

EtherCAT System Structure

Motion Controllers

PC-based controller



MH2 Series

Refer to p.11 for details.

Servo Systems

AC Servo Drive

ASDA-A3-E



ASDA-A2-E



ASDA-B3-E



** Please refer to the catalogues of Delta's servo drives and motors ASDA Series for detailed specifications

Gateway Type Remote Modules

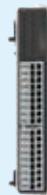
Gateway Type E-Bus Remote Power Coupler



R1-EC5500D0

Refer to p.15 for details.

Pulse Remote Module



1-Channel Pulse Remote Module

R1-EC5621D0

Refer to p.16 for details.

Digital Remote Modules

16 Digital Input Remote Module
R1-EC6002D0
R1-EC6022D0



16 Digital Input Remote Module
R1-EC7062D0
R1-EC70A2D0
R1-EC70E2D0
R1-EC70F2D0

Remote Module R2-EC0902D0



Refer to p.17~19 for details.

Analog Remote Modules

4-Channel Analog Input Remote Module
R1-EC8124D0

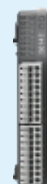


4-Channel Analog Output Remote Module
R1-EC9144D0

Refer to p.20~21 for details.

Functional Remote Modules

For Manual Pulse Generator (MPG)
R1-EC5614D0

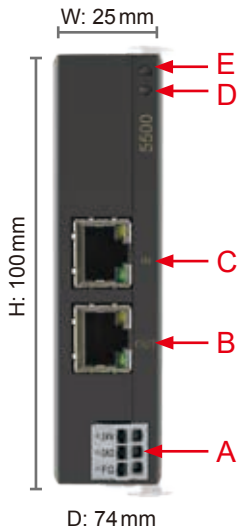


Refer to p.22 for details.


EtherCAT Remote Modules

Gateway Type E-bus Remote Power Coupler

R1-EC5500D0

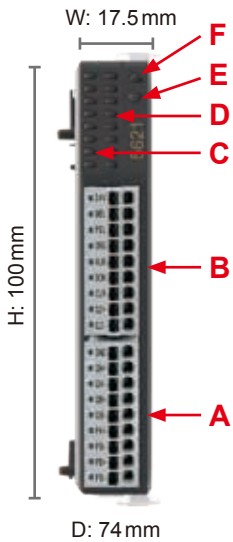


NO.	Description
A.	DC Power Input
B.	EtherCAT Output
C.	EtherCAT Input
D.	Status Indicator
E.	Power Indicator

Technical Data	R1-EC5500D0
Task Within EtherCAT System	Connect EtherCAT Slave module with 100baseTX EtherCAT
Data Transfer Medium	Ethernet/EtherCAT cable (min. CAT 5), shielded
Distance Between Stations	100 M (100BASE-TX) between two slaves
Protocol	EtherCAT
Data Transfer Rates	100 Mbaud
Bus Interface	RJ 45 x 2
Input Voltage	24 V _{DC}
Input Current	50 mA + (E-bus total E-bus current)/4
Current Supply E-Bus	2A
Electrical Isolation	500Vrms (Power contact/Supply voltage/Ethernet)
Vibration/Shock Resistance	EN 60068-2-6/EN 60068-2-27/29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV Communication I/O: 1KV RS (IEC 61131-2, IEC 61000-4-3): 80MHz ~ 1 GHz, 10V/m
Operating Environment	Operating temperature: 0 °C ~ 50 °C Storage temperature: -20 °C ~ 70 °C
Weight	55g
Protection Class	IP20
Safety Certification	CE 
Mounting Type	DIN-rail


1-Channel Pulse Output Remote Module

R1-EC5621D0



NO.	Description	No.	Description
A.	I/O Signal Port	D.	I/O Signal Indicator
B.	I/O Signal Port	E.	Status Indicator
C.	I/O Signal Indicator	F.	Power Indicator

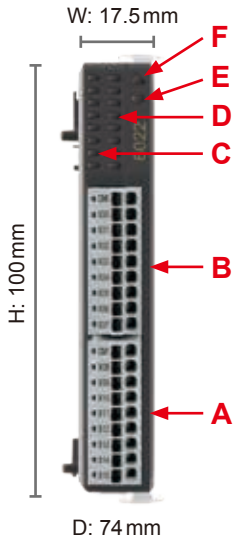
Input	Description	Input	Description
24V	24V Power	GND	External Ground
MEL	End Limit (-)	QA+	Encoder A Phase (+)
PEL	End Limit (+)	QA-	Encoder A Phase (-)
ORG	Home Signal	QB+	Encoder B Phase (+)
ALM	Servo Alarm	QB-	Encoder B Phase (-)
SON	Servo On	PA+	Pulse Signal (+)
CLR	Reset Servo Alarm	PA-	Pulse Signal (-)
QZ+	Encoder Z Phase (+)	PB+	Dir. Signal (+)
QZ-	Encoder Z Phase (-)	PB-	Dir. Signal (-)

Technical Data	R1-EC5621D0
Number of Outputs	1 channel (PA+, PA-, PB+, PB-)
Number of Inputs	1 channel (QA+, QA-, QB+, QB-, QZ+, QZ-)
Power Supply	Supplied by E-bus
Signal Voltage	RS422 standards
Max. Output Current	RS422 standards
Base Frequency	1Hz ~ 4MHz
Numbers of 24V Input	4 (MEL, PEL, ORG, ALM)
Numbers of 24V Output	2 (CLR, SON)
Trigger Voltage (On > Off)	< 8V _{DC}
Trigger Voltage (Off > On)	> 16.5V _{DC}
Maximum Current of Each Output Port	30mA
Current Consumption E-Bus	150mA
Electrical Isolation	500Vrms (E-bus/field potential)
Bit Width in the Process Image	32 byte in/out (1 x 16 byte data, 1 x 16 byte control/status)
Vibration/Shock Resistance	EN 60068-2-6/EN 60068-2-27/29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV Communication I/O: 1KV RS (IEC 61131-2, IEC 61000-4-3: 8MHz ~ 1GHz, 10V/m)
Operating Environment	Operating temperature: 0°C ~ 50°C Storage temperature: -20°C ~ 70°C
Weight	Approx. 60g
Protection Class	IP20
Safety Certification	CE 
Mounting Type	DIN-rail

EtherCAT Remote Modules



16-Channel Input Remote Module

R1-EC6002D0 / R1-EC6022D0



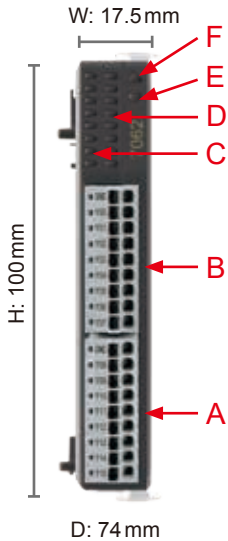
NO	Description	NO.	Description
A.	Port 1 Terminals	D.	Port 1 I/O Signal X08~X15(From the top)
B.	Port 0 Terminals	E.	Status Indicator
C.	Port 0 I/O Signal X00~X07 (From the top)	F.	Power Indicator

Input	Description	Input	Description
CM0	Port 0 COM	CM1	Port1 COM
X00	Input 0	X08	Input 8
X01	Input 1	X09	Input 9
X02	Input 2	X10	Input 10
X03	Input 3	X11	Input 11
X04	Input 4	X12	Input 12
X05	Input 5	X13	Input 13
X06	Input 6	X14	Input 14
X07	Input 7	X15	Input 15

Technical Data	R1-EC6002D0	R1-EC6022D0
Connection Technology	single-ended	
Number of Inputs	16	
Nominal Voltage	24V _{DC} ± 10%	
Signal Type	SINK/SOURCE	
Trigger Voltage (On > Off)	< 8V _{DC}	
Trigger Voltage (Off > On)	> 16.5V _{DC}	
Input Filter	100 μs	2ms
Input Current	3mA at each port	
Current Consumption E-Bus	110mA	
Electrical Isolation	500 V _{rms} (E-bus/field potential)	
Bit Width in the Process Image	16 inputs	
Vibration/Shock Resistance	EN 60068-2-6/EN 60068-2-27/29	
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV Communication I/O: 1KV RS (IEC 61131-2, IEC 61000-4-3): 80MHz ~ 1GHz, 10V/m	
Operating Environment	Operating temperature: 0°C ~ 50°C Storage temperature: -20°C ~ 70°C	
Weight	55g	
Protection Rating	IP20	
Safety Certification	 	
Mounting Type	DIN-rail	

16-Channel Output Remote Module

R1-EC7062D0/R1-EC70E2D0/R1-EC70A2D0/R1-EC70F2D0





NO.	Description	NO.	Description
A.	Port 1 Terminals	D.	Port 1 I/O Signal Y08~Y15(From the top)
B.	Port 0 Terminals	E.	Status Indicator
C.	Port 0 I/O Signal Y00~Y07(From the top)	F.	Power Indicator

Output	Description	Output	Description
GND*	Port 0 GND	GND	Port 1 GND
24V**	Port 0 24V Input		
Y00	Input 0	Y08	Input 8
Y01	Input 1	Y09	Input 9
Y02	Input 2	Y10	Input 10
Y03	Input 3	Y11	Input 11
Y04	Input 4	Y12	Input 12
Y05	Input 5	Y13	Input 13
Y06	Input 6	Y14	Input 14
Y07	Input 7	Y15	Input 15

* R1-EC7062D0/R1-EC70E2D0

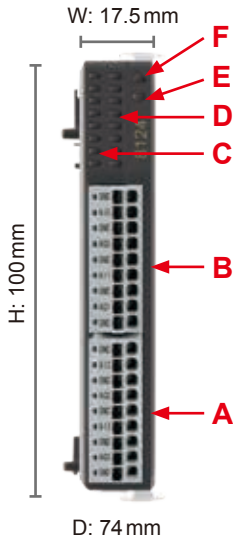
** R1-EC70A2D0/R1-EC70F2D0

Technical Data	R1-EC7062D0	R1-EC70E2D0	R1-EC70A2D0	R1-EC70F2D0
Connection Technology	MOSFET			
Signal Type	SINK		SOURCE	
Nominal Voltage	24V _{DC}			
User-defined Output Disconnection	X	✓	X	✓
Input Current	0.5A (Max.)	0.25A (Max.)		
Current Consumption E-Bus	120mA	200mA		
Response Time/Frequency	1 kHz			
Trigger Time (OFF > ON)	140 μs		160 μs	
Trigger Time (ON > OFF)	150 μs		110 μs	
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV Communication I/O: 1KV RS (IEC 61131-2, IEC 61000-4-3): 80MHz ~ 1GHz, 10V/m			
Operating Environment	Operating temperature: 0°C ~ 50°C Storage temperature : -20°C ~ 70°C			
Weight	Approx. 60g			
Protection Rating	IP20			
Safety Certification	 			
Mounting Type	DIN-rail			

EtherCAT Remote Modules

4-Channel Analog Input Remote Module

R1-EC8124D0



NO.	Description	NO.	Description
A.	CH3/CH4 Signal Port	D.	CH3/CH4 Signal Indicator
B.	CH1/CH2 Signal Port	E.	Status Indicator
C.	CH1/CH2 Signal Indicator	F.	Power Indicator

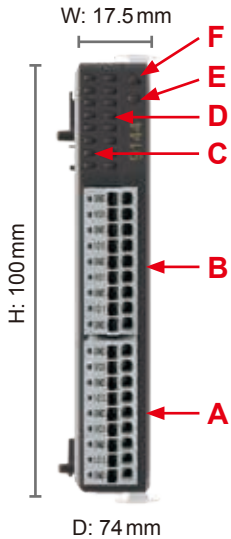
Input	Description	Input	Description
GND	Analog Ground	GND	Analog Ground
AI0	CH1 Voltage/Current Input	AI2	CH3 Voltage/Current Input
GND	Analog Ground	GND	Analog Ground
AG0	CH1 Current COM*	AG2	CH3 Current COM*
GND	Analog Ground	GND	Analog Ground
AI1	CH2 Voltage/Current Input	AI3	CH4 Voltage/Current Input
GND	Analog Ground	GND	Analog Ground
AG1	CH2 Current COM*	AG3	CH4 Current COM*
GND	Analog Ground	GND	Analog Ground

* In current mode: please connect current COM to GND ; In voltage mode: please disconnect this COM

Technical Data	R1-EC8124D0
Number of Inputs	4 (single-ended)
Power Supply	Supplied by E-bus
Signal Voltage	$\pm 10V / \pm 5V$
Internal Resistance	$> 1M\Omega$
Input Filter Limit Frequency	1 kHz ~ 10 kHz
Resolution	16 bit
Over Sampling Rate	0 ~ 64
Conversion Time	$2\mu s \sim 191\mu s$ (depends on Over Sampling Rate)
Measuring Error	$< \pm 0.2\%$ (relative to full scale value)
Electrical Isolation	1,000Vrms (E-bus/signal voltage)
Current Consumption E-Bus	300 mA
Bit Width in the Process Image	Input: 4 x 16 byte data, 4 x 16 byte control/status
Vibration/Shock Resistance	60068-2-6/EN 60068-2-27/29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV Communication I/O: 1KV RS (IEC 61131-2, IEC 61000-4-3): 8MHz ~ 1GHz, 10V/m
Operating Environment	Operating temperature: $0^{\circ}C \sim 50^{\circ}C$ Storage temperature: $-20^{\circ}C \sim 70^{\circ}C$
Weight	Approx. 60g
Protection Rating	IP20
Safety Certification	CE
Mounting Type	DIN-rail


4-Channel Analog Output Remote Module

R1-EC9144D0



NO.	Description	NO.	Description
A.	CH3/CH4 Signal Port	D.	CH3/CH4 Signal Indicator
B.	CH1/CH2 Signal Port	E.	Status Indicator
C.	CH1/CH2 Signal Indicator	F.	Power Indicator

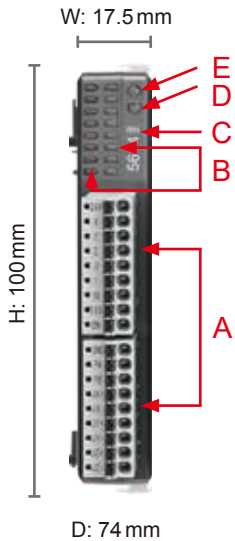
Output	Description	Output	Description
GND	Analog Ground	GND	Analog Ground
VO0	CH1 Voltage Output	VO2	CH3 Voltage Output
GND	Analog Ground	GND	Analog Ground
IO0	CH1 Current Output	IO2	CH3 Current Output
GND	Analog Ground	GND	Analog Ground
VO1	CH2 Voltage Output	VO3	CH4 Voltage Output
GND	Analog Ground	GND	Analog Ground
IO1	CH2 Current Output	IO3	CH4 Current Output
GND	Analog Ground	GND	Analog Ground

Technical Data	R1-EC9144D0
Number of Inputs	4 (single-ended)
Power Supply	Supplied by E-bus
Signal Voltage Output	$\pm 10V / \pm 5V / 0 \sim 5V / 0 \sim 10V$
Current Output	$0 \sim 20\text{mA} / 4 \sim 24\text{mA} / 0 \sim 24\text{mA}$
Load	$> 1\text{k}\Omega$ (short-circuit-proof)
Resolution	16 bit
Conversion Time	$80\ \mu\text{s}$
Measuring Error	$< \pm 0.2\%$ (relative to full scale value) voltage output $< \pm 0.3\%$ (relative to full scale value) current output
Electrical Isolation	$1,000\text{Vrms}$ (E-bus/signal voltage)
Current Consumption E-Bus	550 mA
Bit Width in the Process Image	Output: 4 x 16 byte, (4 x 16-bit analog output)
Vibration/Shock Resistance	EN 60068-2-6/EN 60068-2-27/29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, EC 61000-4-3): 8 MHz \sim 1 GHz, 10V/m
Operating Environment	Operating temperature: $0^\circ\text{C} \sim 50^\circ\text{C}$ Storage temperature: $-20^\circ\text{C} \sim 70^\circ\text{C}$
Weight	Approx. 60 g
Protection Rating	IP20
Safety Certification	CE 
Mounting Type	DIN-rail

EtherCAT Remote Modules

Manual Pulse Generator (MPG) Module


R1-EC5614D0



NO.	Description	NO.	Description
A.	IO Signal Port	D.	Status Indicator
B.	I/O Signal Indicator	E.	Power Indicator
C.	Product No.		

Input	Description	Input	Description
GND	External Ground	24V	External Power Input
PA	MPG Pulse Phase A Input	X	X-axis Pulse Chosen Signal
PB	MPG Pulse Phase B Input	Y	Y-axis Pulse Chosen Signal
JX+	JOG X-axis Signal (+)	Z	Z-axis Pulse Chosen Signal
JX-	JOG X-axis Signal (-)	U	U-axis Pulse Chosen Signal
JY+	JOG Y-axis Signal (+)	1	Pulse magnification (x 1)
JY-	JOG Y-axis Signal (-)	10	Pulse magnification (x 10)
JZ+	JOG Z-axis Signal (+) / *W-axis	100	Pulse magnification (x 100)
JZ-	JOG Z-axis Signal (-) / *V-axis	EN	Motion / Setting Execution

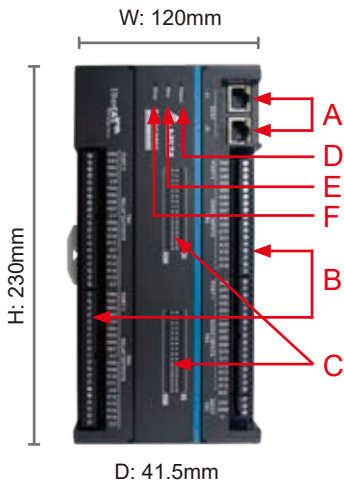
*Supports 6-axis MPG via software: JZ+ needs to connect to W-axis signal; JZ- needs to connect to V-axis signal

Technical Data	R1-EC5614D0
Control Axes	4/6 axes
Power Supply	Supplied by E-bus
Pulse Magnification	x1/x10/x100
JOG Input	3/2 sets
Sampling Rate	40kHz
FIFO Length	30 sets
Communication Time	125 μs - 3,276,800 μs
Trigger Time (ON > OFF)	< 8 V _{DC}
Trigger Time (OFF > ON)	> 16.5 V _{DC}
Current Consumption E-Bus	180 mA
Electrical Isolation	500 Vrms (E-bus/Signal Power)
Vibration / Shock Resistance	Compliant with EN 60068-2-6/EN 60068-2-27/29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2) EFT (IEC 61131-2, IEC 61000-4-4) RS (IEC 61131-2, EC 61000-4-3)
Operating Environment	Operating temperature: 0 °C ~ 50 °C Storage temperature: -20 °C ~ 70 °C
Weight	Approx. 55g
Protection Class	IP20
Safety Certification	CE 
Mounting Type	DIN-rail

EtherCAT Remote Modules

Digital Input / Output Module

R2-EC0902D0



NO.	Description	NO.	Description
A.	EtherCAT DI/DO Terminals	D.	Power Indicator
B.	GPIO DI/DO Terminals	E.	Communication Indicator
C.	GPIO Status Indicator	F.	Alarm Indicator

DI/DO	Description	DI/DO	Description
X00	Port 0 Input 1	24V	External Power Supply Input
...	...		
X15	Port 0 Input 16		
N.C	Reserved	GND	External Power Ground
X00	Port 1 Input 1	FG	Ground
...	...		
X15	Port 1 Input 16		
S/S*	NPN / PNP Setting		
Y00	Port 2 Input 1		
...	...		
Y15	Port 2 Input 16		
Y00	Port 3 Input 1		
...	...		
Y15	Port 3 Input 16		

*1: S/S: NPN/PNP Setting, NPN = V_{cc}, PNP = GND

Technical Data	R2-EC0902D0	
Nominal Voltage	24 V _{DC} -15% ~+20%	
Input Current	< 1 A	
Digital I/O	Digital Input	Digital Output
Isolation	Optical Coupler	Relay
Signal Type	Sink/Source	A (N.O) Dry Contact
I/O Terminals	32-CH	32-CH
Max. Operating Voltage/Current	30 V _{DC} @ 8mA/Per CH	30 V _{DC} @ 2A/Per CH 250 V _{AC} @ 2A/Per CH
Rated Input Voltage/Current	24 V _{DC} @ 5 mA	-
Frequency	1 kHz	1 Hz
Response Time (Operation) (OFF > ON)	300 μs	10 ms
Response Time (Release) (ON > OFF)	300 μs	5 ms
Relay ON/OFF Times	-	Inductive: 20,000 Times @ 30 V _{DC} 2 A Resistive: 100,000 Times @ 30 V _{DC} , 250 V _{AC} 2 A
Dimensions	230x120x41.5mm (W x H x D)	
Operating Environment	Operating Temperature: 0°C ~ 50°C (32° F ~ 122° F) ; Storage Temperature: -20°C ~ 70°C (-4° F ~ 158° F)	
Mounting Type	DIN-rail	
Vibration / Shock Resistance	Compliant with EN 60068-2-6 / EN 60068-2-27/29	
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2) EFT (IEC 61131-2, IEC 61000-4-4) RS (IEC 61131-2, IEC 61000-4-3)	
Protection Rating	IP20	
Safety Certification	