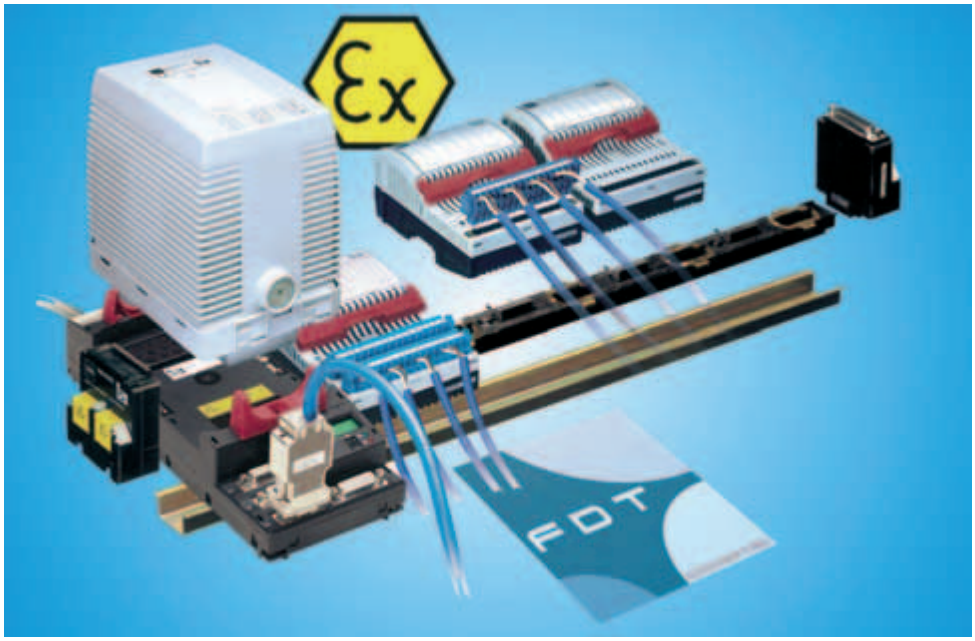
The easy way



Ex Remote I/O System with extended FDT/DTM functionality

Due to its support of the FDT/DTM technology and seamless integration into the remote I/O system, I.S.1 stays true to its basic philosophy: A remote I/O system for all Profibus DP masters implementing state-of-the-art technology that can be used easily, flexibly and at low cost.

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About five years ago, the R. STAHL Schaltgeräte GmbH introduced the second generation of its remote I/O system to the market. The I.S.1 system can be used in hazardous areas classified as Zone 1 or Zone 2, and can now be used in areas subject to the risk of dust explosions classified as Zone 21 or Zone 22 as well.

The input and output signals of the I/O modules comply with the requirements for the intrinsic safety Ex i type of protection. Communication with the automation system is performed using an intrinsically safe field bus such as the Profibus DP.

The best solutions for automation

The first generation introduced in the 1980's, the successful and widely used *ICS MUX* field bus system and the *VOS200* compact field stations derived from it, already contained intelligent field devices that could be integrated using the HART protocol and whose parameters could be set remotely. Due to the lack of standardised interfaces, the first versions used a proprietary service bus for communication. The HART management software from third-party vendors, of which there were only a handful at that time, ran autonomously on a service workstation in a safe part of the plant.

Since the HART protocol can utilise a wide base of installed HART field devices, and it is easy to obtain additional process and diagnostic information with it, the HART protocol is still commonly used in spite of all the new and modern bus systems and will not be replaced in process automation systems for years to come.

The remote I/O technology, as one of the best and most cost-effective solutions for automation tasks in hazardous areas, was a success and is still today the optimum, most effective solution next to the field bus technology. The cost advantages of this technology are apparent, in particular for distributed installation of a number of field devices or when connecting digital sensors.

Many improvements were implemented in the second generation of this technology, the explosion-protected Remote I/O System I.S.1, based on years of experience and discussions with customers.

The proven and innovative functions of its predecessor ICS MUX such as I/O modules and power supplies that could be swapped during operation in Zone 1, the hot-plug functionality and communication via an intrinsically safe (and possibly redundant) field bus were naturally retained and optimised. Simple installation technologies, simple to use in project planning, easy to install and operate, and the use of standard interfaces quickly made this system the market leader as well.

Furthermore, it is possible to "hijack" the HART information from intelligent field devices into an autonomous HART management system for diagnostic and service purposes using the proven service bus and special drivers.

New and significantly more flexible methods

With the introduction of the Profibus DP V1 and the progressive increase of process control systems supporting this protocol, the possibility to use new and significantly more flexible methods was opened. The separately installed service bus is not the only way to exchange HART information with HART management tools or to set parameters or perform diagnostics from the control desk or control room. The Profibus DP V1 HART has been available as an alternative for several years. Since the integration of HART multiplexer functionality in the HART analogue input and output module of the I.S.1 system was a permanent component of the sys-

tem right from the start, no hardware changes or extensions were required to utilise I.S.1 for HART management tasks.

A uniform and manufacturer-independent interface for intelligent field devices and control systems was created with the rise of the new FDT/DTM technology introduced in 2001.

The advantages of this technology, in particular that it is equally suited to support simple field devices as well as complex automation systems, makes it especially interesting to device and system manufacturers.

This means it can be expanded accordingly and guarantees that existing and future requirements will be met. Due to the refinements, increasingly widespread use and acceptance of the FTD/DTM technology, the integration of intelligent HART field devices from various manufacturers into control systems and asset management software tools becomes easier and easier.

For about three years now the I.S.1 system has provided the user with the ability to combine HART management systems with HART field devices using a DTM. With the implementation of the HART gateway DTM in I.S.1 on the basis of the Profibus DP V1 HART specification, HART information from all HART field devices can be exchanged through the remote I/O system with all FDT master programs.

An increased range of functions

The functionality for transferring HART secondary variables cyclically to the automation system via the Profibus DP has already proven to be particularly advantageous in some projects. This permits valuable additional information on process control and preventative maintenance to be obtained, which increases the efficiency and level of acceptance of the installation.

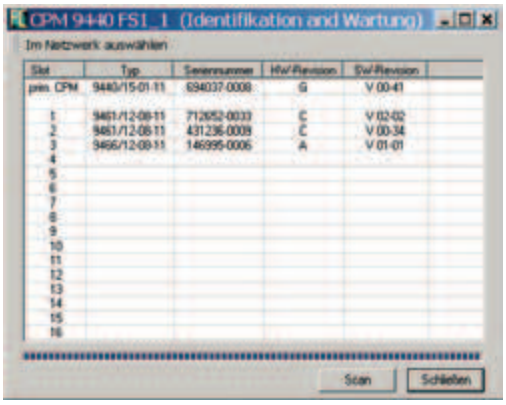
While only the basic functions for communication with HART field devices was available in the first, original version, the new Version 2 now offers the user an increased range of functions and improved functionality.

Version 2 DTM supports automatic topology generation using a bus scan. This means that HART field devices do not have to be added manually any more, but can be detected and entered in the project topology of the FDT master "fully automatically". Of course, the FDT master program used must support this practical and time-saving function.

Otherwise, the only other more or less practical option is to enter the information manually in the device. The basic requirement for automatic topology generation at the Profibus level is the ability of the DTM of the DP V1 master to set the slave address. This functionality was also introduced in Version 2 of the DTM for this reason. The Profibus DP V1 master can search through the entire address space of a Profibus network and insert the DTM corresponding to the DP or PA devices found into the project topology of the FDT master.

The heart and brain of every I.S.1 system is the CPM, which supplies the intrinsically safe power for the I/O modules and controls communication between the control system and the I/O modules. In the latest release of the DTM, the user is now provided with important diagnostic information from the CPM and I/O module of the remote I/O system, which returns detailed information on any transmission problems existing between HART field devices and the DP V1 master and makes finding and eliminating errors much faster and easier.

The function for generating a HART Live List is also new. This means that you can now check which inputs and outputs of an I.S.1 field station are used by the HART field devices connected to it for communication regardless of the HART maintenance system connected. This makes it much easier to check the connection during start-up and maintenance, and also accelerates the scan procedure performed during automatic topology generation.



Example of a HART Live List

I.S.1 identification information

Version 2 also has some new functions for reading system information. Using the "Identification and Maintenance" function, you can read hardware and software information such as the "model number"; "serial number" or hardware and software release numbers from all installed modules of the selected I.S.1 field station that can be reached and present the information in a table. This is an invaluable aid when servicing or validating equipment that requires FDA validation, for example.

The new online help system provides inexperienced users with support and also provides pro's with valuable extra information to facilitate fast and error-free parameterisation of the system. The result is that the already very simple and flexible project planning process for an I.S.1 system is not much more complicated even though there is extended functionality available.

The ability to switch languages is an important feature for international acceptance and operability of the system. The user can switch here between German and English, although additional languages can be implemented if required.

HART gateway DTM for each project volume

The HART gateway DTM for the Remote I/O System I.S.1 is available in various versions for different configuration stages. Depending on the size of the project and the number of HART field devices, the user purchases license keys for 30, 100, 300, 1000 or over 1000 devices and therefore only pays for the functionality he actually needs.

There is a free demo-version available to test the HART gateway DTM that has the same functionality as the full version but is restricted to only one parallel communication channel to HART field devices. The demo-version can be downloaded from the Internet from the I.S.1 home page.