

OMRON

Model **F10-C20/C25**

Model **F10-C30/C35**

Model **F10-C50/C55**

PATTERN MATCHING SENSOR AMPLIFIER

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product.□

Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

PRECAUTIONS IN USING THE PRODUCT

When the product is used under the circumstances below, ensure adherence to the limitations of the ratings and functions. Also, take countermeasures for safety precautions such as fail-safe installations.

Use under the circumstances or environment which are not described in the instruction sheet.

Use for the equipment which require higher level of safety, such as nuclear devices, railroad, aircrafts, vehicles, combustion devices, amusement machinery, medical equipment, safety devices.

Use for the applications where death, serious injury or property damage is possible and extensive safety precautions are required.

Safety Precautions

Be sure to follow the safety precautions below for added safety.

- (1) Do not use the sensor under the environment with explosive or ignition gas.
- (2) Set the Sensor away from the high voltage machines or the high-tension lines to secure the safety of the operation and the maintenance.
- (3) keep the supply voltage within the specified range in this instruction sheet.
- (4) If the Sensor or cable has lock mechanisms, be sure to lock the mechanisms securely before use.
- (5) Never disassemble, repair nor tamper with the product.
- (6) Dispose of the product as industrial waste.
- (7) Do not short-circuit the load. Doing so may cause Sensor damage or malfunction.

Correct Use

Be sure to keep the followings to make full use of the Sensor function.

1. Conditions

- (1) Do not use the Amplifier under the following conditions.
 - In the place where the operating ambient temperature is not between 0 and 50 .
 - In the place where condensation may occur, because the ambient temperature changes are extreme.

- In the place where the operating ambient humidity is not between -35 and 85 % RH.
- In the place where corrosive gas, combustible gas, dust, salinity or iron powder exist.
- In the place where vibration or shock is directly transmitted to the product.
- In the place exposed to the direct sunlight.
- In the place where the spray of water, oil or chemicals exists.

(2) Mounting on a Flat Surface Directly

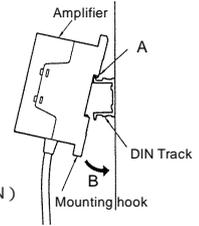
When mounting the Amplifier directly, install with the M4 screw using the flat washer together.

Make sure that the tightening torque of each screw on the Amplifier is no greater than 1.2 N · m.

(3) Mounting to DIN Track

To mount the Amplifier on the DIN Track, first enlarge part A, and then push the Amplifier in direction B.

To remove the Amplifier from the DIN Track, pull the mounting hook of the Amplifier toward you.



DIN Track
type PFP-100N2(OMRON)
End Plate
type PFP-M (OMRON)

(4) Mounting Space

The Amplifier radiates heat. If more than one Unit is installed side-by-side, make sure that there is a minimum space of 5 mm between adjacent Units.

2. Operating Temperature

The operating ambient temperature range of the Amplifier is between 0 and 50 .

Be sure to keep under the following conditions.

- Provide enough ventilation to the Amplifier in order to keep the ventilation well .
- Do not install the Amplifier close to heat-radiating devices such as heaters, transformers, and high-capacity resistors.
- Keep the operating ambient temperature under 50 .
- If the operating ambient temperature is close to 50 , use the

forced-air cooling fan or the air-conditioner to keep the temperature under 50 .

3. Noise Resistance

- Do not wire power lines or high-tension lines alongside lines of the Sensor in the same conduit, otherwise the Sensor may be damaged or malfunction due to induction. Be sure to wire the lines of the Sensor separately from power lines or high-tension lines or within an exclusive, shielded conduit.
- If power lines with high current for motors are wired close to the Amplifier, make sure that the Amplifier operates normally and take proper measures so that the power lines will not have a bad influence on the operation of the Amplifier.
- If a standard switching regulator is connected to the Sensor, be sure to ground the FG (frame ground) and G (ground) terminals of the switching regulator. The Sensor may malfunction due to switching noise that will be generated from the switching regulator if these terminals are not grounded.
- An extension cord of the Amplifier can be used provided that the thickness and length of the wire are 0.3 mm² min. and 20 m max. respectively.
- Do not bring the connector on the Amplifier and the metal screws on the bottom of the Amplifier into contact with other metals, because the connector and the bottom-metal- screws of the Amplifier are connected internally to 0-V terminal of the Amplifier.

4. Maintenance

- Organic solvents may damage the casing of the Amplifier, which is made of ABS resin. Do not use any other organic solvent (paint thinner, benzene or alcohol etc.) to clean the product.

5. Others

- The Sensor is ready to operate within 1 sec after the Sensor is turned on. If the Sensor and load are connected to separate power supplies, be sure to turn on the Sensor first.
- Do not disconnect or connect the Head while the Sensor is turned ON.

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1. Specifications/Functions

General Specifications

Item	F10-C20 / C25 / C30 / C35 / C50 / C55
Operating temperature	0 to 50
Operating humidity	35 % to 85 % RH (with no condensation)
Storage temperature	-25 to 65 (with no icing)
Operating environment	With no corrosive gas
Input power supply	+21.6 to 26.4 V DC (with ripple (p-p) 10%)
Current consumption	300 mA max.
Insulation resistance	20 M ohm min. (at 500 V DC)
Dielectric strength	1,000 V AC at 50 / 60 Hz 1 min
Degree of protection	IEC60529 IP40
Vibration resistance	10 to 150 Hz, 0.75-mm max. single amplitude or 100 m/s ² -max. for 32 min each in X, Y, and Z directions
Shock resistance	Peak acceleration : 300 m/s ² 3 times each in X, Y, and Z directions
Cord length	2 m
Casing material	ABS
Weight	Approx. 300 g with pack case (only Amplifier with cable : approx. 200 g)
Appurtenance	Instruction sheet (this manual)

Performance Specifications

Item	F10-C20 / C25	F10-C30/C35/C50/C55
Measurement item	Pattern measurement	
Automatic teaching function	Yes	
Storage temperature	- 25 to 65 (with no icing and condensation)	
Model size	Normal or wide (selectable)	
Measurement processing time	3.6 ms in normal wide and 10.8 ms in wide mode (continuous measurement)	
Number of registered models	1 model	1 model per 1 bank
bank switching	1 bank	8 banks
Output switching	Concord output : Output turns ON, if being concordant with registered model Discord output : Output turns ON, if not being concordant with registered model	
Output off-delay function	20 ms, 40 ms (default), 60 ms, 80 ms, 100 ms, 120 ms, 140 ms, 160 ms	

Head interface (1 channel)	Available Head : F10-S30R, or F10-S15R, or F10-S05R, or F10-S15R
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Operation Interface

Item	F10 - C20/C25/C30/C35	F10 - C50/C55
Teaching button	Yes	
Select button	UP/DOWN	
Mode selector	TEACH/MON/RUN	
Auto-teaching selector	OFF/ON	
Model size selector	NORMAL / WIDE	
Off-delay timer selector	Timer ON / OFF	
Concord or discord output selector	Concord / Discord	
External input selector	No	LINE/RS-232C · 422

External I/O Interface

Item		F10 - C20/C25/C30/C35	F10 - C50/C55
Line Output	Control output	Yes	
	Enable output	Yes	
Line Input	External trigger input (with minimum pulse width of 1 ms)	Yes	
	Continuous measurement	Yes	
	Moving object teaching input	Yes	
	Stationary object teaching input	Yes	
	bank switching input	No	Yes

•External Output Specifications

Item	NPN open collector output type F10-C20 / C30 / C50	PNP open collector output type F10-C25 / C35 / C55
Load voltage	30 V max.	
Load current	50 mA max.	
Residual voltage	1.2 V max.	2.0 V max.

•External Input Specifications

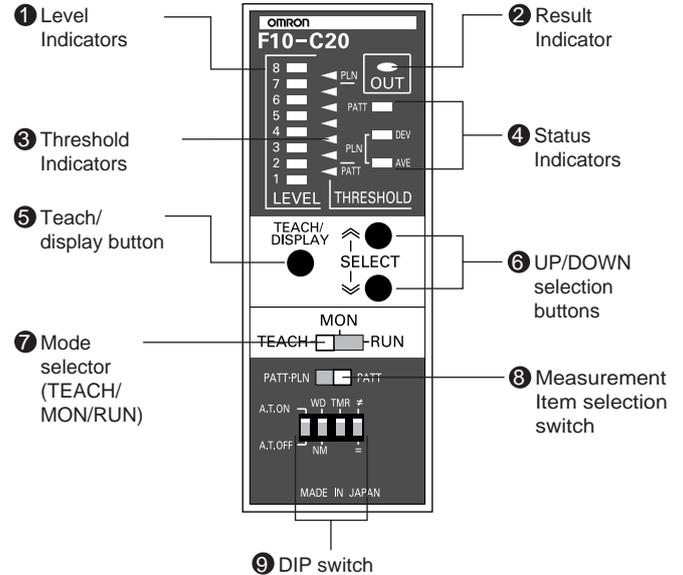
Item	NPN open collector output type F10-C20 / C30 / C50	PNP open collector output type F10-C25 / C35 / C55
Input is ON	Short circuited to 0 V with short-current of 1 mA max. or 1.5 V max.	Short-circuited to Vcc or 9 V min. with max. input voltage +26.4 V DC
Input is OFF	Open or input voltage of 5 V min. (Max. input voltage : 26.4 V DC)	Open or input voltage of 5 V

Serial Communication Interface (only F10-C50 / C55)

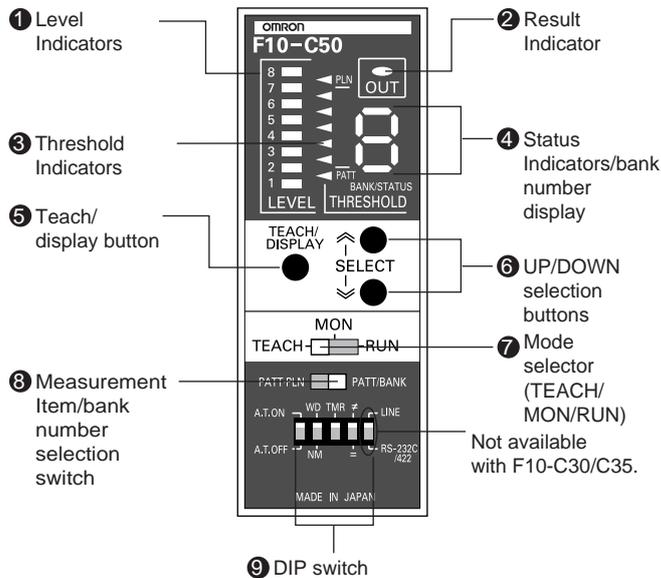
Item	F10 - C50/C55
Interface	RS-232C/422
Baud rate	1200bps, 2400bps, 4800bps, 9600bps 19200bps, 38400bps (default)
Data length (fixed)	8bits
Parity (fixed)	Non
Stop bit (fixed)	1bit
Delimiter (fixed)	CR
Flow control(fixed)	Non
Number of connected amplifier	RS-422 : 31 max. with using Link-Adapter
Acceptable Cable	F10-VR2 (RS-232C) or F10-VR4 (RS-422)

2. Components

Amplifiers F10-C20/C25



F10-C30/C35/C50/C55



- 1 Displays measurement values (degree of conformity with the registered model).
- 2 ON :Lit
OFF:Not lit

- 3 Displays the threshold.

- 4 Displays type of value displayed on the level indicator.

F10-C20/C25

PATT(Pattern measurement): Degree of conformity with model
 PLN(Plain measurement) — DEV : Contrast
 AVE : Average density

F10-C30/C35/C50/C55

 (Pattern measurement) : Degree of conformity with model
 (Plain measurement) : Contrast
 (Plain measurement) : Average density

Also displays bank number for F10-C30/C35/C50/C55

- 5 Starts teaching.
Switches display item.
- 6 Changes the threshold value.
Changes measurement item selection level for plain measurement.
Changes bank number for F10-C30/C35/C50/C55.
- 7 TEACH: Teaching Mode
MON : Monitor Mode
RUN : Run Mode

8 Changing Measurement Items

PATT-PLN PATT
 PATT/BANK

Automatically switches between pattern measurement and plain measurement depending on the taught model.

PATT-PLN PATT
 PATT/BANK

Executes pattern measurement only.

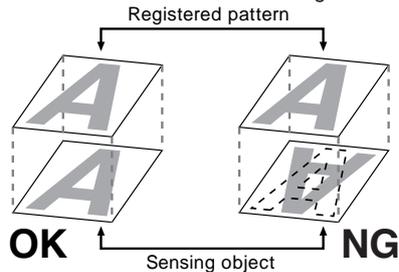
Bank Selection Mode (F10-C30/C35/C50/C55)

PATT-PLN PATT/BANK

Enters the mode for selecting and setting the bank in TEACH Mode

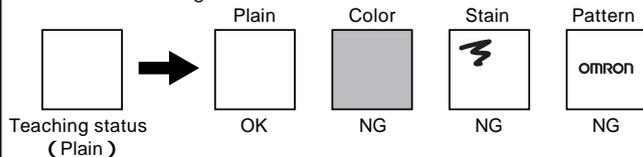
pattern measurement

Measures the degree with which the pattern and the detected image match to differentiate OK and NG images.

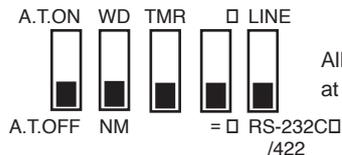


Plain Measurement

Determines the contrast and average density to differentiate OK and NG images.



9 DIP Switch



All the DIP switch pins are set to OFF at the factory.

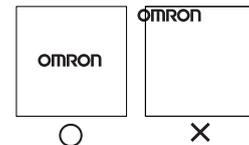
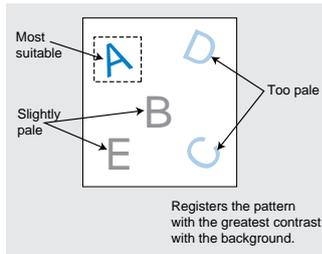
Automatic Teaching

- A.T.ON : Teaching area automatically selected
- A.T.OFF : Teaching area fixed

A.T.ON

Automatically selects the pattern most suitable for the model. The part within the detection range where the target is taken as the most suitable pattern for the model.

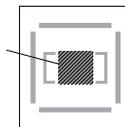
*If the pattern is at the very edge of, or slightly outside, the detection range, it may not be correctly taught. Make sure the pattern is as close as possible to the center of the detection range.

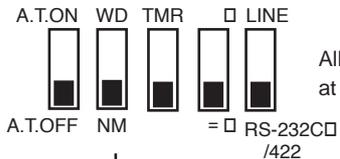


A.T.OFF

Registers only the pattern within the frame as the model.

Registers the pattern within the frame as the model.



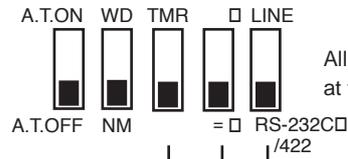
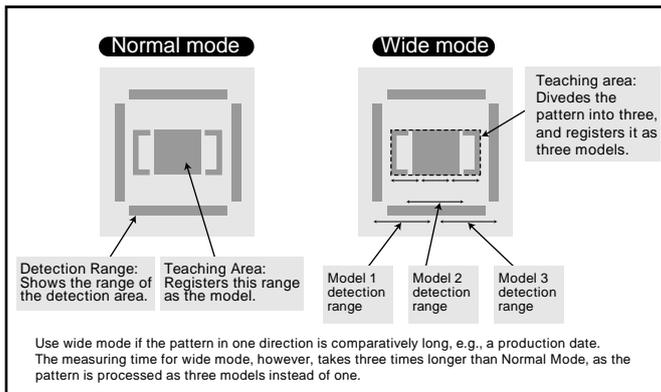


All the DIP switch pins are set to OFF at the factory.

• Model Size

WD : Wide mode

NM : Normal mode



All the DIP switch pins are set to OFF at the factory.

OFF Delay Timer

TMR : Delays the output operation when the control output goes from ON to OFF (Default value is 40ms. Refer to the Operation Manual for the Unit for changing procedure).

No Marking : Timer OFF.

Matching/Not Matching

: Output ON when object does not match registered model.

= : Output ON when object match registered model.

External Input (F10-C50/C55 only)

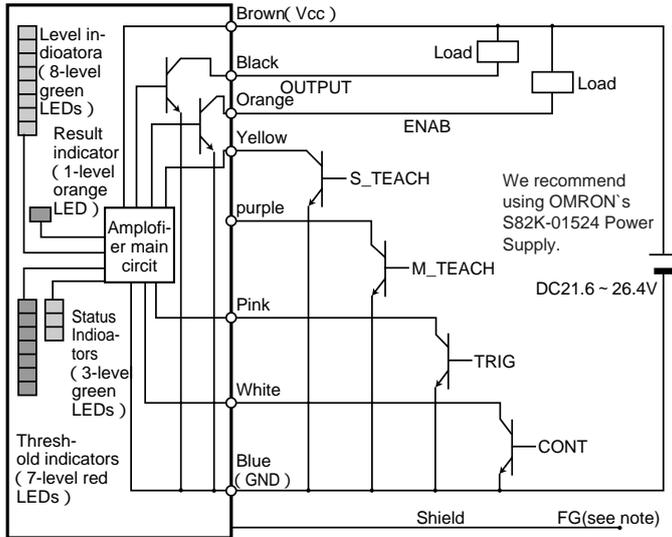
LINE : Executes external input in RUN mode via input line.

RS-232C/422 : Executes external input in RUN mode via serial communications.

3. I/O Circuit Diagram

F10-C20 NPN Models

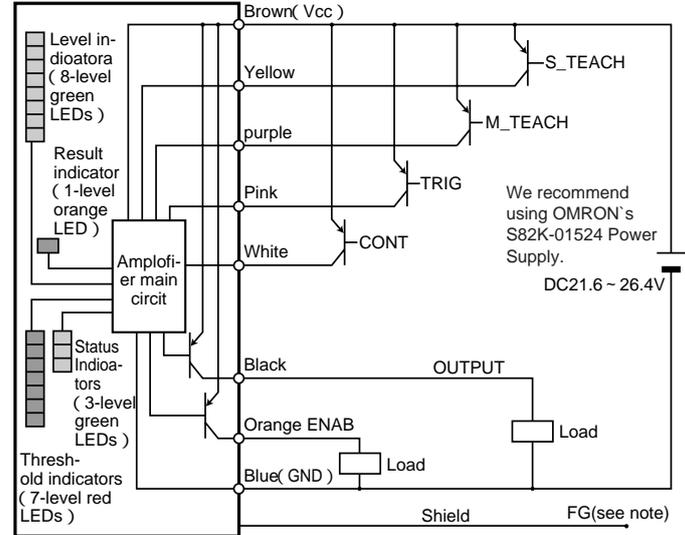
There are gray, green, and red input lines, but they are not used with this model. Take steps to ensure that these lines will not be short-circuited with other lines.



Note: Ground or connect the shielded cable to 0V.
The shield is not connected to the interior or casing.

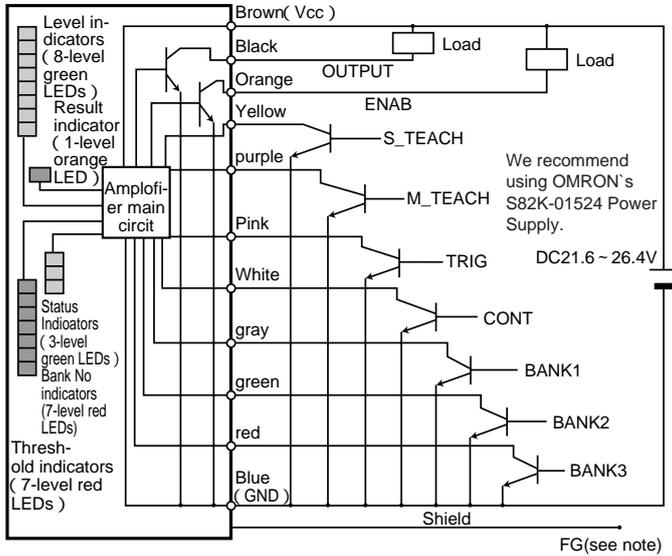
F10-C25 PNP Models

There are gray, green, and red input lines, but they are not used with this model. Take steps to ensure that these lines will not be short-circuited with other lines.



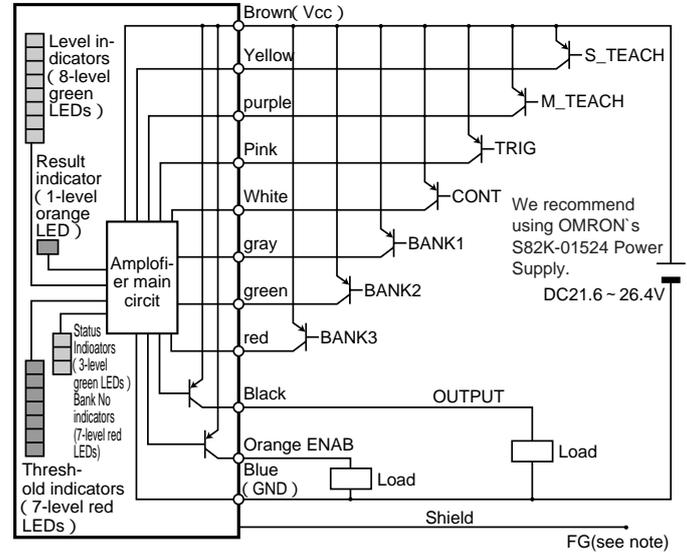
Note: Ground or connect the shielded cable to 0V.
The shield is not connected to the interior or casing.

F10-C30/C50 NPN Models



Note: Ground or connect the shielded cable to 0V.
The shield is not connected to the interior or casing.

F10-C30/C50 PNP Models



Note: Ground or connect the shielded cable to 0V.
The shield is not connected to the interior or casing.

I/O Signals

Signal	Function
OUTPUT	Control output
ENAB	Enabled output
S_TEACH	Stationary object teaching input
M_TEACH	Moving object teaching input
TRIG	Measurement trigger input
CONT	Continuous measurement input
BANK1	Bank switching input (F10-C30/C35/C50/C55)
BANK2	
BANK3	

•All input signals are enabled in RUN mode only.

Switching Banks (F10-C30/C35/C50/C55)

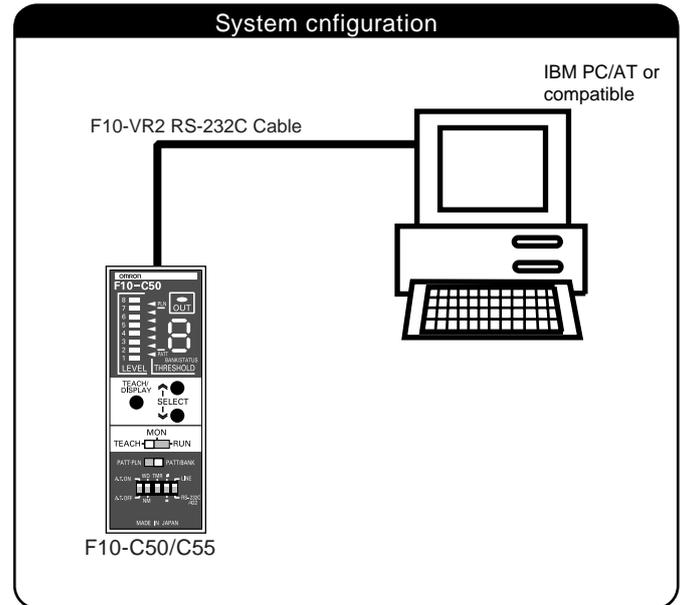
You can switch banks by connecting BANK1 to BANK3 as shown below.

Bank No	BANK1	BANK2	BANK3
Bank 0	OFF	OFF	OFF
Bank 1	ON	OFF	OFF
Bank 2	OFF	ON	OFF
Bank 3	ON	ON	OFF
Bank 4	OFF	OFF	ON
Bank 5	ON	OFF	ON
Bank 6	OFF	ON	ON
Bank 7	ON	ON	ON

4. Connection of Serial Communication

You can input the measurement trigger and output the measurement results via an RS-232C port. You can also back up the settings in an IBM PC/AT or compatible. Refer to the Operation Manual for the Unit for details on communications commands.

1:1 Connection

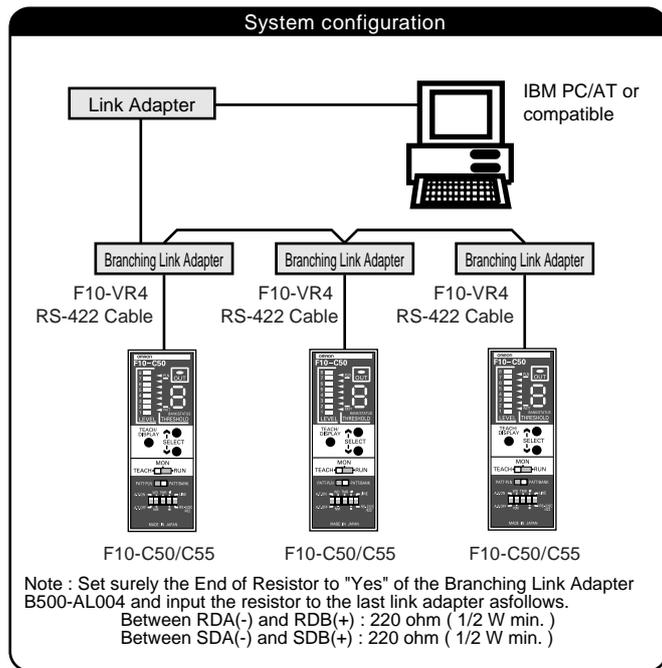


Multidrop Connections

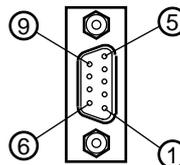
A maximum of 31 F10-C50/C55 Sensors can communicate with an IBM PC/AT or compatible by connecting through RS-232C/422 converters.

Recommended Link Adapters (manufactured by OMRON)

Link Adapter	B500-AL004
Branching Link Adapter	B500-AL001



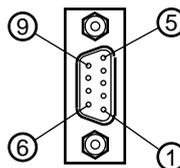
- F10-VR2
RS-232C Cable: D-sub 9-pin connector (2 m)



Pin No.	Signal	Name
2	SD(TXD)	Send data
3	RD(RXD)	Receive data
5	SG(GND)	Signal ground

Note: Signal and name are in reference to the F10.

- F10-VR4
RS-422 Cable: D-sub 9-pin connector (2 m)



Pin No.	Signal	Name
1	RDB(+)	Receive data (+)
3	SG(GND)	Signal ground
5	SDB(+)	Send data (+)
6	RDA(-)	Receive data (-)
9	SDA(-)	Send data (-)

Note: Signal and name are in reference to the F10.

- Please cover serial-communication-connector with the attached cap, when not using.
- Please fix surely the cable in order not to take off the connector.

5. Setting Procedure

5.1 TEACH Mode

- 1 Set the mode selector to TEACH.
- 2 Make the automatic teaching and model size settings on the DIP switch.
 - ➔ If using an F10-C30/C35/C50/C55, go to step 3 to set the bank number.
 - If using an F10-C20/C25, go to step 5
- 3 Set the measurement item/bank number selection switch to PATT/BANK. Bank No. 0 will be displayed.



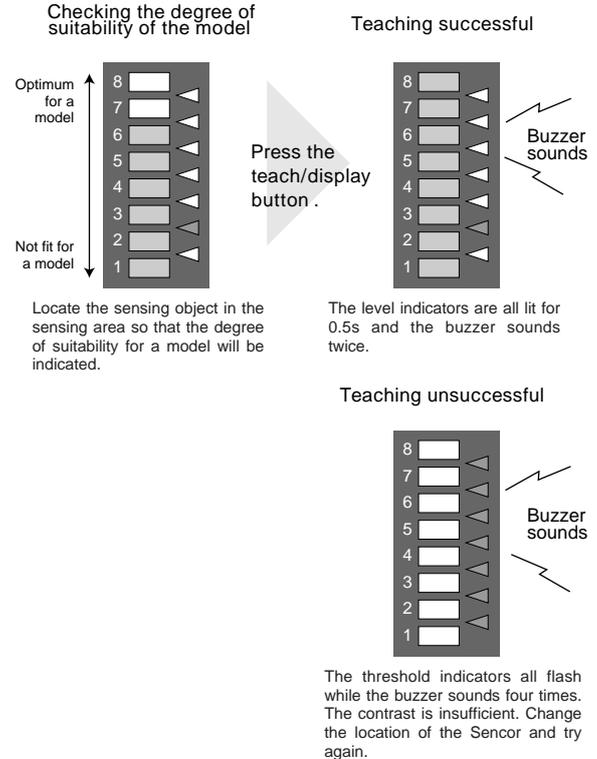
Banks

Each F10-C30/C35/C50/C55 Sensor has eight banks for storing data, and a different threshold value can be stored in each of the eight banks. Use this function to take measurements under various conditions. You can switch operation simply by switching banks.

- 4 Press the UP/DOWN select buttons to set the bank number.
- 5 Use the measurement item (bank number) selection switch to set the measurement method.

- 6 Press the teach/display button after locating the sensing object in the sensing area.

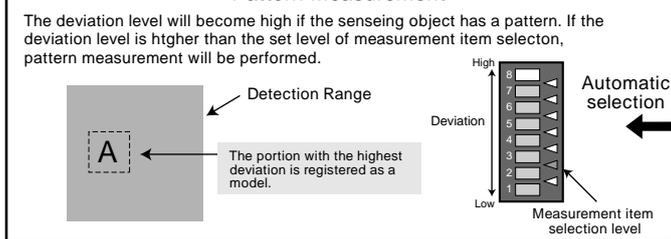
Measurement Items: PATT/BANK



Measurement Item: PATT/PLN

Whether measurement is patterned or plain is determined automatically by comparing the contrast with the background within the detection range. When teaching is finished, all the level indicators will light for 0.5 s, and the buzzer will sound twice.

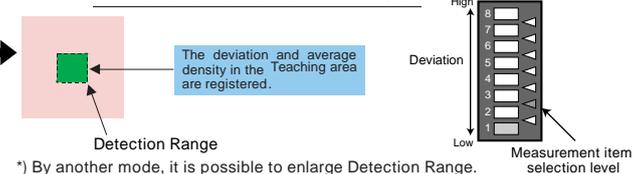
Pattern Measurement



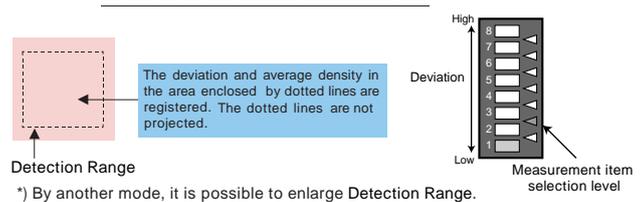
Plain Measurement

If the set level of measurement item selection is higher than the deviation level, plain measurement will be performed.

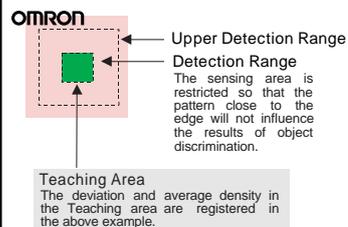
Plain Measurement with A.T.OFF



Plain Measurement with A.T.ON



The pattern is outside the Sensing area.



Teaching is performed in the Teaching area. The pattern close to the edge of the sensing area is not registered as a model because such a pattern may not be always located in the sensing area and accurate measurement cannot be performed. In this example, the deviation level in the area enclosed by the dotted line is small. Therefore, plain measurement will be performed.

The set level of measurement item selection is increased or decreased by pressing the SELECT buttons. Adjust the level according to the background and deviation. The level is factory-set between 2 and 3.

If the object has some light-color lines or light-color patterns, pattern measurement may be performed. In this case, by increasing the set level of measurement item selection, plain measurement will be performed.

Note: Do not turn OFF the Sensor before the Sensor is set to MONITOR mode, otherwise the teaching data will be lost.

Change of Plain Measurement Detection Range Selection Mode

*Detection range at Plain Measurement

Detection range at Plain Measurement is as following.

Mode 1 and 2 can be changed by the operation at the power supply input.

	Plain Measurement detection range selection mode	
	Mode 1 (Initial setting)	Mode 2
A Plain Measurement with A.T.OFF	<p>Detection range at measurement becomes the same size as the teaching area.</p> <p>Detection range (=Teaching area)</p>	<p>Detection can be enlarged. It becomes the following dotted line frame.</p> <p>Detection Range</p> <p>Approx. 1.0mm (F10-S30R) Approx. 0.5mm (F10-S15R) Approx. 0.2mm (F10-S05R) Approx. 1.6mm (F10-S50R)</p>
B Plain Measurement with A.T.ON	<p>Detection range at measurement becomes the following dotted line frame.</p> <p>Detection range</p> <p>Approx. 4.0mm (F10-S30R) Approx. 2.0mm (F10-S15R) Approx. 0.7mm (F10-S05R) Approx. 6.4mm (F10-S50R)</p>	<p>Detection can be enlarged. It becomes the following dotted line frame.</p> <p>Detection range</p> <p>Approx. 1.0mm (F10-S30R) Approx. 0.5mm (F10-S15R) Approx. 0.2mm (F10-S05R) Approx. 1.6mm (F10-S50R)</p>
<p>Detection range becomes small when a pattern is in the end as the following figure.</p> <p>Detection range (=Teaching area)</p>		

When using F10-C30/C35/C50/C55

When switching banks setting around of a bank to switch for Plain Measurement detection range selection mode different from the bank causes Plain Measurement detection range type error. Please note that you set the same mode as a bank to switch to around of the bank.

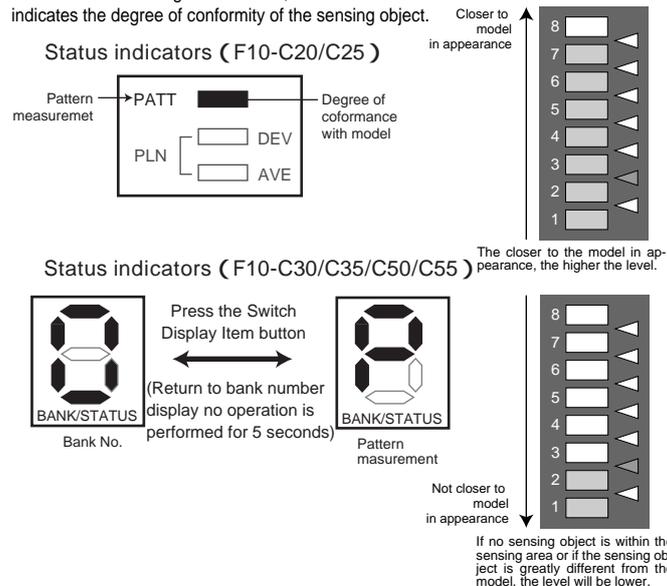
5.2 MONITOR Mode

The Sensor operates in MONITOR mode for threshold level adjustments and desktop sample tests for object discrimination with no signal output. No external output operation signal or external input signal is accepted in MONITOR mode.

- 1 Set the mode selector to MON. Measurement continues as long as the selector is set to MON.

Pattern Measurement

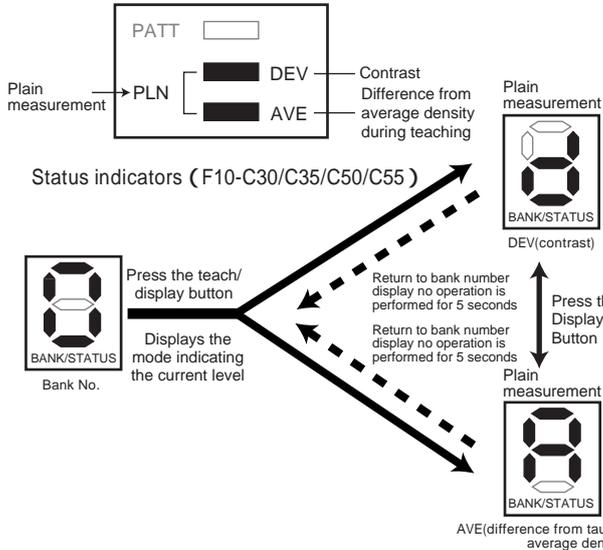
On the basis of the registered model, the level indicator indicates the degree of conformity of the sensing object.



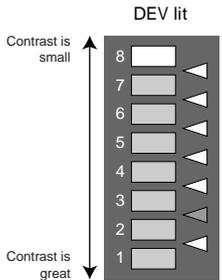
Plain Measurement

Press the teach/display button to change the display (DEV AVE).

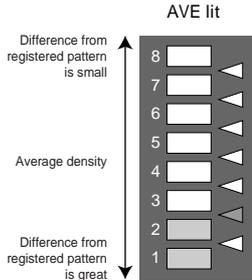
Status indicators (F10-C20/C25)



Status indicators (F10-C30/C35/C50/C55)



Increases the smaller the contrast.



Increases the smaller the contrast compared with the

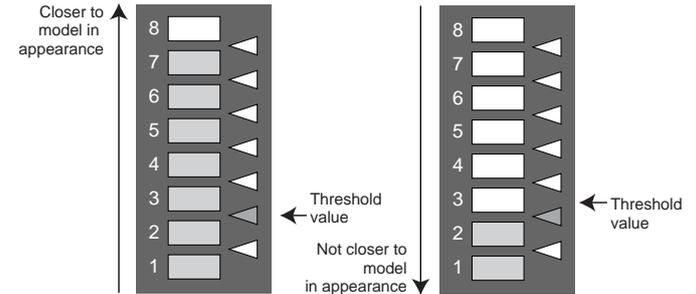
- Press the UP/DOWN selection buttons to adjust the threshold. Adjust the threshold to the most suitable level by monitoring the level indicator. Altered threshold values will not be saved unless the mode selector is changed once to either RUN or TEACH

Pattern Measurement

In wide mode, the pattern with the lowest degree of conformance among the three models is selected.

Plain Measurement

Set the threshold values for both DEV (contrast) and AVE (average density). If either is lower than the threshold value, the discrimination result will be set to OFF.



Turns OK if the measurement value is higher than the threshold.



The result indicator and output signal are ON.(See note.)

Turns NG if the measurement value is lower than the threshold.



The result indicator and output signal are OFF.(See note.)

Note: Use the DIP switch to turn ON and OFF the output signal. Refer to Nomenclature for details.

5.3 RUN Mode

- 1 Set the mode selector to RUN.
When the switch is set to RUN mode, measurements are made in response to external input signals.

Relationship between the F10 I/O terminal operations and ON/OFF indications in the timing charts are as shown in the following table.

Signal	Indication in timing charts	NPN (F10-C20/ C30/C50)	PNP (F10-C25/ C35/C55)
Input TRIG (pink) CONT (white) S_TEACH (yellow) M_TEACH (purple)	ON	GND	Vcc
BANK1 (gray) (see note) BANK2 (green) (see note) BANK3 (red) (see note)	OFF	OPEN	OPEN
Output OUTPUT (black)	ON	GND	Vcc
ENAB (orange)	OFF	Vcc	GND

Note: F10-C20/C25 do not have banks 1 to 3.

Enable Output

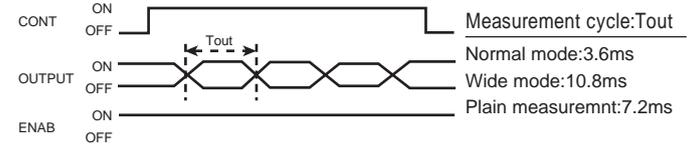
Enable output turns ON when the Sensor is ready to be in sensing operation. Therefore, enable output will turn OFF if the mode selector is set to TEACH or MON.

Enable output is OFF in the following cases in RUN mode.

1. The Sensor is in teaching process with external teaching input.
2. The Sensor is in sensing operation with TRIG signal input.
3. No teaching data has been registered.
4. The hardware fails.

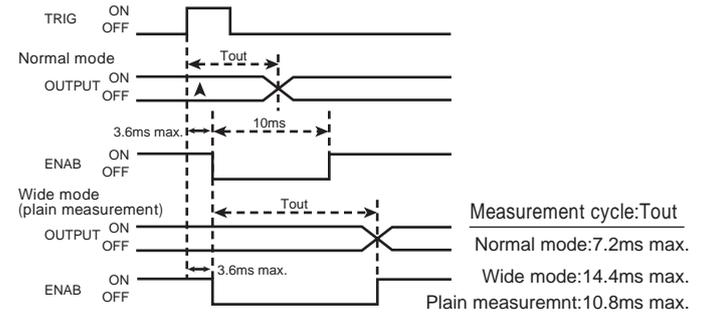
CONT Mode

In CONT mode, the Sensor is in sensing operation repeatedly while the CONT signal is ON. The measurement result is renewed once per measurement cycle, and output.



TRIG Mode

The Sensor in TRIG mode is used for object measurement only once in synchronization with the rising edge of the TRIG signal and the result is output.



Minimum ON width for the trigger signal is 1 ms.

The OUTPUT signal is stored until the measurement results are refreshed.

ENAB signal: OFF width is 10ms in normal mode.

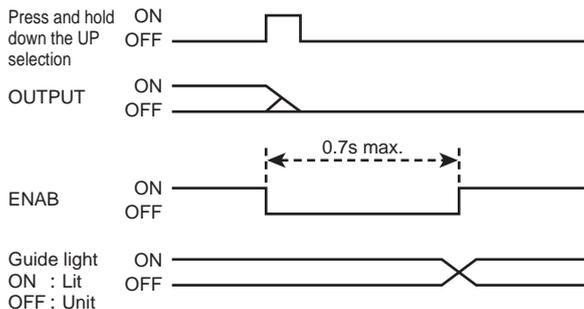
Turns ON when the OUTPUT signal is refreshed.

You can set the guide light to always ON to turn ON the guide light and execute synchronous measurement.

Press the UP selection button when in RUN mode to turn ON and OFF the guide light.

While the guide light is being turned ON or OFF, the ENAB signal is turned OFF, and no external inputs can be received.

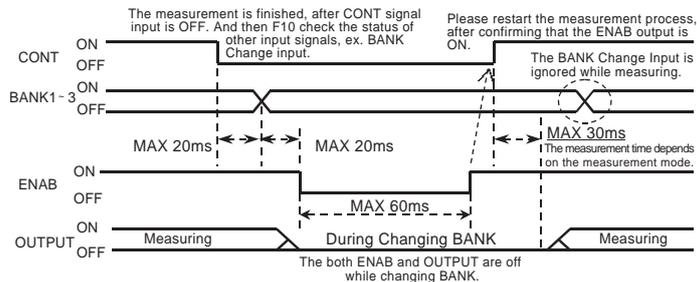
The OUTPUT signal is turned OFF when the UP selection button is pressed.



Bank Change Input

Please input the number of BANK to "BANK 1 to 3" input lines.
The relation of "BANK 1 to 3" and the number of BANK is shown as follows.

BANK No.	BANK 0	BANK 1	BANK 2	BANK 3	BANK 4	BANK 5	BANK 6	BANK 7
BANK Input 1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
BANK Input 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
BANK Input 3	OFF	OFF	OFF	OFF	ON	ON	ON	ON

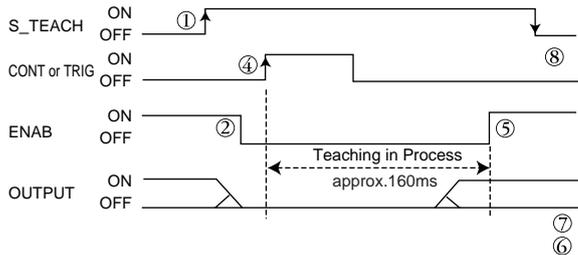


6. External Teaching in RUN Mode

In RUN mode, a model can be registered by external signal input using either of the following methods.

The data of the model is stored in the EEPROM when the teaching process of the Sensor completes. Therefore, do not turn OFF the Sensor during the teaching process.
If the Sensor is turned OFF, an EEPROM data error will result when the Sensor is turned ON again. In this case, perform proper teaching and threshold level adjustments again.

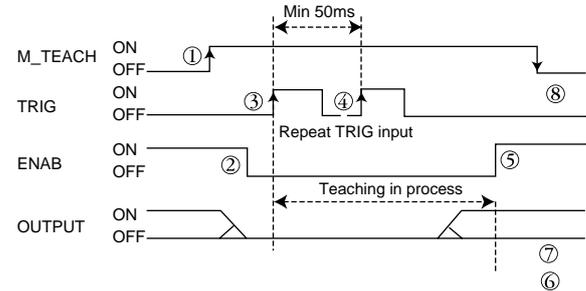
Stationary Object Teaching (S_TEACH)



Stationary object teaching is performed with the TRIG signal input or CONT signal input after external S_TEACH signal input. Therefore, do not move the object until teaching is completed.

1. Provide S_TEACH signal input.
2. Check that the ENAB signal is OFF.
3. Check that the stationary object is in the teaching area (or in the sensing area if A.TEACH is set to ON).
4. Provide external CONT or TRIG signal input.
5. After teaching is completed, the ENAB signal will turn ON. At that time, check the status of the OUTPUT signal.
6. The OUTPUT signal will be ON if teaching is successfully completed.
7. The OUTPUT signal will be OFF if teaching is unsuccessful.
8. Turn the S_TEACH signal OFF to complete the teaching process. If teaching has been unsuccessful, the Sensor will remain in the previous status. Therefore, perform teaching again.

Moving Object Teaching (M_TEACH)



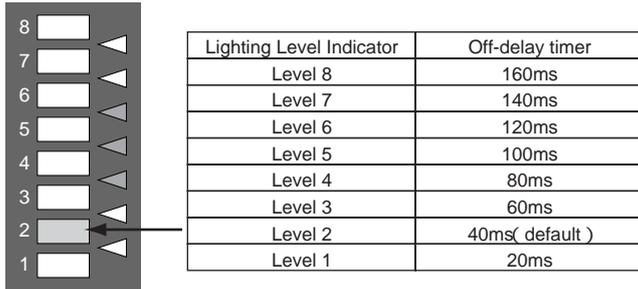
Moving object teaching is performed by using more than one object. Perform this teaching if the sensing objects cannot be stopped. After M_TEACH signal input, this teaching requires six processes in synchronization with external trigger input. The Sensor will not be in detection operation during the teaching process. External trigger input is ignored after it turned ON six times.

1. Provide external M_TEACH signal input.
2. Check that the ENAB signal is OFF.
3. Provide TRIG signal input in synchronization with the measurement timing of the sensing objects used for teaching.
4. Repeat step 3 six times.
5. After teaching is completed, the ENAB signal will turn ON. At that time, check the status of the OUTPUT signal.
6. The OUTPUT signal will be ON if teaching is successfully completed.
7. The OUTPUT signal will be OFF if teaching is unsuccessful.
8. Turn the M_TEACH signal OFF to complete the teaching process. If the teaching has been unsuccessful, the Sensor will remain in the previous status. Therefore, perform teaching again. The teaching operation will be disabled if the M_TEACH signal is turned OFF during the teaching process.

7. System setting

7.1 Off-delay timer setting

1. Set the mode selector to TEACH, before turning on the power supply.
2. While pressing the SELECT UP and Down buttons, turn on the power supply.
3. Release the SELECT UP and DOWN buttons, after lighting on the 3 center threshold indicators.
4. The lighting level indicator displays the current off-delay timer setting.



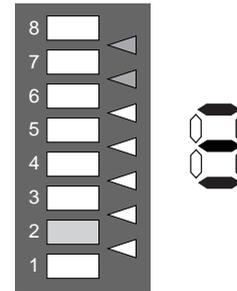
5. Press the SELECT buttons to adjust the off-delay timer.
6. Press the teaching button, after adjusting the off-delay timer.

Do not turn off, before pressing the teaching button, otherwise the changed timer will not be registered.

7.2 Unit Number setting (only F10-C50/C55)

1. Set the mode selector to TEACH, before turning on the power supply.
2. While pressing the Teaching button and SELECT UP button, turn on the power supply.
3. Release the Teaching and SELECT UP buttons, after lighting on the 2 upper threshold indicators.
4. The lighting level and bank number indicators display the current unit number setting. The lighting level indicators display MSD (most significant digit : 101) and the bank number indicators display LSD (LSD; least significant digit: 100).

Ex.) Unit number : 23



5. Press the SELECT buttons to adjust the unit number.
6. Press the teaching button, after adjusting the unit-number.

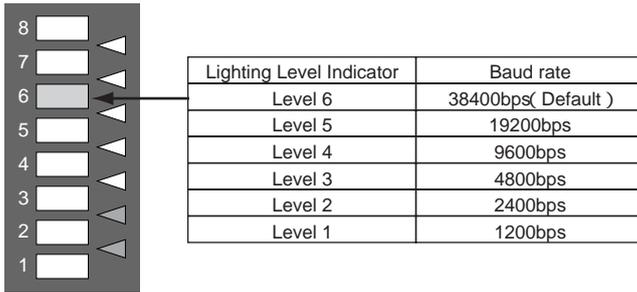
Do not turn off, before pressing the teaching button, otherwise the changed timer will not be registered.

It is possible to change the unit number by the serial communication command too. Please refer to the 7.4 Command Reference.

7.3 Serial Communication 1 Baud Rate setting

(only F10-C50/C55)

1. Set the mode selector to TEACH, before turning on the power supply.
2. While pressing the Teaching button and SELECT DOWN button, turn on the power supply.
3. Release the Teaching and SELECT DOWN buttons, after lighting on the 2 lower threshold indicators.
4. The lighting level indicators display the current baud rate setting.



5. Press the SELECT buttons to adjust the baud rate.
6. Press the teaching button, after adjusting the baud rate.

Do not turn off, before pressing the teaching button, otherwise the changed timer will not be registered.

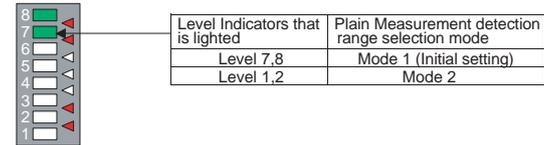
It is possible to change the unit number by the serial communication command too. Please refer to the 7.4 Command Reference.

Note : The other settings in the communication specifications are fixed as follows.

Item	Settings
Data length	8 (bits)
Parity	None
Stop bit	1 (bits)
Flow	None

7.4 Mode Change Plain Measurement Process

1. Change the Mode selector to TEACH, while the power supply is turning off.
2. Turn on the power supply, while pushing the Teach/display button.
3. Release the Teach/display button after confirming that the illumination of each 2 pieces of the upper and the lower side of the Threshold Indicators.
4. The current Plain Measurement detection range selection mode is displayed to the Level Indicators.

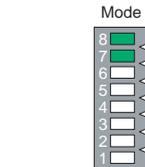


5. Mode can be switched with the UP/DOWN selection buttons.
6. By pushing the Teach/display button after switching it's confirmed.

Please do not turn off the power supply before pushing the Teach/display button. The setting is not changed

Plain Measurement detection range selection mode can be confirmed by processing as following.

1. Switch Mode Selector to MON.
2. Push the Teach/display button for more than 2 seconds.
Plain Measurement detection range selection mode is displayed.



Action is returned to the normal Monitor mode after Level Indicators 7 and 8 are lighted for 3 seconds.



Action is returned to the normal Monitor mode after Level Indicators 1 and 2 are lighted for 3 seconds.

8. Serial Communication Command (only F10-C50/C55)

8.1 Basic Input Format

The basic format of input commands is described below.

Header @(\$40) 1 byte fixed	Unit No. 00 to 31, XX 2 bytes fixed	Command code A(\$41) to Z(\$5A) 2 bytes fixed	Parameters Space(\$20), 0(\$30) to 9(\$39), A(\$41) to Z(\$5A) 31 bytes max.	Delimiter CR(\$0D) 1 byte fixed
-----------------------------------	---	---	---	---------------------------------------

- Specify the header @(\$40) at the beginning of input commands (1 byte fixed).
- A value between 00 to 31, or XX, can be set as the unit number (2 bytes).

When the unit number is a single digit, it must be prefixed with X0€ (\$30) to arrive at the required length of 2 bytes.

With a one-to-one connection, specifying 00 as the unit number performs the process regardless of the unit number of the F10.

With a one-to-many connection, specifying XX as the unit number sends a command to all connected amplifiers. (XX cannot be specified with some commands and parameters.)

- Set the command as a 2-byte fixed-length code between A(\$41) and Z(\$5A).
- The presence and length of parameters varies according to the command.

Parameters are specified using the space character (\$20), 0 (\$30) to 9 (\$39), and A(\$41) to Z(\$5A).

The parameters can be a maximum of 31 bytes in length, including the leading space. Lower-case letters cannot be used.

- Input commands must conclude with the one-byte delimiter CR (\$0D).

8.2 Output Response Format

Normal Response

When the input command has been recognized correctly, a response will be returned in the following format:

Header @(\$40) 1 byte fixed	Unit No. 00 to 31 2 bytes fixed	Command A(\$41) to Z(\$5A) 2 bytes fixed	Space (\$20) 1 byte fixed	Response Space(\$20), 0(\$30) to 9(\$39), A(\$41) to Z(\$5A) Byte length variable	Delimiter CR(\$0D) 1 byte fixed
-----------------------------------	---------------------------------------	--	---------------------------------	--	---------------------------------------

Error Response

When a unit number between 00 and 31 has been designated and the header and unit number have been recognized correctly but the command has not been recognized, a response will be returned in the following format:

Header @(\$40) 1 byte fixed	Unit No. 00 to 31 2 bytes fixed	Space (\$20) 1 byte fixed	Response E(\$46) R(\$52) 2 bytes fixed	Delimiter CR(\$0D) 1 byte fixed
-----------------------------------	---------------------------------------	---------------------------------	--	---------------------------------------

No Response

When the unit number has been specified as XX, and the format up to the header or unit number is incorrect, no response will be returned.

8.3 List of Input Commands

Specifying F10 Operation

The following commands specify the operation of the F10, such as executing a measurement, changing the bank number, etc.

Command	Function
BC	Change bank number.
MD	Acquire previous measurement result.
ME	Execute image capture measurement once only.
	Begin continuous or synchronous measurements.
	Execute measurement of image in image memory once only.
	Stop measurement.
RT	Reset.
TC	Execute teaching.

Saving/Loading data

The following commands back up data that has been set using F10.

Command	Function
BL	Transfer bank data from external device (load).
BS	Transfer bank data to external device (save).
SG	Acquire system data.
SS	Set system data.

Acquiring or Changing Current Settings

The following commands acquire measurement threshold levels or other setting or change the settings. The host can use these commands to determine F10 settings, as well as modify values and specify operation.

Command	Function
BA	Acquire the current bank number.
HT	Acquire the head type.
MC	Change the signal/serial priority mode.
MM	Acquire the measurement mode.
LS	Set the threshold level.
LG	Acquire the threshold level.

8.4 Command Reference

Command formats are explained below in alphabetical order. Commands are input in ASCII. Only uppercase characters can be used.

The space character (\$20) displays as "_" (under-bar) in this command reference.

BA -BAnc- : Acquire current bank number

BA acquires the current bank.

Input Command

@<unit_number>BA[CR]

- Set the following numerical values for <unit_number>.

Unit No.	Content
00 to 31	Unit number of the Unit whose bank number is sought.

Output Response

@<unit_number>BA_<bank_number>[CR]:Executed correctly
 <unit_number> 00 to 31: Unit number of Unit to acquire bank number
 <bank_number> 00 to 07: Bank number

Example

To acquire the current bank in Unit 0 (when the bank number is 1):

Input: @00BA[CR]

Output: @00BA_01[CR]

BC -Bank Change- : Change bank number

BC changes the bank number to a specified bank number.

Input Command

@<unit_number>BC_<bank_number>[CR]

- Set the following numerical values for <unit_number>.

Unit No.	Content
00 to 31	Unit number of the Unit whose bank number is sought.

- Set the following numerical values for <bank_number>.

Bank No.	Content
00 to 07	Bank number

Output Response

@<unit_number>BC OK[CR] : Executed correctly
 @<unit_number>BC ER[CR] : Not executed correctly
 <unit_number> 00 to 31: Unit number of Unit to change

Example

To change the bank number of Unit 10 to 7:

Input: @10BC_07[CR]
 Output: @10BC_OK[CR]

BL -Bank data Load- : Transfer bank data from an external device.

Use the XMODEM (-CRC or ΣSUM) protocol for data transfers.
 "Bank data" is setting data that does not include system data.

Input Command

@<unit_number>BL_<parameter>[CR]
 • Set the following numerical values for <unit_number>.

Unit No.	Content
00 to 31	Unit number whose bank data is to be transferred.

- Set the following numerical values for <parameter>.

Parameter	Content
AL	Transfer all bank data.
CU	Transfer data to current bank.
00 to 07	Transfer data to specified bank number.

Output Response

@<unit_number>BL_READY[CR] :Transfer preparations completed
 @<unit_number>BL_OK[CR] :Transfer concluded normally
 @<unit_number>BL_ER[CR] :Command not executed correctly
 <unit_number>00 to 31: Unit number of Unit whose data is to be transferred

When this command is recognized, a READY response will be returned. After verifying that this response has been received, the host must transfer the bank data using the XMODEM (-CRC or ΣSUM) protocol. When the transfer of all data has been completed, a response indicating normal completion will be returned.

Example

To transfer data to the current bank in Unit 7:

Input :@07BL_CU[CR]
 Output :@07BL_READY[CR]
 (Transfer data using XMODEM.)
 Output :@07BL_OK[CR]

BS -Bank data Save- : Transfer bank data to external device

When this command is recognized, the bank data is transferred by XMODEM (-CRC or -SUM) protocol.

"Bank data" is setting data that does not include system data.

Input Command

@<unit_number>BS_<parameter>[CR]
 • Set the following numerical values for <unit_number>.

Unit No.	Content
00 to 31	Unit number whose bank data is to be transferred.

- Set the following numerical values for <parameter>.

Parameter	Content
AL	Transfer all bank data.
CU	Transfer data from current bank.
00 to 07	Transfer data from specified bank number.

Output Response

@<unit_number>BS_OK[CR] :Data transfer completed normally
 @<unit_number>BS_ER[CR] :Data transfer not completed normally
 <unit_number>00 to 31 :Unit number of Unit transferring data

- The response is returned after transfer has been completed.

Example

To transfer all bank data from Unit 6 to the host:

Input :@06BS_AL[CR]

(Data will be transferred using the XMODEM protocol.)

Output :@06BS_OK[CR]

HT -Head Type- :Acquire head type

HT acquires the head type.

Input Command

@<unit_number>HT[CR]

- Set the following numerical values for <unit_number>.

Unit No.	Content
00 to 31	Unit number of the Unit whose head type is to be acquired.

Output Response

@<unit_number>HT_<type>[CR] :Executed correctly
<unit_number> 00 to 31:Designated unit number
<type> S30R:F10-S30R
S15R:F10-S15R
S05R:F10-S05R

Example

To acquire the head type of Unit 30:

Input: @30HT[CR]

Output: @30HT_S15R[CR] (when F10-S15R is connected)

LG -Level Get- : Acquire threshold level

LG acquires the threshold level. Four threshold levels are retained in memory, regardless of the current measurement mode. The specified level will be returned.

Input Command

@<unit_number>LG_<type>[CR]

- Set the following numerical values for <unit_number>.

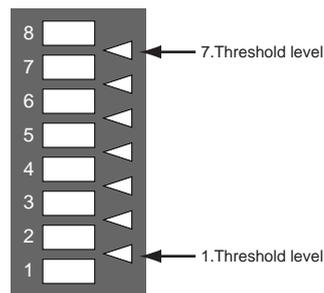
Unit No.	Content
00 to 31	Unit number of Unit whose threshold level is to be acquired.

- Set the following numerical values for <type>

Type	Content
0	Contrast threshold(plain measurement)
1	Concentration mean threshold (plain measurement)
2	Agreement level threshold(pattern measurement)
3	Measured item selection (pattern/plain) level threshold

Output Response

@<unit_number>LG_<level>[CR] :Executed correctly
@<unit_number>LG_ER[CR] :Not executed correctly
<unit_number> 00 to 31: Designated unit number
<level> 1 to 7: Threshold level



Example

To acquire the threshold level of the Pattern Measurement Mode of Unit 5:

Input: @05LG_2[CR]

Output: @05LG_4[CR] (when threshold level is 4)

LS -Level Set- : Set threshold level

LS sets the threshold level. Any of the four threshold levels can be set regardless of the current measurement mode.

Input Command

@<unit_number>LS_<type>_<level>[CR]

- Set the following numerical values for <unit_number>.

Unit No.	Content
00 to 31	Unit number of the Unit whose threshold level is to be set.
XX	Used when setting all F10 threshold levels.

- Set the following numerical values for <type>.

Type	Content
0	Contrast threshold (plain measurement)
1	Concentration mean threshold (plain measurement)
2	Agreement level threshold (pattern measurement)
3	Measured item selection (pattern/plain) level threshold

- Set the following numerical values for <level>.

Type	Content
1 to 7	Threshold level

Output Response

@<unit_number>LS_OK[CR] : Executed correctly
 @<unit_number>LS_ER[CR] : Not executed correctly
 <unit_number> 00 to 31: Designated unit number

Example

To change the pattern measurement threshold levels of all connected F10's to 6:

Input :@XXLS_2_6[CR]
 Output : (No response)

MC -Mode Change- :Change mode priority between external signal line and serial communications

MC enables changing the mode of an F10 amplifier to external signal line priority mode even when its DIP switch is set to serial communications priority mode. After using MC to change to external signal line priority mode, all other commands will be ignored until the mode is returned to serial communications priority mode.

Input Command

@<unit_number>MC_<parameter>[CR]

- Set the value of <unit_number> to a number between 00 and 31, or XX.

Unit No.	Content
00 to 31	Unit number of Unit to change.
XX	Used to change all F10's.

- Set the following numerical values for <parameter>.
 <parameter> can be omitted. If omitted, the value defaults to 1.

Parameter	Content
0	Signal priority mode
1	Serial priority mode

Output Response

@<unit_number>MC_OK[CR] : Executed correctly
 @<unit_number>MC_ER[CR] : Not executed correctly
 <unit_number> Unit number (00 to 31)

Example

To change all connected F10's to external signal line priority mode:

Input: @XXMC_0[CR]
 Output: (No response)

MD -Measure Data- :Acquire previous measurement results

MD returns the previous measurement results. The results are not output to the external signal line.

Input Command

@<unit_number>MD[CR]
 @<unit_number>MD_<parameter>[CR]

- Set the following numerical values for <unit_number>.

Unit No.	Content
00 to 31	Unit number of Unit performing measurement.


```

<comparison_result><contrast><average_density>[CR]
      :Plain measurement
<comparison_result><agreement>[CR]
      : Pattern measurement at 1 model
<comparison_result><agreement><agreement>[CR]
      : Pattern measurement at 2 models(Wide-mode)
<comparison_result><agreement><agreement><agreement>[CR]
      : Pattern measurement at 3 models(Wide-mode)
<comparison_result>      0: Comparison result was OK
      1: Comparison result was NG
<contrast>              0 to 8:Level of density distribution
<average_density>      0 to 8:Level of difference between
                        average density and reference value

```

```

-----<agreement>-----0 to 8:Level of density correlation
Agreement is output in the order center, left side, and right side

```

Explanation

- After executing ME, a measurement stop command must be executed before proceeding to the next operation. All commands before the measurement stop will be ignored.
- When the continuous or synchronous measurements do not return results, an OK response will be returned once the command is recognized. If a ~~measurement stop command is subsequently executed, an OK response will be returned at the termination of measurements.~~

Example

To use Unit 14 in continuous measurement mode and output to an external signal line only:

```

Input: @14ME_1_0[CR]
Output: @14ME_OK[CR]

```

Following this, measurements will be performed while the CONT input signal line is ON, with measurement results sent to an output signal line.

Example

To stop measurements performed by Unit 14:

```

Input: @14ME_0[CR]
Output: @14ME_OK[CR]

```

- When a measurement is performed once only and no result is returned, an OK response will be returned after the single measurement is completed.

Example

To perform a single measurement using all connected F10's, and output the results to an external signal line:

```

Input: @XXME_3_0[CR]
Output: (No response)

```

Measurement results will be output to an output signal line only.

- When results are returned for continuous or synchronous measurements, a READY response will be returned as soon as the command is recognized. Results will be output for each measurement after this response. If a measurement stop command is subsequently executed, measurements will stop, and an OK response will be returned after the last measurement result has been output.

Example

To perform synchronous measurement with Unit 3, and return the result to the serial communications line (where Unit 3 is performing pattern measurements in Wide Mode, and the comparison result is OK):

```

Input: @03ME_2_1[CR]
Output: @03ME_READY[CR]

```

Following this, measurement results will be output to the host each time the TRIG input signal line turns ON.

```

Output: 1767[CR]

```

- When performing a single measurement and outputting the results, an OK response will be returned as soon as the command is recognized. Subsequently, after each measurement is completed, the result will be output and an OK response will be returned.

Example

To use Unit 27 to measure the image in memory once only, and return the results by serial communications (with Unit 27 in Plain Measurement Mode):

Input: @27ME_4_1[CR]
Output: @27ME_READY[CR]

(Measurement performed on image in memory)

Output: 122[CR]
Output: @27ME_OK[CR]

MM -Measure Mode- : Acquire measurement mode

MM acquires the current measurement mode.

Unit No.	Content
00 to 31	Unit number of the Unit whose measurement mode is to be acquired.

Input Command

@<unit_number>MM[CR]

- Set the following numerical values for <unit_number>.

Output Response

@<unit_number>MM_<measurement_mode>[CR] :Executed correctly

<unit_number> 00 to 31: Designated unit number
<measurement_mode> 0: Plain Measurement Mode
1: Pattern Measurement Mode,
1 model
2: Pattern Measurement Mode,
2 models, Wide Mode
3: Pattern Measurement Mode,
3 models, Wide Mode
N: Not registered

- If registered in Plain Measurement Mode, 0 is returned regardless of whether the Unit is in Normal or Wide Mode.
- In Normal Mode or Wide Mode with single-model Pattern Measurement Mode, 1 is returned.
- In Wide Mode with 2 or 3 models registered, 2 or 3 is returned.
- If unregistered, the response “N” is returned.

Example

To acquire the measurement mode of Unit 26:

Input: @26MM[CR]
Output: @26MM_N[CR] (when unregistered)

RT -Reset- : Reset

Unit No.	Content
00 to 31	Unit number of the Unit to reset.
XX	Used to reset all F10's.

RT resets the F10. Once RT is recognized, a response is returned and the reset operation is performed.

Input Command

@<unit_number>RT[CR]

- Set the following numerical values for <unit_number>

Output Response

@<unit_number>RT_OK[CR] : Recognized normally
<unit_number> 00 to 31: Designated unit number.

Example

To reset Unit 21:

Input: @21RT[CR]
Output : @21RT_OK[CR] (Reset is performed after this

Unit No.	Content
00 to 31	Unit number of Unit whose data is to be acquired.

response is transmitted.)

Parameter	Content
0	Unit number
1	Baud rate
2	OFF delay timer value
3	LED guide light ON/OFF

SG -System data Get- : Acquire system data

SG acquires system data information. System data is data that is not reliant on banks.

Input Command

- @<unit_number>SG_<parameter>[CR]
 • Set the following numerical values for <unit_number>.
- Set the following numerical values for <parameter>.

Output Response

- @<unit_number>SG_<value>[CR] : Executed correctly
 @<unit_number>SG_ER[CR] : Not executed correctly
- <unit_number> 00 to 31: Designated unit number
 <parameter> = 0: Unit number
 <value> 01 to 31: Unit number
 <parameter> = 1: Baud rate
 <value> 1: 1200 bps 2: 2400 bps
 3: 4800 bps 4: 9600 bps
 5: 19200 bps 6: 38400 bps
 <parameter> = 2: OFF delay timer value
 <value> 1: 20 ms 2: 40 ms
 3: 60 ms 4: 80 ms

5: 100	Unit No.	Content
m s	00 to 31	Unit number of Unit whose data is to be set.
6: 120	XX	Used to set data of all F10's.
ms		

- 7: 140 ms 8: 160 ms
 <parameter> = 3: LED guide light ON/OFF
 <value> 0: OFF
 1: ON

Example

Parameter	Content	Value	Meaning
0	Unit number	01 to 31	Unit number
1	Baud rate	1	1200 bps
		2	2400 bps
		3	4800 bps
		4	9600 bps
		5	19200 bps
		6	38400 bps
2	OFF delay timer value	1	20 ms
		2	40 ms
		3	60 ms
		4	80 ms
		5	100 ms
		6	120 ms
		7	140 ms
		8	160 ms
3	LED guide light ON/OFF	0	OFF
		1	ON

determine the state of the LED guide light of Unit 31:

- Input: @31SG_3[CR]
 Output: @31SG_0[CR] (not lit)

SS -System data Set- : Set system data

SS changes system data settings. System data is data that is not reliant on banks.

Input Command

- @<unit_number>SS_<parameter>_<value>[CR]
 • Set the following numerical values for <unit_number>.

When XX (all Units) is specified as the unit number, the unit

number for <parameter> cannot be specified.

- Set the following numerical values for <parameter> and <value>.

Unit No.	Content
00 to 31	Unit number of Unit on which to perform teaching.
XX	Used to perform teaching on all F10's.

Type	Content
0	Stationary Object Teaching
1	Moving Object Teaching (start)
2	Moving Object Teaching (abort)

After changing the unit number, the previous unit number will remain in effect until a response output has been returned

Output Response

A.T.OFF/ON	Content
0	Auto Teach OFF
1	Auto Teach ON

Pattern/Plain	Content
0	Set in Pattern Measurement Mode
1	Determine whether to use Pattern or Plain Measurement Mode, then set.

@<unit_number>SS_OK[CR] : Executed correctly

@<unit_number>SS_ER[CR] : Not executed correctly

Normal/Wide	Content
0	Set in Normal Mode
1	Set in Wide Mode.

<unit_number> 00 to 31: Unit number of Unit to set

After the baud rate has been changed, output will remain at the previous baud rate until a response output has been returned.

Example

To change the unit number from 24 to 3:

Input: @24SS_0_03[CR]

Output: @24SS_OK[CR] (Unit number will change to 3 after this response.)

 TC-TeaCh- :Execute teaching

Input Command

@<unit_number>TC_<type>_<A.T.OFF/ON>_<pattern/plain>_<normal/wide>[CR]

- Set the following numerical values for <unit_number>.

- Set the following numerical values for <type>.

- Stationary Object Teaching is accomplished with this single command. There is no need to turn CONT or TRIG ON. During teaching the ENAB signal will be ON.

- Moving Object Teaching performs the same action as teaching via an external signal line.
After this command has been recognized, the ENAB output signal will turn ON. Once ENAB is ON, turn the TRIG input signal ON at least 6 times. (The TRIG input signal must be left ON for at least 50 ms.)

- Set the following numerical values for <A.T.OFF/ON>

- Set the following numerical values for <pattern/plain>.

- Set the following numerical values for <normal/wide>.

Output Response

@<unit_number>TC_OK[CR] : Teaching concluded normally
 @<unit_number>TC_ER[CR] : Teaching error occurred, or
 the command was not recognized correctly
 <unit_number> 00 to 31: Designated unit number

Example

To teach with the workpiece stopped for all connected F10's (where automatic teaching is OFF and pattern measurement is performed in Normal Mode):

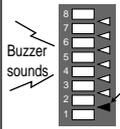
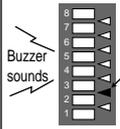
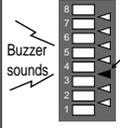
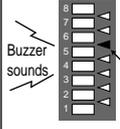
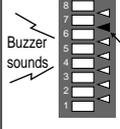
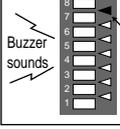
Input: @XXTC_0_0_0_0[CR]

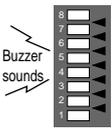
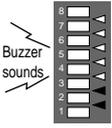
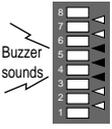
After receiving the input command, the ENAB output signal line will turn ON.

Output: (There is no response.)

The ENAB signal turns OFF after teaching has been completed.

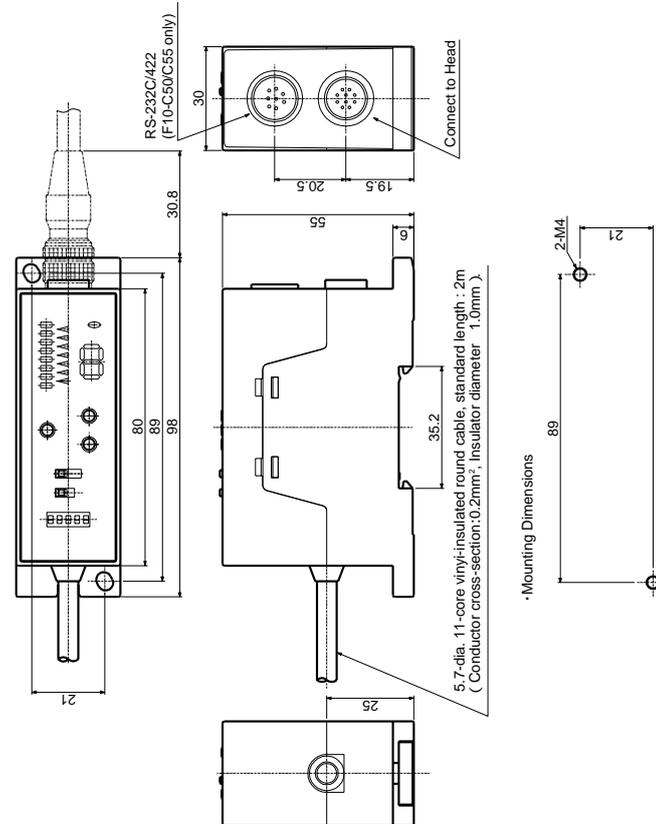
9. Trouble Shooting

Problem	Probable cause	Remedy
 <p>This LED of the threshold indicators flashes and the buzzer sounds.</p>	Head disconnection error The Head is not connected properly and no image signal is obtainable.	Connect the Head and turn the Sensor OFF and ON. Note: If the same error occurs again, the Head may be broken. Consult your OMRON representative.
 <p>This LED of the threshold indicators flashes and the buzzer sounds.</p>	Hardware error A hardware failure, such as CPU runaway, has resulted.	Consult your OMRON representative.
 <p>This LED of the threshold indicators flashes and the buzzer sounds.</p>	Head data read error 1. The EEPROM data of the Head is not readable. 2. The data is illegal.	
 <p>This LED of the threshold indicators flashes and the buzzer sounds.</p>	Amplifier data read error 1. The EEPROM data of the Amplifier is not readable. 2. The data is illegal.	Turn the Sensor OFF and ON. Note: All internal data of the Amplifier may be cleared. Note: If the same error occurs again After turning the Sensor OFF And ON, consult your OMRON Representative.
 <p>This LED of the threshold indicators flashes and the buzzer sounds.</p>	Amplifier data write error 1. No EEPROM data is written to the Amplifier. 2. The data is illegal.	
 <p>This LED of the threshold indicators flashes and the buzzer sounds.</p>	Head type error An F10-S30/S15 is connected to the head.	Connect an F10-S30R/S15R/S05R to the head.

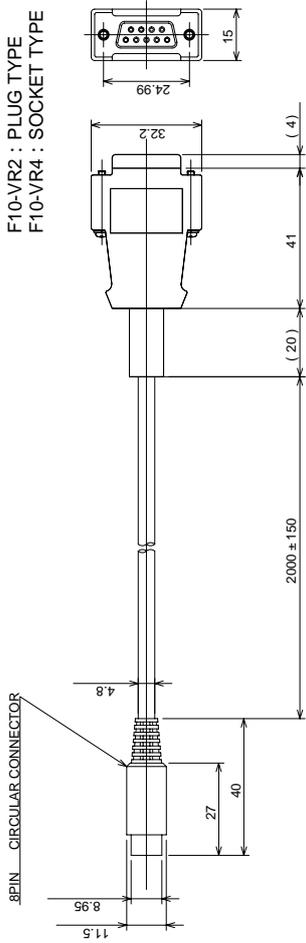
Problem	Probable cause	Remedy
 <p>All the LED of the threshold indicators flashes and the buzzer sounds.</p>	<p>Teaching data setting error</p> <p>The Sensor was set to MONITOR or RUN mode before teaching completed.</p>	<p>Perform the teaching of the Sensor in TEACH mode.</p> <p>➔ Refer to 1. Pattern Registration(TEACH Mode) on page 19.</p>
 <p>This LED of the threshold indicators flashes and the buzzer sounds.</p>	<p>Serial buffer overflow error</p> <p>Either the send buffer or receive buffer has become full during communications.</p>	<p>Send buffer overflow Change the communications settings.</p> <p>Receive buffer overflow Wait for a response from the F10 then send the command.</p>
<p>Control output (OUTPUT) and enable output are OFF, and will not turn ON.</p>	<p>A current exceeding the rated value has flowed to the output transistor and the over-current protective circuit has been triggered.</p>	<p>Reduce the current so that it will not exceed the rated value.</p> <p>Consult your OMRON representative, when these signals do not become ON even if reducing.</p>
 <p>This LED of the threshold indicators flashes and the buzzer sounds three times.</p>	<p>Detection Range type error</p> <p>Detection Range mode currently set is different from that set in teaching.</p>	<p>Perform again the teaching in TEACH mode or change the Detection Range mode.</p> <p>➔ Refer to 4.1. TEACH mode.</p>

- The F10-S30R/S50R can not detect red object with white backgrounds. Use the F10-S15R/S05R in stead.
- The F10-S15R/S05R can not detect green object with white backgrounds. Use the F10-S30R/S50R in stead.

10. Dimensions



F10-VR2 : PLUG TYPE
F10-VR4 : SOCKET TYPE



Note : Specifications subject to change without notice.



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