

ECM M400-A10-04-C Series

EtherCAT Master Controller

NVIDIA® Jetson AGX Orin



Main Features

- EtherCAT technology with NexECM, **Class A** EtherCAT Master
- EtherCAT communication cycle up to 250 μ s
- Support high-level API for CiA 402 profile
- Powerful & flexible EtherCAT configuration tool NexECM Studio
- Support NexRTOS (A real-time verified Linux system)
- NVIDIA® Jetson AGX Orin™
- Single Display : HDMI
- 5 x RJ45 port.
- 3 x USB 3.2 Gen1 Type A, 1 x USB 3.2. Gen2 Type A
- 2 x RS232, 2 x RS232/422/485 with Insolated
- 8 x GMSL
- DC 24V to 48V input.
- 4 x COM (2 x RS232, 2 x RS232/422/485)
- Support -5~50 °C operating temperature.
- 2 x CAN FD / 5Mb

Product Overview

Powered by the NVIDIA® Jetson AGX Orin™ AI hardware platform, the ECM M400-A10-04-C is an advanced PC-based EtherCAT controller designed for precise and efficient machine automation. It integrates NexCOBOT's EtherCAT Master, NexECM, enabling real-time communication with an ultra-fast cycle time of up to 250 μ s. Featuring NexRTOS, a real-time verified system, it ensures optimal jitter adjustment for precise and stable control. Additionally, the ECM M400 provides APIs for the CiA 402 servo drive control protocol and a built-in EtherCAT configuration tool, streamlining development for automation users.

Software Specifications

EtherCAT Master Performance & Utility

- EtherCAT Compliance : EtherCAT Standard Class A
- Maximum Number of Slave Modules : Up to 64
- Cycle Time : As low as 250 μ s
- Protocol Support: Compliant with the CiA 402 standard protocol
- EtherCAT Configuration Tool : NexECM Studio

EtherCAT Master Standard Function

- Process data (PDO)
- CoE / FoE
- Distributed Clock (DC)
- ESI / ENI file
- Slave to Slave

EtherCAT Master Advanced Function

- Cable redundancy
- CiA402 servo stack
- Hot connect
- Remote control

NexRTOS

- Ubuntu : 22.04
- Linux Kernel : 5.15 (with PREEMPT_RT)
- Jetpack: 6.2
- CUDA: 12.6
- OPENCV: 4.10

Hardware Specifications

CPU Support

- 12-core Arm® Cortex® -A78AE v8.2 64-bit
- Integrated cache: 3MB L2 + 6MB L3 Equipped

GPU Support

- 2048-core NVIDIA Ampere architecture GPU with 64 Tensor Cores
- AI Performance : 275 TOPS

Memory

- 64 GB LPDDR5 (256-bit)
- Memory bandwidth: 2048.8 GB/s

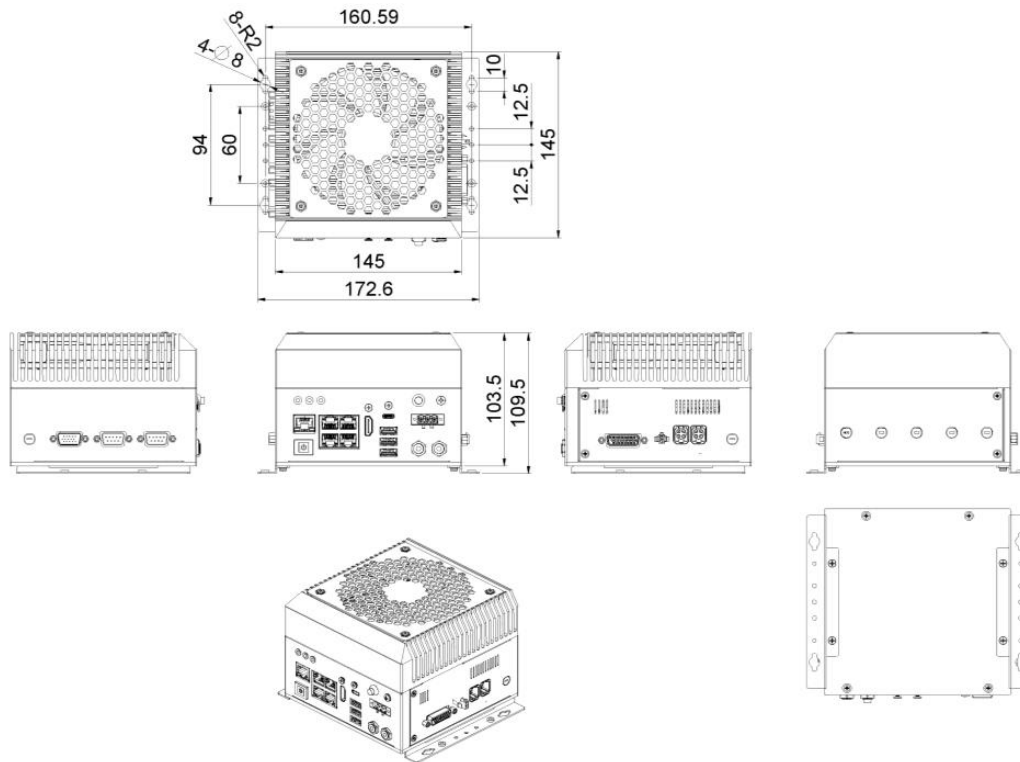
Storage

- M.2 Key M 2280 1T
- 64GB eMMC 5.1 on Jetson AGX Orin board

I/O Interface-Front

- 1 x HDMI
- 5 x RJ45 LAN
- 3 x USB 3.2 Gen1, 1 x USB 3.2 Gen2
- 4 x COM (2 x RS232, 2 x RS-232/485/422)
- 1 x HD Audio Jack (MIC-In, Line-Out)
- 1 x 8GPIO (8GPI & 8GPO)
- 1 x 3 PIN Power connector

Block Diagram



Expansion Slot

- 1 x Micro SD
- 1 x M.2 Key B 3042/3052 (USB2.0, USB3.1) support 4G/5G module
- 1 x M.2 Key E 2230 (PCIe x 1 Gen1, USB2.0) support WiFi/BT module

Power Requirement

- DC 24V to 48V input

Dimensions

- 172.6(W) x 145(D) x 109.5(H) mm

Construction

- Aluminum and metal chassis with cooling design
- Installation: wall-mounting

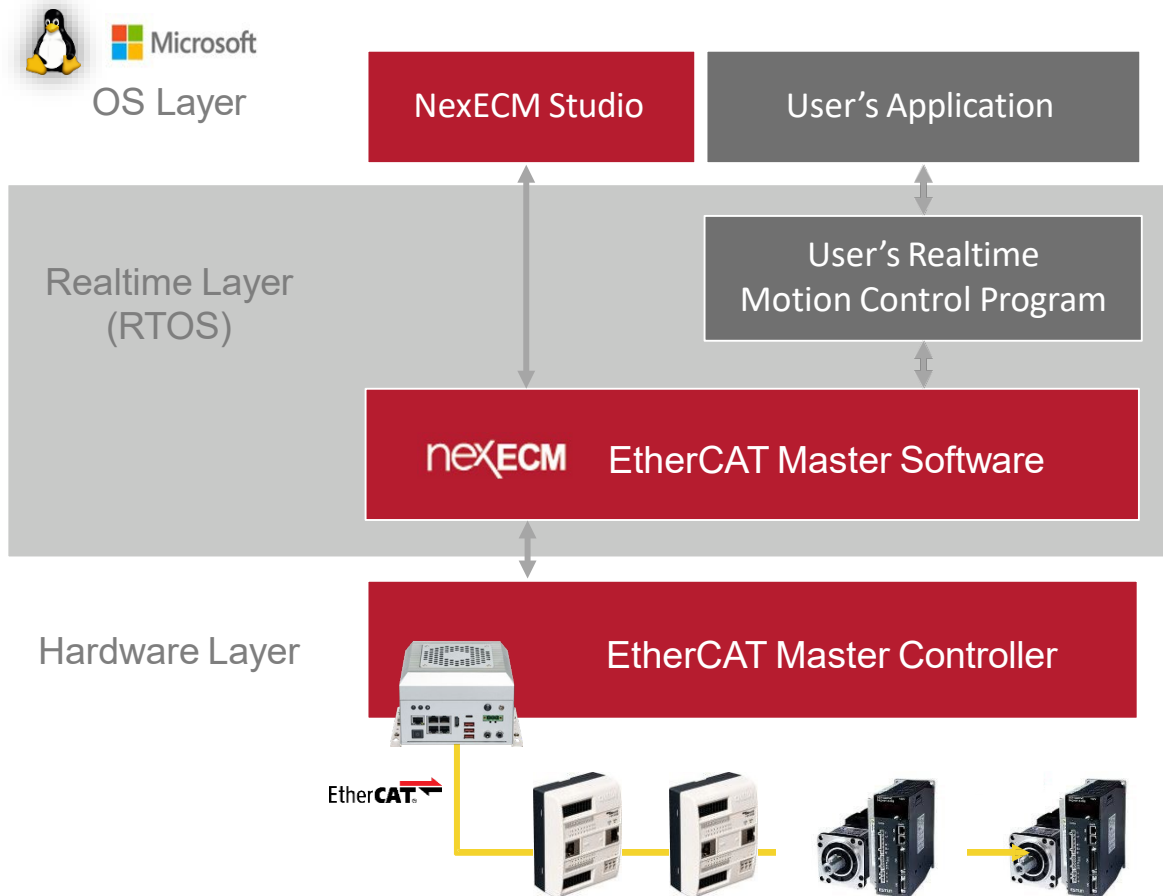
Environment

- Operating temperature: Ambient with air flow: -20°C to 50°C (according to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 85°C
- Relative humidity: 25~50°C, 90% (non-condensing)

Certifications

- CE
 - EN61000-6-2
 - EN61000-6-4
- FCC Class A

Software Architecture



Pre-Installed Software Package & Realtime Performance

ECM M400-A10-04-C

- Operating System : **Ubuntu 22.04**
- Linux Kernel : **5.15 (with PREEMPT_RT)**
- Jetpack : **6.2**
- CUDA : **12.6**
- OPENCV : **4.10**
- EtherCAT Master : **NexECM**
- Realtime Performance : **Class A (< 50us)**

Ordering Information

ECM M400-A10-04-C-1T-X (P/N: 98EMM400A01XF)

EtherCAT Master Controller (NVIDIA Jetson AGX Orin 64GB)

Specifications:

- NVIDIA Jetson AGX Orin®
- RAM: 64GB
- Storage: 64GB eMMC + 1TB PCIe Gen4x4 3D TLC SSD
- I/O: 5x RJ45 Ports (GMSL ports not included)
- CPU: 12-core Arm Cortex
- GPU: 2048-core NVIDIA Amper
- **Note: 8 Ports GMSL module is not included.**
- **Note: Power Adapter is not included.**

ECM M400-A10-04-C-1T-G8-X (P/N: 98EMM400A02XF)

EtherCAT Master Controller (NVIDIA Jetson AGX Orin 64GB)

Specifications:

- NVIDIA Jetson AGX Orin®
- RAM: 64GB
- Storage: 64GB eMMC + 1TB PCIe Gen4x4 3D TLC SSD
- I/O: 5x RJ45 Ports, GMSL 8 Ports
- CPU: 12-core Arm Cortex
- GPU: 2048-core NVIDIA Amper
- **Note: Power Adapter is not included.**

Packing List

- 1 x SYSTEM
- 1 x Power Connector
- 4 x screws

Optional Accessories

- DC POWER CABLE (P/N: 603POW0391X00)
- Power Adapter 24V/120W (P/N: 7400120026X00)