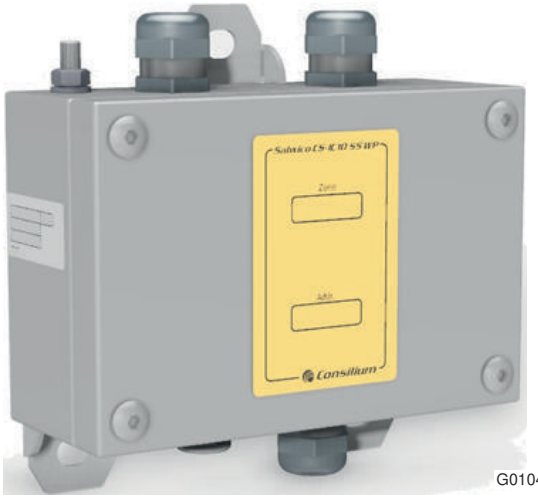


G010413

Input Loop Unit
CS-IC10 SS WP

Part no. 5210066-00A

System: CFD5000

General description

The CS-IC10 SS WP is an input unit for various integration of safety inputs. It has been designed for use in harsh and corrosive environments and to comply with the standards for the industrial, maritime, offshore and rolling stock markets up to Safety Integrity Level 2 (SIL 2).

The CS-IC10 SS WP has one input that can be connected to external equipment with a dry relay contact. The CS-IC10 SS WP supervises the cable to the external equipment for cable break and short circuit, and the input can be configured as active high or active low. The function of the input can be configured to be:

- a general input
- a fault
- an alarm from a manual call point
- an alarm from a smoke sensor
- an alarm from a heat sensor
- an alarm from a flame sensor
- an alive signal (output)

Features:

- One supervised input for a dry relay contact
- Communication with the loop-line
- Handling of short circuits and cable breaks on the loop-line
- Stainless steel enclosure IP66

Local intelligence via an integrated CPU

The integrated CPU makes it possible to make decisions locally, like evaluation of the alarm condition.

IDAxt protocol

The IDAxt protocol meets the demands on data integrity, reliability and robustness required for use in SIL 1 and SIL 2 safety functions and safety systems.

Periodic BIST

The Periodic Built-In Self-Test is a central mechanism which the system uses to ensure long proof test intervals.

Countermeasures (defences) have been implemented in order to address the fault modes (threats) in the fire detection system. These countermeasures are done in order to increase the confidence in the system.

The system has two types of Built-In Self-Tests (BIST). The first BIST is made continuously; for instance when reading A/D values from hardware. This typically involves evaluation of the read value to determine if the hardware is broken; i.e. gives measurements outside an acceptable interval.

The second BIST is the Periodic Built-In Self-Test (Periodic BIST) which is made once every five minutes in order to verify the safety function by testing communication paths. All internal communication paths and all testable

parts of the loop-units are included in the Periodic BIST mechanism, to verify the whole path from detection to reporting (fire) status.

The system creates a log with the results of the Periodic BIST. This log can be extracted from the system with a USB memory stick.

Short Circuit Isolator (SCI)

The built-in SCI isolates short circuits on the loop-line and also has a probe function for evaluating a short circuit. The SCI ensures that the fire detection system does not lose contact with the loop units when there is one short circuit on the loop-line. The probe function makes it possible to reset the short circuit condition without restart of the loop-line.

Data

Operating voltage	22–38 VDC
Operating current:	
- Normal condition	0.1 mA ± 5%
- Alarm condition with LED activated	3 mA ± 5%
Sub-Loop (Remote indication, supervised dry-contact reading)	Current limited: 5 mA
Loop communication protocol	IDAxt
Operating temperature range	-40 °C to +70 °C (OT4)
Switch-on extended operating temperature	+15 °C during 10 min (ST1)
Temperature classes according to	EN 50155:2017
Storage temperature	-50 °C to +70 °C
Relative humidity	≤ 95 % RH non-condensing
Addressing method	DIP switch
Ingress protection	IP66
Cable gland	M20 for cable ø 6–13mm Material: Nickel plated brass
Cable terminals	2.5 mm^2
Material	Enclosure: Stainless steel AISI 304 Gasket: Polyurethane and Silicone
Weight	1.070 kg ± 5%
Colour	Polished surface
Loop cable requirement	See the Installation & Commissioning manual
Approvals	EN 50155, EN 45545-2

CE

When Safety Matters SIL 2 IEC 61508/EN 50126/28/29

RAMS EN50126/EN50128/EN50129

Functional Safety Data

Type	B
HFT	0
SFF	93 %
PFD_{avg}	2.61×10^{-4}

PFD_{avg} is calculated for MTTR 8 h and proof test interval 1 year.

Suitable for use in SIL 1 and SIL 2 environments.

Data for built-in Short Circuit Isolator (SCI)

Ic max (Maximum Continuous current)	500 mA
Is max (Maximum Switching current)	800 mA
Current when short circuited (IL max)	< 1 mA
Open to Close voltage	22 ± 2 VDC
Open to Close, maximum load expressed in ohms on the non-energized side	≈1.2 kΩ
Close to Open voltage	14 ± 2 VDC

Configuration of Safe I/O

The CS-IC10 has one configurable input/output, called Safe I/O.

Table 1. The allowed configurations of Safe I/O

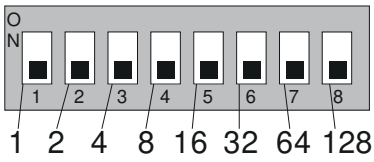
Safe I/O		Active High/Low	Monitored[a.]	CS-IC10
Input	Alarm[b.]	H/L	X	X
	Fault	H/L	X	X
	General	H/L	X	X
Output	Alive signal	NA		X
	Remote Indication (RIL)	NA		

[a.] Monitored for cable break and short circuit

[b.] A Safe I/O configured as an Alarm input can be assigned the alarm sub-types: ‘Smoke’, ‘Heat’, ‘Flame’ and ‘MCP’

Address switch

The loop units are identified by a physical address. The address number is set on an 8 pole DIP switch located on the loop unit. (For settings use a pointed tool of suitable size.)



1 to 150 are valid addresses. The DIP switch value follows the binary system.

Location of DIP switches

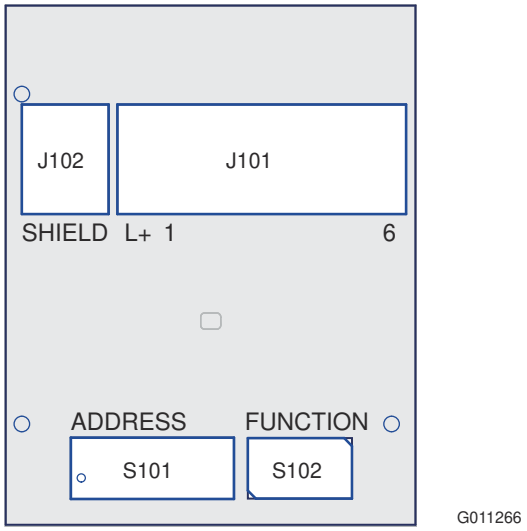


Figure 1. Location of DIP switches and terminals on the PCB

Address switch S101 (8 pole) for the loop address.

Function switch S102 (5 pole) is factory set to ID0. Do not change!

For terminal no. see Connection examples [4].

Connection examples

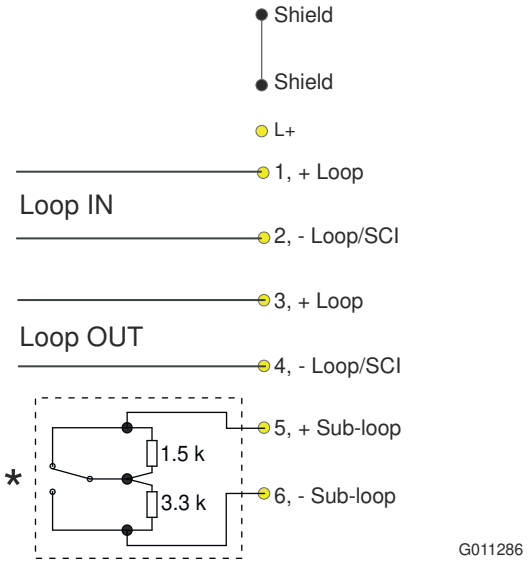


Figure 2. Terminals J101 and J102

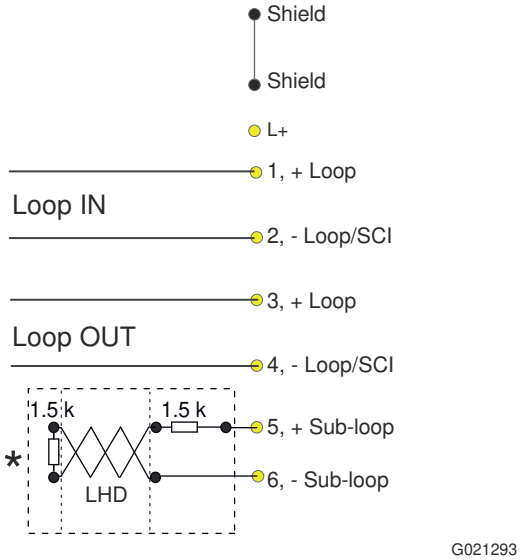


Figure 3. Linear Heat Detection (LHD) cable

* External connection shown in normal not active state

If a shielded cable is used on the sub-loop it shall only be terminated at one end. If the shield is terminated in the I/O unit it is connected to the shield terminal, this is only possible if the loop line is shielded.

External earth connection

The external earth connection on the enclosure shall be connected to earth. For more information see the Installation & Commissioning manual.

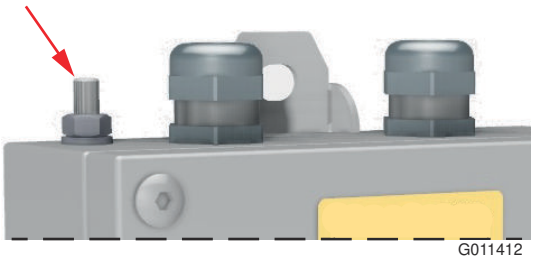
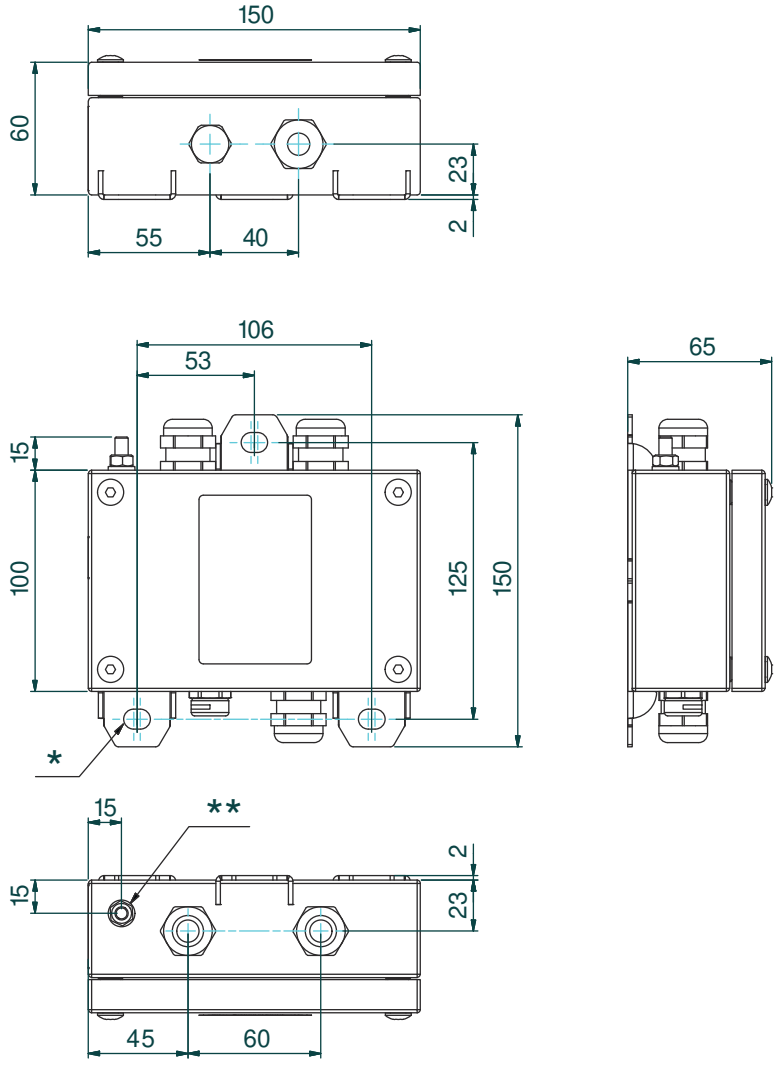


Figure 4. The M6 external earth connection

Dimensions (mm)



* **Holes for wall mounting (x3)**: Max screw thread M8

** **M6 external earth connection**

Do not use electrical screwdriver.

Maximum torque 2 Nm.