

Technical Note

Installation instruction for all SpeedSys versions

Technical Note No.	TN_SSY-20210729-1
Date	30JUL-2021
Applies to	SpeedSys 200, SpeedSys300
Hardware version	0.14.0
Firmware version	1.20

Abstract

Best engineering practice for the physical installation of SpeedSys 200/300 ODS modules.

General precautions

Manual

Before installing a Speedsys module carefully read the installation and safety manual!

Competence

Installing SpeedSys modules require sufficient background in the installation of electronic equipment in an industrial environment. Knowledge of installation of field wiring and protective earth (PE), Instrument Earth (IE) and Intrinsically Safe earth (IS) is required.

ESD protection

Electrostatic discharge (ESD) is a costly nuisance for all electronics equipment. The release of buildup static charge can cause irreparable damage to electronic parts. Although SpeedSys was designed and tested in compliance with the applicable EMC and IEC directives (up to 6 kV Electrostatic Discharge), it is advised while handling the modules to use electrostatic wrist straps.

These antistatic devices work by continuously grounding the person wearing them. In other words, they prevent electrostatic discharge by preventing electric charge from building up.



ESD strap example

ATEX input circuits

The ATEX certified sensor input circuits are protected against overload and overvoltage. Supplying high voltages to the input circuits can blow the overvoltage fuse leading to an inactive unit.

It is strongly advised, prior to powering the unit, to verify if the applied voltage does not exceed the input limits of SpeedSys (refer to the manual for the limit values).

Mounting and dismantling connectors

The SpeedSys connectors are each physically coded to prevent mismatching between connectors and the correct slot. Each connector has two orange asymmetrically shaped pins that fit only in their corresponding slot. During assembly of the unit the pins can be oriented in various ways preventing mismatching during use. Removing the connectors can be done by lifting the release lever on each connector. To mount a connector: Carefully insert the connectors into place, verifying the coding pins. Once the connector is pushed in approx. 3-5 mm the connector can be pushed so it will lock itself into place.

Pushing a connector into place should not require a lot of force. Applying too much force on a connector can lead to damaged coding pins and incorrectly placed connectors.

Note that the physical coding is different between connectors, but the same from Speedsys to Speedsys, making the units easily replaceable.

The connection screws can be loosened and tightened by using a DIN 5264 screwdriver.
Clamping range, min. 0,13 mm², clamping range, max. 3,31 mm²
minimum tightening torque 0.4 Nm, maximum tightening torque 0.6 Nm.

Power, Grounding and Shielding

Power

The SpeedSys is certified as being a Separated Extra Low Voltage (SELV) system.

Note: SELV electrical circuits are electrically separated from other circuits that carry higher voltages, isolated from the earth and from the protective earth conductors of other circuits. The system cannot suffer any electrical surge from other systems, not even through other systems ground connectors.

SpeedSys is designed for 24 V_{DC} isolated (SELV) power supplies.

See PSU and Shielding connection section for the grounding and shielding option for the connection option of the power supply.

Grounding

The unit always needs to be connected to ground as follows:

- One IE* terminal per unit needs to be connected to the IE* ground.
- One IS** terminal needs to be connected to IS** ground in case of an ATEX environment. In case ATEX is not applicable it can be connected to IE* ground.
- Cabinets and casings need to be connected to PE ***ground.

*) *IE = Instrument Earth*

**) *IS = Intrinsically safe earth*

***) *PE = Protective earth*

See PSU and Shielding connection section for the grounding options for the connection of the SpeedSys ODS to ground (IE, IS).

Shielding

SpeedSys is designed and verified based on the following cable and shielding configuration:

Table1: the shielding configuration as described is for an installation in an EMC uncontrolled environment.

SENSOR CONNECTION	DESCRIPTION	MAX CABLE LENGTH	TYPE OF CABLE	SHIELDING	SHIELD INSTRUMENT SIDE	SHIELD SENSOR SIDE
B1-B4	Eddy Current	1000 m	Twisted pair (Li2YCY PiMF $2x \geq 0.5 \text{ mm}^2$)	Yes	Yes	No
B5-B8	Hall Sensor	Typically, 300 m	Twisted pair (Li2YCY PiMF $2x \geq 0.5 \text{ mm}^2$)	Yes	Yes	No
B9-B12	Magnetic pick up	*	Twisted pair (Li2YCY PiMF $2x \geq 0.5 \text{ mm}^2$)	Yes	Yes	Yes **
OTHER CONNECTION	DESCRIPTION	MAX CABLE LENGTH	TYPE OF CABLE	SHIELDING	SHIELD INSTRUMENT SIDE	SHIELD OPPOSITE SIDE
A1-A4	Safety Analog / Freq out	30 m	2 wire	Yes	Yes	No
A5-A8	PSU 1	10 m	2 wire	Yes	Yes	No
A9-A12	PSU 2	10 m	2 wire	Yes	Yes	No
B1-B4	Safety relay 1	30 m	2 wire	Yes	Yes	Yes***
B5-B8	Safety relay 2	30 m	2 wire	Yes	Yes	Yes***
B9-B12	Status relay 3 & 4	30 m	2 wire	Yes	Yes	Yes***
C1-C4	PST in / out	30 m	2 wire	Yes	Yes	Yes***
C5-C8	Modbus interface	30 m	2 wire	Yes	Yes	Yes***

* The maximum cable length in case of magnetic pickup is depending on sensor impedance, cable impedance, cable routing and instrument input impedance and can vary from 10 till 500 m.

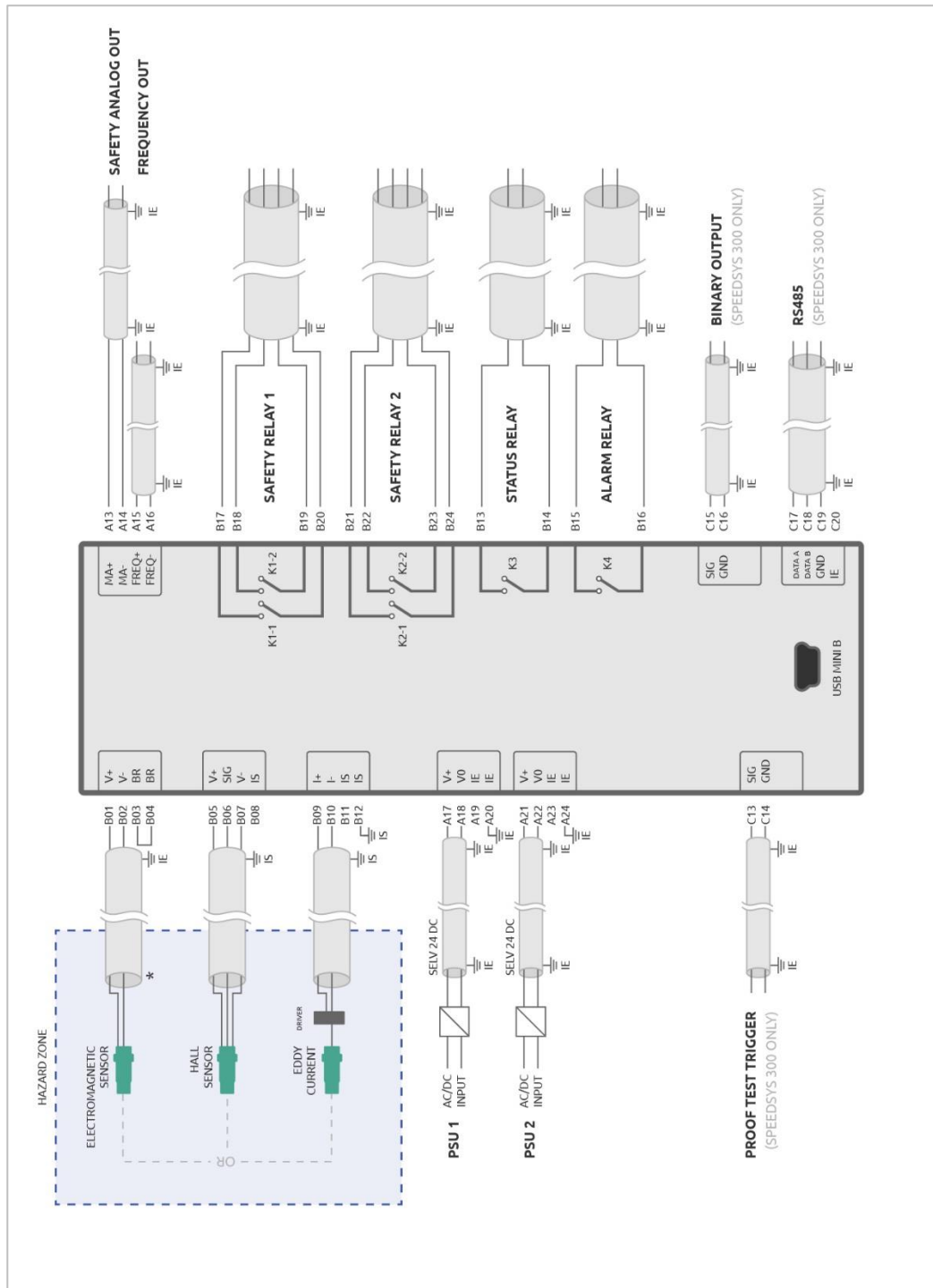
** In case of an ATEX zone, the area can be regarded as an EMC controlled environment and the shield at the sensor side is not required.

*** In case of a shielded EMC cabinet the inside of the cabinet can be regarded as a controlled environment. Connections and wiring remaining inside the cabinet do not require any shielding except for the speed signals.

See PSU and Shielding connection section for the connection cable shielding to ground (IE, IS).

For further information contact Istec International through our website: www.istec.com

PSU and shielding connection



* An ATEX Zone can be regarded as an ESD controlled area and the shield cab be single ended connected. In case the installation is in an ESD uncontrolled area the Magnetic Pick-up cable must be connected to IE on both sides.