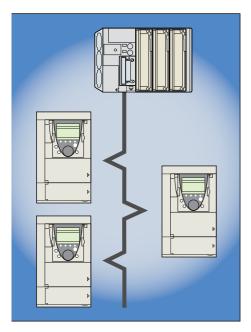
# Altivar 61/71 EtherNet/IP™ card

# **User manual**

VW3 A3 316

11/2010





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## 1. Important Information

#### NOTICE

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



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personnal injury if the instruction are not followed.



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

# **A** DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death, serious injury, or equipment damage.

# **A** WARNING

Warning indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

# **A** CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, can result in injury or equipment damage.

#### PLEASE NOTE

Electrical equipment should be serviced only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. This document is not intended as an instruction manual for untrained persons. © 2006 Schneider Electric. All Rights Reserved.

Read and understand these instructions before performing any procedure with this drive.

### **DANGER**

#### HAZARDOUS VOLTAGE

- Read and understand this bulletin in its entirety before installing or operating Altivar 71 drive. This equipment must only be installed, adjusted, repaired, and maintained by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts of this variable speed drive, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- · DO NOT short across terminals PA and PC or across the DC bus capacitors.
- Install and close all the covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
  - Disconnect all power.
  - Place a "DO NOT TURN ON" label on the variable speed drive disconnect.
  - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive.
   WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure given in the Installation Manual to verify that the DC voltage is less than 45 VDC. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

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

# **WARNING**

#### DAMAGED EQUIPMENT

Do not install or operate any drive or drive accessory that appears damaged. The relays, inputs, or outputs of a damaged drive may not operate in a normal manner, leading to unintended equipment operation. Failure to follow this instruction can result in death, serious injury, or equipment damage.

# 

#### LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- · Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.\*
- € Each implementation of an Altivar 71 Modbus TCP/IP EtherNet/IP card must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

\* For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems".

The following Altivar 71 technical documents are available on the Web site www.schneider-electric.com.

#### Installation Manual

This manual describes:

- · How to assemble the drive.
- How to connect the drive.

#### Programming Manual

This manual describes:

- The functions.
- The parameters
- How to use the drive display terminal (integrated display terminal and graphic display terminal).

#### Communication Parameters Manual

This manual describes:

- The drive parameters with specific information (addresses, formats, etc.) for use via a bus or communication network.
- The operating modes specific to communication (state chart).
- The interaction between communication and local control.

# ■ Modbus, CANopen<sup>®</sup>, Ethernet<sup>™</sup>, Profibus, INTERBUS, Uni-Telway, DeviceNet<sup>™</sup>, Modbus Plus, Fipio, etc., manuals.

These manuals describe:

- Connection to the bus or network.
- Configuration of the communication-specific parameters via the integrated display terminal or the graphic display terminal.
- Diagnostics.
- Software setup.
- The communication services specific to the protocol.

#### ■ Altivar 58/58F Migration Manual

This manual describes the differences between the Altivar 71 and the Altivar 58/58F.

It explains how to replace an Altivar 58 or 58F, including how to replace drives communicating on a bus or network.

### 4.1. Presentation

The EtherNet/IP card (catalog number VW3 A3 316) is used to connect an Altivar 71 or an Altivar 61 drive to an Ethernet network using the EtherNet/IP protocol.

**IMPORTANT**: This communication option card is fully supported with the version V1.5 IE 13 and above of the Altivar 61 firmware. This communication option card is only supported with the version V1.6 IE 19 and above of the Altivar 71 firmware. Specific versions of the Altivar 71 firmware are not supported.

The VW3 A3 316 card is equipped with two shielded RJ45 EtherNet/IP connectors.

The accessories for connection to the EtherNet/IP network must be ordered separately.

The data exchanges permit full drive functionality:

- Configuration
- Adjustment
- Control
- MonitoringDiagnostics

The standard Web server (English only) provides access to the following pages:

- Altivar Viewer
- Data Viewer
- EtherNet/IP
- Security
- Etc.

The graphic display terminal or the integrated display terminal can be used to access numerous functions for communication diagnostics.

### 4.2. Notation

#### **Drive terminal displays**

The graphic display terminal menus are shown in square brackets. Example: [1.9 COMMUNICATION].

The integrated 7-segment display terminal menus are shown in round brackets. Example: ([]] -).

The parameter names displayed on the graphic display terminal are shown in square brackets. Example: [Fallback speed].

The parameter codes displayed on the integrated 7-segment display terminal are shown in round brackets. Example:  $(L \not\in F)$ .

#### Formats

Hexadecimal values are written as follows: 16# Binary values are written as follows: 2# PC-Software: Commissioning Software

### 5.1. Receipt

- Check that the card catalog number marked on the label is the same as that on the delivery note corresponding to the purchase order.
- Remove the option card from its packaging and check that it has not been damaged in transit.

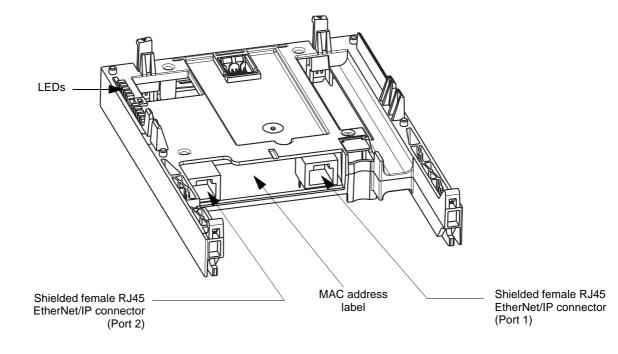
# 

#### STATIC SENSITIVE COMPONENTS

The EtherNet/IP card can be damaged by static electricity. Observe electrostatic precautions when handling and installing the card.

Failure to follow this instruction can result in equipment damage.

### 5. 2. Hardware description

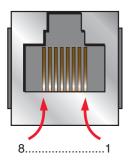


### 5. 3. Installing the card in the drive

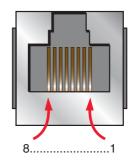
See the Installation Manual.

### 6. 1. Card RJ45 connector pinout

The EtherNet/IP card is equipped with two shielded RJ45 connectors. The shielding is connected to the drive ground. Use an STP (shielded twisted pair) EtherNet/IP cable.



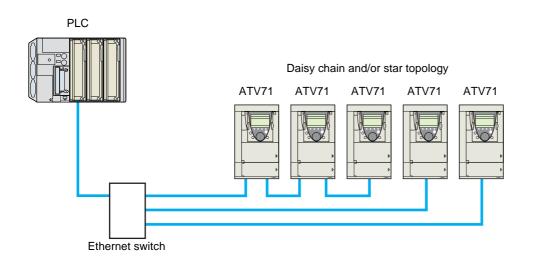
Pin	Signal
1	TD+
2	TD-
3	RD+
4	
5	
6	RD-
7	
8	



The transmission speed is detected automatically by the card (10 Mbps or 100 Mbps).

The card can operate in half duplex or full duplex mode, whether connected to a hub or a switch and regardless of the transmission speed (10 Mbps or 100 Mbps).

### 6. 2. Example of connection to an EtherNet/IP network

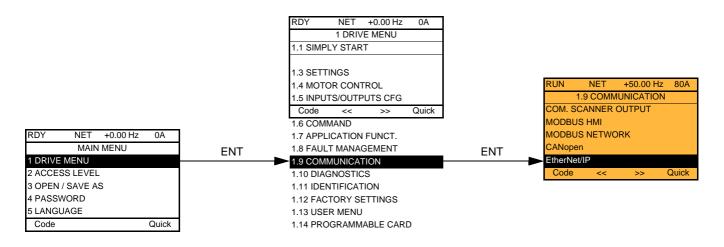


### 7. 1. Access to EtherNet/IP menu via graphic display terminal

The [EtherNet/IP] submenu is used to configure and display the EtherNet/IP card parameters and can be accessed via the [1.9 - COMMUNICATION] menu.

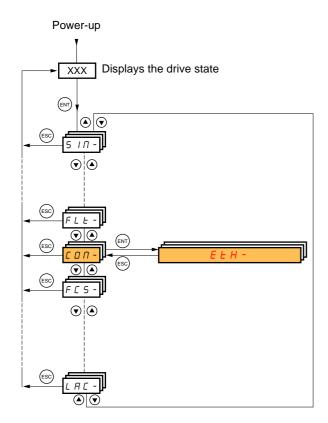
This menu is only accessible in standard, advanced and expert mode: In the [2 ACCESS LEVEL] (L R L -) menu, set the level to [expert] (E P r).

Can be accessed by the other level.



### 7. 2. Access to EtherNet/IP menu via the integrated display terminal

The (E L H -) submenu is used to configure and display the EtherNet/IP card parameters. It can be accessed via the (C D I -) menu.



### 7. 3. Ethernet/IP configuration with the HMI

Detail of the Ethernet/IP configuration menu: (All these settings can also be performed from the webserver or PC-Software). In the table, parameters which are not followed by their parameter code (between parenthesis) are not displayed on the 7 segment display of the drive. [1.9 - COMMUNICATION] ( $\mathcal{L} \square \Pi -$ )  $\rightarrow$  menu [ETHIP] ( $\mathcal{E} \vdash h$ )

Parameter	Possible value	Terminal display
[DEVICE NAME]	16 chars.	[ABC]
The device name is required if the card uses DHCP to obtain its IP Address.		
[Rate Setting] (r d 5)	0 : Autodetect (default)	[Auto] ( <i>R U E D</i> )
This field is used to set the transmission	1 : 10 Mbps Full	[10 Mbps full]( / 🛛 F)
speed and the transmission mode of the	2 : 10 Mbps Half	[10 Mbps half]( / 🛛 H)
	3 : 100 Mbps Full	[100 Mbps full]( <i>I 🛛 🖓 F</i> )
	4 : 100 Mbps Half (do not use)	[100 Mbps half]( / 🛛 🖓 H)
[Actual Rate] (Я r d)	0 : Autodetect	[Auto] (月日上日)
This field displays the haud rate and the	1 : 10 Mbps Full	[10 Mbps full]( / 🛛 F)
This field displays the baud rate and the transmission mode currently used by the	2 : 10 Mbps Half	[10 Mbps half]( / 🛛 H)
	3 : 100 Mbps Full	[100 Mbps full]( / 🛛 🖓 F)
	4 : 100 Mbps Half	[100 Mbps half]( / 🛛 🖓 H)
[IP mode] ( <i>I P П</i> )	0 : Manu	[fixed] (П Я ¬ U)
Lies this personator to cale at the ID address	1 : BOOTP	[BOOTP] ( <i>b 0 0 E</i> )
Use this parameter to select the IP address assignment method.	2 : DHCP	[DHCP] ( <i>d H E P</i> )
[IP card] ( / P [ -)	These fields are editable when IP mode is set to Fixed	[139.160.069.241]
( IPE I) ( IPE 2)	address	(139)(160)(069)(241)
(		
IP address of the card		
[IP Mask] ( / P // - )	These fields are editable when IP mode is set to Fixed	[255.255.254.0]
(	address	(255)(255)(254)(0)
(		
Subnet mask		
[IP Gate] ( / P L -)	These fields are <u>editable</u> when IP mode is set to Fixed	[0.0.0.0]
( I P G I) ( I P G 2)	address	(0)(0)(0)
(		
Default gateway IP address		
<ul> <li>If the address has been given by a BOOTP</li> <li>After dynamic addressing by a BOOTP or D</li> </ul>	or a DHCP server, these fields are read only. DHCP server, the new address value is displayed.	1
	0 : Web Server and Email functions are disabled.	0
Enables web server and e-mail server *	1: Web Server activated.	1
This parameter is significant at the hit laws	2: Email function activated	2
rnis parameter is significant at the bit level.	3: Web server and Email functions are activated	3
	[00-80-F4-XX-XX-XX]	[00-80-F4-XX-XX-XX]

\*: This functionality can only be configured from the WEB server or from commissioning software.

### 7. 4. Detail of the configured parameters

#### ■ IP address

#### **Assigning IP addresses**

The drive needs 3 IP addresses:

- The drive IP address.
- The subnet mask.
- The gateway IP address.

They can be provided by:

- A BOOTP server (correspondence between the MAC address and the IP addresses).
- Or a DHCP server (correspondence between Device Name [DEVICE NAME] and the IP addresses).

The address is assigned according to the IPmode parameter:

IP Mode value	Comments
IP mode = 0	The card uses the address defined in IPC1, IPC2, IPC3, IPC4
IP mode = 1	The card receives its address from a BOOTP server
IP mode = 2	The card receives its address from a DHCP server
And Device name contains a valid name.	

IMPORTANT: The IP mode parameter may be modified according to the **configuration control attribute** of the **TCP/IP interface object** (CIP standard). See page <u>50</u>.

### 7. 5. Assemblies and scanner configuration

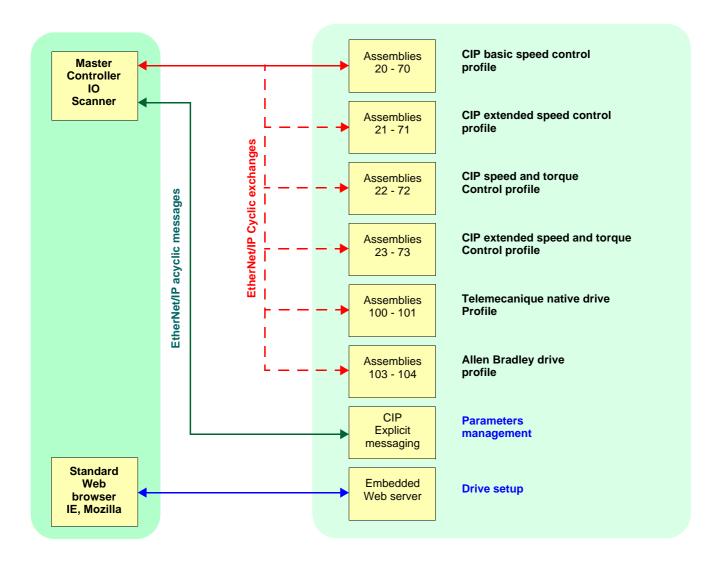
The assemblies are chosen at the master controller level (see for example chapter 16 Integration in RSlogix).

For the 4 ODVA set of assemblies (20,21,22,23,70,71,72,73) there are no more configuration to do at the communication scanner level. For the Telemecanique assembly (100,101) and Allen Bradley® assembly (103,104) you must:

- configure at the drive level the size of the assembly,
- define the mapping of the additional parameters.

### 8. 1. Configuration of the assemblies: overview

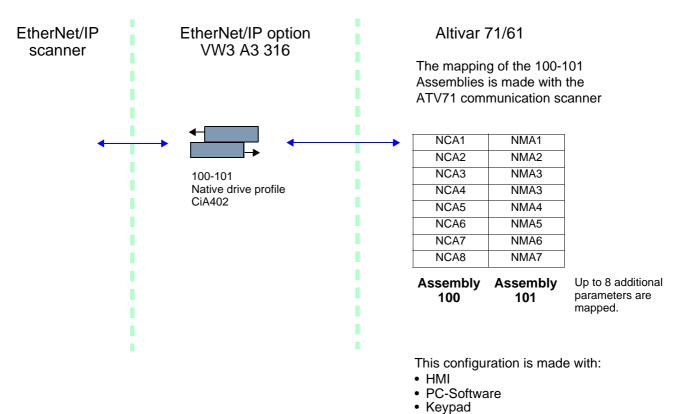
VW3 A3 316 EtherNet/IP communication card Features overview



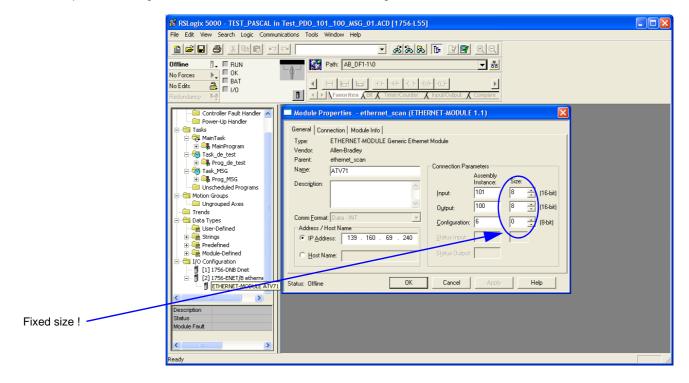
### 8. 2. Configuration of the assembly (100,101) Telemecanique native profile

The size of the assembly is fixed and is equal to 8. The mapping of the other parameters is made with the communication scanner : The configuration of the addresses defined with NCAx and NMAx can be made with the graphic keypad: For assembly 100 : [1.9- COMMUNICATION] ( $[D \ \Pi -)$  menu, [COM.SCANNER OUTPUT] ( $D \ L \ 5 -$ ) submenu. For assembly 101 : [1.9- COMMUNICATION] ( $[D \ \Pi -)$  menu, [COM.SCANNER INPUT] ( $I \ L \ 5 -$ ) submenu. See menu [1.2 MONITORING] > COMMUNICATION MAP to monitor the communication scanner.

See also "Configuring the communication scanner" page 16.



Here is an example of the configuration of the assemblies 100, 101 from RSLogix software:



### 8. 3. Configuration of the assembly (103,104) Allen Bradley® profile

The size of the assembly is selectable from 2 to 10 words.

The 2 first words of the input assembly are fixed: Control word, Speed setpoint.

The 4 first words of the output assembly are fixed two pad words: Status word, Actual Speed.

#### IMPORTANT: NCA1 and NCA2 are already configured (default settings of the drive). It is important when configuring this assembly set to handly remove the default assignment of NCA1 and NCA2: By setting NCA1 and NCA2 to a null address or by configuring this two address to other required parameters of the drive.

This will avoid a conflict between NCA1 and the control word of the profile (located in the first word of the assembly 103).

The configuration of the addresses defined with NCAx and NMAx can be made with the graphic keypad:

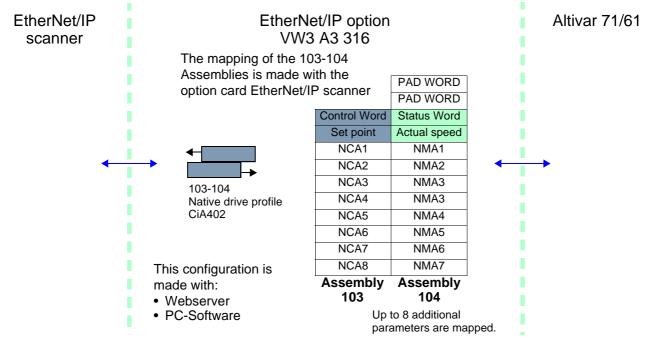
For assembly 103 : [1.9- COMMUNICATION] ( C II 7 -) menu, [COM.SCANNER OUTPUT] ( C C 5 -) submenu.

For assembly 104 : [1.9- COMMUNICATION] ( [ ] 7 -) menu, [COM.SCANNER INPUT] ( / [ 5 -) submenu.

See menu [1.2 MONITORING] > COMMUNICATION MAP to monitor the communication scanner.

See also "Configuring the communication scanner" page 16

The mapping of the other parameters is made with the EtherNet/IP scanner:



Here is an example of the configuration of the assemblies 103, 104 from RSLogix software

djusted according to the ettings defined with the therNet/IP scanner setup webserver or PC-Software). Iote: The size of the assembly cannot be modified dynamically; such change requires a power ON. Given that assemblies 103 and 104 uses NCAx and NMAx, the configuration edited with the webserver or PC-Software are also applied to the communication scanner of	Image: State interfection provided into interfection provided int	
or PC-Software are also applied to the	Ungrouped Axes     Trends     Trends     Data Types     User-Defined     Strings	Comm Eormat:         Data - INT           Address:         Host Name           Of Host Name         Default           Onfiguration:         6           Host Name         Status Input:
	ETHERNET-MODULE     Observation     Status     Module Fault     Ready	Status: Offine OK Cancel Apply Help

### 8. 4. Configuring the communication scanner

You need to read this chapter only if you use the assemblies 100 or 101 that use the drive communication scanner.

The variables exchanged by the output assembly 100 and input assembly 101 are selected by configuring the communication scanner.

The 8 output variables are assigned by means of the 8 parameters [Scan. Oute address] (n [Re]). They are configured using the graphic display terminal via the [1.9 - COMMUNICATION] ([ [R - ) menu, [COM. SCANNER OUTPUT] ([ [ [ 5 - ) submenu.

The 8 input variables of the assembly 101 are assigned by means of the 8 parameters [Scan. Ine address] (n [1 Re). They are configured using the graphic display terminal via the [1.9 - COMMUNICATION] ([ [] [] -) menu, [COM. SCANNER INPUT] ([ [] [] -) submenu.

Enter the logic address of the parameter (see the Communication parameters manual). If a parameter [Scan. Out• address] (n L R•) or [Scan. In• address] (n R R•) is equal to zero, the corresponding period variable is not used by the drive.

These 8 assignment parameters are described in the tables below:

Parameter name	Output assembly 100	Default assignment	
[Scan. Out1 address] ( n [ R I)		NCA1 = 8501	
[Scan. Out2 address] ( n [ R 2)		NCA2 = 8602	
[Scan. Out3 address] ( n [ R 3)		NCA3 = not used	
[Scan. Out4 address] ( n [ Я 4)		NCA4 = not used	
[Scan. Out5 address] ( n [ R 5)		NCA5 = not used	
[Scan. Out6 address] ( n [ Я Б)		NCA6 = not used	
[Scan. Out7 address] ( n [ R 7)		NCA7 = not used	
[Scan. Out8 address] ( n [ R B)		NCA8 = not used	

Parameter name	Input assembly 101	Default assignment	
[Scan. In1 address] (ヮ Π 用 I)		NMA1=3201	
[Scan. In2 address] ( ¬ П Я 2)		NMA2=8604	
[Scan. In3 address] ( ¬ П Я Э)		NMA3=not used	
[Scan. In4 address] (		NMA4=not used	
[Scan. In4 address] ( ¬ П Я 5)		NMA5=not used	
[Scan. In4 address] ( п П Я Б)		NMA6=not used	
[Scan. In4 address] ( ¬ П Я 7)		NMA7=not used	
[Scan. In4 address] ( ¬ П Я В)		NMA8=not used	

#### Example of configuration via the graphic display terminal:

RDY	NET	+0.00	)Hz	0A
	COM. SC	CANNER IN	PUT	
Scan. In1	address	:		3204
Scan. In2	address	:		3206
Scan. In3	address	:		0
Scan. In4	address	:		0
Scan. In5	address	:		0
Code	e		Quick	$\checkmark$
Scan. In6	address	:		0
Scan. In7	address	:		0
Scan. In8	address	:		0

RDY	NET	+0.00Hz	0A
	COM. SCAN	INER OUTPL	л 🗌
Scan. Out	t1 address	:	9001
Scan. Out	t2 address	:	9002
Scan. Out	t3 address	:	0
Scan. Out	t4 address	:	0
Scan. Out	t5 address	:	0
Code	9		Quick 🗸
Scan. Out	t6 address	:	0
Scan. Out	t7 address	:	0
Scan. Out	t8 address	:	0

#### Note:

All modifications to parameters [Scan. Oute address] (n [ Re) or [Scan. Ine address] (n [ Re) must be made with the motor stopped. The master PLC program should be updated to take account of this modification.

### 8. 5. Configuring the control

#### Principle

By the configuration of the control, it is possible to decide from what channel the drive receives its commands and setpoint, either permanently or depending on a switching command.

Numerous configurations are possible. For more information, refer to the Programming manual and Communication parameters manual. The following configurations are some of the possibilities available.

#### Control with communication scanner

If the default assemblies (100, 101) are selected, all possibilities of Altivar 71 drive are available.

It is possible to use all profiles and modes of the drive:

- I/O profile,
- Drivecom profiles with separate or non separate mode.

By the configuration of the communication scanner, it is possible to assign any relevant parameter of the drive to the 4 input and 4 output variables of the assemblies.

See the input / output interface with the PLC can be fully customised depending on the application.

The use of the communication scanner is also the best way to interface with a "Controller Inside" card.

#### Control according to ODVA AC drive profile

The ODVA AC drive profile is activated when one of the following assemblies is selected:

- 20: Basic speed control output
- 21: Extended speed control output
- 22: Speed and torque control output
- 23: Extended speed and torque control output
- 70: Basic speed control input
- 71: Extended speed control input
- 72: Speed and torque control input
- 73: Extended speed and torque control input

The advantage of using the ODVA drive profile standard is the interchangeability with other brands.

The drive must be configured in the Drivecom profile with separate mode.

The EtherNet/IP card translates the commands, behaviour and monitoring information from of ODVA profile (on the network) to the Drivecom profile (in the drive).

#### Control according to Allen-Bradley® drive profile

The Allen-Bradley® Drive profile is activated when one of the following assemblies is selected:

- 103: Allen-Bradley® drive output
- 104: Allen-Bradley® drive input

If you need to replace Allen-Bradley® drives, in an existing application, this profile is a good way to minimise the modifications.

The drive must be configured in the Drivecom profile with separate mode.

The EtherNet/IP card translates the commands, behaviour and monitoring information from of Allen-Bradley® drive profile (on the network) to the Drivecom profile (in the drive).

#### Available configurations

#### □ If you use the communication scanner:

- 100: Communication scanner output
- 101: Communication scanner input there is no limitation in the configuration of the control.

The examples below are only possible if you use the communication scanner.

#### If you use the ODVA AC drive profile or Allen-Bradley® Drive profile, that is, the assemblies:

- 20: Basic speed control output
- 21: Extended speed control output
- 22: Speed and torque control output
- 23: Extended speed and torque control output
- 70: Basic speed control input
- 71: Extended speed control input
- 72: Speed and torque control input
- 73: Extended speed and torque control input
   103: Allen-Bradley® drive output
- 103: Allen-Bradley® drive output
  104: Allen-Bradley® drive input

Parameter	Permitted value	Comment	
Profile	Drivecom profile separate	The run commands are in Drivecom profile,	
		the command and the reference can come from different channels.	
Setpoint 1 configuration	Network card	Setpoint 1 comes from EtherNet/IP.	
Setpoint 1B configuration	Terminals	Setpoint 2 comes from terminals (Al1 or Al2).	
Setpoint 2 configuration	Terminals	Setpoint 2 comes from terminals (Al1 or Al2).	
Command 1 configuration	Network card	Command 1 comes from EtherNet/IP.	
Command 2 configuration	Terminals	Command 2 comes from terminals.	
Command switching	Network card bit 12	Bit 12 of the control word switches the command.	
Setpoint switching	Network card bit 13	Bit 13 of the control word switches the setpoint (1 <-> 1B or 1 <-> 2).	

Configuration via the graphic display terminal or the integrated display terminal:

Case 1: Setpoint 1B is connected to the functions (Summing, PID, etc) which remain active even after switching.

Menu	Parameter	Permitted value
[1.6 - COMMAND] ( <i>L</i> + <i>L</i> -)	[Profile] ( L H L F )	[Separate] (5 E P)
	[Ref.1 channel] (F r 1)	[Com. card] ( n E E )
	[Ref.1B channel] (F r I b)	[Ref. Al1] ( <i>R</i> / /) or [Ref. Al2] ( <i>R</i> / 2)
	[Cmd channel 1] ( [ d I)	[Com. card] ( n E L )
	[Cmd channel 2] ( <i>[ d 2</i> )	[Terminals] ( E F )
	[Cmd switching] ( <i>L L</i> 5)	[C312] ( <i>E</i> ∃ <i>I 2</i> )
[1.7 APPLICATION FUNCT.] (FUn-) [REFERENCE SWITCH.]	[Ref 1B switching] (r [ b)	[C313] ( <i>[</i> ∃ / ∃)

**Case 2:** Setpoint 2 is directly connected to the drive reference limit. If switching is performed, the functions that affect the reference (summing, PID, etc.) are inhibited.

Menu	Parameter	Permitted value
	[Profile] ( L H L F )	[Separate] (5 E P)
[1.7 APPLICATION FUNCT.] (F U n -) [REFERENCE SWITCH.]	[Ref.1 channel] (F r I)	[Com. card] ( n E E )
	[Ref.2 channel] (F r 2)	[Ref. Al1] ( <i>R</i> / /) or [Ref. Al2] ( <i>R</i> / 2)
	[Cmd channel 1] ( C d I)	[Com. card] (n E E)
	[Cmd channel 2] ( [ d 2)	[Terminals] ( <i>E E r</i> )
	[Cmd switching] ( <i>L L</i> 5)	[C312] ( <i>[</i> 3 12)
	[Ref. 2 switching] ( r F L )	[C313] ( <i>[</i> ∃ <i> </i> ∃)

Note: It is not possible to configure the display terminal as a channel.

To switch to the display terminal, use the function force local and assign the parameter [Forced local Ref.] to [HMI] (L [ ]).

#### ■ Control via EtherNet/IP in I/O profile

Note: This configuration can only be used if the communication scanner assemblies (100 and 101) are selected.

The command and the setpoint come from EtherNet/IP. Control is in I/O profile.

Configure the following parameters:

Parameter	Value	Comment
Profile	I/O profile	The run command is simply obtained by bit 0 of the command word.
Setpoint 1 configuration	Network card	The setpoint comes from EtherNet/IP.
Command 1 configuration	Network card	The command comes from EtherNet/IP.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] ( <i>L</i> + <i>L</i> -)	[Profile] ( L H L F )	[I/O profile] ( / [])
	[Ref.1 channel] (F r 1)	[Com. card] ( n E L )
	[Cmd channel 1] ( C d I)	[Com. opt card] ( $n \in E$ )

#### ■ Control via EtherNet/IP or via the terminals in I/O profile

Note: This configuration can only be used if the communication scanner assemblies (100 and 101) are selected.

The command and the setpoint both come from EtherNet/IP or the terminals. Input LI5 at the terminals is used to switch between EtherNet/IP and the terminals. Control is in I/O profile.

Configure the following parameters:

Parameter Value		Comment		
Profile	I/O profile	The run command is simply obtained by bit 0 of the control word.		
Setpoint 1 configuration	Network card	Setpoint 1 comes from EtherNet/IP.		
Setpoint 1B configuration	Analog input 1 on the terminals	Setpoint 1B comes from input Al1 on the terminals.		
Setpoint switching	Input LI5	Input LI5 switches the setpoint $(1 \leftrightarrow 1B)$ .		
Command 1 configuration Network card		Command 1 comes from EtherNet/IP.		
Command 2 configuration Terminals		Command 2 comes from the terminals.		
Command switching	Input LI5	Input LI5 switches the command.		

Note: Setpoint 1B is connected to the functions (Summing, PID, etc) which remain active even after switching.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] ( <i>L</i> + <i>L</i> - )	[Profile] ( L H L F )	[I/O profile] ( / [])
	[Ref.1 chan] (F r 1)	[Com. card] ( <u>n E L</u> )
	[Cmd channel 1] ( [ d I)	[Com. card] ( <u>n E L</u> )
	[Cmd channel 2] ( [ d 2)	[Terminals] ( E F r )
	[Cmd switching] ( <i>L L</i> 5)	[LI5] ( <i>L</i> / 5)
[1.7 APPLICATION FUNCT.] (F U n -)	[Ref.1B chan] (F r 1b)	[Al1 ref.] ( R / /)
[REFERENCE SWITCH.]	[Ref 1B switching] ( - L b)	[LI5] ( <i>L</i> / 5)

#### ■ Control via EtherNet/IP in Drivecom profile

Note: This configuration can only be used if the communication scanner assemblies (100 and 101) are selected.

The command and the setpoint come from EtherNet/IP.

Configure the following parameters:

Parameter	Value	Comment		
Profile	Separate Drivecom profile	The run commands are in Drivecom profile, the command and the setpoint can come from different channels.		
Setpoint 1 configuration	Network card	The setpoint comes from EtherNet/IP.		
Command 1 configuration	Network card	Command 1 comes from EtherNet/IP.		

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] ( <i>L L -</i> )	[Profile] ( [ H [ F ]	[Separate] (5 E P)
	[Ref.1 chan] (F r 1)	[Com. card] ( $n E E$ )
	[Cmd channel 1] ( <i>L</i> d I)	[Com. card] ( n E L )

#### ■ Control via EtherNet/IP or the terminals in Drivecom profile

Note: This configuration can only be used if the communication scanner assemblies (100 and 101) are selected.

The command and the setpoint both come from EtherNet/IP or the terminals. Input LI5 at the terminals is used to switch between EtherNet/IP and the terminals.

Configure the following parameters:

Parameter Value		Comment		
Profile	Separate Drivecom profile	The run commands are in Drivecom profile, the command and the setpoint can come from different channels.		
Setpoint 1 configuration Network card		Setpoint 1 comes from EtherNet/IP.		
Setpoint 2 configuration	Analog input 1 on the terminals	Setpoint 2 comes from input Al1 on the terminals.		
Setpoint switching	Input LI5	Input LI5 switches the setpoint $(1 \leftrightarrow 2)$ and the command.		
Command 1 configuration Network card		Command 1 comes from EtherNet/IP.		
Command 2 configuration Terminals		Command 2 comes from the terminals.		
Command switching Input LI5		Input LI5 switches the command.		

**Note:** Setpoint 2 is directly connected to the drive reference limit. If switching is performed, the functions that affect the reference (summing, PID, etc) are inhibited.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value	
[1.6 - COMMAND] ( <i>L L -</i> )	[Profile] ( L H L F )	[Separate] (5 E P)	
	[Ref.1 chan] (F r 1)	[Com. card] ( n E L )	
	[Ref.2 chan] (F r 2)	[Al1 ref.] ( <i>R</i> / /)	
	[Ref. 2 switching] (r F [)	[LI5] (L / 5)	
	[Cmd channel 1] ( [ d 1)	[Com. card] ( n E L )	
	[Cmd channel 2] ( [ d 2)	[Terminals] ( E F )	
	[Cmd switching] ( <i>L L</i> 5)	[LI5] (L / 5)	

#### ■ Control in Drivecom profile via EtherNet/IP and setpoint switching at the terminals

Note: This configuration can only be used if the communication scanner assemblies (100 and 101) are selected.

The command comes from EtherNet/IP.

The setpoint comes either from EtherNet/IP or from the terminals. Input LI5 at the terminals is used to switch the setpoint between EtherNet/IP and the terminals.

Control is in Drivecom profile.

Configure the following parameters:

Parameter Value		Comment	
Profile	Separate Drivecom profile	The run commands are in Drivecom profile, the command and the setpoint can come from different channels.	
Setpoint 1 configuration	Network card	Setpoint 1 comes from EtherNet/IP.	
Setpoint 1B configuration	Analog input 1 on the terminals	Setpoint 1B comes from input Al1 on the terminals.	
Setpoint switching	Input LI5	Input LI5 switches the setpoint (1 $\leftrightarrow$ 1B).	
Command 1 configuration Network card		Command 1 comes from EtherNet/IP.	
Command switching Channel 1		Channel 1 is the command channel.	

Note: Setpoint 1B is connected to the functions (summing, PID, etc) that remain active, even after switching.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value	
[1.6 - COMMAND] ( <i>E E L -</i> )	[Profile] ( C H C F )	[Separate] (5 E P)	
	[Ref.1 chan] (F r 1)	[Com. card] ( ¬ E Ł )	
	[Cmd channel 1] ( [ d I)	[Com. card] ( ¬ E Ł )	
	[Cmd switching] ( <i>L L</i> 5)	[ch1 active] ([ d I)	
[1.7 APPLICATION FUNCT.] (F U n -)	[Ref.1B chan] (F r 1b)	[Al1 ref.] ( <i>R   1</i> )	
[REFERENCE SWITCH.]	[Ref 1B switching] (r [ b)	[LI5] (L / 5)	

### 9. 1. Fault management

An EtherNet/IP time out is triggered if the card does not receive any cyclic messages (regardless within a predefined time period). This period is managed by the EtherNet/IP controller (not by the drive) and is configured in its module properties box. The duration of the time out is defined by the RPI (Request packet intervals).

If the card is controlled by explicit messages(without periodic exchanges) There is no control of the communication time-out.

Module Properties - ethernet_scan (ETHERNET-MODULE 1.1)	×
General       Connection       Module Info         Bequested Packet Interval (RPI):       1000.0 ÷ ms       (1.0 - 3200.0 ms)         Inhibit Module	
Status: Running OK Cancel Apply Help	

The response of the drive in case of such event can be configured.

Configuration can be performed using the graphic display terminal or integrated display terminal using the [Network fault mgt] (L L) parameter in the [1.8 FAULT MANAGEMENT] (F L L -) menu, [COM. FAULT MANAGEMENT] (L L -) submenu.

RDY NET	+0.	.00Hz	0A
COM. FAUL	T MANA	GEMENT	
Network fault mgt	:	Fre	ewheel
CANopen fault mgt	:	Freewheel	
Modbus fault mgt	:	Fre	ewheel
	:		
	:		
Code		Quic	k √

The values of the [Network fault mgt] (*L L*) parameter, trigger a [COM. network] (*L n F*) drive fault, are:

Value	Meaning
[Freewheel] ( 9 E 5)	Freewheel stop (factory setting)
[Ramp stop] ( r П P)	Stop on ramp
[Fast stop] (F 5 L)	Fast stop
[DC injection] ( d [ 1)	DC injection stop

The values of the [Network fault mgt] (L L) parameter, which do not trigger a drive fault, are:

Value	Meaning
[Ignore] ( ¬ [])	Fault ignored
[Per STT] (5 <i>E E</i> )	Stop according to configuration of [Type of stop] (5 L L)
[Fallback spd] (L F F)	Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.
[Spd maint.] (r L 5)	The drive maintains the speed at the time the fault occurred, as the fault persists and the run command has not been removed.

The fallback speed can be configured via the [Fallback spd] (L F F) parameter in the [1.8 FAULT MANAGEMENT] (F L E -) menu.

### 9. 2. Status of the LEDs

The VW3 A3 316 Ethernet/IP card features 5 LEDs, which are visible through the Altivar 61/71 cover.

- 1.1
   1.2
   1.3
   1.4
   1.5
   2.1 Port 1 activity
   2.2 Port 2 activity
   2.3 Link status
   2.4 NS "Network status"
- 2.5 MS "Module status"

The 2 first LEDS are respectively dedicated to each Ethernet port. The third LED is relative to the IP level. The 2 last LEDs are specific to EtherNet/IP and CIP communication protocol.

LED	Color/ state	Description
2.1	Off	No link
	Flashing Green/yellow	Power up testing.
	Green ON	Link at 100 Mbps.
	Yellow ON	Link at 10 Mbps.
	Green BLINK	Activity at 100 Mbps.
	Yellow BLINK	Activity at 10 Mbps.
2.2	Off	No link
	Flashing Green/yellow	Power up testing.
	Green ON	Link at 100 Mbps.
	Yellow ON	Link at 10 Mbps.
	Green BLINK	Activity at 100 Mbps.
	Yellow BLINK	Activity at 10 Mbps.
2.3	Off	Physical connections unplugged - No IP address obtained
	Flashing Green/red	Power up testing.
	Green ON	At least one port is connected and an IP address has been obtained.
	Green flashing 3 times	All ports are unplugged, but the card has an IP address.
	•	Error: Duplicated IP address (1)
	Green flashing 5 times	The card is performing a BOOTP or DHCP sequence
2.4	Off	The device does not have an IP address or powered off.
"NS"	Flashing Green/red	Power up testing.
	Green ON	The device has at least one established connection (even to the Message Router).
	Green flashing	The device has not established connections, burt has obtained an IP address.
	Red flashing	One or more of the connections in which this device is the target has timed out. This shall be left only if all time out connections are reestablished or if the device is reset.
	Red ON	The device has detected that its IP address is already in use (1).
2.5 "MS"	Off	No power is supplied to the device
1013	Flashing Green/red	Power Up testing.
	Green ON	The device is operating correctly.
	Green flashing	The device has not been configured.
	Red flashing	The device has detected a recoverable minor fault.
	Red ON	The device has detected a non-recoverable major fault (1).

(1) In case of duplicate IP Address, the led 2.3 is green flashing 4 times, led 2.4 and 2.5 are solid red.

## 10. Configuration of monitored parameters

It is possible to select up to 4 parameters to display their values in the [1.2 - MONITORING] menu on the graphic display terminal.

The selection is made via the [6 - MONITORING CONFIG.] menu, [6.3 - COM. MAP CONFIG.] submenu.

Each parameter in the range [Address 1 select.] ... [Address 4 select.] is used to select the parameter logic address. Select an address of zero to disable the function.

In the example given here, the monitored words are:

- Parameter 1 = Motor current (LCR): logic address 3204; signed decimal format.
- Parameter 2 = Motor torque (OTR): logic address 3205; signed decimal format.
- Parameter 3 = Last fault occurred (LFT): logic address 7121; hexadecimal format.
- Disabled parameter: address 0; default format: hexadecimal format.

RDY NE	T	+0.00Hz	0A
6.3 C	om. Maf	P CONFIG	i. 🗌
Word 1 add. sele	ect. :		3204
Format word 1	:		Signed
Word 2 add. sele	ect. :		3205
Format word 2	:		Signed
Word 3 add. sele	ect. :		7121
Code			Quick 🗸
Format word 33	:		Hex
Word 4 add. sele	ect. :		0
Format word 4	:		Hex

One of the three display formats below can be assigned to each monitored word:

Format	Range	Terminal display
Hexadecimal	0000 FFFF	[Hex]
Signed decimal	-32,767 32,767	[Signed]
Unsigned decimal	0 65,535	[Unsigned]

This chapter describes the function of the integrated webserver of the EtherNet/IP card.

### 11. 1. Opening the Altivar home page

From your web browser, default http password and login are : USER, USER for monitor and setup security level and ADMIN, ADMIN for administrator level.



From the altivar home page, you can access to 4 main menus:

- Drive,
- Network setup,
- Network diagnostic,
- Email

### 11. 2. Web pages structure

Each web page uses the same structure. Each main menu, "Drive", "Network setup" and "Network Diagnostics" contains each own sub menu. This last one is displayed on the left side of web page.

Schneider	Altivar® 71-61			
I Network setup	Drive	Network setup	Network diagnostic	Email
EtherNet/IP setup				
EtherNet/IP scanner		Agerterm		
Monitor security				
Setup security				
Administrator security				

The 🚺 toggle button shows or hides the left sided menu.

## 11. Webserver

### 11. 3. Drive

Creating Contracting Contract		nall
	Schreider	I Drive
	Altivar 71	Drive monitor
	A CARE AND A CARE A CAR	Drive parameters
	Web site version : 1.0.0.2 © 2009 Schneider Electric. All Rights Reserved.	Drive recorder

### ■ Drive monitor

<b>■</b> Drive	Drive monitor	Drive			Network setup	Network diagnostic	Email
Drive monitor							
Drive parameters					LI1 LI7 AII 🧕	.0040 R1	
Drive recorder		<b>Device</b> Reference	ATV71H0	75M3	LI2 LI8 AI2 0	02	
		Device Name	Not defin	red		.u R4	
		Altivar State	RDY			LO1	
					LI13 AO2 0 LI14 AO3 0	.0 LO3	
		FRH Freq. Ref. RFR Output Freq OTR Output Torq ULN Mains Volta	ue %	0.0 0.0 0.0 218.7	-360	360	
		UOP Motor volta LCR Motor Curren		0.0	-720	720	
		THD Drive Therm		44.0	-1 080-	1 080	
		THR1 Motor Ther		0.0			
		OPR Output Power APH Power Used	r % kWh	0.0	-1 440	1 440	
		RTH Run Time	h	0.0	-1 800	1 800	

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#### ■ Drive parameters

] rive	Drive parameters	Drivi	2		Network set	up Network c	liagnostic	Ema
rive monitor					Rate 1000	IP address 10.0.0.1		
rive parameters								
	Control parameters	neter	Address	UnitId	Description	Value	Unit	
rive recorder	Setpoint parameters		7391	0	Date	0		
	Status parameters Actual values parameters		7392	0	Time	0		
	Reference parameters		3207	0	Mains voltage	218.8	V	
	Measurement parameters		3230	0	Energy consumption	0	Wh	
	I/O parameters		3209	0	Drive thermal state	44	%	
	Fault parameters		9630	0	Motor thermal state	0	%	
	Log parameters		14114	0	Resistor thermal state	0	%	
	Identification parameters		3231	0	Total motor operating time	0	S	
	Communication parameters		3232	0	Internal motor operating time	0	s	
	Controller Inside paramete		3233	0	Total drive operating time	6	s	
	DS402 configuration param		3235	0	IGBT alarm time	0	s	
	SIMPLY START		12209	0	Current bobbin time	0	min	
	SETTINGS	110						
	MOTOR CONTROL							
	INPUTS / OUTPUTS CFG							
	LI CONFIGURATION							
	AI1 CONFIGURATION							
	AI2 CONFIGURATION							
	AI3 CONFIGURATION							
	AI4 CONFIGURATION							
	RP CONFIGURATION							
	ENCODER CONFIGURATIC							
	R1 CONFIGURATION							
	R2 CONFIGURATION							
	R3 CONFIGURATION							
	R4 CONFIGURATION							
	LO1 CONFIGURATION							
		•	1		THE		•	

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The left column is used to select a mod/imd group (or list) of parameters. The right columns displays the parameters, its Modbus address and its current value.

### **SAVING PARAMETERS**

When parameters of the drive are modified from the webserver, they are not saved into drive memory (to avoid numerous write access to the flash memory).

However, it is possible to perform the backup of the parameters from the webserver: This operation can be done by writing 2 to CMI parameter. This operation saves ALL the parameters of the drive to flash memory.

### ■ Drive recorder



The trend viewer shows traces of two preselected parameters

RUN/STOP: Starts or stoppes the trends recording.

Reset : Erases the recorded trend.

Min/Max : defines the lowest and highest values that are displayed on the trend window. Per(s) : Periodicity : Minimal value.

### 11. 4. Network setup



### Monitor security

<b>∢</b> Network setup	Monitor security	Drive		Network setup	Network diagnostic	Email
EtherNet/IP setup			Monitor login:			
EtherNet/IP scanner			New password:			
Monitor security			Confirm password:			
Setup security	-6		Commin password.	C - 1		
Administrator security				Change pass	word	
			Monitor login: New monitor login:			
			Confirm monitor login:	Change monitor	login	

The Monitor security password is the basic level access to the drive through the webserver: it allows the access to the different web pages but don't authorize write access.

New level username and password can be redefined here.

### Setup security

S	Electric	the second second second second	r® 71-61			
∎ Network setup	Setup security	Drive		Network setup	Network diagnostic	Email
EtherNet/IP setup			Setup password:	70		
EtherNet/IP scanner			New setup password:	91 91		
Monitor security						
Setup security			Confirm setup password:			
Administrator security				Change setup pass	word	

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HTTP : data write.Data write level password.

### Administrator security

▲ Network setup	Administrator security	Drive	Network setup	Network diagnostic	Email
EtherNet/IP setup	_	Login:	Administrator		
EtherNet/IP scanner		Password:			
Monitor security		New password:	2		
Setup security		Confirm password:			
Administrator security		Comming a coword.	Change adm pass	word	
		Login:	Administrator		
		Password:	Reset all use	right	

### EtherNet/IP setup

S	Chneider Gelectric	100000000 0000000	1 <b>r® 71-61</b>				
<b>T</b> Network setup	EtherNet/IP setup	Drive		Netwo	ork setup	Network diagnostic	Email
EtherNet/IP setup	Network setting						
EtherNet/IP scanner	•	Actorector		ID made	Augusta 1		
Monitor security	Rate & duplex mode	Autodetect	~	IP mode	Manual 💌		
Setup security	_			IP address	192.168.1.12	_	
Administrator security	— <sup>1</sup>			Subnet mask	255.255.255.0		
23. 	<b></b> -			Gateway address	192.108.1.1		
				Device Name			
			PassWord				
			© 2009	3 Schneider Electric. All Rights	s Reserved.		

### ■ EtherNet/IP scanner setup

Schneide Blectri		lectric		Altivar® 71-61									
<b>1</b> Network setup	Eth	erNet/IP so	anner		Drive			Ņ	letw	vork setup	Network diag	anostic	Email
EtherNet/IP setup	Drive input parameters						Drive output parameters						
EtherNet/IP scanner		Parameter	Config		Description		Parameter	Config	8	Description			
Monitor security	~	CW	-		Control word	<b>v</b>	SW	-		Status word			
Setup security		VP	-		Velocity point		VF			Velocity feedbac	k		
	- I	NCA1	CMD	~	Cmd value	•	NMA1	ETA	*	ETA state word			
Administrator security		NCA2	LFRD	*	LFRD		NMA2	RFRD	×	RFRD			
	~	NCA3	-0-	*	Not Assigned	•	NMA3	-0-	~	Not Assigned			
		NCA4	ACC	•	Acceleration		NMA4	-0-	~	Not Assigned			
	~	NCA5	-0-	~	Not Assigned	<b>v</b>	NMA5	-0-	~	Not Assigned			
		NCA6	-0-	~	Not Assigned		NMA6	-0-	~	Not Assigned			
	~	NCA7	-0-	×	Not Assigned	•	NMA7	-0-	v	Not Assigned			
		NCA8	-0-	¥	Not Assigned		NMA8	-0-	*	Not Assigned			
					Save	t unit R	pm 💽	port					

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### Email management

Email man	agement	Drive		Network setup	Network diagnostic	Ema
Se F F F			Email IP server @ Email dest. @ Email from @	Not defined		
	hernet IP @	10.0.0.1	Send cour	nter 0		
De	evice name		Error cour	iter 0		
Er	nail status	Idle		Reset Counter		
Laste	email Error	0				

### 11. 5. Diagnostics



### Ethernet statistics

◀ Network diagnostics	Ethernet statistics	Drive		Ne	twork setup Netw	ork diagnostic	Emai
Ethernet statistics	Device Type	ALTIVAR 71	Data rate	100 Mbit/s	IP address	10.0.0.1	1
essage statistics	Device reference	ATV71H075M3	Duplex mode	Full Duplex	Subnet mask	255.255.255.0	
	Software revision	1.0ie01			Gateway address	0.0.0.0	
	MAC Address	00-80-f4-7d-00-03			IP mode	Manual	
					Device name	Not defined	
	Transmit		Receive		Other errors		
	Transmit counter	57818	Receive counter	67668	Collisions	0	
	Transmit errors	0	Receive errors	0	Multi Collisions	0	
					Over Run	0	
	Deferred Emissions	0	CRC errors	0			
	Late collisions	0	Frame errors	0			
	Buffer Errors	0	Buffer Errors	0			
						Reset counters	1

#### Message statistics

<ul> <li>Network diagnostics</li> </ul>	Message statistics	Drive		Network setup	Network diagnostic	Emai
Ethernet statistics Message statistics	TCP/UDP Open soci				0	
	CIP Input Output	Assemblies Instance Size 0 0 0	I/O messaging Transmit counter 0 Receive counter 0 Error counter 0	Explicit messa UCMM request UCMM error Class3 request Class3 error	ging 0 0 0 0	
	Receiv	TCP it counter 2582 e counter 2593 r counter 0			Reset counters	
			© 2009 Schneider Electric. /	All Rights Reserved.		

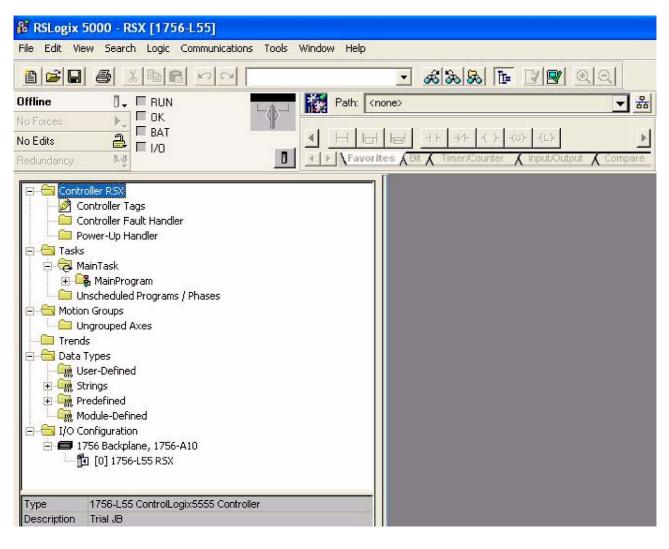
**NOTE:** As a Schneider product, The EtherNet/IP option card uses internally MODBUS TCP for the web-server. (The MODBUS TCP port is not accessible).

### 12.1. Principle

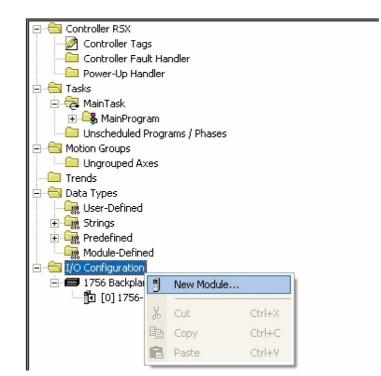
RSX drive equipped with an EtherNet/IP card shall be configured as a "Generic Ethernet Module" in the same way as the EtherNet/IP adapter of PowerFlex 70 drives.

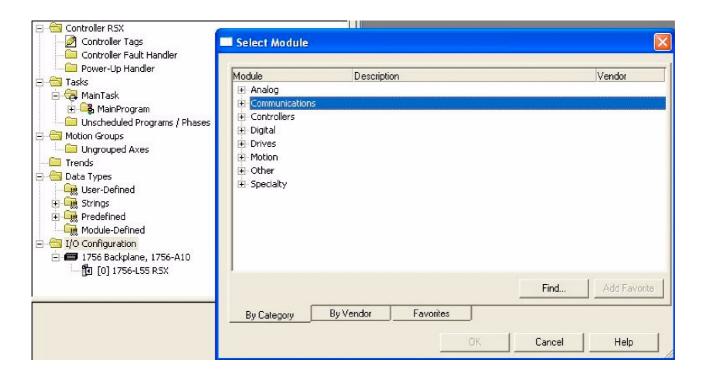
### 12.2. Procedure

### ■ Create a new project

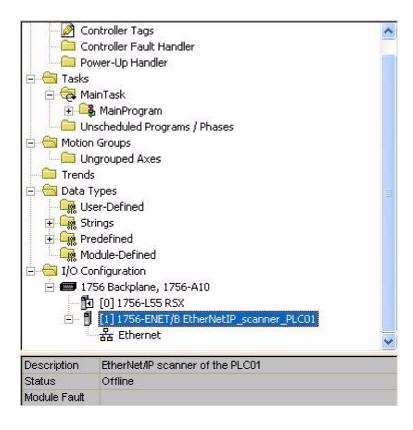


■ Add a EtherNet/IP scanner to the I/O configuration





	Vendor
1756 ControlNet Bridge, Redundant Media	Allen-Bradley
1756 ControlNet Bridge, Redundant Media	Allen-Bradley
1756 DH+ Bridge/RIO Scanner	Allen-Bradley
1756 DH+ Bridge/RIO Scanner	Allen-Bradley
1756 DH+ Bridge/RIO Scanner	Allen-Bradley
1756 DeviceNet Scanner	Allen-Bradley
1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
1756 Ethernet Communication Interface	Allen-Bradley
1756 Ethernet Communication Interface	Allen-Bradley
1756 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv	. Allen-Bradley
SynchLink Interface	Allen-Bradley
	<ul> <li>1756 ControlNet Bridge, Redundant Media</li> <li>1756 DH+ Bridge/RIO Scanner</li> <li>1756 DH+ Bridge/RIO Scanner</li> <li>1756 DH+ Bridge/RIO Scanner</li> <li>1756 DeviceNet Scanner</li> <li>1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media</li> <li>1756 Ethernet Communication Interface</li> <li>1756 Ethernet Communication Interface</li> <li>1756 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv.</li> </ul>



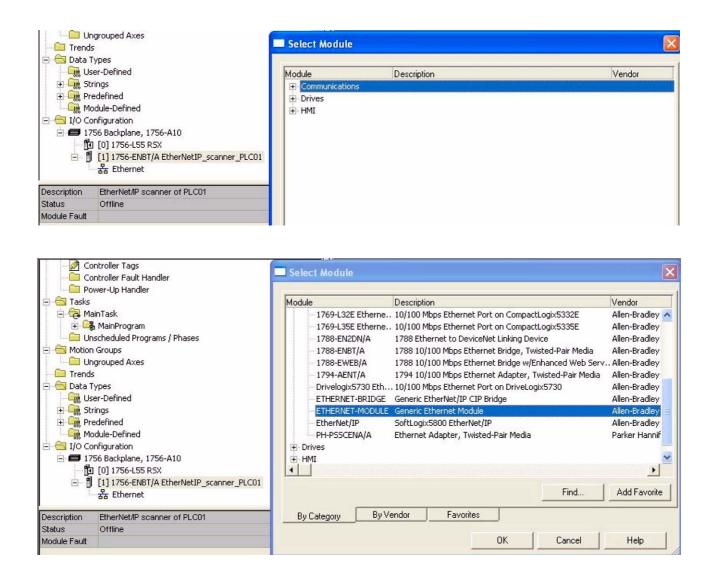
■ Configure the EtherNet/IP scanner

Controller Trial_Altivar	New Module
<ul> <li>Ø Controller Tags</li> <li>Controller Fault Handler</li> <li>Power-Up Handler</li> <li>Tasks</li> <li>MainTask</li> <li>MainProgram</li> </ul>	Type:       1756-ENBT / A 1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media         Vendor:       Allen-Bradley         Parent:       Local         Name:       EtherNetIP_scanner_PLC01
Unscheduled Programs / Phases Motion Groups Ungrouped Axes Trends	Description: EtherNet/IP scanner of the PLC #01
Data Types Wer-Defined Strings Predefined Module-Defined	Slot: 1 Revision: 3 1 Electronic Keying: Compatible Keying Compatible Keying Disable Keying Exact Match
I/O Configuration 1756 Backplane, 1756-A10 [0] 1756-LS5 Trial_Altivar [1] 1756-ENBT/A 금품 Ethernet	Open Module Properties     OK Cancel Help

■ Add a EtherNet/IP ATV71/61 drive to the I/O configuration

Cashadlan Tasa			
Controller Tags			
Controller Fault Handler			
Power-Up Handler			
🖻 🖓 🦰 Tasks			
🖻 🧔 MainTask			
主 🖳 MainProgram			
Unscheduled Programs / Phases			
🖻 🔠 Motion Groups			
Ungrouped Axes			
🛅 Trends			
🚊 📹 Data Types		≡	
- 🙀 User-Defined			
🕀 🙀 Strings			
🕀 🙀 Predefined			
Module-Defined			
🗄 😁 🔄 I/O Configuration			
🖻 📟 1756 Backplane, 1756-A10			
🚺 [0] 1756-L55 RSX			
🖃 📲 🚺 [1] 1756-ENBT/A EtherNetIP_scanner_PLC01			
ය. Chernet	٩	New Module	
Description EtherNet/IP scanner of PLC01	Ж	Cut	Ctrl+X
Status Offline Module Fault	Ð	Сору	Ctrl+C
Module Fault	E.	Paste	Ctrl+V
		Delete	Del
		Cross Reference	Ctrl+E
		Properties	

# 12. Integration in RSLogix



Po	wer-Up Handler	^
🖻 🔠 Tasks		
📄 🗟 Ma	ainTask	
÷ 🕞	MainProgram	-
🔄 🛄 Ur	scheduled Programs / Phases	
🖻 🔠 Motion	Groups	
🛄 🛄 Ur	grouped Axes	
Trends		
🖻 🔠 Data T	ypes	
Us 🛄 Us	er-Defined	
📄 🕀 🙀 Sti	rings	
	edefined	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	odule-Defined	
and all the second second second	nfiguration	
	56 Backplane, 1756-A10	
	[0] 1756-L55 ATV	
	[1] 1756-ENBT/A EtherNetIP_scanner_PLC01	
Ē	ං쁆 Ethernet	
	1756-ENBT/A EtherNetIP_scanner_PLC01	
	ETHERNET-MODULE ATV_01	~
Description	Drive ATV n°01	
Status	Offline	
Module Fault		

## ■ Configure the ATV71 EtherNet/IP card

<s MainTask</s 	New Module				
MainProgram     Jnscheduled Programs / Phases     on Groups     Jngrouped Axes     ds     Types     Jser-Defined     Strings	Type:       ETHERNET-MODULE Generic Ethernet Non-Bradley         Vendor:       Allen-Bradley         Parent:       EtherNetIP_scanner_PLC01         Name:       ATV_01         Description:       Drive ATV	Connection Para	Assembly Instance:	Size:	-
Predefined Module-Defined Configuration 1756 Backplane, 1756-A10	Comm Format: Data - INT 🗾	Input: Output: Configuration:	104 103 6	10	+ (16-bit) + (16-bit) + (8-bit)
10 [0] 1756-L55 Trial_Altivar [1] 1756-ENBT/A EtherNetIP_sca 二 器 Ethernet - 別 ETHERNET-MODULE - 読 1756-ENBT/A EtherNetIF	IP Address:         100 . 100 . 101 . 11           Image: Comparison of the state of the s	Status Input: Status Dutput:			
	✓ Open Module Properties	ОК	Car		Help

Above the Allen-Bradley drive profile is selected.

Below the CIP extended speed control profile is selected.

l'ype: /endor:	ETHERNET-MODULE Generic Etherne Allen-Bradley	t Module			
Parent:	EtherNetIP_scanner_PLC01				
Name:	ATV_01	- Connection Para			
Description:			Assembly Instance:	Size:	
Description.	Drive ATV	Input:	71	2	÷ (16-bit)
		Output:	21	2	÷ (16-bit)
Comm Forma	t: Data - INT 📃 💌	Configuration:	6	0	÷ (8-bit)
Address / H				-	-
IP Addr	ess: 100 . 100 . 101 . 11	Status Input:			
C Host Na	ame:	Status Output:			

Below the CIP extended speed and torque control profile is selected.

Type:	ETHERNET-MODULE Generi	c Ethernet Module			
Vendor: Parent:	Allen-Bradley EtherNetIP_scanner_PLC01				
Na <u>m</u> e:	ATV_01	Connection Par	ameters		
– Description:		_	Assembly Instance:	Size:	
-		Input:	73	3	÷ (16-bit)
		O <u>u</u> tput:	23	3	÷ (16-bit)
Comm <u>F</u> ormal - Address / H	and the second	<u><u>C</u>onfiguration:</u>	6	0	(8-bit)
● IP <u>A</u> ddr		11 <u>S</u> tatus Input:			
G Host Na	ame:	Status Output			

Below native RSX profile is selected.

Type: Vendor:	nnection   Module Info   ETHERNET-MODULE Generic Eth Allen-Bradlev	ernet Module			
Parent:	EtherNetIP_scanner_PLC01				
Na <u>m</u> e: Description:		Connection Para	ameters Assembly Instance:	Size:	
Description:	Drive ATV		101	8	🕂 (16-bit)
	8	0 <u>u</u> tput:	100	8	🛨 (16-bit)
Comm <u>F</u> ormat ⊢ Address / H		<u>C</u> onfiguration:	6	0	🗧 (8-bit)
IP <u>A</u> ddr		<u>S</u> tatus Input:	<u> </u>		
C Host Na	ame:	Słatus Output:			

# 12. 3. Registering the EDS file in RSlogix

An EDS file is provided with the drive. (This file is available on the CD or on www.schneider-electric.com). It exists 1 EDS file for the ATV71 and 1 EDS file for the ATV61. The following lines describe how to import these files in your project:

In RSnetWorx , start the EDS wizards

*EtherNet/IP - RSNetWorx for EtherNet/IP		. 🗗 🗙
Elle Edit View Network Device Diagnostics Tools Hel		88
🖀 🗳 - 🔚 🎒 🐰 🖻 💼 除 🛛 EDS Wit		
	SNMP	
		1
xI     Worst Case Device Usages       Address     Address       Minimum CPU:     192.168.1.100       Maximum CPU:     192.168.1.100	Pending     Address     Pending     Pending       0.04%     Connection:     192.168.1.100     0.78%     Devices not included:     0       0.04%     Consume:     Produce:     Produce:     Produce:	
Hardware	= <b>×</b> 1756-A7/A	
	192.163.1.100	X
	→ H ← H \ Graph / Spreadsheet ) Diagnostics /	<u>&gt;</u>
X Message Code Date	Description	
Message Code Date     Date     12/09/2007 11:29:32	Edits enabled.	
ENET:81E7 12/09/2007 11:29:32	Mode changed to online. The communication timeout is 3000 msec. The online path is WXFR63469DIAB_ETHIP-1.	
	Mode changed to offline.	
ENET:81E8 12/09/2007 11:29:15	Edits canceled.	
ENET:81E7 12/09/2007 11:13:15	Edits canabled.	~
DENE 18 1E5         12/09/2007 11:29:15           ENET:8 1E8         12/09/2007 11:29:15           DENET:8 1E7         12/09/2007 11:13:15		>
Execute the Electronic Data Sheet installation wizard	Online Not Brow	sina
🛃 démarrer 🛛 🕲 🗟 🖙 🐵 🍣 😂 🖻	* Scobes A RSLogi 27 *Ether 20 D:\doc A Adobe 20 D:\doc	

Follow the instructions:



Choose "Register" to import a new EDS file.

If you want to update an EDS file you need to "unregister" this device first.



# **12. Integration in RSLogix**

Select the required file:

vell Software's E	DS Wizard					
gistration Electronic Data She Software application	et file(s) will be added to your system Is.	i for use in Rockwell				
Register a <u>s</u> ingle file Register a <u>d</u> irectory o ned:	of EDS files 🗖 Look i		ass Pendin; 68.1.100 0.78%		Pending 0	
• If there is an i then this image	con file (.ico) with the same name as will be associated with the device. To perform an ins < Précédi	tallation test on the file(s), click Next	0			
		nt <u>S</u> uivant > Annuler	Select an EDS fil	e		?
		HI I M Graph & Spread	Regarder dans : TELEIP61.eds TELEIP71.eds	EDS .	<b>• ← ← ☆ Ⅲ</b> •	
18. N. 19.	<ul> <li>Defense</li> </ul>					
lessage Code	Date	Description	Nom du fichier :	1		Ouvrir
ENET:81E7 ENET:81E4	12/09/2007 11:29:32	Edits enabled. Mode changed to online. The commu		J.		Ouver
ENEL:01E4	12/09/2007 11:29:17 12/09/2007 11:29:15	Mode changed to offline.	Fichiers de type :	EDS Files (*.eds)	*	Annule
	and the second	Edits cancelled.		Ouvrir en lecture seule		-
ENET:81E5	12/09/2007 11:29:15					
	12/09/2007 11:29:15 12/09/2007 11:13:15	Edits enabled.		I♥ Ouvrir en lecture seule		

Then finish, the dialog box displays the result of the import operation.

Rockwell Software's EDS Wizard	
EDS File Installation Test Results This test evaluates each EDS file for errors in the EDS fil guarantee EDS file validity.	e. This test does not
Installation Test Results Installation Test Results Installation Test Results Installation Test Results	ı∖eds`teleip71.eds
	nt Suivant > Annuler

# 13. 1. Supported object classes

Three categories of object classes can be defined: • 1: CIP device on EtherNet/IP.

- 2: AC/DC drive.
- 3: VSD specific.

These objects are detailed here:

Object class	Class ID	Cat.	Number of instances	Effect on behavior Interface
Identity object (13. 2.) page 44	16#01	1	1	Supports the reset service
Message router object (13. 3.) page 45	16#02	1	1	Explicit message connection
Ethernet Link object (13. 4.) page 47	16#F6	1	1	Counter and status information
TCP/IP Interface object (13. 5.) page 50	16#F5	1	1	TCP/IP configuration
Connection object manager (13. 6.) page 52	16#05	1	1	
Motor data object (13. 7.) page 53	16#28	2	1	Defines data for the motor connected to the device
Control supervisor object (13. 8.) page 54	16#29	2	1	Manages drive functions, operational states and control
AC/DC Drive Object (13. 9.) page 56	16#2A	2	1	Provides drive configuration
Assembly object (13. 10.) page 57	16#04	2	12	Defines I/O data format
Application objects (13. 11.) page 58		3	1	Vendor specific - drive's parameters

# 13. 2. Identity object

The Identity object provides identification and status information about the drive.

#### **Class code**

Hexadecimal	Decimal
16#01	1

#### **Class attributes**

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Revision	Opt.	UINT	1	—
2	Get	Max Instances	Opt.	UINT	1	1 defined instance

# 13. CIP objects

#### Instance attributes

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Vendor ID	Req.	UINT	243	Schneider Automation, Inc [243]
2	Get	Device type	Req.	UINT	16#02	AC/DC drive profile
3	Get	Product code	Req.	UINT	5 or 7	5: ATV71 7: ATV61
4	Get	Revision	Req.	Struct of: USINT USINT	-	Product revision of the drive (1)
5	Get	Status	Req.	WORD	—	See definition in the table below
6	Get	Serial number	Req.	UDINT	—	Serial number of the drive
7	Get	Product name	Req.	Struct of: USINT STRING	-	11 (product name length) "ATV71 Drive"
8	Get	State	Opt.	USINT	_	0: Non existent 1: Device self-testing 2: Standby 3: Operational 4: Major recoverable fault 5: Major unrecoverable fault
10	Get/Set	Heartbeat interval (2)	Opt.	USINT	0–255	Interval in seconds between two heartbeat messages. 0: No message.

(1) Mapped in a word: MSB minor revision (second USINT), LSB major revision (first USINT). Example: 517 = 16#0205 means revision V5.2.

(2) The heartbeat message broadcasts the current state of the device.

# 13. 3. Message router object

The Message router object is the element through which all the "Explicit messages" objects pass in order to be directed towards the objects they are truly destined to.

#### **Class code**

Hexadecimal	Decimal
16#02	2

#### **Class attributes**

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Revision	Opt.	UINT	1	-
2	Get	Max instances	Opt.	UNT	1	1 Defined instance

# 13. CIP objects

#### Instance attributes

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Object list: Number classes	Opt.	Struct of: UINT UINT []	20 (codes)	List of supported objects; the first UINT is the number of supported classes; the remaining UINTs are the codes of these classes.
2	Get	Number available	Opt.	UINT	1	Maximum number of simultaneous connections
3	Get	Number active	Opt.	UINT	1	Number of active connections
4	Get	Active connections	Opt.	UINT [ ]	1	List of active connections (referred to with their respective Connection instance ID)

#### **Class service**

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute

#### Instance service

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute

# 13. 4. Ethernet Link object

This object provides the mechanism to configure a device's TCP/IP network interface.

#### ■ Class code

Hexadecimal	decimal
16#F5	245

## Class attributes

Class attributes for this object are optional.

#### ■ Instance attributes

Attribute ID	Access	Name	need	Data type	Value		Details
1	Get	Status	Req.	DWORD		0	The interface configuration attribute has not been configured.
		Bit leve		Bit level	1	The interface configuration contains a valid configuration.	
						2-15	Reserved for future use.
2	Get	Configuration capability	Req.	DWORD		0	BOOTP Client.
					1	DNS Client.	
				Bit level	2	DHCP Client.	
					3	DHCP-DNS capable.	
					4	Interface configuration settable.	
						All ot	her bits are reserved and shall be set to 0.
3	Get	Configuration	Req.	DWORD		0	The interface configuration is valid.
	Set	control			Bit level	1	The interface configuration must be obtained with BOOTP.
						2	The interface configuration must be obtained with DHCP
						3	Reserved.
		racts with the Altiv	ar 71 paran	neter [IPmode].		4	DNS Enable.
(see chapter	<u>8. </u> ).					All ot	her bits are reserved and shall be set to 0.
4	Get	Physical link	Req.	STRUCT {			size: number of 16 bit words in the element
			UINT path si Padded EPA <sup>-</sup> }			link o class	: Logical segments identifying the physical bject. The path is restricted to one logical segment and one logical instance segment. naximum size is 12 bytes.

Attribute ID	Access	Name	need	Data type	Value	Details
5	Access Get Set	Interface configuration	Req.	STRUCT { UDINT IP A UDINT Netv UDINT Gate UDINT Prim server UDINT Seco server	ddress vork Mask eway address	<ul> <li>IP Address: Value of 0 indicates noIP address has been configured. Otherwise, the IP address shall be set to a valid Class A, B, or C address and shall not be set to the loopback address (127.0.0.1).</li> <li>Network Mask: Value of 0 indicates no network mask address has been configured.</li> <li>Gateway Address: Value of 0 indicates no IP address shall be set to a valid Class A, B, or C address and shall not be set to the loopback address (127.0.0.1).</li> <li>Primary name: Value of 0 indicates no name server address shall be set to a valid Class A, B, or C address (127.0.0.1).</li> <li>Primary name: Value of 0 indicates no name server address shall be set to a valid Class A, B, or C address.</li> <li>Secondary Name: Value of 0 indicates no secondary name server address has been configured. Otherwise, the name server address shall be set to a valid Class A, B, or C address.</li> <li>Default domain name: ASCII characters.</li> </ul>
6	Get	Host Name	Reg.	STRING		Maximum length is 48 characters. Shall be padded to an even number of characters (pad not included in length). A length of 0 shall indicate no Domain Name is configured. ASCII characters. Maximum length is
o	Set	nost name	rteq.	STRING		64 characters. Shall be padded to an even number of characters (pad not included in length). A length of 0 shall indicate no Host Name is configured.

# ■ Class service

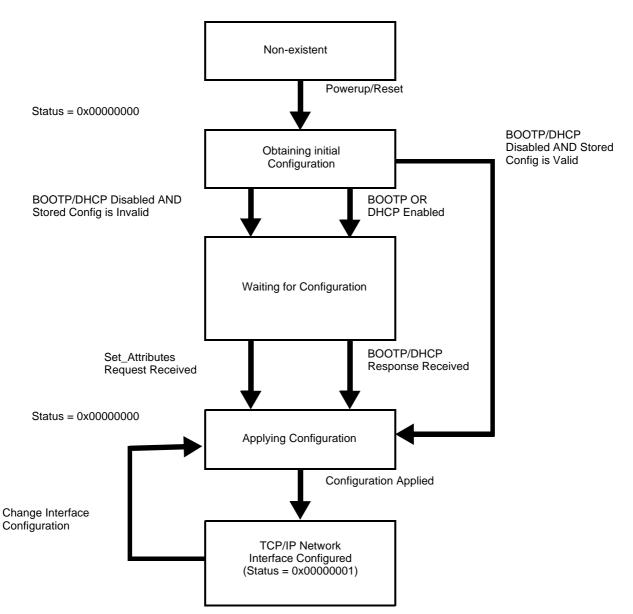
Service Code	Service Name	Need	Description
16#01	Get_Attribute_All	Optional	Returns a predefined listing of this objects attributes.
16#0E	Get_Attribute_Single	Optional	Returns the contents of the specified attribute.

# ■ Instance service

Service Code	Service Name	Need	Description
16#01	Get_Attribute_All	Optional	Returns a predefined listing of this objects attributes.
16#0E	Get_Attribute_Single	Required	Returns the contents of the specified attribute.
16#02	Set_Attribute_All	optional	Modifies all settable attributes.
16#10	Set_Attribute_Single	Required	Modifies a single attribute.

#### Behaviour

The following state machine is used to configure the TCP/IP network interface.



# 13. 5. TCP/IP Interface object

This object maintains link specific counters and status information for an Ethernet 802.3 communications interface.

### ■ Class code

Hexadecimal	Decimal
16#F6	246

## Class attributes

Attribute ID	Access	Name	Need	Data type	Value
1	Get	Revision	Req.	UINT	2
2 through 7			optional		

#### ■ Instance attributes ../

Attribute ID	Access	Name	Need	Data type	Value	Detail	S		
1	Get	Interface Speed	Req.	UDINT	0,10,100 1000, etc.	Speed	l in Mbps.		
2	Get	et Interface flags	Req.	DWORD		0	Link status		
						1	Half/full duplex		
					Bit	2-4	Negotiation status		
					level	5	Manual setting / requires reset		
						6	Local Hardware fault		
						All oth	er bits are reserved and shall be set to 0.		
3	Get	Physical Address	Req.	ARRAY OF 6 USINTs			rray contains the MAC address of the format: XX-XX-XX-XX-XX-XX		
4	Get	Interface	Cond.	STRUCT {					
		counters		UDINT In Octets		Octets received on the interface			
			UDINT In Uca	UDINT In Ucast Packets		Unicast Packets received on the interface.			
				UDINT <b>In NU</b> Packets	UDINT In NUcast Packets		Non Unicast Packets received on the interface.		
				UDINT <b>In Dis</b>	UDINT <b>In Discards</b>		nd packets received on the interface but ded.		
				UDINT In Errors			nd packets that contain errors. (does not e in Discards)		
					UDINT <b>In U</b> Protos		known	Inbour	nd packets with unknown protocol.
				UDINT Out C	Octets	Octets sent on the interface.			
				UDINT <b>Out U</b> packest	UDINT <b>Out Ucast</b> packest UDINT <b>Out NUcast</b> Packets		Unicast Packets sent on the interface.		
							Inicast Packets sent on the interface.		
				UDINT Out o	UDINT Out discards		und packets discarded		
				UDINT		Outbound packets that contain errors			
				}					

# 13. CIP objects

Attribute ID	Access	Name	Need	Data type	Value	Details	
5	Get	Media Counters	Cond.	STRUCT {			
				UDINT Alignment errors		Frames received that are not an integral number of octets in length	
				UDINT FCS Errors		Frames received that do not pass the FCS check	
				UDINT Single collisi	ions	Successfully transmitted frames which experienced exactly one collision	
				UDINT Multiple Coll	isions	Successfully transmitted frames which experienced more than one collision	
				UDINT SQE Test Erro	ors	Number of times SQE test error message is generated	
				UDINT <b>Deferred</b> Transmissions			Frames for which first transmission attempt is delayed because the medium is busy
				UDINT Late Collisions		Number of times a collision is detected later than 512 bittimes into the transmission of a packet	
				UDINT Excessive Co	ollisions	Frames for which transmission fails due to excessive collision	
				UDINT MAC Transm	nit errors	Frames for which transmission fails due to an internal MAC sublayer transmit error	
				UDINT Carrier sense Errors	e Errors	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame	
				UDINT Frame too lor	ng	Frames received that exceed the maximum permitted frame size	
				UDINT MAC Receive	Errors	Frames for which reception on an interface fails due to an internal MAC sublayer receive error	
				}			
6	Set	Interface control	Optional	STRUCT {			
				WORD Control Bits		Interface control bits	
				UINT Force interface Speed	)	Speed at which the interface shall be forced to operate.	
				}			

# 13. CIP objects

#### ■ Class service

Service Code	Service Name	Need	Description
16#01	Get_Attribute_All	Optional	Returns a predefined listing of this objects attributes.
16#0E	Get_Attribute_Single	Optional	Returns the contents of the specified attribute.
16#10	Get_and_clear	Cond.	Modifies a single attribute

#### ■ Instance service

Service Code	Service Name	Need	Description
16#01	Get_Attribute_All	Optional	Returns a predefined listing of this objects attributes.
16#0E	Get_Attribute_Single	Required	Returns the contents of the specified attribute.
16#10	Set_Attribute_Single	Required	Modifies a single attribute.

# 13. 6. Connection object manager

#### Class code

Hexadecimal	Decimal
16#05	5

#### **Class attributes**

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Revision	Opt.	UINT	1	—
2	Get	Max instances	Opt.	UINT	4	3 defined instances (1)

(1) Only instances 1 (explicit message), 2 (polled I/O message), and 4 (change of state/cyclic message) are supported. Instance 3 (bit strobe) is not supported.

#### Attributes of instance 1—Explicit message instance

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	State	Req.	USINT	_	0 : Non-existent 3 : Established 5 : Deferred Delete
2	Get	Instance_type	Req.	USINT	0	Explicit Message
3	Get	TransportClass_trigger	Req.	BYTE	16#83	Class 3 server
4	Get	Produced_connection_id	Req.	UINT	10xxxxxx011	xxxxxx = Node address
5	Get	Consumed_connection_id	Req.	UINT	10xxxxx100	xxxxxx = Node address
6	Get	Initial_comm_characteristics	Req.	BYTE	16#21	Explicit messaging via Group 2
7	Get	Produced_connection_size	Req.	UINT	36	Produced data maximum size (in bytes)
8	Get	Consumed_connection_size	Req.	UINT	36	Consumed data maximum size (in bytes)
9	Get/Set	Expected_packet_rate	Req.	UINT	2500	2.5 sec. (TimeOut)
12	Get/Set	Watchdog_timeout_action	Req.	USINT	1 or 3	1 : Auto-Delete 3 : Deferred Delete (Default)
13	Get	Produced connection path length	Req.	UINT	0	Length of attribute 14 data
14	Get	Produced connection path	Req.	Array of UINT	Null	Empty
15	Get	Consumed connection path length	Req.	UINT	0	Length of attribute 16 data
16	Get	Consumed connection path	Req.	Array of UINT	Null	Empty

Refer to EtherNet/IP specification for more information.

# 13. 7. Motor data object

The Motor data object acts as a motor parameter database.

### Class code

Hexadecimal	Decimal
16#28	40

#### **Object 28hex (Motor Data)**

Path	CIP name	CIP configuration parameter name
16#28/01/06 = 40/1/6	RatedCurrent	Motor Rated Cur
16#28/01/07 = 40/1/7	RatedVoltage	Motor Rated Volt
16#28/01/09 = 40/1/9	RatedFreq	Motor Rated Freq
16#28/01/0F = 40/1/15	BaseSpeed	Motor Base Speed

#### Telemecanique adaptation:

Path	Code	Altivar name	Logic address
16#28/01/06 = 40/1/6	NCR	Rated mot. current	16#2583 = 9603
16#28/01/07 = 40/1/7	UNS	Rated motor volt.	16#2581 = 9601
16#28/01/09 = 40/1/9	FRS	Rated motor freq.	16#2582 = 9602
16#28/01/0F = 40/1/15	NSP	Rated motor speed	16#2584 = 9604

#### **Class attributes**

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Revision	Opt.	UINT	2	—
2	Get	Max instance	Opt.	UINT	1	—
6	Get	Max ID number of class attribute	Opt.	UINT	7	—
7	Get	Max ID number of instance attribute	Opt.	UINT	15	—

#### Instance attributes

Attribute ID	Access	Name	Need	Data type	Value	Details
3	Get/Set	MotorType	Req.	USINT	7	6 = Wound rotor induction motor 7 = Squirrel cage induction motor
6	Get/Set	RatedCurrent	Req.	UINT	Depends on the drive rating	[Rated mot. current] (n [ r)
7	Get/Set	RatedVoltage	Req.	UINT	Depends on the drive rating	[Rated mot. volt.] ( <i>U</i> n 5)
9	Get/Set	RatedFreq	Opt.	UINT	50/60	[Rated motor freq.] (F r 5)
15	Get/Set	BaseSpeed	Opt.	UINT	Depends on the drive rating	[Nom motor speed] (n 5 P)

#### **Class service**

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute

#### Instance service

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute
16#10	Set_Attribute_Single	Opt.	Write an attribute

# 13. 8. Control supervisor object

The Control supervisor object models the functions for managing all devices within the hierarchy of motor control devices.

Object 29hex (Control Supervisor)					
Path	CIP name	CIP configuration parameter name			
16#29/01/0D = 41/1/13	FaultCode	Fault Code			

#### Telemecanique adaptation:

Path	Code	Altivar name	Logic address
16#29/01/0D = 41/1/13	ERRD	CiA402 fault code	16#219E = 8606

#### **Class code**

Hexadecimal	Decimal
16#29	41

#### **Class attributes**

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Revision	Opt.	UINT	2	—
2	Get	Max instance	Opt.	UINT	1	_
6	Get	Max ID number of class attribute	Opt.	UINT	7	_
7	Get	Max ID number of instance attribute	Opt.	UINT	17	—

#### Instance attributes

Attribute ID	Access	Name	Need	Data type	Details
3	Get/Set	Run Fwd	Req.	BOOL	On an edge (0 →1)
4	Get/Set	Run Rev	Opt.	BOOL	On an edge (0 →1)
5	Get/Set	NetCtrl	Opt.	BOOL	0: Local Control (Channel 1) 1: Network Control (default)
6	Get	State	Opt.	USINT	0 = Vendor Specific, 1 = Startup, 2 = Not_Ready, 3 = Ready, 4 = Enabled, 5 = Stopping, 6 = Fault_Stop, 7 = Faulted
7	Get	Running Fwd	Req.	BOOL	
8	Get	Running Rev	Opt.	BOOL	
9	Get	Ready	Opt.	BOOL	
10	Get	Faulted	Req.	BOOL	
12	Get/Set	FaultRst	Req.	BOOL	Fault reset (0 →1)
13	Get	FaultCode	Opt.	UINT	Refer to the Communication parameters manual: DSP402 fault code (Errd)
15	Get	CtrlFromNet	Opt.	BOOL	0 = Local Control; 1 = Network Control

# 13. CIP objects

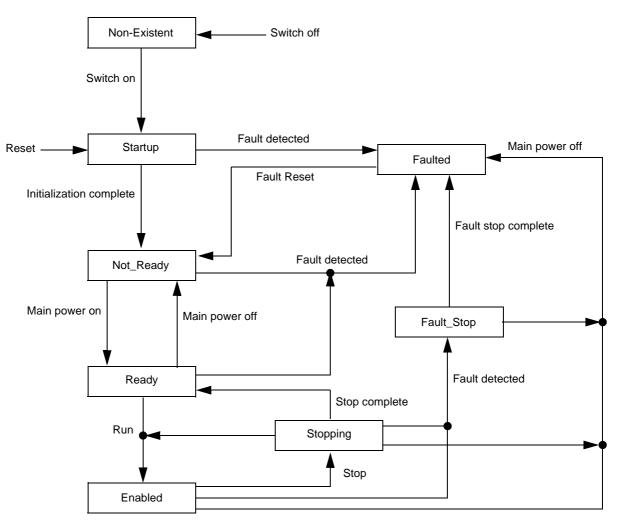
#### **Class service**

Service Code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute

#### Instance service

Service Code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute
16#10	Set_Attribute_Single	Req.	Write an attribute
16#05	Reset	Req.	Drive reset

#### Control supervisor state transition diagram



# 13. 9. AC/DC Drive Object

The AC/DC Drive object models the functions (such as torque control and speed ramp) that are specific to drives.

## Class code

Hexadecimal	Decimal
16#2A	42

### **Class attributes**

Attribute ID	Access	Name	Need	Data Type	Value	Details
1	Get	Revision	Opt.	UINT	1	—
2	Get	Max instance	Opt.	UINT	1	—
6	Get	Max ID number of class attribute	Opt.	UINT	7	—
7	Get	Max ID number of instance attribute	Opt.	UINT	21	—

#### Instance attributes

Attribute ID	Access	Name	Need	Data type	Details
3	Get	AtReference	Opt.	BOOL	
4	Get/Set	NetRef (1)	Req.	BOOL	0: Local speed setpoint (Al1 or Al2) 1: Speed setpoint via the network
5	Get/Set	NetProc	Opt.	BOOL	Not handled
6	Get/Set	Drive mode	Req.	USINT	1: Open loop 2: Closed loop (FVC)
7	Get	SpeedActual	Req.	INT	Output speed (rFrd)
8	Get/Set	SpeedRef	Req.	INT	Speed setpoint (LFrd)
9	Get	CurrentActual	Opt.	INT	Motor current (LCr)
10	Get/Set	CurrentLimit	Opt.	INT	[Mot. therm. current] (ItH)
11	Get	TorqueActual	Opt.	INT	Output torque (Otrn)
12	Get/Set	TorqueRef	Opt.	INT	Torque setpoint (LtCr)
18	Get/Set	AccelTime	Opt.	UINT	Acceleration time (ACCd)
19	Get/Set	DecelTime	Opt.	UINT	Deceleration time (dECd)
20	Get/Set	LowSpdLimit	Opt.	UINT	Parameter [Low speed] (LSP) converted in RPM
21	Get/Set	HighSpdLimit	Opt.	UINT	Parameter [High speed] (HSP) converted in RPM

#### **Class service**

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute

#### Instance service

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute
16#10	Set_Attribute_Single	Opt.	Write an attribute

# 13. 10. Assembly object

The Assembly object binds together the attributes of multiple objects so that information to or from each object can be communicated over a single connection.

Assembly objects are static.

The assemblies in use can be modified through the parameter access of the network configuration tool (RSNetWorx).

The drive needs a power off to take into account a new assembly assignment.

#### **Class code**

Hexadecimal	Decimal
16#04	4

#### **Class attribute**

Attribute ID	Access	Name	Need	Data type	Value	Details
1	Get	Revision	Opt.	UINT	2	_
2	Get	Max instance	Opt.	UINT	105	13 defined instances

#### **Instances supported**

Instance	Name	Data size
20	ODVA Basic speed control output	4 bytes
21	ODVA Extended speed control output	4 bytes
22	ODVA Speed and torque control output	6 bytes
23	ODVA Extended speed and torque control output	6 bytes
100	Native drive output	16 bytes
103	Allen-Bradley® drive output	20 bytes
70	ODVA Basic speed control input	4 bytes
71	ODVA Extended speed control input	4 bytes
72	ODVA Speed and torque control input	6 bytes
73	ODVA Extended speed and torque control input	6 bytes
101	Native drive input	16 bytes
104	Allen-Bradley® drive input	20 bytes

The description of each instance is detailed in chapter 15. Device profiles

#### Instance attributes

Attribute ID	Access	Name	Need	Data type	Value	Details
3	Get/Set (1)	Data	Req.			

(1) Set access is restricted to output instances only (instances 20, 21, 22, 23, 100 and 103).

#### **Class service**

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute

#### Instance service

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute
16#10	Set_Attribute_Single	Opt.	Write an attribute

# 13.11. Application objects

#### Class code

Hexadecimal	Decimal
16#70 to 16#A8	112 to 424

#### Altivar parameters path

The Altivar parameters are grouped in classes. Each application class has only 1 instance. Each instance groups 200 parameters. Each attribute in an instance relates to a parameter.

The first parameter registered in the first application class (class code: 16#70 = 112) has the logical address 3000.

Examples:

Logical address	Path Hexadecimal	Path decimal
3 000	16# 70 / 01 / 01	112/1/1
3 100	16# 70 / 01 / 65	112 / 1 / 101
3 200	16# 71 / 01 / 01	113/1/1
64 318	16# A2 / 1 / 77	418 / 1 / 119

Refer to the Communication parameters manual.

#### **Class attributes**

Attribute ID	Access	Name	Need	Data type	Value
1	Get	Revision	Opt.	UINT	1
2	Get	Max instance	Opt.	UINT	1
6	Get	Max ID number of class attribute	Opt.	UINT	7
7	Get	Max ID number of instance attribute	Opt.	UINT	Х

#### Instance attributes

Attribute ID	Access	Name	Data type	Value
1	Get/Set	First parameter of the class	UINT / USINT	Value returned by the drive
Х	Get/Set	Last parameter of the class	UINT / USINT	Value returned by the drive

Note: Depending on the parameter, write access may be prohibited. Refer to the Communication parameters manual for more information.

#### **Class service**

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute

#### Instances service

Service code	Service name	Need	Description
16#0E	Get_Attribute_Single	Req.	Read an attribute
116#0	Set_Attribute_Single	Opt.	Write an attribute

# ■ Object 2Ahex (AC/DC Drive)

Path	CIP name	CIP configuration parameter name
16#2A/01/07 = 42/1/7	SpeedActual	Speed Actual
16#2A/01/08 = 42/1/8	SpeedRef	Speed Reference
16#2A/01/09 = 42/1/9	CurrentActual	Current Actual
16#2A/01/0A = 42/1/10	CurrentLimit	Current Limit
16#2A/01/0B = 42/1/11	TorqueActual	Torque Actual
16#2A/01/0C = 42/1/12	TorqueRef	Torque Reference
16#2A/01/12 = 42/1/18	AccelTime	Accel Time
16#2A/01/13 = 42/1/19	DecelTime	Decel Time
16#2A/01/14 = 42/1/20	LowSpdLimit	Low Speed Limit
16#2A/01/15 = 42/1/21	HighSpdLimit	High Speed Limit

#### Telemecanique adaptation:

Path	Code	Altivar name	Logic address	Unit Id
16#2A/01/07 = 42/1/7	RFRD	Output velocity	16#219C = 8604	
16#2A/01/08 = 42/1/8	LFRD	Speed setpoint	16#219A = 8602	
16#2A/01/09 = 42/1/9	LCR	Motor current	16#0C84 = 3204	
16#2A/01/0A = 42/1/10	ITH	Mot. therm. current	16#2596 = 9622	
16#2A/01/0B = 42/1/11	Otrn	Output torque (Nm)	16#2A0B = 10763	251
16#2A/01/0C = 42/1/12	n.a.	Torque setpoint (Nm)	16#2A0C = 10764	251
16#2A/01/12 = 42/1/18	ACCD	CIP acceleration time	16#2A12 = 10770	251
16#2A/01/13 = 42/1/19	DECD	CIP deceleration time	16#2A13 = 10771	251
16#2A/01/14 = 42/1/20	LSPD	CIP Low speed limit	16#2A14 = 10772	251
16#2A/01/15 = 42/1/21	HSPD	CIP High speed limit	16#2A15 = 10773	251

# 14. Explicit Messaging

The following example shows an example of explicit messaging: The value of the ACC parameter (Modbus @ = 9001 / CIP address 16#2A:1:16#12) is modified when the variable "bit01" is toggled ON.

👪 RSLogix 5000 - TEST	in Test_PDO_101_100_MSG_01.ACD [1756-L55] - [Prog_MSG - Gestion_MSG]	
🛱 File Edit View Search Logic	Communications Tools Window Help	_ & ×
8 <b>6 6 8</b> 8 8	<u></u>	
Offline I RUN No Forces C RUN No Edits A Forces I RUN Redundancy I I	Path:       AB_DF1-1\0         Image: AB_DF1-1\0	
Controller Fault Handler		
- Stasks     - Asks     - AninTask     - AninT	0 Type - CIP Generic Message Control	message CN)-
Program Tags Routine_de_test Task_MSG Prog_MSG Program Tags Program Tags Castion_MSG Castion_MSG Castion_MSG	message_DN message_ER	bit01
Motion Groups     Motion Groups     Motion Grouped Axes     Trends     Stata Types     Metropefined     Strings     Predefined	2	Add Source A 1 Source B tempo01 1 tempo01 1 tempo01
Type Ladder Diagram (Ma.	Source A tempo01 Source B 10 Source B 10 S	
	Routine_test / Gestion_MSG /	•
Ready		Rung 0 of 4 APP VER

The detailed configuration of the message Box:

Message Configuration - message	X
Configuration Communication Tag	<b>•</b>
Service Set Attribute Single	Source Element: tag_message_A  Source Length: 2  Bytes) Destination New Tag
🔘 Enable 🔘 Enable Waiting 🔘 Start	Done Done Length: 0
Error Code: Extended Error Code: Error Path: Error Text:	☐ Timed Out ≪
OK	Annuler Appliquer Aide

EtherNet/IP card provides several profiles:

- CIP AC drive profile (0x02) (default setting),
- Allen Bradley drive profile,
- Telemecanique: CiA 402 and I/O.

The profile is chosen by the selection of the right input assembly and output assembly.

In this manual, the chapter "Integration in RSLogix 5000" shows how the user may select the assemblies.

#### ■ List of assemblies

#### **Output assemblies**

Assembly name	Number	Size
CIP basic speed control output	20	2 words (4 bytes)
CIP extended speed control output	21	2 words (4 bytes)
CIP speed and torque control output	22	3 words (6 bytes)
CIP extended speed and torque control output	23	3 words (6 bytes)
Native drive output	100	2 to 10 words (4 to 20 bytes)
Allen-Bradley® drive output	103	2 to 10 words (4 to 20 bytes)

#### Input assemblies

Assembly name	Number	Size
CIP basic speed control input	70	2 words (4 bytes)
CIP extended speed control input	71	2 words (4 bytes)
CIP speed and torque control input	72	3 words (6 bytes)
CIP extended speed and torque control input	73	3 words (6 bytes)
Native drive input	101	2 to 10 words (4 to 20 bytes)
Allen-Bradley® drive input	104	2 to 10 words (4 to 20 bytes)

#### **IMPORTANT REMARK:**

For the assemblies 20 and 22, the default settings defines that the speed setpoint is originated from the terminals. To fully control the drive from the network the following operation is required:

The object 2A/1/4 (netref) must be changed from 0 to 1 (byte). Such assignment can be done:

- By program, with an MSG() instruction block.
- With the Class instance editor:
- (

xecute Transaction Ar	numente
Service Code	Object Address
	Class: Instance: <u>A</u> ttribute:
Value Description	2A 1 4
10 Set Single /	Attribute 🗾 🔽 Send the attribute ID
Transmit data size:	Data sent to the device:
Byte ·	<ul> <li>↓</li> <li>↓</li> </ul>
-	
	Values in decimal
eceive Data	Local and the second seco
eceive Data Output size format:	Data received from the device:
Byte	The execution was completed.
-	
Output radix format: Hexadecimal	

#### ■ Assembly 20: CIP basic speed control output

# Assembly mapping

Word number	Definition
0	CIP basic command word
1	Speed setpoint (rpm)

#### CIP basic command word

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Not used	Fault reset (1) 0 = No command 1 = Fault reset	Not used	Run Forward (2) 0 = Stop 1 = Run				

(1) Active on rising edge.(2) Active on level.

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Not used							

#### ■ Assembly 70: CIP basic speed control input

#### Assembly mapping

Word number	Definition
0	CIP basic status word
1	Actual speed (rpm)

#### CIP basic status word

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Not used	Running 0 = Stopped 1 = Running	Not used	Faulted 0 = No fault 1 = Fault				

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Not used							

## ■ Assembly 21: CIP extended speed control output

#### Assembly mapping

Word number	Definition
0	CIP extended command word
1	Speed setpoint (rpm)

#### **CIP** extended command word

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1 Bit 0
Not used	Network setpoint	Network command	Not used	Not used	Fault reset (1)	Run forward / reverse
	0 = Setpoint by terminals 1 = Setpoint by network	0 = Command by terminals 1 = Command by network			0 = No command 1 = Fault reset	00 = Quick stop 01 = Run forward 10 = Run reverse 11 = Freewheel stop

Bit 15 B	Bit 14 Bit 13	3 Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Not used Not us	ed Not used	Not used	Not used	Not used	Not used	Not used

(1) Active on rising edge.

## ■ Assembly 71: CIP extended speed control input

#### Assembly mapping

Word number	Definition
0	CIP extended status word
1	Actual speed (rpm)

#### CIP extended status word

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
		Command from network	Ready 0 = Not ready	Running forward	/ reverse	Warning	Not used
1 = Reference reached	from terminals 1 = Setpoint	0 = Command from terminals 1 = Command from network	1 = Ready	00 = Stopped 01 = Running for 10 = Running rev 11 = Not used	ward	0 = No warning 1 = Warning	

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Not used	Bit 8 to bit 10 are 000 = Not used 001 = Startup 010 = Not Ready 011 = Ready 100 = Enabled 101 = Stopping 110 = Fault Stop 111 = Faulted	/	ve state				

# ■ Assembly 22: CIP speed and torque control output Assembly mapping

Word number	Definition
0	CIP basic command word (1)
1	Speed setpoint (rpm)
2	Torque setpoint (Nm)

(1) Refer to assembly 20.

# ■ Assembly 72: CIP speed and torque control input Assembly mapping

Word number	Definition
0	CIP basic status word (1)
1	Actual speed (rpm)
2	Actual torque (Nm)

(1) Refer to assembly 70.

# ■ Assembly 23: CIP extended speed and torque control output Assembly mapping

Word number	Definition
0	CIP extended command word (1)
1	Speed setpoint (rpm)
2	Torque setpoint (Nm)

(1) Refer to assembly 21.

# ■ Assembly 73: CIP extended speed and torque control input

## Assembly mapping

Word number	Definition					
0	CIP extended status word (1)					
1	Actual speed (rpm)					
2	Actual torque (Nm)					

(1) Refer to assembly 71.

## ■ Assembly 100: Native drive output

## Assembly mapping

Word number	Definition				
0	Control word				
1	Velocity setpoint				
2	Scanner write word 1				
3	Scanner write word 2				
4	Scanner write word 3				
5	Scanner write word 4				
6	Scanner write word 5				
7	Scanner write word 6				

#### Altivar 71/61 assignment

Word number	Code	Name	Logic address
0	NC1	Communication scanner, value of write word 1 (default value :CMD, Control word)	16#31D9 = 12761
1	NC2	Communication scanner, value of write word 2 (default value: LFRD, velocity setpoint)	16#31DA = 12762
2	NC3	Communication scanner, value of write word 3	16#31DB = 12763
3	NC4	Communication scanner, value of write word 4	16#31DC = 12764
4	NC5	Communication scanner, value of write word 5	16#31DD = 12765
5	NC6	Communication scanner, value of write word 6	16#31DE = 12766
6	NC7	Communication scanner, value of write word 7	16#31DF = 12767
7	NC8	Communication scanner, value of write word 8	16#31E0 = 12768

Note: The default assignment of NC1 and NC2 must be changed to "Not assigned".

## ■ Assembly 101: Native drive input

# Assembly mapping

Word number	Definition
0	Scanner read word 1
1	Scanner read word 2
2	Scanner read word 3
3	Scanner read word 4
4	Scanner read word 5
5	Scanner read word 6
6	Scanner read word 7
7	Scanner read word 8

## Altivar 71/61 assignment

Word number	Code	Name	Logic address
0	NM1	Communication scanner, value of read word 1 (default value: Status word, ETA)	16#31C5 = 12741
1	NM2	Communication scanner, value of read word 2 (default value: Velocity actual value, RFRD)	16#31C6 = 12742
2	NM3	Communication scanner, value of read word 3	16#31C7 = 12743
3	NM4	Communication scanner, value of read word 4	16#31C8 = 12744
4	NM5	Communication scanner, value of read word 5	16#31C9 = 12745
5	NM6	Communication scanner, value of read word 6	16#31CA = 12746
6	NM7	Communication scanner, value of read word 7	16#31CB = 12747
7	NM8	Communication scanner, value of read word 8	16#31CC = 12748

# ■ Assembly 103: Allen-Bradley® drive output Assembly mapping

#### Word number Definition 0 Allen-Bradley® drive logic command 1 Standardized speed setpoint (reference) 2 Scanner write word 1 3 Scanner write word 2 4 Scanner write word 3 5 Scanner write word 4 6 Scanner write word 5 7 Scanner write word 6 Scanner write word 7 8 9 Scanner write word 8

#### Altivar 71/61 assignment

Word number	Code	Name	Logic address
0	n.a.	Allen-Bradley® drive logic command	n.a.
1	LFR	Frequency setpoint	16#2136 = 8502
2	NC1	Communication scanner, value of write word 1	16#31D9 = 12761
3	NC2	Communication scanner, value of write word 2	16#31DA = 12762
4	NC3	Communication scanner, value of write word 3	16#31DB = 12763
5	NC4	Communication scanner, value of write word 4	16#31DC = 12764
6	NC5	Communication scanner, value of write word 5	16#31DD = 12765
7	NC6	Communication scanner, value of write word 6	16#31DE = 12766
8	NC7	Communication scanner, value of write word 7	16#31DF = 12767
9	NC8	Communication scanner, value of write word 8	16#31E0 = 12768

Note: The default assignment of NC1 and NC2 must be changed to another value or to not assigned..

## ■ Allen-Bradley® drive logic command

The logic command is a 16-bit word of control produced by the scanner and consumed by the EtherNet/IP card.

If enabled, the Logic command word is always word 0 in the output image.

Bit 7	Bit 6	Bit 5 Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
MOP Increment	Local control	Direction	Clear faults (3)	Jog	Start (2)	Stop (1)
0 = Not Increment 1 = Increment	0 = No local control 1 = Local control	00 = No command (4) 01 = Forward command 10 = Reverse command 11 = Hold direction control	0 = Not clear faults 1 = Clear faults	0 = Not jog 1 = Jog	0 = Not start 1 = Start	0 = Not stop 1 = Stop

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11 Bit 10	Bit 9 Bit 8
MOP Decrement	Reference se	elect		Decel rate	Accel rate
0 = Not decrement 1 = Decrement	000 = No cor 001 = Setpoi 010 = Setpoi 011 = Ref. 3 100 = Ref. 4 101 = Ref. 5 110 = Ref. 6 111 = Ref. 7	nt 1 channel nt 2 channel (Preset 3) (Preset 4) (Preset 5) (Preset 6)	· /	00 = No command (6) 01 = Decel rate 1 command 10 = Decel rate 2 command 11 = Hold decel rate	00 = No command (5) 01 = Accel rate 1 command 10 = Accel rate 2 command 11 = Hold accel rate

(1) Stop: Active at level.

(2) Start: Active on rising edge. A Not stop condition (logic 0 = 0) must first be present before a Start condition (logic 1 = 1) will start the drive.

(3) Clear faults: Active on rising edge. To perform this command, the value must switch from "0" to "1."

(4) Direction \ No command: If a direction is selected acts like Hold direction control.

(5) Accel rate \ No command: If a rate is selected acts like Hold accel rate.

(6) Decel rate \ No command: If a rate is selected acts like Hold decel rate.

(7) Reference select \ No command: If a rate is selected acts like Hold command.

# ■ Altivar 71/61 assignment

Bit 7	Bit 6	Bit 5 Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Not used		Direction 00 = No command (4) 01 = Forward command 10 = Reverse command 11 = Hold direction control	Clear faults (3) 0 = Not clear faults 1 = Clear faults	Not used	Start (2) 0 = Not start 1 = Start	Stop (1) 0 = Not stop 1 = Stop

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Not used	Setpoint select			Not used	Not used	Not used	Not used
	000 = No c 001 = Terr 010 = Con 011 = Pres 100 = Pres 101 = Pres 110 = Pres 111 = Pres	ninals trol by netv set 3 set 4 set 5 set 6	vork				

#### ■ Standardised setpoint

The setpoint (16 bits only) is produced by the controller and consumed by the EtherNet/IP card. If enabled, the setpoint is always word 1 in the output image.

The setpoint value is a standardised (e.g. scaled) value; it is not an engineering value.

#### **Telemecanique adaptation**

[Frequency setpoint] (L F r) shall be configured in high resolution: standardised value on 16 signed bits at maximum frequency. The value 32767 corresponds to the parameter [Max frequency] (L F r). The default value of the parameter [Max frequency] (L F r) is 60 Hz, and the resolution is then approximately 0.0018 Hz.

#### Note:

The commanded maximum speed can never exceed the value of the parameter [High speed] (HSP).

The table below shows example setpoints and their results on an Altivar drive that has its parameter [Max frequency] (E F r) set to 130 Hz and its parameter [High speed] (H 5 P) set to 60 Hz.

Setpoint value	Scale		Output speed	Feedback value	
	Percent	Value		i ceuback value	
32767 (1)	100%	130 Hz	60 Hz (2)	15123 (3)	
16384	50%	65 Hz	60 Hz (2)	15123 (3)	
8192	25%	32.5 Hz	32.5 Hz	8192	
0	0%	0 Hz	0 Hz	0	

(1) A value of 32767 is equivalent to the parameter [Max frequency] (E F r) frequency value. Values greater than 32767 reverse speed. (2) The drive runs at 60 Hz instead of 130 Hz or 65 Hz because the parameter [High speed] (H 5 P) sets 60 Hz as the maximum speed.

(3) The feedback value is also scaled based on the value of the parameter [Max frequency] (E F c), for example, 60/130 = 0.46 so

32767 x 0.46 = 15123.

#### ■ Assembly 104: Allen-Bradley® drive input

#### Assembly mapping

Word number	Definition
0	Allen-Bradley® drive logic status
1	Speed feedback (actual value)
2	Scanner read word 1
3	Scanner read word 2
4	Scanner read word 3
5	Scanner read word 4
6	Scanner read word 5
7	Scanner read word 6
8	Scanner read word 7
9	Scanner read word 8

Word number	Code	Name	Logic address
0	n.a.	Allen-Bradley® drive logic status	n.a.
1	RFR	Output frequency	16#0C82 = 3202
2	NM1	Communication scanner, value of read word 1	16#31C5 = 12741
3	NM2	Communication scanner, value of read word 2	16#31C6 = 12742
4	NM3	Communication scanner, value of read word 3	16#31C7 = 12743
5	NM4	Communication scanner, value of read word 4	16#31C8 = 12744
6	NM5	Communication scanner, value of read word 5	16#31C9 = 12745
7	NM6	Communication scanner, value of read word 6	16#31CA = 12746
8	NM7	Communication scanner, value of read word 7	16#31CB = 12747
9	NM8	Communication scanner, value of read word 8	16#31CC = 12748

Note: The default assignment of NM1 and NM2 must be changed to "Not assigned".

#### ■ Allen-Bradley® drive logic status

The Logic Status is a 16-bit word of status produced by the EtherNet/IP card and consumed by the scanner. If enabled, the Logic status word is always word 2 in the input image.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Fault	Alarm	Decelerating	Accelerating	Actual direction	Command direction	Active	Ready
0 = No fault 1 = Fault		0 = Not decelerating 1 = Decelerating	0 = Not accelerating 1 = Accelerating	0 = Reverse 1 = Forward	0 = Reverse 1 = Forward	0 = Not active 1 = Active	0 = Not ready 1 = Ready

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Reference	1			Local control			At speed
0000 = Ref A 0001 = Ref E 0010 = Prese 0100 = Prese 0100 = Prese 0101 = Prese 0110 = Prese 0111 = Prese 0111 = Prese 1000 = Term 1001 = DPI 1 1010 = DPI 2 1011 = DPI 3 1100 = DPI 4 1101 = DPI 6 1111 = Jog r	auto et 2 auto et 3 auto et 3 auto et 4 auto et 5 auto et 6 auto blk manual manual e manual amanual f manual f manual f manual f manual f manual			000 = Port 0 001 = Port 1 010 = Port 2 011 = Port 3 100 = Port 4 101 = Port 5 110 = Port 6 111 = No loca	``,		0 = Not at reference 1 = At reference

#### Telemecanique adaptation

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Fault	Alarm	Decelerating	Accelerating	Actual direction	Command direction	Running	Ready
0 = No fault 1 = Fault		0 = Not decelerating 1 = Decelerating	0 = Not accelerating 1 = Accelerating	0 = Reverse 1 = Forward	0 = Reverse 1 = Forward	0 = Not active 1 = Active	0 = Not ready 1 = Read

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Setpoint so	urce			Control source			At speed
1010 = Moo 1011 = CAN 1100 = PC- 1101 = Ethe	used set 2 set 3 set 4 set 5 set 6 set 7 used phic display dbus Nopen Software erNet/IP card ntroller inside	1		000 = Terminals 001 = Graphic of 010 = Modbus 011 = CANoper 100 = PC-Softw 101 = EtherNet/ 110 = Controlle 111 = not used	display terminal n vare /IP card		0 = Not at reference 1 = At reference

**Note:** When the value of Setpoint source (bits 12, 13, 14 and 15) is Preset speed x, it means that the corresponding command is given by the assembly 103 via Setpoint select (bits 12,13 and 14) (not by the terminals).

This chapter illustrates of to proceed to exchange Powerflex® drive an ATV71. This example has been realized by RSlogix® software. There are three way to configure the drive equipped with an EtherNet/IP card.

#### **IMPORTANT NOTE:**

The ATV71/61 provides several assembly sets. Assembly 103 and 104 emulates the Powerflex drive assemblies. But for compatibility reasons these assemblies can also use number 1 and 2. This means that in the ATV71/61:

- output assembly 103 and 2 are identical,
- input assembly 104 and 1 are identical.

In the following example, we start with an application based on a network made of a single VSD (a Powerflex drive). The following pages describe how to replace it by an ATV71.

RSLogix 5000 - TEST_ETHIP 16IE25.ACD [1756-L55     Image: Search Logic Communications Tools W			
			- 0 *
Rem Run II = Run Mode	AB_ETHIP-1\192.168.1.100\Backplane\0* 로움		
No Edits	Image: Image		
E Gontroller TEST_ETHIP	Scope: TEST_ETHIP(contrr V Show All	Sort: Tag Name	
Controller Tags	Tag Name	🛆 Value 🛛 🗧	Description
Controller Fault Handler     Dower-Up Handler	+ Powerflex:I.Data[0]	0	
E Tasks	+ Powerflex:I.Data[1]	0	
🖻 🤯 MainTask	+ Powerflex:I.Data[2]	3596	Allen Bradley drive logic status
🗄 🕞 MainProgram	+ Powerflex:I.Data[3]	0	actual speed
🖃 🔞 Task_de_test	+ Powerflex:I.Data[4]	2	IO scanning word 1
E Sprog_de_test	+ Powerflex:I.Data[5]	18	ID scanning word 2
Program Tags	+ Powerflex:I.Data[6]	880	IO scanning word 3
Unscheduled Programs	+ Powerflex:I.Data[7]	100	IO scanning word 4
🖃 🔄 Motion Groups	+ Powerflex:I.Data[8]	2	IO scanning word 5
Ungrouped Axes	+ Powerflex:I.Data[9]	18	IO scanning word 6
Trends	+ Powerflex:I.Data[10]	880	IO scanning word 7
Data Types	+ Powerflex:I.Data[11]	100	IO scanning word 8
	- Powerflex:0	{}	
T Predefined	- Powerflex:0.Data	{}	
🕀 🙀 Module-Defined	+ Powerflex:0.Data[0]	8192	Allen Bradley drive logic command
E 🔄 I/O Configuration	+ Powerflex:0.Data[1]	2000	Speed reference
[1] 1756-DNB Dnet	+ Powerflex:0.Data[2]	2	To Scanning Word 1
[2] 1756-ENET/B ethernet_scan     ETHERNET-MODULE Powerflex	+ Powerflex:0.Data[3]	0	To Scanning Word 2
g effekter mobile Powerliex	+ Powerflex:0.Data[4]	0	lo Scanning Word 3
	+ Powerflex:0.Data[5]	0	To Scanning Word 4
	Monitor Tags / Edit Tags /	^	La Commine I / and E
Ready	▲Going online with controller Complete - 0 error(s), 0 warning(s) <1>↓ Errors Search Results (Watch /		

#### Put the RSlogix environment Offline:

m Run 👖 🖪 Run Mode	Path: AB_ETHIP-1\192.168.1.100\Backplane\0" ▼ 盎
Forces Go Offline	
Upiuou	Favorites & Bit & Timer/Counter & Input/Output & Compare
Contro Program Mode	Controller Tags - TEST_ETHIP(controller)
Co Run Mode	Scope: TEST_ETHIP(contr Show, Show All - Sort: Tag Name -
Por Test Mode	
Tasks	Tag Name 🛆 Value 🗢 Description
Clear Eaults	+ Local1:S {}
🗄 🕞 Go To Faults	+ Message1 ()
🖻 🔞 Ta:	+ Message2 ()
Controller Properties	E Powerflex:C (···)
Program Lags	Powerliex! ()
Routine_de_test     Unscheduled Programs	- Powerflex:I.Data {}
Motion Groups	+ Powerflex:LData[0] 0
Ungrouped Axes	+ Powerflex:I.Data[1] 0
Trends	+ Powerflex: I. Data[2] 3584 Allen Bradlev drive logic status
🖂 Data Types	+ Powerflex:I.Data[3] 0 actual speed
User-Defined	+ Powerflex:LData[4] 3 IO scanning word 1
🗈 🙀 Strings	+ Powerflex:I.Data[5] 1 IO scanning word 2
🗄 🚂 Predefined	+ Powerflex I. Data[6] 880 10 scanning word 3
🗄 🙀 Module-Defined	+ Powerflex: Data[7] 100 ID scanning word 4
I/O Configuration [1] 1756-DNB Dnet	+ Powerflex: Data[8] 3 ID scanning word 5
[1] 1750-DND Direct	+ Powerflex I. Data[0] 1 ID scanning word 6
ETHERNET-MODULE Powerflex	
-	+ Powerflex:I.Data[10] 880 ID scanning word 7
	+ Powerflex I.Data[11] 100 ID scanning word 8
	Powerflex:     O     O     ta
	F Powerflex:0.Data

Then edit the module properties of the "ETHERNET MODULE Powerflex" by double-clicking in the navigation tree.

Type: Vendor:	ETHERNET-MODULE Generic Ether Allen-Bradley	net Module			
Parent: Nama:	ethernet_scan	Connection Para	ameters		
Na <u>m</u> e: Description:	Powerflex		Assembly Instance:	Size:	
_		Input:	1	12	÷ (16-bit)
	<u> </u>	O <u>u</u> tput:	2	10	÷ (16-bit)
Comm <u>F</u> orma - Address / H	t Data - INT	<u>C</u> onfiguration:	6	0	÷ (8-bit)
· IP Addr		<u>S</u> tatus Input:			
C Host N	ame:	Status Output.			

Notice that only the Module Name is changed.

Type: Vendor:	ETHERNET-MODULE Generic Ether Allen-Bradley	net Module
Parent: Name:	ethernet_scan ATV71	Connection Parameters
Description:		Assembly Instance: Size:
E E E E E E E E E E E E E E E E E E E	<u></u>	Input: 1 12 ÷ (16-bit)
	×	0 <u>u</u> tput: 2 10 🕂 (16-bit)
	at: Data - INT	Configuration: 6 0 + (8-bit)
Address /	Host Name dress: 192 . 168 . 1 . 1	Status Input:
C Host I		Sjatus Output:

Here, we have used Assemblies 1 and 2 (As Powerflex VSD).

But Assemblies 103 and 104 could also be used, like in the dialog box below-

Type: Vendor:	ETHERNET-MODULE Generic Etherr Allen-Bradley	net Module	
Parent:	ethernet_scan	Connection Parameters	
Na <u>m</u> e:	ATV71	Assembly	
Description:		Istanc	Size:
		Input: 104	12 🛨 (16-bit)
		Output: 103	10 ÷ (16-bit)
Comm <u>F</u> orma	t: Data - INT 🔄 💌	Configuration: 6	0 ÷ (8-bit)
Address / H	Host Name	coninguration. 1º	
IP <u>A</u> ddr	ress: 192 . 168 . 1 . 1	<u>S</u> tatus Input	
	ame:	Status Output	-

Confirm the modification by OK, save the project and download it to the PLC.

Now, switch to RSnetworx, The old configuration is always displayed:

Edit View Network	k <u>D</u> evice Diagnostics <u>T</u> ools <u>H</u> e	leip	
<b>ĕ•∎ ≜</b> Q <b>€ 1</b> : <b>₩</b>	× B C N? • B ∧ II II		
	Worst Case Device Usages — Address Minimum CPU: 192.168.1.100 Maximum CPU: 192.168.1.100		
ware		PowerFlex 70 1756-A7/A	
	erNet/IP chine Interface PI Devices able Logic Controller	192.168.1.7 192.168.1.100	
E 🖗 SCANport I E 🖗 Vendor E 🖗 Rockwell A			
B: CANport I CANPORT B: Rockwell A B: Rockwell A B: Rockwell A B: Rockwell S B: Schneider	Drives on EtherNet/IP utomation - Allen-Bradley utomation - Reliance Electric oftware, Inc. Automation, Inc.	K < ► M\ Graph / Spreadsheet } Diagnostics /	
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CANport I     Vendor     Vendor     Cockwell A	Drives on EtherNet/IP utomation - Allen-Bradley utomation - Reliance Electric oftware, Inc. Automation, Inc. Date 12/09/2007 11:13:15	Description Edits enabled.	
H S SCANport I Vendor H R Rockwell A H R Rockwell A H R Rockwell S R Rockwell S R Rockwell S R Rockwell S R R Rockwell S R R Rockwell S R R R Rockwell S R R R R R R R R R R R R R R R R R R R	Drives on EtherNet/IP utomation - Allen-Bradley utomation - Reliance Electric oftware, Inc. Automation, Inc. Date 12/09/2007 11:13:15 12/09/2007 10:45:46	Description Edits enabled. Mode changed to online. The communication timeout is 3000 msec. The online path is WXFR63469DIAB_ETHIP-1.	
CANPORT  CAPPORT  CAPPORT CAPPORT  CAPPORT  CAPPORT CAPPORT  CAPPORT  CAPPORT CAPPORT CAPPORT  CAPPORT CAPPORT  CAPPORT  CAPPORT CAPPORT CAPPORT CAPPORT CAPPORT CAPPORT  CAPPORT CAPP	Drives on EtherNet/IP utomation - Allen-Bradley utomation - Reliance Electric oftware, Inc. Automation, Inc. Date 12/09/2007 11:13:15 12/09/2007 10:45:45	Description Edits enabled. Mode changed to online. The communication timeout is 3000 msec. The online path is WXFR63469DIAB_ETHIP-1. Mode changed to offline.	
CANport I     Vendor     Vendor     Convention	Drives on EtherNet/IP utomation - Allen-Bradley utomation - Reliance Electric oftware, Inc. Automation, Inc. Date 12/09/2007 11:13:15 12/09/2007 10:45:46	Description Edits enabled. Mode changed to online. The communication timeout is 3000 msec. The online path is WXFR63469DIAB_ETHIP-1.	

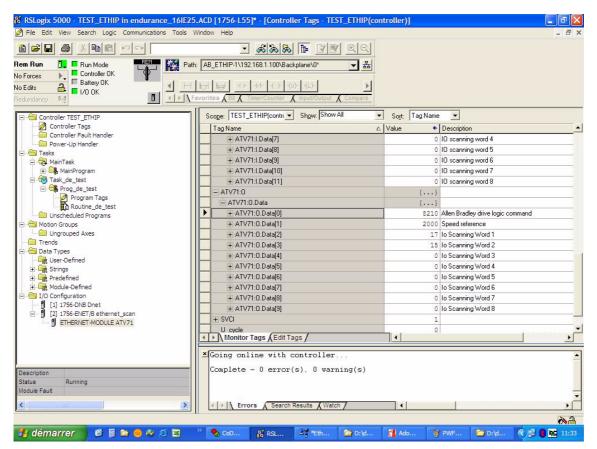
#### Browse the whole Network:

*EtherNet/IP - R	SNetWorx for EtherNet/IP		a X
	vork Device Diagnostics Iools Hel 성 분 🖻 💼 🎌 V 응 사 📰 🎬	p	1
Biggs Participation Participat	Worst Case Device Usages Address Minimum CPU: 192.168.1.100 Maximum CPU: 192.168.1.100	Pending Address Pending Pending 0.04% Connection: 192.168.1.100 0.78% Devices not included: 1 0.04% Consume: Produce:	
D DSI to E     D DSI to E     D Modular	nication Adapter		<u>*</u>
Message Code	Date	Description	
BENET:81E7	12/09/2007 11:13:15	Edits enabled.	
DENET:81E4	12/09/2007 10:45:46	Mode changed to online. The communication timeout is 3000 msec. The online path is WXFR63469D!AB ETHIP-1.	
	12/09/2007 10:45:45	Mode changed to offline.	
	12/09/2007 10:24:32	Mode changed to online. The communication timeout is 3000 msec. The online path is WXFR63469D1AB_ETHIP-1.	
Mess	l III		>
Ready		Online Not Browsing	

\*EtherNet/IP - RSNetWorx for EtherNet/IP 81 File Edit View Network Device Diagnostics Tools Help 12 - 2 3 8 h 6 N? ⊕ Q E 1E 1₩ - 品 사 📰 👪 Device Usage Ix Worst Case Device Usages Edits Enabled Pending 0.04% Pending 33.33% Addr Addres Pending Minimum CPU: 192.168.1.100 Connection: 192.168.1.1 Devices not included: 0 Maximum CPU: 192.168.1.100 0.04% Consume Produce: Hardware × ALTIVAR71 1756-A7/A EtherNet/I Category Category
Control
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Communication Adapter
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Communication Adapter
Communication Machine Interface
Communication Machine Interface
Communication Machine Logic Controller
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 Convert Automation - Allen-Bradley
 Rockwell Automation - Relance Electric
 Rockwell Software, Inc. > H I I M Graph / Spreadsheet ) Diagnostics / 4 × Date Description Message Code ~ ENET:81E7 ENET:81E4 ENET:81E5 ENET:81E8 ENET:81E8 ENET:81E7 12/09/2007 11:29:32 Edits enabled 12/09/2007 11:29:17 Mode changed to online. The communication timeout is 3000 msec. The online path is WXFR63469DIAB\_ETHIP-1 12/09/2007 11:29:15 Mode changed to offline Message 12/09/2007 11:29:15 Edits cancelled 12/09/2007 11:13:15 Edits enabled. Online Not Browsing 🛃 démarrer 📄 🎯 📓 🐚 🐵 😂 🖾 CoD. RSL RSL 34 \*Eth. 🔄 D:\d 🚮 Ado W PWF 🗁 D:\d 🤹 🗊 🛢 🚾 11:29

Once the network has been scanned, you should obtain this:

This last screen shows the data screen of the ATV71.



ATV61\_71\_Ethernet/IP\_EN\_AAV68822\_03 AAV68822 11/2010