SIEMENS

Desigo™ Room Automation

Actuating DXR2, BACnet/IP and BACnet/SC, 24 V

DXR2.E10PL-102B, DXR2.E10PLX-102B



Combination room automation station and actuator for buildings with increased demands placed on functionality and flexibility in Room Automation applications, VAV, Dual Duct and FPB applications. TRA offers the highest level of flexibility for energy-optimized solutions without sacrificing comfort.

- Compact, programmable room automation stations for HVAC, lighting, and shading.
- Integrated with actuator for ease of installation.
- BACnet IP Ethernet Communication (BTL certified).
- BACnet Secure Connect communication
- 2 port Ethernet switch.
- KNX PL-Link bus to connect sensors, actuators, and operator units (including bus power).
- USB interface.
- Operating voltage AC 24 V.
- Built-in 10 Nm actuator mounted directly on the damper shaft.
- Internal 0…500 Pa (0…2 in WC) differential pressure sensor.
- Plug-in terminal blocks.

Features

- Total Room Automation applications combining multiple disciplines (HVAC, lighting, blinds/shading) into one comprehensive solution.
- BTL Listed as a BACnet Advanced Application Controller (B-AAC) device.
- Fully programmable using block programming.
- Proven, pre-loaded applications.
- Operational modes (Comfort, Standby, Economy, Protection, and so on).

Preconfigured applications

Variable Air Volume (VAV) or Constant Volume (CV)

- VAV Cooling Only
- VAV with staged Electric Heat
- VAV with Hot Water
- VAV with Hot Water and Supply Temp Control

Dual Duct Variable Air Volume (VAV)

- VAV Dual duct – Cold duct and Hot duct with configurable ventilation delivery with hot water or electric heating coils and radiator
- VAV Dual duct – Cold duct and dedicated ventilation duct with DCV with hot water or electric heating coils and radiator

VAV with Fan Powered Boxes (FPB)

- VAV Series FPB with staged Electric Heat
- VAV Series FPB with Hot Water
- VAV Series FPB with Hot Water and Supply Temp Control
- VAV Parallel FPB with staged Electric Heat
- VAV Parallel FPB and Hot Water
- VAV Parallel FPB with Hot Water and Supply Temp Control

Chilled Beam

- Chilled Beam Passive Heating and Cooling with Hot Water Radiator
- Chilled Beam Active Heating and Cooling VAV with Hot Water Radiator
- Chilled Beam Active Heating and Cooling VAV with Electric 1-Stage Radiator

Additional Applications

- Electrical terminal heating coils, PWM, 1…3 stages or analog
- Series or Parallel fans, 1…3 stages or analog
- Chill water coils and heating/cooling coils (2-pipe or 4-pipe)
- Supply/Extract (Exhaust) airflow tracking and control
- Radiant ceiling including Chilled beams, cooling, heating and heating/cooling (2-pipe or 4-pipe) control
- Radiator/Baseboard: hot water, steam or electric
- Lighting – up to four separated or overlapping zones
  - Manual switching and dimming
  - Occupancy control and Vacancy control
  - Automatic Daylight Harvesting - step or constant level control
  - Stairwell lighting
  - Scene control
- Blinds – one or two separate zones

- Manual control: Up, Down, Predefined positions
- Occupancy control and Vacancy control
- Glare Protection
- Energy efficiency functions including solar radiation optimization
- Slat angle
- Scene control

Pre-loaded Application Options

- Separate maximum and minimum flow setpoints for both heating and cooling control.
- Separate minimum ventilation flow setpoints for each occupancy mode.
- CO2 sensor and Demand control ventilation with maximum ventilation flow setpoint.
- Flexible occupancy modes: Comfort, Pre-Comfort, Economy and Protection.
- Supply (discharge) air temperature control for modulating heating or cooling coils.
- Configurable occupancy sensor control.
- Relative humidity sensor and room dew point calculation.
- Greenleaf energy efficiency determination and display.
- Configurable plant operating modes (heating, cooling, warm up, cool down, flush/purge, and so on).

Functions

The selected application and its parameters as well as input and output configuration determine the room automation station's functionality.

A detailed description of functionality is available in the ABT (Automation Building Tool) online help.

Communication

- 2-Port Ethernet switch for cost-effective cabling via line topology.
- USB connection for service and commissioning, firmware download, and LAN access.
- The following functions are available with the KNX PL-Link bus:
  - Communication with room operator units, switches, sensors, actuators, and luminaires.
  - Plug-and-play connection of Siemens field devices with KNX PL-Link.
  - Integration of common devices using KNX S-Mode (ETS engineering required).

LED indication

LED	Color	Activity	Function
RUN	Green	Steady ON	Device is ready for operation
		Steady OFF	Device is not powered
		Regular flashing	Start-up or the program is stopped
	Red	Steady OFF	OK
		Steady ON	Program error Communications error (KNX PL-Link) Hardware fault
		Rapid flashing	Wrong or corrupt software No application loaded
		Blinking per wink command	Physical device identification

LED	Color	Activity	Function
SVC (Service button)	--	Short press	Physical identification on the network
	--	Factory reset	1. Power off the device. 2. Power on the device. 3. Wait until the RUN LED lights up and turns off again, then press the Service button. 4. Keep the Service button pressed until the RUN LED lights up, then release the button. The device restarts. 5. Wait until the device has fully started – unconfigured (green RUN LED on, flashes red)

Type summary

Type	Order number	Inputs	Outputs
DXR2.E10PL-102B (Version with 30 data points)	S55376-C145	1 DI, 2 UI, 1 ΔP sensor	4 DOs, 1 AO.
DXR2.E10PLX-102B (Version with 60 data points)	S55376-C146	1 DI, 2 UI, 1 ΔP sensor	4 DOs, 1 AO.

Accessories

Type	Order number	Designation
985-124		499 ohm Resistor Kit

Product Documentation

Topic	Title	Document ID
Installation and mounting	ADXR Installation Instructions	A6V11260017
Global datasheet*	ADXR2 24V IP ADXR2 24V MS/TP	A6v11259958 A6V11259964
Setup and commissioning	DXR VAV Start-up Procedures DXR FPB Start-up Procedures Balancing Procedures	A6V10665935 A6V10665938 A6V10665943
Room Unit Datasheet	Wall mounted	A6V10394781
BTL listing	ADXR PIC Statement	

* Please see the Global datasheets for additional information not found in this submittal sheet.

Technical Data

Housing

Color	RAL 7035 (light-gray)
Dimensions	201 mm (7.91 in) x 136.94 mm (5.39 in) x 81.72 mm (3.22 in)
Weight DXR2.x10… Packaging	 ca. 831 g (29.3 oz) ca. 200 g (7.05 oz)

Function data

Communication	
A/D Resolution (analog in) D/A Resolution (analog out)	14 Bits 12 Bits

Actuator	
Torque	88 lb-in (10 Nm)
Runtime for 90°opening or closing Nominal angle of rotation Maximum angular rotation	90 sec. (50 Hz or 60 Hz) 90° 95°
Shaft size	3/8…5/8 inch (8…16 mm) Dia. 1/4…1/2 inch (6…13 mm) Dia.
Minimum shaft length	3/4 inch (20 mm)

Power data

Power supply	
Operating voltage	AC 24 V -15%/+20%
Frequency	50/60 Hz
Internal fuse	4 A irreversible
Transformer with secondary current limitation of max. 10 A or external secondary current fuse Non-renewable fuse Circuit breakers	 Max. 10 A, (Class 2, 4A) Max. 13 A, characteristic B, C, D as per EN 60898

Apparent power (VA) for transformer design						
	Base load including I/O without load by field devices	Max. output load Triac at 500 mA each	Max. load for AC 24 V field supply at 200 mA	Max. load KNX PL-Link at 50 mA	Max. load for DC 24 V field supply at 100 mA	Power consumption including connected field devices
DXR2.E10P…	11	4 x 12 = 48	-	4	-	63

NOTE:
To calculate the total VA, add the Base Load + the number of Triacs + field supplies+ KNX PL-Link devices.
This cannot exceed the maximum power consumption. See the *Wiring Guidelines* for more information.

Inputs

Analog Inputs		
Resistance sensor	**Temperature measurement**	**Voltage measurement**
AI 1000 Ω	AI PT1K 375 (NA)*)	AI 0 to 10V
AI 2500 Ω	AI PT1K 385 (EU)*)	AI 0 to 10V (0 to 100%)
AI 10 KΩ	AI (LG-)Ni1000*)	
AI 100 KΩ	AI Ni1000 DIN*)	
	AI T1 (PTC)*)	
	AI NTC10K (Type II)**)	
	AI NTC100K**)	

* A fixed value of 1 Ω is calibrated to correct line resistance.

** Configurable default.

Digital Inputs	
Contact voltage	Universal input: 18V Digital input: 21V
Contact current	Universal input: 1.2 mA; 7.4 mA initial current Digital input: 1.6 mA; 9.4 mA initial current
Contact resistance for closed contacts	Max. 100 Ω
Contact resistance for open contacts	Min. 50 kΩ

Differential pressure sensor (inputs P1+, P1-)	
Connections (nipple diameter)	Dia. 5.2 mm (0.20 in)
Measuring range	0 to 500 Pa (0 - 2.01 in WC)
Overload range	0 to 100 kPa (0 - 402 in WC)
Measuring range accuracy Zero point accuracy Resolution	4.5% 0.2 Pa 12 bit

Outputs

Analog Outputs	
AO 0-10 V	Max. 1 mA

Switching outputs Triac (outputs Y3...Y6)	
Type	High side The Triac closes the contact to AC 24 V
Switching voltage	AC 24 V
Permissible load	500 mA / 12 VA per output
Protection	Short-circuit proof

Connections

Interfaces	
Ethernet	Plugs: 2 x RJ45, screened Interface type: 10Base-T/100BASE-TX, IEEE 802.3 compliant Bitrates: 10/100 Mbps, autosensing Protocol: BACnet over UDP/IP
USB (2.0)	Plug: Type B Data rate: 12 Mbps
KNX	Type: KNX TP1 PL-Link, galvanic isolation Baud rate: 9.6 kbps Bus power: 50 mA Short-circuit proof Protection against faulty wiring at max. AC 24 V

Wiring connections	
Pluggable screw terminals	Copper wire or copper stranded wire with connector sleeves 1 x 0.6 mm ø to 2.5 mm^2 (22 to 14 AWG) or 2 x 0.6 mm ø to 1 mm^2 (22 to 18 AWG) Copper stranded wire without connector sleeves 1 x 0.6 mm ø to 2.5 mm^2 (22 to 14 AWG) or 2 x 0.6 mm ø to 1.5 mm^2 (22 to 16 AWG)
Stripping length	6...7.5 mm (0.24...0.29 in)
Slotted screws	Size 1, tightening torque 0.6 Nm (0.44 lb-ft)
Wiring lengths for signals	KNX PL-Link 80 m (260 ft) with internal bus power or 300 m (990 ft) with external power supply Ethernet 100 m (330 ft) Signal lines 80 m (260 ft) For inputs AI 100 kOhm, AI NTC10K, AI NTC100K: 30 m (100 ft) or 80 m (260 ft), if shielded.

KNX/PL-Link Network and Power Wriring.*	
Cable configuration	1 or 2 twisted pair - Pair 1 red/black - Pair 2 yellow/white
Gauge	20 AWG (solid copper)
Twists per foot	4 Minimum
Capacitance	30 pF/foot or less
Shields	100% foil with drain wire
UL type	300Vrms, CMP (75 °C or higher)
CSA type	300Vrms, FT6 (75 °C or higher)

* Alternative 18 AWG STP CMP (Belden 6320FE 8771000)

Conformity

⚠ CAUTION	
	**National safety regulations** Failure to comply with national safety regulations may result in personal injury and property damage. Observe national provisions and comply with the appropriate safety regulations.

Ambient conditions and protection classification	
Climatic ambient conditions ● Transport and Storage ● Operation	 ● Temperature -25 to 70°C (-13 to 158°F) Air humidity 5 to 95% rh. ● Temperature -5 to 45°C (23 to 113°F)/ -5 to 50 °C (23 to 122°F) Air humidity 5 to 95% rh.

Standards, directives and approvals	
UL Listing	UL 916 PAZX - Conforms to UL916 9th and 10th Edition. UL 864 UUKL Smoke Control Equipment - Conforms to UL864 9th and 10th Edition. (Smoke Control 'K' variant only)
Suitable for plenum area installation	UL1995
Federal Communications Commission	FCC CFR 47 Part 15 Class B
CSA Compliance and cUL certification	C22.2 No. 205
Environmental compatibility - RoHS Compliant	The product environmental declaration contains data on environmentally compatible product design and assessments (composition, packaging, environmental benefit, disposal).
BACnet BTL Listing	BTL-AAC
CEC Title 24 Supported	—
ASHRAE Guideline 36 Supported	—
ASHRAE 90.1 Supported	—
Quality	ISO 9001 (Quality).

Issued by
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