IndraControl S20

The modular IndraControl S20 I/O system in protection category IP20 enables real-time data flow between the control and peripherals.

It links fast sensors and actuators via the system bus and links the bus coupler to the network. The system provides for constant cycle synchronicity of sercos the automation bus, which is a worldwide standard for Ethernet-based real-time communication, or alternatively via PROFINET. Modularly extendable I/O modules only require an update time of 1 µs each. This reduces update times to a minimum, even with the maximum extension of up to 63 I/O modules per bus coupler. Faster recording and transfer of measurement results improves process control, enabling shorter cycle times and higher precision.

The IndraControl S20 system has been designed for heavy-duty use and tested in comprehensive continuous shock tests. Adjustable filter times improve electromagnetic compatibility and reduced radiation makes the system future-proof. Cable assembly does not require tools and simplifies wiring and maintenance. In the case of a malfunction, the user can simply remove the plug and exchange the electronics module.

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Fast, robust, and simple

- Reliable measurement of time-critical signals
- Extremely robust design and mechanics
- Easy to handle

Fieldbus coupler

Fieldbus couplers – for connecting as the first module in an IndraControl S20 station and as an interface to the fieldbus system. The various I/O modules can be directly connected to the fieldbus couplers.

Digital I/O modules

Digital I/O modules – for connection of digital signals from pushbuttons, limit switches, or proximity switches.

Analog I/O modules

Analog I/O modules – for acquiring and outputting analog signals from standard sensors and analog actuators.

Function modules

Function modules – for solving special tasks, for example fast counting forwards/backwards, incremental recording.

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General technical data

Ambient conditions		
Temperature range (operation)		-25°C to +60°C
Relative humidity (operation)		5 to 95% (no dewing)
Vibration		5 g acc. to EN 60068-2-6
Shock		25 g acc. to EN 60062-2-27
Continuous shock		10 g acc. to EN 60068-2-29
Protection category		IP20
Electromagnetic compatibility		
Interference emission		Class B acc. to EN 61000-6-3
Interference immunity		Acc. to EN 61000-4
Supply voltage		
Nominal value		24 V DC
Ripple		±5% acc. to EN 61131-2
Permissible range		19.2 to 30.0 V
System data		
System bus cycle time		2 µs
Offset per module		1 µs
Connection		
Connection type		Direct-plug spring-force connection
Connection data	Rigid	0.2–1.5 mm²
	Flexible	0.2–1.5 mm²
	AWG	24–16

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Fieldbus coupler – technical data

	S20-PN-BK	S20-S3-BK
Interfaces		
Fieldbus system	PROFINET-IO	sercos
Connection type	RJ45 socket autonegotiation and autocrossing	RJ45 socket autonegotiation and autocrossing
Number	2	2
Transmission speed	100 Mbit/s (full-duplex)	100 Mbit/s (full-duplex)
Transmission length	Max. 100 m	Max. 100 m
PROFINET-IO		
Device function	PROFINET-IO device	sercos
Update rate	250 µs	250 µs
Local bus interface		
Designation	Axio bus	Axio bus
Connection type	Connection for bus socket module	Connection for bus socket module
Transmission speed	100 Mbit/s	100 Mbit/s
Number of supported segments	Max. 63 (per station)	Max. 63 (per station)
Module electronics supply		
Logic voltage supply U_L	24 V DC	24 V DC
Maximum permissible voltage range	19.2 to 30 V DC (including all tolerances, including ripple)	19.2 to 30 V DC (including all tolerances, including ripple)
Logic voltage U_{BUS}	5 V DC (via bus socket module)	5 V DC (via bus socket module)
Power supply at U_{BUS}	2 A	2 A
Protective circuit	Overvoltage protection for supply voltage Reverse polarity protection for supply voltage	Overvoltage protection for supply voltage Reverse polarity protection for supply voltage
Mechanical data		
Dimensions (W x H x D)	40 x 123.6 x 75 mm	40 x 123.6 x 75 mm
Dimensional drawing (see p. 186)	Type 1	Type 1
Weight	173 g	173 g

Digital inputs – technical data

	S20-DI-16/4	S20-DI-32/1
Local bus interface		
Designation	Axio bus	Axio bus
Connection type	Bus socket module	Bus socket module
Module electronics supply		
Logic voltage U_{BUS}	5 V DC (via bus socket module)	5 V DC (via bus socket module)
Power consumption from U_{BUS}	120 mA	120 mA
Peripherals supply		
Digital input module supply U_I	24 V DC	24 V DC
Maximum permissible voltage range	19.2 to 30 V DC including all tolerances, including ripple	19.2 to 30 V DC including all tolerances, including ripple
Power consumption from U_I	Max. 4 A (2 A per group of eight inputs)	Max. 4 A (2 A per group of eight inputs)
Protective circuit	Overvoltage protection for supply voltage Reverse polarity protection for supply voltage	Overvoltage protection for supply voltage Reverse polarity protection for supply voltage
Digital inputs		
Connection technique	2, 3, 4-wire	1-wire
Number of inputs	16	32
Input description	EN 61131-2, Type 1 and 3	EN 61131-2, Type 1 and 3
Nominal input voltage U_{IN}	24 V DC	24 V DC
Nominal input current at U_{IN}	2.4 mA	2.4 mA
Input filter time	500 µs (default)	3000 µs (default)
		1000 µs
	<100 µs	<100 µs
Protective circuit	Input reverse polarity protection	Input reverse polarity protection
Mechanical data		
Dimensions (W x H x D)	53.6 x 129.9 x 51.4 mm	53.6 x 129.9 x 51.4 mm
Dimensional drawing (see p. 187)	Type 2	Type 3
Weight	231 g	167 g

Digital outputs – technical data

	S20-DO-16/3	S20-DO-32/1
Local bus interface		
Designation	Axio bus	Axio bus
Connection type	Bus socket module	Bus socket module
Module electronics supply		
Logic voltage U_{BUS}	5 V DC (via bus socket module)	5 V DC (via bus socket module)
Power consumption from U_{BUS}	120 mA	120 mA
Peripherals supply		
Digital output module supply U_O	24 V DC	24 V DC
Maximum permissible voltage range	19.2 to 30 V DC including all tolerances, including ripple	19.2 to 30 V DC including all tolerances, including ripple
Power consumption from U_O	8 A	16 A
Protective circuit	Overvoltage protection for supply voltage Reverse polarity protection for supply voltage	Overvoltage protection for supply voltage Reverse polarity protection for supply voltage
Digital outputs		
Connection technique	2, 3-wire	1-wire
Number of outputs	16	32
Output voltage	24 V DC	24 V DC
Maximum output current per channel	500 mA	500 mA
Maximum output current per module	8 A	16 A
Overload behavior	Switch off with automatic restart	Switch off with automatic restart
Protective circuit	Short-circuit protection, overload protection of the outputs	Short-circuit protection, overload protection of the outputs
Mechanical data		
Dimensions (W x H x D)	53.6 x 129.9 x 51.4 mm	53.6 x 129.9 x 51.4 mm
Dimensional drawing (see p. 187)	Type 2	Type 3
Weight	234 g	209 g

Analog inputs – technical data

	S20-AI-8
Local bus interface	
Designation	Axio bus
Connection type	Bus socket module
Module electronics supply	
Logic voltage U_{BUS}	5 V DC (via bus socket module)
Power consumption from U_{BUS}	130 mA
Peripherals supply	
Analog module supply U_A	24 V DC
Maximum permissible voltage range	19.2 to 30 V DC including all tolerances, including ripple
Protective circuit	Overvoltage protection, reverse polarity protection, transient protection
Analog inputs	
Connection technique	2-wire (shielded, twisted in pairs)
Number of inputs	8 (differential inputs, either voltage or current may be selected)
Voltage input signal	0 to 5 V, -5 to 5 V, 0 to 10 V, ±10 V
Current input signal	0 to 20 mA, 4 to 20 mA, ±20 mA
Characteristic values	
Measurement representation	16 bits (15 bits + sign bit)
Input filter	30 Hz, 12 kHz and averaging (configurable)
Accuracy	0.1% (of measurement range and value with active averaging and 30 Hz filter)
Mechanical data	
Dimensions (W x H x D)	53.6 x 129.9 x 51.4 mm
Dimensional drawing (see p. 187)	Type 3
Weight	204 g

Analog outputs – technical data

	S20-AO-8
Local bus interface	
Designation	Axio bus
Connection type	Bus socket module
Module electronics supply	
Logic voltage U_{BUS}	5 V DC (via bus socket module)
Power consumption from U_{BUS}	130 mA
Peripherals supply	
Analog module supply U_A	24 V DC
Maximum permissible voltage range	19.2 to 30 V DC including all tolerances, including ripple
Protective circuit	Overvoltage protection, reverse polarity protection, transient protection
Analog outputs	
Connection technique	2-wire (shielded, twisted in pairs)
Number of outputs	8 (differential inputs, either voltage or current may be selected)
Voltage output signal	0 to 5 V, -5 to 5 V, 0 to 10 V, ±10 V
Current output signal	0 to 20 mA, 4 to 20 mA, ±20 mA
Load impedance	500 Ω
Characteristic values	
Measurement representation	16 bits (15 bits + sign bit)
Accuracy	0.1% (of output range end value)
Mechanical data	
Dimensions (W x H x D)	53.6 x 129.9 x 51.4 mm
Dimensional drawing (see p. 187)	Type 3
Weight	260 g

Temperature module – technical data

	S20-AI-8-RTD
Local bus interface	
Designation	Axio bus
Connection type	Bus socket module
Module electronics supply	
Logic voltage U_{BUS}	5 V DC (via bus socket module)
Power consumption from U_{BUS}	180 mA
Peripherals supply	
Analog module supply U_A	24 V DC
Maximum permissible voltage range	19.2 to 30 V DC including all tolerances, including ripple
Protective circuit	Overvoltage protection, reverse polarity protection, transient protection
Analog inputs	
Connection technique	2, 3, 4-wire (shielded, twisted in pairs)
Number of outputs	8 (for resistive temperature sensors)
Protective circuit	Short-circuit protection, overload protection of the inputs, transient protection of the inputs, transient protection of the sensor supplies
Compatible sensor types	Pt, Ni, KTY, Cu sensors
Linear resistance range	500 Ω, 5 kΩ
Characteristic values	
Measurement representation	16 bits (15 bits + sign bit)
Input filter time	40 ms/60 ms/100 ms/120 ms (configurable)
Accuracy	Typ. ±0.1 K (Pt100 in 3-wire connection)
Mechanical data	
Dimensions (W x H x D)	53.6 x 129.9 x 51.4 mm
Dimensional drawing (see p. 187)	Type 3
Weight	197 g

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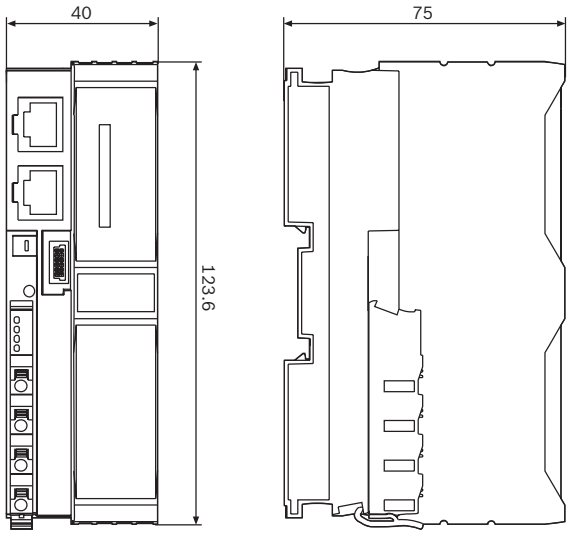
Technology module – technical data

	S20-CNT-INC-2/2
Local bus interface	
Designation	Axio bus
Connection type	Bus socket module
Module electronics supply	
Logic voltage U_{BUS}	5 V DC (via bus socket module)
Power consumption from U_{BUS}	100 mA
Peripherals supply	
Analog module supply U_A	24 V DC
Maximum permissible voltage range	19.2 to 30 V DC including all tolerances, including ripple
Protective circuit	Overvoltage protection, reverse polarity protection, transient protection
Counter inputs	
Number of inputs	2 (S1, S2)
Input frequency	Max. 300 kHz/150 kHz (dependent on the circuit)
Input voltage	24 V DC
Encoder inputs	
Number of inputs	2 (A1, /A1, B1, /B1, Z1, /Z1; A2, /A2, B2, /B2, Z2, /Z2)
Encoder signals	Symmetrical and asymmetrical encoders
Input frequency	Max. 300 kHz/150 kHz (dependent on the circuit)
Digital inputs	
Connection technique	1-wire
Number of inputs	8
Input description	EN 61131-2 type 3
Nominal input voltage U_{IN}	24 V DC
Nominal input current at U_{IN}	2.5 mA (per channel)
Digital outputs	
Connection technique	1-wire
Number of outputs	2
Output voltage	24 V DC
Maximum output current per channel	500 mA
Protective circuit	Short-circuit protection, overload protection of the outputs
Mechanical data	
Dimensions (W x H x D)	53.6 x 129.9 x 51.4 mm
Dimensional drawing (see p. 187)	Type 3
Weight	205 g

IndraControl S20 – ordering data

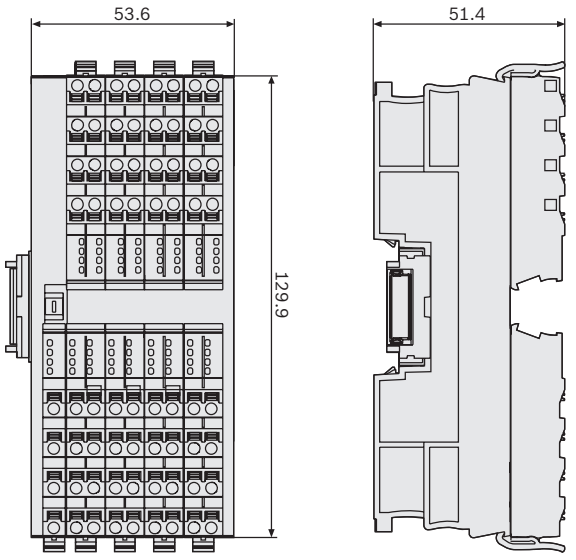
Description	Type code
IndraControl S20 PROFINET IO bus coupler (incl. connection plug)	S20-PN-BK
IndraControl S20 sercos bus coupler (incl. connection plug)	S20-S3-BK
IndraControl S20 digital input module, 16 inputs, 24 V DC, 2, 3, 4-wire connection (incl. bus socket module and plugs)	S20-DI-16/4
IndraControl S20 digital input module, 32 inputs, 24 V DC, 1-wire connection (incl. bus socket module and plugs)	S20-DI-32/1
IndraControl S20 digital output module, 16 outputs 24 V DC, 2, 3-wire connection (incl. bus socket module and plugs)	S20-DO-16/3
IndraControl S20 digital output module, 32 outputs 24 V DC, 1-wire connection (incl. bus socket module and plugs)	S20-DO-32/1
IndraControl S20 analog input module, 8 inputs: 0-10 V, ±10 V, 0-20 mA, 4-20 mA, ±20 mA, 2-wire connection (incl. bus socket module and plugs)	S20-AI-8
IndraControl S20 analog output module, 8 outputs: 0-10 V, ±10 V, 0-5 V, ±5 V, 0-20 mA, 4-20 mA, ±20 mA, 2-wire connection (incl. bus socket module and plugs)	S20-AO-8
IndraControl S20 temperature module, 8 inputs for connecting resistance temperature detectors (RTD) (incl. bus socket module and plugs)	S20-AI-8-RTD
IndraControl S20 technology module, 2 counter inputs, 2 incremental-value encoder inputs (incl. bus socket module and plugs)	S20-CNT-INC-2/2
IndraControl S20 bus socket module	S20-BS

Type 1



IndraControl S20

Type 2



Type 3