The new inside:

AS-i Master SIMATIC ET 200SP

AS-Interface Master module from Siemens

The modular AS-i Master from Siemens

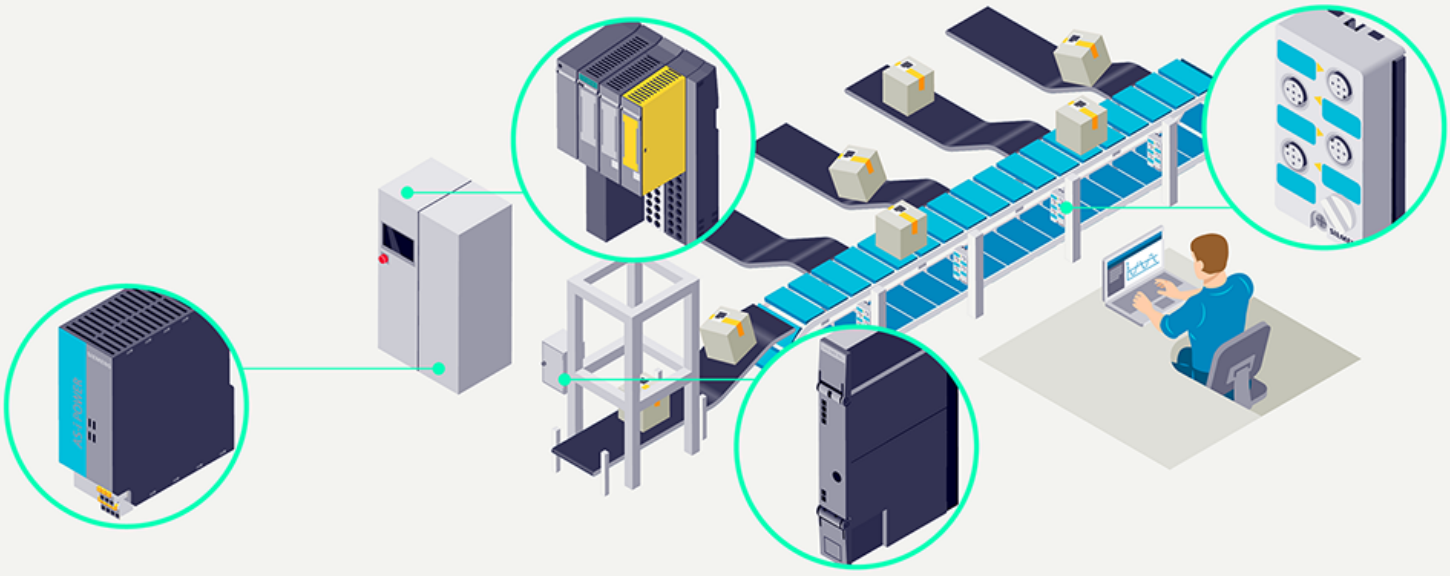
The AS-i Master communication module for SIMATIC ET 200SP was first launched on the market in 2013 and has since been very popular in logistics, mechanical engineering, process technology and production. For good reason: The AS-i Master module from Siemens is simply plugged into the distributed I/O system SIMATIC ET 200SP and is fully integrated into the Totally Integrated Automation concept. With a width of only 20 mm and extensive expansion options with regard to multiple Masters, safety applications and combinations with other ET 200SP modules, Siemens offers the ideal solution for every plant concept.

Now with new firmware version

The global chip crisis poses major challenges for all device manufacturers. In order to solve the extreme procurement problems for electronic components, Siemens has decided to redesign the AS-i Master. All components were checked and, if necessary, replaced by more available and future-proof components. A new firmware version has been created to match this. After only a few months, Siemens was able to start delivering the new version of the AS-i Master at the beginning of 2023.

Improvements in the new version of the AS-i Master

In addition to the goal of restoring stable delivery capability while keeping the same functionality, all components were



Example of application

selected in such a way that the AS-i Master can also be used at lower temperatures. The AS-i Master is now specified for operation in the ambient temperature range -25 ... +60°C. The internal system test was successfully carried out even at significantly lower temperatures.

Since the new components require less current, the new AS-i Master consumes around 10 % less power and thus contributes to improving sustainability.

The new layout offers scope for future ideas. The link to Technical Support is available on the siemens.com/as-interface website. By entering article number 3RK7137-6SA00-0BC1 as a product reference, users can forward technical questions about the AS-i Master or suggestions for optimizing the functions of the AS-i Master to Siemens.

AS-i system with PROFINET redundancy

With the new firmware, the AS-i Master can be used in a setup with PROFINET system redundancy R1 and the new redundant ET 200SP interface module IM 155-6 PN R1 and CPU S7-1500R/H. PROFINET system redundancy S2 is still possible with the AS-i Master and a suitable ET 200SP interface module IM 155-6 PN.

Applications in process technology

Siemens offers a block library for AS-i to easily integrate the AS-i Master and the connected AS-i modules into the SIMATIC PCS 7 process control system. On the website siemens.com/as-interface the link to the AS-i block library for PCS 7 is available.

Diagnostic options in the AS-i network

As a module of the ET 200SP, the AS-i Master is completely integrated into the SIMATIC system diagnostics. In the event of an error in the AS-i network, a meaningful alarm message is generated automatically and without programming effort, which can show the user the error type, the source of the error, the timestamp, possible causes of errors and suggestions for troubleshooting as text in several languages.

The alarms are stored in the diagnostic buffer of the SIMATIC CPU. The alarm text can be read via the TIA Portal, the web interface of the CPU, the display of the CPU or via an HMI panel. The TIA Portal provides a graphical representation of the AS-i network with online status as well as a comprehensive overview of the online status of the entire AS-i network. Furthermore, the counting of errors logged in the AS-i Master can also be displayed in the TIA Portal.

AS-i diagnostics in web browser

In addition, an AS-i diagnostics package can be integrated into the user program so that the online status is displayed graphically via a web browser or on an HMI panel without starting the TIA Portal. Since the diagnostics web pages are always accessed via the web interface of the CPU, protection against unauthorized access can be implemented particularly effectively and easily via the plant-wide cybersecurity concept.

Process data transmission with the AS-i Master in real time

The basic idea of AS-Interface has always been: The sensors and actuators, which are spatially distributed in a machine, should be connected with the shortest possible signal cables, and their signals transmitted in real time, whereby the system components are as easy to install as possible.

Since each sensor or actuator usually requires only one or two signals, only 4 inputs and 4 outputs are transmitted per AS-i address. This definition automatically achieves short transmission times. The AS-i Master from Siemens also transmits analog process data, which usually does not change rapidly, in real time.

And since the small AS-i modules are installed in a machine exactly where the sensors and actuators are located, only short signal cables are required. Thus,

the AS-i system saves enormous costs for wiring, assembly and troubleshooting.

For applications that require a higher number of process signals, a higher speed or additional technological functions in the distributed I/O, Siemens offers a large selection of PROFINET components in the existing portfolio that can be conveniently combined with an AS-i system.

System connection of IO-Link sensors

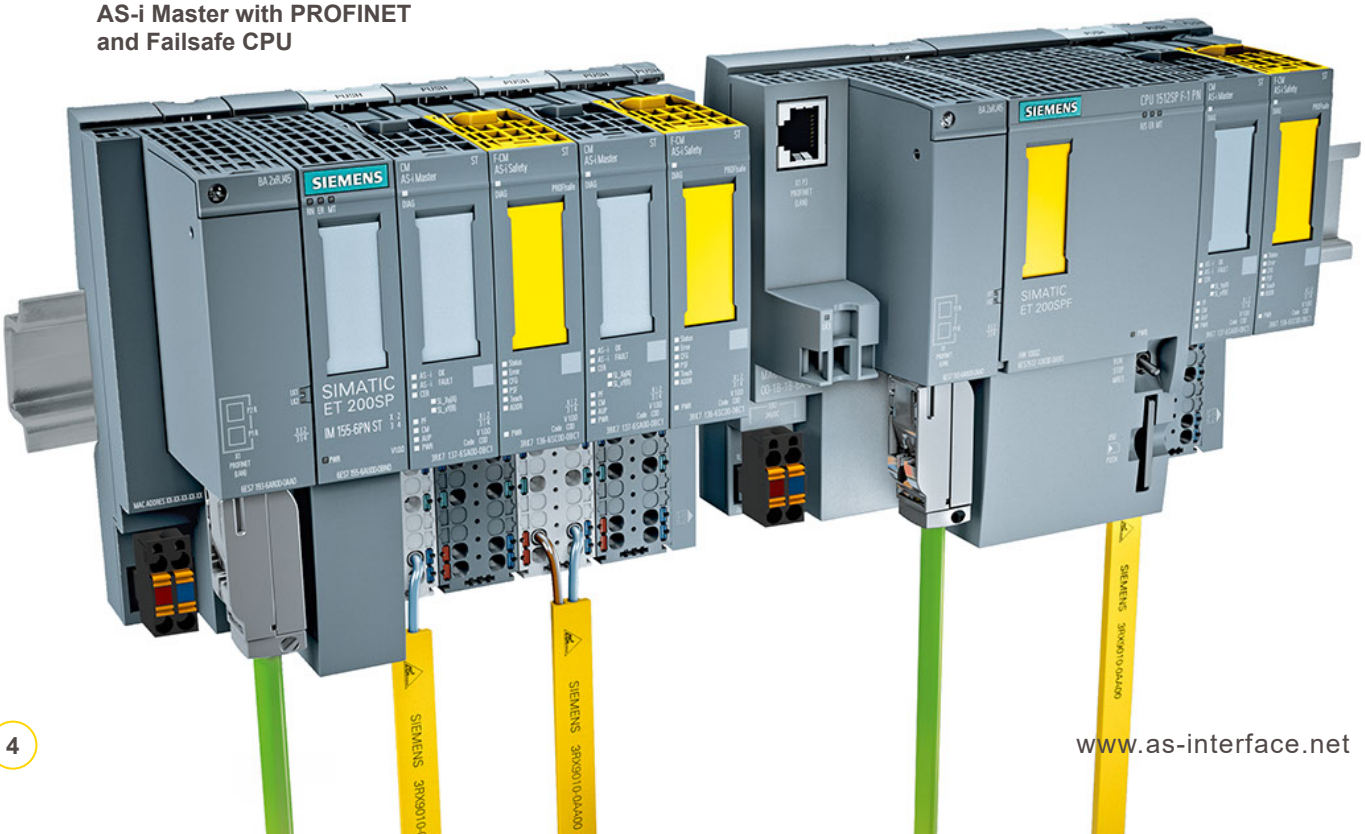
Siemens offers perfect solutions for IO-Link using SIMATIC ET 200 modules that are seamlessly integrated into the TIA concept. AS-i Master and IO-Link Master are simply combined side by side in an ET 200SP station, with practical independent configuration of the modules. The possibilities are presented on siemens.com/io-link.

EMERGENCY STOP buttons and safety-related signals in the AS-i network

AS-i Safety Modules for emergency stop or safety gates, etc. are plugged directly onto the AS-i cable in the machine - just as easily as with standard modules. The complex wiring of the safety sensors is reduced to a short signal cable from the sensor to the AS-i Safety module.

The AS-i Master from Siemens remains unchanged when extended to a safety-related AS-i system. The F-CM AS-i Safety module is additionally plugged into the ET 200SP station. The safety-related signals are forwarded to the SIMATIC F-CPU and processed there as usual in the safety program. Failsafe output modules or ET 200SP motor starters can be used for shutdown in the control cabinet.

AS-i Master with PROFINET and Failsafe CPU



The Siemens modular design allows you to change from a standard system to a safety-related system at any time. Configuration and programming are carried out completely in the TIA Portal - or with STEP 7 classic.

Use with Ethernet/IP or Modbus TCP and other higher-level systems

When using the ET 200SP MultiFieldbus Interface Module IM155-6MF, the AS-i input and output data can be docked to an Ethernet/IP or Modbus TCP system. The ET 200SP PROFIBUS interface module IM155-6DP is selected for a PROFIBUS connection. The AS-i Master from Siemens always remains the same.

Keyword OPC UA

The AS-i data can be accessed centrally via the OPC UA server of the SIMATIC Controller. In this way, the data is universally passed on to the IT system.

And for the I/O test of the AS-i modules during commissioning without a CPU, the PRONETA tool from Siemens is available for download. In this case, the AS-i Master from Siemens is capable of displaying the status of the AS-i Safety inputs.

The ideal AS-Interface solution for every plant concept: **AS-i Master SIMATIC ET 200SP from Siemens.**

More information: **www.siemens.com/as-interface**

Author: Ulrich Düsel

Product Manager AS-Interface,
Siemens AG in Erlangen

„AS-Interface from Siemens: Integration makes the difference“