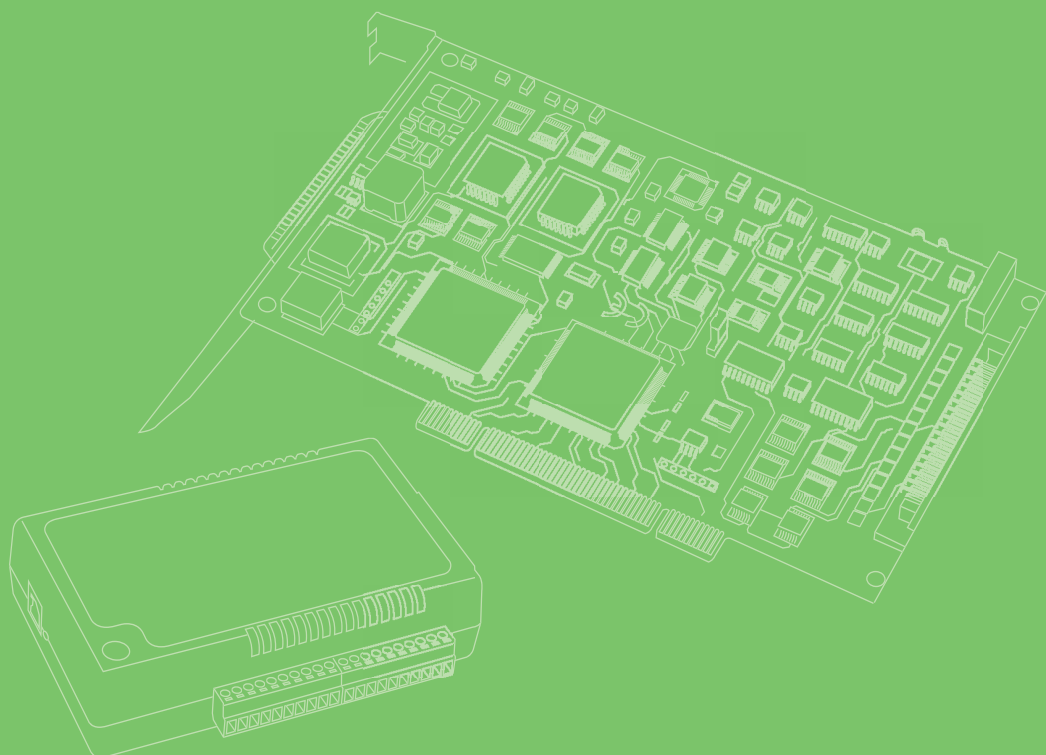


User Manual



AMAX-4800 Series

Industrial EtherCAT Slave Modules

ADVANTECH

Enabling an Intelligent Planet

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This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

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1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
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3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
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5. Write the RMA number clearly on the outside and then ship the package prepaid to your dealer.

Declaration of Conformity

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. This type of cable is available from Advantech. Please contact your local supplier for more information.

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 a residential area is likely to cause harmful interference. In such cases, users are required to correct the interference at their own expense.

Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information to hand before calling:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (OS, version, application software, etc.)
 - Comprehensive description of the problem encountered
 - The exact wording of any error messages

Safety Precautions - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from the PC chassis before manually handling the product. Do not touch any components on the CPU card or other cards when the PC is powered on.
- Disconnect the power before making any configuration changes. The sudden rush of power after connecting a jumper or installing a card can damage sensitive electronic components.

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket should be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place this equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If unused for a long time, disconnect the equipment from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following occurs, have the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated the equipment.
 - The equipment has been exposed to moisture.
 - The equipment is malfunctioning, or does not operate according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment shows obvious signs of breakage.
15. Do not store the equipment in an environment where the temperature fluctuates below -20 °C (-4 °F) or above 60 °C (140 °F) as this can cause damage. The equipment should be stored in a controlled environment.
16. The battery is at risk of explosion if incorrectly installed or replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
17. According to IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).

DISCLAIMER: These instructions are provided in accordance with IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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Chapter 1

Introduction

1.1 EtherCAT Introduction

EtherCAT (Ethernet Control Automation Technology) is a high-performance, Ethernet-based fieldbus industrial network system. The protocol is standardized in IEC 61158 and applied to automation applications that require fast and efficient communications. Short data update times with precise synchronization make EtherCAT suitable for real-time automation technology requirements.

1.1.1 EtherCAT

Functional Principle

EtherCAT is a flexible, real-time, high-speed, Ethernet-based protocol. In EtherCAT networks, the master sends Ethernet frames through all the slave nodes. However, standard Ethernet packets or frames are no longer received, interpreted, and copied as process data at every node. Instead, slave devices read the data addressed to them while inserting input data as the telegram passes through the device, effectively processing data immediately. Typically, the entire network can be addressed using a single frame. Compared with other Ethernet-based communication solutions, EtherCAT uses the full available duplex bandwidth more efficiently.

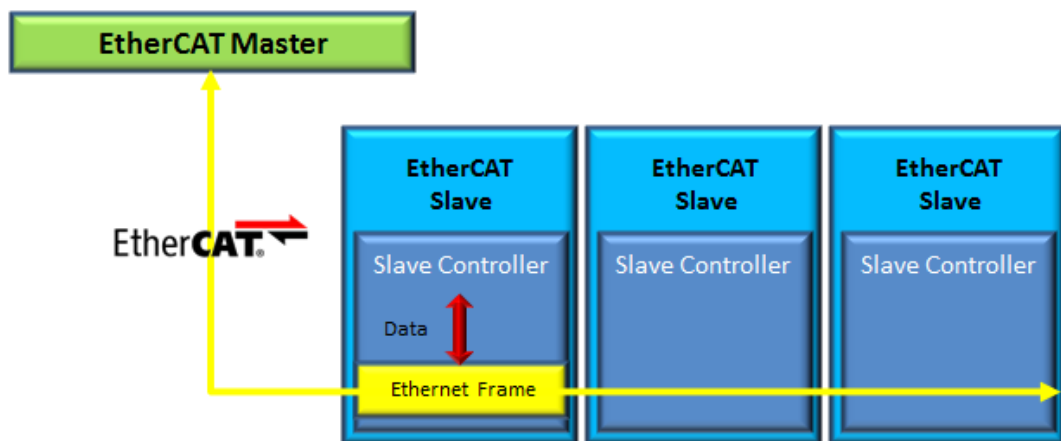


Figure 1.1 EtherCAT Function Principle

1.1.1.1 Protocol

Data exchanges are cyclically updated between the EtherCAT master and slaves. Data in EtherCAT frames is transported within the standard IEEE 802.3 Ethernet frame using EtherType 0x88a4 and then processed by the EtherCAT slave controller. Every EtherCAT datagram is a command that consists of a header, data, and a working counter. The datagram header indicates the type of access requested by the master device (see the examples listed below).

- Read, write, read-write
- Access to a specific slave device through direct addressing
- Access to multiple slave devices through logical addressing

Logical addressing is used for the cyclical exchange of process data. The header and data are used to specify the operation that the slave must perform. The working counter is updated by the slave to notify the master that the command has been processed.

Every EtherCAT datagram ends with a 16-bit working counter (WKC). The WKC counts the number of devices successfully addressed by the EtherCAT datagram.

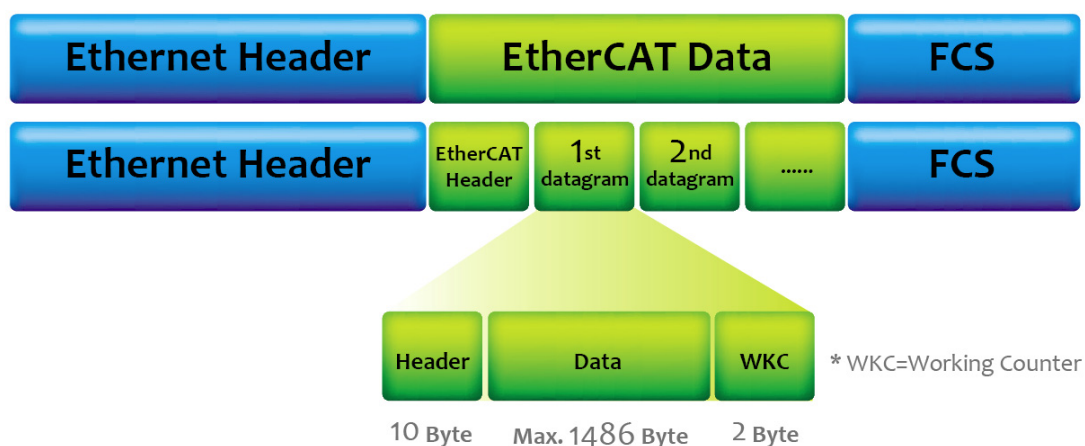


Figure 1.2 EtherCAT Protocol

EtherCAT datagrams are processed before the complete frame is received.

Encase the data is invalid, the frame check sum (FCS) is set as “not valid” and the slave does not set the data as “valid” for local applications.

1.1.1.2 Topology

EtherCAT supports various network topologies, including line, tree, ring, and star topologies. The line and tree topologies are more conducive to fieldbus applications because they require fewer connections and use a comparatively simpler and more flexible cabling scheme that does not necessitate switches or hubs.

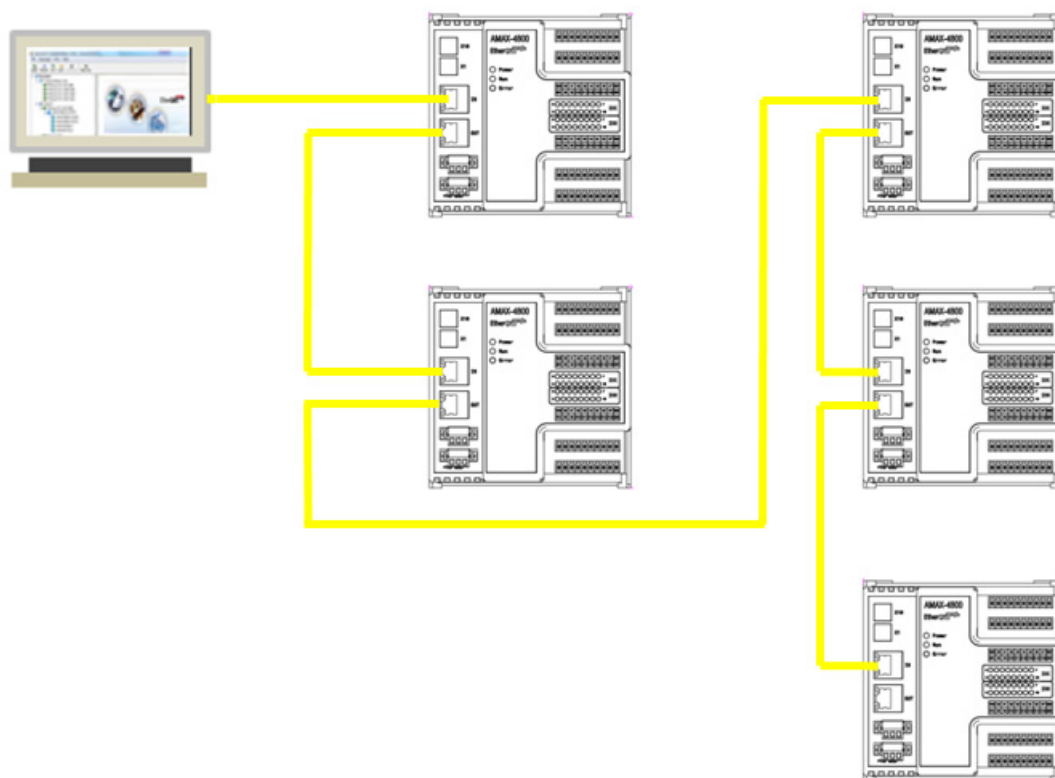


Figure 1.3 EtherCAT Topology

Inexpensive industrial Ethernet cables placed up to 100 m apart can be used between two nodes in 100BASE-TX mode. EtherCAT facilitates the creation of a pure bus or line topology with hundreds of nodes. Up to 65,535 devices can be connected to EtherCAT, enabling almost unlimited network expansion.

EtherCAT also supports the connection and disconnection of individual nodes during operation. If one slave in the network is removed, the rest of the network can still operate normally. EtherCAT also enables other communication features, such as cable redundancy or even master redundancy with hot standby.

1.1.1.3 Synchronization

The **distributed clock (DC) mechanism** is used to provide highly precise time synchronization between slaves in an EtherCAT network, equivalent to the IEEE 1588 Precision Time Protocol standard. By using distributed clocks, EtherCAT is able to synchronize the time of all local bus devices within a very narrow tolerance range. All EtherCAT slaves are provided with an internal clock known as “system time” ($t_{Local\ Time}$). One EtherCAT slave, usually the first one, is used as a reference clock and distributes its time cyclically.

Misalignments between the reference clock and the clocks of the other slaves are usually caused by the following: when a slave is switched on, the internal free-running register that holds the current time is reset to zero. Unfortunately, this action does not occur simultaneously in all the slaves, resulting in an initial offset (t_{Offset}) among the clocks that must be compensated for.

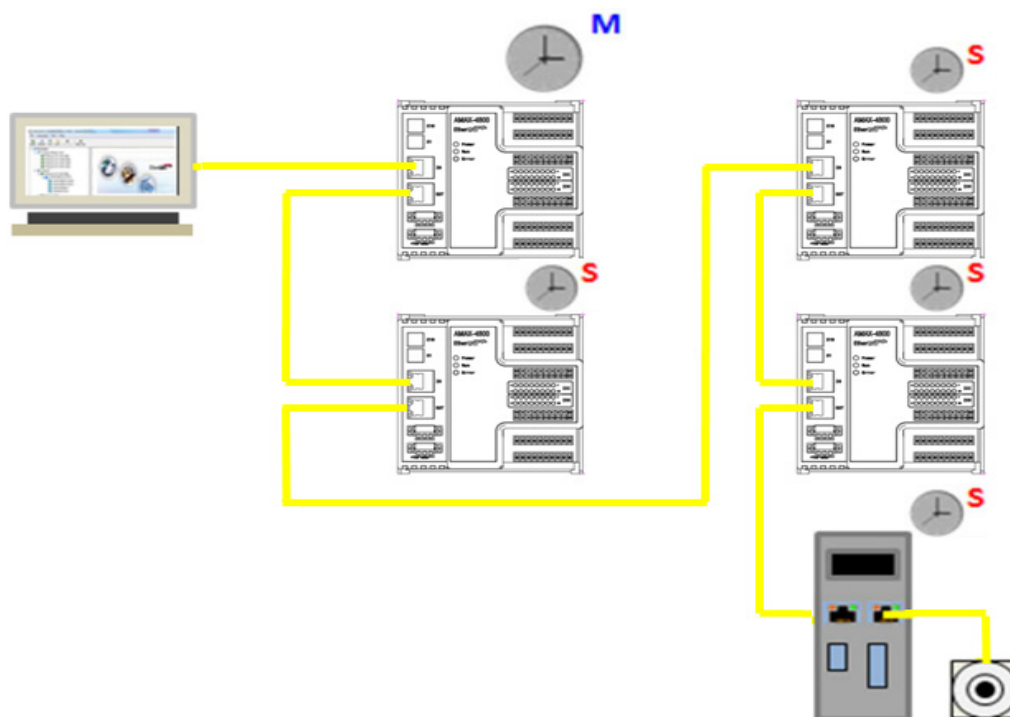


Figure 1.4 EtherCAT Distributed Clock

Typically, the master sends a broadcast to all slaves in the system. Upon receiving the message, all slaves latch the value of their internal clock. There are two latch values – receiving and returning. Thus, the master can read all latched values and calculate the delay for each slave ($t_{\text{Propagation Delay}}$). Delays are stored in the offset register. Subsequently, the master periodically sends a message to all other slaves in the EtherCAT network declaring the first slave the reference clock and instructing all other slaves to set their internal clock according to the calculated offset.

$$\Delta t = (t_{\text{Local Time}} + t_{\text{Offset}} - t_{\text{Propagation Delay}}) - t_{\text{Received System Time}}$$

Because slave synchronization in DC mode is performed by the hardware's internal clock, EtherCAT guarantees a time jitter of less than 1 us.

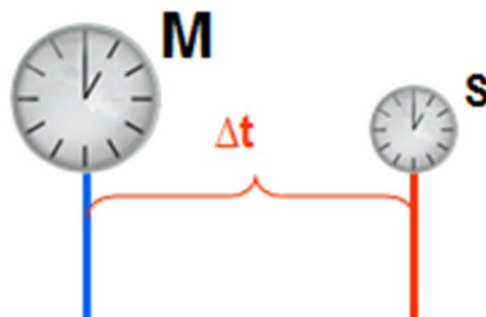


Figure 1.5 EtherCAT Distributed Clock Jitter

1.1.1.4 Diagnosis with Exact Localization

EtherCAT is an ultra-fast I/O system. To achieve optimal high-speed communication, communication accuracy is required. EtherCAT comprises a wide range of system-specific diagnostic features for precisely detecting and locating system errors. Besides broken wire detection and localization, the protocol, physical layer, and topology of the EtherCAT system enable quality monitoring of each individual transmission segment.

As mentioned previously, every EtherCAT datagram ends with a 16-bit WKC for counting the number of devices successfully addressed by the EtherCAT datagram. The master can check the data exchange situation through the WKC in the cycle and detect the error frame by analyzing the nodes' error counters. The slave application is only executed when the frame is correctly received. The automatic evaluation of the associated error counters enables precise localization of critical network sections.

Bit errors during transmission can be reliably identified by analyzing the cyclic redundancy check (CRC) check sum. CRC is an error-detecting code commonly used in digital networks and storage devices to detect accidental changes to raw data. In addition to the error detection and localization protocol, the transmission physics and topology of the EtherCAT system allow quality monitoring of every single transmission path. Overall, EtherCAT features a very effective monitoring mechanism.

1.2 AMAX-4800 Series Features

The AMAX-4800 series comprises industrial EtherCAT slave modules equipped with the EtherCAT protocol. The modules' compact size and integrated DIN rail mount kit enable easy installation in cabinets. Euro-type pluggable terminal blocks and LED indicators assist users with system setup and maintenance. All modules are protected by an isolation circuit, making them suitable for demanding industrial applications.

1.2.1 EtherCAT Free-Run and Distributed Clock (DC) Modes

EtherCAT telegrams are sent by the EtherCAT master to all connected EtherCAT slaves, which perform continually synchronous/asynchronous sequences of calculations and/or data copying actions. EtherCAT has two data transfer modes – Free Run mode and DC mode.

Free Run Mode

In Free Run mode, the local cycle is triggered via a local timer interrupt, and the cycle time can be modified by the master (optional) to change the timer interrupt. The local cycle operates independent of the communication cycle, and the slave refreshes I/O data asynchronous to the master.

DC Mode

In DC mode, the slave refreshes I/O data in synchronization with the master's communication cycle. A mechanism known as a distributed clock (DC) is applied to timing signals generated independent of the communication cycle for precise timing requirements. The DC is shared to synchronize the master and the slaves. Interruptions (Sync0) are generated in the slaves at precise intervals based on this clock. Each slave executes I/O processing at this exact time. This means that all EtherCAT devices can share the same EtherCAT system time (global time base) for synchronization.

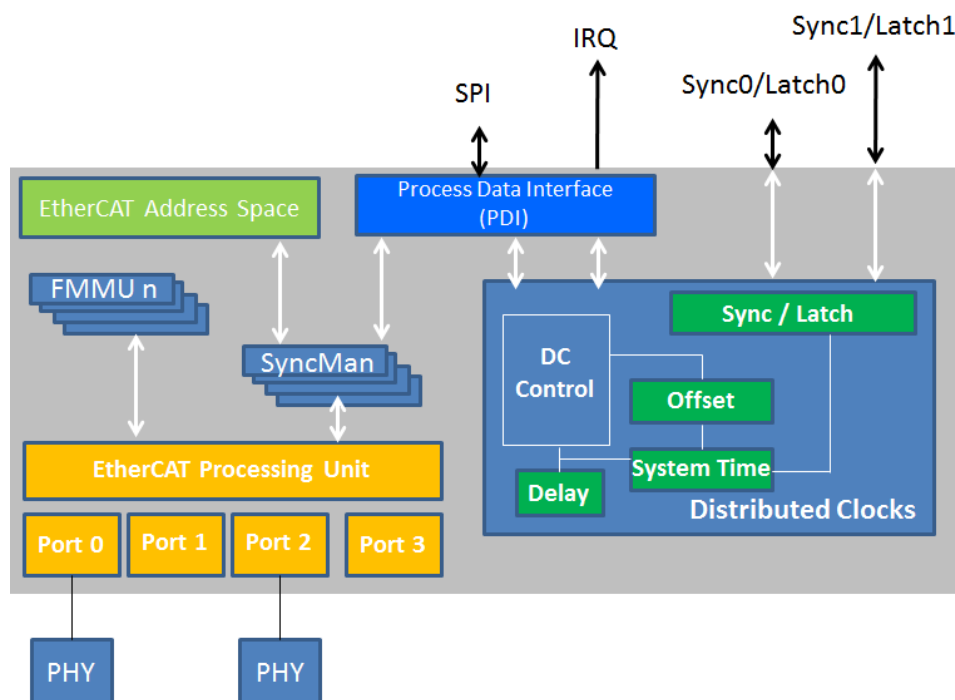


Figure 1.6 Distributed Clock Unit Interfaces

1.2.2 Software Support

Based on the EtherCAT standard, Advantech provides the necessary DLL drivers and Windows utilities to configure the AMAX-4800 series modules, including I/O modules integrated with Windows XP/7/8/10.

Advantech also provides a Common Motion I/O API for users to develop unique applications under a Common Motion architecture in order to unify the user interfaces of all Advantech motion devices.

Users can also configure parameter settings via a third-party EtherCAT master, such as TwinCAT, Codesys, or Aconis, by using the AMAX-4800 series module's ESI file to connect to existing EtherCAT networks.

1.3 Specifications

1.3.1 Communication

Item	Description
Interface	EtherCAT
Data Transfer Medium	Ethernet/EtherCAT cable (min. CAT5), shielded
Distance Between modules	Max. 100 m (100BASE-TX)
Communication Cycle Time	100 us
Data Transfer Rates	100 Mbps

1.3.2 General

Item	Description
Connectors	10-pin terminal block, 3.81 mm *N
	3-pin screw terminal block, 3.81 mm * 2 (power)
	RJ-45 * 2 (EtherCAT)
Dimensions	120 x 120 x 40 mm (4.72 x 4.72 x 1.57 in) for AMAX-4817/20/30/33/34/50/60
	168 x 120 x 40 mm (6.61 x 4.72 x 1.57 in) for AMAX-4855/56/62
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}
Certification	CE, FCC Class A

*N

	AMAX 4817	AMAX 4820	AMAX 4830	AMAX 4833	AMAX 4834	AMAX 4850	AMAX 4855	AMAX 4856	AMAX 4860	AMAX 4862
N	2	1	4	4	4	4	8	8	3	6

1.3.3 I/O

Channels

Item	AMAX-4830/SO	AMAX 4833	AMAX 4834	AMAX 4850	AMAX 4855	AMAX 4856	AMAX 4860	AMAX 4862
Isolated Digital Input Channels	16	32	-	16	32	32	8	16
Isolated Digital Output Channels	16	-	32	-	-	32	-	-
PhotoMOS Relay Output Channels	-	-	-	8	16	-	-	-
Relay Output Channels	-	-	-	-	-	-	8	16

Isolated Digital Input

Item	Description
Input Voltage	Logic 0: 3 V max.
	Logic 1: 10 V min. (30 V max.)
Operating Temperature	-20 ~ 60 °C (32 ~ 140 °F)
Isolation Protection	2,500 V _{DC}

Isolated Digital Output

Item	Description
Load Voltage	5 ~ 40 V _{DC}
Load Current	350mA/ch sink or source @ 25 °C
	250mA/ch sink or source @ 60 °C
Isolation Protection	2,500 V _{DC}
Opto-Isolator Response Time	100 µs

Relay Output

Item	Description
Relay Type	Form A
Contact Rating (Resistive)	2A@250 V _{AC} , 2A@30 V _{DC}
Max. Switching Power	500 V _{AC} , 60 W
Max. Switching Voltage	270V _{AC} , 125V _{DC}
Resistance	30 mΩ max.
Operating Time	10 ms max.
Releasing Time	5 ms max.
Life Expectancy	Mechanical 2 x 10 ⁷ ops. at no load
	Electrical 3 x 10 ⁴ ops. @2A/250 V _{AC}

PhotoMOS Relay Output

Item	Description
Relay Type	PhotoMOS SPST (Form A)
Load Voltage	60 V (AC peak or DC)
Load Current	1.2A
Peak Load Current	4A @100ms (1 pulse)
Isolation Protection	1,500 V _{DC}
Turn-On Time	1 ms typical
Turn-Off Time	0.6 ms typical

Analog Input

Item	Description
Channels	8 (AMAX-4817 only)
Resolution	16 bits
Voltage Input Range	0 ~ 10 V, ± 10 V
Common-Mode Voltage Range	± 275 V
Measurement Error	< $\pm 0.1\%$ of full-scale range
Isolation Protection	2,500 V _{DC}

Analog Output

Item	Description
Channels	4 (AMAX-4820 only)
Resolution	16 bits
Voltage Output Range	0 ~ 5 V, 0 ~ 10 V, ± 5 V, ± 10 V
Current Output Range	0 ~ 20 mA, 4 ~ 20 mA
Load	> 1 k Ω (voltage output) < 625 Ω (current output)
Output Error	< $\pm 0.1\%$ of full-scale range
Isolation Protection	2,500 V _{DC}

1.3.4 Power Consumption

Model	Power Consumption
AMAX-4817	Typ. 160mA @ 24 V; Max. 190mA @ 24 V
AMAX-4820	Typ. 160mA @ 24 V; Max. 190mA @ 24 V
AMAX-4830	Typ. 85mA @ 24 V; Max. 110mA @ 24 V
AMAX-4830SO	Typ. 85mA @ 24V; Max. 110mA @24V
AMAX-4833	Typ. 85mA @ 24 V; Max. 110mA @ 24 V
AMAX-4834	Typ. 85mA @ 24 V; Max. 110mA @ 24 V
AMAX-4850	Typ. 85mA @ 24 V; Max. 110mA @ 24 V
AMAX-4855	Typ. 85mA @ 24 V; Max. 130mA @ 24 V
AMAX-4856	Typ. 85mA @ 24 V; Max. 130mA @ 24 V
AMAX-4860	Typ. 85mA @ 24 V; Max. 110mA @ 24 V
AMAX-4862	Typ. 85mA @ 24 V; Max. 110mA @ 24 V

1.4 Appearance

1.4.1 Dimensions

The dimensions of the system unit and I/O unit are shown below. All dimensions are in millimeters.

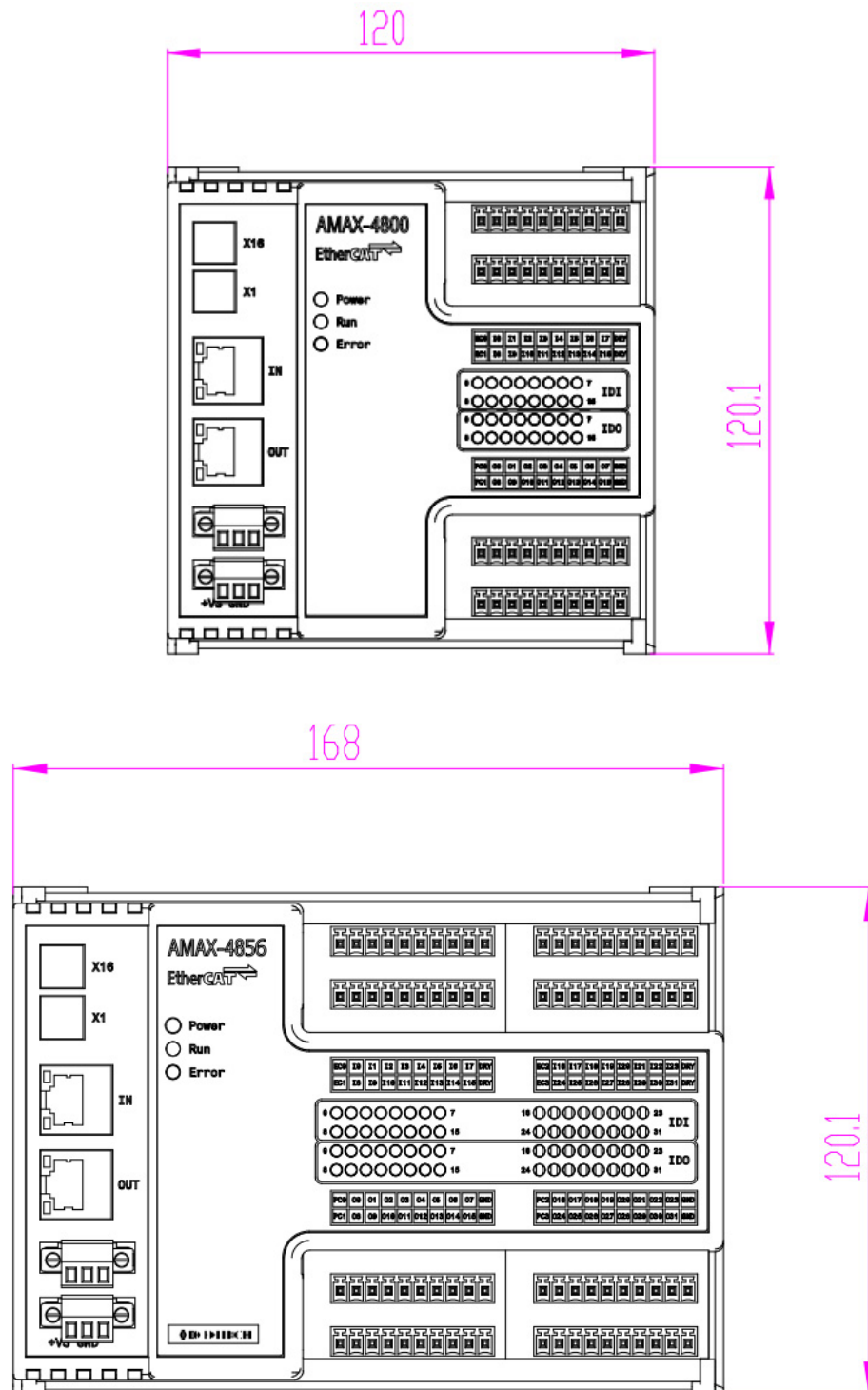


Figure 1.7 AMAX-4800 Module Dimensions

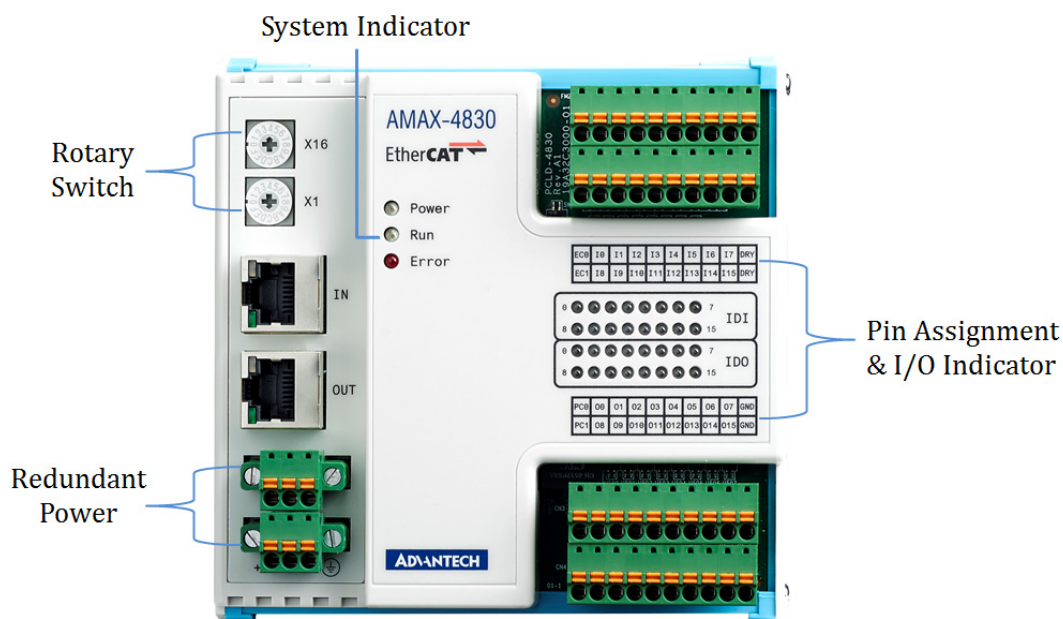


Figure 1.8 AMAX-4800 Appearance

1.4.2 LED Indicator

System status and I/O indicators are located on the AMAX-4800 front panel. The LED indicator states follow EtherCAT specifications and are explained below.

1.4.2.1 LED States

[Power] Indicator

Indicator State	System State	Description
Off	Power Off	The system power is turned off
On	Power On	The system power is turned 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, or the device is in the Bootstrap state. Firmware download operation 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	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 RJ45)

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

1.4.2.2 LED Timing Diagram

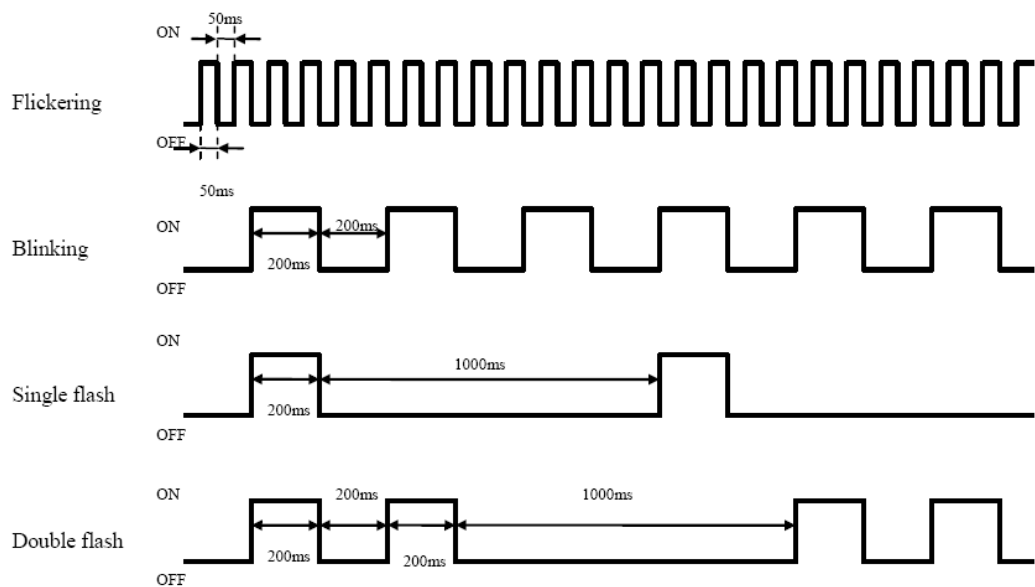


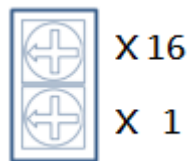
Figure 1.9 LED Indicator Flash Rates

1.4.3 LAN Connector

Two RJ45 connectors can be set as EtherCAT ports. One connector is the EtherCAT network “IN”, the other is the EtherCAT network “OUT”.

1.4.4 Rotate Switch

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



For example, if a user arranges the rotate switches according to the sequence “4, F,” the slave ID will be set as “4 x 16 + F x 1 = 79”. The default rotary switch is set as zero.

Note! Slave IDs can be defined in the following two ways:



1. If the rotate switch is set as non-zero, the switch defines the slave ID.
2. If the rotate switch is set as zero, the slave ID will be defined by EEPROM. The master can be used to change EEPROM's slave IDs.

1.4.5 Power

AMAX-4800 series modules are equipped with two power input terminals, support an input power voltage of 10 ~ 30 V_{DC}, and feature redundant power functionality. With the provision of two power sources, when one source is interrupted, the other source will assume the primary supply function immediately. The AMAX-4800 series can also function with a single power source.

Chapter 2

Signal Connections

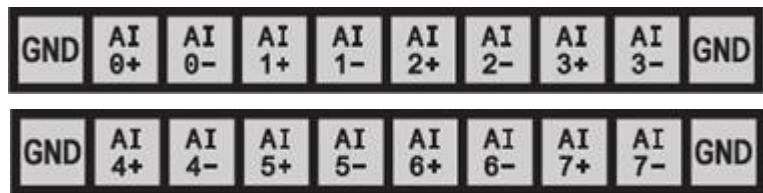
2.1 Overview

Maintaining signal connections is crucial to ensuring that the application system is sending and receiving data correctly. A good signal connection can reduce costly damage to hardware devices. This chapter provides useful information regarding connecting input and output signals to the AMAX-4800 series modules via an I/O connector.

2.2 Pin Assignment

2.2.1 AMAX-4817 Pin Assignment

Analog Input



Signal Name	Description
AI<0 ~ 7>+	Analog positive input channels 0 through 7
AI<0 ~ 7>-	Analog negative input channels 0 through 7
GND	Ground

2.2.2 AMAX-4820 Pin Assignment

Analog Output



Signal Name	Description
AO<0 ~ 3>	Analog output channels 0 through 3
GND	Ground

2.2.3 AMAX-4830/SO Pin Assignment

**Isolated
Digital Input**

EC0	I0	I1	I2	I3	I4	I5	I6	I7	DRY
EC1	I8	I9	I10	I11	I12	I13	I14	I15	DRY

**Isolated
Digital Output**

PC0	O0	O1	O2	O3	O4	O5	O6	O7	GND
PC1	O8	O9	O10	O11	O12	O13	O14	O15	GND

Signal Name	Description
I<0 ~ 15>	Isolated digital input
EC0, EC1	External common Vcc/GND for isolated digital input (8 channels share 1 EC pin)
DRY	External ground for isolated digital input
O<0 ~ 15>	Isolated digital output
PC0, PC1	Free wheeling common diode for isolated digital output (8 channels share 1 PC pin)
GND	External ground for isolated digital output

2.2.4 AMAX-4833 Pin Assignment

**Isolated
Digital Input**

EC0	I0	I1	I2	I3	I4	I5	I6	I7	DRY
EC1	I8	I9	I10	I11	I12	I13	I14	I15	DRY

**Isolated
Digital Input**

EC2	I16	I17	I18	I19	I20	I21	I22	I23	DRY
EC3	I24	I25	I26	I27	I28	I29	I30	I31	DRY

Signal Name	Description
I<0 ~ 31>	Isolated digital input
EC0, EC1, EC2, EC3	External common Vcc/GND for isolated digital input (8 channels share 1 EC pin)
DRY	External ground for isolated digital input

2.2.5 AMAX-4834 Pin Assignment

**Isolated
Digital Output**

PC0	O0	O1	O2	O3	O4	O5	O6	O7	GND
PC1	O8	O9	O10	O11	O12	O13	O14	O15	GND

**Isolated
Digital Output**

PC2	O16	O17	O18	O19	O20	O21	O22	O23	GND
PC3	O24	O25	O26	O27	O28	O29	O30	O31	GND

Signal Name	Description
O<0 ~ 31>	Isolated digital output
PC0, PC1, PC2, PC3	Free wheeling common diode for isolated digital output (8 channels share 1 PC pin)
GND	External ground for isolated digital output

2.2.6 AMAX-4850 Pin Assignment

**Isolated
Digital Input**

EC0	I0	I1	I2	I3	I4	I5	I6	I7	DRY
EC1	I8	I9	I10	I11	I12	I13	I14	I15	DRY

Relay Output

NA	N00	C0	N01	C1	N02	C2	N03	C3	NA
NA	N04	C4	N05	C5	N06	C6	N07	C7	NA

Signal Name	Description
I<0 ~ 15>	Isolated digital input
EC0, EC1	External common Vcc/GND for isolated digital input (8 channels share 1 EC pin)
DRY	External ground for isolated digital input
NO<0 ~ 7>	Normally open pin of the relay output
C<0 ~ 7>	Normally closed pin of the relay output
NA	Not connected

2.2.7 AMAX-4855 Pin Assignment

Isolated Digital Input	EC0	I0	I1	I2	I3	I4	I5	I6	I7	DRY
	EC1	I8	I9	I10	I11	I12	I13	I14	I15	DRY
	EC2	I16	I17	I18	I19	I20	I21	I22	I23	DRY
	EC3	I24	I25	I26	I27	I28	I29	I30	I31	DRY
Relay Output	NA	NO 0	C 0	NO 1	C 1	NO 2	C 2	NO 3	C 3	NA
	NA	NO 4	C 4	NO 5	C 5	NO 6	C 6	NO 7	C 7	NA
	NA	NO 8	C 8	NO 9	C 9	NO 10	C 10	NO 11	C 11	NA
	NA	NO 12	C 12	NO 13	C 13	NO 14	C 14	NO 15	C 15	NA
Signal Name		Description								
I<0 ~ 31>		Isolated digital input								
EC0, EC1, EC2, EC3		External common Vcc/GND for isolated digital input (8 channels share 1 EC pin)								
DRY		External ground for isolated digital input								
NO<0 ~ 15>		Normally open pin of the relay output								
C<0 ~ 15>		Common pin of the relay output								
NA		Not connected								

2.2.8 AMAX-4856 Pin Assignment

Isolated Digital Input	EC0	I0	I1	I2	I3	I4	I5	I6	I7	DRY
	EC1	I8	I9	I10	I11	I12	I13	I14	I15	DRY
	EC2	I16	I17	I18	I19	I20	I21	I22	I23	DRY
	EC3	I24	I25	I26	I27	I28	I29	I30	I31	DRY

Isolated Digital Output	PC0	O0	O1	O2	O3	O4	O5	O6	O7	GND
	PC1	O8	O9	O10	O11	O12	O13	O14	O15	GND
	PC2	O16	O17	O18	O19	O20	O21	O22	O23	GND
	PC3	O24	O25	O26	O27	O28	O29	O30	O31	GND

Signal Name	Description
I<0 ~ 31>	Isolated digital input
EC0, EC1, EC2, EC3	External common Vcc/GND for isolated digital input (8 channels share 1 EC pin)
DRY	External ground for isolated digital input
O<0 ~ 31>	Isolated digital output
PC0, PC1, PC2, PC3	Free wheeling common diode for isolated digital output (8 channels share 1 PC pin)
GND	External ground for isolated digital output

2.2.9 AMAX-4860 Pin Assignment

Isolated
Digital Input

EC0	I0	I1	I2	I3	I4	I5	I6	I7	DRY
-----	----	----	----	----	----	----	----	----	-----

Relay Output

NA	NO0	C0	NO1	C1	NO2	C2	NO3	C3	NA
NA	NO4	C4	NO5	C5	NO6	C6	NO7	C7	NA

Signal Name	Description
I<0 ~ 7>	Isolated digital input
EC0	External common Vcc/GND for isolated digital input (8 channels share 1 EC pin)
DRY	External ground for isolated digital inputs
NO<0 ~ 7>	Normally open pin of the relay output
C<0 ~ 7>	Normally closed pin of the relay output
NA	Not connected

2.2.10 AMAX-4862 Pin Assignment

Isolated
Digital Input

EC0	I0	I1	I2	I3	I4	I5	I6	I7	DRY
EC1	I8	I9	I10	I11	I12	I13	I14	I15	DRY

Relay Output

NA	NO0	C0	NO1	C1	NO2	C2	NO3	C3	NA
NA	NO4	C4	NO5	C5	NO6	C6	NO7	C7	NA
NA	NO8	C8	NO9	C9	NO10	C10	NO11	C11	NA
NA	NO12	C12	NO13	C13	NO14	C14	NO15	C15	NA

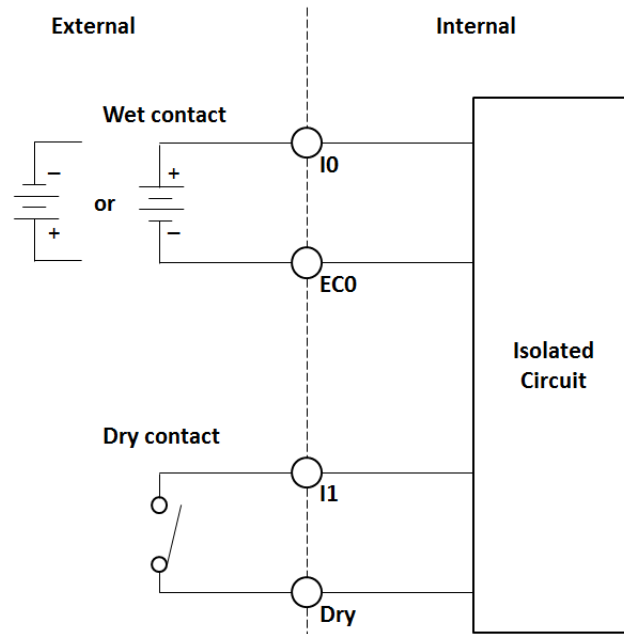
Signal Name	Description
I<0 ~ 15>	Isolated digital input
EC0, EC1	External common Vcc/GND for isolated digital inputs (8 channels share 1 EC pin)
DRY	External ground for isolated digital inputs
NO<0 ~ 15>	Normally open pin of the relay output
C<0 ~ 15>	Common pin of the relay output
NA	Not connected

2.3 Connections

2.3.1 Isolated DI Connection

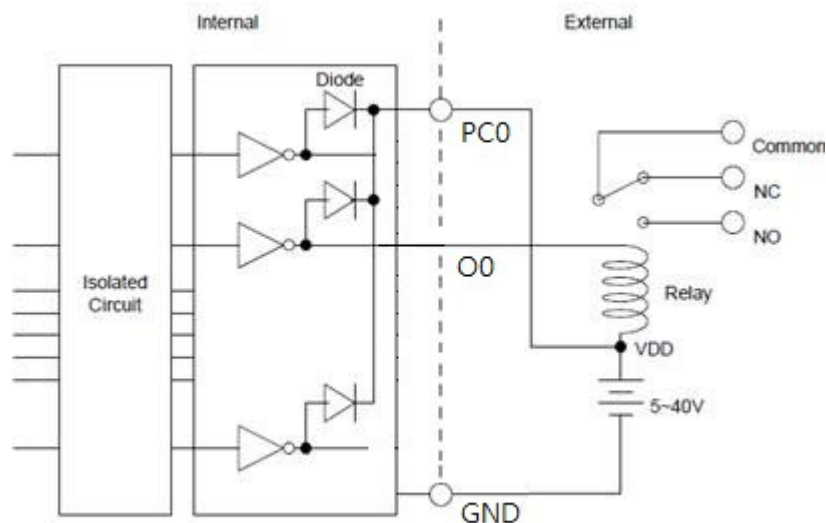
All isolated digital input channels accept voltages ranging from 10 to 30 V.

Additionally, every eight input channels share one external common pin (channels 0 ~ 7 use EC0, channels 8 ~ 15 use EC1). The figure below shows how to connect an external input source to the module's isolated inputs.

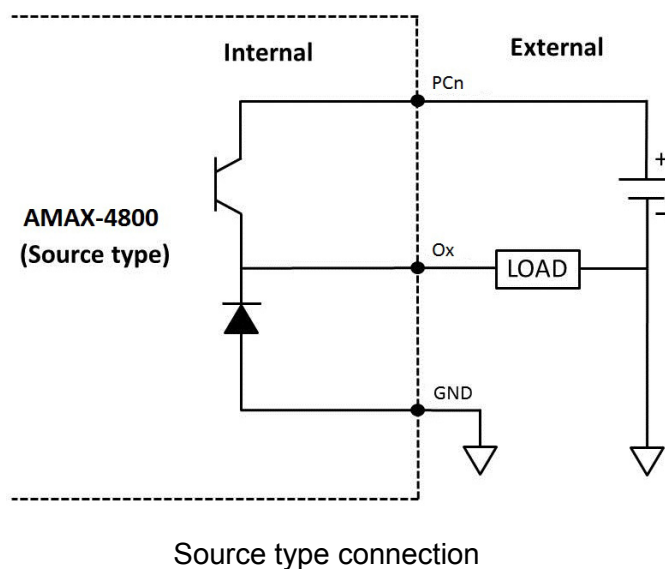


2.3.2 Isolated Digital Output

If an external voltage source (5 ~ 40 V) is connected to each isolated output channel (On) and its isolated digital output is turned on (350 mA max./ch), the module will sink current from the external voltage source. IDO modules provide GND pins for IDO connection. The following figures show how to connect an external output load to the module's isolated outputs for sink type and source type output respectively.

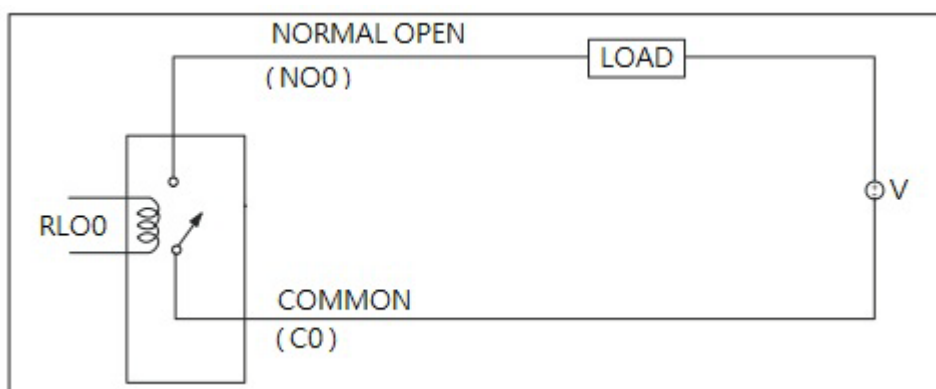


Sink type connection



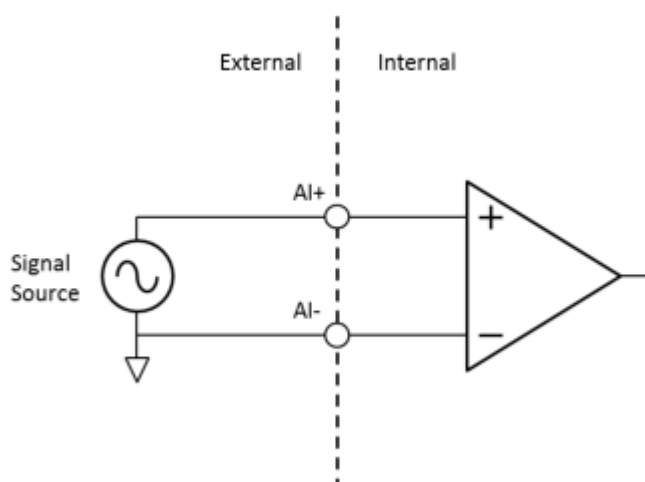
2.3.3 Relay Output

The figure below illustrates the structures and connections of the relay outputs.



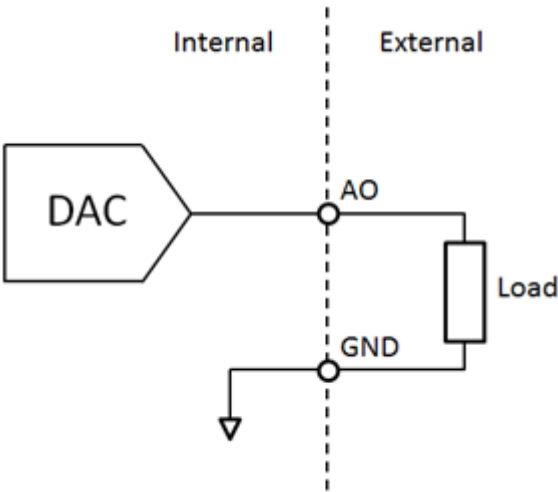
2.3.4 Analog Input Connections

AMAX-4817 provides eight differential analog input channels, as shown below.



2.3.5 Analog Output Connections

AMAX-4820 provides four single-ended analog output channels.



2.4 Switch

2.4.1 AMAX-4830SO

AMAX-4830SO provides separated COM connection that grouped every eight digital input/output channels. By default, the EC0, EC1, PC0 and PC1 are isolated from each other. However, in some cases that EC0 and EC1 need to be connected together and/or, similar situation happens to PC0 and PC1. These can be done by the SW2 and SW3. The EC0 and EC1 are connected together as the SW2 being switched to lower place. The SW3 makes identical effect to PC0 and PC1.

	SW2 or SW3 switched to up position EC0 & EC1 Open PC0 & PC1 Open
	SW2 or SW3 switched to down position EC0 & EC1 Close PC0 & PC1 Close

Chapter 3

Getting Started

3.1 Introduction

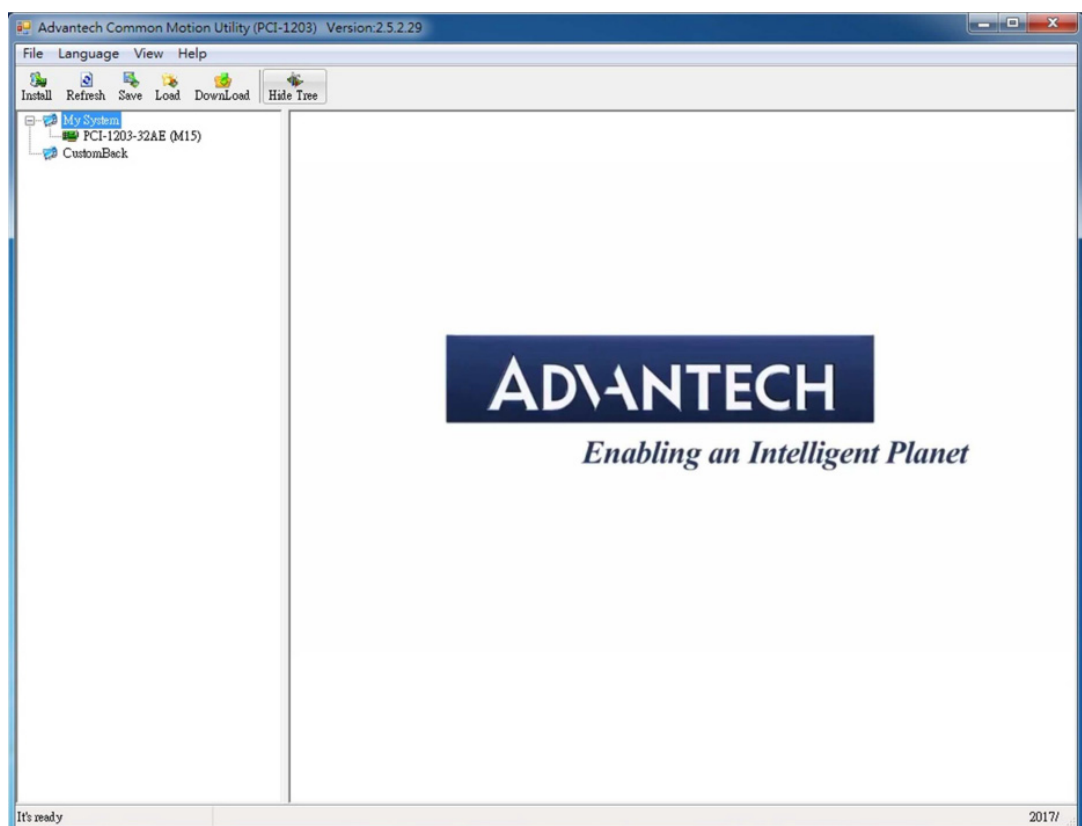
This chapter explains how to access the AMAX-4800 module through the Advantech Common Motion utility, Bechhoff TwinCAT and Codesys. These utilities provide a Windows-based application development environment for users to configure and verify AMAX-4800 function. The parameter settings are easy to configure, shortening the system installation and evaluation time.

3.2 Advantech Common Motion Utility (PCI-1203)

Access AMAX-4800 via the Advantech Common Motion utility. Install the PCI-1203 driver provided on the enclosed CD or downloaded from the Advantech website.

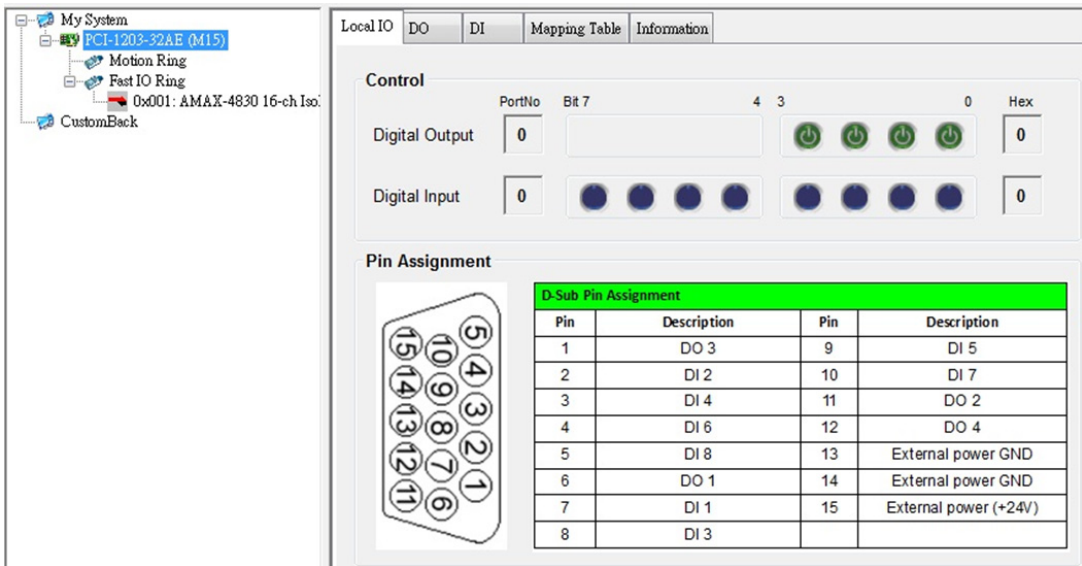
3.2.1 Main Form

Right click the Common Motion Utility (PCI-1203) icon in the Common Utility folder.



3.2.2 Master Page

The slaves connected to PCI-1203 will be listed under the Fast I/O Ring menu item. The specifications of the AMAX-4800 module are shown in the right panel.

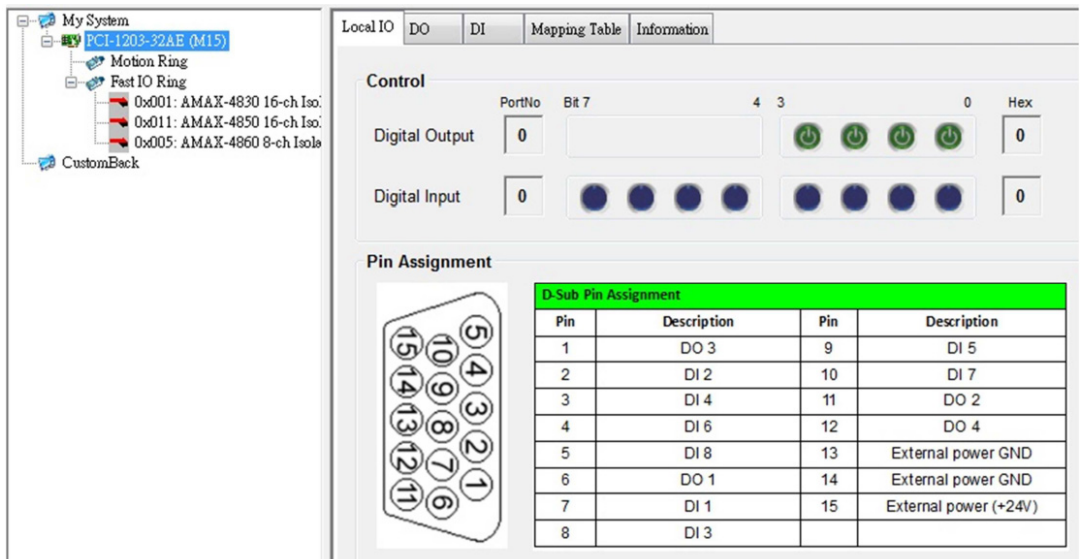


The screenshot shows the Master Page interface. On the left, the slave tree under 'My System' has 'PCI-1203-32AE (M15)' selected, which contains 'Motion Ring', 'Fast I/O Ring', and 'CustomBack'. The 'Fast I/O Ring' is highlighted. On the right, the 'Local IO' tab is active, showing 'DO', 'DI', 'Mapping Table', and 'Information' sub-tabs. The 'Control' section has 'PortNo' set to 0 and 'Bit 7' set to 0. The 'Digital Output' and 'Digital Input' sections show 0. The 'Pin Assignment' section shows a D-Sub Pin Assignment table.

Pin	Description	Pin	Description
1	DO 3	9	DI 5
2	DI 2	10	DI 7
3	DI 4	11	DO 2
4	DI 6	12	DO 4
5	DI 8	13	External power GND
6	DO 1	14	External power GND
7	DI 1	15	External power (+24V)
8	DI 3		

3.2.3 Module Page

If the EtherCAT slave is AMAX-4830, for example, the modules connected to the Advantech Common Motion utility will be shown in the slave tree node.



The screenshot shows the Module Page interface. On the left, the slave tree under 'My System' has 'PCI-1203-32AE (M15)' selected, which contains 'Motion Ring', 'Fast I/O Ring', and 'CustomBack'. The 'Fast I/O Ring' is highlighted. On the right, the 'Local IO' tab is active, showing 'DO', 'DI', 'Mapping Table', and 'Information' sub-tabs. The 'Control' section has 'PortNo' set to 0 and 'Bit 7' set to 0. The 'Digital Output' and 'Digital Input' sections show 0. The 'Pin Assignment' section shows a D-Sub Pin Assignment table.

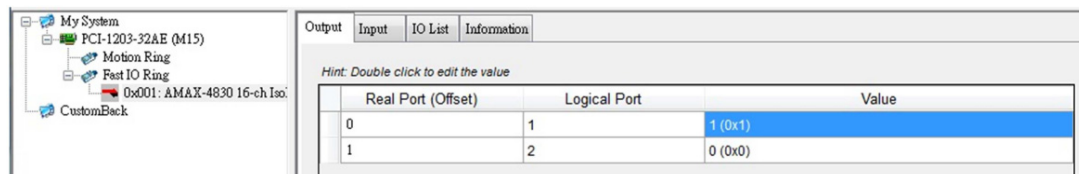
Pin	Description	Pin	Description
1	DO 3	9	DI 5
2	DI 2	10	DI 7
3	DI 4	11	DO 2
4	DI 6	12	DO 4
5	DI 8	13	External power GND
6	DO 1	14	External power GND
7	DI 1	15	External power (+24V)
8	DI 3		

Note! If more than one slave module is connected, each module must be assigned a unique slave ID.

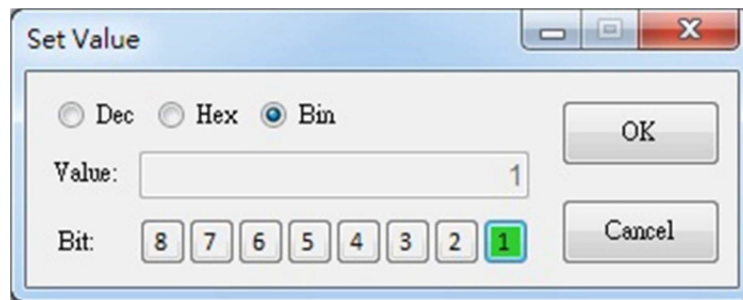


3.2.3.1 Digital Input/Output Modules

AMAX-4830 supports 16 digital input channels and 16 digital output channels.



To set the output/input value, left click the port value to access the Set Value pop-up menu.



3.3 TwinCAT®

TwinCAT software was developed by Beckhoff for operating EtherCAT devices. EtherCAT slave information (ESI) files must be imported to the TwinCAT folder for the AMAX-4800 module to function correctly.

3.3.1 EtherCAT Slave Information (ESI) Files

For each EtherCAT slave, a device description known as the ESI, must be provided in the form of an XML file. This file describes the EtherCAT specifications as well as the application-specific features of the slave. ESI files must be imported into the TwinCAT I/O EtherCAT installation folder before initiating TwinCAT.

The default path of the installation folder is
C:\TwinCAT\Io\

After importing the ESI file, reopen TwinCAT and wait for the utility rebuild the EtherCAT device description cache.



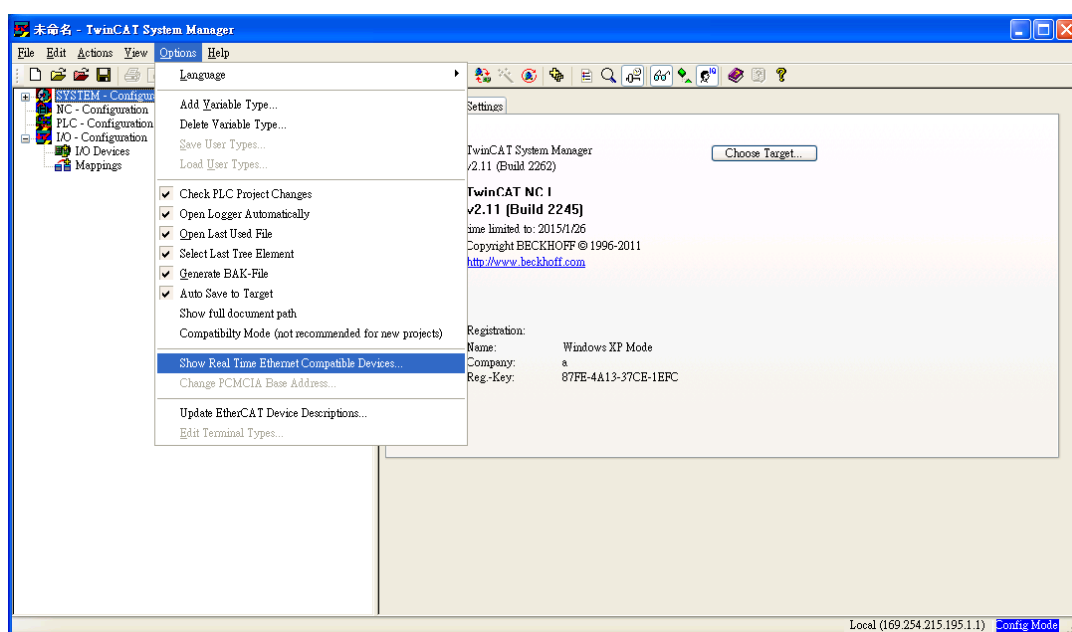
3.3.2 Main Form

To start the TwinCAT System Manager software, right click the TwinCAT icon in the system tray and choose System Manager.



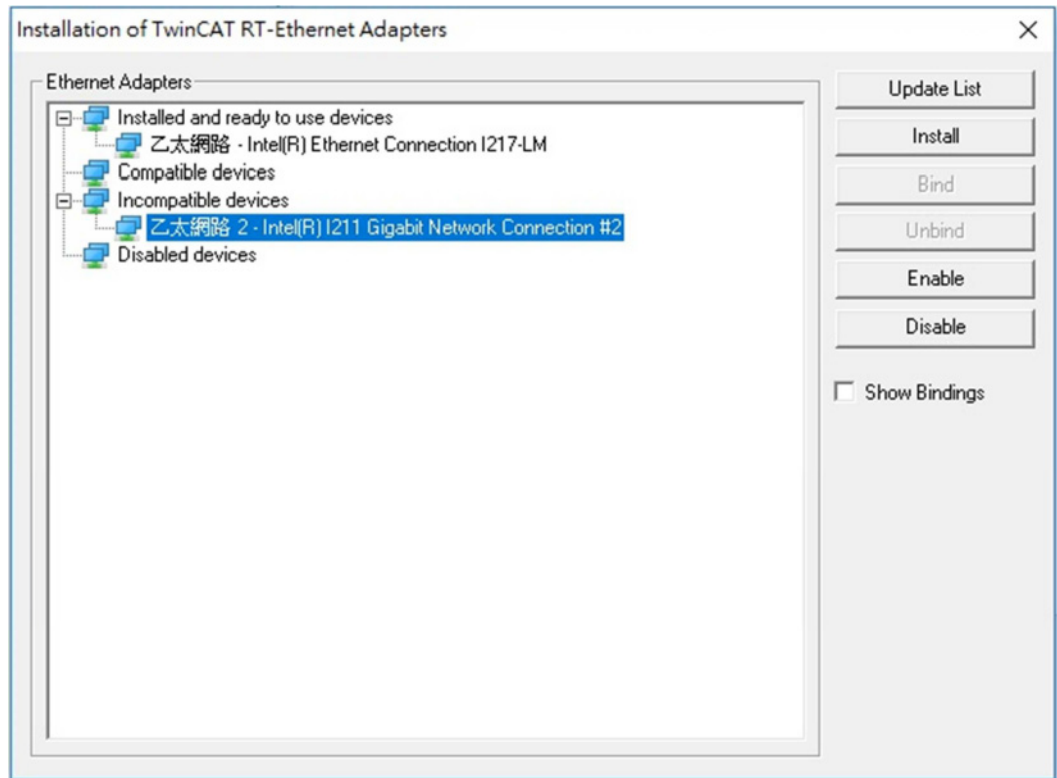
3.3.3 Install EtherCAT Driver

Before initializing TwinCAT, the EtherCAT network interface card driver must be installed. Click on the Options menu and select the Show Real-Time Ethernet Compatible Drivers option.



All of the network interface cards are listed in the [incompatible devices] tree node. Select the device to be used for EtherCAT by TwinCAT and click the Install button. After the driver is installed, the devices will be shown in the Installed and Ready to Use Devices node.

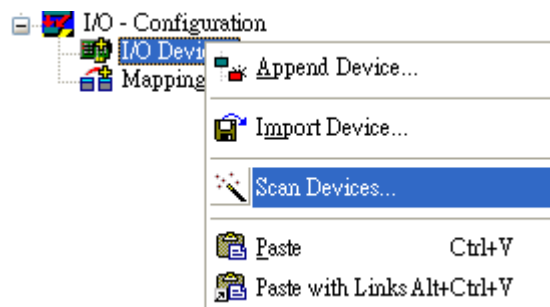
Although the driver is installed for TwinCAT use, it does not differ from a standard network interface card and can still connect to Ethernet.



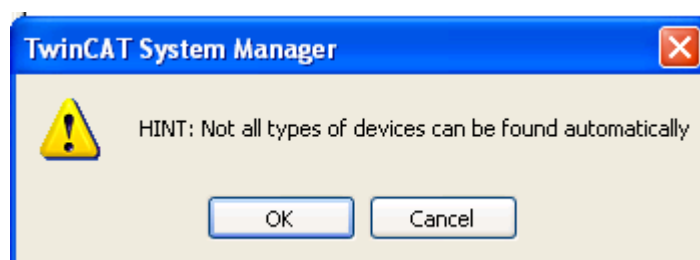
3.3.4 Scan for AMAX-4800 Series Devices

Select the I/O - Configuration -> I/O Devices menu item, then right click and select Scan Devices to initiate a scan for EtherCAT devices. Before scanning the devices, ensure that TwinCAT is in the Config mode. The current mode of the TwinCAT System Manager is displayed at the lower right corner of the utility. Users can switch

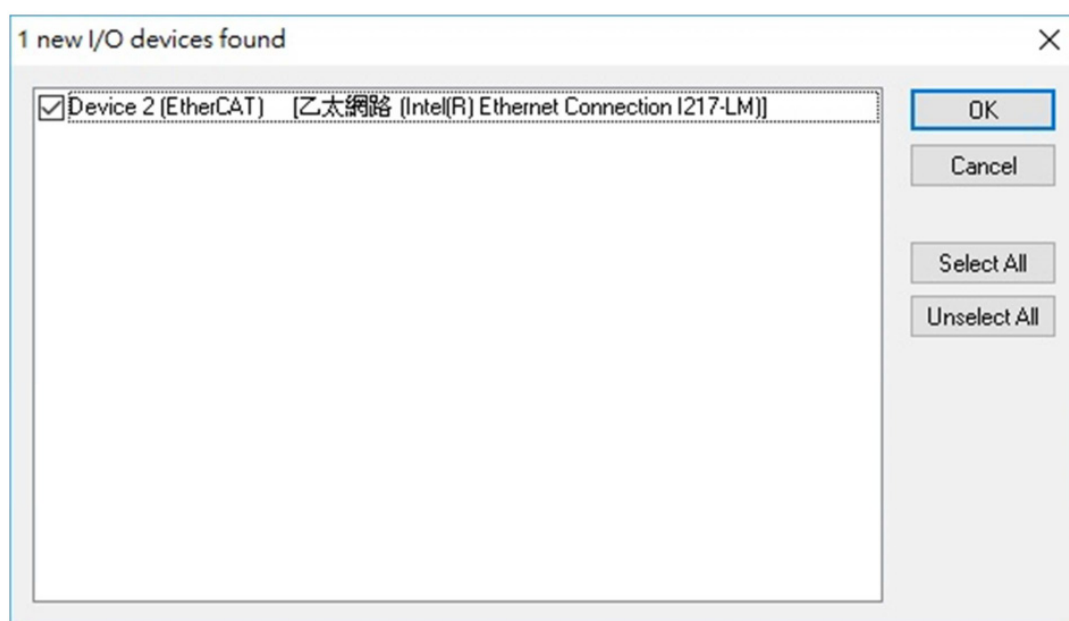
between modes by clicking the  button and selecting **Config Mode** in the toolbar.



Click [OK] when the HINT window appears.



All network interface cards will be listed in the popup window. If slaves are connected to the network interface card and have been identified by TwinCAT, the device check box will be checked.



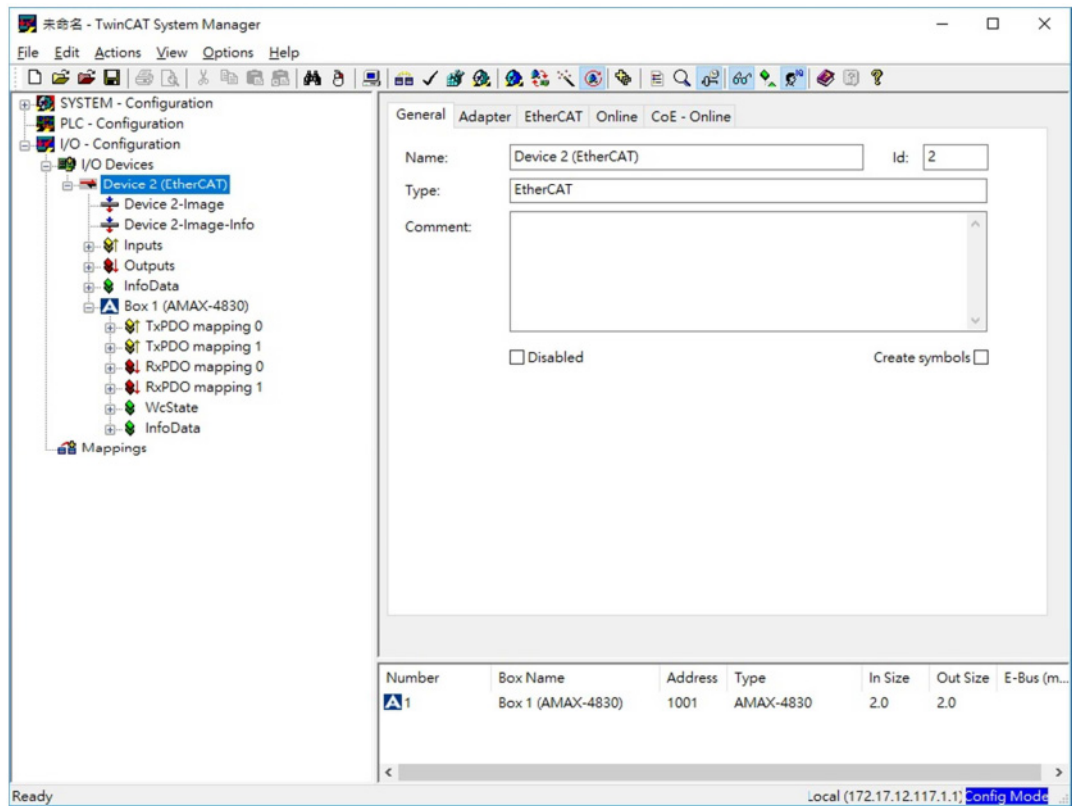
Click [Yes] to scan for EtherCAT slave devices.



Click [Yes] to activate the slaves.



After activation, AMAX-4800 will be listed as a slave device of the EtherCAT master and the “Run” status LED will emit a green light. This indicates that the user can begin operating the device.

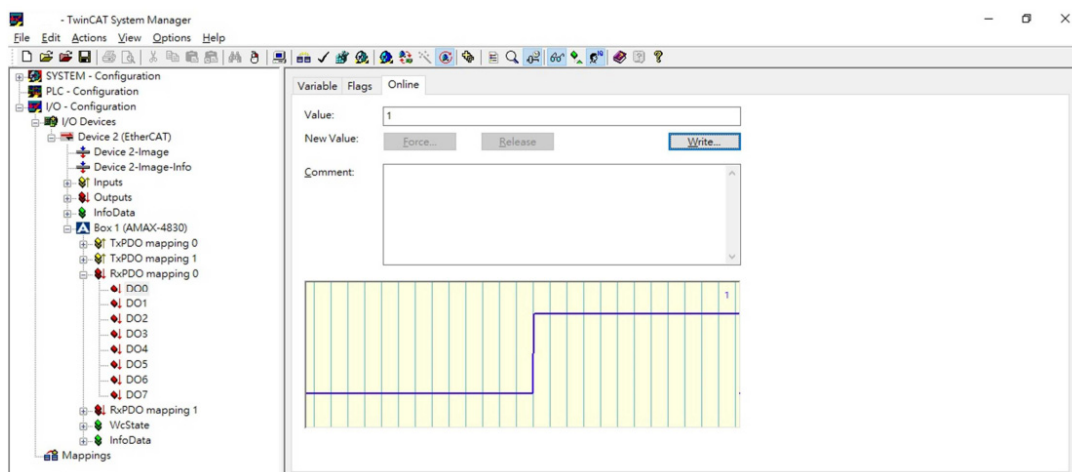


3.3.5 Port Operation

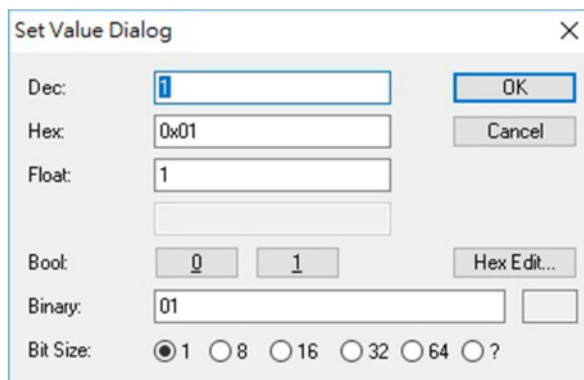
In the left window of the TwinCAT System Manager, right click on the branch to be configured.

Digital Input/Output Modules

For this example, an AMAX-4830 module is plugged into Slot 1 of AMAX-4830. There are 16 digital input channels and 16 digital output channels, and each port comprises 8 channels. To set the output value of the third port (DO0 ~ DO7), right click on the “DO0” branch at the left of the window. In the Online tab, click the Write button to set the value.



In this case, the value of the first port is set as 1, which means the DO0 signals are set to High.

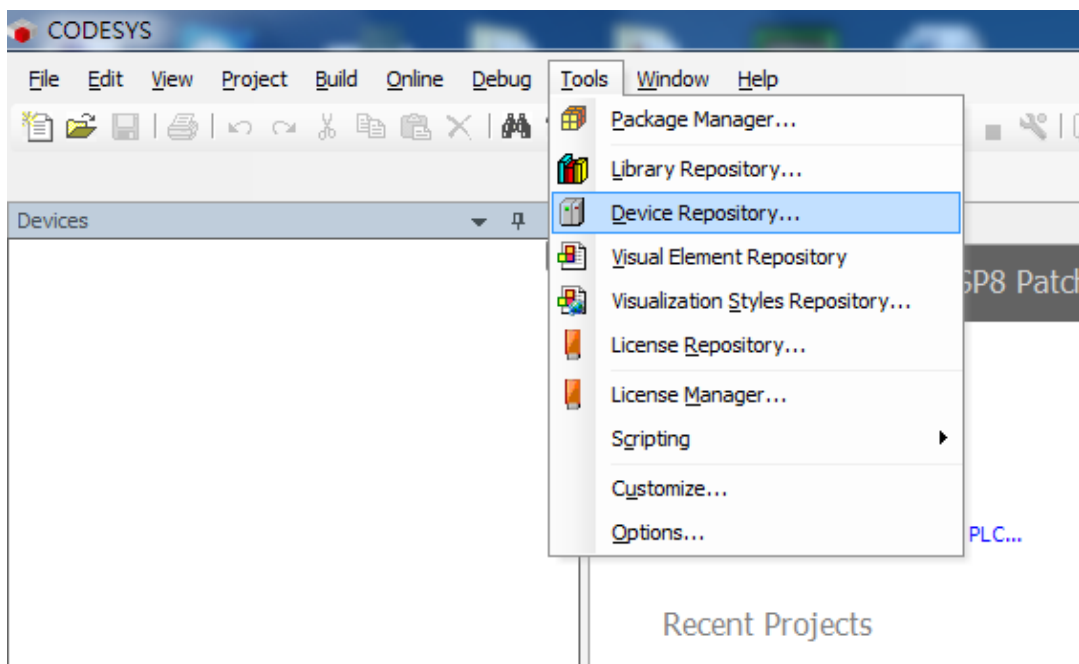


3.4 CODESYS

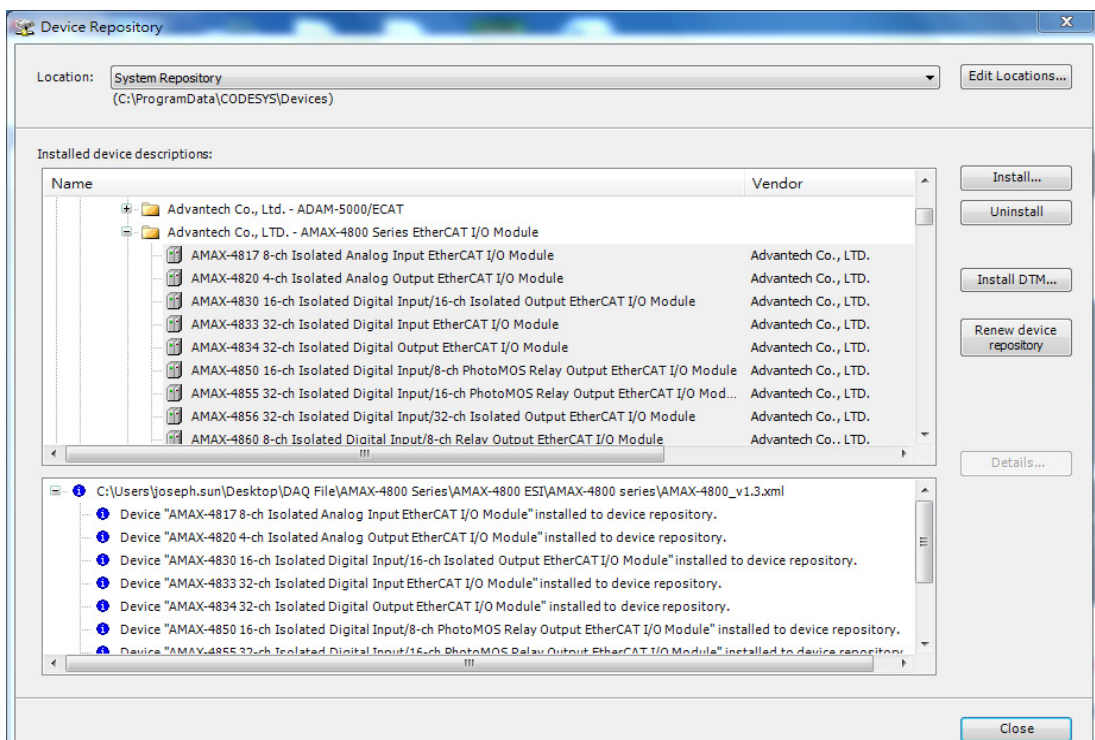
The CODESYS engineering tool is the standard widely implemented in OEM products. The logic support and HMI integration makes CODESYS ideal for numerous applications, including machine automation, factory automation, building automation, and facility/infrastructure management.

3.4.1 Import ESI Files to CODESYS

1. Open the CODESYS software:
Select Tools -> Device Repository



2. Click [Install] to import the AMAX-4800 ESI file into CODESYS.

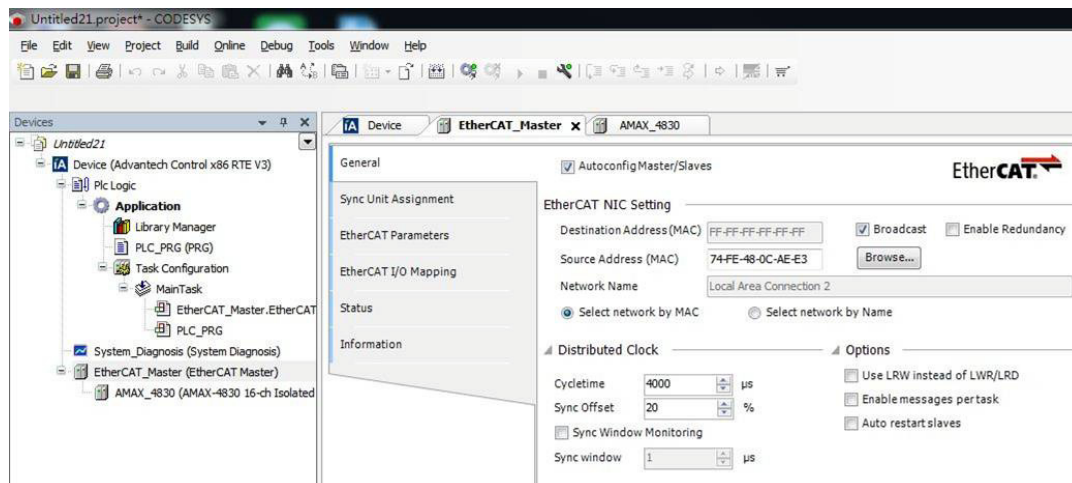


3.4.2 How to Use the AMAX-4800 Series with CODESYS

Master Page

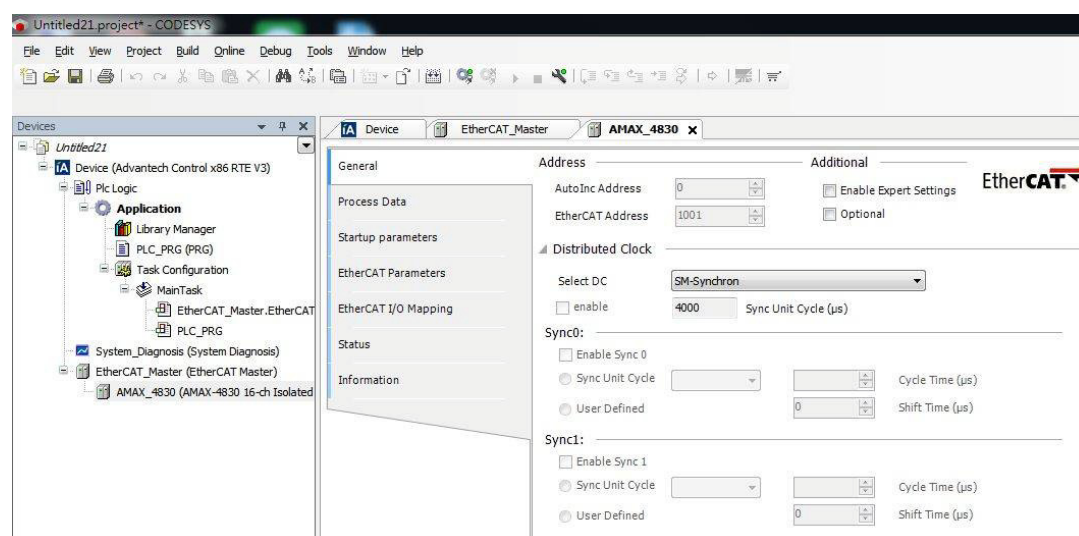
The slaves connected to the CODESYS system will be listed under the EtherCAT_Master menu item.

The specifications of the AMAX-4800 module are shown in the right panel.



Module Page

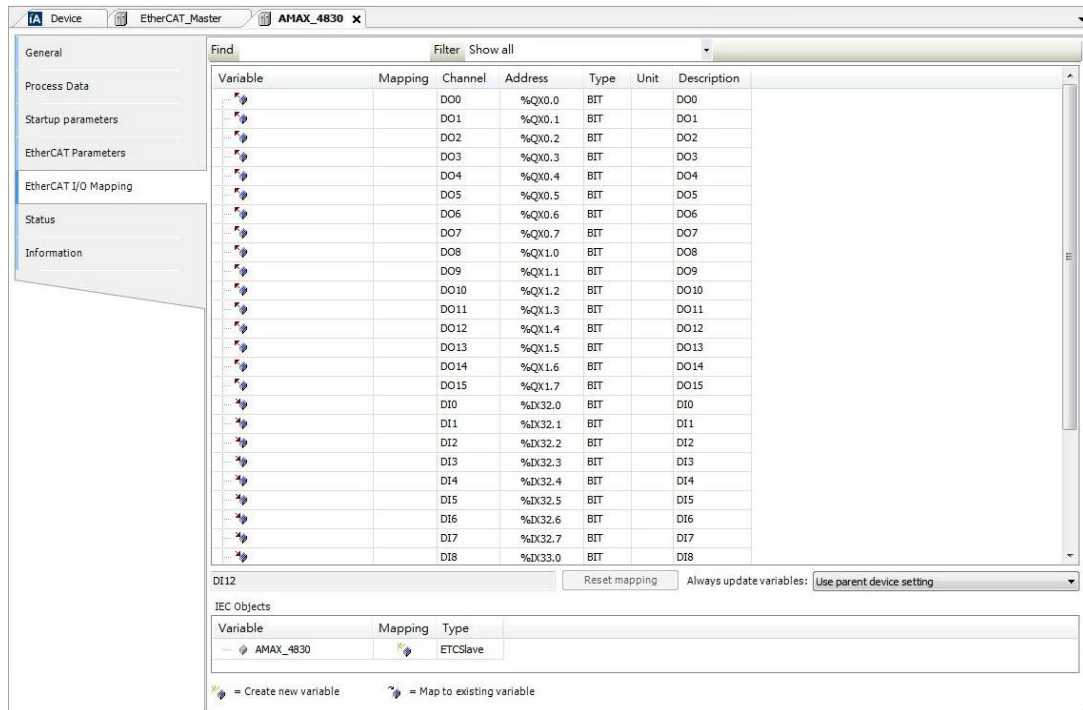
If the EtherCAT slave is AMAX-4830, for example, the modules connected to the CODESYS utility will be shown in the slave tree node.



I/O Mapping Variables

There are 16 digital input and 16 digital output channels and the data type of each channel variable is in single bit.

If the value is 1, this means that the channel is on; if the value is 0, this means that the channel is off. All channel values can be represented as one word.



3.5 Module Configuration

3.5.1 AMAX-4817: 8-Channel Analog Input Module

3.5.1.1 Object Dictionary Configuration

■ Analog Input Range

Index	Name	Data Type	Flags	Default
2180:01	AI 0 Range	UINT16	RW	0x0000 (0dec)
2181:01	AI 1 Range	UINT16	RW	0x0000 (0dec)
2182:01	AI 2 Range	UINT16	RW	0x0000 (0dec)
2183:01	AI 3 Range	UINT16	RW	0x0000 (0dec)
2184:01	AI 4 Range	UINT16	RW	0x0000 (0dec)
2185:01	AI 5 Range	UINT16	RW	0x0000 (0dec)
2186:01	AI 6 Range	UINT16	RW	0x0000 (0dec)
2187:01	AI 7 Range	UINT16	RW	0x0000 (0dec)

0: ± 10 V

1: 0 ~ 10 V

■ Analog Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	AI 0	UINT16	RO P	0x0000 (0dec)
6000:02	AI 1	UINT16	RO P	0x0000 (0dec)
6000:03	AI 2	UINT16	RO P	0x0000 (0dec)
6000:04	AI 3	UINT16	RO P	0x0000 (0dec)
6000:05	AI 4	UINT16	RO P	0x0000 (0dec)
6000:06	AI 5	UINT16	RO P	0x0000 (0dec)
6000:07	AI 6	UINT16	RO P	0x0000 (0dec)
6000:08	AI 7	UINT16	RO P	0x0000 (0dec)

For the ± 10 V range (2's complement):

Raw Data	Measured Voltage
0x7FFF	9.999695 V
0x0001	0.000305 V
0x0000	0.000000 V
0xFFFF	-0.000305 V
0x8000	-10.000000 V

For the 0 ~ 10 V range:

Raw Data	Measured Voltage
0x7FFF	9.999695 V
0x0001	0.000305 V
0x0000	0.000000 V

■ Calibration Parameters

Index	Name	Data Type	Flags	Default
2180:02	AI 0 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2180:03	AI 0 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)
2181:02	AI 1 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2181:03	AI 1 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)
2182:02	AI 2 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2182:03	AI 2 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)
2183:02	AI 3 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2183:03	AI 3 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)
2184:02	AI 4 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2184:03	AI 4 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)
2185:02	AI 5 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2185:03	AI 5 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)
2186:02	AI 6 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2186:03	AI 6 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)
2187:02	AI 7 Offset Calibration Parameter	UINT16	RW	0x0000 (0dec)
2187:03	AI 7 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)

$$CODE_CAL = (CODE + OffsetPar) \times \left(\frac{GainPar + 2^{15}}{2^{16}} \right)$$

■ Load/Save Calibration Parameters

Index	Name	Data Type	Flags	Default
2190:01	Load Calibration Parameters	UINT16	RW	0x0000 (0dec)

1: Load calibration parameters from a user-configurable area

0: Load calibration parameters from the default area

Index	Name	Data Type	Flags	Default
2190:02	Save Calibration Parameters	UINT16	RW	0x0000 (0dec)

1: Save calibration parameters to a user-configurable area

3.5.2 AMAX-4820: 4-Channel Analog Output Module

3.5.2.1 Object Dictionary Configuration

■ Analog Output Enabled

Index	Name	Data Type	Flags	Default
2180:01	AO 0 Output Enabled	UINT16	RW	0x0000 (0dec)
2181:01	AO 1 Output Enabled	UINT16	RW	0x0000 (0dec)
2182:01	AO 2 Output Enabled	UINT16	RW	0x0000 (0dec)
2183:01	AO 3 Output Enabled	UINT16	RW	0x0000 (0dec)

0: Output disabled

1: Output enabled

■ Analog Output Range

Index	Name	Data Type	Flags	Default
2180:02	AO 0 Range Configuration	UINT16	RW	0x0000 (0dec)
2181:02	AO 1 Range Configuration	UINT16	RW	0x0000 (0dec)
2182:02	AO 2 Range Configuration	UINT16	RW	0x0000 (0dec)
2183:02	AO 3 Range Configuration	UINT16	RW	0x0000 (0dec)

0: 0 ~ 5 V

1: 0 ~ 10 V

2: ± 5 V

3: ± 10 V

4: 0 ~ 20 mA

5: 4 ~ 20 mA

■ Analog Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	AO 0	UINT16	RW P	0x0000 (0dec)
7000:02	AO 1	UINT16	RW P	0x0000 (0dec)
7000:03	AO 2	UINT16	RW P	0x0000 (0dec)
7000:04	AO 3	UINT16	RW P	0x0000 (0dec)

For the 0 ~ 5 V range

$$V_{OUT} = \frac{CODE}{2^{16}} \times 5V$$

For the 0 ~ 10 V range

$$V_{OUT} = \frac{CODE}{2^{16}} \times 10V$$

For the ±5 V range

$$V_{OUT} = \left(\frac{CODE}{2^{16}} \times 10V \right) - 5V$$

For the ±10 V range

$$V_{OUT} = \left(\frac{CODE}{2^{16}} \times 20V \right) - 10V$$

For the 0 ~ 20 mA range

$$I_{OUT} = \frac{CODE}{2^{16}} \times 20mA$$

For the 4 ~ 20 mA range:

$$I_{OUT} = \left(\frac{CODE}{2^{16}} \times 16mA \right) + 4mA$$

■ Calibration Parameters

Index	Name	Data Type	Flags	Default
2180:03	AO 0 Offset Calibration Parameters	UINT16	RW	0x0000 (0dec)
2180:04	AO 0 Gain Calibration Parameters	UINT16	RW	0x8000 (32768dec)
2181:03	AO 1 Offset Calibration Parameters	UINT16	RW	0x0000 (0dec)
2181:04	AO 1 Gain Calibration Parameters	UINT16	RW	0x8000 (32768dec)
2182:03	AO 2 Offset Calibration Parameters	UINT16	RW	0x0000 (0dec)
2182:04	AO 2 Gain Calibration Parameters	UINT16	RW	0x8000 (32768dec)
2183:03	AO 3 Offset Calibration Parameters	UINT16	RW	0x0000 (0dec)
2183:04	AO 3 Gain Calibration Parameter	UINT16	RW	0x8000 (32768dec)

$$CODE_{CAL} = CODE \times \left(\frac{GainPar + 2^{15}}{2^{16}} \right) + OffsetPar$$

Note! The offset calibration parameters are in 2's complement format. See the following table for further details.



Code	Value
0x7FFF	+32767
0x7FFE	+32766
0x0002	+2
0x0001	+1
0x0000	0
0xFFFF	-1
0xFFFE	-2
0x8001	-32767
0x8000	-32768

■ Load/Save Calibration Parameters

Index	Name	Data Type	Flags	Default
2190:01	Load Calibration Parameters	UINT16	RW	0x0000 (0dec)

1: Load calibration parameters from a user-configurable area

0: Load calibration parameters from the default area

Index	Name	Data Type	Flags	Default
2190:02	Save Calibration Parameters	UINT16	RW	0x0000 (0dec)

1: Save calibration parameters to a user-configurable area

3.5.2.2 Instruction Flow

■ Start Outputting Voltage/Current

1. Set output range (Index 218x:02)
2. Set output value (Index 7000)
3. Enable output (Index 218x:01)

■ Change Output Range

1. Disable output (Index 218x:01)
2. Set output range (Index 218x:02)
3. Set output value (Index 7000)
4. Enable output (Index 218x:01)

3.5.2.3 Calibration Flow

1. Disable the AO channel to be calibrated.
2. Connect a DMM with a resolution of at least 6.5 bits to the AO channel.
3. Set the range and enable the AO channel.
4. Set AO data to 0x0040.
5. If the reading of the DMM is outside the “Offset Value” range shown in the following table, adjust the “AO n Offset Calibration Parameter” until the DMM reading falls within the “Offset Value” range. If the reading is too low, increase the “AO n Offset Calibration Parameter” and vice versa.
6. Set AO data to 0xFFC0.
7. If the reading of the DMM is outside the “Gain Value” range shown in the following table, adjust the “AO n Gain Calibration Parameter” until the DMM reading falls within the “Gain Value” range. If the reading is too low, increase the “AO n Gain Calibration Parameter” and vice versa.
8. Set AO data to 0x0040.
9. If the reading of the DMM is outside the “Offset Value” range shown in the following table, return to Step 5. Otherwise, the calibration for this range of the AO channel is complete.

Range	Offset Value	Gain Value
0 ~ 5 V	0.00481 ~ 0.00496 V	4.9950 ~ 4.9952 V
0 ~ 10 V	0.00961 ~ 0.00992 V	9.9901 ~ 9.9904 V
±5 V	-4.9904 ~ -4.9901 V	4.9901 ~ 4.9904 V
±10 V	-9.9808 ~ -9.9802 V	9.9802 ~ 9.9808 V
0 ~ 20 mA	0.0192 ~ 0.0198 mA	19.9802 ~ 19.9808 mA
4 ~ 20 mA	4.0154 ~ 4.0158 mA	19.9872 ~ 19.9876 mA

3.5.3 AMAX-4830/SO: 16-Channel IDI and 16-Channel IDO Module

3.5.3.1 Object Dictionary Configuration

■ Digital Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	DI 0	BOOLEAN	RO P	FALSE
6000:02	DI 1	BOOLEAN	RO P	FALSE
6000:03	DI 2	BOOLEAN	RO P	FALSE
6000:04	DI 3	BOOLEAN	RO P	FALSE
6000:05	DI 4	BOOLEAN	RO P	FALSE
6000:06	DI 5	BOOLEAN	RO P	FALSE
6000:07	DI 6	BOOLEAN	RO P	FALSE
6000:08	DI 7	BOOLEAN	RO P	FALSE
6001:01	DI 8	BOOLEAN	RO P	FALSE
6001:02	DI 9	BOOLEAN	RO P	FALSE
6001:03	DI 10	BOOLEAN	RO P	FALSE
6001:04	DI 11	BOOLEAN	RO P	FALSE
6001:05	DI 12	BOOLEAN	RO P	FALSE
6001:06	DI 13	BOOLEAN	RO P	FALSE
6001:07	DI 14	BOOLEAN	RO P	FALSE
6001:08	DI 15	BOOLEAN	RO P	FALSE

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

■ Digital Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	DO 0	BOOLEAN	RW P	FALSE
7000:02	DO 1	BOOLEAN	RW P	FALSE
7000:03	DO 2	BOOLEAN	RW P	FALSE
7000:04	DO 3	BOOLEAN	RW P	FALSE
7000:05	DO 4	BOOLEAN	RW P	FALSE
7000:06	DO 5	BOOLEAN	RW P	FALSE
7000:07	DO 6	BOOLEAN	RW P	FALSE
7000:08	DO 7	BOOLEAN	RW P	FALSE
7001:01	DO 8	BOOLEAN	RW P	FALSE
7001:02	DO 9	BOOLEAN	RW P	FALSE
7001:03	DO 10	BOOLEAN	RW P	FALSE
7001:04	DO 11	BOOLEAN	RW P	FALSE
7001:05	DO 12	BOOLEAN	RW P	FALSE
7001:06	DO 13	BOOLEAN	RW P	FALSE
7001:07	DO 14	BOOLEAN	RW P	FALSE
7001:08	DO 15	BOOLEAN	RW P	FALSE

TRUE: Turn ON the digital output channel.

FALSE: Turn OFF the digital output channel.

3.5.4 AMAX-4833: 32-Channel IDI Module

3.5.4.1 Object Dictionary Configuration

■ Digital Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	DI 0	BOOLEAN	RO P	FALSE
6000:02	DI 1	BOOLEAN	RO P	FALSE
6000:03	DI 2	BOOLEAN	RO P	FALSE
6000:04	DI 3	BOOLEAN	RO P	FALSE
6000:05	DI 4	BOOLEAN	RO P	FALSE
6000:06	DI 5	BOOLEAN	RO P	FALSE
6000:07	DI 6	BOOLEAN	RO P	FALSE
6000:08	DI 7	BOOLEAN	RO P	FALSE
6001:01	DI 8	BOOLEAN	RO P	FALSE
6001:02	DI 9	BOOLEAN	RO P	FALSE
6001:03	DI 10	BOOLEAN	RO P	FALSE
6001:04	DI 11	BOOLEAN	RO P	FALSE
6001:05	DI 12	BOOLEAN	RO P	FALSE
6001:06	DI 13	BOOLEAN	RO P	FALSE
6001:07	DI 14	BOOLEAN	RO P	FALSE
6001:08	DI 15	BOOLEAN	RO P	FALSE
6002:01	DI 16	BOOLEAN	RO P	FALSE
6002:02	DI 17	BOOLEAN	RO P	FALSE
6002:03	DI 18	BOOLEAN	RO P	FALSE
6002:04	DI 19	BOOLEAN	RO P	FALSE
6002:05	DI 20	BOOLEAN	RO P	FALSE

6002:06	DI 21	BOOLEAN	RO P	FALSE
6002:07	DI 22	BOOLEAN	RO P	FALSE
6002:08	DI 23	BOOLEAN	RO P	FALSE
6003:01	DI 24	BOOLEAN	RO P	FALSE
6003:02	DI 25	BOOLEAN	RO P	FALSE
6003:03	DI 26	BOOLEAN	RO P	FALSE
6003:04	DI 27	BOOLEAN	RO P	FALSE
6003:05	DI 28	BOOLEAN	RO P	FALSE
6003:06	DI 29	BOOLEAN	RO P	FALSE
6003:07	DI 30	BOOLEAN	RO P	FALSE
6003:08	DI 31	BOOLEAN	RO P	FALSE

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

3.5.5 AMAX-4834: 32-Channel IDO Module

3.5.5.1 Object Dictionary Configuration

■ Digital Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	DO 0	BOOLEAN	RW P	FALSE
7000:02	DO 1	BOOLEAN	RW P	FALSE
7000:03	DO 2	BOOLEAN	RW P	FALSE
7000:04	DO 3	BOOLEAN	RW P	FALSE
7000:05	DO 4	BOOLEAN	RW P	FALSE
7000:06	DO 5	BOOLEAN	RW P	FALSE
7000:07	DO 6	BOOLEAN	RW P	FALSE
7000:08	DO 7	BOOLEAN	RW P	FALSE
7001:01	DO 8	BOOLEAN	RW P	FALSE
7001:02	DO 9	BOOLEAN	RW P	FALSE
7001:03	DO 10	BOOLEAN	RW P	FALSE
7001:04	DO 11	BOOLEAN	RW P	FALSE
7001:05	DO 12	BOOLEAN	RW P	FALSE
7001:06	DO 13	BOOLEAN	RW P	FALSE
7001:07	DO 14	BOOLEAN	RW P	FALSE
7001:08	DO 15	BOOLEAN	RW P	FALSE
7002:01	DO 16	BOOLEAN	RW P	FALSE
7002:02	DO 17	BOOLEAN	RW P	FALSE
7002:03	DO 18	BOOLEAN	RW P	FALSE
7002:04	DO 19	BOOLEAN	RW P	FALSE
7002:05	DO 20	BOOLEAN	RW P	FALSE
7002:06	DO 21	BOOLEAN	RW P	FALSE
7002:07	DO 22	BOOLEAN	RW P	FALSE
7002:08	DO 23	BOOLEAN	RW P	FALSE
7003:01	DO 24	BOOLEAN	RW P	FALSE
7003:02	DO 25	BOOLEAN	RW P	FALSE
7003:03	DO 26	BOOLEAN	RW P	FALSE
7003:04	DO 27	BOOLEAN	RW P	FALSE
7003:05	DO 28	BOOLEAN	RW P	FALSE

7003:06	DO 29	BOOLEAN	RW P	FALSE
7003:07	DO 30	BOOLEAN	RW P	FALSE
7003:08	DO 31	BOOLEAN	RW P	FALSE

TRUE: Turn ON the digital output channel.

FALSE: Turn OFF the digital output channel.

3.5.6 AMAX-4850: 16-Channel IDI and 8-Channel PhotoMOS Output Module

3.5.6.1 Object Dictionary Configuration

■ Digital Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	DI 0	BOOLEAN	RO P	FALSE
6000:02	DI 1	BOOLEAN	RO P	FALSE
6000:03	DI 2	BOOLEAN	RO P	FALSE
6000:04	DI 3	BOOLEAN	RO P	FALSE
6000:05	DI 4	BOOLEAN	RO P	FALSE
6000:06	DI 5	BOOLEAN	RO P	FALSE
6000:07	DI 6	BOOLEAN	RO P	FALSE
6000:08	DI 7	BOOLEAN	RO P	FALSE
6001:01	DI 8	BOOLEAN	RO P	FALSE
6001:02	DI 9	BOOLEAN	RO P	FALSE
6001:03	DI 10	BOOLEAN	RO P	FALSE
6001:04	DI 11	BOOLEAN	RO P	FALSE
6001:05	DI 12	BOOLEAN	RO P	FALSE
6001:06	DI 13	BOOLEAN	RO P	FALSE
6001:07	DI 14	BOOLEAN	RO P	FALSE
6001:08	DI 15	BOOLEAN	RO P	FALSE

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

■ PhotoMOS Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	DO 0	BOOLEAN	RW P	FALSE
7000:02	DO 1	BOOLEAN	RW P	FALSE
7000:03	DO 2	BOOLEAN	RW P	FALSE
7000:04	DO 3	BOOLEAN	RW P	FALSE
7000:05	DO 4	BOOLEAN	RW P	FALSE
7000:06	DO 5	BOOLEAN	RW P	FALSE
7000:07	DO 6	BOOLEAN	RW P	FALSE
7000:08	DO 7	BOOLEAN	RW P	FALSE

TRUE: Turn ON the photoMOS channel.

FALSE: Turn OFF the photoMOS channel.

3.5.7 AMAX-4855: 32-Channel IDI and 16-Channel PhotoMOS Output Module

3.5.7.1 Object Dictionary Configuration

■ Digital Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	DI 0	BOOLEAN	RO P	FALSE
6000:02	DI 1	BOOLEAN	RO P	FALSE
6000:03	DI 2	BOOLEAN	RO P	FALSE
6000:04	DI 3	BOOLEAN	RO P	FALSE
6000:05	DI 4	BOOLEAN	RO P	FALSE
6000:06	DI 5	BOOLEAN	RO P	FALSE
6000:07	DI 6	BOOLEAN	RO P	FALSE
6000:08	DI 7	BOOLEAN	RO P	FALSE
6001:01	DI 8	BOOLEAN	RO P	FALSE
6001:02	DI 9	BOOLEAN	RO P	FALSE
6001:03	DI 10	BOOLEAN	RO P	FALSE
6001:04	DI 11	BOOLEAN	RO P	FALSE
6001:05	DI 12	BOOLEAN	RO P	FALSE
6001:06	DI 13	BOOLEAN	RO P	FALSE
6001:07	DI 14	BOOLEAN	RO P	FALSE
6001:08	DI 15	BOOLEAN	RO P	FALSE
6002:01	DI 16	BOOLEAN	RO P	FALSE
6002:02	DI 17	BOOLEAN	RO P	FALSE
6002:03	DI 18	BOOLEAN	RO P	FALSE
6002:04	DI 19	BOOLEAN	RO P	FALSE
6002:05	DI 20	BOOLEAN	RO P	FALSE
6002:06	DI 21	BOOLEAN	RO P	FALSE
6002:07	DI 22	BOOLEAN	RO P	FALSE
6002:08	DI 23	BOOLEAN	RO P	FALSE
6003:01	DI 24	BOOLEAN	RO P	FALSE
6003:02	DI 25	BOOLEAN	RO P	FALSE
6003:03	DI 26	BOOLEAN	RO P	FALSE
6003:04	DI 27	BOOLEAN	RO P	FALSE
6003:05	DI 28	BOOLEAN	RO P	FALSE
6003:06	DI 29	BOOLEAN	RO P	FALSE
6003:07	DI 30	BOOLEAN	RO P	FALSE
6003:08	DI 31	BOOLEAN	RO P	FALSE

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

3.5.7.2 PhotoMOS Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	DO 0	BOOLEAN	RW P	FALSE
7000:02	DO 1	BOOLEAN	RW P	FALSE
7000:03	DO 2	BOOLEAN	RW P	FALSE
7000:04	DO 3	BOOLEAN	RW P	FALSE
7000:05	DO 4	BOOLEAN	RW P	FALSE
7000:06	DO 5	BOOLEAN	RW P	FALSE
7000:07	DO 6	BOOLEAN	RW P	FALSE
7000:08	DO 7	BOOLEAN	RW P	FALSE
7001:01	DO 8	BOOLEAN	RW P	FALSE
7001:02	DO 9	BOOLEAN	RW P	FALSE
7001:03	DO 10	BOOLEAN	RW P	FALSE
7001:04	DO 11	BOOLEAN	RW P	FALSE
7001:05	DO 12	BOOLEAN	RW P	FALSE
7001:06	DO 13	BOOLEAN	RW P	FALSE
7001:07	DO 14	BOOLEAN	RW P	FALSE
7001:08	DO 15	BOOLEAN	RW P	FALSE

TRUE: Turn ON the photoMOS channel.

FALSE: Turn OFF the photoMOS channel.

3.5.8 AMAX-4856: 32-Channel IDI and 32-Channel IDO Module

3.5.8.1 Object Dictionary Configuration

■ Digital Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	DI 0	BOOLEAN	RO P	FALSE
6000:02	DI 1	BOOLEAN	RO P	FALSE
6000:03	DI 2	BOOLEAN	RO P	FALSE
6000:04	DI 3	BOOLEAN	RO P	FALSE
6000:05	DI 4	BOOLEAN	RO P	FALSE
6000:06	DI 5	BOOLEAN	RO P	FALSE
6000:07	DI 6	BOOLEAN	RO P	FALSE
6000:08	DI 7	BOOLEAN	RO P	FALSE
6001:01	DI 8	BOOLEAN	RO P	FALSE
6001:02	DI 9	BOOLEAN	RO P	FALSE
6001:03	DI 10	BOOLEAN	RO P	FALSE
6001:04	DI 11	BOOLEAN	RO P	FALSE
6001:05	DI 12	BOOLEAN	RO P	FALSE
6001:06	DI 13	BOOLEAN	RO P	FALSE
6001:07	DI 14	BOOLEAN	RO P	FALSE
6001:08	DI 15	BOOLEAN	RO P	FALSE
6002:01	DI 16	BOOLEAN	RO P	FALSE
6002:02	DI 17	BOOLEAN	RO P	FALSE
6002:03	DI 18	BOOLEAN	RO P	FALSE
6002:04	DI 19	BOOLEAN	RO P	FALSE

6002:05	DI 20	BOOLEAN	RO P	FALSE
6002:06	DI 21	BOOLEAN	RO P	FALSE
6002:07	DI 22	BOOLEAN	RO P	FALSE
6002:08	DI 23	BOOLEAN	RO P	FALSE
6003:01	DI 24	BOOLEAN	RO P	FALSE
6003:02	DI 25	BOOLEAN	RO P	FALSE
6003:03	DI 26	BOOLEAN	RO P	FALSE
6003:04	DI 27	BOOLEAN	RO P	FALSE
6003:05	DI 28	BOOLEAN	RO P	FALSE
6003:06	DI 29	BOOLEAN	RO P	FALSE
6003:07	DI 30	BOOLEAN	RO P	FALSE
6003:08	DI 31	BOOLEAN	RO P	FALSE

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

■ Digital Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	DO 0	BOOLEAN	RW P	FALSE
7000:02	DO 1	BOOLEAN	RW P	FALSE
7000:03	DO 2	BOOLEAN	RW P	FALSE
7000:04	DO 3	BOOLEAN	RW P	FALSE
7000:05	DO 4	BOOLEAN	RW P	FALSE
7000:06	DO 5	BOOLEAN	RW P	FALSE
7000:07	DO 6	BOOLEAN	RW P	FALSE
7000:08	DO 7	BOOLEAN	RW P	FALSE
7001:01	DO 8	BOOLEAN	RW P	FALSE
7001:02	DO 9	BOOLEAN	RW P	FALSE
7001:03	DO 10	BOOLEAN	RW P	FALSE
7001:04	DO 11	BOOLEAN	RW P	FALSE
7001:05	DO 12	BOOLEAN	RW P	FALSE
7001:06	DO 13	BOOLEAN	RW P	FALSE
7001:07	DO 14	BOOLEAN	RW P	FALSE
7001:08	DO 15	BOOLEAN	RW P	FALSE
7002:01	DO 16	BOOLEAN	RW P	FALSE
7002:02	DO 17	BOOLEAN	RW P	FALSE
7002:03	DO 18	BOOLEAN	RW P	FALSE
7002:04	DO 19	BOOLEAN	RW P	FALSE
7002:05	DO 20	BOOLEAN	RW P	FALSE
7002:06	DO 21	BOOLEAN	RW P	FALSE
7002:07	DO 22	BOOLEAN	RW P	FALSE
7002:08	DO 23	BOOLEAN	RW P	FALSE
7003:01	DO 24	BOOLEAN	RW P	FALSE
7003:02	DO 25	BOOLEAN	RW P	FALSE
7003:03	DO 26	BOOLEAN	RW P	FALSE
7003:04	DO 27	BOOLEAN	RW P	FALSE
7003:05	DO 28	BOOLEAN	RW P	FALSE
7003:06	DO 29	BOOLEAN	RW P	FALSE

7003:07	DO 30	BOOLEAN	RW P	FALSE
7003:08	DO 31	BOOLEAN	RW P	FALSE

TRUE: Turn ON the digital output channel.

FALSE: Turn OFF the digital output channel.

3.5.9 AMAX-4860: 8-Channel IDI and 8-Channel Relay Output Module

3.5.9.1 Object Dictionary Configuration

■ Digital Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	DI 0	BOOLEAN	RO P	FALSE
6000:02	DI 1	BOOLEAN	RO P	FALSE
6000:03	DI 2	BOOLEAN	RO P	FALSE
6000:04	DI 3	BOOLEAN	RO P	FALSE
6000:05	DI 4	BOOLEAN	RO P	FALSE
6000:06	DI 5	BOOLEAN	RO P	FALSE
6000:07	DI 6	BOOLEAN	RO P	FALSE
6000:08	DI 7	BOOLEAN	RO P	FALSE

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

■ Relay Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	DO 0	BOOLEAN	RW P	FALSE
7000:02	DO 1	BOOLEAN	RW P	FALSE
7000:03	DO 2	BOOLEAN	RW P	FALSE
7000:04	DO 3	BOOLEAN	RW P	FALSE
7000:05	DO 4	BOOLEAN	RW P	FALSE
7000:06	DO 5	BOOLEAN	RW P	FALSE
7000:07	DO 6	BOOLEAN	RW P	FALSE
7000:08	DO 7	BOOLEAN	RW P	FALSE

TRUE: Turn ON the relay channel.

FALSE: Turn OFF the relay channel.

3.5.10 AMAX-4862: 16-Channel DI and 16-Channel Relay Output Module

3.5.10.1 Object Dictionary Configuration

■ Digital Input Data (PDO)

Index	Name	Data Type	Flags	Default
6000:01	DI 0	BOOLEAN	RO P	FALSE
6000:02	DI 1	BOOLEAN	RO P	FALSE
6000:03	DI 2	BOOLEAN	RO P	FALSE
6000:04	DI 3	BOOLEAN	RO P	FALSE
6000:05	DI 4	BOOLEAN	RO P	FALSE
6000:06	DI 5	BOOLEAN	RO P	FALSE
6000:07	DI 6	BOOLEAN	RO P	FALSE
6000:08	DI 7	BOOLEAN	RO P	FALSE
6001:01	DI 8	BOOLEAN	RO P	FALSE
6001:02	DI 9	BOOLEAN	RO P	FALSE
6001:03	DI 10	BOOLEAN	RO P	FALSE
6001:04	DI 11	BOOLEAN	RO P	FALSE
6001:05	DI 12	BOOLEAN	RO P	FALSE
6001:06	DI 13	BOOLEAN	RO P	FALSE
6001:07	DI 14	BOOLEAN	RO P	FALSE
6001:08	DI 15	BOOLEAN	RO P	FALSE

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

■ Relay Output Data (PDO)

Index	Name	Data Type	Flags	Default
7000:01	DO 0	BOOLEAN	RW P	FALSE
7000:02	DO 1	BOOLEAN	RW P	FALSE
7000:03	DO 2	BOOLEAN	RW P	FALSE
7000:04	DO 3	BOOLEAN	RW P	FALSE
7000:05	DO 4	BOOLEAN	RW P	FALSE
7000:06	DO 5	BOOLEAN	RW P	FALSE
7000:07	DO 6	BOOLEAN	RW P	FALSE
7000:08	DO 7	BOOLEAN	RW P	FALSE
7001:01	DO 8	BOOLEAN	RW P	FALSE
7001:02	DO 9	BOOLEAN	RW P	FALSE
7001:03	DO 10	BOOLEAN	RW P	FALSE
7001:04	DO 11	BOOLEAN	RW P	FALSE
7001:05	DO 12	BOOLEAN	RW P	FALSE
7001:06	DO 13	BOOLEAN	RW P	FALSE
7001:07	DO 14	BOOLEAN	RW P	FALSE
7001:08	DO 15	BOOLEAN	RW P	FALSE

TRUE: Turn ON the relay channel.

FALSE: Turn OFF the relay channel.

Appendix **A**

Object Dictionary

A.1 Object Dictionary

A.1.1 AMAX-4817 Object Dictionary

Standard Object (0x1000-0x1FFF)				
Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4817
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	The hardware version of the module
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	The firmware version of the module
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)
1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004817 (18455dec)
1018:03	Revision Number	UInt32	RO	0x00000000 (0dec)
1018:04	Serial Number	UInt32	RO	0x00000000 (0dec)
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)

Index 1600 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x01 (1dec)
1600:01	Dummy Output 0	UInt32	RO	0x7000:01, 16
Index 1A00 TxPDO Mapping				
Index	Name	Data Type	Flags	Default
1A00:00	TxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1A00:01	AI 0	UInt32	RO	0x6000:01, 16
1A00:02	AI 1	UInt32	RO	0x6000:02, 16
1A00:03	AI 2	UInt32	RO	0x6000:03, 16
1A00:04	AI 3	UInt32	RO	0x6000:04, 16
1A00:05	AI 4	UInt32	RO	0x6000:05, 16
1A00:06	AI 5	UInt32	RO	0x6000:06, 16
1A00:07	AI 6	UInt32	RO	0x6000:07, 16
1A00:08	AI 7	UInt32	RO	0x6000:08, 16
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0001 (1dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0001 (1dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)

1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE
Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE
Standard Object (0x2000-0x2FFF)				
Index 2180-2187 AO Configuration				
Index	Name	Data Type	Flags	Default
2180:00	AI 0 Configuration	UInt8	RO	0x03 (3dec)
2180:01	Range	UInt16	RW	0x0000 (0dec)
2180:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2180:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2181:00	AI 1 Configuration	UInt8	RO	0x03 (3dec)
2181:01	Range	UInt16	RW	0x0000 (0dec)
2181:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2181:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2182:00	AI 2 Configuration	UInt8	RO	0x03 (3dec)
2182:01	Range	UInt16	RW	0x0000 (0dec)
2182:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)

2182:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2183:00	AI 3 Configuration	UInt8	RO	0x03 (3dec)
2183:01	Range	UInt16	RW	0x0000 (0dec)
2183:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2183:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2184:00	AI 4 Configuration	UInt8	RO	0x03 (3dec)
2184:01	Range	UInt16	RW	0x0000 (0dec)
2184:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2184:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2185:00	AI 5 Configuration	UInt8	RO	0x03 (3dec)
2185:01	Range	UInt16	RW	0x0000 (0dec)
2185:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2185:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2186:00	AI 6 Configuration	UInt8	RO	0x03 (3dec)
2186:01	Range	UInt16	RW	0x0000 (0dec)
2186:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2186:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2187:00	AI 7 Configuration	UInt8	RO	0x03 (3dec)
2187:01	Range	UInt16	RW	0x0000 (0dec)
2187:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2187:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
Index 2190 Load/Save Calibration Parameter				
Index	Name	Data Type	Flags	Default
2190:00	Load/Save Calibration Parameter	UInt8	RO	0x02 (2dec)
2190:01	Load Calibration Parameter	UInt16	RW	0x0000 (0dec)
2190:02	Save Calibration Parameter	UInt16	RW	0x0000 (0dec)
Standard Object (0x6000-0x7FFF)				
Index 6000 Analog Input				
Index	Name	Data Type	Flags	Default
6000:00	Analog Input	UInt8	RO P	0x08 (8dec)
6000:01	AI 0	UInt16	RO P	0x0000 (0dec)
6000:02	AI 1	UInt16	RO P	0x0000 (0dec)

6000:03	AI 2	UInt16	RO P	0x0000 (0dec)
6000:04	AI 3	UInt16	RO P	0x0000 (0dec)
6000:05	AI 4	UInt16	RO P	0x0000 (0dec)
6000:06	AI 5	UInt16	RO P	0x0000 (0dec)
6000:07	AI 6	UInt16	RO P	0x0000 (0dec)
6000:08	AI 7	UInt16	RO P	0x0000 (0dec)
Index 7000 Dummy Output				
Index	Name	Data Type	Flags	Default
7000:00	Dummy Output	UInt8	RW P	0x01 (1dec)
7000:01	Dummy Output 0	UInt8	RW P	0x00 (0dec)

A.1.2 AMAX-4820 Object Dictionary

Standard Object (0x1000-0x1FFF)				
Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4820
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	The hardware version of the module
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	The firmware version of the module
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)
1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004820 (18464dec)
1018:03	Revision Number	UInt32	RO	0x00000000 (0dec)
1018:04	Serial Number	UInt32	RO	0x00000000 (0dec)

Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x04 (4dec)
1600:01	AO 0	UInt32	RO	0x7000:01, 16
1600:02	AO 1	UInt32	RO	0x7000:02, 16
1600:03	AO 2	UInt32	RO	0x7000:03, 16
1600:04	AO 3	UInt32	RO	0x7000:04, 16
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0001 (1dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0000 (0dec)
Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)

1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE
Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE
Standard Object (0x2000-0x2FFF)				
Index 2180-2183 AO Configuration				
Index	Name	Data Type	Flags	Default
2180:00	AO 0 Configuration	UInt8	RO	0x03 (3dec)
2180:01	Range	UInt16	RW	0x0000 (0dec)
2180:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2180:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2181:00	AO 1 Configuration	UInt8	RO	0x03 (3dec)
2181:01	Range	UInt16	RW	0x0000 (0dec)
2181:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2181:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2182:00	AO 2 Configuration	UInt8	RO	0x03 (3dec)
2182:01	Range	UInt16	RW	0x0000 (0dec)
2182:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2182:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
2183:00	AO 3 Configuration	UInt8	RO	0x03 (3dec)

2183:01	Range	UInt16	RW	0x0000 (0dec)
2183:02	Offset Calibration Parameter	UInt16	RW	0x0000 (0dec)
2183:03	Gain Calibration Parameter	UInt16	RW	0x8000 (32768dec)
Index 2190 Load/Save Calibration Parameter				
Index	Name	Data Type	Flags	Default
2190:00	Load/Save Calibration Parameter	UInt8	RO	0x02 (2dec)
2190:01	Load Calibration Parameter	UInt16	RW	0x0000 (0dec)
2190:02	Save Calibration Parameter	UInt16	RW	0x0000 (0dec)
Standard Object (0x6000-0x7FFF)				
Index 7000 Analog Output				
Index	Name	Data Type	Flags	Default
7000:00	Analog Output	UInt8	RW P	0x04 (4dec)
7000:01	AO 0	UInt16	RW P	0x0000 (0dec)
7000:02	AO 1	UInt16	RW P	0x0000 (0dec)
7000:03	AO 2	UInt16	RW P	0x0000 (0dec)
7000:04	AO 3	UInt16	RW P	0x0000 (0dec)

A.1.3 AMAX-4830/SO Object Dictionary

A.1.3.1 Standard Object (0x1000-0x1FFF)

Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4830 or AMAX-4830SO
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	The hardware version of the module

Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	The firmware version of the module
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)
1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004830 (18480dec)
1018:03	Revision Number	UInt32	RO	The revision number of the module
1018:04	Serial Number	UInt32	RO	The serial number of the module
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600-1601 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1600:01	DO0	UInt32	RO	0x7000:01, 1
1600:02	DO1	UInt32	RO	0x7000:02, 1
1600:03	DO2	UInt32	RO	0x7000:03, 1
1600:04	DO3	UInt32	RO	0x7000:04, 1
1600:05	DO4	UInt32	RO	0x7000:05, 1
1600:06	DO5	UInt32	RO	0x7000:06, 1
1600:07	DO6	UInt32	RO	0x7000:07, 1
1600:08	DO7	UInt32	RO	0x7000:08, 1
1601:00	RxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1601:01	DO8	UInt32	RO	0x7001:01, 1
1601:02	DO9	UInt32	RO	0x7001:02, 1
1601:03	DO10	UInt32	RO	0x7001:03, 1
1601:04	DO11	UInt32	RO	0x7001:04, 1
1601:05	DO12	UInt32	RO	0x7001:05, 1
1601:06	DO13	UInt32	RO	0x7001:06, 1
1601:07	DO14	UInt32	RO	0x7001:07, 1
1601:08	DO15	UInt32	RO	0x7001:08, 1

Index 1A00-1A01 TxPDO Mapping				
Index	Name	Data Type	Flags	Default
1A00:00	TxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1A00:01	DI0	UInt32	RO	0x6000:01, 1
1A00:02	DI1	UInt32	RO	0x6000:02, 1
1A00:03	DI2	UInt32	RO	0x6000:03, 1
1A00:04	DI3	UInt32	RO	0x6000:04, 1
1A00:05	DI4	UInt32	RO	0x6000:05, 1
1A00:06	DI5	UInt32	RO	0x6000:06, 1
1A00:07	DI6	UInt32	RO	0x6000:07, 1
1A00:08	DI7	UInt32	RO	0x6000:08, 1
1A01:00	TxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1A01:01	DI8	UInt32	RO	0x6001:01, 1
1A01:02	DI9	UInt32	RO	0x6001:02, 1
1A01:03	DI10	UInt32	RO	0x6001:03, 1
1A01:04	DI11	UInt32	RO	0x6001:04, 1
1A01:05	DI12	UInt32	RO	0x6001:05, 1
1A01:06	DI13	UInt32	RO	0x6001:06, 1
1A01:07	DI14	UInt32	RO	0x6001:07, 1
1A01:08	DI15	UInt32	RO	0x6001:08, 1
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0002 (2dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
1C12:02	Second Entry	UInt16	RO	0x1601 (5633dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0002 (2dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
1C13:02	Second Entry	UInt16	RO	0x1A01 (6657dec)
Index 1C32 SM Output Parameter				

Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE

Index 1C33 SM Input Parameter

Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE

A.1.3.2 Standard Object (0x6000-0x7FFF)

Index 6000-6001 Digital Input Port

Index	Name	Data Type	Flags	Default
6000:00	Digital Input Port 0	UInt8	RO P	0x08 (8dec)
6000:01	DI0	BOOLEAN	RO P	FALSE
6000:02	DI1	BOOLEAN	RO P	FALSE
6000:03	DI2	BOOLEAN	RO P	FALSE
6000:04	DI3	BOOLEAN	RO P	FALSE
6000:05	DI4	BOOLEAN	RO P	FALSE
6000:06	DI5	BOOLEAN	RO P	FALSE
6000:07	DI6	BOOLEAN	RO P	FALSE
6000:08	DI7	BOOLEAN	RO P	FALSE
6001:00	Digital Input Port 1	UInt8	RO P	0x08 (8dec)
6001:01	DI8	BOOLEAN	RO P	FALSE

6001:02	DI9	BOOLEAN	RO P	FALSE
6001:03	DI10	BOOLEAN	RO P	FALSE
6001:04	DI11	BOOLEAN	RO P	FALSE
6001:05	DI12	BOOLEAN	RO P	FALSE
6001:06	DI13	BOOLEAN	RO P	FALSE
6001:07	DI14	BOOLEAN	RO P	FALSE
6001:08	DI15	BOOLEAN	RO P	FALSE
Index 7000-7001 Digital Output Port				
Index	Name	Data Type	Flags	Default
7000:00	Digital Output Port 0	UInt8	RW P	0x08 (8dec)
7000:01	DO0	BOOLEAN	RW P	FALSE
7000:02	DO1	BOOLEAN	RW P	FALSE
7000:03	DO2	BOOLEAN	RW P	FALSE
7000:04	DO3	BOOLEAN	RW P	FALSE
7000:05	DO4	BOOLEAN	RW P	FALSE
7000:06	DO5	BOOLEAN	RW P	FALSE
7000:07	DO6	BOOLEAN	RW P	FALSE
7000:08	DO7	BOOLEAN	RW P	FALSE
7001:00	Digital Output Port 1	UInt8	RW P	0x08 (8dec)
7001:01	DO8	BOOLEAN	RW P	FALSE
7001:02	DO9	BOOLEAN	RW P	FALSE
7001:03	DO10	BOOLEAN	RW P	FALSE
7001:04	DO11	BOOLEAN	RW P	FALSE
7001:05	DO12	BOOLEAN	RW P	FALSE
7001:06	DO13	BOOLEAN	RW P	FALSE
7001:07	DO14	BOOLEAN	RW P	FALSE
7001:08	DO15	BOOLEAN	RW P	FALSE

A.1.4 AMAX-4833 Object Dictionary

A.1.4.1 Standard Object (0x1000-0x1FFF)

Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4833

Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	The hardware version of the module
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	The firmware version of the module
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)
1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004833 (18483dec)
1018:03	Revision Number	UInt32	RO	The revision number of the module
1018:04	Serial Number	UInt32	RO	The serial number of the module
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600-1601 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x01 (1dec)
1600:01	Dummy Output 0	UInt32	RO	0x7000:01, 1
1A00:02	DI1	UInt32	RO	0x6000:02, 1
1A00:03	DI2	UInt32	RO	0x6000:03, 1
1A00:04	DI3	UInt32	RO	0x6000:04, 1
1A00:05	DI4	UInt32	RO	0x6000:05, 1
1A00:06	DI5	UInt32	RO	0x6000:06, 1
1A00:07	DI6	UInt32	RO	0x6000:07, 1
1A00:08	DI7	UInt32	RO	0x6000:08, 1
1A01:00	TxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1A01:01	DI8	UInt32	RO	0x6001:01, 1
1A01:02	DI9	UInt32	RO	0x6001:02, 1
1A01:03	DI10	UInt32	RO	0x6001:03, 1
1A01:04	DI11	UInt32	RO	0x6001:04, 1
1A01:05	DI12	UInt32	RO	0x6001:05, 1
1A01:06	DI13	UInt32	RO	0x6001:06, 1
1A01:07	DI14	UInt32	RO	0x6001:07, 1

1A01:08	DI15	UInt32	RO	0x6001:08, 1
1A02:00	TxPDO Mapping 2	UInt8	RO	0x08 (8dec)
1A02:01	DI16	UInt32	RO	0x6002:01, 1
1A02:02	DI17	UInt32	RO	0x6002:02, 1
1A02:03	DI18	UInt32	RO	0x6002:03, 1
1A02:04	DI19	UInt32	RO	0x6002:04, 1
1A02:05	DI20	UInt32	RO	0x6002:05, 1
1A02:06	DI21	UInt32	RO	0x6002:06, 1
1A02:07	DI22	UInt32	RO	0x6002:07, 1
1A02:08	DI23	UInt32	RO	0x6002:08, 1
1A03:00	TxPDO Mapping 3	UInt8	RO	0x08 (8dec)
1A03:01	DI24	UInt32	RO	0x6003:01, 1
1A03:02	DI25	UInt32	RO	0x6003:02, 1
1A03:03	DI26	UInt32	RO	0x6003:03, 1
1A03:04	DI27	UInt32	RO	0x6003:04, 1
1A03:05	DI28	UInt32	RO	0x6003:05, 1
1A03:06	DI29	UInt32	RO	0x6003:06, 1
1A03:07	DI30	UInt32	RO	0x6003:07, 1
1A03:08	DI31	UInt32	RO	0x6003:08, 1
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0001 (1dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0004 (4dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
1C13:02	Second Entry	UInt16	RO	0x1A01 (6657dec)
1C13:03	Third Entry	UInt16	RO	0x1A02 (6658dec)
1C13:04	Fourth Entry	UInt16	RO	0x1A03 (6659dec)

Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE

Index 1C33 SM Input Parameter

Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE

Index 6000-6003 Digital Input Port

Index	Name	Data Type	Flags	Default
6000:00	Digital Input Port 0	UInt8	RO P	0x08 (8dec)
6000:01	DI0	BOOLEAN	RO P	FALSE
6000:02	DI1	BOOLEAN	RO P	FALSE
6000:03	DI2	BOOLEAN	RO P	FALSE
6000:04	DI3	BOOLEAN	RO P	FALSE
6000:05	DI4	BOOLEAN	RO P	FALSE
6000:06	DI5	BOOLEAN	RO P	FALSE
6000:07	DI6	BOOLEAN	RO P	FALSE
6000:08	DI7	BOOLEAN	RO P	FALSE
6001:00	Digital Input Port 1	UInt8	RO P	0x08 (8dec)
6001:01	DI8	BOOLEAN	RO P	FALSE

6001:02	DI9	BOOLEAN	RO P	FALSE
6001:03	DI10	BOOLEAN	RO P	FALSE
6001:04	DI11	BOOLEAN	RO P	FALSE
6001:05	DI12	BOOLEAN	RO P	FALSE
6001:06	DI13	BOOLEAN	RO P	FALSE
6001:07	DI14	BOOLEAN	RO P	FALSE
6001:08	DI15	BOOLEAN	RO P	FALSE
6002:00	Digital Input Port 2	UInt8	RO P	0x08 (8dec)
6002:01	DI16	BOOLEAN	RO P	FALSE
6002:02	DI17	BOOLEAN	RO P	FALSE
6002:03	DI18	BOOLEAN	RO P	FALSE
6002:04	DI19	BOOLEAN	RO P	FALSE
6002:05	DI20	BOOLEAN	RO P	FALSE
6002:06	DI21	BOOLEAN	RO P	FALSE
6002:07	DI22	BOOLEAN	RO P	FALSE
6002:08	DI23	BOOLEAN	RO P	FALSE
6003:00	Digital Input Port 3	UInt8	RO P	0x08 (8dec)
6003:01	DI24	BOOLEAN	RO P	FALSE
6003:02	DI25	BOOLEAN	RO P	FALSE
6003:03	DI26	BOOLEAN	RO P	FALSE
6003:04	DI27	BOOLEAN	RO P	FALSE
6003:05	DI28	BOOLEAN	RO P	FALSE
6003:06	DI29	BOOLEAN	RO P	FALSE
6003:07	DI30	BOOLEAN	RO P	FALSE
6003:08	DI31	BOOLEAN	RO P	FALSE
Index 7000 Dummy Output				
Index	Name	Data Type	Flags	Default
7000:00	Dummy Output	UInt8	RW P	0x01 (1dec)
7000:01	Dummy Output 0	BOOLEAN	RW P	FALSE

A.1.5 AMAX-4834 Object Dictionary

A.1.5.1 Standard Object (0x1000-0x1FFF)

Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)

Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4834
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	The hardware version of the module
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	The firmware version of the module
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)
1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004834 (18484dec)
1018:03	Revision Number	UInt32	RO	The revision number of the module
1018:04	Serial Number	UInt32	RO	The serial number of the module
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600-1601 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1600:01	DO0	UInt32	RO	0x7000:01, 1
1600:02	DO1	UInt32	RO	0x7000:02, 1
1600:03	DO2	UInt32	RO	0x7000:03, 1
1600:04	DO3	UInt32	RO	0x7000:04, 1
1600:05	DO4	UInt32	RO	0x7000:05, 1
1600:06	DO5	UInt32	RO	0x7000:06, 1
1600:07	DO6	UInt32	RO	0x7000:07, 1
1600:08	DO7	UInt32	RO	0x7000:08, 1
1601:00	RxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1601:01	DO8	UInt32	RO	0x7001:01, 1
1601:02	DO9	UInt32	RO	0x7001:02, 1
1601:03	DO10	UInt32	RO	0x7001:03, 1
1601:04	DO11	UInt32	RO	0x7001:04, 1

1601:05	DO12	UInt32	RO	0x7001:05, 1
1601:06	DO13	UInt32	RO	0x7001:06, 1
1601:07	DO14	UInt32	RO	0x7001:07, 1
1601:08	DO15	UInt32	RO	0x7001:08, 1
1602:00	RxPDO Mapping 2	UInt8	RO	0x08 (8dec)
1602:01	DO16	UInt32	RO	0x7002:01, 1
1602:02	DO17	UInt32	RO	0x7002:02, 1
1602:03	DO18	UInt32	RO	0x7002:03, 1
1602:04	DO19	UInt32	RO	0x7002:04, 1
1602:05	DO20	UInt32	RO	0x7002:05, 1
1602:06	DO21	UInt32	RO	0x7002:06, 1
1602:07	DO22	UInt32	RO	0x7002:07, 1
1602:08	DO23	UInt32	RO	0x7002:08, 1
1603:00	RxPDO Mapping 3	UInt8	RO	0x08 (8dec)
1603:01	DO24	UInt32	RO	0x7003:01, 1
1603:02	DO25	UInt32	RO	0x7003:02, 1
1603:03	DO26	UInt32	RO	0x7003:03, 1
1603:04	DO27	UInt32	RO	0x7003:04, 1
1603:05	DO28	UInt32	RO	0x7003:05, 1
1603:06	DO29	UInt32	RO	0x7003:06, 1
1603:07	DO30	UInt32	RO	0x7003:07, 1
1603:08	DO31	UInt32	RO	0x7003:08, 1
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0004 (4dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
1C12:02	Second Entry	UInt16	RO	0x1601 (5633dec)
1C12:03	Third Entry	UInt16	RO	0x1602 (5634dec)
1C12:04	Fourth Entry	UInt16	RO	0x1603 (5635dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0000 (0dec)

Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE
Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE

A.1.5.2 Standard Object (0x6000-0x7FFF)

Index 7000-7003 Digital Output Port				
Index	Name	Data Type	Flags	Default
7000:00	Digital Output Port 0	UInt8	RW P	0x08 (8dec)
7000:01	DO0	BOOLEAN	RW P	FALSE
7000:02	DO1	BOOLEAN	RW P	FALSE
7000:03	DO2	BOOLEAN	RW P	FALSE
7000:04	DO3	BOOLEAN	RW P	FALSE
7000:05	DO4	BOOLEAN	RW P	FALSE
7000:06	DO5	BOOLEAN	RW P	FALSE

7000:07	DO6	BOOLEAN	RW P	FALSE
7000:08	DO7	BOOLEAN	RW P	FALSE
7001:00	Digital Output Port 1	UInt8	RW P	0x08 (8dec)
7001:01	DO8	BOOLEAN	RW P	FALSE
7001:02	DO9	BOOLEAN	RW P	FALSE
7001:03	DO10	BOOLEAN	RW P	FALSE
7001:04	DO11	BOOLEAN	RW P	FALSE
7001:05	DO12	BOOLEAN	RW P	FALSE
7001:06	DO13	BOOLEAN	RW P	FALSE
7001:07	DO14	BOOLEAN	RW P	FALSE
7001:08	DO15	BOOLEAN	RW P	FALSE
7002:00	Digital Output Port 2	UInt8	RW P	0x08 (8dec)
7002:01	DO16	BOOLEAN	RW P	FALSE
7002:02	DO17	BOOLEAN	RW P	FALSE
7002:03	DO18	BOOLEAN	RW P	FALSE
7002:04	DO19	BOOLEAN	RW P	FALSE
7002:05	DO20	BOOLEAN	RW P	FALSE
7002:06	DO21	BOOLEAN	RW P	FALSE
7002:07	DO22	BOOLEAN	RW P	FALSE
7002:08	DO23	BOOLEAN	RW P	FALSE
7003:00	Digital Output Port 3	UInt8	RW P	0x08 (8dec)
7003:01	DO24	BOOLEAN	RW P	FALSE
7003:02	DO25	BOOLEAN	RW P	FALSE
7003:03	DO26	BOOLEAN	RW P	FALSE
7003:04	DO27	BOOLEAN	RW P	FALSE
7003:05	DO28	BOOLEAN	RW P	FALSE
7003:06	DO29	BOOLEAN	RW P	FALSE
7003:07	DO30	BOOLEAN	RW P	FALSE
7003:08	DO31	BOOLEAN	RW P	FALSE

A.1.6 AMAX-4850 Object Dictionary

A.1.6.1 Standard Object (0x1000-0x1FFF)

Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)

Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4850
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	The hardware version of the module
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	The firmware version of the module
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)
1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004850 (18512dec)
1018:03	Revision Number	UInt32	RO	The revision number of the module
1018:04	Serial Number	UInt32	RO	The serial number of the module
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1600:01	DO0	UInt32	RO	0x7000:01, 1
1600:02	DO1	UInt32	RO	0x7000:02, 1
1600:03	DO2	UInt32	RO	0x7000:03, 1
1600:04	DO3	UInt32	RO	0x7000:04, 1
1600:05	DO4	UInt32	RO	0x7000:05, 1
1600:06	DO5	UInt32	RO	0x7000:06, 1
1600:07	DO6	UInt32	RO	0x7000:07, 1
1600:08	DO7	UInt32	RO	0x7000:08, 1
Index 1A00-1A01 TxPDO Mapping				
Index	Name	Data Type	Flags	Default
1A00:00	TxPDO Mapping 0	UInt8	RO	0x08 (8dec)

1A00:01	DI0	UInt32	RO	0x6000:01, 1
1A00:02	DI1	UInt32	RO	0x6000:02, 1
1A00:03	DI2	UInt32	RO	0x6000:03, 1
1A00:04	DI3	UInt32	RO	0x6000:04, 1
1A00:05	DI4	UInt32	RO	0x6000:05, 1
1A00:06	DI5	UInt32	RO	0x6000:06, 1
1A00:07	DI6	UInt32	RO	0x6000:07, 1
1A00:08	DI7	UInt32	RO	0x6000:08, 1
1A01:00	TxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1A01:01	DI8	UInt32	RO	0x6001:01, 1
1A01:02	DI9	UInt32	RO	0x6001:02, 1
1A01:03	DI10	UInt32	RO	0x6001:03, 1
1A01:04	DI11	UInt32	RO	0x6001:04, 1
1A01:05	DI12	UInt32	RO	0x6001:05, 1
1A01:06	DI13	UInt32	RO	0x6001:06, 1
1A01:07	DI14	UInt32	RO	0x6001:07, 1
1A01:08	DI15	UInt32	RO	0x6001:08, 1
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0001 (1dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0002 (2dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
1C13:02	Second Entry	UInt16	RO	0x1A01 (6657dec)
Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent

1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE
Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE

A.1.6.2 Standard Object (0x6000-0x7FFF)

Index 6000-6001 Digital Input Port				
Index	Name	Data Type	Flags	Default
6000:00	Digital Input Port 0	UInt8	RO P	0x08 (8dec)
6000:01	DI0	BOOLEAN	RO P	FALSE
6000:02	DI1	BOOLEAN	RO P	FALSE
6000:03	DI2	BOOLEAN	RO P	FALSE
6000:04	DI3	BOOLEAN	RO P	FALSE
6000:05	DI4	BOOLEAN	RO P	FALSE
6000:06	DI5	BOOLEAN	RO P	FALSE
6000:07	DI6	BOOLEAN	RO P	FALSE
6000:08	DI7	BOOLEAN	RO P	FALSE
6001:00	Digital Input Port 1	UInt8	RO P	0x08 (8dec)
6001:01	DI8	BOOLEAN	RO P	FALSE
6001:02	DI9	BOOLEAN	RO P	FALSE
6001:03	DI10	BOOLEAN	RO P	FALSE
6001:04	DI11	BOOLEAN	RO P	FALSE

6001:05	DI12	BOOLEAN	RO P	FALSE
6001:06	DI13	BOOLEAN	RO P	FALSE
6001:07	DI14	BOOLEAN	RO P	FALSE
6001:08	DI15	BOOLEAN	RO P	FALSE
Index 7000 Digital Output Port				
Index	Name	Data Type	Flags	Default
7000:00	Digital Output Port 0	UInt8	RW P	0x08 (8dec)
7000:01	DO0	BOOLEAN	RW P	FALSE
7000:02	DO1	BOOLEAN	RW P	FALSE
7000:03	DO2	BOOLEAN	RW P	FALSE
7000:04	DO3	BOOLEAN	RW P	FALSE
7000:05	DO4	BOOLEAN	RW P	FALSE
7000:06	DO5	BOOLEAN	RW P	FALSE
7000:07	DO6	BOOLEAN	RW P	FALSE
7000:08	DO7	BOOLEAN	RW P	FALSE

A.1.7 AMAX-4855 Object Dictionary

Standard Object (0x1000-0x1FFF)				
Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4855
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	Dependent
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	Dependent
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)

1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004855 (18517dec)
1018:03	Revision Number	UInt32	RO	0x00000000 (0dec)
1018:04	Serial Number	UInt32	RO	0x00000000 (0dec)
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600-1601 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1600:01	DO0	UInt32	RO	0x7000:01, 1
1600:02	DO1	UInt32	RO	0x7000:02, 1
1600:03	DO2	UInt32	RO	0x7000:03, 1
1600:04	DO3	UInt32	RO	0x7000:04, 1
1600:05	DO4	UInt32	RO	0x7000:05, 1
1600:06	DO5	UInt32	RO	0x7000:06, 1
1600:07	DO6	UInt32	RO	0x7000:07, 1
1600:08	DO7	UInt32	RO	0x7000:08, 1
1601:00	RxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1601:01	DO8	UInt32	RO	0x7001:01, 1
1601:02	DO9	UInt32	RO	0x7001:02, 1
1601:03	DO10	UInt32	RO	0x7001:03, 1
1601:04	DO11	UInt32	RO	0x7001:04, 1
1601:05	DO12	UInt32	RO	0x7001:05, 1
1601:06	DO13	UInt32	RO	0x7001:06, 1
1601:07	DO14	UInt32	RO	0x7001:07, 1
1601:08	DO15	UInt32	RO	0x7001:08, 1
Index 1A00-1A03 TxPDO Mapping				
Index	Name	Data Type	Flags	Default
1A00:00	TxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1A00:01	DI0	UInt32	RO	0x6000:01, 1
1A00:02	DI1	UInt32	RO	0x6000:02, 1
1A00:03	DI2	UInt32	RO	0x6000:03, 1
1A00:04	DI3	UInt32	RO	0x6000:04, 1
1A00:05	DI4	UInt32	RO	0x6000:05, 1
1A00:06	DI5	UInt32	RO	0x6000:06, 1
1A00:07	DI6	UInt32	RO	0x6000:07, 1
1A00:08	DI7	UInt32	RO	0x6000:08, 1
1A01:00	TxPDO Mapping 1	UInt8	RO	0x08 (8dec)

1A01:01	DI8	UInt32	RO	0x6001:01, 1
1A01:02	DI9	UInt32	RO	0x6001:02, 1
1A01:03	DI10	UInt32	RO	0x6001:03, 1
1A01:04	DI11	UInt32	RO	0x6001:04, 1
1A01:05	DI12	UInt32	RO	0x6001:05, 1
1A01:06	DI13	UInt32	RO	0x6001:06, 1
1A01:07	DI14	UInt32	RO	0x6001:07, 1
1A01:08	DI15	UInt32	RO	0x6001:08, 1
1A02:00	TxPDO Mapping 2	UInt8	RO	0x08 (8dec)
1A02:01	DI16	UInt32	RO	0x6002:01, 1
1A02:02	DI17	UInt32	RO	0x6002:02, 1
1A02:03	DI18	UInt32	RO	0x6002:03, 1
1A02:04	DI19	UInt32	RO	0x6002:04, 1
1A02:05	DI20	UInt32	RO	0x6002:05, 1
1A02:06	DI21	UInt32	RO	0x6002:06, 1
1A02:07	DI22	UInt32	RO	0x6002:07, 1
1A02:08	DI23	UInt32	RO	0x6002:08, 1
1A03:00	TxPDO Mapping 3	UInt8	RO	0x08 (8dec)
1A03:01	DI24	UInt32	RO	0x6003:01, 1
1A03:02	DI25	UInt32	RO	0x6003:02, 1
1A03:03	DI26	UInt32	RO	0x6003:03, 1
1A03:04	DI27	UInt32	RO	0x6003:04, 1
1A03:05	DI28	UInt32	RO	0x6003:05, 1
1A03:06	DI29	UInt32	RO	0x6003:06, 1
1A03:07	DI30	UInt32	RO	0x6003:07, 1
1A03:08	DI31	UInt32	RO	0x6003:08, 1
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0002 (2dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
1C12:02	Second Entry	UInt16	RO	0x1601 (5633dec)

Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0004 (4dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
1C13:02	Second Entry	UInt16	RO	0x1A01 (6657dec)
1C13:03	Third Entry	UInt16	RO	0x1A02 (6658dec)
1C13:04	Fourth Entry	UInt16	RO	0x1A03 (6659dec)
Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE
Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE
Standard Object (0x6000-0x7FFF)				

Index 6000-6003 Digital Input Port				
Index	Name	Data Type	Flags	Default
6000:00	Digital Input Port 0	UInt8	RO P	0x08 (8dec)
6000:01	DI0	BOOLEAN	RO P	FALSE
6000:02	DI1	BOOLEAN	RO P	FALSE
6000:03	DI2	BOOLEAN	RO P	FALSE
6000:04	DI3	BOOLEAN	RO P	FALSE
6000:05	DI4	BOOLEAN	RO P	FALSE
6000:06	DI5	BOOLEAN	RO P	FALSE
6000:07	DI6	BOOLEAN	RO P	FALSE
6000:08	DI7	BOOLEAN	RO P	FALSE
6001:00	Digital Input Port 1	UInt8	RO P	0x08 (8dec)
6001:01	DI8	BOOLEAN	RO P	FALSE
6001:02	DI9	BOOLEAN	RO P	FALSE
6001:03	DI10	BOOLEAN	RO P	FALSE
6001:04	DI11	BOOLEAN	RO P	FALSE
6001:05	DI12	BOOLEAN	RO P	FALSE
6001:06	DI13	BOOLEAN	RO P	FALSE
6001:07	DI14	BOOLEAN	RO P	FALSE
6001:08	DI15	BOOLEAN	RO P	FALSE
6002:00	Digital Input Port 2	UInt8	RO P	0x08 (8dec)
6002:01	DI16	BOOLEAN	RO P	FALSE
6002:02	DI17	BOOLEAN	RO P	FALSE
6002:03	DI18	BOOLEAN	RO P	FALSE
6002:04	DI19	BOOLEAN	RO P	FALSE
6002:05	DI20	BOOLEAN	RO P	FALSE
6002:06	DI21	BOOLEAN	RO P	FALSE
6002:07	DI22	BOOLEAN	RO P	FALSE
6002:08	DI23	BOOLEAN	RO P	FALSE
6003:00	Digital Input Port 3	UInt8	RO P	0x08 (8dec)
6003:01	DI24	BOOLEAN	RO P	FALSE
6003:02	DI25	BOOLEAN	RO P	FALSE
6003:03	DI26	BOOLEAN	RO P	FALSE
6003:04	DI27	BOOLEAN	RO P	FALSE
6003:05	DI28	BOOLEAN	RO P	FALSE
6003:06	DI29	BOOLEAN	RO P	FALSE
6003:07	DI30	BOOLEAN	RO P	FALSE
6003:08	DI31	BOOLEAN	RO P	FALSE
Index 7000-7001 Digital Output Port				
Index	Name	Data Type	Flags	Default
7000:00	Digital Output Port 0	UInt8	RW P	0x08 (8dec)
7000:01	DO0	BOOLEAN	RW P	FALSE
7000:02	DO1	BOOLEAN	RW P	FALSE

7000:03	DO2	BOOLEAN	RW P	FALSE
7000:04	DO3	BOOLEAN	RW P	FALSE
7000:05	DO4	BOOLEAN	RW P	FALSE
7000:06	DO5	BOOLEAN	RW P	FALSE
7000:07	DO6	BOOLEAN	RW P	FALSE
7000:08	DO7	BOOLEAN	RW P	FALSE
7001:00	Digital Output Port 1	UInt8	RW P	0x08 (8dec)
7001:01	DO8	BOOLEAN	RW P	FALSE
7001:02	DO9	BOOLEAN	RW P	FALSE
7001:03	DO10	BOOLEAN	RW P	FALSE
7001:04	DO11	BOOLEAN	RW P	FALSE
7001:05	DO12	BOOLEAN	RW P	FALSE
7001:06	DO13	BOOLEAN	RW P	FALSE
7001:07	DO14	BOOLEAN	RW P	FALSE
7001:08	DO15	BOOLEAN	RW P	FALSE

A.1.8 AMAX-4856 Object Dictionary

Standard Object (0x1000-0x1FFF)				
Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4856
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	Dependent
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	Dependent
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)

1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004856 (18518dec)
1018:03	Revision Number	UInt32	RO	0x00000000 (0dec)
1018:04	Serial Number	UInt32	RO	0x00000000 (0dec)
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600-1603 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1600:01	DO0	UInt32	RO	0x7000:01, 1
1600:02	DO1	UInt32	RO	0x7000:02, 1
1600:03	DO2	UInt32	RO	0x7000:03, 1
1600:04	DO3	UInt32	RO	0x7000:04, 1
1600:05	DO4	UInt32	RO	0x7000:05, 1
1600:06	DO5	UInt32	RO	0x7000:06, 1
1600:07	DO6	UInt32	RO	0x7000:07, 1
1600:08	DO7	UInt32	RO	0x7000:08, 1
1601:00	RxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1601:01	DO8	UInt32	RO	0x7001:01, 1
1601:02	DO9	UInt32	RO	0x7001:02, 1
1601:03	DO10	UInt32	RO	0x7001:03, 1
1601:04	DO11	UInt32	RO	0x7001:04, 1
1601:05	DO12	UInt32	RO	0x7001:05, 1
1601:06	DO13	UInt32	RO	0x7001:06, 1
1601:07	DO14	UInt32	RO	0x7001:07, 1
1601:08	DO15	UInt32	RO	0x7001:08, 1
1602:00	RxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1602:01	DO16	UInt32	RO	0x7002:01, 1
1602:02	DO17	UInt32	RO	0x7002:02, 1
1602:03	DO18	UInt32	RO	0x7002:03, 1
1602:04	DO19	UInt32	RO	0x7002:04, 1
1602:05	DO20	UInt32	RO	0x7002:05, 1
1602:06	DO21	UInt32	RO	0x7002:06, 1
1602:07	DO22	UInt32	RO	0x7002:07, 1
1602:08	DO23	UInt32	RO	0x7002:08, 1
1603:00	RxPDO Mapping 2	UInt8	RO	0x08 (8dec)
1603:01	DO24	UInt32	RO	0x7003:01, 1
1603:02	DO25	UInt32	RO	0x7003:02, 1
1603:03	DO26	UInt32	RO	0x7003:03, 1

1603:04	DO27	UInt32	RO	0x7003:04, 1
1603:05	DO28	UInt32	RO	0x7003:05, 1
1603:06	DO29	UInt32	RO	0x7003:06, 1
1603:07	DO30	UInt32	RO	0x7003:07, 1
1603:08	DO31	UInt32	RO	0x7003:08, 1
Index 1A00-1A03 TxPDO Mapping				
Index	Name	Data Type	Flags	Default
1A00:00	TxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1A00:01	DI0	UInt32	RO	0x6000:01, 1
1A00:02	DI1	UInt32	RO	0x6000:02, 1
1A00:03	DI2	UInt32	RO	0x6000:03, 1
1A00:04	DI3	UInt32	RO	0x6000:04, 1
1A00:05	DI4	UInt32	RO	0x6000:05, 1
1A00:06	DI5	UInt32	RO	0x6000:06, 1
1A00:07	DI6	UInt32	RO	0x6000:07, 1
1A00:08	DI7	UInt32	RO	0x6000:08, 1
1A01:00	TxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1A01:01	DI8	UInt32	RO	0x6001:01, 1
1A01:02	DI9	UInt32	RO	0x6001:02, 1
1A01:03	DI10	UInt32	RO	0x6001:03, 1
1A01:04	DI11	UInt32	RO	0x6001:04, 1
1A01:05	DI12	UInt32	RO	0x6001:05, 1
1A01:06	DI13	UInt32	RO	0x6001:06, 1
1A01:07	DI14	UInt32	RO	0x6001:07, 1
1A01:08	DI15	UInt32	RO	0x6001:08, 1
1A02:00	TxPDO Mapping 2	UInt8	RO	0x08 (8dec)
1A02:01	DI16	UInt32	RO	0x6002:01, 1
1A02:02	DI17	UInt32	RO	0x6002:02, 1
1A02:03	DI18	UInt32	RO	0x6002:03, 1
1A02:04	DI19	UInt32	RO	0x6002:04, 1
1A02:05	DI20	UInt32	RO	0x6002:05, 1
1A02:06	DI21	UInt32	RO	0x6002:06, 1
1A02:07	DI22	UInt32	RO	0x6002:07, 1
1A02:08	DI23	UInt32	RO	0x6002:08, 1
1A03:00	TxPDO Mapping 3	UInt8	RO	0x08 (8dec)
1A03:01	DI24	UInt32	RO	0x6003:01, 1
1A03:02	DI25	UInt32	RO	0x6003:02, 1
1A03:03	DI26	UInt32	RO	0x6003:03, 1
1A03:04	DI27	UInt32	RO	0x6003:04, 1
1A03:05	DI28	UInt32	RO	0x6003:05, 1
1A03:06	DI29	UInt32	RO	0x6003:06, 1
1A03:07	DI30	UInt32	RO	0x6003:07, 1
1A03:08	DI31	UInt32	RO	0x6003:08, 1

Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0004 (4dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
1C12:02	Second Entry	UInt16	RO	0x1601 (5633dec)
1C12:03	Third Entry	UInt16	RO	0x1602 (5634dec)
1C12:04	Fourth Entry	UInt16	RO	0x1603 (5635dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0004 (4dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
1C13:02	Second Entry	UInt16	RO	0x1A01 (6657dec)
1C13:03	Third Entry	UInt16	RO	0x1A02 (6658dec)
1C13:04	Fourth Entry	UInt16	RO	0x1A03 (6659dec)
Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE

Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE
Standard Object (0x6000-0x7FFF)				
Index 6000-6003 Digital Input Port				
Index	Name	Data Type	Flags	Default
6000:00	Digital Input Port 0	UInt8	RO P	0x08 (8dec)
6000:01	DI0	BOOLEAN	RO P	FALSE
6000:02	DI1	BOOLEAN	RO P	FALSE
6000:03	DI2	BOOLEAN	RO P	FALSE
6000:04	DI3	BOOLEAN	RO P	FALSE
6000:05	DI4	BOOLEAN	RO P	FALSE
6000:06	DI5	BOOLEAN	RO P	FALSE
6000:07	DI6	BOOLEAN	RO P	FALSE
6000:08	DI7	BOOLEAN	RO P	FALSE
6001:00	Digital Input Port 1	UInt8	RO P	0x08 (8dec)
6001:01	DI8	BOOLEAN	RO P	FALSE
6001:02	DI9	BOOLEAN	RO P	FALSE
6001:03	DI10	BOOLEAN	RO P	FALSE
6001:04	DI11	BOOLEAN	RO P	FALSE
6001:05	DI12	BOOLEAN	RO P	FALSE
6001:06	DI13	BOOLEAN	RO P	FALSE
6001:07	DI14	BOOLEAN	RO P	FALSE
6001:08	DI15	BOOLEAN	RO P	FALSE
6002:00	Digital Input Port 2	UInt8	RO P	0x08 (8dec)
6002:01	DI16	BOOLEAN	RO P	FALSE
6002:02	DI17	BOOLEAN	RO P	FALSE
6002:03	DI18	BOOLEAN	RO P	FALSE
6002:04	DI19	BOOLEAN	RO P	FALSE
6002:05	DI20	BOOLEAN	RO P	FALSE
6002:06	DI21	BOOLEAN	RO P	FALSE

6002:07	DI22	BOOLEAN	RO P	FALSE
6002:08	DI23	BOOLEAN	RO P	FALSE
6003:00	Digital Input Port 3	UInt8	RO P	0x08 (8dec)
6003:01	DI24	BOOLEAN	RO P	FALSE
6003:02	DI25	BOOLEAN	RO P	FALSE
6003:03	DI26	BOOLEAN	RO P	FALSE
6003:04	DI27	BOOLEAN	RO P	FALSE
6003:05	DI28	BOOLEAN	RO P	FALSE
6003:06	DI29	BOOLEAN	RO P	FALSE
6003:07	DI30	BOOLEAN	RO P	FALSE
6003:08	DI31	BOOLEAN	RO P	FALSE
Index 7000-7003 Digital Output Port				
Index	Name	Data Type	Flags	Default
7000:00	Digital Output Port 0	UInt8	RW P	0x08 (8dec)
7000:01	DO0	BOOLEAN	RW P	FALSE
7000:02	DO1	BOOLEAN	RW P	FALSE
7000:03	DO2	BOOLEAN	RW P	FALSE
7000:04	DO3	BOOLEAN	RW P	FALSE
7000:05	DO4	BOOLEAN	RW P	FALSE
7000:06	DO5	BOOLEAN	RW P	FALSE
7000:07	DO6	BOOLEAN	RW P	FALSE
7000:08	DO7	BOOLEAN	RW P	FALSE
7001:00	Digital Output Port 1	UInt8	RW P	0x08 (8dec)
7001:01	DO8	BOOLEAN	RW P	FALSE
7001:02	DO9	BOOLEAN	RW P	FALSE
7001:03	DO10	BOOLEAN	RW P	FALSE
7001:04	DO11	BOOLEAN	RW P	FALSE
7001:05	DO12	BOOLEAN	RW P	FALSE
7001:06	DO13	BOOLEAN	RW P	FALSE
7001:07	DO14	BOOLEAN	RW P	FALSE
7001:08	DO15	BOOLEAN	RW P	FALSE
7002:00	Digital Output Port 2	UInt8	RW P	0x08 (8dec)
7002:01	DO16	BOOLEAN	RW P	FALSE
7002:02	DO17	BOOLEAN	RW P	FALSE
7002:03	DO18	BOOLEAN	RW P	FALSE
7002:04	DO19	BOOLEAN	RW P	FALSE
7002:05	DO20	BOOLEAN	RW P	FALSE
7002:06	DO21	BOOLEAN	RW P	FALSE
7002:07	DO22	BOOLEAN	RW P	FALSE
7002:08	DO23	BOOLEAN	RW P	FALSE
7003:00	Digital Output Port 3	UInt8	RW P	0x08 (8dec)
7003:01	DO24	BOOLEAN	RW P	FALSE
7003:02	DO25	BOOLEAN	RW P	FALSE
7003:03	DO26	BOOLEAN	RW P	FALSE

7003:04	DO27	BOOLEAN	RW P	FALSE
7003:05	DO28	BOOLEAN	RW P	FALSE
7003:06	DO29	BOOLEAN	RW P	FALSE
7003:07	DO30	BOOLEAN	RW P	FALSE
7003:08	DO31	BOOLEAN	RW P	FALSE

A.1.9 AMAX-4860 Object Dictionary

A.1.9.1 Standard Object (0x1000-0x1FFF)

Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4860
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	The hardware version of the module
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	The firmware version of the module
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)
1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004860 (18528dec)
1018:03	Revision Number	UInt32	RO	The revision number of the module
1018:04	Serial Number	UInt32	RO	The serial number of the module
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)

10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1600:01	DO0	UInt32	RO	0x7000:01, 1
1600:02	DO1	UInt32	RO	0x7000:02, 1
1600:03	DO2	UInt32	RO	0x7000:03, 1
1600:04	DO3	UInt32	RO	0x7000:04, 1
1600:05	DO4	UInt32	RO	0x7000:05, 1
1600:06	DO5	UInt32	RO	0x7000:06, 1
1600:07	DO6	UInt32	RO	0x7000:07, 1
1600:08	DO7	UInt32	RO	0x7000:08, 1
Index 1A00 TxPDO Mapping				
Index	Name	Data Type	Flags	Default
1A00:00	TxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1A00:01	DI0	UInt32	RO	0x6000:01, 1
1A00:02	DI1	UInt32	RO	0x6000:02, 1
1A00:03	DI2	UInt32	RO	0x6000:03, 1
1A00:04	DI3	UInt32	RO	0x6000:04, 1
1A00:05	DI4	UInt32	RO	0x6000:05, 1
1A00:06	DI5	UInt32	RO	0x6000:06, 1
1A00:07	DI6	UInt32	RO	0x6000:07, 1
1A00:08	DI7	UInt32	RO	0x6000:08, 1
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0001 (1dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)

Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0001 (1dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE
Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE

A.1.9.2 Standard Object (0x6000-0x7FFF)

Index 6000 Digital Input Port				
Index	Name	Data Type	Flags	Default
6000:00	Digital Input Port 0	UInt8	RO P	0x08 (8dec)
6000:01	DI0	BOOLEAN	RO P	FALSE
6000:02	DI1	BOOLEAN	RO P	FALSE
6000:03	DI2	BOOLEAN	RO P	FALSE
6000:04	DI3	BOOLEAN	RO P	FALSE

6000:05	DI4	BOOLEAN	RO P	FALSE
6000:06	DI5	BOOLEAN	RO P	FALSE
6000:07	DI6	BOOLEAN	RO P	FALSE
6000:08	DI7	BOOLEAN	RO P	FALSE
Index 7000 Digital Output Port				
Index	Name	Data Type	Flags	Default
7000:00	Digital Output Port 0	UInt8	RW P	0x08 (8dec)
7000:01	DO0	BOOLEAN	RW P	FALSE
7000:02	DO1	BOOLEAN	RW P	FALSE
7000:03	DO2	BOOLEAN	RW P	FALSE
7000:04	DO3	BOOLEAN	RW P	FALSE
7000:05	DO4	BOOLEAN	RW P	FALSE
7000:06	DO5	BOOLEAN	RW P	FALSE
7000:07	DO6	BOOLEAN	RW P	FALSE
7000:08	DO7	BOOLEAN	RW P	FALSE

A.1.10 AMAX-4862 Object Dictionary

Standard Object (0x1000-0x1FFF)				
Index 1000 Device Type				
Index	Name	Data Type	Flags	Default
1000:00	Device Type	UInt32	M RO	0x00001389 (5001dec)
Index 1001 Error Register				
Index	Name	Data Type	Flags	Default
1001:00	Error Register	UInt16	RO	0x0000 (0dec)
Index 1008 Device Name				
Index	Name	Data Type	Flags	Default
1008:00	Device Name	String	RO	AMAX-4862
Index 1009 Hardware Version				
Index	Name	Data Type	Flags	Default
1009:00	Hardware Version	String	RO	Dependent
Index 100A Software Version				
Index	Name	Data Type	Flags	Default
100A:00	Software Version	String	RO	Dependent
Index 1018 Identity Object				
Index	Name	Data Type	Flags	Default
1018:00	Identity Object	UInt16	RO	0x0004 (4dec)

1018:01	Vendor ID	UInt32	RO	0x000013FE (5118dec)
1018:02	Product Code	UInt32	RO	0x00004862 (18530dec)
1018:03	Revision Number	UInt32	RO	0x00000000 (0dec)
1018:04	Serial Number	UInt32	RO	0x00000000 (0dec)
Index 10F1 Error Settings				
Index	Name	Data Type	Flags	Default
10F1:00	Error Settings	UInt8	RO	0x02 (2dec)
10F1:01	Local Error Reaction	UInt32	RW	0x00000001 (1dec)
10F1:02	Sync Error Counter Limit	UInt32	RW	0x00000004 (4dec)
Index 1600-1601 RxPDO Mapping				
Index	Name	Data Type	Flags	Default
1600:00	RxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1600:01	DO0	UInt32	RO	0x7000:01, 1
1600:02	DO1	UInt32	RO	0x7000:02, 1
1600:03	DO2	UInt32	RO	0x7000:03, 1
1600:04	DO3	UInt32	RO	0x7000:04, 1
1600:05	DO4	UInt32	RO	0x7000:05, 1
1600:06	DO5	UInt32	RO	0x7000:06, 1
1600:07	DO6	UInt32	RO	0x7000:07, 1
1600:08	DO7	UInt32	RO	0x7000:08, 1
1601:00	RxPDO Mapping 1	UInt8	RO	0x08 (8dec)
1601:01	DO8	UInt32	RO	0x7001:01, 1
1601:02	DO9	UInt32	RO	0x7001:02, 1
1601:03	DO10	UInt32	RO	0x7001:03, 1
1601:04	DO11	UInt32	RO	0x7001:04, 1
1601:05	DO12	UInt32	RO	0x7001:05, 1
1601:06	DO13	UInt32	RO	0x7001:06, 1
1601:07	DO14	UInt32	RO	0x7001:07, 1
1601:08	DO15	UInt32	RO	0x7001:08, 1
Index 1A00-1A01 TxPDO Mapping				
Index	Name	Data Type	Flags	Default
1A00:00	TxPDO Mapping 0	UInt8	RO	0x08 (8dec)
1A00:01	DI0	UInt32	RO	0x6000:01, 1
1A00:02	DI1	UInt32	RO	0x6000:02, 1
1A00:03	DI2	UInt32	RO	0x6000:03, 1
1A00:04	DI3	UInt32	RO	0x6000:04, 1
1A00:05	DI4	UInt32	RO	0x6000:05, 1
1A00:06	DI5	UInt32	RO	0x6000:06, 1
1A00:07	DI6	UInt32	RO	0x6000:07, 1
1A00:08	DI7	UInt32	RO	0x6000:08, 1
1A01:00	TxPDO Mapping 1	UInt8	RO	0x08 (8dec)

1A01:01	DI8	UInt32	RO	0x6001:01, 1
1A01:02	DI9	UInt32	RO	0x6001:02, 1
1A01:03	DI10	UInt32	RO	0x6001:03, 1
1A01:04	DI11	UInt32	RO	0x6001:04, 1
1A01:05	DI12	UInt32	RO	0x6001:05, 1
1A01:06	DI13	UInt32	RO	0x6001:06, 1
1A01:07	DI14	UInt32	RO	0x6001:07, 1
1A01:08	DI15	UInt32	RO	0x6001:08, 1
Index 1C00 Sync Manager Type				
Index	Name	Data Type	Flags	Default
1C00:00	Sync Manager Type	UInt16	RO	0x0004 (4dec)
1C00:01	Communication Type Sync Manager 0	UInt8	RO	0x01 (1dec)
1C00:02	Communication Type Sync Manager 1	UInt8	RO	0x02 (2dec)
1C00:03	Communication Type Sync Manager 2	UInt8	RO	0x03 (3dec)
1C00:04	Communication Type Sync Manager 3	UInt8	RO	0x04 (4dec)
Index 1C12 RxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C12:00	RxPDO Assignment	UInt16	RO	0x0002 (2dec)
1C12:01	First Entry	UInt16	RO	0x1600 (5632dec)
1C12:02	Second Entry	UInt16	RO	0x1601 (5633dec)
Index 1C13 TxPDO Assignment				
Index	Name	Data Type	Flags	Default
1C13:00	TxPDO Assignment	UInt16	RO	0x0002 (2dec)
1C13:01	First Entry	UInt16	RO	0x1A00 (6656dec)
1C13:02	Second Entry	UInt16	RO	0x1A01 (6657dec)
Index 1C32 SM Output Parameter				
Index	Name	Data Type	Flags	Default
1C32:00	SM Output Parameter	UInt16	RO	0x0020 (32dec)
1C32:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C32:02	Cycle Time	UInt32	RO	Dependent
1C32:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C32:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C32:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C32:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C32:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C32:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C32:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)

1C32:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C32:20	Sync Error	BOOLEAN	RO	FALSE
Index 1C33 SM Input Parameter				
Index	Name	Data Type	Flags	Default
1C33:00	SM Input Parameter	UInt16	RO	0x0020 (32dec)
1C33:01	Synchronization Type	UInt16	RO	0x0001 (1dec)
1C33:02	Cycle Time	UInt32	RO	Dependent
1C33:04	Synchronization Types Supported	UInt16	RO	0x401E (16414dec)
1C33:05	Minimum Cycle Time	UInt32	RO	0x000186A0 (100000dec)
1C33:06	Calc and Copy Time	UInt32	RO	0x00000000 (0dec)
1C33:08	Get Cycle Time	UInt16	RW	0x0000 (0dec)
1C33:09	Delay Time	UInt32	RO	0x00000000 (0dec)
1C33:0A	Sync0 Cycle Time	UInt32	RW	0x00000000 (0dec)
1C33:0B	SM-Event Missed	UInt16	RO	0x0000 (0dec)
1C33:0C	Cycle Time Too Small	UInt16	RO	0x0000 (0dec)
1C33:20	Sync Error	BOOLEAN	RO	FALSE
Standard Object (0x6000-0x7FFF)				
Index 6000-6001 Digital Input Port				
Index	Name	Data Type	Flags	Default
6000:00	Digital Input Port 0	UInt8	RO P	0x08 (8dec)
6000:01	DI0	BOOLEAN	RO P	FALSE
6000:02	DI1	BOOLEAN	RO P	FALSE
6000:03	DI2	BOOLEAN	RO P	FALSE
6000:04	DI3	BOOLEAN	RO P	FALSE
6000:05	DI4	BOOLEAN	RO P	FALSE
6000:06	DI5	BOOLEAN	RO P	FALSE
6000:07	DI6	BOOLEAN	RO P	FALSE
6000:08	DI7	BOOLEAN	RO P	FALSE
6001:00	Digital Input Port 1	UInt8	RO P	0x08 (8dec)
6001:01	DI8	BOOLEAN	RO P	FALSE
6001:02	DI9	BOOLEAN	RO P	FALSE
6001:03	DI10	BOOLEAN	RO P	FALSE
6001:04	DI11	BOOLEAN	RO P	FALSE
6001:05	DI12	BOOLEAN	RO P	FALSE
6001:06	DI13	BOOLEAN	RO P	FALSE
6001:07	DI14	BOOLEAN	RO P	FALSE
6001:08	DI15	BOOLEAN	RO P	FALSE

Index 7000-7001 Digital Output Port				
Index	Name	Data Type	Flags	Default
7000:00	Digital Output Port 0	UInt8	RW P	0x08 (8dec)
7000:01	DO0	BOOLEAN	RW P	FALSE
7000:02	DO1	BOOLEAN	RW P	FALSE
7000:03	DO2	BOOLEAN	RW P	FALSE
7000:04	DO3	BOOLEAN	RW P	FALSE
7000:05	DO4	BOOLEAN	RW P	FALSE
7000:06	DO5	BOOLEAN	RW P	FALSE
7000:07	DO6	BOOLEAN	RW P	FALSE
7000:08	DO7	BOOLEAN	RW P	FALSE
7001:00	Digital Output Port 1	UInt8	RW P	0x08 (8dec)
7001:01	DO8	BOOLEAN	RW P	FALSE
7001:02	DO9	BOOLEAN	RW P	FALSE
7001:03	DO10	BOOLEAN	RW P	FALSE
7001:04	DO11	BOOLEAN	RW P	FALSE
7001:05	DO12	BOOLEAN	RW P	FALSE
7001:06	DO13	BOOLEAN	RW P	FALSE
7001:07	DO14	BOOLEAN	RW P	FALSE
7001:08	DO15	BOOLEAN	RW P	FALSE

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