SIEMENS

Ingenuity for life

Connect, Optimize, Expand

SIRIUS motor control products with industrial communication

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We believe in a better future.

With technological innovations Siemens supports industrial enterprises to become more productive, efficient and flexible.

The vision of complete digitalization is based simply on the fact that the real world is simulated in a virtual reality. Data and information are continuously read from sensors, electronic devices, machines and systems and transmitted to intelligent systems which create a digital image of the actual environment. The virtual model permits planning, engineering, simulation and optimization of the processes, before an actual implementation even begins. In this way, processes are implemented even faster, more smoothly and effectively, and productivity is significantly increased.

The key to successfully digitalizing your industry, is an industrial communication network of optimal performance. You need an industrial network that meets the requirements of your application and integrates into your enterprise IT with unquestioned reliability.

Siemens provides a variety of communication capable products based on proven standards, allowing you to implement powerful, integrated data networks that are future-proof, getting your products to market faster, more efficiently, and with greater flexibility, all with the same or even better quality.

AS-i

AS-i is an industrial fieldbus system and international standard in accordance with EN 50295 and IEC 62026-2. It's a straightforward, 2-wire cable communication system with space saving slave modules in the field.

A single master module collects the data from many AS-i slaves and transfers it to the process image of the PLC. From the perspective of the PLC CPU, the AS-i master acts like an I/O module with numerous inputs and outputs.

AS-i is primarily used for field devices such as sensors and actuators, as a subsystem for larger bus systems, in various automation applications. Examples of applications include bottling plants, conveyer systems, packaging machines and airport baggage carousels.

Benefits:

- Numerous individual sensors and actuators can be connected to a PLC as easily as possible.
- The sensor and actuator cables are shortened to a minimum, because the I/O modules of the AS-i network in IP65 enclosures can be placed directly next to the sensors and actuators.
- The copper component, cable routes, space requirement, weight, installation overhead, testing overhead and troubleshooting are reduced.
- Standard signals and safe signals, e.g. for safety doors or emergency stop pushbuttons, are transmitted on the same cable.
- The system configuration is further simplified when devices with integrated AS-i interface are used.

Siemens AS-i field devices

Siemens wide range of AS-i enabled field devices, from the 3SE5 series limit switches to SIRIUS ACT commanding and signaling devices, make for extremely short commissioning times, easy expansions and quick and painless device replacement. With only one cable for data and energy, wiring is minimized, and connections are fast and simple.

Adding to the efficiency of AS-i enabled field devices, having field devices connected to the network brings all the advantages of the TIA Portal right down to field level. In this way, engineering time is reduced, and diagnostic and fault messages can be traced from all levels.

Please see table on page 7 showing all possible communication options for 3SE5

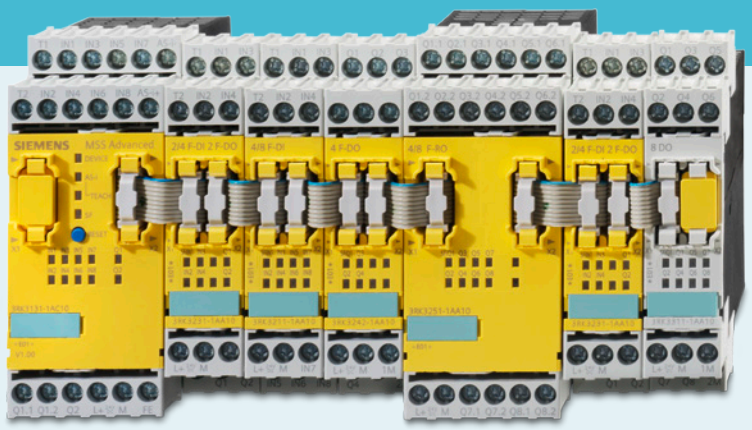
PROFIBUS

PROFIBUS has long been established as the fieldbus for machines and automation systems. Based on serial bus technology, it revolutionized the automation world in the 1980s and created the basis for decentralized concepts for the first time. In the 90s, Ethernet spread into IT and industry. With the PROFINET standard, Ethernet has been extended by the features for networking in automation and has been used successfully since then. Today, it is impossible to imagine production without both systems.

The system is easy to use and adaptable to diverse applications.

Benefits:

- The replacement of an interface module allows conversion to PROFINET devices, making it possible to continue to use existing PROFIBUS know-how.
- Fast I/O communication is made possible.
- It's the most widely distributed bus system worldwide.



3RK3 connects to plant controllers via PROFIBUS

SIRIUS 3RK3 Modular Safety System (MSS) offers numerous safety features. Besides the ability to connect as many as 9 expansion modules with the advanced central unit, the addition of a DP interface module allows the safety system to be connected to higher level plant control. Cyclic transmissions of diagnostic data are then possible via PROFIBUS.

PROFIBUS communication is also beneficial when it comes to using the MSS ES software. A complete parameter set can be downloaded into the MSS via PROFIBUS. MSS ES Software can then be used to parameterize all required safety functions, rapidly and easily using the drag and drop function.

With SIRIUS 3RK3 MSS, you can rely on an integrated safety solution to facilitate machine and plant operation with maximum flexibility and efficiency for new concepts and retrofits.

Please see table on page 7 showing all possible communication options for 3RK3

EtherNet/IP

Ethernet is a global standard (IEEE 802.3) that eliminates the boundaries between cabled, wireless, LWL and IWLAN connectivity and can handle nearly any topology.

Ethernet/IP is also often used in plant engineering, machine building and process automation, much like PROFINET.

Benefits:

- Products are fully compatible with existing non-Siemens components – most requiring just a software driver for Ethernet/IP.
- Enable you to take advantage of Siemens advanced features on existing EtherNet/IP networks.
- Enables utilization of existing equipment, wiring and processes.

3RW5 Soft Starters with Communication Module

Packed with features and various communication capabilities, SIRIUS 3RW5 series Soft Starters make it easy to integrate this versatile product with your industrial network. Do you want to communicate with your Modbus TCP/IP devices? Simply plug in a Modbus TCP/IP module and you're ready to connect. In fact, plugging in a communication module is all you need to adapt to your communication network, whether it be Modbus, PROFIBUS, PROFINET or EtherNet/IP.

Take advantage of the versatility of the 3RW5 series soft starters. They can be used for almost any soft starting application, from simple to sophisticated drive requirements like heavy-duty starting. They enable you to start three-phase motors smoothly, easily, and efficiently and implement reliable machine concepts. Intelligent functions such as condition monitoring, automatic parameterization, pump cleaning and integrated brake functions make 3RW5 Soft Starters adaptable to a wide range of applications.

Please see table on page 7 showing all possible communication options for 3RW5

IO-Link

IO-Link is the smart concept for standardized linking of switching devices and sensors to the control level by means of an economical point-to-point connection. The IO-Link communication standard at the fieldbus level enables centralized fault diagnostics and localization down to the sensor/actuator level. Because parameter data can be modified dynamically direct from the application, the devices can be adjusted to the prevailing production requirements during operation.

The requirements for integrated communication are increasing. At the same time, sensors and actuators are becoming more and more intelligent. This is where the IO-Link solution from Siemens goes that extra distance in the process, with data transparency from the field level to the highest automation level, and with an increasing number of IO-Link-enabled products. As an open interface, the IO-Link can be integrated into all common fieldbus and automation systems. Thanks to data access right down to the lowest field level, plant availability is increased, and the engineering overhead is reduced. Consistent interoperability ensures maximum protection of investment. This also applies in the context of existing machine concepts for continued use of sensors without an IO-Link interface. IO-Link enables automatic integration of measured values for energy data management systems without additional installation costs. This makes it easy to determine and subsequently analyze energy consumption and fluctuations right down to the field level.

IO-Link is often used in packaging systems and handling and conveyer technology.

Benefits:

- A motor starter with IO-Link results in considerable savings in wiring overhead.
- Multiple diagnostic options optimize plant operation.
- Engineering efficiency is optimized.
- Faults in the control room are rapidly detected and targeted troubleshooting is enabled.

SIRIUS 3RB24 Solid-State Overload Relays with IO-Link connectivity

SIRIUS 3RB24 Solid-State Overload Relays for IO-Link are an excellent example of how the advantages of IO-Link can be used to simplify configuration and enhance adaptability and diagnostics in an industrial environment.

3RB24 relays incorporate a modular device concept and are capable of monitoring currents as high as 820 A.

Additional functions include phase unbalance and phase failure protection and analogue output capability, where motor current can be converted to a 4-20 mA DC signal, along with the added benefits of IO-Link connectivity, provide further evidence of the versatility of SIRIUS 3RB24 Solid-State Overload Relays for IO-Link.

Please see table on page 7 showing all possible communication options for 3RB24

MODBUS RTU and TCP/IP

Modbus RTU is an open, serial (RS-232 or RS-485) protocol based on master/slave or client/server architecture. The protocol interconnects field equipment such as sensors, actuators, and controllers. The fieldbus environment is the base level group of digital networks in the hierarchy of plant networks.

Modbus is widely used in both process and manufacturing automation, as well as oil and gas substation applications.

Benefits:

- The protocol is simple and easy to use.
- Can be run over virtually all communication media, including twisted pair wires, wireless, fiberoptics, and ethernet.

PROFINET

PROFINET is the open industrial Ethernet standard for automation. It allows data to be exchanged quickly and securely between the field devices of different manufacturers as well as between all levels, based on an established standard (IEC 61158/61784). PROFINET is always full duplex, meaning there is simultaneous communication in two directions.

PROFINET is widely used in plant engineering, machine building and process automation.

Benefits:

- Flexibility, efficiency and performance are maximized.
- Modular machine concepts are implemented especially easily and quickly, thanks to variant management functions and a modular architecture.
- Efficient configuration and diagnostic tools allow easy operation, integration and commissioning.
- The system is 100 percent Ethernet based – users benefit from all of Ethernet's advantages, capabilities and future innovations, including TCP/IP support.
- It combines the benefits of PROFIBUS with the latest Ethernet technology.

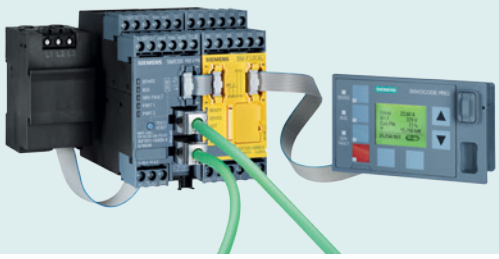
SIRIUS ACT with PROFINET

- Efficient PLC integration
- Reduced wiring outlay – fewer sources of error during installation and commissioning
- Quick installation with flat ribbon cable without special tools
- High degree of flexibility
  - Additional 4 digital inputs, 1 digital output (DI, DQ) and 1 analog input (AI)
  - Modular and plug-in design of all components
- Optionally with Safety Integrated – making it possible to integrate safety technology; e.g. emergency stop with safety-related Interface Module via PROFIsafe communication
- No addressing of individual push buttons and command points required – only one IP address for up to 21 devices
- Easy replacement of memory modules without programming knowledge
- Extended diagnostic and parameterization options and end-to-end engineering when integrated into the TIA Portal

Please see table on page 7 showing all possible communication options for SIRIUS ACT

SIMOCODE pro V for PROFINET

- Integrated Ethernet-based network structure throughout the system
- PROFINET system redundancy
- PROFIenergy profile: Availability of measured values for energy management and support of shutdown during breaks
- Devices pro V PN, pro V PN GP-2 ports:
  - Redundancy concepts based on 2 integrated communication ports, optional ring structure with Media Redundancy Protocol (MRP)
- Read/write for pro V PN, read for pro V PN GP:
  - OPC UA for open communication with visualization and control systems connects SIMOCODE to the Mindsphere cloud
  - Web server for direct device diagnostics via standard web browser; possibility for remote access and diagnostics without additional costs
- Network-synchronized Realtime clock (NTP)
- Devices pro V PN (High Performance)
- PROFIsafe profile: Safety solutions with DM-F Local and DM-F PROFIsafe modules



Please see table on page 7 showing all possible communication options for SIMOCODE

Optimize your systems using our communication enabled products

	AS-i	ETHERNET I/P	IO Link	MODBUS RTU	MODBUS TCP	PROFIBUS	PROFINET
Combination Starters 3RA2 series	✓		✓				
Compact Combination Starters 3RA6 series	✓		✓				
Contactors 3RT2 series	✓		✓				
Current Monitoring Relays 3RR24 series			✓				
Limit Switches 3SE5 series	✓						
Modular Safety System 3RK3 series	✓					✓	
Monitoring Relays 3UG48 series			✓				
Motor Starters 3RK1 series	✓		✓			✓	✓
Signaling Columns 8WD4 series	✓		✓				
SIMOCODE PRO 3UF7 series		✓		✓		✓	✓
SIRIUS ACT Pilot Devices	✓		✓				✓
Soft Starters 3RW44 series						✓	✓
Soft Starters 3RW5 series		✓		✓	✓	✓	✓
Solid State Overload Relays 3RB24 series			✓				
Temperature Monitoring Relays 3RS14/5 series			✓				

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Order No.CP-0031-0211

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