

ETS Hardware Reference Manual



4CHANNEL **DIGITAL INPUT/OUTPUT** MODULE

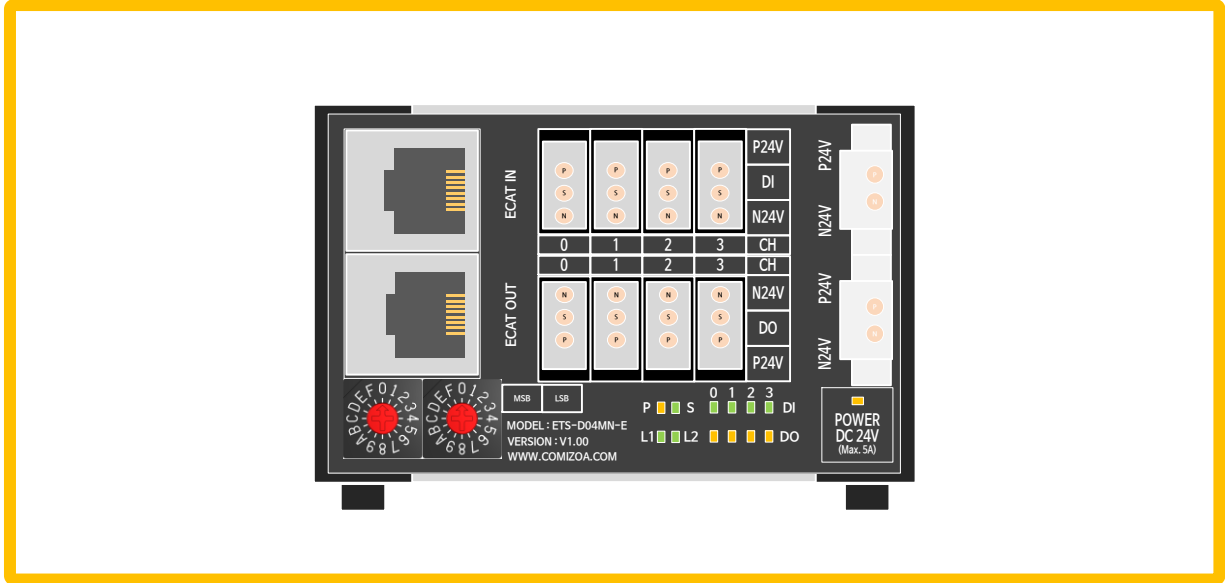
ETS-D04MN-E

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개요



ETS - D04MN - E (Digital NPN Input 4ch / Output 4ch)

ETS-D04MN-E는 커미조아의 EtherCAT 기반 제어기의 4채널 Digital 입력 / 4채널 Digital 출력 모듈입니다. 각 채널의 내부 제어 신호와 외부 입출력 신호는 포토커플러를 사용하여 절연됩니다. 본 매뉴얼은 ETS-D04MN-E의 하드웨어 구성과 기능에 대해 설명하는 하드웨어 매뉴얼입니다.

- ▣ EtherCAT Slave Module
- ▣ CiA Standard 401 and ETG.5001 Modular Device Profile
- ▣ Supports Terminal Device ID
- ▣ Digital I/O Power Over Current Protection
- ▣ Digital Input 4(NPN)
- ▣ Digital Output 4(NPN)
- ▣ Independent System Power

Specification
Power Specification

Contents	Details
Power Dissipation(System)	Max. 40mA @ 24.0V DC
Power Dissipation(I/O)	Max. 30mA @ 24.0V DC
Rated Input Voltage	24V DC (-15%/+20%, ripple ratio within 5%) EN 61131-2

Comm. Specification

Contents	Details
Transmission speed for EtherCAT	100 Mbit/s with Full Duplex
MDI/MDI-X	MDI/MDI-X auto-crossover.
ESD Protection	Contact Discharge (Typ.) 4kV
	Air Discharge (Typ.) 8kV

Digital Specification

Contents	Details
Number of Inputs	Isolated 4 Input
Input type	Current Sink Type (NPN)
Input Range	DC 0 ~ 24V
Input Current	Min. 3.6mA / channel
Input Impedance	5.1 KOhm
Input Level Tolerant	Low (Min. 0V ~ Max. 5V)
	High (Min. 18V ~ Max. 24V)
Isolation	1 KV Channel to Channel
Wiring contact	I/O : 3-Pin E-CON / Power : USL-3FBS-2P

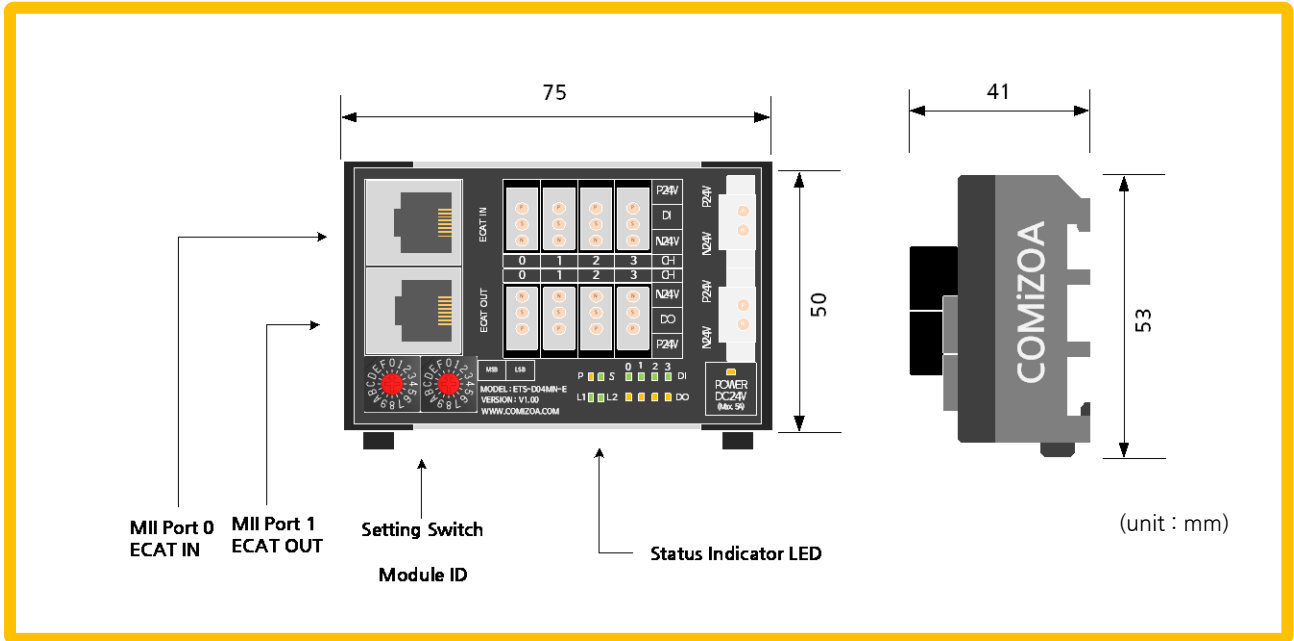
Digital Input Specification

Contents	Details
Number of Outputs	Isolated 4 Output
Output type	MOSFET with common ground (NPN)
Output Voltage	Min. 5V ~ Max. 35V
Sink Current	Max. 500mA / channel
Rds(On state resistance)	Max. 500mOhm
Throughput	10Khz (0.1ms)
Overload Shutdown	1.1A Min ~ 2A Max

Digital Output Specification
Environmental Specification

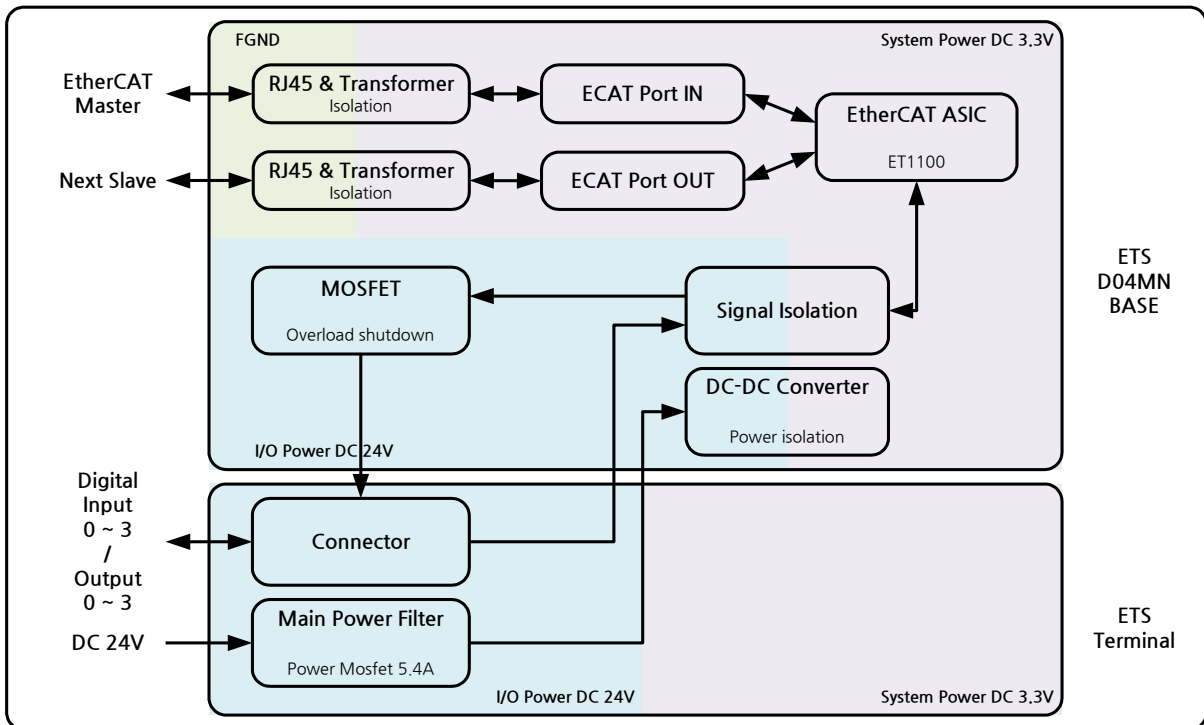
Contents	Details
Dimension	75 * 53 * 41 (mm)
Install	Industrial DIN rail
Operating Temperature Range	0°C ~ 50°C
Storage Temperature Range	-20°C ~ 80°C
Operating Humidity Range	5% ~ 90%RH, non-condensing
Storage Humidity Range	5% ~ 90%RH, non-condensing

Specification

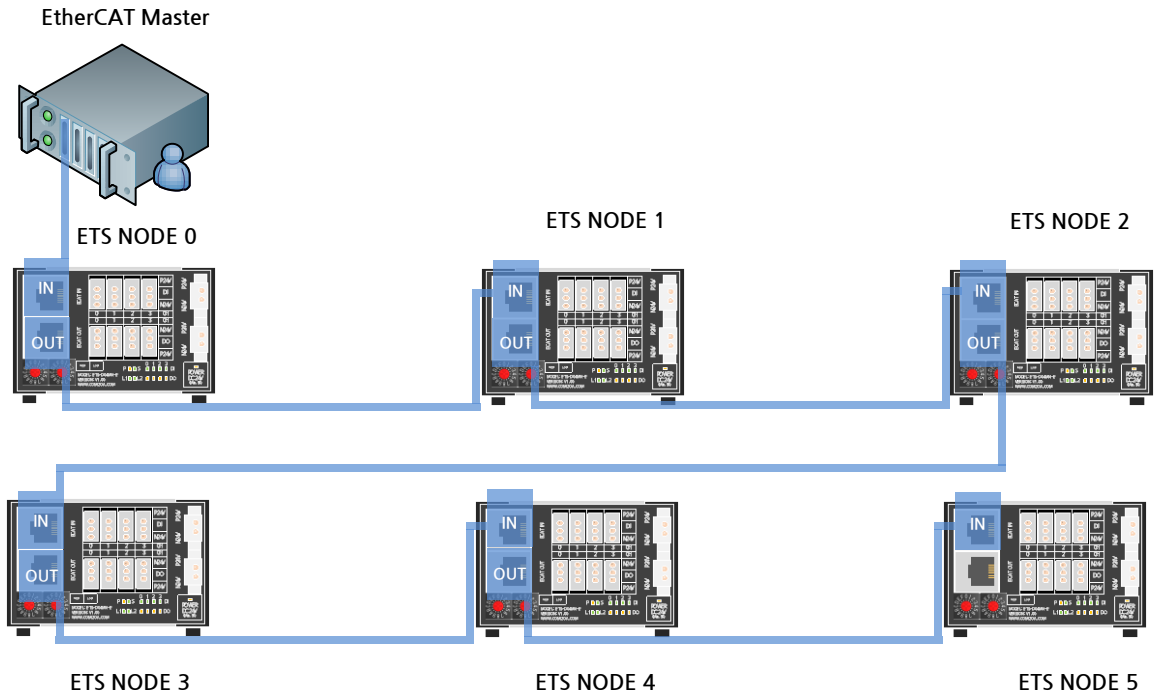



Dimension

Block diagram



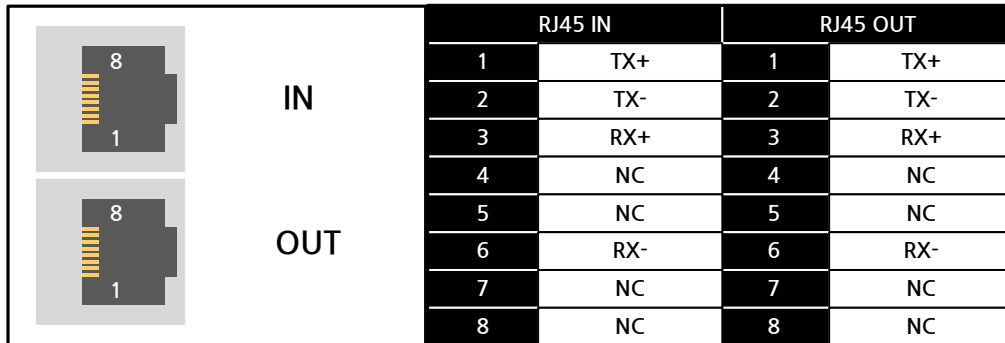
ETS-D04MN-E Block diagram

Interface Connect

Device ID Setting

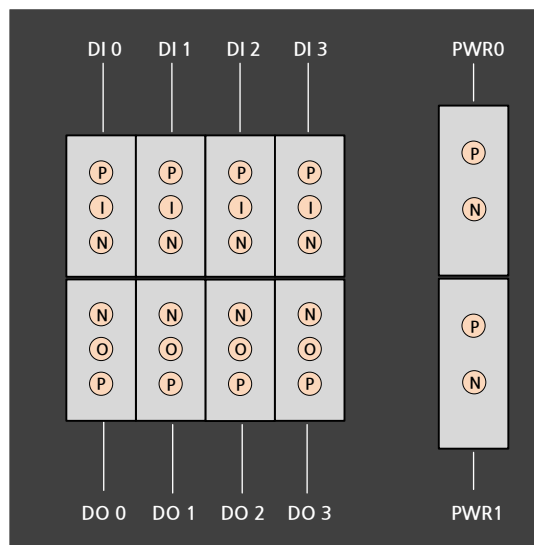
 MSB LSB	NODE ID setting	$I.P = MSB * 16 + LSB$
	NODE ID range	1 ~ 256

Connector

▣ RJ45 Connector

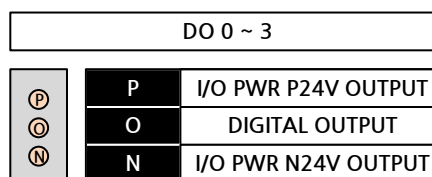
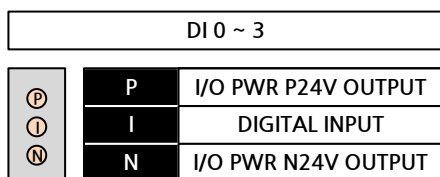
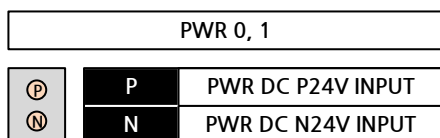


▣ Contact Number



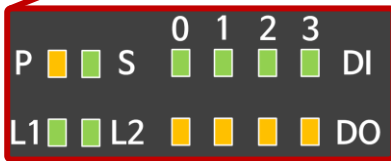
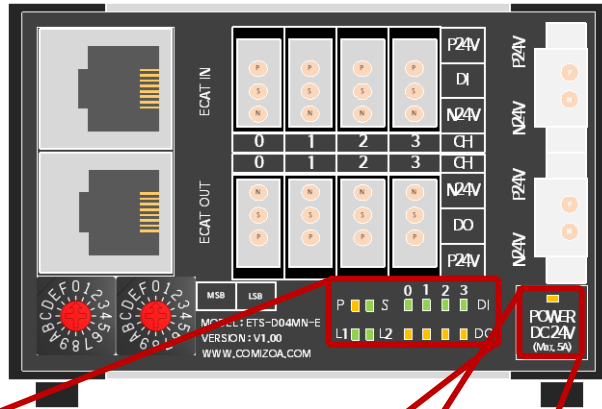
* PWR1 커넥터는 PWR0 커넥터로 들어온 전원을 다음 제품으로 전달해주는 Bridge 역할의 커넥터입니다. Bridge를 통해 공급할 수 있는 전류의 크기는 8A 입니다. 전원 배선시 유의 바랍니다.

▣ PIN MAP



** PWR0과 PWR1의 전원 커넥터는 나사가 체결된 상태에서 강제로 케이블을 분리하려고 할 경우, 전원 커넥터 몸체가 분리 또는 파손될 수 있습니다. 반드시 나사 체결을 해제 확인 후 커넥터를 분리해주시기 바랍니다.

Status LED



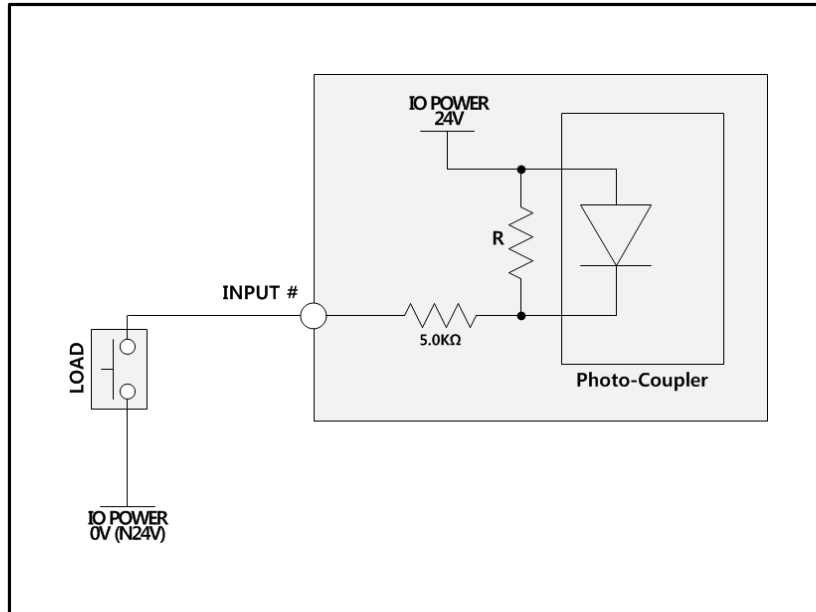
POWER DC24V	I/O POWER LED	ON	DIGITAL I/O POWER(24V DC) ON
		OFF	DIGITAL I/O POWER(24V DC) OFF
P	SYSTEM POWER LED	ON	SYSTEM POWER(3.3V DC) ON
		OFF	SYSTEM POWER(3.3V DC) OFF
S	EtherCAT AL STATE LED	OFF	INIT
		Blinking(slow)	PRE-OP
		Single Flash	SAFE-OP
		ON	OP
		Flickering(fast)	BOOTSTRAP
L1(2)	LINK 1(2) STATE LED	Blinking(slow)	MII Port 0(1) OPEN
		OFF	MII Port 0(1) Closed
DI 0-3	INPUT STATE LED	ON	INPUT ON STATE (LOGIC ' 1')
		OFF	INPUT OFF STATE (LOGIC ' 0')
DO 0-3	OUTPUT STATE LED	ON	OUTPUT ON STATE (LOGIC ' 1')
		OFF	OUTPUT OFF STATE (LOGIC ' 0')

* 전원을 인가하였으나 모든 LED가 OFF 상태라면

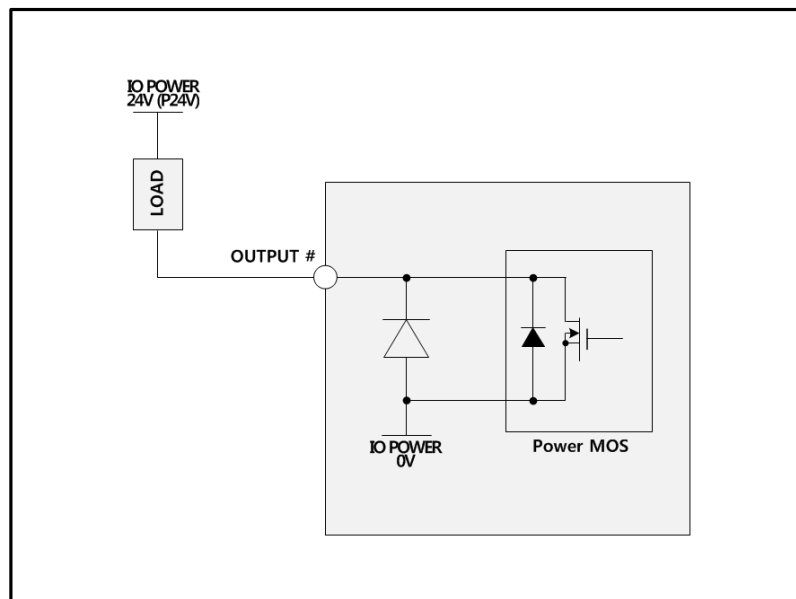
과전류 또는 전원 short 상태이므로 해당 제품에 연결된 IO 관련 배선을 우선 확인 바랍니다.

** 이 제품은 과전류 또는 전원 short 상태에서 벗어나 정상 상태 복귀시 바로 재시작되는 점 유의 바랍니다.

Circuit Diagram (Digital Input)



Circuit Diagram (Digital Output)



Hardware Reference Manual Update List

No.	Version	Date	Changes in
1	1.00	2019.05.10	First Edition

ETS Reference Manual

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