



ETHERCAT NETWORK ADAPTER

LIGHT VERSION

EW62L9086

USER MANUAL



Non-warranty clause

We checked the contents of this publication for compliance with the associated hardware and software. We can, however, not exclude discrepancies and do therefore not accept any liability for the exact compliance. The information in this publication is regularly checked, necessary corrections will be part of the subsequent publications.



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Table of Contents

EtherCat Network Adapter Light Version	1
EW62L9086	1
User Manual.....	1
1 Important Notes	6
1.1 Safety Instruction	6
1.1.1 Symbols	6
1.1.2 Safety Notes	7
1.1.3 Certification	7
2 Specification	8
2.1 ENVIRONMENT SPECIFICATION	8
3 General Description	9
3.1 EW62L9086 Specification	9
3.2 EW62L9086 Wiring Diagram	10
3.3 EW62L9086 Led Indicator.....	11
3.3.1 LED Indicator	11
3.3.2 MOD (Module Status LED)	11
3.3.3 RUN (Current Running Status LED).....	11
3.3.4 ERR (Error Status LED)	12
3.3.5 IOS LED (Extension I/O Module Status LED).....	12
3.4 EW62L9086 Electrical Interface	13
3.4.1 RJ-45 Socket	13
3.4.2 DIP Switch.....	13
3.5 EtherCAT ID Type Setup	14
3.5.1 Hot Connection On TwinCAT.....	14
3.6 I/O Process Image Map	16
3.6.1 Mapping Data into Image Table	17
4 Dimension	23
4.1 EW62L9086	23
5 EtherCAT Basics	24
5.1 EtherCAT State Machine.....	24
5.2 CoE Interface	26
5.2.1 Parameter management in the EtherCAT system	26
5.2.2 Communication Objects.....	26
6 Trouble shooting	29
7 Mounting.....	30
7.1 I/O Inserting and Removing Devices	30
7.2 RTB (Removable Terminal Block)	31
8 G-Bus Pin Description	32
9 APPENDIX A.....	33
9.1 Product List	33
9.2 Glossary.....	35

1 IMPORTANT NOTES

Solid state equipment has operational characteristics differing from those of electromechanical equipment.

Safety Guide lines for the Application, Installation and Maintenance of Solid-State Controls describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will ESA be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, ESA cannot assume responsibility or liability for actual use based on the examples and diagrams.

Warning!

- ✓ If you don't follow the directions, it could cause a personal injury, damage to the equipment or explosion
 - Do not assemble the products and wire with power applied to the system. Else it may cause an electric arc, which can result into unexpected and potentially dangerous action by field devices. Arching is explosion risk in hazardous locations. Be sure that the area is non-hazardous or remove system power appropriately before assembling or wiring the modules.
 - Do not touch any terminal blocks or IO modules when system is running. Else it may cause the unit to an electric shock or malfunction.
 - Keep away from the strange metallic materials not related to the unit and wiring works should be controlled by the electric expert engineer. Else it may cause the unit to a fire, electric shock or malfunction

Caution!

- ✓ If you disobey the instructions, there may be possibility of personal injury, damage to equipment or explosion. Please follow below Instructions.
 - Check the rated voltage and terminal array before wiring. Avoid the circumstances over 50°C of temperature. Avoid placing it directly in the sunlight.
 - Avoid the place under circumstances over 85% of humidity.
 - Do not place Modules near by the inflammable material. Else it may cause a fire.
 - Do not permit any vibration approaching it directly.
 - Go through module specification carefully, ensure inputs, output connections are made with the specifications. Use standard cables for wiring.
 - Use Product under pollution degree 2 environment.

1.1 Safety Instruction

1.1.1 Symbols

	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death property damage, or economic loss
	Identifies information that is critical for successful application and understanding of the product

ATTENTION 	Identifies information about practices or circumstances that can lead to personal injury, property damage, or economic loss. Attentions help you to identity a hazard, avoid a hazard, and recognize the consequences
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1.1.2 Safety Notes

DANGER 	The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, BUS Pin.
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1.1.3 Certification

- c-UL-us UL Listed Industrial Control Equipment, certified for U.S. and Canada

See UL File E189179

- CE Certificate

EN 61000-6-2; Industrial Immunity

EN 61000-6-4; Industrial Emissions

Reach, RoHS (EU, CHINA)



2 SPECIFICATION

2.1 ENVIRONMENT SPECIFICATION

Environmental Specification	
Operation Temperature	-20 °C ... 60°C: 1.0A full load is allowed
UL Temperature	-20 °C ... 60°C
Storage Temperature	-40 °C ... 85°C
Relative Humidity	5% ... 90% non-Condensing
Mounting	DIN Rail
General Specification	
Shock Operating	IEC 60068-2-27
Vibration Resistance	Based on IEC 60068-2-6 DNVGL-CG-0039: Vibration Class B, 4g
Industrial Emissions	EN61000-6-4/A11: 2011
Industrial Immunity	EN61000-6-2: 2005
Installation Position	Vertical and horizontal installation is available
Product Certifications	CE, UL, FCC



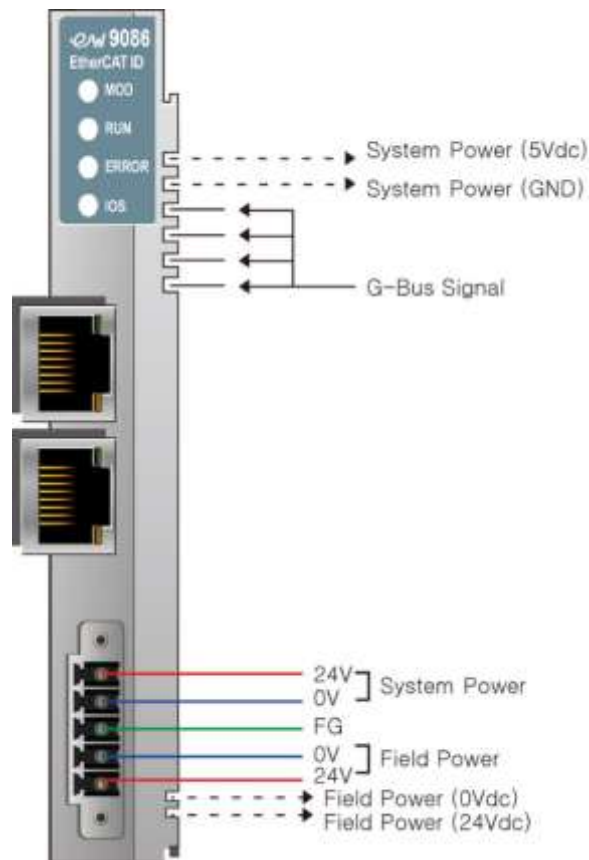
3 GENERAL DESCRIPTION

3.1 EW62L9086 Specification

Items	Specification
Communication Interface Specification	
Adapter Type	Slave Node EtherCAT ID
Max. Expansion Slot	16 slots
I/O Data Size	Max. Input 256 bytes / Output 256 bytes
Max. Length Bus Line	Up to 100m from Ethernet Hub/Switch with twisted CAT5 UTP/STP
Max. Network Node	65535
Baud Rate	10/100Mbps
Bus Connection	2 x RJ-45
Mac Address / IP Address	Not needed
Indicator	4 Status LEDs: 1 Green/Red, Module Status (MOD) 1 Green, Current Communication Status (RUN) 1 Red, Error Status (ERR) 1 Green/Red, Expansion I/O Module Status (IOS)
Module Location	Starter module left side of EW620 Series system

General Specification	
UL System Power	Supply voltage: 24Vdc nominal, Class 2
System Power	Supply voltage: 24Vdc nominal Supply voltage range: 15 ... 28.8Vdc Protection: Reverse polarity protection
Power Dissipation	40mA typical @ 24Vdc
Current for I/O Module	1.0A @ 5Vdc
Isolation	System power to internal logic: non-Isolation System power I/O driver: Isolation
UL field power	Supply voltage: 24Vdc nominal, Class2
Field Power	Supply voltage: 24Vdc typical (Max. 28.8Vdc) * Field Power Range is different depending on IO Module series. Refer to IO Module's Specification.
Max. Current Field Power Contact	DC 8A Max
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Torque	0.8Nm (7lb-in)
Weight	76g
Module Size	22mm x 109mm x 70mm

3.2 EW62L9086 Wiring Diagram



Pin No.	Signal Description
1	System Power, 24V
2	System Power, Ground
3	Frame Ground
4	Field Power, Ground
5	Field Power, 24V

3.3 EW62L9086 Led Indicator

3.3.1 LED Indicator



LED No.	LED Function / Description	LED Color
MOD	Module Status	Green / Red
RUN	Current Communication Status	Green
ERR	Error Status	Red
IOS	Expansion I/O Module Status	Green / Red

3.3.2 MOD (Module Status LED)

Status	LED	To indicate
Not Powered	OFF	power is not supplied to the unit.
Normal, Operational	Green	The unit is operating in normal condition.
Device in Standby	Flashing Green	The EEPROM parameter is not initialized yet. Serial Number is zero value (0x00000000)
Minor Fault	Flashing Red	The unit has occurred recoverable fault in self-testing. - EEPROM checksum fault.
Unrecoverable Fault	Red	The unit has occurred unrecoverable fault in self-testing. - Firmware fault

3.3.3 RUN (Current Running Status LED)

Status	LED	To indicate
Init	OFF	State of the EtherCAT State Machine: INIT = Initialization.
Pre-Operation	Blinking	State of the EtherCAT State Machine: PREOP = Pre-Operation.
Safe Operation	Single Flash	State of the EtherCAT State Machine: SAFEOP = Safe Operation.
Initialization or Bootstrap	Flashes	State of the EtherCAT State Machine: BOOT = Bootstrap (Update of the coupler firmware)
Operational	ON	State of the EtherCAT State Machine: Operational.



3.3.4 ERR (Error Status LED)

Status	LED	To indicate
No Error	OFF	No Error.
Invalid Configuration	Blinking	Invalid Configuration

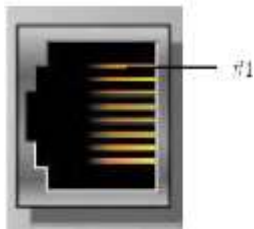
3.3.5 IOS LED (Extension I/O Module Status LED)

Status	LED	To indicate
Not Powered	OFF	Adapter may not be powered.
No Expansion Module	Flashing Red	Adapter has no expansion module.
Internal Bus Connection, Run Exchanging I/O	Green	Exchanging I/O data.
Expansion Configuration Failed	Red	One or more expansion module occurred in fault state. - Detected invalid expansion module ID. - Overflowed In/Output Size - Too many expansions module - Initialization failure - Communication failure. - Changed expansion module configuration. - Mismatch vendor code between adapter and expansion module.



3.4 EW62L9086 Electrical Interface

3.4.1 RJ-45 Socket



RJ-45	Signal Name	Description
1	TD +	Transmit +
2	TD -	Transmit -
3	RD +	Receive +
4	-	
5	-	
6	RD -	Receive -
7	-	
8	-	
Case	Shield	Shield RJ-45 Socket

3.4.2 DIP Switch



DIP Pole #	Description
1	IdentificationValue DIP bit#0
2	IdentificationValue DIP bit#1
3	IdentificationValue DIP bit#2
4	IdentificationValue DIP bit#3
5	IdentificationValue DIP bit#4
6	IdentificationValue DIP bit#5
7	IdentificationValue DIP bit#6
8	IdentificationValue DIP bit#7
9	Not Used
10	Not Used

3.5 EtherCAT ID Type Setup

3.5.1 Hot Connection On TwinCAT

Hot connection function can be used to remove a node from a preconfigured Configuration or change the location of nodes and flexible. This feature is available only Ethercat ID Type in TwinCAT.

The user can use the external Dip Switch settings of the Adapter Identification Value.

For an example of using an external Dip Switch

Ex) node 1 (Min)

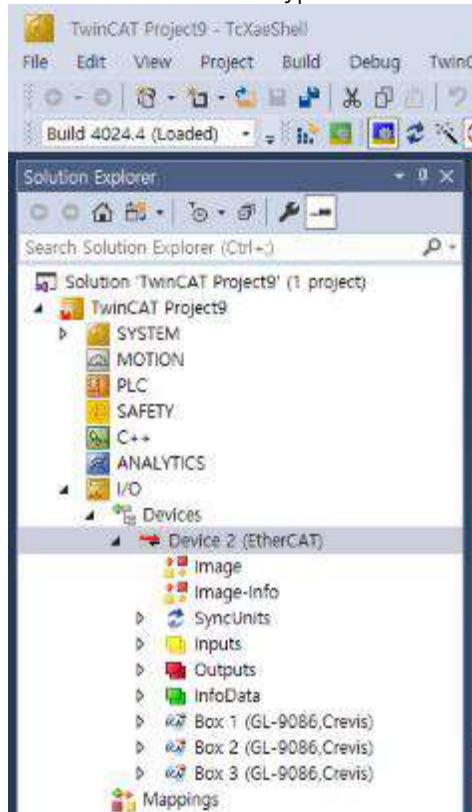


Ex) node 255 (Max)

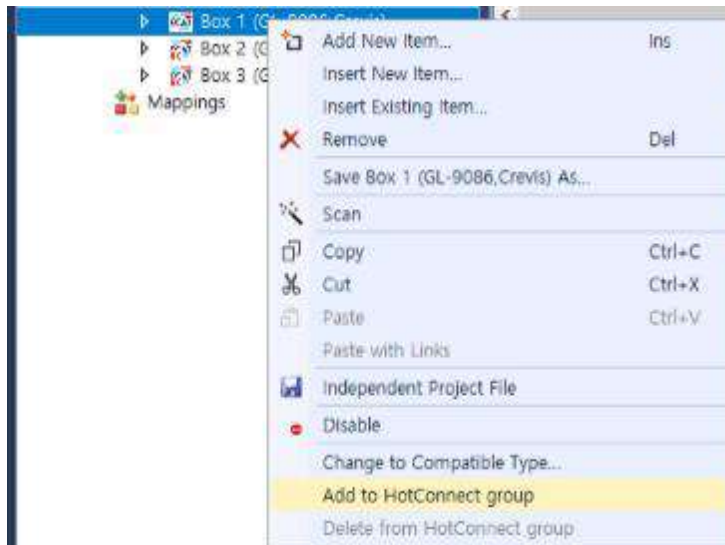


Hot Connection setting procedure

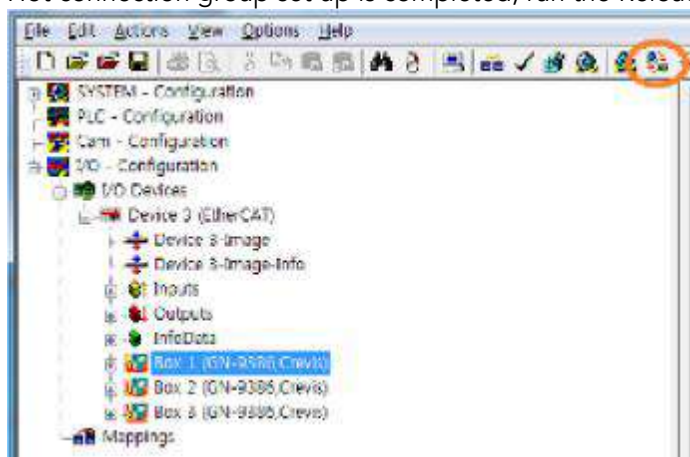
- 1) Add the EtherCAT ID Type in TwinCAT.



- 2) Hot Connect Group setting
Set the identification value same as dip-switch



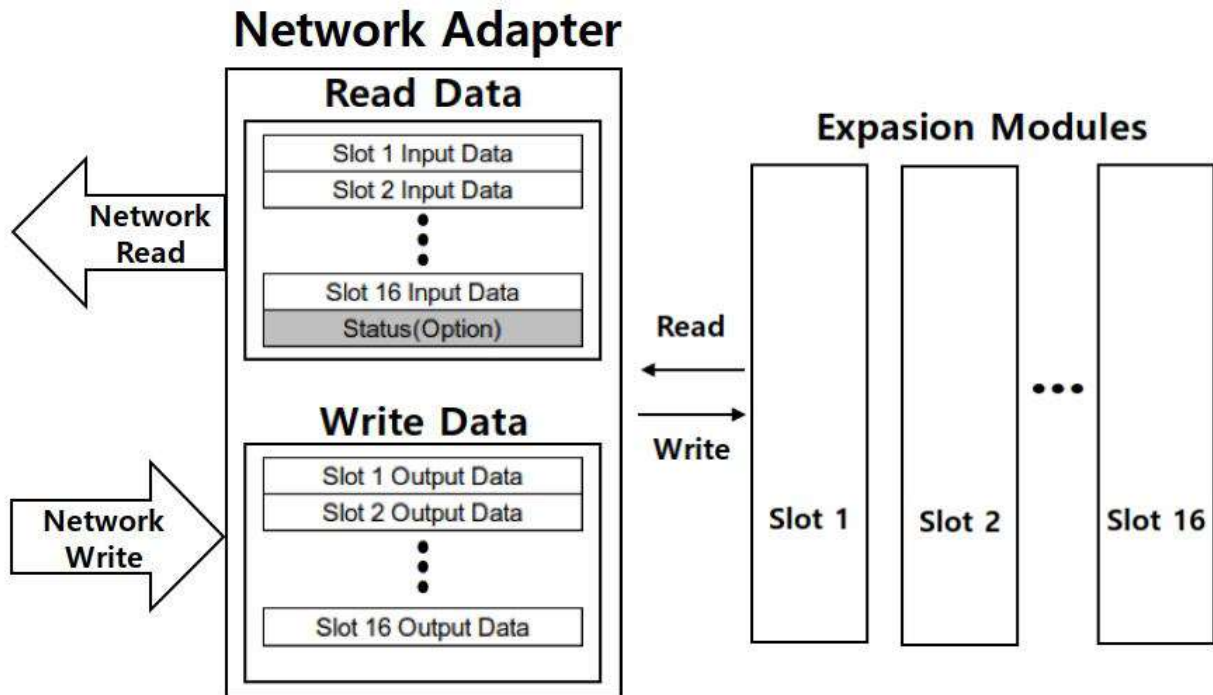
- 3) Hot connection group set up is completed, run the Reload I/O device(F4).



- 4) Now you can use the Hot connection feature.
Node is not overlapped between products. If there are same nodes, It should be changed.

3.6 I/O Process Image Map

An expansion module may have 3 types of data as I/O data, configuration parameter and memory Register. The data exchange between network adapter and expansion modules is done via an I/O process image data by EW620 Series protocol. The following figure shows the data flow of process image between network adapter and expansion modules.





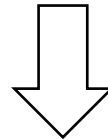
3.6.1 Mapping Data into Image Table

< Discrete Input Module >

- 4 Point Input Module

Input Module Data

D3	D2	D1	D0
----	----	----	----



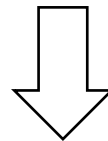
Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0

- 8 Point Input Module

Input Module Data

D7	D6	D6	D4	D3	D2	D1	D0
----	----	----	----	----	----	----	----



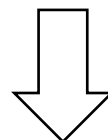
Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0

- 16 Point Input Module

Input Module Data

D7	D6	D6	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8



Input Image Value

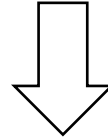
Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8

- 32 Point Input Module



Input Module Data

D7	D6	D6	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8
D23	D22	D21	D20	D19	D18	D17	D16
D31	D30	D29	D28	D27	D26	D25	D24



Input Image Value

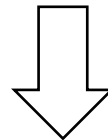
Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8
Byte2	D23	D22	D21	D20	D19	D18	D17	D16
Byte3	D31	D30	D29	D28	D27	D26	D25	D24

< Discrete Output Module >

- 4 Point Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0



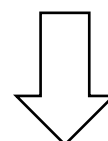
Output Module Data

D3	D2	D1	D0
----	----	----	----

- 8 Point Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0





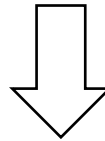
Output Module
Data

D7	D6	D6	D4	D3	D2	D1	D0
----	----	----	----	----	----	----	----

- 16 Point Output Module

Output Image
Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8



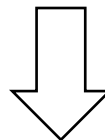
Output Module
Data

D7	D6	D6	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8

- 32 Point Output Module

Output Image
Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8
Byte2	D23	D22	D21	D20	D19	D18	D17	D16
Byte3	D31	D30	D29	D28	D27	D26	D25	D24



Output Module
Data

D7	D6	D6	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8
D23	D22	D21	D20	D19	D18	D17	D16
D31	D30	D29	D28	D27	D26	D25	D24

< Analog Input Module >

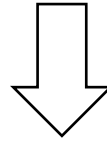
- 4 Channel Analog Input Module

Input Module Data

Analog Input Ch0



Analog Input Ch1
Analog Input Ch2
Analog Input Ch3



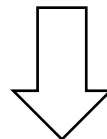
Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Ch0 low byte							
Byte1	Analog Input Ch0 high byte							
Byte2	Analog Input Ch1 low byte							
Byte3	Analog Input Ch1 high byte							
Byte4	Analog Input Ch2 low byte							
Byte5	Analog Input Ch2 high byte							
Byte6	Analog Input Ch3 low byte							
Byte7	Analog Input Ch3 high byte							

- 8 Channel Analog Input Module

Input Module Data

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3
Analog Input Ch4
Analog Input Ch5
Analog Input Ch6
Analog Input Ch7



Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Ch0 low byte							
Byte1	Analog Input Ch0 high byte							
Byte2	Analog Input Ch1 low byte							
Byte3	Analog Input Ch1 high byte							
Byte4	Analog Input Ch2 low byte							
Byte5	Analog Input Ch2 high byte							
Byte6	Analog Input Ch3 low byte							
Byte7	Analog Input Ch3 high byte							
Byte8	Analog Input Ch4 low byte							
Byte9	Analog Input Ch4 high byte							
Byte10	Analog Input Ch5 low byte							
Byte11	Analog Input Ch5 high byte							



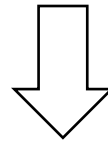
Byte12	Analog Input Ch6 low byte
Byte13	Analog Input Ch6 high byte
Byte14	Analog Input Ch7 low byte
Byte15	Analog Input Ch7 high byte

< Analog Output Module>

- 4 Channel Analog Output Module

Output Image
Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Ch0 low byte							
Byte1	Analog Input Ch0 high byte							
Byte2	Analog Input Ch1 low byte							
Byte3	Analog Input Ch1 high byte							
Byte4	Analog Input Ch2 low byte							
Byte5	Analog Input Ch2 high byte							
Byte6	Analog Input Ch3 low byte							
Byte7	Analog Input Ch3 high byte							



Output Module
Data

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3

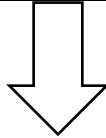
- 8 Channel Analog Out put Module

Output Image
Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Ch0 low byte							
Byte1	Analog Input Ch0 high byte							
Byte2	Analog Input Ch1 low byte							
Byte3	Analog Input Ch1 high byte							
Byte4	Analog Input Ch2 low byte							
Byte5	Analog Input Ch2 high byte							
Byte6	Analog Input Ch3 low byte							
Byte7	Analog Input Ch3 high byte							
Byte8	Analog Input Ch4 low byte							
Byte9	Analog Input Ch4 high byte							
Byte10	Analog Input Ch5 low byte							



Byte11	Analog Input Ch5 high byte
Byte12	Analog Input Ch6 low byte
Byte13	Analog Input Ch6 high byte
Byte14	Analog Input Ch7 low byte
Byte15	Analog Input Ch7 high byte

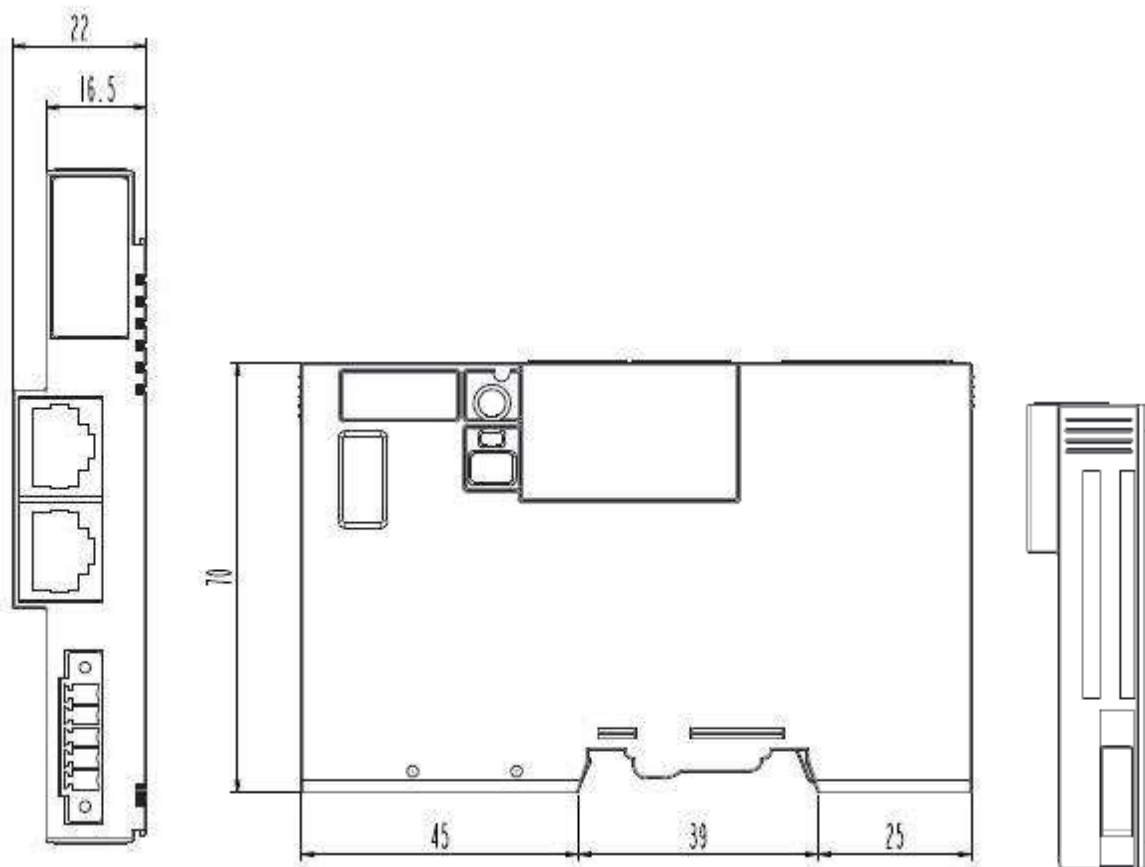


Output Module
Data

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3
Analog Input Ch4
Analog Input Ch5
Analog Input Ch6
Analog Input Ch7

4 DIMENSION

4.1 EW62L9086



5 ETHERCAT BASICS

The EtherCAT protocol uses an officially assigned EtherType inside the Ethernet Frame. The use of this EtherType allows transport of control data directly within the Ethernet frame without redefining the standard Ethernet frame. The frame may consist of several sub-telegrams, each serving a particular memory area of the logical process images that can be up to 4 gigabytes in size. Addressing of the Ethernet terminals can be in any order because the data sequence is independent of the physical order. Broadcast, Multi-cast and communication between slaves are possible.

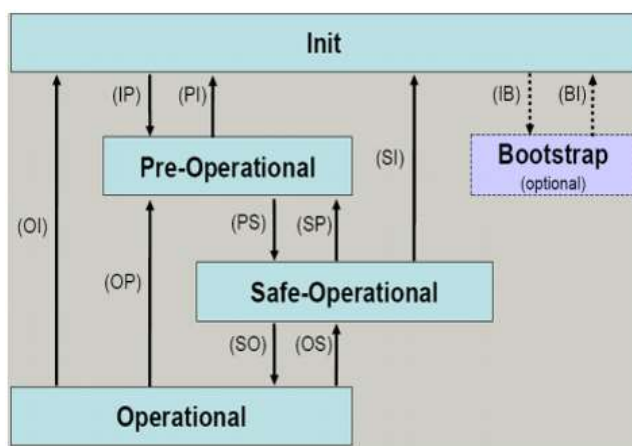
5.1 EtherCAT State Machine

The state of the EtherCAT slave is controlled via the EtherCAT State Machine (ESM). Depending upon the state, different functions are accessible or executable in the EtherCAT slave. Specific commands must be sent by the EtherCAT master to the device in each state, particularly during the boot up of the slave.

A distinction is made between the following states:

- Init
- Pre-Operational
- Safe-Operational and
- Operational
- Bootstrap

The regular state of each EtherCAT slave after bootup is the OP state.



Init

After switch-on the EtherCAT slave in the Init state. No mailbox or process data communication is possible. The EtherCAT master initializes sync manager channels 0 and 1 for mailbox communication.

Pre-Operational (Pre-Op)

During the transition between Init and Pre-Op the EtherCAT slave checks whether the mailbox was initialized correctly. In Pre-Op state mailbox communication is possible, but not process data communication. The EtherCAT master initializes the sync manager channels for process data (from sync manager channel 2), the FMMU channels and, if the slave supports configurable mapping, PDO mapping or the sync manager PDO assignment. In this state the settings for the process data transfer and perhaps terminal-specific parameters that may differ from the default settings are also transferred.

Safe-Operational (Safe-Op)



During transition between Pre-Op and Safe-Op the EtherCAT slave checks whether the sync manager channels for process data communication and, if required, the distributed clocks settings are correct. Before it acknowledges the change of state, the EtherCAT slave copies current input data into the associated DP-RAM areas of the EtherCAT slave controller (ECSC).

In Safe-Op state mailbox and process data communication is possible, although the slave keeps its outputs in a safe state, while the input data are updated cyclically.

Operational (Op)

Before the EtherCAT master switches the EtherCAT slave from Safe-Op to Op it must transfer valid output data. In the Op state the slave copies the output data of the masters to its outputs. Process data and mailbox communication is possible.

Bootstrap

In the Boot state the slave firmware can be updated. The Boot state can only be reached via the Init state. In the Boot state mailbox communication via the file access over EtherCAT (FoE) protocol is possible, but no other mailbox communication and no process data communication.

5.2 CoE Interface

5.2.1 Parameter management in the EtherCAT system

The CiA organization (CAN in Automation) pursues among other things the goal of creating order and exchange ability between devices of the same type by the standardization of device descriptions. For this purpose so called profiles are defined, which conclusively describe the changeable and unchangeable parameters of a device. Such a parameter encompasses at least the following characteristics:

- Index number for the unambiguous identification of all parameters. The index number is divided into a main index and a sub-index in order to mark and arrange associated parameters.
 - Main index
 - Subindex, offset by a colon ':'
- Official name in the form of an understandable, self-descriptive text
- Specification of changeability, e.g. whether it can only be read or can also be written
- A value depending upon the parameter the value can be a text, a number or another parameter index.

Index Range

The relevant ranges for EtherCAT fieldbus users are:

- x1000: This is where fixed identity information for the device is stored, including name, manufacturer, serial number etc., plus information about the current and available process data configurations.
- x8000: This is where the operational and functional parameters for all channels are stored, such as filter settings or output frequency.

Other important ranges are:

- x4000: In some EtherCAT devices the channel parameters are stored here (as an alternative to the x8000 range).
- x6000: Input PDOs ("input" from the perspective of the EtherCAT master)
- x7000: Output PDOs ("output" from the perspective of the EtherCAT master)

5.2.2 Communication Objects

Index	Sub-Index	Name	Flags	Default Value
1000		Device type	RO	0x00001389
1001		bus Status	RO	Normal Operation : 0x00 **
1002		Master Fault Action	RW	0x00
1008		Device name	RO	EW62L9086
1009		Hardware version	RO	9086 v1
100A		Software version	RO	1.000
1018		Identity	RO	0x05
	01	Vendor ID	RO	0x0000078F
	02	Product Code	RO	0x474C9086
	03	Revision	RO	0x0001000
	04	Serial Number	RO	0xFFFFFFFF
	05	Release date	RO	0x20200325

10F1	Error setting		RO	0x02
	01	Local error reaction	RO	0x00000000
	02	Sync Error Counter Limit	RO	0x00000004
1601*	Slot#x, EW62Txxxx, RXPDO		RO	0xnn
	01	SubIndex 001	RO	0x7010:01, 8
	...	...	...	...
	nn	SubIndex nnn	RO	0x7010:nn, 8
1A01*	Slot#x, EW62Txxxx, TXPDO		RO	0xnn
	01	SubIndex 001	RO	0x6010:01, 8
	...	...	...	...
	nn	SubIndex nnn	RO	0x6010:nn, 8
1C00	Sync manager type		RO	0x04
	01	SubIndex 001	RO	0x01
	02	SubIndex 002	RO	0x02
	03	SubIndex 003	RO	0x03
	04	SubIndex 004	RO	0x04
1C12	RxPDO assign		RO	0x01
	01	SubIndex 001	RO	0x1601
1C13	TxPDO assign		RO	0x02
	01	SubIndex 001	RO	0x1A01
	02	SubIndex 002	RO	0x1A02
7010*	EW62Txxxx		RO	0xnn
	01	Byte#0	RW P	0x00
	...	...	...	...
	nn	Byte#nn	RW P	0xnn
8000	EW62L9086 (Parameter)		RO	
	01	Byte#0	RW	
	02	Byte#1	RW	
	03	Byte#2	RW	
	04	Byte#3	RW	
8nn0*	EW62Txxxx (Parameter)		RO	
	01	Byte#0	RW	
	...	...	...	
	nn	Byte#nn	RW	
F000	Module Device Profile		RO	
	01	Module index distance	RO	
	02	Maximum number of modules	RO	
F010*	Module List		RO	
	01	SubIndex 001 (EW62L9086)	RO	0x00009086
	...	...	...	...
	16	SubIndex 016	RO	0x0000xxxx
F050	Detected Module Ident List		RO	
	01	SubIndex 001	RO	



*This value can be changed depending on the configuration of expansion modules

** BUS Status

- Normal Operation: 0x00
- Communication Fault: 0x02
- Configuration Failed: 0x03
- No Expansion Module: 0x04
- Vendor Error: 0x07
- Not expected slot: 0x08
- CRC Error: 0x09



6 TROUBLE SHOOTING

How to diagnose by LED indicator

LED Status	Cause	Action
All LED turns off	No Power	Check main power Cable
MOD LED is red	Occurrence critical error in firmware	Contact ESA and send module for repair.
ERROR LED blinking red	Invalid Configuration	Check I/O size configuration
IOS LED turns off	Device may not be powered.	Check main power Cable
IOS LED flashes red	Adapter has no expansion module	Add one or more expansion modules.
IOS LED is red	One or more expansion module occurred in fault s tate. - Detected invalid expansion module ID. - Overflowed Input/Output Size - Too many expansion module - Initialization failure - Communication failure. - Changed expansion module configuration. - Mismatch vendor code between adapter and expansion module	Use expansion slot up to 63. Compose that IO total size is not excess. Check status of expansion IO connection. Check the vendor code of module.

How to diagnose when device couldn't communicate network

Inspection of wrong or omission cable connection

- Check status of cable connection for each node.
- Check that all color matches between connector and cable.
- Check wire omission.

Terminator resistor

- If terminator resistor is not installed, install terminator resistor
- Check location of terminator resistor

Configuration of Node address

- Check duplication node address.

Configuration of Master

- Check configuration of master
- Check whether to do download or don't
- Check composition is right as below Configuration of communication baud rate I/O size Configuration of each node

Ground and environment

- Check ground is contacted
- Check environment factor (temperature, humidity, etc.) is in less than regular limit

7 MOUNTING

Caution!

- **Hot surface!**

The surface of the housing can become hot during operation. If the device was operated at high ambient temperatures, allow it to be cool before touching it.

Notice!

- **Perform work on devices only if they are de-energized!**

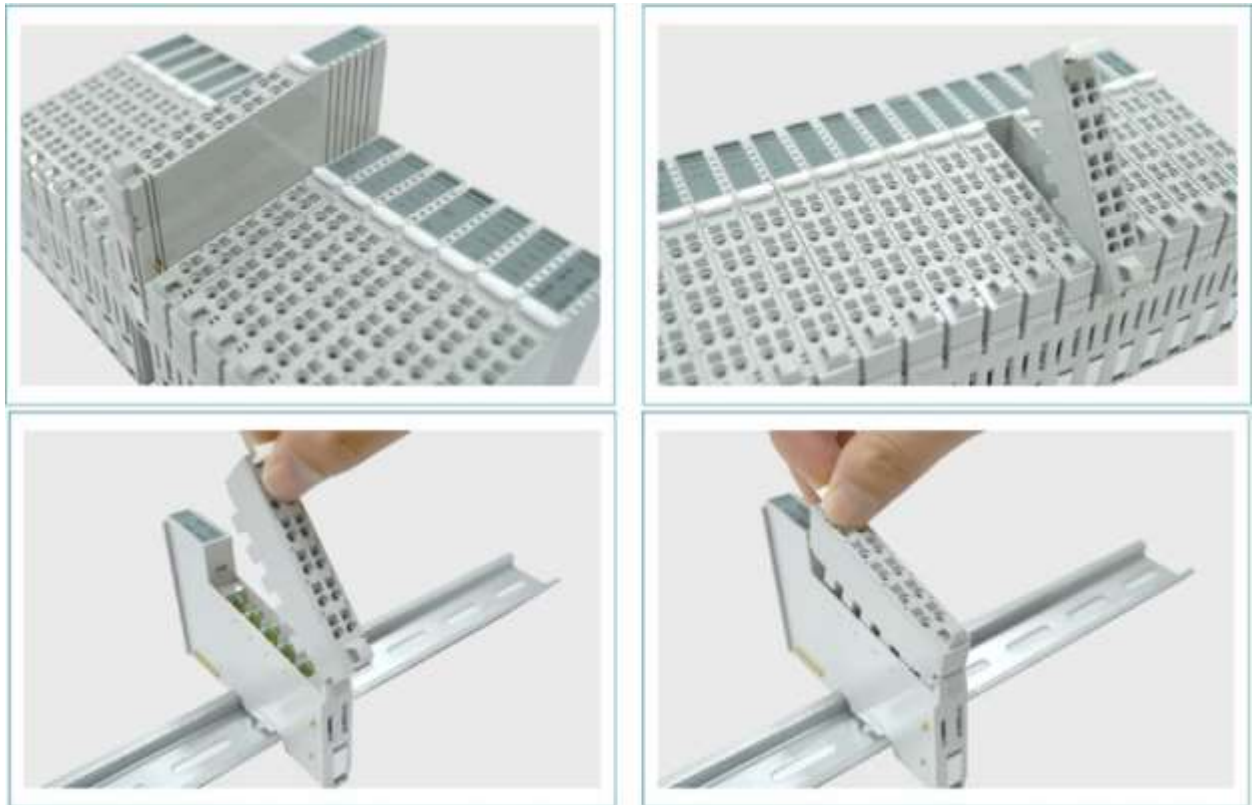
Working on energized devices can damage them. Therefore, turn off the power supply before working on the devices.

7.1 I/O Inserting and Removing Devices



- As above figure in order to safeguard the EW620-Series module from jamming, it should be fixed onto the DIN rail with locking level. To do so, fold on the upper of the locking lever.
To pull out the EW620 Series module, unfold the locking lever as below figure.

7.2 RTB (Removable Terminal Block)



- Whole terminal block can be combined and removed for the convenience.
- There is a locking switch on the RTB for the easy combination and easy removal.
- Easy combination and easy removal for IO modules on the din rail through One Touch Locking Switch.

8 G-BUS PIN DESCRIPTION

Communication between the EW620 series and the expansion module as well as system / field power supply of the bus modules is carried out via the internal bus. It is comprised of 6 data pin and 2 field power pin.

 The diagram shows a vertical pin connector with two rows of pins. The top row is labeled 0 to 9, and the bottom row is labeled P1 to P8. The pins are arranged in a 2x8 grid. The top row (0-9) has pins 0 and 1 at the top, followed by 2-9. The bottom row (P1-P8) has pins P1 and P2 at the top, followed by P3-P8. The pins are color-coded: P1 and P2 are red, P3-P6 are green, and P7 and P8 are blue.	<table> <tr> <th>No</th><th>Description</th></tr> <tr> <td>P1</td><td>System Power (VCC)</td></tr> <tr> <td>P2</td><td>System Power (GND)</td></tr> <tr> <td>P3</td><td>GBUS TX +</td></tr> <tr> <td>P4</td><td>GBUS TX -</td></tr> <tr> <td>P5</td><td>GBUS RX +</td></tr> <tr> <td>P6</td><td>GBUS RX -</td></tr> <tr> <td>P7</td><td>Field Power (GND)</td></tr> <tr> <td>P8</td><td>Field Power (VCC)</td></tr> </table>	No	Description	P1	System Power (VCC)	P2	System Power (GND)	P3	GBUS TX +	P4	GBUS TX -	P5	GBUS RX +	P6	GBUS RX -	P7	Field Power (GND)	P8	Field Power (VCC)
No	Description																		
P1	System Power (VCC)																		
P2	System Power (GND)																		
P3	GBUS TX +																		
P4	GBUS TX -																		
P5	GBUS RX +																		
P6	GBUS RX -																		
P7	Field Power (GND)																		
P8	Field Power (VCC)																		

Do not touch data and field power pins in order to avoid soiling and damage by ESD noise.

9 APPENDIX A

9.1 Product List

No.	Part Number	Description	ID(hex)
Digital Input Module			
1	EW62T1238	8 Points, Universal, 24Vdc, 10RTB	1238
2	EW62T123F	16 Points, Universal, 24Vdc, 20P connector	123F
3	EW62T12DF	16 Points, Universal, 24Vdc, 18RTB	12DF
4	EW62T12FA	32 Points, Universal, 24Vdc, 40P connector	12FA
5	EW62T1428	8 Sink Input / 8 Source Output with Diagnostic, 24Vdc	1428
6	EW62T1804	4 Points, 120Vac, 10RTB	1804
7	EW62T1904	4 Points, 240Vac, 10RTB	1904
Digital Output Module			
8	EW62T2318	8 Points, Sink, 24Vdc/0.5A, 10RTB	2318
9	EW62T2328	8 Points, Source, 24Vdc/0.5A, 10RTB	2328
10	EW62T221F	16 Points, Sink, 24Vdc/0.3A, 20P connector	221F
11	EW62T222F	16 Points, Source, 24Vdc/0.3A, 20P connector	222F
12	EW62T225F	16 Points, Sink, 24Vdc/0.3A, 18RTB	225F
13	EW62T226F	16 Points, Source, 24Vdc/0.3A, 18RTB	226F
14	EW62T22BA	32 Points, Sink, 24Vdc/0.3A, 40P connector	22BA
15	EW62T22CA	32 Points, Source, 24Vdc/0.3A, 40P connector	22CA
16	EW62T2418	8 Channels Sink Output with Diagnostics	2418
17	EW62T2428	8 Channels Source Output with Diagnostics	2428
18	EW62T2618	8 Points, Sink, 24Vdc/2A, 10RTB	2618
19	EW62T2628	8 Points, Source, 24Vdc/2A, 10RTB	2628
20	EW62T2734	4 Points, MOS Relay, 240Vdc/ac, 0.5A, 10RTB	2734
21	EW62T2738	8 Points, MOS Relay Output Terminal, 240Vdc, 0.5A	2738
22	EW62T2744	4 Points, Relay, 24Vdc/2A, 240Vac/2A, 10RTB	2744
23	EW62T2764	4 Points, MOS Relay, 24Vdc/ac, 2A, 10RTB	2764
24	EW62T2768	8 Points, Relay Output Terminal, 24Vdc/ac, 2A	2768
25	EW62T2784	4 Points, MOS Relay, 110Vdc/ac, 1A, 10RTB	2784
26	EW62T2788	8 Points, Relay Output Terminal, 110Vdc/ac, 1A	2788
Analog Input Module			
27	EW62T3002	2ch load cell input unit, strain gauge	3002
28	EW62T3114	4 Channels, 0~20, 4~20mA, 12bits, 10RTB	3114
29	EW62T3154	4 Channels, 0~20, 4~20mA, 16bits, 10RTB	3154
30	EW62T3118	8 Channels, 0~20, 4~20mA, 12bits, 10RTB	3118
31	EW62T3158	8 Channels, 0~20, 4~20mA, 16bits, 10RTB	3158
32	EW62T311F	16 Channels, 0~20, 4~20mA, 12bits, 20P connector	311F
33	EW62T315F	16 Channels, 0~20, 4~20mA, 16bits, 20P connector	315F
34	EW62T317F	16 Channels, 0~20, 4~20mA, 12bits, 18RTB	317F
35	EW62T319F	16 Channels, 0~20, 4~20mA, 16bits, 18RTB	319F
36	EW62T3424	4 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 10RTB	3424
37	EW62T3464	4 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 10RTB	3464
38	EW62T3428	8 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 10RTB	3428

39	EW62T3468	8 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 10RTB	3468
40	EW62T342F	16 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 20P connector	342F
41	EW62T346F	16 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 20P connector	346F
42	EW62T347F	16 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 18RTB	347F
43	EW62T349F	16 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 18RTB	349F
44	EW62T3704	4 Channels, RTD, 10RTB	3704
45	EW62T3708	8 Channels, RTD, 20P connector	3708
46	EW62T3804	4 Channels, Thermocouple, 10RTB	3804
47	EW62T3808	8 Channels, Thermocouple, 20P connector	3808
48	EW62T3714	4 Channels, TEMP. Controller, RTD Input, SSR Output	3714
49	EW62T3734	4 Channels, TEMP. Controller, RTD Input, Current Output	3734
50	EW62T3814	4 Channels, TEMP. Controller, TC Input, SSR Output	3814
51	EW62T3834	4 Channels, TEMP. Controller, TC Input, Current Output	3834
52	EW62T3901	AC Measurement	3901
53	EW62T3914	4 Channels, Differential, 0~20, 4~20, +/-20mA, 12Bits, 10RTB	3914
54	EW62T3934	4 Channels, Differential, 0~20, 4~20, +/-20mA, 16Bits, 10RTB	3934
55	EW62T3918	8 Channels, Differential, 0~20, 4~20, +/-20mA, 12Bits, 18RTB	3918
56	EW62T3938	8 Channels, Differential, 0~20, 4~20, +/-20mA, 16Bits, 18RTB	3938
57	EW62T3924	4 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 12Bits, 10RTB	3924
58	EW62T3944	4 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 16Bits, 10RTB	3944
59	EW62T3928	8 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 12Bits, 18RTB	3928
60	EW62T3948	8 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 16Bits, 18RTB	3948

Analog Output Module

61	EW62T4114	4CH, 0~20mA, 12Bits, 10RTB	4114
62	EW62T4154	4CH, 0~20mA, 16Bits, 10RTB	4154
63	EW62T4118	8CH, 0~20mA, 12Bits, 10RTB	4118
64	EW62T4158	8CH, 0~20mA, 16Bits, 10RTB	4158
65	EW62T4214	4 Channels, Current Output, 4~20mA, 12bits	4214
66	EW62T4254	4 Channels, Current Output, 4~20mA, 16bits	4254
67	EW62T4218	8 CHANNELS CURRENT OUTPUT, 4~20mA, 12BIT	4218
68	EW62T4258	8 CHANNELS CURRENT OUTPUT, 4~20mA, 16BIT	4258
69	EW62T4424	4CH, 0~10Vdc, 12Bits, 10RTB	4424
70	EW62T4464	4CH, 0~10Vdc, 16Bits, 10RTB	4464
71	EW62T4428	8CH, 0~10Vdc, 12Bits, 10RTB	4428
72	EW62T4468	8CH, 0~10Vdc, 16Bits, 10RTB	4468
73	EW62T442F	16CH, 0~10Vdc, 12Bits, 20P Connector	442F
74	EW62T446F	6CH, 0~10Vdc, 16Bits, 20P Connector	446F
75	EW62T447F	16CH, 0~10Vdc, 12Bits, 18RTB	447F
76	EW62T449F	16CH, 0~10Vdc, 16Bits, 18RTB	449F
77	EW62T4524	AO 4 CHs, ± 10 Vdc, 12Bits, 10RTB	4524
78	EW62T4564	AO 4 CHs, ± 10 Vdc, 16Bits, 10RTB	4564

Special Module

79	EW62T5102	2CH, Encoder, Input, 5Vdc, 10RTB	5102
80	EW62T5112	High Speed Counter, 2CHs, 24Vdc, Encoder Input, 10RTB	5112



81	EW62T5114	High Speed Counter, 4CHs, 24Vdc, Encoder Input, 10RTB	5114
82	EW62T5211	1CH, RS 232, RTS/CTS, Full Duplex Type, 10RTB	5211
83	EW62T5212	2CH, RS 232, Full Duplex Type, 10RTB	5212
84	EW62T5221	1CH, RS 485, Full Duplex Type, 10RTB	5221
85	EW62T5231	1CH, RS 485, Half Full Duplex Type, 10RTB	5231
86	EW62T5232	2CH, RS 485, Half Full Duplex Type, 10RTB	5232
87	EW62T5352	2CH, Synchronous Serial Interface Input, 10RTB	5352
88	EW62T5442	PWM Output, 2CHs, 0.5A/24Vdc, Source, 18RTB	5442
89	EW62T5444	PWM Output, 4CHs, 0.5A/24Vdc, Source, 18RTB	5444
90	EW62T5642	Pulse Output, 2CHs, 0.5A/24Vdc, Source, 18RTB	5642
91	EW62T5652	Pulse Output, 2CHs, RS422 (Differential), 18RTB	5652
92	EW62T5521	1CH, Stepper Module (TBD)	5521

Power Module			
93	EW62T7408	Shield Module	7408
94	EW62T7508	Common for 0Vdc	7508
95	EW62T7511	Power Expansion, In 24Vdc, Out 1A/5Vdc	7511
96	EW62T7518	Common for 24Vdc	7518
97	EW62T7588	Common for 0Vdc, 24Vdc	7588
98	EW62T7641	Field Power, 5/24/48 Vdc, 110/220 Vac	7641
99	EW62T7151	Noise Filter Module, 18RTB, None ID Type	7151
100	EW62T7851	Noise Filter Module, 18RTB, ID Type	7851

9.2 Glossary

- System Power: The power for starting up CPU.
- Field Power: The power for input and output line.
- Terminator Resistor: Resistor for prevention reflected wave.
- EDS: Electronic Data Sheet.
- sinking: The method of input and output what device does not have power source. - sourcing: The method of input and output what device have power source.