



## EMP-2848M

Compact EtherCAT Master PAC

### Features

- Combines Compact size, economy, flexibility and excellent performance
- EtherCAT cycle time up to 500  $\mu$ s
- Supports up to 128 EtherCAT slaves control
- Motion control up to 16 axes
- Supports all IEC-61131-3 SoftPLC languages (FBD, LD, IL, ST, and SFC)
- Modbus TCP/RTU/ASCII
- Supports CIA402 drives
- Cortex-A53, Quad-core, 1.6GHz
- Real-Time Linux (RT-Preempt)

### Introduction

The EMP-2848M series is a SoftPLC based EtherCAT master with an integrated multi-axis motion control kernel. The programmable automation controller combines compact size, economy, flexibility, and excellent performance and is the ideal partner for small and medium-sized motion control applications where cost and space-constraints is an deciding factor.

The high-performance quad-core Cortex-A53 processor together with the Real-Time Linux (RT-Preempt) operating system and built-in SoftPLC ensures fast, deterministic and real-time behavior of the motion control application. The integrated, configurable high-speed EtherCAT master can be connected to any standard, 3rd party EtherCAT slave, such as I/Os, servo motor, stepper motor, encoder, etc.. The EtherCAT master can synchronously update up to 128 slaves including 16 servo/stepper drives within a cycle time of 500 microseconds.

The integrated web server assist the user in configuring and diagnosing the EtherCAT networks, and testing of motion control functions

Win-GRAF workbench is a programming software from ICPDAS developed according to the international standard IEC 61131 and aimed at achieving compatibility and reusability.

Feature:

- Conforming to the five programming languages as define by the IEC 61131-3 standard
  - > SFC (Sequential Function Chart)
  - > ST (Structured Text)
  - > FBD (Function Block Diagram)
  - > LD (Ladder Diagram)
  - > IL (Instruction List)
- Several programming languages can be used in the same application project
- Includes functions for converting an existing program into another programming language
- Supports project comparison for comparing two project versions
- Multitasking programming with priority settings
- Extensive libraries significantly simplifying PLC applications
- Supports creation of user libraries
- Integrated fieldbus support
- Comprehensive online help

**164(L) x 42(H) x 129(W) mm**

**Control EtherCAT**

- Cycle time up to 500 $\mu$ s
- Supports up to 128 slaves
- Motion control up to 16 axes

**Machine Network**

- Servos
- Vision systems
- Sensors
- Inverters
- Distributed I/O

**Hardware Design**

- High-performance quad-core Cortex-A53 processor
- Built-in microSD card slots
- Built-in memory of up to 1GB
- Built-in FLASH memory of up to 8GB (eMMC)

**Communication**

- Supports Modbus TCP, Master/Slave
- Supports Modbus RTU/ASCII, Master/Slave

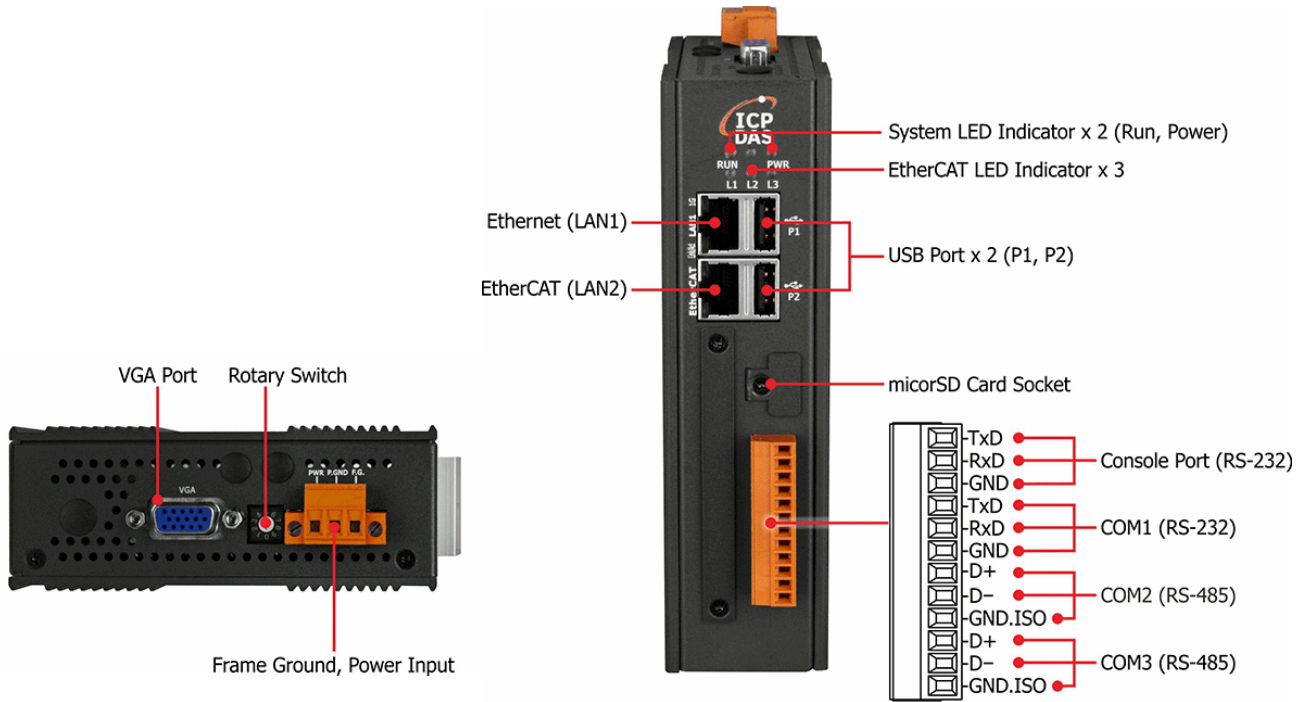
**Case**

- Full-metal casing prevent noise interference and stable operations in all kinds of demanding working environments.
- Compact size, can be mounted on DIN-Rail

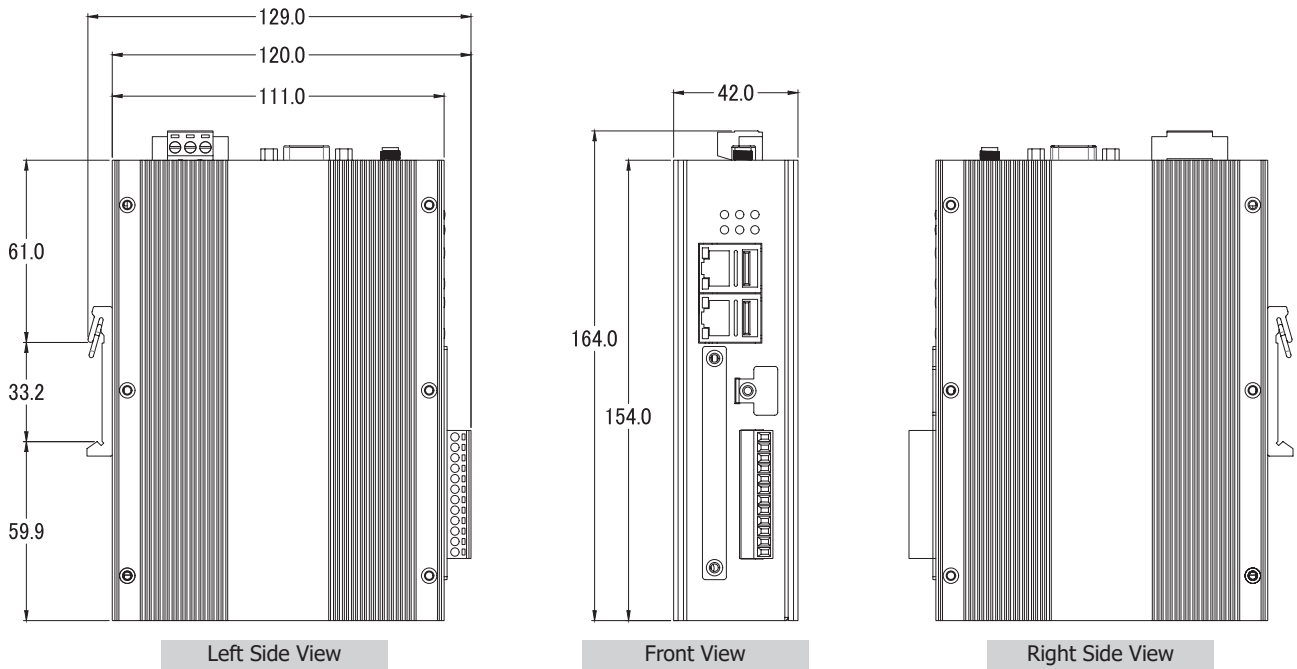
## Specifications

<b>Model</b>	<b>EMP-2848M</b>
<b>Software</b>	
OS	Real-Time Linux (RT-Preempt, Kernel 4.14.98)
Programming languages per IEC 61131-3	Instruction List (IL)
	Ladder Diagram (LD)
	Function Block Diagram (FBD)
	Structured Text (ST)
	Sequential Function Chart (SFC)
Development Software	Win-GRAF
Protocols	Modbus TCP, Master/Slave Modbus RTU/ASCII, Master/Slave
	EtherCAT
Motion Control	PLCopen Function Blocks
<b>Main Unit</b>	
CPU	Cortex-A53, Quad-core, 1.6GHz
SDRAM	LPDDR4 - 1GB
Storage	eMMC Flash – 8GB, 4GB microSD card
LED Indicators	1 x Run, 1 x Power, 3 x EtherCAT Runtime
<b>Communication Ports</b>	
Ethernet	1 x RJ-45, 10/100/1000 Base-TX
EtherCAT	1 x RJ-45
USB	2 x USB 2.0
Console	RS-232 (RxD, TxD, GND); Non-isolated
COM1	RS-232 (RxD, TxD, GND); Non-isolated
COM2	RS-485 (Data+, Data-); 2500 VDC isolated
COM3	RS-485 (Data+, Data-); 2500 VDC isolated
<b>EtherCAT</b>	
Cycle Time	500 $\mu$ s (min.)
Number of Slaves	128
Number of Axes	16
<b>Power</b>	
Input Range	+12 ~ 48 VDC
Consumption	7.2 W (0.3 A @ 24 VDC)
<b>Mechanical</b>	
Casing	Metal
Dimensions (W x L x H)	42 mm x 164 mm x 129mm
Installation	DIN-Rail Mounting
<b>Environmental</b>	
Operating Temperature	-25 ~ +75 $^{\circ}$ C
Storage Temperature	-40 ~ +80 $^{\circ}$ C
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)

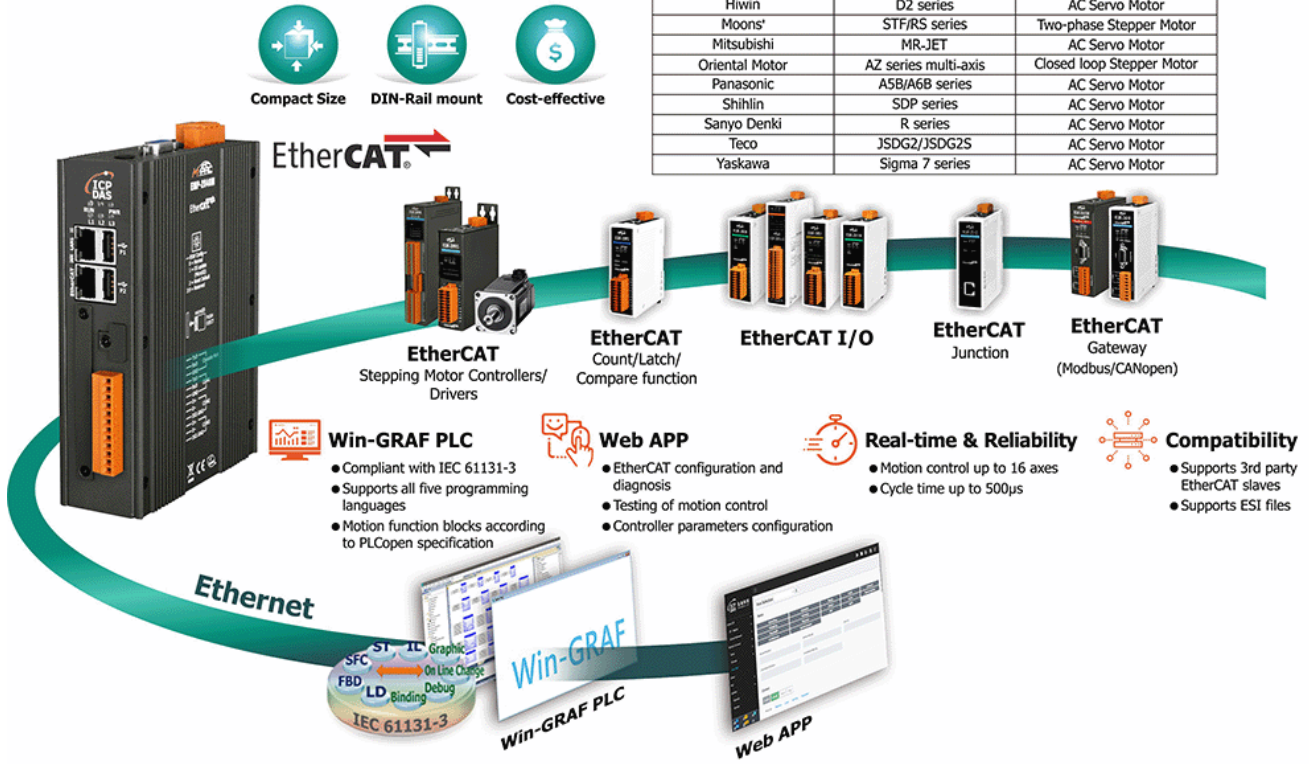
## Appearance



## Dimensions (Units: mm)



## System Architecture



List of Common Drivers and Motors That Have Been Market Tested

Company	Drivers	Types of Motors
Delta	ASDA A2-E series	AC Servo Motor
Hiwin	D2 series	AC Servo Motor
Moons'	STF/RS series	Two-phase Stepper Motor
Mitsubishi	MR-JET	AC Servo Motor
Oriental Motor	AZ series multi-axis	Closed loop Stepper Motor
Panasonic	ASB/A6B series	AC Servo Motor
Shihlin	SDP series	AC Servo Motor
Sanyo Denki	R series	AC Servo Motor
Teco	JSDG2/JSDG2S	AC Servo Motor
Yaskawa	Sigma 7 series	AC Servo Motor

## Ordering Information

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