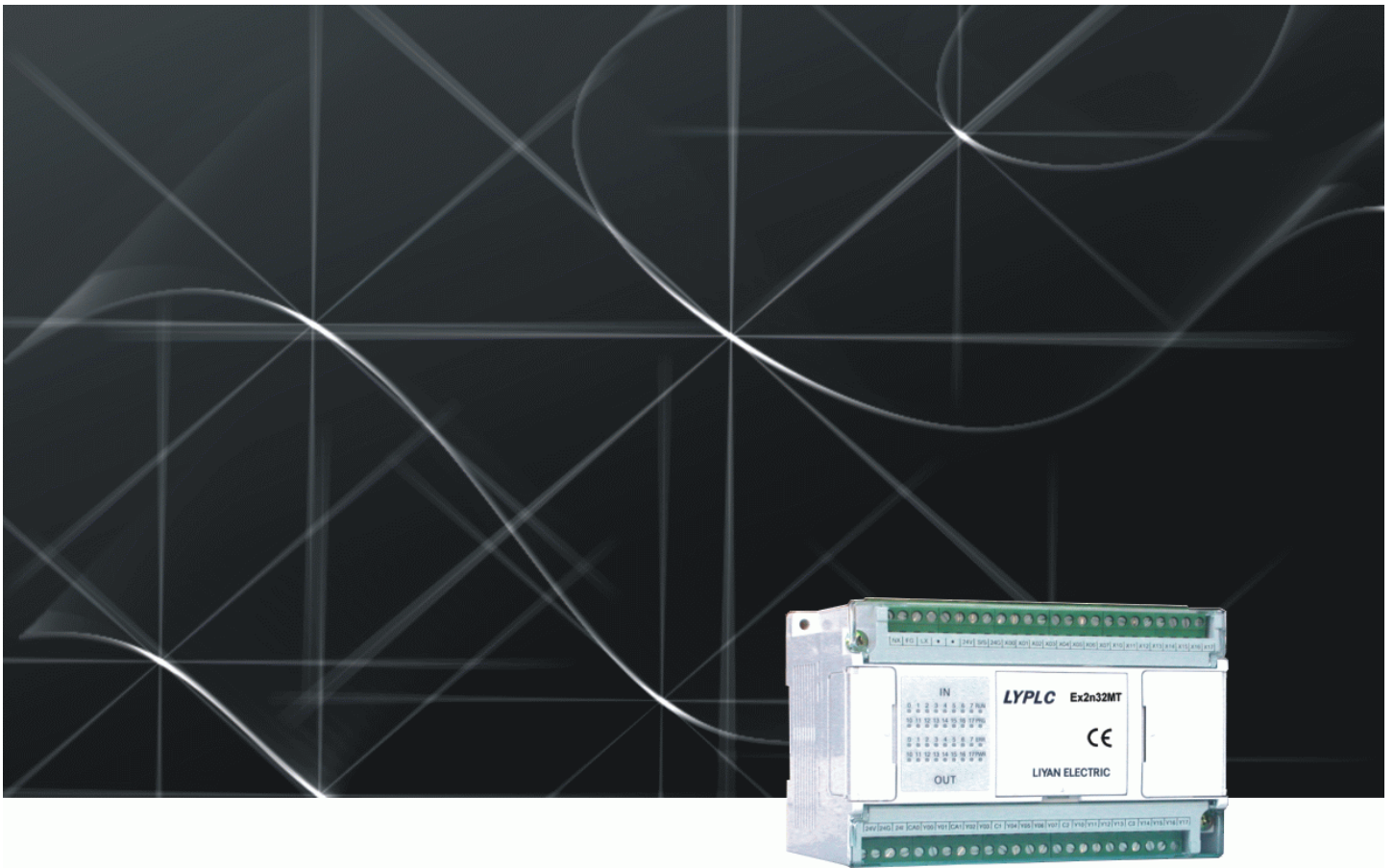


Liyan

PROGRAMMABLE LOGIC CONTROLLER

Ex1s, Ex1n Series
Ex2n Series

2 axes inside



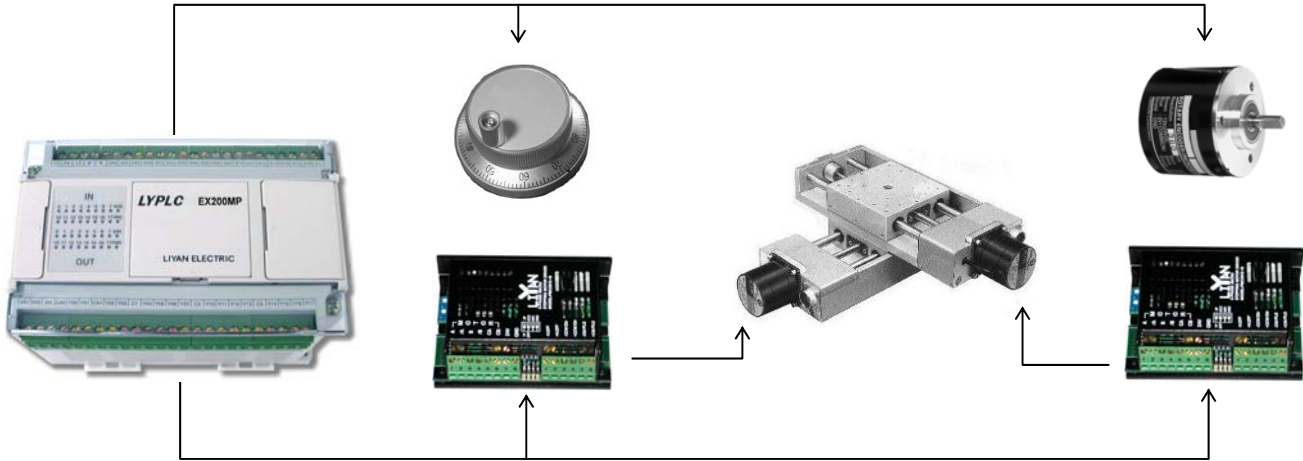
Manual Pulse Generator (MPG) Function

Floating point operation, Square root, Trigonometric function

<http://www.liyanplc.com>

Linear / Circular Interpolation

◆ System Configuration (EX200MP)



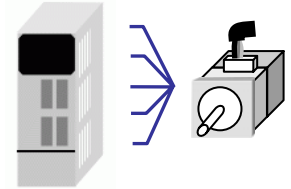
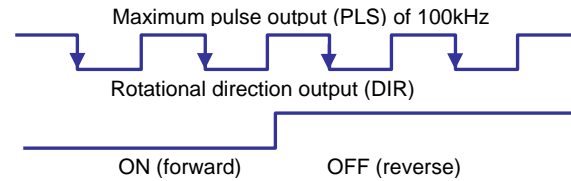
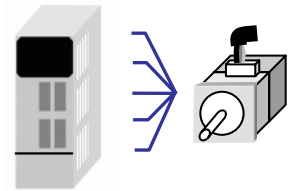
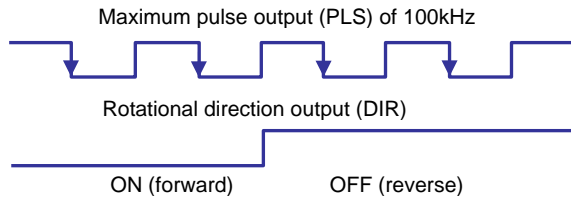
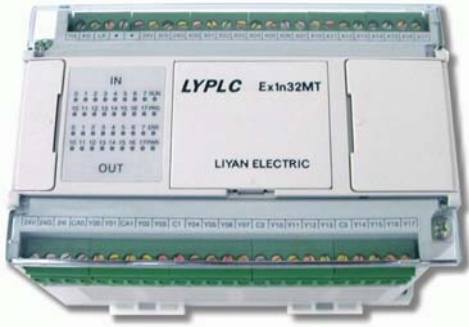
◆ List of Interpolation Instructions

Operation pattern and Program	Description of action	
<p>Linear Interpolation (G01)</p> <pre> X10 ↑↑ [SET M8142] set Linear Interpolation enable flag [RST M8143] clear Circular Interpolation enable flag [RST M8134] increment position mode flag [RST M8135] increment position mode flag [DMOV K5000 D100] Vector Speed [DMOV K2000 D102] X Axis increment address [DMOV K400 D104] Y Axis increment address M8142 [S1.] [S2.] [S3.] [D.] ↑↑ [DPLSR D100 D102 D104 Y00] </pre>	<p>Start position (D8152, D8154)</p>	<p>Vector speed</p> <p>Max. Speed (D8157, D8156)</p> <p>Time</p>
<p>Circular Interpolation (G02, G03)</p> <pre> X10 ↑↑ [SET M8143] Circular Interpolation Mode [RST M8142] Clockwise direction [SET M8134] Absolute position mode flag [SET M8135] Absolute position mode flag [DMOV K5000 D100] Vector Speed [DMOV K0 D102] X Axis increment address [DMOV K0 D104] Y Axis increment address [DMOV K500 D106] X Axis circle center coordinate [DMOV K500 D108] Y Axis circle center coordinate M8143 [S1.] [S2.] [S3.] [D.] ↑↑ [DPLSR D100 D102 D104 Y00] [D.] Assign to Y00, circle center input method </pre>	<p>Target (x, y) ((S2.), (S3.))</p> <p>Center (i, j) ((D106, D108) +)</p> <p>Start point (D8152, D8154)</p> <p>CW M8142=0</p> <p>CCW M8142=1</p>	<ul style="list-style-type: none"> ◆ Input Circle Center (i,j) and Target address (x,y) mode ◆ M8142 = 0 Clockwise Direction ◆ M8143 = 0 Counterclockwise Direction ◆ Can be specified by using either an absolute or increment address ◆ Specify travel to the target (x,y) at Vector Speed D100
<p>Circular Interpolation (G02, G03)</p> <pre> X10 ↑↑ [SET M8143] : Circular Interpolation mode [RST M8142] : Clockwise direction [DMOV K5000 D100] : Vector Speed [DMOV K300 D102] : X Axis increment address [DMOV K400 D104] : Y Axis increment address [DMOV K500 D106] : Assign radius length [DMOV K0 D108] : Don't Care M8143 [S1.] [S2.] [S3.] [D.] ↑↑ [DPLSR D100 D102 D104 Y01] [D.] assign to Y01, radius input method </pre>	<p>Target (x, y)</p> <p>Start point</p> <p>CW</p> <p>CCW</p> <p>Radius r</p>	<ul style="list-style-type: none"> ◆ Input Radius (r) and Target address (x,y) mode ◆ M8142 = 0 Clockwise direction ◆ When r is a negative value, the route is the large circle (I) ◆ When r is a positive value, the route is the small circle (II) ◆ Can be specified by using either an absolute or increment address
<p>Circular Interpolation (G02, G03)</p> <pre> X10 ↑↑ [SET M8143] : Circular Interpolation mode [SET M8142] : Counter Clockwise direction [DMOV K5000 D100] : Vector Speed [DMOV K300 D102] : X Axis increment address [DMOV K400 D104] : Y Axis increment address [DMOV K-500 D106] : Assign radius length [DMOV K0 D108] : Don't Care M8143 [S1.] [S2.] [S3.] [D.] ↑↑ [DPLSR D100 D102 D104 Y01] [D.] assign to Y01, radius input method </pre>	<p>Target (x, y)</p> <p>Start (D8152, D8154)</p> <p>CCW</p> <p>Radius r</p>	<ul style="list-style-type: none"> ◆ Input Radius (r) and Target address (x,y) mode ◆ M8142 = 1 Counterclockwise direction ◆ When r is a negative value, the route is the large circle (I) ◆ When r is a positive value, the route is the small circle (II) ◆ Specify travel from Start Point (D8152, D8154) to the target (x,y) at Vector Speed

Position Control

◆ System Configuration

Ex1s, Ex1n and Ex2n Series
(Transistor output type)



◆ List of Positioning Instructions

Operation pattern	Description of action
<p>Zero Point Return (PLSR, ZRN)</p> <pre> [SET M112] ZRN Start [RST M8152] ZRN Finish flag [RST M8158] decide direction by M8156 [RST M8156] Forward direction [RST M8154] Forward Mode M112 [DZRN D116 D118 X06 Y00] M8029 M8152 [RST M8029] </pre>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Forward Mode</p> <p>Zero DOG Start</p> </div> <div style="text-align: center;"> <p>Reverse Mode</p> <p>DOG Start</p> </div> </div>
<p>Single positioning (PLSR, DRVI, DRVA)</p> <pre> [MOV K100 D8168] Y00 bias speed [MOV K100 D8164] Y00 Acc/Deceleration time [MOV K1000 D8165] Y00 deceleration time [RST M8150] Acc / Deceleration separate flag [DMOV K100000 D8156] Maximum Speed M100 [DDRVA D100 D102 Y00 Y02] M8029 [RST M8029] [SET M101] </pre>	<p>Start Target position</p> <ul style="list-style-type: none"> ◆ With relative position, the target position is treated as the current position ◆ With absolute position, the target position is treated as the original position.
<p>Variable speed (PLSV)</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>① [Initial Parameter Setting]</p> <pre> [SET M8132] Without slope flag [MOV K50000 D100] Speed setting [MOV K0 D102] Without target [MOV K0 D104] Don't care M100 [DPLSV D100 D102 D104 Y00] M8029 [RST M8029] </pre> </div> <div style="width: 45%;"> <p>③ [Initial Parameter Setting]</p> <pre> [RST M8132] With slope flag [DMOV K50000 D100] Speed setting [DMOV K0 D102] Without target [DMOV K1000 D104] Target II pulse M100 [DPLSV D100 D102 D104 Y00] M8029 [RST M8029] </pre> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>② [Initial Parameter Setting]</p> <pre> [RST M8132] With slope flag [MOV K50000 D100] Speed setting [MOV K0 D102] Without target [MOV K0 D104] Don't care M100 [DPLSV D100 D102 D104 Y00] M8029 [RST M8029] </pre> </div> <div style="width: 45%;"> <p>④ [Initial Parameter Setting]</p> <pre> [RST M8132] With slope flag [DMOV K20000 D102] Target I pulse [DMOV K1000 D104] Target II pulse M100 [DPLSV D100 D102 D104 Y00] M8029 [RST M8029] </pre> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>① Without slope mode</p> <p>M8132 = 1 [S+1] = 0 [S+2] = 0</p> </div> <div style="width: 45%;"> <p>③ Initial without target running, interrupt signal ON Speed-change Position-change</p> <p>M8132 = 0 [S+1] = 0 [S+2] ≠ 0</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>② With slope mode</p> <p>M8132 = 0 [S+1] = 0 [S+2] = 0</p> </div> <div style="width: 45%;"> <p>④ Initial with target running, interrupt signal ON Speed-change Position-change</p> <p>M8132 = 0 [S+1] ≠ 0 [S+2] ≠ 0</p> </div> </div> <p>③④, change target position when M8140 or M8141 ON</p>
<p>JOG operation (PLSR)</p> <pre> [Initial Parameter Setting] X14 X16 [M8146] : JOG + Forward direction Enable Flag X16 X14 [M8148] : JOG - Reverse direction Enable Flag M8146 M8198 [DPLSR D100 D102 K100 Y00] M8148 M8196 M8196 Y00: JOG + busy flag, M8198 Y00: JOG - busy flag </pre>	<ul style="list-style-type: none"> ◆ Pulse train output at any frequency ◆ Quick response ◆ Variable-speed permitted

Performance Specification

ITEM		Ex1s	Ex1n, Ex2n
Operating control method		Cyclic operation by stored program	
I/O control method		Batch processing method (when END instruction is executed)	
Operation time		Basic instruction 0.5us, Applied instruction from 2us to several 100us.	
Programming language		Relay symbolic language + Step ladder	
Program capacity / memory		8000 steps (built in EEprom)	
Number of instruction		Basic instruction: 27; Step ladder instruction: 2; Applied instruction: 105(1s) 107(1n) 118(2n)	
Input Relay		1s : X00 ~ X17 1n : X000 ~ X177 (Sink/Source DC24V 7mA photo coupler isolation)	
Output Relay		1s : Y00 ~ Y17 1n : Y000 ~ Y177 (Relay : AC250V/1A or Transistor : DC30V/0.5A)	
Auxiliary Relay (M)	Latched	M000 ~ M499 (EEprom backup)	M000 ~ M499 (EEprom backup)
	General	M500 ~ M1535 (no backup)	M500 ~ M1535 (no backup)
	Special	M8000 ~ M8255 (no backup)	M8000 ~ M8255 (no backup)
State Relay (S)	Latched	S000 ~ S499 (EEprom backup)	S000 ~ S499 (EEprom backup)
	General	S500 ~ S999 (no backup)	S500 ~ S999 (no backup)
Timer (T)	100 msec	T000 ~ T199 (no backup)	T000 ~ T199 (no backup)
	10 msec	T200 ~ T245 (no backup)	T200 ~ T245 (no backup)
	1 ms integration	4 points, T246 ~ T249 (EEprom backup)	4 points, T246 ~ T249 (EEprom backup)
	100 ms integration	6 points, T250 ~ T255 (EEprom backup)	6 points, T250 ~ T255 (EEprom backup)
	Analog	2 points, (Define by user)	2 points, (Define by user)
Counter (C)	16bits Counter	C00 ~ C31 Latched (EEprom backup)	C00 ~ C31 Latched (EEprom backup)
		C32 ~ C199 General	C32 ~ C199 General
	32bits Counter	C200 ~ C215 General	C200 ~ C215 General
		C216 ~ C255 Latched (backup)	C216 ~ C255 Latched (backup)
High Speed Counter	6 points : X0 ~ X5 ; X0 or X1 for 1 phase 60KHz , X2 ~ X5 for 1phase 10KHz X0 and X1 for 2 phase 30KHz , X2 ~ X5 for 2phase 5KHz		
Data Register	Latched	D000 ~ D255 (EEprom backup)	
	General	D256 ~ D3999 (can used FNC(12) MOV stored at EEPROM)	
	Special	D8000 ~ D8255 (no backup)	
Index		V0 ~ V7, Z0 ~ Z7	
Nest Routine (N)		N0 ~ N7	
Subroutine Pointer (P)		P000 ~ P127 (CJ, CALL)	
Interrupt Pointer (I)		I00x, I10x, I20x, I30x, I40x, I50x (External interrupt), x=1 rising edge, x=0 falling edge	
		I6xx, I7xx, I8xx (Timer interrupt), xx=10~99ms	
		I010, I020, I030, I040, I050, I060 : High speed counter interrupt	
Communication Interface		RS-232C (COM1) & RS-232C/RS-422,RS-485 (COM2)	
Calendar (Option)		Week, Year, Month, Day, Hour, Minute, Second	
Constant(K)	Decimal	16 bits: -32,768 ~ +32,767	16 bits: -32,768 ~ +32,767
		32 bits: -2,147,483,648 ~ +2,147,483,647	32 bits: -2,147,483,648 ~ +2,147,483,647
Constant(H)	Hexadecimal	16 bits: 0000 ~ FFFF	16 bits: 0000 ~ FFFF
		32 bits: 00000000 ~ FFFFFFFF	32 bits: 00000000 ~ FFFFFFFF


◆ Basic Instruction

Mnemonic	Function	Devices	Mnemonic	Function	Devices
LD	LoaD	X . Y . M . S . T . C	MC	Master Control	Y . M .
LD I	LoaD Inverse	X . Y . M . S . T . C	MCR	Master Control Reset	N/A
OUT	OUT	Y . M . S . T . C	MPS	Point Store	N/A
AND	AND	X . Y . M . S . T . C	MRD	Read	N/A
AN I	AND Inverse	X . Y . M . S . T . C	MPP	PoP	N/A
OR	OR	X . Y . M . S . T . C	END	END	N/A
OR I	OR Inverse	X . Y . M . S . T . C	LDP	LoaD Pulse	X . Y . M . S . T . C
ANB	ANd Block	N/A	LDF	LoaD Falling pulse	X . Y . M . S . T . C
ORB	OR Block	N/A	ANP	ANd Pulse	X . Y . M . S . T . C
NOP	No Operation	N/A	ANF	ANd Falling pulse	X . Y . M . S . T . C
SET	SET	Y . M . S	ORP	OR Pulse	X . Y . M . S . T . C
RST	ReSeT	X . Y . M . S . T . C	ORF	OR Falling pulse	X . Y . M . S . T . C
PLS	PuLSe	Y . M .	INV	INVerse	N/A
PLF	PuLse Falling	Y . M .			



◆ STL Instruction

Mnemonic	Function	Devices	Mnemonic	Function	Devices
STL	Beginning of stage Ladder	S	RET	End of Stage Ladder	N/A

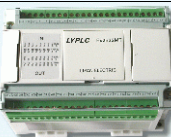
Ex1s Series Master Unit

Model		I/O Number	Inputs		Outputs		Dimensions
	Ex1s24MR	24	16	Sink / Source selectable	8	Relay	A type
	Ex1s24MT					Transistor (NPN)	
	Ex1s32MR	32	16		16	Relay	
	Ex1s32MT					Transistor (NPN)	



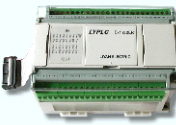
Ex1n Series Master Unit

Model		I/O Number	Inputs		Outputs		Dimensions
	Ex1n16MR	16	8	Sink / Source selectable	8	Relay	B type
	Ex1n14MT	14	8		6	Transistor (NPN)	
	Ex1n24MR	24	16		8	Relay	A type
	Ex1n24MT					Transistor (NPN)	
	Ex1n32MR	32	16	16	Relay		
	Ex1n32MT				Transistor (NPN)		


Ex2n Series Master Unit

Model		I/O Number	Inputs		Outputs		Dimensions
	Ex2n24MR	24	16	Sink / Source selectable	8	Relay	A type
	Ex2n24MT					Transistor (NPN)	
	Ex2n32MR	32	16		16	Relay	
	Ex2n32MT					Transistor (NPN)	


Extension I/O Unit

Model		I/O Number	Inputs		Outputs		Dimensions
	Ex1s08EX	8	8	Sink / Source selectable	0	---	C type
	Ex1s08ER	8	4		4	Relay	
	Ex1s08ET			Transistor (NPN)			
	Ex1s08EYR	8	0	---	8	Relay	
	Ex1s08EYT					Transistor (NPN)	
	Ex1n16EX	16	16	Sink / Source selectable	0	---	B type
	Ex1n16ER	16	8		8	Relay	
	Ex1n16ET			Transistor (NPN)			
	Ex1n16EYR	16	0	---	16	Relay	
	Ex1n16EYT					Transistor (NPN)	
	Ex1n24ER	24	16	Sink / Source selectable	8	Relay	A type
	Ex1n24ET					Transistor (NPN)	
	Ex1n32ER	32	16		16	Relay	
	Ex1n32ET					Transistor (NPN)	

Wire Extension Module

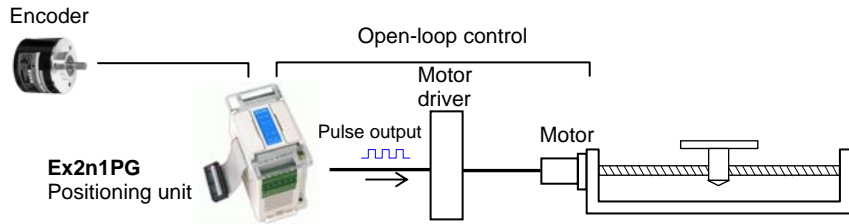
Model		I/O Number	Wire Length		Dimensions
	Ex1nNEXT-50	0	50cm		C type
	Ex1nNEXT-80		80cm		

Power Extension Module

Model		Wire Length		Dimensions
	ExPower-E	Input : 100-240VAC 50/60Hz		B type
		Output : DC24V ±15% 500mA		

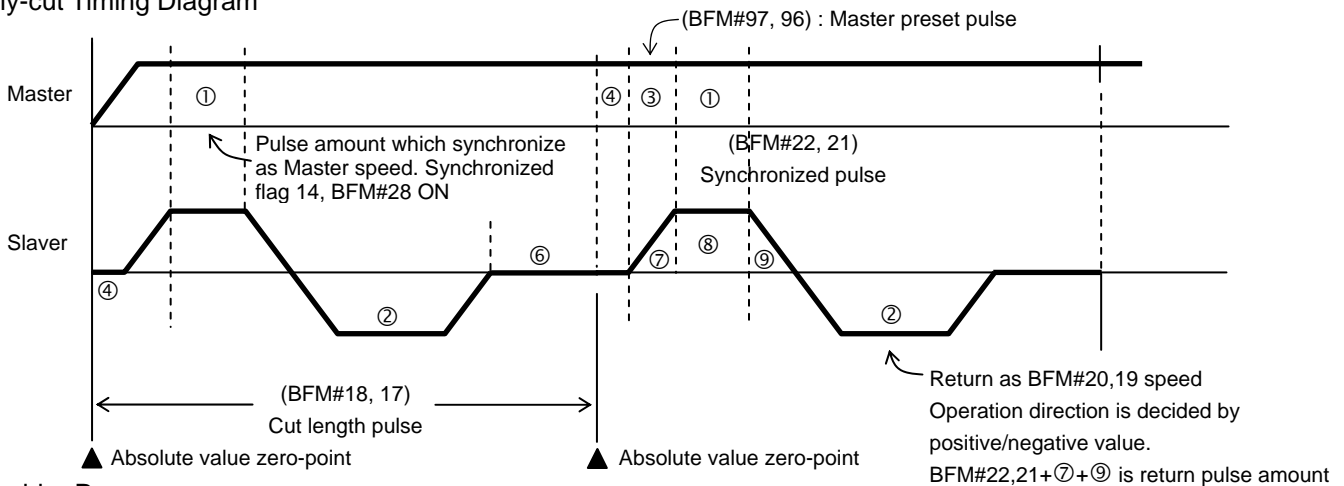
Positioning Controller

- Ex2n1PG

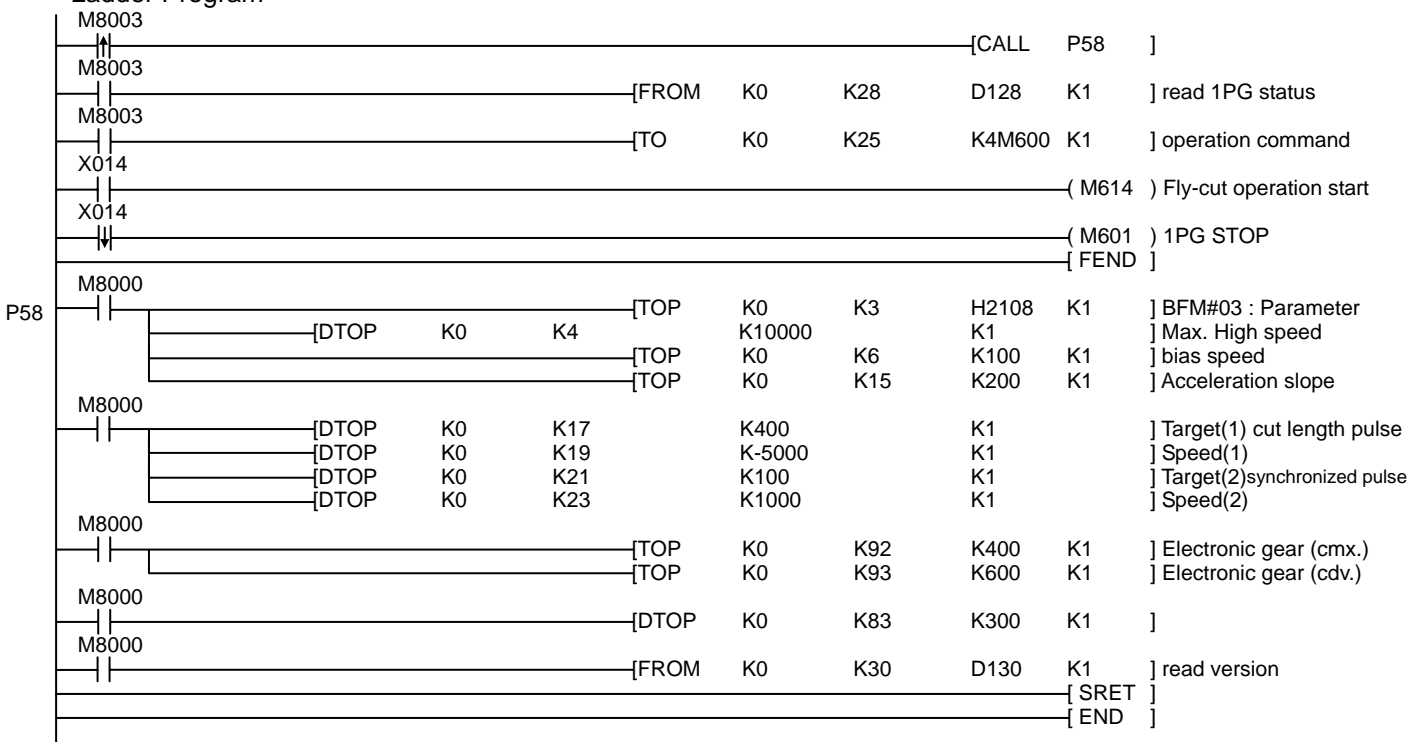


Item	Specifications	
Number of control axes	1 axis / block, maximum expand to 8 blocks	
Operation speed	10pps ~ 100Kpps	
Setting position data range	-2,147,483,648 ~ 2,147,483,647	
Pulse output format	PLS and DIR, CW and CCW	
Number of I/O points occupied	NONE	
Power supply	For input signals	24VDC±10% from the output voltage of PLC, Current consumption : 40mA or less
	For internal control	5VDC, 60mA supplied from PLC via extension cable
	For pulse output	24VDC±10%, current consumption : 40mA or less
Applicable PLC	Ex1n / Ex2n series PLC	
Dimensions	C type	
Weight (NW)	186gw	

-- Fly-cut Timing Diagram

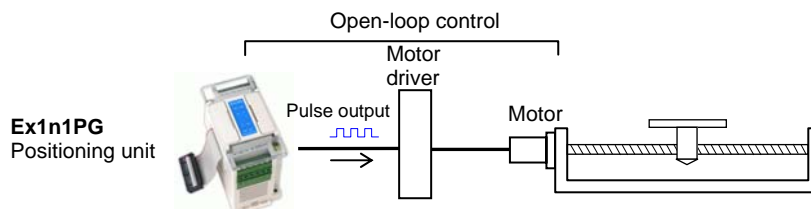


-- Ladder Program



Positioning Controller

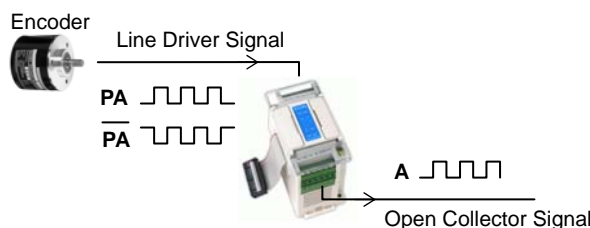
- Ex1n1PG



Item	Specifications	
Number of control axes	1 axis / block, maximum expand to 8 blocks	
Operation speed	10pps ~ 100Kpps	
Setting position data range	-2,147,483,648 ~ 2,147,483,647	
Pulse output format	PLS and DIR, CW and CCW	
Number of I/O points occupied	NONE	
Power supply	For input signals	24VDC±10% from the output voltage of PLC, Current consumption : 40mA or less
	For internal control	5VDC, 60mA supplied from PLC via extension cable
	For pulse output	24VDC±10%, current consumption : 40mA or less
Applicable PLC	Ex1n / Ex2n series PLC	
Dimensions	C type	
Weight (NW)	186gw	

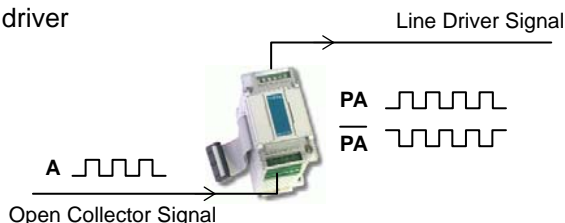
Signal Conversion Module

- Ex1nLTOC Line driver TO open Collector



Item	Specifications
Input signal	Line Driver Signal (PA, \overline{PA} , PB, \overline{PB} , PZ, \overline{PZ})
Output signal	Open Collector Signal (A, B, Z)
Number of I/O points occupied	None
Power supply	24VDC±10%, 40mA or less
Applicable PLC	Ex1n / Ex2n series PLC
Dimensions	C type
Weight	140gw

- Ex1nCTOL open Collector TO Line driver



Item	Specifications
Input signal	Open Collector Signal (A, B, Z)
Output signal	Line Driver Signal (PA, \overline{PA} , PB, \overline{PB} , PZ, \overline{PZ})
Number of I/O points occupied	None
Power supply	24VDC±10%, 40mA or less
Applicable PLC	Ex1n / Ex2n series PLC
Dimensions	C type
Weight	140gw

Analog Module

- Ex1n2DA



- ◆ Two channels for voltage output (-10V ~ +10V DC) or current output (4 to 20mA DC)
- ◆ Voltage or Current output can be specified for each channel
- ◆ 12bits + 1 sign bit resolution

Item	Voltage output	Current output
Analog output range	-10 to 10V DC	4 to 20mA
Resolution	2.5mV [10-(-10)]V/8000	4μA [(20-4)mA/4000]
Overall accuracy	±1% (full scale -10 to +10V)	±1% (full scale 4 to 20mA)
Conversion speed	2 scan-time / 1 channel	
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Power supply	5VDC, 50mA (digital circuit power from main unit), 24VDC±10%, 100mA (analog circuit)	
Number of occupied I/O points	Occupy 16 output points	
Applicable PLC	Ex1n, Ex2n series PLC	
Dimension	C type	
Weight (NW)	200gw	

- Ex1s2AD



- ◆ This module provide 2 channels of analog input conversion to digital value
- ◆ 11 bits + 1 sign bit resolution, accuracy: ±1%
- ◆ Conversion speed :1 scan-time
- ◆ Number of occupied I/O points : None
- ◆ Dimensions: C type / Weight (NW): 145gw

Item	Voltage input	Current input
Analog input range	-10 to +10V DC	4 to 20mA
Resolution	5.0mV (20V/4000)	8μA (16mA/2000)
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Power supply	5VDC, 40mA (digital circuit power from main unit), 24VDC±10%, 100mA (analog circuit)	
Applicable PLC	Ex1s, Ex1n, Ex2n series PLC	

- Ex1n4AD



- ◆ Four channels for voltage input (-10V to +10V DC) or current input (4 to 20mA DC)
- ◆ For each channel, voltage or current input can be specified independently
- ◆ 11bits + 1 sign bit resolution
- ◆ Power supply : 5VDC, 50mA (digital circuit power from main unit),
24VDC±10%, 100mA (analog circuit)
- ◆ Dimensions : C type / Weight (NW) : 179gw

- Ex1n8AD



- ◆ Eight channels for voltage input (-10V to +10V DC) or current input (4 to 20mA DC)
- ◆ For each channel, voltage or current input can be specified independently
- ◆ 11bits + 1 sign bit resolution
- ◆ Power supply : 5VDC, 50mA (digital circuit power from main unit),
24VDC±10%, 100mA (analog circuit)
- ◆ Dimensions : B type / Weight (NW) : 250gw

Item	Voltage input	Current input
Analog input range	-10 to +10V DC (input resistance 102KΩ)	4 to 20mA DC (input resistance 500Ω)
Resolution	5mV (20V/4000)	8μA [(20-4)mA/4000]
Overall accuracy	±1% (full scale -10 to +10V)	±1% (full scale 4 to 20mA)
Conversion speed	500μs x Number of used channel	
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Number of occupied I/O points	None	
Applicable PLC	Ex1n, Ex2n series PLC	

Analog Module

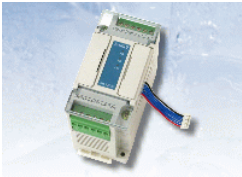
- Ex1s2TC



- ◆ K or J type thermocouple temperature sensor input
- ◆ 11 bits + 1 sign bit resolution, accuracy: $\pm 1\%$ full scale
- ◆ Conversion speed : 1CH / 2 scan-time
- ◆ Number of occupied I/O points : None
- ◆ Dimensions: C type / Weight (NW): 138gw

Item	Centigrade (°C)	Fahrenheit (°F)
Analog input signal	K: -100 to 1200°C, J: -100 to 600°C	K: -148 to 2192°F, J: -148 to 1112°F
Resolution	K: 0.4°C, J: 0.3°C	K: 0.72°F, J: 0.54°F
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Power supply	5VDC, 40mA (digital circuit power from main unit), 24VDC $\pm 10\%$, 100mA (analog circuit)	
Applicable PLC	Ex1s, Ex1n, Ex2n series PLC	

- Ex1s2LD



- ◆ This module provide 2 channels of load cell module input
- ◆ 11 bits + 1 sign bit resolution, accuracy: $\pm 1\%$ full scale
- ◆ Conversion speed : 1CH / 2 scan-time
- ◆ Number of occupied I/O points : None
- ◆ Dimensions: C type / Weight (NW): 138gw

Item	Type A	Type B
Rated output voltage	10mV/10V	20mV/10V
Resolution	11 bits	11 bits
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Power supply	5VDC, 40mA (digital circuit power from main unit), 24VDC $\pm 10\%$, 100mA (analog circuit)	
Applicable PLC	Ex1s, Ex1n, Ex2n series PLC	

- Ex1s2PT



- ◆ Platinum temperature sensor (Pt100, 3 wire type) input, 2 channels
- ◆ 11 bits + 1 sign bit resolution, accuracy: $\pm 1\%$ full scale
- ◆ Conversion speed : 1CH / 2 scan-time
- ◆ Number of occupied I/O points : None
- ◆ Dimensions: C type / Weight (NW): 144gw

Item	Centigrade (°C)	Fahrenheit (°F)
Analog input signal	1mA sensor : 100 Ω Pt100 (3850PPM / °C)	
Resolution	0.2 to 0.3°C	0.36 to 0.54°F
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Power supply	5VDC, 40mA (digital circuit power from main unit), 24VDC $\pm 10\%$, 100mA (analog circuit)	
Applicable PLC	Ex1s, Ex1n, Ex2n series PLC	

- Ex1s2PT



- ◆ Platinum temperature sensor (Pt100, 3 wire type) input, 2 channels
- ◆ 11 bits + 1 sign bit resolution, accuracy: $\pm 1\%$ full scale
- ◆ Conversion speed : 1CH / 2 scan-time
- ◆ Number of occupied I/O points : None
- ◆ Dimensions: C type / Weight (NW): 180gw

Item	Centigrade (°C)	Fahrenheit (°F)
Analog input signal	1mA sensor : 100 Ω Pt100 (3850PPM / °C)	
Resolution	0.2 to 0.3°C	0.36 to 0.54°F
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Power supply	5VDC, 50mA (digital circuit power from main unit), 24VDC $\pm 10\%$, 100mA (analog circuit)	
Applicable PLC	Ex1n, Ex2n series PLC	

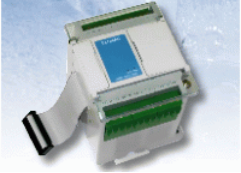
Analog Module

- Ex1n4TC Analog Input Block for Thermocouple Temperature Sensor



- ◆ K or J type thermocouple temperature sensor input
- ◆ Centigrade (°C) or Fahrenheit (°F) measurement can be changed
- ◆ Four input channels
- ◆ Power supply : 5VDC, 50mA (digital circuit power from main unit), 24VDC±10%, 100mA (analog circuit)
- ◆ Dimensions : C type / Weight (NW) : 180gw


- Ex1n8TC Analog Input Block for Thermocouple Temperature Sensor



- ◆ K or J type thermocouple temperature sensor input
- ◆ Centigrade (°C) or Fahrenheit (°F) measurement can be changed
- ◆ Eight input channels
- ◆ Power supply : 5VDC, 50mA (digital circuit power from main unit), 24VDC±10%, 100mA (analog circuit)
- ◆ Dimensions : B type / Weight (NW) : 250gw

Item	Centigrade (°C)	Fahrenheit (°F)
Analog input range	K: -100 to 1200°C, J: -100 to 600°C	K: -148 to 2192°F, J: -148 to 1112°F
Resolution	K: 0.4°C, J: 0.3°C	K: 0.72°F, J: 0.54°F
Overall accuracy	±0.5% (full scale 1°C)	
Conversion speed	100ms x Number of used channel	
Isolation	Photo-coupler isolation between analog and digital circuits DC/DC converter isolates main unit power, no isolation between analog channels	
Number of occupied I/O points	None	
Applicable PLC	Ex1n, Ex2n series PLC	

Remote I/O Module

Model	I/O Number	Inputs	Outputs	Dimensions			
	EXRM0808R	16	8	Sink / Source selectable	8	Relay	B type
	EXRM0808T					Transistor (NPN)	

Communication Module

- EX485LNK



- ◆ Isolation : Photo-coupler isolation
- ◆ CPU Link, 1 : N network
- ◆ Applicable PLC : Ex1n, Ex2n series PLC
- ◆ Dimensions: C type
- ◆ Weight (NW) : 191gw

Item	Specification
Transmission standard	RS422/485
Maximum transmission distance	RS422/485 : 500m
LED indicators	SD, RD
Communication method	Half duplex
Baud rate	1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200
Power supply external	24V DC ± 10%, 40mA
Power supply internal	5V DC, 80mA is supplied from the main unit

Communication Module

- EX232BD



- ◆ Can communicate with personal computer, bar code reader, operation panel
- ◆ Can used a dedicated protocol to communicate with RS232C equipment
- ◆ Applicable PLC : Ex1s, Ex1n, Ex2n series PLC
- ◆ Dimensions (W) x (L) x (H) : 47mm x 89mm x 29mm
- ◆ Weight (NW) : 51gw

Item	Specification
Transmission standard	RS232C
Maximum transmission distance	15m
LED indicators	RXD, TXD
Communication method	Half duplex
Isolation	No isolation
Power supply-Internal	5V DC 20mA is supplied as the power from the main unit

- EX485BD



- ◆ Can used a dedicated protocol to communicate with multi RS422/485 equipments
- ◆ CPU Link, N : N network
- ◆ Applicable PLC : Ex1s, Ex1n, Ex2n series PLC
- ◆ Dimensions (W) x (L) x (H) : 47mm x 89mm x 29mm
- ◆ Weight (NW) : 48gw

Item	Specification
Transmission standard	RS422/485
Maximum transmission distance	50m
LED indicators	SD, RD
Communication method	Half duplex
Isolation	No isolation
Power supply-Internal	5V DC 30mA is supplied as the power from the main unit

- EX232ADP



- ◆ Can communicate with personal computer, bar code reader, operation panel
- ◆ Can used a dedicated protocol to communicate with RS232C equipment
- ◆ Applicable PLC : Ex1s, Ex1n, Ex2n series PLC
- ◆ Dimensions : C type
- ◆ Weight (NW) : 138gw

Item	Specification
Transmission standard	RS232C
Maximum transmission distance	50m
LED indicators	RXD, TXD
Communication method	Half duplex
Isolation	Photo-coupler isolation
Power supply-external	24V DC \pm 10%, 50mA
Power supply-Internal	5V DC, 60mA is supplied from the main unit

- EX485ADP



- ◆ Can used a dedicated protocol to communicate with multi RS422/485 equipments
- ◆ CPU Link, N : N network
- ◆ This is an isolation type adapter for connect with inverter, servo driver or long distance equipment
- ◆ Applicable PLC : Ex1s, Ex1n, Ex2n series PLC
- ◆ Dimensions : C type / Weight (NW) : 140gw

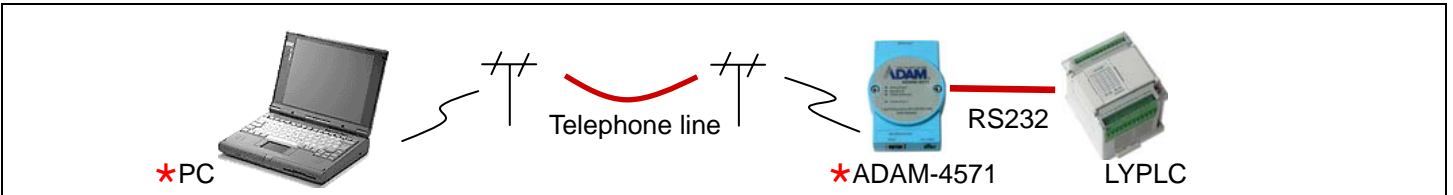
Item	Specification
Transmission standard	RS422/485
Maximum transmission distance	500m
LED indicators	SD, RD
Communication method	Half duplex
Isolation	Photo-coupler isolation
Power supply-external	24V DC \pm 10%, 50mA
Power supply-Internal	5V DC, 60mA is supplied from the main unit

Communications

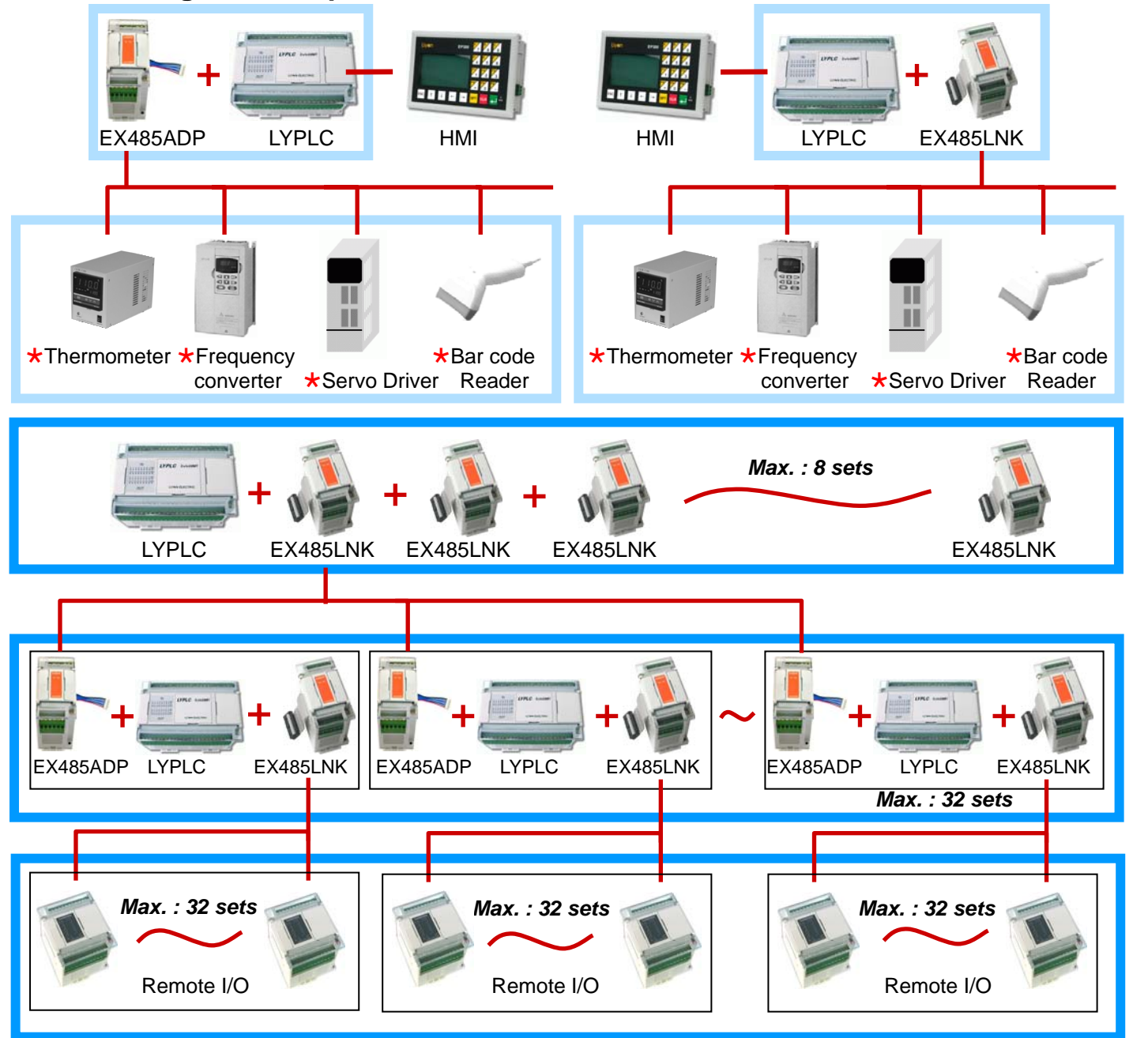
◆ Programming



◆ Ethernet

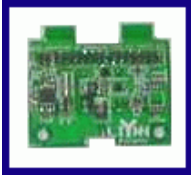
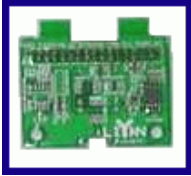
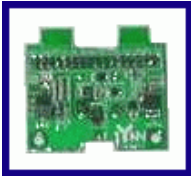


◆ Connecting with Peripheral Device



* Other brand's product

Memory Board

Ex1RTC1-1		<ul style="list-style-type: none"> ◆ Real Time Clock extension board ◆ For more than 24 points of Ex1s, Ex1n, Ex2n series main unit used. ◆ Rechargeable Lithium battery (2 months / 2 x EXRTC-CAP-C) ◆ Second, minute, hour, date, month, year, week (with compensation for leap year) 		
Ex1RTC1-2		<ul style="list-style-type: none"> ◆ EEPROM (8000 steps) ◆ For more than 24 points of Ex1s, Ex1n, Ex2n series main unit used. 	Ex1RTC1-4	<ul style="list-style-type: none"> ◆ Multi-mode EEPROM (8000 steps) ◆ For more than 24 points of Ex1s, Ex1n, Ex2n series main unit used. ◆ SW-2 OFF / SW-1 OFF: execute internal EEprom program, not execute copy function ◆ SW-2 ON / SW-1 OFF: execute external EEprom program, not execute copy function ◆ SW-2 OFF / SW-1 ON: copy EEprom program of RTC1-4 and content of D register to EEprom of CPU ◆ SW-2 ON / SW-1 ON: copy content of D register in EEprom of CPU to EEprom of RTC1-4
Ex1RTC1-3		<ul style="list-style-type: none"> ◆ EEPROM (8K steps) and Real Time clock extension board ◆ For more than 24 points of Ex1s, Ex1n, Ex2n series main unit used. ◆ Rechargeable Lithium battery (2 months / 2 x EXRTC-CAP-C) ◆ Second, minute, hour, date, month, year, week (with compensation for leap year) 	Ex1RTC1-5	<ul style="list-style-type: none"> ◆ Multi-mode EEPROM (8K steps) and Real Time Clock extension board ◆ SW-2 OFF / SW-1 OFF: execute internal EEprom program, not execute copy function ◆ SW-2 ON / SW-1 OFF: execute external EEprom program, not execute copy function ◆ SW-2 OFF / SW-1 ON: copy EEprom program of RTC1-4 and content of D register to EEprom of CPU ◆ SW-2 ON / SW-1 ON: copy content of D register in EEprom of CPU to EEprom of RTC1-4 ◆ Other functions are as same as Ex1RTC1-3

Hand Held Programming Panel

- EX20P



- ◆ Programming is mnemonic symbol.
- ◆ Monitor the status of X, Y, M, S T, C and the content of Timers, Counters, Data Registers.
- ◆ The liquid crystal display is 16 characters × 2 lines.
- ◆ The panel is small (87mm x 166mm x 35mm) and light (258gw) easy to carry.
- ◆ PLC cable : EXCAB-KBD01
- ◆ Weight (NW) : 258gw

Programming function	Read, Write, Insert, Delete, Monitor and Test.
Display capacity	16 characters × 2 lines
Program editing method	Built-In memory is edited off line
Program memory function	Can maintain for 7 days, if connected to PLC for half hour or more
Applicable PLC	Ex1s, Ex1n, Ex2n series PLC

Stepping Motor Driver





- PMC2615-16





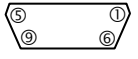
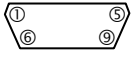



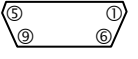








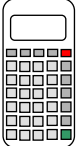
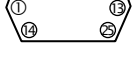




- ◆ PWM Digital circuit construction, control accurately, running smoothly.
- ◆ 200, 400, 800, 1600 Stepping accuracy select.
- ◆ Build-in motor stop automatically reduce current function.
- ◆ DC 12VDC ~ 36VDC power source, wiring conveniently.
- ◆ Compatible with all 2-phase stepping motor in the market.
- ◆ Weight (NW): 200gw Dimensions(L)x(W)x(H): 100mm x 68mm x 37mm

Item	Specifications
Power source	Within DC12V to DC36V, more than 4A
Drive method	PWM fixed current unipolar
Maximum output current	1.5A / Phase
Accuracy	Can set 200, 400, 800, 1600 steps / Per motor turning circumference
Power source signal	Clockwise pulse, Counterclockwise pulse, stop trigger signal, signal input use photo-coupler, signal input impedance less than 220Ω, DC 20V, 20 mA
Adjustable function	Motor performance current
DIP switch	ACD automatically reduce current function. When motor stop, it can reduce to stop holding current automatically within 0.2sec 1P / 2P power source pulse input method selection, MS1, MS2 motor accuracy selection

Spare Part

	EXTRMA07 (Transistor)		NY24W-K (Relay)		PCN-123D3MHZ (Relay)
	EXRTC-Cap-C 7mA / 3V	For backup Real Time clock Extension Board used.			

Download Program Cable

		 9Pin female D-SUB (up view of cable)	<table border="0"> <tr><td>①</td><td>↔</td><td>①</td></tr> <tr><td>②</td><td>↔</td><td>② TXD</td></tr> <tr><td>③</td><td>↔</td><td>③ RXD</td></tr> <tr><td>④</td><td>↔</td><td>④</td></tr> <tr><td>⑤</td><td>↔</td><td>⑤ SG</td></tr> <tr><td>⑥</td><td>↔</td><td>⑥</td></tr> <tr><td>⑦</td><td>↔</td><td>⑦</td></tr> <tr><td>⑧</td><td>↔</td><td>⑧</td></tr> <tr><td>⑨</td><td>↔</td><td>⑨</td></tr> </table>	①	↔	①	②	↔	② TXD	③	↔	③ RXD	④	↔	④	⑤	↔	⑤ SG	⑥	↔	⑥	⑦	↔	⑦	⑧	↔	⑧	⑨	↔	⑨	 9Pin male D-SUB (up view of cable)																							
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EXCAB-Link01 Length : 20cm	* Link mode: can't be more than 50cm. If it is more than 50cm, have to add EX485BD or EX485ADP.																																																					

Main Unit

Number of I/O points	Ex1s (can't extension)		Ex1n (can extension)		Ex2n (can extension)		xxIn/xxOut	Package	Wiring form	Remark
	AC Power DC Input		AC Power DC Input		AC Power DC Input					
	Relay Type	Transistor	Relay Type	Transistor	Relay Type	Transistor				
14	—	—	—	Ex1n14MT	—	—	08IN / 06OUT	B	Pluggable terminal	
16	—	—	Ex1n16MR	—	—	—	08IN / 08OUT	B	Pluggable terminal	
24	Ex1s24MR	Ex1s24MT	Ex1n24MR	Ex1n24MT	Ex2n24MR	Ex2n24MT	16IN / 08OUT	A	Pluggable terminal	
32	Ex1s32MR	Ex1s32MT	Ex1n32MR	Ex1n32MT	Ex2n32MR	Ex2n32MT	16IN / 16OUT	A	Pluggable terminal	
32	EX200MP (Linear & Circular Interpolation module / can extension)						16IN / 16OUT	A	Pluggable terminal	

Extension I/O Module

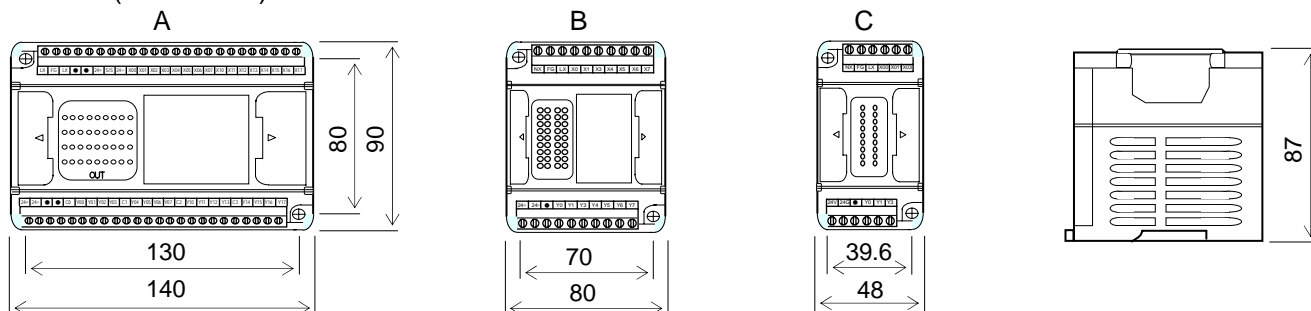
I/O points	DC Input / Relay type	DC Input / Transistor type	xxIn/xxOut	Package	Wiring form	Remark
8	Ex1s08EX	—	08IN / 00OUT	C	Pluggable terminal	
8	Ex1s08ER	Ex1s08ET	04IN / 04OUT	C	Pluggable terminal	
8	Ex1s08EYR	Ex1s08EYT	00IN / 08OUT	C	Pluggable terminal	
16	Ex1n16EX	—	16IN / 00OUT	B	Pluggable terminal	
16	Ex1n16ER	Ex1n16ET	08IN / 08OUT	B	Pluggable terminal	
16	Ex1n16EYR	Ex1n16EYT	00IN / 16OUT	B	Pluggable terminal	
24	Ex1n24ER	Ex1n24ET	16IN / 08OUT	A	Pluggable terminal	
32	Ex1n32ER	Ex1n32ET	16IN / 16OUT	A	Pluggable terminal	

Special Module

Item	Description	Occupy point	Package	Wiring form	Remark
EXRM0808R	Remote I/O module (Relay output, 08IN/08OUT)	—	B	Pluggable terminal	
EXRM0808T	Remote I/O module (Transistor output, 08IN/08OUT)	—	B	Pluggable terminal	
Ex1nNEXT-50	Wire Extension Module – 50cm length	—	C	Pluggable terminal	
Ex1nNEXT-80	Wire Extension Module – 80cm length	—	C	Pluggable terminal	
ExPower-E	Power Extension Module	—	B	Pluggable terminal	
EX232BD	RS232 interface module (without photo-coupler)	—	N	Pluggable terminal	
EX485BD	RS422/485 interface module (without photo-coupler)	—	N	Pluggable terminal	
EX232ADP	RS232C interface module (with photo-coupler)	—	C	Pluggable terminal	
EX485ADP	RS422/485 interface module (with photo-coupler)	—	C	Pluggable terminal	
EX485LNK	RS422/485 interface module (with photo-coupler)	—	C	Pluggable terminal	
Ex1n2DA	Analog output module	00IN/ 16OUT	C	Pluggable terminal	
Ex1s2AD	2CH Analog input module (connect to 2 nd comm. port)	—	C	Pluggable terminal	
Ex1s2TC	2CH Thermocouple (connect to 2 nd comm. port)	—	C	Pluggable terminal	
Ex1s2LD	Load Cell analog module (connect to 2 nd comm. port)	—	C	Pluggable terminal	
Ex1s2PT	PT100 (connect to 2 nd communication port)	—	C	Pluggable terminal	
Ex1n4AD	4CH Analog input module	—	C	Pluggable terminal	
Ex1n4TC	4CH Thermocouple	—	C	Pluggable terminal	
Ex1n8AD	8CH Analog input module	—	B	Pluggable terminal	
Ex1n8TC	8CH Thermocouple	—	B	Pluggable terminal	
Ex1n2PT	2CH PT100	—	C	Pluggable terminal	
Ex1n1PG	Positioning unit	—	C	Pluggable terminal	
Ex2n1PG	Positioning unit for special function	—	C	Pluggable terminal	
Ex1nCTOL	open Collector TO Line driver	—	C	Pluggable terminal	
Ex1nLTOC	Line driver TO open Collector	—	C	Pluggable terminal	

N : no housing Ex1s:can't extension Ex1n:can extension Ex2n:can extension

■ Dimension (unit : mm)



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