KYWT Series AUTBUS Protocol Converter

Hardware Installation Manual

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KYLAND

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Disclaimer: Kyland Technology Co., Ltd. tries to keep the content of this manual as accurate and as updated as possible. This document is not guaranteed to be error-free, and we reserve the right to amend it without notice to users.

Notice for Safety Operation

The product performs reliably as long as it is used according to the guidance. Artificial damage or destruction of the device should be avoided. Before using the device, read this manual carefully for personal and equipment safety. Please keep the manual for further reference. Kyland is not liable to any personal or equipment damage caused by violation of this notice.

- Do not place the device near water sources or damp areas. Keep the ambient relative humidity within the range from 5% to 95% (non-condensing).
- Do not place the device in an environment with high magnetic field, strong shock, or high temperature. Keep the working and storage temperatures within the allowed range.
- Install and place the device securely and firmly.
- Please keep the device clean; if necessary, wipe it with a soft cotton cloth.
- Do not place any irrelevant materials on the device or cables. Ensure adequate heat dissipation and tidy cable layout without knots.
- Wear antistatic gloves or take other protective measures when operating the device.
- Avoid any exposed metal wires because they may be oxidized or electrified.
- Install the device in accordance with related national and local regulations.
- Before power-on, make sure the power supply is within the allowed range of the device. High voltage may damage the device.
- Power connectors and other connectors should be firmly interconnected.
- Do not plug in or out the power supply with wet hands. When the device is powered on, do not touch the device or any parts with wet hands.
- Before operating a device connected to a power cable, remove all jewelry (such as rings, bracelets, watches, and necklaces) or any other metal objects, because they may cause electric shock or burns.
- Do not operate the device or connect or disconnect cables during an electrical storm.
- Use compatible connectors and cables. If you are not sure, contact our sales or technical support personnel for confirmation.

- Do not disassemble the device by yourself. When an anomaly occurs, contact our sales or technical support personnel.
- If any part is lost, contact our sales or technical support personnel to purchase the substitute. Do not purchase parts from other channels.
- Dispose of the device in accordance with relevant national provisions, preventing environmental pollution.

In the following cases, please immediately shut down your power supply and contact your Kyland representative:

- Water gets into the equipment.
- Equipment damage or shell damage.
- Equipment operation or performance has abnormally changed.
- The equipment emits odor, smoke or abnormal noise.

Contents

1 Product Overview

KYWT series AUTBUS protocol converter implements real-time and transparent transmission of service data from Ethernet, RS485 or CAN ports to the AUTBUS network over a long distance and the transfer rate can reach 100 Mbps, while users are unaware of the link layer protocol AUTBUS. This series has metal housing with IP30 protection class, DIN rail seat with strong anti-vibration capability, and high adaptability to extreme ambient temperatures (-40℃~+70℃), enabling it to work properly in rugged industrial environment, including intelligent transportation, intelligent city building, factory automation, rail transit, power, metallurgical, chemical and petroleum industries, etc. This series includes the following types of converters:

- AUTBUS to Ethernet Converter: Supports conversion between the AUTBUS and Ethernet protocols;
- AUTBUS to CAN Converter: Supports conversion between the AUTBUS and CAN protocols.
- AUBTUS to RS485 Converter: Supports conversion between the AUTBUS and RS485 protocols.

The detailed configurations are shown in the following table.

Table 1 AUTBUS to CAN Converter

Models	**KYWT-A1TB-C1TB-L2** **KYWT-A1M8-C1TB-L2**
Ports	A1TB, A1M8, C1TB
	Note: *A1TB: One terminal block type AUTBUS port;* *A1M8: One M8 type AUTBUS port;* *C1TB: One terminal block type CAN bus port;*
Power Supply	L2: 24~48 V DC

Table 2 AUTBUS to RS485 Converter

Models	**KYWT-A1TB-S1TB-L2** **KYWT-A1M8-S1TB-L2**
Ports	A1TB, A1M8, S1TB
	Note: *A1TB: One terminal block type AUTBUS port;* *A1M8: One M8 type AUTBUS port;* *S1TB: One terminal block type RS485 bus port;*
Power Supply	L2: 24~48 V DC

Table 3 AUTBUS to Ethernet Converter

Models	**KYWT-A1TB-E1RJ-L2** **KYWT-A1M8-E1RJ-L2** **KYWT-A1SA-E1RJ-L2-L2**
Ports	A1TB, A1M8, A1SA, E1RJ
	Note: *A1TB: One terminal block type AUTBUS port;* *A1M8: One M8 type AUTBUS port;* *A1SA: One SPE (Single Pair Ethernet) type AUTBUS port;* *E1RJ: One RJ45 Ethernet port;*
Power Supply	L2: 24~48 V DC L2-L2: 24~48 V DC, redundant input

Note:

We reserve the right to amend the product information listed in the table above without notice.

To obtain the latest information, contact our sales or technical support personnel.

2 Structure and Interface

Caution:

It is recommended to purchase the port dustproof shield (optional) to keep ports clean and ensure converter performance.

2.1 Front Panel

2.1.1 AUTBUS to Ethernet Converter

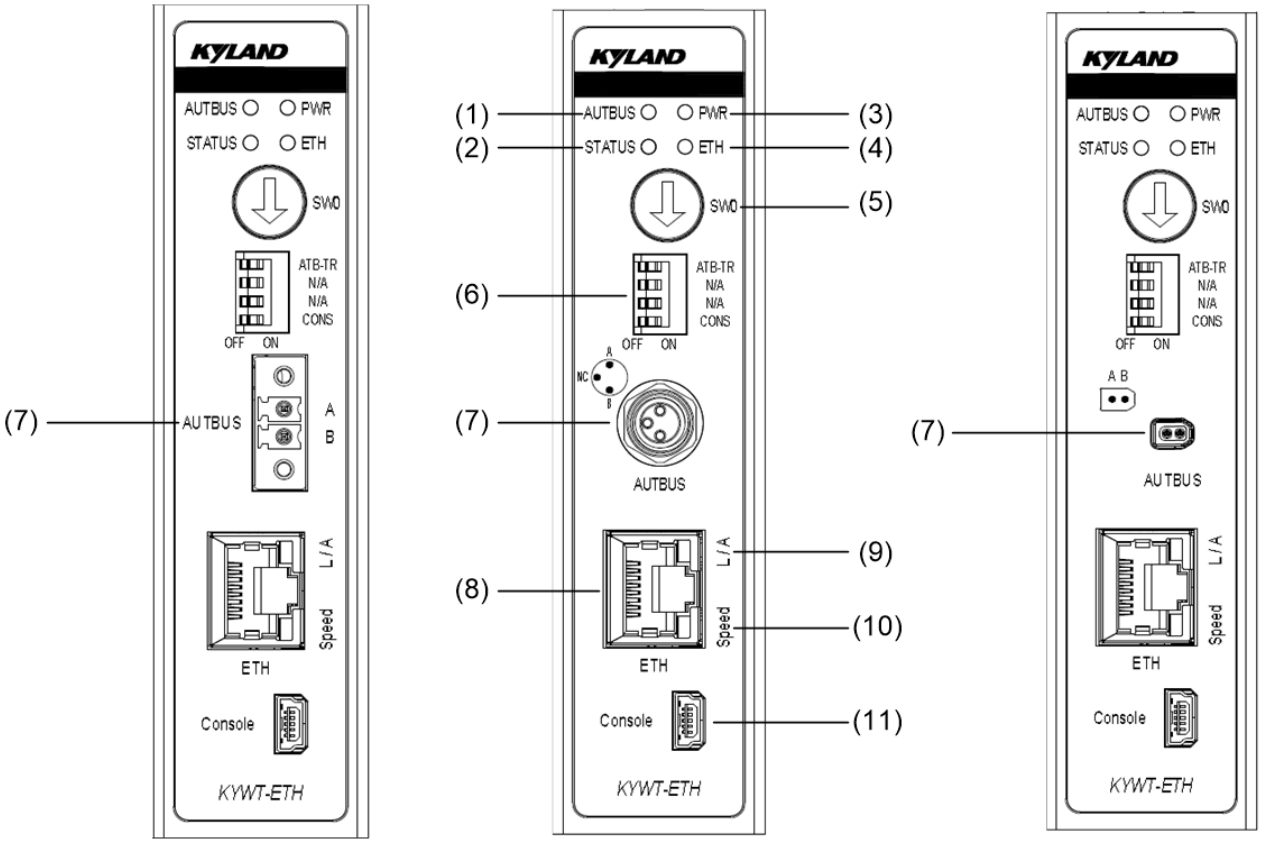


Figure 1 Front Panel

Table 4 Description of Front Panel

No.	Identifier	Description
(1)	AUTBUS	AUTBUS signal LED
(2)	STATUS	Node status LED

(3)	PWR	Power LED
(4)	ETH	Ethernet port communication status LED
(5)	SW0	Rotary Double In-Line Package (DIP) switch
(6)	ATB-TR N/A N/A CONS	Sliding DIP switch
(7)	AUTBUS	AUTBUS port
(8)	ETH	Ethernet port
(9)	L/A	Ethernet port communication status LED
(10)	Speed	Ethernet port speed LED
(11)	Console	Console port

2.1.2 AUTBUS to CAN Converter

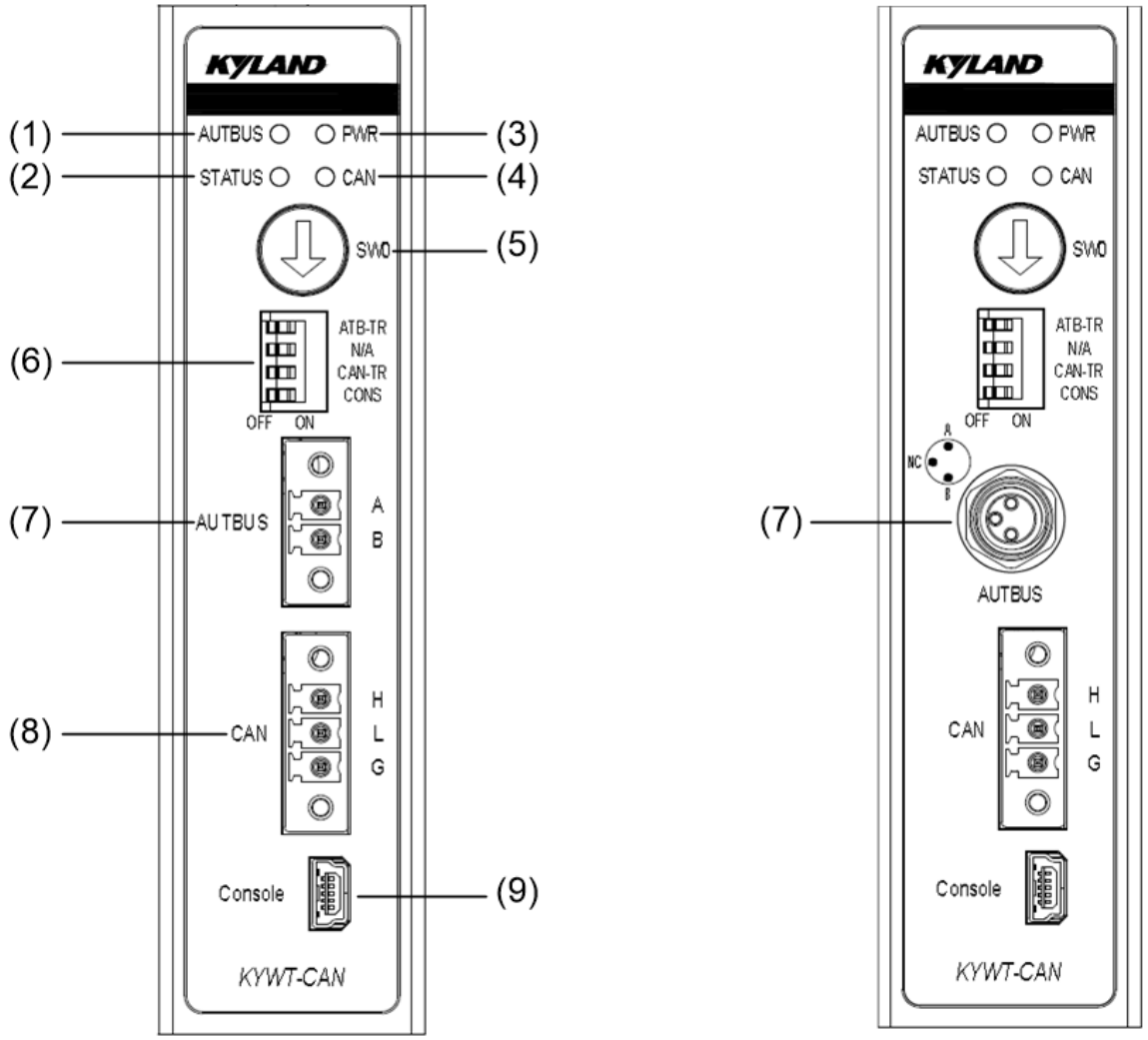


Figure 2 Front Panel

Table 5 Description of Front Panel

No.	Identifier	Description
(1)	AUTBUS	AUTBUS signal LED
(2)	STATUS	Node status LED
(3)	PWR	Power LED
(4)	CAN	CAN bus port communication status LED
(5)	SW0	Rotary Double In-Line Package (DIP) switch

(6)	ATB-TR N/A CAN-TR CONS	Sliding DIP switch
(7)	AUTBUS	AUTBUS port
(8)	CAN	CAN bus port
(9)	Console	Console port

2.1.3 AUTBUS to RS485 Converter

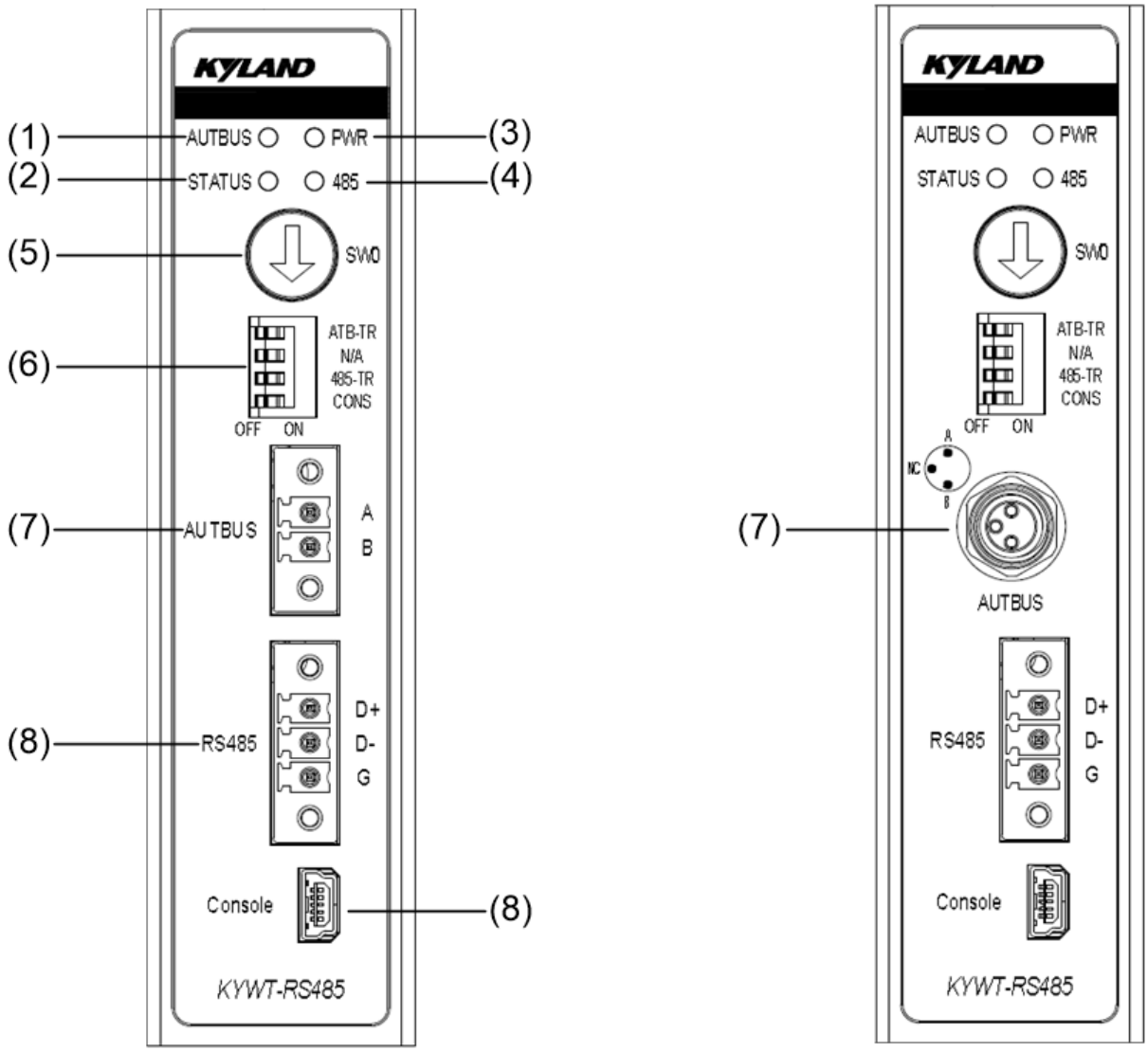


Figure 3 Front Panel

Table 6 Description of Front Panel

No.	Identifier	Description
(1)	AUTBUS	AUTBUS signal LED
(2)	STATUS	Node status LED
(3)	PWR	Power LED
(4)	485	RS485 bus port communication status LED
(5)	SW0	Rotary Double In-Line Package (DIP) switch

(6)	ATB-TR N/A 485-TR CONS	Sliding DIP switch
(7)	ATB	AUTBUS port
(8)	RS485	RS485 bus port
(9)	Console	Console port

2.2 Top Panel

- Models with Single Power Supply

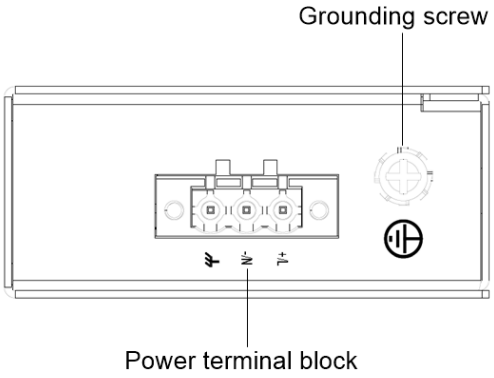


Figure 4 Top Panel – Single Power Supply Model

- Models with Redundant Power Supply

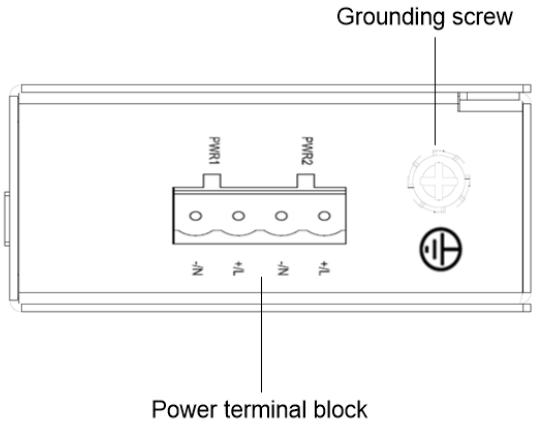


Figure 5 Top Panel – Redundant Power Supply Model

3 Installation

3.1 Dimension Drawing

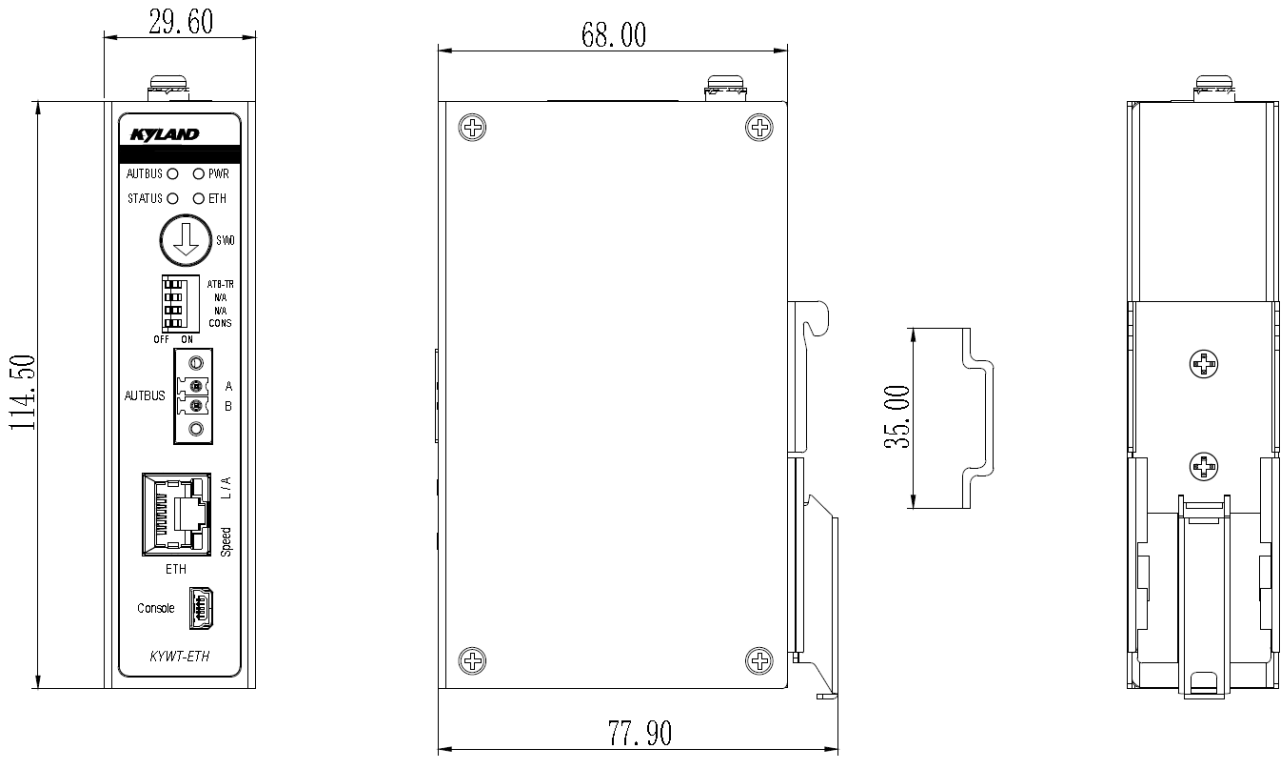


Figure 6 Dimension Drawing (unit: mm)

Caution:

- As part of the heat dissipation system, the converter housing becomes hot during operation. Please use caution when coming in contact and avoid covering the converter housing when the converter is running.
- The figures in this manual are only for reference.

3.2 Mounting Modes and Steps

The device supports DIN-rail mounting. Before installation, make sure that the following requirements are met.

1) Environment: temperature (-40℃ to 70℃), ambient relative humidity (5% to 95%, non-condensing)

2) Power requirement: The power input is within the voltage range of the converter.

3) Grounding resistance: < 5 Ω

4) No direct sunlight, distant from heat source and areas with strong electromagnetic interference.

5) Devices are to be installed in an authority certified enclosure and accessible only by the use of a tool.

6) Devices should be installed and accessed by service personnel or users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.

3.2.1 DIN-Rail Mounting

Step 1: Select the mounting position for the device and guarantee adequate space and heat dissipation.

Step 2: Insert the connecting seat onto the top of the DIN rail, and push the bottom of the device inward and upward to ensure the DIN rail fits in the connecting seat. Make sure the device is firmly installed on the DIN rail, as shown in the following figure.

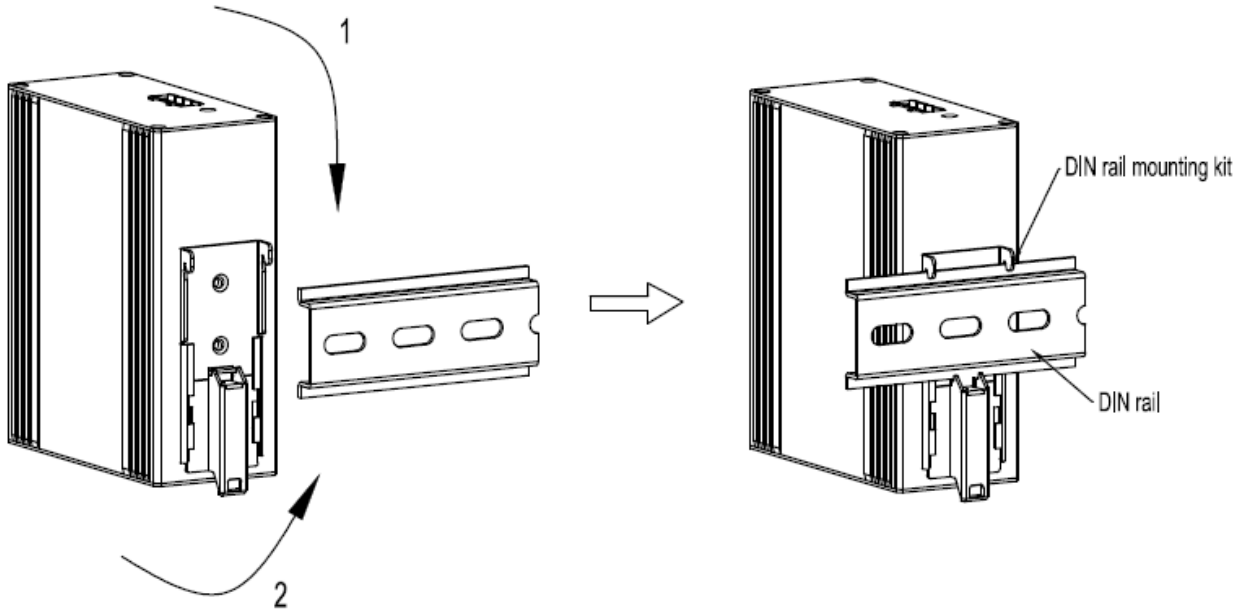


Figure 7 DIN-Rail Mounting

3.2.2 DIN-Rail Dismounting

Step 1: As shown in the following figure, press the device downward and move the device in direction 1 until the bottom of the device is detached from the DIN rail.

Step 2: Pull the device upward and move the device in direction 2 until the device is removed from the DIN rail completely.

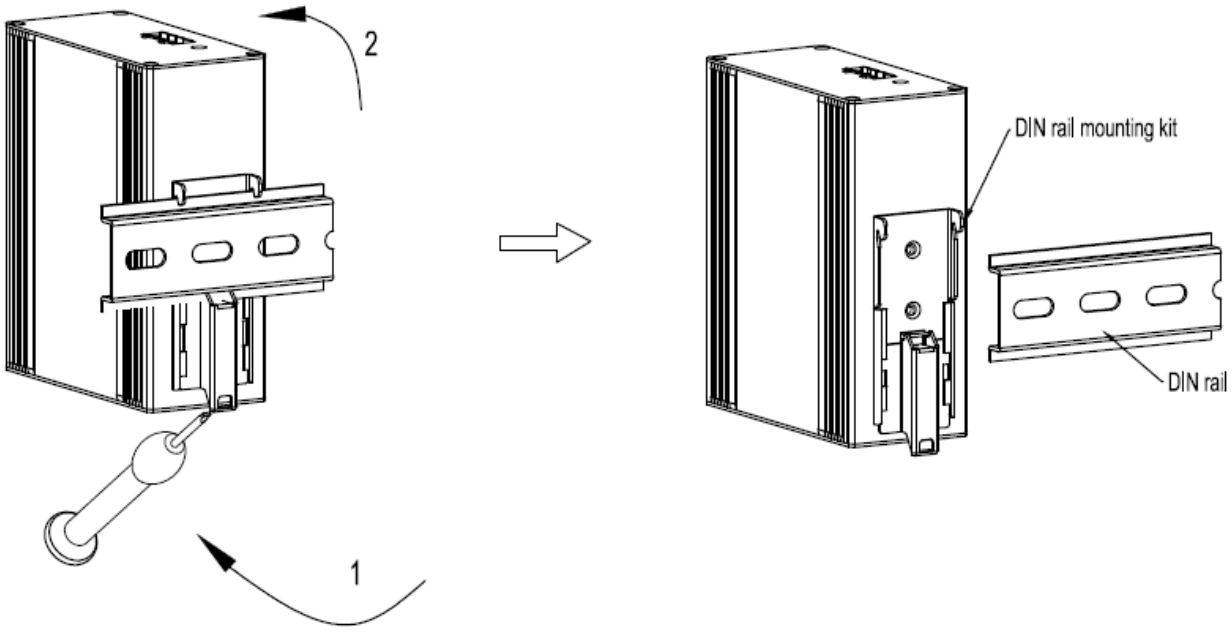


Figure 8 DIN-Rail Dismounting

Caution:

Cut off the power and disconnect all cables before mounting, dismounting or moving the equipment.

4 Cable Connection

4.1 10/100Base-T(X) Ethernet Port

10/100Base-T(X) Ethernet port is equipped with RJ45 connector. The port is self-adaptive. It can automatically configure itself to work in 10M or 100M state, full or half duplex mode. The port can also adapt to MDI or MDI-X connection automatically. You can connect the port to a terminal or network device with a straight-through or cross-over cable.

- Pin Definition

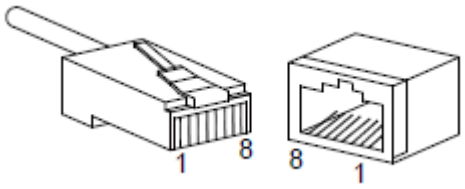


Figure 9 RJ45 Port

Table 7 Pin Definitions of 10/100Base-T(X) Ethernet Port

Pin	MDI-X Signal	MDI Signal
1	Receive Data+ (RD+)	Transmit Data+ (TD+)
2	Receive Data- (RD-)	Transmit Data- (TD-)
3	Transmit Data+ (TD+)	Receive Data+ (RD+)
6	Transmit Data- (TD-)	Receive Data- (RD-)
4, 5, 7, 8	Unused	Unused
NOTE	**Note:** "+" and "-" indicate level polarities.	

- Wiring Sequence

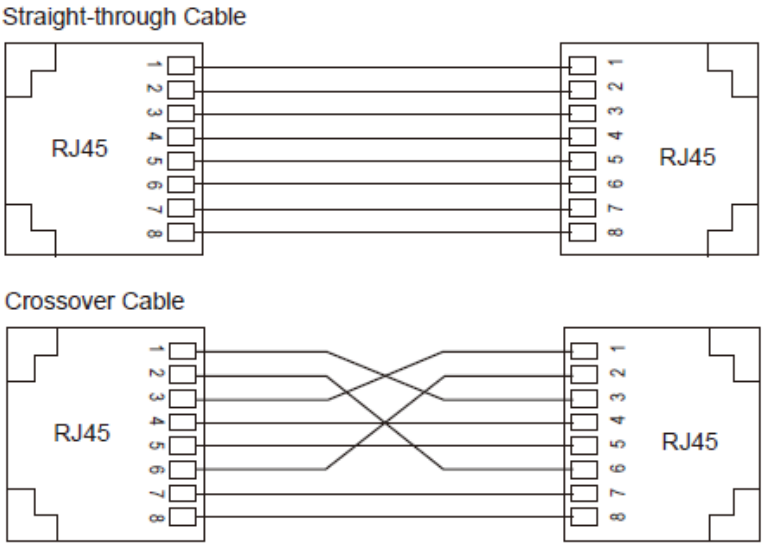


Figure 10 Connection Using Straight-through/Cross-over Cable

Note:

The color of the cable for RJ45 connector meets the 568B standard: 1-orange and white, 2-orange, 3-green and white, 4-blue, 5-blue and white, 6-green, 7-brown and white, and 8-brown.

4.2 CAN Bus Port

The CAN (CAN2.0B) bus port is equipped with a 3-pin 3.08mm-spacing plug-in terminal block, which is connected with the twisted/untwisted pair cable to transmit differential signals through the H and L terminals. Shielded Twisted Pair (STP) is recommended for better signal quality. The maximum transfer rate can reach 1 Mbps. To enable communication between the CAN bus ports on two devices, connect the H terminal with the H terminal, and the L terminal with the L terminal.

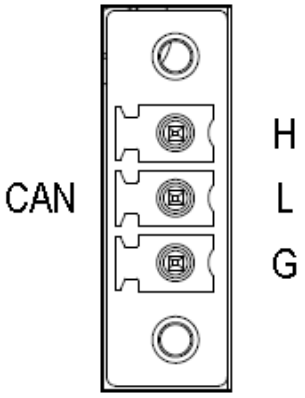


Figure 11 CAN Bus Port

Table 8 Pin Definitions of CAN Bus Port

Pin	Description
H	CAN_H line connection
L	CAN_L line connection
G	Grounding line connection

4.3 RS485 Bus Port

The RS485 bus port is equipped with a 3-pin 3.08mm-spacing plug-in terminal block, which is connected with the twisted/untwisted pair cable to transmit differential signals through the D+ and D- terminals. Shielded Twisted Pair (STP) is recommended for better signal quality. The maximum transfer rate can reach 10 Mbps. To enable communication between the RS485 ports on two devices, connect the D+ terminal with the D+ terminal, and the D- terminal with the D- terminal.

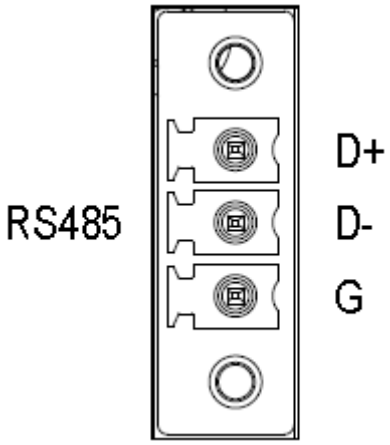


Figure 12 RS485 Bus Port

Table 9 Pin Definitions of RS485 Bus Port

Pin	Description
D+	Positive signal
D-	Negative signal
G	Grounding line

4.4 AUTBUS Bus Port

The AUTBUS bus port is connected with the twisted/untwisted pair cable, which transmits differential signals through the A and B terminals. Shielded Twisted Pair (STP) is recommended for better signal quality. The transfer rate can reach 100 Mbps from a distance of up to 500 m.

Note:

- The attenuation parameters of the AUTBUS cable is critical to the distance that AUTBUS signals can travel over. The attenuation parameters of a standard AUTBUS cable should meet: ≤ 1.0 dB/100m@1MHz; ≤ 5.0 dB/100m@32 MHz;
- The characteristic impedance and Return Loss (RL) of the AUTBUS cable are also important to the distance that AUTBUS signals can travel over. The characteristic impedance of a standard AUTBUS cable should be 100 ± 10 Ω, and RL should meet: -20 dB@1~32 MHz;

The AUTBUS bus port supports three types of connectors.

- 2-Pin 3.81mm-Spacing Plug-in Terminal Block

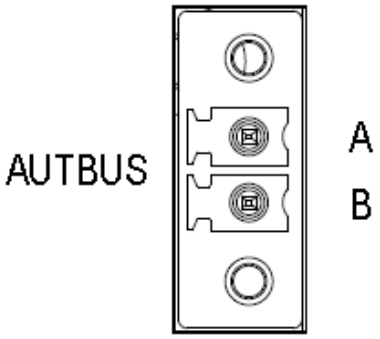


Figure 13 2-Pin 3.81mm-Spacing Plug-in Terminal Block

Table 10 Pin Definitions of 2-Pin 3.81mm-Spacing Plug-in Terminal Block

Pin	**Signal**
A/B	AUTBUS two-wire terminal block (non-polarized)

- 3-Pin M8 Port

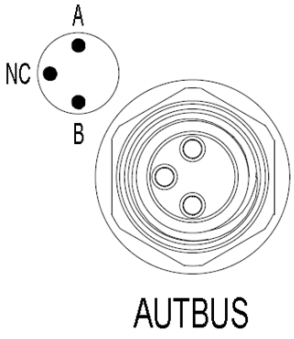


Figure 14 3-Pin M8 Port

Table 11 Pin Definitions of 3-Pin M8 Port

Pin	**Description**
A/B	AUTBUS two-wire terminal block (non-polarized)
NC	Not used

- SPE Port

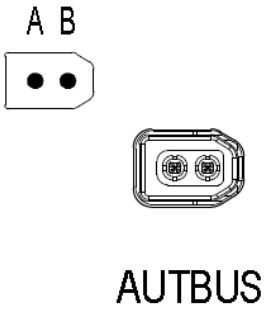


Figure 15 SPE Port

Table 12 Pin Definitions of SPE Port

Pin	Description
A/B	AUTBUS two-wire terminal block (non-polarized)

Note:

- The attenuation parameters of the AUTBUS connector is critical to the maximum number of AUTBUS nodes that can be supported in the AUTBUS network. The attenuation parameters of a standard AUTBUS connector should meet: ≤ 0.012 db@1~32 MHz.
- The characteristic impedance and Return Loss (RL) of the AUTBUS connector are also important to the maximum number of AUTBUS nodes that can be supported in the AUTBUS network. The characteristic impedance of a standard AUTBUS connector should be 100 ± 10 Ω, and RL should meet: ≤ -10 dB@1~32 MHz.

4.5 Console Port

Caution:

To use the console port with a Mini USB connector, you need to purchase a USB console cable (optional).

The device provides the console port on the front panel. To use the console port, you need to install console driver on the computer.

One end of a USB console cable is Mini USB connector to be inserted into the console port of the converter, and the other end is the USB connector to be inserted into the USB

port of a PC. You can configure, maintain, and manage the converter by running a terminal that supports console connections.

Figure 16 Console Port

Figure 17 Mini USB Connector

Figure 18 USB Connector

Table 13 Pin Definitions of Mini USB Connector and USB Connector

Mini USB Pin	**USB Pin**	**Definition**
1	1	VBUS
2	2	D-
3	3	D+
4	--	ID
5	4	Grounding

4.6 Grounding

Grounding protects the device from lightning and interference. Therefore, you must ground the device properly. You need to ground the device before it is powered on and disconnect the grounding cable after the device is powered off.

There is a grounding screw on the top panel of the device. The screw is for chassis grounding. After crimping one end of the grounding cable to a cold pressed terminal, secure the end to the grounding screw and firmly connect the other end to ground.

Note:

Cross-sectional area of the chassis grounding cable: > 2.5 mm^2; grounding resistance: < 5 Ω.

4.7 DIP Switch

4.7.1 Rotary DIP Switch

There is a rotary DIP switch on the front panel of the device, which supports 16 dial codes (0~F), and the default dial code is 0. The rotary DIP switch makes the configuration of AUTBUS network parameters more conveniently. Based on dial code configurations, protocol converter can work in two modes:

- Plug-and-Play Mode: In this mode, each dial code has been inbuilt with fixed configurations of the role, AUTBUS parameter and resource allocation. With the DIP switch pointing to a specific dial code, the corresponding configurations are delivered and transparent data transmissions are implemented by the protocol converter in the AUTBUS network. This mode is easy to use without users' manual configurations and can satisfy varied application requirements.
- Non-Plug-and-Play Mode (self-definition): In this mode, user can customize AUTBUS configurations as needed and save the configurations to the dial codes. For details, refer to subsequent introductions of each dial code. This mode requires that the user have a deep knowledge of AUTBUS protocol. For more information about AUTBUS technology, visit: https://www.autbus.org.

Note:

- After modifying the dial code that the DIP switch points to, restart the device to enable the modification to take effect.
- Two work modes cannot be used simultaneously.

In the AUTBUS network, you should configure one device to act as Management Node (MN). MN is responsible for Terminal Node (TN) management, resource configuration, etc.

Only one MN can exist in the AUTBUS network. To configure a device to act as MN, you should configure the rotary DIP switch on this device to point to dial code 4, 5, 6, 7, 8, 9, A, B, C, D, E or F. To configure a device to act as TNs, you should configure the rotary DIP switch to point to dial code 0, 1, 3 or F. Note that for all dial codes except F, the role configuration is always fixed and cannot be manually configured.

The dial code configurations on the devices in the AUTBUS network need to match the mapping relationships as shown in the following table.

Table 14 Dial Code Mapping Relationships

Type	**TN**	**MN**
Plug-and-Play Mode	0/1	4~7
Non-Plug-and-Play Mode	3	8/9/A/B/C/D/E
	F	F

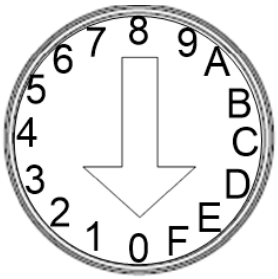


Figure 19 Dial Code Configuration

- Mode 0 and 1

When the rotary switch points to dial code 0 or 1, the device role is TN. TNs configured at mode 0 or 1 can only work with the MN configured at mode 4, 5, 6 or 7 and connected on the same line.

Mode 0 and 1 have been inbuilt with fixed bandwidth configurations for different types of protocol converters and the configurations cannot be modified. In these modes, TN automatically obtain resources. Other configurations, including the sideband mode, transmission mode, transmission gain, etc, are synchronized from the MN. For details about the bandwidth configurations, see the following table.

Table 15 Bandwidth Definition of Mode 0 and 1

Converter Type	Bandwidth Definition (Mbps)	
	Mode 0	Mode 1
AUTBUS to RS485	0.75	1.5
AUTBUS to CAN	0.75	1.5
AUTBUS to Ethernet	4.75	10.0

- Mode 2

  This mode is reserved and not supported currently.

- Mode 3

When the rotary DIP switch points to dial code 3, the device role is TN. TNs configured at mode 3 can only work with the MN configured at mode 8, 9, A, B, C, D or E and connected on the same bus line. Similar to mode 0 and 1, TNs configured at mode 3 also synchronize the sideband mode, transmission mode, transmission gain configurations, etc. from the MN. In this mode, TN also automatically obtain resources. The difference is that this mode allows the user to define the bandwidth of TN.

- Mode 4

When the rotary DIP switch points to dial code 4, the device role is MN. Mode 4 is applicable to short-distance transmission scenarios (within 100 m). This mode features high bandwidth and real-time capabilities. The AUTBUS parameter and resource allocation configurations are fixed and cannot be modified.

Table 16 AUTBUS Parameter Configurations of Mode 4

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	2	3	100 Mbps	1	5	1 ms

- Mode 5

When the rotary DIP switch points to dial code 5, the device role is MN. Mode 5 is applicable to long-distance transmission scenarios (within 500 m) that requires high

bandwidth. This mode features better anti-interference capabilities than mode 4. The AUTBUS parameter and resource allocation configurations are fixed and cannot be modified.

Table 17 AUTBUS Parameter Configurations of Mode 5

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	1	3	100 Mbps	1	5	2 ms

- Mode 6

When the rotary DIP switch points to dial code 6, the device role is MN. Mode 6 is applicable to long-distance transmission scenarios (within 500 m). This mode features better anti-interference and fault-tolerant capabilities than mode 5. The AUTBUS parameter and resource allocation configurations are fixed and cannot be modified.

Table 18 AUTBUS Parameter Configurations of Mode 6

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	1	2	62 Mbps	1	5	2 ms

- Mode 7

When the rotary DIP switch points to dial code 7, the device role is MN. Mode 7 is applicable to environments where there are many interference sources. This mode features better anti-interference capabilities than mode 6 while supporting transmission over long distances (within 500 m). The AUTBUS parameter and resource allocation configurations are fixed and cannot be modified.

Table 19 AUTBUS Parameter Configurations of Mode 7

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	0	0	31 Mbps	1	5	4 ms

- Mode 8~E

When the rotary DIP switch points to dial codes 8 to E, the device role is MN. Modes 8

to E have been inbuilt with default AUTBUS parameter configurations. You can use the defaults or redefine them as needed and save the defined configurations to the dial code Modes 8 to E allow the user to define the bandwidth of TN. The AUTBUS parameter configurations and resource allocation are fixed and cannot be modified.

Table 20 AUTBUS Parameter Configurations of Modes 8~E

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	0	1	31 Mbps	0	0	4 ms

- Mode F

When the rotary DIP switch points to dial code F, the rotary DIP switch of all devices must point to F; otherwise, communication is not possible. Mode F is the full self-definition mode. You need to manually configure the device role, AUTBUS parameter and resource allocation and save the configurations to dial code F ~~through the console terminal~~.

4.7.2 Sliding DIP Switch

There are four sliding DIP switches on the front panel of the device. Each DIP switch has two states: ON and OFF. By default, all the four switches are in OFF status.

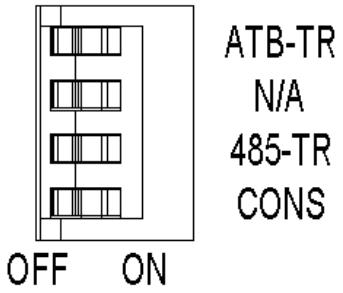


Figure 20 AUTBUS to RS485 Converter

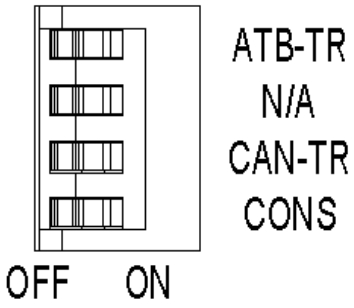


Figure 21 AUTBUS to CAN Converter

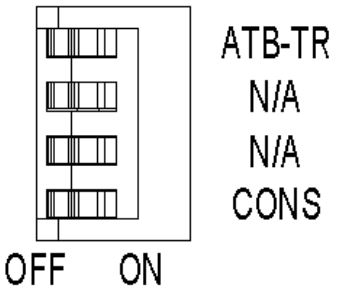


Figure 22 AUTBUS to Ethernet Converter

Table 21 Function Descriptions of Sliding DIP Switch

Identifier	**Status**	**Description**
CONS	OFF	Enable Console port of CPU A, which is used for application debugging.
	ON	Enable Console port of CPU B, which is used for baseband debugging.
N/A	-	Not used
485-TR	OFF	Disable termination resistor (120 Ω) for RS485 bus port.
	ON	Enable termination resistor (120 Ω) for RS485 bus port.
CAN-TR	OFF	Disable termination resistor (120 Ω) for CAN bus port.
	ON	Enable termination resistor (120 Ω) for CAN bus port.
ATB-TR	OFF	Disable termination resistor (100 Ω) for AUTBUS bus port.
	ON	Enable termination resistor (100 Ω) for AUTBUS bus port.

Note:

- It is recommended to enable termination resistor for CAN and RS485 bus ports;
- For AUTBUS ports, termination resistor needs to be enabled for short-distance transmission scenarios and disabled for long-distance transmission scenarios. For example, when the distance between two TNs is within 1m and the transmission gain value is relatively larger for better signal quality, the termination resistor on the two TNs should be enabled.

4.8 Power Terminal Block

There is a power terminal block on the top panel of the converter. You need to connect the power cable to the terminal block to provide power for the converter.

This series devices adopt the 3-pin and 4-pin 5.08 mm-spacing plug-in terminal blocks for power input. The 4-pin 5.08 mm-spacing plug-in terminal block supports single and redundant power input. When the redundant power supply is used and one power supply is faulty, the device can continue operating properly, thereby improving network reliability.

Note:

- 0.75 mm^2 < Cross-sectional area of the power wire < 2.5 mm^2; grounding resistance: < 5 Ω.
- The devices supporting SPE type AUTBUS ports are equipped with the 4-pin 5.08 mm-spacing plug-in power terminal block.

- 3-pin 5.08 mm-spacing plug-in terminal block

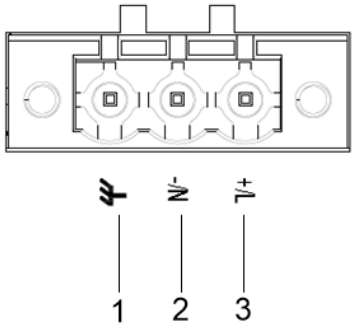


Figure 23 3-Pin 5.08 mm-Spacing Plug-in Terminal Block

Table 22 Pin Definitions of 3-Pin 5.08 mm-Spacing Plug-in Terminal Block

No.	Signal	DC Definition	AC Definition
1	⏚	PGND	PGND
2	-/N	PWR: -	PWR: N
3	+/L	PWR: +	PWR: L

- 4-pin 5.08 mm-spacing plug-in terminal block

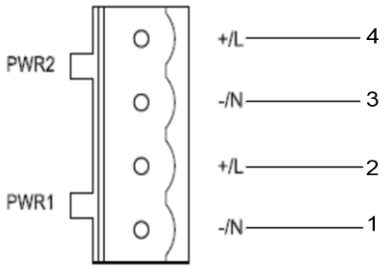


Figure 24 4-Pin 5.08 mm-Spacing Plug-in Terminal Block

Table 23 Pin Definitions of 4-Pin 5.08 mm-Spacing Plug-in Terminal Block

No.	Signal	DC Definition	AC Definition
1	-/N	PWR1: -	PWR1: N
2	+/L	PWR1: +	PWR1: L
3	-/N	PWR2: -	PWR2: N
4	+/L	PWR2: +	PWR2: L

- Wiring and mounting

Step 1: Ground the converter properly according to section 4.6

Step 2: Remove the power terminal block from the converter.

Step 3: Insert the power cable into the power terminal block according to Table 22 or Table 23 to fix the power cable.

Step 4: Insert the terminal with the connected cable into the terminal block on the device.

Step 5: Connect one end of the power cable to an external power supply system (with the allowed power range). If the power LED on the front panel of the converter turns on, the power supply is connected properly.

Wiring and mounting should meet the following specifications.

Table 24 Wiring and Mounting Specifications

Terminal Type	Required Torque	Wire Range (AWG)
Terminal Block Plug	WEIDMUELLER: 4.4-5.0 lb-in	12-24

Caution:

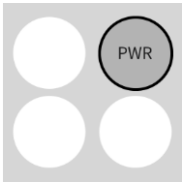
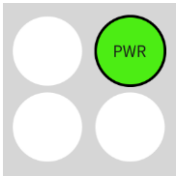
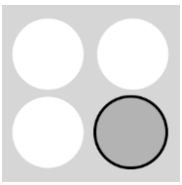
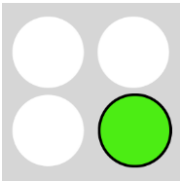
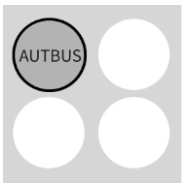
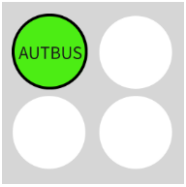
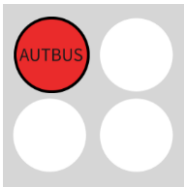
- Before connecting the device to power supply, make sure that the power input meets the power requirement. If connected to an incorrect power input, the device may be damaged.
- To comply with UL restrictions, this equipment must be powered from a source compliant with Class 2.

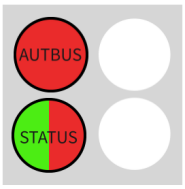
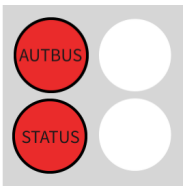
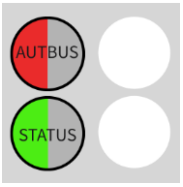
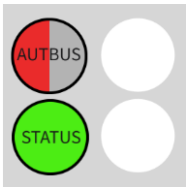
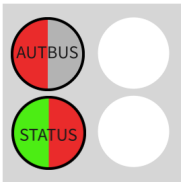
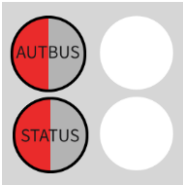
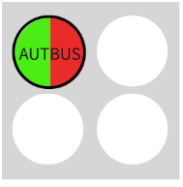
Warning:

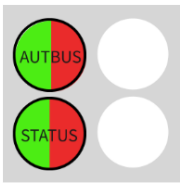
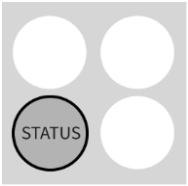
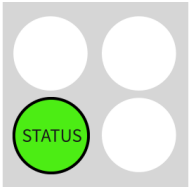
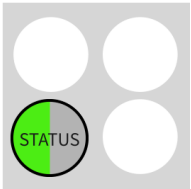
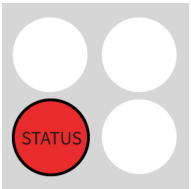
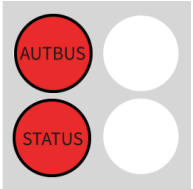
- Do not touch any exposed conducting wire, terminal, or component with a voltage warning sign, because it may cause damage to humans.
- Do not remove any part or plug in or out any connector when the device is powered on.

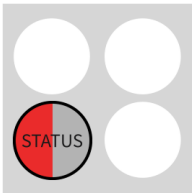
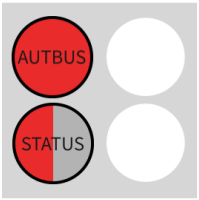
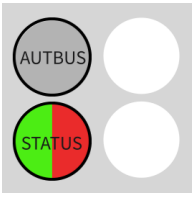
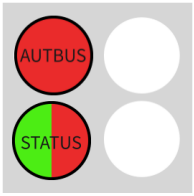
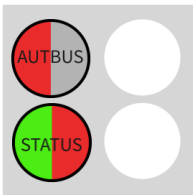
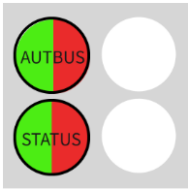
5 LEDs

Table 25 LEDs

LED	LED Status	Color	Descriptions
Power LED - PWR		Off	The power is not connected or operates abnormally.
		Steady Green	The power is connected and operates normally.
Service Port Communication Status LED - ETH/CAN/485		Off	ETH/CAN/485 port is not connected or the power is not connected.
		Steady Green	ETH/CAN/485 port is connected but no data is passing through.
		Flashing Green	ETH/CAN/485 port is connected and there is data passing through.
AUTBUS Signal Quality LED - AUTBUS		Off	The power is not connected or operates abnormally.
		Steady Green	Signal quality is good.
		Steady Red	Signal quality is not steady and packet loss might occur.

		Steady Red	If at the same time the status LED alternates between red and green, it indicates that the current device is TN and more than one MN device is detected.
		Steady Red	If at the same time the status LED is steady red, it indicates that the current device is TN, and device manufacturing information cannot be obtained.
		Flashing Red	On MN, this indicates TN is not detected.
		Flashing Red	On TN, this indicates MN is not detected.
		Flashing Red	If at the same time the status LED alternates between red and green, it indicates that the current device is MN, and more than one MN device is detected.
		Flashing Red	If at the same time the status LED is flashing red, it indicates the current device is MN, and device manufacturing information cannot be obtained.
		Alternating Red & Green	Signal quality is barely satisfactory.

		Alternating Red & Green	If at the same time the status LED alternates between red and green, it indicates that the user has lighted the LED to locate the device through the AUTBUS Management Software. For information about the management software, contact customer service personnel.
AUTBUS Status LED - STATUS		Off	The power is not connected.
		Steady Green	The current device is TN and works normally.
		Flashing Green	The current device is MN and works normally.
		Steady Red	The current device is TN and has gone offline.
		Steady Red	If at the same time the AUTBUS signal LED is steady red, it indicates that the current device is TN, and device manufacturing information cannot be obtained.

		Flashing Red	The current device is TN and has come online but fails to obtain resources or MN fails to start up.
		Flashing Red	If at the same time the AUTBUS signal LED is steady red, it indicates the current device is MN, and device manufacturing information cannot be obtained.
		Alternating Red & Green	If at the same time the AUTBUS signal LED is off, it indicates that software version startup fails.
		Alternating Red & Green	If at the same time the AUTBUS signal LED is steady red, it indicates that the current device is TN and more than one MN device is detected.
		Alternating Red & Green	If at the same time the AUTBUS signal LED is flashing red, it indicates that the current device is MN, and more than one MN device is detected.
		Alternating Red & Green	If at the same time the AUTBUS signal LED is alternating between green and red, it indicates that the user has lighted the LED through the AUTBUS Management Software to help identify the device position. For information about the management software, contact customer service personnel.

6 Access

6.1 Access through Console Port

You can access the AUTBUS network through the console port and software that supports a console connection. The following is an example for AUTBUS network access via Putty through the console port.

Step 1: Install console driver on PC and then connect the USB port of the PC to the console port of the converter with the USB console cable.

Step 2: Open Putty, select [Connection] → [Serial], and set up the console connection on the remote terminal. Set port parameters (Bits per second: 115200, Data bits: 8, Parity: None, Stop bits: 1, and Flow control: None), as shown in the following figure.

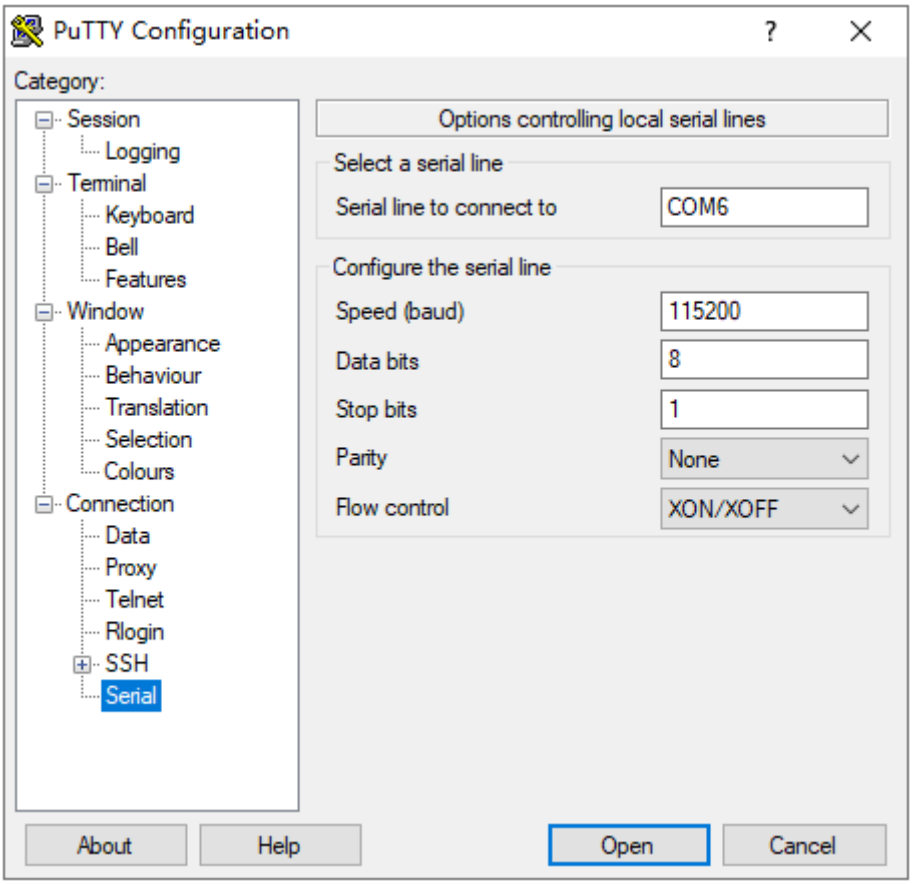


Figure 25 Setting Parameters

Note：

To confirm the communication port in use, right-click [My Computer] and select [Property]. Click [Hardware] → [Device Manager] → [Port] to view the communication port.

Step 3: After setting the parameters, select [Session], set Connection Type to “Serial”, and then click <Open> button to enter the CLI.

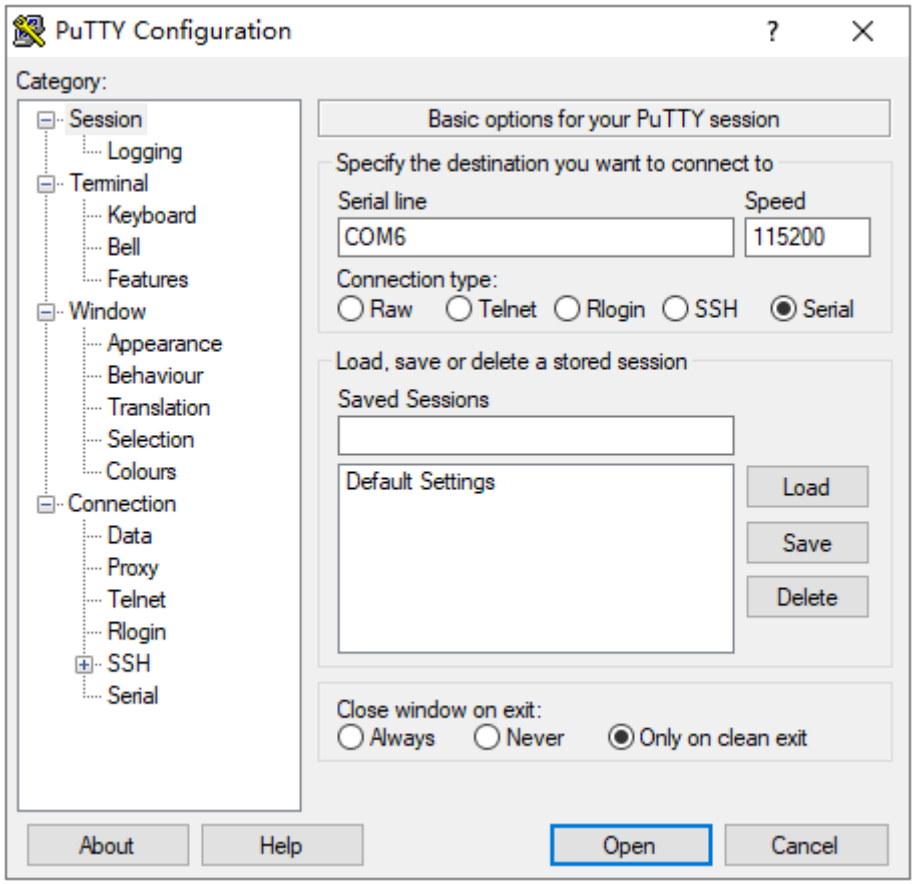


Figure 26 Establish Console Connection

Step 4: Enter the command interface. Input the default username “root” and password “autbus” as prompted.

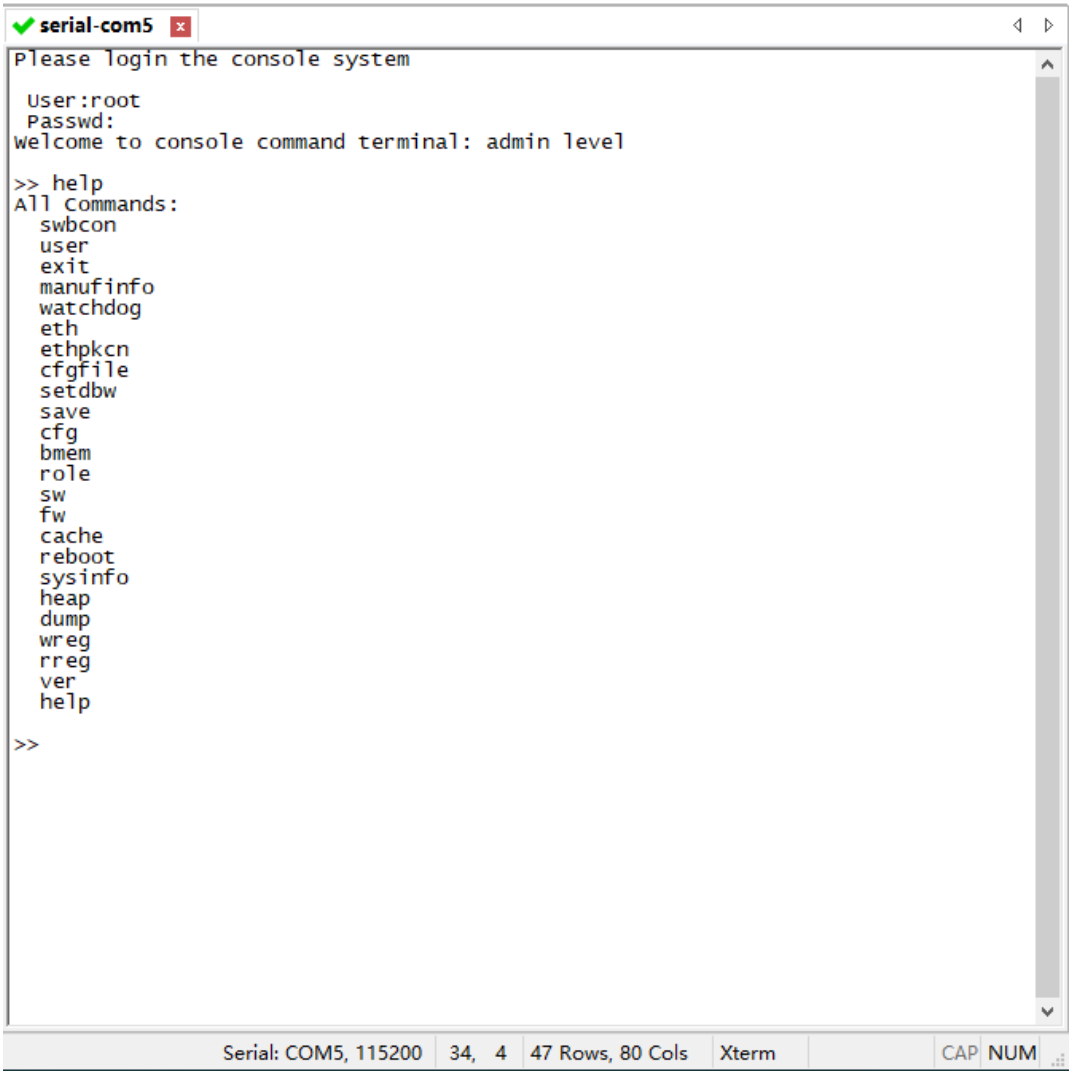


Figure 27 Command Interface

Step 5: After you have successfully log in, you can perform operations using the following commands.

Table 26 Commands

Command	**Description**
>> help	Query the available commands.
>> ver	Query the firmware version of the protocol converter.
>> reboot	Restart the protocol converter
>> save	Save the configurations.

6.2 Access through AUTBUS Management Software

Step 1: Before using the AMS to manage the AUTBUS network, make sure the AUTBUS network is available.

Step 2: Connect the PC on which the AMS is installed to an AUTBUS device that has an Ethernet port (AUTBUS to Ethernet protocol converter).

Step 3: Double-click the AMS program. The login page is displayed.

Step 4: Select the language option; enter the default username “user” or “admin” and password “123” and then click <Login>, as shown below.

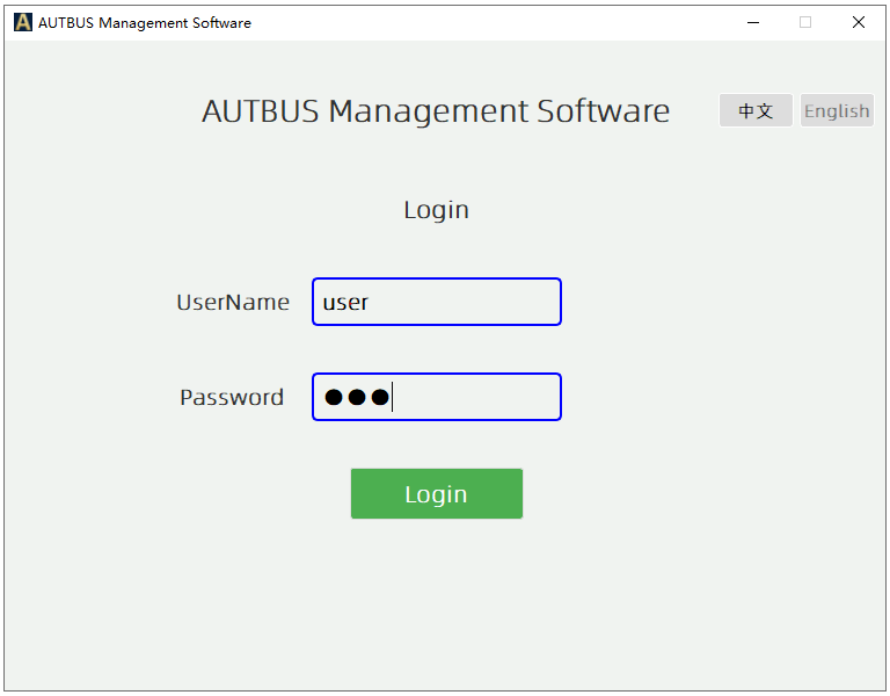


Figure 1 Login Page

Step 5: After the user successfully logs into AMS, the home page is displayed, as shown below.

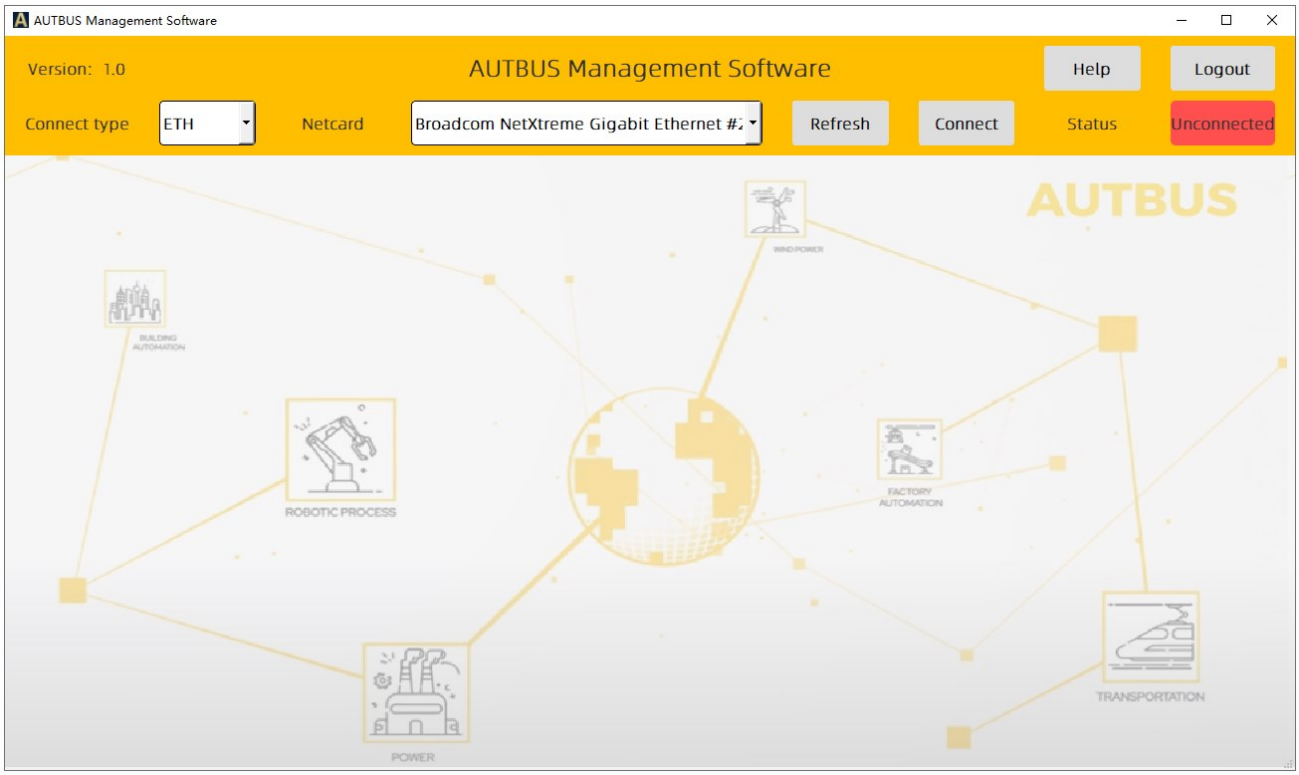


Figure 2 Home Page

Note:

For details about how to use AMS, refer to the corresponding operation manual.

7 Basic Features and Specifications

Power Requirements	
Power Identifier	Voltage Range
L2	24-48 V DC
Terminal Block	L2: 3-pin 5.08mm-spacing plug-in terminal block L2-L2: 4-pin 5.08mm-spacing plug-in terminal block
Rated Power Consumption	
Rated Power Consumption	3 W (MAX)
Physical Characteristics	
Housing	Metal, fanless
Protection Class	IP30
Installation	DIN-rail mounting
Dimensions (W × H × D)	29.6 mm x 114.5 mm x 68 mm (excluding the connector, DIN rail, and component for panel mounting)
Weight	0.2 kg
Environmental Limits	
Operating Temperature	-40℃~+70℃
Storage Temperature	-40℃~+85℃
Ambient Relative Humidity	5%~95% (non-condensing)
MTBF	
MTBF	AUTBUS to ETH: 274740.7h AUTBUS to RS485: 328960.9h AUTBUS to CAN: 374344.4h
Warranty	
Warranty	5 years

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For more information about KYLAND products, please visit our website:

http://www.kyland.com