EC30 MDR CONTROL CARD WITH ZPA FUNCTIONALITY

Key Features

- 24V High Current 2-Zone MDR Control Card. Delivers up to 5A continuous current to each MDR roller.
- High Performance and reliable EtherCAT Connectivity. 1KHz or faster scan time/polling rate.
- Built-in power rails transients, overcurrent and short circuit protections.
- **Built-in ZPA logic. Install without any programming or PLC/Gateway for transport conveyor.**
- Compact Form-Factor that fits inside conveyor channel.
- Direction and Speed Control for MDR Rollers.
- Diagnostic data, e.g. individual motor current, peak current, input voltage.
- Free programming software for conveyor automation, e.g. transport, merge, cross-transfer etc.
- Dual power inputs. Motor power is separate from CPU/Network/Photoeye power. Allows unit to remain powered during ESTOP.

Overview

EC30 is our flagship MDR control Card based on EtherCAT Technology, equipped with two high current MDR motor outputs, as well as two inputs for photoeyes.

Compatible rollers include:

- Interroll EC310
- Interroll EC5000 24V AI (20W / 35W / 50W)
- Rulmeca BL3
- Itoh Denki PM500XK
- Itoh Denki PM500XC
- And more

The EC30 allows quick installation of the control system using **M8 plugs** for motors and photoeyes, and Snap-On mounting hardware. The device uses **vampire connectors** for easy connection to the Power cables, which allows for significant reductions in installation costs as well as maintenance.

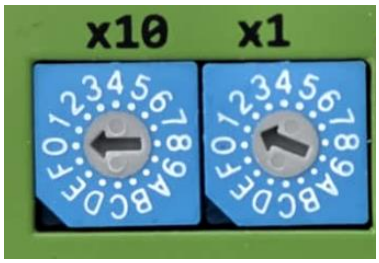
The EC30 unit puts out 0-10V analog voltage to set the motor speed as well as motor direction. These parameters are set in two modes:

- **ZPA mode**. The speed, direction, on/off state are set by a ZPA map pre-programmed in this unit.
- **EtherCAT Gateway/PLC** e.g. IntellECAT Gateway/PLC. The motor speed, direction and on/off state are controlled from network polling data.

The EC30 also provides **Diagnostic data for Motor Voltage, individual Motor current as well as peak current**. This information is helpful to identify failing motor and quickly avoid downtime. The information is relayed back to the Gateway/PLC over EtherCAT and then to the PC/PLC/HMI app for monitoring.

The ZPA mode is selected on the rotary dial. In ZPA mode, no EtherCAT master is required. The device operates independently, without requiring any programming. Different types of ZPA configurations are supported.

Station ID



The station ID is configured by the rotary switches.

EtherCAT Station ID range : 01 – 64

Station ID between 01 and 64, device operates in EtherCAT Mode.

ZPA Mode Station ID range : 65 – FF

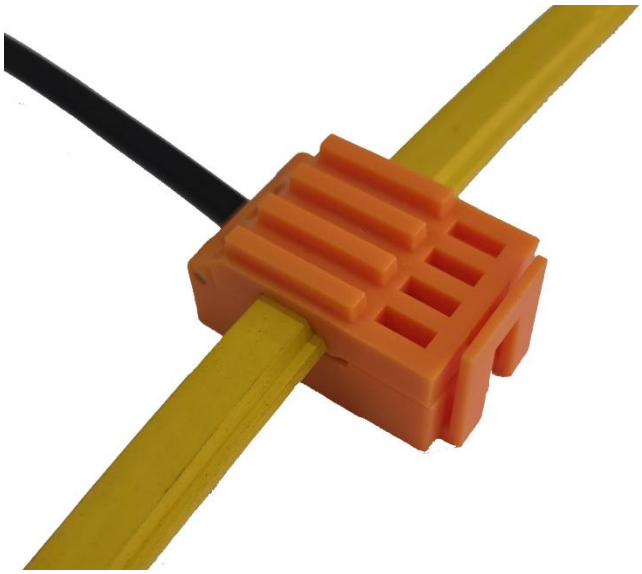
Values between 65 and FF, device operates in ZPA mode, no EtherCAT master is required. The selected ZPA logic control one or both zones.

Enclosure

Status LEDs

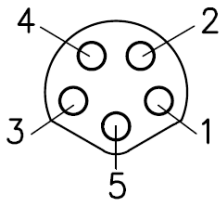
CPU	Status of CPU
FLT ½	Motor Fault States
MTR ½	On/Off State of connected motor
SNSR ½	On/Off State of connected sensor
ERROR	Device fault-state Indicator
DIR ½	Commanded Motor Direction for each motor

Motor & CPU Power Wiretap Connectors



Motor Output Plugs MOT1 and MOT2 – M8 5-Pin Female Connectors

M8 5-Pin (Female) Connectors used for Motor Outputs
Output Voltage: Power Input Voltage –1V (eg if Power Input is 24v, Power Output will be 23V)
Max Output Continuous Current: 3 Amps
Max Output Peak Current: 5 Amps Peak
Cable Length: 30”
Fuse: Built in PTC Resettable Fuse on each motor output for short circuit and over-current protection.

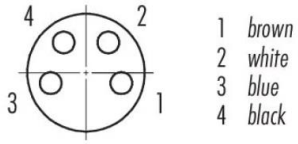


PIN	Description
Pin1	+24V
Pin2	Direction Output. PNP output to provide 24V up to 5mA when activate Direction signal. OFF: Open Circuit ON: 24V, Max 5mA
Pin3	GND
Pin4	Fault Input. Digital input (NPN Open-Drain): • Input tied to 0V (Grounded): NO Fault • Input Unconnected or Open Circuit: Error, Fault state
Pin5	Speed. 0-10V Analog output voltage, max 10mA.

Sensor Input Plugs IN1 and IN2 - M8 4-Pin Female Connectors

M8 4pin (FEMALE)

PhotoEye Voltage: 24V
Max Current: 500mA
Cable Length: 30”



Pin	Description
Pin1	+24V (Brown)
Pin2	Not Used (white)
Pin3	GND (Blue)
Pin4	Signal. PNP. Active when beam is interrupted. (black)

Network Connection (NET-IN, NET-OUT)

Use only shielded twisted-pair (STP) Ethernet cables when connecting the EC30 cards.

Network Cable specifications	
CAT5e	Cat5e Shielded STP Ethernet Cable 350Mhz or better specification.

ZPA Configuration Table

Code	Mode	Runtime (s)	Accel (s)	Direction	Speed (%)	Speed (FPM)
70	Dual	3	0.15	CW	40	50
71	Dual	3	0.15	CW	55	80
72	Dual	3	0.15	CW	70	130
73	Dual	3	0.15	CW	85	160
74	Dual	3	0.15	CW	100	220
75	Dual	3	0.15	CCW	40	50
76	Dual	3	0.15	CCW	55	80
77	Dual	3	0.15	CCW	70	130
78	Dual	3	0.15	CCW	85	160
79	Dual	3	0.15	CCW	100	220
7A	Dual	3	1	CW	40	50
7B	Dual	3	1	CW	55	80
7C	Dual	3	1	CW	70	130
7D	Dual	3	1	CW	85	160
7E	Dual	3	1	CW	100	220
7F	Dual	3	1	CCW	40	50
80	Dual	3	1	CCW	55	80
81	Dual	3	1	CCW	70	130
82	Dual	3	1	CCW	85	160
83	Dual	3	1	CCW	100	220

Code	Mode	Runtime (s)	Accel (s)	Direction	Speed (%)	Speed (FPM)
84	Single	3	0.15	CW	40	50
85	Single	3	0.15	CW	55	80
86	Single	3	0.15	CW	70	130
87	Single	3	0.15	CW	85	160
88	Single	3	0.15	CW	100	220
89	Single	3	0.15	CCW	40	50
8A	Single	3	0.15	CCW	55	80
8B	Single	3	0.15	CCW	70	130
8C	Single	3	0.15	CCW	85	160
8D	Single	3	0.15	CCW	100	220
8E	Single	3	1	CW	40	50
8F	Single	3	1	CW	55	80
90	Single	3	1	CW	70	130
91	Single	3	1	CW	85	160
92	Single	3	1	CW	100	220
93	Single	3	1	CCW	40	50
94	Single	3	1	CCW	55	80
95	Single	3	1	CCW	70	130
96	Single	3	1	CCW	85	160
97	Single	3	1	CCW	100	220

Code	Mode	Runtime (s)	Accel (s)	Direction	Speed (%)	Speed (FPM)
98	Transport-S	3	0.15	CW	40	50
99	Transport-S	3	0.15	CW	55	80
9A	Transport-S	3	0.15	CW	70	130
9B	Transport-S	3	0.15	CW	85	160
9C	Transport-S	3	0.15	CW	100	220
9D	Transport-S	3	0.15	CCW	40	50
9E	Transport-S	3	0.15	CCW	55	80
9F	Transport-S	3	0.15	CCW	70	130
A0	Transport-S	3	0.15	CCW	85	160
A1	Transport-S	3	0.15	CCW	100	220
A2	Transport-D	3	1	CW	40	50
A3	Transport-D	3	1	CW	55	80
A4	Transport-D	3	1	CW	70	130
A5	Transport-D	3	1	CW	85	160
A6	Transport-D	3	1	CW	100	220
A7	Transport-D	3	1	CCW	40	50
A8	Transport-D	3	1	CCW	55	80
A9	Transport-D	3	1	CCW	70	130
AA	Transport-D	3	1	CCW	85	160
AB	Transport-D	3	1	CCW	100	220

Code	Mode	Runtime (s)	Accel (s)	Direction	Speed (%)	Speed (FPM)
AC	Dual	9	0.15	CW	40	50
AD	Dual	9	0.15	CW	55	80
AE	Dual	9	0.15	CW	70	130
AF	Dual	9	0.15	CW	85	160
B0	Dual	9	0.15	CW	100	220
B1	Dual	9	0.15	CCW	40	50
B2	Dual	9	0.15	CCW	55	80
B3	Dual	9	0.15	CCW	70	130
B4	Dual	9	0.15	CCW	85	160
B5	Dual	9	0.15	CCW	100	220
B6	Dual	9	1	CW	40	50
B7	Dual	9	1	CW	55	80
B8	Dual	9	1	CW	70	130
B9	Dual	9	1	CW	85	160
BA	Dual	9	1	CW	100	220
BB	Dual	9	1	CCW	40	50
BC	Dual	9	1	CCW	55	80
BD	Dual	9	1	CCW	70	130
BE	Dual	9	1	CCW	85	160
BF	Dual	9	1	CCW	100	220

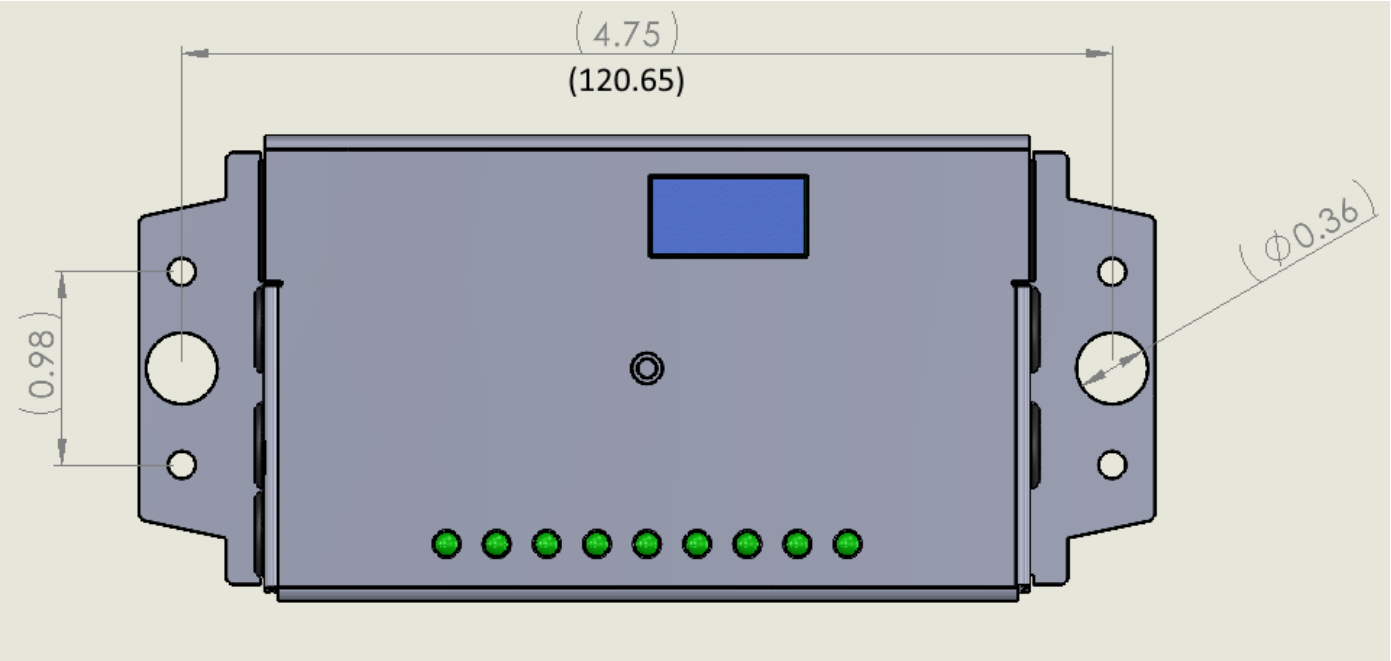
Code	Mode	Runtime (s)	Accel (s)	Direction	Speed (%)	Speed (FPM)
C0	Single	9	0.15	CW	40	50
C1	Single	9	0.15	CW	55	80
C2	Single	9	0.15	CW	70	130
C3	Single	9	0.15	CW	85	160
C4	Single	9	0.15	CW	100	220
C5	Single	9	0.15	CCW	40	50
C6	Single	9	0.15	CCW	55	80
C7	Single	9	0.15	CCW	70	130
C8	Single	9	0.15	CCW	85	160
C9	Single	9	0.15	CCW	100	220
CA	Single	9	1	CW	40	50
CB	Single	9	1	CW	55	80
CC	Single	9	1	CW	70	130
CD	Single	9	1	CW	85	160
CE	Single	9	1	CW	100	220
CF	Single	9	1	CCW	40	50
D0	Single	9	1	CCW	55	80
D1	Single	9	1	CCW	70	130
D2	Single	9	1	CCW	85	160
D3	Single	9	1	CCW	100	220

Code	Mode	Runtime (s)	Accel (s)	Direction	Speed (%)	Speed (FPM)
D4	Transport-S	9	0.15	CW	40	50
D5	Transport-S	9	0.15	CW	55	80
D6	Transport-S	9	0.15	CW	70	130
D7	Transport-S	9	0.15	CW	85	160
D8	Transport-S	9	0.15	CW	100	220
D9	Transport-S	9	0.15	CCW	40	50
DA	Transport-S	9	0.15	CCW	55	80
DB	Transport-S	9	0.15	CCW	70	130
DC	Transport-S	9	0.15	CCW	85	160
DD	Transport-S	9	0.15	CCW	100	220
DE	Transport-D	9	1	CW	40	50
DF	Transport-D	9	1	CW	55	80
E0	Transport-D	9	1	CW	70	130
E1	Transport-D	9	1	CW	85	160
E2	Transport-D	9	1	CW	100	220
E3	Transport-D	9	1	CCW	40	50
E4	Transport-D	9	1	CCW	55	80
E5	Transport-D	9	1	CCW	70	130
E6	Transport-D	9	1	CCW	85	160
E7	Transport-D	9	1	CCW	100	220

Code	Mode	Runtime (s)	Accel (s)	Direction	Speed (%)	Speed (FPM)
E8	External	0	0.15	CW	40	50
E9	External	0	0.15	CW	55	80
EA	External	0	0.15	CW	70	130
EB	External	0	0.15	CW	85	160
EC	External	0	0.15	CW	100	220
ED	External	0	0.15	CCW	40	50
EE	External	0	0.15	CCW	55	80
EF	External	0	0.15	CCW	70	130
F0	External	0	0.15	CCW	85	160
F1	External	0	0.15	CCW	100	220
F2	External	0	1	CW	40	50
F3	External	0	1	CW	55	80
F4	External	0	1	CW	70	130
F5	External	0	1	CW	85	160
F6	External	0	1	CW	100	220
F7	External	0	1	CCW	40	50
F8	External	0	1	CCW	55	80
F9	External	0	1	CCW	70	130
FA	External	0	1	CCW	85	160
FB	External	0	1	CCW	100	220

Technical Data

Electrical specifications	
Motor Power	24 VDC (±4 Volts)
	Max Current: 6Amps.
CPU Power	24 VDC (±4 Volts)
	Max Current: 100 mA
Inputs	
Number/Type	2 Inputs for Sensors (IN1, IN2) Above 16V triggers the input.
Outputs	
Number/Type	2 outputs for DC roller motors (MOT1, MOT2)
Current	3A continuous current to each MDR rollers.
Overload Protection	Resettable Fuse, triggers > 3 Amps for 3 to 5 seconds for each motor. Auto recovers on power cycle and cool off time.
Roller Speed Signal	0 … 10 V
Roller Direction Signal	OFF: Open Circuit. ON: 24V, Max 2mA
Motor Fault	Digital input (NPN Open-Drain): • Input tied to 0V (Grounded): NO Fault • Input Unconnected or Open Circuit: Error, Fault state
Ambient Conditions	
Ambient Temperature	-25 ... 65 °C
Storage Temperature	-25 ... 85 °C
Mechanical Specifications	
Degree of Protection	IP60
Connection	EtherCAT: RJ45 Both In and Out Power: Insulation piercing technology Inputs/outputs: M8 round plug connector in accordance with EN 61076-2-104 Inputs: LF004-GS1-A (4-pin, bushing contacts, screw lock, A-coded) Matching connector: LM004-Gx1-A or similar Outputs: NF005-SS1-B (5-pin, bushing contacts, snap lock, B-coded). Matching connector: NM005-Sx1-B or similar
Mass	400 grams (~0.9 lb)
Mounting	2 clips with Ø 9 mm drill hole
Cable Length	30” for Photo Eyes and Motors. 7” for Power.

Dimension Data

All Dimensions are in inches(gray) and millimeters(black).