S7-2/5 SERIES
INSTRUCTION MANUAL

CONTROLS

OUTPUT LED
The yellow LED on indicates that the NO output is closed.

DISPLAY (4 green-coloured digits)
The display indicates the signal level received, the switching threshold and messages relative to the parameter setting.
Please refer to the "SETTING" paragraph for setup procedure indications.

STABILITY LED (S)
The green stability LED on indicates that the received signal has a safety margin larger than 30% of the output switching value.

DELAY LED (T)
The green delay LED on indicates that the function is active.

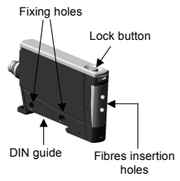
SPEED LED (H)
The green speed LED on indicates that the sensor is functioning with the maximum switching frequency.

SET PUSHBUTTON
A long pressure on the pushbutton activates the self-setting procedure.
The REMOTE input allows the external SET control.
This pushbutton also allows to set the sensor's paramters.

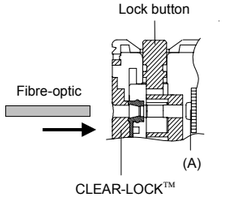
+ PUSHBUTTON and - PUSHBUTTON
A long pressure contemporarily on both pushbuttons, gives access to the setting menù of the parameters.
The switching threshold can be changed pressing the + or – pushbutton.
Please refer to the "SETTING" paragraph for setup procedure indications.

INSTALLATION

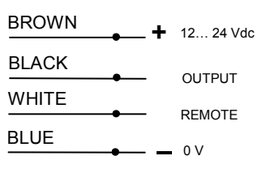
The transparent command protection cover rotates more than 130° in order to have an easy access.
It can be removed opening it completely and pulling it slightly, with a slight pression it can be replaced back.
Mount the sensor on a DIN rail or thanks to the fixing holes using screws (M3x20 or longer).



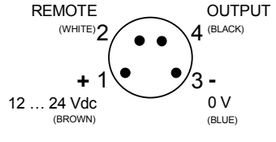
Installation of the fibre-optics:
Press the lock pushbutton and keep it pressed until all the fibres has been completely inserted.
Insert the fibres in the corresponding holes as described in the dimension drawing.
The transparent CLEAR-LOCK™ fixing block allows to easily check that the fibres are correctly inserted.
The insertion resistance is due to the O-ring seal; please insert the fibres for about 6mm deeper until they touch the photoelements (A).



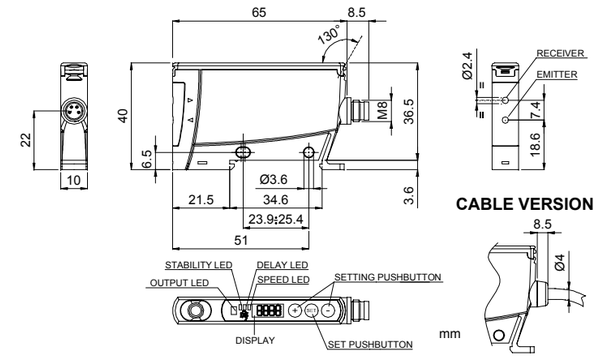
CONNECTIONS



M8 CONNECTOR



DIMENSIONS



TECHNICAL DATA

Power supply:	12 … 24 Vdc ±10% (reverse polarity protection)
Ripple:	2 Vpp max.
Consumption (output current excluded):	50 mA
Outputs:	NPN (S7-x-N) or PNP (S7-x-P)
Output current:	100 mA max.
Output saturation voltage:	1.2 V
Response time:	500 µs max. at low speed / 100 µs max. at fast speed
Switching frequency:	1 KHz max. at low speed / 5KHz. max. at fast speed
Indicators:	4 digit DISPLAY (GREEN); OUTPUT LED (YELLOW) STABILITY LED (GREEN) DELAY LED (GREEN); SPEED LED (GREEN)
Setting:	SET pushbutton; + pushbutton; - pushbutton
Data retention:	non volatile EEPROM memory
Operating temperature:	-10 … 55 °C
Storage temperature:	-25 … 70 °C
Electrical protection:	Class 2
Operating distance (typical values):	proximity (with OF-xx-ST fibre-optic): 0 … 100 mm (with 1KHz frequency) proximity (with OF-xx-ST fibre-optic): 0 … 50 mm (with 5KHz frequency) through beam (with OF-xx-ST fibre-optic): 0 … 300 mm (with 1KHz frequency) through beam (with OF-xx-ST fibre-optic): 0 … 150 mm (with 5KHz frequency)
Emission type:	red (670 nm)
Ambient light rejection:	EN 60947-5-2
Vibrations:	1.5 mm amplitude, 10 … 55 Hz frequency, 2 hours for each X, Y, Z axes
Shock resistance:	500 ms (about 50 G) 3 shock per axis
Housing material:	ABS (TYPE 1 ENCLOSURE)
Mechanical protection:	IP65
Connections:	2 m ∅ 4 mm cable (S7-3-x) M8 4-pole connector (S7-6-x)
Weight:	115 g. max. cable vers. / 30 g. max. connector vers.

SETTING

EASY TOUCH™
The sensor uses the patent-covered EASY TOUCH™ technology that allows a rapid and safe self-setting of the product.
Two different setting possibilities are available:
- *EASY TOUCH™;* a long pressure of the SET pushbutton allows self-setting.
- *FINE DETECTION;* to be used only in particularly critical conditions. This setting procedure is used only when the EASY TOUCH™ is not sufficient.

S7 setting
The EASY TOUCH™ foresees the LIGHT operating mode.
Thus using proximity fibres, the output is closed and the output LED is ON when the object is detected.
Using through beam fibres, the output is closed and the output LED is ON when the object does not interrupt the beam (i.e. the object is not detected).

- *EASY TOUCH™ (standard detection)*

Place the object to detect in front of the proximity fibres within the operating range, or in the middle of the through beam fibres.

	Bar Graph			Display				Keyboard		
OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	4	5	○	●	○

- *Press the SET pushbutton for at least 2sec.*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	E	a	s	y	○	●	○

- *The "Easy" text appears for EASY TOUCH™ detection*
- *The single detection is made releasing the pushbutton*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	4	5	●	○	●

- *The switching threshold value begins to blink*
- *The switching threshold can be changed using the + or – pushbuttons*
- *The sensor returns to the Normal mode, visualising the received signal, after 5sec.of inactivity*

- *Fine detection*

This mode offers an improved detection precision. The sensor can function either in the DARK operating or in the LIGHT operating mode.
Place the object to detect in front of the proximity fibres within the operating distance, or in the middle of the through beam fibres.

	Bar Graph			Display				Keyboard		
OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	4	5	○	●	○

- *Press the SET pushbutton for at least 4sec.*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
■	□	□	□	S	E	T	1	○	●	○

- *The "SET1" text appears to detect the object's condition*
- *The output LED begins to blink releasing the SET pushbutton*
- Remove the object to detect and press the SET pushbutton again

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
■	□	□	□	S	E	T	2	○	●	○

- *The "SET2" text appears.*
- *The output LED continues to blink.*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	4	5	●	○	●

- *If the detection is correct the switching threshold value begins to blink*
- *The switching threshold can be changed with the + or – pushbutton*
- *The sensor returns to the Normal mode, visualising the received signal, after 5sec.of inactivity.*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	■	□	□	F	A	I	L	○	●	○

- *The "FAIL" message appears if the detection is not correct and the output turns off*
- *The STABILITY LED blinks.*

Switching threshold setting

	Bar Graph			Display				Keyboard		
OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	4	5	●	○	●

- *Press the + or – pushbutton for at least 2sec.*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	4	5	●	○	●

- *The switching threshold value begins to blink.*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	5	3	●	○	●

- *The switching threshold value is changed pressing the + or – pushbutton*
- *The units change at each pressure*
- *The digits change if the pressure is maintained*
- *The display returns to the Normal mode if the pushbuttons are not pressed for at least 5sec.*

PARAMETER SETTING

	Bar Graph			Display				Keyboard		
OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	1	9	4	5	○	●	○

- *Pressing contemporilly the + and – pushbuttons 2sec.*

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	■	□	□	M	E	n	u	○	●	○

- *The "Menù" text appears, access to the parameter setting is obtained releasing the buttons*

Visualisation of the delay value

By simply pressing the + or – pushbutton, the menù is visualised (onwards and backward) showing the following:

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	■	□	□	d	E	L	0	●	○	●
				d	E	L	1	●	○	●
				d	E	L	2	●	○	●
				d	E	L	3	●	○	●
				d	E	L	4	●	○	●

At each pressure of the SET pushbutton, the different levels of the output deactivation delay are visualised cyclically and the relative delay value is also memorised.
When the "del0" message is visualised, the T LED is off; it is on in all the other levels (del…del3).
The + pushbutton has to be pressed to continue through the setting menù (the – pushbutton to go backwards).
The delay levels are: 0=no delay; 1=5ms; 2=10ms; 3=20ms; 4=40ms.

Visualisation of the sensor's switching frequency

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	■	□	□	d	E	L	0	●	○	●
				n	O	r	M	○	●	○

At each pressure of the SET pushbutton, the different levels of the switching frequency are visualised.
When the Fast speed is selected the H LED is on; the H LED is off if the low "NorM" speed is selected.
The + pushbutton has to be pressed to continue through the setting menù (the – pushbutton to go backwards).

Visualisation of the sensor's LIGHT/DARK logic switching

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	L	-	O	n	●	○	●
				d	-	O	n	○	●	○

At each pressure of the SET pushbutton, the two logic types (LIGHT or DARK) are visualised.
When the LIGHT mode is selected the "L-On" is visualised; "d-On" to select the DARK mode.
The + pushbutton has to be pressed to continue through the setting menù (the – pushbutton to go backwards).

Visualisation of the display orientation

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	D	S	u	P	●	○	●
				D	S	d	n	○	●	○

At each pressure of the SET pushbutton, the visualisation of the messages on the display is inverted.
The + pushbutton has to be pressed to continue through the setting menù (the – pushbutton to go backwards).

Visualisation of the display turning off

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	D	S	O	n	●	○	●
				D	S	O	F	○	●	○

At each pressure of the SET pushbutton, the turning off or on of the dislay is visualised.
If "dSOF" is selected the display will be turned off when back to the normal mode and turned on at each pressure. It will turn off again if not pressed for at least 5 sec.
The + pushbutton has to be pressed to continue through the setting menù (the – pushbutton to go backwards).

Visualisation of the SAVE parameters set by the user

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	S	A	V	E	●	○	●

All the changed values will be memorised by pressing the SET pushbutton and you exit the menù, returning to the normal mode.

The + pushbutton has to be pressed to continue through the setting menù (the – pushbutton to go backwards).

Visualization of the parameter RESET with pre-set values

OUT	S	T	H	Dig1	Dig2	Dig3	Dig4	+	SET	-
□	□	□	□	r	S	E	t	●	○	●

The default parameters are reset when the SET pushbutton is pressed.
The "RESET" text blinks until the pushbutton is pressed.
The sensor returns to function normally when the button is released.

Default parameters:

Speed	***NORM***
Delay	***OFF***
Switching	***LIGHT***
Delay	***OFF***
Switching frequency	***NORM***
DARK/LIGHT	***L ON***
Orientation	***UP***
Display	***ON***

REMOTE FUNCTION

The REMOTE wire connected to +Vdc is equal to pressing the SET pushbutton. The *keyboard block* is activated if at the sensor powering the REMOTE wire is connected +Vdc, and thus the SET pushbutton is no longer active. To deactivate the *keyboard block* the sensor has to be turned off and then turned on with the REMOTE wire not connected.

DECLARATION OF CONFORMITY
We DATASENSOR SpA declare under our sole responsibility that these products are conform to the 89/336 CEE, 73/23 CEE Directives and successive amendments.

WARRANTY
DATASENSOR SpA warrants its products to be free from defects.
DATASENSOR SpA will repair or replace, free of charge, any product found to be defective during the warranty period of 36 months from the manufacturing date.
This warranty does not cover damage or liability deriving from the improper application of DATASENSOR products.

DATASENSOR SpA Via Lavino 265
40050 Monte S. Pietro - Bologna - Italy
Tel: +39 051 6765611 Fax: +39 051 6759324
http://www.datasensor.com e-mail: info@datasensor.com

826001510 Rev.A

S7-3/6 SERIES
INSTRUCTION MANUAL

CONTROLS

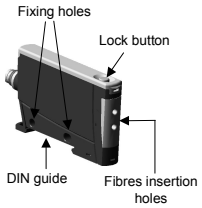
OUTPUT LED
The yellow LED on indicates that the NO output is closed.

READY/ERROR LED
The permanently green LED indicates that the received signal guarantees a stable output status.
The alternative green and red blinking of the LED indicates a wrong setting condition.
Please refer to the "SETTING" paragraph for correct for detection or setup procedure indications.

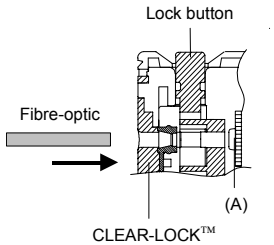
SET PUSHBUTTON
A long pressure on the pushbutton activates the self-setting procedure.
The REMOTE input allows the external SET control.

INSTALLATION

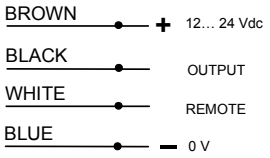
The transparent command protection cover rotates more than 130° in order to have an easy access.
It can be removed opening it completely and pulling it slightly, with a slight pression it can be replaced back.
Mount the sensor on a DIN rail or thanks to the fixing holes using screws (M3x20 or longer).



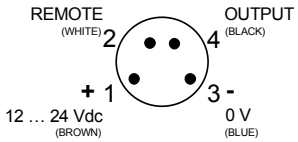
Installation of the fibre-optics:
Press the lock pushbutton and keep it pressed until all the fibres has been completely inserted.
Insert the fibres in the corresponding holes as described in the dimension drawing.
The transparent CLEAR-LOCK™ fixing block allows to easily check that the fibres are correctly inserted.
The insertion resistance is due to the O-ring seal; please insert the fibres for about 6mm deeper until they touch the photoelements (A).



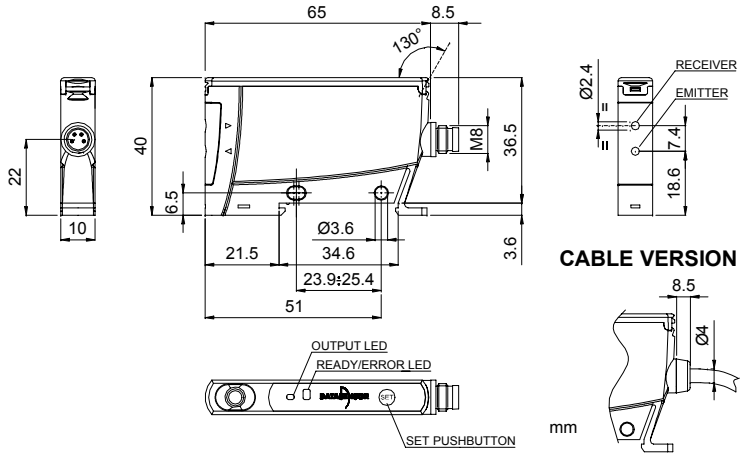
CONNECTIONS



M8 CONNECTOR



DIMENSIONS



CABLE VERSION

mm

TECHNICAL DATA

Power supply:	12 … 24 Vdc ±10% (reverse polarity protection)
Ripple:	2 Vpp max.
Consumption (output current excluded):	40 mA
Outputs:	NPN (S7-x-N) or PNP (S7-x-P)
Output current:	100 mA max. at 25°C derating –2mA/°C
Output saturation voltage:	1.2 V max.
Response time:	500 µs max.
Indicators:	OUTPUT LED (YELLOW) and READY/ERROR LED (GREEN/RED)
Setting:	1 SET pushbutton
Data retention:	non volatile EEPROM memory
Operating temperature:	-10 … 55 °C
Storage temperature:	-25 … 70 °C
Electrical protection:	Class 2
Operating distance (typical values):	proximity (with OF-xx-ST fibre optic) 0 … 100 mm through beam (with OF-xx-ST fibre optic) 0 … 300 mm
Emission type:	red (670 nm)
Ambient light rejection:	according to EN 60947-5-2
Vibrations:	1.5 mm amplitude, 10 … 55 Hz frequency, 2 hours for each X, Y, Z axes
Shock resistance:	500 ms (about 50 G) 3 shock per axis
Housing material:	ABS (TYPE 1 ENCLOSURE)
Mechanical protection:	IP65
Connections:	2 m ∅ 4 mm cable (S7-3-x) / M8 4-pole M8 connector (S7-6-x)
Weight:	115 g. max. cable vers. / 30 g. max. connector vers.

DELAY FUNCTION

Press the SET pushbutton until the READ/ERROR LED turns off. Keep the SET pushbutton pressed until the READ/ERROR LED begins to blink green and release it after it turns off.
If the delay function ***is not activated*** the READY/ERROR LED begins to blink green with two fast pulses.
If the function ***is activated*** the READY/ERROR LED begins to blink green with four fast pulses.
Press the SET pushbutton to change the function status and check that the blinking mode has changed.
If the SET pushbutton is not pressed for at least ten seconds, the sensor will exit automatically from the delay function.
The delay function adds 20ms to the sensor's ON pulse duration.

SETTING

EASY TOUCH™
The sensor uses the patent-covered EASY TOUCH™ technology that allows a rapid and safe self-setting of the product.
Two different setting possibilities are available:
- *EASY TOUCH™;* a long pressure of the SET pushbutton allows self-setting.
- *FINE DETECTION;* to be used only in particularly critical conditions.

This setting procedure is used only when the EASY TOUCH™ is not sufficient.

S7 setting
The EASY TOUCH™ foresees the LIGHT operating mode.
Thus using proximity fibres, the output is closed and the output LED is ON when the object is detected.
Using through beam fibres, the output is closed and the output LED is ON when the object does not interrupt the beam (i.e. the object is not detected).

- *EASY TOUCH™ (standard detection)*
  Place the object to detect either in front of the proximity fibres within the operating range, or in the middle of the through beam fibres.
  Press the SET pushbutton and keep the pushbutton pressed until the signalling LED turns green and the READY/ERROR LED turns OFF.
  Release the SET pushbutton. The sensor is now ready to detect the object.
- *Fine detection*
  This mode offers an improved detection precision. The sensor can function either in the DARK operating or in the LIGHT operating mode.
  1) Place the object to detect in front of the proximity fibres within the operating distance, or in the middle of the through beam fibres.
     Press the SET pushbutton and keep it pressed until the READY/ERROR LED turns ON.
     Keep it pressed until the LED turns off and maintain the pressure until the signalling LED begins to blink green. The sensor is now ready for the second setting.
  2) Remove the object to detect and press the SET pushbutton again until the READY/ERROR LED to turn green.
     The sensor is now ready to detect very precisely the object.
     If the READY/ERROR LED begins to blink red and green, the setting has failed, as the contrast is insufficient. Thus the setting procedure has to be repeated.

  Following this setting procedure, the sensor functions in the LIGHT mode with proximity fibres and in the DARK mode with through beam fibres. To set the sensor in the DARK mode for proximity or LIGHT mode for through beam, invert the sequence given above.
  The operative DARK/LIGHT mode is automatically selected by the sensor when is used as contrast sensor.

REMOTE FUNCTION

The REMOTE wire connected to +Vdc is equal to pressing the SET pushbutton. The ***keyboard block*** is activated if at the sensor powering the REMOTE wire is connected +Vdc, and thus the SET pushbutton is no longer active. To deactivate the ***keyboard block*** the sensor has to be turned off and then turned on with the REMOTE wire not connected.

DECLARATION OF CONFORMITY
We DATASENSOR SpA declare under our sole responsibility that these products are conform to the 89/336 CEE, 73/23 CEE Directives and successive amendments.

WARRANTY
DATASENSOR SpA warrants its products to be free from defects.
DATASENSOR SpA will repair or replace, free of charge, any product found to be defective during the warranty period of 36 months from the manufacturing date.
This warranty does not cover damage or liability deriving from the improper application of DATASENSOR products.

DATASENSOR SpA Via Lavino 265
40050 Monte S. Pietro - Bologna - Italy
Tel: +39 051 6765611 Fax: +39 051 6759324
http://www.datasensor.com e-mail: info@datasensor.com

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