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OMRON

Model E3X-MC11

Mobile Consol

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

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PRECAUTIONS IN USING THE PRODUCT

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

1. Use under the circumstances or environment which are not described in the instruction sheet.
2. Use for the equipment which require higher level of safety, such as nuclear devices, railroad, aircrafts, vehicles, combustion devices, amusement machinery, medical equipment, safety device.
3. Use for the applications where death, serious injury or property damage is possible and extensive safety precautions are required.

Notice

Be sure to keep the following items to secure safety.

(1) Never conduct following actions, as they will cause liquid leakage, generating heat, burst, or ignition of built-in battery
 * Throwing this product into fire or heating it
 * Disassembling or damaging built-in battery
 * Charging with AC adapter other than the one supplied as an accessory
 * Giving strong shock to this product or throw it.

(2) If built-in battery shows any abnormal conditions, such as leak of liquid, discoloring, or deformation, etc., do not use the battery. It will cause generating heat, burst, or ignition.

(3) Built-in battery contains alkali liquid inside of it. Sticking of liquid to skin or cloth will cause skin trouble. Immediately wash the liquid out with clear water such as tap water.

(4) Never conduct the following action as they will cause leak of liquid, heat generation, deterioration of performance, or short life of built-in battery.
 * Do not charge the battery in the environment below 0˚C or above 40˚C.
 * Do not use or leave this product in strong direct sunlight or high temperature place such as inside the car under hot weather or front of heater.

(5) Do not sprinkle water on this product. It will cause breakdown or ignition.

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1. RATING/FUNCTIONS AND BASIC OPERATION

· Rating

Item		Description
Communication method		E3X-DA-N series exclusive method
Communication connecting method		Optical connection
Number of connected sensors		16 units max.
Power supply		Ni-MH secondary battery 2.4V
Charge rating		5V +5% 1A
Ambient temperature		0 to 40˚C
Ambient humidity		35 to 80%RH (there should be no dew condensation)
Material	Case	ABS
	Window	Polycarbonate
Weight		Main unit: approx. 120g (approx. 580g when packed)
Accessories		Communication cable, AC adaptor, Instruction manual

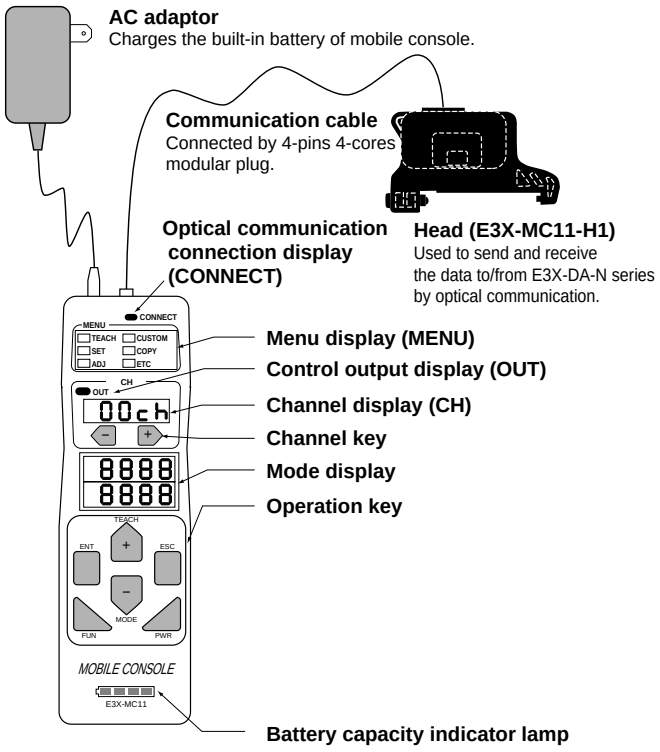
· Basic operation of mobile console

1. Mount the optical communication head to left side of the sensor (See item 3.)
2. Turn ON the mobile console. (See item 4.)
3. Select the sensor (channel) to be set. (See item 6.)
4. Select the menu to be set. (See item 7.)
5. Make setting. (See item 8 to 13.)
6. Turn OFF the mobile console and remove the optical communication head. (See item 3 and 4.)

· Functions

Menu	Function	
Teaching (TEACH)	Maximum sensitivity setting 1-point teaching 2-point teaching Pinpoint teaching	
Various functions setting (SET)	Detection function	Standard mode
		Long-distance mode
		High-speed mode
	Timer setting	0 to 200ms
	Flashing function	ON
		OFF
	Hold function	OFF
		Peak hold
		Bottom hold
	Display direction	Standard
		Reverse
	Display content	Digital display of light amount
		Digital percent display
		Bar display
	Monitor focus range	The upper limit of Monitor outoput
		The lower limit of Monitor outoput
Manual adjustment (ADJ)	Adjustment of sensitivity	Threshold adjustment
	Zero reset	Setting
		Release
Various functions lock (CUSTOM)	Setting possible	Applicable menu * Teaching (TEACH) * Various functions setting (SET) * Manual adjustment (ADJ)
	Setting impossible	
	Mode non-display	
Copy setting (COPY)	Copy	Setting for one sensor -> Another single sensor
		Setting for one sensor -> Other sensors group connected
		Setting for sensors group connected -> Other sensors group connected
		Setting of prohibiting writing to bank
Other settings (ETC)	Eco mode	ON
		OFF
	Displayed digits number	0 to 4 digits
	Hysteresis	Hysteresis adjustment
	Time mode	OFF delay
		ON delay
		One shot
	Sensor initialization	Initialize to setting at purchase of sensor
	Teaching with RUN mode setting	Enable teaching during RUN with sensor

2. NOMENCLATURE AND FUNCTION

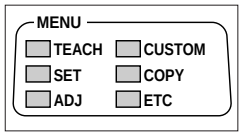


2.1 Optical communication connection display (CONNECT)



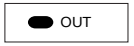
This is displayed when the mobile console is connected to the sensor via optical communication. Operate after checking that the display is lit.

2.2 Menu display (MENU)



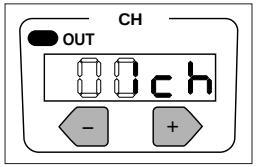
- The indicator lamp of the menu being set is lit.
- When power is turned ON, [TEACH] blinks.

2.3 Control output display (OUT)



- Indicates output status of the sensor of displayed channel. This indicator lights when output is ON.
- Indicates output of 1CH when channel is [ALL].

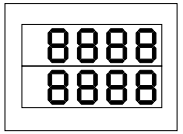
2.4 Channel display (CH) and channel key



- Displays the selected sensor with channel.
- [ALL] for selecting all sensors is also displayed.
- Numeral increases by pressing [+] and decreases by [-].

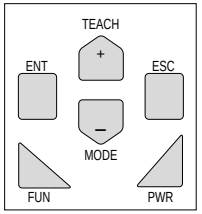
2.5 Mode display

• Displays function and value when setting.



2.6 Operation key

• Used to turn ON/OFF the power, select, and set.



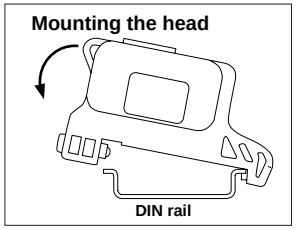
2.7 Battery capacity indicator lamp

• Indicates capacity remained of built-in battery and status of charging.



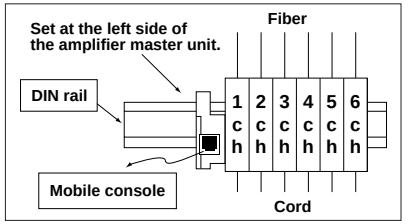
3. MOUNTING TO SENSOR/CONNECTION

1. Mount the optical communication head to DIN rail.
- Set the head to the left side of the sensor that is used as master unit.
- Hang one side on DIN rail and push other side as illustrated.
- Slide the communication head and make it stick to the master unit.



2. Connect the mobile console to the optical communication head using a communication cable.

When communication to the sensor is started, CONNECT LED in the mobile console lights up, and CH is displayed.

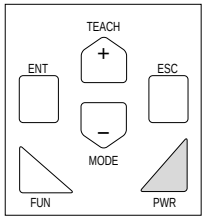


<Note>

1. When making setting for the sensor from the mobile console, be sure to select RUN mode at the sensor. It is not possible to make setting for the sensor in other mode. If it is attempted to make setting in other mode, error code [Err/COO3] is displayed.
2. In order to ensure stable communication between the head of mobile console and the sensor amplifier, be sure to make the head stick to the sensor.

4. POWER ON/OFF

4.1 Power ON



1. Turn ON the sensor.
2. Set the sensor in [RUN] mode.
3. Keeping pressing PWR key three seconds or longer turns ON the mobile console.
4. [TEACH] blinks and the battery capacity indicator lamp lights.
5. When the sensor is connected by the optical communication, [CONNECT] lights and [1CH] is displayed.

4.2 Power OFF

Pressing PWR key three seconds or longer turns OFF the mobile console. Indicator lamp goes out.

<Note>

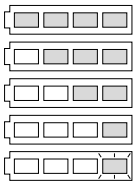
Do not turn OFF the mobile console while communication to the sensor is being performed. Correct setting may not be made. If the power is turned OFF by mistake, make setting again.

4.3 Automatic Power OFF

If no operation is performed in 10 minutes or longer after the power is turned ON, mobile console is automatically turned OFF.

4.4 Indication of Remaining Capacity of Battery

Indication changes according to the remaining capacity of the built-in battery as follows. When the last one of indication starts to blink, charge the battery.



5. CHARGING

In order to prevent damage of the console, charge in accordance with the procedure below.

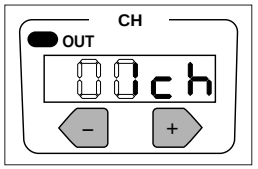
1. Turn OFF the power of the console.
2. Insert AC adaptor supplied as accessory. Charging starts.
3. When blinking of the battery capacity indicator lamp stops, charging has finished. Disconnect AC adaptor.

<Note>

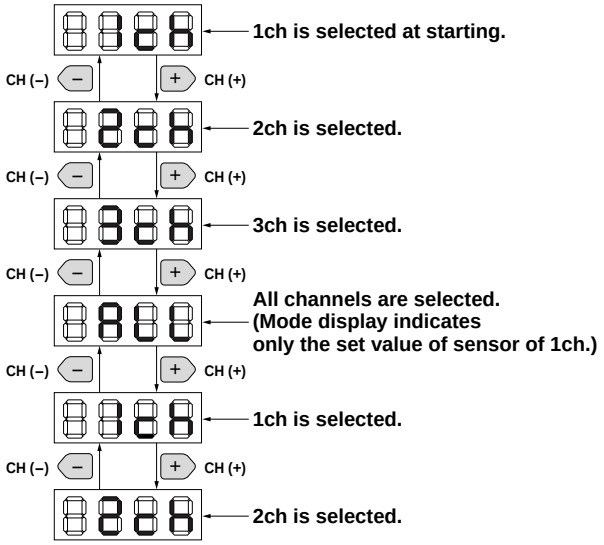
1. Be sure to use AC adaptor supplied as accessory for charging the mobile console.
2. When charging, always turn OFF the power before inserting AC adaptor. Charging will finish in approx.1.5 hours. Mobile console with fully charged battery can be operated about six hours.
3. Do not turn ON the power with AC adaptor inserted. Life of the battery may become short.
4. Battery used in the mobile console is Ni-MH secondary battery. This secondary battery has memory effect. Therefore, if charging is repeatedly performed when more than half capacity of the battery remains, available capacity decreases.
   In such case, discharge completely, then charge. By doing this procedure two or three times, memory effect is cancelled.
5. Life of the secondary battery is about three years, though it depends on use. For replacement of the battery, contact us.

6. CHANNEL SELECTION

When changing the setting of the sensor from the mobile console, select the channel.
Channel selecting method is given below.



Changing selected channel display when connected to three sensors



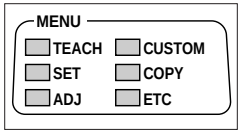
Changing selected channel display

Sensor at the left end (sensor connected to the optical communication head) is 1CH. To right, 2CH, 3CH ... in sequence.
To select all channels, select [ALL].
As channel selection is independent from other functions, channel can be changed in any operating state.
When the channel is changed by pressing the channel key, the digital display of the selected sensor will blink. Also, the sensor being set can be confirmed in short cut mode.

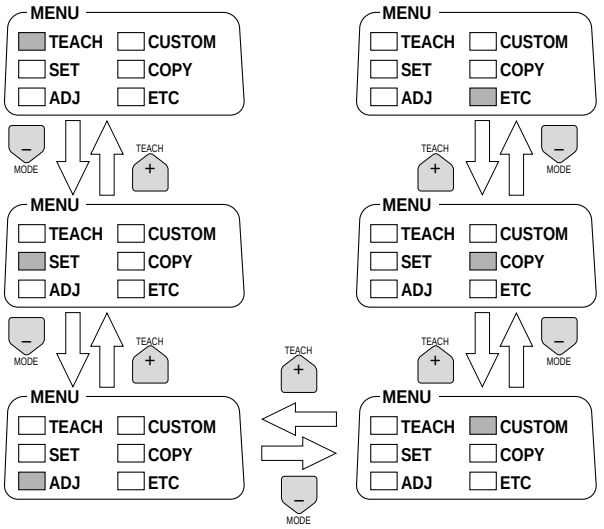
<Note>

1. If the channel is changed during the setting, content of the setting so far is cancelled.
2. When making a setting, be sure to confirm where the channel is set.

7. MENU SELECTION



1) Select menu with [MODE] key or [TEACH] key. LED of the selected menu will blink.
2) Select each menu as illustrated below.

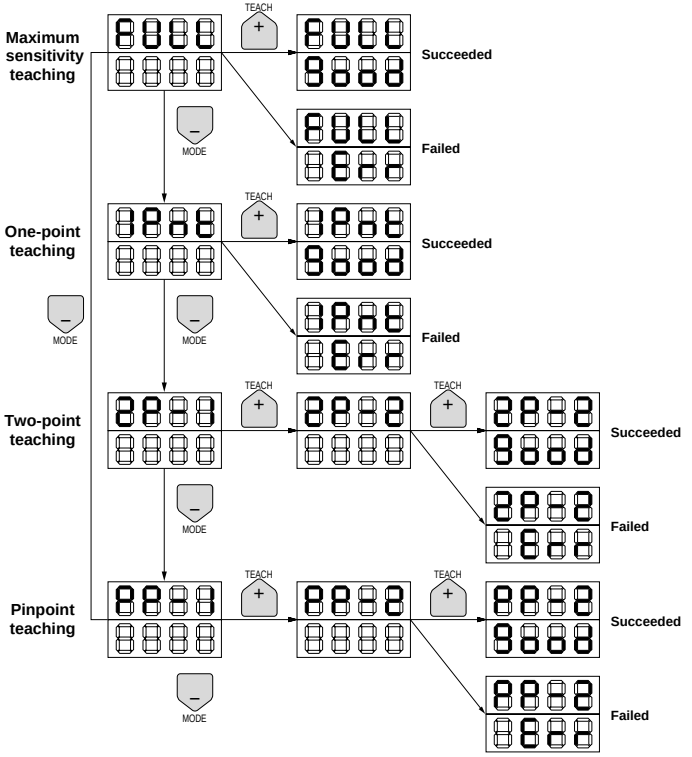


3) By pressing [ENT] when the selected menu is displayed, setting becomes possible.

4) For setting method of each menu, refer to the item of respective menu setting.

8. TEACH (teaching)

Perform teaching for the sensor.
There are following types of teaching: Maximum sensitivity setting, One-point teaching, Two-point teaching, and Pinpoint teaching.
For each teaching, refer to the instruction manual for the sensor.



Upper section displays the mode of teaching executed and the lower section displays the light receiving level of the selected sensor.
[MODE] key is used to select the teaching modes. [TEACH] key is used to execute teaching. Execute teaching two times, as two light receiving levels must be specified for two-point teaching and pinpoint teaching.
When teaching is finished, success or failure is displayed. Displaying [good] indicates teaching is succeeded. If [Err] is displayed, perform teaching once again.

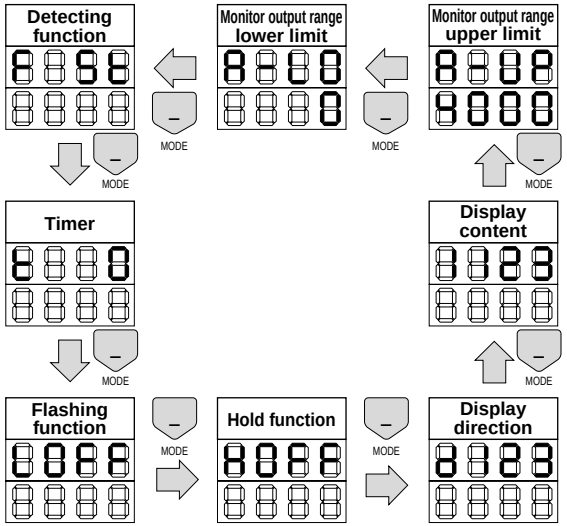
9. SET (Various function setting)

Set various functions of the sensor.
Following functions can be set.

Item	Functions
Detection function (F)	Standard mode (st) Long distance mode (Ld) High-speed mode (Hs)
Timer setting (t)	0 to 20mS : every 1mS 20 to 200mS : every 5mS
Flashing function (L)	Selection of ON/OFF
Hold function (H)	OFF Peak hold (PE) Bottom hold (bO)
Display direction (d)	Selection of standard / reverse
Display content (l)	Digital display of light amount Digital percent display Bar display
Monitor focus function (A)	Setting of the upper limit (UP)/ the lower limit (LO) of monitor output

Operate with the following keys:

[MODE] key **Selecting the set items**
[TEACH] key **Changing the set value**
[ESC] key **Moving to menu**



A letter for the item to be set is displayed at the left end of the upper section, and the current setting state is displayed at the right of the letter. Nothing is displayed in the lower section except the setting value of monitor focus range.

<Note>

Content of the change is reflected on the selected sensor only by changing the set value.

10. ADJ (Manual adjustment)

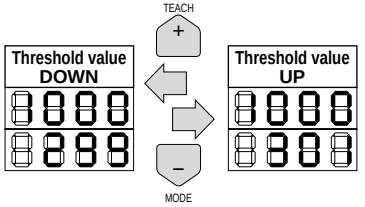
Threshold value of the sensor can be adjusted.

Pressing [TEACH] key decreases the threshold value. (Sensitivity increases.)

Pressing [MODE] key increases the threshold value. (Sensitivity decreases.)

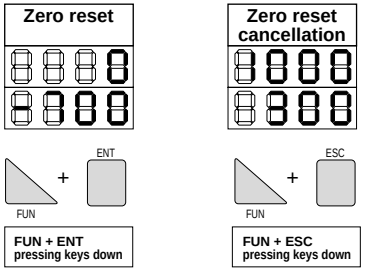
Display of the sensor can be reset to zero at this MENU.

· Adjusting the sensitivity (ALL channel cannot be adjusted.)



Upper section: digital quantity of light
Lower section: threshold value

· Resetting to zero (ALL channel can be reset to zero)



Upper section: digital quantity of light
Lower section: threshold value

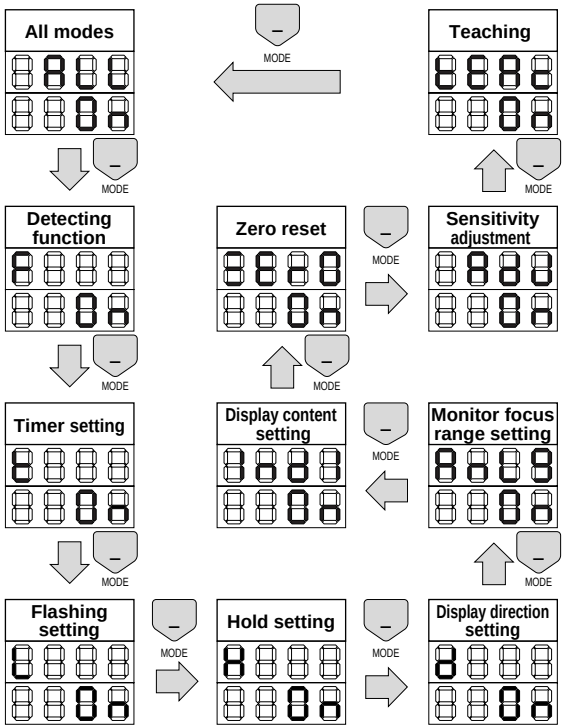
11. CUSTOM (Various function lock)

For the settings in the table below, it is possible to select the following functions: <Setting possible : ON>, <Mode non-display: OFF>, or <Setting impossible : Loc>

Use [TEACH] key to select the setting state.

	Setting possible ON	Mode non-display OFF	Setting impossible Loc
All modes <ALL>	○	○	○
Detecting function <F>	○	○	○
Timer setting <t>	○	○	○
Flashing setting <L>	○	○	○
Hold setting <H>	○	○	○
Display direction setting <d>	○	○	○
Monitor focus range setting <AnLg>	○	○	○
Display content setting <indl>	○	×	○
Zero reset <Zero>	○	×	○
Sensitivity adjustment <Adj>	○	×	○
Teaching <tEAc>	○	×	○

By using the above [All modes <ALL>], all items can be set at a time. However, if [Mode non-display <OFF>] is set, the items for which [Mode non-display <OFF>] cannot be selected (Display content setting, Zero reset, Sensitivity adjustment, Teaching) are set to [Setting impossible <Loc>].



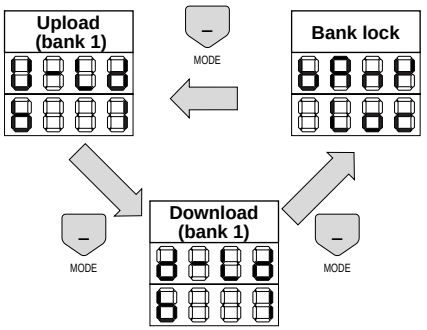
12. COPY (copy setting)

Following three methods allow to copy the setting of the sensor to other sensor. Inside the mobile console are 10 banks of the memory to store the data of sensor. (Setting of writing prohibition can be made for each bank.)

1. Setting of one sensor -> Mobile console 1 bank -> another sensor
2. Setting of one sensor -> Mobile console 1 bank -> Other connected sensors group
3. Setting of connected sensors group -> Mobile console 1 bank -> Other connected sensor group

Select the following items using [MODE] key.

- Acquisition of data from the sensor ... Upload (U-Ld)
- Writing of data to the sensor ... Download (d-Ld)
- Prohibition of writing to the bank ... Bank lock (bank/Loc)



<Note>

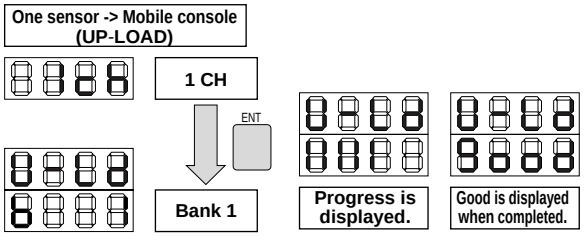
Copying between the sensors group is possible only for the numbers of sensors with same combination. If the number of units is different, error code [Err/COO6] is displayed.

12.1 Acquisition of the Setting data from One Sensor

Copy the setting data of one sensor to the bank of mobile console as follows.

Select <U-Ld> with [MODE] key, select a bank (1 to 10) with [TEACH] key and press [ENT] key for UP-LOAD.

Diagram below shows that the setting data is taken in the bank 1 of mobile console from 1CH sensor.

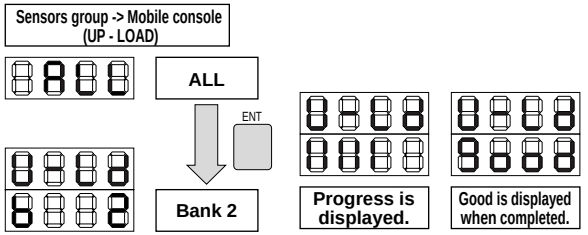


12.2 Acquisition of Setting Data from Connected Sensors Group

Copy all setting data of the connected sensor groups collectively to the bank of mobile console. Maximum 16 sensors can be copied at a time.

Select <U-Ld> with [MODE] key, select a bank (1 to 10) with [TEACH] key and press [ENT] key for UP-LOAD.

Diagram below shows that the setting data is taken in the bank 2 of mobile console from the connected sensors group.

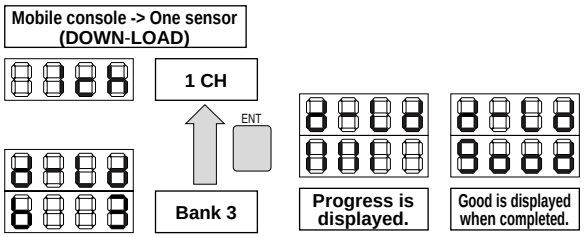


12.3 Writing of Setting Data to One Sensor

Copy the setting data of one sensor stored in the bank of mobile console to another sensor.

Select <d-Ld> with [MODE] key, select bank (1 to 10) with [TEACH] key and press [ENT] key for DOWN-LOAD.

Diagram below shows that the setting data of bank 3 of mobile console is copied to 1CH of the sensor.

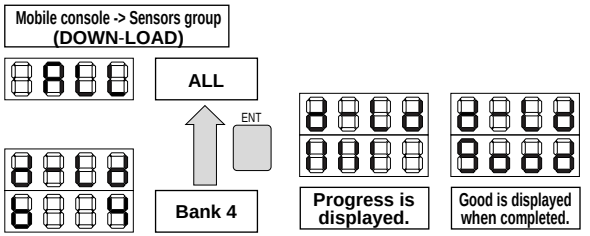


12.4 Writing of the Setting Data to the Connected Sensors Group

Copy the setting data of one sensor or connected sensors group stored in the bank of the mobile console to the other connected sensors group. Data can be copied to maximum 16 sensors at a time.

Select <d-Ld> with [MODE] key, select a bank (1 to 10) with [TEACH] key, and press [ENT] key for DOWN-LOAD.

Diagram below shows that the setting data of bank 4 of mobile console is copied to all sensors connected.



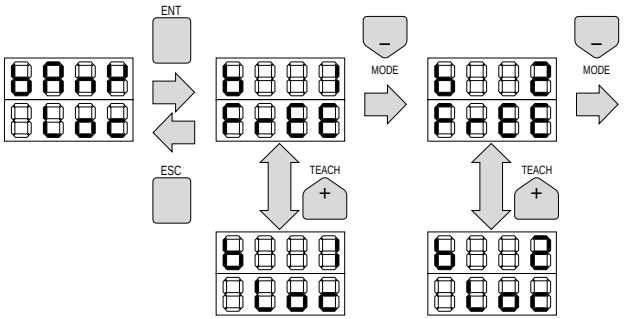
<Note>

When the setting data stored in the bank of mobile console is for one sensor, the data is written in all the sensors connected.

12.5 Setting of Prohibition of Writing the Data to Bank.

To prohibit overwriting to bank that has written the setting data of the sensor, select the setting mode of prohibiting the writing.

Select <bAnk/Loc> with [MODE] key and press [ENT] key. The setting mode to prohibit writing is effected. Select the object bank with [MODE] key and set the writing prohibition <Loc> or the writing permit <FrEE> with [TEACH] key.



<Note>

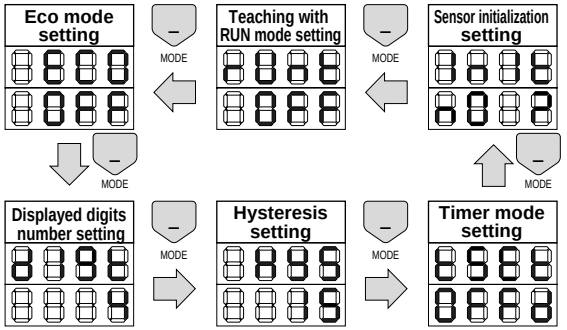
The bank which prohibition of writing is set cannot be selected when acquiring the setting data. (The bank is not displayed.)

13. ETC (OTHER SETTINGS)

Following settings are possible. When the mode you want to set is displayed, make setting by referring to detail of each mode.

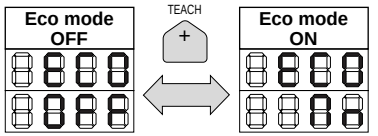
Press [ENT] key, settings are reflected to the sensor.

<Selection of mode>



13.1 Eco Mode Setting

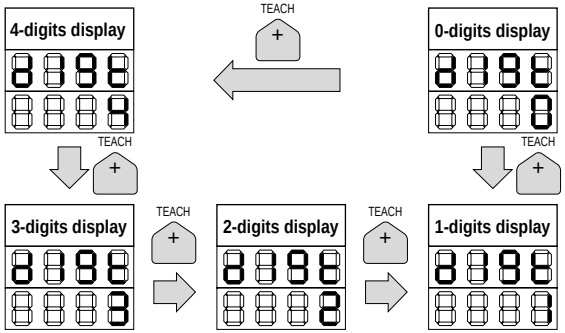
To set eco mode, select "On" with [TEACH] key and press [ENT] key. Eco mode is effected and display of the selected sensor becomes dark .



13.2 Displayed Digits Number Setting

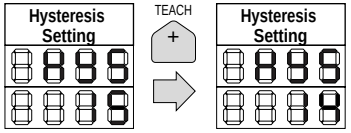
Displayed digits number of the sensor can be changed (0 to 4 digit). Setting the displayed digit number to 0 reduces the power consumption.

Pressing [ENT] key changes the displayed digits number of the selected sensor.



13.3 Hysteresis Setting

Hysteresis of the sensor can be changed with [TEACH] key. When the hysteresis reaches 0, it returns to the setting upper limit value and decreases from it. Pressing [ENT] key changes hysteresis of the selected sensor.

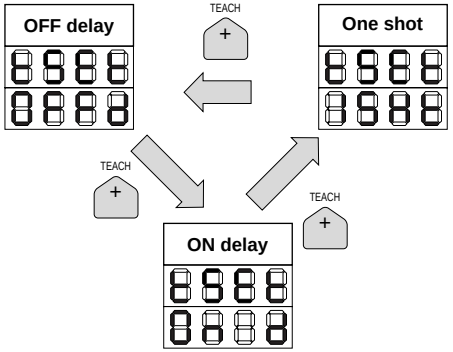


<Note>

1. Hysteresis of ALL ch cannot be adjusted.
2. The upper limit of the setting value is 100. It may become below 100 depending on the set threshold value.

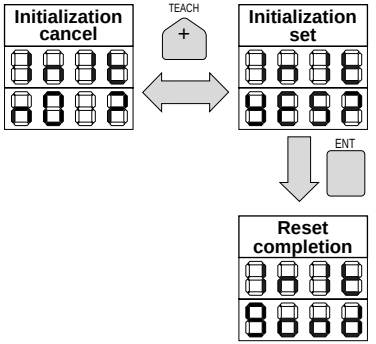
13.4 Timer Mode Setting

Timer mode can be set to any of OFF delay, ON delay, or One shot. Pressing [ENT] key changes the timer mode of the selected sensor.



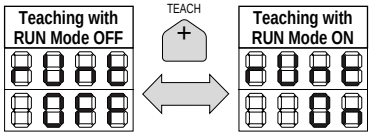
13.5 Sensor Initialization Setting

To return the sensor setting state to the state of its purchase, select [YES?] with [TEACH] key and press [ENT] key. After [good] is displayed, the first display appears.



13.6 Teaching with RUN Mode Setting

Following teachings can be executed at sensor with RUN mode. To use teaching at the sensor with RUN mode, select "On" with [TEACH] key and press [ENT] key.



• 2-points teaching

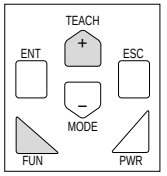
Press the sensor setting key (▲). 2-point teaching can be executed in the same procedure as SET mode.

• Automatic teaching

Teaching can be executed with a moving work.

1. Press the sensor setting key (▲) three seconds or longer. (Indicator lamp starts to blink.)
2. With the key pressed, enter the work.
3. When the key is released, the threshold value is displayed for approx. one second and teaching is completed. Threshold value is set in the middle of the maximum value and minimum value of the quantity of received light while the key is being pressed.
   (When any error occurs, the level indicator lamp blinks in red. In this case, make setting again.)

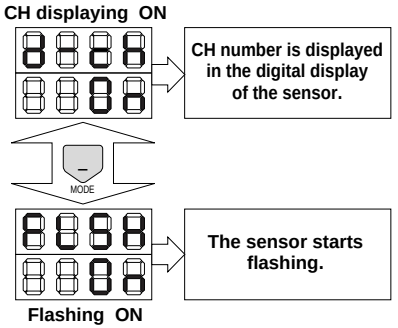
14. SHORTCUT MODE



Following two types of shortcut function are provided:

- Displaying the channel on the sensor
- Letting the sensor flashing

1. Press [FUN] key and [TEACH] key simultaneously.
2. Press [MODE] key. CH displaying function and flashing function are switched.



3. To return to the original mode, press [ESC] key. When the original mode is returned, channel display and flashing display are cancelled.

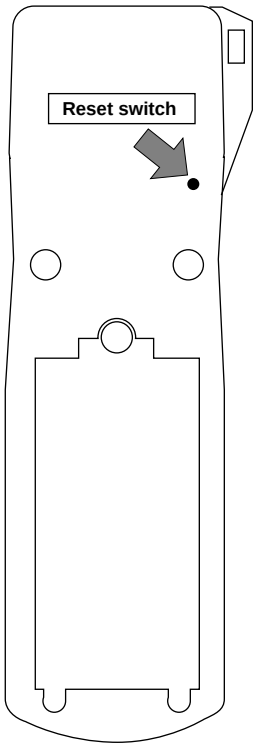
<Note>

In this mode, do not remove the head of mobile console or do not turn OFF the power of mobile console. Sensor may not work normally. If the head is removed or power is turned OFF in this mode, remount the head or turn ON the power again.

15. RESETTING

Mobile console is equipped with reset switch for case of abnormal operation. Press the reset switch by putting a thin stick into the hole on the back of the main body.

The circuit is reset and power is turned OFF. Wait approx.10 seconds and press PWR key.



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