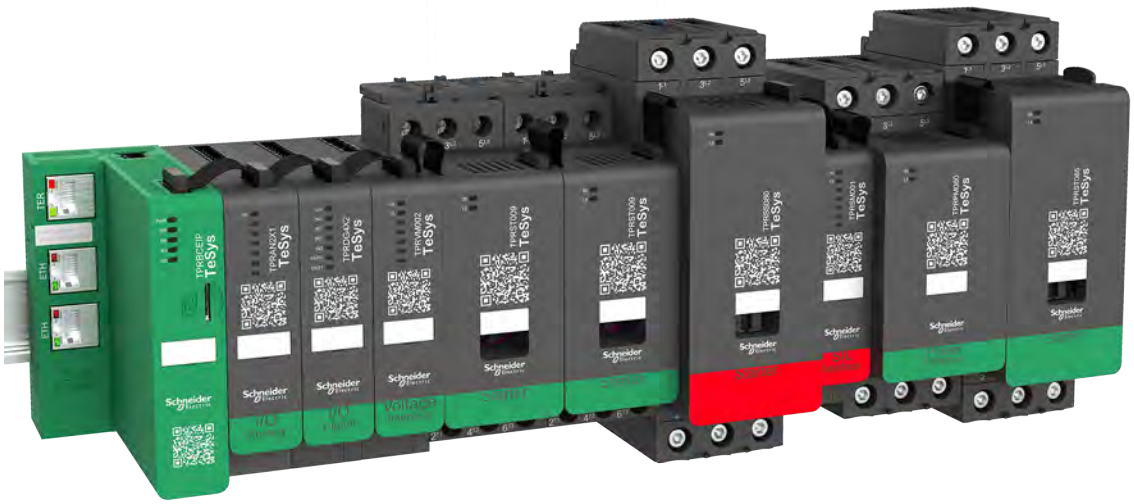
TeSys™ island

PROFIBUS/PROFINET Function Block Library Guide

Instruction Bulletin

TeSys offers innovative and connected solutions for motor starters. This instruction bulletin describes the library of add-on instructions referred to as function blocks for the Siemens ® Totally Integrated Automation (TIA) Portal.

8536IB1917EN R02/20
Release date 04/2020



Legal Information

Table of Contents

Hazard Categories and Special Symbols

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

NOTE: Provides additional information to clarify or simplify a procedure.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

About the Book

Master Range: TeSys

TeSys™ is an innovative motor control and management solution from the global market leader. TeSys offers connected, efficient products and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.

Scope

This user guide describes the TeSys™ island IEC 61131-3 function block libraries for Siemens® Totally Integrated Automation (TIA) Portal. These libraries mainly consist of function blocks that can be used to control, monitor, and diagnose the avatars and devices of a TeSys™ island from within a PLC program written in Siemens TIA Portal.

To aid in creating such a PLC program, this guide provides details on the interfaces of said function blocks as well as an introduction to their usage. It also defines the requirements and prerequisites that need to be met to use the function blocks.

Validity Note

This instruction bulletin is valid for all TeSys™ island configurations. The availability of some functions described in this bulletin depends on the communication protocol used and the physical modules installed on the island.

For product compliance with environmental directives such as RoHS, REACH, PEP, and EOLI, go to *www.se.com/green-premium*.

For technical characteristics of the physical modules described in this bulletin, go to *www.se.com*.

The technical characteristics presented in this bulletin should be the same as those that appear online. We may revise content over time to improve clarity and accuracy. If you see a difference between the information contained in this bulletin and online information, use the online information.

Related Documentation

Table 1 - Related Documentation

Document Title	Description	Document Number
TeSys™ island System Guide	Introduces and describes the main functions of TeSys island	*8536IB1901*
TeSys™ island Installation Guide	Describes the mechanical installation, wiring, and commissioning of TeSys island	*8536IB1902*
TeSys™ island Operating Guide	Describes how to operate and maintain TeSys island	*8536IB1903*
TeSys™ island Functional Safety Guide	Describes the Functional Safety features of TeSys island	*8536IB1904*
TeSys™ island Third Party Function Block Guide	Contains the information needed to create function blocks for third party hardware	*8536IB1905*
TeSys™ island EtherNet/IP™ Function Block Library Guide	Describes the TeSys island library used in the Rockwell Software® Studio 5000® EtherNet/IP™ environment	*8536IB1914*
TeSys™ island EtherNet/IP™ Quick Start Guide	Describes how to quickly integrate TeSys island into the Rockwell Software Studio 5000 EtherNet/IP environment	*8536IB1906*
TeSys™ island DTM Online Help Guide	Describes how to install and use various functions of TeSys island configuration software and how to configure the parameters of TeSys island	*8536IB1907*
TeSys™ island PROFINET and PROFIBUS Function Block Library Guide	Describes the TeSys island library used in the Siemens™ TIA Portal environment	*8536IB1917*
TeSys™ island Quick Start Guide for PROFINET and PROFIBUS Applications	Describes how to quickly integrate TeSys island into the Siemens™ TIA Portal environment	*8536IB1916*
TeSys™ island Product Environmental Profile	Describes constituent materials, recyclability potential, and environmental impact information for the TeSys island	*ENVPEP1904009*
TeSys™ island Product End of Life Instructions	Contains end of life instructions for the TeSys island	*ENVEOLI1904009*
TeSys™ island Instruction Sheet, Bus Coupler, TPRBCEIP	Describes how to install the TeSys island Ethernet/IP bus coupler	*MFR44097*
TeSys™ island Instruction Sheet, Bus Coupler, TPRBCPFN	Describes how to install the TeSys island PROFINET bus coupler	*MFR44098*
TeSys™ island Instruction Sheet, Bus Coupler, TPRBCPFB	Describes how to install the TeSys island PROFIBUS DP bus coupler	*GDE55148*
TeSys™ island Instruction Sheet, Starters and Power Interface Modules, Size 1 and 2	Describes how to install size 1 and 2 TeSys island starters and power interface modules	*MFR77070*
TeSys™ island Instruction Sheet, Starters and Power Interface Modules, Size 3	Describes how to install size 3 TeSys island starters and power interface modules	*MFR77085*
TeSys™ island Instruction Sheet: Input/Output Modules	Describes how to install the TeSys island analog and digital I/O modules	*MFR44099*
TeSys™ island Instruction Sheet: SIL Interface and Voltage Interface Modules	Describes how to install the TeSys island voltage interface modules and SIL[1] interface modules	*MFR44100*

1. Safety Integrity Level according to standard IEC 61508.

Third-Party Documentation

Document Title	Description	Download link
Siemens Guideline on Library Handling in TIA Portal	Among other topics describes the procedure to import libraries into TIA Portal	*https://support.industry.siemens.com/cs/document/109747503/guideline-on-library-handling-in-tia-portal-?dti=0&lc=en-PL*
Siemens SIMATIC S7 S7-1200 Programmable controller	System Manual for Step 7 and S7-1200 CPU	*https://support.industry.siemens.com/cs/document/109772940/simatic-s7-s7-1200-programmable-controller?dti=0&lc=en-WW*
SIMATIC S7-1200 / S7-1500 Comparison list for programming languages based on the international mnemonics	Detailed list of instructions available on different Siemens PLC families	*https://support.industry.siemens.com/cs/document/86630375/simatic-s7-1200-s7-1500-comparison-list-for-programming-languages-based-on-the-international-mnemonics?dti=0&lc=en-WW*

Precautions

Read and understand the following precautions before performing any procedures in this guide.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside this equipment.
- Use only the specified voltage when operating this equipment and any associated products.
- Always use a properly rated voltage sensing device to confirm power is off.
- Use appropriate interlocks where personnel and/or equipment hazards exist.
- Power line circuits must be wired and protected in compliance with local and national regulatory requirements.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices per NFPA 70E, NOM-029-STPS, or CSA Z462 or local equivalent.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- For complete instructions about functional safety, refer to the *TeSys™ island Functional Safety Guide*, 8536IB1904.
- Do not disassemble, repair, or modify this equipment. There are no user serviceable parts.
- Install and operate this equipment in an enclosure appropriately rated for its intended application environment.
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ **WARNING:** This product can expose you to chemicals including Antimony oxide (Antimony trioxide), which is known to the State of California to cause cancer. For more information go to *www.P65Warnings.ca.gov*.

Qualified Personnel

Only appropriately trained persons who are familiar with and understand the content of this guide and all other related product documentation are authorized to work on and with this product.

The qualified person must be able to detect possible hazards that may arise from modifying parameter values and generally from mechanical, electrical, or electronic equipment. The qualified person must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when designing and implementing the system.

The use and application of the information contained in this guide requires expertise in the design and programming of automated control systems. Only you, the user, the machine builder, or the integrator, can be aware of all the conditions and factors present during installation, setup, operation, and maintenance of the machine or process, and can therefore determine the automation and associated equipment and the related safeties and interlocks which can be effectively and properly used.

When selecting automation and control equipment (and any other related equipment or software) for a particular application, you must also consider applicable local, regional, or national standards and/or regulations.

Pay particular attention to adhere to any safety information, electrical requirements, and normative standards that apply to your machine or process in the use of this equipment.

Intended Use

The products described in this instruction bulletin, together with software, accessories, and options, are starters for low-voltage electrical loads, intended for industrial use according to the instructions, directions, examples, and safety information contained in this document and other supporting documentation.

The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements, and the technical data.

Before using the product, you must perform a hazard analysis and risk assessment of the planned application. Based on the results, appropriate safety-related measures must be implemented.

Since the product is used as a component of a machine or process, you must ensure the safety of persons by means of the overall system design.

Operate the product only with the specified cables and accessories. Use only genuine accessories and spare parts.

Any use other than the use explicitly permitted is prohibited and can result in unanticipated hazards.

Cybersecurity

NOTE: Schneider Electric adheres to industry best practices in the development and implementation of control systems. This includes a “Defense-in-Depth” approach to secure an industrial Control System. This approach places the controllers behind one or more firewalls to restrict access to authorized personnel and protocols only.

⚠WARNING

UNAUTHENTICATED ACCESS AND SUBSEQUENT UNAUTHORIZED MACHINE OPERATION

- Evaluate whether your environment or your machines are connected to your critical infrastructure and, if so, take appropriate steps in terms of prevention, based on Defense-in-Depth, before connecting the automation system to any network.
- Limit the number of devices connected to a network inside your company.
- Isolate your industrial network from other networks inside your company.
- Protect any network against unintended access by using firewalls, VPN, or other, proven security measures.
- Monitor activities within your systems.
- Prevent subject devices from direct access or direct link by unauthorized parties or unauthenticated actions.
- Prepare a recovery plan including backup of your system and process information.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Island Concept

TeSys™ island is a modular, multifunctional system providing integrated functions inside an automation architecture, primarily for the direct control and management of low-voltage loads. TeSys island can switch, help protect, and manage motors and other electrical loads up to 80 A (AC1) installed in an electrical control panel.

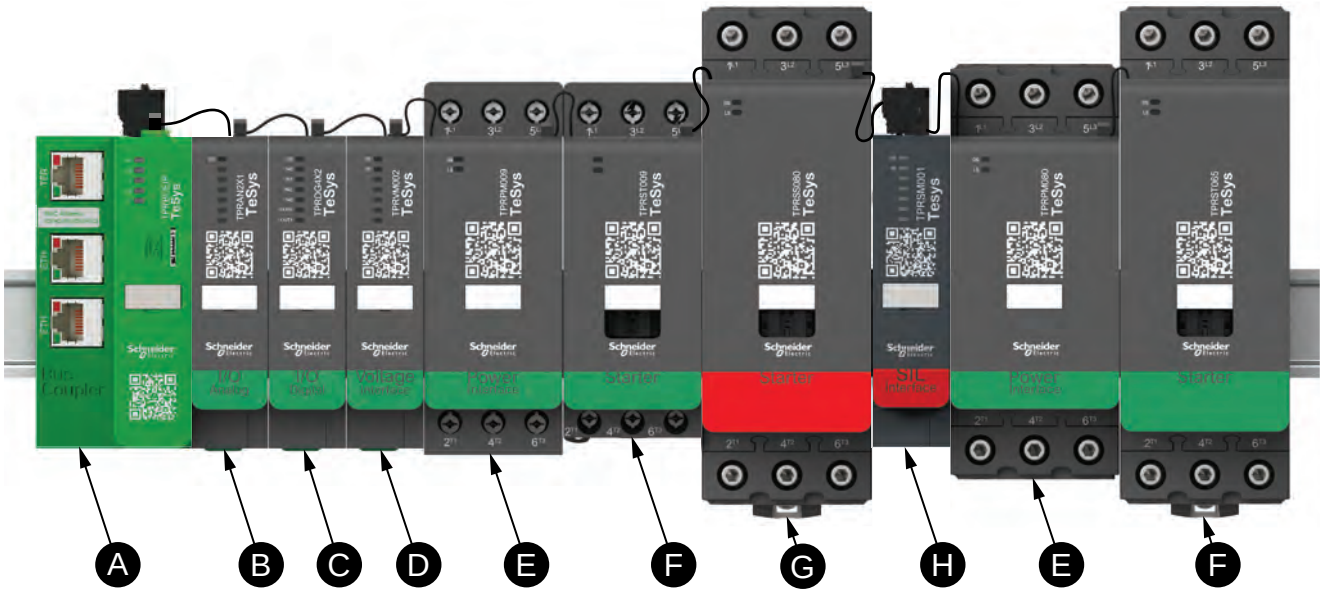
This system is designed around the concept of TeSys avatars. These avatars

- Represent both the logical and physical aspects of the automation functions
- Determine the configuration of the island

The logical aspects of the island are managed with software tools, covering all phases of product and application lifecycle: design, engineering, commissioning, operation, and maintenance.

The physical island consists of a set of devices installed on a single DIN rail and connected together with flat cables providing the internal communication between modules. The external communication with the automation environment is made through a single bus coupler module, and the island is seen as a single node on the network. The other modules include starters, power interface modules, analog and digital I/O modules, voltage interface modules, and SIL (Safety Integrity Level according to standard IEC 61508) interface modules, covering a wide range of operational functions.

Figure 1 - TeSys island Overview



A	Bus Coupler	E	Power Interface Module
B	Analog I/O Module	F	Standard Starter
C	Digital I/O Module	G	SIL Starter
D	Voltage Interface Module	H	SIL Interface Module

General Information

The TeSys™ island function block library for the TIA Portal provides IEC 61131-3 function blocks to support developing applications and to control avatar modules. Avatar modules are digital function objects managed by the TeSys island system. The system interacts with power devices and accessories such as the Analog I/O devices. The avatar modules are configured on the TeSys island, and the bus coupler (via the System avatar) manages fieldbus communication with the controller.

The configuration of the TeSys island modules is managed by the TeSys island Device Type Manager (DTM). For usage with TIA Portal, we recommend you use the DTM integrated into SoMove™ software. For further information, refer to *8536IB1907*, *TeSys™ island DTM Online Help Guide*; *8536IB1916*, *TeSys™ island Quick Start Guide for PROFINET and PROFIBUS Applications*; and other related documentation. See *Related Documentation, page 7*.

NOTE: Unless otherwise specified, the term “function blocks” in this document refers to the IEC61131-3 function blocks in the TeSys™ island function block library for the TIA Portal.

Avatar Definition

TeSys™ avatars bring ready-to-use functions through their predefined logic and associated physical devices. The avatar logic is executed in the bus coupler. The bus coupler manages data exchanges internally within the island, and also externally with the PLC.

There are four types of TeSys avatars:

System avatar

Represents the whole island as a system. The System avatar allows setting the network configuration and computes island level data.

Device avatars

Represent functions performed by switches and I/O modules.

Load avatars

Represent functions related to specific loads, such as a forward-reverse motor. Load avatars include the appropriate modules and operating characteristics to serve the load type. For example, a Motor Two Directions avatar includes two starter modules, accessories, pre-programmed control logic, and a pre-configuration of the available protection functions.

Standard (non-SIL[2]) Load avatars provide the following:

- Local control
- Bypass (to allow an operator to use a local command to temporarily bypass a trip condition and continue the operation of the avatar)
- Process variable monitoring

2. Safety Integrity Level according to standard IEC 61508.

Application avatars

Represent functions related to specific user applications, such as a pump or conveyor. Application avatars provide the following:

- Local control
- Bypass (to allow an operator to use a local command to temporarily bypass a trip condition and continue the operation of the avatar)
- Manual mode override (to allow an operator to use a local input to override the configured control mode and control the avatar from a local command source)

  NOTE: Manual mode override only applies to the Pump avatar.
- Process variable monitoring

For example, a Pump avatar includes the following:

- one starter module
- one or more digital I/O modules for local control and Process Variable (PV) switches
- one or more analog I/O modules for PV inputs
- configurable control logic
- pre-configuration of the load and electrical functions

PV inputs receive analog values from sensors such as a pressure meter, a flow meter, or a vibration meter. PV switches receive discrete signals from switches such as a flow switch or a pressure switch.

Operational control (Run and Stop command) of the avatar in autonomous mode is configurable for up to two PV inputs or PV switches. It includes settings for the threshold and hysteresis for analog inputs, and positive or negative logic for both analog and digital inputs for the Pump avatar.

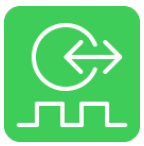
The avatars installed on the TeSys island are controlled by the island's bus coupler. Each avatar includes predefined logic for managing its physical modules, while also providing easy data exchange with PLCs through function blocks. Avatars include pre-configuration of the available protection functions.

Information accessible through the avatar includes the following:

- Control data
- Advanced diagnostics data
- Asset management data
- Energy data

List of TeSys™ Avatars

Table 2 - TeSys Avatars

Name	Icon	Description
System avatar		A required avatar that enables a single point of communication to the island.
Device		
Switch		To make or break a power line in an electrical circuit
Switch - SIL Stop, W. Cat 1/2[3]		To make or break a power line in an electrical circuit with Stop Category 0 or Stop Category 1[4] function compliance for Wiring Category 1 and Category 2.
Switch - SIL Stop, W. Cat 3/4[5]		To make or break a power line in an electrical circuit with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 3 and Category 4.
Digital I/O		To provide control of 2 digital outputs and status of 4 digital inputs
Analog I/O		To provide control of 1 analog output and status of 2 analog inputs
Load		
Power Interface without I/O (measure)		To monitor current supplied to an external device, such as a solid-state relay, soft starter, or variable speed drive
Power Interface with I/O (control)		To monitor current supplied to and to control an external device, such as a solid-state relay, soft starter, or variable speed drive

3. Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.
4. Stop category according to EN/IEC 60204-1.
5. Safety Integrity Level according to standard IEC 61508. Wiring Category 3 and Category 4 according to ISO 13849.

Table 2 - TeSys Avatars (Continued)

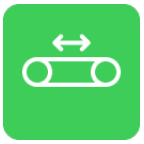
Name	Icon	Description
Motor One Direction		To manage[6] a motor in one direction
Motor One Direction - SIL Stop, W. Cat 1/2		To manage a motor in one direction, with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 1 and Category 2.
Motor One Direction - SIL Stop, W. Cat 3/4		To manage a motor in one direction, with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 3 and Category 4.
Motor Two Directions		To manage a motor in two directions (forward and reverse)
Motor Two Directions - SIL Stop, W. Cat 1/2		To manage a motor in two directions (forward and reverse), with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 1 and Category 2
Motor Two Directions - SIL Stop, W. Cat 3/4		To manage a motor in two directions (forward and reverse), with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 3 and Category 4
Motor Y/D One Direction		To manage a wye-delta (star-delta) motor in one direction
Motor Y/D Two Directions		To manage a wye-delta (star-delta) motor in two directions (forward and reverse)
Motor Two Speeds		To manage a two-speed motor
Motor Two Speeds - SIL Stop, W. Cat 1/2		To manage a two-speed motor, with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 1 and Category 2

6. “Manage” in this context encompasses energizing, controlling, monitoring, diagnosing, and protecting the load.

Table 2 - TeSys Avatars (Continued)

Name	Icon	Description
Motor Two Speeds - SIL Stop, W. Cat 3/4		To manage a two-speed motor, with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 3 and Category 4
Motor Two Speeds Two Directions		To manage a two-speed motor in two directions (forward and reverse)
Motor Two Speeds Two Directions - SIL Stop, W. Cat 1/2		To manage a two-speed motor in two directions (forward and reverse), with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 1 and Category 2
Motor Two Speeds Two Directions - SIL Stop, W. Cat 3/4		To manage a two-speed motor in two directions (forward and reverse), with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 3 and Category 4
Resistor		To manage a resistive load
Power Supply		To manage a power supply
Transformer		To manage a transformer
Application		
Pump		To manage a pump
Conveyor One Direction		To manage a conveyor in one direction
Conveyor One Direction - SIL Stop, W. Cat 1/2		To manage a conveyor in one direction, with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 1 and Category 2

Table 2 - TeSys Avatars (Continued)

Name	Icon	Description
Conveyor Two Directions		To manage a conveyor in two directions (forward and reverse)
Conveyor Two Directions - SIL Stop, W. Cat 1/2		To manage a conveyor in two directions (forward and reverse), with Stop Category 0 or Stop Category 1 function compliance for Wiring Category 1 and Category 2

Function Block Library

The TeSys™ island IEC 61131-3 function block library for the TIA Portal provides function blocks that interact with the TeSys™ island through the bus system interface of Siemens SIMATIC PLCs for PROFINET IO and PROFIBUS DP. To access the data, both cyclic and acyclic communication is used, depending on the way the data is provided by the island. The function blocks themselves only act as a proxy forwarding information between the PLC program and the TeSys™ island without changing it. The implementation of the control logic for the avatars resides entirely within the island itself.

The following sections give an overview of what is required to use the function blocks in the TIA Portal, which data types are being used by the function blocks, which types of function blocks exist and how access to the data of the TeSys™ island from the PLC program.

In general, the function block interface and functionality for both PROFINET IO and PROFIBUS DP is identical. The implementation of the function blocks varies slightly due to the different inner mechanics of PROFIBUS DP.

Prerequisites

Installation requirements

To make full use of the function block library for the TIA Portal described here, we recommend you use it in the context of the full TIA Portal integration for TeSys™ island. Beyond installing the function block library, this usage requires installation of the device descriptions for TeSys™ island for PROFIBUS DP, PROFINET IO, or both. In addition, the AML import/export functionality for island configuration requires installation of the optional TIA Portal package, “TIA Portal Openness”.

You can find more information about the usage and installation of the other parts of the TeSys™ island TIA Portal integration, as well as instructions on how to import the function block library into the TIA Portal, in document 8536IB1916, *TeSys™ island Quick Start Guide for PROFINET and PROFIBUS Applications*.

NOTE: We recommended that you read document 8536IB1916, *TeSys™ island Quick Start Guide for PROFINET and PROFIBUS Applications*, before using the TeSys™ island function block library for the TIA Portal.

Library compatibility

The function block library described in this document has been developed for the Siemens® TIA Portal V15. It should be compatible with any Siemens SIMATIC S7-1200 or S7-1500 series PLCs that meet the PLC requirements (see below).

The library should be compatible with any firmware version of TeSys™ island and any DTM library version for TeSys™ island sharing the same major and minor version (at the time of writing this documentation, version 2.2.x)

All elements within the library (function blocks and data blocks) are configured to use non-optimized data access.

PLC requirements

In order to work, the function blocks in the TeSys™ island function block library for TIA Portal require specific Extended Instructions to be available on the PLC. The instructions required, and the versions of these instructions that the library was tested for, are as follows:

- IO2MOD V1.1
- DPRD_DAT V1.0
- LOG2GEO V1.2
- RDREC V1.0
- WRREC V1.1

At the time of writing this document, these instructions are all available on any Siemens SIMATIC S7-1200 PLC with firmware version V4.1 and above, or SIMATIC S7-1500 PLC with firmware version V1.0 and above.

For more details on the availability and usage of the instruction listed above, refer to the Siemens TIA Portal Information System and the other *Third Party Documentation, page 8* by Siemens.

> **NOTE:** The resources for acyclic communication through the instructions RDREC and WRREC are limited on the Siemens PLCs. Therefore, all function blocks in the library using acyclic communication provide an interlocking input to inhibit acyclic communication, should that be required. See *Acyclic Data, page 36* for more details.

Data Types

In general, the TeSys™ island function block library for the TIA Portal at the function block interfaces uses the standard simple data types (as defined by IEC 61131-3) provided by the Siemens TIA Portal. The individual data types have been chosen to best match the representation and bit-size of the data on the TeSys™ island. Timestamps are represented using the complex data type “DTL” of the Siemens TIA Portal.

For parametrization of the data exchange, the two special data types “Variant” (cyclic input data) and “HW_IO” (acyclic data) are used as function block inputs where appropriate (see also *Data Access, page 34*).

For additional information on the usage, data ranges, bit-sizes, and conversion functions for the Siemens TIA Portal data types, refer to the Siemens TIA Portal Information System.

For some purposes, the function blocks use User Defined Types (UDTs) in the Siemens TIA Portal. See *UDTs, page 20*.

UDTs

To provide structured access to coherent data (for example, the energy data of an avatar), User Defined Types (UDTs) have been created in the Siemens TIA Portal. Some of the UDTs are used at the function block interface, while some are merely for internal use by the function block. The definitions of all required UDTs are included in the TeSys™ island IEC 61131-3 library for the Siemens TIA Portal.

Some UDTs also use structured sub-types for further structuring of the data (for example, individual bits within a bit-field).

The following sections specify the contents of all UDTs included in the library and their sub-structures where appropriate.

NOTE: When importing function blocks to your TIA Portal project, you need only import the function blocks for the functionalities required by your application. The TIA Portal also automatically imports the UDT definitions required by the function blocks. When updating the function block library to a new version, you also need to import the latest definitions of the used UDTs alongside the latest function block versions.

NOTE: Do not alter the definitions of the UDTs described in this document. Otherwise, the function blocks will not work correctly.

UDT_Control

The *Control* UDT is used to transfer the acyclic control data of an avatar, like alarm and trip messages. The interfaces of all PROFINET IO and PROFIBUS DP Control avatar function blocks contain this UDT as a parameter.

Not all Alarm and Trip Message bits are supported by all Control avatars. Details of which bits are supported by the individual avatars are included in the descriptions of the *Avatar Control Function Blocks, page 61*.

Table 3 - Elements

Element	Data Type	Description
MotorTemperature	UINT	Indicates the temperature of the motor in increments of 0.1 °C. Depending on the temperature sensor type, the range is as follows: • –200 to 850 °C (–328 to 1562 °F) (for PT100) • –200 to 600 °C (–328 to 1112 °F) (for PT1000) • –60 to 180 °C (–76 to 356 °F) (for NI 100/1000)
SIL[7] Group	USINT	Indicates the number of the SIL group.
ThermalCapacity	USINT	Provides the percentage (%) of the thermal capacity of the motor.
AlarmMsg1	STRUCT	The alarm messages of a Control avatar. See *Struct AlarmMsg1, page 21*.
AlarmMsg2	STRUCT	The alarm messages of a Control avatar. See *Struct AlarmMsg2, page 22*.
TripMsg1	STRUCT	The trip messages of a Control avatar. See *Struct TripMsg1, page 22*.
TripMsg2	STRUCT	The trip messages of a Control avatar. See *Struct TripMsg2, page 23*.
TimeToTrip	UINT	Estimated time (s) before a Thermal Overload trip will occur given the current conditions.
TimeToReset	UINT	Estimated time to wait before a reset could acknowledge a Thermal Overload trip.
PAStatusReg1	Struct	Predictive Alarm Status Register 1

Table 4 - Struct AlarmMsg1

Element	Data Type	BIT	Description
(reserved)	BOOL	8	
(reserved)	BOOL	9	
(reserved)	BOOL	10	
(reserved)	BOOL	11	
(reserved)	BOOL	12	
(reserved)	BOOL	13	
(reserved)	BOOL	14	

7. Safety Integrity Level according to standard IEC 61508.

Table 4 - Struct AlarmMsg1 (Continued)

Element	Data Type	BIT	Description
(reserved)	BOOL	15	
(reserved)	BOOL	0	
(reserved)	BOOL	1	
GroundCurrent	BOOL	2	The avatar has detected the conditions to cause a ground current event.
ThermalOverload	BOOL	3	The avatar thermal capacity has increased above the thermal overload level.
(reserved)	BOOL	4	
Jam	BOOL	5	The avatar has detected the conditions to cause a jam event.
CurrentPhaseUnbalance	BOOL	6	The avatar has detected the conditions to cause a current phase unbalance event.
UnderCurrent	BOOL	7	The avatar has detected the conditions to cause an undercurrent event.

Table 5 - Struct AlarmMsg2

Element	Data Type	BIT	Description
(reserved)	BOOL	8	
(reserved)	BOOL	9	
(reserved)	BOOL	10	
(reserved)	BOOL	11	
(reserved)	BOOL	12	
(reserved)	BOOL	13	
(reserved)	BOOL	14	
(reserved)	BOOL	15	
(reserved)	BOOL	0	
(reserved)	BOOL	1	
(reserved)	BOOL	2	
OverCurrent	BOOL	3	The avatar has detected the conditions to cause an overcurrent event.
(reserved)	BOOL	4	
(reserved)	BOOL	5	
MotorOverheat	BOOL	6	The motor temperature has increased above the motor overheat level.
(reserved)	BOOL	7	

Table 6 - Struct TripMsg1

Element	Data Type	BIT	Description
Stall	BOOL	8	The avatar has detected the conditions to cause a stall trip event.
(reserved)	BOOL	9	
(reserved)	BOOL	10	
(reserved)	BOOL	11	
(reserved)	BOOL	12	
(reserved)	BOOL	13	

Table 6 - Struct TripMsg1 (Continued)

Element	Data Type	BIT	Description
(reserved)	BOOL	14	
(reserved)	BOOL	15	
(reserved)	BOOL	0	
(reserved)	BOOL	1	
GroundCurrent	BOOL	2	The avatar has detected the conditions to cause a ground current trip event.
ThermalOverload	BOOL	3	The avatar thermal capacity has increased above 100%.
LongStart	BOOL	4	The avatar has detected the conditions to cause a long start trip event.
Jam	BOOL	5	The avatar has detected the conditions to cause a jam trip event.
CurrentPhaseUnbalance	BOOL	6	The avatar has detected the conditions to cause a current phase unbalance trip event.
UnderCurrent	BOOL	7	The avatar has detected the conditions to cause an undercurrent trip event.

Table 7 - Struct TripMsg2

Element	Data Type	BIT	Description
(reserved)	BOOL	8	
(reserved)	BOOL	9	
(reserved)	BOOL	10	
(reserved)	BOOL	11	
(reserved)	BOOL	12	
(reserved)	BOOL	13	
(reserved)	BOOL	14	
(reserved)	BOOL	15	
(reserved)	BOOL	0	
(reserved)	BOOL	1	
PhaseConfig	BOOL	2	The avatar has detected the conditions to cause a phase configuration trip event.
OverCurrent	BOOL	3	The avatar has detected the conditions to cause an overcurrent trip event.
CurrentPhaseLoss	BOOL	4	The avatar has detected the conditions to cause a current phase loss trip event.
CurrentPhaseReversal	BOOL	5	The avatar has detected the conditions to cause a current phase reversal trip event.
MotorOverheat	BOOL	6	The motor temperature has increased above the motor overheat trip level.
(reserved)	BOOL	7	

Table 8 - Struct PAStatusReg1

Element	Data Type	BIT	Description
PA8Status	BOOL	8	Status of Predictive Alarm Bit 8
PA9Status	BOOL	9	Status of Predictive Alarm Bit 9
(reserved)	BOOL	10	
(reserved)	BOOL	11	

Table 8 - Struct PAStatusReg1 (Continued)

Element	Data Type	BIT	Description
(reserved)	BOOL	12	
(reserved)	BOOL	13	
(reserved)	BOOL	14	
(reserved)	BOOL	15	
PA0Status	BOOL	0	Status of Predictive Alarm Bit 0
PA1Status	BOOL	1	Status of Predictive Alarm Bit 1
PA2Status	BOOL	2	Status of Predictive Alarm Bit 2
PA3Status	BOOL	3	Status of Predictive Alarm Bit 3
PA4Status	BOOL	4	Status of Predictive Alarm Bit 4
PA5Status	BOOL	5	Status of Predictive Alarm Bit 5
PA6Status	BOOL	6	Status of Predictive Alarm Bit 6
PA7Status	BOOL	7	Status of Predictive Alarm Bit 7

UDT_Diagnostic

The *Diagnostic* UDT is used to transfer the acyclic diagnostic data of an avatar, like Irms, alarm and trip information. The interfaces of the PROFINET IO and PROFIBUS DP generic diagnostic avatar function blocks contain this UDT as a parameter.

Table 9 - Elements

Element	Data Type	Description
MaxAvgIRMS	UDINT	Maximum average Irms current value.
MaxAvgIRMSTImeStamp	DTL	Date and time when the maximum average value of the Irms current was recorded.
IRMSPhase1	UDINT	Value of the phase L1 Irms. (Unit: mA).
IRMSPhase2	UDINT	Value of the phase L2 Irms. (Unit: mA).
IRMSPhase3	UDINT	Value of the phase L3 Irms. (Unit: mA).
AlarmCnt	STRUCT	Alarm counters. See *Struct AlarmCnt, page 24*.
TripCnt	STRUCT	Trip counters. See *Struct TripCnt, page 25*.
TripRecReg1	STRUCT	Record 1 of a trip event. See *Struct TripRecRegX, page 25*.
TripRecReg2	STRUCT	Record 2 of a trip event. See *Struct TripRecRegX, page 25*.
TripRecReg3	STRUCT	Record 3 of a trip event. See *Struct TripRecRegX, page 25*.
TripRecReg4	STRUCT	Record 4 of a trip event. See *Struct TripRecRegX, page 25*.
TripRecReg5	STRUCT	Record 5 of a trip event. See *Struct TripRecRegX, page 25*.

Table 10 - Struct AlarmCnt

Element	Data Type	Description
ThermOverload	UInt	Counter of advisories related to thermal overload protection.
Jam	UInt	Counter of advisories related to jam protection.
Undercurrent	UInt	Counter of advisories related to undercurrent protection.
Overcurrent	UInt	Counter of advisories related to overcurrent protection.
IPhaseUnbal	UInt	Counter of advisories related to phase unbalance protection.
GroundCurrent	UInt	Counter of advisories related to ground current protection.

Table 10 - Struct AlarmCnt (Continued)

Element	Data Type	Description
Overheat	UInt	Counter of motor overheat events.
AllAlarms	UInt	Counter of advisories related to protections.

Table 11 - Struct TripCnt

Element	Data Type	Description
ThermOverload	UInt	Counter of trips related to thermal overload protection.
Jam	UInt	Counter of trips related to jam protection.
Undercurrent	UInt	Counter of trips related to undercurrent protection.
LongStart	UInt	Counter of trips related to long start protection.
Overcurrent	UInt	Counter of trips related to overcurrent protection.
Overheat	UInt	Counter of motor overheat trip events.
Stall	UInt	Counter of trips related to stall protection.
IPhaseUnbal	UInt	Counter of trips related to phase unbalance protection.
PhaseConfT	UInt	Counter of trips related to phase configuration protection.
GroundCurrent	UInt	Counter of trips related to ground current protection.
PhaseReversal	UInt	Counter of trips related to phase reversal protection.
CurrentPhaseLoss	UInt	Counter of trips related to phase loss protection.
AllTrips	UInt	Counter of trips related to protections.

Table 12 - Struct TripRecRegX

Element	Data Type	Description
DTL	DTL	TIA timestamp format
TTTT	WORD	Trip event identifier 0000—No Detected Event 0001—Thermal Overload 0002—Motor Overheat 0003—Jam 0004—Undercurrent 0005—Long Start 0006—Overcurrent 0007—Stall 0008—Ground Current 0009—Current Phase Reversal 0010—Phase Configuration 0011—Current Phase Unbalance 0012—Current Phase Loss

UDT_Energy

The *Energy* UDT is used to transfer the acyclic energy data of an avatar, like power and active/reactive energy information. The interfaces of the PROFINET IO and PROFIBUS DP generic energy avatar function blocks contain this UDT as a parameter.

Table 13 - Elements

Element	Data Type	Description
TotActPower	DINT	Total active power for the avatar. (Unit: W)
MaxTotActPow	DINT	Maximum value of the active power value for the avatar (Unit: W)
MaxTotActPowTimestamp	DTL	Date and time when the maximum active power value was recorded.
TotReactPower	DINT	Total reactive power value of the avatar (Unit: VAR)
MaxTotReactPow	DINT	Maximum value of the reactive power value for the avatar (Unit: VAR)
MaxTotReactPowTimestamp	DTL	Date and time when the maximum reactive power value was recorded.
TruePowFact	USINT	True power factor value.
MinTruePowFact	USINT	Minimum value of the true power factor.
MaxTruePowFact	USINT	Maximum value of the true power factor.
MinTruePowFactTimestamp	DTL	Date and time when the minimum true power factor was recorded.
MaxTruePowFactTimestamp	DTL	Date and time when the maximum value of the true power factor was recorded.
TotActEnergy	UDINT	Total active energy value for all avatars in the system with Energy Monitoring Enabled. (Unit: Wh)
TotReactEnergy	UDINT	Total reactive energy value for all avatars in the system with Energy Monitoring Enabled. (Unit VARh)
ToU_TotActEnergyCh1	UDINT	Channel 1: ToU (Time of Use) total active energy value.
ToU_TotActEnergyCh2	UDINT	Channel 2: ToU (Time of Use) total active energy value.
ToU_TotActEnergyCh3	UDINT	Channel 3: ToU (Time of Use) total active energy value.
ToU_TotActEnergyCh4	UDINT	Channel 4: ToU (Time of Use) total active energy value.
ToU_TotReactEnergyCh1	UDINT	Channel 1: ToU (Time of Use) total reactive energy value.
ToU_TotReactEnergyCh2	UDINT	Channel 2: ToU (Time of Use) total reactive energy value.
ToU_TotReactEnergyCh3	UDINT	Channel 3: ToU (Time of Use) total reactive energy value.
ToU_TotReactEnergyCh4	UDINT	Channel 4: ToU (Time of Use) total reactive energy value.

UDT_PVControl

The *PVControl* UDT is used to transfer an avatar's cyclic process variable data, like analog values from sensors and discrete signals from switches. The interfaces of the PROFINET IO and PROFIBUS DP application avatar function blocks contain this UDT as a parameter.

Table 14 - Elements

Element	Data Type	Description
PVInput0	INT	Process variable input for analog value
PVInput1	INT	Process variable input for analog value
PVInput2	INT	Process variable input for analog value
PVInput3	INT	Process variable input for analog value
PVInput4	INT	Process variable input for analog value
PVSwitch0	BOOL	Process variable switch for discrete signals
PVSwitch1	BOOL	Process variable switch for discrete signals
PVSwitch2	BOOL	Process variable switch for discrete signals
PVSwitch3	BOOL	Process variable switch for discrete signals

Table 14 - Elements (Continued)

Element	Data Type	Description
PVSwitch4	BOOL	Process variable switch for discrete signals
Reserve	BOOL	
Reserve	BOOL	
Reserve	BOOL	
PVControlIn0	BOOL	Status of PV Control-Input 0
PVControlIn1	BOOL	Status of PV Control-Input 1
Reserve	BOOL	
Reserve	BOOL	
Reserve	BOOL	
Reserve	BOOL	
Reserve	BOOL	
Reserve	BOOL	

UDT_PredictiveAlarmMessages

The *PredictiveAlarmMessages* UDT is used as a template when importing the predictive alarm status messages from SoMove™ software into the TIA Portal. This UDT contains the predictive alarm status messages for one avatar. See the *TeSys™ island Quick Start Guide for PROFINET and PROFIBUS Applications*, document number *8536IB1916* for more details on importing predictive alarm status messages.

Table 15 - Elements

Element	Data Type	Description
PAStatusMessage0	STRING[150]	Message associated with Predictive Alarm Bit 0
PAStatusMessage1	STRING[150]	Message associated with Predictive Alarm Bit 1
PAStatusMessage2	STRING[150]	Message associated with Predictive Alarm Bit 2
PAStatusMessage3	STRING[150]	Message associated with Predictive Alarm Bit 3
PAStatusMessage4	STRING[150]	Message associated with Predictive Alarm Bit 4
PAStatusMessage5	STRING[150]	Message associated with Predictive Alarm Bit 5
PAStatusMessage6	STRING[150]	Message associated with Predictive Alarm Bit 6
PAStatusMessage7	STRING[150]	Message associated with Predictive Alarm Bit 7
PAStatusMessage8	STRING[150]	Message associated with Predictive Alarm Bit 8
PAStatusMessage9	STRING[150]	Message associated with Predictive Alarm Bit 9

UDT_ProductData

The *ProductData* UDT is used to provide an avatar's product data as one coherent variable. The interfaces of the PROFINET IO and PROFIBUS DP System Asset Management and the Device Asset Management avatar function blocks use this UDT as a parameter.

Table 16 - Elements

Element	Data Type	Description
VendorName	STRING[20]	Vendor name.
ProductCode	STRING[32]	Vendor specific product code.
MajorMinorRev	STRING[7]	Revision number of the application firmware in format xxx.yyy.

Table 16 - Elements (Continued)

Element	Data Type	Description
VendorURL	STRING[64]	Vendor URL.
ProductName	STRING[32]	Product name.
ModelName	STRING[20]	Model name.
SerialNumber	STRING[20]	Serial number of the module.

UDT_RDREC

The *RDREC* UDT is used to store status information of an acyclic read request internally.

Table 17 - Elements

Element	Data Type	Description
xQ_RTrig	BOOL	Rising edge result, to transfer data to function block variables
qxValid	BOOL	Acyclic read request result is VALID
qxBusy	BOOL	Acyclic read function is busy
qxError	BOOL	Acyclic read request ends with ERROR
qdwStatus	DWORD	Status result of acyclic read function
quiLen	UINT	Length of read data as feedback value.
ixStartRead	BOOL	Enable/Start acyclic read function

UDT_SystemDiag

The *SystemDiag* UDT is used to transfer the acyclic diagnostic data of the system. The interfaces of the PROFINET IO and PROFIBUS DP SystemDiag avatar function blocks contain this UDT as a parameter.

Table 18 - Elements

Element	Data Type	Description
CntErrComm	UINT	Number of detected errors for the fieldbus communication.
CntAllAlarms	UINT	Number of detected alarms for the system.
CntSystemEvt	UINT	Number of detected minor events for the system.
EvtRecReg1	STRUCT	Information on a detected minor event – register 1. See *Struct EvtRecRegX, page 29*.
EvtRecReg2	STRUCT	Information on a detected minor event – register 2. See *Struct EvtRecRegX, page 29*.
EvtRecReg3	STRUCT	Information on a detected minor event – register 3. See *Struct EvtRecRegX, page 29*.
EvtRecReg4	STRUCT	Information on a detected minor event – register 4. See *Struct EvtRecRegX, page 29*
EvtRecReg5	STRUCT	Information on a detected minor event – register 5. See *Struct EvtRecRegX, page 29*.
SILStopMsgGrp1	STRUCT	Status for SIL Stop 0[8] function of SIL group 1. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp2	STRUCT	Status for SIL Stop 0 function of SIL group 2. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp3	STRUCT	Status for SIL Stop 0 function of SIL group 3. See *Struct SILStopMsgX, page 29*.

8. Safety Integrity Level according to standard IEC 61508. Stop categories according to EN/IEC 60204-1.

Table 18 - Elements (Continued)

Element	Data Type	Description
SILStopMsgGrp4	STRUCT	Status for SIL Stop 0 function of SIL group 4. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp5	STRUCT	Status for SIL Stop 0 function of SIL group 5. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp6	STRUCT	Status for SIL Stop 0 function of SIL group 6. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp7	STRUCT	Status for SIL Stop 0 function of SIL group 7. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp8	STRUCT	Status for SIL Stop 0 function of SIL group 8. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp9	STRUCT	Status for SIL Stop 0 function of SIL group 9. See *Struct SILStopMsgX, page 29*.
SILStopMsgGrp10	STRUCT	Status for SIL Stop 0 function of SIL group 10. See *Struct SILStopMsgX, page 29*.

Table 19 - Struct EvtRecRegX

Element	Data Type	Description
DTL	DTL	TIA timestamp format
FFFF	WORD	Detected minor event identifier. 0000: No Detected Minor Event. 0001: No module in the island. 0002: Number of physical devices detected in the island is beyond the limit allowed. 0003: Modules mismatch. 0004: Island control power supply voltage fluctuation.

Table 20 - Struct SILStopMsgX

Element	Data Type	Description
SILGrpNotInSysConf	BOOL	SIL Group not present in system configuration
Reserved	BOOL	SIL Group impacted by Avatar Device event
SILCmdRecSILStarterNotOpen	BOOL	SIL Group stop command received; SIL starters not open yet
SILCmdOkSILStarterOpened	BOOL	SIL Group stop command successfully issued; all SIL starters are open
SILCmdTo1Terminal	BOOL	SIL Group stop command issued to only 1 SIL interface module (SIM) input channel (jumper or SIM input wiring is causing an issue) but SIL starters did successfully open
NormalOperation	BOOL	Normal operation, SIL starters can be open or closed
<Reserved>	BOOL	Byte-filler
<Reserved>	BOOL	Byte-filler

UDT_SystemEnergy1

The *SystemEnergy1* UDT is used to transfer the acyclic voltage energy data of the System avatar. The interfaces of the PN_SystemEnergy and DP_SystemEnergy function blocks contain this UDT as a parameter.

Table 21 - Elements

Element	Data Type	Description
VrmsAverg	UINT	Average Vrms voltage on three phases. (Unit: V)
VrmsMaxAvg	UINT	This register indicates maximum voltage the avatar has measured in its lifetime. (Unit: V)
VtimeMaxAvg	DTL	Timestamp of maximum average.
VrmsPhase1	UINT	Average Vrms voltage between L1 and neutral. (Unit: V)
VrmsPhase2	UINT	Average Vrms voltage between L2 and neutral. (Unit: V)
VrmsPhase3	UINT	Average Vrms voltage between L3 and neutral. (Unit: V)
VrmsL1L2	UINT	Average Vrms voltage between L1 and L2. (Unit: V)
VrmsL2L3	UINT	Average Vrms voltage between L2 and L3. (Unit: V)
VrmsL3L1	UINT	Average Vrms voltage between L3 and L1. (Unit: V)
VUnbalPerc	USINT	Unbalance voltage in percent (%).
VUnbalMax	USINT	Maximum unbalance voltage in percent (%).
VtimeUnbalMax	DTL	Date and time of maximum unbalance voltage.
PhaseSequ	Byte	Phase sequence (ABC or ACB).
Frequency	USINT	Main power voltage frequency (line frequency as measured on phase 1). (Unit: Hz)
VDipRecordReg1	STRUCT	Voltage Dip record register 1. See *Struct VDipRecordRegX, page 30*.
VDipRecordReg2	STRUCT	Voltage Dip record register 2. See *Struct VDipRecordRegX, page 30*.
VDipRecordReg3	STRUCT	Voltage Dip record register 3. See *Struct VDipRecordRegX, page 30*.
VDipRecordReg4	STRUCT	Voltage Dip record register 4. See *Struct VDipRecordRegX, page 30*.
VDipRecordReg5	STRUCT	Voltage Dip record register 5. See *Struct VDipRecordRegX, page 30*.
VDipCnt	UINT	Voltage dip counter value.

Table 22 - Struct VDipRecordRegX

Element	Data Type	Description
uiMagnitude	UINT	Magnitude of the voltage register.
dtlStartDate	DTL	Start timestamp of the voltage register.
dtlStopDate	DTL	Stop timestamp of the voltage register.

UDT_SystemEnergy2

The *SystemEnergy2* UDT is used to transfer the acyclic energy and power data of the System avatar. The interfaces of the PN_SystemEnergy and DP_SystemEnergy function blocks contain this UDT as a parameter.

Table 23 - Elements

Element	Data Type	Description
VSwellRecordReg1	STRUCT	See *Struct VSwellRecordRegX, page 31*.
VSwellRecordReg2	STRUCT	See *Struct VSwellRecordRegX, page 31*.
VSwellRecordReg3	STRUCT	See *Struct VSwellRecordRegX, page 31*.
VSwellRecordReg4	STRUCT	See *Struct VSwellRecordRegX, page 31*.
VSwellRecordReg5	STRUCT	See *Struct VSwellRecordRegX, page 31*.
VSwellCnt	UINT	Voltage swell counter value.
TotActPow	DINT	Total active power for the system. (Unit: W)

Table 23 - Elements (Continued)

Element	Data Type	Description
MaxTotActPow	DINT	Maximum value of the active power for the system. (Unit: W)
MaxTotActPowTimestamp	DTL	Date and time when the maximum active power value was recorded.
TotReactPower	DINT	Total reactive power for the system. (Unit: VAR)
MaxTotReactPow	DINT	Maximum value of the reactive power for the system. (Unit: VAR)
MaxTotReactPowTimestamp	DTL	Date and time when the maximum reactive power value was recorded.
TruePowFact	USINT	True power factor value.
MinTruePowFact	USINT	True minimum power factor value.
MaxTruePowFact	USINT	True maximum power factor value.
MinTruePowFactTimestamp	DTL	Date and time when the minimum true power factor value was recorded.
MaxTruePowFactTimestamp	DTL	Date and time when the maximum power factor value was recorded.
TotActEnergy	UDINT	Total active energy value for all avatars in the system with Energy Monitoring Enabled. (Unit: Wh)
TotReactEnergy	UDINT	Total reactive energy value for all avatars in the system with Energy Monitoring Enabled. (Unit: VARh)

Table 24 - Struct VSwellRecordRegX

Element	Data Type	Description
uiMagnitude	UINT	Magnitude of the voltage register.
dtlStartDate	DTL	Start timestamp of the voltage register.
dtlStopDate	DTL	Stop timestamp of the voltage register.

UDT_SystemWriteCmds

The *SystemWriteCmds* UDT is used to transfer the acyclic system reset commands and avatar energy preset data. The interfaces of the PN_SystemWriteCmds and DP_SystemWriteCmds function blocks contain this UDT as a parameter.

Table 25 - Elements

Element	Data Type	Description
stSystemWrite	STRUCT	The acyclic write commands of the system. See *Struct SystemWrite, page 31*.
aAvatarWrite	Array[1..20] of STRUCT	Contains an array of the acyclic write commands of all 20 possible avatars. See *Struct AvatarWrite, page 32*.

Table 26 - Struct SystemWrite

Element	Data Type	Description
usiResetVoltageDipCnt	USINT	If this input is set to 1, the value of the parameter VDipCnt is reset.
usiResetVoltageSwellCnt	USINT	If this input is set to 1, the value of the parameter VSwellCnt is reset.
usiResetMaxTotActive	USINT	If this input is set to 1, the value of the parameter MaxTotActPow and the associated time stamp MaxTotActPowTimestamp are reset.
usiResetMaxTotReactive	USINT	If this input is set to 1, the value of the parameter MaxTotReactPow and the associated time stamp MaxTotReactPowTimestamp are reset.

Table 26 - Struct SystemWrite (Continued)

Element	Data Type	Description
usiResetMinTruePow	USINT	If this input is set to 1, the true value of the parameter MinTruePowFact is reset to 1 and the associated time stamp MinTruePowFactTimestamp is reset.
usiResetMaxTruePow	USINT	If this input is set to 1, the true value of the parameter MaxTruePowFact is reset to 1 and the associated time stamp MaxTruePowFactTimestamp is reset.
usiResetTotReactEng	USINT	If this input is set to 1, the value of the parameter TotReactEnergy is reset.
usiResetTotActEng	USINT	If this input is set to 1, the value of the parameter TotActEnergy is reset.

Table 27 - Struct AvatarWrite

Element	Data Type	Description
usiSetActEng	USINT	Command to set the Total Active Energy value to Total Active Energy Preset value.
usiSetReactEng	USINT	Command to set the Total Reactive Energy value to Total Reactive Energy Preset value.
udiTotActEngValue	UDINT	Preset the Total Active Energy value.
udiTotReactEngValue	UDINT	Preset the Total Reactive Energy value.

UDT_WRREC

The *WRREC* UDT is used to store status information of an acyclic write request internally.

Table 28 - Elements

Element	Data Type	Description
xQ_RTrig	BOOL	Rising edge result, to transfer data to function block variables.
qxDone	BOOL	Acyclic write request result is DONE.
qxBusy	BOOL	Acyclic write function is busy.
qxError	BOOL	Acyclic write request ends with ERROR.
qdwStatus	DWORD	Status result of acyclic write function.
ixStartWrite	BOOL	Enable/Start acyclic write function.

Function Block Types

There are three basic types of function blocks:

- System Avatar function blocks
- Avatar function blocks
- Device Asset Management function blocks

The following sections give an overview of the functionalities that each of these function block types provides.

The function blocks in the TeSys™ island function block library for the TIA Portal potentially use both cyclic and acyclic communication with the island. Details on the control mechanisms and parameters involved with the two communication types are given in *Data Access, page 34*.

System Avatar Function Blocks

The System avatar represents the whole island as a system. The System avatar allows the setting of the network configuration, and it computes island-level data. The function blocks of this category provide access to the various functionalities of the System avatar as well as its Diagnostic, Energy, and Asset Management Data. The function blocks of this category are contained in the folders “DP_System” (PROFIBUS DP) and “PN_System” (PROFINET IO) of the library respectively.

System avatar function blocks use a combination of cyclic input and output data as well as acyclic read and write requests, depending on the functionality of the individual function block.

Avatar Function Blocks

The Avatar function blocks are sub-divided into two categories:

- Avatar Control function blocks
- Generic Avatar function blocks

Avatar Control Function Blocks

For each avatar type (Device, Load, or Application), the TeSys™ island function block library for the TIA Portal provides a dedicated control function block in the folder “DP_Avatar” or “PN_Avatar”. These function blocks can be used to control the functionalities of the respective avatars and retrieve status information about the avatar. Each instance of an avatar on a TeSys™ island also requires its own instance of the appropriate avatar control function block in the PLC program, if it will be controlled from the PLC program.

Avatar Control function blocks use a combination of cyclic input and output data as well as acyclic read requests, depending on the functionality of the individual function block and the data the avatar provides.

Generic Avatar Function Blocks

Some data sets and functionalities are common to all avatars. For these, generic function blocks have been defined to access the data. They work with any avatar that supports the data sets and functionality (see individual function block descriptions for details). The function blocks can be found in the folders “DP_Common” and “PN_Common”. For each avatar that the functionality is used for, or that the data is retrieved for, an individual instance of the function blocks must be created using the same data access parameters as used for the avatar control function blocks. The access to acyclic data should be interlocked externally to avoid detected errors, due to resource limitations of the PLC as described in *Acyclic Data, page 36*. For cyclic communication, the protocol is designed so that there is no interference between different function blocks.

Generic avatar function blocks use a combination of cyclic input and output data as well as acyclic read requests, depending on the functionality they provide.

Device Asset Management Function Blocks

Asset Management Data supplements the data of the System avatar and the individual Device, Load, and Application avatars. Asset Management Data of the island devices can be accessed through the Device Asset Management function blocks. For each type of device, an individual function block has been created. Starters and SIL[9] Starters share a common implementation, as do Digital and Analog I/O modules. These function blocks can be found in the folders “DP_Devices” and “PN_Devices”. The function blocks must be instantiated for each device that the Asset Management data is retrieved for.

Device Asset Management function blocks only use acyclic read requests.

9. Safety Integrity Level according to standard IEC 61508.

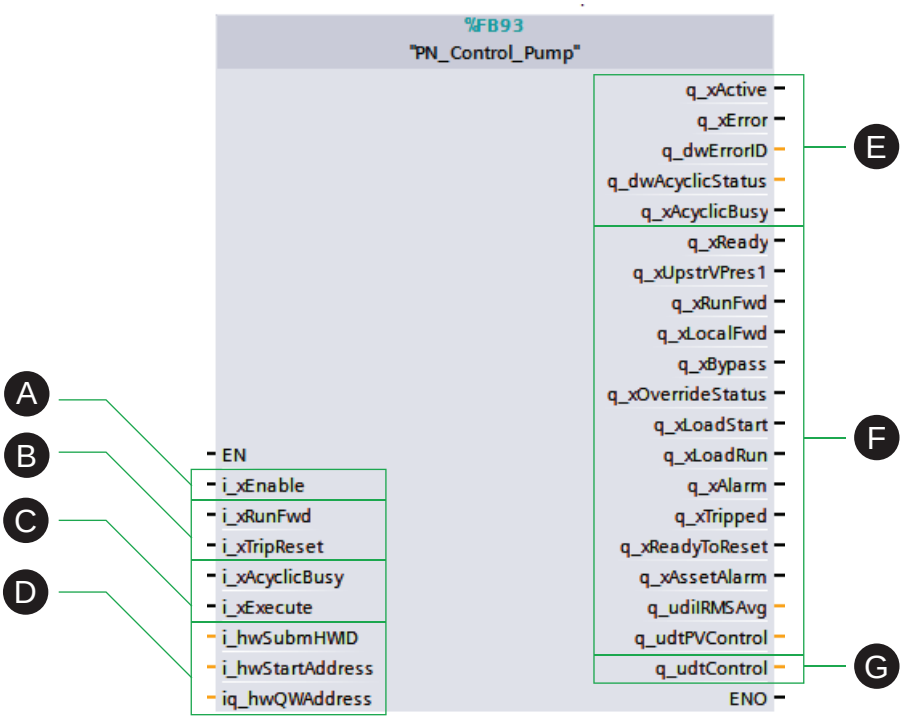
NOTE: The devices of the TeSys™ island are represented in the slots starting at number 101 on the TeSys™ island bus device for both PROFINET IO and PROFIBUS DP.

Data Access

As previously stated, the function blocks use both cyclic and acyclic communication mechanisms to retrieve data from and send data to the TeSys™ island, depending on their functionality.

The following sections give an overview of how these two communication mechanisms can be controlled at the function block interface, what status information about the communication is available, and what parameters are involved to configure data access.

Figure 2 -



A	Variables to control cyclic communication	E	Function block status
B	Variables to control the Avatar communication	F	Avatar status
C	Variables to control acyclic communication	G	Results of acyclic communication
D	Parameters for cyclic and acyclic communication		

Cyclic Data

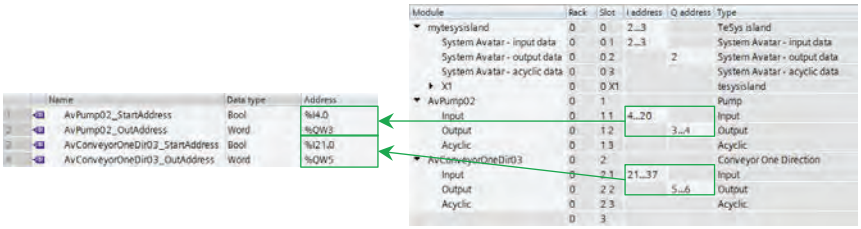
All function blocks accessing cyclic data use two interface variables to parametrize the access to the cyclic data:

- i_hwStartAddress for cyclic input data
- iq_hwQWAddress for cyclic output data

Interface variable “i_hwStartAddress” (data type “Variant”) is used by the function blocks to retrieve the full amount of cyclic input data associated with the avatar. For the function block to do that, it must be parametrized with the starting address

of the input range of the avatar (input sub-module of the avatar for PROFINET IO, avatar module for PROFIBUS DP). The usual method is to create PLC Tags for an address at the beginning of the range. The data size of the PLC tag is of no consequence, as long as it is at the beginning of the range (for example, BOOL “AvPump02_StartAddress” pointing to Address “%I4.0” for the Pump avatar in the example below).

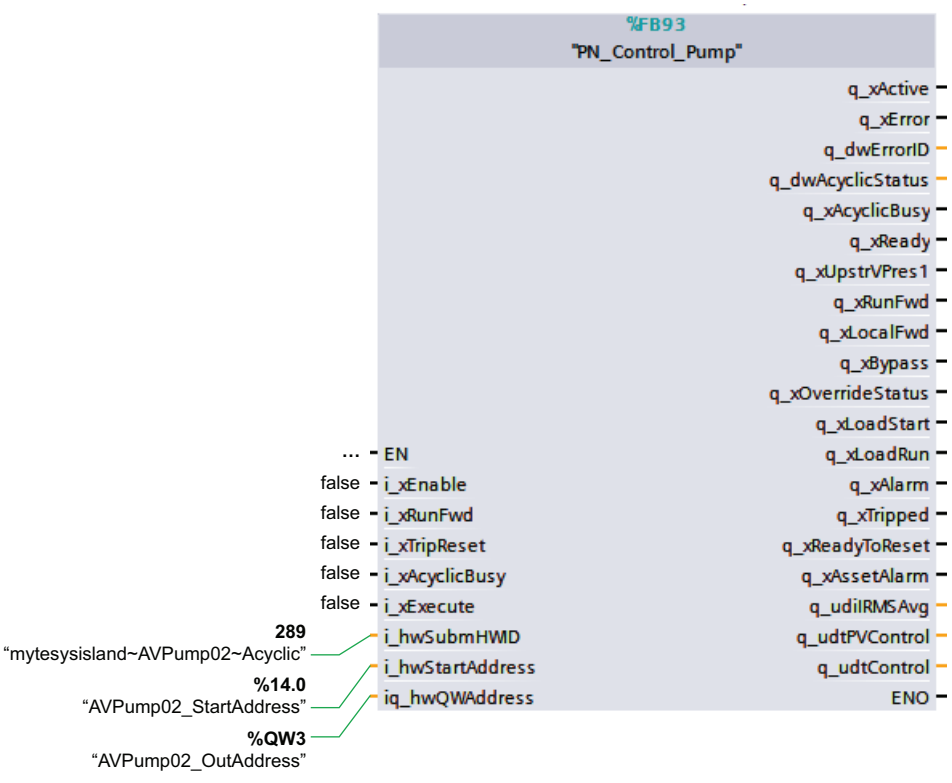
Figure 3 -



For the output data direction, the function blocks use the in/out variable “iq_hwQWAddress” (in some cases also “iq_hwQBAddress” because there is only a single Byte of output data for the avatar). In contrast to the input data, this variable refers to the complete output data of the island (in most cases one Word) and is connected as an in/out variable to the function block—as in some cases, multiple function blocks access the output data of the same avatar in different areas (for example, Avatar Control function block in conjunction with an Avatar Diagnostic function block) and therefore the current status needs to be read before a change is written to the output. Usually access to the output area of the avatar should also be configured using a PLC tag for the complete output area (in the example above, “AvConveyorOneDir03_OutAddress” of type Word referencing address “%QW5”).

NOTE: The function blocks in the TeSys™ island library for the TIA Portal cannot detect any misconfiguration of input/output areas of the avatars. Therefore, the user is responsible for ensuring that the correct input and output areas are configured and used together with the appropriate function block types. Neglecting to do so might result in unexpected behavior of the TeSys™ island.

Figure 4 -



As soon as the input variable “i_xEnable” is set to “true” in the program, function blocks involving cyclic communication will execute and update the cyclic data. This means that any input variables at the function block interface controlling the avatar through cyclic communication (for example, “i_xRunFwd” in the example above) will be written to the output data area of the avatar. At the same time, any relevant status information from the input data area of the avatar are read by the function block and copied to the output interface (for example, “q_xRunFwd”).

The status output “q_xActive” of the function blocks is the counterpart of “i_xEnable”. If the execution of the function block is enabled and no detected error occurred, “q_xActive” is “true”. If a detected error occurs during the execution of the function block, this is signaled by a rising edge on “q_xError”. The retrieval of cyclic input data and execution of the function block is halted. Additionally, “q_dwErrorID” provides details about what kind of detected error occurred using one of the error code values from the data block ConstTeSysIsland (see *Data Block ConstTeSysIsland, page 39*). At the same time, all outputs of the function block which are results of either cyclic or acyclic communication with the TeSys island are reset to their respective default values. This means the following:

- All results of numeric (INT, UINT, …) of bitfield (WORD, DWORD, …) type are set to 0.
- All results of string type are set to an empty string.
- All results of Boolean type are set to FALSE.
- All results of the date and time type (DTL in this library) are reset to the minimal value of that type (DTL#1970-01-01-00:00:00.0).
- All results grouped into a user defined type (UDT) or struct are reset to the default values specified in the type definition. These in general also follow the rules above.

  NOTE: Changes to the definitions of the UDTs contained in the library also result in changes in the default values used by the function blocks when an error occurs, and therefore **must be avoided**.

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

- To avoid interruptions in the operation of the load represented by the avatar when an error occurs, the cyclic output data sent to the island (for example, the Run commands) are left untouched. If a shutdown of the load is required when an error occurs, **you are responsible** for removing any active input bits of the function block as required due to the situation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The function block only leaves the detected error state after a new rising edge on “i_xEnable” is detected, and if the condition that led the function block to enter the detected error state has been cleared.

Acyclic Data

For those function blocks that use acyclic communication with TeSys™ island, a reference to a hardware module containing the acyclic data is required for the function block. Usually, this reference is provided at the function block interface as an input of the type “HW_IO” called “i_hwSubmHWID”. When a device is created in the Siemens TIA Portal (for example, via import of an AML file), system constants with the values for the hardware ID are created automatically for all devices, modules, and sub-modules. These can be directly used to parametrize the access to the acyclic data of an avatar or a device. The names of these constants are usually created using the following pattern: <device name>~<module name>~<submodule name> (for example, “mytesysisland~AvPump02~Acyclic”).

Figure 5 -

PLC tags

	Name	Data type	Value
52	mytesysisland~AvPump02~Input	Hw_SubModule	266
53	mytesysisland~AvPump02~Output	Hw_SubModule	267
54	mytesysisland~AvPump02~Acyclic	Hw_SubModule	268
55	mytesysisland~AvPump02	Hw_SubModule	265
56	mytesysisland~AvOneDirection03~Input	Hw_SubModule	270
57	mytesysisland~AvOneDirection03~Output	Hw_SubModule	271
58	mytesysisland~AvOneDirection03~Acyclic	Hw_SubModule	272
59	mytesysisland~AvOneDirection03	Hw_SubModule	269
60	mytesysisland~Device2	Hw_SubModule	273
61	mytesysisland~Device3	Hw_SubModule	274
62	mytesysisland~Device4	Hw_SubModule	275

For access to the Asset Management data of the devices of the TeSys™ island, these too are represented as modules in the TeSys™ island. The device modules are placed in the slots starting at slot number 101 for both PROFINET IO and PROFIBUS DP.

NOTE:

- For PROFIBUS DP no sub-modules exist within a module. Therefore, all cyclic and acyclic data belong to the module itself instead of the individual sub-modules. This means that for PROFIBUS DP function blocks that involve cyclic as well as acyclic communication, the hardware ID can be directly derived from the input start address, and no additional hardware ID needs to be parametrized. However, for those function blocks that only use acyclic communication (mainly the Device Asset Management function blocks), the hardware ID of the module must be provided to the function block interface (interface variable “i_hwModuleHWID”).
- The function blocks cannot detect whether there is a match between the module that the hardware ID provided at the function block interface references, and the type of avatar or device that the function block is made for. Therefore, it remains your responsibility to ensure that the correct hardware IDs are used with the appropriate function blocks. Neglecting to do so might result in unexpected behavior of the TeSys™ island.

The reading or writing of the acyclic data has to be triggered using a rising edge at the function block input “i_xExecute”. However, the acyclic reading or writing is only started if the function block is enabled (“i_xEnable”), no detected error has occurred, and the input variable “i_xAcyclicBusy” is “false”. Variable “i_xAcyclicBusy” can be used to interlock multiple instances of function blocks using acyclic communication (either from the TeSys™ island library for the TIA Portal or any other part of the PLC program using the functions RDREC or WRREC) to avoid detected errors due to the limited resources for acyclic communication of the Siemens PLCs. Each function block involving acyclic communication also provides an output “q_xAcyclicBusy” that is set to “true” while an acyclic read or write request is being executed by the function block and can be used to interlock with other function blocks.

NOTE: You are responsible for ensuring that sufficient resources are available for acyclic communication when starting an acyclic request with one of the function blocks in the library. For details on the limitations of the different PLC types, refer to the Third-Party documentation by Siemens.

If a detected error occurs during acyclic communication, the function block indicates this occurrence with a rising edge on the output “q_xError”, combined with an appropriate detected error code in “q_dwErrorID” from the data block ConstTeSysIsland. All outputs based on communication results are reset to their default values (the same reaction as for all other detected errors—see also *Cyclic Data, page 34*; for details on the values from ConstTeSysIsland, see *Data Block ConstTeSysIsland, page 39*). In addition to the detected error ID, the function block in some cases also provides a status code for the acyclic communication in the variable “q_dwAcyclicStatus”. The table below provides an overview of the acyclic status codes in use.

Table 29 - Acyclic status codes

Acyclic status code	Description
Cdw_StsNoMsg	No status details available (also see *Data Block ConstTeSysIsland, page 39*)
All others	TIA Portal specific status/error code of the used system function • RDREC/WRREC if “q_dwErrorID” is one of the following values from ConstTeSysIsland: ◦ Cdw_ErrReadAcycData1 ◦ Cdw_ErrReadAcycData2 ◦ Cdw_ErrWriteAcycData • LOG2GEO (if “q_dwErrorID” is equal to Cdw_ErrInvalidHwid from ConstTeSysIsland) For further information about the TIA specific detected error codes, see the Siemens TIA Portal information System and *Third-Party Documentation, page 8*.

If the function block finishes the acyclic communication successfully, “q_xAcyclicBusy” returns to false, “q_dwErrorID” shows the appropriate status code (see *Data Block ConstTeSysIsland, page 39*) and the data read from the island acyclically is copied to the output variables. The data remains present on the outputs until it is overwritten after a new acyclic request has been completed, the function block is disabled, or an error is detected and the output data is overwritten with default values.

Data Blocks

The function block library currently only contains the definition of a single global data block. The following section defines the content of this data block and its intended usage.

Data Block ConstTeSysIsland

The data block ConstTeSysIsland serves as a global storage of constants relevant across multiple function blocks. Currently it only contains the definition of the common set of status and error codes that are used by all function blocks. See *Function Blocks, page 40* for a description of each of the function blocks contained in this library and details about which error and status codes are used by the function block.

NOTE: As the function blocks directly reference this global data block, it must always be present within a PLC project using the function blocks described in this document.

To avoid unintended behavior of the function blocks, this data block is protected against changes to the values contained within it. To review the contents of the data block, double-click on it. If prompted for a password, choose Cancel. As protected function blocks within a library are pre-compiled for a type of Siemens® PLC, the function block library contains one Master copy for each PLC type that the library is designed for. All Master copies of the DataBlock (DB) contain the same members and values.

Table 30 - Content of Data Block ConstTeSysIsland

Member	Data Type	Value	Description
Cdw_ErrNoMsg	DWORD	16#0000	Error code: No error message available
Cdw_ErrInternal	DWORD	16#1101	Error code: Internal function block error detected
Cdw_ErrInvalidCycInAddr	DWORD	16#1201	Error code: Invalid start address for cyclic input data configured
Cdw_ErrInvalidHwid	DWORD	16#1202	Error code: Invalid HWID for acyclic communication configured (Details in q_dwAcyclicStatus)
Cdw_ErrInvalidNumOfAvatars	DWORD	16#1203	Error code: Invalid number of avatars specified (i_uiNoConfAvatar must be less or equal 20)
Cdw_ErrReadCycIn	DWORD	16#1301	Error code: Error reading cyclic input data
Cdw_ErrReadAcycData1	DWORD	16#1401	Error code: Error reading acyclic data set 1 (Details in q_dwAcyclicStatus)
Cdw_ErrReadAcycData2	DWORD	16#1402	Error code: Error reading acyclic data set 2 (Details in q_dwAcyclicStatus)
Cdw_ErrWriteAcycData	DWORD	16#1481	Error code: Error writing acyclic data set (Details in q_dwAcyclicStatus)
Cdw_StsNoMsg	DWORD	16#0000	Status code: No status details available
Cdw_StsReadAcycData1Compl	DWORD	16#2001	Status code: Reading acyclic data set 1 completed successfully
Cdw_StsReadAcycData2Compl	DWORD	16#2002	Status code: Reading acyclic data set 2 completed successfully
Cdw_StsWriteAcycDataCompl	DWORD	16#2081	Status code: Writing acyclic data set completed successfully

Function Blocks

The following sections define the interfaces of each of the function blocks of the library, their functionality, and their intended use. Besides names, data types, and a description, for each interface variable of the function blocks, one of the following categories is specified:

Table 31 - Categories

Category	Meaning
Function block control	Input variable to control the execution of the function block (for example, trigger acyclic communication).
Function block status	Output variable that gives information on the status of the function block execution.
Communication parameter	Input or in/out variable used to parametrize either cyclic or acyclic data access.
Cyclic data	Input or output variable that is part of the data transferred through cyclic communication to or from TeSys™ island.
Acyclic data	Input or output variable that is part of the data transferred through acyclic communication to or from TeSys™ island.

Additionally, the sections document which values (e.g. which common error and status codes) from ConsTeSysisland (see *Data Block ConstTeSysIsland, page 39*) are used by each of the function blocks.

System Function Blocks

System Control

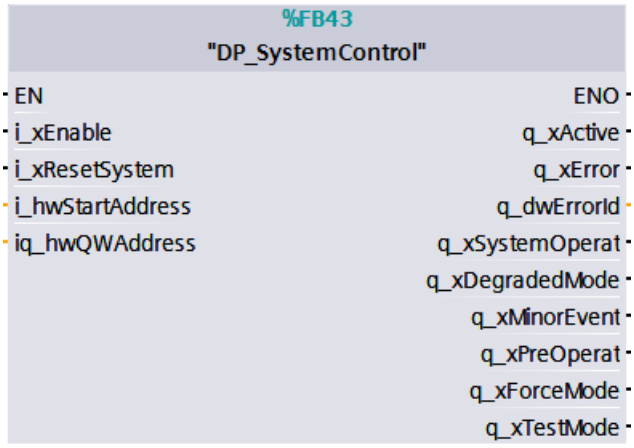
Table 32 - Function block profile

Function block type	System avatar function block
Type of data access	Cyclic (read/write)
Intended use	System avatar (Bus coupler)
Functionality	The System Control function block returns the status of the acyclic control data of the System avatar.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_SystemControl (PROFIBUS DP)

Figure 6 -



The following tables give information about the parameters of the function block interface.

Table 33 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xResetSystem	BOOL	If this input is set to TRUE, the system is reset.	Cyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication	Communication parameter

Table 34 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication	Communication parameter

Table 35 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_xSystemOperat	BOOL	If this output is set to TRUE, the System avatar is in Operational mode. For detailed information on machine states, refer to the *TeSys island Operating Guide* (document no. *8536IB1903*).	Cyclic data
q_xDegradedMode	BOOL	If this output is set to TRUE, the System avatar is in Degraded mode.	Cyclic data
q_xMinorEvent	BOOL	If this output is set to TRUE, the System avatar is in detected Minor Event mode.	Cyclic data

Table 35 - Outputs (Continued)

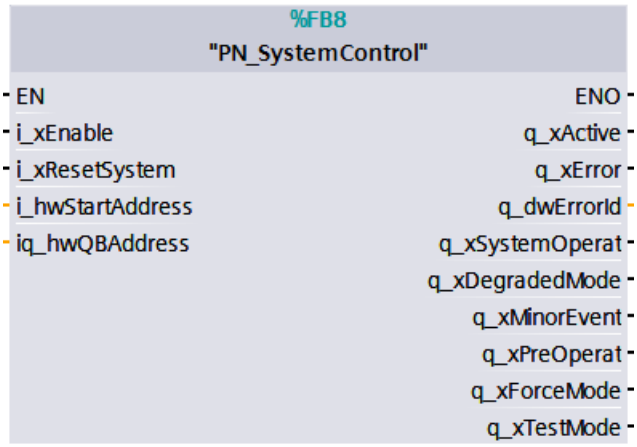
Output	Data Type	Description	Variable Category
q_xPreOperat	BOOL	If this output is set to TRUE, the System avatar is in Preoperational mode.	Cyclic data
q_xForceMode	BOOL	If this output is set to TRUE, the System avatar is in Force mode.	Cyclic data
q_xTestMode	BOOL	If this output is set to TRUE, the System avatar is in Test mode.	Cyclic data

Table 36 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	No
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_SystemControl (PROFINET IO)

Figure 7 -



The following tables give information about the parameters of the function block interface.

Table 37 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xResetSystem	BOOL	If this input is set to TRUE, the system is reset.	Cyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication	Communication parameter

Table 38 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQBAddress	Byte	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication	Communication parameter

Table 39 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_xSystemOperat	BOOL	If this output is set to TRUE, the System avatar is in Operational mode. For detailed information on machine states, refer to the *TeSys island Operating Guide* (document no. *8536IB1903*).	Cyclic data
q_xDegradedMode	BOOL	If this output is set to TRUE, the System avatar is in Degraded mode.	Cyclic data
q_xMinorEvent	BOOL	If this output is set to TRUE, the System avatar is in detected Minor Event mode.	Cyclic data
q_xPreOperat	BOOL	If this output is set to TRUE, the System avatar is in Preoperational mode.	Cyclic data
q_xForceMode	BOOL	If this output is set to TRUE, the System avatar is in Force mode.	Cyclic data
q_xTestMode	BOOL	If this output is set to TRUE, the System avatar is in Test mode.	Cyclic data

Table 40 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	No
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No

Table 40 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

System Diagnostic

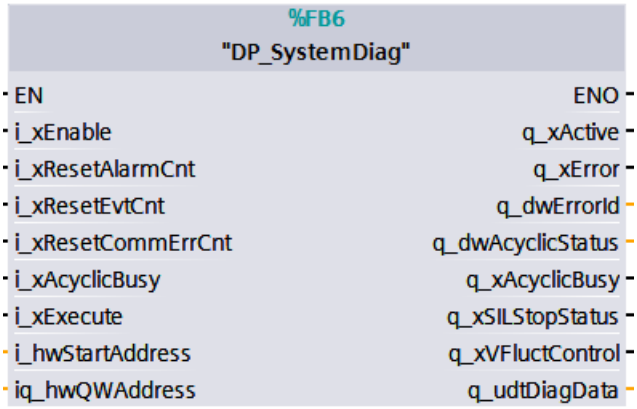
Table 41 - Function block profile

Function block type	System avatar function block
Type of data access	Cyclic (read/write) and acyclic (read)
Intended use	System avatar (Bus coupler)
Functionality	The System Diagnostic function block returns the status of the acyclic diagnostic data of the System avatar.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_SystemDiag (PROFIBUS DP)

Figure 8 -



The following tables give information about the parameters of the function block interface.

Table 42 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/ written to the hardware IO interface.	Function block control
i_xResetAlarmCnt	BOOL	If this input is set to TRUE, the counter of detected alarms for the system is set to 0.	Cyclic data
i_xResetEvtCnt	BOOL	If this input is set to TRUE, the counter of detected minor events for the system is set to 0.	Cyclic data
i_xResetCommErrCnt	BOOL	If this input is set to TRUE, the counter of detected errors for the fieldbus communication is set to 0.	Cyclic data

Table 42 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related Avatar to be able to execute cyclic read communication	Communication parameter

Table 43 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related Avatar to be able to execute cyclic write communication.	Communication parameter

Table 44 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar FB is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, an error was detected while executing the Avatar FB. For detailed information about the error see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xSILStopStatus	BOOL	Status of SIL[10] Group Stop function. If this output is set to FALSE, no SIL group has received a SIL Group Stop command.	Cyclic data
q_xVFluctControl	BOOL	If this output is set to TRUE, a control voltage fluctuation is detected.	Cyclic data
q_udtDiagData	UDT_SystemDiag	This is a structure of acyclic system diagnostic data which includes information about the SIL Group stop status and event counters of the system. For detailed information about the structure of this UDT, see *UDT_SystemDiag, page 28*.	Acyclic data

Table 45 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes

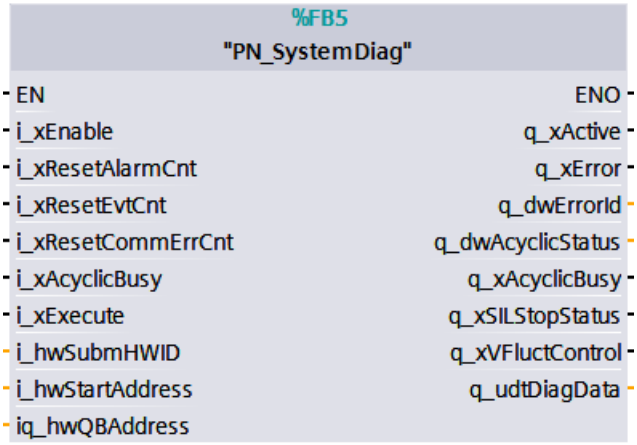
10. Safety Integrity Level according to standard IEC 61508.

Table 45 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_SystemDiag (PROFINET IO)

Figure 9 -



The following tables give information about the parameters of the function block interface.

Table 46 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xResetAlarmCnt	BOOL	If this input is set to TRUE, the counter of detected alarms for the system is set to 0.	Cyclic data
i_xResetEvtCnt	BOOL	If this input is set to TRUE, the counter of detected minor events for the system is set to 0.	Cyclic data
i_xResetCommErrCnt	BOOL	If this input is set to TRUE, the counter of detected errors for the fieldbus communication is set to 0.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control

Table 46 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 47 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQBAddress	Byte	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 48 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xSILStopStatus	BOOL	Status of SIL[11] Group Stop function. If this output is set to FALSE, no SIL group has received a SIL Group Stop command.	Cyclic data
q_xVFluctControl	BOOL	If this output is set to TRUE, a control voltage fluctuation is detected.	Cyclic data
q_udtDiagData	BOOL	This is a structure of acyclic system diagnostic data which includes information about the SIL Group stop status and detected event counters of the system. For detailed information about the structure of this UDT, see *UDT_ SystemDiag, page 28*.	Acyclic data

Table 49 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes

11. Safety Integrity Level according to standard IEC 61508.

Table 49 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

System Energy Management

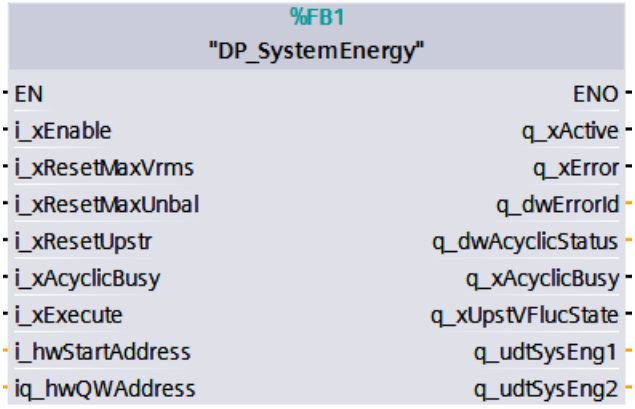
Table 50 - Function block profile

Function block type	System avatar function block
Type of data access	Cyclic (read/write) and acyclic (read)
Intended use	System avatar (Bus coupler)
Functionality	The System Energy function block returns the status of the acyclic energy data of the System avatar.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_SystemEnergy (PROFIBUS DP)

Figure 10 -



The following tables give information about the parameters of the function block interface.

Table 51 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xResetMaxVRMS	BOOL	If this input is set to TRUE, the value of the parameter ResetMaxVRMS is reset.	Cyclic data
i_xResetMaxUnbal	BOOL	If this input is set to TRUE, the value of the parameter ResetMaxUnbalanceVltg is reset.	Cyclic data

Table 51 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xResetUpstr	BOOL	If this input is set to TRUE, the voltage fluctuation status is reset.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 52 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 53 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xUpstrVFluctState	BOOL	If this output is set to TRUE, a voltage dip or swell is detected.	Cyclic data
q_udtSysEng1	UDT_ SystemEnergy1	This is a structure of acyclic system energy data. See *UDT_SystemEnergy1, page 29*.	Acyclic data
q_udtSysEng2	UDT_ SystemEnergy2	This is a structure of acyclic system energy data. See *UDT_SystemEnergy2, page 30*.	Acyclic data

Table 54 - Status and error codes from ConstTeSysIsland

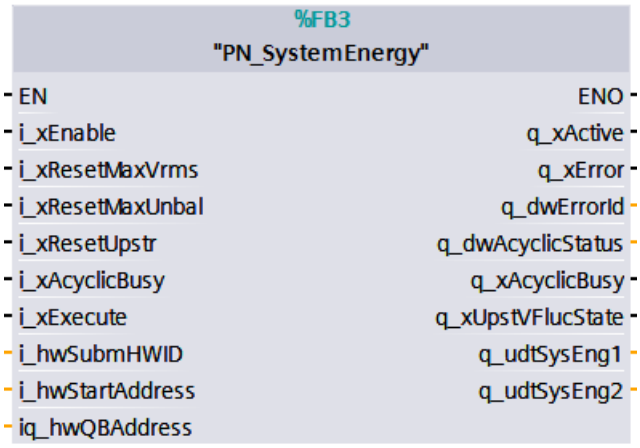
Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	Yes
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes

Table 54 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_StsReadAcycData2Compl	Yes
Cdw_StsWriteAcycDataCompl	No

PN_SystemEnergy (PROFINET IO)

Figure 11 -



The following tables give information about the parameters of the function block interface.

Table 55 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xResetMaxVRMS	BOOL	If this input is set to TRUE, the value of the parameter ResetMaxVRMS is reset.	Cyclic data
i_xResetMaxUnbal	BOOL	If this input is set to TRUE, the value of the parameter ResetMaxUnbalanceVltg is reset.	Cyclic data
i_xResetUpstr	BOOL	If this input is set to TRUE, the voltage fluctuation status is reset.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication	Communication parameter

Table 56 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQBAddress	Byte	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication	Communication parameter

Table 57 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xUpstrVFluctState	BOOL	If this output is set to TRUE, a voltage dip or swell is detected.	Cyclic data
q_udtSysEng1	UDT_ SystemEnergy1	This is a structure of acyclic system energy data. See *UDT_SystemEnergy1, page 29*.	Acyclic data
q_udtSysEng2	UDT_ SystemEnergy2	This is a structure of acyclic system energy data. See *UDT_SystemEnergy2, page 30*.	Acyclic data

Table 58 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	Yes
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	Yes
Cdw_StsWriteAcycDataCompl	No

System Asset Management

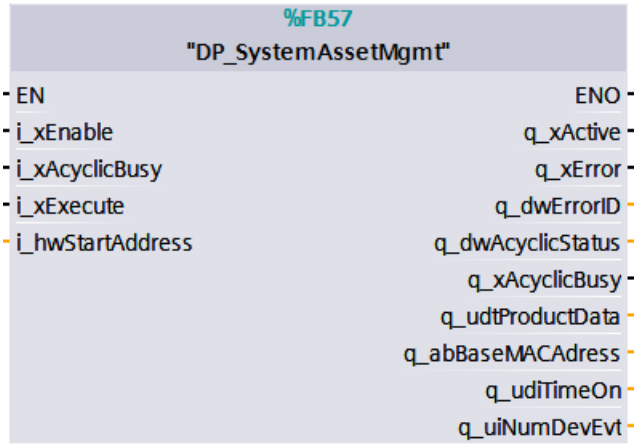
Table 59 - Function block profile

Function block type	System avatar function block
Type of data access	Acyclic (read)
Intended use	System avatar (Bus coupler)
Functionality	The System Asset Management function block returns the status of the acyclic asset management data of the System avatar.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_SystemAssetMgmt (PROFIBUS DP)

Figure 12 -



The following tables give information about the parameters of the function block interface.

Table 60 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the input address range of the related avatar to be able to execute acyclic read communication	Communication parameter

Table 61 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ProductData	Product data of the bus coupler.	Acyclic data
q_abBaseMACAddress	Array[0..5] of Byte	The MAC address of the fieldbus Ethernet port 1.	Acyclic data

Table 61 - Outputs (Continued)

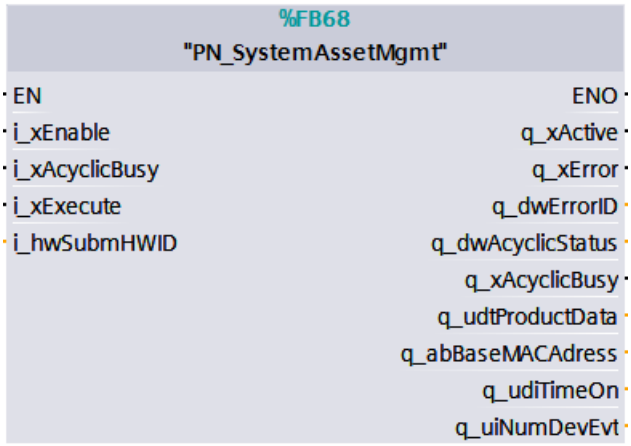
Output	Data Type	Description	Variable Category
q_udiTimeOn	UDINT	The length of time that the system is switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected System minor events.	Acyclic data

Table 62 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_SystemAssetMgmt (PROFINET IO)

Figure 13 -



The following tables give information about the parameters of the function block interface.

Table 63 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control

Table 63 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication	Communication parameter

Table 64 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Product data of the bus coupler.	Acyclic data
q_abBaseMACAddress	Array[0..5] of Byte	The MAC address of the fieldbus Ethernet port 1.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the system is switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected System minor events.	Acyclic data

Table 65 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	No
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

System Write Commands

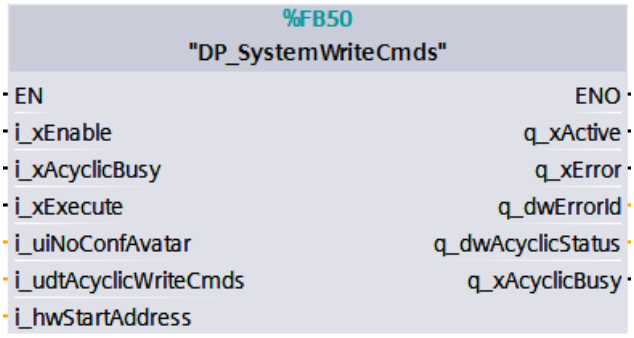
Table 66 - Function block profile

Function block type	System avatar function block
Type of data access	Acyclic (write)
Intended use	System avatar (Bus coupler)
Functionality	The System Write Commands function block writes the acyclic reset commands and energy values for the complete system at once.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_SystemWriteCmds (PROFIBUS DP)

Figure 14 -



The following tables give information about the parameters of the function block interface.

Table 67 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/ written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_uiNoConfAvatar	UINT	Used to parameterize the number of configured avatars to define the length of the data, which needs to be written. Minimum value is 0 (only Bus coupler) and maximum value is 20.	Function block control
i_udtAcyclicWriteCmds	UDT_SystemWriteCmds	This is a structure of acyclic system write data, which includes reset commands and energy data of the system and all avatars. See *UDT_ SystemWriteCmds, page 31*.	Acyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the I address of the related avatar to be able to execute the acyclic write communication.	Communication parameter

Table 68 - Outputs

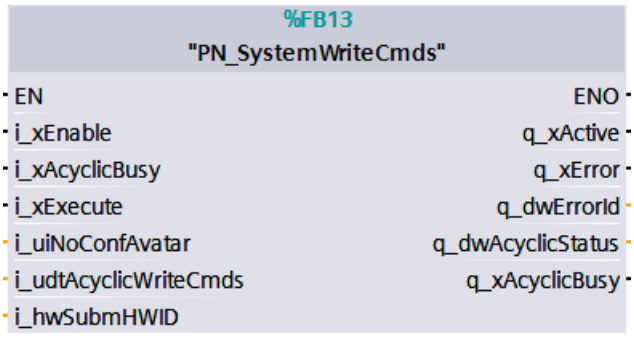
Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status

Table 69 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	Yes
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	Yes
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	Yes

PN_SystemWriteCmds (PROFINET IO)

Figure 15 -



The following tables give information about the parameters of the function block interface.

Table 70 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_uiNoConfAvatar	UINT	Used to parameterize the number of configured avatars to define the length of the data, which needs to be written. Minimum value is 0 (only Bus coupler) and maximum value is 20.	Function block control
i_udtAcyclicWriteCmds	UDT_SystemWriteCmds	This is a structure of acyclic system write data, which includes reset commands and energy data of the system and all avatars. For detailed information about the structure of this UDT, see *UDT_SystemWriteCmds, page 31*.	Acyclic data
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter

Table 71 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status

Table 72 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	No
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	Yes
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	Yes

Table 72 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	Yes

System Time

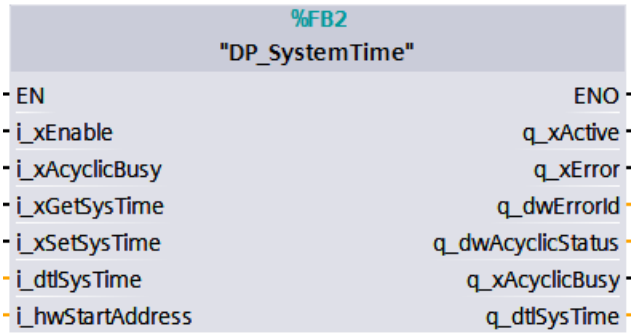
Table 73 - Function block profile

Function block type	System avatar function block.
Type of data access	Acyclic (read/write).
Intended use	System avatar (Bus coupler).
Functionality	The System Time function block reads and writes the system time of the Bus coupler. Write command has higher priority.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_SystemTime (PROFIBUS DP)

Figure 16 -



The following tables give information about the parameters of the function block interface.

Table 74 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xGetSysTime	BOOL	If this input is set to TRUE, the system time of the Bus coupler is read to the PLC.	Function block control
i_xSetSysTime	BOOL	If this input is set to TRUE, the time is written from PLC to the Bus coupler.	Function block control
i_dtlSysTime	DTL	Corresponds to PLC time to be written to the Bus coupler.	Acyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the I address of the related avatar to be able to execute the acyclic communication.	Communication parameter

Table 75 - Outputs

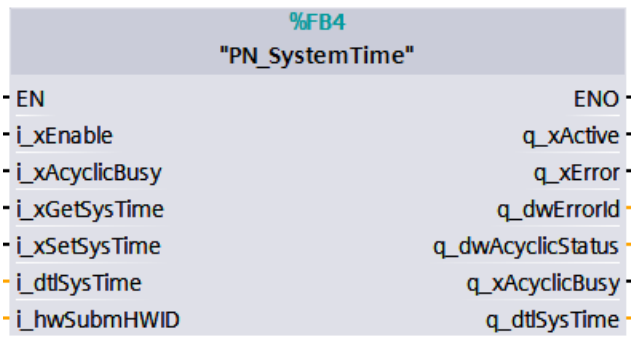
Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_dtlSysTime	DTL	Corresponds to the system time read from the Bus coupler.	Acyclic data

Table 76 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	Yes
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_SystemTime (PROFINET IO)

Figure 17 -



The following tables give information about the parameters of the function block interface.

Table 77 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xGetSysTime	BOOL	If this input is set to TRUE, the system time of the Bus coupler is read to the engineering system.	Function block control
i_xSetSysTime	BOOL	If this input is set to TRUE, the engineering system time is written to the Bus coupler.	Function block control
i_dtlSysTime	DTL	Corresponds to engineering system time written to the Bus coupler.	Acyclic data
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter

Table 78 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_dtlSysTime	DTL	Corresponds to the system time read from the Bus coupler.	Acyclic data

Table 79 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	No
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No

Table 79 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrWriteAcycData	Yes
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	Yes

Avatar Control Function Blocks

Switch

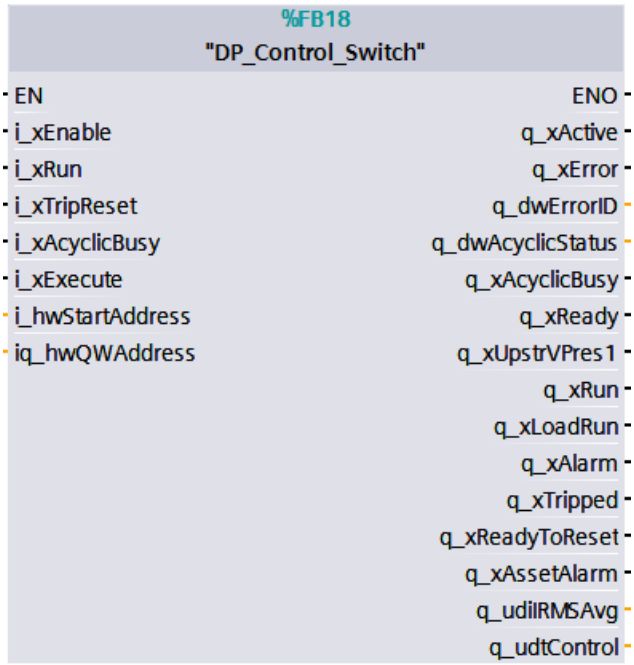
Table 80 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Device avatar “Switch”.
Functionality	The Switch function block establishes or interrupts a power line in an electric circuit.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Switch (PROFIBUS DP)

Figure 18 -



The following tables give information about the parameters of the function block interface.

Table 81 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 82 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 83 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data

Table 83 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[12] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 66*.	Acyclic data

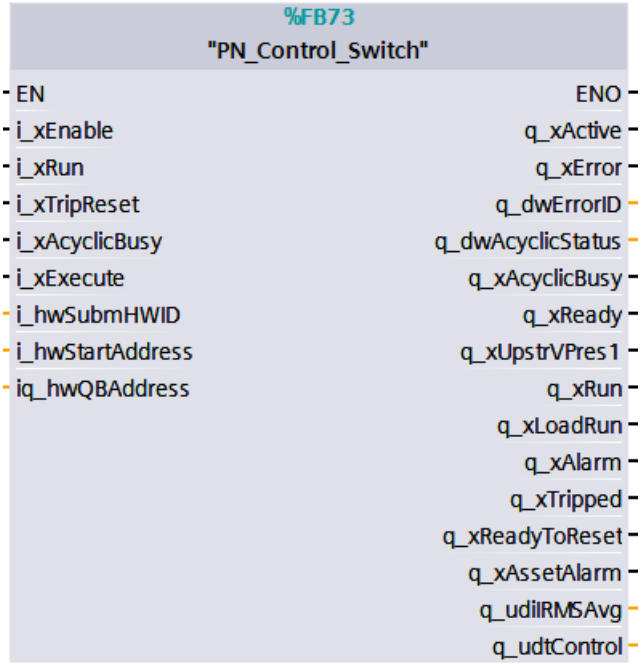
Table 84 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

12. Safety Integrity Level according to standard IEC 61508.

PN_Control_Switch (PROFINET IO)

Figure 19 -



The following tables give information about the parameters of the function block interface.

Table 85 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 86 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQBAddress	Byte	Must correspond to the address of the cyclic output submodule of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 87 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[13] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 66*.	Acyclic data

Table 88 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes

13. Safety Integrity Level according to standard IEC 61508.

Table 88 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 89 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	No
SILGroup	n/A	No
ThermalCapacity	n/A	No
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	No
	PhaseUnbalance	Yes
	UnderCurrent	No
AlarmMsg2	OverCurrent	No
	MotorOverheat	No
TripMsg1	GroundCurrent	Yes
	ThermalOverload	No
	LongStart	No
	Jam	No
	PhaseUnbalance	Yes
	UnderCurrent	No
	Stall	No
TripMsg2	PhConfig	Yes
	OverCurrent	No
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	No
TimeToTrip	n/A	No
TimeToReset	n/A	No

Table 89 - Elements (Continued)

Element	Sub-Element	Supported
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Switch – SIL Stop, W. Cat. 1/2

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.

Table 90 - Function block profile

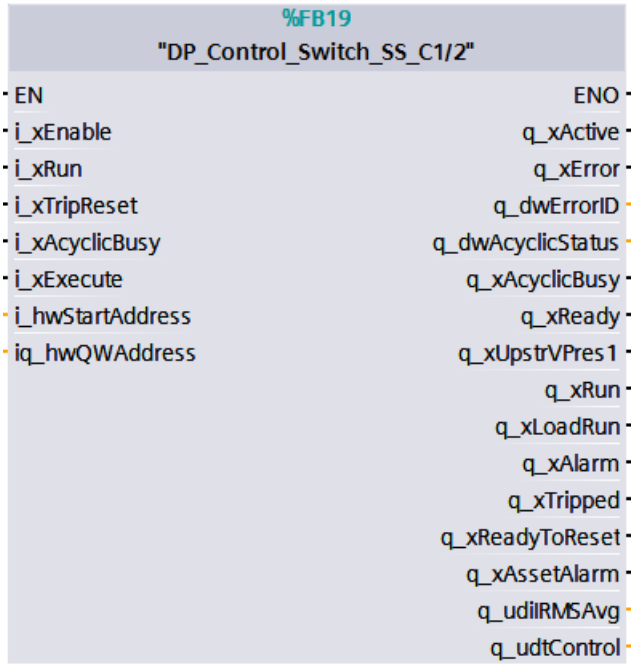
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Device avatar “Switch – SIL Stop, W. Cat. 1/2”
Functionality	The Switch SIL Stop Cat function block establishes or interrupts a power line in an electric circuit with Stop Category 0 or Stop Category 1[14], Wiring Category 1 and Category 2.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

14. Stop categories according to EN/IEC 60204-1.

DP_Control_Switch_SS_C1/2 (PROFIBUS DP)

Figure 20 -



The following tables give information about the parameters of the function block interface.

Table 91 - Input

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 92 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 93 - Output

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[15] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 72*.	Acyclic data

Table 94 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes

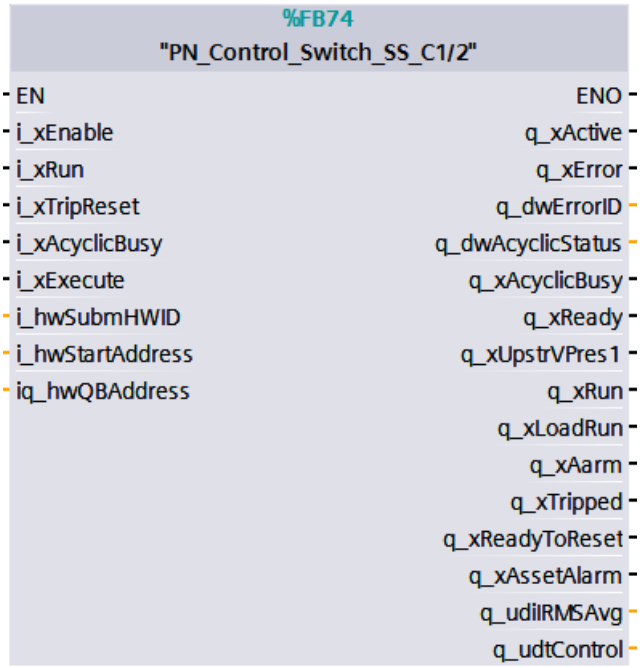
15. Safety Integrity Level according to standard IEC 61508.

Table 94 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Switch_SS_C1/2 (PROFINET IO)

Figure 21 -



The following tables give information about the parameters of the function block interface.

Table 95 - Input

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control

Table 95 - Input (Continued)

Input	Data Type	Description	Variable Category
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 96 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQBAddress	Byte	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 97 - Output

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 97 - Output (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[16] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 72*.	Acyclic data

Table 98 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 99 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	No
SILGroup	n/A	Yes
ThermalCapacity	n/A	No

16. Safety Integrity Level according to standard IEC 61508.

Table 99 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	No
	PhaseUnbalance	Yes
	UnderCurrent	No
AlarmMsg2	OverCurrent	No
	MotorOverheat	No
TripMsg1	GroundCurrent	Yes
	ThermalOverload	No
	LongStart	No
	Jam	No
	PhaseUnbalance	Yes
	UnderCurrent	No
	Stall	No
TripMsg2	PhConfig	Yes
	OverCurrent	No
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	No
TimeToTrip	n/A	No
TimeToReset	n/A	No
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Switch – SIL Stop, W. Cat. 3/4

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 3 and Category 4 according to ISO 13849.

Table 100 - Function block profile

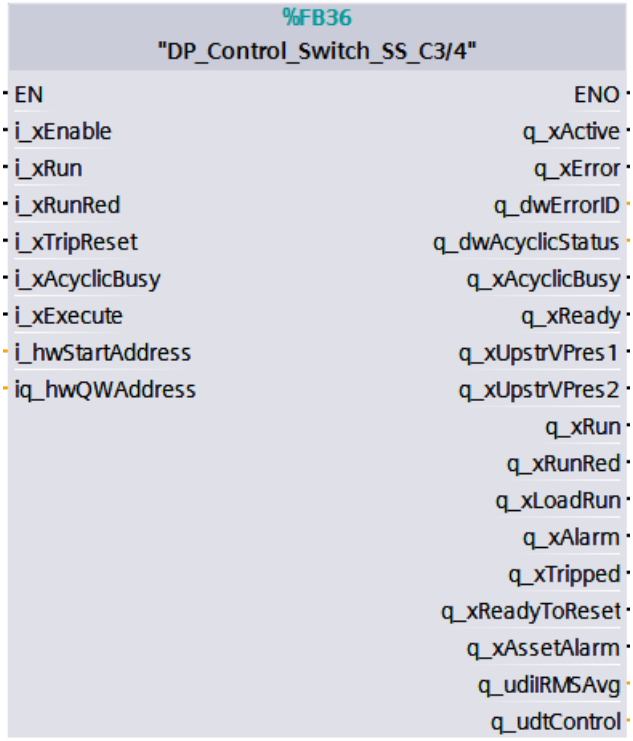
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Device avatar “Switch – SIL Stop, W. Cat. 3/4”
Functionality	The Switch SIL Stop Cat function block establishes or interrupts a power line in an electric circuit with Stop Category 0 or Stop Category 1[17], Wiring Category 3 and Category 4.

17. Stop categories according to EN/IEC 60204-1.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Switch_SS_C3/4 (PROFIBUS DP)

Figure 22 -



The following tables give information about the parameters of the function block interface.

Table 101 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRed	BOOL	If this input is set to TRUE, the redundant avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 102 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 103 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Communication parameter
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRed	BOOL	If this output is set to TRUE, the redundant avatar forward switch is closed.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[18] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 78*.	Acyclic data

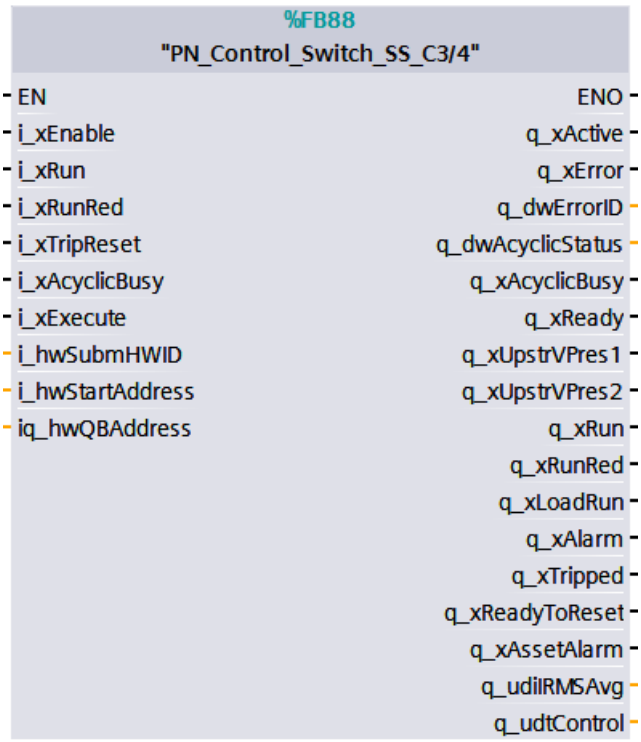
18. Safety Integrity Level according to standard IEC 61508.

Table 104 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Switch_SS_C3/4 (PROFINET IO)

Figure 23 -



The following tables give information about the parameters of the function block interface.

Table 105 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRed	BOOL	If this input is set to TRUE, the redundant avatar forward switch is closed.	Cyclic data

Table 105 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 106 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQBAddress	Byte	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 107 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRed	BOOL	If this output is set to TRUE, the redundant avatar forward switch is closed.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data

Table 107 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[19] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 78*.	Acyclic data

Table 108 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 109 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	No
SILGroup	n/A	Yes
ThermalCapacity	n/A	No

19. Safety Integrity Level according to standard IEC 61508.

Table 109 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	No
	PhaseUnbalance	Yes
	UnderCurrent	No
AlarmMsg2	OverCurrent	No
	MotorOverheat	No
TripMsg1	GroundCurrent	Yes
	ThermalOverload	No
	LongStart	No
	Jam	No
	PhaseUnbalance	Yes
	UnderCurrent	No
	Stall	No
TripMsg2	PhConfig	Yes
	OverCurrent	No
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	No
TimeToTrip	n/A	No
TimeToReset	n/A	No
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Digital I/O

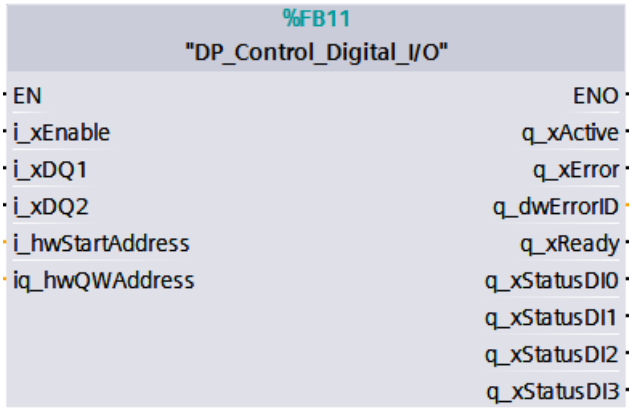
Table 110 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write).
Intended use	Device avatar “Digital I/O”.
Functionality	The Digital I/O function block provides information about the Digital I/O avatar with four inputs and two outputs.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Digital_I/O (PROFIBUS DP)

Figure 24 -



The following tables give information about the parameters of the function block interface.

Table 111 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xDQ1	BOOL	If this input is set to TRUE, the digital output 0 is set to TRUE.	Cyclic data
i_xDQ2	BOOL	If this input is set to TRUE, the digital output 1 is set to TRUE.	Cyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 112 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 113 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xStatusDI0	BOOL	If this output is set to TRUE, the digital input 0 of the Digital I/O avatar is set to TRUE.	Cyclic data
q_xStatusDI1	BOOL	If this output is set to TRUE, the digital input 1 of the Digital I/O avatar is set to TRUE.	Cyclic data

Table 113 - Outputs (Continued)

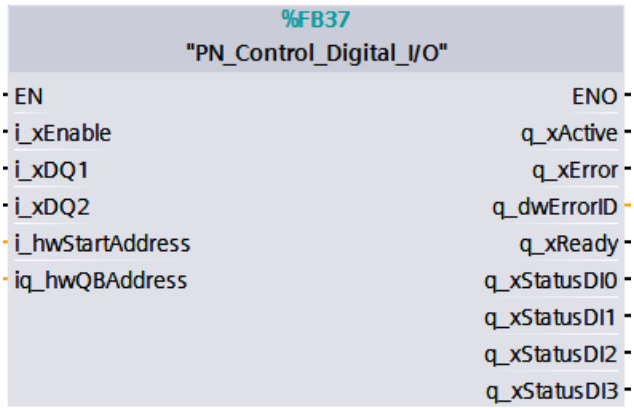
Output	Data Type	Description	Variable Category
q_xStatusDI2	BOOL	If this output is set to TRUE, the digital input 2 of the Digital I/O avatar is set to TRUE.	Cyclic data
q_xStatusDI3	BOOL	If this output is set to TRUE, the digital input 3 of the Digital I/O avatar is set to TRUE.	Cyclic data

Table 114 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	No
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Digital_I/O (PROFINET IO)

Figure 25 -



The following tables give information about the parameters of the function block interface.

Table 115 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xDQ1	BOOL	If this input is set to TRUE, the digital output 0 is set to TRUE.	Cyclic data

Table 115 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xDQ2	BOOL	If this input is set to TRUE, the digital output 1 is set to TRUE.	Cyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 116 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQBAddress	Byte	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 117 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xStatusDI0	BOOL	If this output is set to TRUE, the digital input 0 of the Digital I/O avatar is set to TRUE.	Cyclic data
q_xStatusDI1	BOOL	If this output is set to TRUE, the digital input 1 of the Digital I/O avatar is set to TRUE.	Cyclic data
q_xStatusDI2	BOOL	If this output is set to TRUE, the digital input 2 of the Digital I/O avatar is set to TRUE.	Cyclic data
q_xStatusDI3	BOOL	If this output is set to TRUE, the digital input 3 of the Digital I/O avatar is set to TRUE.	Cyclic data

Table 118 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	No
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The Digital I/O avatar does not support any of the contained members, therefore no output variable of that type exists.

Analog I/O

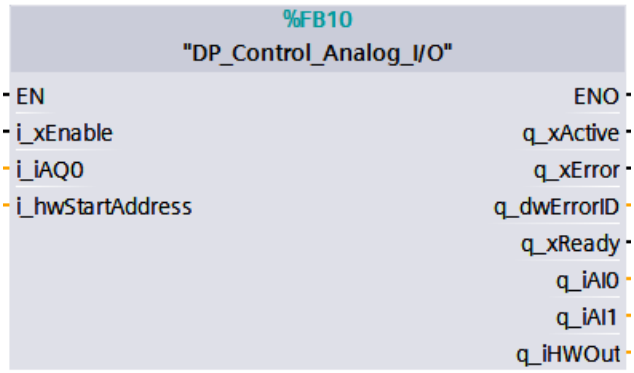
Table 119 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write).
Intended use	Device avatar “Analog I/O”.
Functionality	The Analog I/O function block provides information about the Analog I/O avatar with two inputs and one output.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Analog_I/O (PROFIBUS DP)

Figure 26 -



The following tables give information about the parameters of the function block interface.

Table 120 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_iAQ0	INT	Value to be written to analog output 0. Unit and scaling depends on the analog output type configured. • Type 0 (Unit: mV) • Type 1 (Unit: mV) • Type 2 (Unit: µA) • Type 3 (Unit: µA)	Cyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 121 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_iAI0	INT	Indicates the value read from the analog input 0. Unit and scaling depends on the analog output type configured. • Type 0 to 12 (Unit: 0.1 °C) • Type 13 (Unit: mV) • Type 14 (Unit: mV) • Type 15 (Unit: µA) • Type 16 (Unit: µA)	Cyclic data
q_iAI1	INT	Indicates the value read from the analog input 1.	Cyclic data
q_iHWOut	INT	Hardware address of the analog output.	Communication parameter

Table 122 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	No
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No

Table 122 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Analog_I/O (PROFINET IO)

The following tables give information about the parameters of the function block interface.

Figure 27 -

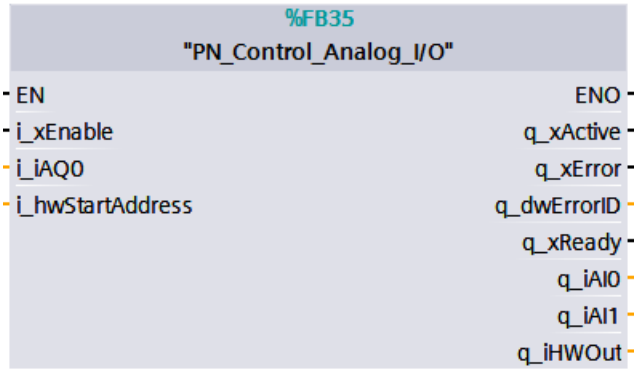


Table 123 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_iAQ0	INT	Value to be written to analog output 0. Unit and scaling depends on the analog output type configured. • Type 0 (Unit: mV) • Type 1 (Unit: mV) • Type 2 (Unit: µA) • Type 3 (Unit: µA)	Cyclic data
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 124 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data

Table 124 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_iAI0	INT	Indicates the value read from the analog input 0. Unit and scaling depends on the analog output type configured. • Type 0 to 12 (Unit: 0.1 °C) • Type 13 (Unit: mV) • Type 14 (Unit: mV) • Type 15 (Unit: µA) • Type 16 (Unit: µA)	Cyclic data
q_iAI1	INT	Indicates the value read from the analog input 1.	Cyclic data
q_iHWOut	INT	Hardware address of the analog output.	Communication parameter

Table 125 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	No
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	No
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	No
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The Digital I/O avatar does not support any of the contained members, therefore no output variable of that type exists.

Power Interface – without I/O (measure)

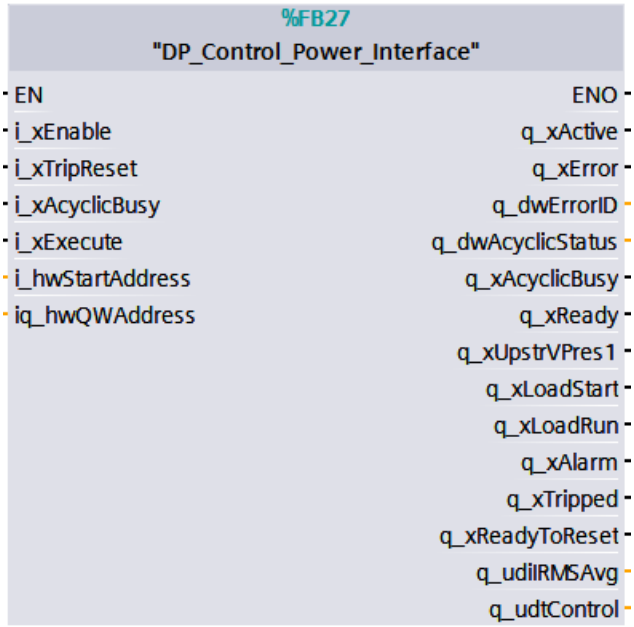
Table 126 - Function block profile

Function block type	Avatar Control function block
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Power Interface – without I/O”.
Functionality	The Power Interface function block is used to monitor current on an external power device, such as a solid-state relay, soft starter, or variable speed drive.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Power_Interface (PROFIBUS DP)

Figure 28 -



The following tables give information about the parameters of the function block interface.

Table 127 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 128 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 129 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status

Table 129 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 91*.	Acyclic data

Table 130 - Status and error codes from ConstTeSysIsland

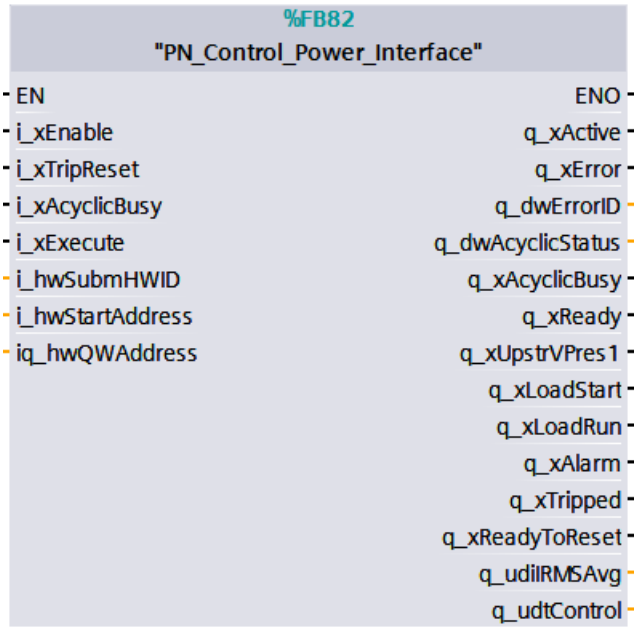
Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes

Table 130 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Power_Interface (PROFINET IO)

Figure 29 -



The following tables give information about the parameters of the function block interface.

Table 131 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 132 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 133 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A).	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 91*.	Acyclic data

Table 134 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No

Table 134 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 135 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes

Table 135 - Elements (Continued)

Element	Sub-Element	Supported
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Power Interface – with I/O (control)

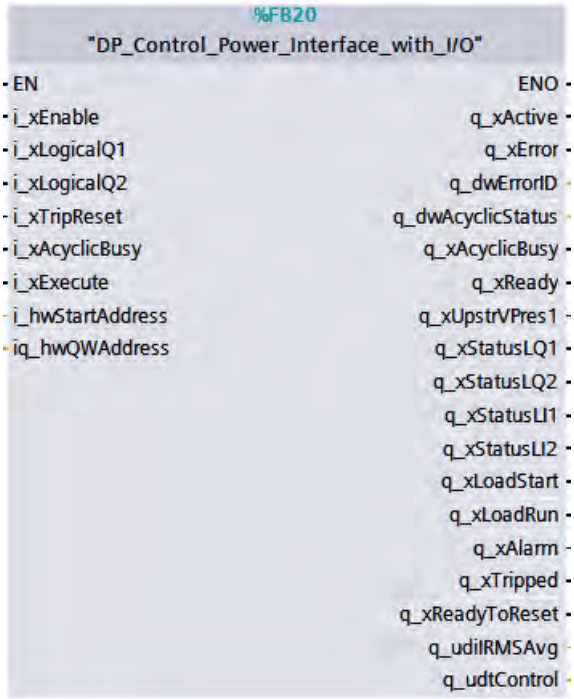
Table 136 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load Avatar “Power Interface – with I/O”.
Functionality	The Power Interface with I/O function block is used to monitor current and control an external power device, such as a solid-state relay, soft starter, or variable speed drive.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Power_Interface_with_I/O (PROFIBUS DP)

Figure 30 -



The following tables give information about the parameters of the function block interface.

Table 137 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xLogicalQ1	BOOL	If this input is set to TRUE, the logical output 1 is set to TRUE.	Cyclic data
i_xLogicalQ2	BOOL	If this input is set to TRUE, the logical output 2 is set to TRUE.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 138 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 139 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xStatusLQ1	BOOL	If this output is set to TRUE, the logical output 1 is set to TRUE.	Cyclic data
q_xStatusLQ2	BOOL	If this output is set to TRUE, the logical output 2 is set to TRUE.	Cyclic data

Table 139 - Outputs (Continued)

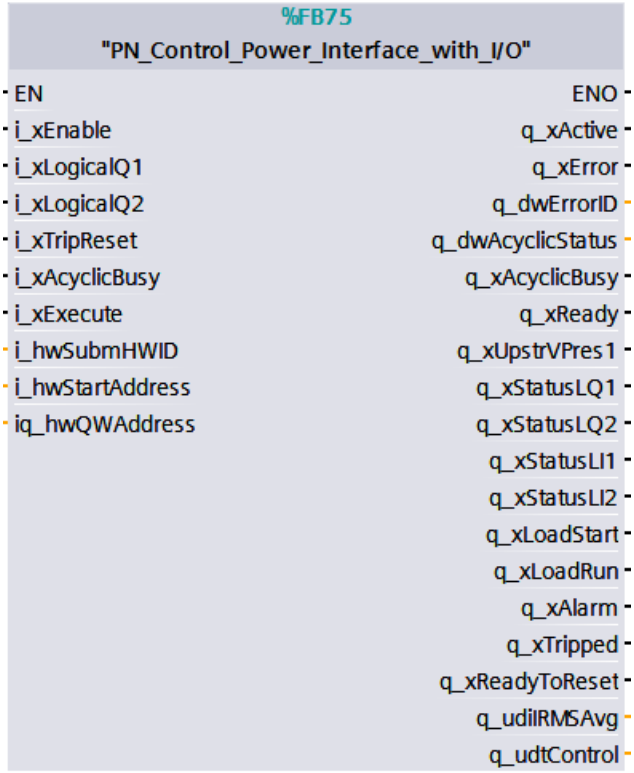
Output	Data Type	Description	Variable Category
q_xStatusLI1	BOOL	If this output is set to TRUE, the logical input 1 of the avatar is set to TRUE.	Cyclic data
q_xStatusLI2	BOOL	If this output is set to TRUE, the logical input 2 of the avatar is set to TRUE.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 97*.	Acyclic data

Table 140 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Power_Interface_with_I/O (PROFINET IO)

Figure 31 -



The following tables give information about the parameters of the function block interface.

Table 141 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xLogicalQ1	BOOL	If this input is set to TRUE, the logical output 1 is set to TRUE.	Cyclic data
i_xLogicalQ2	BOOL	If this input is set to TRUE, the logical output 2 is set to TRUE.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 142 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 143 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xStatusLQ1	BOOL	If this output is set to TRUE, the logical output 1 is set to TRUE.	Cyclic data
q_xStatusLQ2	BOOL	If this output is set to TRUE, the logical output 2 is set to TRUE.	Cyclic data
q_xStatusLI1	BOOL	If this output is set to TRUE, the logical input 1 of the avatar is set to TRUE.	Cyclic data
q_xStatusLI2	BOOL	If this output is set to TRUE, the logical input 2 of the avatar is set to TRUE.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 97*.	Acyclic data

Table 144 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 145 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes

Table 145 - Elements (Continued)

Element	Sub-Element	Supported
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor One Direction

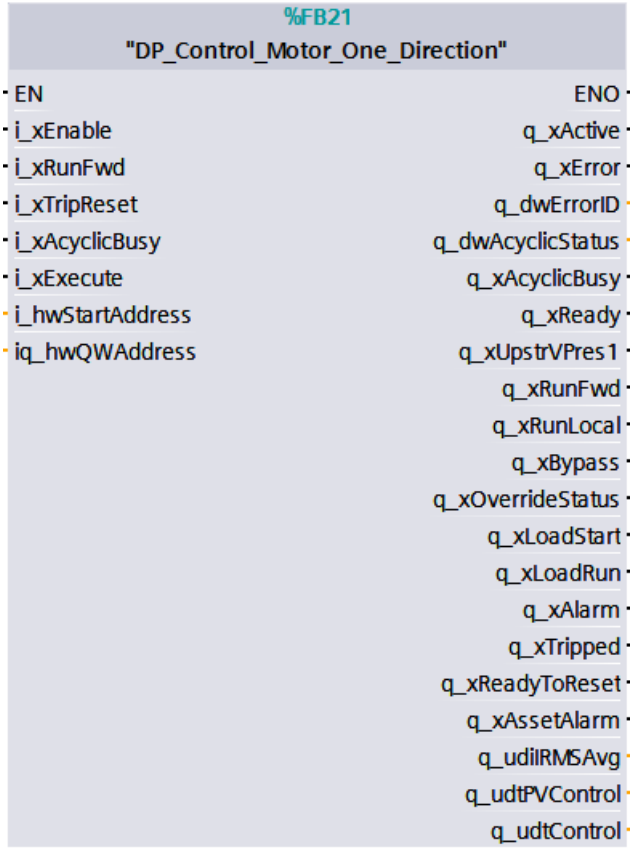
Table 146 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor One Direction”.
Functionality	The Motor One Direction function block is used to manage a motor in one direction.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_One_Direction (PROFIBUS DP)

Figure 32 -



The following tables give information about the parameters of the function block interface.

Table 147 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 148 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 149 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[20] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

20. Safety Integrity Level according to standard IEC 61508.

Table 149 - Outputs (Continued)

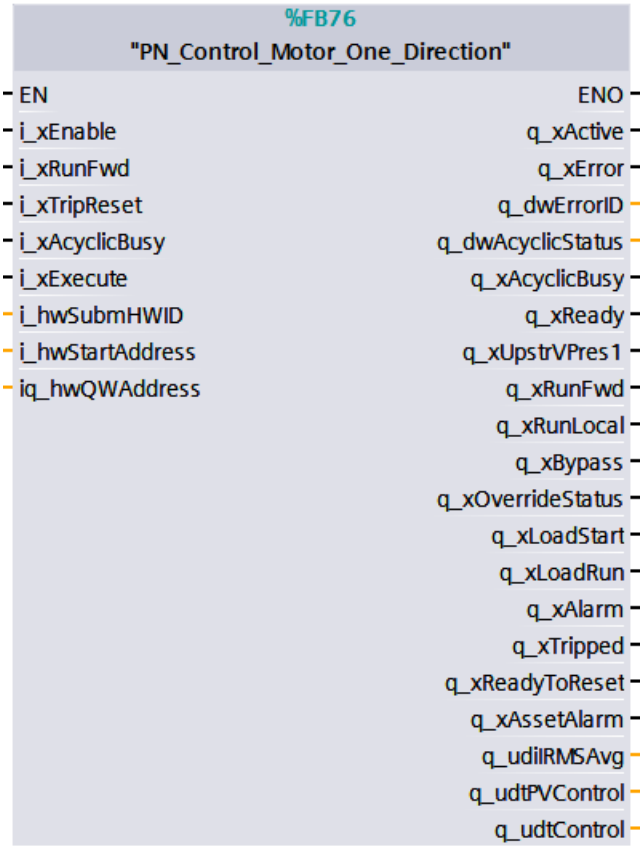
Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 104*.	Acyclic data

Table 150 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Motor_One_Direction (PROFINET IO)

Figure 33 -



The following tables give information about the parameters of the function block interface.

Table 151 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 152 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 153 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[21] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

21. Safety Integrity Level according to standard IEC 61508.

Table 153 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 104*.	Acyclic data

Table 154 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 155 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes

Table 155 - Elements (Continued)

Element	Sub-Element	Supported
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Motor One Direction – SIL Stop, W. Cat. 1/2

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.

Table 156 - Function block profile

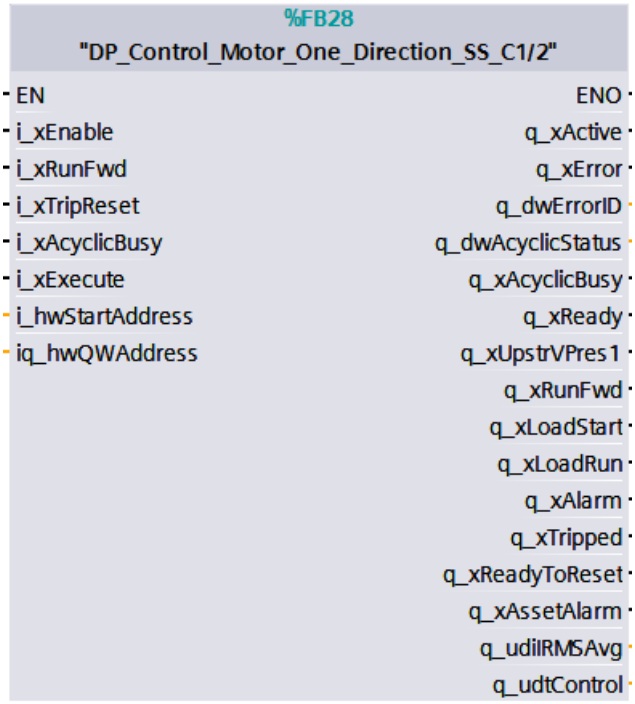
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor One Direction – SIL Stop, W. Cat. 1/2”.
Functionality	The Motor One Direction SIL function block is used to manage a motor in one direction with Stop Category 0 or Stop Category 1[22], Wiring Category 1 and Category 2.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

22. Stop categories according to EN/IEC 60204-1.

DP_Control_Motor_One_Direction_SS_C1/2 (PROFIBUS DP)

Figure 34 -



The following tables give information about the parameters of the function block interface.

Table 157 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 158 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 159 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[23] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 110*.	Acyclic data

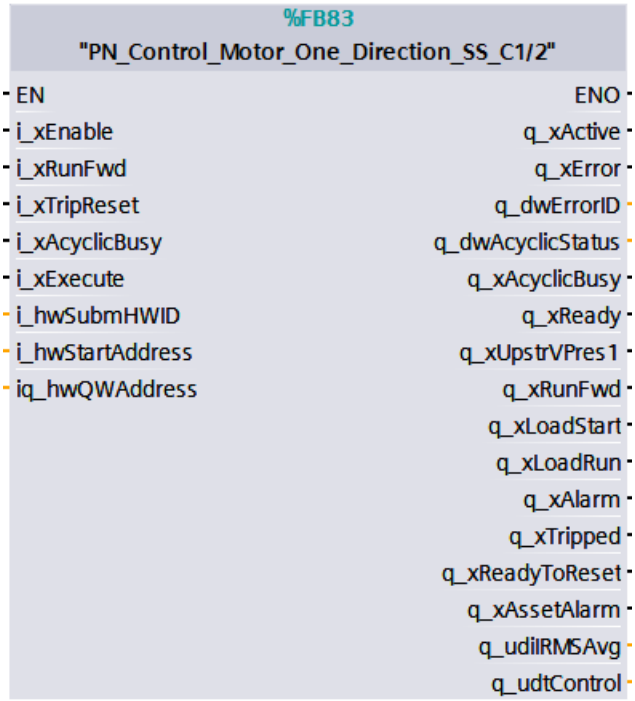
23. Safety Integrity Level according to standard IEC 61508.

Table 160 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Motor_One_Direction_SS_C1/2 (PROFINET IO)

Figure 35 -



The following tables give information about the parameters of the function block interface.

Table 161 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data

Table 161 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 162 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 163 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data

Table 163 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[24] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 110*.	Acyclic data

Table 164 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes

24. Safety Integrity Level according to standard IEC 61508.

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor One Direction – SIL Stop, W. Cat. 3/4

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 3 and Category 4 according to ISO 13849.

Table 165 - Function block profile

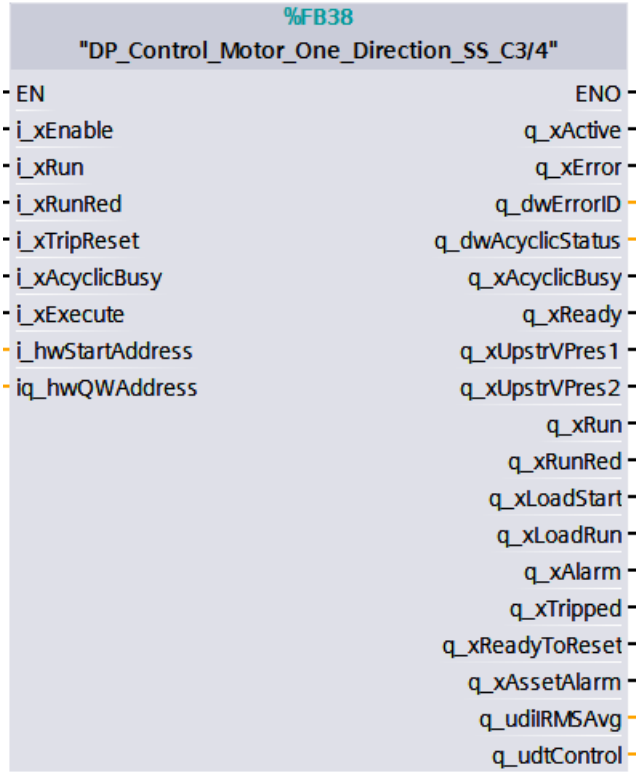
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor One Direction – SIL Stop, W. Cat. 3/4”
Functionality	The Motor One Direction SIL function block is used to manage a motor in one direction with Stop Category 0 or Stop Category 1[25], Wiring Category 3 and Category 4.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

25. Stop categories according to EN/IEC 60204-1.

DP_Control_Motor_One_Direction_SS_C3/4 (PROFIBUS DP)

Figure 36 -



The following tables give information about the parameters of the function block interface.

Table 166 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRed	BOOL	If this input is TRUE, the redundant avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 167 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 168 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRed	BOOL	If this output is set to TRUE, the redundant avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[26] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data

26. Safety Integrity Level according to standard IEC 61508.

Table 168 - Outputs (Continued)

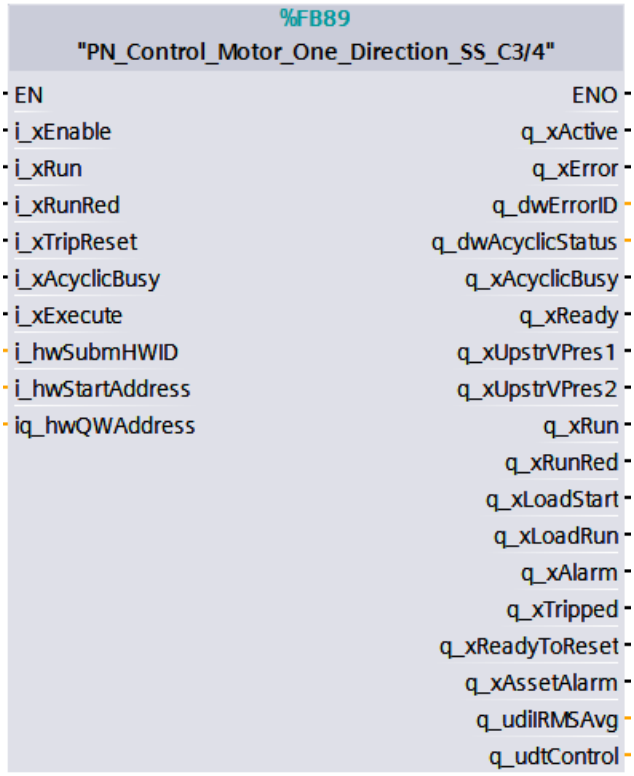
Output	Data Type	Description	Variable Category
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 117*.	Acyclic data

Table 169 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Motor_One_Direction_SS_C3/4 (PROFINET IO)

Figure 37 -



The following tables give information about the parameters of the function block interface.

Table 170 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRed	BOOL	If this input is TRUE, the redundant avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 171 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 172 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRed	BOOL	If this output is set to TRUE, the redundant avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[27] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data

27. Safety Integrity Level according to standard IEC 61508.

Table 172 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 117*.	Acyclic data

Table 173 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 174 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes

Table 174 - Elements (Continued)

Element	Sub-Element	Supported
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor Two Directions

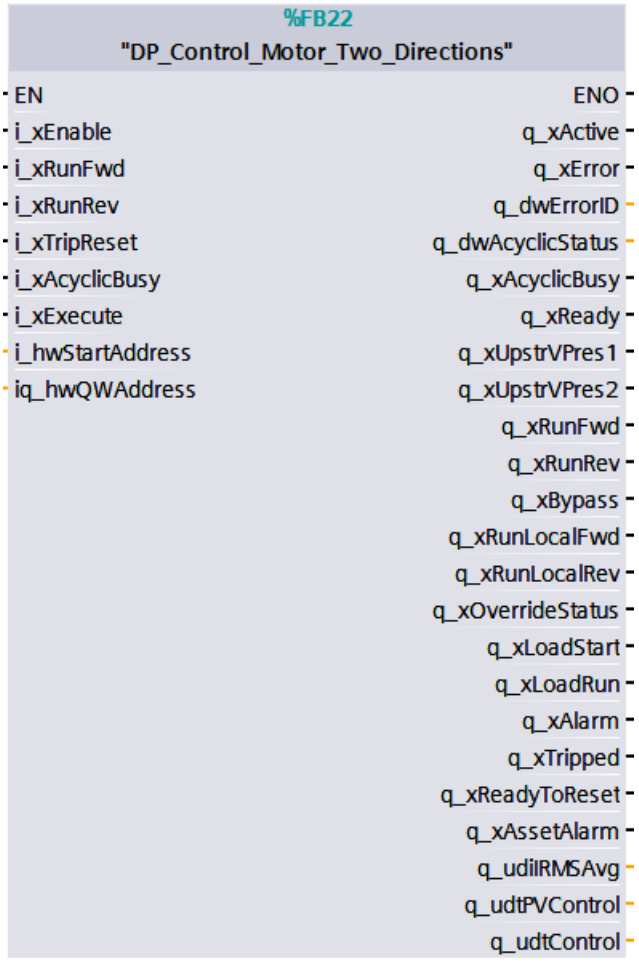
Table 175 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Direction”.
Functionality	The Motor Two Directions function block is used to manage a motor in two directions (forward and reverse).

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Two_Directions (PROFIBUS DP)

Figure 38 -



The following tables give information about the parameters of the function block interface.

Table 176 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	Cyclic data.	
i_xTripReset	BOOL	Cyclic data.	
i_xAcyclicBusy	BOOL	Function block control.	
i_xExecute	BOOL	Function block control.	
i_hwStartAddress	Variant	Communication parameter.	

Table 177 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 178 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 178 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[28] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 124*.	Acyclic data

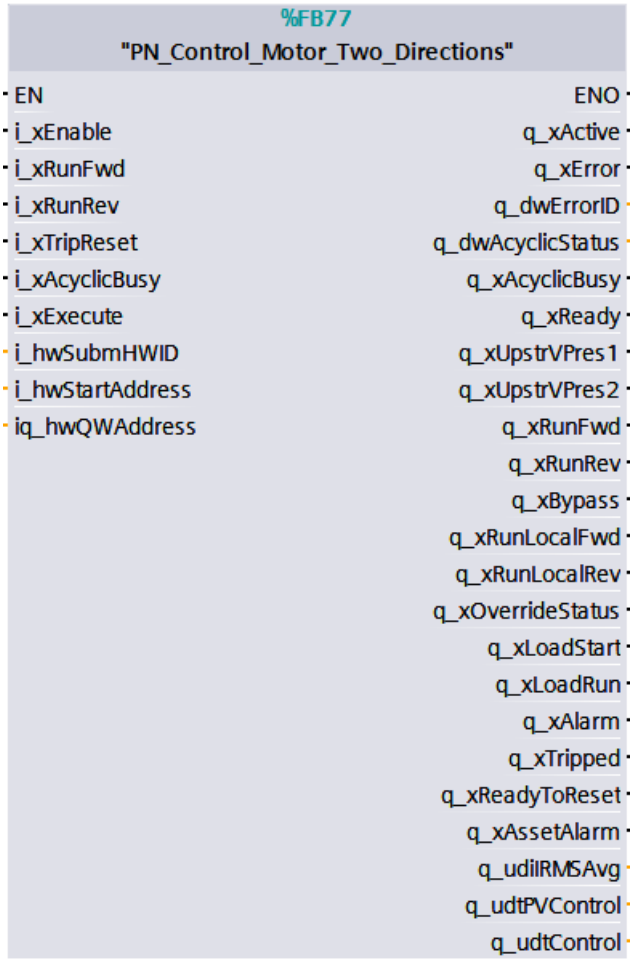
Table 179 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

28. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Two_Directions (PROFINET IO)

Figure 39 -



The following tables provide information about the function block interface parameters.

Table 180 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 181 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 182 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 182 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[29] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 124*.	Acyclic data

Table 183 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

29. Safety Integrity Level according to standard IEC 61508.

Table 184 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor Two Directions – SIL Stop, W. Cat. 1/2

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.

Table 185 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).

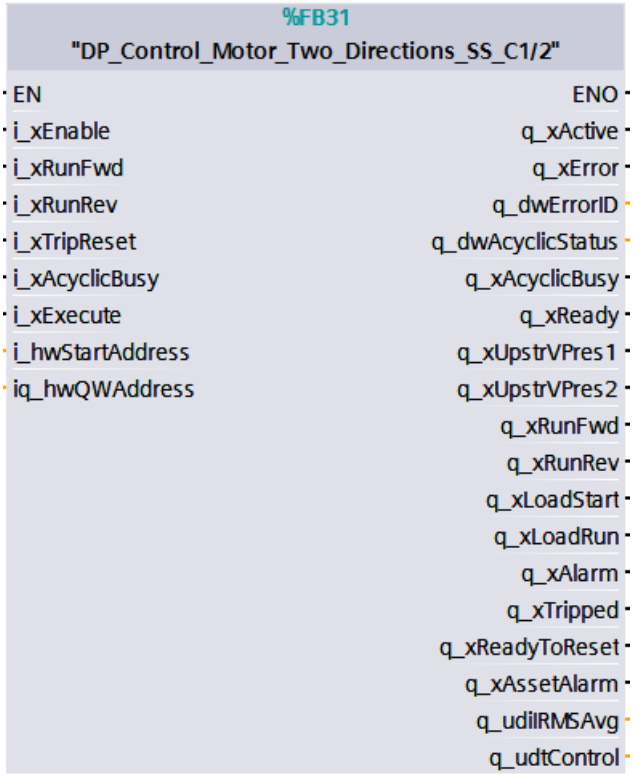
Table 185 - Function block profile (Continued)

Intended use	Load avatar “Motor Two Directions - SIL Stop, W. Cat. 1/2".
Functionality	The Motor Two Direction SIL function block is used to manage a motor in two directions (forward and reverse) with Stop Category 0 or Stop Category 1[30], Wiring Category 1 and Category 2.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Two_Directions_SS_C1/2 (PROFIBUS DP)

Figure 40 -



The following tables give information about the parameters of the function block interface.

Table 186 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control

30. Stop categories according to EN/IEC 60204-1.

Table 186 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 187 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 188 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data

Table 188 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[31] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 131*.	Acyclic data

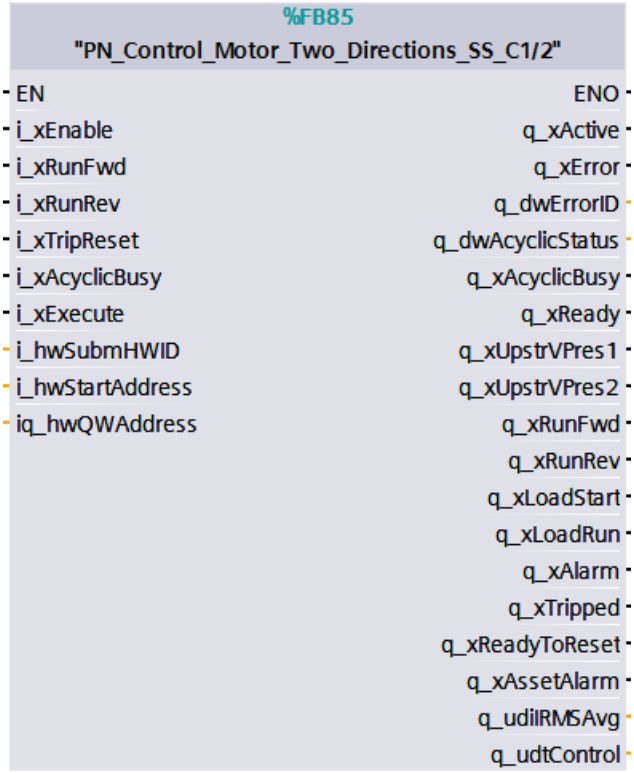
Table 189 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

31. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Two_Directions_SS_C1/2 (PROFINET IO)

Figure 41 -



The following tables give information about the parameters of the function block interface.

Table 190 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 191 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 192 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[32] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data

32. Safety Integrity Level according to standard IEC 61508.

Table 192 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A).	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 131*.	Acyclic data

Table 193 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 194 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes

Table 194 - Elements (Continued)

Element	Sub-Element	Supported
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor Two Directions – SIL Stop, W. Cat. 3/4

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 3 and Category 4 according to ISO 13849.

Table 195 - Function block profile

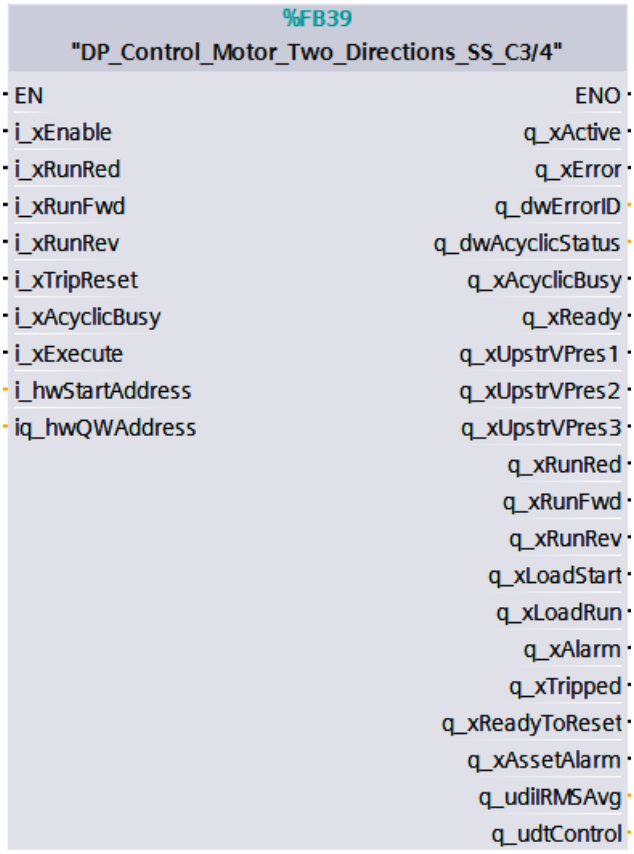
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Directions - SIL Stop, W. Cat. 3/4".
Functionality	The Motor Two Direction SIL function block is used to manage a motor in two directions (forward and reverse) with Stop Category 0 or Stop Category 1[33], Wiring Category 3 and Category 4.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

33. Stop categories according to EN/IEC 60204-1.

DP_Control_Motor_Two_Directions_SS_C3/4 (PROFIBUS DP)

Figure 42 -



The following tables give information about the parameters of the function block interface.

Table 196 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunRed	BOOL	If this input is TRUE, the redundant avatar switch is closed.	Cyclic data
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 197 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 198 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xRunRed	BOOL	If this output is set to TRUE, the redundant avatar switch is closed.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 198 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[34] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 138*.	Acyclic data

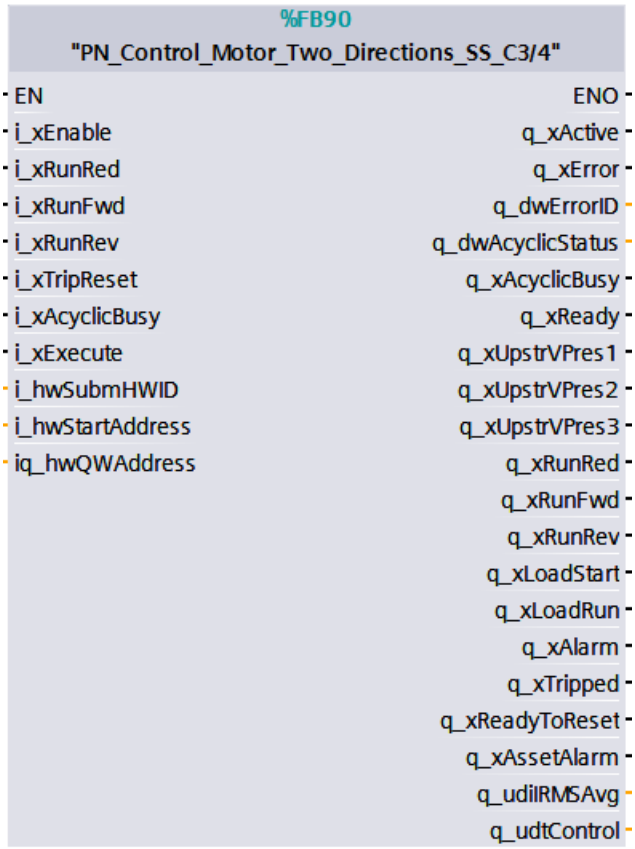
Table 199 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

34. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Two_Directions_SS_C3/4 (PROFINET IO)

Figure 43 -



The following tables give information about the parameters of the function block interface.

Table 200 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunRed	BOOL	If this input is TRUE, the redundant avatar switch is closed.	Cyclic data
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 201 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 202 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xRunRed	BOOL	If this output is set to TRUE, the redundant avatar switch is closed.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 202 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[35] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 138*.	Acyclic data

Table 203 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes

35. Safety Integrity Level according to standard IEC 61508.

Element	Sub-Element	Supported
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor Y/D, One Direction

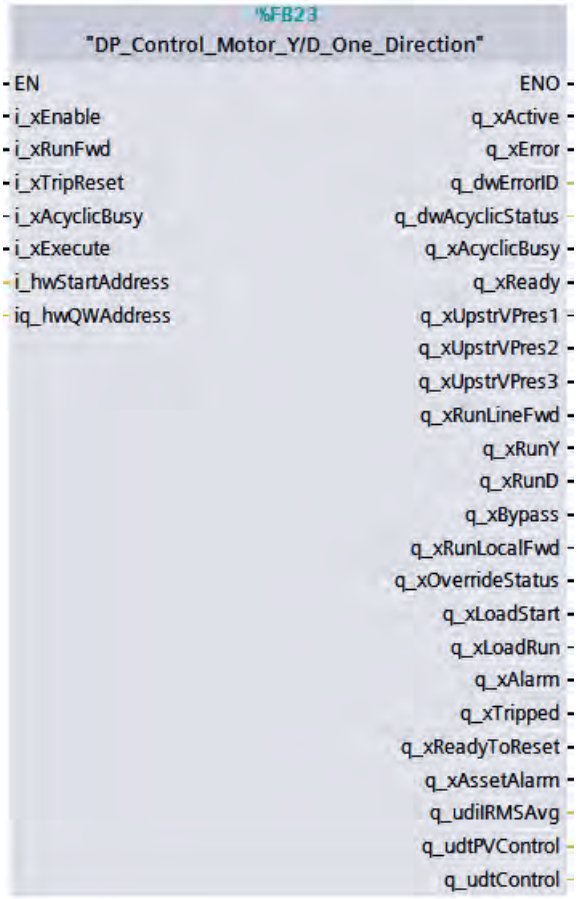
Table 204 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Y/D, One Direction“.
Functionality	The Motor YD One Direction function block is used to manage a wye/ delta (star/triangle) motor in one direction.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Y/D_One_Direction (PROFIBUS DP)

Figure 44 -



The following tables give information about the parameters of the function block interface.

Table 205 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 206 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 207 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xRunLineFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunY	BOOL	If this output is set to TRUE, the Y switch for Motor Y/D avatar is closed.	Cyclic data
q_xRunD	BOOL	If this output is set to TRUE, the D switch for Motor Y/D avatar is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 207 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[36] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 145*.	Acyclic data

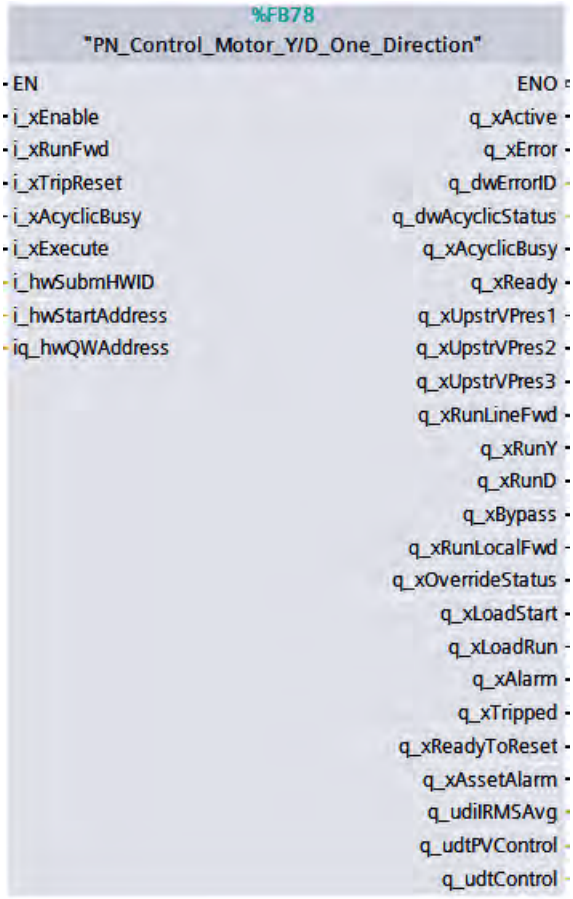
Table 208 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

36. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Y/D_One_Direction (PROFINET IO)

Figure 45 -



The following tables give information about the parameters of the function block interface.

Table 209 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 210 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 211 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xRunLineFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunY	BOOL	If this output is set to TRUE, the Y switch for Motor Y/D avatar is closed.	Cyclic data
q_xRunD	BOOL	If this output is set to TRUE, the D switch for Motor Y/D avatar is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data

Table 211 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[37] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 145*.	Acyclic data

Table 212 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

37. Safety Integrity Level according to standard IEC 61508.

Table 213 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Motor Y/D, Two Directions

Table 214 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Y/D, Two Directions“.
Functionality	The Motor YD Two Direction function block is used to manage a wye/delta (star/triangle) motor in two directions (forward and reverse).

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Y/D_Two_Directions (PROFIBUS DP)

Figure 46 -

The following tables give information about the parameters of the function block interface.

Table 215 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 216 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 217 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xRunY	BOOL	If this output is set to TRUE, the Y switch for Motor Y/D avatar is closed.	Cyclic data
q_xRunD	BOOL	If this output is set to TRUE, the D switch for Motor Y/D avatar is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data

Table 217 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[38] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 153*.	Acyclic data

Table 218 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

38. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Y/D_Two_Directions (PROFINET IO)

Figure 47 -

The following tables give information about the parameters of the function block interface.

Table 219 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 220 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 221 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xRunY	BOOL	If this output is set to TRUE, the Y switch for Motor Y/D avatar is closed.	Cyclic data
q_xRunD	BOOL	If this output is set to TRUE, the D switch for Motor Y/D avatar is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data

Table 221 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[39] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 153*.	Acyclic data

Table 222 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

39. Safety Integrity Level according to standard IEC 61508.

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 223 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Motor Two Speeds

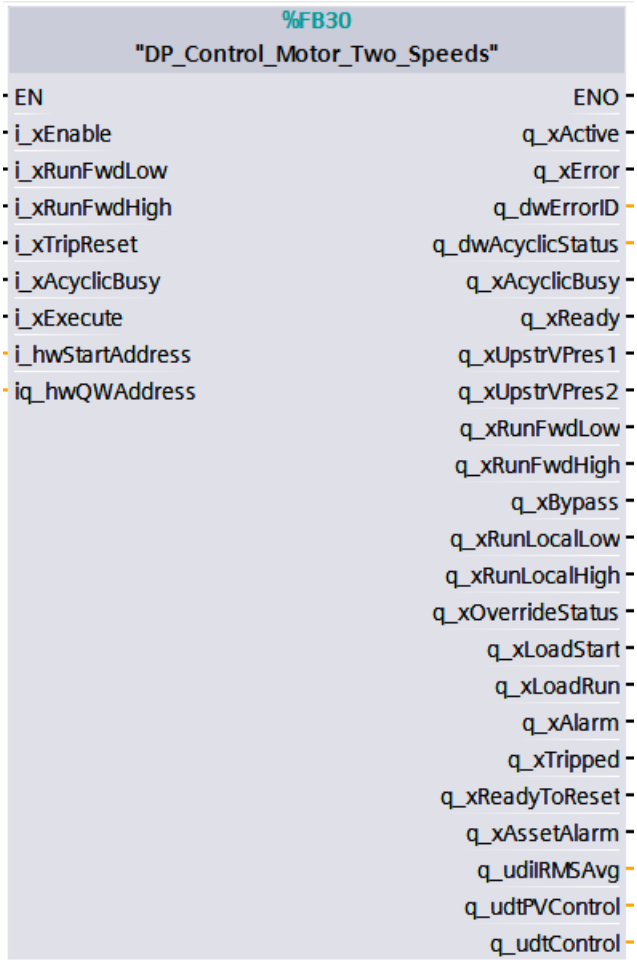
Table 224 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Speeds“.
Functionality	The Motor Two Speeds function block is used to manage a two–speed motor.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Two_Speeds (PROFIBUS DP)

Figure 48 -



The following tables give information about the parameters of the function block interface.

Table 225 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data

Table 225 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 226 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 227 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data

Table 227 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xRunLocalLow	BOOL	If this output is set to TRUE, the avatar Local Low Speed command is set.	Cyclic data
q_xRunLocalHigh	BOOL	If this output is set to TRUE, the avatar Local High Speed command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[40] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 160*.	Acyclic data

Table 228 - Status and error codes from ConstTeSysIsland

Member name	Used by the Description
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes

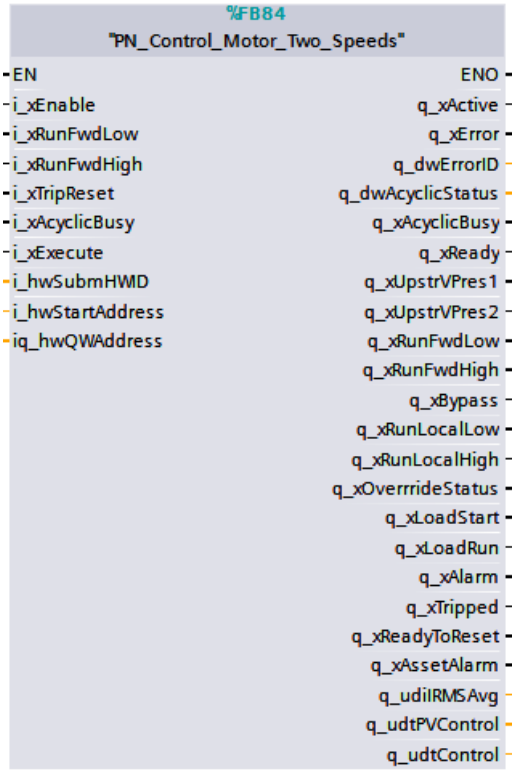
40. Safety Integrity Level according to standard IEC 61508.

Table 228 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the Description
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Motor_Two_Speeds (PROFINET IO)

Figure 49 -



The following tables give information about the parameters of the function block interface.

Table 229 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control

Table 229 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 230 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 231 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalLow	BOOL	If this output is set to TRUE, the avatar Local Low Speed command is set.	Cyclic data
q_xRunLocalHigh	BOOL	If this output is set to TRUE, the avatar Local High Speed command is set.	Cyclic data

Table 231 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[41] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 160*.	Acyclic data

Table 232 - Status an error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

41. Safety Integrity Level according to standard IEC 61508.

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 233 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Motor Two Speeds – SIL Stop, W. Cat. 1/2

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.

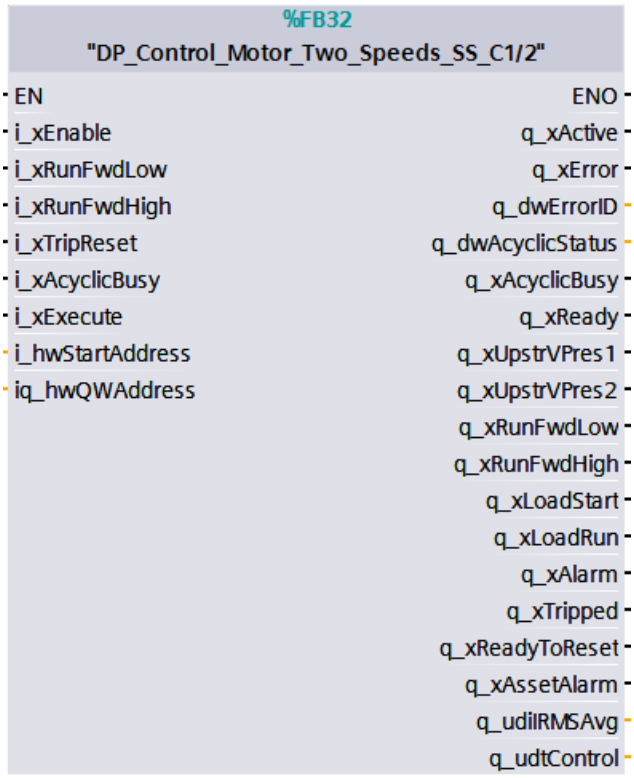
Table 234 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Speeds – SIL Stop, W. Cat. 1/2“.
Functionality	The Motor Two Speeds SIL function block is used to manage a two speed motor with Stop Category 0 or Stop Category 1[42], Wiring Category 1 and Category 2.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Two_Speeds_SS_C1/2 (PROFIBUS DP)

Figure 50 -



The following tables give information about the parameters of the function block interface.

Table 235 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data

42. Stop categories according to EN/IEC 60204-1.

Table 235 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 236 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 237 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data

Table 237 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[43] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A).	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 166*.	Acyclic data

Table 238 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

43. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Two_Speeds_SS_C1/2 (PROFINET IO)

Figure 51 -

The following tables give information about the parameters of the function block interface.

Table 239 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 240 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 241 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[44] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data

44. Safety Integrity Level according to standard IEC 61508.

Table 241 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 166*.	Acyclic data

Table 242 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 243 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes

Table 243 - Elements (Continued)

Element	Sub-Element	Supported
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor Two Speeds – SIL Stop, W. Cat. 3/4

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 3 and Category 4 according to ISO 13849.

Table 244 - Function block profile

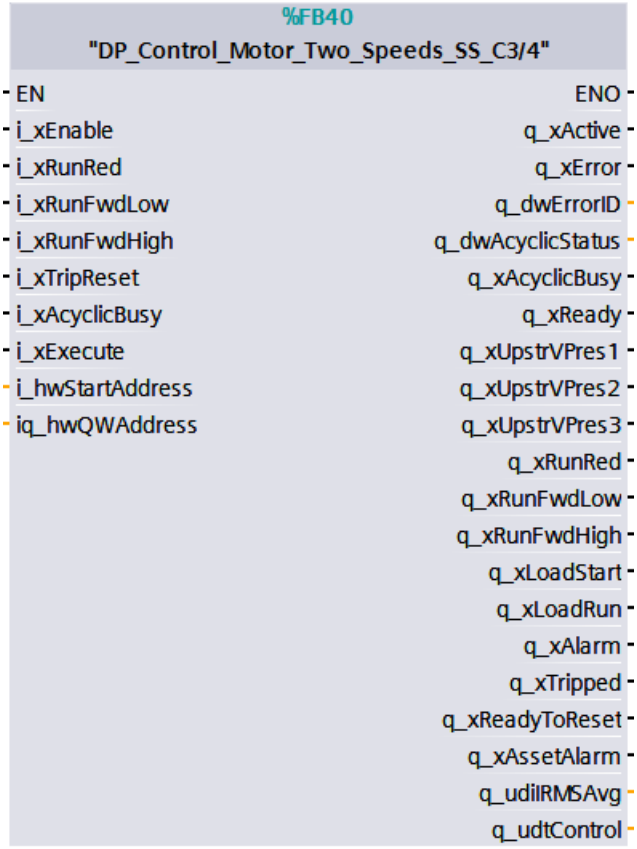
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Speeds – SIL Stop, W. Cat. 3/4“
Functionality	The Motor Two Speeds SIL function block is used to manage a two speed motor with Stop Category 0 or Stop Category 1[45], Wiring Category 3 and Category 4.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

45. Stop categories according to EN/IEC 60204-1.

DP_Control_Motor_Two_Speeds_SS_C3/4 (PROFIBUS DP)

Figure 52 -



The following tables give information about the parameters of the function block interface.

Table 245 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunRed	BOOL	If this input is TRUE, the redundant avatar switch is closed.	Cyclic data
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 246 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 247 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xRunRed	BOOL	If this input is TRUE, the redundant avatar switch is closed.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data

Table 247 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[46] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 173*.	Acyclic data

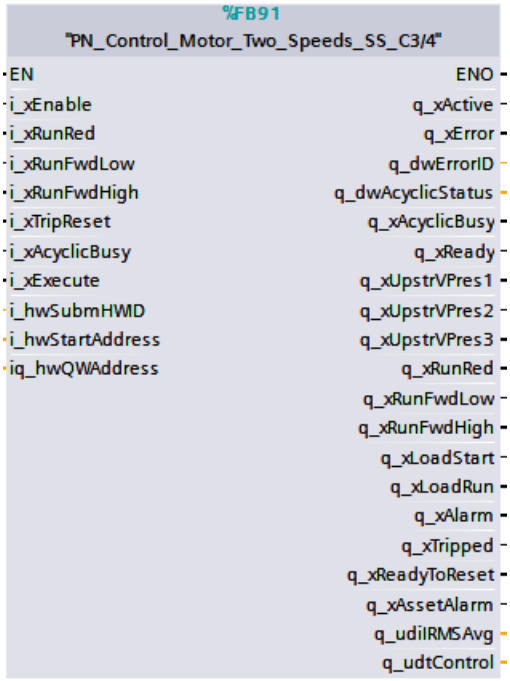
Table 248 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

46. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Two_Speeds_SS_C3/4 (PROFINET IO)

Figure 53 -



The following tables give information about the parameters of the function block interface.

Table 249 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunRed	BOOL	If this input is TRUE, the redundant avatar switch is closed.	Cyclic data
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 250 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 251 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xRunRed	BOOL	If this input is TRUE, the redundant avatar switch is closed.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 251 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[47] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 173*.	Acyclic data

Table 252 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 253 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes

47. Safety Integrity Level according to standard IEC 61508.

Table 253 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor Two Speeds, Two Directions

Table 254 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Speeds, Two Directions“.
Functionality	The Motor Two Speeds Two Directions function block is used to manage a two speed motor in two directions (forward and reverse).

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Two_Speeds_Two_Directions_ (PROFIBUS DP)

Figure 54 -

The following tables give information about the parameters of the function block interface.

Table 255 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xRunRevLow	BOOL	If this input is set to TRUE, the motor starts in reverse direction with low speed.	Cyclic data
i_xRunRevHigh	BOOL	If this input is set to TRUE, the motor starts in reverse direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control

Table 255 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 256 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 257 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xRunRevLow	BOOL	If this output is set to TRUE, the low speed reverser switch is closed.	Cyclic data

Table 257 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xRunRevHigh	BOOL	If this output is set to TRUE, the high speed reverser switch is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwdLow	BOOL	If this output is set to TRUE, the avatar Local Forward Low Speed command is set.	Cyclic data
q_xRunLocalFwdHigh	BOOL	If this output is set to TRUE, the avatar Local Forward High Speed command is set.	Cyclic data
q_xRunLocalRevLow	BOOL	If this output is set to TRUE, the avatar Local Reverse Low Speed command is set.	Cyclic data
q_xRunLocalRevHigh	BOOL	If this output is set to TRUE, the avatar Local Reverse High Speed command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[48] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 181*.	Acyclic data

Table 258 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes

48. Safety Integrity Level according to standard IEC 61508.

Table 258 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Motor_Two_Speeds_Two_Directions (PROFINET IO)

Figure 55 -

The following tables give information about the parameters of the function block interface.

Table 259 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xRunRevLow	BOOL	If this input is set to TRUE, the motor starts in reverse direction with low speed.	Cyclic data
i_xRunRevHigh	BOOL	If this input is set to TRUE, the motor starts in reverse direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 260 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 261 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data

Table 261 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xRunRevLow	BOOL	If this output is set to TRUE, the low speed reverser switch is closed.	Cyclic data
q_xRunRevHigh	BOOL	If this output is set to TRUE, the high speed reverser switch is closed.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xRunLocalFwdLow	BOOL	If this output is set to TRUE, the avatar Local Forward Low Speed command is set.	Cyclic data
q_xRunLocalFwdHigh	BOOL	If this output is set to TRUE, the avatar Local Forward High Speed command is set.	Cyclic data
q_xRunLocalRevLow	BOOL	If this output is set to TRUE, the avatar Local Reverse Low Speed command is set.	Cyclic data
q_xRunLocalRevHigh	BOOL	If this output is set to TRUE, the avatar Local Reverse High Speed command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 261 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[49] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 181*.	Acyclic data

Table 262 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 263 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes

49. Safety Integrity Level according to standard IEC 61508.

Table 263 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Motor Two Speeds, Two Directions – SIL Stop, W. Cat. 1/2

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.

Table 264 - Function block profile

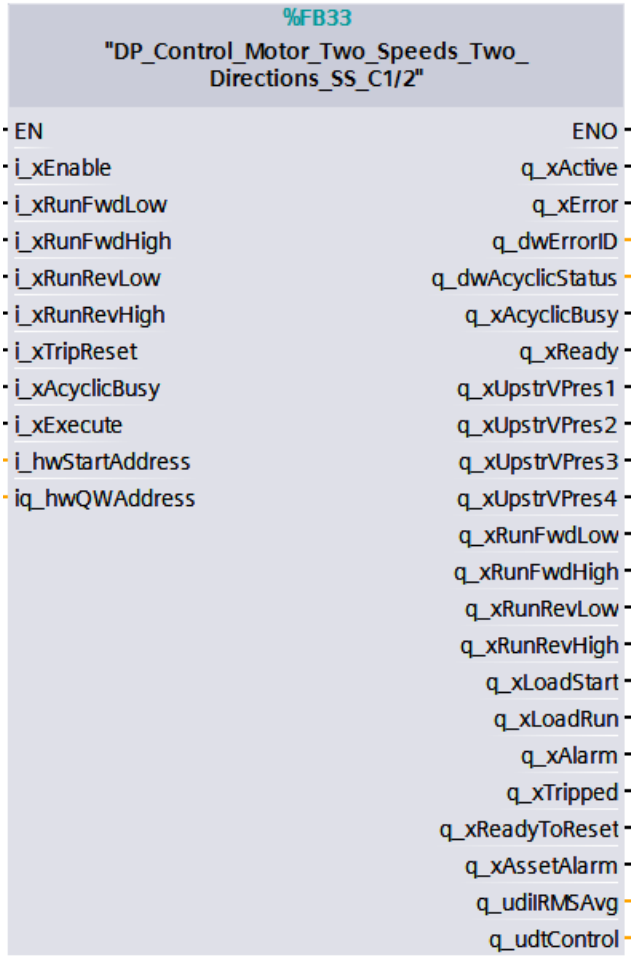
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Speeds, Two Directions – SIL Stop, W. Cat. 1/2 “.
Functionality	The Motor Two Speeds Two Directions – SIL Stop, W. Cat. 1/2 function block is used to manage a two speed motor in two directions (forward and reverse) with Stop Category 0 or Stop Category 1[50], Wiring Category 1 and Category 2.

50. Stop categories according to EN/IEC 60204-1.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Two_Speeds_Two_Directions_SS_C1/2 (PROFIBUS DP)

Figure 56 -



The following tables give information about the parameters of the function block interface.

Table 265 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xRunRevLow	BOOL	If this input is set to TRUE, the motor starts in reverse direction with low speed.	Cyclic data
i_xRunRevHigh	BOOL	If this input is set to TRUE, the motor starts in reverse direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control

Table 265 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 266 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 267 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xRunRevLow	BOOL	If this output is set to TRUE, the low speed reverser switch is closed.	Cyclic data

Table 267 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xRunRevHigh	BOOL	If this output is set to TRUE, the high speed reverser switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[51] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 189*.	Acyclic data

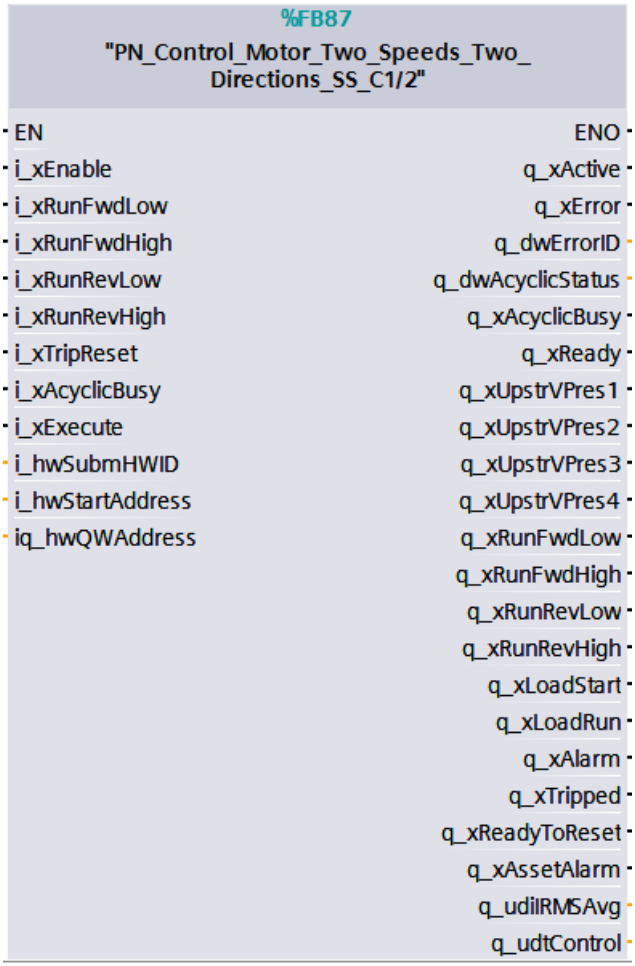
Table 268 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

51. Safety Integrity Level according to standard IEC 61508.

PN_Control_Motor_Two_Speeds_Two_Directions_SS_C1/2 (PROFINET IO)

Figure 57 -



The following tables give information about the parameters of the function block interface.

Table 269 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xRunRevLow	BOOL	If this input is set to TRUE, the motor starts in reverse direction with low speed.	Cyclic data
i_xRunRevHigh	BOOL	If this input is set to TRUE, the motor starts in reverse direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control

Table 269 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 270 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 271 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data

Table 271 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xRunRevLow	BOOL	If this output is set to TRUE, the low speed reverser switch is closed.	Cyclic data
q_xRunRevHigh	BOOL	If this output is set to TRUE, the high speed reverser switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[52] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 189*.	Acyclic data

Table 272 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

52. Safety Integrity Level according to standard IEC 61508.

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 273 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Motor Two Speeds, Two Directions – SIL Stop, W. Cat. 3/4

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 3 and Category 4 according to ISO 13849.

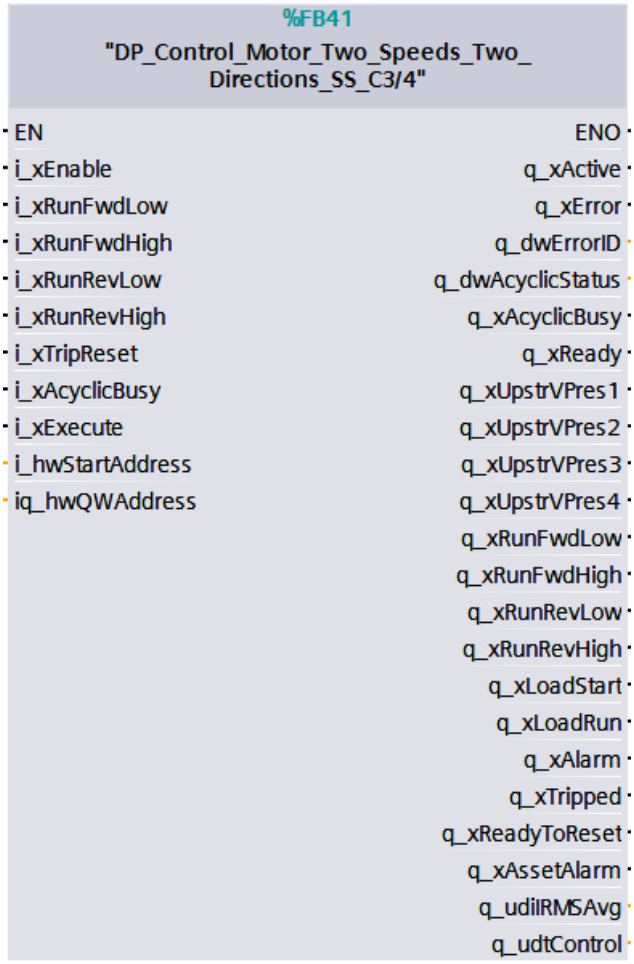
Table 274 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Motor Two Speeds, Two Directions – SIL Stop, W. Cat. 3/4 “.
Functionality	The Motor Two Speeds Two Directions – SIL Stop, W. Cat. 3/4 function block is used to manage a two speed motor in two directions (forward and reverse) with Stop Category 0 or Stop Category 1[53], Wiring Category 3 and Category 4.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Motor_Two_Speeds_Two_Directions_SS_C3/4 (PROFIBUS DP)

Figure 58 -



The following tables give information about the parameters of the function block interface.

53. Stop categories according to EN/IEC 60204-1.

Table 275 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xRunRevLow	BOOL	If this input is set to TRUE, the motor starts in reverse direction with low speed.	Cyclic data
i_xRunRevHigh	BOOL	If this input is set to TRUE, the motor starts in reverse direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 276 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 277 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data

Table 277 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xRunRevLow	BOOL	If this output is set to TRUE, the low speed reverser switch is closed.	Cyclic data
q_xRunRevHigh	BOOL	If this output is set to TRUE, the high speed reverser switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[54] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 196*.	Acyclic data

Table 278 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes

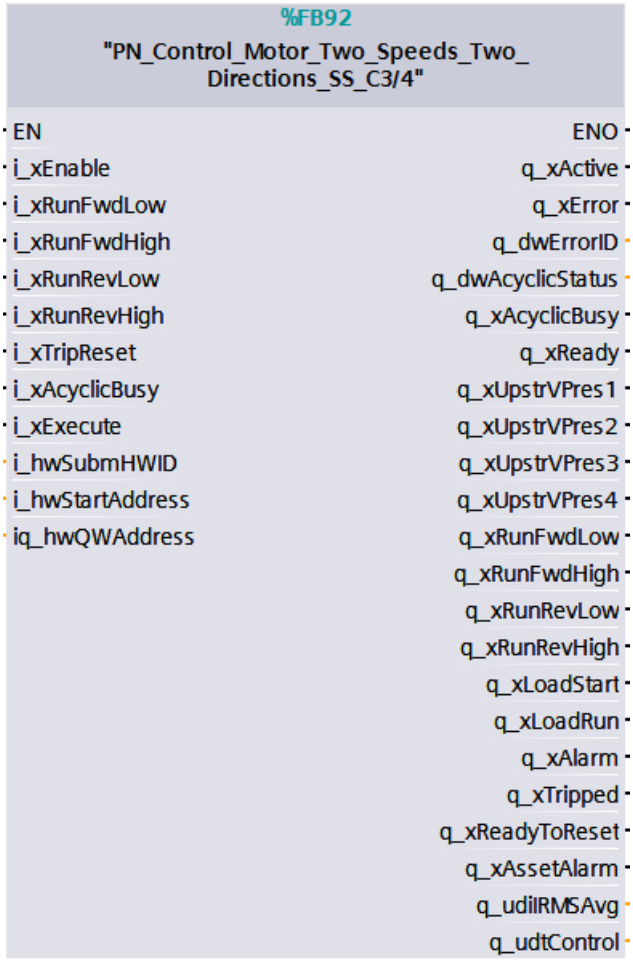
54. Safety Integrity Level according to standard IEC 61508.

Table 278 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Motor_Two_Speeds_Two_Directions_SS_C3/4 (PROFINET IO)

Figure 59 -



The following tables give information about the parameters of the function block interface.

Table 279 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwdLow	BOOL	If this input is set to TRUE, the motor starts in forward direction with low speed.	Cyclic data
i_xRunFwdHigh	BOOL	If this input is set to TRUE, the motor starts in forward direction with high speed.	Cyclic data
i_xRunRevLow	BOOL	If this input is set to TRUE, the motor starts in reverse direction with low speed.	Cyclic data
i_xRunRevHigh	BOOL	If this input is set to TRUE, the motor starts in reverse direction with high speed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 280 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 281 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data

Table 281 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_xRunFwdLow	BOOL	If this output is set to TRUE, the motor is running in low speed. If this output is set to FALSE, the motor is stopped or is running in high speed.	Cyclic data
q_xRunFwdHigh	BOOL	If this output is set to TRUE, the motor is running in high speed. If this output is set to FALSE, the motor is stopped or is running in low speed.	Cyclic data
q_xRunRevLow	BOOL	If this output is set to TRUE, the low speed reverser switch is closed.	Cyclic data
q_xRunRevHigh	BOOL	If this output is set to TRUE, the high speed reverser switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[55] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 196*.	Acyclic data

55. Safety Integrity Level according to standard IEC 61508.

Table 282 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 283 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes

Table 283 - Elements (Continued)

Element	Sub-Element	Supported
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Resistor

Table 284 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Resistor“.
Functionality	The Resistor function block is used to manage a resistive load.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Resistor (PROFIBUS DP)

The following tables give information about the parameters of the function block interface.

Figure 60 -

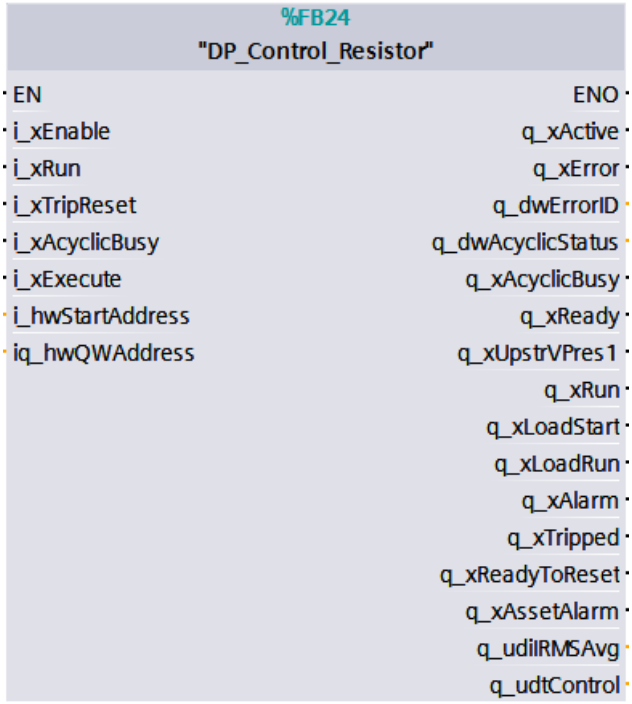


Table 285 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 286 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 287 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[56] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 202*.	Acyclic data

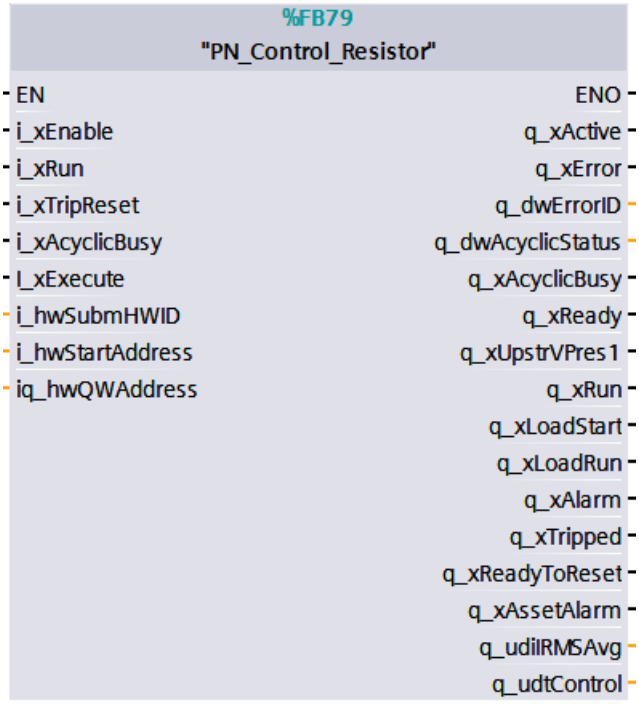
56. Safety Integrity Level according to standard IEC 61508.

Table 288 - Status and error codes from ConstTeSysIsand

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Resistor (PROFINET IO)

Figure 61 -



The following tables give information about the parameters of the function block interface.

Table 289 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data

Table 289 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 290 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 291 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data

Table 291 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[57] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 202*.	Acyclic data

Table 292 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 293 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	No
SILGroup	n/A	No
ThermalCapacity	n/A	No

57. Safety Integrity Level according to standard IEC 61508.

Table 293 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	No
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	No
TripMsg1	GroundCurrent	Yes
	ThermalOverload	No
	LongStart	No
	Jam	No
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	No
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	No
TimeToTrip	n/A	No
TimeToReset	n/A	No
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Power Supply

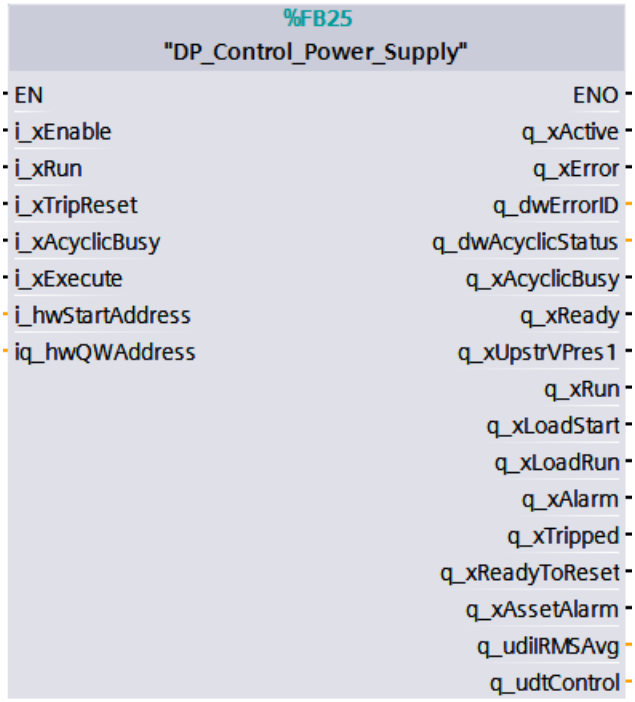
Table 294 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Power Supply“.
Functionality	The Power Supply function block is used to manage a power supply.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Power_Supply (PROFIBUS DP)

Figure 62 -



The following tables give information about the parameters of the function block interface.

Table 295 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 296 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 297 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[58] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 208*.	Acyclic data

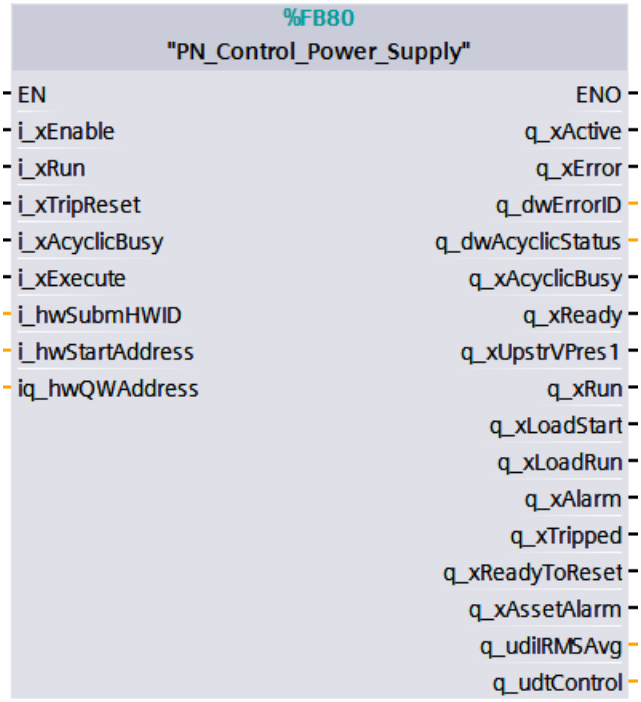
58. Safety Integrity Level according to standard IEC 61508.

Table 298 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Power_Supply (PROFINET IO)

Figure 63 -



The following tables give information about the parameters of the function block interface.

Table 299 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data

Table 299 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 300 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 301 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data

Table 301 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[59] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 208*.	Acyclic data

Table 302 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 303 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	No
SILGroup	n/A	No
ThermalCapacity	n/A	No

59. Safety Integrity Level according to standard IEC 61508.

Table 303 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	No
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	No
TripMsg1	GroundCurrent	Yes
	ThermalOverload	No
	LongStart	No
	Jam	No
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	No
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	No
TimeToTrip	n/A	No
TimeToReset	n/A	No
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Transformer

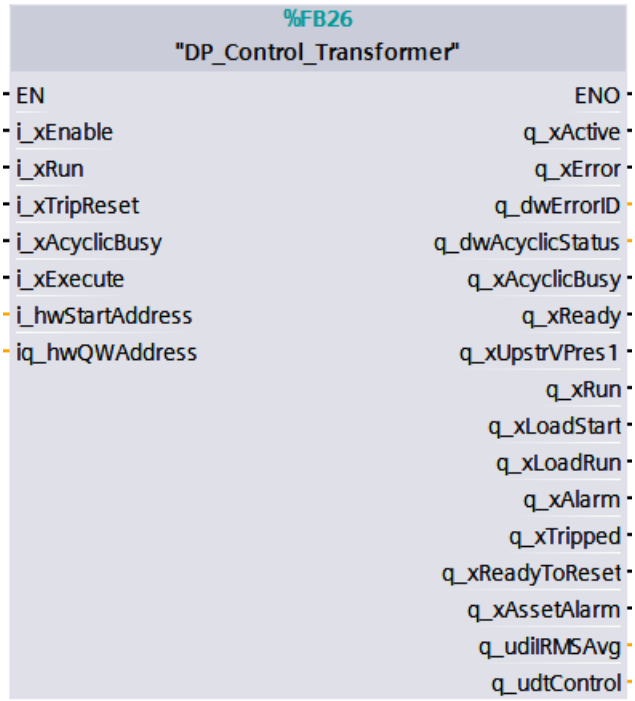
Table 304 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Load avatar “Transformer“.
Functionality	The Transformer function block is used to manage a transformer.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Transformer (PROFIBUS DP)

Figure 64 -



The following tables give information about the parameters of the function block interface.

Table 305 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 306 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 307 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[60] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 214*.	Acyclic data

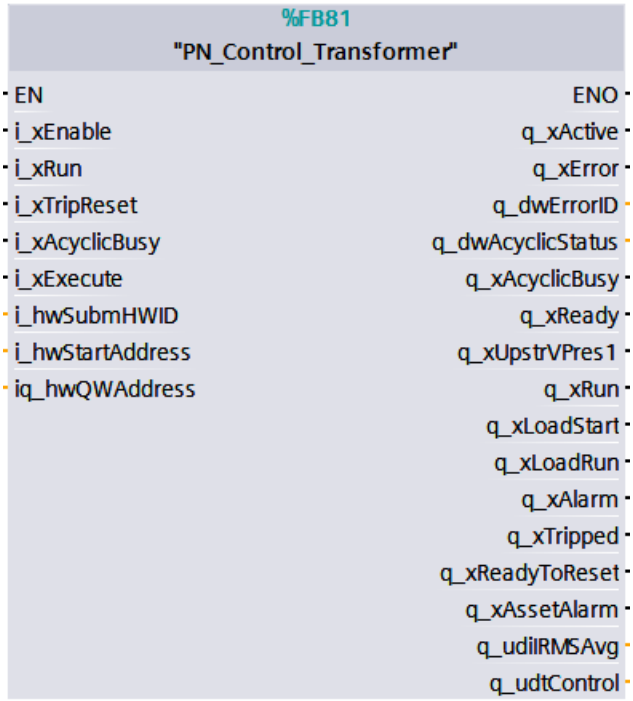
60. Safety Integrity Level according to standard IEC 61508.

Table 308 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Transformer (PROFINET IO)

Figure 65 -



The following tables give information about the parameters of the function block interface.

Table 309 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRun	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data

Table 309 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 310 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 311 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRun	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data

Table 311 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[61] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 214*.	Acyclic data

Table 312 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 313 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	No
SILGroup	n/A	No
ThermalCapacity	n/A	No

61. Safety Integrity Level according to standard IEC 61508.

Table 313 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	No
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	No
TripMsg1	GroundCurrent	Yes
	ThermalOverload	No
	LongStart	No
	Jam	No
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	No
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	No
TimeToTrip	n/A	No
TimeToReset	n/A	No
PAStatusReg1	PA0Status	No
	PA1Status	No
	PA2Status	No
	PA3Status	No
	PA4Status	No
	PA5Status	No
	PA6Status	No
	PA7Status	No
	PA8Status	No
	PA9Status	No

Pump

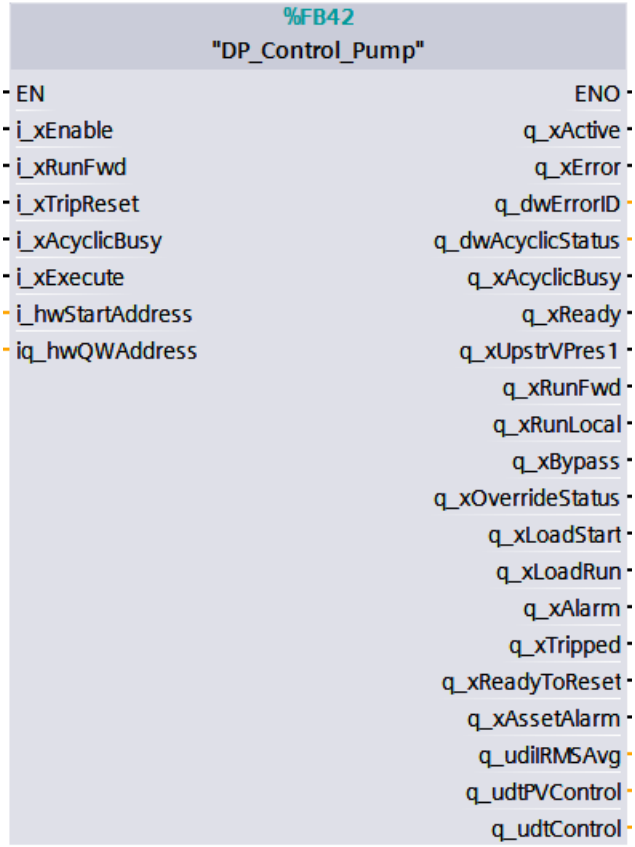
Table 314 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Application avatar “Pump“.
Functionality	The Pump function block is used to manage a pump.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Pump (PROFIBUS DP)

Figure 66 -



The following tables give information about the parameters of the function block interface.

Table 315 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 316 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 317 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Run command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[62] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

62. Safety Integrity Level according to standard IEC 61508.

Table 317 - Outputs (Continued)

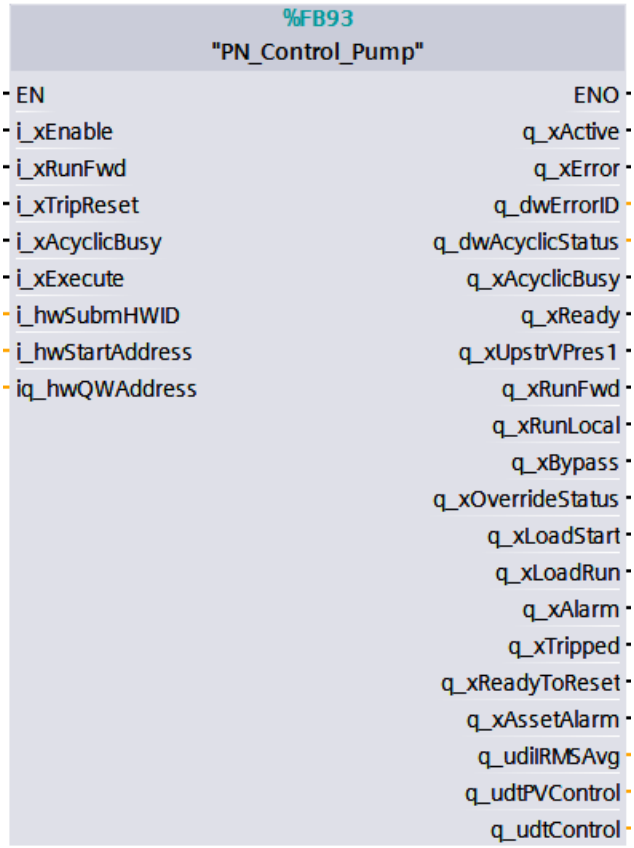
Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 221*.	Acyclic data

Table 318 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Pump (PROFINET IO)

Figure 67 -



The following tables give information about the parameters of the function block interface.

Table 319 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 320 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 321 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Run command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xOverrideStatus	BOOL	If this output is set to TRUE, the avatar Manual mode is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[63] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

63. Safety Integrity Level according to standard IEC 61508.

Table 321 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 221*.	Acyclic data

Table 322 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 323 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes

Table 323 - Elements (Continued)

Element	Sub-Element	Supported
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	No
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Conveyor, One Direction

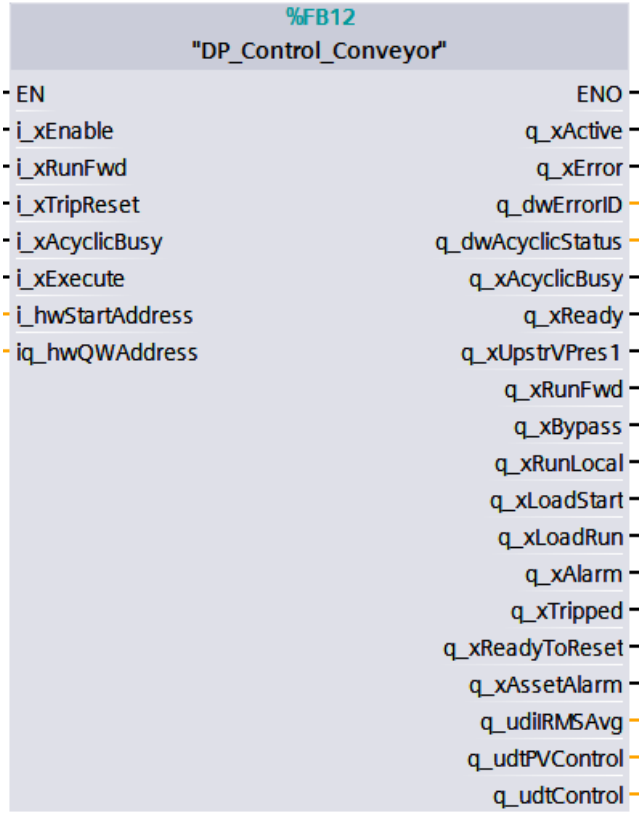
Table 324 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Application avatar “Conveyor, One Direction“.
Functionality	The Conveyor One Direction function block is used to manage a conveyor in one direction.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Conveyor (PROFIBUS DP)

Figure 68 -



The following tables give information about the parameters of the function block interface.

Table 325 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 326 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 327 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[64] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

64. Safety Integrity Level according to standard IEC 61508.

Table 327 - Outputs (Continued)

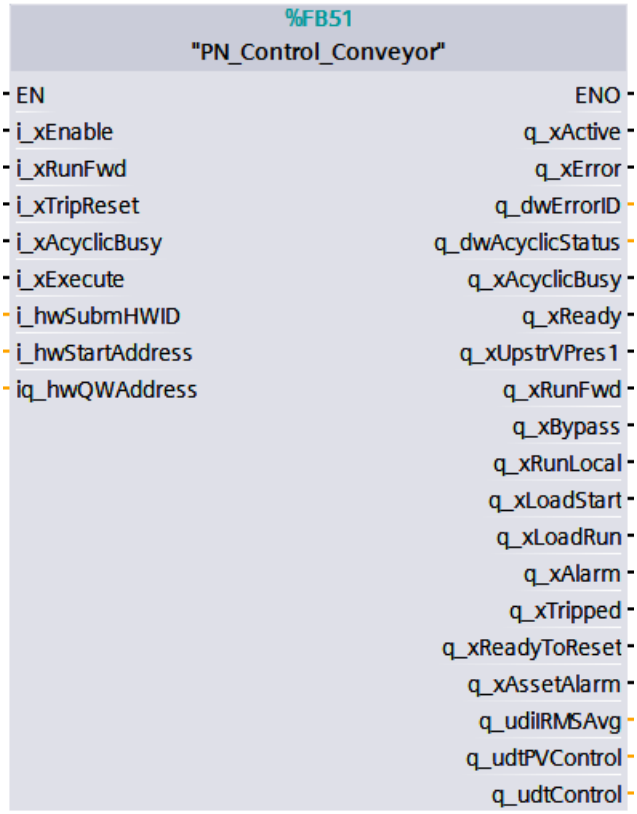
Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*..	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 228*.	Acyclic data

Table 328 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Conveyor (PROFINET IO)

Figure 69 -



The following tables give information about the parameters of the function block interface.

Table 329 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 330 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 331 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[65] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

65. Safety Integrity Level according to standard IEC 61508.

Table 331 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 228*.	Acyclic data

Table 332 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 333 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes

Table 333 - Elements (Continued)

Element	Sub-Element	Supported
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Conveyor, One Direction – SIL Stop, W. Cat. 1/2

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.

Table 334 - Function block profile

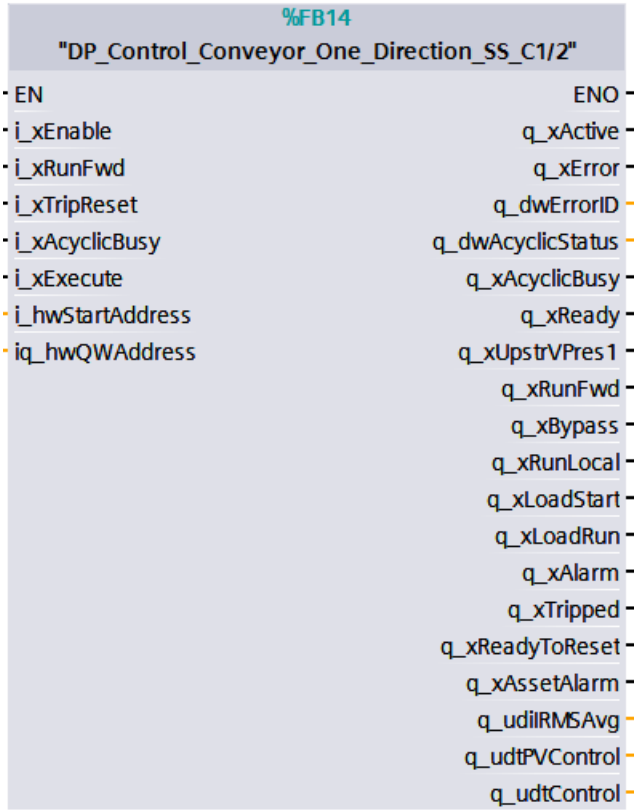
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Application avatar “Conveyor, One Direction – SIL Stop, W. Cat. 1/2“.
Functionality	The Conveyor One Direction – SIL Stop, W. Cat. 1/2 function block is used to manage a conveyor in one direction with Stop Category 0 or Stop Category 1[66], Wiring Category 1 and Category 2.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

66. Stop categories according to EN/IEC 60204-1.

DP_Control_Conveyor_One_Direction_SS_C1/2 (PROFIBUS DP)

Figure 70 -



The following tables give information about the parameters of the function block interface.

Table 335 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 336 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 337 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[67] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

67. Safety Integrity Level according to standard IEC 61508.

Table 337 - Outputs (Continued)

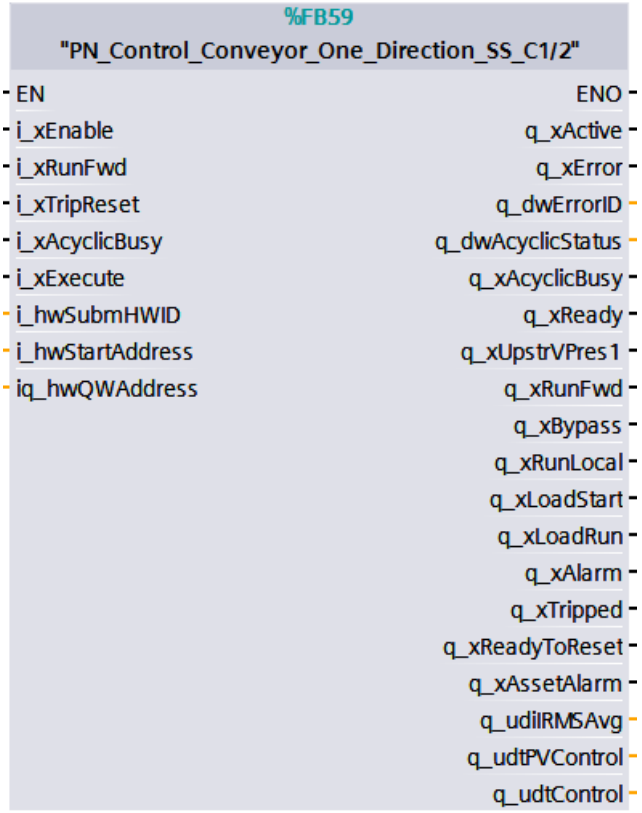
Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 235*.	Acyclic data

Table 338 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Control_Conveyor_One_Direction_SS_C1/2 (PROFINET IO)

Figure 71 -



The following tables give information about the parameters of the function block interface.

Table 339 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 340 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 341 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunLocal	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[68] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data

68. Safety Integrity Level according to standard IEC 61508.

Table 341 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 235*.	Acyclic data

Table 342 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 343 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes

Table 343 - Elements (Continued)

Element	Sub-Element	Supported
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Conveyor, Two Directions

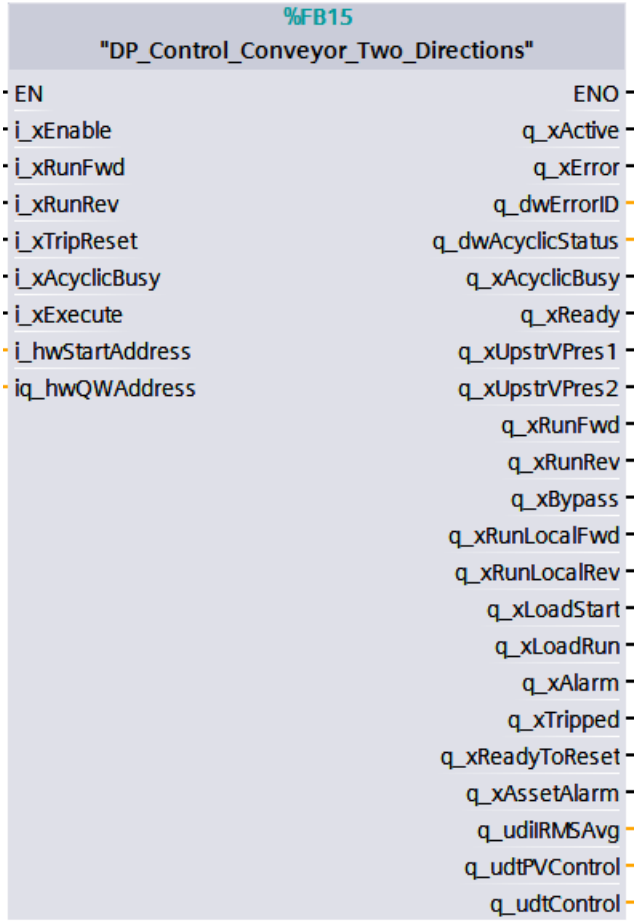
Table 344 - Function block profile

Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Application avatar “Conveyor, Two Directions“.
Functionality	The Conveyor Two Directions function block is used to manage a conveyor in two directions (forward and reverse).

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Conveyor_Two_Directions (PROFIBUS DP)

Figure 72 -



The following tables give information about the parameters of the function block interface.

Table 345 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 346 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 347 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 347 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[69] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 242*.	Acyclic data

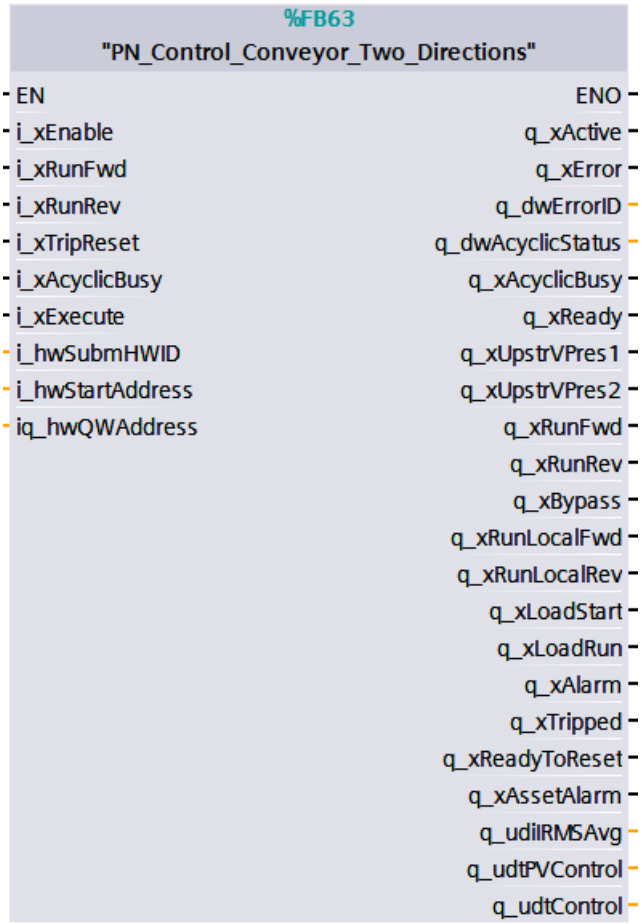
Table 348 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

69. Safety Integrity Level according to standard IEC 61508.

PN_Control_Conveyor_Two_Directions (PROFINET IO)

Figure 73 -



The following tables give information about the parameters of the function block interface.

Table 349 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 350 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 351 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 351 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[70] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 242*.	Acyclic data

Table 352 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	No
ThermalCapacity	n/A	Yes

70. Safety Integrity Level according to standard IEC 61508.

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Conveyor, Two Directions – SIL Stop, W. Cat. 1/2

NOTE: Safety Integrity Level according to standard IEC 61508. Wiring Category 1 and Category 2 according to ISO 13849.

Table 353 - Function block profile

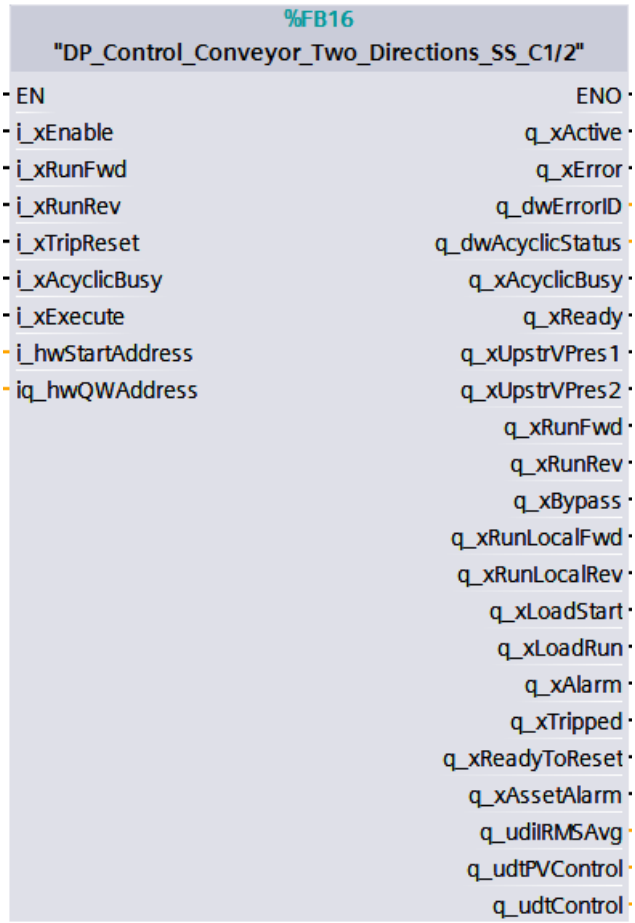
Function block type	Avatar Control function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	Application avatar “Conveyor, Two Directions – SIL Stop, W. Cat. 1/2“.
Functionality	The Conveyor Two Directions – SIL Stop, W. Cat. 1/2 function block is used to manage a conveyor in two directions (forward and reverse) with Stop Category 0 or Stop Category 1[71], Wiring Category 1 and Category 2.

71. Stop categories according to EN/IEC 60204-1.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Control_Conveyor_Two_Directions_SS_C1/2 (PROFIBUS DP)

Figure 74 -



The following tables give information about the parameters of the function block interface.

Table 354 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 355 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 356 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 356 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[72] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 249*.	Acyclic data

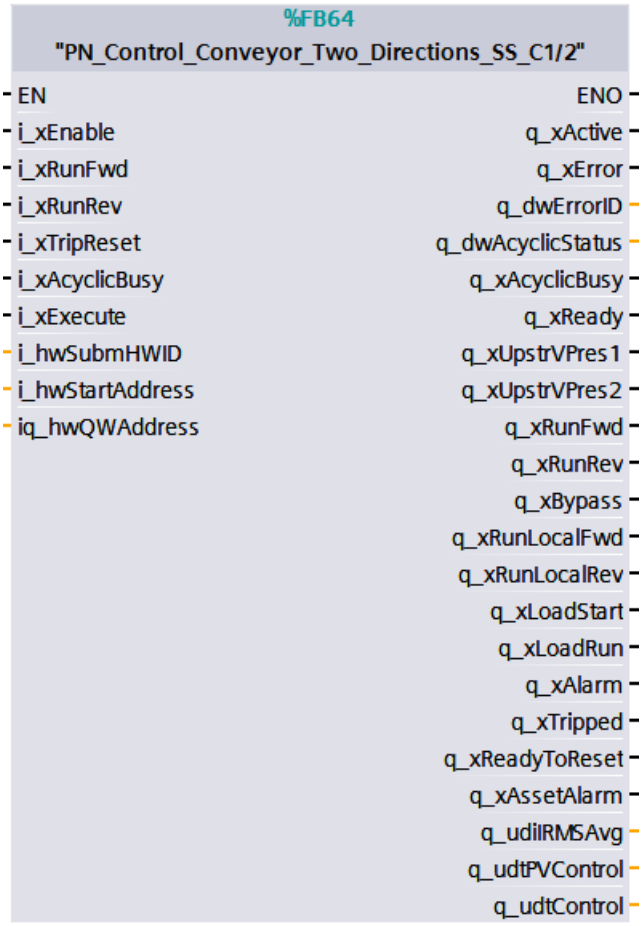
Table 357 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

72. Safety Integrity Level according to standard IEC 61508.

PN_Control_Conveyor_Two_Directions_SS_C1/2 (PROFINET IO)

Figure 75 -



The following tables give information about the parameters of the function block interface.

Table 358 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunFwd	BOOL	If this input is set to TRUE, the avatar forward switch is closed.	Cyclic data
i_xRunRev	BOOL	If this input is TRUE, the avatar reverse switch is closed.	Cyclic data
i_xTripReset	BOOL	If this input is set to TRUE, detected trips whose trip reset conditions have been met will reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 359 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 360 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xReady	BOOL	Indicates TRUE if the function block is ready to receive an Execute command.	Cyclic data
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xRunFwd	BOOL	If this output is set to TRUE, the avatar forward switch is closed.	Cyclic data
q_xRunRev	BOOL	If this output is set to TRUE, the avatar reverse switch is closed.	Cyclic data
q_xRunLocalFwd	BOOL	If this output is set to TRUE, the avatar Local Forward command is set.	Cyclic data
q_xRunLocalRev	BOOL	If this output is set to TRUE, the avatar Local Reverse command is set.	Cyclic data
q_xBypass	BOOL	If this output is set to TRUE, the avatar Bypass command is set.	Cyclic data
q_xLoadStart	BOOL	If this output is set to TRUE, the motor is in start phase.	Cyclic data
q_xLoadRun	BOOL	If this output is set to TRUE, a Run or Close command has been executed, and current is flowing in the poles (equivalent to motor running but also for non-motor avatars).	Cyclic data
q_xAlarm	BOOL	If this output is set to TRUE, a protection alarm has been detected by the avatar.	Cyclic data
q_xTripped	BOOL	If this output is set to TRUE, a protection trip event has been detected by the avatar.	Cyclic data
q_xReadyToReset	BOOL	If this output is set to TRUE, the avatar meets the trip reset conditions and can be reset with a Trip Reset command.	Cyclic data

Table 360 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_xAssetAlarm	BOOL	If this output is set to TRUE, a power device or SIL[73] Starter within the avatar has reached or exceeded 90% of the expected durability (per the avatar parameter).	Cyclic data
q_udiIRMSAvg	UDINT	Indicates the average of the most recent phase current Irms values. (Unit: A)	Cyclic data
q_udtPVControl	UDT_ PVControl	This is a structure of cyclic PV status data for Control avatars. For detailed information about the structure of this UDT, see *UDT_PVControl, page 26*.	Cyclic data
q_udtControl	UDT_Control	This is a structure of acyclic status data for Control avatars, which includes information about alarm and trip messages and maintenance information about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*. For an overview of which members of the UDT are supported by this avatar, see *Supported Members of UDT_Control, page 249*.	Acyclic data

Table 361 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Supported Members of UDT_Control

Not all members of the user defined type “UDT_Control” (see *UDT_Control, page 21*) are supported by all avatars. The following table gives an overview of which elements are available for this avatar. Unsupported values will always use the default value.

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 362 - Elements

Element	Sub-Element	Supported
MotorTemperature	n/A	Yes
SILGroup	n/A	Yes
ThermalCapacity	n/A	Yes

73. Safety Integrity Level according to standard IEC 61508.

Table 362 - Elements (Continued)

Element	Sub-Element	Supported
AlarmMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
AlarmMsg2	OverCurrent	Yes
	MotorOverheat	Yes
TripMsg1	GroundCurrent	Yes
	ThermalOverload	Yes
	LongStart	Yes
	Jam	Yes
	PhaseUnbalance	Yes
	UnderCurrent	Yes
	Stall	Yes
TripMsg2	PhConfig	Yes
	OverCurrent	Yes
	PhaseLoss	Yes
	PhaseReversal	Yes
	MotorOverheat	Yes
TimeToTrip	n/A	Yes
TimeToReset	n/A	Yes
PAStatusReg1	PA0Status	Yes
	PA1Status	Yes
	PA2Status	Yes
	PA3Status	Yes
	PA4Status	Yes
	PA5Status	Yes
	PA6Status	Yes
	PA7Status	Yes
	PA8Status	Yes
	PA9Status	Yes

Generic Avatar Function Blocks

Avatar Diagnostic

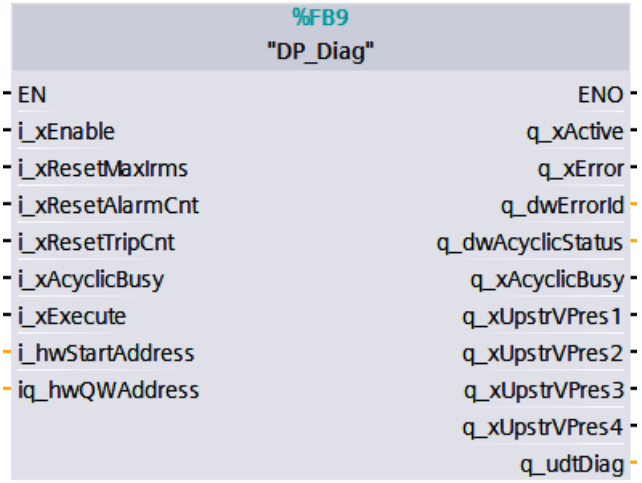
Table 363 - Function block profile

Function block type	Avatar Generic function block.
Type of data access	Cyclic (read/write) and acyclic (read).
Intended use	All Load, Application and Device avatars. For the Device avatars “Analog I/O” and “Digital I/O” the data can be retrieved but will only contain default values as these avatars do not support this functionality.
Functionality	The Avatar Diagnostic function block returns the status of the diagnostic data of the specified avatar.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Diag (PROFIBUS DP)

Figure 76 -



The following tables give information about the parameters of the function block interface.

Table 364 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xResetMaxIRMS	BOOL	If this input is set to TRUE, the maximum average Irms current value and the timestamp are reset.	Cyclic data
i_xResetAlarmCnt	BOOL	If this input is set to TRUE, all counters are reset for this avatar.	Cyclic data
i_xResetTripCnt	BOOL	If this input is set to TRUE, all trip counters are reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 365 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 366 - Outputs

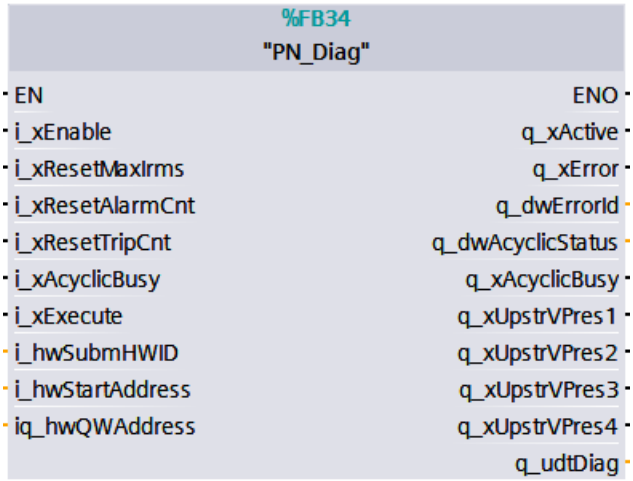
Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_udtDiag	UDT_ Diagnostic	This is a structure of acyclic diagnostic data for Control avatars, which includes information about Irms values and trip record about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*.	Acyclic data

Table 367 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Diag (PROFINET IO)

Figure 77 -



The following tables give information about the parameters of the function block interface.

Table 368 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xResetMaxIRMS	BOOL	If this input is set to TRUE, the maximum average Irms current value and the timestamp are reset.	Cyclic data
i_xResetAlarmCnt	BOOL	If this input is set to TRUE, all alarm counters are reset for this avatar.	Cyclic data
i_xResetTripCnt	BOOL	If this input is set to TRUE, all trip counters are reset for this avatar.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input submodule address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 369 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 370 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_xUpstrVPres1	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the first starter/power device in this avatar.	Cyclic data
q_xUpstrVPres2	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the second starter/power device in this avatar.	Cyclic data
q_xUpstrVPres3	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the third starter/power device in this avatar.	Cyclic data
q_xUpstrVPres4	BOOL	If this output is set to TRUE, the avatar has detected that upstream main power is present for the fourth starter/power device in this avatar.	Cyclic data
q_udtDiag	UDT_ Diagnostic	This is a structure of acyclic diagnostic data for Control avatars, which includes information about Irms values and trip record about the avatar. For detailed information about the structure of this UDT, see *UDT_Control, page 21*.	Acyclic data

Table 371 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	Yes
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Avatar Energy Management

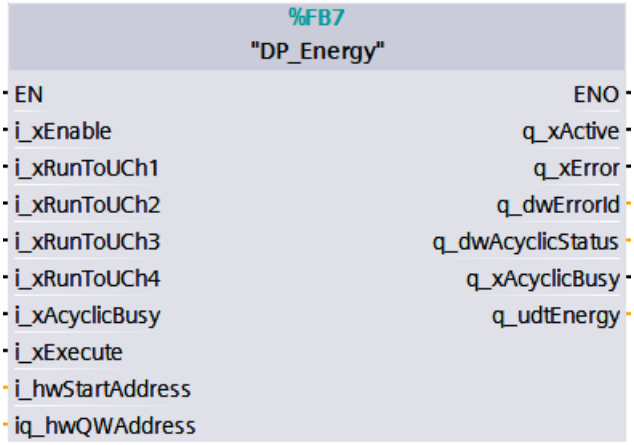
Table 372 - Function block profile

Function block type	Avatar Generic function block.
Type of data access	Cyclic (write) and acyclic (read).
Intended use	All Load, Application and Device avatars. For the Device avatars “Analog I/O” and “Digital I/O” the data can be retrieved but will only contain default values as these avatars do not support this functionality.
Functionality	The Avatar Energy function block returns the status of the energy data of the specified avatar.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this avatar.

DP_Energy (PROFIBUS DP)

Figure 78 -



The following tables give information about the parameters of the function block interface.

Table 373 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunToUCh1	BOOL	If this input is set to TRUE, the Record Time of Use Channel 1 command is started.	Cyclic data
i_xRunToUCh2	BOOL	If this input is set to TRUE, the Record Time of Use Channel 2 command is started.	Cyclic data
i_xRunToUCh3	BOOL	If this input is set to TRUE, the Record Time of Use Channel 3 command is started.	Cyclic data
i_xRunToUCh4	BOOL	If this input is set to TRUE, the Record Time of Use Channel 4 command is started.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control

Table 373 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwStartAddress	Variant	Must correspond to the first address of the cyclic input address range of the related avatar to be able to execute cyclic read communication.	Communication parameter

Table 374 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the output address of the related avatar to be able to execute cyclic write communication.	Communication parameter

Table 375 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtEnergy	UDT_Energy	This is a structure of acyclic energy data for Control avatars, which includes information about active and reactive energy of the avatar. For detailed information about the structure of this UDT, see *UDT_Energy, page 25*.	Acyclic data

Table 376 - Status and error codes from ConstTeSysIsland

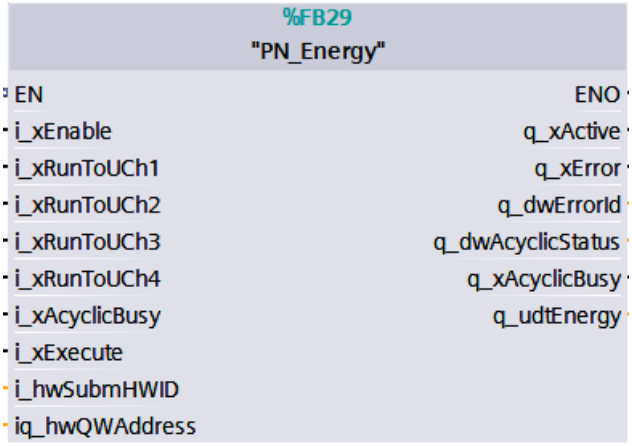
Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	Yes
Cdw_ErrInvalidHwid	No
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes

Table 376 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

PN_Energy (PROFINET IO)

Figure 79 -



The following tables give information about the parameters of the function block interface.

Table 377 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xRunToUCh1	BOOL	If this input is set to TRUE, the Record Time of Use Channel 1 command is started.	Cyclic data
i_xRunToUCh2	BOOL	If this input is set to TRUE, the Record Time of Use Channel 2 command is started.	Cyclic data
i_xRunToUCh3	BOOL	If this input is set to TRUE, the Record Time of Use Channel 3 command is started.	Cyclic data
i_xRunToUCh4	BOOL	If this input is set to TRUE, the Record Time of Use Channel 4 command is started.	Cyclic data
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the acyclic submodule of the related avatar to be able to execute the acyclic communication.	Communication parameter

Table 378 - In/Out

InOut	Data Type	Description	Variable Category
iq_hwQWAddress	WORD	Must correspond to the address of the cyclic output submodule to be able to execute cyclic write communication.	Communication parameter

Table 379 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtEnergy	UDT_Energy	This is a structure of acyclic energy data for Control avatars, which includes information about active and reactive energy of the avatar. For detailed information about the structure of this UDT, see *UDT_Energy, page 25*.	Acyclic data

Table 380 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	No
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

Device Asset Management Function Blocks

All Device Asset Management function blocks share the same set of detected error codes as stated in the following table:

Table 381 - Status and error codes from ConstTeSysIsland

Member name	Used by the function block
Cdw_ErrNoMsg	Yes
Cdw_ErrInternal	Yes
Cdw_ErrInvalidCycInAddr	No

Table 381 - Status and error codes from ConstTeSysIsland (Continued)

Member name	Used by the function block
Cdw_ErrInvalidHwid	Yes
Cdw_ErrInvalidNumOfAvatars	No
Cdw_ErrReadCycIn	No
Cdw_ErrReadAcycData1	Yes
Cdw_ErrReadAcycData2	No
Cdw_ErrWriteAcycData	No
Cdw_StsReadAcycData1Compl	Yes
Cdw_StsReadAcycData2Compl	No
Cdw_StsWriteAcycDataCompl	No

SIL Interface Module, Asset Management

NOTE: Safety Integrity Level according to standard IEC 61508.

Table 382 - Function block profile

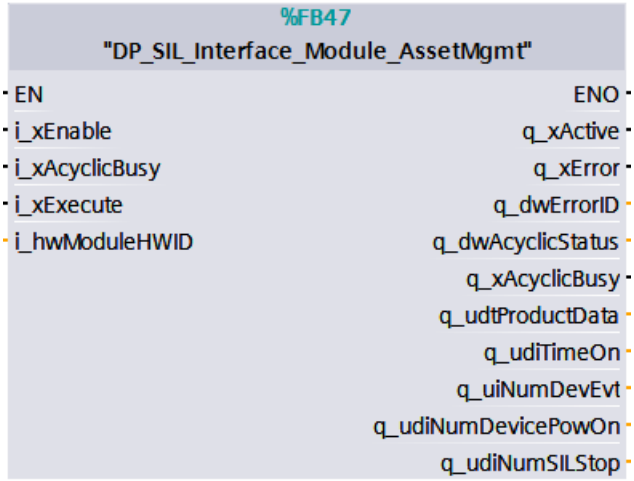
Function block type	Device function block.
Type of data access	Acyclic (read).
Intended use	SIL Interface Module devices.
Functionality	The SIL Interface Module, Asset Management function block returns the status of the acyclic asset management data of the specified device.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this device.

DP_SIL_Interface_Module_AssetMgmt (PROFIBUS DP)

NOTE: Safety Integrity Level according to standard IEC 61508.

Figure 80 -



The following tables give information about the parameters of the function block interface.

Table 383 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwModuleHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

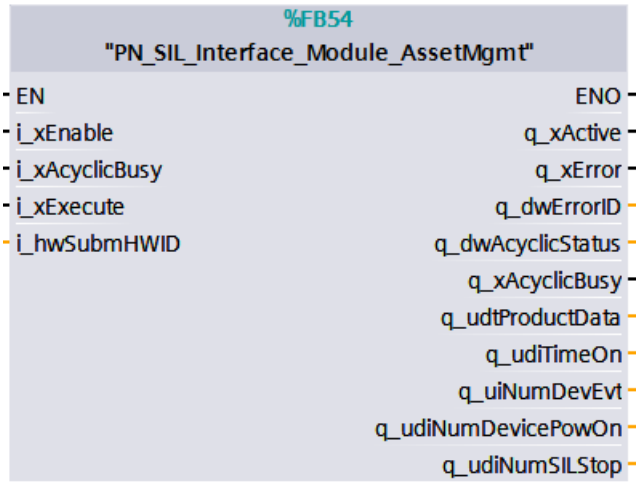
Table 384 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_udiNumSILStop	UDINT	The number of SIL Stops of the device.	Acyclic data

PN_SIL_Interface_Module_AssetMgmt (PROFINET IO)

NOTE: Safety Integrity Level according to standard IEC 61508.

Figure 81 -



The following tables give information about the parameters of the function block interface.

Table 385 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 386 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data

Table 386 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_udiNumSILStop	UDINT	The number of SIL Stops of the device.	Acyclic data

Starter, Asset Management

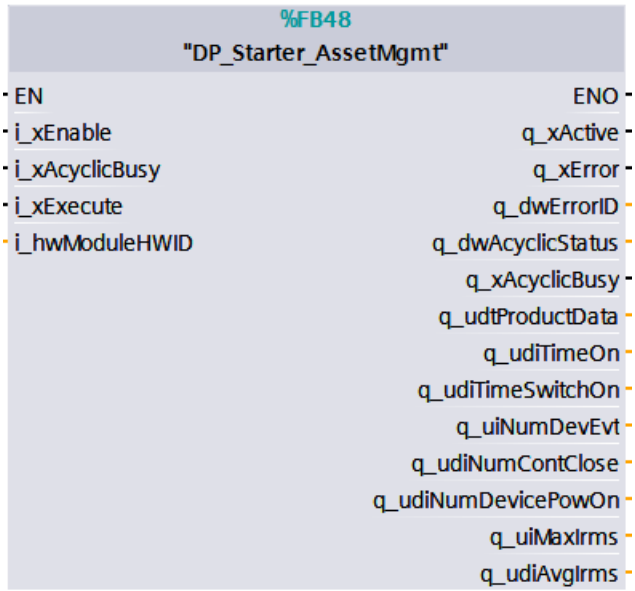
Table 387 - Function block profile

Function block type	Device function block.
Type of data access	Acyclic (read).
Intended use	Standard or SIL[74] Starter devices.
Functionality	The Starter, Asset Management function block returns the status of the acyclic asset management data of the specified device.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this device.

DP_Starter_AssetMgmt (PROFIBUS DP)

Figure 82 -



The following tables give information about the parameters of the function block interface.

74. Safety Integrity Level according to standard IEC 61508.

Table 388 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwModuleHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 389 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_udiTimeSwitchOn	UDINT	The length of time that the contactor has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumContClose	UDINT	The number of closing cycles of the contactor.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_uiMaxIrms	UINT	The maximum measured current value during device lifetime.	Acyclic data
q_udiAvgIrms	UDINT	The calculated average current value.	Acyclic data

PN_Starter_AssetMgmt (PROFINET IO)

The following tables give information about the parameters of the function block interface.

Figure 83 -

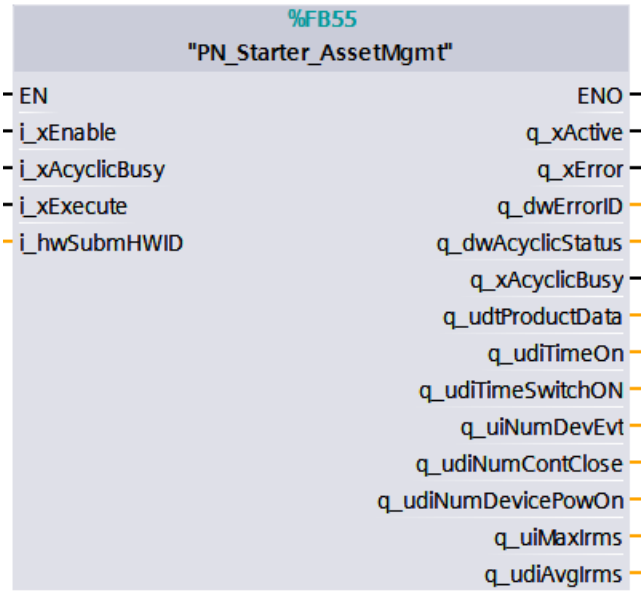


Table 390 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 391 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status

Table 391 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_udiTimeSwitchOn	UDINT	The length of time that the contactor has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumContClose	UDINT	The number closing cycles of the contactor.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_uiMaxIrms	UINT	The maximum measured current value during device lifetime.	Acyclic data
q_udiAvgIrms	UDINT	The calculated average current value.	Acyclic data

Voltage Interface Module, Asset Management

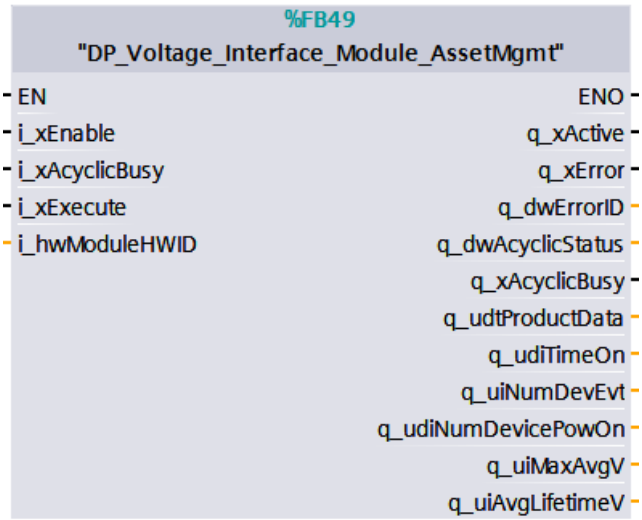
Table 392 - Function block profile

Function block type	Device function block.
Type of data access	Acyclic (read).
Intended use	Voltage Interface Module devices.
Functionality	The Voltage Interface Module, Asset Management function block returns the status of the acyclic asset management data of the specified device.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this device.

DP_Voltage_Interface_Module_AssetMgmt (PROFIBUS DP)

Figure 84 -



The following tables give information about the parameters of the function block interface.

Table 393 - Inputs

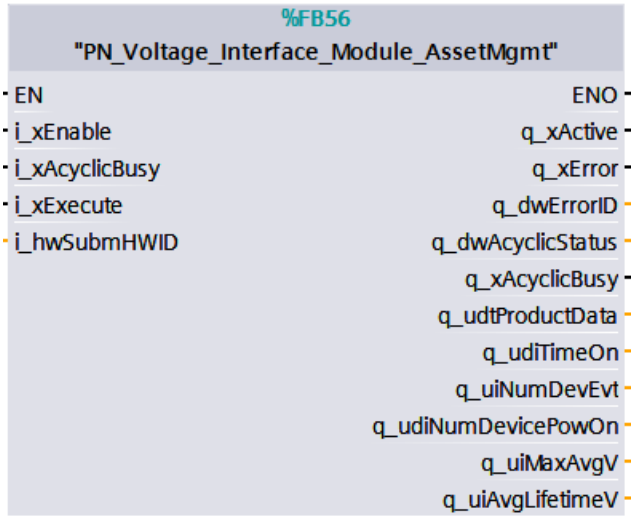
Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwModuleHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 394 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_uiMaxAvgV	UINT	The maximum average voltage value during device lifetime.	Acyclic data
q_uiAvgLifetimeV	UINT	The calculated average voltage value, since last reset.	Acyclic data

PN_Voltage_Interface_Module_AssetMgmt (PROFINET IO)

Figure 85 -



The following tables give information about the parameters of the function block interface.

Table 395 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 396 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data

Table 396 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_uiMaxAvgV	UINT	The maximum average voltage value during device lifetime.	Acyclic data
q_uiAvgLifetimeV	UINT	The calculated average voltage value, since last reset.	Acyclic data

I/O Module, Asset Management

Table 397 - Function block profile

Function block type	Device function block.
Type of data access	Acyclic (read).
Intended use	I/O Module devices.
Functionality	The I/O Module, Asset Management function block returns the status of the acyclic asset management data of the specified device.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this device.

DP_I/O_Module_AssetMgmt (PROFIBUS DP)

The following tables give information about the parameters of the function block interface.

Figure 86 -

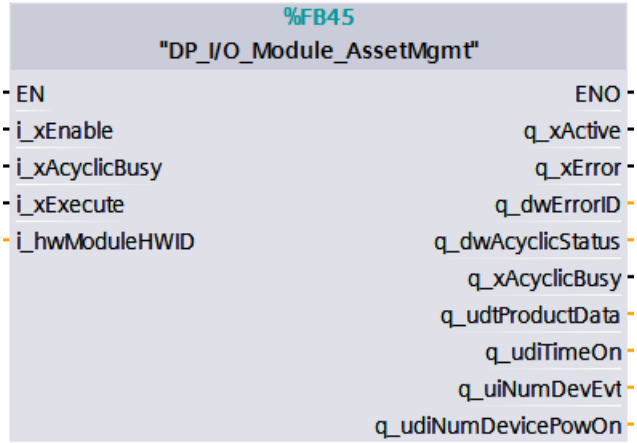


Table 398 - Inputs

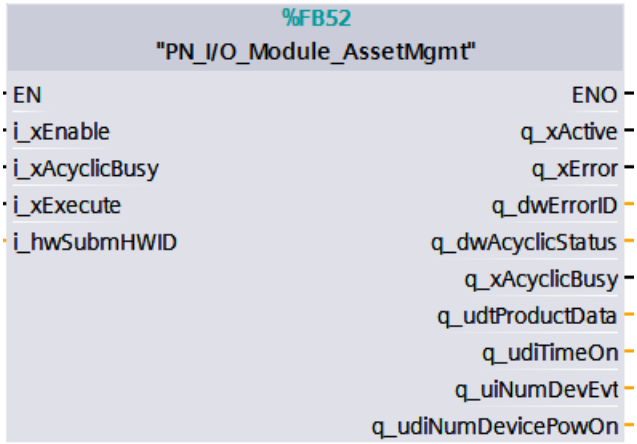
Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwModuleHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 399 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data

PN_I/O_Module_AssetMgmt (PROFINET IO)

Figure 87 -



The following tables give information about the parameters of the function block interface.

Table 400 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control

Table 400 - Inputs (Continued)

Input	Data Type	Description	Variable Category
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 401 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data

Power Interface Module, Asset Management

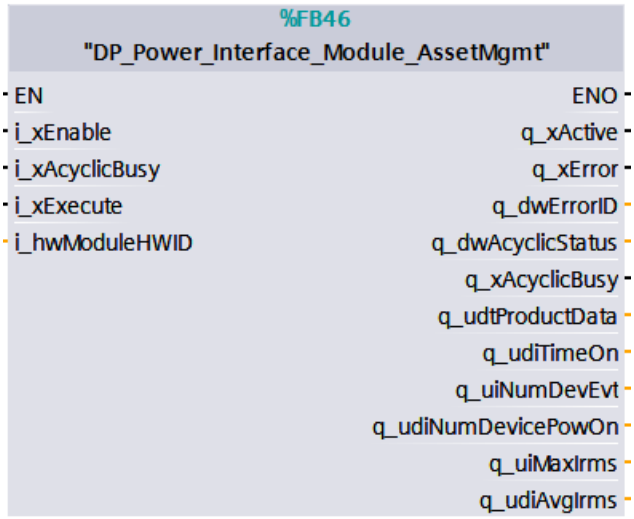
Table 402 - Function block profile

Function block type	Device function block.
Type of data access	Acyclic (read).
Intended use	Power Interface Module device.
Functionality	The Power Interface Module, Asset Management function block returns the status of the acyclic asset management data of the specified device.

The following sections provide detailed information about the interface and the use of the parameters of the PROFINET IO and PROFIBUS DP function blocks for this device.

DP_Power_Interface_Module_AssetMgmt (PROFIBUS DP)

Figure 88 -



The following tables give information about the parameters of the function block interface.

Table 403 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwModuleHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 404 - Outputs

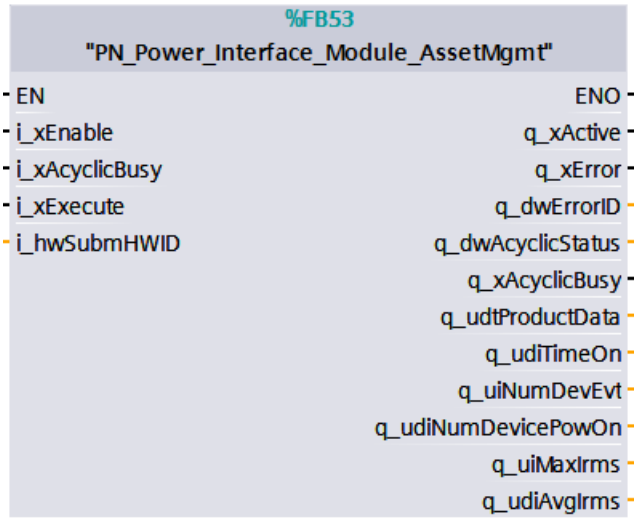
Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data

Table 404 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_uiMaxIrms	UINT	The maximum measured current value during device lifetime.	Acyclic data
q_udiAvgIrms	UDINT	The calculated average current value.	Acyclic data

PN_Power_Interface_Module_AssetMgmt (PROFINET IO)

Figure 89 -



The following tables give information about the parameters of the function block interface.

Table 405 - Inputs

Input	Data Type	Description	Variable Category
i_xEnable	BOOL	Activates the function block processing. Cyclic data will be read/written to the hardware IO interface.	Function block control
i_xAcyclicBusy	BOOL	Can be used to block the acyclic execution if acyclic communication of another function block is active.	Function block control
i_xExecute	BOOL	Starts an acyclic request on a rising edge.	Function block control
i_hwSubmHWID	HW_IO	Must correspond to the hardware identifier of the of the related device to be able to execute the acyclic communication.	Communication parameter

Table 406 - Outputs

Output	Data Type	Description	Variable Category
q_xActive	BOOL	If this output is set to TRUE, the Avatar function block is enabled, or an acyclic request is busy.	Function block status
q_xError	BOOL	If this output is set to TRUE, a detected error occurred while executing the Avatar function block. For detailed information about the detected error, see the value of the Error ID.	Function block status
q_dwErrorID	DWORD	The Error ID shows detailed information about the detected error that occurred. Possible values are shown in the table below.	Function block status

Table 406 - Outputs (Continued)

Output	Data Type	Description	Variable Category
q_dwAcyclicStatus	DWORD	The Acyclic status provides detailed information about the acyclic fieldbus communication, including detected error details. For detailed information about the status values, see *Function Block Library, page 19*.	Function block status
q_xAcyclicBusy	BOOL	If this output is set to TRUE, an acyclic request is still busy.	Function block status
q_udtProductData	UDT_ ProductData	Contains all relevant product data of the device.	Acyclic data
q_udiTimeOn	UDINT	The length of time that the device has been switched on.	Acyclic data
q_uiNumDevEvt	UINT	The number of detected device events.	Acyclic data
q_udiNumDevicePowOn	UDINT	The number of device power cycles.	Acyclic data
q_uiMaxIrms	UINT	The maximum measured current value during device lifetime.	Acyclic data
q_udiAvgIrms	UDINT	The calculated average current value.	Acyclic data

Schneider Electric
800 Federal Street
01810 Andover, MA
USA

https://www.schneider-electric.com/en/work/support/

https://www.se.com

As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

8536IB1917EN