

Overview

AS-Interface is an open, international standard according to IEC 62026-2 for process and field communication. Leading manufacturers of actuators and sensors all over the world support the AS-Interface. Interested companies are provided with the electrical and mechanical specifications by the AS-Interface Association.

AS-Interface is a single master system. For automation systems from Siemens, there are communications processors (CPs), communications modules (CMs) and gateways (links) that control the process or field communication as masters, and actuators and sensors that are activated as AS-Interface slaves.



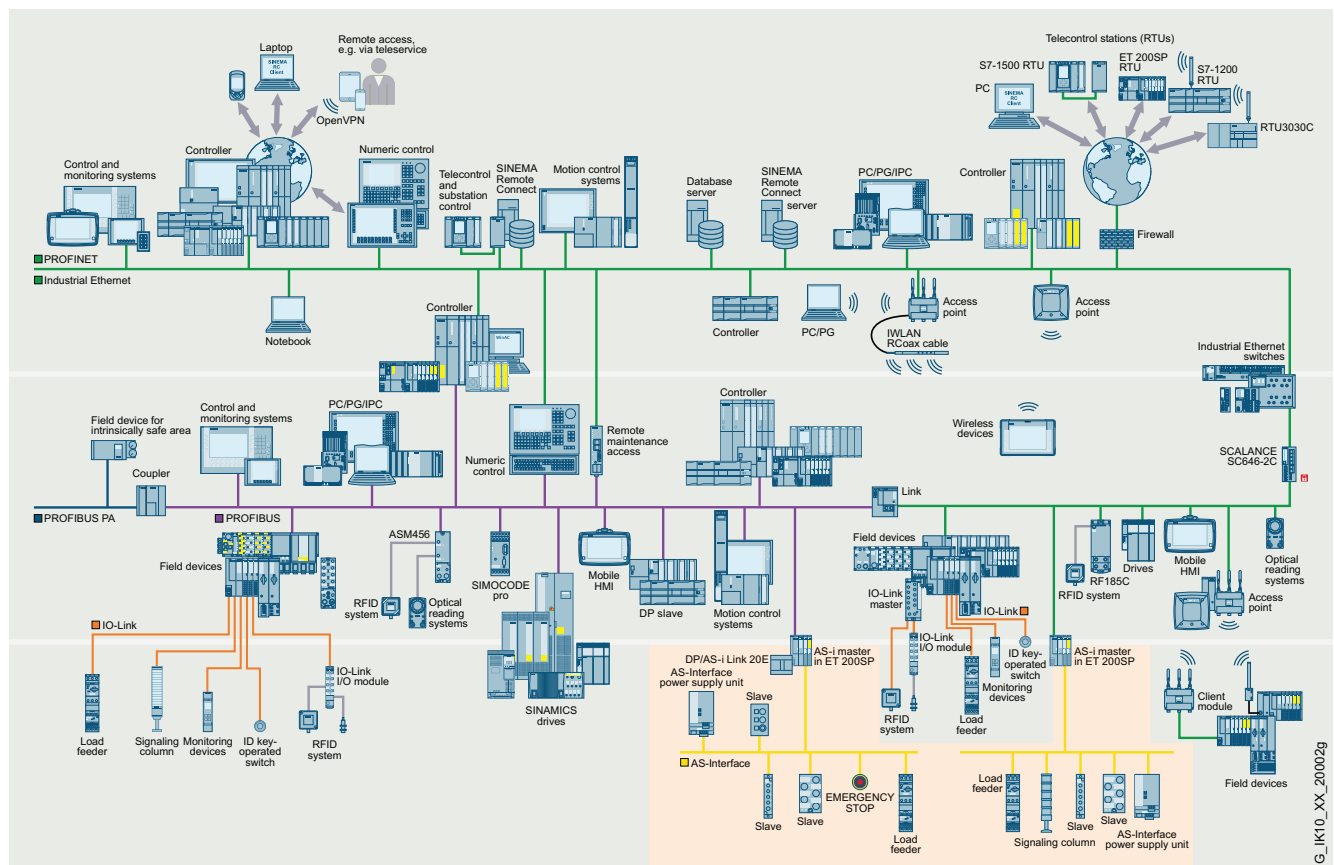
Video: AS-Interface – Powerful integration in SIMATIC ET 200SP

More information

Homepage, see www.siemens.com/as-interface

SiePortal, see www.siemens.com/product?as-interface

TIA Selection Tool Cloud (TST Cloud), see www.siemens.com/tstcloud/?node=ASInterface



AS-Interface in the SIMATIC NET communications landscape

Industrial communication

AS-Interface

Introduction

Communication overview

Benefits

An important characteristic of the AS-Interface technology is the use of a shared twisted pair for data transmission and distribution of auxiliary power to the sensors and actuators. An AS-i power supply unit or alternatively a standard power supply unit that meets the requirements of the AS-Interface transmission method and has an external AS-i data decoupling module is used for the distribution of auxiliary power. The AS-Interface cable used for the wiring is mechanically coded and hence protected against polarity reversal and can be easily contacted by the insulation piercing method.

Elaborately wired control cables in the control cabinet and marshaling racks can be replaced by AS-Interface.

The AS-Interface cable can be connected to any points thanks to a specially developed cable and connection by the insulation piercing method.

With this concept you become extremely flexible and achieve high savings.

Application

I/O data exchange

The AS-i master automatically transfers the inputs and outputs between the controller and the digital and analog AS-Interface slaves. Slave diagnostics information is forwarded to the control system when required.

The latest AS-Interface masters according to the AS-Interface specification V3.0 support integrated analog value processing. This means that data exchange with analog AS-Interface slaves is just as easy as with digital slaves.

Command interface

In addition to I/O data exchange with binary and analog AS-Interface slaves, the AS-Interface masters can provide a number of other functions through the command interface.

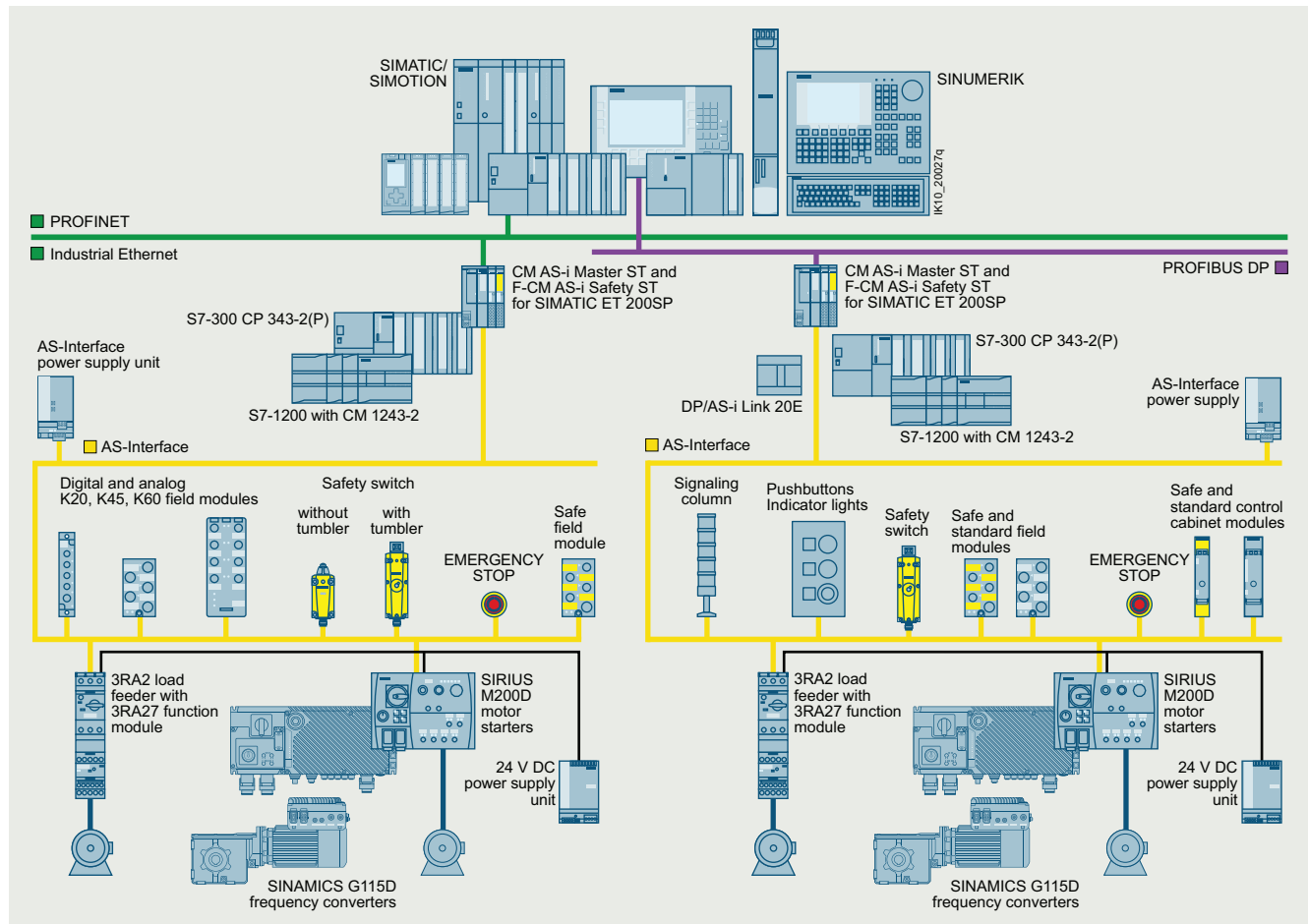
Hence it is possible, for example, for slave addresses to be issued, parameter values transferred or configuration information read out from user programs.

For more information, see <https://support.industry.siemens.com/cs/ww/en/view/51678777>.

Overview

To implement communication, the following components of a system installation are available:

- AS-i master modules for central control units such as SIMATIC S7, ET 200M/ET 200SP distributed I/Os, or gateways from PROFIBUS to AS-Interface
- AS-i power supply unit or alternatively a standard power supply unit in combination with an AS-i data decoupling module for the power supply to the slaves and sensors
- AS-Interface shaped cables
- Network components such as repeaters and extension plugs (cannot be used for AS-i Power24V)
- I/O modules (AS-i slaves) for connection of standard sensors/actuators
- Actuators and sensors with integrated AS-i slave
- Safe I/O modules (ASIsafe slaves) for transmitting safety-related data through AS-Interface
- Addressing device for setting slave addresses during commissioning



Example of a configuration with the system components

Features

Standard	IEC 62026-2	Maximum cycle time	5 ms in maximum configuration with 31 standard addresses 10 ms in maximum configuration with 62 A/B addresses - Profile-specific for slaves with extended data, e.g. analog slaves
Topology	Line, star or tree topology (same as electrical wiring)	Number of stations per AS-Interface line	- Up to 62 slaves (A/B addressing) - Integrated analog value transmission
Transmission medium	Unshielded twisted pair (2 x 1.5 mm ²) for data and auxiliary power	Number of binary sensors and actuators	Max. 496 DI/496 DQ
Connection methods	Contacting of the AS-Interface cable by insulation piercing method	Access control	- Cyclic polling master/slave procedure - Cyclic data acceptance from host (PLC, PC)
Maximum cable length	100 m without repeater, without an extension plug 200 m with an extension plug 300 m with two repeaters in series connection 600 m with three extension plugs and two repeaters connected in parallel Longer cable lengths also possible through parallel connection of more repeaters.	Error safeguard	Identification and repetition of faulty message frames

Industrial communication

AS-Interface

Introduction

AS-Interface specification > Specification V3.0

Overview

Scope of AS-Interface specification V3.0

Maximum number of slaves			Number of digital inputs	Number of digital outputs
Digital	Analog	ASIsafe	DI	DQ
62	62	31	62 X 8 = 496	62 X 8 = 496

Basic data

- AS-Interface specification V3.0 describes a fieldbus system with an AS-i master and up to 62 AS-i slaves.
- Every AS-i slave with standard addressing occupies one AS-i address (1...31).
- Slaves with extended addressing divide an AS-i address into an A address (1A...31A) and a B address (1B...31B). Up to 62 A/B slaves can be connected accordingly to one AS-Interface network.
- Mixed operation of slaves with standard addressing and extended addressing (A/B slaves) is possible without difficulty. The AS-i master identifies automatically which type of slave is connected, so no special adjustments are required of the user.
- One digital AS-i slave typically has up to four digital inputs and four digital outputs.
- Transmission of the digital input/output data requires max. 5 ms cycle time for 31 slaves; for further values, see [Communication cycle](#).
- Integrated analog value transmission permits access to both analog values and digital values without the need for any special function blocks.

Communication cycle

Maximum cycle time (digital signals)
5 ms with 31 slaves 10 ms with 62 slaves - Up to 20 ms for slaves with A/B address and 4 DI/4 DQ - Up to 40 ms for slaves with A/B address and 8 DI/8 DQ

Each address is queried in max. 5 ms cycle time. If two A/B slaves are operated on one basic address (e.g. 12A and 12B), a maximum of 10 ms will be required to update the data of both slaves.

Slaves with A/B addressing transmit max. 4 DI/3 DQ in one cycle.

Slaves with A/B addressing and 4 DQ or 4 DI/4 DQ transmit the output data in two consecutive cycles. The double transmission time of these outputs has no effect in typical applications. The transmission procedure is performed automatically by the AS-i master according to AS-i specification V3.0. These slaves are identified in the selection data with addressing type A/B (spec. V3.0).

Slaves with a single A/B address and 8 DI/8 DQ transmit the input and output data in four consecutive cycles. The transmission time of the inputs/outputs of these slaves increases accordingly. The transmission procedure is performed automatically by the AS-i master according to AS-i specification V3.0.

The slaves offered by Siemens with 8 DI or 8 DI/2 DQ use two AS-i addresses so that the time-consuming procedure is not needed and a fast data update is ensured.

All slave types can be mixed and used on a single AS-Interface network.

For more information, such as the addressing type used by the AS-interface slave (standard or A/B address), see the [Selection and ordering data for the relevant slave](#).

More information

System Manual for AS-Interface, see <https://support.industry.siemens.com/cs/ww/en/view/26250840>

AS-Interface product range

AS-Interface products from Siemens use the current AS-Interface specification V3.0, which is standardized internationally as IEC 62026-2.

The alternating pulse modulation developed more than 20 years ago for AS-Interface has proven to be a reliable transmission method with which the direct voltage supply for the bus modules and the connected sensors is provided on the standard twisted pair.

Multiple development stages were implemented to produce the proven-in-use system components with optimum EMC properties available today. The extensive product range with AS-Interface specification V3.0 undergoes constant innovation and is extremely cost-efficient, both to install and operate.

The bus cable can be retrofitted with repeaters of AS-Interface specification V3.0, and the modules function without any reciprocal interference. Master modules from Siemens enable ideal integration into the SIMATIC environment, in particular for the AS-Interface master of the ET 200SP distributed I/O system.

The underlying industrial requirements for the system concept are still applicable today: Numerous individual digital input and output signals are spatially distributed in the machine. Rather than having to install thick cable harnesses from the control cabinet to the sensors and actuators, smaller, more manageable AS-i modules are simply inserted in situ onto the bus cable in the IP67 enclosure, and the sensors and actuators connected with short M12 cables.

An additional AS-i module is installed in proximity to the next sensor to ensure that the length of the M12 cables is kept as short as possible. As analog signals are likewise transmitted without any problems, the AS-Interface also replaces the long, shielded analog cables.

Depending on requirements, the switching devices can also be connected to AS-i modules with terminal connection or conveniently used with the integrated AS-i connection. Motor controllers with digital and analog inputs and outputs are also offered with the current AS-Interface specification V3.0.

Safety signals are also transmitted simply and flexibly by the AS-Interface. The safety-related sensors for protective doors and EMERGENCY-STOP buttons can be installed and retrofitted in any position.

The AS-i Safety functionality from Siemens has been continuously optimized and complies with the proven AS-Interface specification V3.0.

For industrial components which require greater transmission capacities, Siemens provide respective solutions with the suitable communications systems.

The AS-Interface system from Siemens continues to provide an ideal and consistent solution for a multitude of simple sensors and actuators, including safety technology and special applications.

Available masters with the latest AS-Interface specification V3.0

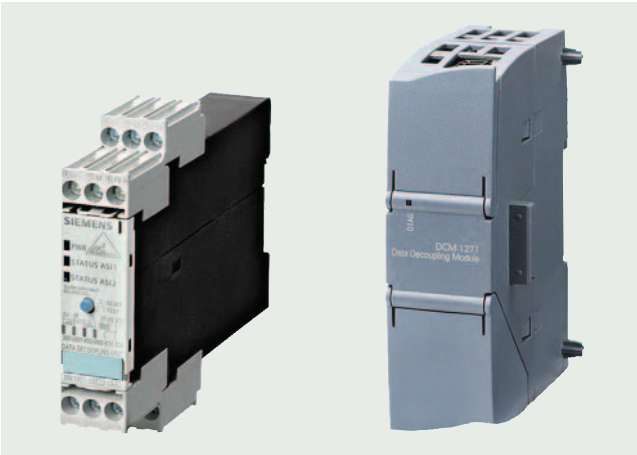
- CM AS-i Master ST, F-CM AS-i Safety ST (ET 200SP)
- CM 1243-2 (S7-1200)
- CP 343-2P/CP 343-2 (S7-300/ET 200M)
- DP/AS-Interface Link 20E

Overview

More information

For a complete overview of AS-i Power24V-capable devices currently available from Siemens, see <https://support.industry.siemens.com/cs/ww/en/view/42806066>

For details of AS-i Power24V, see System Manual for AS-Interface, <https://support.industry.siemens.com/cs/ww/en/view/26250840>



AS-Interface data decoupling modules for AS-i Power24V
Left: S22.5 data decoupling module,
Right: DCM 1271 data decoupling module for SIMATIC S7-1200

Parallel wiring frequently dominates, above all, in applications with very few I/Os. AS-Interface can, however, also replace extensive parallel wiring in small applications at a favorable price.

AS-i Power24V enables an already existing standard 24 V DC power supply unit to be used for the AS-i network.

Data and power in the standard AS-Interface network

One of the great advantages of AS-Interface is the ability to convey not only data, but also the power needed for the connected slaves and sensors via the same unshielded twisted pair. This is owed to the service-proven AS-Interface power supply units which provide integrated data decoupling as well as overload and short-circuit protection and integrated ground fault monitoring.

AS-i Power24V

Instead of the AS-Interface power supply unit (with 30 V output voltage and integrated data decoupling) the AS-i cable is supplied via a data decoupling module from a 24 V standard power supply unit. The communication technology of AS-Interface works at the same high level of quality with an operational voltage of both 30 V DC and 24 V DC.

Key data of AS-i Power24V

Number of slaves	Up to 62 slaves and up to 31 safe slaves
Topology	Any
Range	Up to 50 m
Components	• 24 V power supply unit with low residual ripple and limitation to max. 40 V • AS-i Power24V-capable data decoupling with integrated ground fault detection • AS-i Power24V-capable masters, slaves and components

Requirements for operation of an AS-i Power24V network

- When 24 V power supply units are used, the maximum network range of 50 m must be observed to reach slaves and sensors with a sufficient level of voltage (at least 18 V).
- The power supply units must comply with the ES1 (IEC 62368-1) or PELV (Protective Extra Low Voltage)/SELV (Safety Extra Low Voltage) standards, have a residual ripple of < 250 mV_{pp}, and must limit the output voltage to a maximum of 40 V in the event of a fault. We recommend SITOP power supplies, see page 15/1 or Catalog KT 10.1, <https://support.industry.siemens.com/cs/ww/en/view/109745655>.
- When used in conjunction with standard 24 V power supply units, each AS-Interface network requires AS-i Power24V-capable data decoupling, see page 2/71 onwards.
- For reliable operation of an AS-i network with 24 V voltage, it is important that the masters, slaves and other components are approved for AS-i Power24V. AS-i Power24V-capable AS-i components can also be used without restriction in standard 30 V AS-i networks.
- Use of repeaters or extension plugs in AS-i Power24V networks is not permitted.

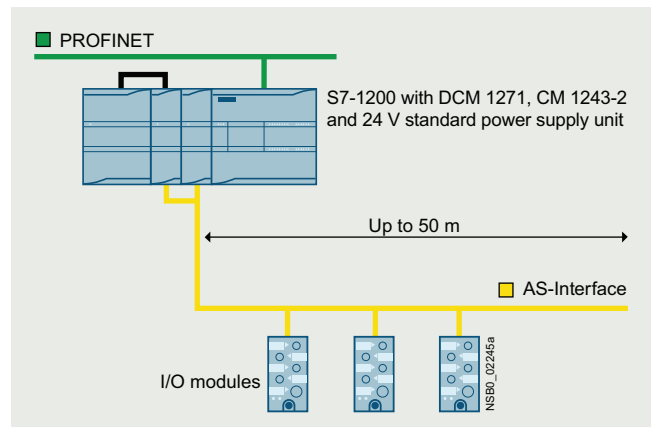
Benefits

In small control cabinets the AS-i power supply unit can be replaced by an AS-i data decoupling module that is connected to an existing 24 V power supply unit.

- The advantages of the AS-i communications system in terms of commissioning, maintenance and diagnostics can be fully exploited.
- If a double data decoupling module is used, two AS-i networks can be supplied.

Application

Configuration of an AS-i Power24V network



Configuration of an AS-i Power24V network with an AS-Interface DCM 1271 data decoupling module and S7-1200 (simple network)

Industrial communication

AS-Interface

ASIsafe

Introduction

Overview

More information

For more information and typical circuit diagrams on safety technology, see <https://support.industry.siemens.com/cs/ww/en/view/83150405>

ASIsafe – Safety is included

ASIsafe enables the integration of safety-related components such as EMERGENCY-STOP buttons, protective door switches, cable-operated switches or other AS-i safety sensors in an AS-Interface network. These are fully compatible with the familiar AS-Interface components (masters, slaves, power supply units, repeaters, etc.) according to IEC 62026-2 and are operated in conjunction with them on the yellow AS-Interface cable.

Tested safety

- Protective door switches
- Cable-operated switches
- Other AS-i safety sensors

The transmission method for safety-related signals is released for applications up to SIL 3 (IEC 62061)/PL e (ISO 13849-1).

Higher-level control

As usual, nodes on the AS-Interface bus are controlled in operation by the standard program of the higher-level SIMATIC (F) CPU or by a SINUMERIK control.

Configuring safety functions

In order to implement safe functions, the information from the safe and standard nodes must be combined logically and further parameters set.

In conjunction with the modular safety AS-i master, which is formed by combining the CM AS-i Master ST and F-CM AS-i Safety ST modules in an ET 200SP station, all safety functions and combinations are configured via STEP 7 and processed in the controller (F-CPU) by the Failsafe program.

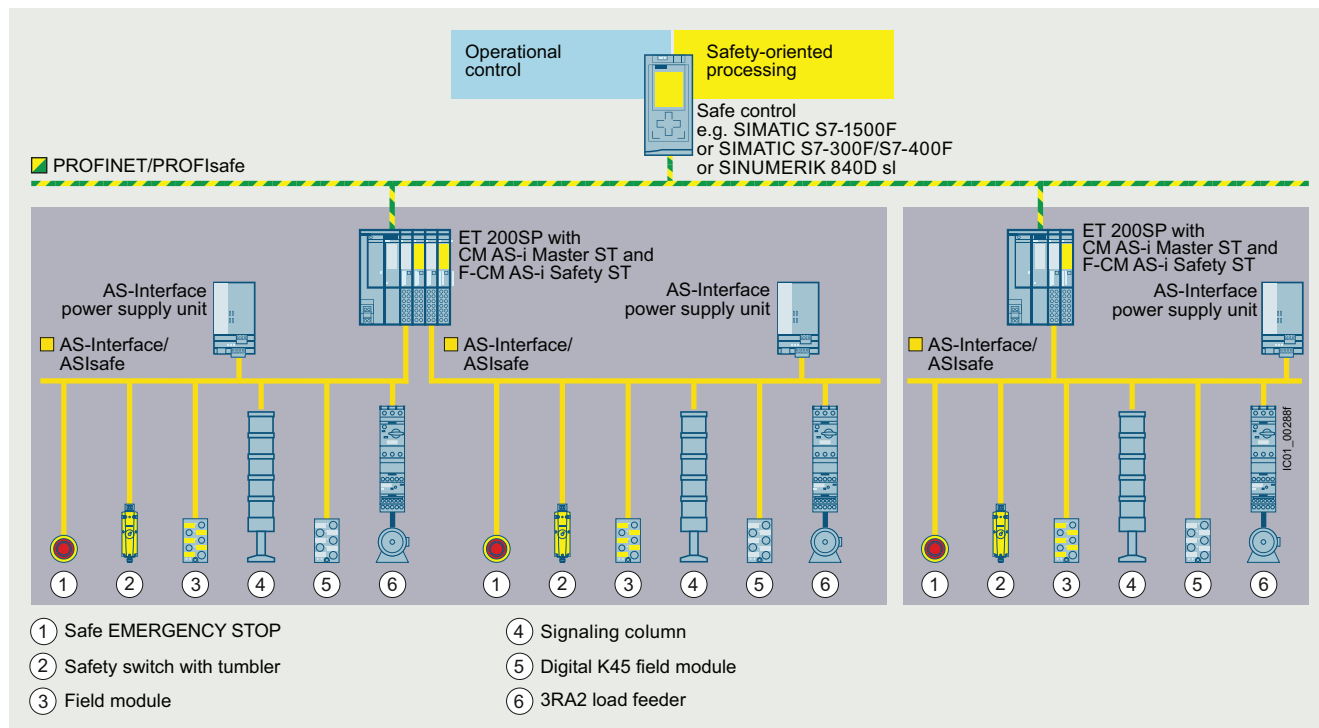
Benefits

- Simple system structure thanks to standardized AS-Interface technology
- Safety-related and standard data on the same bus
- Existing systems can be expanded quickly and easily
- Optimum integration in TIA (Safety Diagnostics) and Safety Integrated
- Inclusion of the safety signals in the plant diagnostics, also on existing HMI Panels
- Approved up to SIL 3 (IEC 62061)/PL e (ISO 13849-1)
- ASIsafe is certified by TÜV (Germany), NRTL (USA) and INRS (France)

Application

Integrated safety technology in the AS-Interface system can be used wherever EMERGENCY-STOP buttons, protective door interlocks, safety switches, light arrays and two-hand operation are installed.

Overview



AS-Interface configuration with AS-i master modules in the ET 200SP

The AS-i communications modules in the ET 200SP facilitate the use of AS-Interface under fail-safe SIMATIC or SINUMERIK controllers.

The allocation of tasks is as follows:

- Detection of safety-related signals via safe input slaves on the AS-Interface bus.
Further signals can be detected through other F-DI modules of the SIMATIC.
- Evaluation and processing of signals via the fail-safe SIMATIC or SINUMERIK control
- Reacting by means of SIMATIC F-DQ modules

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-related gateway between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion with further I/O modules of the ET 200SP.

Using these design methods, it is possible to create expansion versions for virtually any application. Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without Failsafe functionality.

F-CM AS-i Safety ST for SIMATIC ET 200SP, [see page 2/34 onwards](#).

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AS-Interface

ASIsafe

AS-Interface safety modules

Overview



AS-Interface safety modules: K45F (left), K20F (center) and SC17.5F (right)

Safety modules for AS-Interface (ASIsafe modules) are available for field use in degree of protection IP67 (K20F and K45F compact modules) and for the control cabinet (SC17.5F SlimLine Compact modules) in degree of protection IP20.

A very compact module with an optimum price/performance ratio is thus available for every application.

All modules for the connection of (mechanical) switches and safety sensors with contacts feature cross-circuit monitoring of the connected sensor cable.

Function

The safety-related modules with 2 F-DI have two safe inputs. These inputs can be used in a 2 x 1-channel configuration for applications up to SIL 1/PL c or as 1 x 2-channel for applications up to SIL 3/PL e according to IEC 62061 or ISO 13849-1. According to the AS-Interface specification, the two safe inputs are always evaluated in AND-gated pairs, i.e. the two inputs always influence the safety function as a pair and cannot therefore influence the two different actuators independently. A safety-related module takes up one AS-i address (1 ... 31) with standard addressing and no A/B address.

If the module is used in a 2 x 1-channel configuration, the actuator can be activated as soon as the contacts are closed at both inputs. No discrepancy check is made.

If the module is used in a 1 x 2-channel configuration, the actuator can be activated as soon as the contacts are closed at both inputs and no discrepancy has first been detected at the input pair. The response of the discrepancy check can be set via the evaluation unit (e.g. F-CM AS-i Safety module).

The safety-related modules with 4 F-DI have four safe inputs, where each pair of 2 F-DI exert an influence jointly as described above (2 x 2 F-DI). The two input pairs work independently of each other. Each input pair can influence one actuator (i.e. a safety function). The safety-related modules with 4 F-DI take up two AS-i addresses.

Safety-related modules with 2 F-DI/2 DQ contain not only the safety-related inputs but also non-safety-related standard outputs. The standard outputs must not be used for safety-related switching functions.

The safe inputs are designed for connecting (mechanical) switches with contacts. Safety sensors with solid-state outputs (OSSD) cannot be used at the safe inputs.

AS-Interface safety modules

The following modules are available for selection:

K20F compact safety modules for use in the field

Being only 20 mm wide, the K20F module is particularly well suited for applications where modules need to be arranged in the most confined space. The K20F modules are connected to the AS-Interface with a round cable with M12 cable box instead of with the AS-Interface flat cable. This enables extremely compact installation. The flexibility of the round cable means that it can also be used on moving machine parts without any problems. The K20 modules are also ideal for such applications as their non-encapsulated design makes them particularly light in weight.

K45F compact safety modules for use in the field

The platform of the K45F modules covers the connection of ("mechanical") switches/safety sensors with contacts:

- K45F 2 F-DI: two safety-related inputs. These can be used in a 2 x 1-channel configuration for applications up to SIL 1/PL c or as 1 x 2-channel for applications up to SIL 3/PL e according to IEC 62061 or ISO 13849-1.
- K45F 2 F-DI/2 DQ: There are also two standard outputs in addition to the safe inputs. Depending on the selected K45F module, the outputs are powered either from the yellow AS-Interface cable or via the auxiliary voltage U_{aux} from the black 24 V DC cable. Modules with degree of protection IP67 do not have a switch for setting the power supply on the module.
- K45F 4 F-DI: four safety-related inputs. Functionality as for two K45F 2 F-DI modules, but combined with a K45F enclosure. Extremely compact double slave (uses two AS-i addresses)

SC17.5F SlimLine Compact safety modules with a width of just 17.5 mm for use in control cabinets and local control boxes

With a width of only 17.5 mm, SC17.5F SlimLine Compact safety modules are ideal for space-saving use in a control cabinet. The modules have two safety inputs for connecting signals to an ASIsafe network in the control cabinet. In operation up to SIL 1/PL c, the two inputs can be assigned separately (with AND gating of the inputs); if SIL 3/PL e is required, the inputs must be used in a 2-channel configuration.

There are also two module versions which have two standard outputs in addition to the two safety inputs. These outputs are supplied with power either via the yellow AS-Interface cable only or via the 24 V DC auxiliary voltage. The type of supply voltage is set via a slide switch on the rear of the device.

When using several modules, they can be connected simply via the optional device connector. This simplifies the wiring. The yellow AS-i bus cable and the 24 V DC auxiliary voltage U_{aux} then only need to be connected to one module.

Selection and ordering data

For multi-unit packaging
for SC17.5F, see
page 16/7.



3RK1205-0BQ30-0AA3



3RK1205-0BQ00-0AA3



3RK1405-2BE00-2AA2

Version			Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
K20F compact safety module Slave addressing type: Standard address			3RK1205-0BQ30-0AA3		1	1 unit	42C
I/O type	U_{aux} 24 V	Degree of protection					
2 F-DI	--	IP67					
K45F compact safety modules Slave addressing type: Standard address (modules supplied without mounting plate)			3RK1205-0BQ00-0AA3 3RK1205-0CQ00-0AA3 3RK1405-0BQ20-0AA3 3RK1405-1BQ20-0AA3		1	1 unit	42C
I/O type	U_{aux} 24 V	Degree of protection					
2 F-DI	--	IP67					
4 F-DI ¹⁾	--						
2 F-DI/2 DQ	--						
2 F-DI/2 DQ	✓						
SC17.5F SlimLine Compact safety modules Slave addressing type: Standard address			Screw terminals 3RK1205-0BE00-2AA2 Spring-loaded terminals (push-in) 3RK1205-0BG00-2AA2 Screw terminals 3RK1405-2BE00-2AA2 Spring-loaded terminals (push-in) 3RK1405-2BG00-2AA2		1	1 unit	42C
I/O type	Outputs	Degree of protection					
2 F-DI	--	IP20					
2 F-DI	--						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						
2 F-DI/2 DQ	Power supply U_{AS-i}/U_{aux} can be switched over						

✓ Available or possible

-- Not available or not possible

¹⁾ Module occupies two AS-Interface addresses

Standard I/O modules for AS-Interface

- For degree of protection IP67, [see page 2/44 onwards](#)
- For degree of protection IP20, [see page 2/59 onwards](#)

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AS-Interface safety modules

Accessories

More information

For the Equipment Manual for SlimLine Compact modules, see <https://support.industry.siemens.com/cs/ww/en/view/109481489>

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
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Accessories for compact safety modules

 3RK1901-2EA00	 3RK1901-1AA00	K45 mounting plates For mounting K45F - For wall mounting - For DIN-rail mounting	3RK1901-2EA00 3RK1901-2DA00	1 1	1 unit 1 unit	42C 42C
		Input jumpers for K20F and K45F For screwing into M12 input sockets, connects pin 1 to pin 2, for bridging input 2 when used with 1-channel sensor at input 1 - Black version - Red version	3RK1901-1AA00 3RK1901-1AA01	1 1	1 unit 1 unit	42C 42C
 3RK1901-1KA00	 3RK1901-1KA01	AS-Interface sealing caps M12 For free M12 sockets (one set contains 10 sealing caps) - Standard version - Tamper-proof	3RK1901-1KA00 3RK1901-1KA01	100 100	10 units 10 units	42C 42C

Accessories for SlimLine Compact safety modules

 3RK1901-1YA00	 3RK1901-1YA01	Device connectors For the electrical connection of SlimLine Compact modules (connects AS-i bus cable and 24 V DC auxiliary power supply U_{aux} when using several SlimLine Compact modules) • Width 17.5 mm • Width 22.5 mm	3RK1901-1YA00 3RK1901-1YA10	1 1	1 unit 1 unit	42C 42C
		Device termination connectors Required for the last module in the network • Width 17.5 mm • Width 22.5 mm	3RK1901-1YA01 3RK1901-1YA11	1 1	1 unit 1 unit	42C 42C
 3ZY1121-2BA00		Removable terminals, without inscription • Screw terminals up to 2 x 1.5 mm² or 1 x 2.5 mm² - 2-pole - 4-pole • Push-in terminals up to 2 x 1.5 mm² - 2-pole - 4-pole	Screw terminals  3ZY1121-1BA00 3ZY1141-1BA00 Spring-loaded terminals (push-in)  3ZY1121-2BA00 3ZY1141-2BA00 3ZY1450-1BA00	1 1 1 1 1	6 units 6 units 6 units 6 units 5 units	41L 41L 41L 41L 41L
 3ZY1450-1BA00		Hinged covers Replacement for SlimLine Compact module, without terminal labeling, width 17.5 mm, yellow	3ZY1311-0AA00	1	10 units	41L
		Push-in lugs for wall mounting (Two lugs are required per device)	3ZY1440-1AA00	1	12 units	41L
 3RT2900-1SB20		Blank labels Unit labeling plates ¹⁾ • 10 mm x 7 mm, titanium gray • 20 mm x 7 mm, titanium gray	3RT2900-1SB10 3RT2900-1SB20	100 100	816 units 340 units	41B 41B
 3RA2908-1A		Screwdriver For all SIRIUS devices with spring-loaded terminals Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	Spring-loaded terminals (push-in)  3RA2908-1A	1	1 unit	41B

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see page 16/18).

Overview



CM AS-i Master ST for SIMATIC ET 200SP



Video: AS-Interface – Powerful integration in SIMATIC ET 200SP

More information

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/71756485>
 SIMATIC ET 200SP Manual Collection, see <https://support.industry.siemens.com/cs/ww/en/view/84133942>
 Diagnostics blocks with visualization, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>
 AS-Interface block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see page 14/22 onwards
 Released combinations of the AS-i modules for ET 200SP, see <https://support.industry.siemens.com/cs/ww/en/view/103624653>

The CM AS-i Master ST communications module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- Connection of up to 62 AS-Interface slaves
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- User-friendly configuration with graphic or tabular display of the AS-i line in TIA Portal or STEP 7 (Classic) or via GSD in other systems
- Supply via AS-Interface cable
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage
- Extended temperature range from -25 °C (from hardware function status FS20 onwards)
- Integrated ground fault monitoring for the AS-Interface cable
- Through connection to AS-Interface, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM AS-i Master ST).
- Integrated analog value processing

AS-i gateways with ET 200SP

An AS-i gateway or AS-i link enables access to the AS-Interface data via PROFINET, PROFIBUS, EtherNet/IP or Modbus TCP.

With the CM AS-i Master ST module, flexible and powerful solutions or autonomous ET 200SP CPU stations with an AS-i connection are set up. Depending on the requirements, even several AS-i masters can be plugged into one ET 200SP station, so that the setup can easily be extended from a single master to double masters or multiple masters.

The maximum number of modules is determined by the ET 200SP interface module (IM): Up to 32 AS-i masters with PROFINET IM 155-6PN Standard (6ES7155-6AU02-0BN0), up to 43 AS-i masters with IM 155-6PN High Feature, or a single AS-i master with IM 155-6PN Basic. For the connection to PROFIBUS, the IM 155-6DP HF interface module with up to 7 AS-i master modules is used. With the MultiFieldbus interface module IM 155-6MF, the AS-i master modules are connected to PROFINET, EtherNet/IP, and Modbus TCP.

Since in many plants an ET 200SP station is provided with I/O, motor starter or other peripheral modules, the AS-i master modules are simply plugged in without any additional effort. There are countless possible combinations.

An AS-i Safety gateway can also be implemented without any problems by adding the safety-oriented module F-CM AS-i Safety ST in the ET 200SP station. This greatly simplifies the cabling and connection of distributed EMERGENCY-STOP buttons and protective door monitoring systems to a Failsafe CPU. The AS-i Safety application is completely configured in TIA Portal/STEP 7.

The ET 200SP modules CM AS-i Master ST and F-CM AS-i Safety ST (see from page 2/34) can of course also be used directly on an ET 200SP CPU or F-CPU, so that an extremely compact SIMATIC control system with AS-i bus connection can be set up.

For further application possibilities, see the brochure "The modular AS-i Master".

More information, see the [SIMATIC ET 200SP Manual Collection](#).

Design

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The communications module has LED displays for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative module inscription on the front for

- Plain-text marking of the module type and function class
- 2D matrix code (Article No. and serial number)
- Circuit diagram
- Color coding module type communications module: light gray
- Hardware and firmware version
- Supported BaseUnit type BU: C0

Industrial communication

AS-Interface Masters

Masters for SIMATIC ET 200 > CM AS-i Master ST for SIMATIC ET 200SP

Function

The CM AS-i Master ST communications module supports all specified functions of the AS-Interface specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves are accessible via the cyclic process image or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the online function in STEP 7/TIA Portal.

For the implementation of modular machine concepts, the AS-i slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine setups and tool changing with integrated input/output modules during ongoing operation. AS-i input/output modules can be added to the system without deactivating the controller.

An existing AS-i installation can be read into the STEP 7 hardware configuration and adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 bytes (depending on the interface module (IM) used).

Diagnostics information is accessed via automatic alarm indications, via the status information in the process image or via the graphical status display in the online diagnostics of the TIA Portal. The transmission quality of the AS-i network can also be read out. To avoid configuration errors, duplicate addresses can be detected on the AS-i network.

Configuration is possible with SIMATIC CPUs S7-300 up to S7-1500 and with a SINUMERIK 840D sl or other controller.

The online diagnostic status of the AS-i slaves can be displayed directly on the slaves in the network view in TIA Portal.

Notes on security:

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see www.siemens.com/cybersecurity-industry.

Configuration

The following software is required for configuration of the CM AS-i Master ST module:

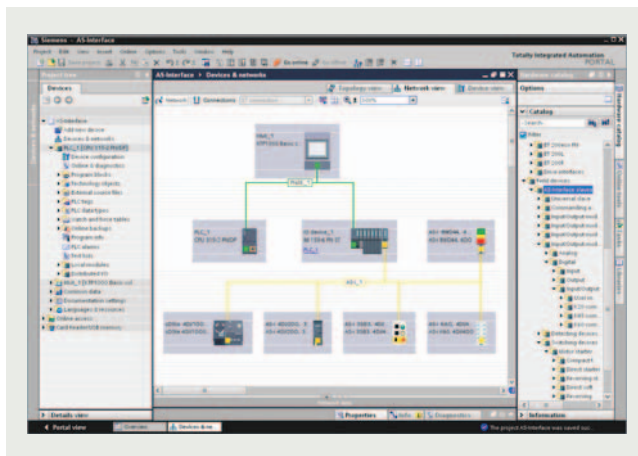
- STEP 7 (TIA Portal) or
- STEP 7 (Classic) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slave modules.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the TARGET configuration at the "touch of a button" via the online function integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.

In the default setting, the CM AS-i Master ST module occupies 32 input/output bytes. To adapt the number and type of AS-i slaves used, the I/O address space can be reduced, or expanded up to 288 bytes.

Together with an ET 200SP CPU 1510SP, 1512SP, 1514SP or 1515SP PC, preprocessing of safe AS-i signals directly in the ET 200SP station and setting up of an independent AS-i station without a higher-level CPU are possible.



Configuration of an AS-Interface network with CM AS-i Master ST via the TIA Portal

Benefits

The CM AS-i Master ST communications module for ET 200SP enables modular, simple and high-performance expansion of AS-interface networks via engineering in the TIA Portal.

Up to 32 CM AS-i Master ST units can be plugged into one ET 200SP station with IM 155-6PN Standard. When using the IM 155-6 PN High Feature, the number of CM AS-i Master ST in the ET 200SP station can be further increased. The maximum configuration depends on the interface module used. Multiple masters as well as single masters can thus be implemented in the ET 200SP depending on the number of modules.

Together with the interface module, a scalable PROFINET/AS-i link or PROFIBUS/AS-i link can be assembled.

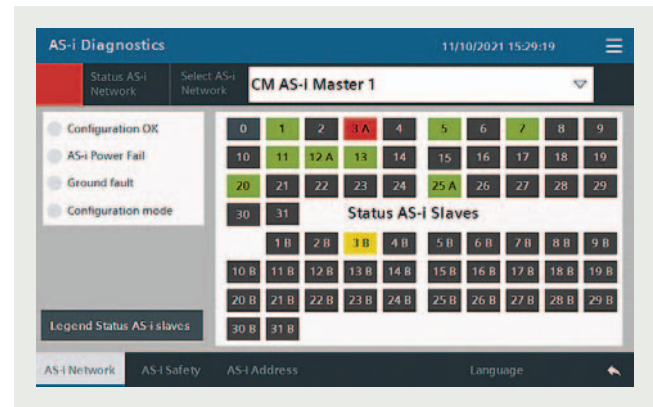
For the connection of an AS-i network to systems with EtherNet/IP and Modbus TCP, the ET 200SP MultiFieldbus interface module IM 155-6MF in combination with the CM AS-i Master ST module is available.

Using TIA Portal/STEP 7, the AS-i network in the SIMATIC controller is consistently configured and programmed with only one configuration tool.

The PRONETA PC program (for ET 200SP with PROFINET interface module) is available for convenient input/output testing during the commissioning of an AS-i network without a CPU; see www.siemens.com/proneta.

The CM AS-i Master ST module can be used in a system with PROFINET system redundancy S2. Furthermore, the CM AS-i Master ST module (from FW version V1.1.11 onwards or from FW version 2.0 onwards) can be used in a system with PROFINET system redundancy R1 with SIMATIC S7-1500R/H CPU.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



CM AS-i Master ST diagnostics block

Industrial communication

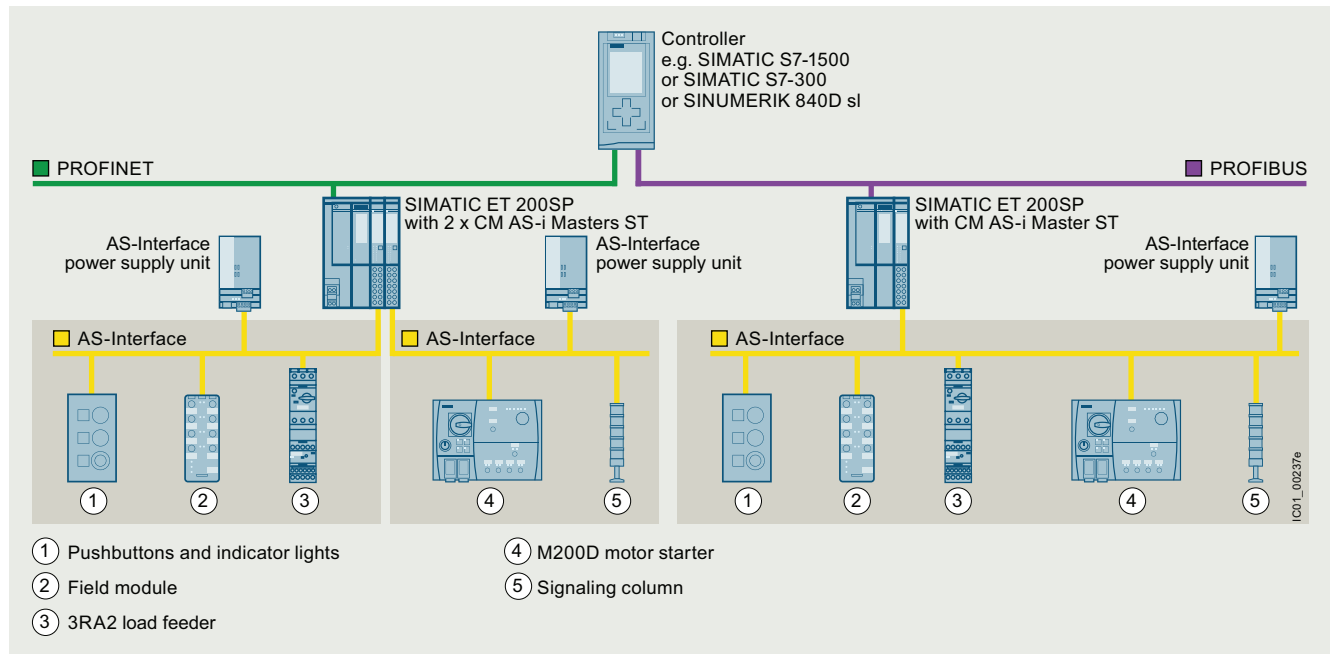
AS-Interface

Masters

Masters for SIMATIC ET 200 > CM AS-i Master ST for SIMATIC ET 200SP

Application

Configuration examples of AS-Interface networks with CM AS-i Master ST for SIMATIC ET 200SP



Configuration of AS-Interface networks under a SIMATIC ET 200SP

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 CM AS-i Master ST communications module - AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0 - Corresponds to AS-Interface specification V3.0 - Dimensions W x H x D (mm): 20 x 73 x 58	3RK7137-6SA00-0BC1		1	1 unit	42C

3RK7137-6SA00-0BC1

Masters for SIMATIC ET 200 > CM AS-i Master ST for SIMATIC ET 200SP

Accessories

Version		Spring-loaded terminals		PU (UNIT, SET, M)	PS*	PG
		Article No.	Price per PU			
	BaseUnit BU20-P6+A2+4D • BaseUnit (light), BU type C0 • Suitable for the CM AS-i Master ST module • For connection of the AS-Interface cable to the CM AS-i Master ST • Start of an AS-i network, isolation of the AS-i voltage from the left-hand module	6ES7193-6BP20-0DC0		1	1 unit	255
6ES7193-6BP20-0DC0						

Version		Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	PROFINET interface module IM 155-6PN Basic Max. 12 I/O modules, max. 32 bytes of I/O data per station • Including server module and 2 x RJ45 ports (supplied without RJ45 plug)	6ES7155-6AR00-0AN0		1	1 unit	255
6ES7155-6AR00-0AN0						
	PROFINET interface modules IM 155-6PN Standard NEW Max. 32 I/O modules, max. 1440 bytes of I/O data per station • Including server module and BusAdapter 2 x RJ45 (supplied without RJ45 plug) • Including server module (BusAdapter must be ordered separately, see below)	6ES7155-6AA02-0BN0		1	1 unit	255
6ES7155-6AA02-0BN0		6ES7155-6AU02-0BN0		1	1 unit	255
	PROFINET interface modules IM 155-6PN High Feature Max. 64 I/O modules, max. 1440 bytes of I/O data per station • IM 155-6PN/2 High Feature 2-port IM with a BusAdapter slot, including server module (BusAdapter must be ordered separately, see below) • IM 155-6PN/3 High Feature 3-port IM with two BusAdapter slots, including server module (BusAdapter must be ordered separately, see below)	6ES7155-6AU01-0CN0		1	1 unit	255
6ES7155-6AU01-0CN0		6ES7155-6AU30-0CN0		1	1 unit	255
	PROFINET interface module IM 155-6PN High Speed Max. 30 I/O modules, max. 968 bytes of I/O data per station • Including server module (BusAdapter must be ordered separately, see below)	6ES7155-6AU00-0DN0		1	1 unit	255
6ES7155-6AU00-0DN0						
	PROFIBUS interface module IM 155-6DP High Feature Max. 32 I/O modules, max. 244 bytes of I/O data per station • Including server module and PROFIBUS plug	6ES7155-6BA01-0CN0		1	1 unit	255
6ES7155-6BA01-0CN0						
	MultiFieldbus interface module IM 155-6MF High Feature NEW For operation on PROFINET, EtherNet/IP or Modbus TCP controllers, one slot for BusAdapter, max. 64 I/O modules, max. 1440 bytes of I/O data per station • Including server module (BusAdapter must be ordered separately, see below) For more information, see https://support.industry.siemens.com/cs/ww/en/view/109779189 .	6ES7155-6MU01-0CN0		1	1 unit	255
6ES7155-6MU01-0CN0						
	BusAdapters for PROFINET/Ethernet/Modbus TCP For connection of the Ethernet cable to the PROFINET IM 155-6PN interface module and the MultiFieldbus IM 155-6MF interface module • Connection 2 x RJ45 (supplied without RJ45 plug) • Connection 2 x FC (FastConnect) For more BusAdapters with fiber-optic cable connection, see SiePortal .	6ES7193-6AR00-0AA0		1	1 unit	255
6ES7193-6AR00-0AA0		6ES7193-6AF00-0AA0		1	1 unit	255
						
6ES7193-6AF00-0AA0						

Industrial communication

AS-Interface
Masters

Masters for SIMATIC ET 200 > F-CM AS-i Safety ST for SIMATIC ET 200SP

Overview



F-CM AS-i Safety ST for SIMATIC ET 200SP

More information

Equipment Manual, see
<https://support.industry.siemens.com/cs/ww/en/view/90265988>
 SIMATIC ET 200SP Manual Collection, see
<https://support.industry.siemens.com/cs/ww/en/view/84133942>
 Diagnostics blocks with visualization, see
<https://support.industry.siemens.com/cs/ww/en/view/109479103>
 Released combinations of the AS-i modules for ET 200SP, see
<https://support.industry.siemens.com/cs/ww/en/view/103624653>

The F-CM AS-i Safety ST fail-safe communications module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communications module for the ET 200SP
 - 31 fail-safe input channels in the process image
 - 16 fail-safe output channels in the process image
 - Certified up to SIL 3 (IEC 62061)/PL e (ISO 13849-1)
 - Parameterization conforms with other Failsafe I/O modules of the ET 200SP
- The communications module supports PROFINET and PROFIBUS configurations. Can be used with fail-safe SIMATIC S7-300F, S7-400F CPUs and S7-1500F CPUs and also the Failsafe versions of the ET 200SP station with ET 200SP F-CPU 1510SP F, 1512SP F, 1514SP F or 1515SP PC F.
- For reading up to 31 fail-safe AS-i input slaves
 - Two sensor inputs/signals for each fail-safe AS-i input slave
 - Adjustable evaluation of sensor signals: 2-channel or 2 x 1-channel
 - Integrated discrepancy evaluation in the case of 2-channel signals
 - Integrated AND operation in the case of 2 x 1-channel signals
 - Input delay configurable
 - Start-up test can be set
 - Sequence monitoring can be activated
- For control of up to 16 fail-safe AS-i output circuit groups
 - The output circuit groups are controlled independently of one another.
 - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously).
 - The F-CM AS-i Safety ST module transmits the switching command of the output circuit group on the AS-i cable.
 - A safe AS-i output module that is installed at any point on the AS-i cable receives the switching command and switches the connected actuator (e.g. contactor).
 - Simple fault acknowledgment via the process image

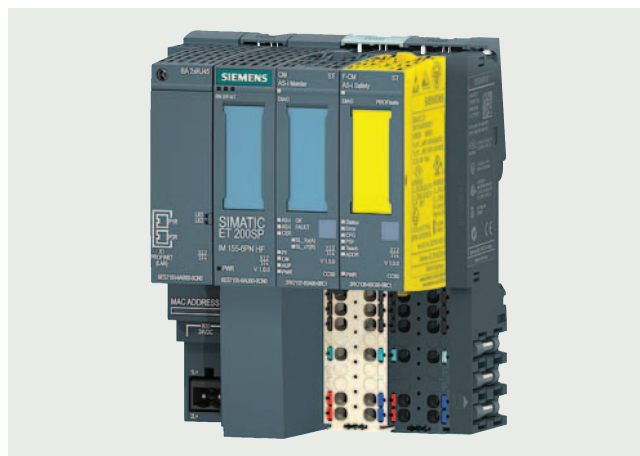
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element
- Comprehensive diagnostics options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Informative automatic alarm indications
- Supply via AS-Interface voltage
- Eight LED displays for diagnostics, operating state, fault indication and supply voltage
- Informative module inscription on the front
 - Plain-text marking of the module type and function class
 - 2D matrix code (Article No. and serial number)
 - Circuit diagram
 - Color coding module type communications module: light gray
 - Hardware and firmware version
 - Supported BaseUnit type BU: C1, C0

Design

The fail-safe F-CM AS-i Safety ST module has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i specification V3.0 and safe AS-i input slaves and/or safe AS-i output modules are needed for operation. The CM AS-i Master ST communications module (Article No. 3RK7137-6SA00-0BC1) is recommended as the AS-i master for the ET 200SP, [see page 2/29 onwards](#).

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-oriented gateway between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion.



Combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

With the digital and analog I/O modules of the ET 200SP, additional local inputs and outputs can be realized so as to ensure that the modular AS-i gateway complies precisely with customer requirements. Expansion versions for almost every application are possible thanks to the selection of standard and Failsafe I/O modules.

Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without fail-safe functionality.

Masters for SIMATIC ET 200 > F-CM AS-i Safety ST for SIMATIC ET 200SP

Supported BaseUnits

With the combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, immediately to the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

Notes on security:

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see www.siemens.com/cybersecurity-industry.

Configuration

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (TIA Portal) and Safety Advanced or
- STEP 7 (Classic) and Distributed Safety or F-Configuration Pack SP11 or SIMATIC S7 F/FH Systems

In other PROFSafe-enabled systems, configuration via GSD is possible. Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

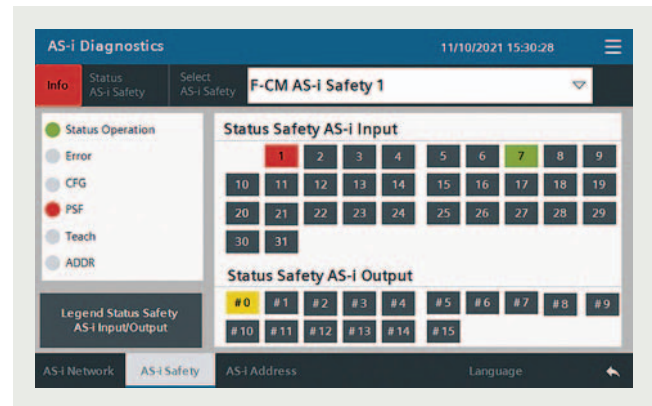
Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

The input and output channels are assigned to the process image automatically and manual linking via configuration blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



Diagnostics block for F-CM AS-i Safety ST

Application

Thanks to the use of the fail-safe module in the ET 200SP, it is possible to fulfill the safety-related application requirements in a manner that is integrated in the overall automation solution.

The safety functions required for fail-safe operation are integrated in the modules. Communication with the fail-safe SIMATIC S7 CPUs is realized via PROFSafe.

The safety application is programmed in the SIMATIC S7 F-CPU with Distributed Safety, S7 F/FH Systems or Safety Advanced. The fail-safe input signals of the ASIsafe input modules are read in via the AS-i bus line and are combined with any chosen further signals in the fail-safe program.

The fail-safe F-CM AS-i Safety ST module can be configured independently of the AS-i master. In this way, the F-CM AS-i Safety ST module can be connected to any AS-i network as required to evaluate the Safety data of the safe AS-i input modules and forward them to the F-CPU. In this case, the fail-safe module is plugged into a light BaseUnit of type C0.

The fail-safe output signals can be output via safe SIMATIC output modules or also directly via fail-safe AS-i output modules. No special functions are required for this in the program.

Operation with SINUMERIK 840D sl is possible with SINUMERIK software version V4.7 SP2 HF1 or higher.

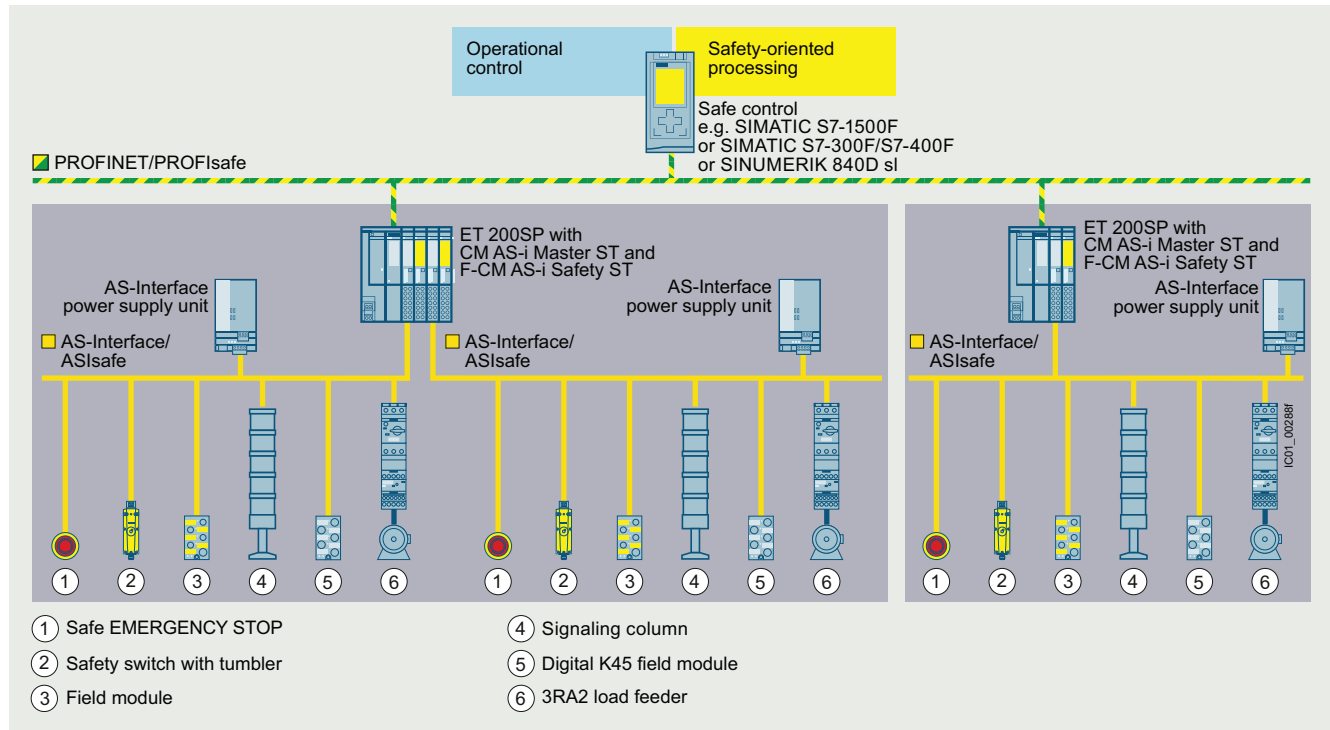
Together with an ET 200SP station with ET 200SP F-CPU 1510SP F, 1512SP F, 1514SP F or 1515SP PC F, pre-processing of safe AS-i signals directly in the ET 200SP station is possible, as well as the configuration of an autonomous AS-i Safety station without a higher-level CPU.

Industrial communication

AS-Interface
Masters

Masters for SIMATIC ET 200 > F-CM AS-i Safety ST for SIMATIC ET 200SP

Configuration examples of AS-Interface networks with CM AS-i Master ST and F-CM AS-i Safety ST for SIMATIC ET 200SP



AS-Interface configuration comprising an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
F-CM AS-i Safety ST communications module - Fail-safe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0) - Operation requires an AS-i master, e.g. CM AS-i Master ST (see page 2/29 onwards) - Can be used up to SIL 3 (IEC 62061)/PL e (ISO 13849-1) - Coding element type H (included in scope of supply) - Dimensions W x H x D (mm): 20 x 73 x 58	3RK7136-6SC00-0BC1		1	1 unit	42C



3RK7136-6SC00-0BC1

Accessories

Version	Spring-loaded terminals	PU (UNIT, SET, M)	PS*	PG
BaseUnit BU20-P6+A2+4B - BaseUnit (dark), BU type C1 - Suitable for the F-CM AS-i Safety ST fail-safe communications module - Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module	6ES7193-6BP20-0BC1	1	1 unit	255
Coding elements type H (spare part) - For the ET 200SP modules F-CM AS-i Safety ST and CM 4xIO-Link - Packing unit 5 items	6ES7193-6EH00-1AA0	1	5 units	256



6ES7193-6BP20-0BC1

More accessories, see page 2/33.

Overview



CM 1243-2 communications module for S7-1200

More information

Equipment Manual for AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module, see <https://support.industry.siemens.com/cs/ww/en/view/57358958>

The CM 1243-2 communications module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- Indication of the operating state on the front of the device displayed via LED
- Display of operating mode, AS-Interface voltage faults, configuration faults and peripheral faults via LED behind the front flap
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage: A standard 24 V power supply unit can be used in combination with the optional DCM 1271 data decoupling module.
- Configuration and diagnostics via the TIA Portal
- Improved performance with current firmware version V1.2

Design

The CM 1243-2 communications module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It has:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in scope of supply) can be removed to facilitate installation.

Function

The CM 1243-2 supports all specified functions of the AS-Interface specification V3.0.

The values of the digital AS-i slaves can be activated via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

If required, master calls can be performed with the data record interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling module (see [Accessories, page 2/38](#)) has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A. For more information on DCM 1271, see [page 2/73](#).

Notes on security:

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see www.siemens.com/cybersecurity-industry.

Configuration

The TIA Portal enables user-friendly configuration and diagnostics of the AS-Interface master and any connected slave modules.

When operated on an S7-1200 CPU with firmware version V4.0 or higher, the firmware version V1.1 (or higher) is required for the CM 1243-2 module.

Benefits

- More flexibility and versatility in the use of SIMATIC S7-1200 as the result of a significant increase in the number of digital and analog inputs/outputs available
- Very easy configuration and diagnostics of the AS-Interface via the TIA Portal
- Simple operation with AS-Interface power supply unit (see [page 2/67](#)) possible without restrictions.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is supplied through an existing 24 V DC PELV power supply unit. For decoupling, the AS-i DCM 1271 data decoupling module is required, see [Accessories and page 2/73](#).
- LEDs for indication of fault statuses for fast diagnostics
- Monitoring of AS-Interface voltage facilitates diagnostics

Industrial communication

AS-Interface

Masters

Masters for SIMATIC S7 > CM 1243-2

Application

The CM 1243-2 is the AS-Interface master connection of the SIMATIC S7-1200. Through connection to AS-Interface, the number of digital inputs and outputs available for the S7-1200 is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM).

The integrated analog value processing also makes the analog values available at the AS-Interface for the S7-1200. Up to 31 analog slaves with a standard address (each with up to four channels) or up to 62 analog slaves with an A/B address (each with up to two channels) are possible per CM.

Operating conditions

- The CM 1243-2 communications module exchanges data with the S7-1200 CPU with a cycle time of 10 ms.
- The AS-i cycle time depends on the AS-i bus capacity and is up to 5 ms in the case of 31 slaves addresses; for more information, see [Equipment Manual for AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module](https://support.industry.siemens.com/cs/ww/en/view/57358958), <https://support.industry.siemens.com/cs/ww/en/view/57358958>.
- For calculation of the maximum switching frequency at inputs/outputs of AS-i slaves, these cycle times and the runtime of the user program must be added up.

Selection and ordering data

Version	Screw terminals	PU (UNIT, SET, M)	PS*	PG
Article No.	Price per PU			
	CM 1243-2 communications module			
	- AS-Interface master for SIMATIC S7-1200 - Corresponds to AS-Interface specification V3.0 - Removable terminals (included in the scope of supply) - Dimensions W x H x D (mm): 30 x 100 x 75			
3RK7243-2AA30-0XB0	3RK7243-2AA30-0XB0	1	1 unit	42C

Note:

The CM 1243-2 communications module is available as a SIPLUS version under article number 6AG1243-2AA30-7XB0 in the extended temperature range (from -25 to +70 °C) and for use in harsh environmental conditions (coated according to environment standard IEC 60721).

For more information, see www.siemens.com/siplus-extreme.

Accessories

Version	Screw terminals	PU (UNIT, SET, M)	PS*	PG
Article No.	Price per PU			
	DCM 1271 data decoupling module			
	- Max. 1 x 4 A - Removable terminals (included in the scope of supply) - Dimensions W x H x D (mm): 30 x 100 x 75			
	Screw terminals (spare part)			
	5-pole, For AS-i master CM 1243-2 and AS-i DCM 1271 data decoupling module	1	1 unit	42C
	3-pole, For AS-i DCM 1271 data decoupling module for connecting the power supply unit	1	1 unit	42C
3RK7271-1AA30-0AA0	3RK7271-1AA30-0AA0			
	3RK1901-3MA00	1	1 unit	42C
	3RK1901-3MB00	1	1 unit	42C

Overview



CP 343-2P/CP 343-2

More information

Manual, see <https://support.industry.siemens.com/cs/ww/en/view/5581657>
 For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/61892138>
 AS-Interface block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see page 14/22 onwards

The CP 343-2P communications processor is the AS-Interface master for the SIMATIC S7-300 and the ET 200M distributed I/O station, with user-friendly parameterizing options.

The CP 343-2 is the basic version of the module.

The CP 343-2P/CP 343-2 has the following characteristics:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission
- Support of all AS-Interface master functions according to the AS-Interface specification V3.0
- Status displays of operating states and indication of the readiness for operation of connected slaves by means of LEDs in the front plate
- Fault indications (including AS-Interface voltage errors, configuration errors) by means of LEDs on the front plate
- Compact enclosure in the design of the SIMATIC S7-300
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V
- Additionally for CP 343-2P: Supports the detailed configuration of the AS-Interface network with STEP 7

Benefits

- Shorter startup times through simple configuration at the press of a button
- Design of flexible machine-related structures using the ET 200M distributed I/O system
- Provides diagnostics of the AS-Interface network
- Well suited also for complex applications thanks to connection options for 62 slaves and integral analog value processing
- Reduction of standstill and servicing times in the event of a fault thanks to the LED displays:
 - Status of the AS-Interface network
 - Slaves connected and their readiness for operation
 - Monitoring of the AS-Interface voltage
- Lower costs for stock keeping and spare parts inventory because the CP can be used for the SIMATIC S7-300 and also for the ET 200M
- Additionally for CP 343-2P: Improved plant documentation and support for service assignments thanks to a description of the AS-Interface configuration in the STEP 7 project
- Simple operation with AS-Interface power supply unit (see page 2/67) possible without restrictions.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is supplied through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see page 2/71.

Design

The CP 343-2P/CP 343-2 is connected like an I/O module to the S7-300. It has:

- Two terminal connections for connecting the AS-Interface cable directly.
- LEDs in the front panel for indicating the operating state and the readiness for operation of all connected and activated slaves
- Pushbuttons for switching over the master operating state and for adopting the existing ACTUAL configuration of the AS-i slave as the TARGET configuration

Function

The CP 343-2P/CP 343-2 supports all specified functions of the AS-Interface specification V3.0.

Each CP 343-2P/CP 343-2 occupies 16 bytes in the I/O address area of the SIMATIC S7-300. The digital I/O data of the standard slaves and A slaves are saved in this area. The digital I/O data of the B slaves and the analog I/O data can be accessed with the S7 system functions for read/write data records.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

For more information, see <https://support.industry.siemens.com/cs/ww/en/view/51678777>.

Notes on security:

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see www.siemens.com/cybersecurity-industry.

Configuration

All connected AS-Interface slaves are configured at the press of a button. No further configuration of the CP is required.

Additionally for CP 343-2P

The CP 343-2P also supports configuring of the AS-Interface network with STEP 7. Specifying the AS-i configuration in HW Config facilitates the setting of slave parameters and documentation of the plant. Uploading the ACTUAL configuration of an already configured AS-Interface network is also supported. The saved configuration cannot be overwritten at the press of a button and is therefore tamper-proof.

Industrial communication

AS-Interface

Masters

Masters for SIMATIC S7 > CP 343-2P/CP 343-2

Application

The CP 343-2P/CP 343-2 is the AS-Interface master connection for SIMATIC S7-300 and ET 200M.

Through connection to AS-Interface it is possible to access max. 248 DI/248 DQ per CP, using 62 A/B slaves with 4 DI/4 DQ each.

With the integrated analog value processing, it is easy to transmit analog signals. Up to 62 analog slaves with an A/B address (each with up to two channels) or up to 31 analog slaves with a standard address (each with up to four channels) are possible per CP.

The CP 343-2P is the further development of the CP 343-2 and contains its entire functionality. An existing STEP 7 user program for a CP 343-2 can thus be used without restrictions with a CP 343-2P. It is only in STEP 7 HW-Config that the two modules are configured differently, with the CP 343-2P offering additional options. This is why the CP 343-2P is recommended.

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 6GK7343-2AH11-0XA0	CP 343-2P communications processor • Device version with expanded configuration options for connection of SIMATIC S7-300 and ET 200M to AS-Interface • Configuration of the AS-i network using the SET key or STEP 7 • Without front connector • Corresponds to AS-Interface specification V3.0 • Dimensions W x H x D (mm): 40 x 125 x 120	6GK7343-2AH11-0XA0	1	1 unit	42C
 6GK7343-2AH01-0XA0	CP 343-2 communications processor • Basic version for connection of SIMATIC S7-300 and ET 200M to AS-Interface • Configuration of the AS-i network using the SET key • Without front connector • Corresponds to AS-Interface specification V3.0 • Dimensions W x H x D (mm): 40 x 125 x 120	6GK7343-2AH01-0XA0	1	1 unit	42C

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Front connectors, 20-pole					
• With screw terminals 	6ES7392-1AJ00-0AA0		1	1 unit	230
• With spring-loaded terminals 	6ES7392-1BJ00-0AA0		1	1 unit	230

Overview



DP/AS-Interface Link 20E

More information

Manual, see
<https://support.industry.siemens.com/cs/ww/en/view/5281638>

PN	DP-M	DP-S	AS-i M		
		●	●		

DP/AS-Interface Link 20E connects PROFIBUS DP to AS-Interface and has the following features:

- PROFIBUS DP slave and AS-Interface master
- Up to 62 AS-Interface slaves, each with four digital inputs and four digital outputs as well as analog slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- Supply from AS-Interface cable; hence no additional power supply required
- Suitable for AS-i Power24V (from product version 2/firmware version 3.1) and for AS-Interface with 30 V voltage
- Supports uploading of the AS-Interface configuration in STEP 7

Gateways

High-performance gateways between PROFINET and AS-Interface and between PROFIBUS and AS-Interface can be set up by combining the CM AS-i Master ST and F-CM AS-i Safety ST modules in an ET 200SP station (for safety-related applications), see pages 2/29 and 2/34.

Design

- Compact plastic enclosure in degree of protection IP20 for DIN-rail mounting
- LEDs in the front panel for indicating the operating state and functional readiness of all connected slaves
- Setting of PROFIBUS DP address is possible by pressing a button
- LED display of the PROFIBUS DP slave address, PROFIBUS DP bus faults and diagnostics
- Two pushbuttons for switching over the operating state and for adopting the existing ACTUAL configuration as the TARGET configuration

Functionality

Communication

The DP/AS-Interface Link 20E enables a DP master to access all the slaves of an AS-Interface network.

The DP/AS-Interface Link 20E occupies a standard 32 bytes of input data and 32 bytes of output data in which the digital I/O data of the connected AS-Interface slaves (standard and A/B addressing) of an AS-i line are stored.

The size of the input/output image can be compressed so that only the actually required I/O address area is occupied in the system of the PROFIBUS DP master.

The analog I/O data can be accessed with the S7 system functions for read/write data records.

Configuration

The DP/AS-Interface Link 20E is configured as follows:

- With STEP 7 (TIA Portal) or STEP 7 (Classic)
When configuring, the AS-Interface configuration can be uploaded to STEP 7. Furthermore, AS-Interface slaves from Siemens can also be conveniently configured in HW Config (slave selection dialog).
- By adopting the ACTUAL configuration of the AS-Interface by using the SET pushbutton on the front panel.
- Alternatively, DP/AS-Interface Link 20E can be integrated by means of the PROFIBUS GSD file in the engineering tool (e.g. for non-Siemens engineering tools).

Benefits

- Reduction of installation costs because the power is supplied entirely via the AS-Interface cable, which means that no additional power supply is required
- Short startup times thanks to easy configuration at the touch of a button
- The LED displays help reduce downtime and service times if a slave fails
- Quick and easy commissioning by reading the AS-Interface configuration
- For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser; see
<https://support.industry.siemens.com/cs/ww/en/view/61892138>.

Industrial communication

AS-Interface

Gateways

DP/AS-Interface Link 20E

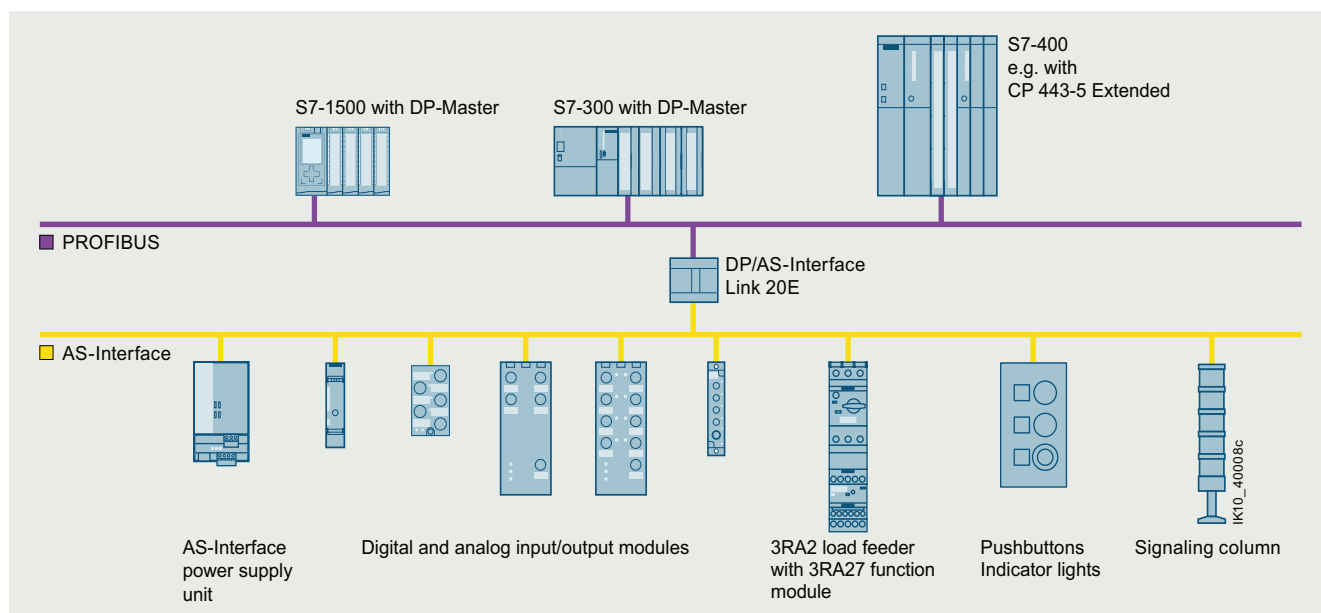
Application

The DP/AS-Interface Link 20E is a PROFIBUS DP slave (according to IEC 61158/IEC 61784) and an AS-Interface master (according to IEC 62026-2). It enables the AS-Interface to be operated on PROFIBUS DP.

Up to 248 DI/248 DQ can be operated via the DP/AS-Interface Link 20E using 62 A/B slaves with 4 DI/4 DQ each.

PROFIBUS DP masters (DP-V0) can exchange digital I/O data cyclically with the AS-Interface.

PROFIBUS DP masters with acyclic services (DP-V1) are additionally able to exchange analog I/O data and initiate AS-Interface master calls (e.g. reading/writing the AS-i configuration during normal operation).



Transition from PROFIBUS DP to AS-Interface using DP/AS-Interface Link 20E

Selection and ordering data

Version	Screw terminals	PU (UNIT, SET, M)	PS*	PG
Article No.	Price per PU			
DP/AS-Interface Link 20E				
 6GK1415-2AA10 Gateway between PROFIBUS DP and AS-Interface in degree of protection IP20; including screw terminals for connection of the AS-Interface cable; corresponds to AS-Interface specification V3.0; dimensions W x H x D (mm): 90 x 80 x 60 (dimensions without fixing lugs)	6GK1415-2AA10		1	1 unit
				42C

6GK1415-2AA10

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
PROFIBUS FC standard cable GP FastConnect standard type with special design for fast installation, 2-core, shielded	6XV1830-0EH10		1	1 M	5K1
PROFIBUS FastConnect bus connectors With insulation displacement connection, max. transfer rate 12 Mbps, activatable terminating resistor integrated					
• RS 485 bus connector with 90° cable outlet					
- Without programming device socket	6ES7972-0BA52-0XA0		1	1 unit	250
- With programming device socket	6ES7972-0BB52-0XA0		1	1 unit	250
• RS 485 bus connector with diagonal cable outlet (35°)					
- Without programming device socket	6ES7972-0BA61-0XA0		1	1 unit	250
- With programming device socket	6ES7972-0BB61-0XA0		1	1 unit	250
PROFIBUS FastConnect stripping tool Preset stripping tool for speedy stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00		1	1 unit	5K2

Industrial communication

AS-Interface
Slaves

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP67 - Introduction

Overview



K60



K45



K20

Three coordinated series of AS-Interface compact modules with digital and analog compact modules and a high degree of protection are available for use in the field:

- Digital modules with a high degree of protection
 - Series K60, [see pages 2/46 and 2/48](#)
 - Series K45, [see page 2/51](#)
 - Series K20, [see page 2/52](#)
- Analog modules with a high degree of protection
 - Series K60, [see page 2/55](#)

All compact modules are characterized by particularly simple handling. The K60 and K45 modules are mounted with a mounting plate. The mounting plate is used to mount the AS-Interface flat cables and enables mounting on a wall or DIN rail.

The particularly narrow K20 modules are directly mounted without a mounting plate and connected to the AS-Interface using a round cable.

Connection types

For flexible connection of different sensors and actuators, the following pin assignments are available on the I/O modules with M12 sockets:

Standard assignment

With the standard assignment, one sensor/actuator is connected per M12 socket. In this case the signal for the outputs is acquired at pin 4 while the signal for the inputs is acquired at pin 4 and pin 2. As the result, sensors can be connected directly to pin 2 and pin 4.

Y-assignment

With the Y-assignment, two sensors or two actuators can be connected to one M12 socket. In this case, both pin 4 and pin 2 are provided for one sensor signal and one actuator signal on each M12 socket.

In this case, the second socket is not required and is closed with a sealing cap.

Y-II assignment

The Y-II assignment offers the following options:

- Individual connection of a sensor/actuator to one M12 socket
- Connection of two sensors/actuators to one M12 socket as follows:
 - The signal of the first sensor/actuator is connected to pin 4 of the first socket.
 - The signal of the second sensor/actuator is connected to pin 2 of the first socket and to pin 4 of the second socket.

Overview of digital compact modules

The following table provides an overview of the important features of the digital compact modules.

Version	K60	K45	K20
8 inputs/2 outputs	✓	--	--
8 inputs	✓	✓	--
4 inputs/4 outputs	✓	✓	✓
4 inputs/3 outputs	✓	--	--
4 inputs/2 outputs	✓	--	--
4 inputs	✓	✓	✓
2 inputs/2 outputs	--	✓	✓
4 outputs	✓	✓	✓
3 outputs	--	✓	--
AS-Interface connection	Flat cable/ round cable	Flat cable	Round cable
I/O connection method	M12	M12/M8	M12/M8
Pin assignment	Standard/Y-II/Y	Standard/Y	Standard/Y
Degree of protection	IP65/IP67/IP68/ IP69 (IP69K)	IP65/IP67	IP65/IP67
Addressing type A/B address	✓	✓	✓

✓ Available

-- Not available

Safety modules for AS-Interface, [see page 2/27](#).

Overview



K60

The K60 digital AS-Interface compact modules are characterized by optimized handling characteristics and user-friendliness. They permit the mounting times and startup times of AS-Interface to be reduced by up to 40%.

Mounting and connection of the AS-Interface shaped cables

Assembly of the K60 modules is performed with a mounting plate which accommodates the AS-Interface shaped cables. Two different mounting plates are offered for

- Wall mounting
- DIN-rail mounting

The mounting plate and the compact module are joined together by means of a screw, with simultaneous contacting of the AS-Interface cable by the service-proven insulation piercing method.

Addressing and connection of the sensors/actuators

Addressing of the K60 modules is performed using an addressing socket integrated in the compact module. The addresses can also be assigned after installation.

K60 modules with a maximum of four digital inputs and outputs

These compact modules contain the M12 standard connections for inputs and outputs. Using M12 standard plugs, a maximum of four sensors and four actuators can be connected to the compact module.

K60 compact modules with a maximum of eight digital inputs

These modules have eight digital inputs for connection through M12 plugs.

The module requires two AS-Interface addresses for processing all eight inputs. The addressing can thus be performed through a double addressing socket integrated in the module.

K60 data couplers

An AS-Interface data coupler has been added to the K60 compact module range. Integrated in this module are two AS-i slaves which are connected to two different AS-i networks. Each of the two integrated slaves has four virtual inputs and four virtual outputs. The bidirectional data transmission of four data bits between two AS-i networks is thus possible in a simple and cost-effective manner. The data coupler needs its own address in each AS-i network. The data coupler is supplied with power directly from the AS-i cable.

Each AS-i network works with a different cycle time depending on the number of stations. Hence two AS-i networks are not necessarily synchronous. For this reason, the AS-i data coupler can be used to transmit only standard data and no safety data.

Industrial communication

AS-Interface

Slaves

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP67 - K60

Selection and ordering data

Version						Article No.	Price per PU	PU (UNIT, SET, M)		PS*	PG
 3RK1400-1DQ00-0AA3	Digital I/O modules, IP67 - K60 • PNP transistor • Width 60 mm • Connection method: M12 • Modules supplied without mounting plate										
	Type	Current-carrying capacity of outputs	Slave addressing type	Pin assignment	Sensor power supply via						
	8 inputs/2 outputs ¹⁾	2 A	A/B	Special	AS-i	3RK2400-1HQ00-0AA3	1	1 unit	42C		
	8 inputs ¹⁾	--	Standard	Y-II	AS-i	3RK1200-0DQ00-0AA3	1	1 unit	42C		
		--	A/B	Y-II	AS-i	3RK2200-0DQ00-0AA3	1	1 unit	42C		
		--	A/B	Y-II	U _{aux}	3RK2200-1DQ00-1AA3	1	1 unit	42C		
	4 inputs/4 outputs	2 A	Standard	Y-II	AS-i	3RK1400-1DQ00-0AA3	1	1 unit	42C		
		2 A	Standard	Standard	AS-i	3RK1400-1CQ00-0AA3	1	1 unit	42C		
		1 A	Standard	Y-II	AS-i	3RK1400-1DQ01-0AA3	1	1 unit	42C		
		1 A	Standard	Standard	AS-i	3RK1400-1DQ03-0AA3	1	1 unit	42C		
		2 A	A/B (spec. V3.0)	Y-II	AS-i	3RK2400-1DQ00-0AA3	1	1 unit	42C		
		2 A	A/B (spec. V3.0)	Y-II	U _{aux}	3RK2400-1DQ00-1AA3	1	1 unit	42C		
	4 inputs/3 outputs	2 A	A/B	Y-II	AS-i	3RK2400-1FQ03-0AA3	1	1 unit	42C		
	4 inputs/2 outputs	2 A	Standard	Y-II	AS-i	3RK1400-1MQ00-0AA3	1	1 unit	42C		
	4 inputs	--	Standard	Y-II	AS-i	3RK1200-0CQ00-0AA3	1	1 unit	42C		
		--	A/B	Y-II	AS-i	3RK2200-0CQ00-0AA3	1	1 unit	42C		
	2 x 2 inputs/2 x 2 outputs	1 A	Standard	Y	AS-i	3RK1400-1DQ02-0AA3	1	1 unit	42C		
	4 outputs	2 A	Standard	Y-II	--	3RK1100-1CQ00-0AA3	1	1 unit	42C		
2 A		A/B (spec. V3.0)	Y-II	--	3RK2100-1CQ00-0AA3	1	1 unit	42C			
Digital I/O module, IP67 - K60 data coupler											
Modules supplied without mounting plate											
Type	Current-carrying capacity of outputs	Slave addressing type	Pin assignment	Sensor power supply via							
Data coupler 4 inputs/4 outputs (virtual)	--	Standard	--	--	3RK1408-8SQ00-0AA3	1	1 unit	42C			

¹⁾ Module occupies two AS-Interface addressesSafety modules for AS-Interface, [see page 2/27 onwards](#).

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RK1901-0CA00 K60 mounting plates Suitable for all K60 compact modules • Wall mounting • DIN-rail mounting	3RK1901-0CA00 3RK1901-0CB01		1 1	1 unit 1 unit	42C 42C
 3RK1901-1KA00 AS-Interface sealing caps M12 For free M12 sockets (one set contains 10 sealing caps)	3RK1901-1KA00		100	10 units	42C
 3RK1902-0AR00 Sealing set • For K60 mounting plate • Cannot be used for K45 mounting plate • One set contains one straight and one shaped seal	3RK1902-0AR00		100	5 units	42D

Overview

Operation in particularly harsh environments



K60R module in degree of protection IP68/IP69 (IP69K)

Modules with degree of protection IP67 cannot be used in areas exposed to permanently high levels of humidity, in applications with drilling emulsions and cutting oils or when cleaning with high-pressure cleaners. The answer for these applications is provided by the expansion of the K60 compact modules with the K60R module with degree of protection IP68/IP69 (IP69K).

The K60R modules are connected instead of the AS-Interface flat cable using a round cable with M12 cable box. The AS-Interface bus cable and the 24 V DC auxiliary power supply are routed in this case in a shared round cable.

Degree of protection IP68 permits many new applications that were impossible with the former field modules with degree of protection IP67. In applications such as filling plants or machine tools, the K60R with degree of protection IP68 enables the module to be used directly in zones exposed to permanent loading by humidity. It is thus possible to make even more rigorous savings in wiring with AS-Interface. For more information on IP68 test conditions, [see IP68/IP69 \(IP69K\) tests, page 2/48](#).

Cleaning with high-pressure cleaners, such as is regularly required in the food and beverages industry for instance, is possible without difficulty (IP69).

In applications with cable carriers, many users rely on placing the AS-Interface bus cable in a round cable. With the K60R module, a round cable connection enables direct connection to a round cable. No adapter is required.

Mounting

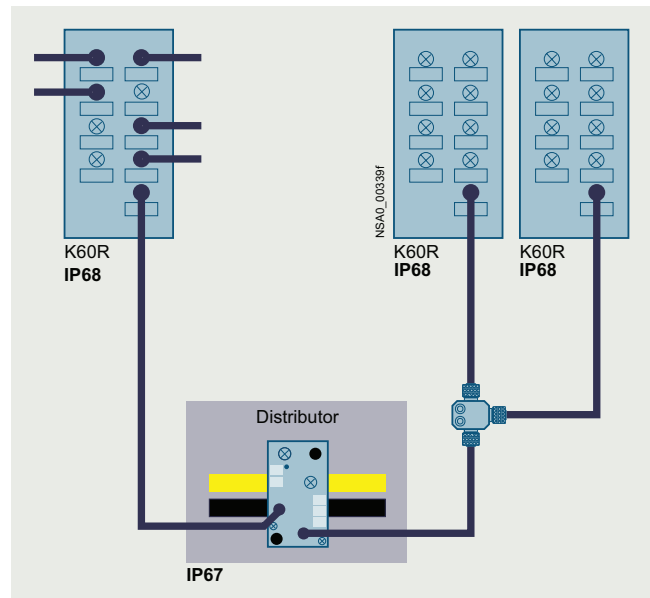
The same mounting plates are used as for the K60 modules. Instead of using flat cables, the K60R is connected using a 4-pole round cable with an M12 connection. With the K60R the mounting plate thus serves only as a fixture and ground terminal.

Addressing

Addressing is performed using the same socket as for the bus connection. Connecting the module to the addressing unit takes place over a 3-pole standard M12 cable.

When the mounting is finished, the module is connected with the addressing cable to the addressing unit and addressed. The addressing cable is then removed and the module connected to the bus cable.

Connection



K60R connection options

In the IP67 environment, the service-proven standard components are connected using flat cables. Spur lines are laid into the IP68 environment by means of an AS-Interface M12 feeder (3RK1901-2NR..). The module is connected with a round cable to an M12 cable box. For this purpose, the module has an M12 bus connection instead of the former addressing socket. The AS-Interface bus cable and the 24 V DC auxiliary voltage are routed together in a 4-pole round cable. There must be no ground conductor in this round cable. Connection to ground is made through the mounting plate.

In the IP68 environment, only cables with extruded M12 plugs may be used.

Please note the following conditions:

- The configuration guidelines for AS-Interface apply. For all M12 connecting cables, the maximum permissible current is limited to 4 A. The cross-section of these cables is just 0.34 mm². For connection of the K60R modules, the aforementioned M12 connecting cables can be used for the spur lines. The voltage drop caused by the ohmic resistance (approx. 0.11 Ω/m) must be taken into account.
- For round cable connections with shared AS-i and U_{aux} in a single cable, the following maximum lengths apply:
 - Per spur line from feeder to module: max. 5 m
 - Total of all round cable segments in an AS-Interface network: max. 20 m

Industrial communication

AS-Interface

Slaves

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP68/IP69 - K60R

IP68/IP69 (IP69K) tests

K60R modules were tested with the following tests:

- Stricter test than IP67: 90 min at 1.8 m depth of water (IP67: 30 min at 1 m depth of water)
- Salt water test: Five months in salt water, 20 cm deep, at room temperature
- Test with particularly creepable oil: Five months completely under oil at room temperature
- Test with drilling emulsion: Five months at room temperature (components of the drilling emulsion: Anionic and non-ionic emulsifiers, paraffinic low-aromatic mineral oil, boric acid alkanolamines, corrosion inhibitors, oil content 40%)
- Test in oil bath (Excellence 416 oil) with alternating oil bath temperature: 130 cycles of 15 to 55 °C, two months
- Cleaning with a high-pressure cleaner according to IP69 (IP69K): 80 to 100 bar, 10 to 15 cm distance, time per side > 30 s, water temperature 80 °C

To simulate requirements as realistically as possible, the modules were artificially aged prior to the tests by 15 temperature cycles of -25/+85 °C. During the test, the modules were connected to 3RX1 connecting cables. Unassigned connections were closed with 3RK1901-1KA00 sealing caps.

Note:

Sealing caps and M12 connections must be tightened with the correct torque.

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 Digital I/O modules, IP68/IP69 - K60R • 4 inputs/4 outputs • Width 60 mm • IP68/IP69 (IP69K) • Standard assignment • Current-carrying capacity - 200 mA (inputs) - 2 A (outputs) • Slave addressing type: Standard address • Modules supplied without mounting plate 3RK1400-1CR00-0AA3	3RK1400-1CR00-0AA3		1	1 unit	42C

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP68/IP69 - K60R

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG																
 3RK1901-0CA00	K60 mounting plates Suitable for all K60 and K60R compact modules • Wall mounting • DIN-rail mounting	3RK1901-0CA00 3RK1901-0CB01	1 1	1 unit 1 unit	42C 42C																
 3RK1901-1KA00	AS-Interface sealing caps M12 For free M12 sockets (one set contains 10 sealing caps)	3RK1901-1KA00	100	10 units	42C																
 3RK1901-2NR21	AS-Interface M12 feeders • Current-carrying capacity up to 4 A • Degree of protection IP67/IP68/IP69 (IP69K) <table><tr><th>For flat cable</th><th>For</th><th>Cable length</th><th>Cable end in feeder</th></tr><tr><td>AS-i/U_{aux}</td><td>M12 socket</td><td>--</td><td>Not available</td></tr><tr><td>AS-i/U_{aux}</td><td>M12 cable box</td><td>1 m</td><td>Not available</td></tr><tr><td>AS-i/U_{aux}</td><td>M12 cable box</td><td>2 m</td><td>Not available</td></tr></table>	For flat cable	For	Cable length	Cable end in feeder	AS-i/U _{aux}	M12 socket	--	Not available	AS-i/U _{aux}	M12 cable box	1 m	Not available	AS-i/U _{aux}	M12 cable box	2 m	Not available	3RK1901-2NR20 3RK1901-2NR21 3RK1901-2NR22	1 1 1	1 unit 1 unit 1 unit	42C 42C 42C
For flat cable	For	Cable length	Cable end in feeder																		
AS-i/U _{aux}	M12 socket	--	Not available																		
AS-i/U _{aux}	M12 cable box	1 m	Not available																		
AS-i/U _{aux}	M12 cable box	2 m	Not available																		
 3RK1901-1NR04	AS-Interface M12 feeder, 4-fold • Current-carrying capacity up to 4 A • Degree of protection IP67 <table><tr><th>For flat cable</th><th>For</th><th>Cable length</th><th>Cable end in feeder</th></tr><tr><td>AS-i/U_{aux}</td><td>4-fold M12 socket, delivery includes mounting plate (for wall and DIN-rail mounting)</td><td>--</td><td>Not available</td></tr></table>	For flat cable	For	Cable length	Cable end in feeder	AS-i/U _{aux}	4-fold M12 socket, delivery includes mounting plate (for wall and DIN-rail mounting)	--	Not available	3RK1901-1NR04	1	1 unit	42C								
For flat cable	For	Cable length	Cable end in feeder																		
AS-i/U _{aux}	4-fold M12 socket, delivery includes mounting plate (for wall and DIN-rail mounting)	--	Not available																		
 3RK1902-4PB15-3AA0	M12 connecting cable • 3-pole • For addressing AS-i slaves with M12 bus connection • Cable length 1.5 m	3RK1902-4PB15-3AA0	1	1 unit	42D																

Industrial communication

AS-Interface

Slaves

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP67 - K45

Overview



Compact modules K45

The K45 series of compact modules supplements the large K60 compact modules which have a proven track record in industry. They are the logical consequence for rounding off the bottom end of the existing product range.

The acclaimed advantages of the existing K60 compact modules are fully emulated by the K45 modules. The K45 modules have a substantially smaller basic area and installation depth, however.

Yet in spite of these small dimensions all the modules have large labels and an integrated addressing socket.

Two mounting plates are offered for the K45 compact modules:

- Mounting plate for wall mounting
This has a hole pattern that is identical to that of the K60 compact modules. This means that K60 compact modules can be mounted together with K45 modules in an aligned arrangement. The shaped cables can be inserted in the recesses of the mounting plates where they cause no hindrance.
- Mounting plate for DIN-rail mounting

Connection of the AS-Interface shaped cables

The mounting plate and the compact module are joined together by means of a screw, with simultaneous contacting of the AS-Interface cable by the service-proven insulation piercing method.

Now, mounting the AS-Interface shaped cables is in fact easier than ever. The yellow and black AS-Interface shaped cable can be inserted into the mounting plates from the left or right regardless of the position of the coding lug. The correct polarity of the applied voltages is thus guaranteed.

Addressing and connection of the sensors/actuators

Addressing of the K45 compact modules is performed using an addressing socket integrated in the module. The addresses can be assigned even when mounted.

K45 modules with a maximum of four digital inputs and outputs

These compact modules contain up to four M12 standard connections or M8 standard connections for inputs and outputs. Using M12 or M8 standard plugs, a maximum of four sensors and four actuators can be connected to the compact module. Depending on the module, the sockets can be assigned in duplicate.

Pin assignment: Y – i.e. via a socket, two sensors or one sensor/one actuator are connected.

K45 modules with a maximum of eight digital inputs

These modules have eight digital inputs for connection through M12 plugs. The sockets have duplicate assignments.

Pin assignment: Y – i.e. via a socket, two sensors or one sensor/one actuator are connected.

The module requires two AS-Interface addresses for processing all eight inputs. The addresses can be assigned through a double addressing socket integrated in the module.

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP67 - K45

Selection and ordering data



3RK1400-0GQ20-0AA3

Digital I/O modules, IP67 - K45

- PNP transistor
- Width 45 mm
- Current-carrying capacity of the inputs: 200 mA
- Modules supplied without mounting plate

Type	Current-carrying capacity of outputs	Slave addressing type	Pin assignment	U_{aux} 24 V	Connection methods	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
8 inputs ¹⁾	--	A/B	Y	--	M12	3RK2200-0DQ20-0AA3		1	1 unit	42C
4 inputs	--	Standard	Standard	--	M12	3RK1200-0CQ20-0AA3		1	1 unit	42C
	--	Standard	Standard	--	M8	3RK1200-OCT20-0AA3		1	1 unit	42C
	--	A/B	Standard	--	M12	3RK2200-0CQ20-0AA3		1	1 unit	42C
	--	A/B	Standard	--	M8	3RK2200-OCT20-0AA3		1	1 unit	42C
2 x 2 inputs	--	A/B	Y	--	M12	3RK2200-0CQ22-0AA3		1	1 unit	42C
2 inputs/ 2 outputs	2 A ²⁾	Standard	Standard	✓	M12	3RK1400-1BQ20-0AA3		1	1 unit	42C
2 x (1 input/ 1 output)	0.2 A	Standard	Y	--	M12	3RK1400-0GQ20-0AA3		1	1 unit	42C
4 x (1 input/ 1 output)	0.2 A	A/B (spec. V3.0)	Y	--	M12	3RK2400-0GQ20-0AA3		1	1 unit	42C
	0.5 A	A/B (spec. V3.0)	Y	✓	M12	3RK2400-1GQ20-1AA3		1	1 unit	42C
4 outputs	1 A	A/B (spec. V3.0)	Standard	✓	M12	3RK2100-1CQ20-0AA3		1	1 unit	42C
3 outputs	1 A	A/B	Standard	✓	M12	3RK2100-1EQ20-0AA3		1	1 unit	42C
4 outputs	1 A	Standard	Standard	✓	M12	3RK1100-1CQ20-0AA3		1	1 unit	42C
2 outputs/ 2 inputs	2 A	A/B	Standard	✓	M12	3RK2400-1BQ20-0AA3		1	1 unit	42C

✓ Available

-- Not available

¹⁾ Module occupies two AS-Interface addresses²⁾ The typical current-carrying capacity per output increases with version "E12" from 1.5 to 2 A (available since approx. 07/2003).

Safety modules for AS-Interface, see page 2/27 onwards.

Accessories



3RK1901-2EA00

K45 mounting plates

- For wall mounting
- For DIN-rail mounting

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	3RK1901-2EA00		1	1 unit	42C
	3RK1901-2DA00		1	1 unit	42C



3RK1901-1MN00

Cable end terminators

For sealing open cable ends of the AS-Interface shaped cable with IP67

	3RK1901-1MN00		1	10 units	42C
--	---------------	--	---	----------	-----



3RK1901-1KA00

AS-Interface sealing caps

(one set contains 10 sealing caps)

- For free M12 sockets
- For free M8 sockets

	3RK1901-1KA00		100	10 units	42C
	3RK1901-1PN00		100	10 units	42C



3RK1901-1PN00

Industrial communication

AS-Interface

Slaves

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP67 - K20

Overview



Digital I/O modules, IP67 - K20

The K20 compact module series rounds off the AS-Interface compact modules with a particularly slim design and only 20-mm width. Thanks to its extremely compact dimensions, these modules are particularly suited for handling machine applications in the field of production engineering where modules need to be arranged in the smallest of spaces.

Robotics is yet another application area. The K20 modules are connected to the AS-Interface with a round cable with M12 cable box instead of with the AS-Interface flat cable. The AS-Interface bus cable and the 24 V DC auxiliary power are routed in this case in a shared round cable. This enables extremely compact installation.

The flexibility of the round cable means that it can also be used on moving machine parts without any problems. The K20 modules are also ideal for such applications as their non-encapsulated design makes them particularly light in weight.

In applications with cable carriers, many users rely on placing the AS-Interface bus cable in a round cable. In this case, the K20 modules support direct connection to the round cable. No flat to round cable adapter is required.

The K20 compact module range includes standard AS-Interface modules, as well as an ASIsafe version for the connection of safety-related sensors, such as EMERGENCY-STOP buttons or protective door monitoring.

For particularly space-saving dimensions, the sensors and actuators are connected over M8 plug-in connectors. Alternatively, M12 connectors with Y-assignment can be used.

Selection and ordering data

Version					Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Digital I/O modules, IP67 - K20									
Width 20 mm									
Type	Current-carrying capacity of outputs	Slave addressing type	Pin assignment	Connection methods					
4 inputs	--	A/B	Standard	M8	3RK2200-OCT30-0AA3		1	1 unit	42C
	--	A/B	Y	M12	3RK2200-OCQ30-0AA3		1	1 unit	42C
2 inputs/ 2 outputs	1	A/B	Standard	M8	3RK2400-1BT30-0AA3		1	1 unit	42C
	1	A/B	Y	M12	3RK2400-1BQ30-0AA3		1	1 unit	42C
4 outputs	1	A/B (spec. V3.0)	Standard	M8	3RK2100-1CT30-0AA3		1	1 unit	42C
4 inputs/ 4 outputs	1	Standard	Standard	M8	3RK1400-1CT30-0AA3		1	1 unit	42C
	1	A/B (spec. V3.0)	Standard	M8	3RK2400-1CT30-0AA3		1	1 unit	42C
2 safe inputs	--	Standard	Special ASIsafe assignment	M12	3RK1205-0BQ30-0AA3		1	1 unit	42C



3RK2200-OCT30-0AA3

Safety modules for AS-Interface, see page 2/27 onwards.

I/O modules for use in the field, high degree of protection > Digital I/O modules, IP67 - K20

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 AS-Interface sealing caps (one set contains 10 sealing caps) - For free M12 sockets - For free M8 sockets					
3RK1901-1KA00	3RK1901-1KA00		100	10 units	42C
 AS-Interface compact distributor, for AS-Interface flat cable AS-i or U_{aux} - Current-carrying capacity up to 8 A - Degree of protection IP67/IP68/IP69 (IP69K)	3RK1901-1PN00		100	10 units	42C
3RK1901-2NN10					
For flat cable For Cable length Cable end in feeder AS-i or U_{aux} Flat cable AS-i or U_{aux} -- Not available	3RK1901-2NN10		1	1 unit	42C
 AS-Interface M12 feeder - Current-carrying capacity up to 2 A - Degree of protection IP67					
3RX9801-0AA00					
For flat cable For Cable length Cable end in feeder AS-i M12 socket -- Available	3RX9801-0AA00		1	1 unit	42C
 AS-Interface M12 feeders - Current-carrying capacity up to 4 A - Degree of protection IP67/IP68/IP69 (IP69K)					
3RK1901-2NR10					
For flat cable For Cable length Cable end in feeder AS-i M12 socket -- Not available	3RK1901-2NR10		1	1 unit	42C
For flat cable For Cable length Cable end in feeder AS-i M12 cable box 1 m Not available	3RK1901-2NR11		1	1 unit	42C
For flat cable For Cable length Cable end in feeder AS-i M12 cable box 2 m Not available	3RK1901-2NR12		1	1 unit	42C
For flat cable For Cable length Cable end in feeder AS-i/U_{aux} M12 socket -- Not available	3RK1901-2NR20		1	1 unit	42C
For flat cable For Cable length Cable end in feeder AS-i/U_{aux} M12 cable box 1 m Not available	3RK1901-2NR21		1	1 unit	42C
For flat cable For Cable length Cable end in feeder AS-i/U_{aux} M12 cable box 2 m Not available	3RK1901-2NR22		1	1 unit	42C
3RK1901-2NR21					
 AS-Interface M12 feeder, 4-fold - Current-carrying capacity up to 4 A - Degree of protection IP67					
3RK1901-1NR04					
For flat cable For Cable length Cable end in feeder AS-i/U_{aux} 4-fold M12 socket, delivery includes mounting plate (for wall and DIN-rail mounting) -- Not available	3RK1901-1NR04		1	1 unit	42C
 M12 Y-shaped coupler plug For connection of two sensors to one M12 socket with Y-assignment					
6ES7194-1KA01-0XA0	6ES7194-1KA01-0XA0		1	1 unit	250
 M12 connecting cable 3-pole - For addressing AS-i slaves with M12 bus connection - Cable length 1.5 m					
3RK1902-4PB15-3AA0	3RK1902-4PB15-3AA0		1	1 unit	42D

Industrial communication

AS-Interface

Slaves

I/O modules for use in the field, high degree of protection > Analog I/O modules, IP67 - K60

Overview



K60 analog compact module

More information

Manual for AS-Interface analog modules, see
<https://support.industry.siemens.com/cs/ww/en/view/7643815>

AS-Interface analog modules from the K60 compact series detect or issue analog signals locally. These modules are linked to the higher-level controller through an AS-Interface master according to specification V2.1 or specification V3.0.

The analog modules are divided into the following groups:

- Input modules for
 - Current sensor
 - Voltage sensor
 - Thermal resistance sensors
- Output modules for
 - Current actuators
 - Voltage actuators

The input modules according to profile 7.3/7.4 are available with two or four input channels. It is possible in addition to convert the 2-channel module to using only one input channel, thus enabling very short times before the analog value is available. The conversion is effected by means of a jumper plug at socket 3. The transmission times achieved with analog modules according to profile 7.A.9 are twice as fast as those achieved with profile 7.3/7.4. Operation is adjustable in this case, e.g. it is possible to choose with the ID1 code whether the module is operated with 1 or 2 channels.

The output modules are configured as 2-channel modules as standard.

The input and output channels are electrically separated from the AS-Interface network. If sensors with a higher power requirement are to be connected, more power can be supplied through the auxiliary voltage as an alternative to the internal supply.

In the manual (see [More information](#)), the modules are presented in great detail along with their technical specifications and in-depth notes on operation. Sample function blocks round off the manual.

Benefits

- Analog modules are just as easy to integrate in AS-Interface as digital modules
- Analog values can be easily detected and issued locally
- Preprocessing of the analog value transfer in the master enables rapid evaluation of the analog values
- Up to four values can be detected using one analog module
- Faster transmission and conversion of analog values thanks to the new option for switching to single-channel operation

In addition, specification V3.0 now also offers:

- A/B technology, now also with analog modules
- On average, double fast transmission times (only 3 or 4 cycles, depending on the resolution selected)
- Variable adjustable mode: 12-bit or 14-bit resolution, 1-channel or 2-channel, selectable via the ID1 code

I/O modules for use in the field, high degree of protection > Analog I/O modules, IP67 - K60

Selection and ordering data

Version			Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Analog I/O modules, IP67 - K60, analog profile 7.3 • Slave addressing type: Standard address • Width 60 mm • Modules supplied without mounting plate							
Inputs	Type	Measuring range					
1 or 2 inputs (selectable using jumper plug at socket 3)	Current	4 ... 20 mA or ± 20 mA (selectable)	3RK1207-1BQ40-0AA3		1	1 unit	42C
	Voltage	± 10 V or 1 ... 5 V (selectable)	3RK1207-2BQ40-0AA3		1	1 unit	42C
	Thermal resistance	Pt100 or Ni100 or 0 ... 600 Ω (selectable)	3RK1207-3BQ40-0AA3		1	1 unit	42C
4 inputs	Current	4 ... 20 mA or ± 20 mA (selectable)	3RK1207-1BQ44-0AA3		1	1 unit	42C
	Voltage	± 10 V or 1 ... 5 V (selectable)	3RK1207-2BQ44-0AA3		1	1 unit	42C
	Thermal resistance	Pt100 or Ni100 or 0 ... 600 Ω (selectable)	3RK1207-3BQ44-0AA3		1	1 unit	42C
Outputs	Type	Output range					
2 outputs	Current for two-wire actuators	4 ... 20 mA or ± 20 mA or 0 ... 20 mA (selectable)	3RK1107-1BQ40-0AA3		1	1 unit	42C
	Voltage for two-wire actuators	± 10 V or 0 ... 10 V or 1 ... 5 V (selectable)	3RK1107-2BQ40-0AA3		1	1 unit	42C
Analog I/O modules, IP67 - K60, analog profile 7.A.9 • Slave addressing type: A/B (spec. V3.0) • Width 60 mm • Modules supplied without mounting plate							
Inputs	Type	Measuring range					
1 or 2 inputs (variably adjustable)	Current	4 ... 20 mA or ± 20 mA (selectable)	3RK2207-1BQ50-0AA3		1	1 unit	42C
	Voltage	± 10 V or 1 ... 5 V (selectable)	3RK2207-2BQ50-0AA3		1	1 unit	42C

Industrial communication

AS-Interface

Slaves

I/O modules for use in the field, high degree of protection > Analog I/O modules, IP67 - K60

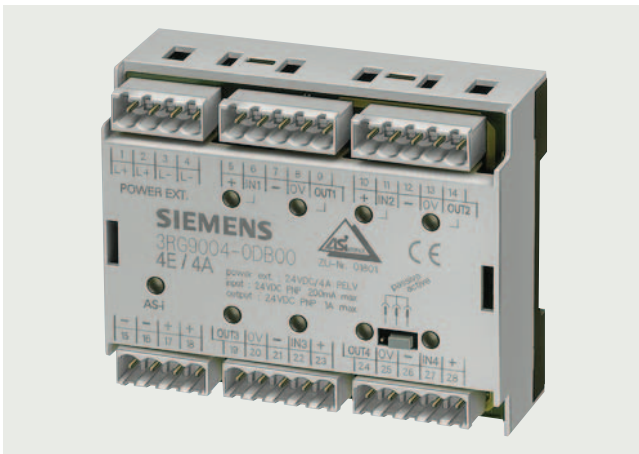
Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RK1901-0CA00	K60 mounting plates Suitable for all K60 compact modules • Wall mounting • DIN-rail mounting		1	1 unit	42C
	3RK1901-0CA00 3RK1901-0CB01		1	1 unit	42C
 3RK1901-1KA00	M12 sealing caps For free M12 sockets (one set contains 10 sealing caps)		100	10 units	42C
 3RK1902-0AR00	Sealing set • For K60 mounting plate • Cannot be used for K45 mounting plate • One set contains one straight and one shaped seal		100	5 units	42D
 3RK1901-1AA00	Input jumper For deactivating analog input 2 on 2-channel analog input modules 3RK1207-.BQ40-0AA3, for screwing into M12 socket 3, connects pin 1 to pin 2, color black		1	1 unit	42C

Overview



SlimLine Compact modules SC17.5F, SC17.5 and SC22.5



F90 module



Flat module

For AS-Interface applications inside control cabinets, there are various module series for the most diverse requirements:

- SlimLine Compact – particularly slim design ideal for space-saving use in the control cabinet
- F90 module – particularly flat design for flat control boxes
- Flat module – special design for integration into customer-specific solutions

The existing SlimLine series of modules S22.5 and S45 are being replaced by the innovative new devices in the SlimLine Compact SC17.5, SC17.5F and SC22.5 series. The previous SlimLine modules are still available as replacements for existing systems.

Available versions

The following table provides an overview of the key features of the different series of control cabinet modules.

Feature	SlimLine Compact	F90 module	Flat module
Digital I/O	✓	✓	✓
Analog I/O	✓	--	--
Safe inputs	✓	--	--
Relay outputs	✓	--	--
Addressing type A/B address	✓	--	--
Mounting on TH 35 DIN rail according to IEC 60715	✓	✓	--
Wall mounting using push-in lugs	✓	--	--
Integrated lugs for screw fixing	--	--	✓
Width in mm	17.5 or 22.5	90	80

✓ Available

-- Not available

Industrial communication

AS-Interface

Slaves

I/O modules for use in the control cabinet > SlimLine Compact

Overview

SlimLine Compact modules



SC17.5 and SC22.5 SlimLine Compact modules with screw terminals

The AS-Interface module series for the control cabinet SlimLine Compact with degree of protection IP20 creates space in the cabinet and in distributed local control boxes. A width of just 17.5 mm or 22.5 mm ensures considerable space savings in the control cabinet.

The SlimLine Compact module series comprises not only digital and analog I/O modules but also ASIsafe modules with safe inputs. Digital outputs are available as solid-state and relay outputs.

Sensors and actuators, as well as the AS-Interface bus cable, are connected by means of removable screw or push-in spring-loaded terminals. Device connectors available as accessories offer the possibility of looping through the AS-Interface bus cable and the 24 V DC power supply U_{aux} from one module to additional modules. This significantly simplifies the wiring, as the AS-Interface bus cable and U_{aux} only have to be connected to one device.



SC22.5 SlimLine Compact module with connector with screw terminals

All devices for the connection of three-wire sensors offer the option of supplying the sensors either from the AS-Interface bus cable or alternatively from the 24 V DC voltage supply U_{aux} depending on the requirements of the particular application. A slide switch is used to make the selection. If supply via U_{aux} is selected, the wiring of the sensor terminals remains unchanged. This means that no external supply is required for the sensors.

All modules have LEDs on the front that provide diagnostics information and indicate the status of the module inputs and outputs. Devices with semiconductor outputs indicate the status of each output by means of a dual LED. Thus the status (on/off/overload) is displayed for each output. An addressing socket integrated on the front enables the module to be addressed also when it is installed. Integrated adapters permit mounting on a DIN rail – either directly for the module or for the device connector. Alternatively, the modules can also be screw-mounted using push-in lugs (accessories). These lugs for screw fastening must be ordered separately.

Selection and ordering data

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 42C

More information

Equipment Manual, see
<https://support.industry.siemens.com/cs/ww/en/view/109481489>

Multi-unit packaging,
 see page 16/7.

Version	Width	Inputs	Outputs	Screw terminals	Spring-loaded terminals (push-in)
I/O type	mm			Article No.	Article No.
				Price per PU	Price per PU

SC17.5 and SC22.5 digital SlimLine Compact modules

Slave addressing type: A/B address



3RK2200-0CG00-2AA2



3RK2400-2CG00-2AA2

4 inputs	17.5	Two-wire	--	3RK2200-0CE00-2AA2	3RK2200-0CG00-2AA2
	22.5	Three-wire	--	3RK2200-2CE00-2AA2	3RK2200-2CG00-2AA2
4 outputs	22.5	--	2 A semiconductor	3RK2100-1CE00-2AA2	3RK2100-1CG00-2AA2
4 inputs/ 2 outputs, relays	22.5	Three-wire	Relay (change-over contacts)	3RK2402-2ME00-2AA2	3RK2402-2MG00-2AA2
4 inputs/ 4 outputs, relays	22.5	Three-wire	Relay (NO contacts)	3RK2402-2CE00-2AA2	3RK2402-2CG00-2AA2
4 inputs/ 4 outputs	22.5	Three-wire	2 A semiconductor	3RK2400-2CE00-2AA2	3RK2400-2CG00-2AA2

Slave addressing type: Standard address

4 inputs/ 4 outputs	22.5	Three-wire	2 A semiconductor	3RK1400-2CE00-2AA2	3RK1400-2CG00-2AA2
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SC22.5 analog SlimLine Compact modules

Slave addressing type: Standard address



3RK1207-0CG00-2AA2

4 inputs	22.5	Voltage/ current selectable (1 ... 5 V, ± 10 V, 4 ... 20 mA, ± 20 mA)	--	3RK1207-0CE00-2AA2	3RK1207-0CG00-2AA2
		Thermal resistance (Pt100, Ni100, 0 ... 600 Ω)	--	3RK1207-3CE00-2AA2	3RK1207-3CG00-2AA2
2 outputs	22.5	--	Voltage/ current selectable (0 ... 10 V, 1 ... 5 V, ± 10 V, 0 ... 20 mA, 4 ... 20 mA, ± 20 mA)	3RK1107-0BE00-2AA2	3RK1107-0BG00-2AA2

SC17.5F ASIsafe SlimLine Compact modules

Slave addressing type: Standard address



3RK1405-2BE00-2AA2

2 safe inputs	17.5	For mechanical contacts	--	3RK1205-0BE00-2AA2	3RK1205-0BG00-2AA2
2 safe inputs/ 2 standard outputs	17.5	For mechanical contacts	Semiconductor, power supply U_{AS} -/ U_{aux} can be switched over	3RK1405-2BE00-2AA2	3RK1405-2BG00-2AA2

For safety modules for AS-Interface, see page 2/27 onwards.

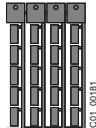
Industrial communication

AS-Interface

Slaves

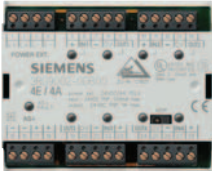
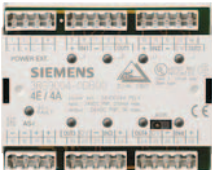
I/O modules for use in the control cabinet > SlimLine Compact

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 Device connectors For electrical connection of SlimLine Compact modules (connects AS-i bus cable and 24 V DC auxiliary power supply U_{aux} when using several SlimLine Compact modules) - Width 17.5 mm - Width 22.5 mm	3RK1901-1YA00		1	1 unit	42C
	3RK1901-1YA10		1	1 unit	42C
 Device termination connectors Required for the last module in the network - Width 17.5 mm - Width 22.5 mm	3RK1901-1YA01		1	1 unit	42C
	3RK1901-1YA11		1	1 unit	42C
 Removable terminals, without inscription - Screw terminals up to $2 \times 1.5 \text{ mm}^2$ or $1 \times 2.5 \text{ mm}^2$ - 2-pole - 4-pole - Push-in terminals up to $2 \times 1.5 \text{ mm}^2$ - 2-pole - 4-pole	Screw terminals 		1	6 units	41L
	3ZY1121-1BA00		1	6 units	41L
	3ZY1141-1BA00		1	6 units	41L
	Spring-loaded terminals (push-in) 		1	6 units	41L
 Hinged covers Replacement for SlimLine Compact module, without terminal labeling - Width 17.5 mm - Titanium gray for SC17.5 - Yellow for SC17.5F - Width 22.5 mm - Titanium gray for SC22.5	3ZY1450-1AA00		1	5 units	41L
	3ZY1450-1BA00		1	5 units	41L
	3ZY1450-1AB00		1	5 units	41L
	3ZY1311-0AA00		1	10 units	41L
 Push-in lugs for wall mounting (Two lugs are required per device)	3ZY1311-0AA00		1	10 units	41L
	3ZY1440-1AA00		1	12 units	41L
 Coding pins for removable terminals For mechanical coding of the terminals	3ZY1440-1AA00		1	12 units	41L
	3ZY1440-1AA00		1	12 units	41L
 Blank labels Unit labeling plates¹⁾ 10 mm x 7 mm, titanium gray 20 mm x 7 mm, titanium gray	3RT2900-1SB10		100	816 units	41B
	3RT2900-1SB20		100	340 units	41B
 Screwdriver For all SIRIUS devices with spring-loaded terminals Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	Spring-loaded terminals (push-in) 		1	1 unit	41B
	3RA2908-1A		1	1 unit	41B

¹⁾ PC labeling system for individual inscription of unit labeling plates available from:
murrplastik Systemtechnik GmbH
(see page 16/18).

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
F90 modules - Slave addressing type: Standard address - Width 90 mm - With COMBICON version: Delivery without COMBICON plug					
 3RG9002-0DB00  3RG9004-0DB00	Type	Connection	Inputs	Outputs	
	4 inputs/ 4 out- puts	Screw 	Two and three-wire PNP transistor	PNP transistor 1 A	3RG9002-0DB00 1 1 unit 42C
			Two and three-wire PNP transistor	PNP transistor 2 A	3RG9002-0DA00 1 1 unit 42C
			Two and three-wire PNP transistor floating	PNP transistor 2 A	3RG9002-0DC00 1 1 unit 42C
		COMBICON ¹⁾ 	Two and three-wire PNP transistor	PNP transistor 1 A	3RG9004-0DB00 1 1 unit 42C
			Two and three-wire PNP transistor	PNP transistor 2 A	3RG9004-0DA00 1 1 unit 42C
			Two and three-wire PNP transistor floating	PNP transistor 2 A	3RG9004-0DC00 1 1 unit 42C

¹⁾ Scope of supply does not include COMBICON connector set 3RX9810-0AA00, this must be ordered separately, see [Accessories](#).

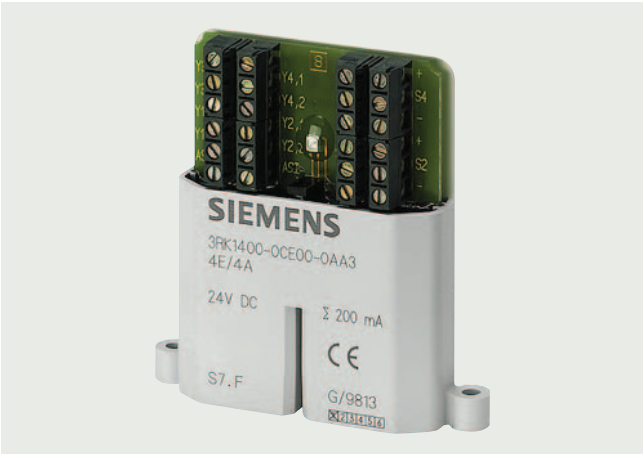
Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
COMBICON connector set For 4I/4O modules with COMBICON connection; one set comprises: 4 x 5-pole plug for connection - Standard sensors/actuators 2 x 4-pole plug for AS-Interface and external auxiliary voltage					
	3RX9810-0AA00		1	1 unit	42C

Industrial communication
AS-Interface
Slaves

I/O modules for use in the control cabinet > Flat module

Overview



Flat module 4I/4O

The flat module for the control cabinet in degree of protection IP20 has four inputs and four outputs.

The module is fitted at the front with an LED which indicates the module's status.

With the integrated lugs, the modules can be screwed on.

An integrated addressing socket enables the module to be addressed when it is installed.

Standard sensors/actuators and the AS-Interface cable can be connected using screw terminals.

Selection and ordering data

Version		Screw terminals		PU (UNIT, SET, M)	PS*	PG
Article No.		Price per PU				
	Flat module 4I/4O	3RK1400-0CE00-0AA3		1	1 unit	42C
	Slave addressing type: Standard address • 4 inputs/4 outputs • 200 mA for all I/Os					

3RK1400-0CE00-0AA3

Overview



Counter module with spring-loaded terminals

The counter module is used to send hexadecimally coded count values (LSB=D0, MSB=D3) to a higher-level controller. The count value is increased by 1 for each valid count pulse at terminal 8. Beginning at 0, the module counts up to 15 and then begins again at 0. The controller adopts the current value and determines the number of pulses between two host invocations through subtraction from the previous value. The total number of count pulses is determined by adding these differences.

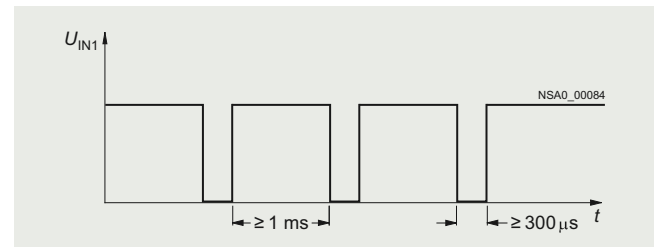
For the values sent to be unambiguous, no more than 15 count values are allowed between two host invocations or AS-Interface master invocations at terminal 8. The maximum permissible transmission frequency is calculated from these times:

$$f_{Tmax} = 15/T_{max}$$

T_{max} : max. possible transmission time from the slave to the host

A further condition for the maximum frequency is the required pulse shape. For the counter to accept a pulse as valid, a Low must have been applied at the input for at least 300 μ s and a High for at least 1 ms.

This results in a maximum frequency of $f_{Zmax} = 1/1.3 \text{ ms} = 769 \text{ Hz}$ independently of the control system (see figure below).



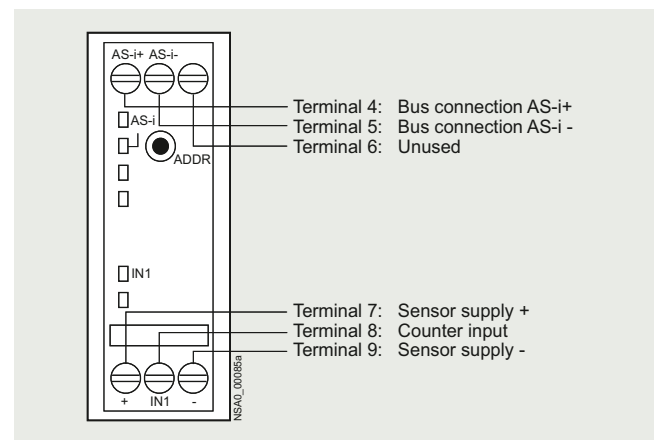
Maximum frequency for the counter module

If the time criterion stipulated in the figure is violated, the count value is rejected.

The counter is active only for the reset parameter P2 (default). The counter is deleted when P2 is set, and the incoming count pulses are not registered until after P2 is reset again.

Note:

A customized function block is necessary or must be programmed.



Counter module connection options

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Counter modules					
Slave addressing type: Standard address					
Width 22.5 mm					
 3RK1200-0CG03-0AA2	• With screw terminals		3RK1200-0CE03-0AA2	1	1 unit 42C
	• With spring-loaded terminals		3RK1200-0CG03-0AA2	1	1 unit 42C

3RK1200-0CG03-0AA2

Industrial communication

AS-Interface

Slaves

Modules with special functions > Ground fault detection modules

Overview



Ground fault detection module with spring-loaded terminals

"Ground faults in any control circuit must not lead to unintentional starting or potentially hazardous movements or prevent the machine from stopping." (IEC 60204-1/VDE 0113-1).

The AS-Interface ground fault detection module is used to meet these requirements. Using this module from the SlimLine series, ground faults in AS-Interface systems can be reliably detected and reported.

The following ground faults are detected:

- Ground fault from AS-i "+" to ground
- Ground fault from AS-i "-" to ground
- Ground fault on sensors and actuators that are supplied from the AS-Interface voltage.

Note:

Not suitable for AS-i Power24V.

Check whether the AS-i power supply unit or the AS-i master module, etc. features integrated ground fault detection, and therefore whether a separate ground fault detection module can be omitted.

It should be noted that an AS-i cable segment behind an AS-i repeater requires its own ground fault monitoring.

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Ground fault detection modules					
Module does not require an AS-i address					
Width 22.5 mm					
• With screw terminals	3RK1408-8KE00-0AA2		1	1 unit	42C
• With spring-loaded terminals	3RK1408-8KG00-0AA2		1	1 unit	42C



3RK1408-8KG00-0AA2

Overview

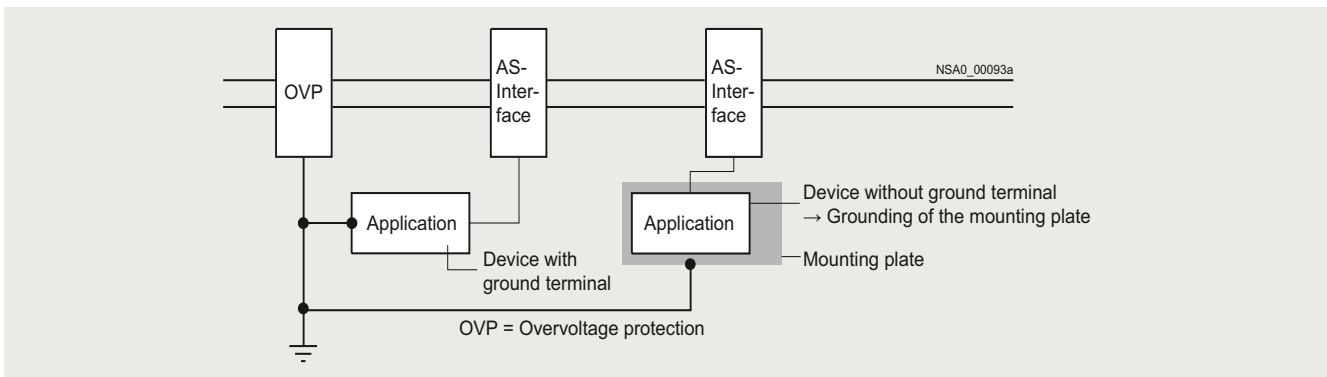


AS-Interface overvoltage protection module

The AS-Interface overvoltage protection module (protection module) protects downstream AS-Interface devices or individual sections in AS-i networks from conducted overvoltages which can be caused by switching operations and remote lightning strikes. The location of the protection module forms the transition from zone 1 to 2/3 within the lightning protection zone concept. Direct lightning strikes must be coped with using additional protective measures at the transitions from lightning protection zone 0A to 1.

With the AS-Interface overvoltage protection module, it is now also possible to integrate AS-Interface in the overall overvoltage protection concept of a plant or machine.

Configuration guidelines



The grounding of protection modules and the units to be protected must be effected through a shared grounding point.

If insulated devices are protected, their mounts must be included in the grounding points.

The module has the same design and degree of protection (IP67) as the AS-Interface K45 compact modules. It is a passive module and as such does not need its own address on the AS-Interface network. The module can be used to protect the AS-Interface cable and the cable for the auxiliary voltage from overvoltage. Overvoltages are discharged through a ground cable with a green/yellow oil-proof outer sheath. This cable is fixed in the module and must be connected with low resistance to the system's ground.

Rated discharge current I_{sn}

The rated discharge current is the peak value of a surge current of the form 8/20 μ s (microseconds), for which the protection module is designed according to a specified test program. With an 8/20 waveform, 100% of the value is achieved after 8 μ s and 50% after 20 μ s.

Protection level U_p

The protection level of a protection module is the highest momentary value of the voltage at the terminals, established in individual tests and characterizes the capability of a protection module to limit overvoltages to a residual level.

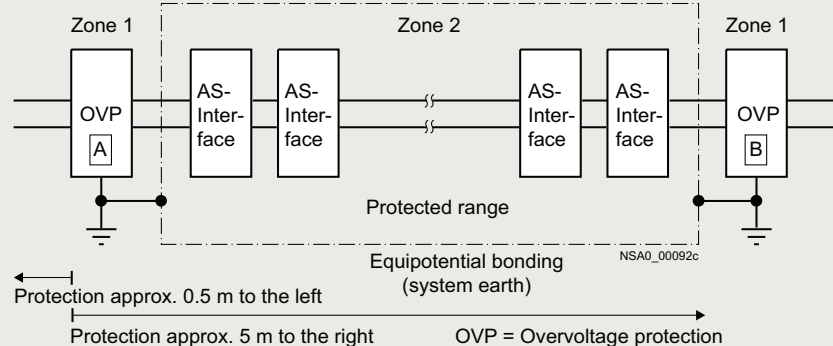
Industrial communication

AS-Interface

Slaves

Modules with special functions > Overvoltage protection modules

Sample application



Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 AS-Interface overvoltage protection module Module does not require an AS-i address Delivery includes mounting plate (for wall and DIN-rail mounting)	3RK1901-1GA01		1	1 unit	42C

Overview



AS-Interface power supply unit for 3 A

More information

Operating Instructions for AS-i power supply units, see <https://support.industry.siemens.com/cs/ww/en/view/21489904> and <https://support.industry.siemens.com/cs/ww/en/view/22317836>

AS-Interface power supply units feed 30 V DC into the AS-Interface cable and supply the AS-Interface components. They include power-optimized data decoupling for the separation of communication signals and supply voltage. As the result, AS-Interface is able to convey both data and power along a single line. The power supply units are resistant to overload and short circuits.

Dimensions

AS-Interface power supply units have compact dimensions in widths of 50/70/120 mm. No distances from other devices need to be observed when mounting the power supply units.

Features

- Higher rating: The power supply units deliver currents of 2.6 to 8 A.
- Integrated data decoupling: As the result, AS-Interface is able to convey both data and power along a single line.
- Integrated ground fault detection: The power supply units perform the reliable detection and signaling of ground faults according to IEC 60204-1. The AS-Interface voltage can be disconnected automatically in the event of a ground fault.
- Integrated overload detection: An output overload is detected and reported over a diagnostics LED.
- Diagnostics memory: Any ground faults or overloads on the output side are stored in a diagnostics memory and signaled until the device is RESET.
- Remote RESET and remote signaling: Using relay contacts, a ground fault can be signaled and evaluated by a central controller and/or indicator light.
- Diagnostics LEDs: Three different LEDs indicate the status of the AS-Interface power supply unit locally at the power supply unit.
- Ultra-wide input range/2-phase connection: The ultra-wide input range of 120 to 500 V of the 8 A version means that the supply units can be used in virtually any network worldwide. In addition, this version dispenses with the need for an N conductor as the device can be connected directly between 2 phases of a network.
- Operation with 24 V DC: The 3 A power supply unit is also available as a version with a 24 V DC input. This power supply unit is suitable for use in battery-powered systems or in systems with UPS (uninterruptible power supply).
- Removable terminal blocks with spring-loaded terminals: For easy exchanging of devices, each power supply unit has three removable terminal blocks: for the input side, for the output side and for Signal/RESET connections.

Benefits

- Complete solution for supplying AS-Interface networks while making full use of the maximum possible cable length per AS-i segment
- Only AS-i masters and AS-i slaves need to be connected to the AS-Interface cable in order to operate AS-Interface
- Compact, space-saving dimensions
- Reliable power supply even for large numbers of AS-Interface modules with a high power requirement
- Integrated ground fault and overload detection saves the need for additional components and enhances safety
- Fast fault detection and reduced downtimes thanks to diagnostics memory, remote signaling and remote RESET
- Reduced downtimes as the result of removable terminal blocks which enable the fast exchanging of devices
- Ultra-wide input range of the 8 A version permits 1-phase and 2-phase operation and removes the need for an N conductor
- Can be used world-wide thanks to, for example, UL/CSA approval (UL 508)
- With the 2.6 A version, the output power is restricted to max. 100 W for use in Class 2 circuits according to NEC (National Electrical Code)

Industrial communication

AS-Interface

Power supply units and data decoupling modules

AS-Interface power supply units

Selection and ordering data

Version		Spring-loaded terminals 	PU (UNIT, SET, M)	PS*	PG
		Article No.	Price per PU		
 3RX9501-0BA00  3RX9503-0BA00		AS-Interface power supply units, IP20 - AS-i single output 30 V DC - Output voltage ES1 according to IEC 62368-1 - With integrated ground fault detection - Ambient temperature during operation -10 ... +70 °C 2.6 A version with output power restricted to max. 100 W (for Class 2 circuits according to NEC) - Dimensions: Width: 50 mm (2.6 A/3 A), 70 mm (5 A), 120 mm (8 A); Height: 125 mm; Depth: 125 mm			
Output current	Input voltage				
3 A	120/230 V AC (selectable)	3RX9501-0BA00		1	1 unit 42C
5 A	120/230 V AC (selectable)	3RX9502-0BA00		1	1 unit 42C
8 A	120/230 ... 500 V AC (selectable)	3RX9503-0BA00		1	1 unit 42C
For special applications					
3 A	24 V DC	3RX9501-1BA00		1	1 unit 42C
2.6 A/max. 100 W	120/230 V AC (selectable)	3RX9501-2BA00		1	1 unit 42C

Overview



PSN130S 30 V power supply units for 3 A, 4 A and 8 A

More information

For operating instructions and other technical information, see <https://support.industry.siemens.com/cs/ww/en/view/64364000> and <https://support.industry.siemens.com/cs/ww/en/view/44030789>

The PSN130S 30 V power supply units feed 30 V DC into the AS-Interface cable and supply the AS-Interface components, but do not include data decoupling. Data decoupling modules are needed in addition therefore to separate communication signals and control supply voltage, see page 2/71 or 2/73.

The power supply units are resistant to overload and short circuits.

Dimensions

The 30 V power supply units have compact dimensions with widths of 50 and 70 mm. No distances from other devices need to be observed when mounting the power supply units.

Features

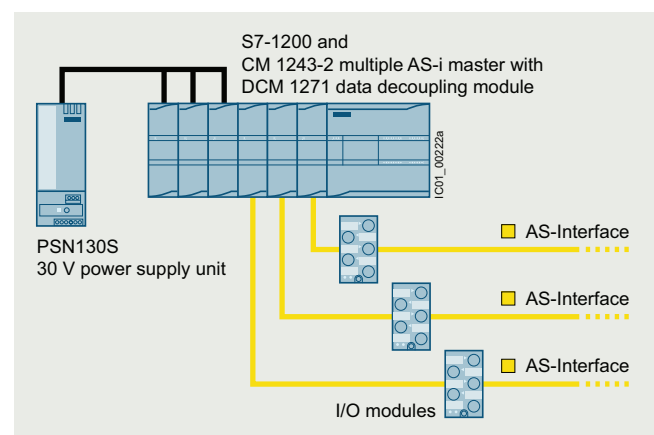
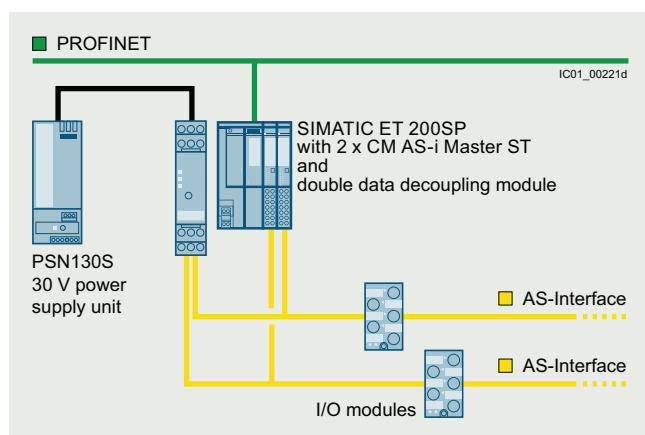
- Primary switched-mode power supplies for connection to a 1-phase AC system
- Power for currents of 3 A, 4 A and 8 A
- The output voltage is floating, and resistant to short-circuits and no-load operation. If there is an overload, the output voltage is reduced or cut-off. After a short circuit or overload, the devices start up again automatically.
- In the event of a device fault, the output voltage will be limited to max. 37 V.
- Modular installation devices in degree of protection IP20 and protection class I
- Diagnostics: With an output voltage > 26.5 V DC, the green LED (30 V O.K.) is lit and the signaling contact 13-14 is closed.

Benefits

- Low-cost alternative solution for supplying AS-Interface networks while making full use of the maximum possible cable length per AS-i segment
- Cost advantage particularly for multiple networks
- Compact, space-saving dimensions
- Reliable power supply even for large numbers of AS-Interface modules with a high power requirement
- Can be used world-wide thanks to, for example, UL/CSA approval (UL 508)

Application

Configuration examples of AS-Interface networks with a 30 V power supply unit



Configuration of AS-Interface multiple networks with one PSN130S 30 V power supply unit (examples with schematic representation):
 Left: Double network based on the S22.5 double data decoupling module and a SIMATIC ET 200SP with two CM AS-i Master ST modules
 Right: Triple network based on the SIMATIC S7-1200 with DCM 1271 data decoupling modules and CM 1243-2 communications processors

Industrial communication

AS-Interface

Power supply units and data decoupling modules

30 V power supply units

Technical specifications

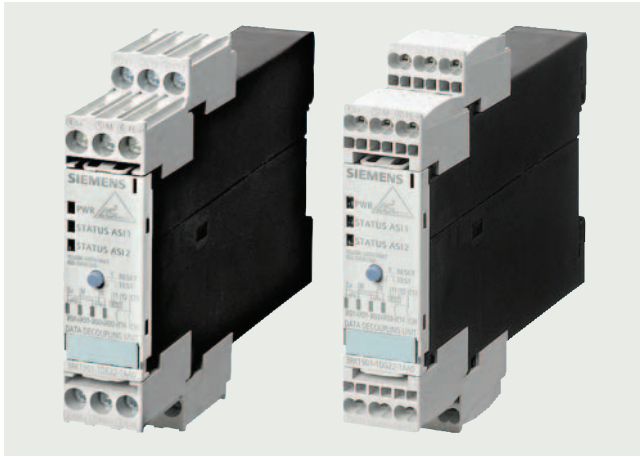
PSN130S 30 V DC power supply unit		3 A	4 A	8 A
Input data				
• Input voltage, rated value U_e	V AC	120/230 V, 1-phase, automatic selection		
• Range of input voltage	V AC	85 ... 132/174 ... 264		
• Mains frequency	Hz	50/60		
• Power consumption at full load, typ.	W	103	139	270
Output data				
• Output voltage, rated value U_a	V DC	30		
• Residual ripple	mV _{pp}	< 150		
• Output current, rated value at -20 ... +60 °C	A	3	4	8
• Max. output current at +60 ... +70 °C	A	3	3	4
Degree of efficiency under rated conditions				
• Degree of efficiency	%	87	88	90
• Power loss, typ.	W	12	17	25

PSN130S 30 V DC power supply unit		3 A	4 A	8 A
Protection and monitoring				
• Output overvoltage protection	V	< 37		
• Current limiting, typ.	A	4	5.5	11
Operating data				
Ambient temperature				
• Operation	°C	-20 ... +70		
• Transport/storage	°C	-40 ... +85		
Pollution degree		2		
Humidity class		Climate class according to DIN 50010, relative air humidity max. 100%, without condensation		
Dimensions and weight				
• Width	mm	50	50	70
• Height x depth	mm	125 x 126.5		
• Weight	kg	0.4	0.4	0.7

Selection and ordering data

Version		Screw terminals		PU (UNIT, SET, M)	PS*	PG
		Article No.	Price per PU			
	PSN130S 30 V DC power supply units (without AS-i data decoupling) • Output voltage 30 V DC • Output voltage ES1 according to IEC 62368-1 • Dimensions: Width: 50 mm (3 A/4 A); 70 mm (8 A); Height: 125 mm; Depth: 126.5 mm					
3RX9511-0AA00	Output current	Input voltage				
	3 A	120/230 V AC (automatic selection)	3RX9511-0AA00	1	1 unit	42C
	4 A	120/230 V AC (automatic selection)	3RX9512-0AA00	1	1 unit	42C
3RX9512-0AA00	8 A	120/230 V AC (automatic selection)	3RX9513-0AA00	1	1 unit	42C
						
3RX9513-0AA00						

Overview



AS-Interface S22.5 double data decoupling module:
Screw terminal version (picture on left),
Spring-loaded terminal version (picture on right)

More information

Operating Instructions, see
<https://support.industry.siemens.com/cs/ww/en/view/44030789>
 More information on AS-i Power24V, see
 System Manual for AS-Interface,
<https://support.industry.siemens.com/cs/ww/en/view/26250840>

With the aid of the S22.5 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be realized along one cable.

The combination of data decoupling modules and standard power supply units is therefore a cost-efficient alternative to the service-proven AS-Interface power supply units.

The quality of the data signals and the reliable operation of the AS-i network are not negatively affected as the result.

Features of the S22.5 data decoupling module

- Degree of protection IP20
- Narrow design: 22.5 mm wide
- Version with screw or spring-loaded terminals
- Versions for single and double data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Adjustable current limiting up to 2 x 4 A
- Integrated ground fault detection with fault storage, display can optionally be switched off
- Diagnostics LEDs and signaling contacts
- RESET by button or remote RESET

Ground fault detection

The integrated ground fault detection works with a grounded and non-grounded supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (downstream from the data decoupling module) is detected and stored as a fault and will be signaled using LEDs and a relay contact.

Using the ground fault detection in the AS-i master is recommended for non-grounded supply. In this case, the ground fault indicator can be deactivated in the data decoupling module to avoid any unwanted LED messages.

Benefits

- Compatible expansion of the AS-Interface system
- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
 - High level of standardization
 - Additional diagnostics and maintenance information
 - Faster commissioning
- Easy and cost-efficient design of single and multiple networks is possible

Application

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-Interface Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for:

- Compact machines using AS-Interface input/output modules
- Applications in the control cabinet for AS-Interface integration of SIRIUS 3RT2 contactors using 3RA27 function modules

When using the double data decoupling module or other data decoupling units, several AS-Interface networks can be operated with a single power supply unit. This results in an additional cost advantage.

Note:

The power supply units must comply with the ES1 (IEC 62368-1) or PELV (Protective Extra Low Voltage)/SELV (Safety Extra Low Voltage) standards, have a residual ripple of < 250 mV_{pp}, and must limit the output voltage to a maximum of 40 V in the event of a fault.

We recommend

- SITOP power supplies, see page 15/1 or Catalog KT 10.1,
<https://support.industry.siemens.com/cs/ww/en/view/109745655>
- PSN130S 30 V power supply units, see page 2/69

Note on AS-i Power24V:

The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified in "AS-i Power24V" for the operation of an AS-i Power24V network, see page 2/23.

For more information on AS-i Power24V, see System Manual for AS-Interface,
<https://support.industry.siemens.com/cs/ww/en/view/26250840>.

Overview



DCM 1271 data decoupling module for SIMATIC S7-1200

More information

Manual for AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module, [see https://support.industry.siemens.com/cs/ww/en/view/57358958](https://support.industry.siemens.com/cs/ww/en/view/57358958)

For more information on AS-i Power24V, [see System Manual for AS-Interface, https://support.industry.siemens.com/cs/ww/en/view/26250840](https://support.industry.siemens.com/cs/ww/en/view/26250840)

With the aid of the DCM 1271 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be realized along one cable.

The DCM 1271 data decoupling module has the same enclosure design as the S7-1200 module and is therefore ideal for combining with the CM 1243-2 AS-i master.

The DCM 1271 data decoupling module has no connection to the backplane bus of the SIMATIC S7-1200 and is not counted as a communications module when calculating the maximum configuration.

Features of the DCM 1271 data decoupling module

- Design: S7-1200, width 30 mm, degree of protection IP20
- Detachable terminals (included in the scope of supply)
- Single data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Current limiting at 4 A
- Integrated ground fault detection
- Diagnostics LEDs for ground faults and overloads
- Signaling contacts for ground fault detection

Ground fault detection

The integrated ground fault detection works with a grounded and non-grounded supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (downstream of the data decoupling module) is identified and signaled via LED and a transistor output.

Benefits

- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
 - High level of standardization
 - Additional diagnostics and maintenance information
 - Faster commissioning

Industrial communication

AS-Interface

Power supply units and data decoupling modules

Data decoupling modules for S7-1200 > DCM 1271 data decoupling module

Application

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-i Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for

- Compact machines using AS-Interface input/output modules
- Applications in the control cabinet for AS-Interface integration of SIRIUS 3RT2 contactors using 3RA27 function modules

Note:

The power supply units must comply with the ES1 (IEC 62368-1) or PELV (Protective Extra Low Voltage)/SELV (Safety Extra Low Voltage) standards, have a residual ripple of $< 250 \text{ mV}_{pp}$, and must limit the output voltage to a maximum of 40 V in the event of a fault.

We recommend

- SITOP power supplies, see page 15/1 or Catalog KT 10.1, <https://support.industry.siemens.com/cs/ww/en/view/109745655>
- PSN130S 30 V power supply units, see page 2/69

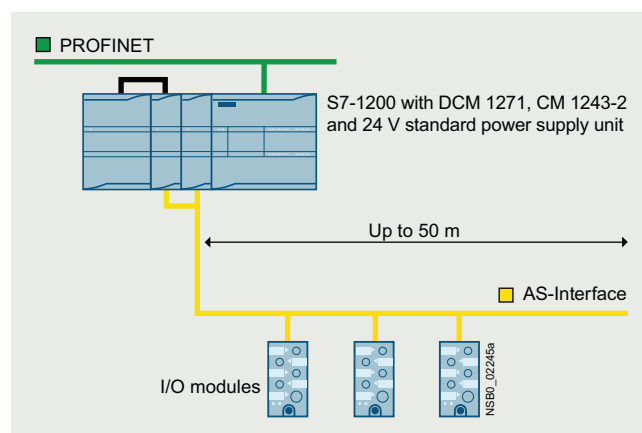
Note on AS-i Power24V:

The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified in "AS-i Power24V" for the operation of an AS-i Power24V network, see page 2/23.

For more information on AS-i Power24V, see [System Manual for AS-Interface](https://support.industry.siemens.com/cs/ww/en/view/26250840), <https://support.industry.siemens.com/cs/ww/en/view/26250840>.



Configuration of an AS-i Power24V network with AS-Interface DCM 1271 data decoupling module

Selection and ordering data

Version	Screw terminals 	PU (UNIT, SET, M)	PS*	PG
Article No.	Price per PU			
DCM 1271 data decoupling module	3RK7271-1AA30-0AA0	1	1 unit	42C
• Max. current: 1 x 4 A • Removable terminals (included in the scope of supply) • Dimensions W x H x D (mm): 30 x 100 x 75				



3RK7271-1AA30-0AA0

Accessories

Version	Screw terminals 	PU (UNIT, SET, M)	PS*	PG
Article No.	Price per PU			
Screw terminals (spare part)				
• 5-pole, for AS-i master CM 1243-2 and AS-i DCM 1271 data decoupling module	3RK1901-3MA00	1	1 unit	42C
• 3-pole, for AS-i DCM 1271 data decoupling module for connecting the power supply unit	3RK1901-3MB00	1	1 unit	42C
CM 1243-2 communications module	3RK7243-2AA30-0XB0	1	1 unit	42C
• AS-Interface master for SIMATIC S7-1200 • Corresponds to AS-Interface specification V3.0 • Removable terminals (included in the scope of supply) • Dimensions W x H x D (mm): 30 x 100 x 75 see also from page 2/37 onwards				



3RK7243-2AA30-0XB0

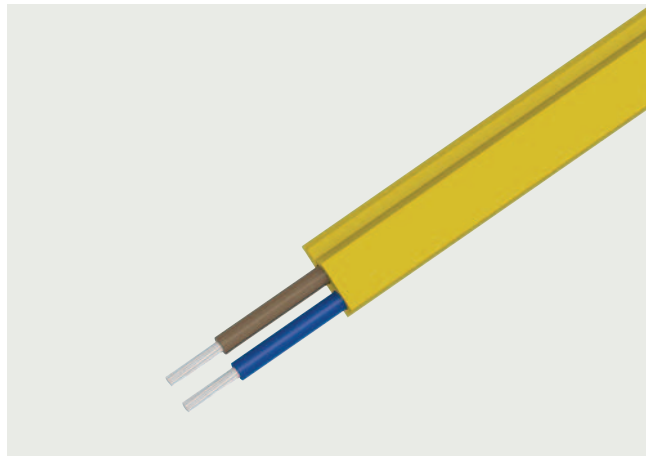
Industrial communication

AS-Interface

Transmission media

AS-Interface shaped cable

Overview



AS-Interface shaped cable

The actuator-sensor interface – the networking system used for the lowest field area – is characterized by very easy mounting and installation. A new connection method was developed specially for AS-Interface.

The stations are connected using the AS-Interface cable. This two-wire AS-Interface shaped cable has a trapezoidal shape, thus ruling out polarity reversal.

Connection is effected by the insulation piercing method. In other words, contact pins pierce the AS-Interface shaped cable and make reliable contact with the two wires. Cutting to length and stripping are superfluous. Consequently, AS-Interface stations (e.g. I/O modules, intelligent devices) can be connected in the shortest possible time and exchanging devices is quick.

To enable use in the most varied ambient conditions (e.g. in an oily environment), the AS-Interface cable is available in different materials (rubber, TPE, PUR).

For special applications it is also possible to use an unshielded standard round cable H05VV-F 2 x 1.5 mm² according to AS-i specification. With AS-Interface, data and energy for the sensors (e.g. proximity switches) and actuators (e.g. indicator lights) are transmitted over the yellow AS-Interface cable.

The black AS-Interface cable must be used for actuators with a 24 V DC supply (e.g. solenoid valves) and a high power requirement.

Suitable for operation in cable carriers

The use of the AS-Interface shaped cables with TPE and PUR outer sheath was checked in a cable carrier test with the following conditions:

Chain length	m	6
Travel	m	10
Bending radius	mm	75
Travel speed	m/s	4
Acceleration	m/s ²	4
Number of cycles		10 million
Duration of test		approx. 3 years (11 000 cycles per day)

After termination of the 10 million cycles only slight wear was visible due to the lugs of the cable carrier. No damage to the cores and core insulation could be detected.

Note:

When using a cable carrier, the cables must be installed in such a way that they are not subject to tensile forces. On no account may the cables be twisted, but they must be routed flat over the cable carrier.

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
AS-Interface shaped cables					
 3RX901.-0AA00	Material	Color	Quantity		
	Rubber	Yellow (AS-Interface)	100 m roll	3RX9010-0AA00	1 1 unit 42C
		Yellow (AS-Interface)	1 km drum	3RX9012-0AA00	1 1 unit 42C
		Black (24 V DC)	100 m roll	3RX9020-0AA00	1 1 unit 42C
		Black (24 V DC)	1 km drum	3RX9022-0AA00	1 1 unit 42C
 3RX901.-0AA00	TPE	Yellow (AS-Interface)	100 m roll	3RX9013-0AA00	1 1 unit 42C
		Yellow (AS-Interface)	1 km drum	3RX9014-0AA00	1 1 unit 42C
		Black (24 V DC)	100 m roll	3RX9023-0AA00	1 1 unit 42C
		Black (24 V DC)	1 km drum	3RX9024-0AA00	1 1 unit 42C
 3RX902.-0AA00	TPE special version according to UL Class 2	Yellow (AS-Interface)	100 m roll	3RX9017-0AA00	1 1 unit 42C
		Black (24 V DC)	100 m roll	3RX9027-0AA00	1 1 unit 42C
 3RX902.-0AA00	PUR	Yellow (AS-Interface)	100 m roll	3RX9015-0AA00	1 1 unit 42C
		Yellow (AS-Interface)	1 km drum	3RX9016-0AA00	1 1 unit 42C
		Black (24 V DC)	100 m roll	3RX9025-0AA00	1 1 unit 42C
		Black (24 V DC)	1 km drum	3RX9026-0AA00	1 1 unit 42C

Overview



AS-Interface repeater

The AS-Interface repeater is used to extend the AS-Interface cable.

- In its basic version, an AS-i network comprises one segment with a maximum cable length of 100 m. An extension plug (see page 2/79) can be used to increase the cable length for a segment to a maximum of 200 m.
- If this is insufficient, however, you can use one or more repeaters.

- A repeater adds an extra segment to an existing segment. The extra segment can have a cable length of up to 100 m (without extension plug) or up to 200 m (with an extension plug in the extra segment).
- Each segment requires a separate AS-i power supply unit. The repeater is automatically supplied with power by the AS-i power supply units.
- Electrical separation of the two AS-Interface shaped cable lines, e.g. interfering signals or ground faults are blocked at the repeater. The wanted signals are prepared by the repeater and passed on after amplification.
- Slaves can be used on both sides of the repeater because the repeater has a symmetrical internal structure. The AS-i master can be positioned before or after the repeater.
- The additional power supply can increase the current infeed for slaves/sensors and lower the voltage drop on the AS-i cable.
- Separate display of the correct AS-Interface voltage by means of LED for each segment
- Installed in K45 module enclosure IP67 with mounting plate
- Easy mounting

Benefits

- More possibilities of use and greater freedom for plant planning through extension of the AS-Interface network
- Reduced downtime and servicing times in the event of a fault thanks to separate display of the correct AS-Interface voltage for each side
- Increased operational reliability in extensive networks due to conditioning and amplification of the wanted signals.

Design of an AS-Interface network with repeaters

- Parallel connection of several repeaters possible (star configuration)
- Combination of series and parallel connection possible

The following conditions apply to enable the signal propagation times to be maintained:

- When used without an extension plug no more than two repeaters are permitted between AS-i master and slave (repeaters connected in series)
- When used with an extension plug no more than one repeater is permitted between AS-i master and slave

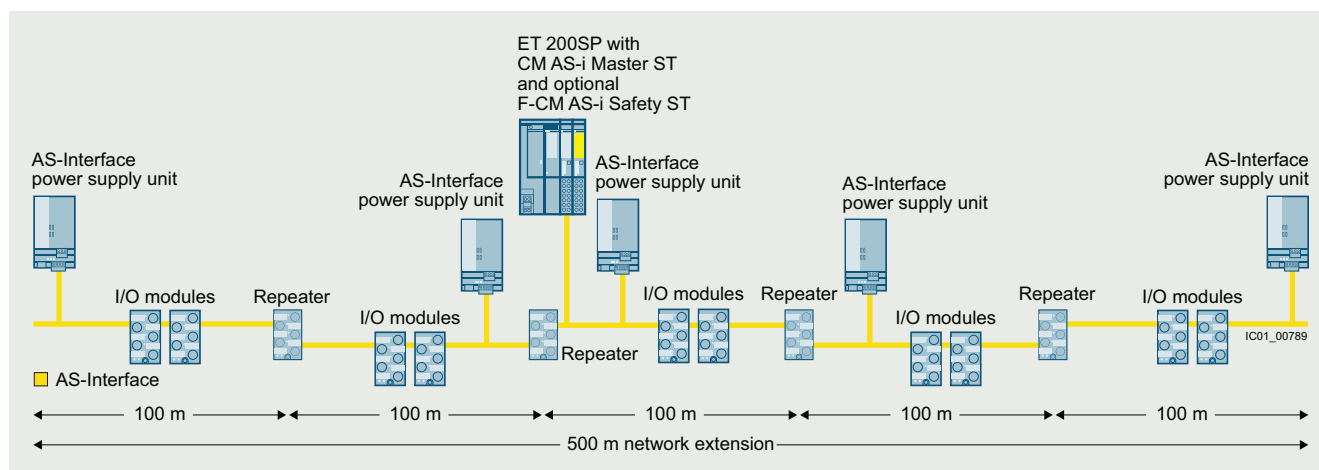
In safety-related applications the following also applies:

- When used without an extension plug, no more than two repeaters are permitted between evaluation unit (e.g. F-CM AS-i Safety ST for ET 200SP) and ASIsafe input slave or safe output module.
- When used with an extension plug, no more than one repeater is permitted between the evaluation unit (e.g. F-CM AS-i Safety ST for ET 200SP) and ASIsafe input slave or safe output module.

Note:

The open end of an AS-i bus cable must not be in the AS-Interface repeater. The AS-Interface shaped cable can be terminated by means of a cable end terminator to provide degree of protection IP67 where required, see [Miscellaneous accessories on page 2/86](#).

The AS-Interface repeater is not suitable for AS-i Power24V networks. It is recommended for use in AS-Interface networks with AS-Interface power supply units (e.g. 3RX9501-0BA00).



Configuration example AS-Interface network with repeaters (without extension plugs)

Industrial communication

AS-Interface

System components and accessories

Repeaters

Application

The repeater is used to extend the AS-Interface network. In this case there are AS-Interface slaves and one AS-Interface power supply unit on each side of the repeater.

As with all AS-Interface networks, any network topology (line, tree, star) is possible.

In a configuration example with two repeaters and three extension plugs, the maximum possible size of the AS-Interface network is 600 m, [see configuration example with extension plug on page 2/79](#).

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 6GK1210-0SA01	Repeater for AS-Interface • Cable extension due to expansion of an existing cable segment by an additional segment • Doubling of the total cable length to 200 m when a repeater is used • Amplification of the wanted signals • Delivery includes mounting plate (for wall and DIN-rail mounting) • Direct connection to AS-Interface shaped cable using the insulation piercing method • Repeater does not require an AS-i address	6GK1210-0SA01	1	1 unit	42C

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RK1901-1MN00	Cable end terminators For sealing open cable ends of the AS-Interface shaped cable with IP67	3RK1901-1MN00	1	10 units	42C

Overview



AS-Interface Extension Plug Compact

With the Extension Plug Compact, it is possible to double the cable length possible in an AS-Interface segment from 100 to 200 m.

Only one AS-i power supply unit is needed to supply power to the slaves on the up to 200 m long segment.

The extension plug suppresses interfering signals that can arise due to reflection at the end of a long cable. The extension plug contains no amplification of the wanted signals.

The extension plug is mounted directly on the AS-Interface shaped cable by means of the insulation piercing method and does not require its own power supply.

Design of an AS-Interface segment with an extension plug

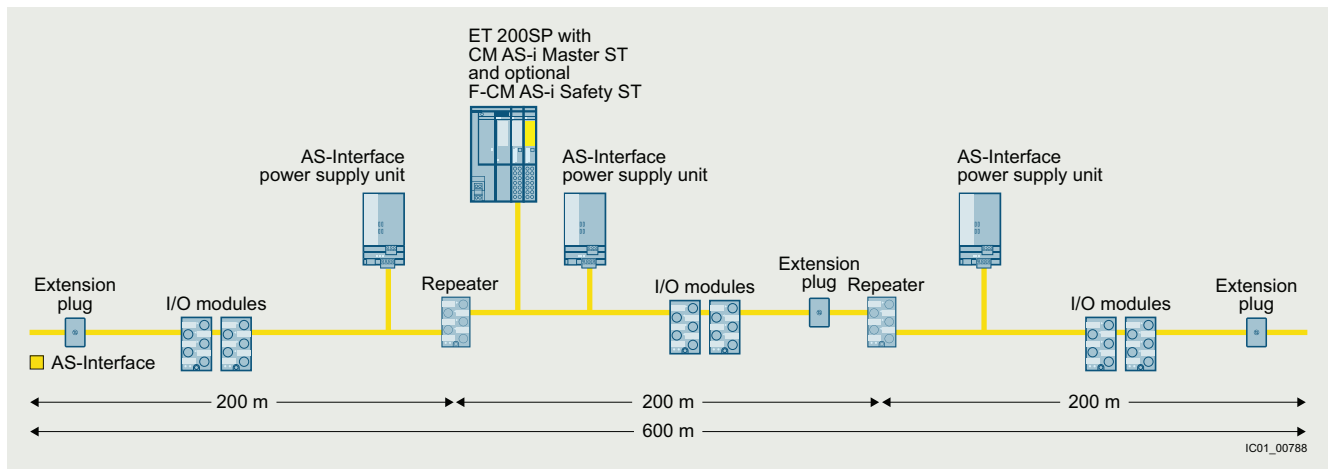
To construct an AS-Interface segment with a cable length of more than 100 m and up to a maximum of 200 m, the extension plug is installed in a radius of around ± 10 m at the point of the network that is furthest from the AS-i power supply unit (tolerance up to 10 m from the end point). The extension plug is not allowed to be used in AS-Interface networks smaller than 100 m. Generally, any network topology (line, tree, star) is possible when using the extension plug. Only one extension plug is required per 200 m segment even with a tree or star topology.

The extension plug can be combined with the AS-Interface repeater, [see page 2/78](#).

Note:

The open end of an AS-i bus cable must not be in the extension plug. The AS-Interface shaped cable can be terminated by means of a cable end terminator to provide degree of protection IP67 where required, [see Miscellaneous accessories on page 2/86](#).

The AS-Interface extension plug is not suitable for AS-i Power24V networks. It is recommended for use in AS-Interface networks with AS-Interface power supply units (e.g. 3RX9501-0BA00).



Configuration example AS-Interface network with repeaters and extension plugs

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 AS-Interface Extension Plug Compact • Doubling of the cable length to 200 m per AS-Interface segment • Direct connection to AS-Interface shaped cable using the insulation piercing method • Extension Plug Compact does not require an AS-i address	3RK1901-1MX02		1	1 unit	42C

3RK1901-1MX02

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 Cable end terminators For sealing open cable ends of the AS-Interface shaped cable with IP67	3RK1901-1MN00		1	10 units	42C

3RK1901-1MN00

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Industrial communication

AS-Interface

System components and accessories

Addressing units

Overview



The innovated addressing unit for AS-Interface of the AS-i specification V3.0

The addressing unit is used to assign an address during commissioning to each AS-Interface slave. The device detects a connected slave module or a complete AS-i network and displays the found module in the LCD display. Each address can be individually set using the Up/Down keys. By turning the rotary switch, further commissioning functions are selected intuitively. The innovative device has been adapted to the current AS-i specification V3.0 and can now also handle the I/O data of the latest slaves.

Functionality

- Reading out and adjusting the slave address 0 to 31 or 1A to 31A, 1B to 31B, with automatic addressing aid and prevention of double addresses
- Reading out the slave profile (IO, ID, ID2)
- Reading out and adjusting the ID1 code
- Input/output test when commissioning the slaves: Read input signals and write outputs with all digital and analog slaves according to AS-Interface specification V3.0, including safe input slaves and complex CTT2 slaves
- Measuring the voltage on the AS-Interface cable (measuring range from 2 to 35 V)
- Display of the operational current in case of direct connection of an AS-i slave (measuring range from 0 to 150 mA)
- Storage of complete network configurations (profiles of all slaves) to simplify the addressing
- Adjusting the slave parameters for commissioning
- Reading out the identification and diagnostics of CTT2 slaves
- Reading out the code table of safe input slaves (ASIsafe)

Note:

For operation of the addressing unit on an AS-Interface cable with connected power supply unit, the following applies: The AS-Interface addressing unit is suitable for standard AS-i networks and AS-i Power24V networks (min. operational voltage on the AS-Interface cable 19 V).

Benefits

- Increased power supply to the slaves up to 150 mA
- Better utilization of the battery capacity thanks to improved circuitry
- Support for the current AS-i specification V3.0
- Expanded display for simultaneously displaying input and output states
- Clearly recognizable display of status of digital inputs/outputs in binary format (0/1), optionally also available as hexadecimal values
- Intuitive display of analog data either as decimal, hexadecimal or as a percentage (e.g. 100% corresponds to input/output value 20 mA)
- I/O data of complex slaves (CTT2 profile) can be displayed
- Decoded display of the input data of safe input slaves, including code table
- Simplification of the operating steps when setting the slave address with automatic read back of the set address
- Addressing cable, ready for operation even without screwing in tight into the M12 socket, thus faster availability of the addressing unit
- Proven compact enclosure with smooth keys and rotary switch
- Connection of standard AS-i networks possible with 30 V as well as Power24V networks
- Complex slaves with high operating currents can be addressed without external supply
- Longer operating time by automatic shutdown after approx. 5 minutes (or approx. 1 minute when data exchange is active) after last operation
- Can be used with all types of digital and analog slaves
- Comprehensive and fast input/output test of plants, even for A/B slaves with 4 DI/4 DQ and current analog modules with an A/B address
- Faster and more reliable commissioning of the AS-Interface modules
- One-hand operation possible, with unique selection of the functions
- Connection via M12 socket (pin 1: ASI+; pin 3: ASI-; pins 2, 4, 5: not used)
- Universal applicability for all AS-i networks

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 AS-Interface addressing unit V3.0 • For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i specification V3.0 • For setting the AS-i address of slaves with standard addresses, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with four type AA batteries (IEC LR6, NEDA 15) • Degree of protection IP40 • Dimensions W x H x D (mm): 84 x 195 x 35 • Scope of supply: - Addressing unit with four batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	3RK1904-2AB02		1	1 unit	42C

3RK1904-2AB02

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RK1902-4PB15-3AA0 Addressing cable, with M12 plug to M12 socket¹⁾ - For addressing slaves with M12 connection, e.g. K20 or K60R modules or light curtains - Length 1.5 m, 3-pole, 3 x 0.34 mm²	3RK1902-4PB15-3AA0		1	1 unit	42D
 3RX9801-0AA00 AS-Interface M12 feeder - Transition of AS-Interface cable to a standard round cable - Insulation piercing method for connection of AS-Interface cable - M12 socket for connection of standard round cable - Current-carrying capacity up to 2 A - Degree of protection IP67	3RX9801-0AA00		1	1 unit	42C
 3RK1901-2NR10 AS-Interface M12 feeder - AS-Interface cable transition without U_{aux}, with M12 socket - Insulation piercing method for connection of AS-Interface cable - M12 socket for connection of standard round cable - Current-carrying capacity up to 4 A - Degree of protection IP67/IP68/IP69 (IP69K)	3RK1901-2NR10		1	1 unit	42C
 3RK1902-4HB50-5AA0 M12 cable plug²⁾ - Extruded M12 plug (angled cable outlet 90°), other cable end open - Length: 5 m, 5-pole, color: Black	3RK1902-4HB50-5AA0		1	1 unit	42D
 3RK1902-4BA00-5AA0 M12 plug, straight²⁾ - For screw fixing, 5-pole screw terminal, max. 0.75 mm² - A-coded, max. 4 A	3RK1902-4BA00-5AA0		1	1 unit	42D
Addressing cable, with M12 plug to addressing plug (hollow plug)³⁾ - Included in the scope of supply of the addressing unit - Length 1.5 m	Z236A				

¹⁾ Not included in scope of supply of the 3RK1904-2AB02 addressing unit.

²⁾ For connecting the addressing unit to an AS-i network via AS-Interface M12 feeder it is necessary to establish a connection by means of a connecting cable (M12 plug to M12 plug) which must be wired as follows:

- M12 cable plug: pin 1/core brown ↔ M12 plug: Pin 1,
- M12 cable plug: pin 3/core blue ↔ M12 plug: Pin 3,
- Pin 2, 4, 5 not connected.

³⁾ Addressing cable available from:
GMC-I Messtechnik GmbH
(see page 16/18).

Industrial communication

AS-Interface

System components and accessories

Analyzer

Overview



AS-Interface analyzer

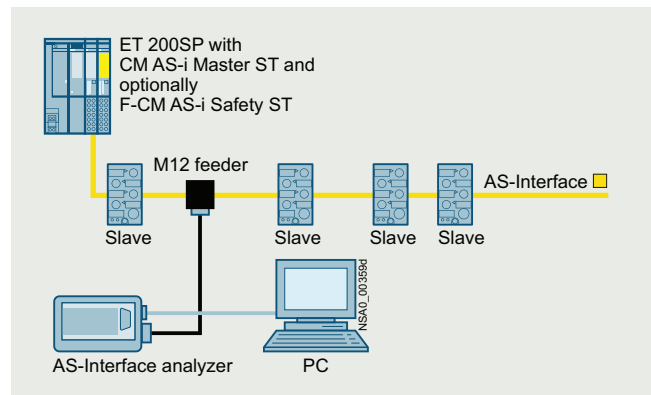
The AS-Interface analyzer is used to test AS-Interface networks.

Installation errors, e.g. loose contacts or EMC interference under extreme loads, can be revealed by this unit.

Thanks to the easy-to-use software the user can assess the quality of complete networks even if he lacks detailed specialist knowledge of AS-Interface. In addition it is an easy matter with the AS-Interface analyzer to create test logs from the records produced, thus providing documentation for startups and service assignments.

For advanced AS-Interface users there are trigger functions for detailed diagnostics.

Connection



Connection of AS-Interface analyzer to PC and AS-Interface network

The AS-Interface analyzer follows the communication on the AS-Interface network as a passive station. The unit is supplied simultaneously from the AS-Interface cable.

This analyzer interprets the physical signals on the AS-Interface network and records the communication.

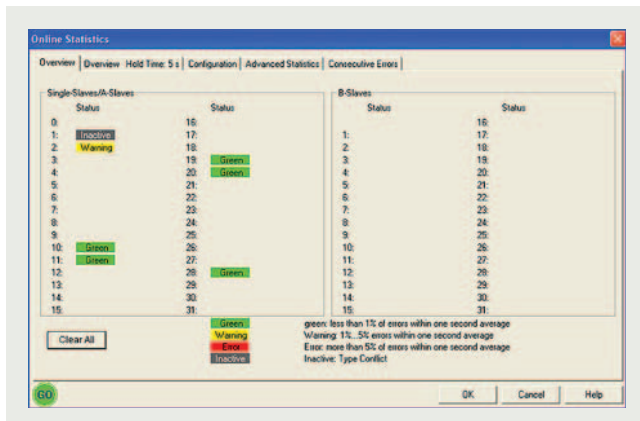
The data thus obtained are transferred through an RS 232 interface to a PC such as a notebook, for evaluation with the supplied diagnostics software.

Benefits

- Simple and user-friendly operation enables diagnostics of AS-Interface networks without help from specialists
- Speedy troubleshooting thanks to intuitive display in statistics mode
- Test logs provide verification of the state and quality of the installation for service and approval
- Recorded logs facilitate remote diagnostics by Technical Support
- Comprehensive trigger functions enable exact analysis
- Process data can be monitored online

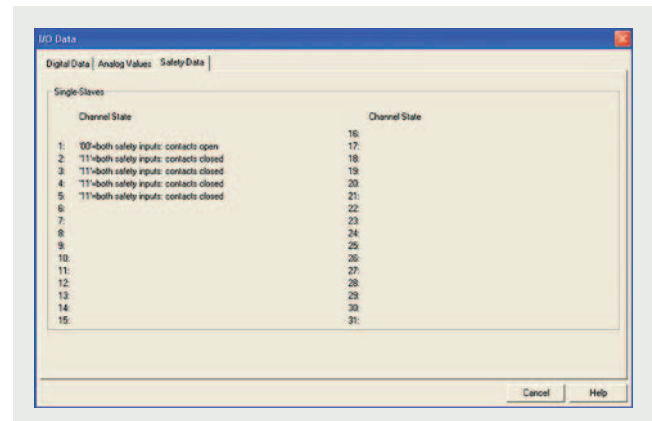
Application

Online statistics

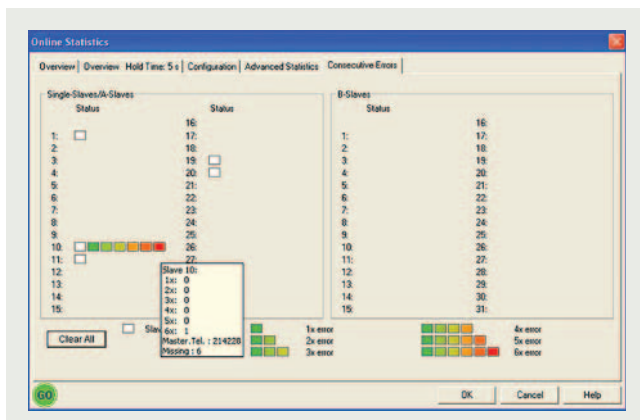


Online statistics, overview

Data mode



Presentation of the I/O data: Safety data



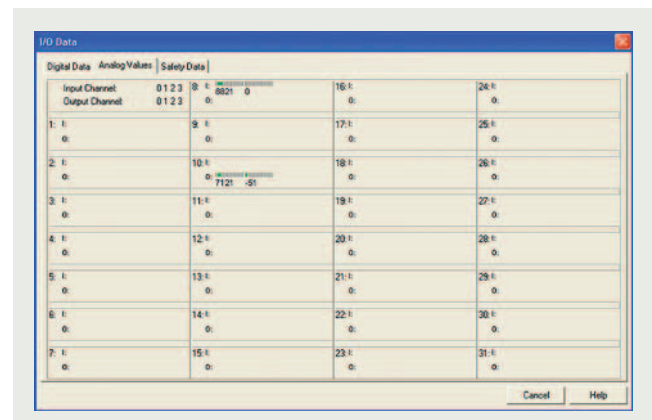
Online statistics, details, e.g. here a fault on slave 10

This mode provides a quick overview of the existing AS-Interface system. The error rates are displayed per slave in a traffic-light function (green, yellow, red).

The bus configuration and the currently transmitted data of the slaves are shown in a well arranged presentation.

With the expanded statistics function, it is possible to determine the error rates as the number of transmitted or faulty bus message frames.

The bundle error overview shows in steps how many multiple repetitions of message frames occurred in order to enable a selective and look-ahead assessment of the transmission quality.



Presentation of the I/O data: Analog values

In this mode, the analyzer shows not only the digital input/output values but also the current analog values and the input status of the safety slaves.

Industrial communication

AS-Interface

System components and accessories

Analyzer

Trace mode

Presentation of message frames in trace mode

The presentation of message frames in the style of a classic fieldbus analyzer is indispensable for complex troubleshooting. Extensive trigger functions and recording and viewing filters are available for this purpose. An external trigger input and trigger output round off the scope of functions in order to find even the most difficult errors.

For troubleshooting in connection with ASIsafe applications, changes of status in the code tables of safety slaves are identified and assessed.

The AS-i analyzer can be used with an AS-i master according to AS-Interface specification V3.0 or a predecessor version.

The analyzer does not automatically decode the process values for type CTT2 - CTT5 AS-i slaves. As for other slave types, the message frames are recorded and evaluated in the statistics. If required, decoding can also be performed by the user manually.

For more information, see

<https://support.industry.siemens.com/cs/ww/en/view/109746763>.

Test log

Example of a test log

The recorded data of the online statistics are easy to output and document using a test log. Verification of the state of the plant can thus be provided for approvals or service assignments.

The integrated measurement assistant records the bus signals for a variable duration, thereby triggering creation of an automatic test log. A standardized quality test of AS-i plants is thus possible.

Note:

The AS-Interface analyzer is suitable for standard AS-i networks and AS-i Power24V networks (min. operational voltage 20 V).

Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 AS-Interface analyzer - For testing AS-Interface systems - For troubleshooting and service assignments in installations and networks with AS-Interface systems - Dimensions W x H x D (mm): 145 x 30 x 92 - Scope of supply: - AS-Interface analyzer - RS 232 cable for connecting to a PC - USB-to-serial/RS 232 adapter - Screwdriver - Magnetic adhesive tape for fastening the analyzer to metal surfaces - Service case with foam insert, dimensions W x H x D (mm): approx. 260 x 70 x 200 - Diagnostics software (CD-ROM) for PC with Windows operating system	3RK1904-3AB01		1	1 unit	42C

Note:

Download the current version of the diagnostics software for PC with Windows operating system, see

<https://support.industry.siemens.com/cs/ww/en/view/109750259>.

Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RX9801-0AA00	AS-Interface M12 feeder • Transition of AS-Interface shaped cable to a standard round cable • Insulation piercing method for connection of AS-Interface cable • M12 socket for connection of standard round cable • Current-carrying capacity up to 2 A • Degree of protection IP67	3RX9801-0AA00	1	1 unit	42C
 3RK1901-2NR10	AS-Interface M12 feeder • AS-Interface cable transition without U_{aux}, with M12 socket • Insulation piercing method for connection of AS-Interface cable • M12 socket for connection of standard round cable • Current-carrying capacity up to 4 A • Degree of protection IP67/IP68/IP69 (IP69K)	3RK1901-2NR10	1	1 unit	42C
 3RK1902-4HB50-5AA0	M12 cable plug • PUR cable, 5-pole • Length 5 m • Color black • Extruded M12 plug (angled cable outlet 90°), other cable end open	3RK1902-4HB50-5AA0	1	1 unit	42D

Industrial communication

AS-Interface

System components and accessories

Miscellaneous accessories

Selection and ordering data

More information

System Manual for AS-Interface, see
<https://support.industry.siemens.com/cs/ww/en/view/26250840>

Version				Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG				
AS-Interface compact distributor, for AS-Interface flat cable • Current-carrying capacity up to 8 A • Degree of protection IP67/IP68/IP69 (IP69K)						1	1 unit	42C				
For flat cable	For	Cable length	Cable end in feeder									
AS-i or U_{aux}	Flat cable AS-i or U_{aux}	--	Not available	3RK1901-2NN10		1	1 unit	42C				
AS-Interface M12 feeder • Current-carrying capacity up to 2 A • Degree of protection IP67												
For flat cable	For	Cable length	Cable end in feeder									
AS-i	M12 socket	--	Available	3RX9801-0AA00		1	1 unit	42C				
AS-Interface M12 feeders • Current-carrying capacity up to 4 A • Degree of protection IP67/IP68/IP69 (IP69K)												
For flat cable	For	Cable length	Cable end in feeder									
AS-i	M12 socket	--	Not available						3RK1901-2NR10	1	1 unit	42C
AS-i	M12 cable box	1 m	Not available						3RK1901-2NR11	1	1 unit	42C
AS-i	M12 cable box	2 m	Not available						3RK1901-2NR12	1	1 unit	42C
AS-i/ U_{aux}	M12 socket	--	Not available						3RK1901-2NR20	1	1 unit	42C
AS-i/ U_{aux}	M12 cable box	1 m	Not available						3RK1901-2NR21	1	1 unit	42C
AS-i/ U_{aux}	M12 cable box	2 m	Not available	3RK1901-2NR22	1	1 unit	42C					
AS-Interface M12 feeder, 4-fold • Current-carrying capacity up to 4 A • Degree of protection IP67												
For flat cable	For	Cable length	Cable end in feeder									
AS-i/ U_{aux}	4-fold M12 socket, delivery includes mounting plate (for wall and DIN-rail mounting)	--	Not available	3RK1901-1NR04		1	1 unit	42C				
M12 Y-shaped coupler plug For connection of two sensors to one M12 socket with Y-assignment				6ES7194-1KA01-0XA0		1	1 unit	250				
AS-Interface sealing caps (one set contains 10 sealing caps) • For free M12 sockets - Standard version - Tamper-proof • For free M8 sockets - Standard version				3RK1901-1KA00 3RK1901-1KA01 3RK1901-1PN00		100 100 100	10 units 10 units 10 units	42C 42C 42C				
AS-Interface M20 seals • For AS-Interface shaped cable • For insertion in M20 glands				3RK1901-1MD00		100	10 units	42C				

Industrial communication

AS-Interface

System components and accessories

Miscellaneous accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Cable adapters for flat cables Connection of AS-Interface cable to metric gland with insulation piercing method - Continuation using standard cable - For M16 gland 3RK1901-3QM00 1 1 unit 42C - For M20 gland 3RK1901-3QM10 1 1 unit 42C - Continuation using pins - For M16 gland 3RK1901-3QM01 1 1 unit 42C - For M20 gland 3RK1901-3QM11 1 1 unit 42C					
Cable clips for cable adapters 3RK1901-3QA00 100 10 units 42C					
Cable end terminators For sealing open cable ends of the AS-Interface shaped cable with IP67 3RK1901-1MN00 1 10 units 42C					
Mounting plates - K45, suitable for all K45 compact modules - For wall mounting 3RK1901-2EA00 1 1 unit 42C - For DIN-rail mounting 3RK1901-2DA00 1 1 unit 42C - K60, suitable for all K60 compact modules - For wall mounting 3RK1901-0CA00 1 1 unit 42C - For DIN-rail mounting 3RK1901-0CB01 1 1 unit 42C					
Sealing sets - For K60 mounting plate - Cannot be used for K45 mounting plate - One set contains one straight and one shaped seal 3RK1902-0AR00 100 5 units 42D					
Control cables, assembled at one end Angled M12 socket for screw fixing, 4-pole, 4 x 0.34 mm ² , A-coded, black PUR sheath, max. 4 A Cable length 5 m 3RK1902-4GB50-4AA0 1 1 unit 42D					
M12 socket, angled For screw fixing, 4-pole screw terminals, max. 0.75 mm ² , A-coded, max. 4 A 3RK1902-4CA00-4AA0 1 1 unit 42D					
M12 plugs For screw fixing, 5-pole screw terminals, max. 0.75 mm ² , A-coded, max. 4 A - Straight 3RK1902-4BA00-5AA0 1 1 unit 42D - Angled 3RK1902-4DA00-5AA0 1 1 unit 42D					
Control cables, assembled at one end Angled M12 plug for screw fixing, 5-pole, 5 x 0.34 mm ² , A-coded, black PUR sheath, max. 4 A - Cable length 1.5 m 3RK1902-4HB15-5AA0 1 1 unit 42D - Cable length 5 m 3RK1902-4HB50-5AA0 1 1 unit 42D - Cable length 10 m 3RK1902-4HC01-5AA0 1 1 unit 42D					
Control cable, assembled at both ends Straight M12 plug, straight M12 socket, for screw fixing, 3-pole, 3 x 0.34 mm ² , A-coded, black PUR sheath, max. 4 A Cable length 1.5 m Also for addressing AS-i slaves with M12 bus connection (e.g. K20, K60R compact modules, M200D motor starters) 3RK1902-4PB15-3AA0 1 1 unit 42D					