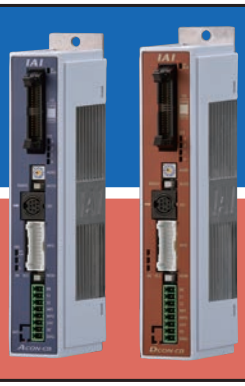
ACON-CB
Position Controller for ROBO Cylinder

DCON-CB
Position Controller for Mini Cylinder



Feature

1 Compatible with Battery-less Absolute Encoder *ACON-CB only

RCA equipped with a battery-less absolute encoder is supported.
Since no battery is needed to retain position data, less space is required in the control panel, which in turn leads to lower both initial and maintenance costs of your equipment.

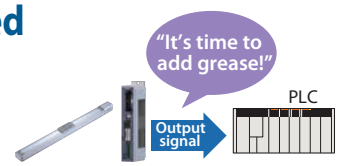
2 Compatible with Many Major Field Networks

DeviceNet, PROFIBUS, EtherCAT, CompoNet, PROFINET, MECHATROLINK, EtherNet/IP, CC-Link

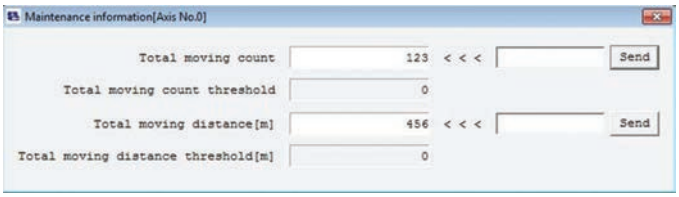
Compatible with DeviceNet, CC-Link, PROFIBUS-DP, PROFINET IO, CompoNet, MECHATROLINK (I / II), EtherCAT, and EtherNet/IP.
Field network connection allows for less-wiring, direct numerical commands, position number commands, current position reading, and more.

3 Maintenance Timings Can Be Checked Using the Traveled Distance Calculation Function

The total distance traveled by the actuator is calculated and recorded in the controller.
If the preset distance is exceeded, a signal is output from the controller.
This function can be used to check when to add grease or perform the next periodic inspection.



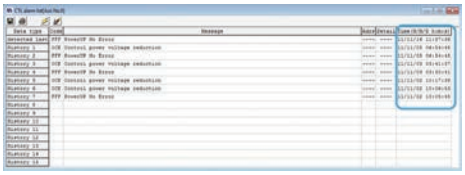
A signal is automatically output to the PLC when the preset maintenance/inspection timing (number of operations or distance traveled) is reached.



<Maintenance information>

4 The Calendar Function Can Retain Alarm Timestamps

The built-in calendar function (clock function) records alarms and other events with timestamps, which helps analyze the causes of troubles should they occur.



5 Equipped with the Offboard Tuning Function *ACON-CB only

The offboard tuning function lets you set an optimal gain for the load.

List of Models

Models			ACON-CB / DCON-CB							
External view										
I/O type			Positioner type	Pulse-train type	Field Network type					
					DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	MECHATROLINK I/II	EtherCAT	EtherNet/IP	PROFINET IO
I/O type model number			NP/PN	PLN/PLP	DV	CC	PR	CN	ML	EC	EP	PRT
ACON-CB	Battery-less absolute spec. Incremental spec.		-	-	-	-	-	-	-	-	-	-
	Simple absolute spec.	With absolute battery	-		-	-	-	-	-	-	-	-
		With absolute battery unit	-		-	-	-	-	-	-	-	-
		Without absolute battery	-		-	-	-	-	-	-	-	-
	Absolute specification		-		-	-	-	-	-	-	-	-
DCON-CB	Incremental specification		-	-	-	-	-	-	-	-	-	-

* Please choose a simple absolute spec. when you use incremental spec. of RCA and RCA2 series actuator as absolute specification.
When you use absolute spec of RCA series actuator, please choose an absolute spec. controller.

Model Specification Items

ACON — Series — Type — Motor Type — Encoder Type — Option — I/O Type — I/O Cable Length — Supply Power — Simple Absolute Option — Mounting Option

Type	
CB	Standard type
CGB	Safety category compliant

Motor Type	
2	2W motor
5	5W motor
5S	5W motor (*1)
10	10W motor
20	20W motor
20S	20W motor (*2)
30	30W motor

(*1) When connecting RCA2-SA2AC/RA2AC
(*2) When connecting RCA-RA3□/RGS3□/RGD3□/RCA2-SA4□/TA5□

Encoder Type	
WAI	Battery-less absolute/incremental
A	Absolute

Option	
HA	Hi accel/decel.
LA	Energy-saving

I/O Type	
NP	PIO (NPN)
PN	PIO (PNP)
PLN	Pulse-train (NPN)
PLP	Pulse-train (PNP)
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP
CN	CompoNet
ML	MECHATROLINK I/II
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

I/O Cable Length	
0	No cable
2	2m
3	3m
5	5m

* If you choose a field network specification, the length of I/O cable will be "0"

Supply Power	
0	DC24V

Simple Absolute Option	
(Blank)	Battery-less absolute spec. Incremental spec. Absolute spec.
AB	Simple absolute spec. (With absolute battery)
ABU	Simple absolute spec. (With absolute battery unit)
ABUN	Simple absolute spec. (Without absolute battery)

* Simple absolute spec. can be chosen when the actuator's encoder type is incremental type.

Mounting Option	
(Blank)	Screw mounting
DN	DIN rail mounting

DCON — Series — Type — Motor Type — I — Encoder Type — I/O Type — I/O Cable Length — 0 — Supply Power — Mounting Option

Type	
CB	Standard type
CGB	Safety category compliant

Motor Type	
3	2.5W DC brush-less motor

Encoder Type	
I	Incremental

I/O Type	
NP	PIO (NPN)
PN	PIO (PNP)
PLN	Pulse-train (NPN)
PLP	Pulse-train (PNP)
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP
CN	CompoNet
ML	MECHATROLINK I/II
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

I/O Cable Length	
0	No cable
2	2m
3	3m
5	5m

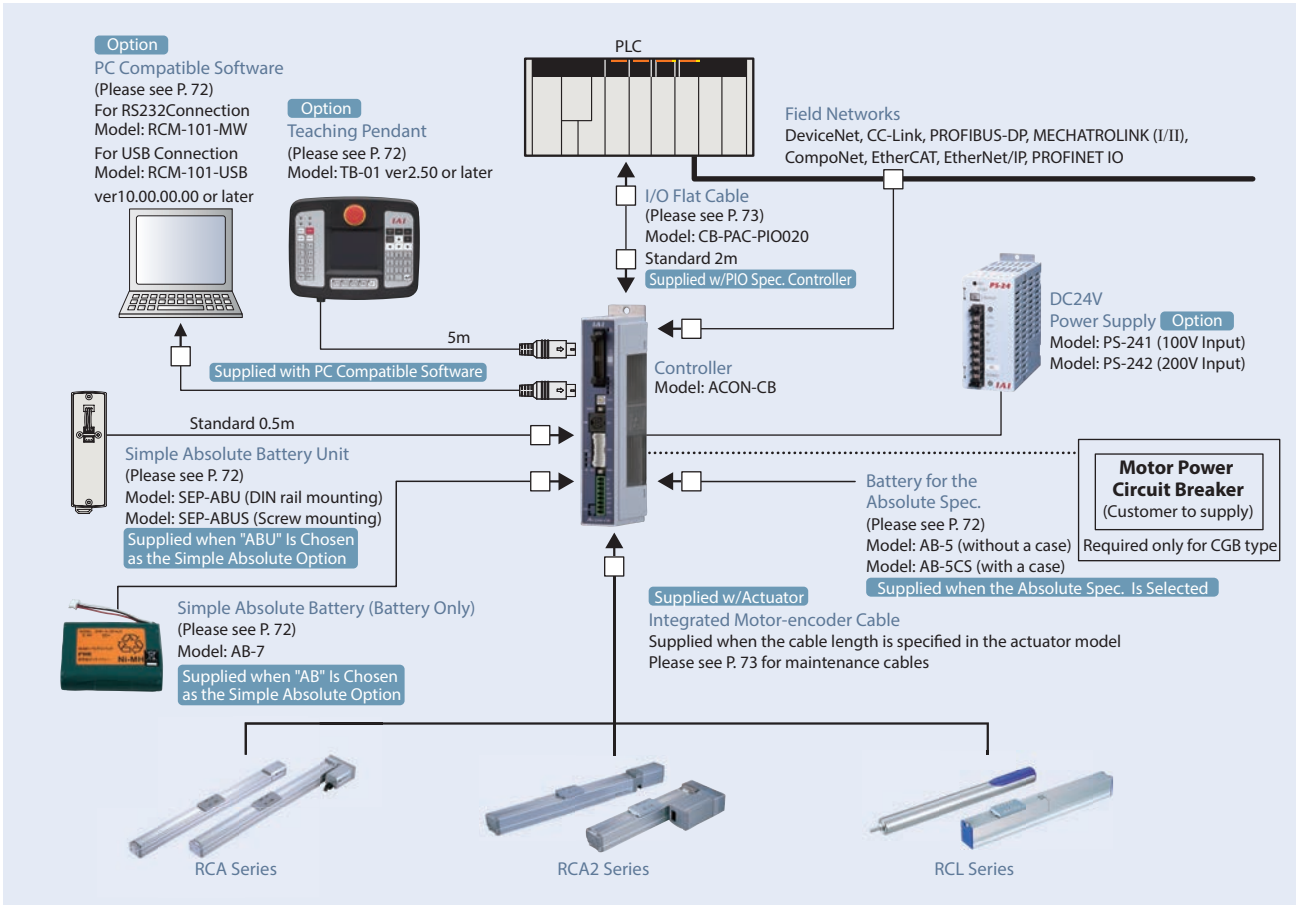
* If you choose a field network specification, the length of I/O cable will be "0"

Supply Power	
0	DC24V

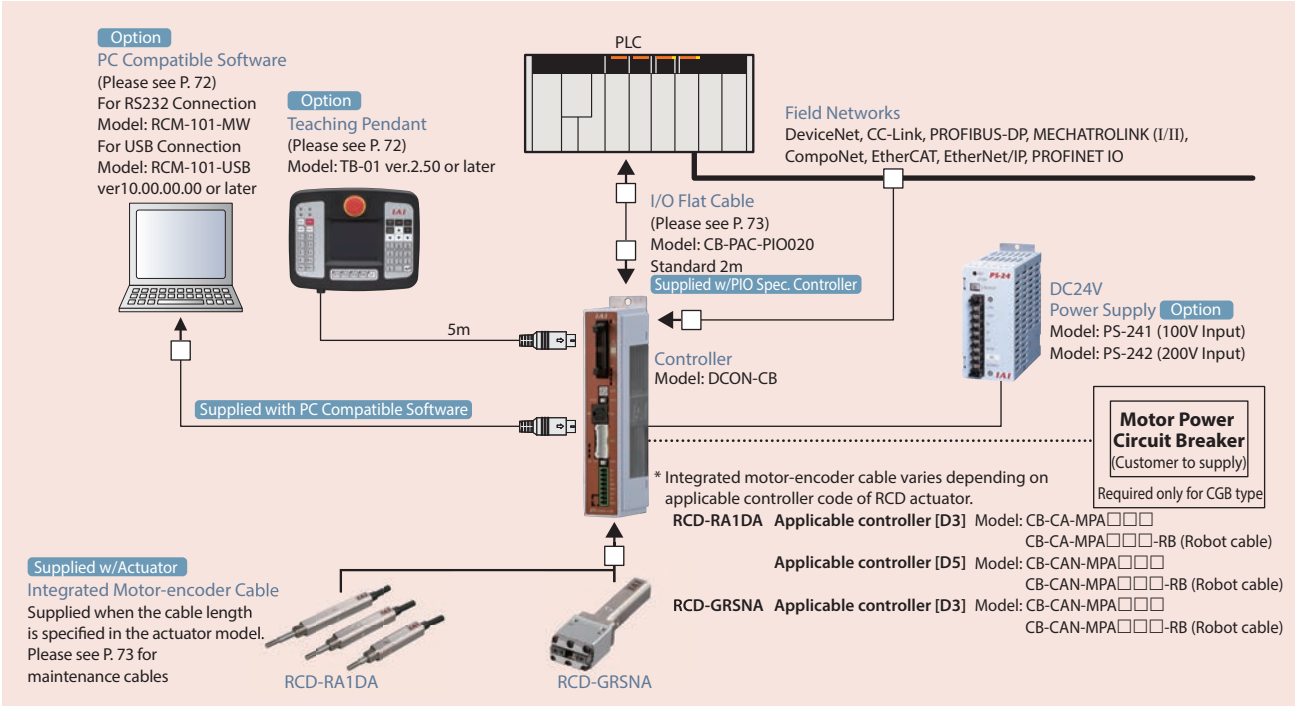
Mounting Option	
(Blank)	Screw mounting
DN	DIN rail mounting

System Configuration

<ACON-CB/CGB>



<DCON-CB/CGB>



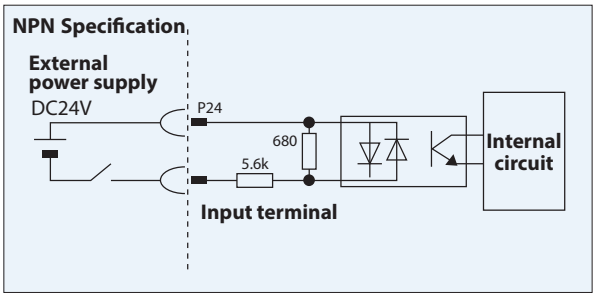
PIO I/O Interface (Common to ACON-CB/DCON-CB)

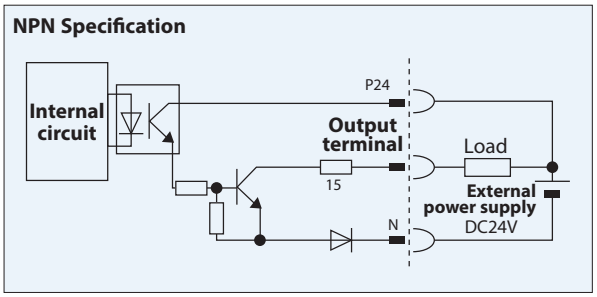
■Input Part External Input Specification

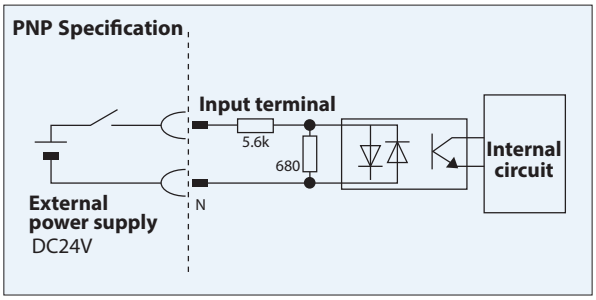
Item	Specification
Input voltage	DC24V ±10%
Input current	5mA 1 circuit
ON/OFF voltage	ON voltage DC18V Min. OFF voltage DC6V Max.

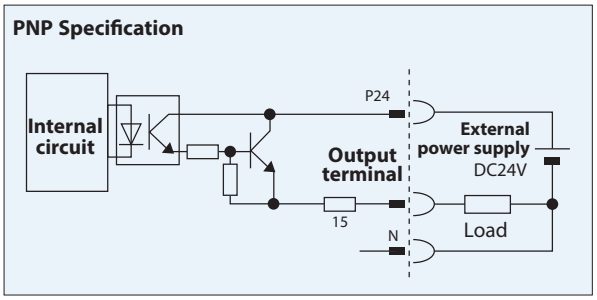
■Output Part External Output Specification

Item	Specification
Load voltage	DC24V
Max. load current	50mA 1 circuit
Leak current	2mA Max. / point









Types of PIO Patterns(Control Patterns) (Common to ACON-CB/DCON-CB)

There are 8 types of control methods ACON-CB and DCON-CB support.
Please select in Parameter #25 (PIO Pattern selection) the pattern which best suits your purpose of use.

Type	Set value of parameter #25	Mode	Summary
PIO Pattern 0	0 (Factory setting)	Positioning mode (Standard type)	Number of positioning points: 64 points Position number command: Binary Coded Decimal (BCD) Zone signal output (*1): 1 point Position zone signal output (*2): 1 point
PIO Pattern 1	1	Teaching mode (Teaching type)	Number of positioning points: 64 points Position number command: Binary Coded Decimal (BCD) Position zone signal output (*2): 1 point Jog (inching) operation using PIO signals is supported Current position data can be written to the position table using PIO signals
PIO Pattern 2	2	256-point mode (256 positioning points)	Number of positioning points: 256 points Position number command: Binary Coded Decimal (BCD) Position zone signal output (*2): 1 point
PIO Pattern 3	3	512-point mode (512 positioning points)	Number of positioning points: 512 points Position number command: Binary Coded Decimal (BCD) No position zone signal output
PIO Pattern 4	4	Solenoid valve mode 1 (7-point type)	Number of positioning points: 7 points Position number command: Individual number signal ON Zone signal output (*1): 1 point Position zone signal output (*2): 1 point
PIO Pattern 5	5	Solenoid valve mode 2 (3-point type)	Number of positioning points: 3 points Position number command: Individual number signal ON Completion signal: A signal equivalent to a LS (limit switch) signal can be output Zone signal output (*1): 1 point Position zone signal output (*2): 1 point
PIO Pattern 6 (Note 1)	6	Pulse-train mode for incremental	Differential pulse input (200 kpps max.) Home return function Zone signal output (*1): 2 points No feedback pulse output
PIO Pattern 7 (Note 1)	7	Pulse-train mode for absolute	Setting a reference point (1 place) Differential pulse input (200 kpps max.) Home return function Zone signal output (*1): 2 points No feedback pulse output

(*1) Zone signal output: A desired zone is set by Parameter #1 and 2 or 23 and 24, and the set zone always remains effective once home return has completed.
(*2) Position zone signal output: This function is available as part of a position number. A desired zone is set in the position table and becomes effective only when the corresponding position is specified, but not with commands specifying other positions.
(Note 1) Pulse Train Control Model is available only if the pulse train control type is indicated (from ACON-PLN/PLP and DCON-PLN/PLP) at the time of purchase.

PIO Patterns and Signal Assignments (Common to ACON-CB/DCON-CB)

The table below lists the signal assignments for the I/O flat cable under different PIO patterns.
Please connect an external device (such as PLC) according to this table.

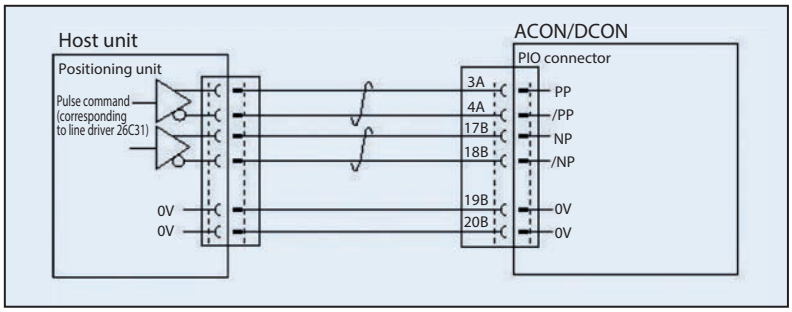
Pin #	Category	PIO function	Parameter No. 25, "PIO pattern selection"					
			0	1	2	3	4	5
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve 1	Solenoid valve 2
	Input	# of positioning point	64 points	64 points	256 points	512 points	7 points	3 points
		Home return signal	○	○	○	○	○	×
		Jog signal	×	○	×	×	×	×
		Teaching signal (writing current position)	×	○	×	×	×	×
		Brake release	○	×	○	○	○	○
	Output	Moving signal	○	○	×	×	×	×
		Zone signal	○	△ (*1)	△ (*1)	×	○	○
		Position zone signal	○	○	○	×	○	○
1A	24V	P24						
2A	24V	P24						
3A	Pulse Input	–						
4A		–						
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1(JOG+)
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (*2)
8A		IN3	PC8	PC8	PC8	PC8	ST3	–
9A		IN4	PC16	PC16	PC16	PC16	ST4	–
10A		IN5	PC32	PC32	PC32	PC32	ST5	–
11A		IN6	–	MODE	PC64	PC64	ST6	–
12A		IN7	–	JISL	PC128	PC128	–	–
13A		IN8	–	JOG+	–	PC256	–	–
14A		IN9	BKRL	JOG–	BKRL	BKRL	BKRL	BKRL
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD
16A		IN11	HOME	HOME	HOME	HOME	HOME	–
17A		IN12	*STP	*STP	*STP	*STP	*STP	–
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	–	–
19A		IN14	RES	RES	RES	RES	RES	RES
20A		IN15	SON	SON	SON	SON	SON	SON
1B	Output	OUT0	PM1(ALM1)	PM1(ALM1)	PM1(ALM1)	PM1(ALM1)	PE0	LSO
2B		OUT1	PM2(ALM2)	PM2(ALM2)	PM2(ALM2)	PM2(ALM2)	PE1	LS1(TRQS)
3B		OUT2	PM4(ALM4)	PM4(ALM4)	PM4(ALM4)	PM4(ALM4)	PE2	LS2 (*2)
4B		OUT3	PM8(ALM8)	PM8(ALM8)	PM8(ALM8)	PM8(ALM8)	PE3	–
5B		OUT4	PM16	PM16	PM16	PM16	PE4	–
6B		OUT5	PM32	PM32	PM32	PM32	PE5	–
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	–
8B		OUT7	ZONE1	MODES	PM128	PM128	ZONE1	ZONE1
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	–
13B		OUT12	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B		OUT15	*BALM (*3)/*ALML	*BALM (*3)/*ALML	*BALM (*3)/*ALML	*BALM (*3)/*ALML	*BALM (*3)/*ALML	*BALM (*3)/*ALML
17B	Pulse Input	–						
18B		–						
19B	0V	N						
20B	0V	N						

(*) In the table above, asterisk * symbol accompanying each code indicates a negative logic signal. PM1 to PM8 are alarm binary code output signals that are used when an alarm generates.
(*1) In all PIO patterns other than 3, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.
(*2) The setting will not become effective until the home return is completed.
(*3) This signal is dedicated only for ACON-CB.

Reference: Negative logic signal
Signals denoted by * are negative logic signals. Negative logic input signals are processed when turned OFF.
Negative logic output signals normally remain ON while the power is supplied, and turn OFF when the signal is output.

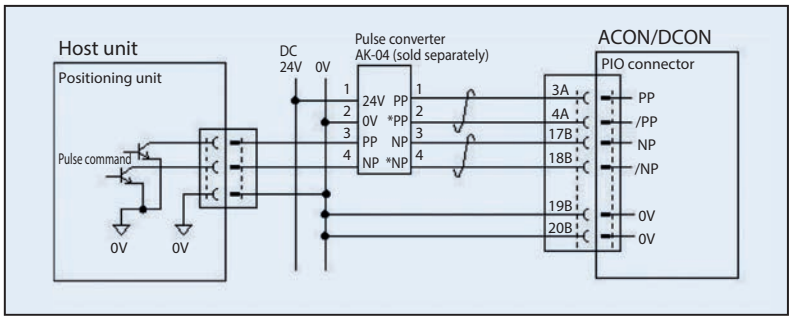
Pulse-train Control Circuit (Common to ACON-CB/DCON-CB)

■Host Unit = Differential Type



■Host Unit = Open Collector Type

The AK-04 (optional) is needed to input pulses.

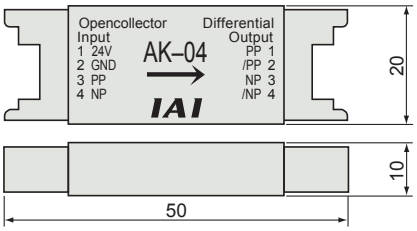


Pulse Converter: AK-04

Open-collector command pulses are converted to differential command pulses.
Use this converter if the host controller outputs open-collector pulses.

Specification

Item	Specification
Input power	DC24V ±10% (max. 50mA)
Input pulse	Open-collector (Collector current: max. 12mA)
Input frequency	200kHz or less
Output pulse	Differential output (max. 10mA) (26C31 or equiv.)
Mass	10g or less (excluding cable connectors)
Accessories	37104-3122-000L (3M) (e-CON connector) x 2 Applic. wire: AWG No. 24~26



Caution: Use the same power supply for open collector input/output to/from the host and for the AK-04.

Command Pulse Input Patterns

	Command pulse-train pattern	Input terminal	Forward	Reverse
Negative logic	Forward pulse-train	PP-/PP		
	Reverse pulse-train	NP-/NP		
	A forward pulse-train indicates the amount of motor rotation in the forward direction, while a reverse pulse-train indicates the amount of motor rotation in the reverse direction.			
	Pulse-train	PP-/PP		
	Sign	NP-/NP	Low	High
	The command pulses indicate the amount of motor rotation, while the sign indicates the rotating direction.			
	Phase A/B pulse-train	PP-/PP		
		NP-/NP		
	Command phases A and B having a 90° phase difference (multiplier is 4) indicate the amount of rotation and the rotating direction.			
Positive logic	Forward pulse train	PP-/PP		
	Reverse pulse-train	NP-/NP		
	Pulse-train	PP-/PP		
	Sign	NP-/NP	High	Low
	Phase A/B pulse-train	PP-/PP		
		NP-/NP		

I/O Signals in Pulse-train Control Mode (Common to ACON-CB/DCON-CB)

The table below lists the signal assignments for the flat cable in the pulse-train control mode. Please connect an external device (such as PLC) according to this table.

Parameter #25 (PIO patterns 6/7)					
Pin number	Category	I/O number	Signal abbreviation	Signal name	Function description
1A	24V		P24	Power supply	I/O power supply +24 V
2A	24V		P24	Power supply	I/O power supply +24 V
3A	Pulse input		PP	Differential pulse-train input (+)	Differential pulses are input from the host. Up to 200 kpps can be input.
4A			/PP	Differential pulse-train input (-)	
5A	Input	IN0	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
6A		IN1	RES	Reset	Present alarms are reset when this signal is turned ON.
7A		IN2	HOME	Home return	Home return operation is performed when this signal is turned ON.
8A		IN3	TL	Torque limit selection	When this signal is turned ON, the motor torque is limited to the value set by the parameter.
9A		IN4	CSTP	Forced stop	The actuator is forcibly stopped when this signal has remained ON for 16ms or more. The actuator decelerates to a stop at the torque set in the controller and the servo turns OFF.
10A		IN5	DCLR	Deviation counter clear	This signal clears the deviation counter.
11A		IN6	BKRL	Forced brake release	The brake is forcibly released.
12A		IN7	RMOD	Operation mode switching	The operation mode can be switched when the MODE switch on the controller is set to AUTO. (AUTO when this signal is OFF, and to MANU when the signal is ON.)
13A		IN8	RSTR*1	Reference position movement command	When this signal turns ON, the movement to the position set in parameter No. 167 starts. *1: Used only in PIO Pattern 7
14A		IN9	NC	—	Not used
15A		IN10	NC	—	Not used
16A		IN11	NC	—	Not used
17A		IN12	NC	—	Not used
18A		IN13	NC	—	Not used
19A		IN14	NC	—	Not used
20A		IN15	NC	—	Not used
1B	Output	OUT0	PWR	System ready	This signal turns ON when the controller becomes ready after the main power has been turned on.
2B		OUT1	SV	Servo ON status	This signal turns ON when the servo is ON.
3B		OUT2	INP	Positioning complete	This signal turns ON when the amount of remaining travel pulses in the deviation counter falls within the in-position band.
4B		OUT3	HEND	Home return complete	This signal turns ON upon completion of home return.
5B		OUT4	TLR	Torque limited	This signal turns ON upon reaching the torque limit while the torque is limited.
6B		OUT5	*ALM	Controller alarm status	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.
7B		OUT6	*EMGS	Emergency stop status	This signal turns ON when the emergency stop of the controller is cancelled, and turns OFF when an emergency stop is actuated.
8B		OUT7	RMDS	Operation mode status	The operation mode status is output. This signal turns ON when the controller is in the manual mode.
9B		OUT8	ALM1	Alarm code output signal	An alarm code is output when an alarm generates. For details, refer to the operation manual.
10B		OUT9	ALM2		
11B		OUT10	ALM4		
12B		OUT11	ALM8		
13B		OUT12	*ALML	Minor failure alarm	This signal turns ON when the controller is normal, and turns OFF when a message-level alarm is generated.
14B		OUT13	REND*1	Refernce position movement complete	The signal turns ON when the movement to the reference position set in parameter No. 167 is completed. *1: Used only in PIO Pattern 7
15B		OUT14	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
16B		OUT15	ZONE2	Zone signal 2	
17B	Pulse input		NP	Differential pulse-train input (+)	Differential pulses are input from the host. Up to 200 kpps can be input.
18B			/NP	Differential pulse-train input (-)	
19B	0V		N	Power supply	I/O power supply 0V
20B	0V		N	Power supply	I/O power supply 0V

(Note) * indicates a negative logic signal. Negative logic signals are normally ON while the power is supplied, and turn OFF when the signal is output.

Field Network Specification: Explanation of Operation Modes (Common to ACON-CB/DCON-CB)

If the ACON-CB/DCON-CB is controlled via a field network, you can select one of the following five modes to operate the actuator.
Please note that the data areas required on the PLC side will vary depending on the mode.

■ Mode Descriptions

	Mode	Description
0	Remote I/O mode	Similarly to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1	Position/simple direct value mode	The target position value is directly inputted, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
2	Half direct value mode	The actuator is operated by directly inputting values for speed, acceleration/deceleration rate and push current, as well as the target position.
3	Full direct value mode	The actuator is operated by directly inputting values for the target position, speed, acceleration/deceleration rate and push current, etc. In addition, you are able to read the current position, current speed, and the specified current, etc.
4	Remote I/O mode 2	This mode is the same as the remote I/O mode above, with the added functionality of reading current position and the specified current.

■ Required Data Size for Each Network

		DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	MECHATROLINKI/II	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 bytes	1 station	2 bytes	2 bytes	*	2 bytes	2 bytes	2 bytes
1	Position/simple direct value mode	8 bytes	1 station	8 bytes	8 bytes	*	8 bytes	8 bytes	8 bytes
2	Half direct value mode	16 bytes	2 stations	16 bytes	16 bytes	*	16 bytes	16 bytes	16 bytes
3	Full direct value mode	32 bytes	4 stations	32 bytes	32 bytes	× (Note 1)	32 bytes	32 bytes	32 bytes
4	Remote I/O mode 2	12 bytes	1 station	12 bytes	12 bytes	*	12 bytes	12 bytes	12 bytes

* "*" indicates that no required data size is set for MECHATROLINK I and II.
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

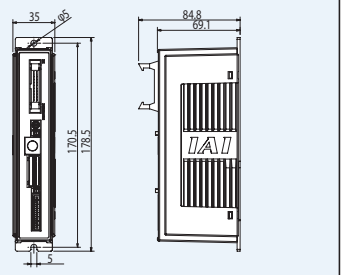
■ List of Functions by Operation Mode

	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2
Number of positioning points	512 points	768 points	Unlimited	Unlimited	512 points
Operation by direct position data input	×	○	○	○	×
Diret speed /acceleration input	×	×	○	○	×
Push-motion operation	○	○	○	○	○
Current position read	×	○	○	○	○
Current speed read	×	×	○	○	×
Operation by position number input	○	○	×	×	○
Completed position number read	○	○	×	×	○

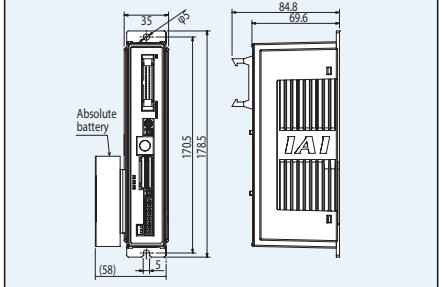
* "○" indicates that the operation is supported, and "×" indicates that it is not supported.
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

External Dimensions (Common to ACON-CB/DCON-CB)

Battery-less Absolute Specification Incremental Specification (Screw mounting)

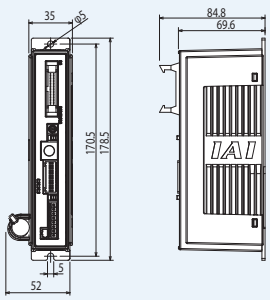


Simple Absolute Specification (Screw mounting)

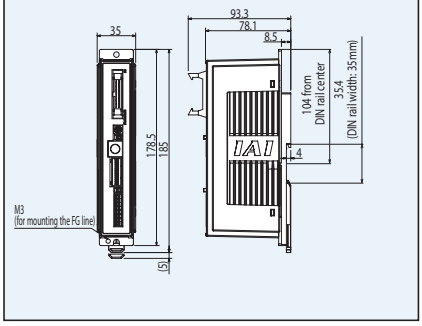


* The absolute battery is installed on the left side when the controller is viewed from the front side.

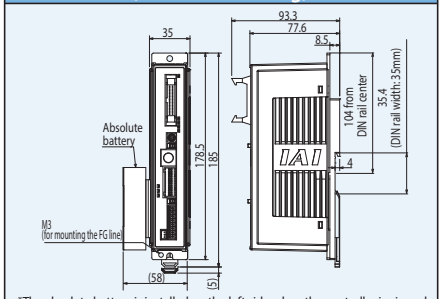
Absolute Specification (Screw mounting)



Battery-less Absolute Specification Incremental Specification (DIN rail mounting)

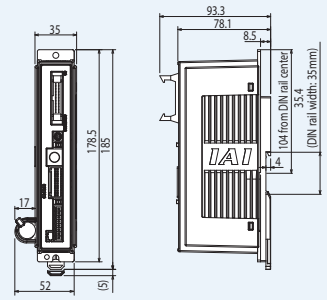


Simple Absolute Specification (DIN rail mounting)

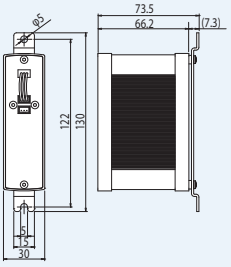


*The absolute battery is installed on the left side when the controller is viewed from the front side.

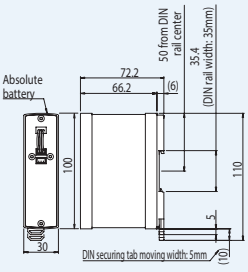
Absolute Specification (DIN rail mounting)



Absolute Battery Unit (Screw mounting)



Absolute Battery Unit (DIN rail mounting)



Specification Table

Item	ACON-CB	DCON-CB
Number of controlled axes	1 axis	
Power supply voltage	DC24V ±10%	
Rush current from power supply	10A (Rush current limiting circuit is provided)	
Cooling method	Natural air cooling	
Off-board tuning	Available (RCA only)	Not available
Backup memory	FRAM (256kbit) Number of rewrite: No limit	
I/O power supply	DC24V ±10%	
Number of I/Os	16IN/16OUT	
Pulse-train specification	Available (differntial type only: AK-04 is used for the open-collector type)	
Fieldbus specification	Available	
Serial communication	RS485: 1 channel (conforming to Modbus protocol)	
Ambient operating temperature	0 to 40°C	
Ambient operating humidity	85% RH or less (non-condensing)	
Protection degree	IP20	
Mass	Battery-less absolute/Incremental spec.: 230g, simple absolute spec.: 240g (incl. battery: 430g)	Incremental specification: 230g
	Absolute spec.: 240g (incl. battery: 260g)	—

Motor Power Capacity

		Motor type	Standard / High-accel/decel		Power-saving	
			Rated [A]	Max. [A]	Rated [A]	Max. [A]
ACON-CB	RCA/RCA2	10W	1.3	4.4	1.3	2.5
		20W	1.3	4.4	1.3	2.5
		30W	1.3	4	1.3	2.2
		20W(20S)	1.7	5.1	1.7	3.4
	RCL	2W	0.8	4.6	—	—
		5W	1	6.4	—	—
		10W	1.3	6.4	—	—
DCON-CB	RCD	3W	0.7	1.5	—	—

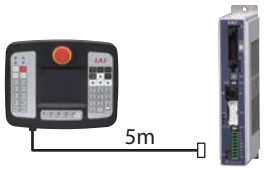
Options (Common to ACON-CB/DCON-CB)

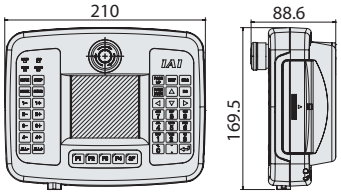
Teaching Pendant

Summary A teaching device that has position input, test operation, monitoring function, etc.

Model **TB-01-C**

Setting





Specification

Rated voltage	DC24V
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 50°C
Ambient operating humidity	20 to 85%RH (Non-condensing)
Environmental resistance	IP40 (initial state)
Mass	507g (TB-01 only)

PC Compatible Software (Windows Only)

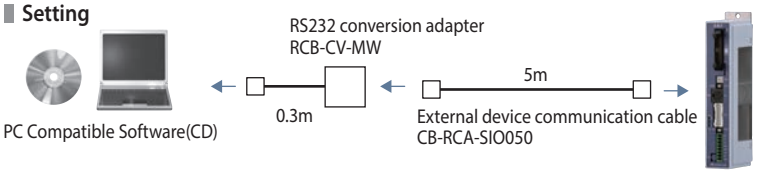
XP SP2 or later/Vista/7/8

Summary A startup support software for inputting positions, performing test runs, and monitoring. With enhancements for adjustment functions, the startup time is shortened.

Model **RCM-101-MW** (External device communication cable and RS232 conversion unit included)

ACON-CB/DCON-CB is supported by Ver.10.00.00.00 or later

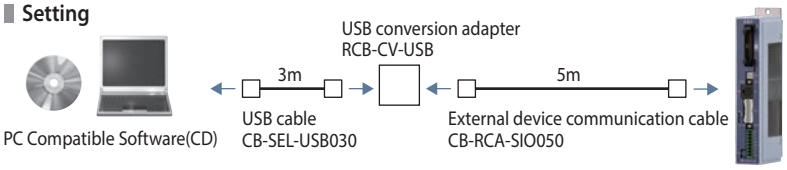
Setting



Model **RCM-101-USB** (External device communication cable, USB conversion adapter, and USB cable included)

ACON-CB/DCON-CB is supported by Ver.10.00.00.00 or later

Setting



Absolute Battery Unit

Summary Battery unit that comes with a simple absolute specification, used to back up the current controller position.

Model **SEP-ABU** (DIN rail mounting specification)
SEP-ABUS (screw mounting specification)

Specification

Item	SEP-ABU / SEP-ABUS
Ambient operating temperature and humidity	0 to 40°C (desirably around 20°C), 95% RH or below (non-condensing)
Operating atmosphere	Free from corrosive gases
Absolute battery	Model: AB-7 (Ni-MH battery/Life: approx. 3 years)
Connection cable to connect between the controller and the absolute battery unit	Model: CB-APSEP-AB005(length: 0.5m)
Mass	Battery box: 140g or less Battery: 140g or less

Replacement Battery (for Simple Absolute Spec.)

Summary The replacement battery for the simple absolute specification.

Model **AB-7**

Replacement Battery (for Absolute Spec.)

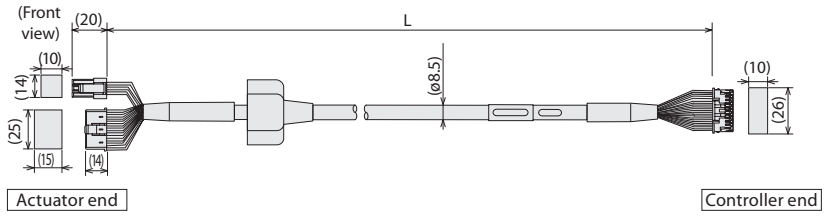
Summary The replacement battery for the absolute specification.

Model **AB-5**

Maintenance Parts

Model Number	CB-ASEP2-MPA□□□	Integrated Motor-Encoder Robot Cable	for [RCA]-[ACON-CB] Connection

*Please indicate the cable length (L) in □□□ (e.g. 080=8m). Maximum length = 20m



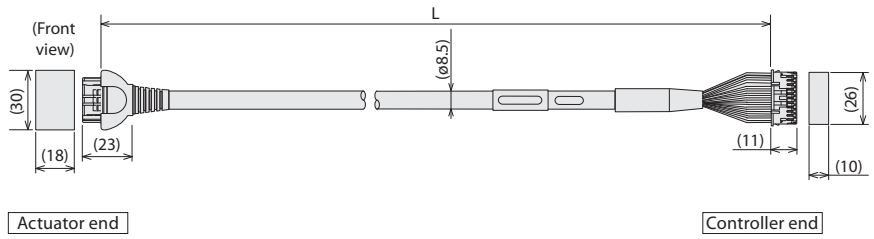
Minimum bending radius R = 68mm or more (Dynamic bending condition)

*Only robot cable is available for this model.

Actuator end Pin number		Controller end Pin number
1	Red [U]	1
2	Yellow [V]	2
	NC	3
	NC	4
3	Black [W]	5
	NC	6
18	Orange [BK+]	7
17	Gray [BK-]	8
7	Black [LS+]	9
16	Brown [LS-]	10
1	White [A+]	11
2	Yellow [A-]	12
3	Red [B+]	13
4	Green [B-]	14
10	Black (identification tape) [Z+]	15
11	Brown (identification tape) [Z-]	16
14	White (identification tape) [VCC]	17
13	Red (identification tape) [VPS/BAT-]	18
15	Yellow (identification tape) [GND]	19
6	Green (identification tape) [(spare)]	20
12	White [BAT+]	21
5	NC	22
8	NC	23
9	Shield [FG]	24

Model Number	CB-APSEP-MPA□□□	Integrated Motor-Encoder Robot Cable	for [RCA2/RCL]-[ACON-CB] Connection

*Please indicate the cable length (L) in □□□ (e.g. 080=8m). Maximum length = 20m



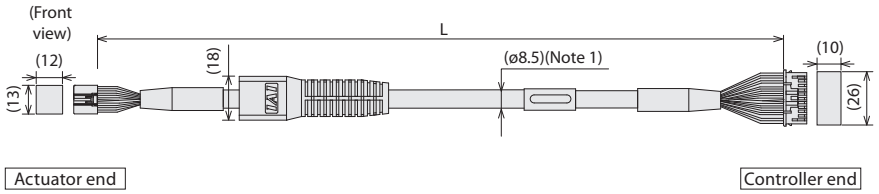
Minimum bending radius R = 68mm or more (Dynamic bending condition)

*Only robot cable is available for this model.

Actuator end Pin number		Controller end Pin number
A1	Black [øA] (U)	1
B1	White [VMM] (V)	2
A2	Brown [ø/A] (W)	5
B2	Green [øB] (-)	3
A3	Yellow [VMM] (-)	4
B3	Red [ø/B] (-)	6
A4	Orange [LS+] (BK+)	7
B4	Gray [LS-] (BK-)	8
A6	White [-] (A+)	11
B6	Yellow [-] (A-)	12
A7	Red [A+] (B+)	13
B7	Green [A-] (B-)	14
A8	Black [B+] (Z+)	15
B8	Brown [B-] (Z-)	16
A5	Black (identification tape) [BK+] (LS+)	9
B5	Brown (identification tape) [BK-] (LS-)	10
A9	Green (identification tape) [GNDLS] (GNDLS)	20
B9	Red (identification tape) [VPS] (VPS)	18
A10	White (identification tape) [VCC] (VCC)	17
B10	Yellow (identification tape) [GND] (GND)	19
A11	NC	21
B11	Shield [FG] (FG)	24
	NC	22
	NC	23

Model Number	CB-CAN-MPA□□□	Integrated Motor-Encoder Cable	for [RCD]-[DCON-CB] Connection
	CB-CAN-MPA□□□-RB	Integrated Motor-Encoder Robot Cable	

*Please indicate the cable length (L) in □□□ (e.g. 080=8m). Maximum length = 20m



Minimum bending radius R = 68mm or more (Dynamic bending condition)

Pin no.	Signal name	Pin no.	Signal name
3	øA/U	1	øA/U
5	VMM/V	2	VMM/V
10	ø_A/W	3	ø_A/W
9	øB/-	4	øB/-
4	VMM/-	5	VMM/-
15	ø_B/-	6	ø_B/-
8	LS+/BK+	7	LS+/BK+
14	LS-/BK-	8	LS-/BK-
12	-/A+	11	-/A+
17	-/A-	12	-/A-
1	A+/B+	13	A+/B+
6	A-/B-	14	A-/B-
11	B+/Z+	15	B+/Z+
16	B-/Z-	16	B-/Z-
20	BK+/LS+	9	BK+/LS+
2	BK-/LS-	10	BK-/LS-
21	LS_GND	17	LS_GND
7	VPS	19	VPS
15	VCC	15	VCC
13	GND	20	GND
19	—	22	—
22	—	21	—
23	—	23	—
24	FG	24	FG

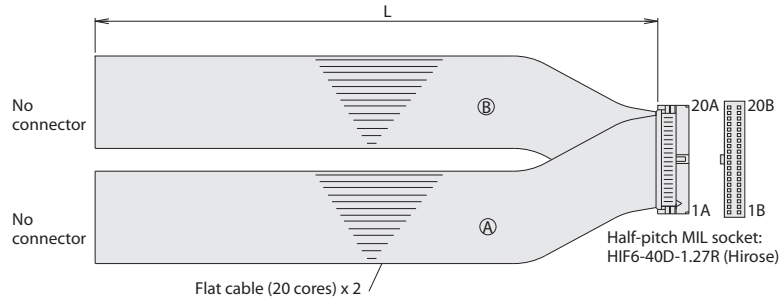
*The robot cable is designed for flex-resistance. Please use the robot cable if the cable has to be installed through the cable track.

Note 1) If the cable length is 5 m or more, the diameter of the non-robot cable becomes ø9.1 while that of the robot cable becomes ø10.

*The cable model code should be CB-CA-MPA□□□/CB-CA-MPA□□□-RB when "D3" is used as the applicable controller with RCD-RA1DA.

Model Number	CB-PAC-PIO□□□	I/O Flat Cable	

*Please indicate the cable length (L) in □□□ (e.g. 080=8m). Maximum length = 10m



HIF6-40D-1.27R

No.	Signal name	Cable color	Wiring
1A	24V	Brown-1	Flat cable Ⓐ (crimped)
2A	24V	Red-1	
3A	Pulse input	Orange-1	
4A		Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	Gray-1	
9A	IN4	White-1	
10A	IN5	Black-1	
11A	IN6	Brown-2	
12A	IN7	Red-2	
13A	IN8	Orange-2	
14A	IN9	Yellow-2	
15A	IN10	Green-2	
16A	IN11	Blue-2	
17A	IN12	Purple-2	
18A	IN13	Gray-2	
19A	IN14	White-2	
20A	IN15	Black-2	

No.	Signal name	Cable color	Wiring
1B	OUT0	Brown-3	Flat cable Ⓑ (crimped) AWG28
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Gray-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B	OUT15	Blue-4	
17B	Pulse input	Purple-4	
18B		Gray-4	
19B	0V	White-4	
20B	0V	Black-4	