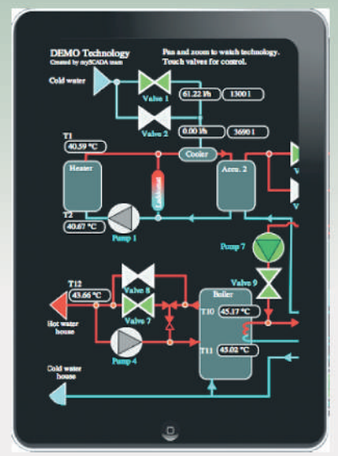
Another option is to display data in a web browser. As already mentioned above, the communication module has a built-in web server on which visualization may be located. Using this visualization it is not only possible to inspect the operation of the PLC, but also to change the parameters.
Supported products include iPhone and Apple iPad. For these devices there are direct applications to access Transdatic. As in the previous case they enable option of inspecting the operation and changing the parameters.



Sending Emails

Among others, the Transdatic system, more specifically its communication module, is equipped with an SMTP server which enables sending reports on the status of monitored equipment to preset email addresses.

Technical Parameters

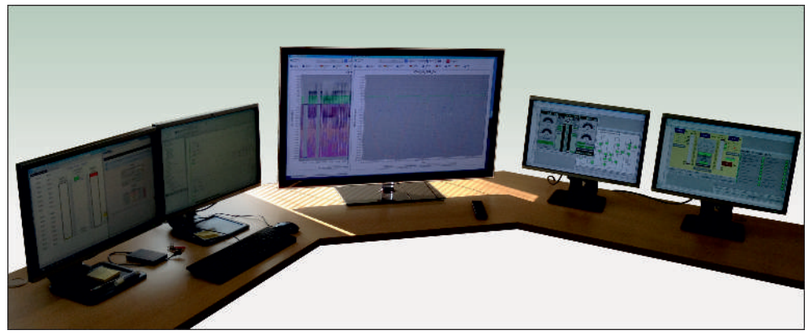
WAN connection	1x Ethernet connector RJ45 (10/100Mbit/s) GPRS modem, support of GPRS, EDGE, 3G (external antenna)
PLC connection	1x Ethernet connector RJ45 (10/100Mbit/s) 2x serial line RS485/422 through connector RJ45
Protocols	Ethernet/IP (Rockwell Automation) ModBus TCP
Other SW equipment	WebServer, SMTP server, DHCP server
Memory	Memory card type microSD (4GB as standard), slot accessible from the frontal panel
Status indication	using three status LEDs on the front panel
Input voltage	12-30V DC (typically 24V DC)
Input current	250mA (max. 400mA at 24 V DC)
Real Time	Real Time Clock(RTC) circuit backed up by a battery, Internet synchronization using NTP server
Operating temperature	0 to 55°C usual design up to 75°C in the special industrial design
Weight	480g (without GSM antenna)
Assembly	On a standard DIN rail
Dimensions	129 mm x 34 mm x 168 mm excluding bracket for DIN rail and antenna connector 146 mm x 34 mm x 180mm including bracket for DIN rail and antenna connector.

INCO engineering s.r.o.
Thámova 13
186 00 Praha 8
Česká republika
sale@incoengineering.cz
www.incoengineering.cz

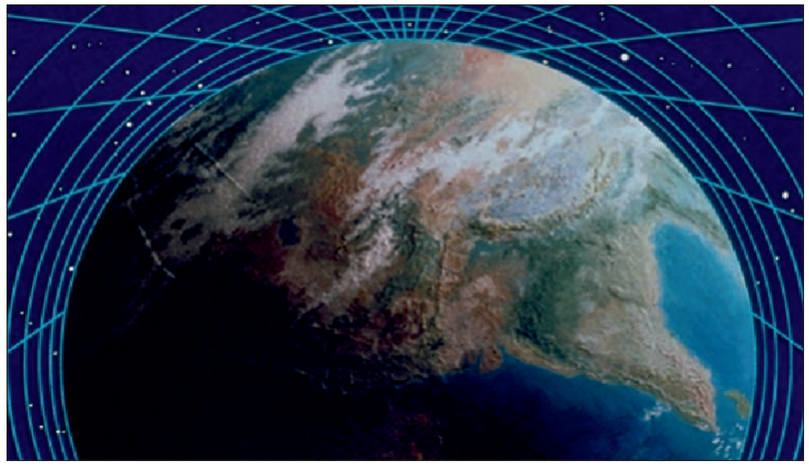
Transdatic System for Remote Service Monitoring of Winders

Use

Transdatic system was developed and field-tested for the execution of remote service monitoring of our winders and other equipment, controlled by programmable logic control systems (hereinafter referred to as PLC), or through multiple PLCs that are interconnected through a redundant network.
Transdatic allows remote monitoring - virtually from anywhere in the world - of operating and possible faulty conditions of the selected winder or other equipment. Data is transmitted, at a high level of security, to the central service center, which forms part of the service and assembly center of INCO engineering company (Karviná, Czech Republic).



Using this technology it is possible to visualize and evaluate the operating conditions of the machine, change its remote setting of individual parameters in the control programs and, in the most secured mode, even modify or completely replace the algorithm of the control programs. In addition to visualization and data analysis, parameter changes, or modifications to algorithms of the control programs, the operationally critical data may also be archived in the service center. The data as such may be used to analyze past events and, in addition, Transdatic system doubles as an external tachograph.
The basic element of the Transdatic system, in addition to its SW equipment, is the communication module. It is equipped with an SMTP server, which enables sending of e-mail reports to preset e-mail addresses concerning operational conditions of the machine.



The remote service monitoring system represents a very progressive service means, through which our in-house specialists may remotely monitor the status of the winder and, in the case of failure, either perform a remote repair by changing the parameters, or by providing on-phone assistance our local service

We believe in innovative perfection...

organization, which is established and operated by our company in all countries. It is also possible to give advice and guidance to remove the fault by phone directly to employees of the operator. Transdatic system further has the following advantages:

- Perfect overview of the machine operation - on a laptop, mobile phone, etc.
- Reduced downtime during service interventions - remote connectivity even with a slow transfer rate is faster than the arrival of service technician.
- Reduced service costs - cost of connection and operation of the system are lower than the arrivals of a technician, both from local service organizations, and particularly from the Czech Republic.
- Possibility of a thorough analysis of the most common failures and their prevention or algorithm optimization.
- Possibility of flexible changes to the algorithm, depending on changes in technology, such as the addition of other sensors and devices.

Description

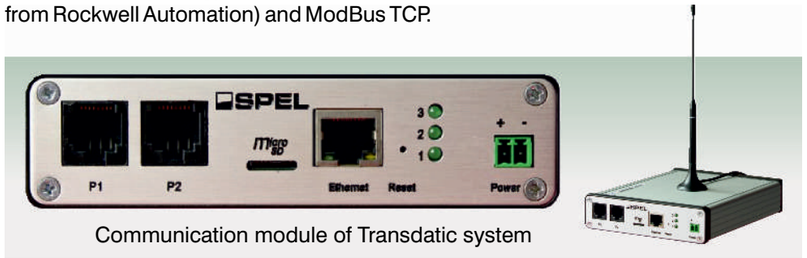
The communication module of the Transdatic system is designed for installation into the control switchboard of the winder or into another device. The control PLC or the PLC set is connected through the Ethernet interface using standard UTP cabling. In the case of multiple programmable logic controllers (PLC sets) an additional switch is used.

The communication module is connected to WAN (Internet) directly either via Ethernet interface and the normal UTP cable or via mobile networks through GPRS/EDGE/3G modem. There is also an option which includes connection via WiFi router and a version with two inputs for the WAN. For example, it is thus possible to have local Internet connection on one input and an ADSL modem or Wi-Fi router on the other, thereby achieving a double (back-up) Internet access in case of failure.

An encrypted private network VPN (Virtual Private Network) is used for connection to a central control center. Supported protocols are PPTP (Point to Point Tunneling Protocol) and IPSec.

Point-to-Point Tunneling Protocol (PPTP) is a way of implementing a virtual private network. It is a simpler protocol than IPSEC with less options as well as somewhat lower level of security. Nevertheless, its advantage consists in the direct support of virtually all operating systems, without having to perform additional installations. The communication module may work as a PPTP server (in this case it is necessary to have a public IP address) or PPTP client (in this case it communicates with the VPN server, which is located in the service center, and which must have a public IP address).

In terms of technology the communication module supports Ethernet/IP (PLC from Rockwell Automation) and ModBus TCP.



Communication module of Transdatic system

Security

An important role in the transmissions over public networks is played by the security of data transmission. As already mentioned above, there is an encrypted VPN tunnel between the communication module and the service control center.

There may be even a multiple-digit coding. Usually 3DES is used. Triple DES algorithm represents a triple application of a DES encryption. The most commonly used option of 3TDES works with a total key length of 168 bits (3x56bits)

Remote Management

At the moment when an encrypted tunnel is created using VPN, the device (PLC, operating panel, etc.) at the other end of the tunnel behaves as if it were connected directly to a PC or local network.

At this point it is possible to:

- Change the parameters of the executed program
- Change the control algorithm in the PLC or in the operating panel, e.g. software upgrades, extension of technology, or during emergency operation
- Download the stored operational data recorded in the last weeks and months (or longer periods)
- Diagnose the status of individual PLCs, sensors, communication networks, etc.

This way it is possible to manage the entire PLC network located virtually anywhere in the world.

Data Archiving

In its internal memory the Transdatic system stores operationally important data. This data may be sampled using a fixed time period, or the data storage may be conditioned by a change in the observed value. The data is stored inside an internal SQL database. Data recording is executed on removable high-capacity microSD memory card.

To access the archived data (history, analysis, report generation, etc.) programs such as Historian and Alarms & Events are used, which form part of the product.

Exact time of data recording is vital while performing a reverse data analysis. Sometimes the reverse analysis of the sequence of events in the PLC network is complicated by the fact that each PLC has a different system time. For maximum accuracy the communication module is equipped with its own circuit of Real Time Clock (RTC), which also may be synchronized according to any of the time servers (NTP server) on the Internet. This guarantees achievement of a deviation of less than 1sec.

Data Visualization

Enclosed programs, such as Historian, Alarms & Events are used for visualization. Using them it is possible to easily create tables, reports and various graphs. These programs are used particularly for detailed analysis of data.