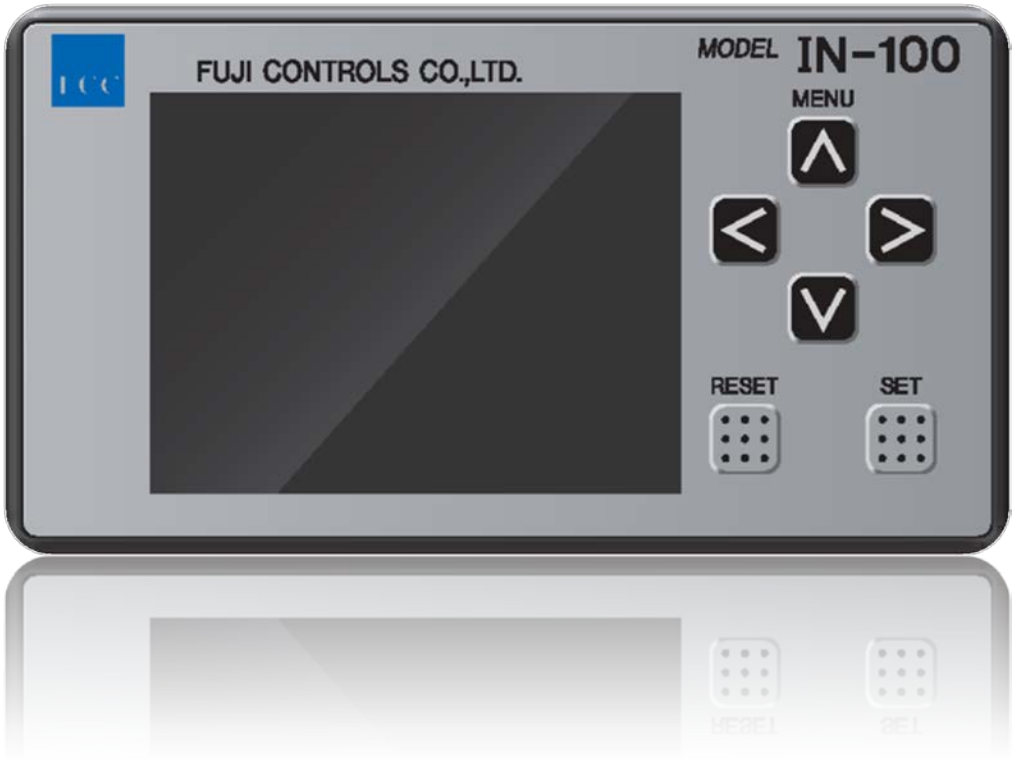
Innovation Indicator

IN-100 INSTRUCTION MANUAL

Ver. 1.05



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Introduction

Thank you for purchasing IN-100.

Please thoroughly read this Manual to make a full use of IN-100. We also recommend storing this Manual for ready use whenever necessary.

Features

- **CC-Link capability equipped as a standard feature**
- Compatible with 12 to 24 VDC power input
- 4 selectable patterns for high and low limit comparison value, set load arrival output, and hold function
- D/A output tuned to match the load value equipped as a standard feature
- DIN size matched to allow its incorporation to testing or manufacturing equipment
- Japanese and English switchable
- Capable of making static strain measurement. Easy to determine defects on the load cell side by plastic deformation

Disclaimer

Information and data on the Product described here are examples only. There is no guarantee of such information or data not violating any intellectual property or other rights of third parties. Therefore, please note that we shall take no responsibility for any liability that may occur from violation of third party intellectual property rights resulting from use of said information or data or from use of the Product or any related accessories.

Accessories

Please contact the retailer or Fuji Controls if any accessory listed below is missing or damaged.

Item	Qty	Check
Micro driver (−)	1	
Input/output connector (load cell terminal, external input/output terminal)	1 each	
Panel mounting jig (panel pre-mounted to the body proper)	2	
DIN rail mounting tool	1	
Power input terminal cover (cover pre-attached to the body proper)	1	
Instruction Manual	1	
CC-Link connector (connector pre-attached to the body proper)	1	
CC-Link connector cover (connector pre-attached to the body proper)	1	

Safety Instructions

This Manual provides precautions and instructions to be complied with by users of this Product so users may safely and properly use the Product. Use the Product based on understanding of these instructions.

Warnings

Be aware of potential risks to users of the Product, including death or serious injury, associated with the following items.

Power supply beyond the rated value to the Product may damage it, cause fire, or cause electric shock. Be sure to use the Product within the rated specifications.

Use of the Product in an atmosphere where there is a risk of explosion is dangerous. Avoid using the Product in such conditions, including the following:

- Places where there is corrosive gas or flammable gas
- Place where the Product is likely to be splashed or dripped on by water, oil or chemicals

Whenever the Product breaks down (abnormal smell or heat generation), immediately stop using it and remove the power plug. Otherwise, it may cause a fire or electric shock.

Do not disassemble the Product.

Sufficiently examine the wiring before supplying electric power to the Product.

Be sure to provide Type D grounding during installation.

When a panel or wire is cut, be sure not to let foreign matter such as metal chips inside.

Do not drop or subject the Product to strong impacts. Otherwise, the Product may be damaged. When that happens, stop using the Product and contact us.

When the Product is used in ways not described by the Manual, safe use may be compromised. Be sure to use the Product as specified by the Manual.

Cautions

⚠ The following items represent situations or conditions where injury to humans or physical properties is expected.

When conducting any of the following, be sure to remove the power plug or power cable:

- Wiring, cabling or connection of DC power, load cells, external input/output terminals, or terminal block to which to connect CC-Link
- Connecting of ground wires

When powering OFF and ON again, be sure to wait 5 or more seconds before powering on again.

Do not touch the rear panel or connector while the Product is on.

Check signal names when connecting power, frame ground, external input/output connector or CC-Link connector. Then wire correctly.

Avoid using the Product in the following places:

- Near power lines
- Where a strong magnetic field exists or occurs
- Where noise occurs such as static electricity or relay

Do not install the Product in any of the following environments:

- Where temperature or relative humidity exceeds the limit in the specifications
- Where there is a lot of salt or iron content
- Where vibration or impact is directly applied
- Outdoors or in altitudes exceeding 2,000 meters
- Where it receives radiation heat from a heat source
- Dusty places
- Places subject to extreme temperature changes
- Places subject to freezing or dew condensation

Do not continue to use the Product while it is damaged.

Since the Product is open type (built-in equipment), be sure to fix it to a frame or a hard foundation prior to use.

When the top cover or panel surface becomes dirty, remove the dirt with a soft cloth soaked with a small amount of diluted neutral detergent and wipe it with a tightly squeezed damp cloth. Do not use wipes or cloths soaked with thinner.

If the Product is used in ways not originally intended, safety may be compromised.

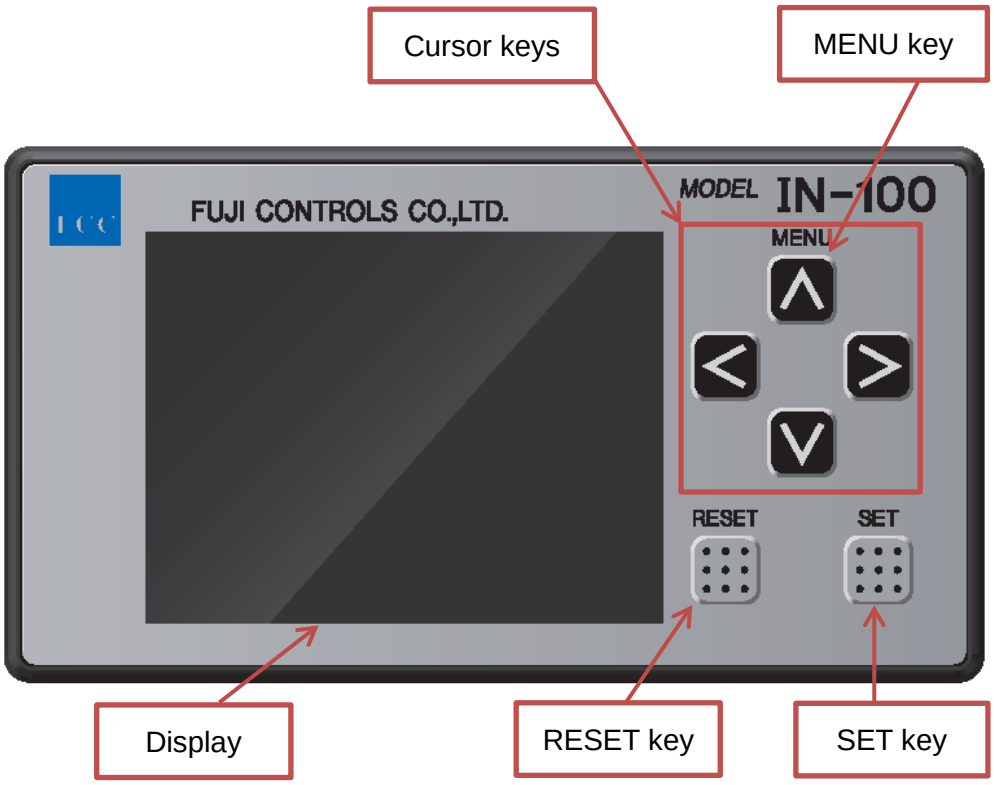
Be sure to use the DC power terminal cover while the Product is on.

Provide noise screening means when the Product is used in an environment subject to noise.

Table of Contents

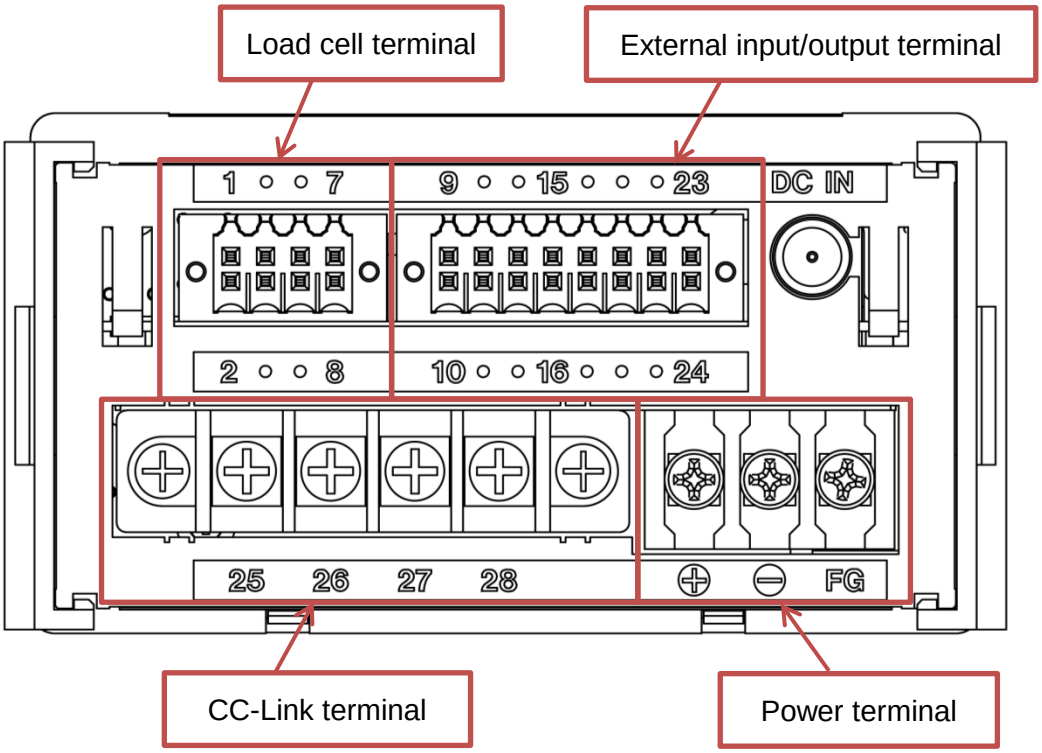
Appearance

Front Nomenclature and Functions



Name	Function
MENU key	When the instruction screen appears, press MENU key for setting screen.
Cursor keys	Use ∧∨<> keys to move the cursor or change the settings.
SET key	Use to determine changed settings and move to the next item.
RESET key	When setting screen appears, press to return to the screen 1 level above. Hold down to clear judgment results and set digital zero.
Display	Shows measurement values, settings, and judgment results.

Rear Nomenclature and Functions



Load Cell Terminal

No.	Terminal name	Function
1	N.C	Not in use. Do not connect.
2	N.C	Not in use. Do not connect.
3	+EXC	Connect +EXC of load cell.
4	−SIG	Connect −SIG of load cell.
5	−EXC	Connect −EXC of load cell.
6	+SIG	Connect +SIG of load cell.
7	SHIELD	Connect SHIELD of load cell.
8	N.C	Not in use. Do not connect.

External Input/Output Terminal

Input/ output	No.	Terminal name	Function
Analog output	9	V-OUT	Analog voltage output terminal.
	10	I-OUT	Analog current output terminal.
	11	COM	COM terminal for analog voltage and current voltage. **Do not short-circuit external input/output terminals Nos. 18 and 24.**
Input	12	RESET	Clears judgment results and sets digital zero.
	13	FREE	Constantly outputs comparison results.
	14	END	Judges and outputs results. ***You can change the input logic of external input/output terminal No. 14 END. See Page 55 Control input logic.***
	15	MODE	Not for use when Hold mode selection is set By menu. When Hold mode selection is By signal, it holds a sample with OFF (HIGH) and holds a peak with ON (LOW).
	16	SEL 1	Not for use when Setting Memory is set By menu. When Setting Memory is set to By signal, you can change Setting Memory between SEL 1 and SEL 2.
	17	SEL 2	
	18	COM	COM terminal of external input. **Do not short-circuit external input/output terminal Nos. 11.**
Output	19	OV	Produces output when it detects an anomaly of a load cell.
	20	LO	Produces output when the judgment result is LO.
	21	OF	Set load arrival output. Differs from the judgment result. Regardless of the input edge of END, it produces output when the set load arrives.
	22	HI	Produces output when the judgment result is HI.
	23	GO	Produces output when the judgment result is GO.
	24	COM	COM terminal of external output. **Do not short-circuit external input/output terminal Nos. 11.**

CC-Link Terminal

No.	Terminal name	Function
25	DA	Connect to DA of CC-Link.
26	DB	Connect to DB of CC-Link.
27	DG	Connect to DG of CC-Link.
28	SLD	Connect to SLD of CC-Link.

Power Terminal

No.	Terminal name	Function
+	DC + input	IN-100 power terminal. Connect 12 to 24 VDC.
−	DC − input	
FG	Frame ground	DC power frame ground terminal. Be sure to connect it.

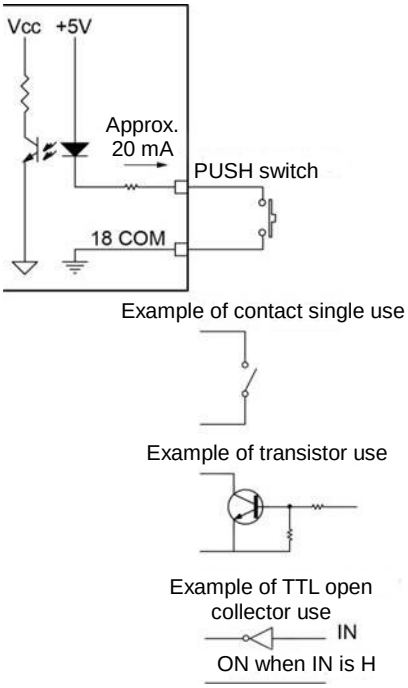
Input/Output Circuit

External input circuit inputs signals by short-circuiting and releasing each control input terminal and COM terminal.

Conduct short-circuiting with contacts or non-contacts (transistor, TTL open collector).

About 20 mA flows when the external contact is ON. When a transistor, for example, is used, select an element that has pressure resistance of 10 V or more and, when ON, allows about 40 mA to flow.

Do not apply voltage to the input terminal from outside.

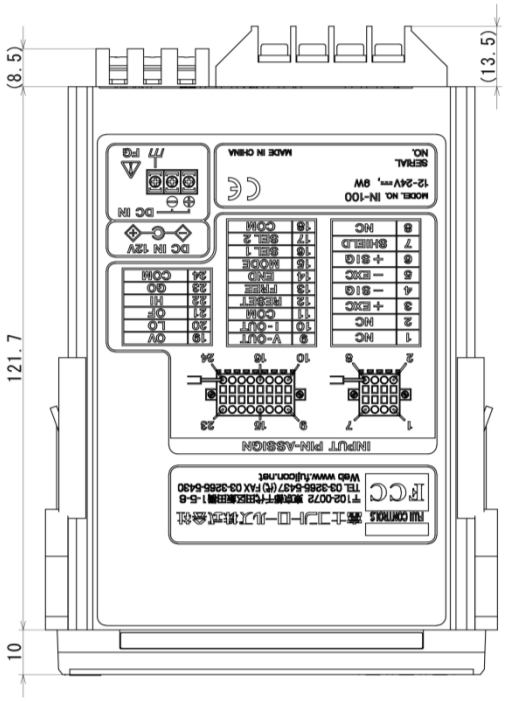


Output circuit is insulated from circuit by a photo coupler.

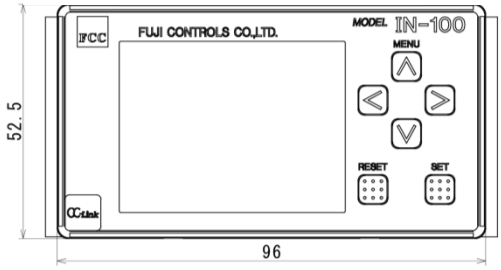
Maximum collector current 20 mA 30 V
Open collector output (NPN, current sink)

How to Install

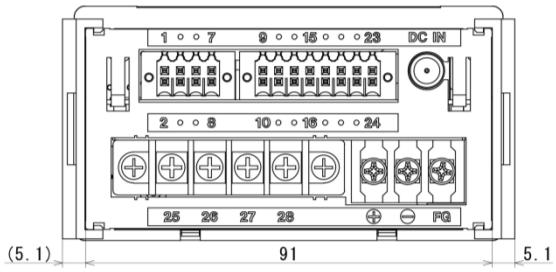
Appearance and Dimensions



Front view

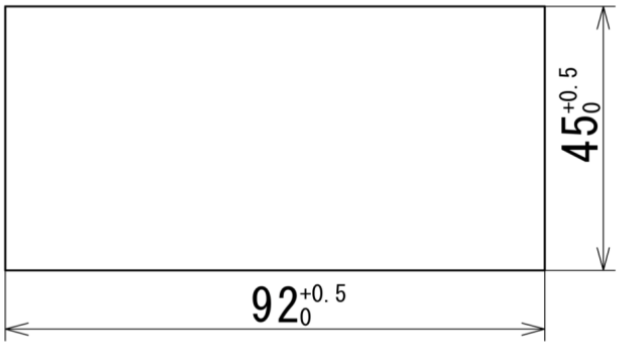


Rear view



Panel Mounting

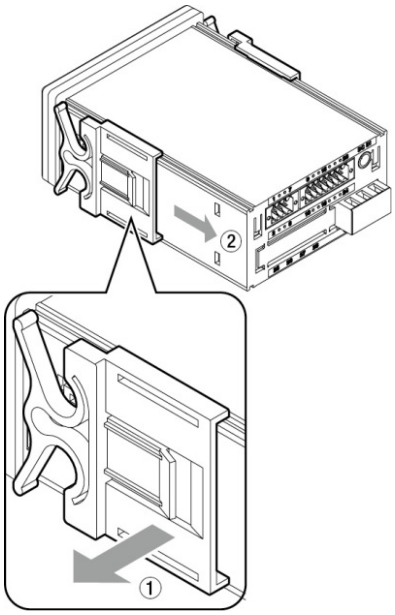
Size of Mounting Hole



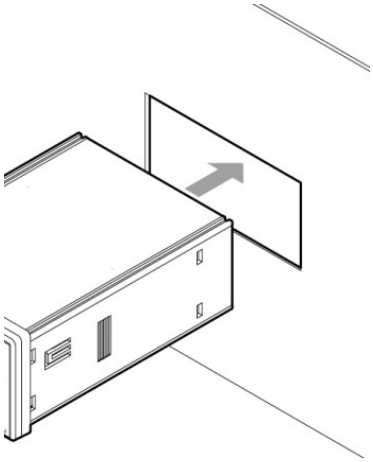
Recommended panel thickness is 0.8 to 5.0 mm.

Panel Mounting

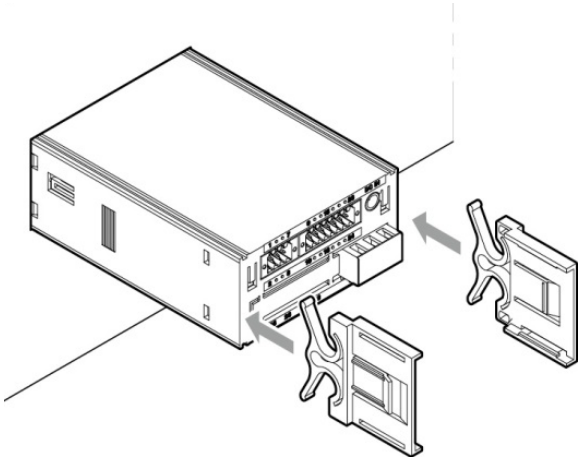
1. Remove both the left and right panel mounting jigs.



2. Set IN-100 in through the panel front.

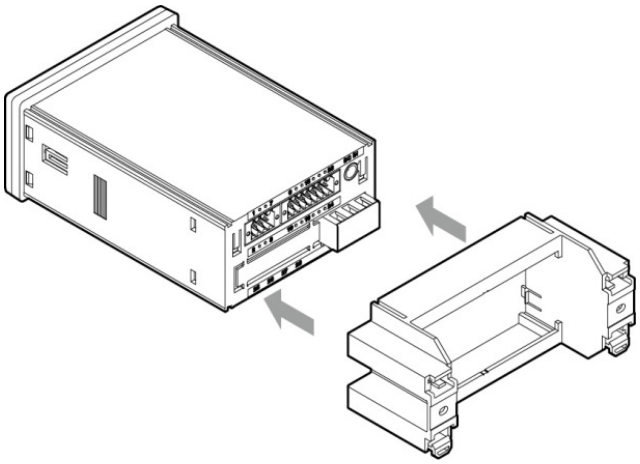


3. Attach left and right panel mounting jigs removed in 1 to the Product rear and fix them.

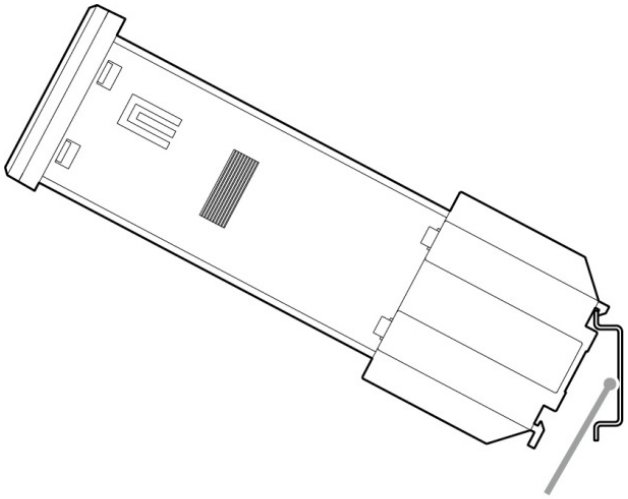


DIN Rail Installation

1. Install the DIN rail mounting adapter to IN-100.



2. Insert the DIN rail adapter diagonally and fix it.



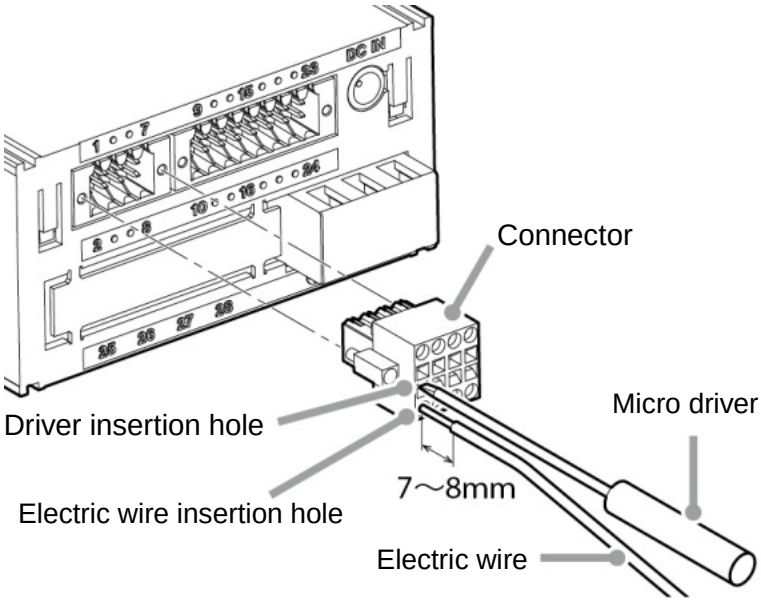
Connection

Connecting to Input/Output Terminal Block

Use a micro driver from Product accessories to connect the connector.

If a micro driver other than Product accessory is used, said driver must be within 2.5 mm in width and 0.4 mm in thickness.

Load Cell Terminal and External Input/Output Terminal



1. Strip wire 7 to 8 mm and twist it enough not to untwist the wire end.
   Applicable wires are 0.13 to 1.0 mm^2 (AWG28 to 18).
2. Insert accessory micro driver into the square hole located either above or under the wire insertion hole while directing the driver in the direction shown in the figure.
   Then, a metal piece that closes the wire insertion hole opens.
3. Insert the wire in the insertion hole without untwisting the wire end.
4. Pull out the micro driver.
5. Slightly pull the wire to confirm the wire has been firmly clamped.
6. Insert the connected plug to IN-100 and fix it with screws.

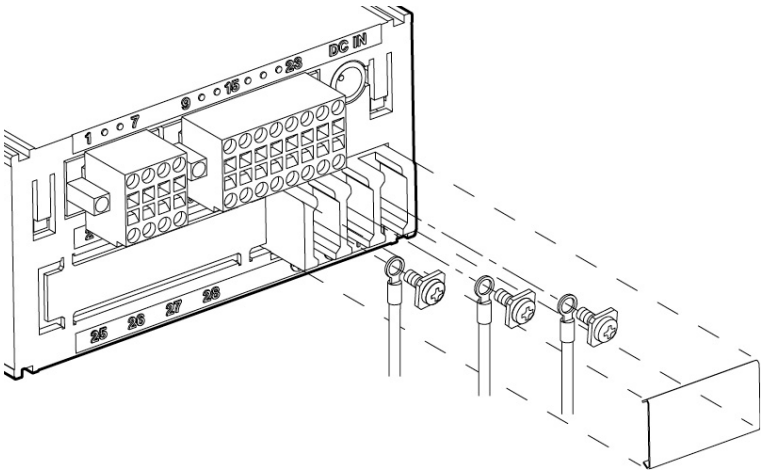
Power Source

DC power input voltage is between 12 and 24 V.

Connect it to the terminal block with crimping terminals (for M3; 6 mm or under in width).

It takes 10 seconds from power input to display start.

Be sure to attach the terminal cover to prevent risk of fire or electric shock.



How to Use

Supplying Power

Confirm the wires are correctly connected.

IN-100 has no power switch. Use an external switch or a circuit protector.

GO output turns on 10 seconds after power input, and display turns on.

When GO output is turned off, start using the Product.

Key Locking

To lock the keys, open load measurement values screen, simultaneously press RESET and SET keys and hold them for 3 seconds. Then **KEY** of **—LOCK—**, located bottom right, lights up.

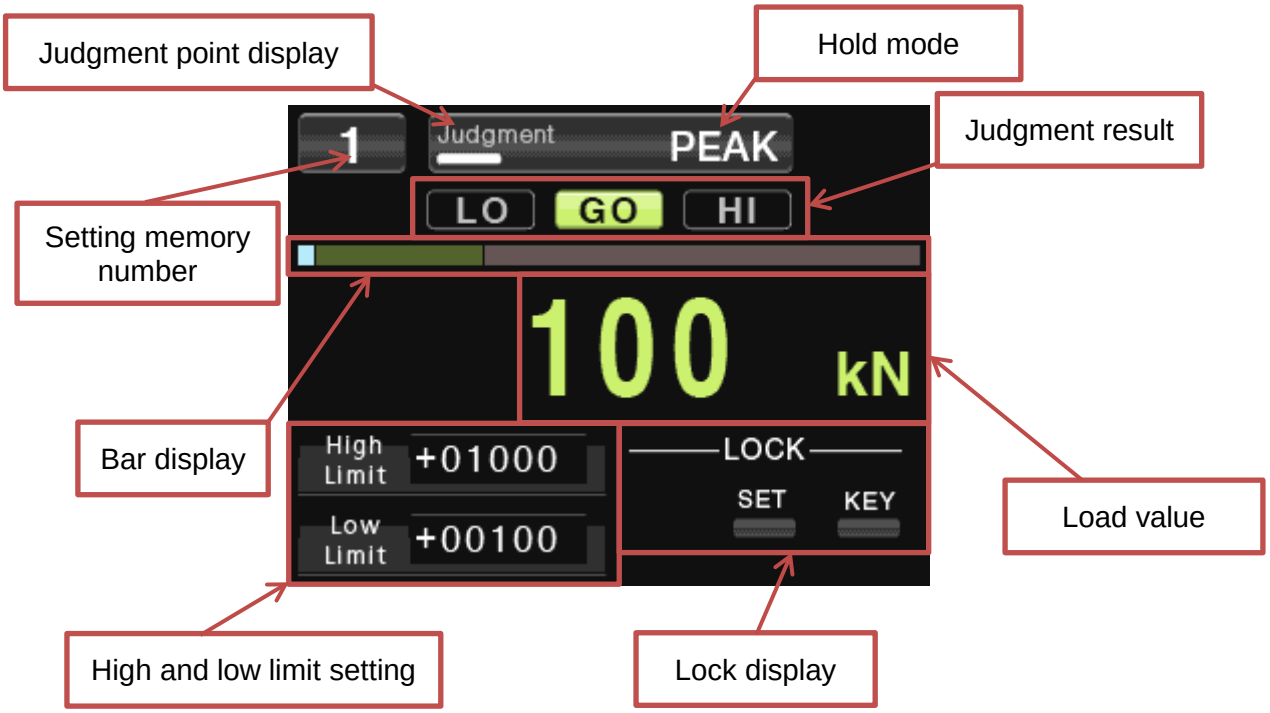
To cancel key lock, simultaneously hold down RESET and SET keys for 3 seconds. Then **KEY** of **—LOCK—**, located bottom right, turns off.

Setting Lock

You cannot lock settings in an ordinary situation. You may either lock settings from CC-Link or contact us.

Screen

Names and Functions



Name	Function
Judgment point display	Turns on while held.
Hold Mode	Displays **SAMPLE** in sample hold mode, **PEAK** in peak hold mode.
Setting Memory number	Displays the number of Setting Memory.
Judgment result	Displays the judgment results.
Bar display	Blue displays LO area, green GO area and pink HI area, respectively.
Load value	Displays the current load value or held load value. When the background is blue and characters are black, **LO** appears; when the background is black and characters are green, **GO**; and when the background is pink and characters are black, **HI**.
High and low limit setting	Set high and low limit comparison values are shown.
Lock display	When locked, **SET** is on. When the keys are locked, **KEY** is on.

Menu List

	Major category	Item	Reference page
MENU	Condition Setting	Filter	Page 43
		Control Input Check	Page 44
		Judge Output Check	Page 45
		Static Strain Disp. Mode	Page 46
		Select Data Output	Page 47
	Comparison Setting	Comp. Value Setting	Page 48
	Hold Function Setting	Hold Mode	Page 49
		Hold mode selection	Page 50
	System Setting	Setting Memory	Page 51
		D/A Converter	Page 53
		Control input logic	Page 55
		Brightness	Page 56
		Power Save Time	Page 57
		CC-Link	Page 58
		Languages	Page 59

Measurement of Load

When Constant Comparison Is OFF

What is "constant comparison OFF"

When external input/output terminal No. 13 FREE is OFF (HIGH), external input/output terminal No. 12 RESET is ON (LOW), edge is detected, hold load value is cleared, judgment result is cleared, digital zero is set, and measurement starts.

Input edge of external input/output terminal No. 14 END is detected, and measurement ends. At this time, the load is held, and the judgment result is output.

When switching from peak hold to sample hold, see Page 50 and Page49.

You can change the input logic of external input/output terminal No. 14 END. See Page 55 Control input logic.

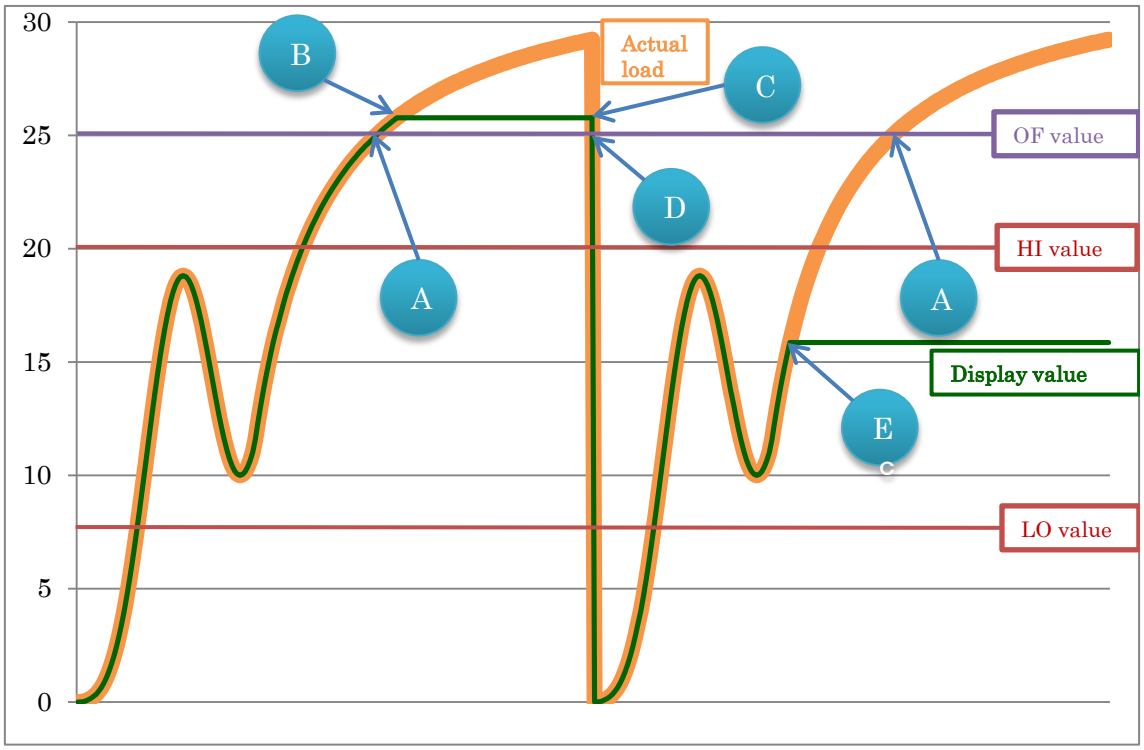
Sample Hold

DESCRIPTION OF OPERATIONS

This function displays load values from the start to the end of measurement in real time.

It holds the value just when measurement was completed and outputs the judgment result.

OPERATION FLOW



Point	Operation
A	OF output ON
B	End input (judgment output, holding of value) HI output ON
C	RESET input (digital zero, judgment clearing, hold clearing)
D	OF output OFF
E	End input (judgment output, holding of value) GO output ON

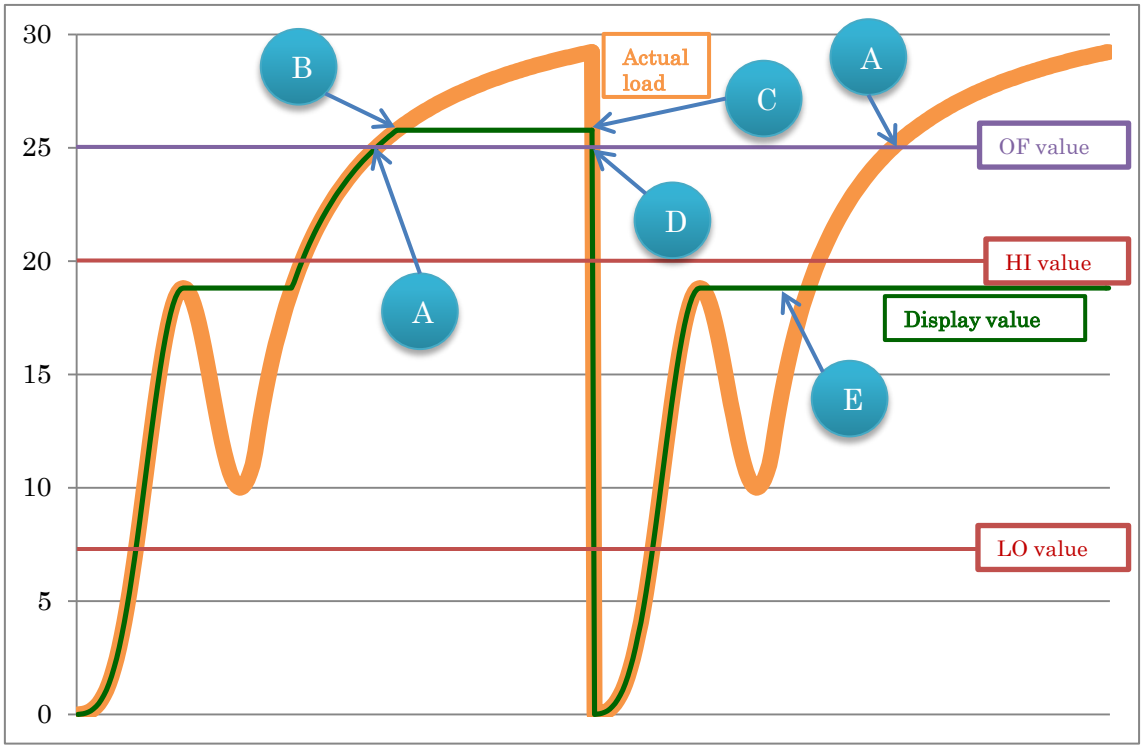
Peak Hold

DESCRIPTION OF OPERATIONS

This functions measures peak loads from the start to end of measurement.

It holds the value just until measurement is completed and outputs the judgment result.

OPERATION FLOW



Point	Operation
A	OF output ON
B	End input (judgment output, holding of value) HI output ON
C	RESET input (digital zero, judgment clearing, hold clearing)
D	OF output OFF
E	End input (judgment output, holding of value) GO output ON

When Constant Comparison Is ON

What is "constant comparison ON"?

When external input/output terminal No. 13 FREE is ON (LOW), external input/output terminal No. 12 RESET is ON (LOW), edge is detected, hold load value is cleared, digital zero is set, and measurement starts.

Judgment results are output in real time.

While external input/output terminal No. 14 END is receiving input, the load value and judgment result are held.

When switching from peak hold to sample hold, see Page 50 and Page 49.

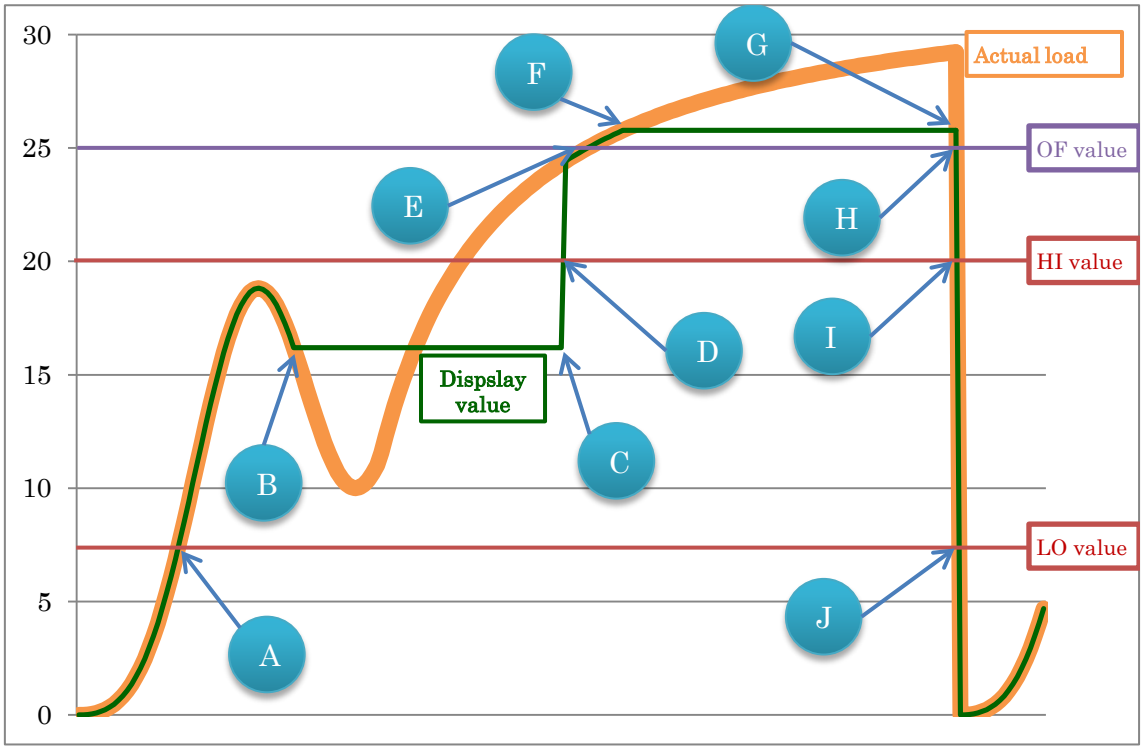
You can change the input logic of external input/output terminal No. 14 END. See Page 55 Control input logic.

Sample Hold

DESCRIPTION OF OPERATIONS

This functions measures loads in real time from the start of measurement and outputs the judgment result in real time.

OPERATION FLOW



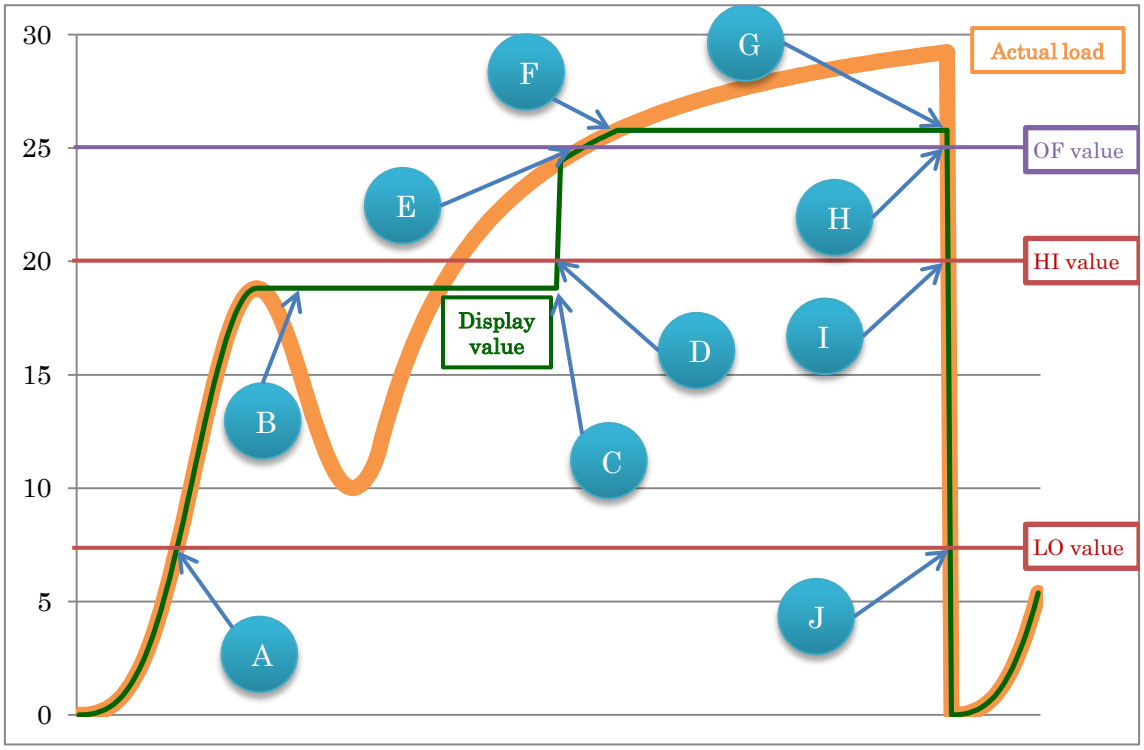
Point	Operation
A	LO output ON
B	END input (holding of value)
C	Release of END (release of value holding)
D	HI output ON
E	OF output ON
F	END input (holding of value)
G	Release of END (release of value holding) RESET input (zero reset)
H	OF output OFF
I	HI output OFF
J	LO output OFF

Peak Hold

DESCRIPTION OF OPERATIONS

This function measures peak loads from the start of measurement to the start of next measurement.

OPERATION FLOW



Point	Operation
A	LO output ON
B	END input (holding of value)
C	Release of END (release of value holding)
D	HI output ON
E	OF output ON
F	END input (holding of value)
G	Release of END (release of value holding) RESET input (zero reset)
H	OF output OFF
I	HI output OFF
J	LO output OFF

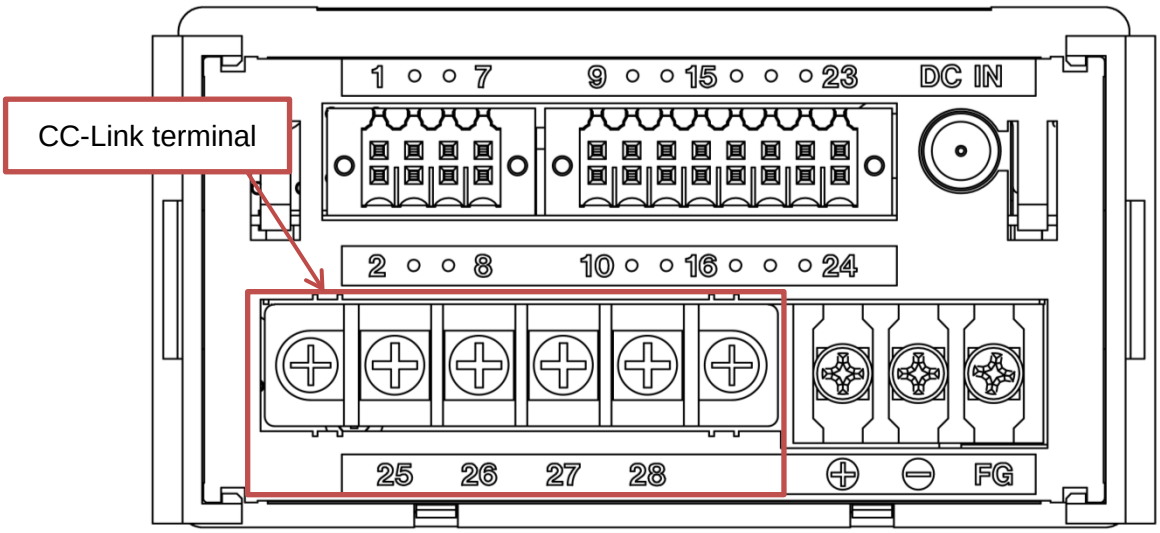
CC-Link Communication

Wire-saving feature of CC-Link allows any input/output of IN-100 to be turned on or off or acquire hold load values or real time load values.

CC-Link version of IN-100 is 1.10, and the type of station is remote device station.

See Page 58 CC-Link for the setting procedure.

Connection



No.	Signal name	Wire color
25	DA	Blue
26	DB	White
27	DG	Yellow
28	SLD	Grounding wire (shield)

Wire color indicates the color of the insulator of the CC-Link dedicated cable.

Removal of Terminal Block

Loosen 2 black screws on both ends of the terminal block and pull them out to remove them from the body proper.

Be sure to turn off power first prior to removal of the terminal block.

Connecting CC-Link Terminal

Use a dedicated cable for CC-Link for connection cable.

Connect the shield to SLD terminal.

Connect the end resistance between DA and DB.

Be sure to turn off power prior to wiring.

Be sure to put the terminal cover on after wiring.

Be aware that CC-Link receives commands only from the measurement display screen.

Address Map

Remote Resister

DATA MEMORY

Station	Output	Address	Name	Input	Address	Name	Area
1	RWr0000	0x2E0	Hold load value	RWw0000	0x1E0	OF value (set load arrival output)	Exclusive area
	RWr0001	0x2E1		RWw0001	0x1E1		
	RWr0002	0x2E2	Real time load value	RWw0002	0x1E2	HI value (High Limit)	
	RWr0003	0x2E3		RWw0003	0x1E3		
2	RWr0004	0x2E4	Reserved	RWw0004	0x1E4	LO value (Low Limit)	
	RWr0005	0x2E5		RWw0005	0x1E5		
	RWr0006	0x2E6	Error code	RWw0006	0x1E6	Reserved	
	RWr0007	0x2E7	Support error code	RWw0007	0x1E7		
3	RWr0008	0x2E8	Reserved	RWw0008	0x1E8	Reserved	
	RWr0009	0x2E9		RWw0009	0x1E9		
	RWr000A	0x2EA		RWw000A	0x1EA		
	RWr000B	0x2EB		RWw000B	0x1EB		
4	RWr000C	0x2EC	Read command data	RWw000C	0x1EC	Write command data	Common area
	RWr000D	0x2ED		RWw000D	0x1ED		
	RWr000E	0x2EE	Read command number	RWw000E	0x1EE	Write command number	
	RWr000F	0x2EF	Reserved	RWw000F	0x1EF	Reserved	

INPUT/OUTPUT

Station	Output	Address	Name	Input	Address	Name
1	RX0000	0x0E0	Respond to Exclusive area	RY0000	0x160	Request Exclusive area
	RX0001			RY0001		
	RX0002		Respond to Common area	RY0002		Request Common area
	RX0003		Respond to R/W	RY0003		Request R/W
	RX0004			RY0004		
	RX0005			RY0005		
	RX0006			RY0006		
	RX0007		CPU normal	RY0007		
	RX0008		Decimal position 1	RY0008		
	RX0009		Decimal position 2	RY0009		
	RX000A		Decimal position 3	RY000A		
	RX000B			RY000B		
	RX000C			RY000C		
	RX000D			RY000D		
	RX000E			RY000E		
	RX000F			RY000F		
1	RX0010	0x0E0	OF signal (set load arrival output)	RY0010	0x160	MODE
	RX0011		HI signal (High Limit)	RY0011		
	RX0012		GO signal (GO)	RY0012		RESET
	RX0013		LO signal (Low Limit)	RY0013		FREE
	RX0014			RY0014		END
	RX0015			RY0015		
	RX0016			RY0016		
	RX0017			RY0017		
	RX0018			RY0018		
	RX0019			RY0019		
	RX001A		Respond to Memory selection 1	RY001A		Request Memory selection 1
	RX001B		Respond to Memory selection 2	RY001B		Request Memory selection 2
	RX001C			RY001C		
	RX001D			RY001D		
	RX001E			RY001E		
	RX001F		OV signal (load cell anomaly)	RY001F		

2 | 3	RX0020 | RX005F	0x0E2 | 0x0E5	Reserved	RY0020 | RY005F	0x162 | 0x165	Reserved
4	RX0060 | RX006F	0x0E6	Reserved	RY0060 | RY006F	0x166	Reserved
	RX0070 | RX0079	0x0E7	Reserved	RY0070 | RY0079	0x167	
	RX007A		Error status flag	RY007A		
	RX007B		Remote Ready	RY007B		
	RX007C | RX007F		Reserved	RY007C | RY007F		

Commands

See Page 40 Reading/Writing Using Commands in Common Area for usage.

Function	Group	Setting name	Command no.	R/W	Setting
Execution		RESET	0000	W	12
		END	0000	W	13
		Measurement screen	0000	W	17
		Static strain display	0000	W	20
D/A	D/A Convertor	D/A Output Mode	1301	R/W	0: Voltage 1: Current
		D/A MAX. Voltage	1302	R/W	1～10
		D/A Zero	1303	R/W	-99999～99999
		D/A Full scale	1304	R/W	-99999～99999
Condition Setting	Filter	Low-path filter	2001	R/W	0: OFF 1: 3 Hz 2: 10 Hz 3: 30 Hz 4: 100 Hz 5: 300 Hz 6: 1000 Hz
		Select Num. of Moving Avg.	2002	R/W	0: OFF 1: 16 2: 32 3: 64 4: 128 5: 256 6: 256 7: 1024 8: 2048
	Select Data Output		2401	R/W	0: Output hold value 1: Output through
Comparison Setting	Comp. Value Setting	OF value (set load arrival output)	3001	R/W	
		HI signal (High Limit)	3002	R/W	
		LO value (Low Limit)	3003	R/W	
Hold Function Setting	Hold Mode	Can write when Hold mode selection is	4001	R/W	1: SAMPLE 2: PEAK

		manual.			
	Hold mode selection		4901	R/W	0: By menu 1: By signal

ystem Setting	Setting Memory		5001	R/W	0: By menu 1: By signal
			5002	R	0: Memory 1 1: Memory 2 2: Memory 3 3: Memory 4
	Control input logic		5901	R/W	0: Standard 1: Reversed
	CC-Link	Station Type	5101	R	0: 4 Station
		Station Number	5102	R	1 to 64
		Transmission Speed	5103	R	0: 156 kbps 1: 625 kbps 2: 2.5 Mbps 3: 5 Mbps 4: 10 Mbps
		Return Data Format	5104	R/W	0: BCD 1: Binary
		Select Memory by	5105	R/W	0: Manual 1: CC-Link
	Lock	Setting lock	5202	R/W	0: OFF 1: ON
		Key locking	5204	R/W	0: OFF 1: ON
	Brightness		5301	R/W	0: OFF 1: Dark 2: Normal 3: Bright
	Power Save Time		5302	R/W	0: OFF 1: 2 min. 2: 5 min. 3: 10 min. 4: 30 min.
	Languages		5303	R/W	0: Japanese 1: English

Load Data

For hold load values and real time load values, data format changes by setting either BCD or Binary at Return Data Format.

See Page 58 CC-Link for the setting procedure.

Real time load value and hold load value

MSB	4 bits	Status	See the following figure.
	4 bits	Decimal position	0: 0 1: 0.0 2: 0.00 3: 0.000 4: 0.0000
	4 bits	Reserved	0
	4 bits	5th digit	BCD/Binary
	4 bits	4th digit	BCD/Binary
	4 bits	3rd digit	BCD/Binary
	4 bits	2nd digit	BCD/Binary
LSB	4 bits	1st digit	BCD/Binary

STATUS

Status	Bit3	Bit2	Bit1	Bit0
0	Plus (+)	BCD display	Without input over	Real time load value
1	Minus (−)	Binary display	With input over	Hold load value

Memory Selection

Setting Memory selection does not work when "Manual" is set by "Select Memory by" in CC-Link settings. When selecting a setting memory on CC-Link, set Select Memory by to CC-Link.

See Page 58 CC-Link for details.

Changing Exclusive Area Values

Confirm that Request Exclusive area, Respond to Exclusive area, Request Common area, and Respond to Common area are all OFF.

When Request Exclusive area is ON, the Product judges that writing of Exclusive area data has been requested and starts writing of Exclusive area data. When writing of Exclusive area data is completed, Respond to Exclusive area is ON.

Exclusive area is only for writing. No reading is allowed.

When OF value (set load arrival output), HI value (High Limit), or LO value (Low Limit) is changed in the Exclusive area, all values are changed. When you want to change either one of them, use the appropriate command of the Common area.

1. Set any arbitrary target value to OF value (set load arrival output), HI value (High Limit), and LO value (Low Limit). Set these values as 32-bit signed binary values.
2. Turn ON Request Exclusive area.
3. Confirm Respond to Exclusive area is ON.
4. Turn OFF Request Exclusive area.
5. Confirm Respond to Exclusive area is OFF.
6. Confirm the values have been changed.

Reading/Writing Using Commands in Common Area

Confirm that Request Exclusive area, Respond to Exclusive area, Request Common area, and Respond to Common area are all OFF.
Then conduct the following process.

When Request Common area is ON, IN-100 judges whether it is "write" or "read" that it should execute depending on ON or OFF of R/W and then executes the command. When execution of the command is completed, the command data change to turn Respond to Common area ON.

When the command ended up being completed as error, Read command number becomes Oxffff, and the error code and error code auxiliary eventually change. See Page 42 List of CC-Link Error Codes.

READ

1. Write the command no. value in Write command no. Set values in 16-bit BCD.
2. Turn ON Request R/W.
3. Confirm Respond to R/W is ON.
4. Turn ON Request Common area.
5. Confirm Respond to Common area is ON.
6. As the value in Read command data has been changed, read this value.
   Set values as 32-bit signed binary values.
7. Turn OFF Request Common area.
8. Confirm Respond to Common area is OFF.

WRITE

1. Write the command no. value in Write command no. Set values in 16-bit BCD.
2. Write the target value in Write command data. Set values as 32-bit signed binary values.
3. Turn OFF Request R/W.
4. Confirm Respond to R/W is OFF.
5. Turn ON Request Common area.
6. Confirm Respond to Common area is ON.
7. As the value in Read command data has been changed, confirm value is the same as the data written in 2. Set values as 32-bit signed binary values.
8. Turn OFF Request Common area.
9. Confirm Respond to Common area is OFF.

List of CC-Link Error Codes

State	Error code	Support error code	Description
Normal	0	0	Normal
Equipment error	1	0	System error
Calibration error	2	0	Error has occurred in calibration processing.
		1	Calibration lock has been set.
		2	No calibration conducted.
Measurement error	3	0	−FULL (lower than the minimum setting display value)
		1	+FULL (higher than the maximum setting display value) On OF output
		2	−OVER FULL (greater than −AD maximum input)
		3	+OVER FULL (greater than AD maximum input)
		4	DA output exceeds the output range.
		5	DA output exceeds the output range.
Command error	4	0	Command execution error
		1	Setting lock
		2	Command No. error

Setting

Filter

What is "Filter"?

When load value is unstable, set a low-path filter or the number of moving average to stabilize the load value.

A low-path filter can remove instantaneous changes such as external noises and stabilize load values.

The function of the number of moving average calculates the average of loads for the set number to stabilize the load value.

How to set

1. Press MENU key.
2. Use △▽ key to select **Condition Setting**.
3. Press SET key.
4. Use △▽ key to select **Filter**.
5. Press SET key.
6. Use ◁▷ key to select the appropriate low-path filter. (default: 100)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again.
9. Use ◁▷ key to select the appropriate number of moving average. (default: OFF)
10. Press SET key and confirm the cursor has turned green.
11. Press SET key again to complete this operation.

Control Input Check

What is "Control Input Check"?

It can check ON or OFF status of each input.

When the signal is OFF, the display is **HIGH**. When it is ON, the display is **LOW**.

You cannot manually turn ON or OFF on the screen.

How to set

1. Press MENU key.
2. Use ▲▼ key to select **Condition Setting**.
3. Press SET key.
4. Use ▲▼ key to select **Control Input Check**.
5. Press SET key.
6. A list is shown.
7. Press RESET key to complete this operation.

Judge Output Check

What is "Judge Output Check"?

This function allows the user to turn on or off Judge Output manually from IN-100 body proper and check wiring.

OF is a set value load output signal, **HI** load HI-NG output, **GO** a load GOOD output, **LO** a load LO-NG output, and **OV** a load cell anomaly output.

How to set

1. Press MENU key.
2. Use ▲▼ key to select **Condition Setting**.
3. Press SET key.
4. Use ▲▼ key to select **Judge Output Check**.
5. Press SET key.
6. Use ▲▼ key to select OF, HI, GO, LO or OV.
7. Use SET key to output. When you want to turn off output, either let another output or return to the TOP screen.
8. Press RESET key to complete this operation.

Static Strain Disp. Mode

What is the "Static Strain Disp. Mode"?

It allows you to display static strain in μST (micro strain), the strain amount unit of load cell.
It is used to survey defects, such as eternal strain of load cell.

When a load value is dubious, check the value and contact us.

How to set

1. Press MENU key.
2. Use ∧∨ key to select **Condition Setting**.
3. Press SET key.
4. Use ∧∨ key to select **Static Strain Disp. Mode**.
5. Press SET key.
6. Use <> key to select **ON**. (default: OFF)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again.
9. Use ∧∨ key to select TOP on the upper part of the screen.
10. Press SET key.
11. Press RESET key to return to the normal display.

Select Data Output

What is "Select Data Output"?

IN-100 is fitted with the analog output function. You can select analog output mode.

When **Output Hold Value** is selected, voltage or current values interlinked with the display value are output in an analogous way.

When **Output Through** is selected, voltage or current values of loads that the load cell received regardless of the display value are output in an analogous way.

How to set

1. Press MENU key.
2. Use △▽ key to select **Condition Setting**.
3. Press SET key.
4. Use △▽ key to select **Select Data Output**.
5. Press SET key.
6. Use △▽ key to select Output Hold Value or Output Through.
   (default: Output Hold Value)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

Comp. Value Setting

What is "Comp. Value Setting"?

It allows you to set each of set load arrival output, high limit judgment value, and low limit judgment value.

OF value is a set load arrival output, **HI** is a high limit judgment value, and **LO** is a low limit judgment value.

When the measured value is smaller than LO value, it is judged LO. When LO value ≤ measured value ≤ HI value, it is judged GO.
When HI value is smaller than the measured value, it is judged HI, and each output is made from the external input/output terminal.

A set load arrival output is made when OF value is smaller than the measured value separately from the high or low limit judgment.

How to set

1. Press MENU key.
2. Use ∧∨ key to select **Comparison Setting**.
3. Press SET key.
4. Use ∧∨ key to select **Comp. Value Setting**.
5. Press SET key.
6. Set OF.
7. Use <> key to change the digit and ∧∨ key to change the value. (default: 1000)
8. Press SET key to determine the value of **OF** and set **HI**.
9. Use <> key to change the digit and ∧∨ key to change the value. (default: 1000)
10. Press SET key to determine the value of **HI** and set **LO**.
11. Use <> key to change the digit and ∧∨ key to change the value. (default: 100)
12. Press SET key to determine the value of **LO** and confirm all values have turned green.
13. Press SET key again to complete this operation.

Hold Mode

What is "Hold Mode"?

This function allows you to select how to display a value from the beginning to the end of load measurement.

When By menu is set by Hold mode selection, the mode of load value display is switched over between the peak hold mode and the sample hold mode.

PEAK is the peak hold mode, while **SAMPLE** the sample hold mode.

The peak hold mode holds and judges the maximum value of load from the beginning of load measurement to end signal.

The sample hold mode holds and judges the instantaneous load when end signal.

How to set

1. Press MENU key.
2. Use ▲▼ key to select **Hold Function Setting**.
3. Press SET key.
4. Use ▲▼ key to select **Hold Mode**.
5. Press SET key.
6. Use ▲▼ key to select PEAK or SAMPLE. (default: PEAK)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

Hold mode selection

What is "Hold mode selection"?

This function allows you to switch over between the peak hold mode and sample hold mode manually or by external input.

When By menu is selected, the mode set by the Hold Mode is effective.

When By signal is selected, set IN-100's external input/output terminal No. 15 MODE to OFF (HIGH) to set the sample hold mode and to ON (LOW) to set the peak hold mode.

The peak hold mode holds and judges the maximum value of load from the beginning of load measurement to end signal.

The sample hold mode holds and judges the instantaneous load when end signal.

How to set

1. Press MENU key.
2. Use △▽ key to select **Hold Function Setting**.
3. Press SET key.
4. Use △▽ key to select **Hold mode selection**.
5. Press SET key.
6. Use △▽ key to select By menu or By signal. (default: By menu)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

Setting Memory

What is "Setting Memory"?

This function allows you switch over 4 patterns of the hold mode, or high limit judgment (HI), low limit judgment (LO), set load arrival output (OF), and Hold Mode.

When By signal is selected, change external input/output terminal No. 16 SEL1 or No. 17 SEL2 with BCD input.

When By menu is selected, select by setting the Setting Memory of IN-100.

How to set

BY SIGNAL

1. Press MENU key.
2. Use △▽ key to select **System Setting**.
3. Press SET key.
4. Use △▽ key to select **Setting Memory**.
5. Press SET key.
6. Use △▽ key to select **By signal**. (default: By menu)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

BY MENU

1. Press MENU key.
2. Use ▲▼ key to select **System Setting**.
3. Press SET key.
4. Use ▲▼ key to select **Setting Memory**.
5. Press SET key.
6. Use ▲▼ key to select **By menu**. (default: By menu)
7. Press SET key and confirm the cursor set to **By menu** has turned green.
8. Press SET key again to select Memory.
9. Use ▲▼ key to select Memory 1, Memory 2, Memory 3 or Memory 4. (default: Memory 1)
10. Press SET key and confirm all cursors have turned green.
11. Press SET key again to complete this operation.

D/A Converter

What is "D/A Converter"?

This function allows you to set analog output that links to the display value or analog output of a load applied to the load cell.

It can change over data to output. See Page 47.

D/A output circuit and the circuit of IN-100 proper are insulated.

You can select the analog output range between 0 ± 10 V by V.

The current is from 4 to 20 mA. No minus output is allowed.

The conversion speed is 4,000 Hz.

D/A Zero outputs 0 V or 4 mA when the load is the set value.

D/A Full Scale outputs voltage as set by **D/A Max. Voltage** or 20 mA when the load is the set value.

Select either **Voltage** or **Current** for analog output. They cannot be output simultaneously.

D/A Max. Voltage is the maximum value of the analog output voltage. However, when a load exceeded the load set by **D/A Full Scale**, the function outputs 10% larger than **D/A Max. Voltage** and then outputs **DA OVER** message.

How to set

1. Press MENU key.
2. Use ⍓⍗ key to select **System Setting**.
3. Press SET key.
4. Use ⍓⍗ key to select **D/A Converter**.
5. Press SET key.
6. Set **D/A Zero** setting. A value when the measured value is zero will be changed.
7. Use ⍃⍄ key to change the digit and ⍓⍗ key to change the value.
   (default: +00000)
8. Press SET key and confirm the value has turned green.
9. Press SET key again to set **D/A Full Scale**.

10. Use ◁▷ key to change the digit and △▽ key to change the value. (default: rated load value)
11. Press SET key and confirm the value has turned green.
12. Press SET key again to set **D/A Output Mode**.
13. Use △▽ key to select Voltage or Current. (default: Voltage)
14. Press SET key and confirm the cursor has turned green.
15. Press SET key again to set **D/A Max. Voltage**.
16. Use ◁▷ key to change the digit and △▽ key to change the value. (default: 10)
17. Press SET key and confirm the value has turned green.
18. Press SET key again to test analog output voltage with **D/A CAL TEST**. No testing is possible when the **D/A Output Mode** is set to current.
19. Use ◁▷ key to change the digit and △▽ key to change the value.
20. Use SET key to output voltage. Output test can only be done once.
21. Press SET key again to test analog output current with **D/A CAL TEST**. No testing is possible when the **D/A Output Mode** is set to voltage.
22. Use ◁▷ key to change the digit and △▽ key to change the value.
23. Use SET key to output current. Output test can only be done once.
24. Press SET key again to complete this operation.

Control input logic

What is "Control input logic"?

This function allows you to switch over normal open (a contact) and normal close (b contact) of external input/output terminal No. 14 END signal.

When Standard is set, the Product comes to have the normal open (a contact) specification and operates with a rising edge.

When Reversed is set, the Product comes to have the normal close (b contact) specification and operates with a falling edge.

How to set

1. Press MENU key.
2. Use 🔼🔽 key to select **System Setting**.
3. Press SET key.
4. Use 🔼🔽 key to select **Control input logic**.
5. Press SET key.
6. Use 🔼🔽 key to select Standard or Reversed. (default: Standard)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

Brightness

What is "Brightness"?

This function allows you to adjust brightness of the backlight of the display.

OFF turns on the backlight with a standard brightness level for 5 seconds from key operation. Select brightness levels of either **Dark**, **Normal**, or **Bright**.

Only while the backlight is on, key operation is kept effective. While it is off, press an arbitrary key and start operation.

How to set

1. Press MENU key.
2. Use ▲▼ key to select **System Setting**.
3. Press SET key.
4. Use ▲▼ key to select **Brightness**.
5. Press SET key.
6. Use ◀▶ key to select OFF, Dark, Normal, or Bright. (default: Normal)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

Changing Power Save Time

What is "Power Save Time"?

When there is no key operation, this function turns off the backlight of the display.

Set the time to turn it off.

The levels of brightness to set follow the settings of Brightness.

Only while the backlight is on, key operation is kept effective. While it is off, press an arbitrary key and start operation.

How to set

1. Press MENU key.
2. Use ▲▼ key to select **System Setting**.
3. Press SET key.
4. Use ▲▼ key to select **Power Save Time**.
5. Press SET key.
6. Use ◀▶ key to select OFF, 2 min, 5 min, 10 min or 30 min. (default: OFF)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

CC-Link

What is "CC-Link"?

Wire-saving feature of CC-Link allows any input/output of IN-100 to be turned on or off or acquire hold load values or real time load values.

CC-Link version of IN-100 is 1.10, and the type of station is remote device station.

How to set

1. Press MENU key.
2. Use ▲▼ key to select **System Setting**.
3. Press SET key.
4. Use ▲▼ key to select **CC-Link**.
5. Press SET key.
6. Confirm **4 Station** is selected.
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again.
9. Use ▲▼ key to select **Station Number**. (default: 01)
10. Press SET key and confirm the cursor has turned green.
11. Press SET key again to select Transmission Speed with ▲▼ key. (default: 10M)
12. Press SET key and confirm the cursor has turned green.
13. Press SET key again to select Return Data Format with ▲▼ key. (default: BCD)
14. Press SET key and confirm the cursor has turned green.
15. Press SET key again to select Select Memory by with ▲▼ key. (default: Manual)
16. Press SET key and confirm the cursor has turned green.
17. Press SET key again.
18. Confirm **Internal ROM** is selected.
19. Press SET key and confirm the cursor has turned green.
20. Press SET key again.
21. The Link Status is shown. Confirm appropriate transmission has been done.
22. Press RESET key to complete this operation.

Languages

What is "Languages"?

IN-100 can switch display languages between Japanese and English.

How to set

1. Press MENU key.
2. Use 🔼🔽 key to select **System Setting**.
3. Press SET key.
4. Use 🔼🔽 key to select **Languages**.
5. Press SET key.
6. Use 🔼🔽 key to select Japanese or English. (default: Japanese)
7. Press SET key and confirm the cursor has turned green.
8. Press SET key again to complete this operation.

List of Error Messages

See Page 42 List of CC-Link Error Codes for CC-Link error messages.

Display	Definition
LOAD	ADC plus over
−LOAD	ADC minus over
FULL	Display plus over (greater than the maximum set value)
−FULL	Display minus over (greater than the maximum set value)
MINUS INPUT	Load cell input is negative.
PARAMETER ERROR	Incorrect set value exists.
ZEROLIMIT	Digital zero limit has been exceeded.
ERROR	Error has occurred.
DA OVER	D/A output exceeded the output range.
DA −OVER	D/A output exceeded the output range.
SYSTEM ERROR	System error has occurred.
INVALID OPERATION	Invalid operation

Specifications

Bridge voltage	10 VDC, 2.5 VDC ±10% (maximum 30 mA)
Signal input range	±3.2 mV/V
Sampling speed	About 4,000 times/sec
Digital filter	Select 3 Hz (−6 db/oct), 10, 30, 100, 300, 1,000 Hz (−12 db/oct), or None.
D/A output	Isolated output: 4,000 times/sec Voltage output: 0 ± 1 to 10 V, 1 V step Current output: 4 to 20 mA
Display	320 × 240 color TFT liquid crystal
Hold function	1 point hold Sample Hold Peak Hold
Setting memory	4 pattern of high and low limit comparison 4 patterns of set load arrival output
Photocoupler output	Max 30 V 20 mA
Power source	Rated 12 VDC to 24 VDC 9 W
Service temperature range	0 to 50°C, 35 to 85% RH, non-condensing
Storage temperature range	−10 to 70°C 60% RH, non-condensing
External dimension	W 96 mm × D 132 mm × H 53 mm; protrusions excluded
Mass	About 350 g