

The image shows two Siemens SIRIUS Act AS-Interface components. On the left is a silver metal terminal block with a keylock, a green push button labeled 'Start Pumpe', a yellow push button, and a red push button labeled 'Stop Pumpe'. On the right is a yellow plastic push button with a red top. A yellow cable is connected to the top of the yellow button. The Siemens logo is visible on the silver block.

SIEMENS

Ingenuity for life

SIRIUS Act AS-Interface

The field level bus system for push buttons, indicator lights and switches in your application

When it comes to communication, SIRIUS ACT is a strong performer. Besides the standard wiring, you can also connect these push buttons, indicator lights and switches directly to the controller – via AS-Interface or with IO-Link. With our new SIRIUS ACT PROFINET technology, you can now directly interface to PROFINET and bring all the features of Ethernet down to the field level.

Get to know AS-Interface in this paper and learn how you can take advantage of this modern industrial bus system in your application.

With AS-Interface, you will reduce wiring time and effort for the sensors and actuators in your application. It also minimizes error source and offers more flexibility for future modifications and expansions. AS-Interface will ultimately save you money.



AS-Interface – Your bus system for the field level

AS-Interface is an effective and powerful bus system which connects all sensors and actuators on the lowest field level with the superior control – with unrevealed ease, safety and integration.

AS-Interface serves as a cost-favorable feeder for PROFIBUS and PROFINET and supports easy engineering. There are also integrated solutions for SIMATIC ET200SP, S7-1200, S7-300 and S7-200.

It is standardized in accordance with EN 50295 and IEC 62026-2 and manufacturer neutral. All components by Siemens comply with the AS-i specification and are correspondingly tested and certified.

AS-i = simple!

Only one cable for data and power supply

Only one cable for both data and energy is required. The reduced cable length supports reduced time expenditures for mounting and installation. Moreover, AS-i supports

easy on-site fault rectification and maintenance on the basis of connections which can be rapidly removed without interrupting the field bus due to the insulation displacement method.

Time-saving mounting / installation

The two-pole AS-i cable is routed throughout the system and connected to the control's AS-i master. It ensures both the sensors' and actuators' data transmission and energy supply – while offering a high degree of protection as all slaves are docked onto the system on the basis of the innovative insulation piercing method.

This is how it works: The modules' contact spikes pierce the cable's insulation and establish safe contact with the copper conductors – ensuring maintenance of the highest degree of protection. When the mandrels are pulled out during removal of a slave, the holes automatically close at the respective position due to the cable's "self-healing power" and thus restore the insulation.

| AS-i = simple! | AS-i = flexible! | AS-i = efficient! |
|---|---|---|
| <ul style="list-style-type: none"> • Only one cable for data and power supply • Time-saving assembly/installation • Engineering in the TIA Portal • User-friendly maintenance | <ul style="list-style-type: none"> • Flexible topologies • Open standard • Expandability • Safety engineering | <ul style="list-style-type: none"> • User-friendly addressing • Fast device replacement • Ruggedness and stability • Device and network diagnostics |



Open standards

AS-Interface is standardized in accordance with EN 50295 and IEC 62026-2. All components by Siemens comply with the AS-i specification and are correspondingly tested and certified. This ensures the perfect interaction of Siemens products with third-party devices.



Engineering in the Totally Integrated Automation (TIA) portal

The TIA portal represents an innovative engineering framework for all automation tasks. As a central component of TIA, the portal facilitates redefined engineering.

User-friendly maintenance

The online diagnostics such as in the TIA portal provides accurately timed information on the slave to be exchanged in plain text. In addition, visual diagnostics information in network and device view and current status messages (operation, fault, maintenance) are provided.

The innovative AS-i insulation piercing method also accelerates device replacement within the scope of maintenance without interruption of the AS-i bus. Replacement can thus be easily realized even by untrained staff.

AS-i = flexible!

Flexible topologies

Whether line, star or tree layout, there are no restrictions in terms of structure or network topology thanks to the rugged functional principle. AS-Interface facilitates your installation technology's optimum adjustment to individual systems or machines and supports ample savings in terms of planning, configuration, mounting and time.

Expandability

AS-i networks can be easily adjusted to system expansions as AS-Interface is accurately matched to the requirements of the lowest field level which means real-time capability, low data volumes and a large number of connected devices – in addition to the already mentioned benefits of freely selectable topology and innovative insulation piercing method.

An AS-i network can be expanded up to 62 AS-i slaves. In terms of simple I/O modules, this corresponds to a maximum of 992 DI/DO points, distributed to a bus length of up to 600 m per AS-i network.

Also, analog values, of analog modules or measuring transducers can be integrated just as easily as digital I/Os. The AS-i master automatically organizes the transfer of all data. This way, a small field bus can be effortlessly expanded and flexibly adjusted to machine or system changes.

Safety engineering

The "ASIsafe" technology already forms part of every AS-i network and can be used by means of corresponding safety related components right away or in the future. Only with Siemens solutions are subordinate safe AS-i networks incorporated with safety integrated and thus become part of fail-safe programming via SIMATIC.

Only Siemens offers the choice between the “small” ASIsafe solution local with targeted separation of safety technology and operational control and the “large” ASIsafe solution PROFIsafe, for example, the bundling of standard and safety technology within the control on the basis of safety integrated. Both solutions offer benefits in terms of easy safety function calculation and evaluation via the Safety Evaluation Tool (SET), minimized engineering expenditures and comprehensive diagnostics for maximum machine and system availability.

AS-i = efficient!

User-friendly addressing

Each sensor and actuator is easily assigned to its own individual address. If required, the slaves can be replaced in next-to-no time and the address is automatically re-assigned. How can a specific sensor for evaluation or a specific actuator for switching be selected from a vast pool of slaves? Very easily. In only two steps:

- Step 1: Each AS-i slave is assigned to a distinct address via the addressing unit
- Step 2: Network configuration is taken over at the push of a button on the master

The AS-i master detects all connected AS-i slaves on the basis of their address in next-to-no time. The control can immediately access the network’s AS-i slaves. The AS-i slaves are automatically assigned to the I/O range of the control. Also address assignment after module replacement is realized automatically. This makes separate configuration or deployment of qualified personnel unnecessary.

Fast device replacement

Due to its user-friendly diagnostics, fault devices can be found easily and replaced. No addressing is necessary. The AS-i system recognizes the replaced device and automatically assigns the correct address.

Ruggedness and stability

The modulation procedure especially developed for AS-Interface ensures extremely stable data transfer and maximum operating availability. An intelligent data

protocol protects the entire system and makes it particularly resistant to faults. As a result, additional cable grounding or shielding is applied.

Device and network diagnostics

Diagnostics information and fault messages can be traced over all bus hierarchies in the TIA Portal right down to the lowest actuator/sensor level and described in plain text. A realistic representation of the respective bus topology serves as the basis.

AS-Interface for SIRIUS ACT

Distributed command devices of the SIRIUS ACT series can be quickly connected to the AS-Interface network using AS-Interface enclosures or front-mounted AS-Interface modules. Using suitable components, you can make your own enclosure or front panel with integrated AS-Interface. You can also modify existing applications. AS-i modules are available as safety and non-safety versions.

AS-Interface standard modules (4DI/DO and 4DI/3DO AB)

Used with SIRIUS ACT the AS-Interface modules 4DI/4DO and 4DI/3DO (AB) can query four mechanical contacts. The AS-Interface module 4DI/4DO also enables control of four indicator lights, while the module 4DI/3DO (AB) enables control of three indicator lights. The power required is supplied by the AS-Interface system. In conjunction with an A/B-compatible AS-Interface master, up to 62 x 4DI/3DO modules can be operated in one AS-Interface network.

The standard modules are available for front mounting, for example, front panel of a switching cabinet and for base mounting to use in a SIRIUS ACT enclosure.



Summary of technical key data

| | |
|------------------|--|
| Number of slaves | Up to 62 |
| Number of I/Os | Up to 496 inputs and 496 outputs |
| Topology | Any, combinable, no termination resistor |
| Medium | Unshielded two-wire line for data and energy |
| Line length | 100m (standard), up to 600m with repeater and extension plug |
| Cycle time | 5 ms (typical) |
| Data transfer | Digital and analog (16 Bit) |

AS-Interface safety module (F slave)

The AS-i F module is used to detect safety-related switching statuses of one or two-channel emergency stop actuators with isolated contact elements. For this purpose, a code table with 8x4 bits is transferred via the AS-Interface bus and evaluated by the safety monitor. With one AS-Interface network up to 31 safety devices can be connected.

When operated properly, the system fulfills safety category 4 according to EN 13849-1. If an emergency stop actuator is connected on just one channel (terminals for F-IN2 jumpered by means of wire), the system fulfills a maximum of safety category 2. In accordance with IEC 61508, the module can be used in loops up to SIL 3, PL e. The PFD value of the entire loop must be calculated by the user.

Configure your individual AS-i enclosure with the SIRIUS ACT Configurator

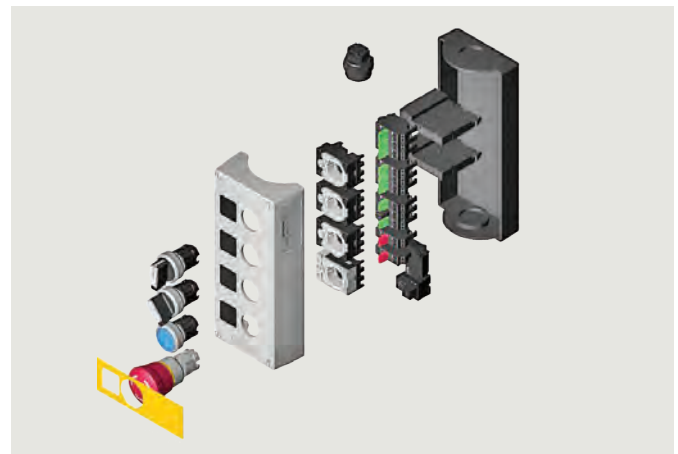
With the SIRIUS ACT configurator, you can configure your individual AS-i enclosure in less than five minutes. The intuitive new online tool makes it as easy as possible for you to choose your product – online, with picture-based component selection, drag-and-drop functions, and user-friendly documentation as well as reordering options.

In the results view, you can see an overview of your enclosure, including all components you have put together with the configurator. All the documents you need, such as a product list, manuals, wiring plan, data sheets or CAx data are just one click away.

As soon as you have added your configuration to the cart, all enclosure specific data, like price, weight and lead time will be automatically calculated and shown instantly. You can easily access the SIRIUS ACT configurator via our homepage and see for yourself: usa.siemens.com/sirius-act-configurator.

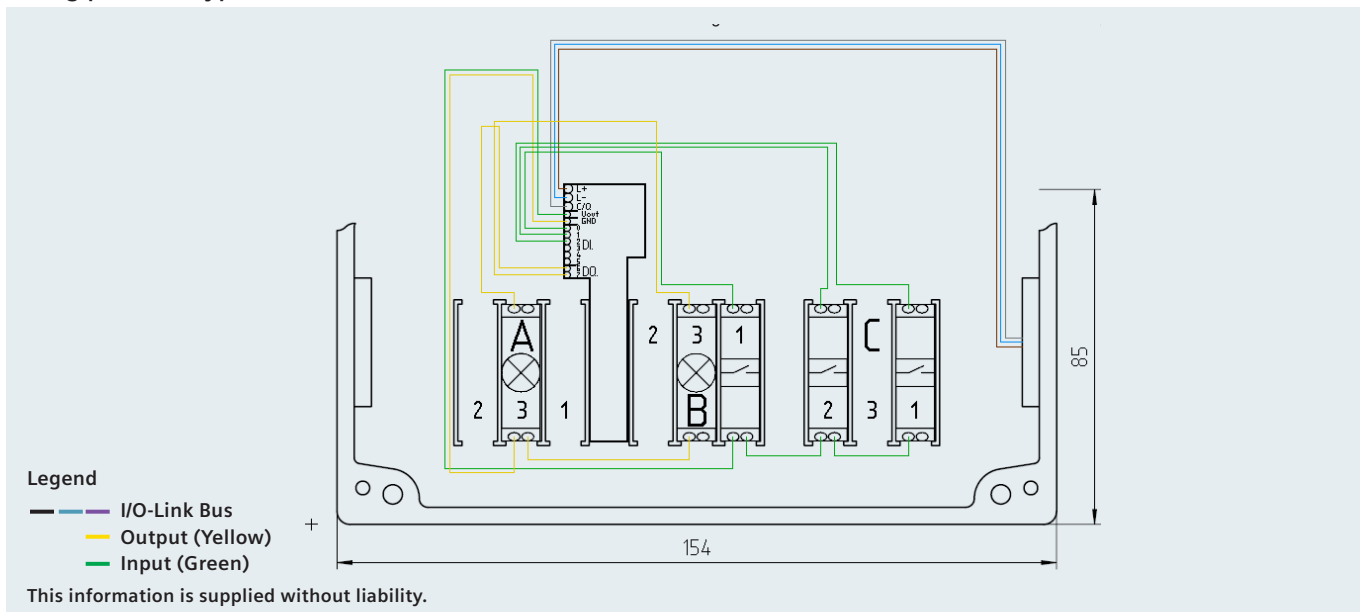


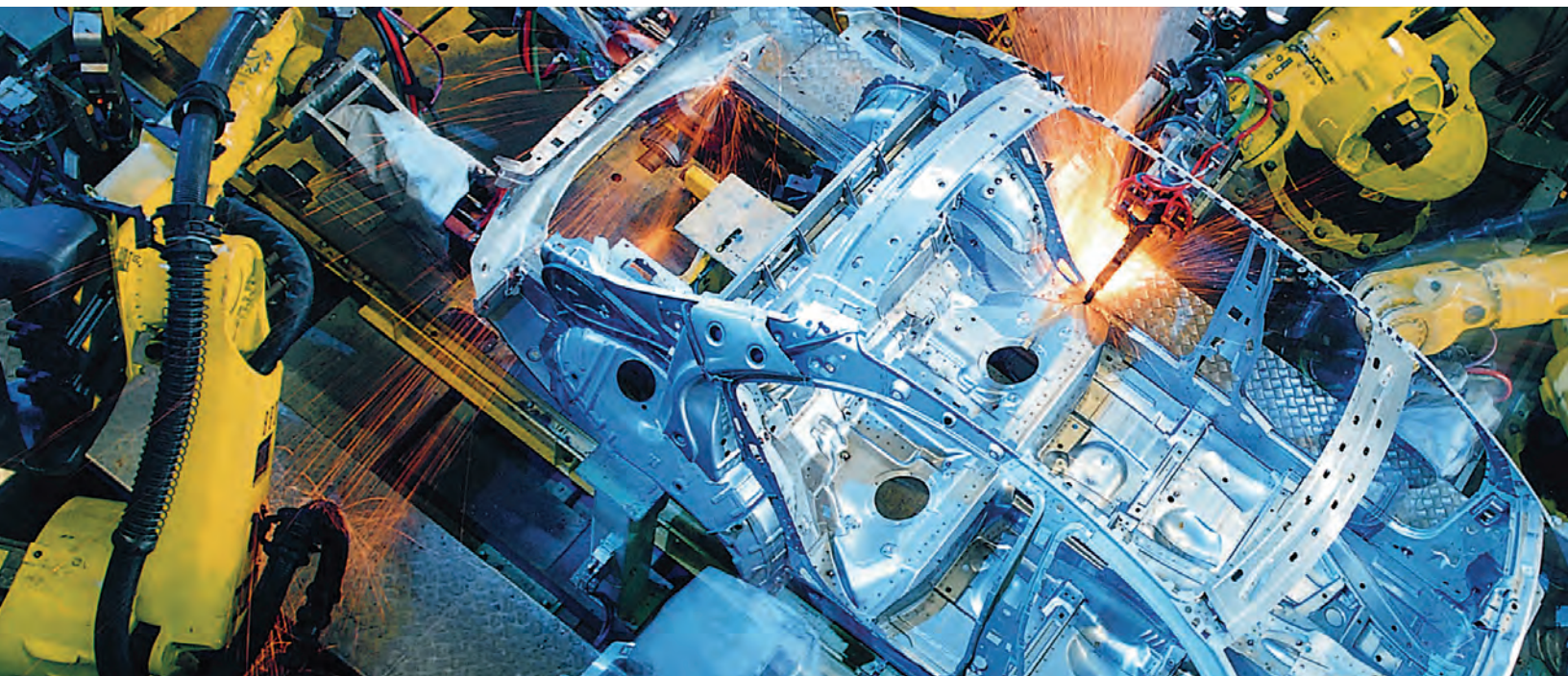
AS-i Safety Module



AS-i Link Enclosure

Wiring plan of a typical SIRIUS ACT AS-i enclosure





Siemens offers you the right solution for your application

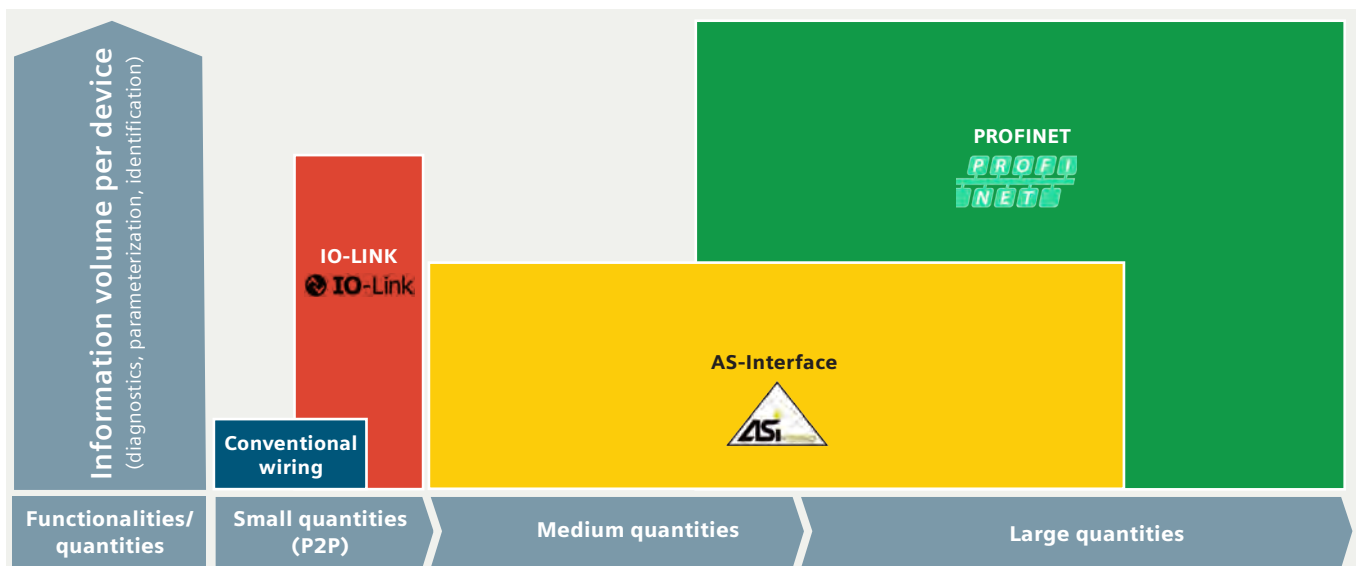
AS-Interface, IO-Link and PROFINET coexist in the Totally Integrated Automation (TIA) world of Siemens. Depending on your application, you can select and combine the communication system according to your individual needs.

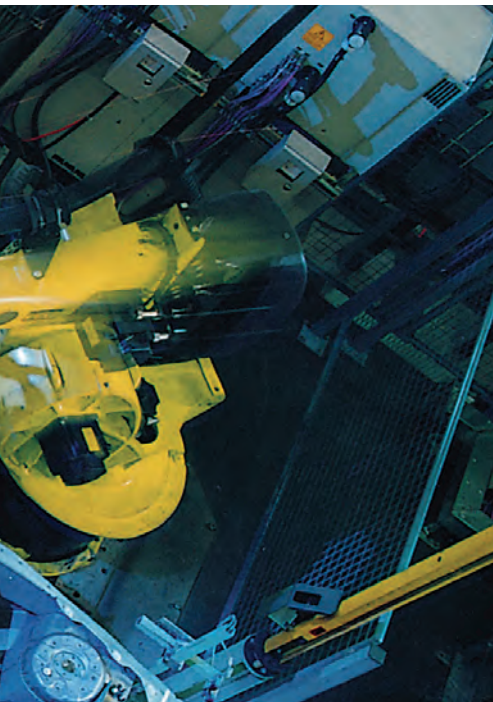
For applications with a low information volume per device, for example, digital sensors and actuators such as push buttons and a medium or high number of network

participants in the switching cabinet or in the field, the AS-Interface bus system is the system of choice.

Applications that require higher information volume per device for small quantities, for example, SIRIUS ACT ID key-operated switch in the switching cabinet or in the field, the point-to-point connection system IO-Link suits the best.

For highly demanding applications, Siemens also offers you the Ethernet-based PROFINET system.








TIA

Totally Integrated Automation

AS-Interface, IO-Link and PROFINET coexist in the Totally Integrated Automation (TIA) world of Siemens.

| | | Kind of the system | Data volume | Dimension | Infrastructure cabling | Safety | Supply of devices | SIRIUS ACT |
|-----------------------------|--|---|---|---|--|------------------|--|------------|
| Field bus / Network Systems | PROFINET  | <ul style="list-style-type: none"> • Network system • Max. 256 devices (w/o router) • Any topology • Real-time • Synchronous | <ul style="list-style-type: none"> • Max 1440 bytes I • Max 1140 bytes O • Parameters • Diagnosis date • Generic data (TCP/IP) | <ul style="list-style-type: none"> • Copper/segment: max. 100m • Optical/segment > 15 km | <ul style="list-style-type: none"> • Fiber optic • Coax • Twisted pair • IWLAN | Yes | Typically No, but possible with PoE (power over Ethernet) | ✓ |
| | AS-Interface  | <ul style="list-style-type: none"> • Field bus • Max. 62 devices • Any topology | <ul style="list-style-type: none"> • 4 I / 4 O • Parameters • Diagnosis data | 100m (standard), up to 600m | <ul style="list-style-type: none"> • Power supply • 2-core data cable • Unshielded | Yes | Power supply via data cable resp. via sensor/actuator connection | ✓ |
| Wiring | IO-Link  | <ul style="list-style-type: none"> • Intelligent point-to-point wiring system | <ul style="list-style-type: none"> • 32 bytes I/O • Parameters and diagnosis data | 20m | <ul style="list-style-type: none"> • 3-core data cable • Unshielded | No | Power supply via cable resp. sensor/actuator connection | ✓ |
| | Conventional wiring | <ul style="list-style-type: none"> • Point-to-point | <ul style="list-style-type: none"> • 1 I / 1 O | 600m | <ul style="list-style-type: none"> • 1-3 core data cable • Unshielded (digital) • Shielded (analog) | No (add. wiring) | Ext. supply | ✓ |

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Siemens Industry, Inc.
5300 Triangle Parkway
Norcross, GA 30092

For more information, please contact
our Customer Support Center.

Phone: 1-800-866-663-7324
E-mail: info.us@siemens.com

usa.siemens.com/sirius-act

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