PRO SERIES

Roboto Condensed
STM32 HIGH-PERFORMANCE ETHERCAT CONTROL BOARD

Model: STM32F429BIT6 | Industrial Automation & Motion Control

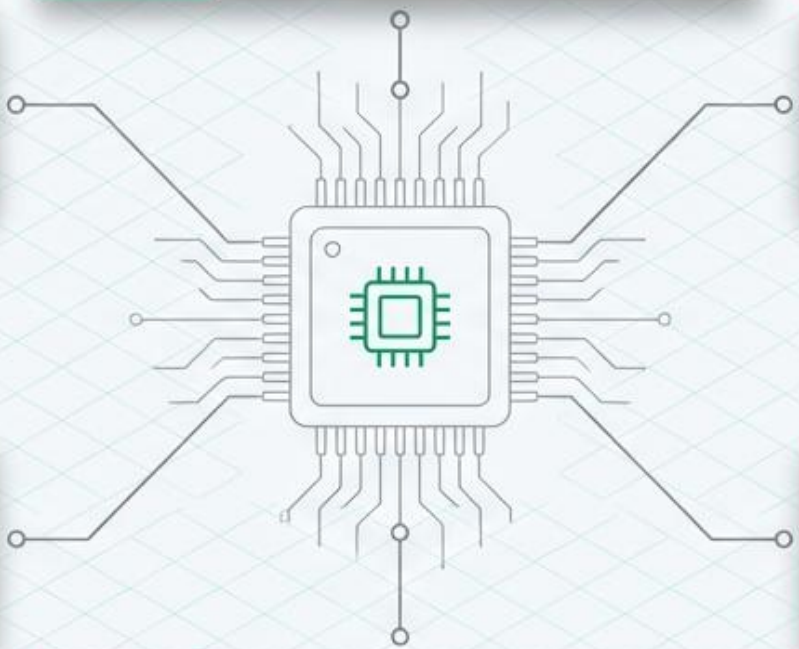
- EtherCAT Slave Station Integration
- Hybrid Precision: 16-Channel ADC (8x 24-bit / 8x 16-bit)
- Massive I/O: 54 Isolated Inputs / 48 Isolated Outputs
- Vibration-proof Spring-Clamp Terminals

System Core Advantages

EtherCAT Technology
Industrial Ethernet Slave Station for real-time synchronization.

Hybrid Analog System
Combined 24-bit high-precision and 16-bit high-speed acquisition.

High-Power Drive
50W PWM Output capable of driving adjustable loads directly.

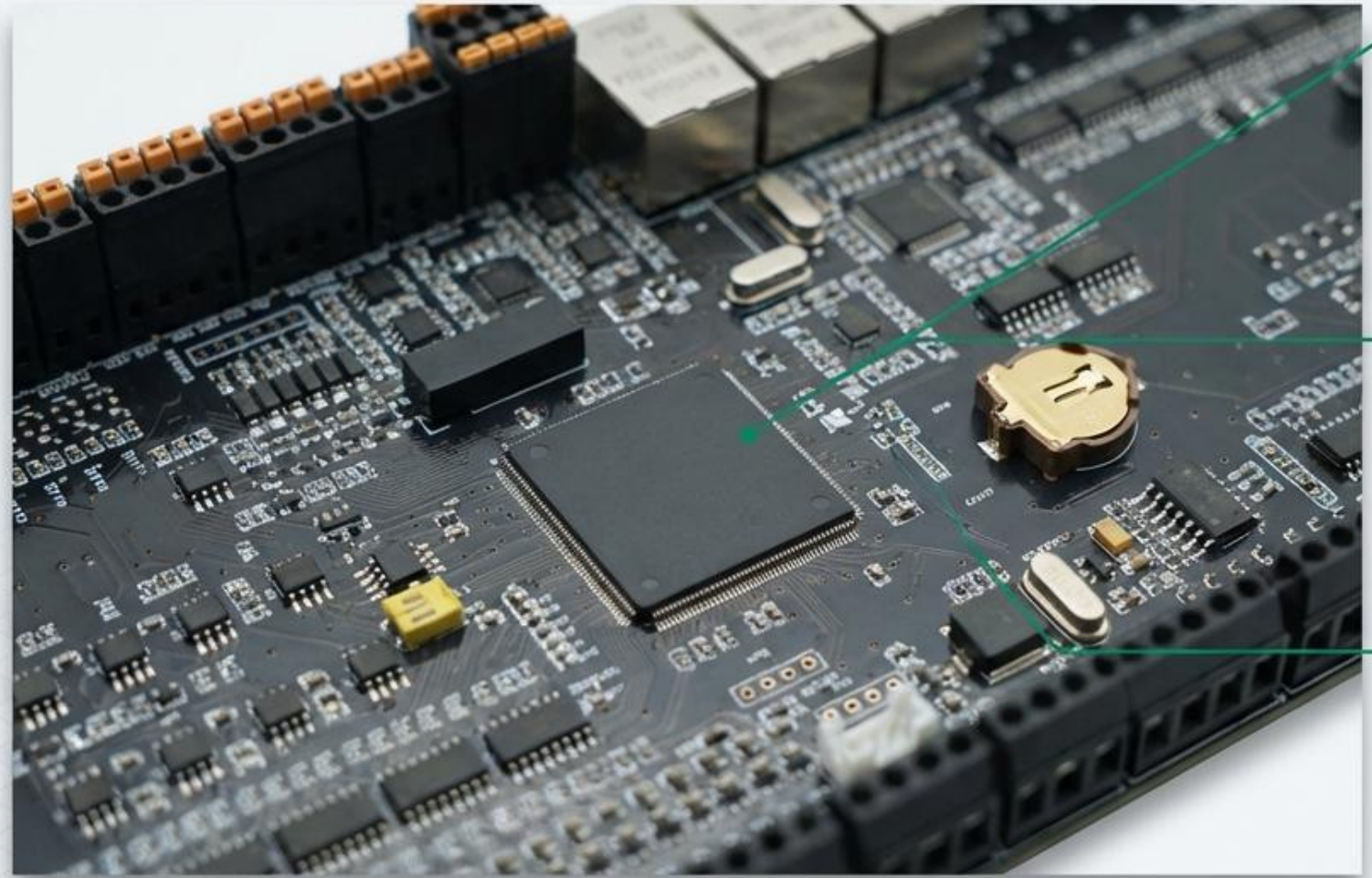


Total Isolation
54 Inputs / 48 Outputs with full galvanic isolation.

Robust Communication
Fully Isolated Dual CAN & Tri-Channel RS485.

Massive Relay Integration
12 Channels Relay Output (5A Current) embedded on-board.

Flagship Core Processing



MCU

STM32F429BIT6 (ARM Cortex-M4 High-Performance Microcontroller).

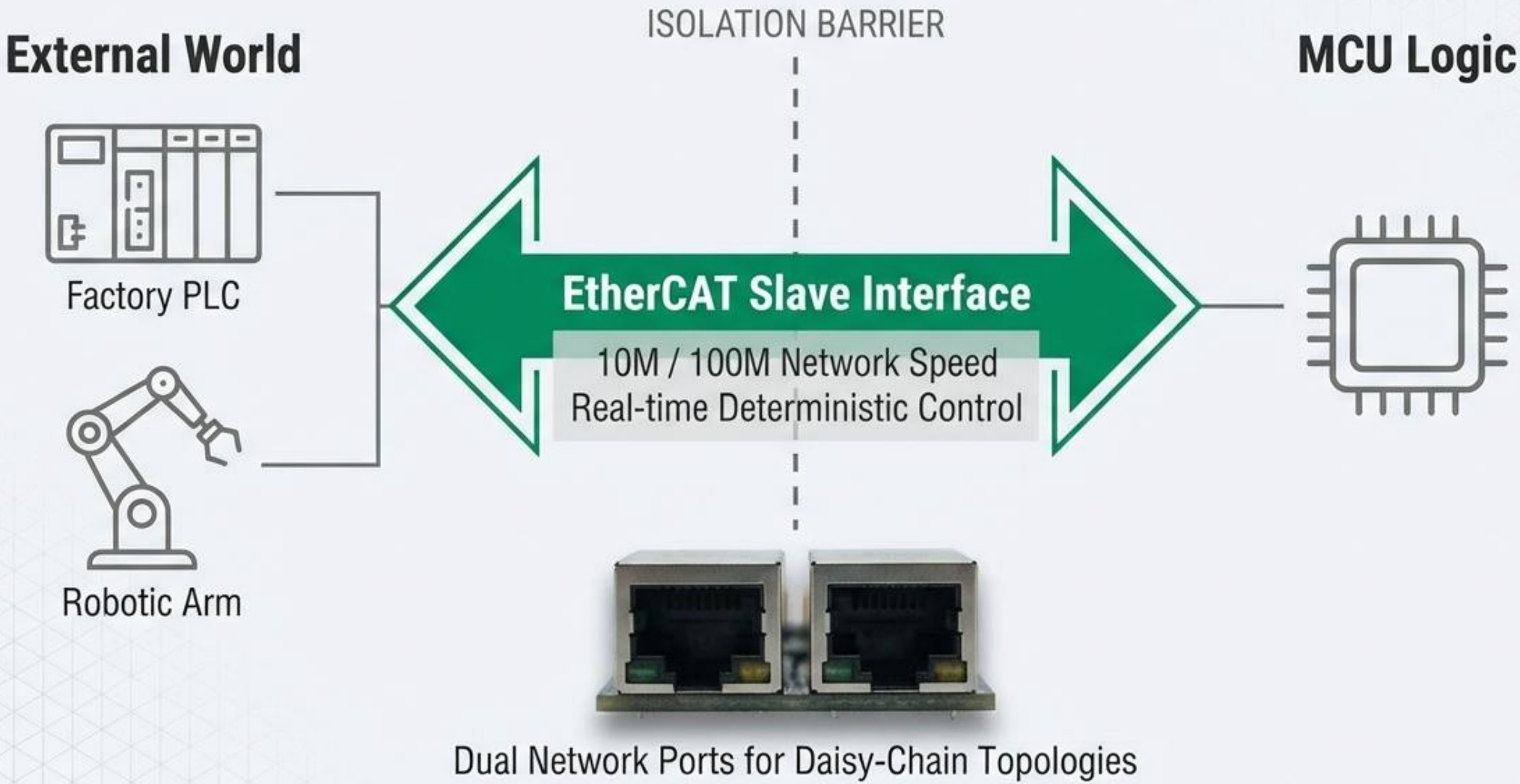
ETHERNET INTERFACE

Direct connection to LAN8720 for 10M/100M EtherCAT speeds.

DATA SAFETY

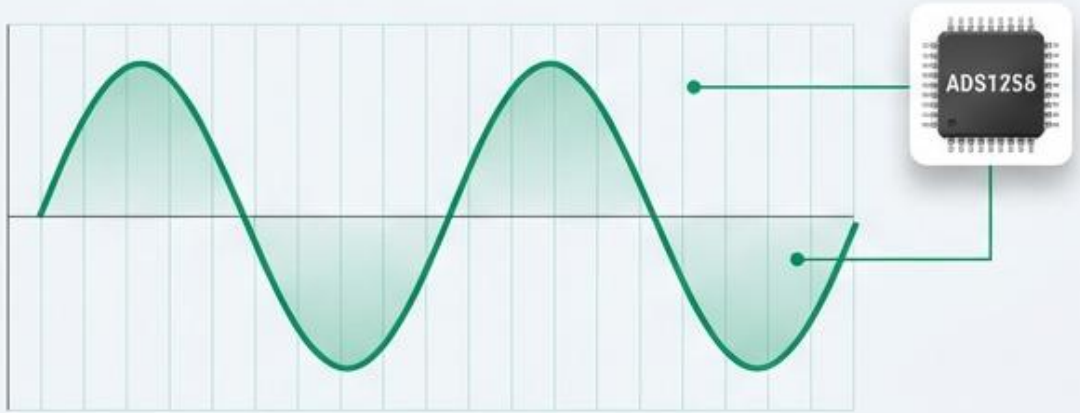
Onboard RTC Battery backup and independent hardware Watchdog.

Industrial Ethernet Connectivity



Hybrid Precision Analog System

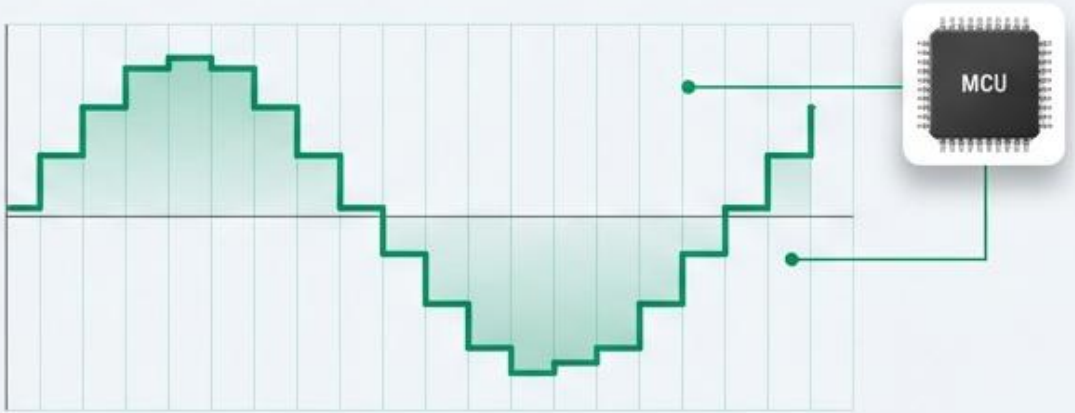
Precision Tier (ADS1256)



8 Channels 24-bit ADC

For high-accuracy sensor data acquisition.

Speed Tier (MCU Internal)



8 Channels 16-bit ADC

For high-speed loop feedback.

Input Support: Switchable -10V~+10V, 0-20mA, and NTC Temperature.

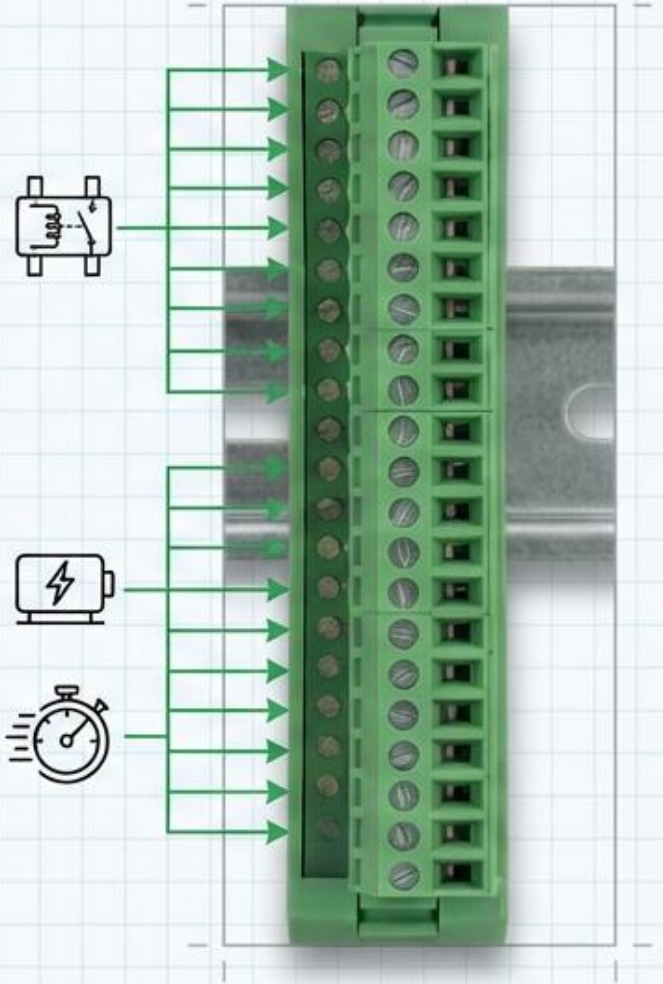
DAC

DAC Output: 8 Channels, 16-bit Resolution (-10V to +10V).

High-Density Digital I/O Matrix

Fully Isolated Architecture

54 Isolated Inputs		48 Isolated Outputs	
	Standard: 16x Isolated Inputs + 12x NPN/PNP Adaptive.		**Heavy Load:** 12 Channels Relay Output (5A Current).
	Specialty: NTC Temperature support via jumper selection.		**Fast Switching:** 24 Channels MOS Tube Output.
	Encoders: 3 Channels Incremental Encoder Inputs (AB Phase).		**Motion:** 12 Channels High-Speed PWM Output.



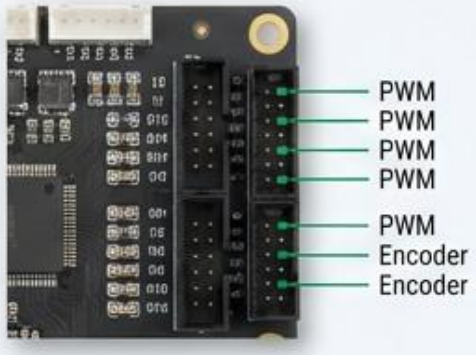
Drive & Motion Control

High-Power PWM

50W Output capacity. Capable of driving adjustable loads directly without external amplification.

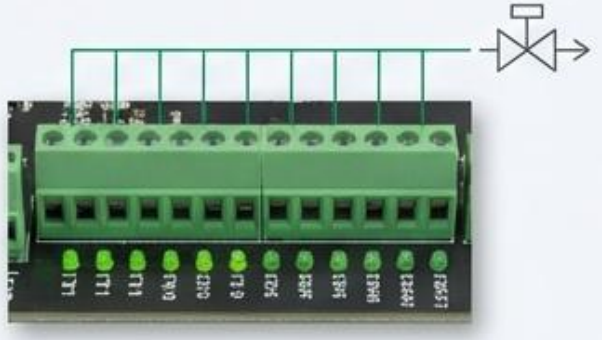
Precision Motion Interface

12 Channels High-Speed PWM Output paired with 3-Channel Incremental Encoder Input for closed-loop control.



Flexible Actuation

24 Channels MOSFET output for fast-switching valves and actuators.

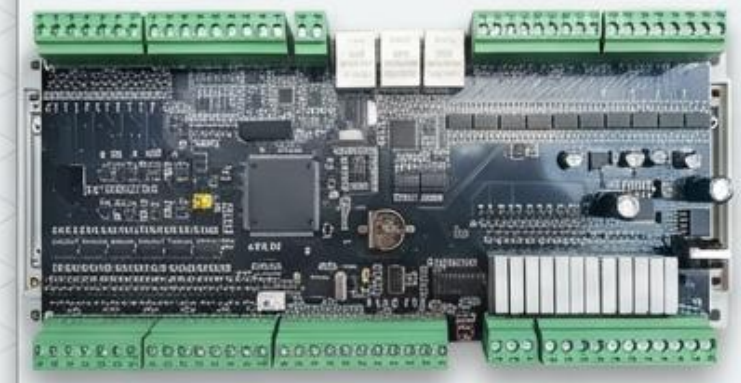


EtherCAT Slave

Isolated Field Communication

Galvanic Isolation Barrier

Field Connectivity



RS485 x3 Channels
Power & Signal Fully Isolated

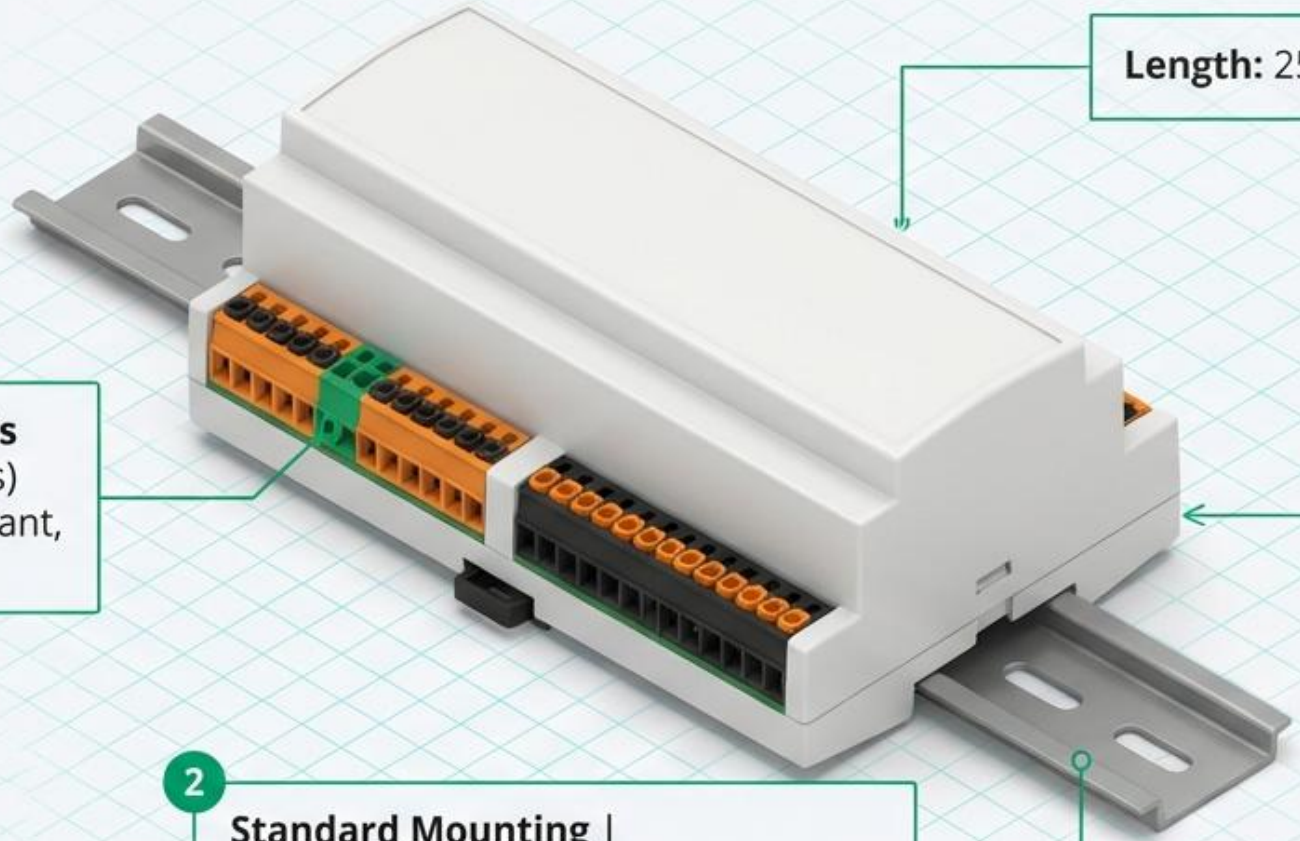
CAN Bus x2 Channels
Power & Signal Fully Isolated

RS232 x2 Channels
Standard Interface

USB x1
USB-to-Serial CH340C
for debugging

System Core

Industrial Integration & Housing



Length: 250mm x **Width:** 110mm

1

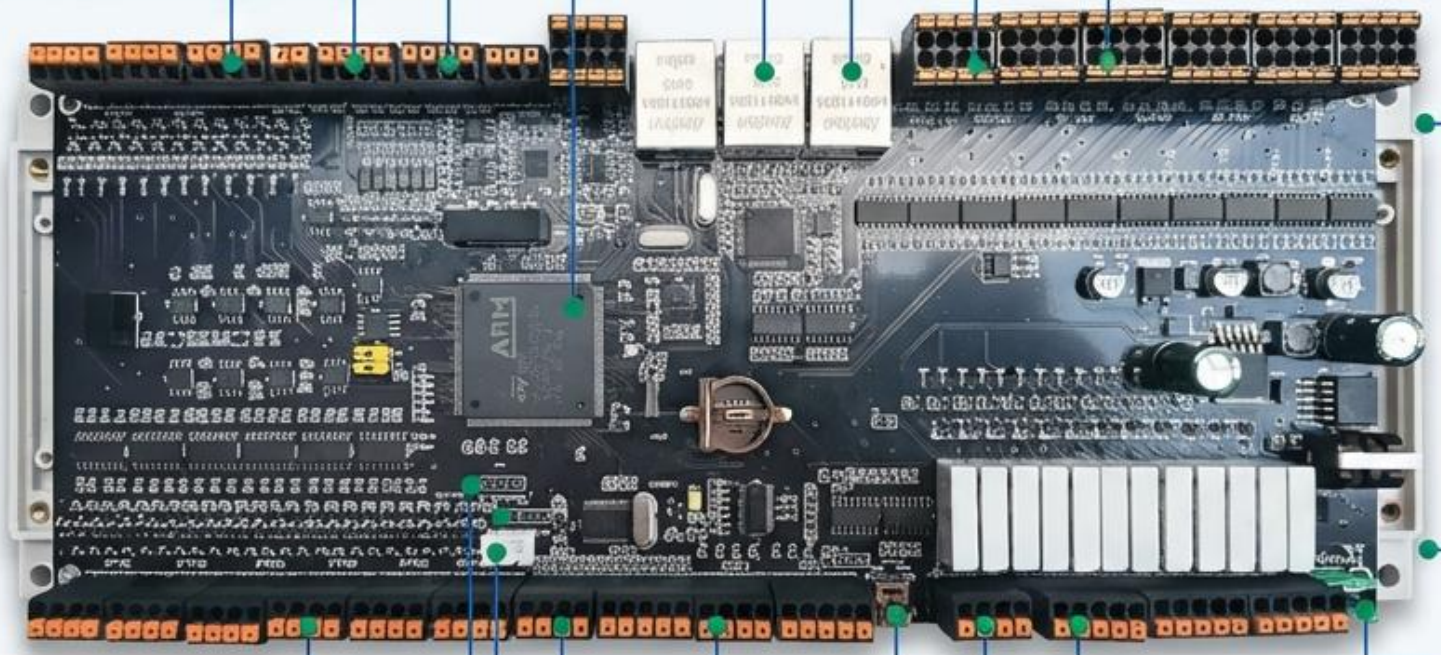
Quick-Connect Terminals | Spring-Clamp (Screwless) design for vibration-resistant, tool-free installation.

2

Standard Mounting |

Compatible with 3.5cm DIN Rail. Fully enclosed shell for dust protection.

Hardware Interface Map



Encoder/TTL Jumpers

12x High-Speed PWM Out

3x Iso RS485

STM32F429 MCU

3x Encoder In

2x Iso CAN

8x 16-bit DAC Out

EtherCAT Port (10/100M)

48x Isolated Inputs (Bank 1)

Serial Screen/TTL

24x MOS Output

I2C/TTL Interface

SWD Download

16x Hybrid ADC In (NTC/Current)

USB-Serial

2x RS232

12x Relay Output

24V Power In

Technical Specifications Summary

TECHNICAL SPECIFICATIONS

Feature	Specification
MCU Core	STM32F429BIT6 (ARM Cortex-M4)
Network	EtherCAT Slave (LAN8720), 10/100M Interface
Analog Input	16 Channels Total (8x 24-bit + 8x 16-bit). Supports 0-20mA / NTC
Analog Output	8 Channels 16-bit DAC (-10V to +10V)
Digital I/O	54 Isolated Inputs / 48 Isolated Outputs (Relay + MOS)
Motion Control	12x HS PWM, 3x Encoder Input, 50W Power PWM
Communication	3x RS485 (Iso), 2x CAN (Iso), 2x RS232, USB-Serial
Power & Install	24V DC Input, DIN Rail Mount, Spring-Clamp Terminals