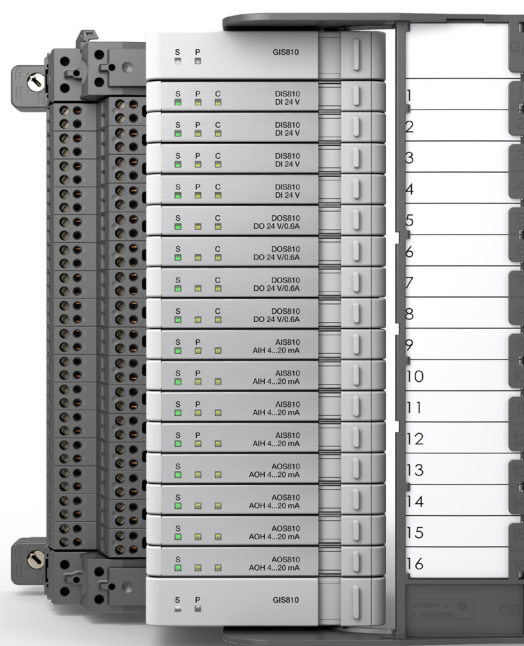


# ABB Ability™ System 800xA®

## Select I/O Overview



# Introduction

Select I/O is an Ethernet networked, single channel granular I/O system for the ABB Ability™ System 800xA automation platform. Select I/O helps decouple project tasks, minimizes the impact of late changes and supports standardization of I/O cabinetry ensuring automation projects are delivered on-time and under budget.

Select I/O provides a comprehensive solution for simplified engineering, installation, commissioning and late changes with features such as built-in disconnect function, field loop current limitation and replaceable terminal blocks. Signal Conditioning Modules (SCMs) are available for both non-SIL, SIL3 and intrinsically safe (IS) applications. The Signal Conditioning Modules (SCMs) are mounted in a Module Termination Unit (MTU) with 16 SCM slots. Each slot includes a removable Field Terminal Block (FTB).

System 800xA's Select I/O is designed to provide a compact and rugged solution e.g. supporting operating temperature of -40 to +70 degrees Celsius, hazardous locations and corrosive gases. The I/O system can be mounted in Zone 2 environments.

Remote and centralized installations are supported via a single or redundant Ethernet Fieldbus Communication Interface with built-in switches. An Ethernet Fieldbus Communication Interface can host up to 192 Signal Conditioning Modules per cluster.

## Optimized engineering

Utilizing single channel granular I/O provides, by design, any number of benefits which simplifies the entire engineering process for both large centralized and small remote cabinets.

Since the I/O Module Termination Units can host any signal type in any slot, classic marshalling can be eliminated which means that cabinets can be standardized and pre-fabricated. Standardized cabinets will reduce the design work and testing efforts which will lead to decreased project execution time and cost.

The Select I/O reduces the impact of late changes by reducing the amount of re-work required during the project.

When an I/O type change is needed, insert a new Signal Conditioning Module (SCM) instead of moving the field wire to a different I/O module.

The marshalling concept implies that any controller can access any I/O signal in any Ethernet I/O station. This can be made at a later stage of the project providing full flexibility when designing your control application.

## Built-in Redundancy and Diagnostics

Select I/O offers optional redundancy down to and including individual Signal Conditioning Modules and including redundant 24 V power connections, redundant Ethernet Fieldbus Communications Interface, redundant Generic I/O modules, and redundant internal architecture.

Select I/O includes enhanced diagnostic possibilities and self testing, eg. loop supervision for all signal types.

## Reduced Footprint and Equipment cost

Built-in disconnect function, field loop current limiting, channel-wise replaceable terminal blocks and the fact that the classic marshalling is no longer needed will significantly reduce the footprint for I/O cabinets by removing ancillary hardware.

In centralized installations, the number of cabinets can be reduced by up to 50% (depending on signal type).

The SCM concept is designed to save footprint. A typical 2000 x 800 x 800 mm cabinet with doors on both sides can include up to 672 I/O channels if mounted on a middle plate in the center of the cabinet.

## Option for Firmware Upgrade

Select I/O supports easy firmware upgrade of FCI, GIO and SCM units via the official Select I/O Firmware Upgrade Tool.

General specification

Operating Temperature	-40 to +70 °C
Storage Temperature	-40 to +85 °C
Humidity	5 ... 95 %, non-condensing
Altitude	-1000 ... 5000 m (restrictions apply) For DOS820 and DIS821 above 150 V -1000 to 3000 m (restrictions apply)
Ingress Protection	Class IP20
Corrosive atmosphere	G3
Electrical Safety	IEC/EN 61010-1 IEC/EN 61010-2-201 UL 61010-1 UL 61010-2-201 CSA-C22.2 No. 61010-1-12 CSA C22.2 No. 61010-2-201
Pollution degree	Degree 2, IEC 60664-1
Functional Safety and Machinery Safety Certification	IEC 61508 Ed. 2, SIL 1-3 IEC 61511-1 IEC 62061 IEC 61131-2, IEC 61131-6 IEC 60204-1 NFPA 72, NFPA 79, NFPA 85, NFPA 86 EN ISO 14118 EN 50156-1 EN 298 EN 54-2, EN 54-2 A1 EN ISO 13850
CE compliance	Yes
UKCA compliance	Yes
RoHS compliance	EU RoHS UAE RoHS CN RoHS
WEEE compliance	EU

For detailed information on each Select I/O module, please visit:  
800xAHardwareselector.com



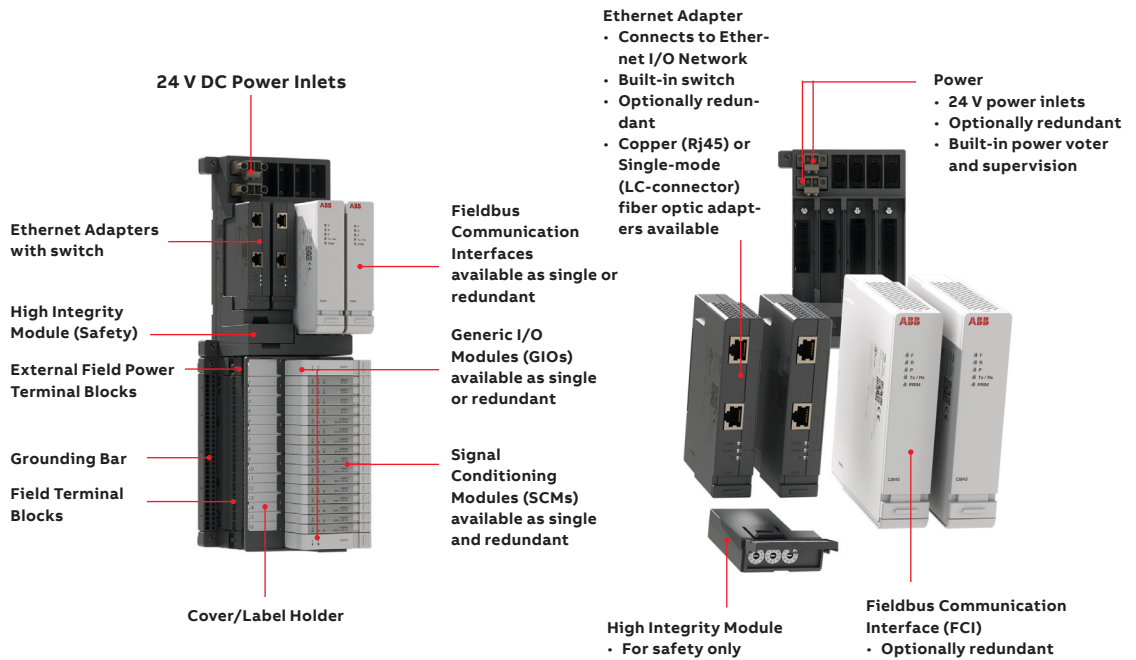
TU865 with redundant TC811, redundant CI845 and HI880 module.



Standard cabinets available pre-designed for Select I/O installations.

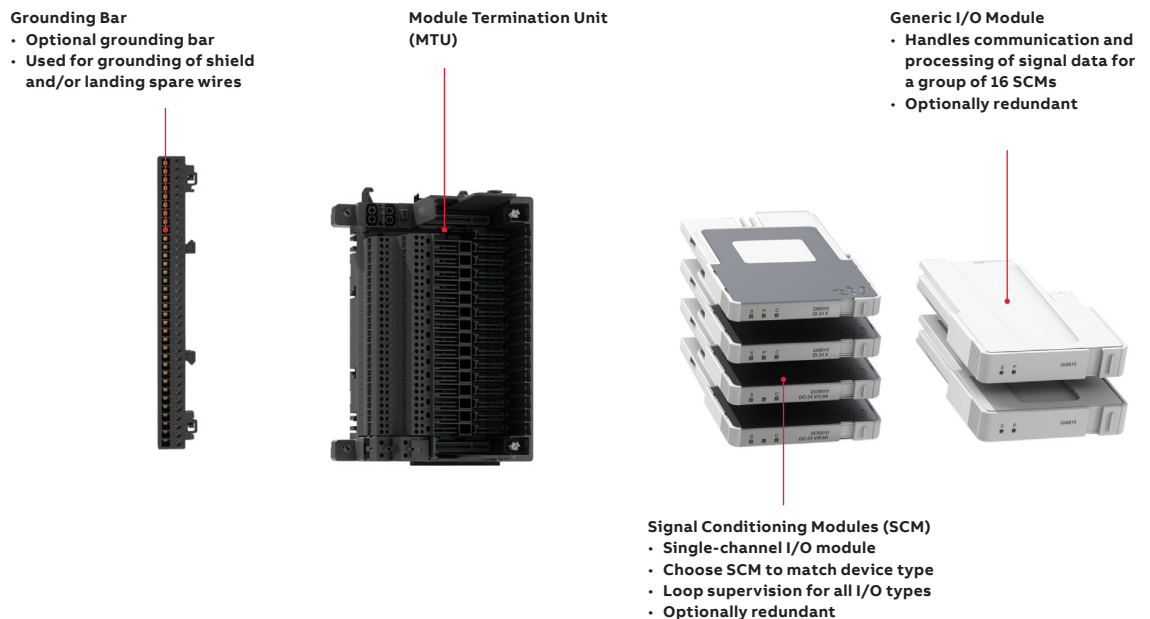
# Select I/O Details

Select I/O was designed with parallel project execution in mind. Termination units can be installed on site long before the electronics are installed. Site engineering can be done completely independently from application programming.



Select I/O is made up of two main sub-assemblies – the Ethernet FCI and up to 12 Select I/O Modular Termination Units each including up to 16 Signal Conditioning Modules (SCMs)

The Ethernet FCI connects the MTUs, populated with Generic I/O and Signal Conditioning Modules (SCM), with the I/O network.



**Redundancy when and where you need it.** Flexible, modular redundancy available from Ethernet Adapters, Field Communications Interface (FCI), Generic I/O (GIO) and Signal Conditioning Modules (SCMs). Where single and redundant channels can be mixed in the same MTU.



#### MTUs for Process IO, IS and 120/230V

The local I/O bus distributes communication, system power and field power to the I/O modules (GIO and SCM). The power is distributed in the back plane. For 120/230 V and high current channels, the field power has to be supplied from the PTB.

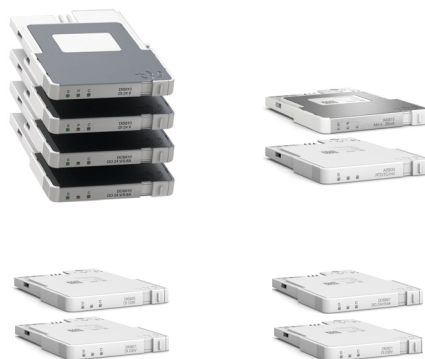
There is a static coding on the FTB which prohibits insertion of IS-SCM in non-IS FTB and vice versa, also prevents 24V modules to be inserted in a FTB for 120/230V. There is also a dynamic coding on the FTB designed for the SCM so that, if an SCM is replaced, only the exact same type of SCM can be inserted.

After all wiring is connected to the FTBs, the terminal cover should be pulled down over the FTBs. With this cover in place, the MTU fulfills the protection class IP30.

**Multiple signal types – only 1 MTU.** – With Select I/O, you can design your solution using the same MTU and then add the components you require. The same MTU is used regardless of process, safety, and IS applications. Just add the correct modules and terminal blocks, that are required, later.

**Reducing the impact of change.** Each Ethernet FCI head station can communicate with up to 10 AC 800M controllers so if you move applications to a or re-work of the cabinet is required. Select I/O's flexible networking can be arranged and deployed as daisy chain, star, ring, ring of stars, and redundant rings.

**One drop – multiple signal types.** Each cluster can handle multiple signal types from process, safety, HART with or without IS barriers and 120/230V. Note: process and safety; IS and non-IS installed in separate termination units as shown.



**Change is good.** An individual Signal Conditioning Module can be changed quickly and easily to accommodate changes in the project by resetting the terminal block key and inserting a new SCM.

#### Field terminal blocks

- Replaceable field terminal block with 4 screws
- Self learning keying between Terminal Block and SCM
- Four types of field terminal blocks are available (IS, non-IS, redundant and 120/230 V)

#### External Field Power Terminal Blocks

- Replaceable external field power terminal block
- 4 screws for daisy chaining power



## Standard SCMs

### AIS810 is an Analog Input Signal Conditioning Module (16 bit) supporting 2/4-wire devices and HART communication

Feature	AIS810 – Analog Input SCM with HART
Type	Analog Input
Supported field devices	2-wire and 4-wire devices (external power required for 4-wire devices)
Signal Range / Signal Specification	4-20 mA 0-20 mA
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field Power	Current limited to 30 mA
Accuracy	0.1 %
Resolution	16-bit A/D converter
Diagnostics	Loop supervision (open circuit and short circuit) Device malfunction low, under-range, over-range, and device malfunction high Internal hardware supervision Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
HART	HART v7, HART pass-through and HART variables to the application
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.62 W at 20 mA
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No

### AIS815 is an Analog Input Signal Conditioning Module (16 bit) supporting 2/3/4-wire devices (1.2 A) and HART communication

Feature	AIS815 – Analog Input SCM with HART, 1.2 A
Type	Analog Input
Supported field devices	2-wire (loop powered transmitters) 3-wire (transmitters powered by SCM) 4-wire (transmitters powered by SCM)
Signal Range / Signal Specification	4...20 mA 0...20 mA
Isolation	Galvanic isolation to system. Routine tested at factory with 3060 VDC.
Field Power	Current limited (configurable)
Accuracy	0.1 %
Resolution	16 bit A/D converter
Diagnostics	Loop supervision (open circuit and short circuit) Device malfunction low, under range, over range, and device malfunction high Internal hardware supervision Communication supervision Internal power supervision Power injection supervision
Field input robustness	±35 V between all terminals
HART	HART v7, HART pass-through and HART variables to the application.
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.63 W
Installation in Hazardous Area/ Locations	Yes/Yes
IS barrier	No



AIS810 Analog input SCM with HART

## Standard SCMs

### AIS830 is an Analog Input Signal Conditioning Module for temperature measurements via RTD/TC/mV

Feature	AIS830 – Analog Input RTD/TC/mV
Type	Analog Input
Supported field devices	2-wire, 3-wire
Signal Range / Signal Specification	RTD/TC/mV
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field Power	Current limited
Accuracy	0.1 %
Resolution	16-bit D/A converter
Diagnostics	Loop supervision (short circuit and open circuit) Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
HART	N/A
SOE	N/A
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.6 W (at 20 mA and 750 Ω load)
Installation in Hazardous Area/Locations	Yes/Pending
IS barrier	No

### AOS810 is an Analog Output Signal Conditioning Module (16 bit) supporting 2-wire devices and HART communication

Feature	AOS810 – Analog Output SCM with HART
Type	Analog Output
Supported field devices	2-wire
Signal Range / Signal Specification	4-20 mA 0-20 mA
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field Power	Current limited
Accuracy	0.1 %
Resolution	16-bit D/A converter
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
HART	HART v7, HART pass-through and HART variables to the application
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.6 W (at 20 mA and 750 Ω load)
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No



AOS810 Analog Output  
SCM with HART



## Standard SCMs

**DIS801 is a Digital Input 24V Signal Conditioning Module supporting 2/3/4-wire devices with Sequence of Events (SOE)**

Feature	DIS801 – Digital Input SCM with SOE
Type	Digital Input
Supported field devices	2-wire, 3-wire and 4-wire sensors (dry contacts and proximity switches, external power required for 4-wire devices)
Signal Range / Signal Specification	24 V DC
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 2000 V.
Field power	Current limited to 35 mA
Diagnostics	Loop supervision (short circuit and open circuit) Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
SOE	Yes
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.45 W
Installation in Hazardous Area/Locations	Yes/Pending
IS barrier	No

**DIS810 is a Digital Input 24 V Signal Conditioning Module supporting 2/3/4-wire devices with Sequence of Events (SOE)**

Feature	DIS810 – Digital Input SCM with SOE
Type	Digital Input
Supported field devices	2-wire, 3-wire and 4-wire sensors (dry contacts and proximity switches, external power required for 4-wire devices)
Signal Range / Signal Specification	24 V DC
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field power	Current limited to 30 mA
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
SOE	Yes
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.55 W
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No



DIS810 Digital Input SCM with SOE



## Standard SCMs

### DIS820 is a Digital Input 120 V Signal Conditioning Module supporting 2/3/4-wire devices with Sequence of Events (SOE)

Feature	DIS820 – Digital Input SCM 120 V with SOE
Type	Digital Input
Supported field devices	2-wire, 3-wire and 4-wire sensors (dry contacts and proximity switches, external power required for 4-wire devices)
Signal Range / Signal Specification	120 V AC/DC
Isolation	Galvanic isolation to system and between each channel. Routine tested at factory with 3060 VDC..
Field power	Current limited through fuse if power injection is used
Diagnostics	Fuse status supervision Communication supervision Internal power supervision
SOE	Yes
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.5 W
Installation in Hazardous Area/Locations	No/No
IS barrier	No

### DIS821 is a Digital Input 230 V Signal Conditioning Module supporting 2/3/4-wire devices with Sequence of Events (SOE)

Feature	DIS821 – Digital Input SCM 230 V with SOE
Type	Digital Input
Supported field devices	2-wire, 3-wire and 4-wire sensors (dry contacts and proximity switches, external power required for 4-wire devices)
Signal Range / Signal Specification	230 V AC/DC
Isolation	Galvanic isolation to system and between each channel. Routine tested at factory with 3060 VDC..
Field Power	Current limited through fuse if power injection is used
Diagnostics	Fuse status supervision Communication supervision Internal power supervision
SOE	Yes
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.5 W
Installation in Hazardous Area/Locations	No/No
IS barrier	No



TUS810K01 with standard SCMs

## Standard SCMs

### DOS801 is a Digital Output (24V/0.6 A) Signal Conditioning Module supporting 2-wire devices

Feature	DOS810 – Digital Output SCM 0.6A
Type	Digital Output
Supported field devices	2-wire
Signal Range / Signal Specification	24 V DC / 0.6 A
Isolation	Galvanic isolation to system. Routine tested at factory with 2000 VDC..
Field Power	Current limited
Diagnostics	Loop supervision (short circuit and open circuit) Communication supervision Internal power supervision Power injection supervision
Field input robustness	±35 V between all terminals
SOE	N/A
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.51 W
Installation in Hazardous Area/Locations	Yes/Pending
IS barrier	No

### DOS810 is a Digital Output (24V/0.6 A) Signal Conditioning Module supporting 2-wire devices

Feature	DOS810 – Digital Output SCM 0.6A
Type	Digital Output
Supported field devices	2-wire
Signal Range / Signal Specification	24 V DC / 0.6 A
Isolation	Galvanic isolation to system. Routine tested at factory with 3060 VDC.
Field Power	Current limited
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision Power injection supervision
Field input robustness	±35 V between all terminals
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.36 W
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No

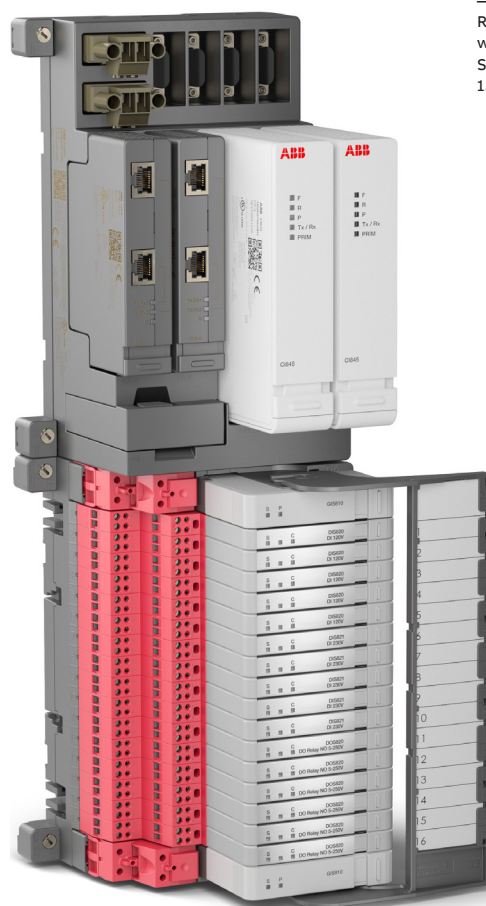


DOS801 Digital output  
SCM 24 V, 0.6 A

## Standard SCMs

### DOS820 is a Digital Output Relay NO Signal Conditioning Module supporting 2-wire devices

Feature	DOS820 – Digital Output Relay NO 5-250V AC, 5-125V DC, 3 A
Type	Digital Output
Supported field devices	2-wire
Voltage Range / Signal Specification	5-250 V AC, 5-125 V DC/ 3 A
Isolation	Galvanic isolation to system and between each channel. Routine tested at factory with 3060 VDC.
Field Power	Current limited through fuse if power injection is used
Diagnostics	Fuse status supervision Communication supervision Internal power supervision
SOE	N/A
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.5 W
Installation in Hazard- ous Area/Locations	Yes/Yes (applies up to 30 V)
IS barrier	No



Redundant CI845 FCI  
with a TUS810K03  
Select I/O MTU for  
120 V / 230V SCMs



DOS820 Digital  
Output Relay NO

## Intrinsically Safe SCMs

**AIS850 is an Analog Input Signal Conditioning Module (16 bit) for intrinsically safe applications (Zone 0) supporting 2-wire devices and HART communication**

Feature	AIS850 – Analog Input SCM, IS
Type	Analog Input
Supported field devices	2-wire (loop powered transmitters)
Signal Range / Signal Specification	4-20 mA 0-20 mA
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 V DC
Field Power	Current limited to 25 mA
Accuracy	0.1 %
Resolution	16 bit A/D converter
Diagnostics	Loop supervision (open circuit and short circuit) Device malfunction low, under range, over range, and device malfunction high Internal hardware supervision Communication supervision Internal power supervision
HART	HART v7, HART pass-through and HART variables to the application
SOE	N/A
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.61 W at 20 mA
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	Yes

**AOS850 is an Analog Output Signal Conditioning Module (16 bit) for intrinsically safe applications (Zone 0) supporting 2-wire field devices and HART communication**

Feature	AOS850 – Analog Output SCM with HART, IS
Type	Analog Output
Supported field devices	2-wire
Signal Range / Signal Specification	4-20 mA 0-20 mA
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 V DC
Field Power	Current limited
Accuracy	0.1 %
Resolution	16 bit A/D converter
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision
HART	HART v7, HART pass-through and HART variables to the application
SOE	N/A
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.7 W
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	Yes



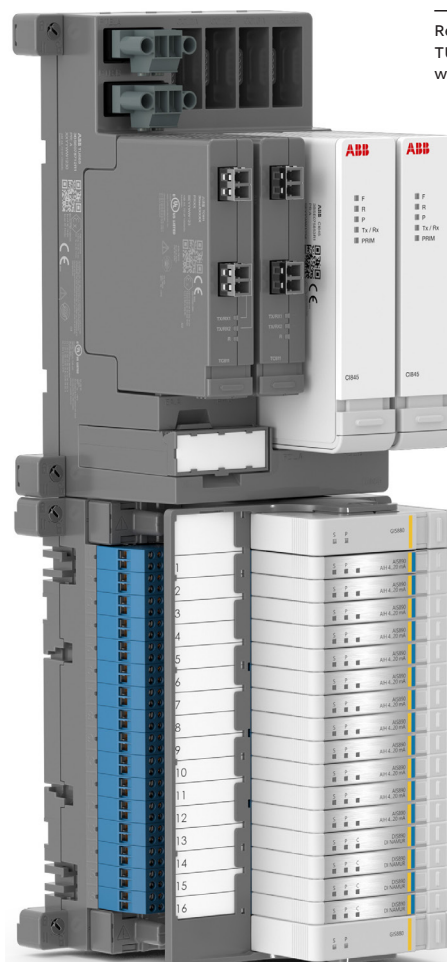
—  
AIS850 Analog input intrinsically safe I/O module

## Intrinsically Safe SCMs

**DIS850 is a Digital Input Signal Conditioning Module for intrinsically safe applications (Zone 0) supporting 2-wire NAMUR field devices with SOE**

Feature	DIS850 – Digital Input SCM, NAMUR, IS
Type	NAMUR Input (EN 60947-5-6)
Supported field devices	2-wire (NAMUR proximity switch) Voltage-free contact <sup>(1)</sup>
Signal Range / Signal Specification	NAMUR (2-wire) 0... 8.4 mA 9.3 V DC
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field power	Current limited
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision
SOE	Yes
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.4 W
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	Yes

(1) Open-/Short-Circuit supervision with voltage-free contacts requires external 1 k series and 10 k parallel resistors



Redundant CI845 FCI with a TUS810K02 Select I/O MTU with IS and SIL3 SCMs

## SIL3 SCMs

**AIS880 is an Analog Input Signal Conditioning Module (16 bit) for use in High Integrity applications (certified for SIL3) supporting 2/4-wire devices and HART communication**

Feature	AIS880 – Analog Input SCM with HART, SIL3
Type	Analog Input
Supported field devices	2-wire and 4-wire devices (external power required for 4-wire devices)
Signal Range / Signal Specification	4-20 mA
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field Power	Current limited to 30 mA
Accuracy	0.1 %
Resolution	16-bit A/D converter
Diagnostics	Loop supervision (open circuit and short circuit) Device malfunction low, under range, over range, and device malfunction high Internal hardware supervision Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
HART	HART v7, HART pass-through and HART variables to the application
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.62 W at 20 mA
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No

**AIS885 is an Analog Input Signal Conditioning Module (16 bit) for use in High Integrity applications (certified for SIL3) supporting 2/3/4-wire devices (1.2 A) and HART communication**

Feature	AIS885 – Analog Input SCM with HART, 1.2 A, SIL3
Type	Analog Input
Supported field devices	2-wire (loop powered transmitters) 3-wire (transmitters powered by SCM) 4-wire (transmitters powered by SCM)
Signal Range / Signal Specification	4...20 mA 1.2 A field power
Isolation	Galvanic isolation to system. Routine tested at factory with 3060 VDC.
Field Power	Current limited (configurable)
Accuracy	0.1 %
Resolution	16 bit A/D converter
Diagnostics	Loop supervision (open circuit and short circuit) Device malfunction low, under range, over range, and device malfunction high Internal hardware supervision Communication supervision Internal power supervision Power injection supervision
Field input robustness	±35 V between all terminals
HART	HART v7, HART pass-through and HART variables to the application.
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.65 W
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	No



AIS885 Analog input SCM, SIL 3

## SIL3 SCMs

**AOS880 is an Analog Output Signal Conditioning Module (16 bit) for use in High Integrity applications (certified for SIL 3) supporting 2-wire devices and HART communication**

Feature	AOS880 – Analog Output SCM with HART, SIL3
Type	Analog Output
Supported field devices	2-wire
Signal Range / Signal Specification	4-20 mA
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field Power	Current limited
Accuracy	0.1 %
Resolution	16-bit D/A converter
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
HART	HART v7, HART pass-through and HART variables to the application
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.6 W (at 20 mA and 750 Ω load)
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No

**DIS880 is a Digital Input 24V Signal Conditioning Module for use in High Integrity applications (certified for SIL3) supporting 2/3/4-wire devices with SOE**

Feature	DIS880 – Digital Input SCM with SOE, SIL3
Type	Digital Input
Supported field devices	2-wire, 3-wire and 4-wire sensors (dry contacts and proximity switches, external power required for 4-wire devices)
Signal Range / Signal Specification	24 V DC
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 VDC.
Field power	Current limited to 30 mA
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision
Field input robustness	±35 V between all terminals
SOE	Yes
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.55 W
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No



AOS880 Analog Output SCM with HART, SIL3



## SIL3 SCMs

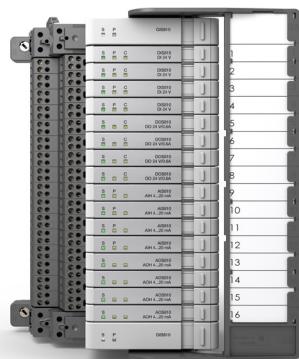
**DOS880 is a Digital Output (24 V/0.6 A) Signal Conditioning Module for use in High Integrity applications (certified for SIL3) supporting 2-wire devices**

Feature	DOS880 – Digital Output SCM, 0.6 A, SIL3
Type	Digital Output
Supported field devices	2-wire
Signal Range / Signal Specification	24V DC / 0.6 A
Isolation	Galvanic isolation to system. Routine tested at factory with 3060 VDC.
Field Power	Current limited
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision Power injection supervision
Field input robustness	±35 V between all terminals
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.36 W
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No

**DOS885 is a Digital Output (24 V/3 A) Signal Conditioning Module for use in High Integrity applications (certified for SIL3) supporting 2-wire devices such solenoids, horns, beacons**

Feature	DOS885 – Digital Output SCM, 3 A, SIL3
Type	Digital Output
Supported field devices	2-wire Solenoids, Horns and Beacons
Signal Range / Signal Specification	24 V DC / 3 A
Isolation	Galvanic isolation to system. Routine tested at factory with 3060 VDC.
Field Power	Current limited
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision Power injection supervision
Field input robustness	±35 V between all terminals
SOE	N/A
Redundancy	Yes
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.61 W
Installation in Hazardous Area/Locations	Yes/Yes
IS barrier	No

**TUS810K01 Select I/O MTU with standard SCMs**



**TUS810K02 Select I/O MTU with IS and SIL3 SCMs**



## Intrinsically Safe SIL3 SCMs

**AIS890 is an Analog Input Signal Conditioning Module (16 bit) for use in High Integrity (certified for SIL3) and intrinsically safe applications (Zone 0) supporting 2-wire devices and HART communication**

Feature	AIS890 – Analog Input SCM, IS, SIL3 with HART
Type	Analog Input
Supported field devices	2-wire (loop powered transmitters)
Signal Range / Signal Specification	4-20 mA
Isolation	Galvanic isolation to system and between each channel (including field power) Routine tested at factory with 3060 V DC
Field Power	Current limited to 25 mA
Accuracy	0.1 %
Resolution	16-bit A/D converter
Diagnostics	Loop supervision (open circuit and short circuit) Device malfunction low, under range, over range, and device malfunction high Internal hardware supervision Communication supervision Internal power supervision
HART	HART v7, HART pass-through and HART variables to the application
SOE	N/A
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.63 W at 20 mA
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	Yes

**DIS890 is a Digital Input Signal Conditioning Module for use in High Integrity (certified for SIL3) and intrinsically safe applications (Zone 0) supporting 2-wire NAMUR field devices with SOE**

Feature	DIS890 – Digital Input Module, NAMUR, IS, SIL3
Type	NAMUR Input (EN 60947-5-6)
Supported field devices	2-wire (NAMUR proximity switch) Voltage-free contact <sup>(1)</sup>
Signal Range / Signal Specification	NAMUR (2-wire) 0... 8.4 mA 9.3 V DC
Isolation	Galvanic isolation to system and between each channel (including field power). Routine tested at factory with 3060 V DC.
Field Power	Current limited
Resolution	16-bit A/D converter
Diagnostics	Loop supervision (short circuit and open circuit) Internal hardware supervision Communication supervision Internal power supervision
SOE	Yes
Redundancy	No
Hot swap	Yes
Calibration	Factory calibration
Power dissipation	0.4 W
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	Yes

(1) Open-/Short-Circuit supervision with voltage-free contacts requires external 1 k series and 10 k parallel resistors.



DIS890 Digital Input  
SCM with IS, SIL3

# Other SCMs

GFS810 is a Signal Conditioning Module providing ground fault detection for signals with field supply sourced from external power injection (can be used in Basic Process Control and High Integrity applications)	
Feature	GFS810 – Ground Fault Detection SCM, non-SIL
Type	Ground Fault Detection
Supported field devices	-
Signal Range / Signal Specification	0...1 MΩ
Isolation	Galvanic isolation to system. Routine tested at factory with 3060 VDC.
Field Power	-
Accuracy	±15 % <sup>(1)</sup>
Diagnostics	Internal hardware supervision Communication supervision Internal power supervision.
Calibration	Factory calibration
Redundancy	No
Hot swap	Yes
Power dissipation	0.4 W
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	No

(1) At 1...5 kΩ, the accuracy is ±0.5 kΩ.



GFS810 Ground Fault Detection SCM, non-SIL

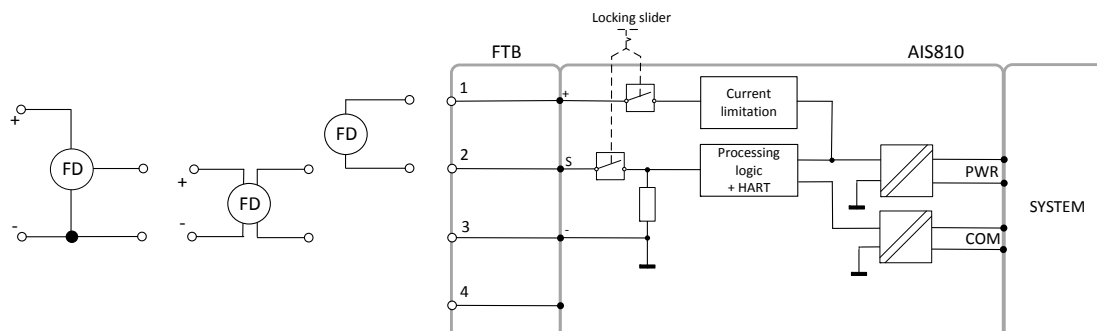
GTS810 is a ground termination option for all field wires connected to the belonging FTB (can be used in Basic Process Control and High Integrity applications)	
Feature	GTS810 – Grounding Termination SCM, non-SIL
Type	Grounding Termination
Supported field devices	-
Signal Range / Signal Specification	-
Isolation	-
Field Power	-
Diagnostics	-
Calibration	-
Redundancy	No
Hot swap	Yes
Power dissipation	-
Installation in Hazardous Area/Locations	Yes/Yes (on IPA)
IS barrier	No



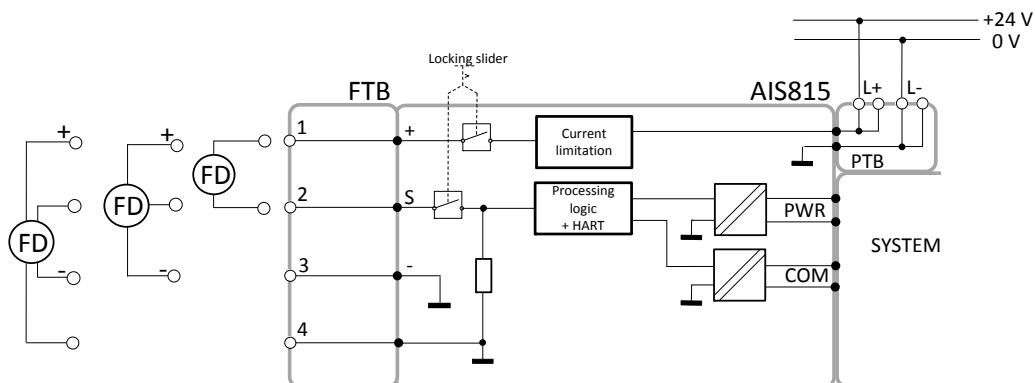
GTS810 Grounding Termination SCM, non-SIL

# Field Loop Diagrams

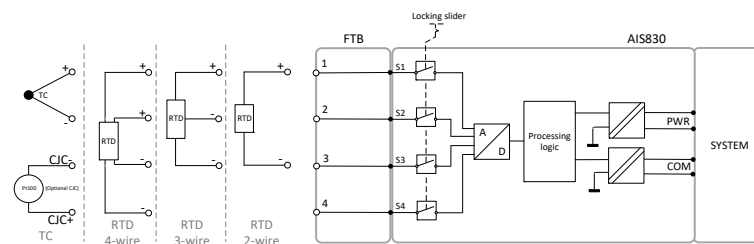
## AIS810



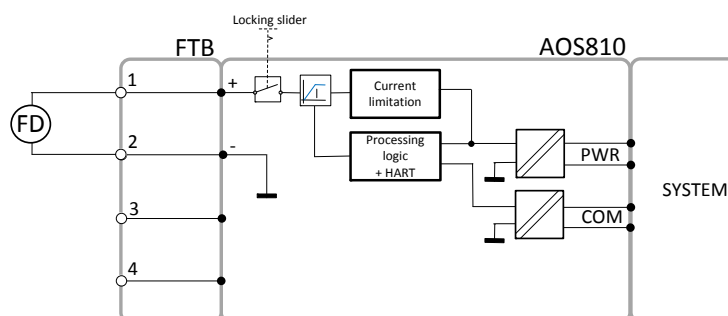
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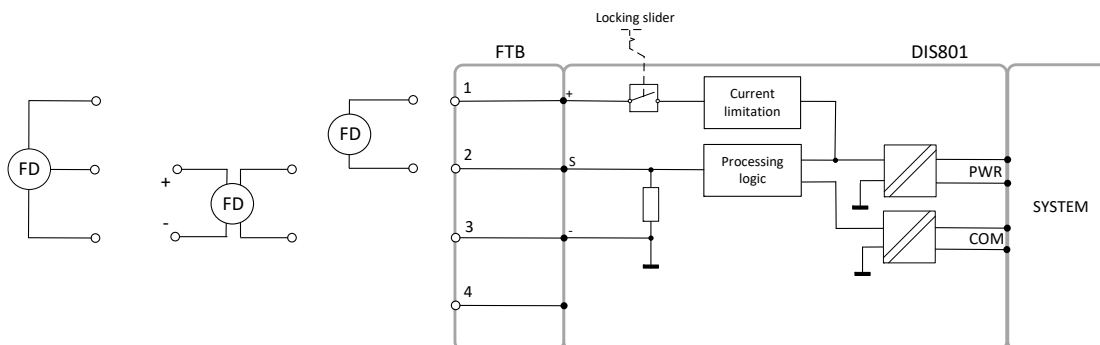
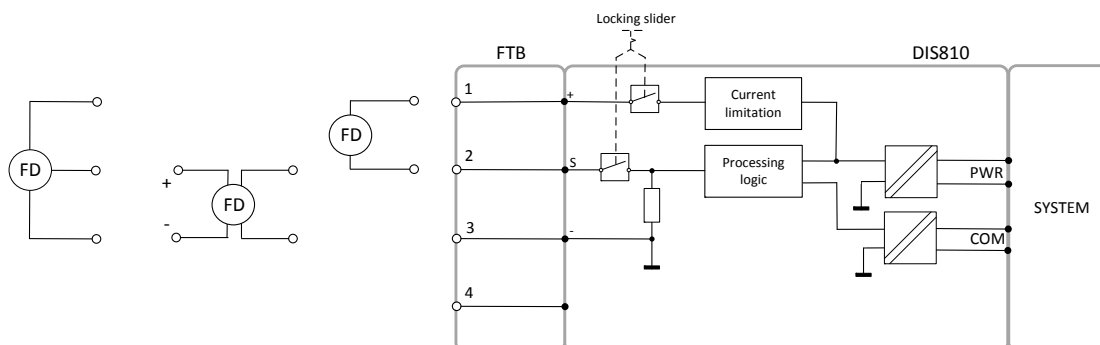
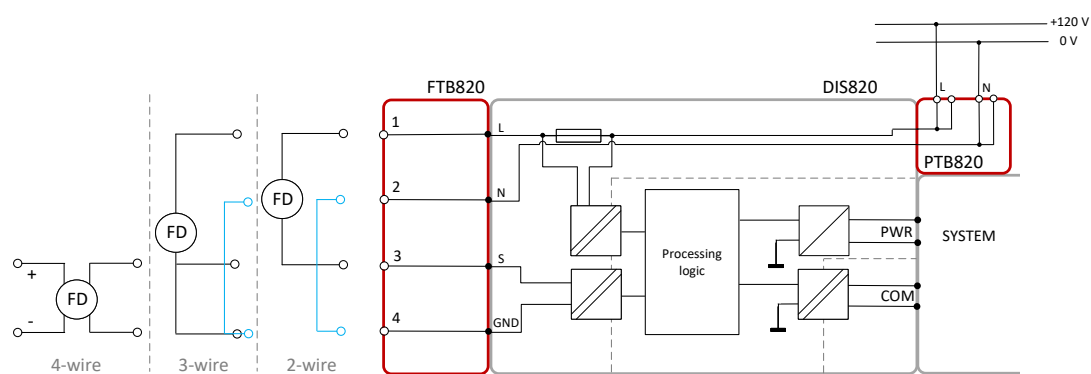
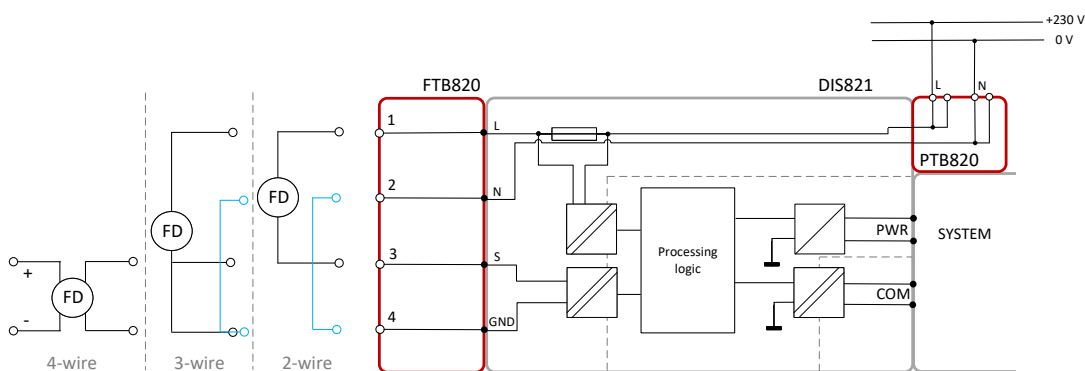


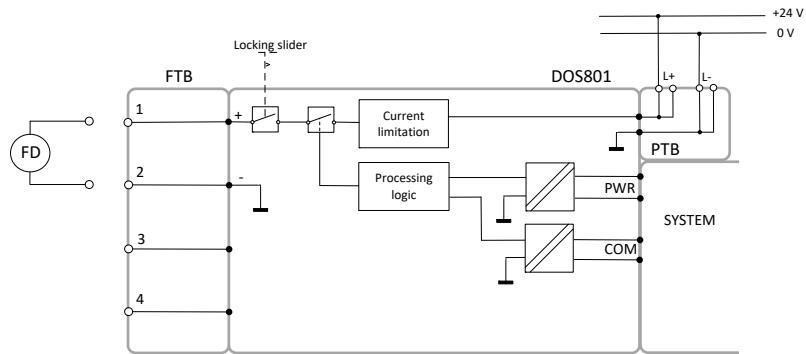
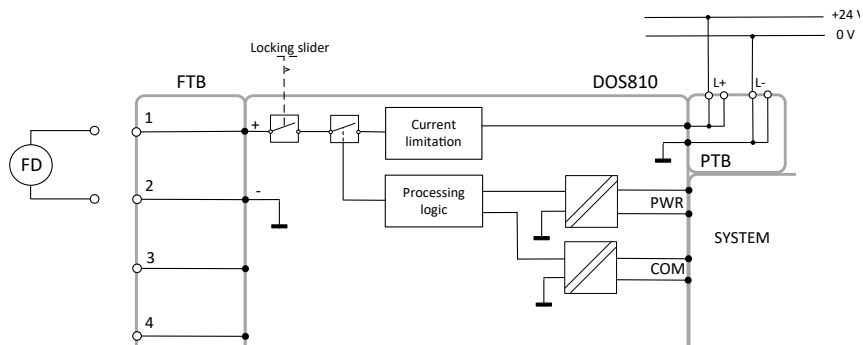
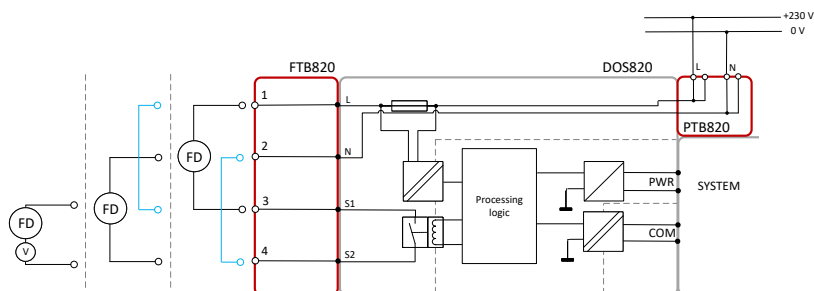
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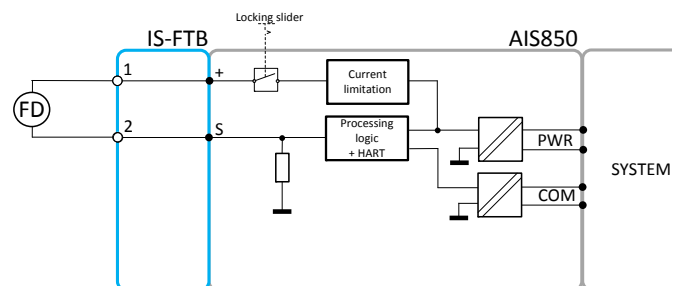
## AOS810



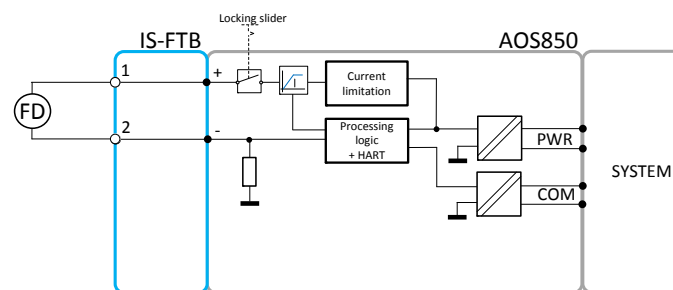
**DIS801****DIS810****DIS820****DIS821**

**DOS801****DOS810****DOS820**

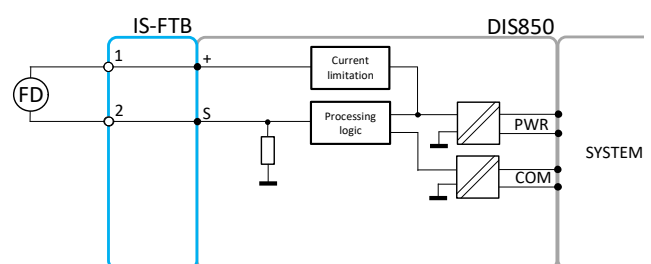
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**AIS850**

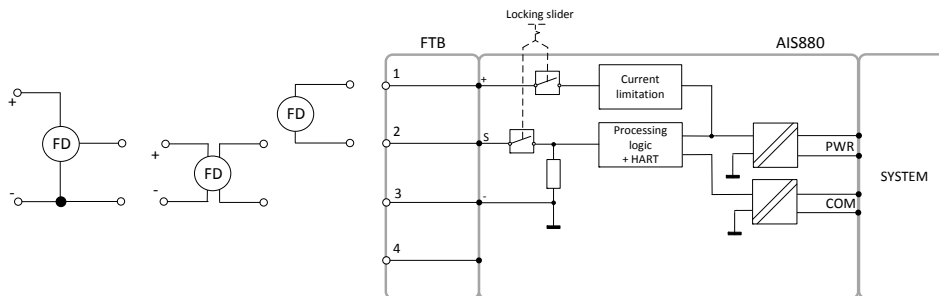
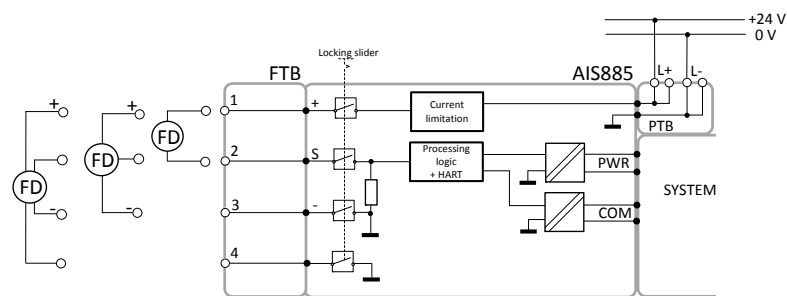
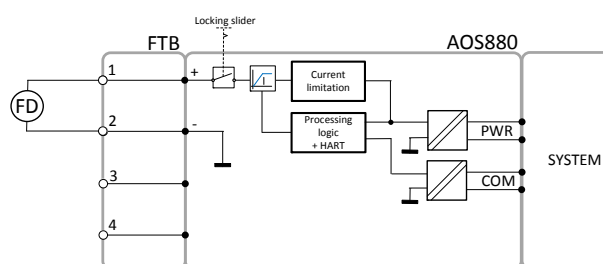
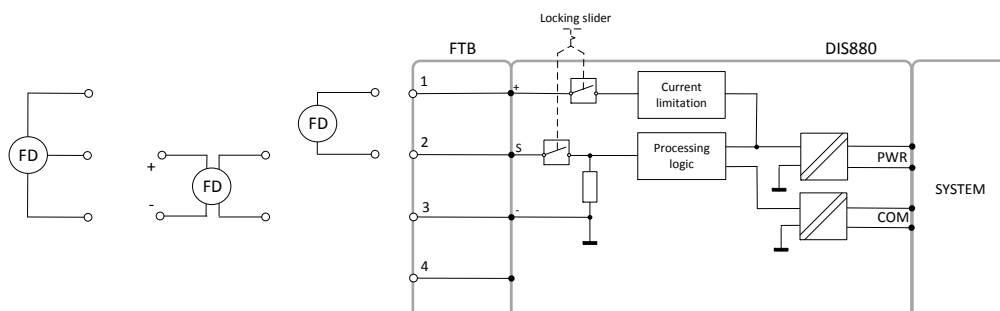
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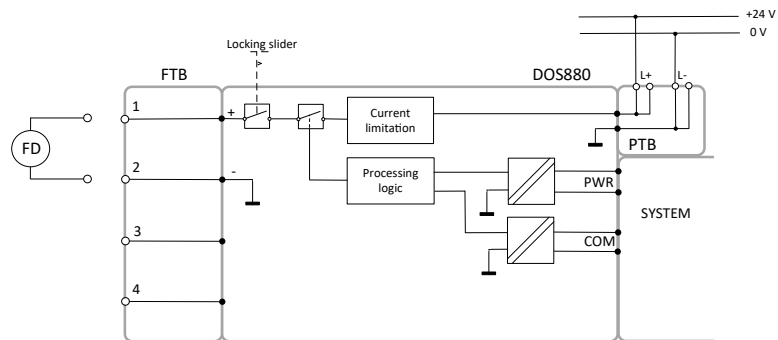
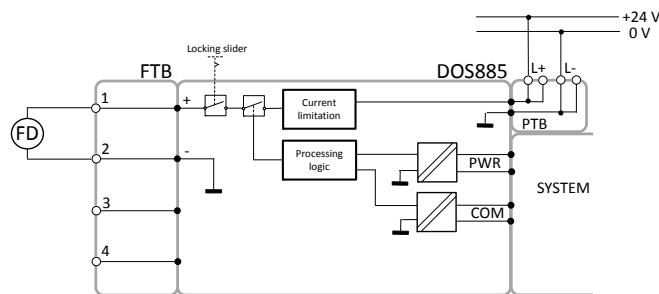
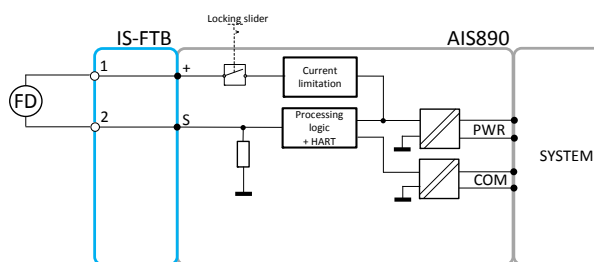
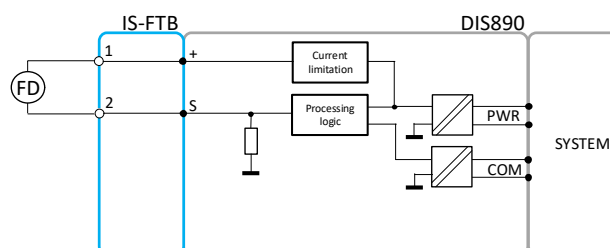
**AOS850**

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**DIS850**

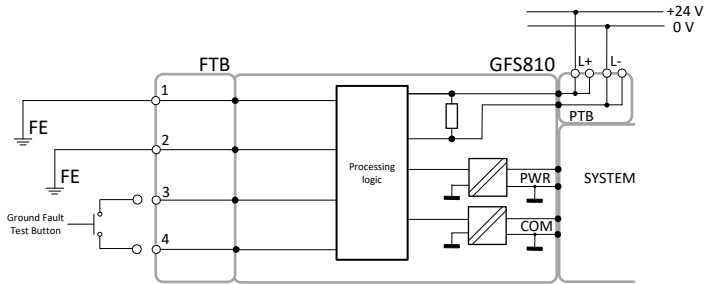


**AIS880****AIS885****AOS880****DIS880**

**DOS880****DOS885****AIS890****DIS890**

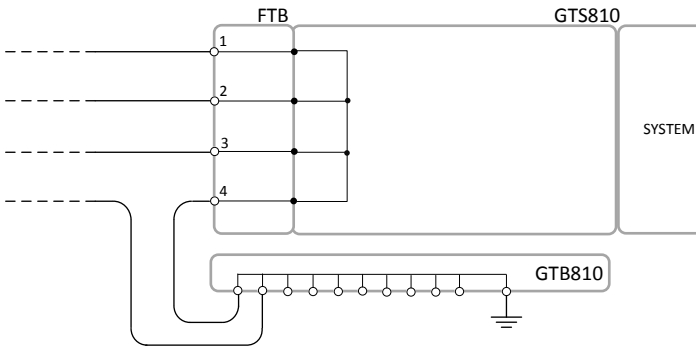
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**GFS810**



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**GTS810**



# Ordering Data

Product ID	Product Name	Product Description
<b>FCI Components</b>		
3BSE075853R1	CI845 Ethernet FCI module	Ethernet Fieldbus Communication Interface Module for connection of S800 I/O or Select I/O to Ethernet. For redundant configuration two Fieldbus Communication Interfaces CI845, two Ethernet Adapters TC810 and one TU860 or one TU865 are needed. For Select I/O High Integrity SIL3 one HI880 is needed.
3BSE078710R1	TU860 MTU for Ethernet FCI S800 I/O	Ethernet Fieldbus Communication Interface Module Termination Unit for connection of single or redundant S800 I/O. Supports single or redundant Ethernet Fieldbus Communication Interface Module, single or redundant Ethernet Adapter for S800 on Ethernet. Mounting on vertical DIN-rail.
3BSE078712R1	TU865 MTU for Ethernet FCI Select I/O	Ethernet Fieldbus Communication Interface Module Termination Unit for connection of single or redundant Select I/O. Supports single or redundant Ethernet Fieldbus Communication Interface Module, single or redundant Ethernet Adapter and High Integrity Module. Mounting on vertical DIN-rail.
3BSE076220R1	TC810 Ethernet Adapter for Ethernet FCI	Ethernet Adapter for copper media with built in 2-port switch. Hosts two RJ45 ports. Use as single or redundant.
3BSE078714R1	TC811 Ethernet Adapter for Ethernet FCI	Ethernet Adapter for Single Mode Fiber with built in 2-port switch. Hosts two LC ports. Use as single or redundant.
3BSE078701R1	HI880 HI Module for Ethernet FCI	High Integrity Module enables High Integrity SIL3 communication with the Select I/O. Compatible with TU865 FCI MTU for Select I/O.
<b>I/O Unit Components</b>		
3BSE083204R1	TUS810K01 MTU for Select I/O	Select I/O Module Termination Unit TUS810K01 includes 1 pcs TUS810, 16 pcs FTB810 Field Terminal Blocks, 2 pcs PTB810 Power Injection Terminal Blocks and 1 pcs TUC810 Terminal Cover. Mounting on vertical DIN-rail.
3BSE093004R1	TUS810K02 MTU for Select I/O (IS)	Select I/O Module Termination Unit TUS810K02 for intrinsically safe usage includes 1 pcs TUS810, 16 pcs FTB890 Field Terminal Blocks, 2 pcs TL820 Empty Slot Protectors and 1 pcs TUC810 Terminal Cover. Mounting on vertical DIN-rail.
2PAA125364R1	TUS810K03 MTU for Select I/O (120/230 V)	Select I/O Module Termination Unit TUS810K03 for 120/230 V usage includes 1pcs TUS810, 16 pcs FTB820 Field Termination Blocks, 2 pcs PTB820 Power Injection Blocks, and 1 pcs TUC810 Terminal cover. Mounting on vertical DIN-rail.
3BSE088180R1	FTB810K01 Field Terminal Block	Field Terminal Block. 10 pcs of FTB.
2PAA125366R1	FTB820K01 Field Terminal Block	Field Terminal Block (120/230 V, red) 120/230 V Kit. 10 pcs of FTB.
3BSE093007R1	FTB840K01 Redundant Field Terminal Block	Redundant 4-wire Field Terminal Block with screws for the Select I/O Module Termination Unit. 10 pcs of FTB.
3BSE092175R1	FTB890K01 Field Terminal Block	Field Terminal Block (IS, blue) 10 pcs of FTB.
3BSE078722R1	GTB810 Grounding Terminal Bar	Grounding Terminal Bar with 34 screw terminals for the Select I/O Module Termination Unit. Used to ground shields and spare cores.
3BSE088182R1	PTB810K01 Power Injection Terminal Block	Power Injection Terminal Block. Kit including 10 pcs of PTB810.
2PAA125365R1	PTB820K01 Power Injection Terminal Block	Power Injection Terminal Block (120/230 V, red). Kit including 10 pcs of PTB820.
<b>Generic I/O components</b>		
3BSE078740R1	GIS810 Generic I/O Module	Generic I/O Module. Use as single or redundant.
3BSE075855R1	GIS880 Generic I/O Module High Integrity	Generic I/O Module High Integrity. Certified for SIL3. Use as single or redundant.

Product ID	Product Name	Product Description
<b>Signal Conditioning Modules</b>		
3BSE078762R1	AIS810 Analog Input 4 to 20 mA	Analog Input Signal Conditioning Module for 2/4-wire devices. 16 bit. HART communication.
2PAA123602R1	AIS815 Analog Input 4 to 20 mA, 1.2 A	Analog Input Signal Conditioning Module for 2/3/4-devices. 16 bit. HART communication. 1.2 A field power.
2PAA123605R1	AIS830 Analog Input RTD/TC/mV	Analog Input Signal Conditioning Module with RTD/TC for 2/3/4-wire device, single.
3BSE078770R1	AIS850 Analog Input	Analog Input Signal Conditioning Module Intrinsically Safe for 2-wire devices. 16 bit. HART communication.
3BSE074053R1	AIS880 Analog Input 4 to 20 mA HI	Analog Input Signal Conditioning Module High Integrity for 2/4-wire devices. 16 bit. HART communication. Certified for SIL3.
3BSE080108R1	AIS885 Analog Input Module SIL3	Analog Input Signal Conditioning Module High Integrity for 2/3/4-wire devices (1.2 A). 16 bit. HART communication. Certified for SIL3.
3BSE074063R1	AIS890 Analog Input	Analog Input Signal Conditioning Module Intrinsically Safe for 2-wire devices. 16 bit. HART communication. Certified for SIL3.
3BSE078764R1	AOS810 Analog Output 4 to 20 mA	Analog Output Signal Conditioning Module for 2-wire devices. 16 bit. HART communication.
3BSE078772R1	AOS850 Analog Output	Analog Output Signal Conditioning Module Intrinsically Safe for 2-wire devices. 16 bit. HART communication.
3BSE074055R1	AOS880 Analog Output 4 to 20 mA HI	Analog Output Signal Conditioning Module High Integrity for 2-wire devices. 16 bit. HART communication. Certified for SIL3.
2PAA123603R1	DIS801 Digital Input 24 V	Digital Input 24 V Signal Conditioning Module for 2/3/4-wire devices. Sequence of Event (SOE) enabled, single.
3BSE078766R1	DIS810 Digital Input 24 V	Digital Input 24 V Signal Conditioning Module for 2/3/4-wire devices. Sequence of Events (SOE) enabled.
2PAA123607R1	DIS820 Digital Input 120 V	Digital Input 120 V Signal Conditioning Module for 2/3/4-wire devices. Sequence of Events (SOE) enabled, single.
2PAA123608R1	DIS821 Digital Input 230 V	Digital Input 230 V Signal Conditioning Module for 2/3/4-wire devices. Sequence of Events (SOE) enabled, single.
3BSE078774R1	DIS850 Digital input	Digital Input NAMUR Signal Conditioning Module Intrinsically Safe for 2-wire devices. Sequence of Events (SOE) enabled.
3BSE074057R1	DIS880 Digital Input 24V HI	Digital Input 24 V Signal Conditioning Module High Integrity for 2/3/4-wire devices. Sequence of Events (SOE) enabled. Certified for SIL3.
3BSE077763R1	DIS890 Digital input	Digital Input NAMUR Signal Conditioning Module Intrinsically Safe for 2-wire devices. Sequence of Events (SOE) enabled. Certified for SIL3.
2PAA123604R1	DOS801 Digital Output 24 V 0.6 A	Digital Output 24 V, 0.6 A Signal Conditioning Module, single.
3BSE078768R1	DOS810 Digital Output 24 V 0.6 A	Digital Output 24 V, 0.6 A Signal Conditioning Module.
2PAA123606R1	DOS820 Digital Output Relay NO	Digital Output Relay Normally Open Signal Conditioning Module. 5-125 VDC, 5-250 VAC, up to 3 A, single.
3BSE074059R1	DOS880 Digital Output 24 V 0.6 A HI	Digital Output 24 V, 0.6 A Signal Conditioning Module High Integrity. Certified for SIL3.
3BSE074061R1	DOS885 Digital Output 24 V 3 A HI	Digital Output 24 V, 3 A Signal Conditioning Module High Integrity. Certified for SIL3.
3BSE093006R1	GTS810 Grounding Termination	Grounding Termination Signal Conditioning Module.
3BSE093005R1	GFS810 Ground Fault Detection	Ground Fault Detection Signal Conditioning Module.

Product ID	Product Name	Product Description
<b>Accessories</b>		
3BSE088163R1	TB861V009 Compact Modulebus Extension	Extends the Modulebus from one DIN-rail to another. Length 0.9 m.
3BSE090352R1	TB861V011 Compact Modulebus Extension	Extends the Modulebus from one DIN-rail to another. Length 1.1 m.
3BSE088164R1	TB861V015 Compact Modulebus Extension	Extends the Modulebus from one DIN-rail to another. Length 1.5 m.
3BSE088162R1	TB868 Modulebus Terminator	One Modulebus Terminator is needed per cluster.
3BSE088170R1	TL810K01 Empty Slot Protector	Empty Slot Protector kit including 10 x TL810 – for FCI.
3BSE088171R1	TL811K01 Empty Slot Protector	Empty Slot Protector kit including 10 x TL811 – for Ethernet FCI.
3BSE088172R1	TL812K01 Empty Slot Protector	Empty Slot Protector kit including 10 x TL812 – for GIO.
3BSE088173R1	TL813K01 Empty Slot Protector	Empty Slot Protector kit including 10 x TL813 – for SCM.
3BSE088174R1	TL814K01 Empty Slot Protector	Empty Slot Protector kit including 10 x TL814 – for HI module (HI880).
3BSE093010R1	TL820K01 Empty Slot Protector	Empty Slot Protector for Power Injection Terminal Block.
3BSE093013R1	TL830K01 IP30 Cover	IP30 cover for used power supply connector of TU865.
3BSE088181R1	TUC810K01 Terminal Cover	Terminal Cover Kit including 10 x TUC810 - for IO-MTU.
3BSE090351R1	TS810K01 Screw Lugs	Screw Lugs kit including 100 x TS810 - for TU860/TU865 and TUS810.
3BSE079084R1	TUW890K01 Separation Wall	Separation wall Kit including 10 x TUW890 - to separate IS and non-IS I/O MTUs.
<b>Power Supplies</b>		
3BSE088188R1	SD853 Power Supply	Power Supply – 10 A.
3BSE088189R1	SD854 Power Supply	Power Supply – 20 A.
2PAA125624R1	SS855 Voter	Voter for redundant power supply systems. 2x20 A in and 1x40 A out.

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[800xahardwareselector.com](https://800xahardwareselector.com)

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