



S80-MH-5-Y29

Distance sensor with laser emission and time of flight measurement

INSTRUCTION MANUAL



CONTROLS

FRONT INDICATORS LED

OUTPUT LED
The yellow LED ON indicates the OR function of the OUT1 and OUT2 outputs (one of the 2 outputs is active).

ALARM LED
The red LED ON indicates the absence of signal.

COMMAND PANEL AND DISPLAY

OUTPUT LED
The yellow LED ON indicates the logic OR function of the two OUT1 and OUT2 outputs (one of the 2 outputs is active).

DISPLAY (4-digit green coloured display)
In the normal mode, the display indicates the detected distance, in centimetres. In presence of distances larger than 9999 millimetres, the display alternates the visualisation of the first important digit with the other 4 digits. The "LLLL" message on display means distance under the minimum value. The "HHHH" message on display means distance over the maximum value. The "FFFF" message on display means low signal received condition.

OUT1, OUT2 LEDs
The n.1 and n.2 green LEDs ON indicate the activation of the OUT1 and OUT2 outputs.

FAST LED
The n.3 green LED ON indicates the activation of the FAST reading mode (500 Hz).

SET PUSHBUTTON
A pressure on the pushbutton activates the self-setting procedure. A long pressure on the pushbutton allows the user to access into the mode (FAST or NORM) and delay setting menu.

+/- PUSHBUTTONS
A light pressure on these pushbuttons allows the user to run through the menu of the sensor parameters and setting menu. Moreover, a long pressure allows to change the switching threshold value, as indicated in the "SWITCHING THRESHOLD ADJUSTMENT" paragraph.

INSTALLATION

The sensor can be positioned by means of the three housing's holes using screws (M5x40 or longer) with nuts and washers. Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the catalogue). For correct functioning, the sensor requires the RT3870 reflector. A second reflector, aligned next to the first, is recommended for distances larger than 70 m, as shown in Fig.1. The reflector is available on rigid support. Adjust the sensor position to guarantee that the spot is inside the reflector's surface (Fig.1). The operating distance is measured from the front surface of the sensor optics up to the reflector surface. The M12 connector can be oriented at two different positions (Fig.2).

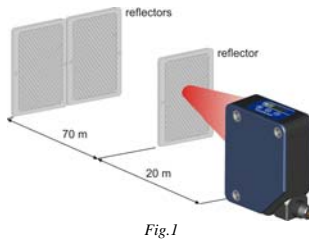
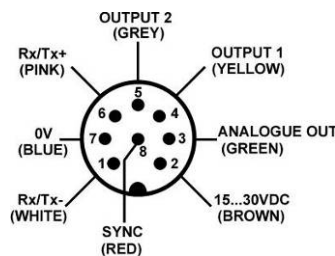


Fig. 2

CONNECTIONS

M12 CONNECTOR

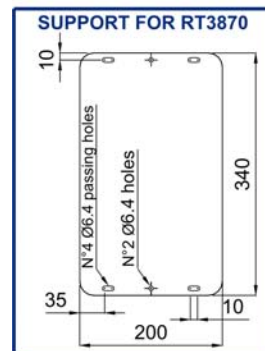
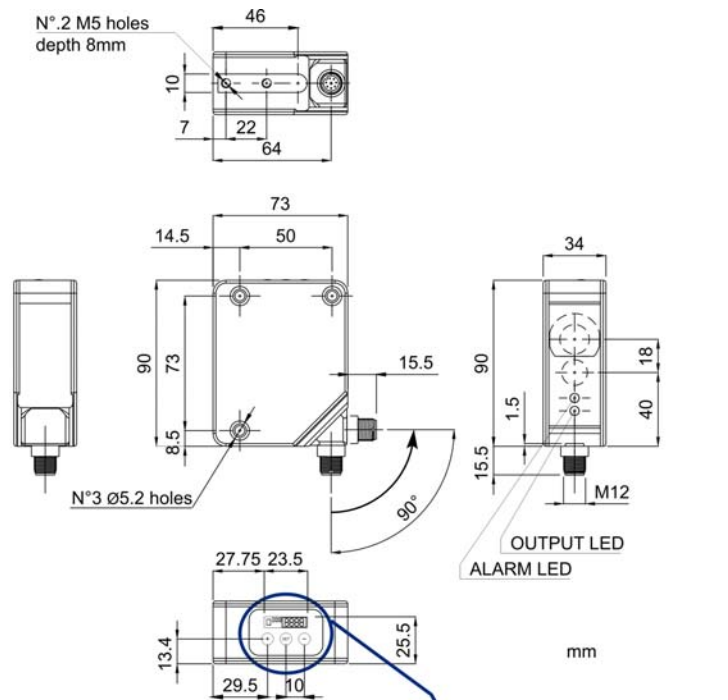


NOTE: the wire colours are referred to the cables manufactured according to the European standard.

TECHNICAL DATA

Table with 2 columns: Parameter and Value. Includes Power supply, Consumption, Outputs, Serial interface, Measurement range, Linearity, Repeatability, Hysteresis, Temperature drift, Output current, Response time, Switching frequency, Warm up, Indicators, Setting, Data retention, Operating temperature, Storage temperature, Insulating strength, Insulating resistance, Minimum and maximum spot dimension, Typical spot dimension, Emission type, Ambient light rejection, Vibrations, Shock resistance, Housing material, Lens material, Mechanical protection, Connections, Weight.

DIMENSIONS



SETTING OF THE 2 CHANNELS

Legend: ● pushbutton pressed ○ pushbutton not pressed ■ LED on □ LED off

The switching threshold setting for each of the 2 channels and the selection of the logic switching is effected placing directly the object to detect in front of the sensor, according to the following procedure:

Detection

- Place the object to detect in front of the sensor.

Table for Detection step showing OR, OUT, Display, and Keyboard states.

- Press the SET pushbutton for at least 2 s.

- The "CH-1" message appears.

Table for CH-1 message showing OR, OUT, Display, and Keyboard states.

Channel selection

- To select the channel setting use the +/- pushbuttons.

Table for Channel selection showing OR, OUT, Display, and Keyboard states.

Table for Channel selection showing OR, OUT, Display, and Keyboard states.

DARK/LIGHT selection

- Press the SET pushbutton again for at least 0.5 s.

- The "L On" message appears.

Table for DARK/LIGHT selection showing OR, OUT, Display, and Keyboard states.

- To select the DARK/LIGHT mode of the channel use the +/- pushbuttons.

- "L On" is visualised when the LIGHT mode is selected; "d On" in case of DARK mode

Table for DARK/LIGHT selection showing OR, OUT, Display, and Keyboard states.

Table for DARK/LIGHT selection showing OR, OUT, Display, and Keyboard states.

Target detection phase

- Press the SET pushbutton for at least 0.5 s, the "uPdt" message begins to blink (4Hz, for 2 s).

Table for Target detection phase showing OR, OUT, Display, and Keyboard states.

- The detection distance value appears.

- The +/- pushbuttons can be used to change the detected distance value.

Table for Target detection phase showing OR, OUT, Display, and Keyboard states.

- The units change if these pushbuttons are pressed repeatedly, the tens if kept pressed.

- Press the SET pushbutton again for at least 0.5 s. to end the detection phase.

Table for Target detection phase showing OR, OUT, Display, and Keyboard states.

SWITCHING THRESHOLD ADJUSTMENT

Table for Switching threshold adjustment showing OR, OUT, Display, and Keyboard states.

- Press the +/- pushbuttons for at least 2 s.

- The "CH-1" message appears.

Table for Switching threshold adjustment showing OR, OUT, Display, and Keyboard states.

Channel selection

- Use the +/- pushbuttons to select the channel to detect.

Table for Channel selection showing OR, OUT, Display, and Keyboard states.

Table for Channel selection showing OR, OUT, Display, and Keyboard states.

Distance of threshold phase

- Press the SET pushbutton for at least 0.5 s.

- The previously detected distance value appears.

- Use the +/- pushbuttons to change the detected distance value.

- The units change if these pushbuttons are pressed repeatedly, the tens if kept pressed.

Table for Distance of threshold phase showing OR, OUT, Display, and Keyboard states.

- Press the SET pushbutton again for at least 0.5 s. to end the adjustment phase.

Table for Distance of threshold phase showing OR, OUT, Display, and Keyboard states.

SETTING OF THE PARAMETERS

Table for Setting of parameters showing OR, OUT, Display, and Keyboard states.

- Press the SET pushbutton for at least 6 s to enter into the parameter setting menu. The "MEnu" message appears.

Table for Setting of parameters showing OR, OUT, Display, and Keyboard states.

- Pressing the + and - pushbuttons the user and run up and down the menu, reading the following messages.

Functioning mode selection

- At each pressure of the SET pushbutton, the user can run through the options of the selected level.

Table for Functioning mode selection showing OR, OUT, Display, and Keyboard states.

Table for Functioning mode selection showing OR, OUT, Display, and Keyboard states.

- The setting of the normal of fast mode is in common to both outputs.

Delay setting

- At each pressure of the SET pushbutton, the user can run through the options of the selected level.

Table for Delay setting showing OR, OUT, Display, and Keyboard states.

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Table for Delay setting showing OR, OUT, Display, and Keyboard states.

- The delay value setting is in common to both outputs. - When a delay value, different from zero, is set, the outputs will be maintained active for a minimum time equal to the number of milliseconds visualised on the display.

Visualisation of the channel 1 data

- At each pressure of the SET pushbutton, the user can run through the options of the selected level.

Table for Visualisation of channel 1 data showing OR, OUT, Display, and Keyboard states.

Table for Visualisation of channel 1 data showing OR, OUT, Display, and Keyboard states.

Table for Visualisation of channel 1 data showing OR, OUT, Display, and Keyboard states.

Visualisation of the channel 2 data

- At each pressure of the SET pushbutton, the user can run through the options of the selected level.

Table for Visualisation of channel 2 data showing OR, OUT, Display, and Keyboard states.

Table for Visualisation of channel 2 data showing OR, OUT, Display, and Keyboard states.

Table for Visualisation of channel 2 data showing OR, OUT, Display, and Keyboard states.

Serial output deactivation

- At each pressure of the SET pushbutton, the user can run through the options of the selected level.

Table for Serial output deactivation showing OR, OUT, Display, and Keyboard states.

Table for Serial output deactivation showing OR, OUT, Display, and Keyboard states.

Memorisation of the parameters set

Table for Memorisation of parameters set showing OR, OUT, Display, and Keyboard states.

Table for Memorisation of parameters set showing OR, OUT, Display, and Keyboard states.

- Pressing the SET pushbutton (the SAVE message blinks for 2s, 4Hz) all the changed values are saved and the user exits from the menu, and returns to the normal mode. - One of the +/- pushbuttons has to be pressed to return to the setting menu.

Exit from the parameter setting menu

- After a 10 s inactivity of the pushbuttons, the sensor returns to the normal mode visualising the distance.

REMOTE FUNCTION

KEYLOCK function (SET pushbutton block)

The keyboard block function is activated at powering on, connecting the SYNC terminal to the positive power supply (+Vdc) for at least 1 s.

After the first second, the SYNC input is ready for the normal synchronisation operations (refer to next paragraph)

To deactivate the *keyboard block*, the sensor has to be turned off and re-powered maintaining the SYNC wire not connected or ground connected (GND).

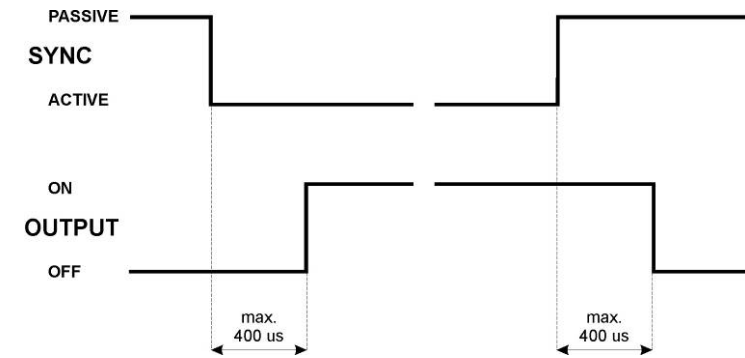
SYNC input (synchronisation)

The connection of the SYNC wire to +Vdc corresponds to the passive logic status while SYNC not connected or connected to 0 V corresponds to the active logic status.

SYNC passive = +Vdc ; SYNC active = 0V

The synchronisation signal allows to calculate the beginning and ending instants of the measurement. The reading cycle begins after the transition of the SYNC signal from passive to active and the sensor outputs are updated after max. 400µs.

All the outputs are deactivated after max. 400µs from the active – passive transition.



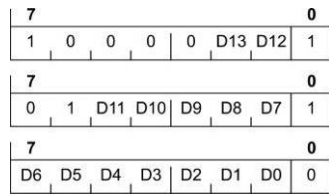
The SYNC wire is used also to determine the transmission direction when the RS485 serial connection is used.

RS485 serial connection

The serial communication parameters are: 9600 baud, non-parity, 8 data bits, 1 stop bit. The refresh time of the serial port is 35 ms.

The SYNC input is used to determine the communication direction, and in particular if low (active) direction S80->User, if high (passive) User->S80.

With SYNC active, the sensor continuously transmits the detected distance value (with a precision of 14bit) in a binary data format. 3 bytes are used: one byte with bit 0 at logic level 0 identifying the less important byte, a second byte with bit 6 at logic level 1 and bit 7 at logic level 0 identifying the intermediate byte, and finally a third byte with bits 6 and 7 at logic level 1 identifying the most important byte.



The RS485 serial interface allows also the complete remote control of the sensor. All the commands have to be sent via terminal in an ASCII format according to the following:

- **Receipt of the channel status:**
At any moment, at the receipt of the 'r <CR> <LF>' remote command (and SYNC passive), the sensor configuration is restored.
- **Remote configuration:**
The commands available are:
 - @ <CR> <LF> beginning of the remote setting mode (and SYNC passive)
 - cx <CR> <LF> channel selection, with x ∈ {1, 2}
 - vxxx <CR> <LF> distance selection, with xxx ∈ {0...4095}
 - bx <CR> <LF> dark/light mode selection, with x ∈ {1, 2}
 - b1 = Dark
 - b2 = Light
 - e <CR> <LF> memorisation of the configuration sequence.
 - q <CR> <LF> exit from remote setting without saving the configuration.

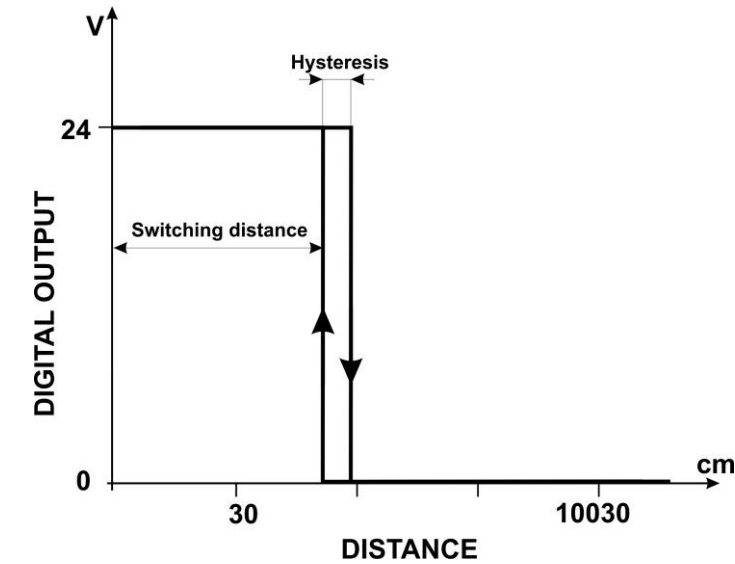
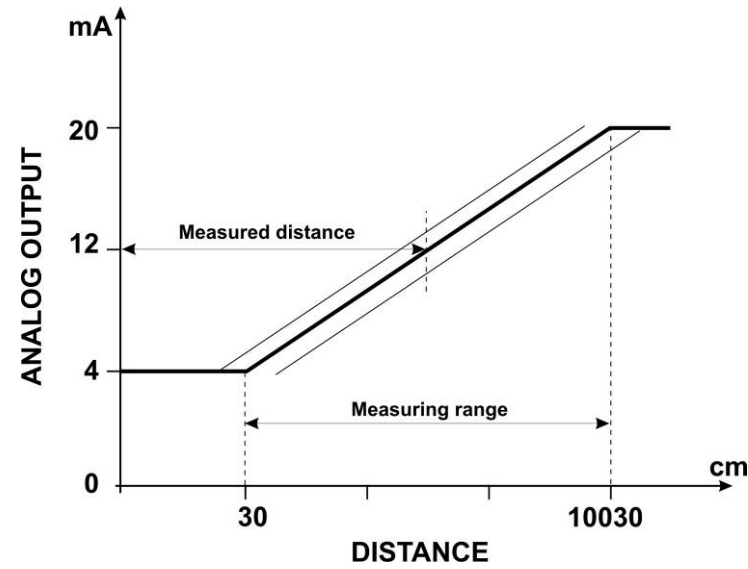
At the receipt of the q <CR> <LF> or e <CR> <LF> commands, the sensor visualises ok <CR> <LF>.
- **Delay configuration:**
The commands available are:
 - @ <CR> <LF> beginning of the delay configuration (and SYNC passive)
 - dx <CR> <LF> delay selection, with x ∈ {0, 1, 2, 3, 4, 5}
 - d0 = 0 ms d3 = 20 ms
 - d1 = 5 ms d4 = 30 ms
 - d2 = 10 ms d5 = 40 ms
 - e <CR> <LF> memorisation of the new delay value
 - q <CR> <LF> exit from the delay configuration without saving the configuration.

At the receipt of the q <CR> <LF> or e <CR> <LF> commands, the sensor visualises ok <CR> <LF>.
- **Normal/fast mode configuration:**
The commands available are:
 - @ <CR> <LF> beginning of the remote setting mode (and SYNC passive)
 - mx <CR> <LF> operating mode selection, with x ∈ {1, 2}
 - m1 = normal mode
 - m2 = fast mode
 - e <CR> <LF> execution of configuration sequence.
 - q <CR> <LF> exit from the remote setting mode without saving the configuration.

At the receipt of the q <CR> <LF> or e <CR> <LF> commands, the sensor visualises ok <CR> <LF>.

NOTE: the single digits have to be distanced amongst themselves at least 1 ms, during the command transmission.

DETECTION DIAGRAMS



SAFETY WARNINGS

All the safety electrical and mechanical regulations and laws have to be respected during sensor functioning. The sensor has to be protected against mechanical damages. Place the given labels in a visible position close to the laser emission.



Do not look directly into the laser beam!
Do not point the laser beam towards people!
Eye irradiation for over 0.25 seconds is dangerous; refer to class 2 standard (EN60825-1).
These sensors are not conform to safety applications!
This product is intended for indoor use only.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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Helpful links at www.datalogic.com: **Contact Us, Terms and Conditions, Support.**

The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorised waste collection centres.

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