# S70

## *Advanced fiber optic amplifiers for high speed and low contrast applications*

- DIN rail mountable models with dual digital displays
- High speed models: 200 µs...5 ms
- Super high speed models: 10 µs...1ms
- Teach-in setting via +/SET/- push-button/switch, remote input or IO-Link
- Standard 2 m cable or M8 4-pole connection

SENSORS

### APPLICATIONS

-Processing and Packaging machinery
-Electronics assembling
-Pharmaceutical industry

| S70 | | |
|---|---|---|
| Response time | | Super high speed: 10 µs (S70...E2)<br>High speed: 200 µs (S70...E1), 15 µs (S70...E2)<br>Fast: 50 µs (S70...E2)<br>Standard: 500 µs (S70...E1), 250 µs (S70...E2)<br>Medium range: 500 µs (S70...E2)<br>Long range: 2 ms (S70...E1), 1 ms (S70...E2)<br>Extra long range: 5 ms (S70...E1) |
| Repeatability | | Super high speed: 5 µs (S70...E2)<br>High speed: 66 µs (S70...E1), 5 µs (S70...E2)<br>Fast: 12 µs (S70...E2)<br>Standard: 100 µs (S70...E1), 50 µs (S70...E2)<br>Medium range: 80 µs (S70...E2)<br>Long range: 100 µs (S70...E1), 165 µs (S70...E2)<br>Extra long range: 100 µs (S70...E1) |
| Power supply | Vdc | 10...30 V, 18...30 V (IO-Link mod.) |
| | Vac | |
| | Vac/dc | |
| Output | PNP | ▪ |
| | NPN | ▪ |
| | NPN/PNP | |
| | relay | |
| | other | IO-Link |
| Connection | cable | ▪ |
| | connector | ▪ |
| | pig-tail | |
| Approximate dimensions (mm) | | 10x79x31.5 |
| Housing material | | ABS and polycarbonate |
| Mechanical protection | | IP50, NEMA 1 |

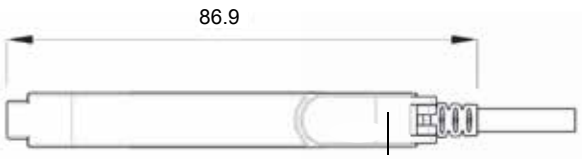
# Fiber Optic Sensors - S70

DATALOGIC

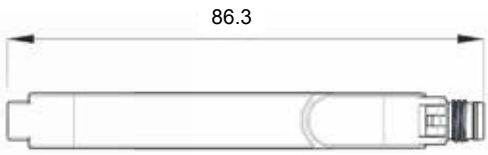
| TECHNICAL DATA | |
|---|---|
| Power supply | 10...30 Vdc (reverse polarity protection)<br>18...30 Vdc (IO-Link mod. S70...PZ) |
| Ripple | 10% max. |
| Consumption (output current excluded) | 40 mA max. (standard display mode), 30 mA max. (ECO display mode) |
| Light emission | red 660 nm (mod. S70...E1)<br>red 635 nm (mod. S70...E2) |
| Setting | +/SET/- push-button, LIGHT/DARK switch, RUN/PRG/ADJ mode switch |
| Indicators | yellow OUTPUT LED<br>red SIGNAL LEVEL 4-digit display<br>green THRESHOLD 4-digit display |
| Output | PNP or NPN<br>PNP and push-pull (IO-Link mod. S70...PZ) |
| Output current | 100 mA max. |
| Saturation voltage | 1,5 V max. (mod. S70...N)<br>2 V max. (mod. S70...P/PZ) |
| Response time | S70...E1: 200 µs (High Speed), 500 µs (Standard), 2 ms (Long Range), 5 ms (Extra Long Range)<br>S70...E2: 10 µs (Super High Speed), 15 µs (High Speed), 50 µs (Fast), 250 µs (Standard), 500 µs (Medium Range), 1 ms (Long Range) |
| Switching frequency | S70...E1: 2,5 kHz (High Speed), 1 kHz (Standard), 250 Hz (Long Range), 100 Hz (Extra Long Range)<br>S70...E2: 50 kHz (Super High Speed), 33 kHz (High Speed), 10 kHz (Fast), 2 kHz (Standard), 1 kHz (Medium Range), 500 Hz (Long Range) |
| IO-Link interface | baud rate: 38400 bps (COM2)<br>process data width: 16 bits<br>IODD files: provide all programming options of top panel interface, plus additional functionality |
| Connection | 2 m cable, M8 4-pole connector |
| Dielectric strength | 500 Vac, 1 min between electronics and housing |
| Insulating resistance | >20 MΩ, 500 Vdc between electronics and housing |
| Electrical protection | class 2 |
| Mechanical protection | IP50, NEMA 1 |
| Ambient light rejection | according to EN 60947-5-2 |
| Vibrations | 0,5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6) |
| Shock resistance | 11 ms (30 G) 6 shock for every axis (EN60068-2-27) |
| Housing material | ABS and polycarbonate |
| Operating temperature | -10 ... 55 °C |
| Storage temperature | -25 ... 85 °C |
| Weight | 69 g max. cable vers., 21 g max. conn. vers. |

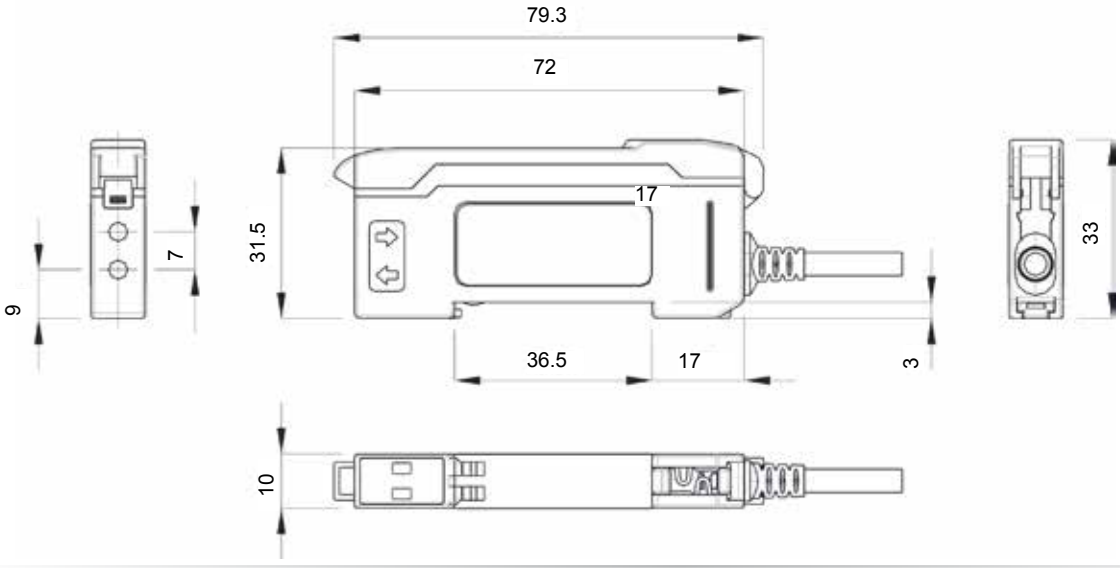
## DIMENSIONS

CABLE



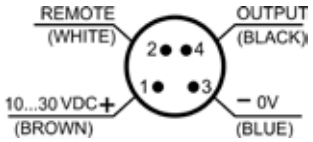

CONNECTOR



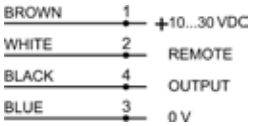



## CONNECTIONS

M8 CONNECTOR




CABLE

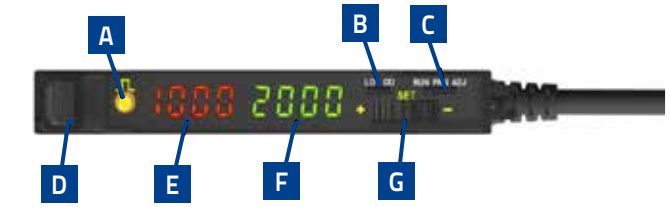



## INDICATOR AND SETTINGS

The **RUN/PRG/ADJ Mode Switch** puts the sensor in RUN, PRG (Program), or ADJ (Adjust) mode. RUN mode allows the sensor to operate normally and prevents unintentional programming changes via the **+/SET/- button.** PRG mode allows the sensor to be programmed through the display driven programming menu. ADJ mode allows the user to perform TEACH and SET methods and Manual Adjust.

The **LO/DO Switch** is used to select Light Operate or Dark Operate mode.

**Top Panel Interface**



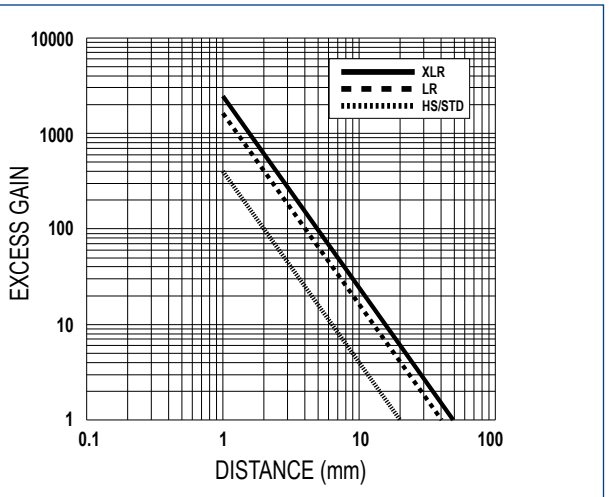

- A Output LED
- B LO/DO Switch
- C RUN/PRG/ADJ
- D Lever Action Fiber Clamp
- E Red Signal Level
- F Green Threschold
- G +/SET/- Rocker Button

As an alternative the sensor can be programmed remotely and the remote input may be used to perform TEACH and SET methods (not available on IO-Link models).

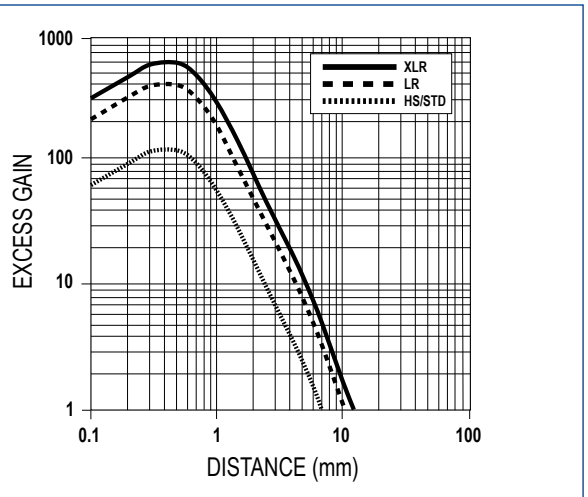
## DETECTION DIAGRAMS

| S70-E1 | | | | |
|---|---|---|---|---|
| | HIGH SPEED | STANDARD | LONG RANGE | EXTRA LONG RANGE |
| Response Time | 200 µs | 500 µs | 2 ms | 5 ms |
| Repeatability | 66 µs | 100 µs | 100 µs | 100 µs |

**Excess gain**

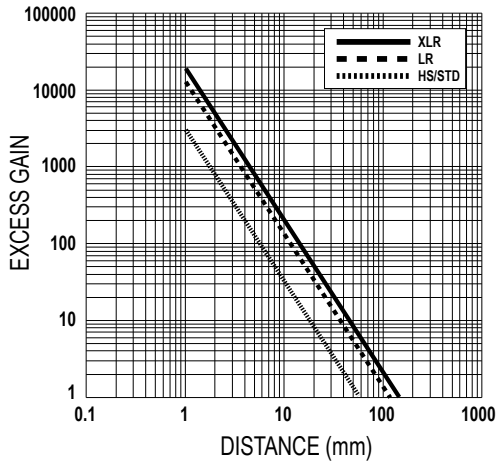



**Through beam with 0.2 mm internal fiber optic diameter**

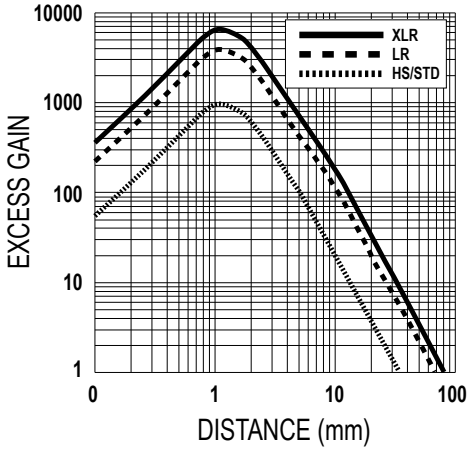



**Diffuse proximity with 0.2 mm internal fiber optic diameter**

## Excess gain

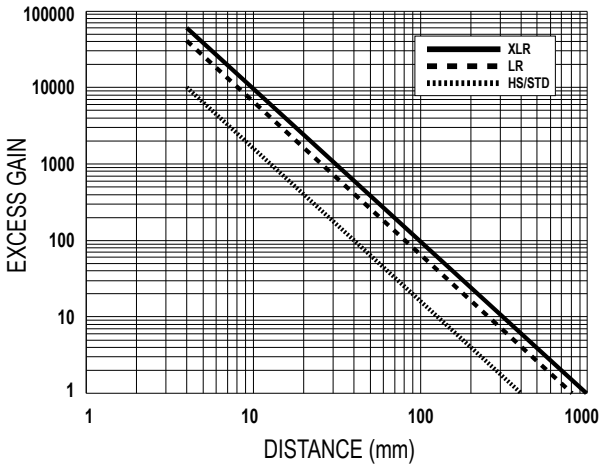



Through beam with 0.5 mm internal fiber optic diameter

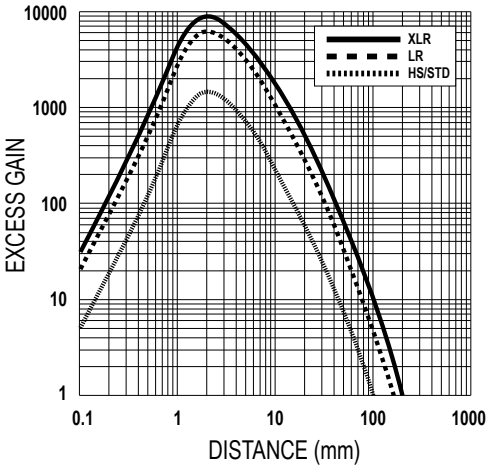



Diffuse proximity with 0.5 mm internal fiber optic diameter

## Excess gain

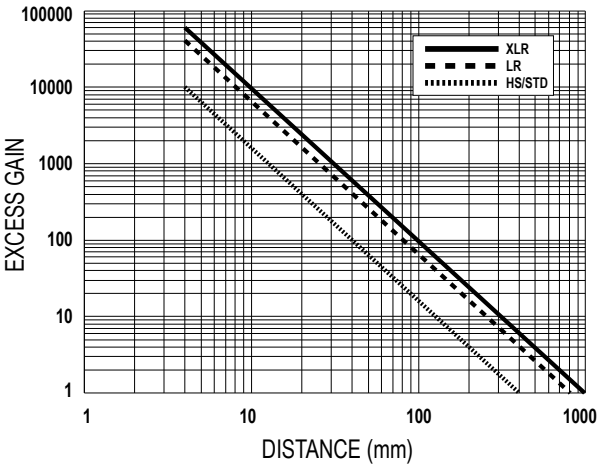



Through beam with 1 mm internal fiber optic diameter

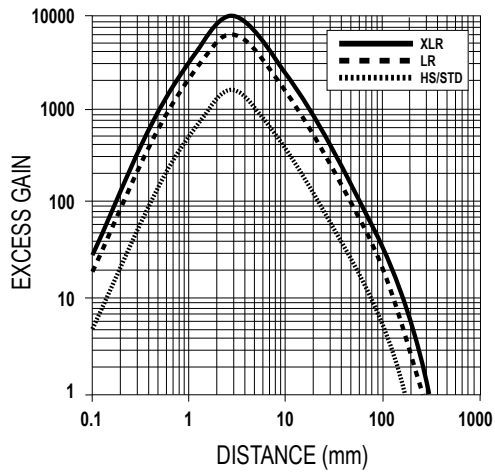



Diffuse proximity with 1 mm internal fiber optic diameter

## Excess gain



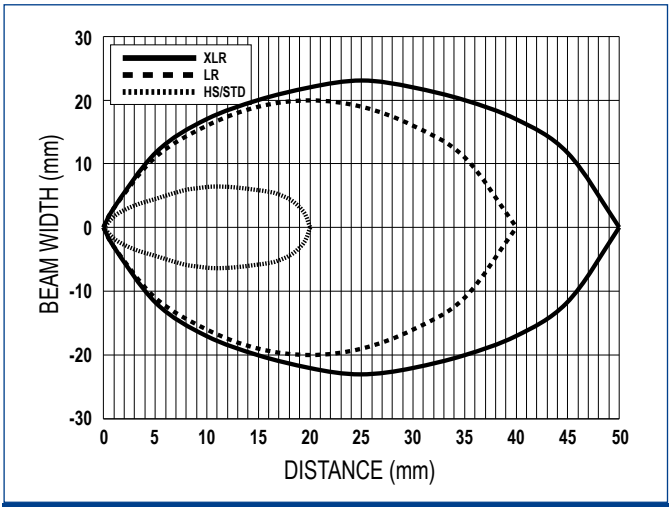

Through beam with 1.5 mm internal fiber optic diameter



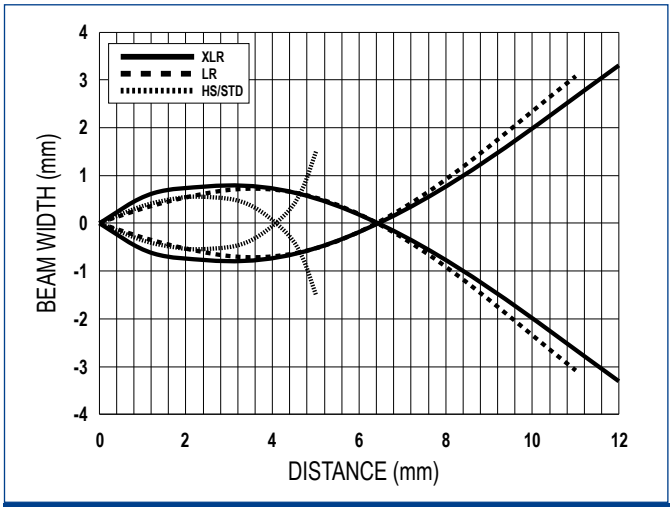

Diffuse proximity with 1.5 mm internal fiber optic diameter

| S70-E1 | | | | |
|---|---|---|---|---|
| | HIGH SPEED | STANDARD | LONG RANGE | EXTRA LONG RANGE |
| Response Time | 200 µs | 500 µs | 2 ms | 5 ms |
| Repeatability | 66 µs | 100 µs | 100 µs | 100 µs |

## Detection area

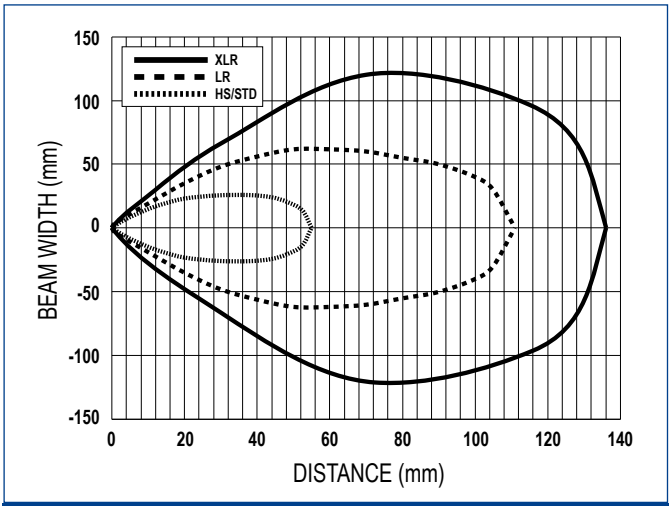



Through beam with 0.2 mm internal fiber optic diameter

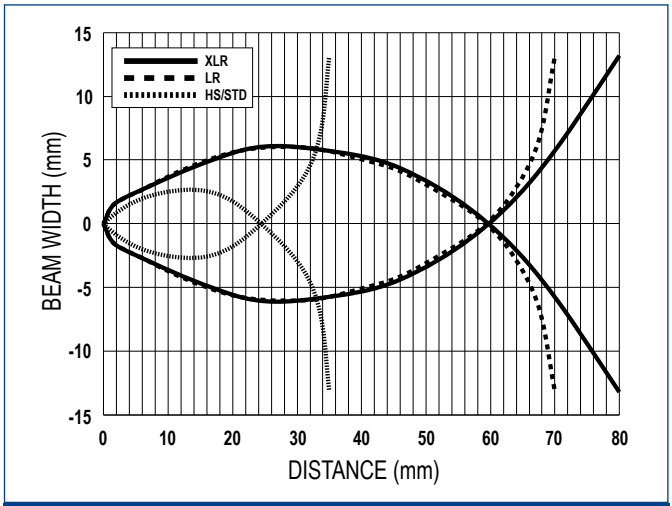



Diffuse proximity with 0.2 mm internal fiber optic diameter

## Detection area




Through beam with 0.5 mm internal fiber optic diameter




Diffuse proximity with 0.5 mm internal fiber optic diameter

| S70-E1 | | | | |
|---|---|---|---|---|
| | HIGH SPEED | STANDARD | LONG RANGE | EXTRA LONG RANGE |
| Response Time | 200 µs | 500 µs | 2 ms | 5 ms |
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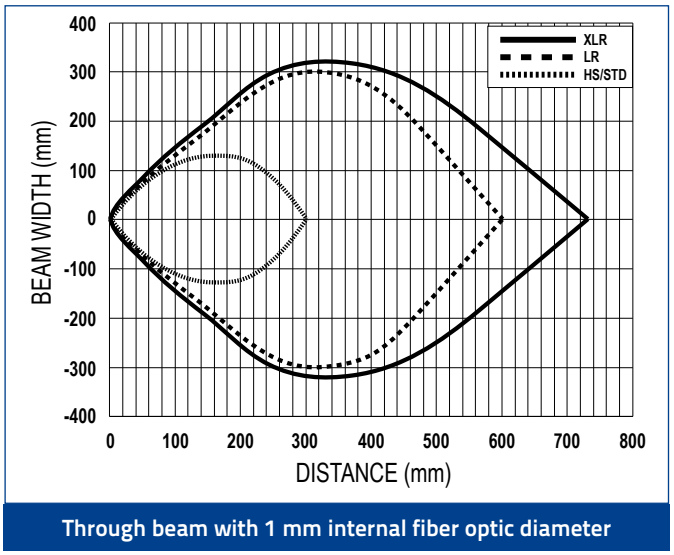
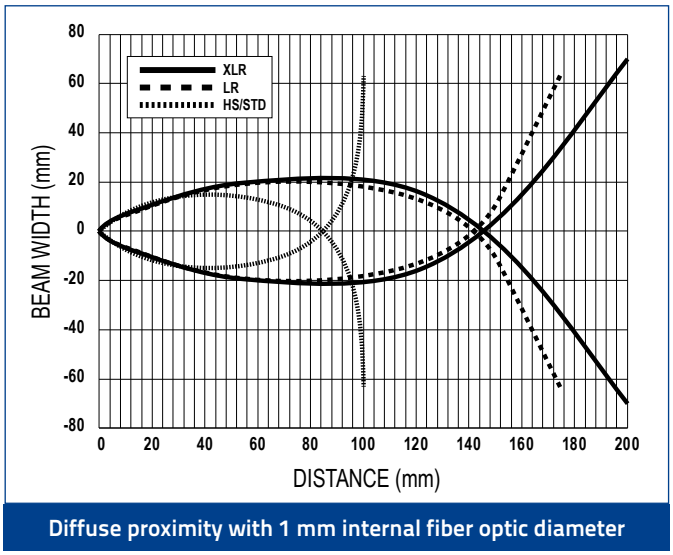
## Detection area

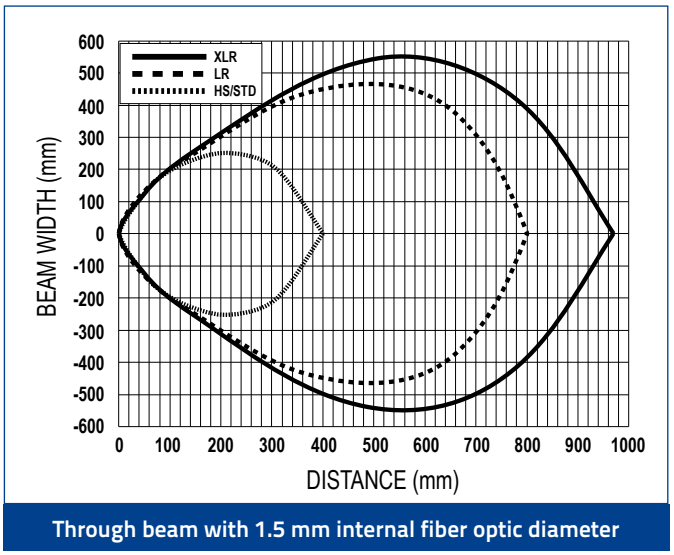



Through beam with 1 mm internal fiber optic diameter

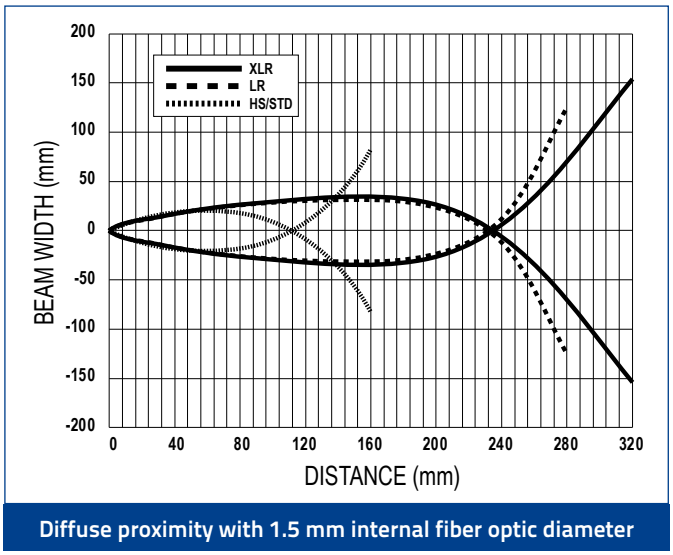



Diffuse proximity with 1 mm internal fiber optic diameter

## Detection area



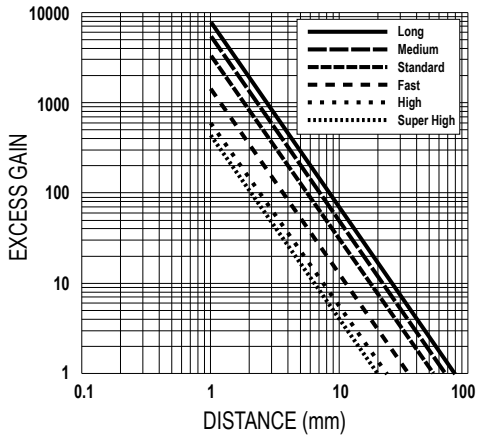

Through beam with 1.5 mm internal fiber optic diameter



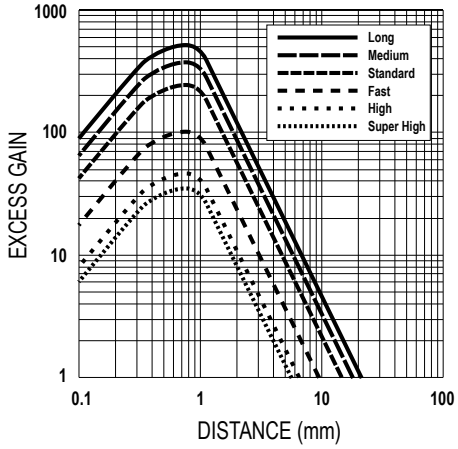

Diffuse proximity with 1.5 mm internal fiber optic diameter

| S70-E2 | | | | | | |
|---|---|---|---|---|---|---|
| | SUPER HIGH SPEED | HIGH SPEED | FAST | STANDARD | MEDIUM RANGE | LONG RANGE |
| Response Time | 10 µs | 15 µs | 50 µs | 250 µs | 500 µs | 1 ms |
| Repeatability | 5 µs | 5 µs | 12 µs | 50 µs | 80 µs | 165 µs |

## Excess gain

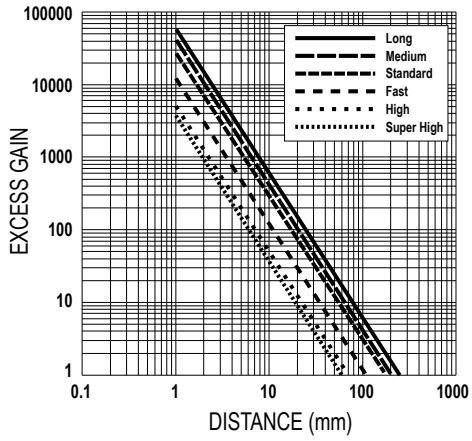



Through beam with 0.2 mm internal fiber optic diameter

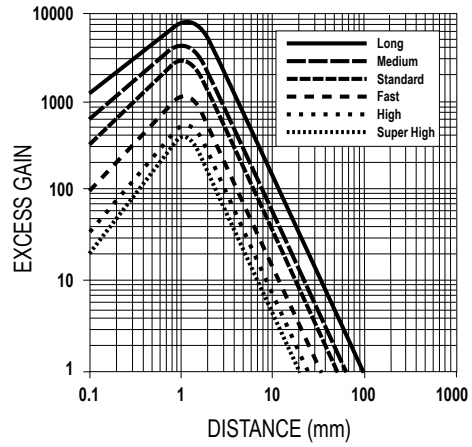



Diffuse proximity with 0.2 mm internal fiber optic diameter

## Excess gain



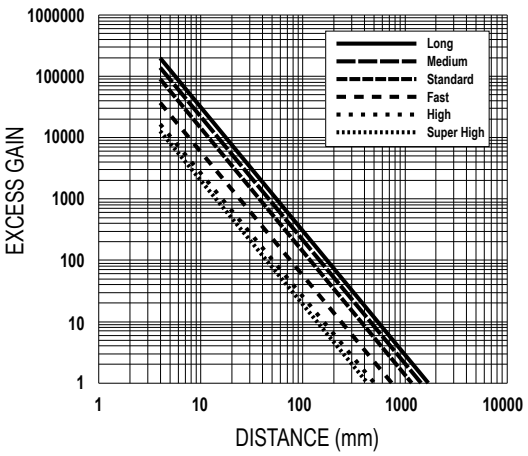

Through beam with 0.5 mm internal fiber optic diameter



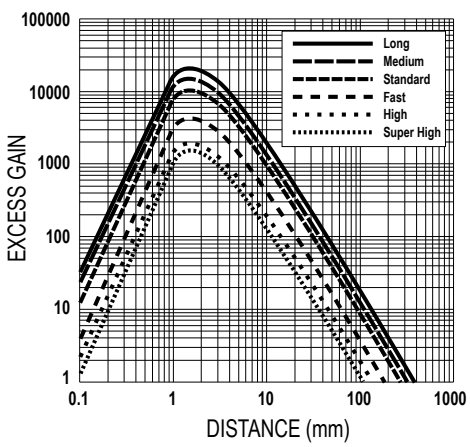

Diffuse proximity with 0.5 mm internal fiber optic diameter

| S70-E2 | | | | | | |
|---|---|---|---|---|---|---|
| | SUPER HIGH SPEED | HIGH SPEED | FAST | STANDARD | MEDIUM RANGE | LONG RANGE |
| Response Time | 10 µs | 15 µs | 50 µs | 250 µs | 500 µs | 1 ms |
| Repeatability | 5 µs | 5 µs | 12 µs | 50 µs | 80 µs | 165 µs |

## Excess gain

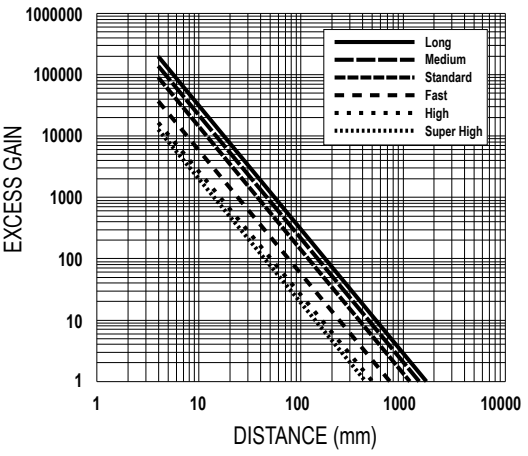



Through beam with 1 mm internal fiber optic diameter

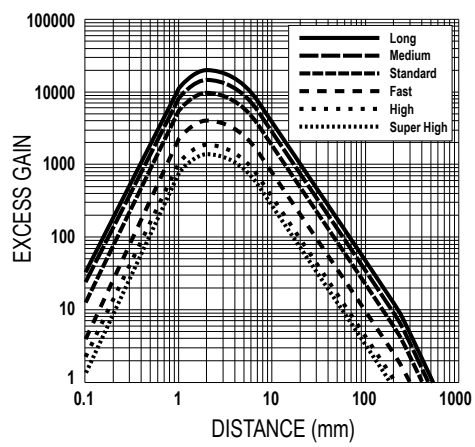



Diffuse proximity with 1 mm internal fiber optic diameter

## Excess gain



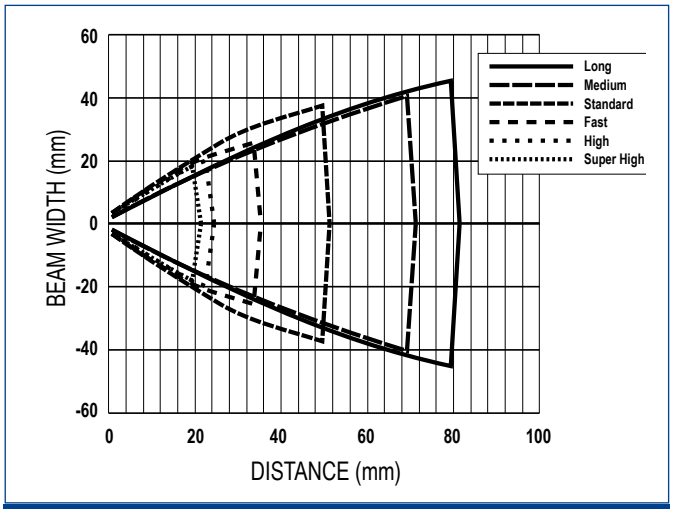

Through beam with 1.5 mm internal fiber optic diameter



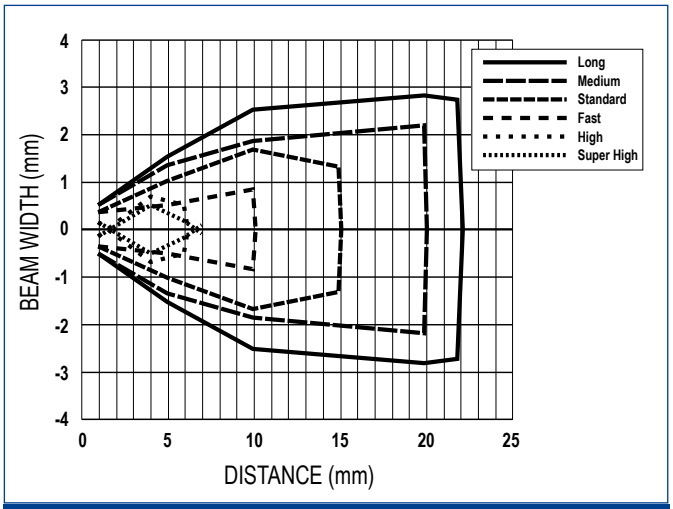

Diffuse proximity with 1.5 mm internal fiber optic diameter

| S70-E2 | | | | | | |
|---|---|---|---|---|---|---|
| | SUPER HIGH SPEED | HIGH SPEED | FAST | STANDARD | MEDIUM RANGE | LONG RANGE |
| Response Time | 10 µs | 15 µs | 50 µs | 250 µs | 500 µs | 1 ms |
| Repeatability | 5 µs | 5 µs | 12 µs | 50 µs | 80 µs | 165 µs |

## Detection area

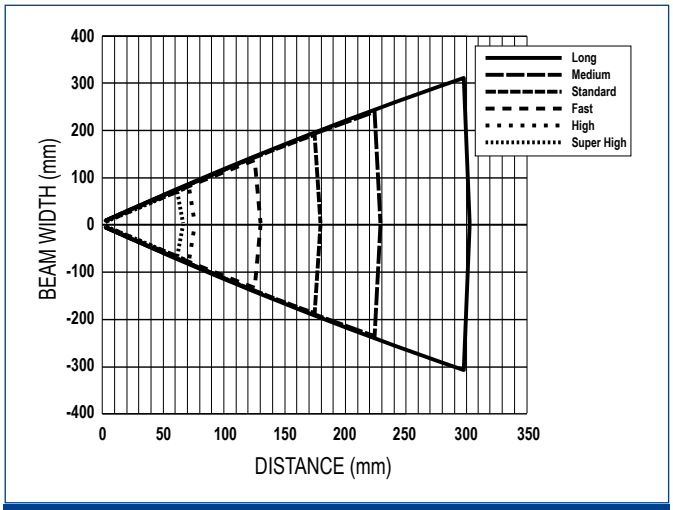



Through beam with 0.2 mm internal fiber optic diameter

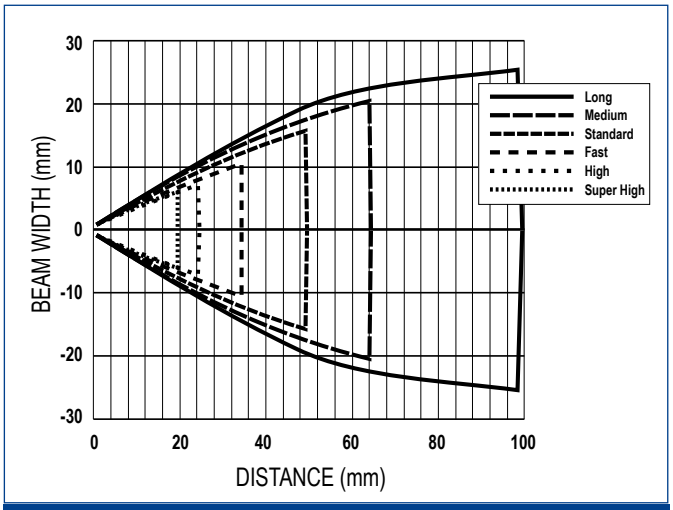



Diffuse proximity with 0.2 mm internal fiber optic diameter

## Detection area



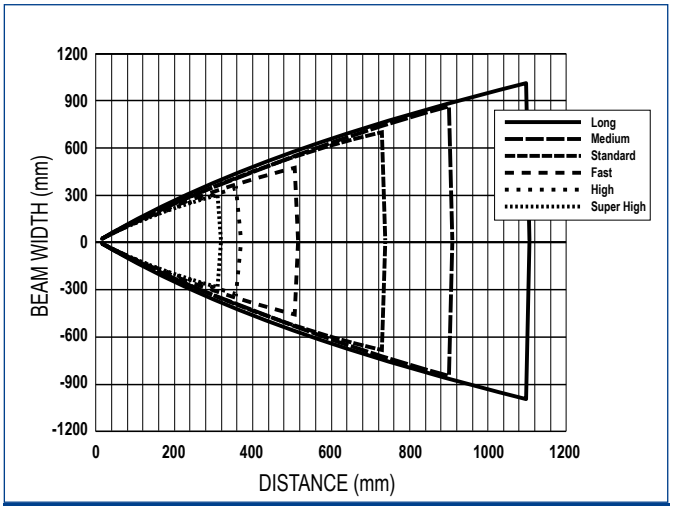

Through beam with 0.5 mm internal fiber optic diameter



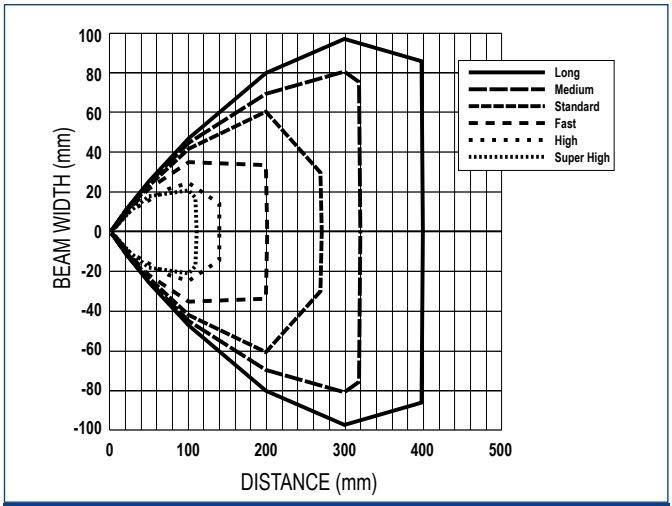

Diffuse proximity with 0.5 mm internal fiber optic diameter

| S70-E2 | | | | | | |
|---|---|---|---|---|---|---|
| | SUPER HIGH SPEED | HIGH SPEED | FAST | STANDARD | MEDIUM RANGE | LONG RANGE |
| Response Time | 10 µs | 15 µs | 50 µs | 250 µs | 500 µs | 1 ms |
| Repeatability | 5 µs | 5 µs | 12 µs | 50 µs | 80 µs | 165 µs |

## Detection area

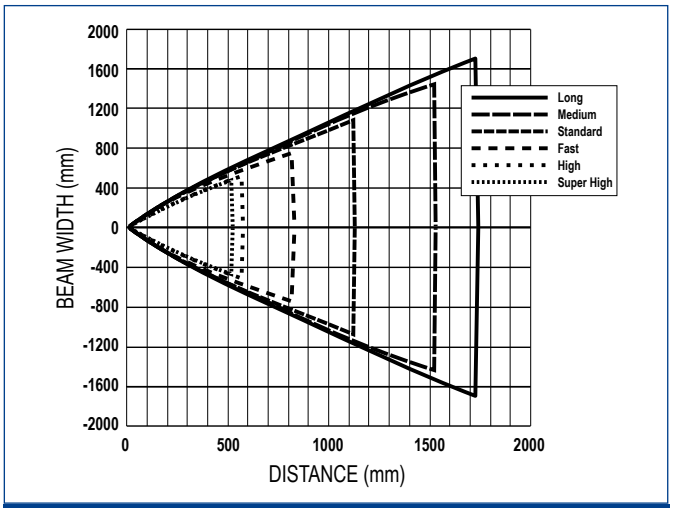



Through beam with 1 mm internal fiber optic diameter

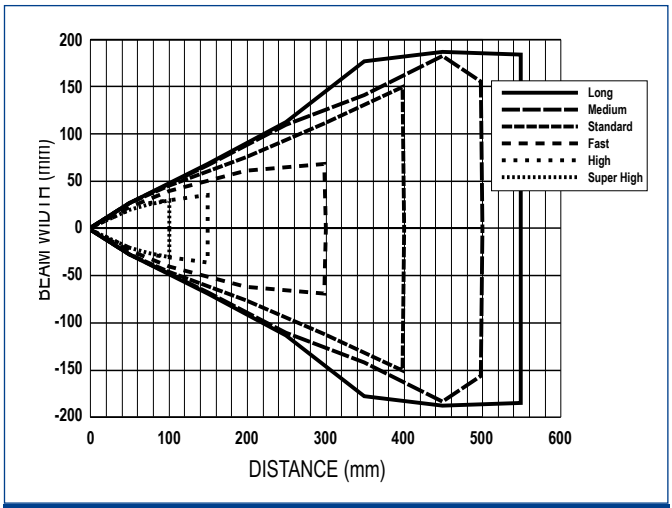



Diffuse proximity with 1 mm internal fiber optic diameter

## Detection area




Through beam with 1.5 mm internal fiber optic diameter



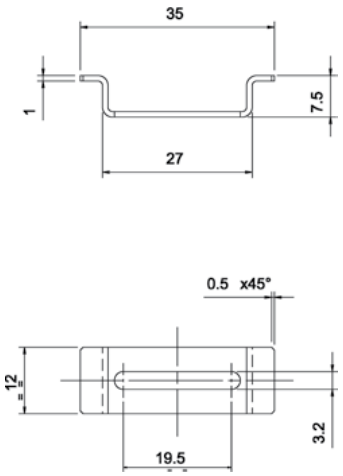

Diffuse proximity with 1.5 mm internal fiber optic diameter

## MODEL SELECTION AND ORDER INFORMATION

| OPTIC FUNCTION | RESPONSE TIME | CONNECTION | OUTPUT | MODEL | ORDER No. |
|---|---|---|---|---|---|
| Optic fiber | 200 µs ... 5 ms | 2 m Cable | NPN | S70-2-E1-N | 950561000 |
| | | | PNP | S70-2-E1-P | 950561010 |
| | | M8 Connector | NPN | S70-5-E1-N | 950561060 |
| | | | PNP | S70-5-E1-P | 950561020 |
| | | | PNP, push-pull IO-Link | S70-5-E1-PZ | 950561030 |
| | 10 µs ... 1 ms | | NPN | S70-5-E2-N | 950561040 |
| | | | PNP | S70-5-E2-P | 950561050 |

## ACCESSORIES

CRD-5000




mm

| MODEL | DESCRIPTION | ORDER No. |
|---|---|---|
| CRD-5000 | DIN rail mounting bracket | 95ACC2790 |

## CABLES

| TYPE | DESCRIPTION | LENGTH | MODEL | ORDER No. |
|---|---|---|---|---|
| Axial M8 Connector | 4-pole, grey, P.V.C. | 3 m | CS-B1-02-G-03 | 95A251420 |
| | | 5 m | CS-B1-02-G-05 | 95A251430 |
| | | 7 m | CS-B1-02-G-07 | 95A251440 |
| | | 10 m | CS-B1-02-G-10 | 95A251480 |
| | 4-pole, P.U.R. | 2 m | CS-B1-02-R-02 | 95A251620 |
| | | 5 m | CS-B1-02-R-05 | 95A251640 |
| Radial M8 Connector | 4-pole, grey, P.V.C. | 3 m | CS-B2-02-G-03 | 95A251450 |
| | | 5 m | CS-B2-02-G-05 | 95A251460 |
| | | 7 m | CS-B2-02-G-07 | 95A251470 |
| | | 10 m | CS-B2-02-G-10 | 95A251530 |
| | 4-pole, P.U.R. | 2 m | CS-B2-02-R-02 | 95A251630 |
| | | 5 m | CS-B2-02-R-05 | 95A251650 |