

AMAX-4800 Series Industrial EtherCAT Slave Modules Startup Manual

Packing List

Before installation, please check that the following items are included in the shipment:

- 1 x AMAX-4800 module
- 2 x Terminal blocks (see Specifications for more details)
- 1 x AMAX-4800 startup manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

User Manual

For more detailed information about this product, download the latest user manual from the Advantech website.

EtherCAT Slave Information File

The AMAX-4800 EtherCAT slave information (ESI) file can be downloaded from the Advantech website at <http://r.advantech.com/q5>.

Every ESI file contains the configuration data of an EtherCAT slave module. Various EtherCAT communication settings can be defined from the ESI files of connected slave units as well the network connection information. ESI files are saved to the configuration tool to provide network configuration data. Subsequently, the network configuration data can be downloaded to an EtherCAT master unit for configuring an EtherCAT network.

For more information about this or other Advantech products, please visit our website at

<http://www.advantech.com>

<http://www.advantech.com/eplatform>

For technical support and service, please visit our support website at

<http://support.advantech.com>

This manual is for the AMAX-4800 series modules.

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Overview

The AMAX-4800 series comprises industrial EtherCAT slave modules equipped with the EtherCAT protocol. The modules' compact size and integrated DIN-rail mount kit ensure easy installation in a variety of cabinets. The modules also feature euro-type pluggable terminal blocks and LED indicators that facilitate system setup and maintenance. All modules are equipped with an isolation circuit that ensures current protection for demanding industrial applications.

Specifications

General

- **Connectors**
 - 10-pin terminal block (3.81 mm) * N
(AMAX-4830/30SO/33/34/50: N = 4,
AMAX-4855/56: N = 8,
AMAX-4860: N = 3,
AMAX-4862: N = 6)
 - 3-pin screw terminal block (3.81 mm) * 2 (power)
 - RJ-45 * 2 (EtherCAT)
- **Dimensions**
 - AMAX-4830/30SO/33/34/50/60: 120 x 120 x 40 mm
 - AMAX-4855/56/62: 168 x 120 x 40 mm
- **Operating Temperature:** -20 ~ 60 °C (32 ~ 140 °F)
- **Storage Temperature:** -40 ~ 70 °C (-40 ~ 158 °F)
- **Storage Humidity:** 5 ~ 95% RH (non-condensing)
- **Power Supply:** 10 ~ 30 V_{DC}

Communications

- **Interface:** EtherCAT
- **Data Transfer Medium:** Ethernet/EtherCAT cable (CAT5 min.), shielded
- **Distance Between Modules:** 100 m max.(100BASE-TX)
- **Communication Cycle Time:** 100 us
- **Data Transfer Rate:** 100 Mbps
- **Configuration:** Not required

Digital Input

- **Channels**
 - AMAX-4830/4830SO/4850/4862: 16 channels
 - AMAX-4833/4855/4856: 32 channels
 - AMAX-4860: 8 channels
- **Input Voltage**
 - Logic 0: 3 V max.
 - Logic 1: 10 V min. (30 V max.)
- **Isolation Protection:** 2,500 V_{DC}

Specifications (Cont.)

Digital Output

- **Channels**
 - AMAX-4830/4830SO: 16 channels
 - AMAX-4834/4856: 32 channels
- **Load Voltage:** 5 ~ 40 V_{DC}
- **Load Current**
 - 350mA/channel (sink) @25 °C
 - 250mA/channel (sink) @60 °CAMAX-4830SO:
 - 250mA/channel (source) @25 °C
 - 200mA/channel (source) @60 °C
- **Isolation Protection:** 2,500 V_{DC}
- **Opto-Isolator Response Time:** 100 us

PhotoMOS Relay Output

- **Channels**
 - AMAX-4850: 8 channels
 - AMAX-4855: 16 channels
- **Relay Type:** PhotoMOS SPST (Form A)
- **Load Voltage:** 60 V (AC peak or DC)
- **Load Current:** 1.2A
- **Peak Load Current:** 4A @100 ms (1 pulse)
- **Isolation Protection:** 1,500 V_{DC}
- **Turn-On Time:** 1 ms typical
- **Turn-Off Time:** 0.6 ms typical

Relay Output

- **Channels**
 - AMAX-4860: 8 channels
 - AMAX-4862: 16 channels
- **Relay type:** Form A
- **Contact Rating (Resistive):** 2A @250 V_{AC}, 2A @30 V_{DC}
- **Max. Switching Power:** 500 VA , 60W
- **Max. Switching Voltage:** 270 V_{AC} , 125 V_{DC}
- **Resistance:** 30 mΩ max.
- **Operating Time:** 10 ms max.
- **Releasing Time:** 5 ms max.
- **Life Expectancy**
 - Mechanical: 2 x 10⁷ ops. at no load
 - Electrical: 3 x 10⁴ ops. @2A/250 V_{AC}

Installation

1. Download the AMAX-4800 user manual and ESI file from the Advantech website (<http://r.advantech.com/q5>).
2. Import the ESI file to create an EtherCAT network information (ENI) file using either
 - (1) Advantech Common Motion Utility (with a PCI-1203 EtherCAT master card)
 - (2) Other EtherCAT master software, such as TwinCAT or Acontis
3. Use the master utility to test the AMAX-4800 modules.

Power

AMAX-4800 modules feature two power input terminals, an input power range of 10 ~ 30 V_{DC}, and power redundancy support. For modules connected to two power input sources, if one source is inactive or interrupted, the other power source can take over immediately. The AMAX-4800 modules can operate with only a single power source.

2 *AMAX-4800 Startup Manual*

Declaration of Conformity

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in residential areas is likely to cause interference. In such cases, users are required to correct the interference at their own expense.

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. Advantech does provide shielded cables. Contact your local supplier for ordering information.

Rotary Switch

AMAX-4800 modules use two hexadecimal rotary switches to represent the slave ID (range: 0 ~ 255).





For example, if a user arranges the rotary switches following the sequence "4, F", the slave ID will be set as "4 x 16 + F x 1 = 79".

Dip Switch

AMAX-4830SO

AMAX-4830SO provides separated COM connections in groups of eight digital input/output channels. As a default, EC0, EC1, PC0, and PC1 are isolated from each other. However, for cases where EC0 and EC1, or PC0 and PC1, need to be connected together, this can be achieved using SW2 and SW3. EC0 and EC1 are connected together when the SW2 switch is in the up (open) position. Similarly, PC0 and PC1 are connected together when the SW3 switch is in the up (open) position.

	SW2/SW3 Switch in the Up Position EC0 & EC1 Open PC0 & PC1 Open
	SW2/SW3 Switch in the Down Position EC0 & EC1 Close PC0 & PC1 Close

LEDs

Power Indicator

Indicator State	System State	Description
Off	Power off	The system is not on/ power is off
On	Power on	The system is on/ power is on

Run Indicator

Indicator State	Slave State	Condition
Off	Initialization	The device is in the Initialization state
Blinking	Pre-Operational	The device is in the Pre-Operational state
Single flash	Safe Operational	The device is in the Safe Operational state
On	Operational	The device is in the Operational state
Flickering	Bootstrap	The device is booting and has not yet entered the Initialization state/ the device is in the Bootstrap state/ firmware download in progress

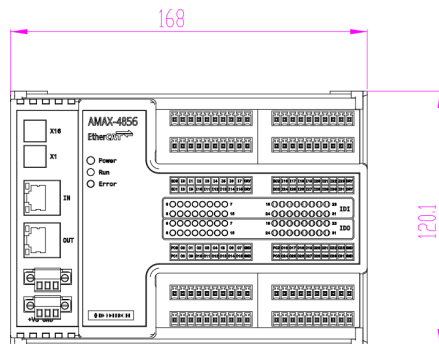
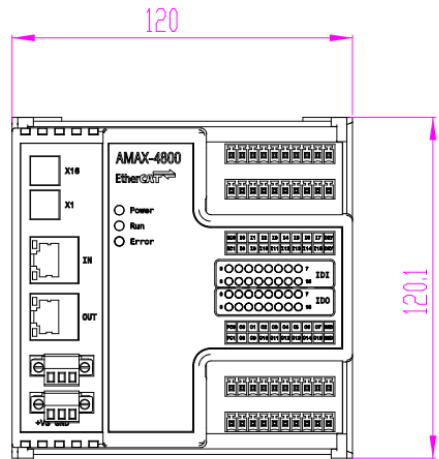
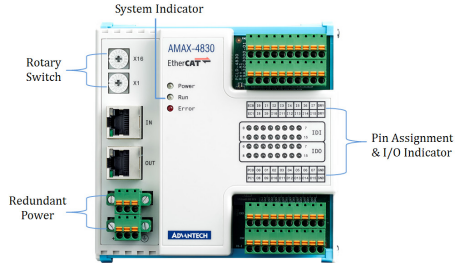
Error Indicator

Indicator State	Error Name	Description
Off	No error	The device is in working condition
Blinking	Invalid configuration	General configuration error
Single flash	Local error	A slave device application has changed the EtherCAT state autonomously due to local error/the error indicator bit is set to 1 in the AL Status register
Double flash	Watchdog timeout	An application watchdog timeout has occurred

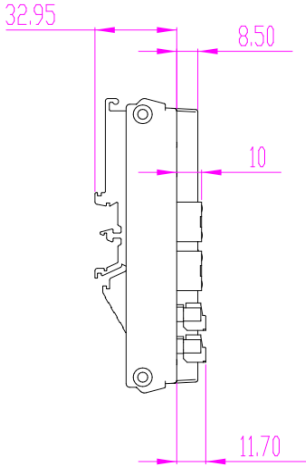
Link Indicator (on RJ-45)

Indicator State	Link	Activity	Description
On	Yes	No	Port open/connected
Flickering	Yes	Yes	Port open/connected
Off	No	Not applicable	Port closed/disconnected

Dimensions



Dimensions (Cont.)

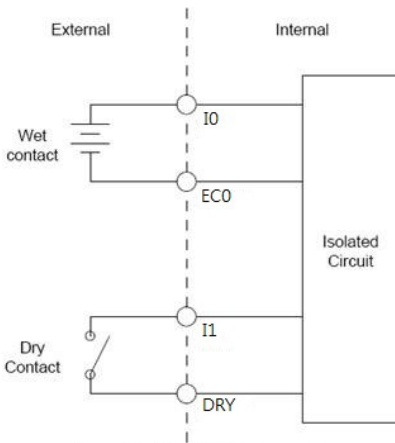


Connections

Isolated Digital Inputs

All isolated digital input channels accept voltages between $10 V_{DC}$ and $30 V_{DC}$. Every eight input channels share one external common collector (channels 0 ~ 7 use EC0 and channels 8 ~ 15 use EC1).

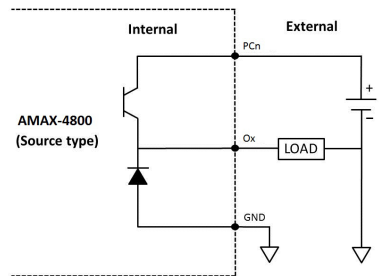
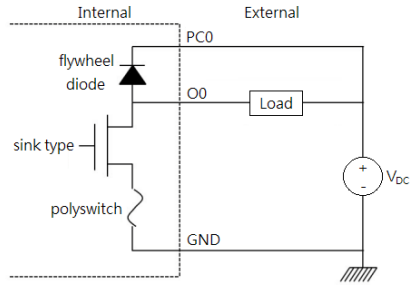
The diagram below shows how an external input source should be connected to the module's isolated inputs.



Connections (Cont.)

Isolated Digital Outputs

If an external voltage source ($5 \sim 40 V$) is connected to each isolated output channel (On) and the isolated digital output is turned on ($350 \text{ mA max./channel}$), the module current will sink from the external voltage source. IDO modules provide EGND pins for IDO connection. The diagrams below show how an external output load should be connected to the module's isolated outputs.



Relay Outputs

The layout and connections of the relay outputs are shown in the diagram below.

