

XN300 Switch XN-332-5ETH-UMS



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Original operating manual

The German-language edition of this document is the original operating manual.

Translation of the original operating manual

All editions of this document other than those in German language are translations of the original operating manual.

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Danger! **Dangerous electrical voltage!**

Before starting with the installation

- De-energize the device
- Secure against retriggering
- Verify isolation from the supply
- Ground and short-circuit
- Cover or enclose any neighboring live parts.
- Follow the mounting instructions (AWA/IL) for the device.
- Only suitably qualified personnel in accordance with EN 50 110-1/-2 (VDE 0105 Part 100) may work on this device/system.
- Before installation and before touching the device, ensure that you are free of electrostatic charge.
- The functional earth (FE) must be connected to the protective earth (PE) or to the equipotential bonding. The system installer is responsible for implementing this connection.
- Connecting cables and signal lines should be installed in such a way that inductive and capacitive interference will not have a negative impact on the automation functions.
- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
- Suitable safety hardware and software measures should be implemented for the I/O interface so that cable or wire breakage on the signal side will not result in undefined states in the automation devices.
- Ensure a reliable electrical isolation of the low voltage for the 24 V supply. Only use power supply units complying with IEC 60364-4-41 or HD 384.4.41 S2 (VDE 0100 Part 410).
- Deviations of the mains voltage from the nominal value must not exceed the tolerance limits given in the specifications, otherwise this may result in malfunction and hazardous states.
- Emergency stop devices complying with IEC/EN 60204-1 must remain functional in all of the automation devices' operating modes. Unlatching the emergency stop devices must not result in an automatic restart.
- Built-in devices for enclosures or cabinets must only be run and operated in an installed state; desktop devices and portable devices only when the housing is closed.
- Measures should be taken to ensure the proper restarting of programs interrupted after a voltage dip or outage. This should not result in dangerous operating states even for a short time. If necessary, emergency stop devices should be implemented.
- Wherever faults in the automation system may cause damage to persons or property, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (for example, by means of separate limit switches, mechanical interlocks, etc.).

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0 About this manual

This manual describes the installation and commissioning of the XN300 switch XN-332-5ETH-UMS.

Support center

The latest version of this manual can be found in other languages on the Internet by visiting our Support Center at:

<http://www.eaton.eu/documentation>

By entering the search keyword "XN300" into the quick search or by entering the document designation, e.g. "MN050011".

0.1 List of revisions

This is the first version of this document, meaning there are no changes.

0.2 Target group

This manual is intended for automation technicians and engineers.

Extensive knowledge of how to work with the field bus being used will make it easier to understand the contents of this manual.

A specialist knowledge of electrical engineering is needed for commissioning and programming.

0.3 Legal disclaimer

All information in this operator manual was provided by us to the best of our knowledge and belief and in accordance with the current state-of-the-art. However, this does not exclude the possibility of inaccuracies so that we cannot accept any liability for the accuracy and completeness of the information. In particular, this information does not guarantee any particular properties.

The devices described here must only be set up and operated as specified in this manual and in the installation instructions provided with the device. Installation, commissioning, operation, maintenance and refitting of the devices must only be carried out by qualified persons. The devices must only be used in the areas recommended and only in conjunction with third-party devices and components that have been approved by us. Only use in technically faultless condition is permitted. Fault-free and safe operation of the system requires proper transport, storage, installation and commissioning as well as careful operation and maintenance. If the following safety instructions are not observed, particularly with regard to commissioning and maintenance of the devices by insufficiently qualified personnel and/or in the event of improper use of the devices, any hazards caused by the devices cannot be excluded. We assume no liability for any injury or damages incurred.

0 About this manual

0.4 Device designations and abbreviations

0.4 Device designations and abbreviations

- XN300 - Device series, including the XN-312 gateways and XN300 slice modules

0.5 Writing conventions

Symbols used in this manual have the following meanings:



DANGER

Warns of hazardous situations that result in serious injury or death.



CAUTION

Warns of the possibility of hazardous situations that could result in slight injury or even death.

NOTICE

Warns about the possibility of material damage.



Indicates useful tips.

- ▶ Indicates instructions to be followed.

For greater clarity, the name of the current chapter and the name of the current section are shown at the top of each page.

- 0 About this manual
- 0.5 Writing conventions

1 XN300 Switch XN-332-5ETH-UMS

1.1 Proper use

The XN300 Switch XN-332-5ETH-UMS is an integral part of the XN300 system. It can be used to connect multiple network segments with its five ports and have the data packets coming into one of Ethernet ports (X1 – X5) be distributed to the other ports.

Power supply and signal terminals must be protected against accidental contact and covered.

The XN300 system may only be operated if it has been correctly fitted and connected by qualified electrical specialists. The installation must comply with regulations for electromagnetic compatibility (EMC).



DANGER

Commissioning the XN300 system devices and switching them on must not result in any hazards being posed by the devices being driven, e.g., unexpected motor startups and equipment becoming unexpectedly energized.

1.2 Overview of functions

The XN-332-5ETH-UMS N300 switch features the same design as the other devices in the XN300 system.

The aforementioned XN300 system includes XN300 slice modules in the form of I/O modules and speciality modules, as well as gateways such as the XN-312-GW-CAN and XN-312-GW-EC.

The XN-332-5ETH-UMS is an unmanaged switch without a system bus and is accordingly snapped onto the top hat DIN rail as a standalone device.



Do not attempt to install the XN-332-5ETH-UMS within an XN300 system block.

Power is provided via a 24 VDC power input at the top of the device.

1 XN300 Switch XN-332-5ETH-UMS

1.3 Versions

1.3 Versions

The XN300 switch is housed in a double-width case. Power is supplied from above through a 4-pin FMC 1.5/4-ST-3.5 connector.

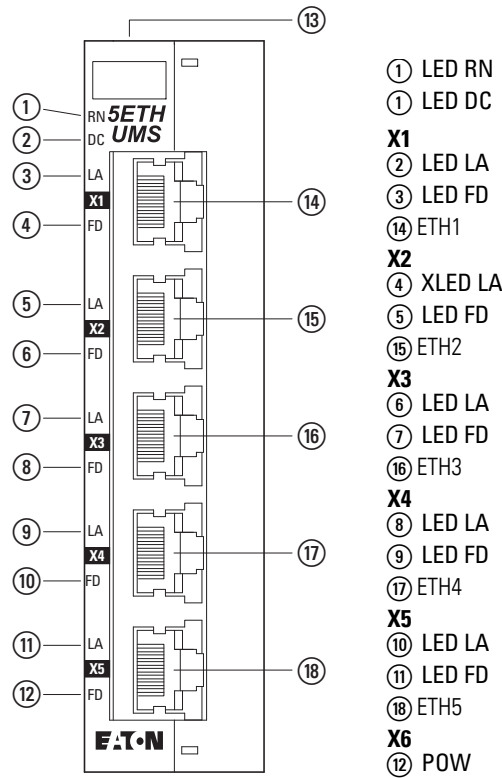
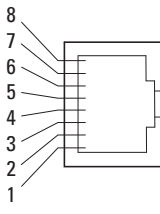


Figure 1: XN-332-5ETH-UMS front view

1.4 Ethernet connections

The XN-332-5ETH-UMS can be used to connect multiple network segments (ETH1 – ETH5) using the five RJ45 ports (X1 – X5). Each of these ports features an LA (Link Active) LED that signals the port's connection status and an FD (Full Duplex) LED that shows which data transfer mode is currently selected. The data transfer rate for the XN300 10/100 BaseT Ethernet switch is set automatically depending on the data transfer rate required by the device with which it is currently communicating: 10Mbit/s in half-duplex mode or 100Mbit/s (Fast Ethernet) in full-duplex mode.

The maximum distance per network segment is 100 m.

X1...X5	Pin	Function	
	1	Tx+/Rx+	
	2	Tx-/Rx-	
	3	Rx+/Tx+	
	4, 5	-	
	6	RX-/TX-	
	7, 8	-	

1 XN300 Switch XN-332-5ETH-UMS

1.5 LED status indicators

1.5 LED status indicators

The device's status LEDs are located underneath the front cover and can be seen underneath the corresponding labels when they light up.

Table 1 What the LEDs mean

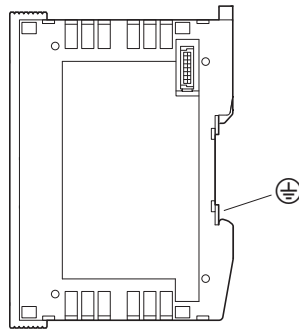
LED	Color	EtherCAT status	Description
RN (Run)			
	yellow	Continuous light	The XN300 switch is in the RUN state and is ready for operation.
	AUS	–	The XN300 switch is not ready for operation.
DC(Direct current)			
	green	Continuous light	Power supply OK
	AUS	–	Voltage below the permissible limit
LA (Ethernet Link active)			
	green	Continuous light	Connection between two PHYs established
		Flashes	Data is being received or transmitted through the Ethernet bus
	AUS	–	INIT
FD (Ethernet Full duplex)			
	yellow	Continuous light	Port working in full-duplex mode.
	AUS	–	Port working in half-duplex mode.

1.6 Potential relationship between the components

The XN-332-5ETH-UMS features a contact point that is used to establish a functional earth connection to the DIN-rail. The supply voltage's ground connection is connected to this functional earth.

Common

- 0V
- 



1 XN300 Switch XN-332-5ETH-UMS

1.6 Potential relationship between the components

2 Installation



DANGER OF ELECTRIC SHOCK!

All installation work must be carried out with the entire installation in a de-energized state.

Always follow the safety rules:

- De-energize and isolate the system.
- Verify isolation from the supply.
- Secure against restart.
- Short-circuit and ground.
- Cover adjacent live parts.

2.1 Mounting XN-332-5ETH-UMS

Install the XN300 switch XN-332-5ETH-UMS in a control panel, a distribution board or an enclosure so that the power supply and terminal capacities cannot be touched accidentally during operation. Mount the XN-332-5ETH-UMS on an EN/IEC 60715 DIN-rail.

The DIN-rail must establish a conductive connection to the control panel's back plate. The individual modules need to be mounted side by side on the DIN-rail and then secured in place by closing the locking elements. Please note that all the devices must be installed in a horizontal position (module designation on top).

In order to ensure that the maximum operating ambient temperature will not be exceeded, make sure that there is enough clearance between the system block's vents and any neighboring components, as well as between the vents and the control panel's back plate.

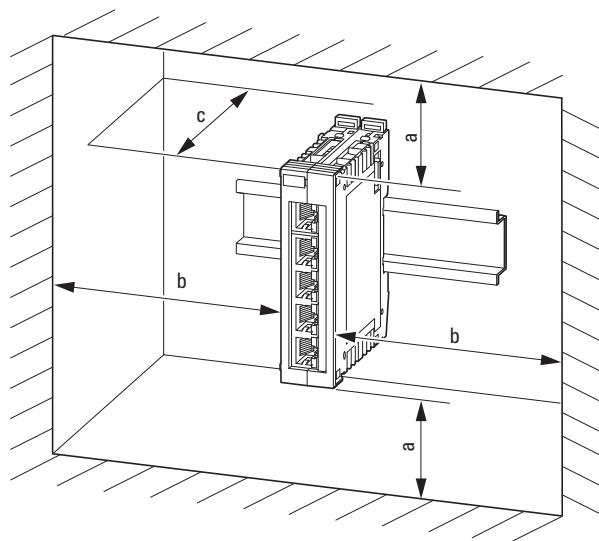


Figure 2: The XN300 slice modules must be installed in a horizontal position

2 Installation

2.1 Mounting XN-332-5ETH-UMS

a	b	c	θ
30 mm (1.18")	30 mm (1.18")	100 mm (3.94")	≤ 55 °C (≤ 131 °F)

The XN-332-5ETH-UMS can be mounted onto the top hat DIN rail by snapping it into place. To mount the system block, follow the steps below:

- ▶ Pull the locking elements at the back of the XN-332-5ETH-UMS upwards. You can use a screwdriver to do this.

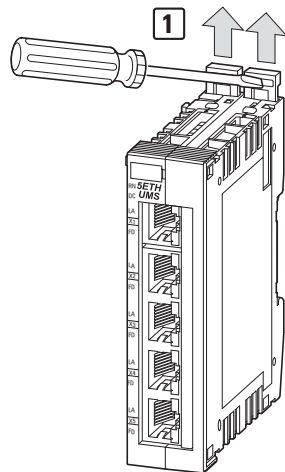


Figure 3: Securing the device on the DIN-rail

- ▶ Wire X6 connector as specified in chapter → Section “2.4 Connecting the power supply”, page 18.
- ▶ Plug the X6 connector into the socket at the top of the device.

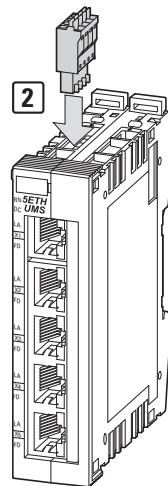


Figure 4: Connecting the power supply

- ▶ Tilt XN-332-5ETH-UMS forward and place it against the DIN-rail's bottom edge in an inclined position.

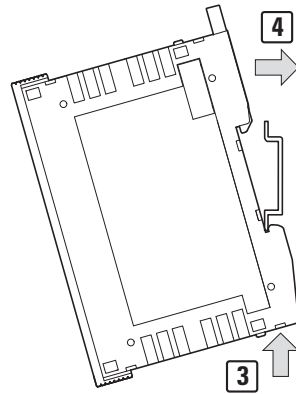


Figure 5: Place the XN-332-5ETH-UMS against the bottom edge of the DIN-rail

- ▶ Push the XN-332-5ETH-UMS over the DIN-rail's top edge.
- ▶ Push the locking elements on the back of the XN-332-5ETH-UMS downwards in order to secure the modules. You can use a screwdriver to do this.

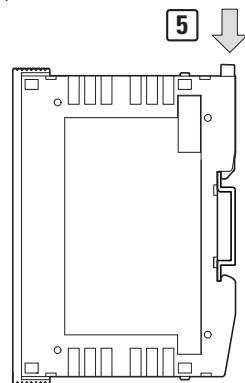


Figure 6: Locking the XN-332-5ETH-UMS into place on the DIN-rail

- ▶ Check to make sure that the XN-332-5ETH-UMS is solidly mounted.

2.2 Dismantling XN-332-5ETH-UMS

To remove the XN-332-5ETH-UMS, follow the steps below:

- ▶ Slide the locking elements on the back of the XN-332-5ETH-UMS upwards. You can use a screwdriver to do this.

2 Installation

2.2 Dismantling XN-332-5ETH-UMS

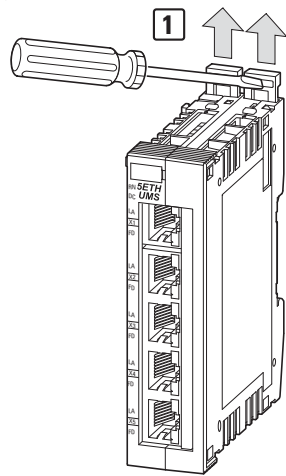


Figure 7: Disengaging the XN-332-5ETH-UMS

- ▶ Tilt the XN-332-5ETH-UMS forward, then pull the block, from its bottom edge, away from the DIN-rail.

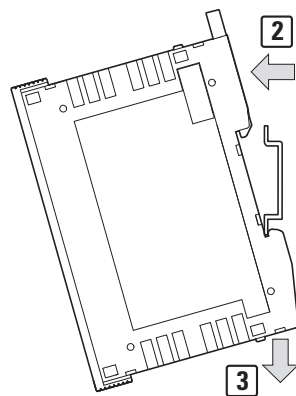


Figure 8: Place the XN-332-5ETH-UMS against the bottom edge of the DIN-rail

- ▶ Make sure that the device is de-energized.
- ▶ Pull connector X6 out from the female connector at the top in order to disconnect the device from the power supply.

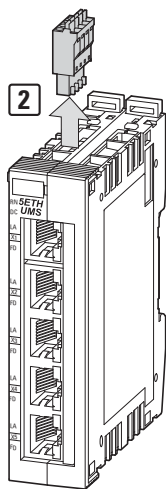


Figure 9: Disconnecting the device from the power supply




2.3 Connection terminals

Plug connector

X6: The required plug connector with push-in spring-cage terminals FMC 1.5/4-ST-3.5 is included as standard with the XN-332-5ETH-UMS. To use them, the conductor simply needs to be slid into the appropriate contact.

In order to release the conductor, simply press on the release mechanism, e.g., with a screwdriver, to pull out the conductor from the corresponding contact.

Table 2: Connection specifications

Cable cross-sectional areas			XN-332-...
10 mm (0.39") 	solid	mm ²	0.2 – 1.5
10 mm (0.39") 	flexible with uninsulated ferrule	mm ²	0.2 – 1.5
10 mm (0.39") 	flexible with insulated ferrule	mm ²	0.2 – 0.75
	Ferrule d	mm	≤ 2.8
	AWG		24 – 16
	Strip length	mm	10

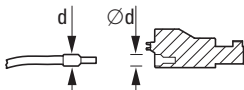


Figure 10: Ferrule with $d_2 = \text{Max. } 2.8 \text{ mm}$



The spring-cage terminals can be used to connect ultrasonically spliced (ultrasonically welded) wires.

2 Installation

2.4 Connecting the power supply

2.4 Connecting the power supply



DANGER

In safety-relevant applications, the power supply used to power the XN300 system must be a PELV power supply unit.

The two 24V V+ terminals are internally connected to each other (X6: ① and ②), as are the two 0V GND terminals (X6: ③ and ④). Only one V+ and one 0 V terminal need to be connected in order to power the gateway

The internally connected terminals can be used to extend the 24 V and 0 V supply voltage connections. However, it is necessary to make sure that a total current of 4 A is not exceeded per terminal.

External 24 VDC voltages can also be distributed using an XN-322-4PS-20 power distribution module or XN-322-18PD-P and XN-322-18PD-M field potential distributor modules.

The plug connector with push-in spring-cage terminal FMC 1.5/4-ST-3.5 is included in the scope of supply.

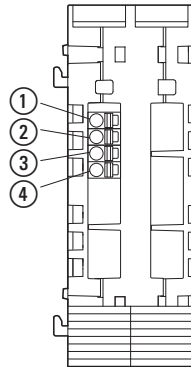


Figure 11: Connection of power supply

- ① 24V V+
- ② 24V V+
- ③ 0V GND
- ④ 0V GND

The device must be powered with a galvanically isolated power supply with a rated voltage of 24 VDC. A UL 249 fuse (max. 4 A) must be installed between the power supply and the device.

2 Installation
2.4 Connecting the power supply

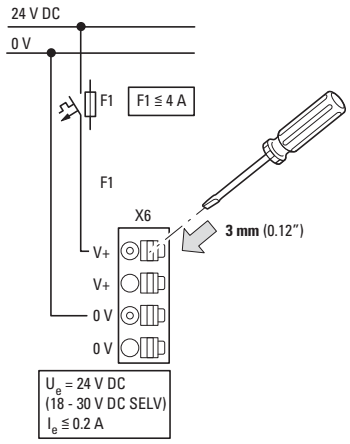


Figure 12: Wiring the power supply

2 Installation

2.4 Connecting the power supply

3 Appendix

3.1 Approvals and national approvals for XN300 system devices

XN300 system devices are approved for use in several countries and regions.

Product standards	<ul style="list-style-type: none"> • IEC/EN; • UL 508 (INDUSTRIAL CONTROL EQUIPMENT); • CE-mark
UL File No.	XN-332-5ETH-UMS: E135462 XN-312-..., XN-322-...: E135462
NA Certification	cULus
Protection type	IEC: IP20

3.2 Dimensions

All XN300 system devices have the exact same dimensions.

Dimensions		XN322-...
Dimensions W x H x D	mm	25 x 101.8 x 72
	in	0.98 x 4.01 x 2.83
Weight	g	79
	lb	0.17
Mounting		Snapped onto IEC/EN 60715 DIN-rail
Mounting position		Horizontal

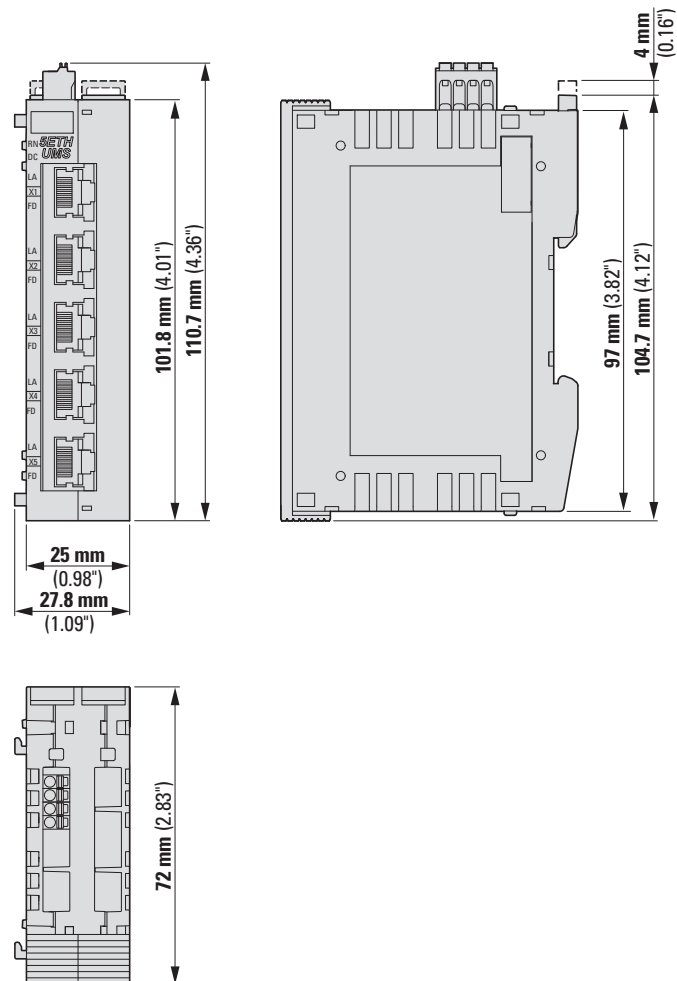


Figure 13: Dimensions XN300 Switch XN-332-5ETH-UMS

3.3 Technical data

3.3.1 Ambient conditions




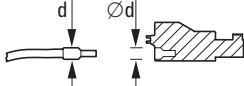
Storage temperature	-20 to +85 °C	
Operating temperature	0 to +55 °C	
Humidity	0 – 95 %, non-condensing	
EMC interference immunity	As per EN 61000-6-2 (industrial environment)	
EMC emitted interference	As per EN 61000-6-4 (industrial environment)	
Vibration resistance	EN 60068-2-6	3.5 mm of 5 Hz - 8.4 Hz 1 g of 8.4 Hz - 150 Hz
Mechanical shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

3.3.2 Power Supply

Specifications for connection to supply voltage			
Specifications for connection to supply voltage	U_e	V	18 –30 V ¹⁾ DC
Residual ripple of input voltage		%	≤ 5
Protection against polarity reversal			No
Overload proof			Yes
Supply current X6			200 mA

1) The device must be powered with a galvanically isolated power supply with a rated voltage of 24 VDC. A UL 249 fuse (max. 4 A) must be installed between the power supply and the end device.

3.3.3 Cable cross-sections

Cable cross-sectional areas			XN-332-...
10 mm (0.39") 	solid	mm ²	0.2 – 1.5
10 mm (0.39") 	Flexible with uninsulated ferrule	mm ²	0.2 – 1.5
10 mm (0.39") 	Flexible with insulated ferrule	mm ²	0.2 – 0.75
	Ferrule d	mm	≤ 2.8
	AWG		24 – 16
	Strip length	mm	10

3 Appendix

3.3 Technical data

3.3.4 Additional information

General	XN-332-...
Imprintable label	MF 10/5 CABUR MC NE WS (Weidmüller)

3.4 Further reading and links

For more information on additional devices and modules, please visit the following links.

Product information

For up-to-date information, please consult the product page on the Internet Eaton.de/xn300

Download Center – Documentation

You can find the documents on the Download Center – Documentation page by entering the document name.

<http://www.eaton.eu/documentation>

File type	Title	Designation
Mounting instruction	XN-332-5ETH-UMS	IL050026ZU
Mounting instruction	XN-312-GW-CAN	IL050017ZU
Mounting instruction	XN-312-GW-EC	IL050025ZU
Mounting instruction	XC300	IL050018ZU
Manual	XN-312-GW-CAN	MN050003
Manual	XN-312-GW-EC	MN050010
Manual	XN300 slice modules	MN050002
Manual	XC300	MN050005

3 Appendix

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