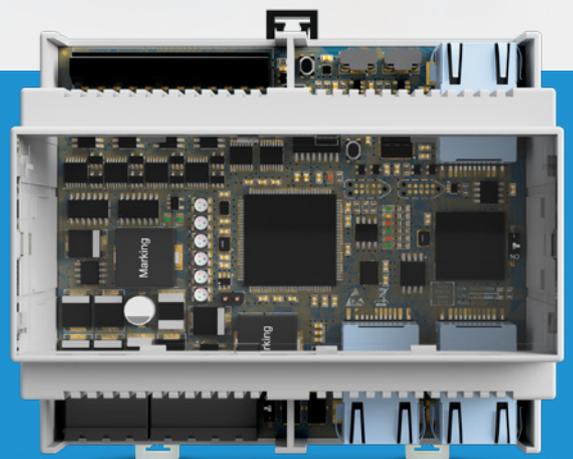


**LBK** System Bus

**3D  
SAFETY  
RADAR**



# 3D SAFETY RADAR

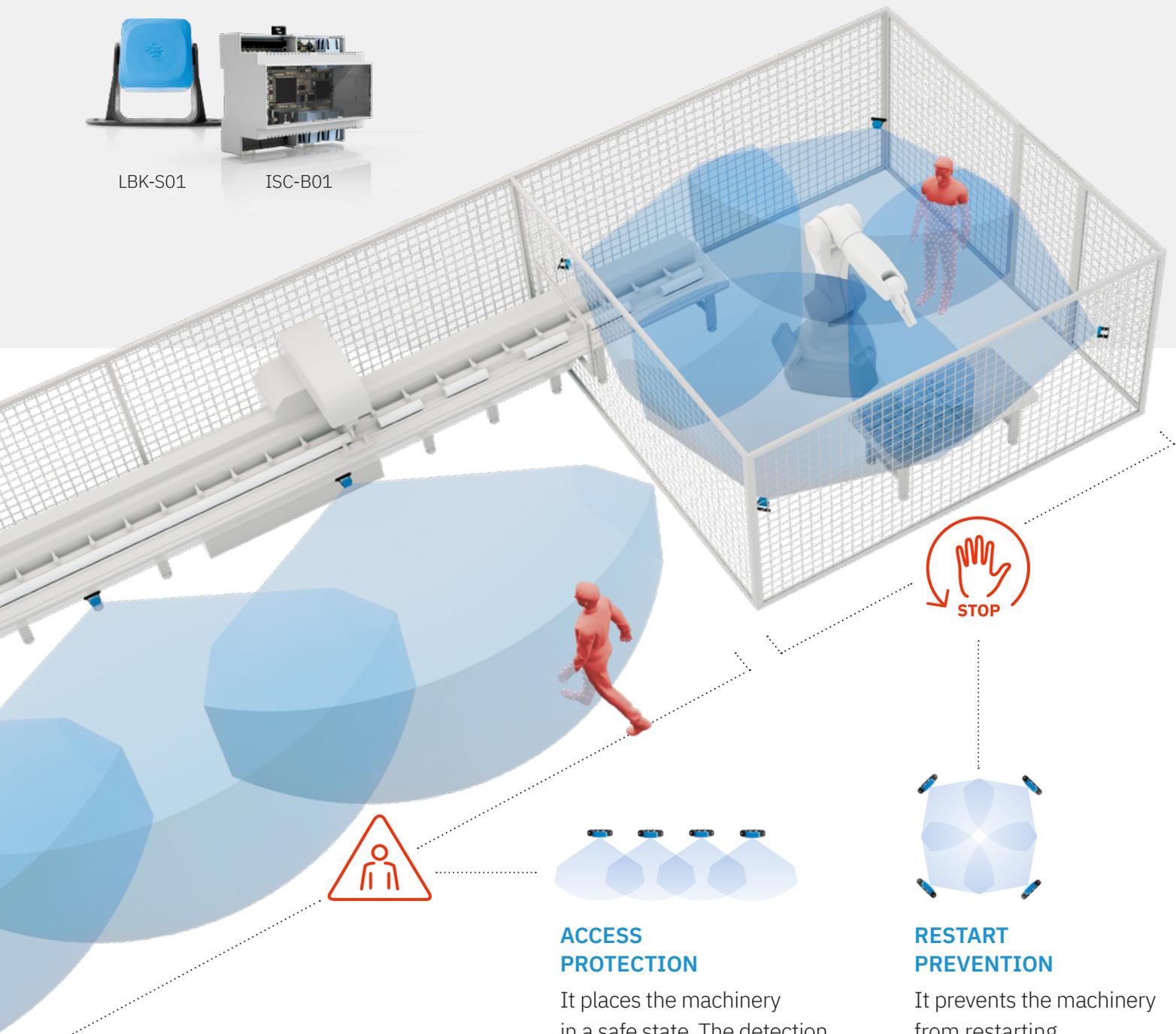
## LBK System Bus

Industrial safety at the highest levels: it detects the access or presence of an operator in a dangerous area allowing real-time dynamic setting of the detection zone, the warning zone, the sensitivity of the system and the input functionality.



LBK-S01

ISC-B01



### ACCESS PROTECTION

It places the machinery in a safe state. The detection parameters can be dynamically modified in real-time.

### RESTART PREVENTION

It prevents the machinery from restarting while operators are in the dangerous area.

**It works where optical sensors stop.**  
**High safety without compromising productivity**

Optical devices often fail due to dust, smoke, water or waste generated by the production process. The Inxpect team, highly specialized in radar technology, has developed a sophisticated 24 GHz radar algorithm that filters out those disturbances, reducing false alarms and increasing productivity.



**DYNAMIC MODIFICATION OF THE DETECTION ZONE**

With ISC-B01 control unit, the system's parameters can be configured in real-time, allowing a dynamic modification of the detection zone.

This feature makes ISC-B01 a perfect solution for Mobile Industrial Robot (MiR) applications.



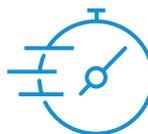
**REMOTE CONFIGURATION**

The ethernet communication guarantees more flexibility, easier integration and the possibility of a remote access for the system configuration. The communication with the ISC-B01 is secured by the most advanced security protocols.



**IMPROVE THE COMMUNICATION WITH THE MACHINERY**

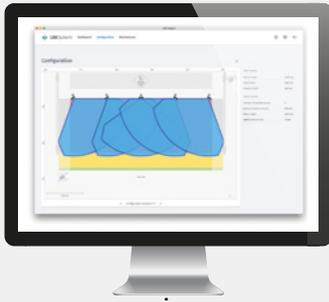
ISC-B01 ethernet safety fieldbus provides a safety mechanism to communicate with the machinery's PLC. The fieldbus can exchange complex information in real-time, such as the position of the target, and allows a quick integration with the machinery's control system.



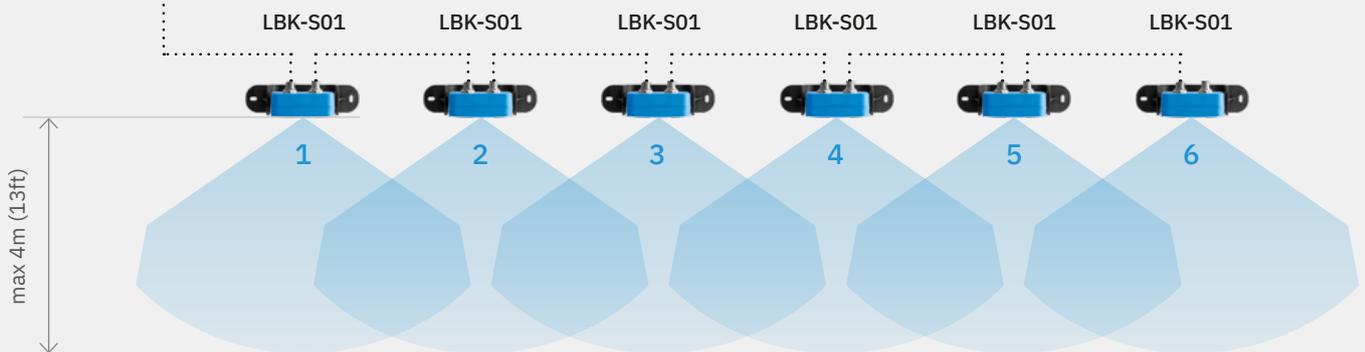
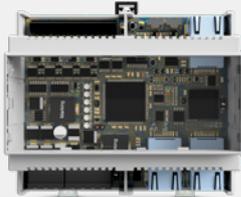
**RESPONSE TIME < 100ms**

With a response time lower than 100 ms, you can save space and reduce the area required to stop the machinery.

INXPECT  
SAFETY APPLICATION



ISC-B01



## Easy setup

The LBK System is composed of the **ISC-B01** control unit and up to six **LBK-S01** sensors. The maximum depth of the monitored area is 4m (13ft).

Configuring the system is quick and easy, thanks to the user friendly **Inxpect Safety Application**. Guided validation procedures and the simple generation of the configuration report complete the installation.



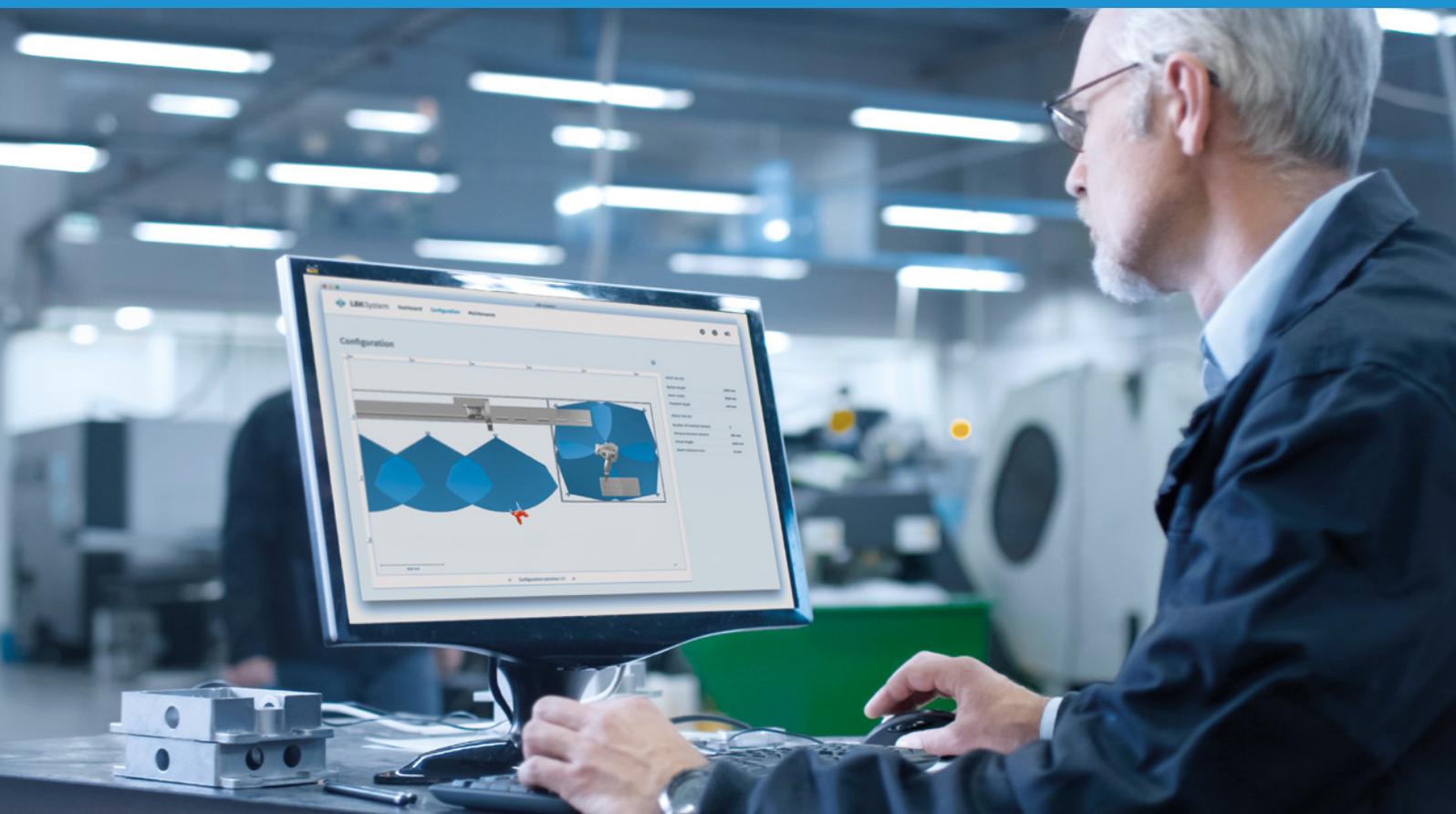
A perfect alignment between sensors is not required.



The provided Inxpect Safety Application allows multiple configuration modes: automatic for regular-shaped areas, manual for the monitoring of more complex areas.



Programmable Muting function: the configuration of sensor groups that can be temporarily muted allows operators to safely access parts of the dangerous area, according to production needs.



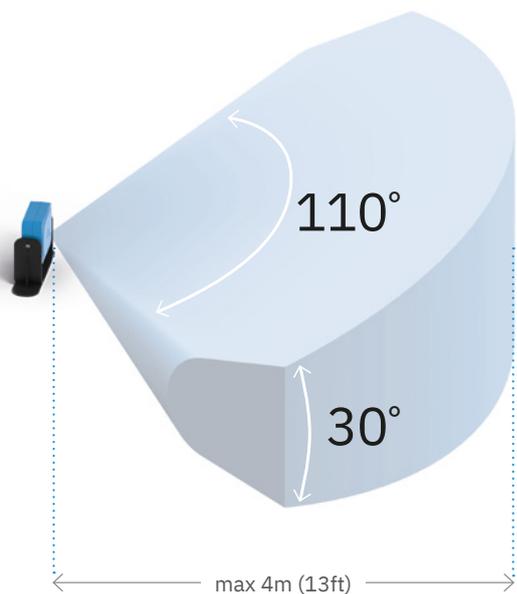
## Sensing field

Each LBK-S01 sensor in the LBK System can be field-programmed, independently from the others, to cover either a Wide or a Narrow sensing field. The actual covered area of each sensor depends on installation height and tilt.

### WIDE COVERAGE FIELD

Horizontal Plane: 110°

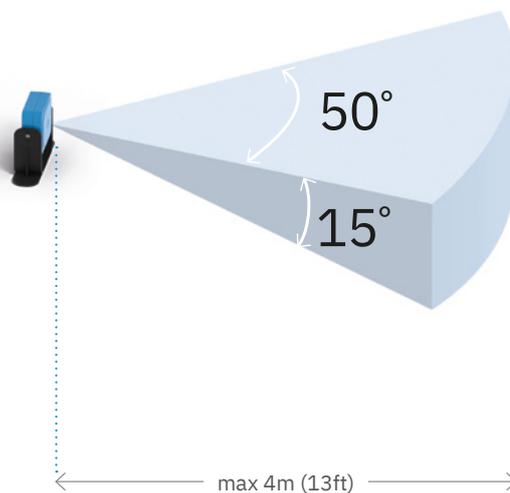
Vertical Plane: 30°



### NARROW COVERAGE FIELD

Horizontal Plane: 50°

Vertical Plane: 15°





## LBK-S01

### The smart radar sensor

The **LBK-S01** sensor is a smart FMCW (Frequency Modulated Continuous Wave) radar device based on proprietary Inxpect detection algorithms. The sensor sends 24 GHz radio waves and recovers motion information, analyzing the returned signals reflected by both static and moving objects in the operative range.

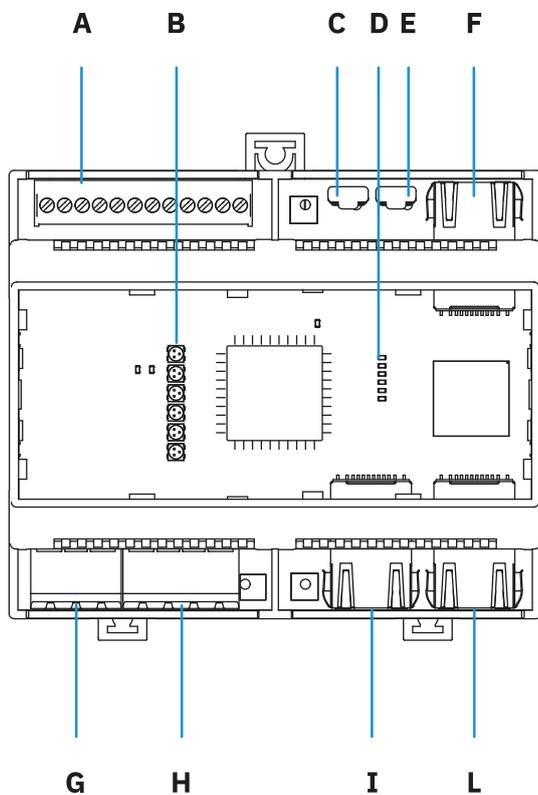
The sensors perform the following primary functions:

- **Motion and scenario analysis.**
- **Communication via CAN bus to the controller of the motion detection signal.**
- **Fault reporting and communication of diagnostic information via CAN bus to the controller.**



# ISC-B01

## The control unit



**ISC-B01** is the new control unit for the Inxpect radar detection system, which improves the performance of the system providing advanced functionality through the ethernet connection:

- **ISC-B01 can be remotely configured using the Inxpect Safety Application: the security is guaranteed by the adoption of the highest security standards.**
- **The detection zone can be dynamically modified in real-time.**
- **The sensitivity of the system, the warning zone and the input functionality can be dynamically configured.**
- **It supports different fieldbus protocols (e.g. ProfiSafe, CIP Safety).**

**A** - I/O Connector

**B** - Sensor's status LED

**C** - Micro USB port for the communication with the Inxpect Safety App

**D** - Ethernet fieldbus' status LED

**E** - Micro USB port (reserved)

**F** - Ethernet port for the communication with the Inxpect Safety App

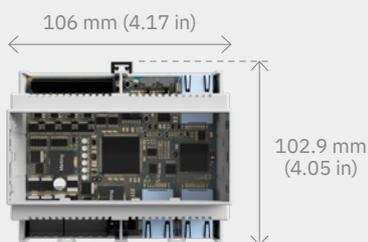
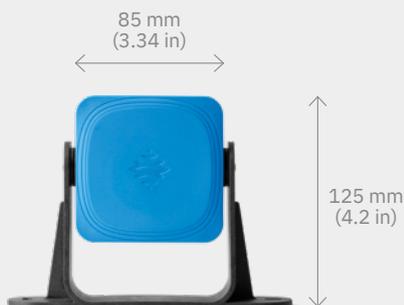
**G** - Power supply connector

**H** - CAN bus and sensor power supply connector

**I** - Ethernet fieldbus port n. 1

**L** - Ethernet fieldbus port n. 2

## Dimensions



## General

<b>Detection method</b>	Inxpect motion detection algorithm based on FMCW radar
<b>Frequency</b>	Working band: 24–24,25 GHz (24.05–24.25 for UK and FR) Transmission power: $\leq 13$ dBm - Modulation: FMCW
<b>Detection interval</b>	From 1 to 4 m (3.2 to 13.1 ft), depending on the installation conditions
<b>Sensing field and Installation height</b>	Wide FOV configuration: 110° Horiz.   30° Vert., Height: 0 to 3 m (0 to 9.8 ft) Narrow FOV configuration: 50° Horiz.   15° Vert., Height: 0 to 3 m (0 to 9.8 ft)
<b>Guaranteed response time</b>	< 100 ms
<b>Total consumption</b>	12 W (controller and six sensors)
<b>Operating Temperature</b>	From -30 to +60 °C (-22 to +140 °F)
<b>Storage Temperature</b>	From -40 to +80 °C (-40 to +176 °F)
<b>Communication protocol (sensors-controller)</b>	CAN complies with standard EN 50325-5
<b>Warranty period</b>	36 months from the date of purchase of the product

## Sensor

<b>Connectors</b>	2 5-pin M12 connectors (1 male and 1 female)
<b>CAN bus termination resistance</b>	120 $\Omega$ (not supplied, to be installed with termination connector)
<b>Power supply</b>	12 V dc $\pm$ 20%, through controller
<b>Degree of protection</b>	IP67
<b>Material</b>	Sensor case: PA66   Bracket: PA66 and glass fiber (GF)

## Controller

<b>Outputs</b>	4 Outputs Signal Switching Devices (OSSDs) 2 dual channel safety outputs
<b>Safety outputs</b>	High-side outputs (with extended protection function) Max voltage: 30 V dc   Max current: 0,4 A   Max power: 12 W
<b>Inputs</b>	2 dual channel TYPE3 digital inputs with common GND
<b>Fieldbus interface</b>	Ethernet based interface with different standard fieldbus (e.g. ProfiSafe)
<b>Power supply</b>	24 V dc (20–28 V dc) Max current: 0.6A
<b>Consumption</b>	Max 5 W
<b>Assembly</b>	DIN guide
<b>Degree of protection</b>	IP20
<b>Terminals</b>	Section: 1 mm <sup>2</sup> (AWG16)   Max Current: 4A with 1 mm <sup>2</sup> cables

## CAN bus cables

<b>Section</b>	2 x 0,25 mm <sup>2</sup> (AWG24) for data signal and 2 x 0,25 mm <sup>2</sup> (AWG24) for power supply
<b>Type</b>	4 wires and 1 drain wire (or shield)
<b>Connectors</b>	5-pole M12
<b>Impedance</b>	120 $\Omega$ $\pm$ 10% (f = 1MHz)
<b>Shield</b>	Shield with twisted wires in tin-plated copper. Requires ground connection.
<b>Length</b>	30 m (98.4 ft) from controller to sensor (configuration with 1 sensor)