

## MICROPROCESSOR SENSOR FOR DIN RAIL



- 10 bit resolution models with 500  $\mu$ s response for high operating distances
- 12 bit resolution models with 50  $\mu$ s response and 4 digit display for high speed
- EASYtouch™ push button setting with remote control, keylock and output delay
- Ultra-thin housing with CLEARLOCK™ patented fibre fixing system

the 1<sup>st</sup> in Europe

## S7 SERIES

The **S7** series is the first fibre optic amplifier to be manufactured in Europe that is equipped with a full 4 digit display, confirming Datasensor's technological leadership. With its slim 10mm body width, the **S7** represents the ideal solution for all applications requiring high accuracy sensing combined with very compact dimensions.

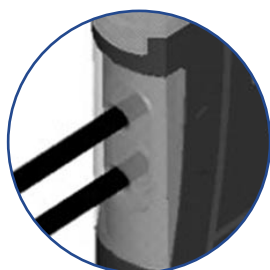
The high resolution 12 bit amplifier has a response time of 50  $\mu$ s for a switching frequency of 10 KHz. The 12 bit, 4096 resolution steps make the **S7** series perfect for ultra high precision detection of small objects and low colour contrasts.

This is made easier by the integral 4 digit display, which clearly indicates the received signal, selected time delay and the adjustable set point values. Moreover, the white light LED emission possibility enhances the contrast detection.

Setting the **S7** is easy and rapid, thanks to the patent-covered EASYtouch™ adjustment system, that offers remote setting, keylock and activation of the output OFF delay function.

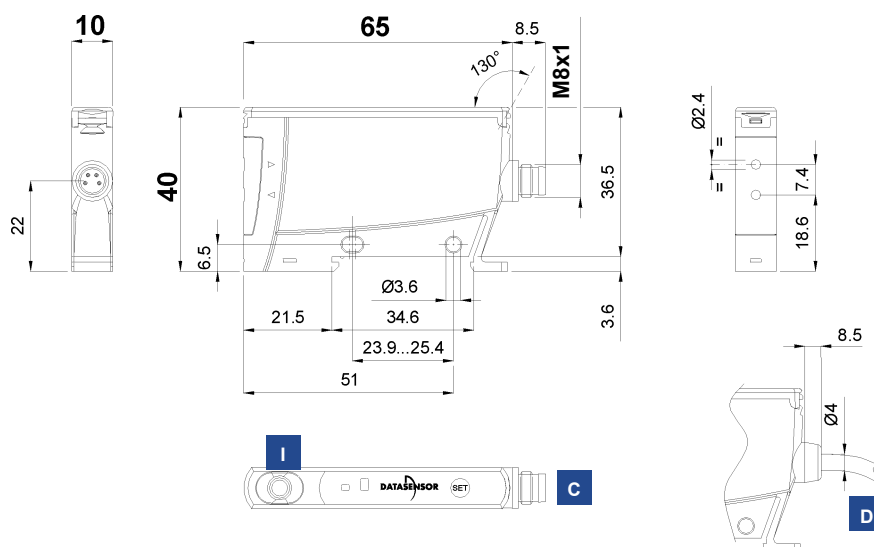
# S7 FIBRE-OPTIC SENSORS

The ultra-thin housing is specifically designed for side-by-side mounting on DIN rail where space is limited or mounting through two M3 clearance holes onto the side of a machine. The **CLEARLOCK™** fibre-optic fixing system assists reliable insertion of standard and high performance 2.2mm Ø fibre-optics. The **EASYtouch™** one touch setting procedure automatically selects the best detection conditions. For critical applications a two touch setting is provided for fine tuning. S7 benefits from remote teach, keypad lock and delay off timing functions. For further information on our extensive range of fibre-optic accessories please see our OF datasheet.

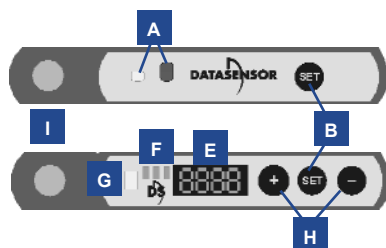


**CLEARLOCK™**

## DIMENSIONS



## INDICATORS AND SETTINGS



Teach-in button for setting.  
*EASYtouch™* provides two setting modes: standard or fine.  
Please refer to instructions manual for operating details

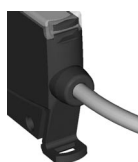
- A** OUTPUT status and READY/ERROR LEDs
- B** Teach-in push-button
- C** M8 connector output
- D** Cable output
- E** 4 digit display
- F** STATUS signalling LEDs
- G** OUTPUT status LED
- H** '+' e '-' buttons (ADJUST/MENU)
- I** Fibre lock/unlock button

## ACCESSORIES

For **dedicated accessories** refer to the **ACCESSORIES** section of this catalogue

Refer also to **Fibre-Optics (A.02)**, **Connectors (A.03)** and **Fixing brackets (A.04)** of the **General Catalogue**

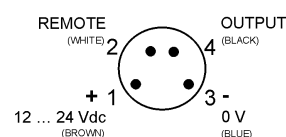
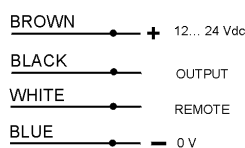
## CONNECTIONS



**S7-1/2/3**



**S7-4/5/6**





## TECHNICAL DATA

|   |                                       | S7-1-E-N | S7-1-E-P | S7-2-E-N | S7-2-E-P | S7-3-E-N | S7-3-E-P | S7-4-E-N | S7-4-E-P | S7-5-E-N | S7-5-E-P | S7-6-E-N | S7-6-E-P |
|---|---------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>Proximity operating distance:</b>    | 0 ... 100 mm (normal mode)            |          |          |          |          |          |          |          |          |          |          |          |          |
|   | 0 ... 50 mm (fast mode)               |          |          |          |          |          |          |          |          |          |          |          |          |
|   | 0 ... 25 mm (fast and normal mode)    | •        | •        |          |          |          |          |          |          |          |          |          |          |
| <b>Through beam operating distance:</b> | 0 ... 300 mm (normal mode)            |          |          |          |          |          |          |          |          |          |          |          |          |
|   | 0 ... 150 mm (fast mode)              |          |          |          |          |          |          |          |          |          |          |          |          |
|   | 0 ... 75 mm (fast and normal mode)    | •        | •        |          |          |          |          |          |          |          |          |          |          |
| <b>Power supply:</b>                    | 12 ... 24 Vdc ± 10 % <sup>1</sup>     | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Consumption:</b>                     | ≤ 50 mA                               | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Light emission<sup>2</sup>:</b>      | red LED 670 nm                        |          |          |          |          |          |          |          |          |          |          |          |          |
|   | white LED 460 ... 630 nm              | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Setting:</b>                         | teach-in SET button                   | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | remote via cable <sup>3</sup>         | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | '+' 'e' '-' buttons (ADJUST/MENU)     | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Setting procedure:</b>               | EASYtouch™ or fine                    | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Indicators:</b>                      | yellow USCITA LED                     | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | green / red READY / ERROR LED         | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | 4 digit display, status bar           | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Output type:</b>                     | PNP, NO                               | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | NPN, NO                               | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Output current:</b>                  | ≤ 100 mA                              | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Saturation voltage:</b>              | ≤ 2 V                                 | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Response time:</b>                   | 500 μs (normal mode)                  | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | 100 μs (fast mode)                    | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | 50 μs (fast mode)                     | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Switching frequency (max.):</b>      | 1 kHz (normal mode)                   | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | 5 kHz (fast mode)                     | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | 10 kHz (fast mode)                    | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Operating mode:</b>                  | light with EASYtouch™                 | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | automatic dark / light with fine acq. | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Timing function:</b>                 | 20 ms minimum output ON               | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Auxiliary functions:</b>             | remote <sup>4</sup>                   | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | keylock                               | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Connection:</b>                      | 2 m Ø 4 mm cable <sup>5</sup>         | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | M8 4-pole connector                   | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Electrical protection:</b>           | class 2                               | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Mechanical protection:</b>           | IP65                                  | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Electrical protection device:</b>    | A, B <sup>6</sup>                     | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Housing material:</b>                | ABS                                   | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Weight:</b>                          | 30 g max.                             | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
|   | 115 g max.                            | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Functioning temp.:</b>               | -10 ... +55°C                         | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Storage temp.:</b>                   | -10 ... +70°C                         | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |
| <b>Reference standard:</b>              | EN 60947-5-2                          | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        | •        |

## SELECTION TABLE

| fibre-optic sensor with display - 2 m cable |           |     |
|---|-----------|-----|
| S7-1-E-N                                    | 950551080 | NPN |
| S7-1-E-P                                    | 950551090 | PNP |
| S7-2-E-N                                    | 950551000 | NPN |
| S7-2-E-P                                    | 950551010 | PNP |

| fibre-optic sensor without display - 2 m cable |           |     |
|--|-----------|-----|
| S7-3-E-N                                       | 950551040 | NPN |
| S7-3-E-P                                       | 950551050 | PNP |

| fibre-optic sensor with display - M8 connector |           |     |
|--|-----------|-----|
| S7-4-E-N                                       | 950551100 | NPN |
| S7-4-E-P                                       | 950551110 | PNP |
| S7-5-E-N                                       | 950551020 | NPN |
| S7-5-E-P                                       | 950551030 | PNP |

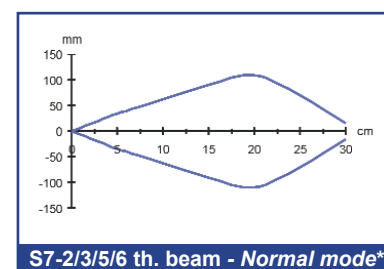
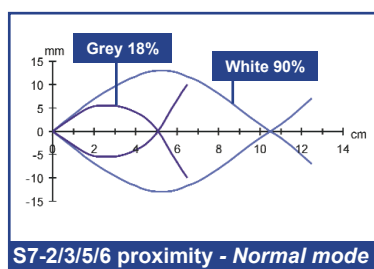
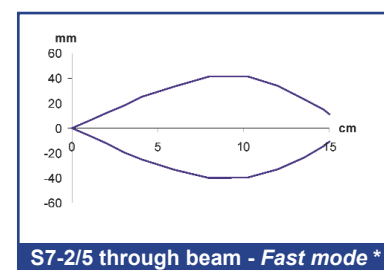
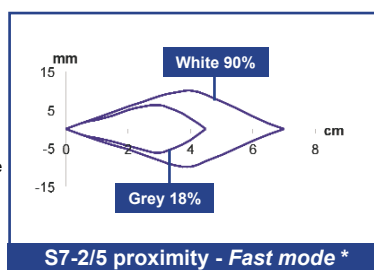
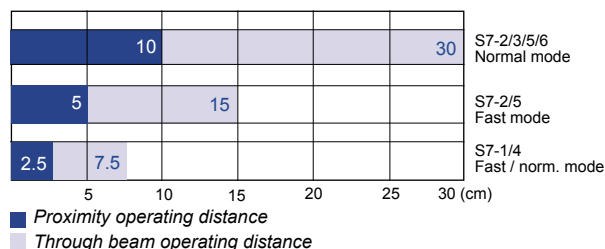
| fibre-optic sensor without display - M8 connector |           |     |
|---|-----------|-----|
| S7-6-E-N  | 950551060 | NPN |
| S7-6-E-P  | 950551070 | PNP |

## TECHNICAL NOTES

- Limit values
- Average life of 100.000 h with  $T_A = +25^\circ\text{C}$
- Connect to 0 V when remote wire not used
- Active with remote at +V at power on
- PVC, 4 x 0.14 mm<sup>2</sup>
- A - reverse polarity protection  
B - overload and short circuit protection



## DETECTION DIAGRAMS



Standard fibre-optics:  
OF-42-ST-20 proximity / OF-43-ST-20 through beam

High efficiency fibre-optics or accessory lenses can be used to obtain larger operating distances. Refer to **Fibre-optics (A.02)** of the **General Catalogue**

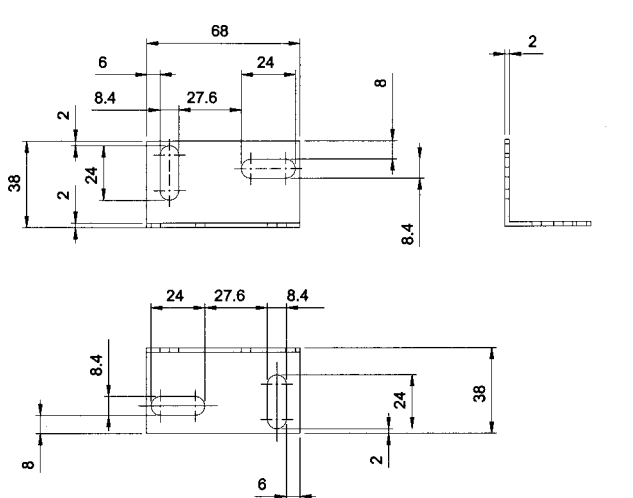
**Note:** the detection diagrams of the S7-1/4 models in normal and fast mode, corresponds to the values of the S7-2/5 models in fast mode, but with half the operating distance

\* standard fibre-optics

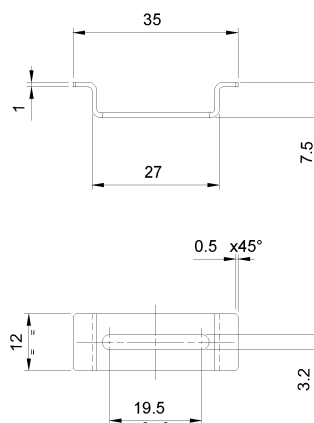
## SELECTION AND ORDER INFORMATION

| MODEL    | CONNECTION          | OUTPUT | DISPLAY | EMISSION  | CODE N°   |
|----------|---------------------|--------|---------|-----------|-----------|
| S7-1-E-N | 4-pole cable        | NPN    | yes     | white LED | 950551080 |
| S7-1-E-P | 4-pole cable        | PNP    | yes     | white LED | 950551090 |
| S7-2-E-N | 4-pole cable        | NPN    | yes     | red LED   | 950551000 |
| S7-2-E-P | 4-pole cable        | PNP    | yes     | red LED   | 950551010 |
| S7-3-E-N | 4-pole cable        | NPN    | no      | red LED   | 950551040 |
| S7-3-E-P | 4-pole cable        | PNP    | no      | red LED   | 950551050 |
| S7-4-E-N | M8 4-pole connector | NPN    | yes     | white LED | 950551100 |
| S7-4-E-P | M8 4-pole connector | PNP    | yes     | white LED | 950551110 |
| S7-5-E-N | M8 4-pole connector | NPN    | yes     | red LED   | 950551020 |
| S7-5-E-P | M8 4-pole connector | PNP    | yes     | red LED   | 950551030 |
| S7-6-E-N | M8 4-pole connector | NPN    | no      | red LED   | 950551060 |
| S7-6-E-P | M8 4-pole connector | PNP    | no      | red LED   | 950551070 |

## ACCESSORIES - DIMENSIONS



**ST-505**



**CRD-5000**

## ACCESSORIES - SELECTION AND ORDER INFORMATION

| MODEL    | DESCRIPTION                     | CODE N°   |
|----------|---------------------------------|-----------|
| ST-505   | 1 pc 'L'- shaped fixing support | 95ACC1300 |
| CRD-5000 | 1 pc fixing support on DIN rail | 95ACC1290 |

Refer also to *Accessories for Sensors* of the *General Catalogue*



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