

AnyWireASLINK
PCI Express Master I/F
B2P8-E01

User's Manual

Ver. 1.9 Feb. 6, 2023

Precautions

● Precautions related to this user's manual

1. The customer is kindly requested to see to it that this user's manual reaches the end user.
2. Read this user's manual thoroughly and understand the descriptions, and then operate this product.
3. This user's manual is intended to describe the details of the functions provided in this product and not to guarantee that this product serves the specific purposes the customer aims at.
4. Reproduction or duplication of part or all of this user's manual without permission is prohibited.
5. Contents of this user's manual may be subject to future changes without prior notice.

● Safety precautions (Make sure to read before use)

When using this product, please carefully read this Manual and the related Manuals introduced in this Manual and pay sufficient attention to safety in order to handle this product properly.

The precautions in this Manual describe only matters related to this product.

For safety precautions as a system, refer to User's Manuals for controllers, such as the CPU unit.

"Safety precautions" ranks the safety precaution items into "⚠ WARNING" and "⚠ CAUTION."



WARNING

Improper handling may cause a dangerous situation and can result in death or serious injury.



CAUTION

Improper handling may cause a dangerous situation and can result in moderate injury or minor injury or is assumed to result in property damage only.

In addition,

Matters described in ⚠ CAUTION may lead to serious consequences depending on the situation.

All describe important contents, therefore, make sure to observe the cautions and warnings.

Carefully store this Manual so as to access it whenever necessary, and deliver this Manual to the end user.

[Application of the product]



WARNING

- Application of the AnyWire system is limited to areas in which any failure and/or problem of the product shall not result in serious consequences and in systems with fail-safe and backup functions are provided externally.
- The AnyWire system is designed for applications in general industrial purposes and does not come with control features designed for mission critical purposes.
Therefore, the product is not applicable in areas like medical equipment, nuclear power plants, railroad, aviation, safety devices, in which extreme safety is the priority.

[Precautions for design]



- The AnyWire system has high noise resistance, however, keep transmission lines and input/output cables 100 mm or more (as a guide) away from high-voltage cables or power lines. A malfunction may result.
- Incorporate an emergency stop circuit and an interlock circuit for safety into an external circuit other than the AnyWire system.
- Since the B2P8-E01 board and driver do not support sleep/standby status of the OS, operation after shift to sleep/standby status shall not be guaranteed. During use of B2P8-E01, be careful not to bring the OS into sleep/standby status.

[Precautions for installation]



- AnyWire products should be used in environments that meet the general specifications presented in the User's Manual.
Using them in environments outside the general specifications may result in injuries due to electric shock, fire, malfunctions and/or damage to or degradation of the products.
- Install respective products properly. Improper installations may cause malfunctions, failures and/or falls.
If they are to be installed on a DIN rail, ensure to orient the products so that the fixed hooks would be on top.
Holding them with the movable hooks on top may cause devices to fall due to vibrations or the weight of cables.
It is strongly recommended to use DIN rail stoppers for secure installation.
If screws were used to install them, fasten screws within the torque specified for respective screws.
Loose screws or screws fastened too tight may cause damage, dropout and/or malfunction of the devices.
- To install and remove the devices, always ensure that all phases of external power supplies used in the system are shut down.
Failing to do so may result in damages and/or malfunctions due to sneak current.
- Do not touch energized parts and electronic components with a bare hand. Doing so may cause malfunctions and/or failures.

[Precautions for wiring]



- Tighten the terminal screws within the specified torque range. Loose tightening of the terminal screws may result in short-circuit, fire or malfunction. Excessive tightening of the terminal screws may cause damage to the screws or unit, resulting in dropping, short-circuit or malfunction.
- Be careful to prevent foreign matter such as cutting chips and wiring offcuts from entering into the unit. Fire, failure or malfunction may result.
- Incorrect wiring may damage the equipment. Be careful with regard to the cable length and layout so that connectors and electric wires are not disconnected.
- When connecting wires with terminal blocks, do not solder. A contact failure may result.
- If wiring for the power line is long, power voltage for the remote slave unit may become insufficient due to voltage drop. Therefore, connect an external power source to ensure the specified voltage.
- Do not turn on the 24 V DC power source before completing wiring and connections of the whole Anywire system.
- Use a 24 V DC direct current stabilized power supply for Anywire system devices.
- Do not bind the control wire and communication cable with the main circuit or power line, or do not bring them close to each other. Noise may result in malfunction.
- Make sure to put electric wires and cables to be connected to the unit into ducts or fix them with clamps. Unless cables are put into ducts or fixed with clamps, drift, movement or careless tensioning of a cable may result in damage to the unit or cable, and a connection failure of a cable may result in malfunction.
- When removing cables connected to the unit, do not hold the cable section by hand when pulling. Remove the cable equipped with a connector by holding the connector on the connection part of the unit. To remove cables connected to the terminal blocks, loosen the terminal screws on the terminal block. When cables are pulled while they are connected to the unit, malfunction or damage of the unit or cable may result.

[Precautions for startup and maintenance]



- Do not touch the terminals while the power is on. Electric shock or malfunction may result.
- To clean or to re-tighten the screws on the terminal block and the unit mounting screws, make sure to shut off all phases of the external supply power used in the system. Unless all phases are shut off, electric shock may result. Loose tightening of the screws may result in short-circuit or malfunction. Excessive tightening of the screws may cause damage to the screws or unit, resulting in dropping, short-circuit or malfunction.



- Do not disassemble or remodel each unit. Failure, malfunction, injury or fire may result.
- Make sure to shut off all phases of the external supply power source used in the system for installation and removal of the unit.
Unless all phases are shut off, failure or malfunction of the unit may result.
- Before touching the unit, make sure to touch grounded metal to discharge static electricity charged to the human body. Unless static electricity is discharged, failure or malfunction of the unit may result.

[Precautions for disposal]



- Dispose of this product as industrial waste.

Contents

1. Quick Start	7
1.1 Installations	7
1.2 Trial operation (When supplying power for the first time)	8
1.3 Regular operation	9
2. Overview	10
3. Specifications	11
3.1 General specifications	11
3.2 Performance specifications.....	12
3.3 Transmission performance (AnyWireASLINK).....	13
3.4 Transmission Required Time.....	14
4. Overview of Functions	17
5. Structure	18
5.1 Outside dimensions.....	18
5.2 Name of each part.....	19
5.3 LED display.....	20
5.4 Installation.....	22
5.5 Installation location.....	23
5.6 Accessories.....	23
5.7 Slave units.....	24
5.8 Transmission lines.....	25
5.9 Connection mode	25
5.10 Transmission distance.....	28
5.11 Transmission cable type and precautions.....	29
5.12 Transmission line supply current value.....	30
5.13 Terminator.....	31
5.14 AnyWire filter.....	32
5.15 Address setting (reference)	34
6. Monitoring function	35
6.1 Transmission line disconnection detection.....	35
6.2 Transmission line short-circuit detection.....	36
6.3 Detection of transmission circuit drive power voltage drop.....	36
6.4 Detection of ID (address) redundancy/not set.....	36
7. Connections	37
8. Package software and API specifications	38
8.1 Package software.....	38
8.2 APIs	41
9. Troubleshooting	42
9.1 Visual check.....	42
9.2 Checking by using the diagnostic tool.....	45
9.3 If a driver cannot be properly installed	45
10. Warranty	46
11. Directive on Waste Electrical and Electronic Equipment (Weee)	47
12. 中国版 RoHS 指令	48
13. Change history	49

1. Quick Start

This section provides an overview of procedures for using the AnyWireASLINK system and indicates the recommended conditions for safely operating the system.

1.1 Installations

1. Transmission line wires

You can use two-core (transmission line only) or four-core (transmission and power lines) general-purpose VCTF cabtyre cable.

2. Transmission line wire diameter

Use a diameter of 0.75mm² to 1.25mm².

3. Number of slave units connected

A maximum of 128 can be connected.

4. Power supply

Use an AnyWire-dedicated 24V DC stabilized power supply or a power line directly branched off from power supply equipment.

B2P8-E01 requires a drive power supply in order to send transmission signals.

Two-wire (non-isolated type) slave unit: Supply drive power of the unit and corresponding load from the transmission signal line.

(See 5.12)

Four-wire (isolated type) slave unit: Supply drive power of the unit and corresponding load from the power line.

We recommend supplying 26.4V power to B2P8-E01.

Make sure that power supplied to a four-wire (isolated type) slave unit is from 21.6V to 27.6V.

5. Personal computer (PC) settings

Drivers, settings and diagnostic tools are to be installed to a personal computer (PC).

You can download drivers, settings and diagnostic tools from our website (<http://www.anywire.jp/>).

Since the B2P8-E01 board and driver do not support sleep/standby status of the OS, operation after shift to sleep/standby status shall not be guaranteed. During use of B2P8-E01, be careful not to bring the OS into sleep/standby status.

Top page>Support & Download>Download>Software [Drivers & Diagnostic Tools]

Top page>Support>Download>Software [Drivers & Diagnostic Tools]

See [APITool.chm] stored in [PCI_Diagnostic Software] for installation and operation.

Drivers & Diagnostic Tools>Help>ASLWDM>JPN [APITool.chm]

Mount B2P8-E01 to the PCI Express X1 connector slot.

If mounting multiple B2P8-E01's, set the ID number by using the "board ID switch" located on the circuit board.

You can set a value from 0 to 7 so that it will be applied to the properties of B2P8-E01.

Access the properties of B2P8-E01 from AnyWire Devices of the device manager to specify initial settings such as device names, transmission points, double checking mode, and output values when a PC monitoring error (WDT) occurs.

ANYWIRE Devices>ASL B2P8-E01 "ASL□□□">Properties>Common Settings tab>Initial Settings [Initial Settings Tool]

6. Wiring

Connect between the transmission line terminals (DP, DN) of B2P8-E01 and the slave unit.

Units requiring an external power source such as a four-wire (isolated type) slave unit must have a separate power line.

A wire diameter of up to 1.25mm² can be used if using the same cable for the transmission and power lines, thereby making it necessary to take a voltage drop into consideration. In such cases, divide the wires or install a suitable local power supply as appropriate.

Although a transmission line can be branched, you should try to make the branches as short as possible.

7. Terminator

Be sure to always connect one terminator to the end of the transmission line farthest from B2P8-E01.

If there is a branched line of 40m or more, connect the terminator to the end of that line. (See 5.14)

Be sure to connect properly as it contains a transmission waveform shaping circuit and has polarity (DP, DN).

1.2 Trial operation (When supplying power for the first time)

1. Power on

Turn the power on according to the procedures: Turn on the external power source => Turn on the PC power.

2. LED display status

Check the following items.

- This device: L is flashing, S is unlit, A is lit, and E is unlit (see 5.3)
- Slave units: LINK is flashing and ALM is unlit
- Terminator (with polarity): Display LED lit (low brightness)

3. Address setting

You must set the address of each slave unit.

Used the specialized address writer (ARW-04 Ver. 04-1.01 or ARW-03 Ver. 2.01 or higher) to set addresses.

The address number is used for interaction between the inputs and outputs of the corresponding slave unit and the master-side memory. Accordingly, the number of points used for each slave unit is indicated at the beginning of the set address number. (See 5.16)

Set the address numbers for input and output separately with a value from 0 to 254.

Set so that there is no address redundancy when setting each of the addresses for input and output.

At the same time, set so that the area occupied by the slave unit does not exceed the range of the number of transmission points.

Be sure to set the addresses because the default address setting that is initially set when the slave unit is shipped from the factory prevents B2P8-E01 from operating.

Address redundancy and lack of setting results in the output of an error flag when automatic address recognition (described below) is performed.

4. Automatic address recognition

Press and hold the SET switch of B2P8-E01 until the "SET" LED lights up, and then release the switch. Automatic address recognition is completed when the "SET" LED turns off. (See 6.1)

After this operation is completed, transmission according to input/output and branch line disconnection detection starts.

5. Input/output check

Check that the input/output of slave units properly corresponds to the program.

Keep in mind the following points due to the possibility of incorrect input or output when performing input/output processing.

- 5-1.** B2P8-E01 requires a one second transition period from when the power of the PC is turned on until input/output data processing is performed.

Accordingly, do not access this unit for the two seconds after the PC power is turned on.

5-2. Supplying power by use of an external power source may result in a transmission power supply voltage drop error during initialization or the DP-DN disconnection error to turn on causing an alarm (ALM) to be output. In such a case, eliminate the abnormal condition and reset the error status. Wait for at least five seconds, and acquire the list of slave unit information.

6. ID check

B2P8-E01 stores the address numbers of the connected slave units by automatic address recognition. This operation stores the address number together with the input/output type information of the set slave unit as an ID.

Address (ID) numbers are classified into input/output types by the following method.

- Stored and displayed in the form of a three-digit hex value.
- The first digit indicates the input/output classification number (Output slave unit: 0, Input slave unit: 2).

Example: ID 000: Output slave unit with an address of "0"
ID 20F: Input slave unit with an address of "15"

You can monitor the list of stored addresses (ID) under [Diagnostic Program].

You can use this monitor to check the number of slave units connected and whether there are any excess or insufficient address settings.

ANYWIRE Devices>ASL B2P8-E01 "ASL□□□">Properties>Common Settings tab>Diagnosis
[Diagnostic Program]

1.3 Regular operation

If there are no problems during trial operation, continue on to regular operation.

2. Overview

This manual describes the PCI Express Master I/F and software package.

You can use B2P8-E01 to configure the AnyWireASLINK system in a PC system.

B2P8-E01 is compatible with a low-profile PCI Express X1 connector.

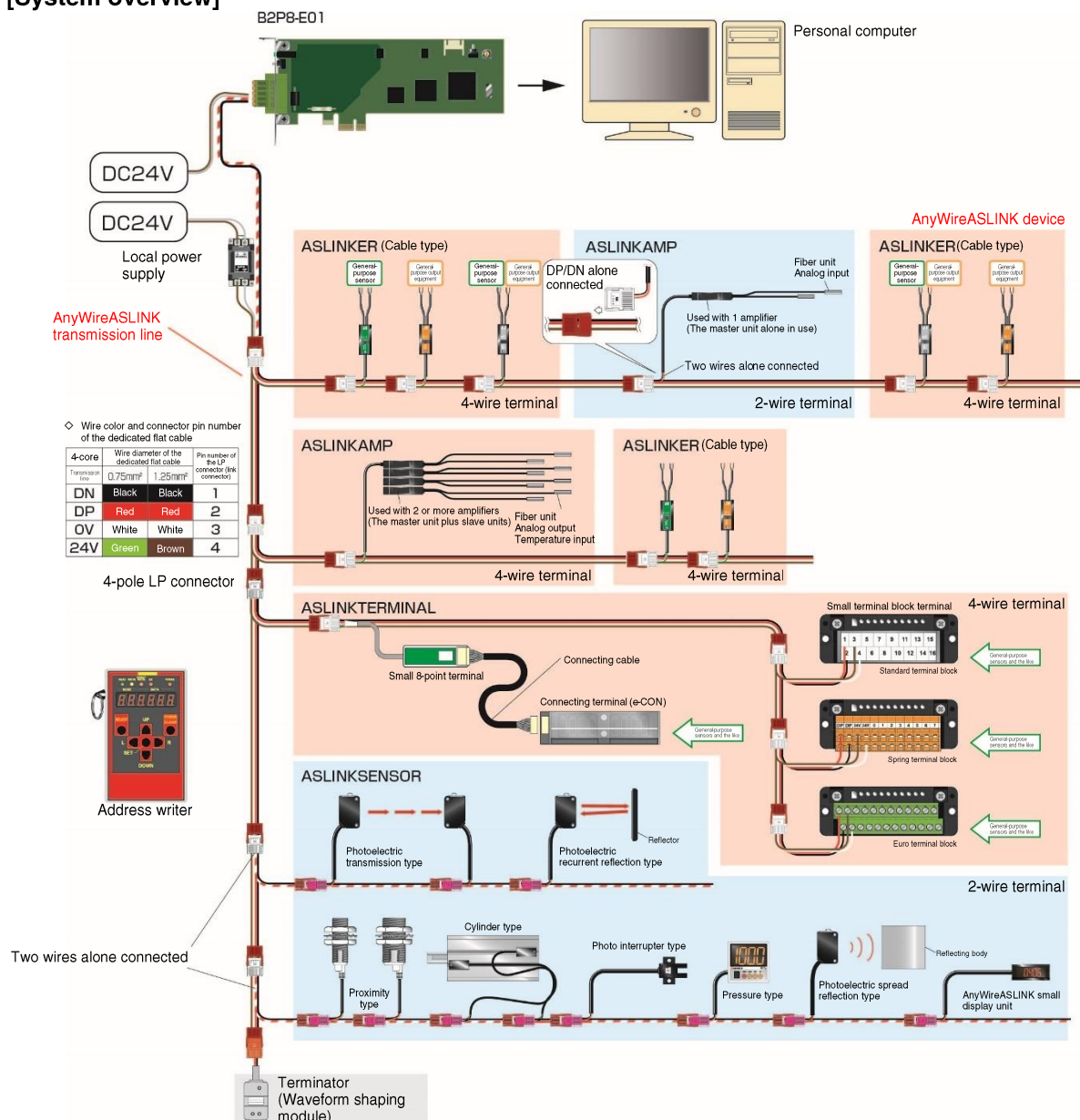
For this reason, it can be used for the slim-type PCs most commonly used for industrial applications and can be mounted to slots of various types of PCI Express lanes (such as x1, x4, x8, and x16).

The dedicated software package provides support for various user operations and diagnosis such as initial settings and monitor screens of B2P8-E01.

Additionally, APIs with DLL are provided in multiple programming language versions for compatibility with the most recent OS and SW development environments.

Since the B2P8-E01 board and driver do not support sleep/standby status of the OS, operation after shift to sleep/standby status shall not be guaranteed. During use of B2P8-E01, be careful not to bring the OS into sleep/standby status.

[System overview]



3. Specifications

3.1 General specifications

Items	Specifications
Operating ambient temperature/humidity	0–+55°C, 10%–90% RH, without condensation
Storage ambient temperature/humidity	-20–+75°C, 10%–90% RH, without condensation
Resistance to vibration	Based on JIS B 3502 and IEC 61131-2
Resistance to shock	Based on JIS B 3502 and IEC 61131-2
Atmosphere	No corrosive gas
Rated altitude*1	0–2000 m
Pollution degree*2	2 or less

*1 Do not use or store the AnyWire ASLINK equipment in an environment pressurized more than the atmospheric pressure at 0 m altitude. Failure to observe this instruction causes malfunction of the equipment.

*2 Index indicating a degree of conductive substance generation under the equipment operating environment. "Pollution degree 2" indicates generation of nonconductive substance only. However, temporary conduction may occur in the environment due to accidental coagulation.

3.2 Performance specifications

■ Performance specification (PCI Express)

Items	Specifications
Ver.	GEN2
No. of boards that can be mounted	8
Mounting slots	PC PCI Express x1, x4, x8, and x16 slots (Standard/Low-profile)
Occupied slots	1 slot
Internal consumption current (Internal 3.3V consumption current of B2P8-E01)	380mA
Mass	65g

■ Performance specifications (AnyWireASLINK)

Items	Specifications			
Transmission clock	27 kHz (37 μ s)			
Transmission method	DC power supply superimposed total frame, cyclic method			
Synchronization	Frame/bit synchronization			
Transmission protocol	AnyWire ASLINK protocol			
Maximum number of bits	512 points (256 inputs, 256 outputs)			
Number of connectable units	128 units max.			
Transmission line allowable supply current *3	Using 1.25mm ² cable: Max. 2A/Total length of 50m or less Using 0.75mm ² cable: Max. 1.2A/Total length of 50m or less			
Error correction	Double check, chuck sum			
RAS functions	Transmission cable disconnection detecting function, Transmission cable short-circuit detecting function, Transmission circuit drive power supply voltage drop detecting function, ID (address) duplication/no setting detecting function			
Applicable cable	<ul style="list-style-type: none"> • General-purpose, 2-core/4-core cable (VCTF, VCT 0.75 to 1.25 mm², Rated temperature: 70°C) • General-purpose cable (0.75 to 1.25 mm², Rated temperature: 70°C) • Dedicated flat cable (0.75 mm² / 1.25 mm², Rated temperature: 90°C) 			
Connection method	T-branching, multi-drop, star-branching, Tree-branching			
Power supply	Voltage: 21.6 to 27.6 V DC (24 V DC -10 to +15%) Ripple: 0.5 V p-p or less Recommended voltage: 26.4 V DC (24 V DC +10%) To comply with the UL standard, be sure to use a 24 V DC stabilized power supply for NEC Class 2 output.			
Bit transmission cycle time	32 inputs	64 inputs	128 inputs	256 inputs
	32 outputs	64 outputs	128 outputs	256 outputs
	2.4 ms	3.6 ms	6.0 ms	10.7 ms
Power consumption	100 mA (not including the load)			
Weight	65 g			

Items	Specifications
Externally supplied power (24V DC power supply for AnyWireASLINK transmission)	Allowable supplied voltage: 21.6 to 27.6V DC (24V DC -10 to +15%), ripple voltage of 0.5 Vp-p or less Recommended voltage: 26.4V DC (24V DC +10%) Consumption current (B2P8-E01): 0.1A

*3: The allowable supply current of a transmission line varies depending on the total length and wire diameter of the transmission line.

See Table 1 for details.

Include the length of connected cable in the total length as well for slave units in which the connecting cable is integrated with the main unit.

Although some slave units with an attached cable have a wire diameter of 0.75mm² or less for the attached cable, there is no problem if the wire diameters of trunk and branch lines other than those of the unit are according to the specifications indicated below.

Table 1: Relationship between total length, wire diameter of connected cables and transmission line supply current of the AnyWireASLINK system

Wire diameter of transmission line	Transmission line supply current value		
	Total length: 50m or less	Total length: Over 50m, no longer than 100m	Total length: Over 100m, no longer than 200m
1.25mm ²	MAX 2A	MAX. 1A	MAX 0.5A
0.75mm ²	MAX 1.2A	MAX 0.6A	MAX 0.3A
0.5mm ²	MAX 0.8A	MAX 0.4A	MAX 0.2A

■ Required PC specifications

Items	Specifications
OS	Windows 7 (32bit/64bit), Windows 8.1 (32bit/64bit), Windows 10 (32bit/64bit)
Development environment	Microsoft Visual Basic 2010(*1), 2012(*1), 2013(*1), 2015(*1) Microsoft Visual C++(MFC) 2010, 2012, 2013, 2015 Microsoft Visual C# 2010(*1), 2012(*1), 2013(*1), 2015(*1) (*1) Express Edition-compatible

3.3 Transmission performance (AnyWireASLINK)

1. Transmission cycle time

The transmission cycle time is the time required for reception of input/output data by B2P8-E01 and all slave units.

The AnyWireASLINK system is a “constant-type” transmission system that determines the transmission cycle time according to the number of transmission points.

The cycle time of B2P8-E01 is as indicated below.

AnyWireASLINK transmission cycle time

(Unit: ms)

Transmission I/O point number setting	64 points (IN32, OUT32)	128 points (IN64, OUT64)	256 points (IN128, OUT128)	512 points (IN256, OUT256)
Transmission cycle time	2.4	3.6	6.0	10.7

3.4 Transmission Required Time

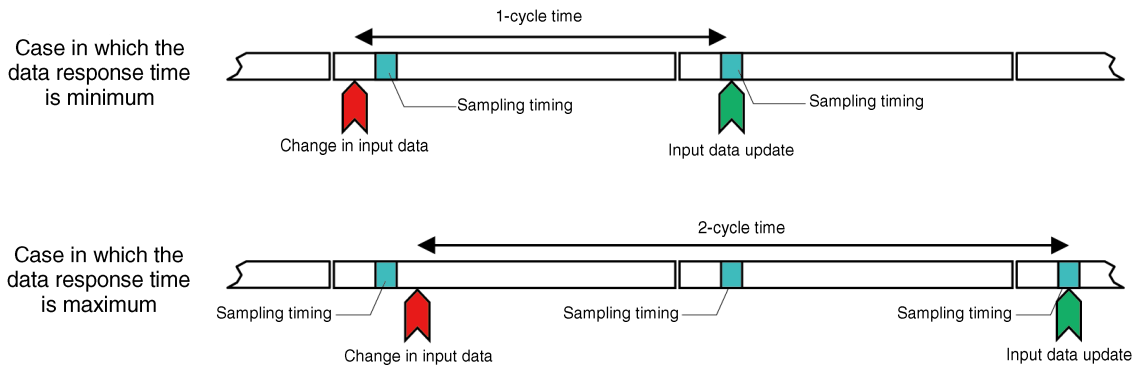
1. Double check

AnyWireASLINK does not update input area data unless it receives the same data consecutively twice (double check). For data update, therefore, it needs a transmission cycle time of one cycle at least and of two cycles at maximum.

[Cautions in handling an input signal]

If the signal transmission time is shorter than two cycles, the signal may not be recognized depending on the input timing. Therefore, **signal input should be longer than a two-cycle time to obtain secure response time.**

* Data is updated on a 16-bit basis between B2P8-E01 and the higher-order controller. With double-checking performed on a 1-bit basis, however, data cannot be guaranteed on a 16-bit basis in a strict sense.



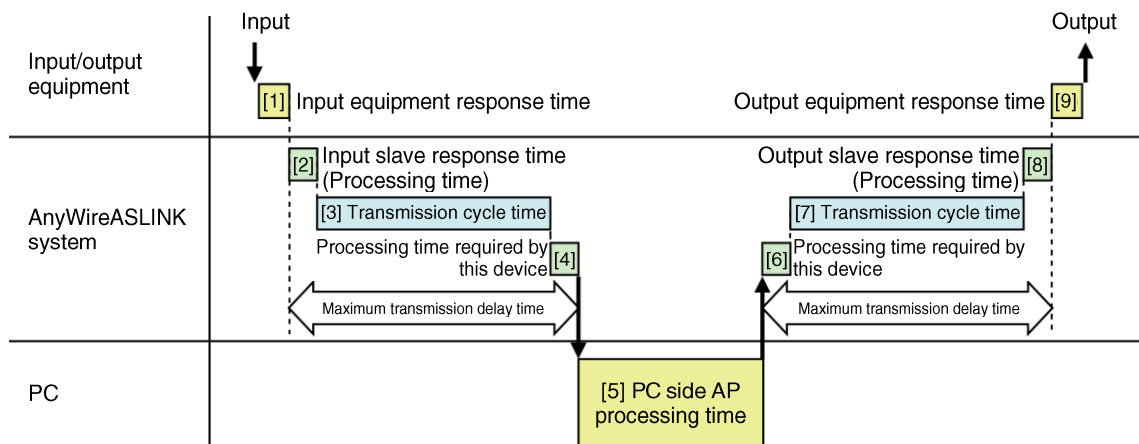
[Cautions in handling an output signal]

Data is double-checked within the output slave unit, too. For this reason, a transmission delay time of one to two cycles is needed to receive the output from the controller and to reflect that output.

Therefore, **hold the output signal from the controller for at least two cycles.**

2. Maximum transmission delay time

The transmission delay time from the input to the output is as shown in the following illustration.



No	Content	Time required
[1] [9]	Input/output equipment response time	Check the specifications of the input/output equipment you use.
[2] [8]	AnyWireASLINK slave unit response time (Processing time)	The specifications differ by slave unit. * For more information, refer to the manual of each slave unit.
[3] [7]	Transmission cycle time	A delay time of the transmission cycle time multiplied by one to two will occur. The transmission cycle time differs depending on how the number of transmission I/O points is set up. For more information, refer to 2.2 Performance specifications.
[4] [6]	Processing time required by B2P8-E01	0.6 [ms]
[5]	Processing time on the personal computer side	Time required to execute the API function

3. Parameter access response time

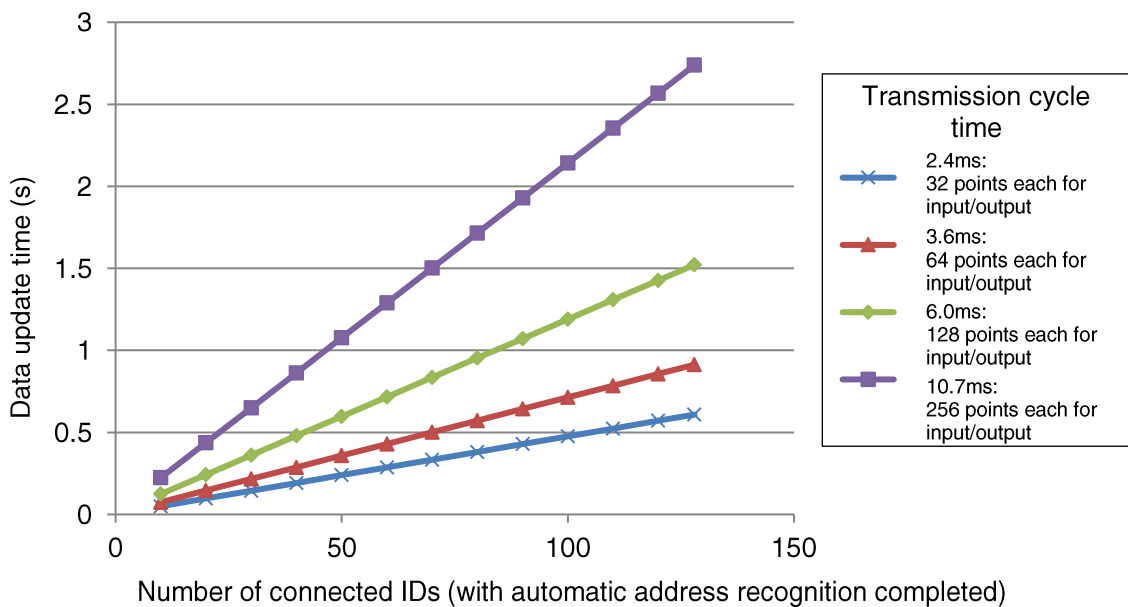
Parameters describe monitoring information of the overall network and setting information for slave units. Parameters are updated in a cycle that is different from input/output data between the memory of B2P8-E01 and slave units.

This parameter access response time can be calculated according to the formulas shown below.

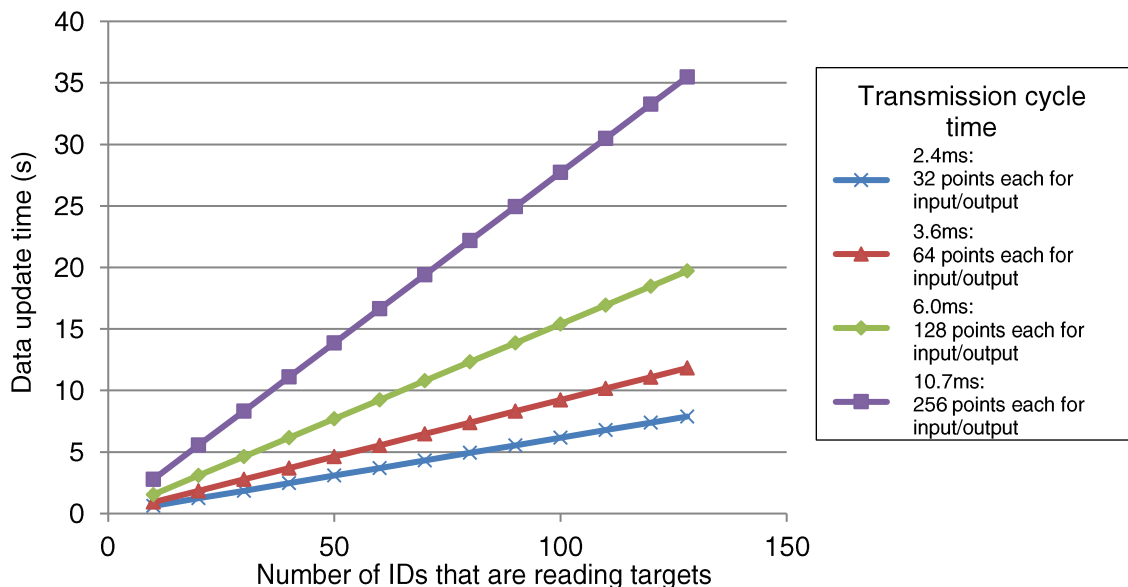
[Calculation Formulas] (The formulas shown below do not include the retry execution time due to transmission error.)

No	Response time	Calculation formula
1	Update interval of automatically updated parameters	Transmission cycle time x {Number of connected IDs x (2 + 1)}
2	Time required for parameter reading	Transmission cycle time x {Number of target IDs x (26 + 1)}
3	Time required for parameter writing	Transmission cycle time x {Number of target IDs x (38 + 1)}

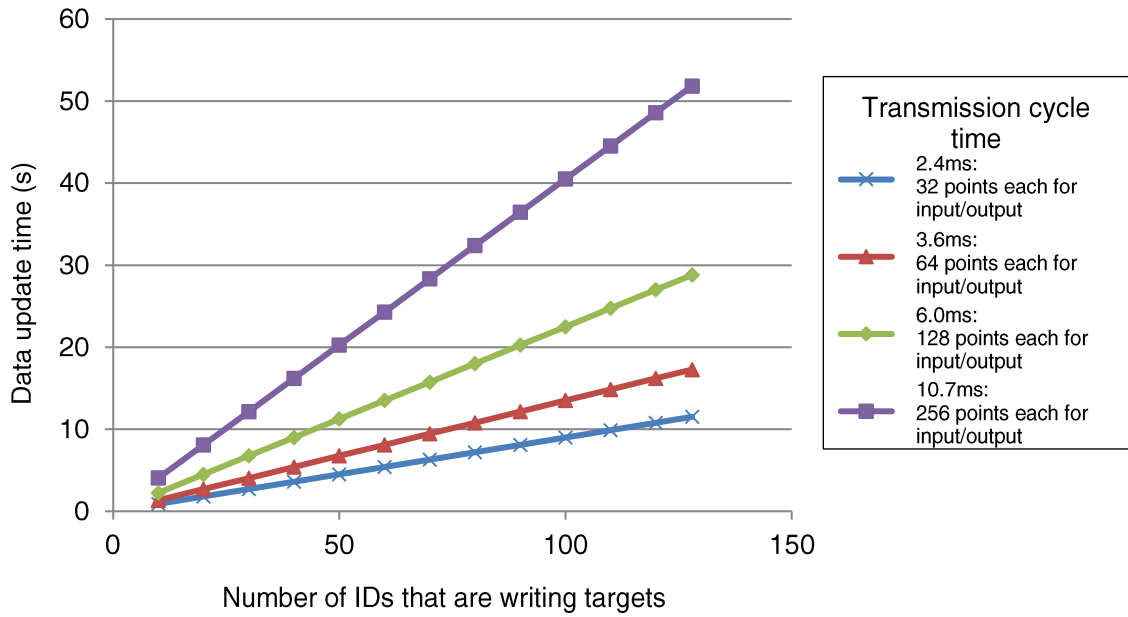
Update interval of automatically updated parameters



Time required for parameter reading



■ Time required for parameter writing



[Reference]

Examples of measured values of API execution time

Average values from 10,000 executions are indicated due to the variation in execution time caused by OS task scheduling.

[Environment]

OS: Windows10 64bit
CPU: Core i7-2600K(3.4GHz)

[Measured values]

Average time for one execution of the AslReadData function
5.4 [usec]

Average time for one execution of the AslWriteData function
5.5 [usec]

4. Overview of Functions

■ AnyWireASLINK transmission

Function	Description
Bit transmission	A maximum of 512 points of input/output data (256 points each for input and output) can be sent and received between B2P8-E01 and slave units.
Double checking	During AnyWireASLINK transmission, this error control method compares the previous and current cycle data, and processes the data as valid if matching, and it prevents updating due to invalid data if not matching. This serves to ensure transmission reliability.
Slave unit parameters reading and writing	The AnyWireASLINK sends and receives input/output parameters, as well as slave unit and AnyWireASLINK parameter information between B2P8-E01 and slave units. This function is used for checking and changing slave unit parameter information.

■ Address Setting

Function	Description
Automatic address recognition	Press the SET switch of B2P8-E01 to register the IDs (addresses) of connected slave units in B2P8-E01, followed by the start of sending/receiving of input/output data, and of checking the responses from registered slave units.

■ RAS

Function	Description
Transmission line short-circuit detection	Transmission is stopped if current exceeding the specified range of the AnyWireASLINK system is detected between DP and DN, or 24V and DP.
Transmission line disconnection position detection	You can determine the location of a disconnected transmission line (DP, DN) from the host system from the notification of the ID (address) of a slave unit that has been disconnected from B2P8-E01 as a result of the disconnection of the transmission line (DP, DN) connecting B2P8-E01 and the corresponding slave unit.
Transmission power supply voltage drop detection	This function detects voltage drops in the 24V DC power supply providing power to the AnyWireASLINK system to allow you to detect power malfunctions and wiring errors from the host system.
ID redundancy detection	This function detects redundant IDs (addresses) by performing automatic address recognition or address redundancy check, and indicates redundancy by forcibly lighting up the LED of the corresponding slave unit.
Detection of units without set ID	This function detects slave units without a set ID (address) (unit has the same default ID as when shipped from the factory) by performing automatic address recognition or address redundancy check.

■ Other

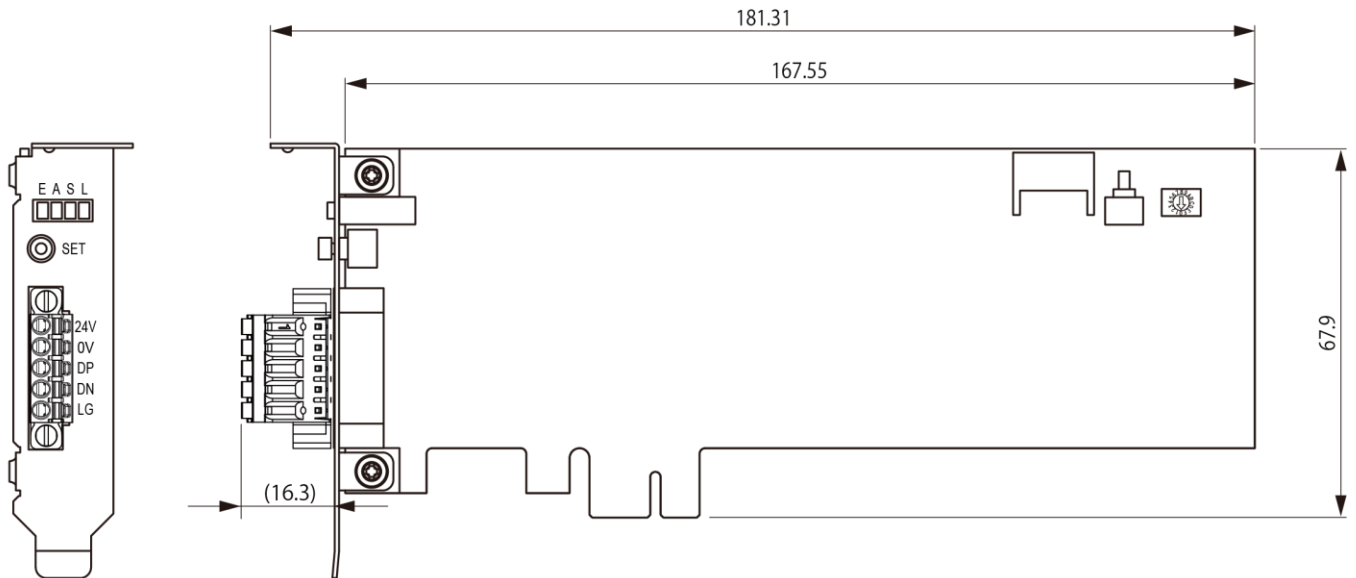
Function	Description
Parameter access error detection	Detects errors during parameter access.
Software reset	Performs a board reset by using software.

5. Structure

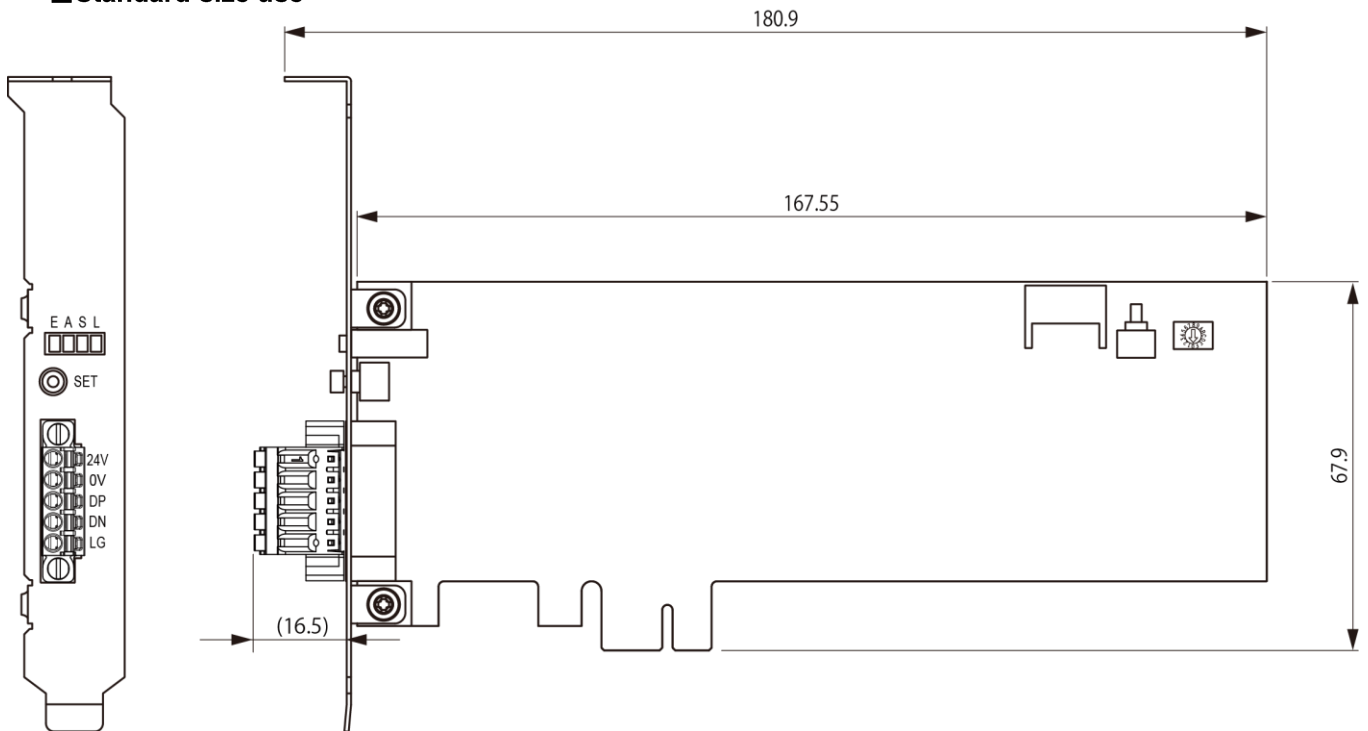
5.1 Outside dimensions

Unit: mm

■ Low-profile use

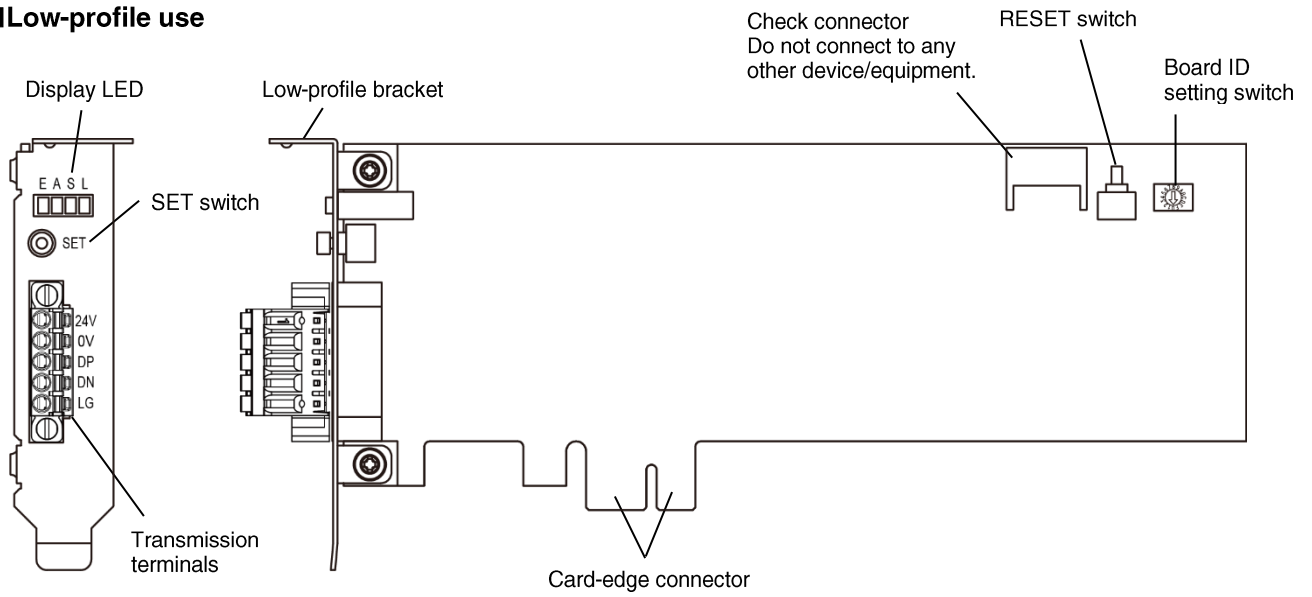


■ Standard-size use

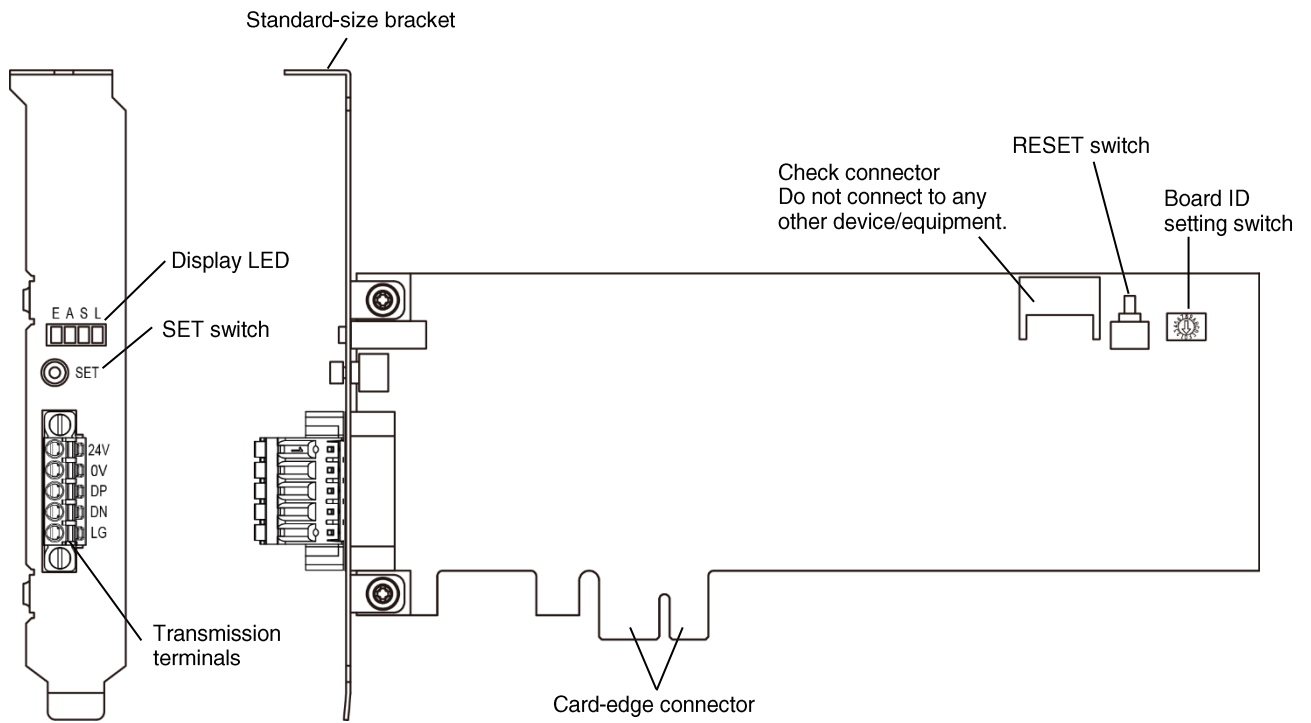


5.2 Name of each part

Low-profile use



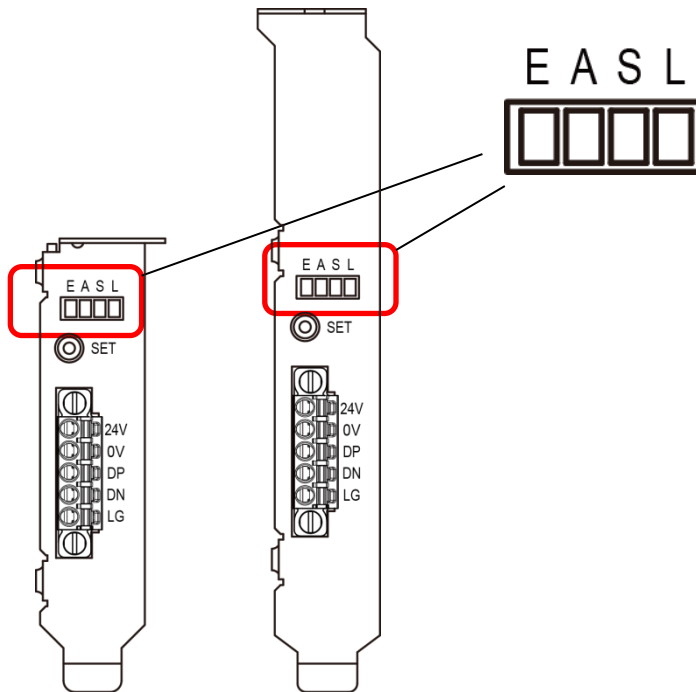
Standard-size use



Name	Description
Bracket	Mounting hardware (low-profile and standard sizes)
Display LED	Indicator lamps for transmission/operating status and board ID
SET switch	Switch for automatic address recognition
Transmission terminals	Terminals for connecting AnyWireASLINK transmission lines and power for transmission circuit driving
RESET switch	Switch for resetting B2P8-E01
Board ID setting switch	Switch for ID (identification number) setting when using multiple B2P8-E01's
Card-edge connector	PCI Express X1-compatible

5.3 LED display

B2P8-E01 has LED indicators that indicate the conditions of the device and system.



The LEDs are labeled as “E”, “A”, “S”, and “L”, and each one can be used to indicate in either “Normal mode” or “Board ID display mode.”

Details of the LED are as described below.

[Normal mode]

This mode displays the operating conditions of B2P8-E01 during transmission.

Name	Color	Meaning	
(L) LINK LED	Green	Flashing (every 0.2 seconds)	Energized with 24V
		Unlit or lit	Malfunction
(S) SET LED	Green	Lit	Automatic address recognition is operating.
		Unlit	Normally operating
		Flashing	Writing to EEPROM
(A) ALM LED	Red	Lit	DP or DN disconnection, or no slave unit response when the power of B2P8-E01 is first turned on
		Slow flashing (every second)	Short-circuit between DP-DN Short-circuit between 24V-DP
		Quick flashing (every 0.2 seconds)	24V DC is not supplied or voltage is low.
		Unlit	Normally operating
(E) ERR LED	Red	Lit	Watchdog timer error has occurred in PC
		Unlit	Normally operating

[Board ID display mode]

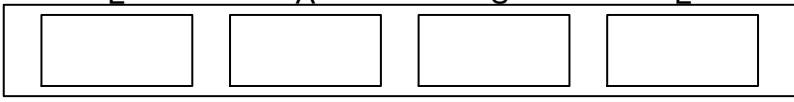
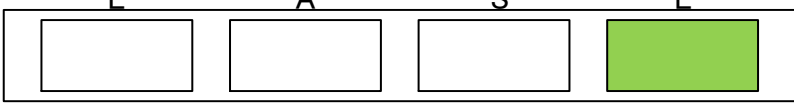
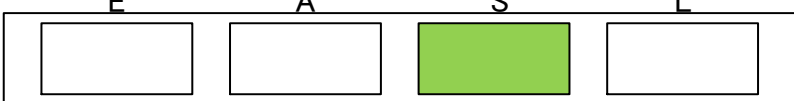

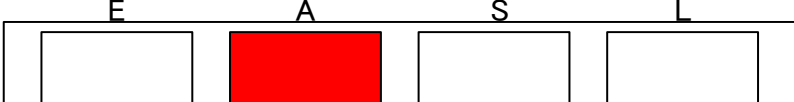
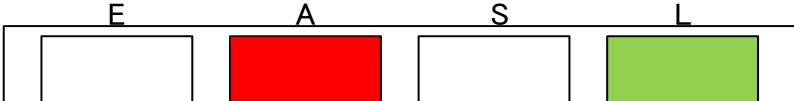



This mode indicates the ID of B2P8-E01 set by the internal board ID setting switch. In contrast to normal mode, indications are only made by using the LED display only.

[Changing to board ID display mode]

Briefly press (one second or less) the SET switch to change to board ID display mode.

[Returning to normal mode]

Briefly press (one second or less) the SET switch to return to normal mode, or the device will return normal mode 10 seconds after changing to board ID display mode.

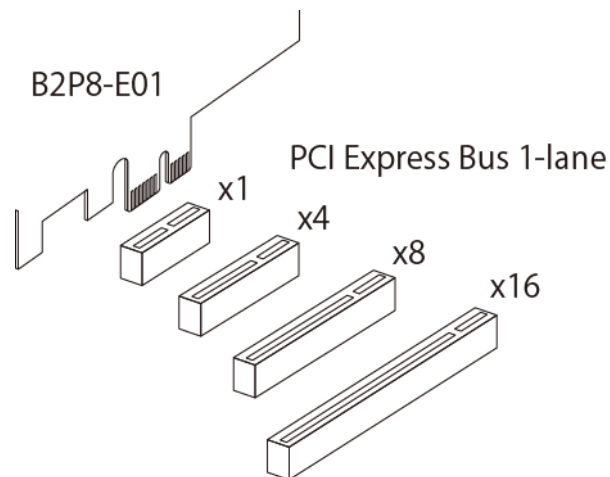
Indication	Meaning
	Board ID: 0
	Board ID: 1
	Board ID: 2
	Board ID: 3
	Board ID: 4
	Board ID: 5
	Board ID: 6
	Board ID: 7
	All LEDs flashing Board ID: Setting is outside of range (8 to F)

5.4 Installation

B2P8-E01 uses a PCI Express X1 connector.

For this reason, it can be mounted to slots of various types of PCI Express lanes (such as x1, x4, x8, and x16) of PCs.

Brackets are available in low-profile and standard-size use. Select the type appropriate for the slot where the device will be mounted.



CAUTION

Discharge static electricity from your body before touching B2P8-E01. Also, be careful not to touch the board mounting surface or card edge. Otherwise, a malfunction may occur.

Mounting surface

Edge connector

5.5 Installation location

Do not install in the following types of locations.

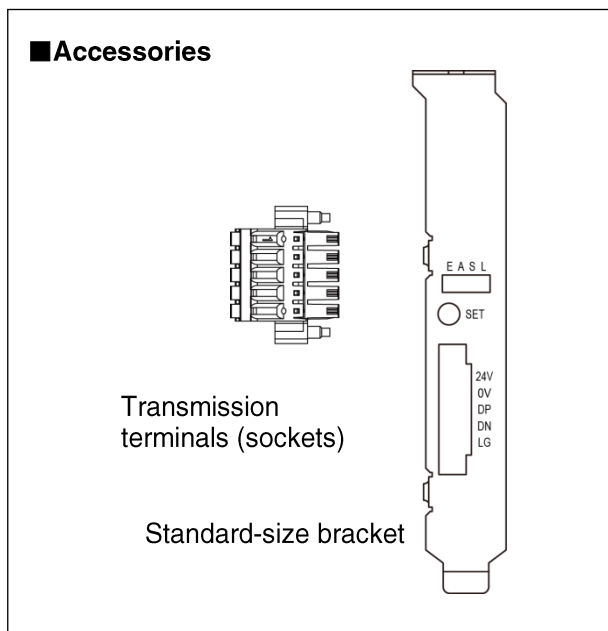
- Locations normally subjected to vibration or impacts
- Locations where this device is directly exposed to dust
- Locations where this device is directly exposed to conductors such as waste metal or sputter
- Locations where condensation readily occurs
- Locations where the atmosphere contains corrosive gas, flammable gas, or sulfur
- Near high-voltage or high-current cables
- Locations near cables or controllers that generate servo, inverter, or other high-frequency noise

5.6 Accessories

B2P8-E01 is mounted on a low-profile bracket when shipped from the factory.

Replace this bracket with the included standard-size bracket when using with a standard-size slot.

(Make sure not to lose the screws and other hardware.)



5.7 Slave units

1. Types of slave units

B2P8-E01 uses slave units for the AnyWireASLINK system.

The following types of slave units can be used.

Unit type	Slave
I/O terminal	ASLINK terminals and the like
Analog terminal	Analog input unit and the like
Sensor/amplifier	ASLINK sensor and the like
Other hardware	Small display unit and the like

- ◆ Confirm the model name and type of the slave unit by using the separate AnyWireASLINK system catalog.

2. Number of slave units connected

The maximum number of slave units that can be connected to one line of the AnyWireASLINK system is 128 units.

(It is necessary that both the total number of points occupied by slave units and the total consumption current of the transmission line do not exceed the maximum number of transmission points and the allowable supply current.)

3. Connection of slave units

There are roughly two types of methods for the connection of AnyWireASLINK slave units.

One is the “two-wire (non-isolated) type” method and the other is the “four-wire (isolated) type” method.

Classification	Operation
Two-wire (non-isolated) type	Slave units and connection loads are driven with just two transmission lines.
Four-wire (isolated) type	Two transmission lines are used to drive the transceivers. Slave units and connection loads are driven by two external power supply lines. This is selected when the allowable supply current via two transmission lines is insufficient, or when you wish to separate the power supply to the load.

Any configuration consisting of the two-wire type only, the four-wire type only, or a mixture of two-wire and four-wire types can be used.

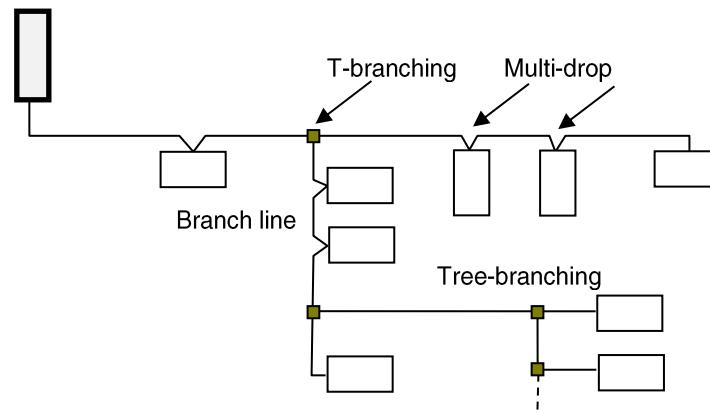
The choice whether to use a two-wire type or a four-wire type depends on the slave unit.

5.8 Transmission lines

The “AnyWireASLINK Protocol” is a low speed transmission clock that can also achieve effective high-speed transmission making it compatible with a wide range of cable characteristics, and therefore allows for various transmission cables and general-purpose electric wires to be used as transmission channels.

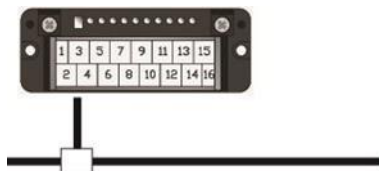
5.9 Connection mode

The AnyWireASLINK system allows for various connections such as T-branching, multi-drop, tree-branching, and star-branching.



1. T-branching method

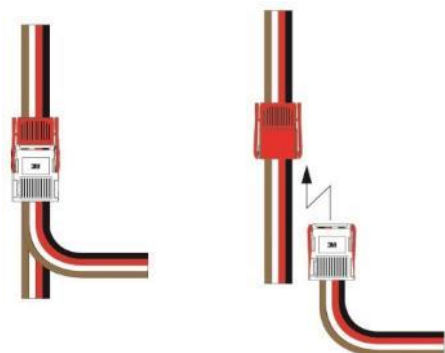
The T-branching method is a connection method to branch off a cable from an insulation displacement connector or terminal block and connect to the slave unit.



The actual wiring is shown below.

● When an insulation displacement connector is used

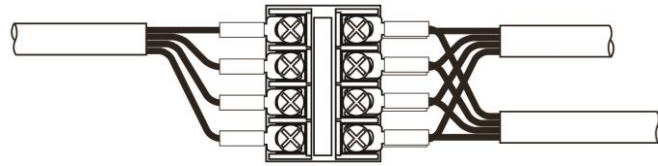
A flat cable is branched using an insulation displacement connector as described below.



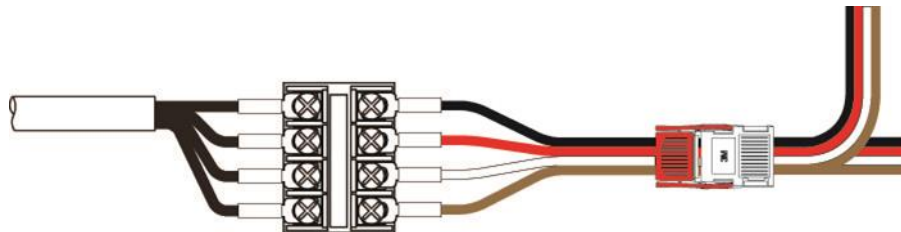
● When a terminal block is used

A cable can be branched as follows using a commercially available terminal block (a terminal block in which terminals that face each other are internally connected).

● **Branching between cabtyre cables**



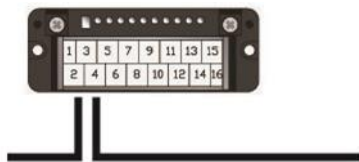
● **Conversion to a dedicated flat cable**



2. Multi-drop method

The multi-drop method is a way to connect slave units directly to cables.

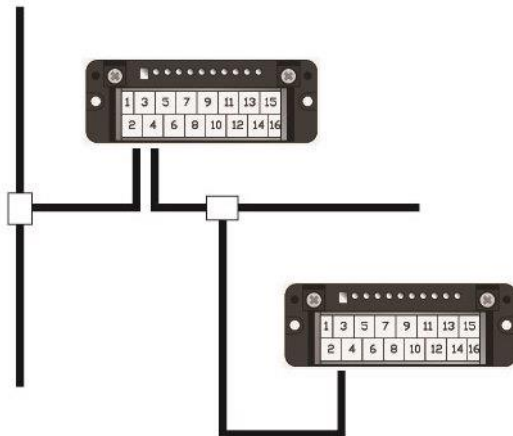
Use of this method eliminates the need for new cables or other connecting devices other than cables.



In the actual wiring, as shown in the image above, the signal lines of transmission cables from one side and those of transmission cables from the other side are integrated and connected to the slave unit.

3. Tree-branching method

The tree-branching method is a way to re-connect a T-branched branch line using the T-branching method or multi-drop method.

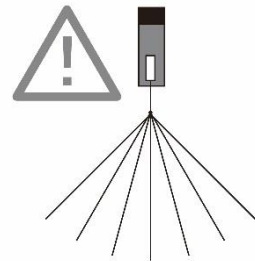


Actual wiring is the same as the T-branching method and the multi-drop method.

4. Star-branching method

The star-branching method is a way to connect the master unit and lay cable radially from a certain branching point to connect the slave unit. This method makes it easy to bundle transmission channels. However, it also tends to easily cause reflection.

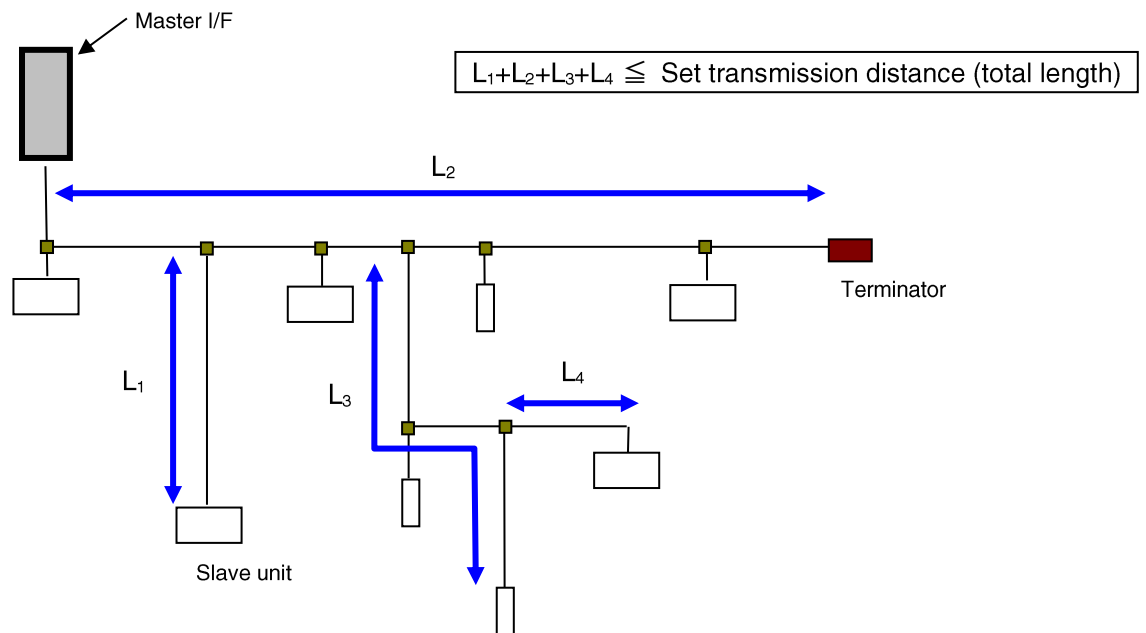
Although the AnyWireASLINK is not susceptible to reflection by a transmission method with a low-speed transmission clock, lay cables at the shortest distance with the minimum number of branches possible.



5.10 Transmission distance

All transmission distances described for AnyWireASLINK refer to the “total length” of a cable. Total length is the total cable length to be used including branches.

Wiring of the AnyWireASLINK system can be established with only two transmission lines (DP, DN). The two transmission lines (DP, DN) support a maximum total length of 200m. This total length also includes the length of the cable coming out of the slave unit.



5.11 Transmission cable type and precautions

General-purpose cable type cables, twisted pair cables and dedicated flat cables, and similar cables can be used for the transmission cable.

Use the following for electric wires.

- General-purpose two-wire/four-wire cable (VCTF, VCT 0.75 to 1.25mm², rated temperature 70°C)
- General-purpose electric wire (0.75 to 1.25mm², rated temperature 70°C)
- Dedicated flat cable (0.75mm², 1.25mm², rated temperature 90°C)

CAUTION **Shielded cable**




Since AnyWire has high noise resistance, it is unnecessary to use shielded cable.

Please note that if the shielded cable shielding is not properly grounded, it may result in problems during use.

CAUTION **Transmission cable**

- Be careful to prevent the voltage from dropping below the lower limit of the allowable voltage range due to voltage drop caused by the cable.
Dropping below the lower limit may result in malfunction.
Install a local power supply if the voltage drops significantly.
- Do not connect soldered wire directly to a terminal. Looseness may result in contact failure.

■ Electric wiring example

Type	Image	Specifications
300V vinyl cabtyre cable (VCTF)		JIS C3306 Cross-section area: 0.75mm ² Allowable current: 7A (30°C) Conductor resistance: 25.1Ω/km (20°C) or less Insulation resistance: 5MΩ/km (20°C) or more
Dedicated flat cable (HKV) Model: FK4-075-100 (100m winding)		Cross-section area: 0.75mm ² Allowable current: 7A Maximum conductor resistance: 25Ω/km
Dedicated flat cable (HKV) Model: FK4-125-100 (100m winding)		Cross-section area: 1.25mm ² Allowable current: 12.7A Maximum conductor resistance: 15Ω/km

5.12 Transmission line supply current value

The AnyWireASLINK system can be constructed with two wires.

Transmission signals as well as power for the slave unit and whatever is connected to the load side of the slave unit are superimposed on these two wires.

The allowable supply current (transmission line supply current value) from the transmission line varies depending on wire diameter and total wiring distance. It is therefore necessary that the total consumption current of the connected DP, DN (consumption current of the slave unit itself + consumption current on the load side connected to the two-wire type slave) does not exceed this allowable current value.

■ Transmission line supply current value

Length of transmission line	Wire diameter of transmission line (DP, DN)	
	1.25mm ²	0.75mm ²
Total length: 50m or less	MAX 2.0A	MAX 1.2A
Total length: Over 50m, no longer than 100m	MAX 1.0A	MAX 0.6A
Total length: Over 100m, no longer than 200m	MAX 0.5A	MAX 0.3A

5.13 Terminator

The terminator is intended to modify shape of transmission waveforms of the AnyWireASLINK system. This unit serves to relieve a condition that transmission waveforms are disturbed under influence of external environment.

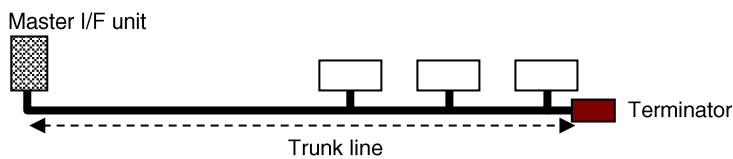
Be sure to connect one terminator relative to one master I/F unit, at the farthest end of the trunk transmission line.

To extend a stay line through branching, one terminator should be connected to the end of the stay line, if the stay line is 40m or longer.

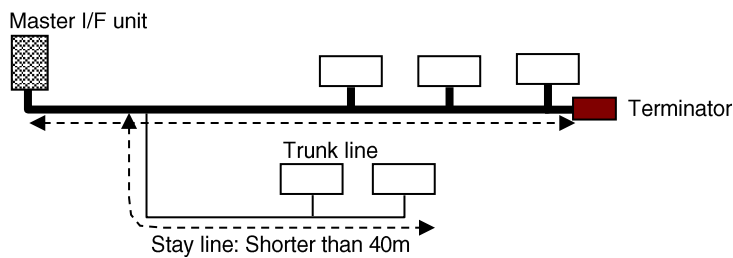
Up to three terminators can be connected to the AnyWireASLINK system.

The terminator has polarity (DP: Red, DN: Black). Ensure correct wiring to the transmission line. Improper wiring may cause transmission failure, resulting in unexpected operation.

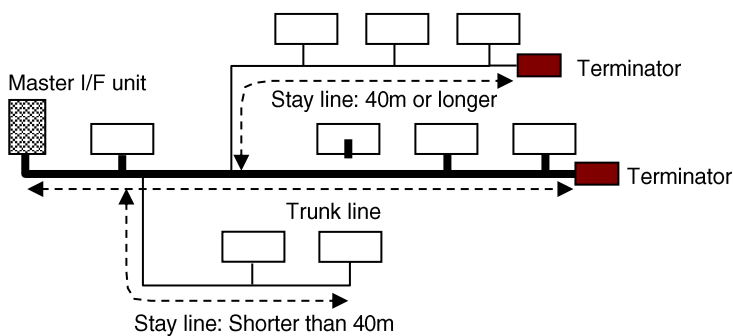
■ Connection of the terminator



■ Branching of transmission line



When the system has no stay line of 40m or longer



When the system has a stay line of 40m or longer

5.14 AnyWire filter

If any of the parallel lines of DP, DN, 24V, or 0V exceeds the total length of 50m in a power supply system to be supplied, connect in series the “ASLINK filter [Type ANF-01]” or a “COSEL filter [Type EAC-06-472]” to 24V and 0V in the starting position of the parallel lines.

This will improve noise resistance, reduce the impact of crosstalk by transmission signals, and stabilize the signals.

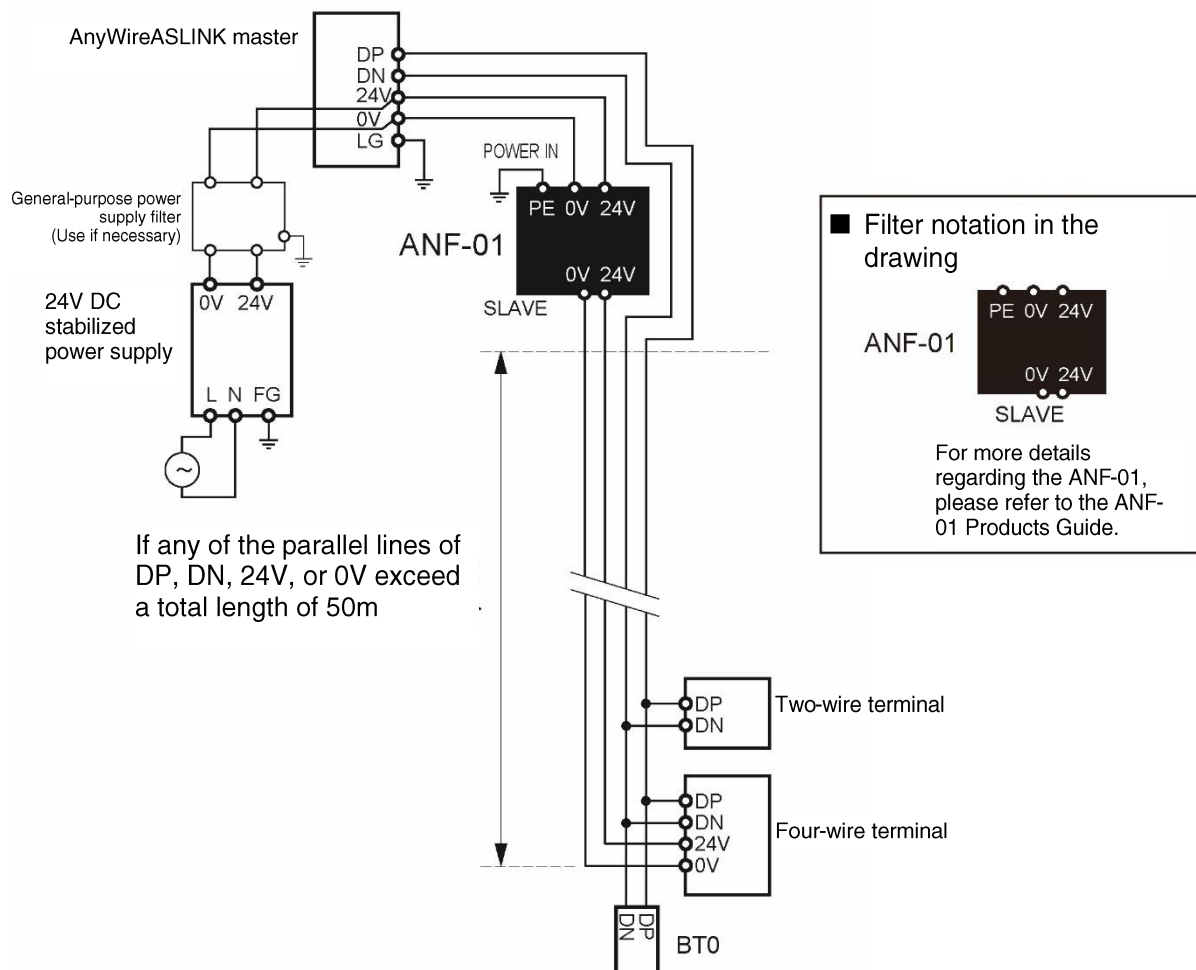
Insert a filter whether using a master power supply for the entire system or using a local power supply.

When complying with CE Standards, insert the “ANF-01” regardless of installation method and distance.

■ Filter allowable current

Model	Type	Allowable current
ASLINK filter	ANF-01	MAX 5A/24V DC
COSEL filter	EAC-06-472	MAX 6A/24V DC

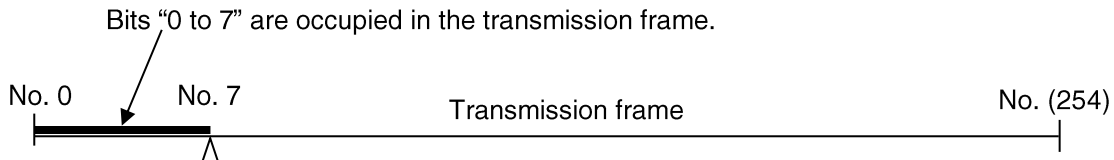
[ASLINK filter (ANF-01) connection example when there is a power supply to the entire system]



5.15 Address setting (reference)

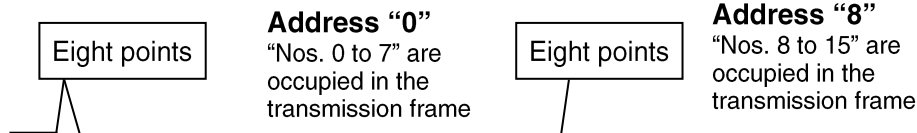
The "Address setting" of a slave unit is **determined by which number bit (in order) in the AnyWireASLINK transmission frame the slave unit is associated with.**
Each terminal occupies the location of its own point number (with the set address number placed at the beginning) from that position.
Addresses can be freely set from "0 to 254" for both input and output.

Example: Eight-point terminal: When address is "0"



Set addresses so as to avoid bit interference.

Example:



The address of a slave unit is processed as a decimal number.

Write the value that you want to set to the slave unit, using a dedicated address writer (ARW-04, ARW-03).

Bit address "255" or "511," showing that the address has not been set, is set before shipment.

Address before shipment differs depending on the slave unit.*

Input/output operations are not performed as long as an address before shipment remains unchanged.

There is no problem if "255" is included in the occupied numbers.

Example: Set address "254" to a two-point occupied terminal, and use "254" and "255."

It is necessary to be careful that the area which the slave unit occupies does not exceed the setting for the number of transmission point that is set on the master side.

* For more information, refer to the manual for the slave unit.

6. Monitoring function

6.1 Transmission line disconnection detection

[Overview]

AnyWireASLINK slave units have their own addresses, and when B2P8-E01 sends out an address, a response from the slave unit with that address allows for disconnection detection and verifies the existence of the slave unit.

B2P8-E01 stores the addresses of the slave units that are connected at that time via the automatic address recognition operation (described later) onto the EEPROM. This information is stored in memory even if the power is turned off.

Next, the registered addresses are sent out sequentially, and if there is no response, the “ALM” LED lights up to indicate a disconnection.

It is also possible to know the address of any slave unit that has an error by dedicated APIs.

[Registration of connected slave unit ⇒ Automatic address recognition]

Storing addresses of the connected slave units onto the EEPROM of B2P8-E01 is called “Automatic address recognition.”

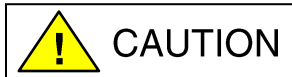
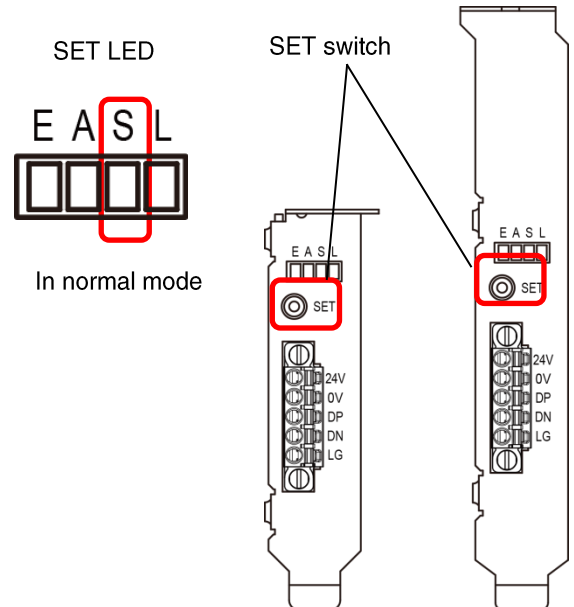
Changes to I/O transmission and monitoring operation when registration is completed.

Execution of automatic address recognition is performed at the following times:

- Start of system operation
- When a slave unit is added after operating the device
- When a slave unit is removed after operating the device
- When a slave unit address is changed after operating the device

Procedure

- 1 Check that all of the slave units are operating normally.
- 2 Press and hold the “SET” switch of B2P8-E01 until the “SET” LED (green) lights up.
- 3 The “SET” LED lights up for a while and then turns off when address storage has been completed.



- Input/output may not be carried out during automatic address recognition. When carrying out the automatic address recognition operation, stop execution of any PC programs or execute in a manner that does not interfere with the operation of the equipment.
- The automatic address recognition operation cannot be carried out if there is an error in the AnyWireASLINK such as a short-circuit, after the power is turned on, or for approximately five seconds after resetting.
- During startup of the system, do not execute automatic address recognition for any purpose other than slave unit configuration change. Otherwise, normally registered ID information will be overwritten.
- If automatic address recognition is executed in a condition that the system has an error (incorrect wiring, etc.), it may result in unexpected operation. For example, ID cannot be normally registered, invalid ID is registered, etc.

[Monitoring operation]

The registered addresses are sent out sequentially, and if there is no response, the “ALM” LED lights up to indicate a disconnection.

This error information is retained until the power is turned off or the alarm is reset. (See 5.3)

Although communication with the disconnected slave unit is not performed, it continues for units that are still connected.

6.2 Transmission line short-circuit detection

Sending of transmission signals is stopped if a short-circuit in transmission signals of DP and DN, or in the 24V DC line supplying DP and B2P8-E01 is detected.

When this occurs, the display LED “A” of B2P8-E01 flashes every second to indicate AslNotifyErrorStatus. A message is also displayed on the [Diagnostic Program] screen.

6.3 Detection of transmission circuit drive power voltage drop

Sending of transmission signals is stopped if the 24V DC voltage supplied to B2P8-E01 is detected to have dropped below the lower limit of the allowable range (approx. 18V).

When this occurs, the display LED “A” of B2P8-E01 flashes every 0.2 second to indicate AslNotifyErrorStatus.

A message is also displayed on the [Diagnostic Program] screen.

6.4 Detection of ID (address) redundancy/not set

The ALM indicator of the corresponding slave unit is forcibly flashed if ID (address) redundancy is detected for a connected slave unit during automatic address recognition.

In addition, AslNotifyErrorStatus is indicated if a slave unit that has not been specified is detected.

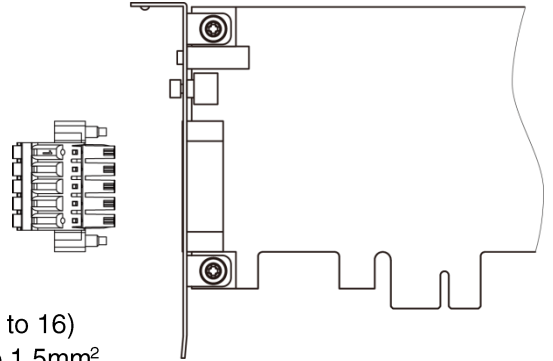
A message is also displayed on the [Diagnostic Program] screen.

ANYWIRE Devices>ASL B2P8-E01 “ASL□□□”>Properties>Common Settings tab>Diagnosis
[Diagnostic Program]

7. Connections

Transmission terminals are connected with a 24V DC power supply for driving B2P8-E01 and the AnyWireASLINK transmission line (DP, DN).
The following shows the terminal arrangement.
This terminal block is a detachable type.

	Signal name	Dedicated flat cable wire color	
		0.75mm ²	1.25mm ²
24V	24V	Green	Brown
0V	0V	White	White
DP	DP	Red	Red
DN	DN	Black	Black
LG	LG	--	--
Connector type: FMC1, 5/5-STF-3, 81 (manufactured by Phoenix Contact)			



- Applicable wire size: Stranded wires of 0.2 to 1.5mm² (AWG 24 to 16)
- Rod terminals without plastic sleeves: Stranded wires of 0.25 to 1.5mm²
- Rod terminals with plastic sleeves: Stranded wires of 0.25 to 0.75mm²

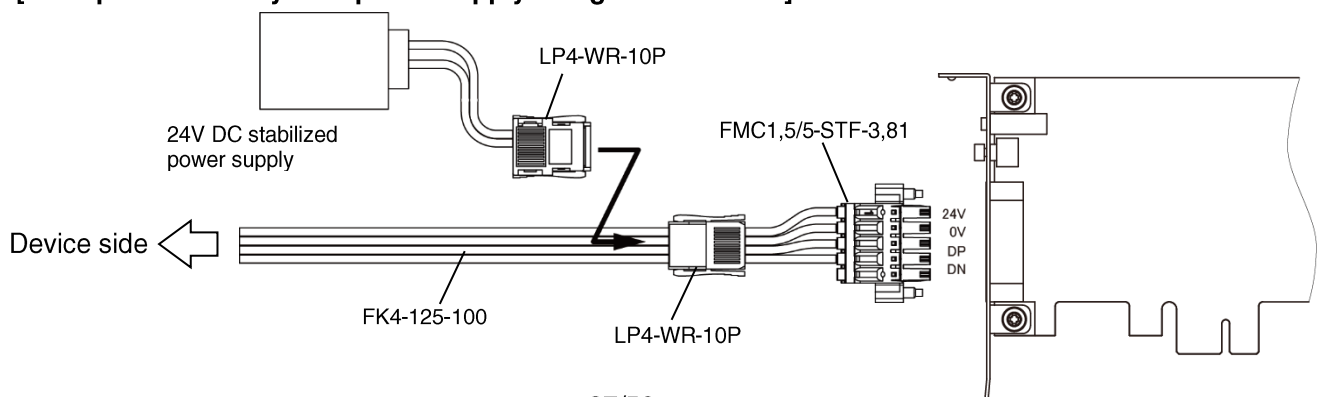
* Wire diameter of 1.25mm²: Can be used with “Rod terminals with plastic sleeves” only if using the dedicated flat cable (FK4-125-100).

Applicable rod terminal (AI 1-10 RD manufactured by Phoenix Contact)

Use a rod terminal that provides a conductive section of 10mm in length as required for this connector.
Before crimping, first check that the wire core is flush with or protrudes past the tip of the conductive section of the rod terminal. Failure of the wire core to completely reach the tip or using a rod terminal with a conductive section having an insufficient length may result in a faulty connection from the wire coming off due to crushing of the rod terminal tip or similar cause after connecting to the connector.
If the wire core is protruding, cut the tip at a position of approximately 0.5mm or less from the conductive section. (In order to make the wire reach the tip, it is best to provide a longish strip length (approx. 15mm) to the wire and cut the part of the wire core protruding from the tip after crimping.)
As there is small margin of the diameter of the conductive section of the applicable rod terminal indicated above in relation to the wire core diameter, carefully insert the stripped wire core by lightly stranding it or using a similar method to ensure that it does become frayed. (Be careful of excessive stranding because this will increase the diameter and prevent the wire core from being inserted into the rod terminal.)

If also supplying the power of B2P8-E01 to slave units, branch off the power line as shown in the example below.
Install the power source near B2P8-E01 and supply power from the closest position possible.

[Example of entire system power supply using LP connector]



8. Package software and API specifications

Package software and API to support transmission settings and diagnosis.

8.1 Package software

You can download drivers, settings and diagnostic tools from our website (<http://www.anywire.jp/>).

- Top page>Support & Download>Download>Software [PCI Express bus I/F]
- Top page>Support>Download>Software [PCI Express bus I/F]

For installation and updating of the driver, various settings and diagnosis tools, etc., refer to [APITool.chm] stored in [B2P8-E01_DRIVER_Installer].

- B2P8-E01_DRIVER_Installer > Help > ASLWDM > JPN [APITool.chm]

◆ Description of APITool.chm

- For details of the AnyWireASLINK driver, refer to [AnyWireASLINK Driver].
- For transmission settings and diagnosis, refer to [Utilities] in [AnyWireASLINK drivers].

Example screens of [Initial Settings Tool] and [Diagnostic Program] related to B2P8-E01 are shown on the following page.

ANYWIRE Devices>ASL B2P8-E01 “ASL□□□”>Properties>Common Settings tab>Diagnosis
[Diagnostic Program]
ANYWIRE Devices>ASL B2P8-E01 “ASL□□□”>Properties>Common Settings tab>Initial Settings
[Initial Settings Tool]

[Initial settings tool screen]

You can use the initial settings tool to set device names for this interface, number of AnyWireASLINK transmission points, double-check function, and output data conditions (HOLD or CLEAR) when a PC monitoring error occurs (WDT timeout).

■Screen configuration

The image shows a Windows Device Manager window with 'ANYWIRE Devices' expanded to show 'ASL B2P8-E01 "ASL000"'. A property window for this device is open, showing 'デバイス名' (Device Name) as 'ASL000' and 'ボードID' (Board ID) as '0'. The 'API-ASL(WDM) 初期設定ツール' (Initial Settings Tool) is also open, displaying the following settings:

- 【デバイス情報】 (Device Information):
 - デバイス (Device): ASL000
 - デバイス名称 (Device Name): B2P8-E01
- 【設定】 (Settings):
 - 伝送点数 (Transmission Points): 0003: 入力256、出力256
 - 2重照合モード (Double-check Mode): 0000: 全点数、Bitを2重照合
 - WDT出力クリア (WDT Output Clear): 0: 出力値を0クリア
- Buttons: 設定 (Settings), 初期値に戻す (Reset to Initial Values), デバイスリセット (Reset Device), 終了 (End)

Annotations with red arrows point to various elements:

- 'This device' points to the 'ASL B2P8-E01' device in Device Manager.
- 'Click here to access the initial settings tool of B2P8-E01.' points to the 'ASL B2P8-E01 "ASL000"' device.
- 'Set the device name for B2P8-E01.' points to the 'デバイス名' field in the property window.
- 'Set value of board ID setting switch of B2P8-E01' points to the 'ボードID' field in the property window.
- 'Click here to start the initial settings tool of B2P8-E01.' points to the '初期設定' button in the property window.
- 'References for [Settings] Start the initial settings tool of B2P8-E01.' points to the '設定' button in the tool.
- 'Select the number of transmission points, double-check mode, and clear WDT output, and then click here to apply the settings.' points to the '設定' button in the tool.
- 'Click here to reset B2P8-E01.' points to the 'デバイスリセット' button in the tool.
- 'Click here to initialize B2P8-E01. [Initial values] Number of transmission points: 0003 (256 for both input and output) Double-check mode: 0000 (double-check all points and bits) Clear WDT output: 0 (clear output value to 0)' points to the '初期値に戻す' button in the tool.

[Settings]

Number of transmission points: Select the number of input and output points for transmission using B2P8-E01.
 Double-check mode: Select whether to perform double-checking in bit (1-point) units or word (16-point) units.
 Select the target area because this check can become mistakenly mixed within the transmission frame.

Example: Number of transmission points: 0003 (256 for both input and output)

Double-check mode: 0001 (Double-check is performed by word until the first word and the remainder by bits.)

⇒ Both input/output addresses "0 to 15" are checked in word units, addresses "16 to 255" are checked in bit units.

Clear WDT output: If the watchdog timer detects a PC error, the output slave unit is forcibly turned off or the condition immediately prior to the error is retained.

[Diagnostic tool screen]

The diagnostic tool screen is as shown below.

It can be used to monitor IDs (addresses) of registered slave units, on/off numbers, and operating conditions.

You can also change parameter settings.

■Screen configuration

The screenshot shows the 'CONTEC 診断プログラム: AnyWireASLINK用モニタ' application. It features several windows and panels:

- Device Manager:** Shows 'ASL B2P8-E01 "ASL000"' selected under 'ANYWIRE Devices'. A red box labeled 'This device' points to it.
- ASL B2P8-E01 "ASL000"のプロパティ:** A window showing device details like 'デバイス名: ASL000' and 'ボードID: 0'. A red box points to the '初期設定' button with the text: 'Click to read-out and display a list of settings details and operating conditions of slave units registered to B2P8-E01.'
- Main Monitoring Window:**
 - Buttons: '接続機器自動検出' (labeled 'Click to read-out and display a list of slave units registered to B2P8-E01.'), 'スレブパラメータ設定' (labeled 'Click here if you want to change parameters and specify settings by using the settings screen.'), and 'エラーリセット'.
 - 【マスタデバイス情報】: Shows 'デバイス: B2P8-E01' and 'デバイス名: ASL000'.
 - 【スレブユニット一覧】: A table with columns: No., ID(Hex), アドレス, 形式, 入出力属性, 入力点数, 出力点数, 状態. It shows one entry: No. 0, ID 208, Address 8, Form BL296SB-08F, Input, 8 inputs, 0 outputs, Status OK.
 - 【モニタ】: Shows 'ID: 208 [Hex]' and '入出力状態' with input/output values set to 0. A red box points to the input field with the text: 'Adjusted to binary value of "1" indicates that the number inside that slave unit that is turned on.'
 - 【マスタエラー】: A section for master error details.
- スレブユニットパラメータ設定:** A window for setting parameters for a selected slave unit (ID: 208, Address: 8). It contains a table:

パラメータ No.	設定値
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0

 A red box points to the '書き込み' button with the text: 'Displays the error contents of the detected slave unit.'

8.2 APIs

The following is a list of supplied APIs.

Name	Function
Common functions	
AslInit	Initialization processing
AslExit	Exit (end) processing
AslResetDevice	Device and driver initialization
AslGetErrorString	Acquire error contents
AslQueryDeviceName	Acquire list of usable devices
AslGetSlaveInfo	Acquire list of slave unit information
AslGetSlaveNetInfo	Acquire specified slave unit information
Simple input/output function	
AslReadData	Input from specified slave unit
AslWriteData	Output from specified slave unit
AslEchoBackData	Input of output conditions from specified slave unit
Multiple unit input/output functions	
AslReadMultiData	Input from multiple specified slave units
AslWriteMultiData	Output from multiple specified slave units
AslEchoBackMultiData	Input of output conditions from multiple specified slave units
Status	
AslGetErrorStatus	Acquisition of error status information
AslResetErrorStatus	Error status reset
Event notifications	
AslNotifyInputChange	Input data change notification
AslSetInputChangeCallBackProc	Call-back function registration for AslNotifyInputChange function
AslNotifyErrorStatus	Notification of error occurrence
AslSetErrorStatusCallBackProc	Call-back function registration for AslNotifyErrorStatus function
Watchdog	
AslWdtEnable	Watchdog timer setting
Device parameters	
AslWriteSlaveParam	Device parameter settings for specified slave unit
AslReadSlaveParam	Acquisition of device parameters from specified slave unit

9. Troubleshooting

9.1 Visual check

B2P8-E01 and each unit have an LED status display function so that errors related to the operating state of the unit or communication can be narrowed down by checking the LEDs.

When any LED displays an error, review the setting and wiring to correct the error.

1. Check the LED state of B2P8-E01 When the “A” LED is lit or flashing

①Flashes slowly (every second): DP-DN short-circuit error

Items to check	Description of measures
Check that the transmission line (DP, DN) is not short-circuited	Check that the transmission line (DP, DN) is not short-circuited. Check that the pin assignment was correct when the link connector was crimped.
Check the wiring of the terminal block	Check that there is no contact of the transmission line (DP, DN) and no miswiring of the terminal block in B2P8-E01 or the slave unit.
Check that the consumption current of the AnyWireASLINK system meets the specification	Modify the cable (line diameter and total length) and units (type and number of units connected) so that the consumption current of all slave units does not exceed the supply current.

②Flashes quickly (every 0.2 seconds): Transmission power supply voltage drop error

Items to check	Description of measures
Check the voltage of the 24V DC external supply power	Make adjustments so that the voltage of the 24V DC external supply power lies within the rated range (21.6 to 27.6V DC). (Recommended voltage is 26.4V DC.)
Check that the power line (24V, 0V) is not short-circuited	Check that the power line (24V, 0V) is not disconnected or short-circuited. Check that the pin assignment was correct when the link connector was crimped.
Check the wiring of the terminal block	Check that the 24V DC external supply power is properly wired to B2P8-E01 and the slave unit terminal block. Also check that there is no short-circuit, miswiring, or insufficient tightening of the screws.

③Lights up: DP-DN (transmission line) disconnection error

Items to check	Description of measures
Check the latest error ID.	Identify a slave unit subject to the DP, DN disconnection error.
<ul style="list-style-type: none"> Check operation of the slave unit corresponding to identified error ID. Check the transmission line (DP, DN) for disconnection. Check if the terminal block and connector are normally connected. 	<p>If disconnection or incorrect connection is found, eliminate the cause of the problem.</p> <p>In case where operation of a slave unit is stopped although transmission and power supply lines are normally connected to the slave unit, it is possible that the unit has a fault.</p>
If this error occurs during system startup, check if automatic address recognition has been executed.	If the factory-set address remains, the ALM LED is lit regardless of whether the system has disconnection or not. If automatic address recognition has not been executed, execute it.

2. Check the LED state of the slave unit

(1) When “LINK” is lit or unlit

①Lit: Transmission waveform error

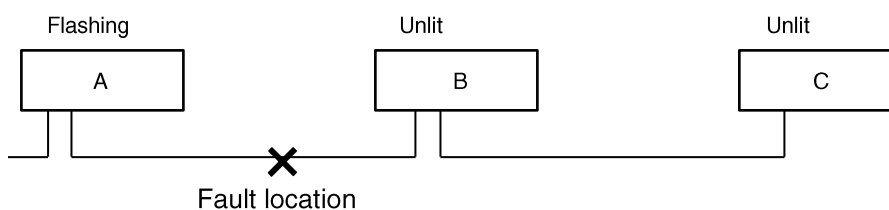
Items to check	Description of measures
Check that the transmission signal reaches the slave unit	<p>Under normal conditions, a voltage of approximately 17V to 18V is observed when measuring between transmission lines (DP, DN) using a tester in DC mode.</p> <p>If the measured voltage is the same as the power supply voltage, check that there is no miswiring of the transmission line.</p> <p>Also check that there is no error in B2P8-E01.</p>

②Unlit: Transmission signal disconnection fault

Items to check	Description of measures
Check that the transmission signal reaches the slave unit	<p>Check that there is no contact failure such as looseness in the connection parts of the transmission line (DP, DN).</p> <p>Check that power is being supplied to B2P8-E01.</p> <p>Check that transmission signals are reaching the terminal of the transmission line (DP, DN).</p> <p>Under normal conditions, a voltage of approximately 17V to 18V is observed using a tester in DC mode.</p>

When the transmission line is disconnected or suffers a similar fault, the position can also be identified by a difference in the “LINK” display of the slave unit.

Example:



“LINK” flashing means that transmission signals can be received up to slave unit A.
 Unlit “LINK” means that transmission signals cannot be received by slave unit B and after.
 Accordingly, it is determined that there is a disconnection between A and B.

(2) When the “ALM” is lit or flashing

① Lit: Slave unit status error

Items to check	Description of measures
Check the details of slave unit status.	Remove the cause of the fault.

② Flashing: Transmission signal level drop

Items to check	Description of measures
Check that the supply voltage of B2P8-E01 is within the allowable voltage range.	Adjust so that it is within the allowable range.
Check that the connection unit and load capacity are appropriate for the total length of the transmission line and allowable supply current.	Adjust the amount of load consumption for the number of connections so that it is with the range of the allowable supply current in accordance with the transmission line length, or reexamine the number of systems.

③ “LINK/ALM” alternately flashes: ID (address) redundancy or ID is not specified

Items to check	Description of measures
Check for address redundancy of slave unit and whether an address is specified.	Reset to eliminate the redundancy error or lack of specified ID.

④ “ALM” is lit, and “LINK” and “I/O” are flashing: Disconnection of two-wire sensor output

Items to check	Description of measures
Check the cable connecting the two-wire sensor with the slave unit.	Remove the cause of the fault in the wiring leading to the sensor. Or, replace the sensor.

(3) Output status on Windows application does not match output status of slave unit

Items to check	Description of measures
Check if the address of the slave unit matches the output address on the application.	Set the slave unit address correctly according to the output address on the application.
Check if the PC is not in sleep/standby status.	B2P8-E01 does not support sleep/standby status. Take measures so that the PC will not become sleep/standby status.

9.2 Checking by using the diagnostic tool

You can monitor the status of registered slave units by using the diagnostic program of the tool. (See 8.1)

■Example of tool screen for disconnection detection and tracking

Click on "Properties" of B2P8-E01.

The status of the connected slave unit is displayed.
BL294SB-08F: One unit connected
Detection of "DP, DN disconnection error"

Click "Diagnosis".

After repairing the disconnection, click here to reset the display and flag.

No.	ID(Hex)	アドレス	形式	入出力属性	入力点数	出力点数	状態
0	208	8	BL294SB-08F	入力	8	0	NG

【モニタ】
ID: 208 [Hex]
入出力状態
入力値: 0 [Hex]
出力値: - [Hex]
センシングレベル: 0

【マスターエラー】

エラーリセット

診断レポート発行

終了

9.3 If a driver cannot be properly installed

If the error "Digital signature error (Code 52)" occurs when installing a driver, install the Security Update for Windows 7 (KB3033929).

10. Warranty

■ Warranty period

The warranty on the delivered Product shall continue to be effective for one (1) year after the delivery thereof to a location as designated by the original owner.

■ Scope of warranty

Should a defect occur in any part of the Product during the foregoing warranty period when it is used normally in accordance with the specifications described in this User's Manual, the Company shall replace or repair the defect free of charge, except when it arises as a result of:

- (1) Misuse or abuse of the Product by the owner;
- (2) Faults due to a cause other than the delivered Product;
- (3) Unauthorized modification or repair of the Product by any party other than Anywire;
- (4) Any act of God, disaster, or other cause beyond the control of Anywire.

The term "warranty," as used herein, refers to the warranty applicable to the delivered product alone. The Company shall not be liable for any damages consequential or incidental to a malfunction of the delivered product.

■ Extra-cost repair

All investigation and repair after the warranty period are made for pay.

During the warranty period, we will accept, for pay, repair of a breakdown or investigation of the cause of a breakdown due to reasons outside the above scope of warranty.

■ Changes in the product specifications and the descriptions in the manual.

The descriptions in this user's manual may be subject to change without previous notice.

11. Directive on Waste Electrical and Electronic Equipment (WEEE)



Note: This symbol mark is for EU countries only.

This symbol mark is according to the directive 2012/19/ EU Article 14 Information for users and Annex IX.

This symbol means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from your household waste.

12. 中国版RoHS指令

的产品中有害物质的名称及含量

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 [Cr(VI)]	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
安装基板	×	○	○	○	○	○
框架	○	○	○	○	○	○

本表格依据 SJ/T11364 的规定编制。
○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T26572 规定的限量要求以下。
×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T26572 规定的限量要求。



基于中国标准法的参考规格：GB/T15969.2

13. Change history

Ver.	Date	Description of changes
First edition	Oct. 17, 2016	Released
1.0	Nov. 24, 2016	Added Chinese RoHS Directive
1.1	Apr. 25, 2017	8.2 API: Added API and troubleshooting information
1.2	Aug. 20, 2018	Addition of the method of correcting the error occurring at the turning-on of the power to Paragraph 5-2 in Chapter 1.2, updates of the contents of Chinese RoHS, unification of expressions, and other matters
1.3	Feb. 1, 2019	Corrections to 3. Specifications
1.4	Aug. 6, 2019	Corrections to 3.1 General specifications Corrections to 3.2 Performance specifications Corrections to 3.4 Transmission Required Time Corrections to 5.7 Slave units Corrections to 5.15 Address setting (reference) Corrections to 10. Warranty Unification of other expressions
1.5	Feb. 26, 2020	Correction in wiring precautions Correction in "5.13 Terminator" Correction in "6 Monitoring function" Correction in "11. Troubleshooting" Updating of contact information Unification of other expressions
1.6	Nov. 16, 2020	Correction in design precautions Correction in "1.1 Installation" Correction in "2. Overview" Correction in "9.1 Visual check"
1.7	Jun. 14, 2021	Correction in "8.1 Package software"
1.8	Sep. 27, 2021	Updating of System overview illustration in "2. Overview"
1.9	Feb. 6, 2023	Added Directive on Waste Electrical and Electronic Equipment(WEEE) Updating of RoHS Directive

Anywire

Anywire Corporation

Headquarters: 1 Babazusho, Nagaokakyo-shi,
Kyoto 617-8550 JAPAN

Website: <http://www.anywire.jp>

E-Mail inquiry: info_e@anywire.jp