

ETS Hardware Reference Manual

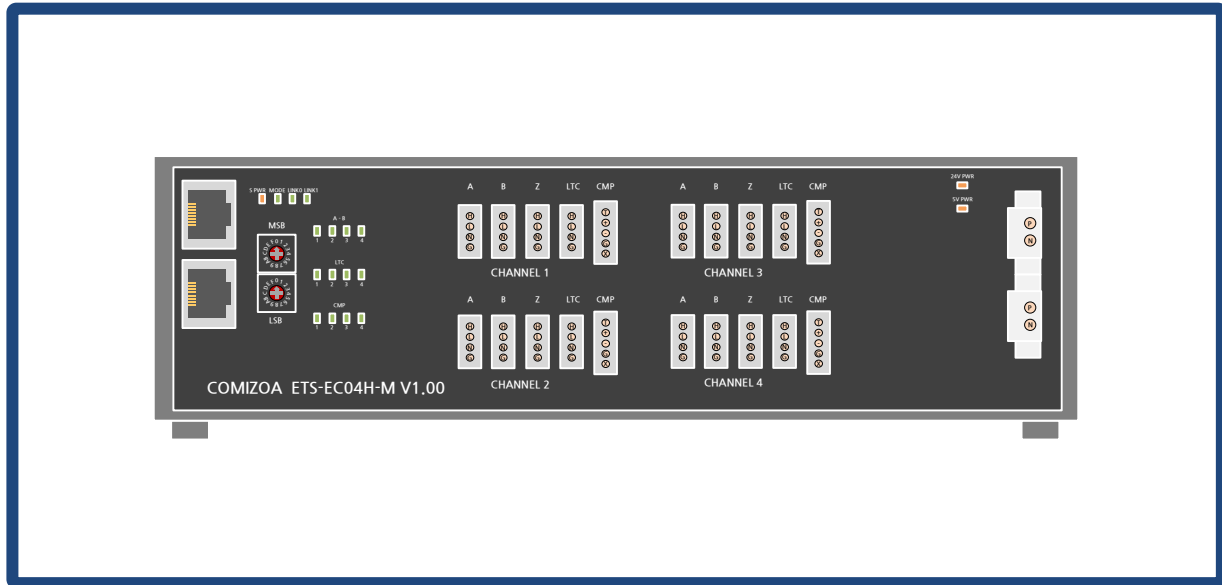


4CHANNEL HIGH SPEED ENCODER COUNTER MODULE ETS-EC04H-M (v1.00)

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개요

ETS - EC04H - M (High Speed Encoder Counter 4ch)

ETS-EC04H-M는 커미조아의 EtherCAT 기반 제어기의 4채널 Encoder counter / 4채널 LTC / 4채널 CMP 모듈입니다.

A / B / Z Counter는 32-bit 해상도를 지원하며, LTC에는 256개의 List를 저장 가능하고, CMP에는 1024 개의 List를 출력 가능합니다.

각 채널에서 A / B / Z / LTC 입력은 NPN / PNP / Line Drive / TTL 입력이 가능하며 각 입력마다 DC 24V와 DC 5V 입력 2가지 Level을 지원합니다. CMP 출력은 TTL / LVDS 출력이 가능합니다.

각 채널의 내부 제어 신호와 외부 입출력 신호는 포토 커플러를 사용하여 절연됩니다.

본 매뉴얼은 ETS-EC04H-M의 하드웨어 구성과 기능에 대해 설명하는 하드웨어 매뉴얼입니다.

EtherCAT 시스템의 전반적인 내용은 EtherCAT product System Reference 매뉴얼을 참조 바랍니다.

- ▣ EtherCAT Slave Module
- ▣ CiA Standard 401 and ETG.5001 Modular Device Profile
- ▣ Supports Terminal Device ID
- ▣ High Speed Photo-coupler
- ▣ Universal Digital Inputs
- ▣ Isolated System Power

Specification

Contents	Details
Dimension	180 * 53 * 35 (mm)
Operating Temperature	0°C ~ 50°C
Storage Temperature	-20°C ~ 80°C
Humidity	5% ~ 90%, non-condensing
Power consumption	System Power : 100mA @ DC 24V ± 5% I/O Power : 50mA @ DC 24V ± 5%

Environmental Specification

Contents	Details
Number of Channels	Isolated 4 Channels
Counter Resolution	32-bit
Input type	Current sinking type (NPN) / Current source type (PNP) / TTL Level (5V)
Input Range	DC 24V (NPN, PNP) / DC 5V (TTL, NPN, PNP) / 5V Line Driver
Maximum Pulse Input Speed	Max. 10M PPS
Wiring Contact	A / B / Z : 5264-04 / Power : USL-3FBS-2P

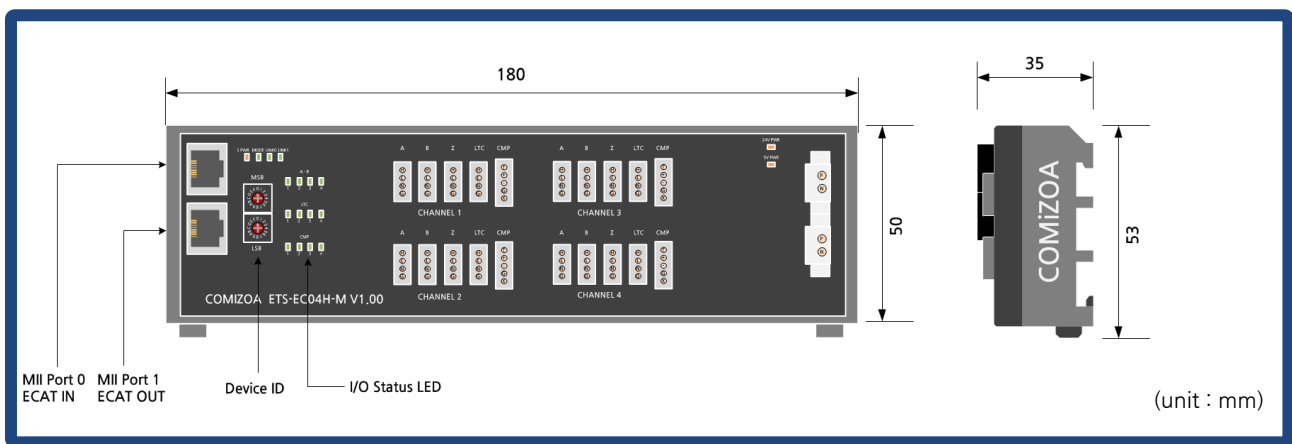
Encoder Counter Input Specification

Contents	Details
Number of Channels	Isolated 4 Channels
Input type	Current sinking type (NPN) / Current source type (PNP) / TTL Level (5V)
Input Range	DC 24V (NPN, PNP) / DC 5V (TTL, NPN, PNP) / 5V Line Driver
Wiring Contact	LTC : 5264-04 / Power : USL-3FBS-2P

Latch Input Specification

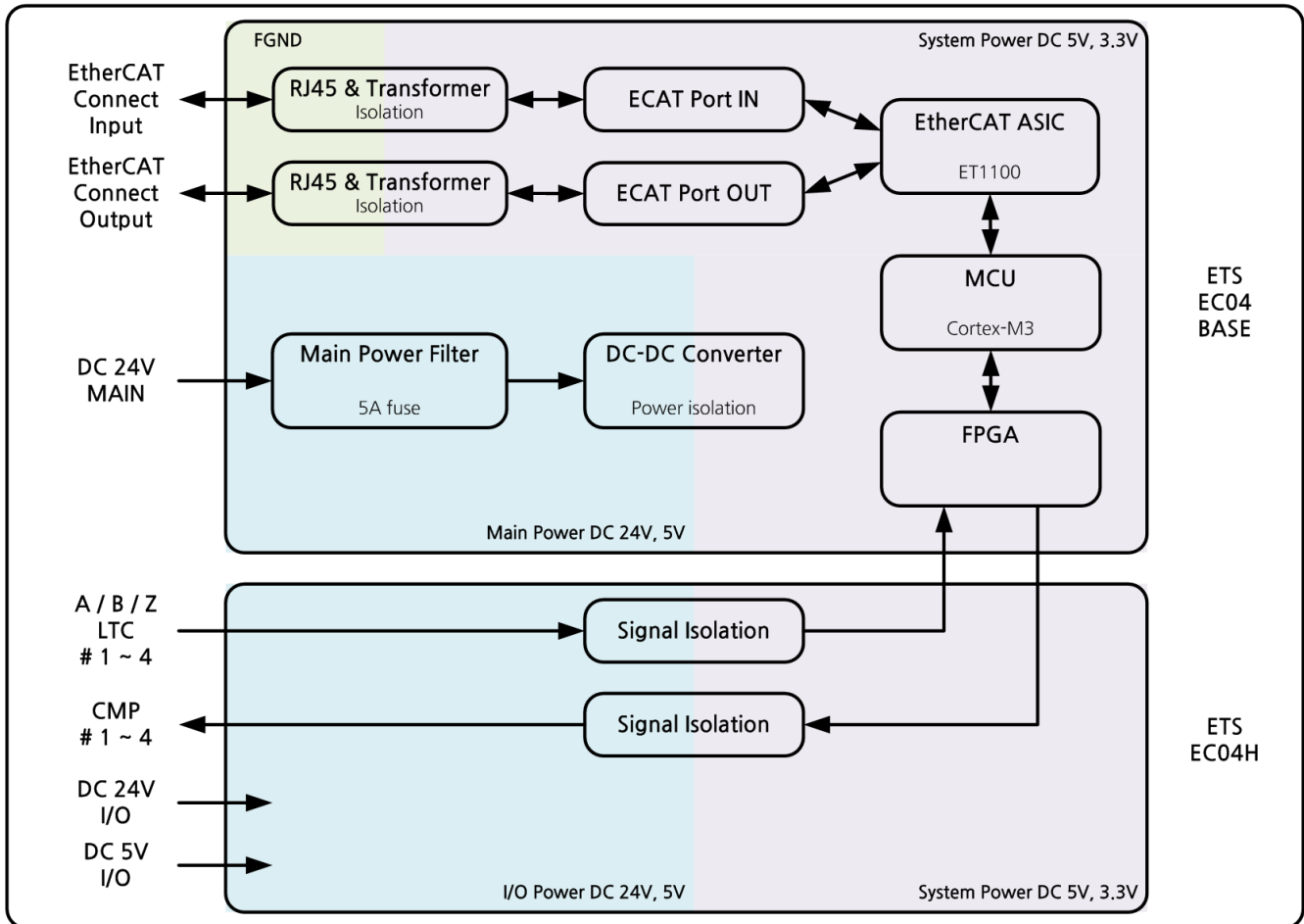
Contents	Details
Number of Channels	Isolated 4 Channels
Output type	TTL Level (5V) / LVDS
Wiring Contact	CMP : 5264-05 / Power : USL-3FBS-2P

Compare Output Specification



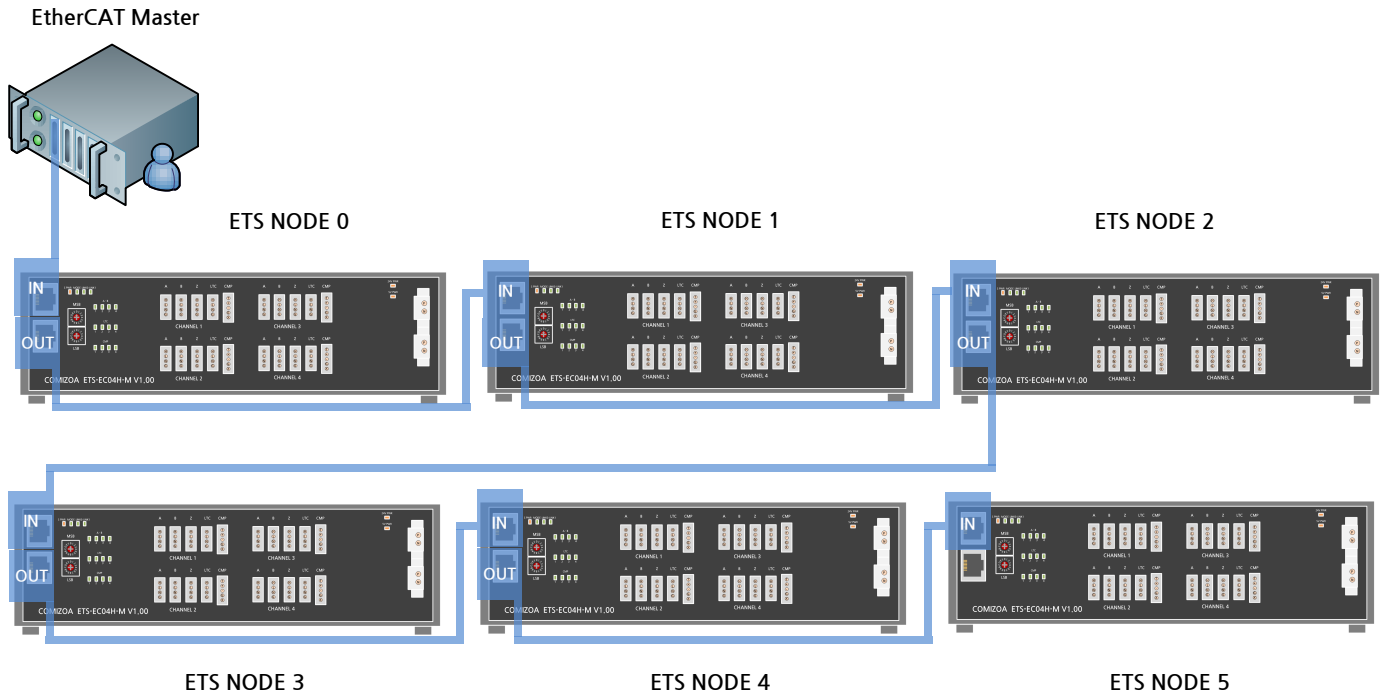
Dimension

Block Diagram



ETS-EC04H-M Block Diagram

Interface Connect



ETS-EC04H-M의 연결 예시 입니다. 위 예시 외에 다양한 조합이 가능합니다.

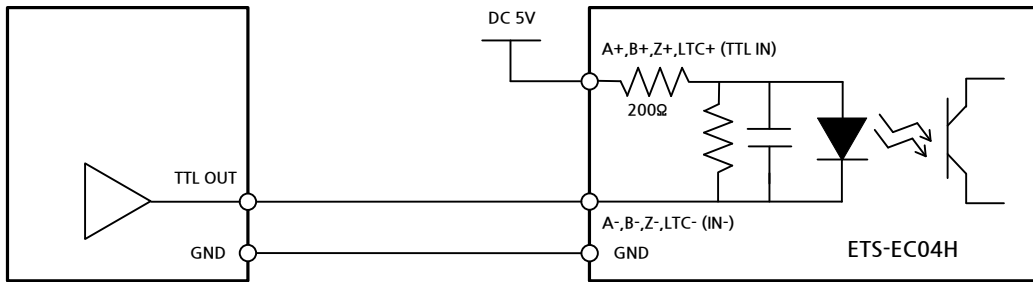
Device ID Setting

EtherCAT 연결시 Device ID를 별도로 사용할 경우의 ID Setting Switch 입니다.

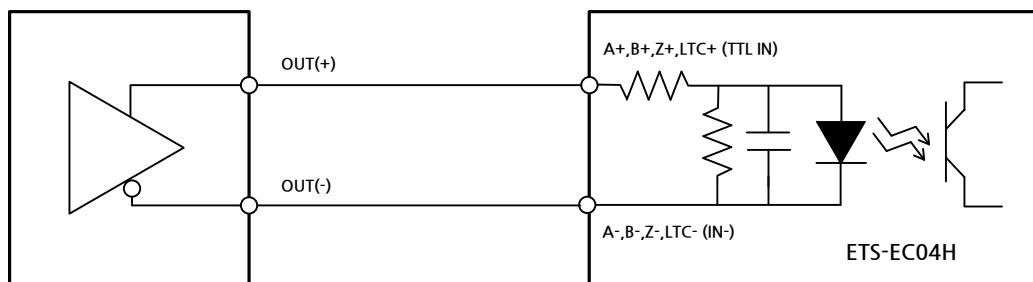
MSB와 LSB를 사용하여 최대 256개의 ID 지정이 가능합니다.

	NODE ID setting	ID Number = MSB * 16 + LSB
	NODE ID range	0 ~ 255

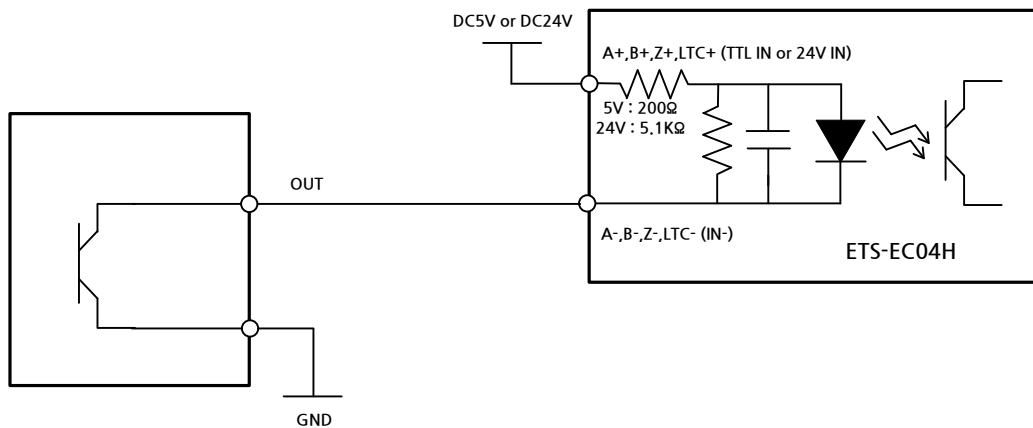
Wiring for Inputs



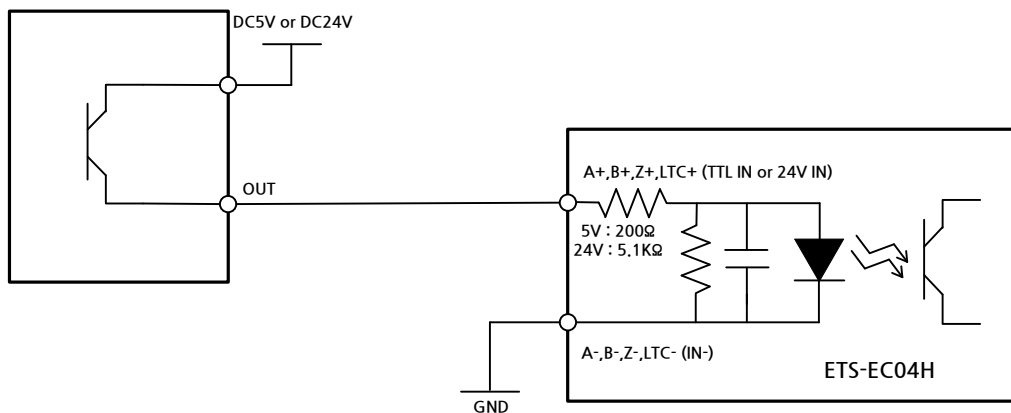
Encoder Counter / LTC Input TTL Wiring



Encoder Counter / LTC Input Line Drive

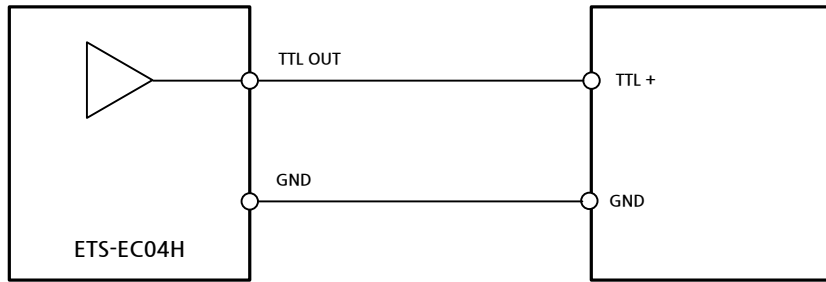


Encoder Counter / LTC Input Current Sink (Open-Collector)

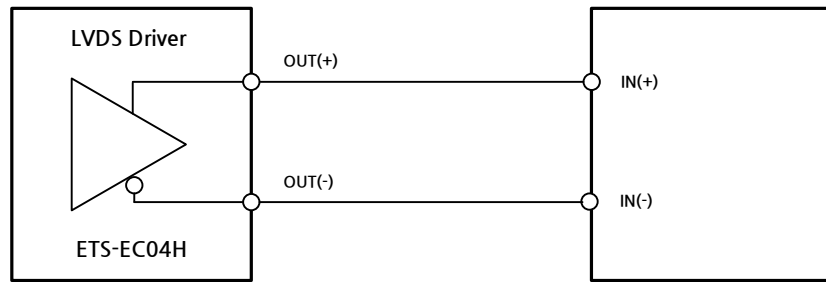


Encoder Counter / LTC Input Current Source (Open-Collector)

Wiring for Output (CMP)



CMP Output TTL Wiring



CMP Output LVDS Wiring

Connector

▣ RJ45 Connector

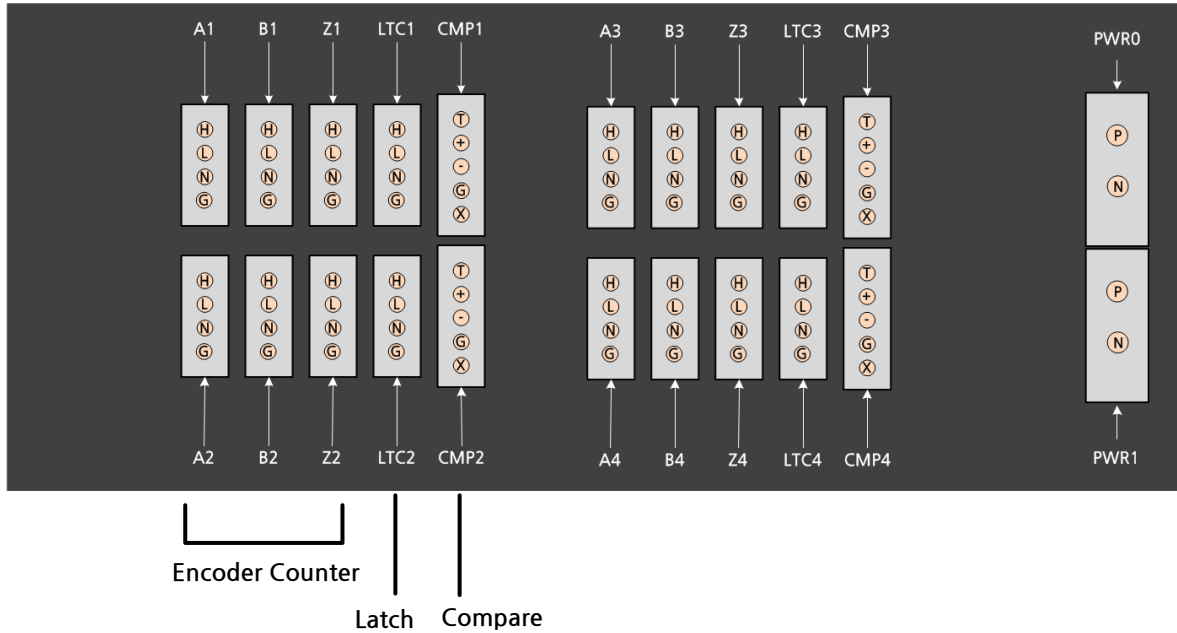
		RJ45 IN		RJ45 OUT	
	IN	1	TX+	1	TX+
		2	TX-	2	TX-
		3	RX+	3	RX+
		4	NC	4	NC
		5	NC	5	NC
		6	RX-	6	RX-
		7	NC	7	NC
		8	NC	8	NC
	OUT				

위 포트들은 EtherCAT 연결로만 사용할 수 있으며,

Category 5e 이상의 LAN 케이블을 사용해야 합니다. (EtherCAT Standard)

Connector

Contact Number



PWR0과 PWR1의 각 P, N 핀은 내부에서 연결되어 있으며, 전원 Bridge 역할로 사용 가능합니다.

PIN MAP

A / B / Z / LTC 1 ~ 4 (5V Line Drive)		
(H)	H	Not Connect
(L)	L	Diff. Signal (+)
(N)	N	Diff. Signal (-)
(G)	G	Ground (Optional)

PWR 0, 1		
(P)	P	PWR DC P24V
(N)	N	PWR DC N24V

CMP 1 ~ 4 (TTL Output)		
(T)	T	CMP OUT TTL Level
(+)	+	Not Connect
(-)	-	Not Connect
(G)	G	Ground
(X)	X	N.C

A / B / Z / LTC 1 ~ 4 (5V NPN / TTL)		
(H)	H	Not Connect
(L)	L	DC +5V IN
(N)	N	Input Signal
(G)	G	Ground

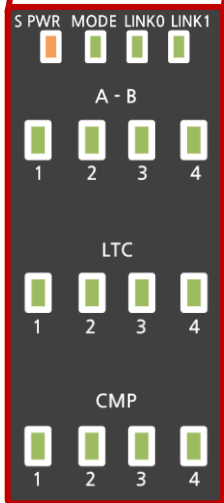
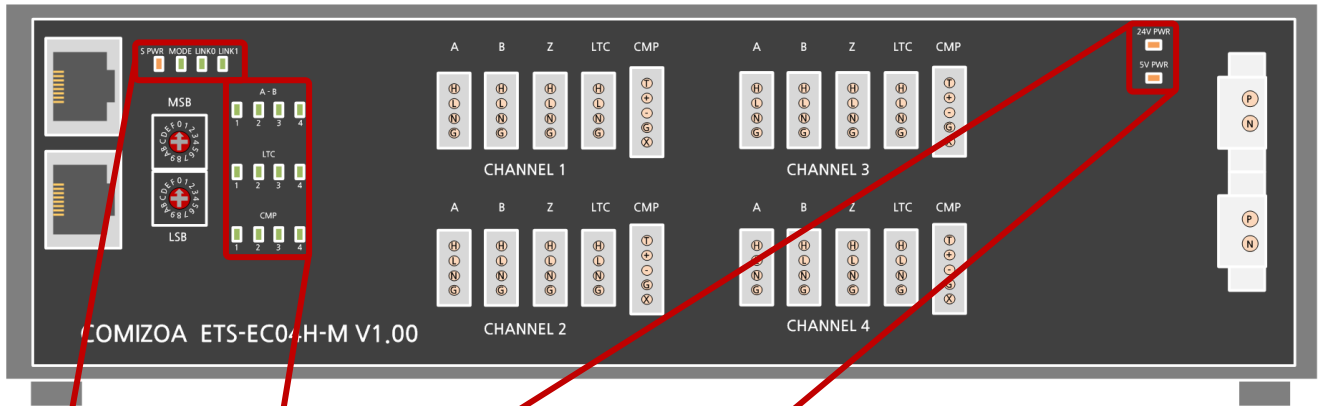
A / B / Z / LTC 1 ~ 4 (5V PNP)		
(H)	H	Not Connect
(L)	L	Input Signal
(N)	N	Ground
(G)	G	Ground

CMP 1 ~ 4 (LVDS Output)		
(T)	T	Not Connect
(+)	+	CMP OUT LVDS (+)
(-)	-	CMP OUT LVDS (-)
(G)	G	Ground (Optional)
(X)	X	N.C

A / B / Z / LTC 1 ~ 4 (24V NPN)		
(H)	H	DC +24V IN
(L)	L	Not Connect
(N)	N	Input Signal
(G)	G	Ground

A / B / Z / LTC 1 ~ 4 (24V PNP)		
(H)	H	Input Signal
(L)	L	Not Connect
(N)	N	Ground
(G)	G	Ground

Status LED



24V / 5V PWR	I/O POWER LED	ON	I/O POWER(24V / 5V DC) ON
		OFF	I/O POWER(24V / 5V DC) OFF
S PWR	SYSTEM POWER LED	ON	SYSTEM POWER ON
		OFF	SYSTEM POWER OFF
MODE	EtherCAT AL STATE LED	OFF	INIT
		Blinking(slow)	PRE-OP
		Single Flash	SAFE-OP
		ON	OP
		Flickering(fast)	BOOTSTRAP
LINK 0(1)	LINK 0(1) STATE LED	Blinking(slow)	MII Port 0(1) OPEN
		OFF	MII Port 0(1) Closed
A - B 1 ~ 4	A / B STATE LED	Blinking	Encoder Counting
		ON or OFF	Encoder Counting is stopped
LTC / CMP 1 ~ 4	LOGIC STATE LED	ON	ACTIVE LOW STATE
		OFF	ACTIVE HIGH STATE / Not Connected

Hardware Reference Manual Update List

No.	Version	Date	Changes in
1	1.00	2017.04.03	First Edition
2	1.01	2017.10.24	RJ-45 Connector Update

ETS Reference Manual

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