MB CONNECT LINE
remote maintenance solutions

Systematic remote maintenance
of systems and machines
SECURE – EFFICIENT - SCALABLE

Ideas and solutions for remote maintenance.

Company profile
MB Connect Line GmbH

The MB Connect Line GmbH offers universal solutions for worldwide remote maintenance of machines and equipment. The company was founded in 1997 by Werner Belle and Siegfried Müller and set value on "Made in Germany" from the beginning. The Headquarters including Sales is located in Ilsfeld. Technical Development and Production are located in Dinkelsbühl.

The industrial router mbNET MDH8xx feature an integrated 4-port-switch. S7-controls can be connected directly via the MPI/Profibus-interface. Furthermore over 90 different drivers from different manufacturers are available for the serial access to controls, operator panels, frequency converters and drives.

The remote maintenance-portal mbCONNECT24 is an intelligent exchange system with integrated user- and facility administration. In case of machine faults, the service specialist can log in to the platform and gain access to the machinery and equipment which is approved for him. The connection is established with a single click.The data transfer itself takes place over secure VPN connections based on the OpenVPN security protocol.

For machine builders and plant operators who want to implement their own service portal within their corporate network, mbCONNECT24 is also available as a pre-installed hardware system called mymbCONNECT. It takes over the complete connection management as the backbone of the service center.

The specialists at MB Connect Line have years of experience and extensive know-how. Customized solutions for customer-specific tasks are a strength of MB Connect Line. This might include the implementation of proprietary protocols and the integration of special hardware, such as the Cisco ASA. No matter if packaging machines, production lines, solar power plants, printing units or biogas plants – MB Connect Line has the suitable remote maintenance solution.

Content

Remote maintenance for effective diagnostics and more service

Remote maintenance is an efficient way to essentially improve the availability and productivity of machines and production lines. When errors or machine downtimes occur, the manufacturer's specialists will be consulted within minutes.

The expert knowledge of the manufacturer's service allows an immediate diagnosis of the cause. If a larger machine failure occurs, the service technician can be sent with the required spare parts immediately.

Further fields of application for remote maintenance are the support of the operators when any questions about operating a system occur and the support during retrofitting or extension of a line.

Generally, remote maintenance offers an integrated service to the machine manufacturer during the complete operating time; from the start up to the maintenance and through to retrofitting. The advantages are obvious. The operator has an optimally mainttainded system with maximum availability and the manufacturer has additional gains through service contracts.

MB Connect Line modular system
The main system components

The mbNET industrial router, in different versions, provide a secure and reliable connection of machines and systems via the Internet.

The mbNET industrial routers are designed specifically for industrial use. They provide a secure and reliable connection of machines and industrial equipment via the Internet. The compact metal housing fits into every switch cabinet and with its variety of interfaces and device drivers the mbNET is the perfect system for remote maintenance of various control systems. Access to the Internet can be made via the company network, the integrated modem activation (PSTN, ISDN, GSM, GPRS, EDGE, UMTS, LTE) or via a broadband connection (DSL). There is an appropriate mbNET industrial router available for almost every on-site infrastructure.

mbSPIDER - The programmable data modem with alarm feature and web visualization for regulating, controlling and visualizing.

The programmable data modem with alarm feature and web visualization is used to record consumption data and for the monitoring of equipment and system components. With the mbSPIDER counter readings, measured values, logic states and analog values can be recorded continuously. All measured values can be displayed, analyzed and visualized via a web browser - even on a smartphone or tablet. All relevant data of the connected devices will be easily saved by script execution. The reading of the data and the signal pre-processing are freely programmable via scripting language. The user can also define which notice or alarm message will be sent via SMS or e-mail as soon as a specific event occurs or a limit value has been exceeded.

MB Connect Line modular system
## The main system components

The core of the modular system is the intelligent exchange system mbCONNECT24. This service portal provides the connection of computers, smartphones or tablets - via a secure connection - to the individual machines / equipment. The convenient user and machine management allows the control of remote maintenance with a few clicks.

All activities on the portal are recorded in a detailed connection report so that they can be analyzed at all times, who when and what actions were taken. These reports help the service technicians to keep track of the services for proper invoicing; the connections reports are customizable by job numbers. Sorting and filtering capabilities for various factors, including the export of data to a PDF or CSV file, complete the convenient reporting system.

mymbCONNECT24 is the combination of VPN portal and server hardware. It combines the advantages of a portal solution with the specific requirements of your business. Administration including hardware remain in your company.

As intelligent exchange system with integrated user and equipment management, this combination of VPN-portal and hardware connects user-accounts for the service personnel as well as mbNET-accounts for machines and equipment.
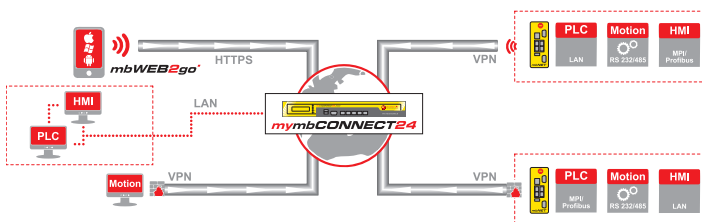
The mymbCONNECT24.hosted portal is hosted on a dedicated server and can be accessed directly via a private IP address.

Also here the administration remains in your company - MB Connect Line takes care of the rest.
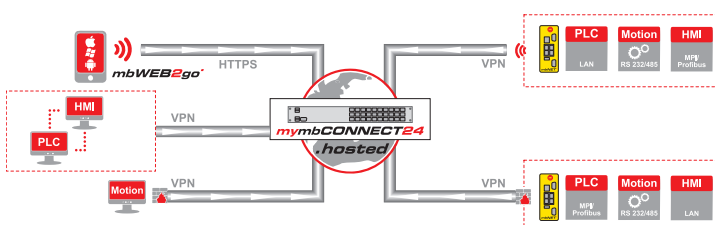
Application examples from practice

Remote maintenance of wind turbines

Wind turbines are becoming increasingly more important in the production of electrical energy. Wind is not only an energy source but also a force of nature. Besides extreme wind the wind turbines are exposed to severe shock and vibration. Furthermore they are built in remote areas or offshore and are therefore difficult to access. Consistent and reliable monitoring via remote maintenance access helps you avoid unplanned downtimes or outages. To provide a flexible and reliable connection to the control center the remote maintenance specialists of MB Connect Line have developed several solutions. Through the increasing use of renewable energies the energy supply is to become resource-efficient and eco-friendly in the future.

The greatest potential is attributed to the wind energy but it sets highest requirements to technology and material. Moreover enormous efforts are necessary to produce electric energy from gusty winds with varying intensity and direction, which provides suitable values for the infeed to the grid concerning voltage, frequency and phase angle. To ensure a failure-free operation despite all the adverse conditions and enormous material stress a continuous condition monitoring is vital. For this purpose the wind turbines have a comprehensive sensor technology for the continuous monitoring of their mechanical components.

Remote maintenance of packaging machines
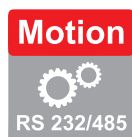
In today's equipment manufacturing industry, most successful companies recognize the importance of offering customers high quality services over the entire life cycle of a machine or personalized service. Cost efficiency is possible through a modern communications infrastructure - for example via a web-based service portal and corresponding intelligent devices. After years of research and development the dedicated developers of MB Connect Line, have developed various remote maintenance solutions for your packaging machines.

Manufacturing companies have to react faster and faster to changing requirements of trade and customers. Especially in the cosmetics- and food producing sector constantly new variants, packaging sizes and flavors are in demand. An equipment downtime isn't just annoying but also really expensive. With a flexible remote maintenance solution – for example via a web-based service portal and suitable intelligent end devices – the down times can be reduced considerably. With the industrial routers mbNET and the remote maintenance portal mbCONNECT24 MB Connect Line has the suitable solution for your packaging line.

Application examples from practice

## Remote maintenance of production facilities

PLC

MPI/ Profibus

For machine and plant manufacturers that need to meet high export share, the role of remote maintenance is strategically important. During the actual implementation phase many technical and organizational questions arise regarding connection management, data security and access protection. In the following sections we will provide some great solutions for overcoming the challenges of maintenance using the central portal solutions of MB Connect Line. Anyone with experience in the installation of a remote maintenance system knows the typical scenarios that can occur. In some companies the IT Department does not allow dial-ups from the outside to the machine for security reasons.

Other users operate a mobile UMTS machine that cannot be accessed from the outside due to the system. In other cases, the machine can indeed connect to the Internet - but the providing of the public IP address is very intricate. An intelligent exchange system which continuously collects data from the machine and may be read at any time solves this problem. The manufacturer can define individual rights for each service specialist in the form of closed user groups and thus ensure a targeted maintenance and monitoring.

Remote maintenance of photovoltaic systems
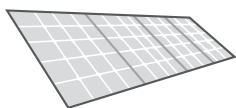
Through the increasing use of renewable energies the energy supply is to become resource-efficient and eco-friendly in the future. Accordingly the generation of electricity through the use of solar powered panels is increasing. The used photovoltaic modules, power lines, inverters or other electro-technical devices are exposed to various risks, such as high winds, hail, lightning or broken cables. Inverters can break due to faulty fans and reduce electricity production. That's why continuous monitoring is important – for example via a web-based service portal and corresponding intelligent end devices.


The remote maintenance specialist MB Connect Line has developed a flexible solution for exactly this. PV systems can be found in various dimensions from garage tops to factory roofs up to huge outdoor facilities. In addition to the weather conditions, faulty components such as broken cells, defective inverters and contact problems due to aging can eventually lead to power reduction or a total failure. The profit cuts could be serious if the power loss is not discovered until the annual reading of the energy meter.

Easy - Secure – Flexible
the fastest way to bring machines online

Establish a secure connection to the portal server mbCONNECT24 with our free client software in no time at all.
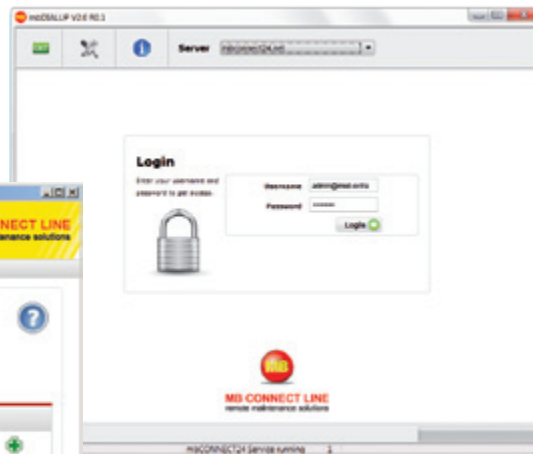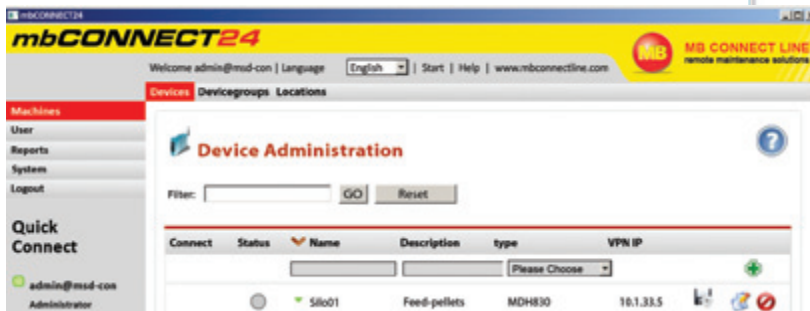
Create a new machine in the user menu in a few steps and then save your settings on a USB flash drive.

Insert the USB-stick in the mbNET. The configuration will be read out and the machine is in the network. Done!

fast
Machines and equipment of your customers are only one mouse click away.

secure
Connections will always be established towards the portal, never the other way around.

flexible
Query of capacity utilization and material consumption to optimize the current maintenance.

mbCONNECT24.net Highlights

VPN/Security	OpenVPN with certificates and username / password.
Availability	Professionally hosted with 24 / 7 monitoring. Availability at least 99%.
Client software	Free mbDIALUP download on the Internet.
Hardware	All mbNETs and mbSPIDERs
License	**Free for 1 active connection and 1 device. Extra accounts and device connections are available for additional costs.**
Functions	■ Assignment of access rights within groups or individual users (e.g. external programmers). ■ Complete management of all machines on one surface ■ Quick Connect Technology. Direct selection of the machine via location- or customer filter. ■ Storage of all connections

Secure remote maintenance via our web portal www.mbCONNECT24.net

mbCONNECT24.net offers a secure remote maintenance web portal and is a central plattform for remote maintenance via internet. Over the 'intelligent exchange system' portal the manufacturers or service providers can access the machines and equipment of their customers via mouse click. The mbNET® industrial routers are installed on the machine side. They register themselves on the portal and are available over it. For each system it can defined individually, whether the router always logs on to the portal as soon as it will be provided with electricity, or only as needed. The connection establishment to the portal can be made manually over the "DIAL OUT" button or from the system control over a signal at the digital input of the router. With these mechanism the operator decides when access is allowed to specific systems. If the router features a modem, the log on to the portal can also be initiated by incoming call or by SMS from the outside. The portal is being hosted by a high-performance computing center and offers a network availability of over 99% with a redundant connection and 365/7/24-monitoring. mbCONNECT24.net offers together with the different mbNET ®-types UMTS/LTE, modem and WAN continuous solutions, independent from the infrastructure on site.

Your benefits from mbCONNECT24.net

- Your data around the remote maintenance are bundled at one place
- You will get a central user- and machine-administration
- Instead of notes with IP-addresses and telephone numbers you can use the portal as comfortable exchange system.
- You have access over each internet connection, also as mobile user

mbCONNECT24.net offers security

- You have a secured area as closed user group
- On the service- and machine-side you only work with outgoing internet connections
- Encoded data transfer based on OpenVPN

Secure remote maintenance with your own server

mymbCONNECT24-Server

**mymbCONNECT24.midi**   **mymbCONNECT24.maxi**

	mymbCONNECT24.midi	mymbCONNECT24.maxi
max. users	250	1000
max. devices	250	1000
max. active connections	50	150
max. accounts	5	25
processor	Intel ATOM - 1,1 GHz	Intel ATOM - 1,6 GHz
RAM	512 MB	1,5 GB
ports	1x WAN / 1x VPN / 2x LAN 1x RS232 Console / 2x USB	1x WAN / 1x VPN / 3x LAN 1x RS232 Console / 2x USB
chassis-type	Compact Size Chassis	19" Rack mount Chassis
size in mm	275 x 43,5 x 180 (W x H x D)	426 x 43,5 x 228,6 (W x H x D)
extra features	-	LCD Display

mymbCONNECT24.hosted

performance class	M1	M2	L1	L2	L3	XL
max. users	unlimited	unlimited	unlimited	unlimited	unlimited	unlimited
max. devices	250	1000	2500	5000	10000	20000
max. active connections	25	50	75	100	150	250
max. accounts	5	5	5	5	5	5
data throughput	10 Mbits/sec.	20 Mbits/sec.	100 Mbits/sec.	100 Mbits/sec.	100 Mbits/sec.	1 Gbits/sec.

Secure remote maintenance
with your own server mymbCONNECT24

mymbCONNECT24 combines the advantages of a portal solution with the specific requirements of your business. You do not want any tunnel endpoints outside of your company? You would like to keep the administration including hardware in-house? Then mymbCONNECT24 is just right for you. As an intelligent exchange system with integrated user and installation management this combination of hardware and VPN portal integrates both, user accounts for the service personnel and mbNET accounts for the machinery and equipment. Depending on the configuration the system is always logged on to the portal or as user-defined, if required.
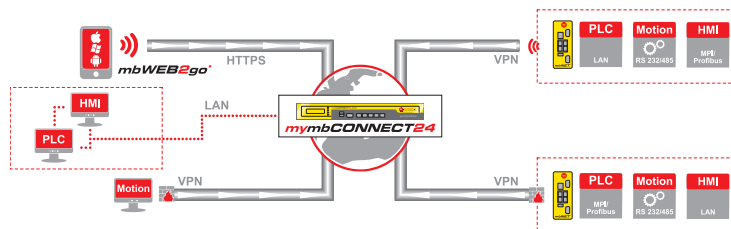
It does not matter whether the provider allocates changing or private IP addresses because the connection is always being established from the user or from the machine to the portal. This also has the advantage that the firewall can be configured at both ends so that the connection is generally blocked from the Internet. This means a high level of protection against unauthorized access. The data transmission itself takes place over secure VPN connections based on the security protocol OpenVPN. The registration for mymbCONNECT24 takes place via free client software, which handles the authentication automatically. Fast and universal.

You will be connected in seconds via mouse click. The remote maintenance of components such as S7 PLCs, drives, control panels and industrial PCs is then completely transparent with the existing configuration software.

mymbCONNECT24.hosted

The mymbCONNECT24.hosted portal is hosted on a dedicated server and can be accessed via a private IP address. The hosting of a high performance data center guarantees an annual average system availability of 99.9%.
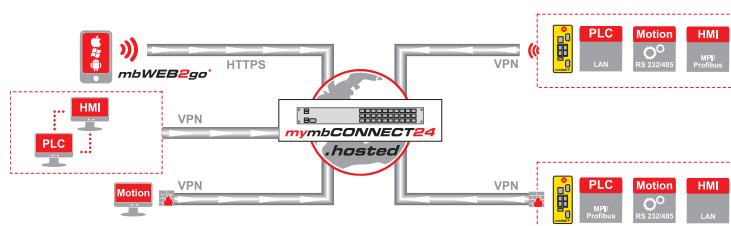
- No additional requirements or retrofitting required
- Continuously progressing state of the art
- Complete scalability
- Personal external server
- No acquisition-, maintenance- or repair-costs of the hardware

mbNET.toolbox

The mbNET.toolbox offers a number of software enhancements for the mbNET Industrial router. It contains a web visualization system, an easy to use scripting language, a database and FTP-Server/Client-function. The mbNET.toolbox is optimized for smartphones and tablet PCs. Users simply log on to the remote maintenance portal mbCONNECT24 via username and password over the mobile web access mbWEB2go. Also for individual remote maintenance solutions security is important.

- Access to router interface and protocols
- Communication of the user programs via TCP / IP, ModbusTCP and S7-ISOTCP or the switchable serial RS232/485 interface
- The supplied widgets for the visualization system (display and control elements) are linked with an integrated database
- Easy to structure visualizations, without HTML or any extensive programming knowledge
- Web visualization optimized for smartphones and tablet PCs, works with any standard browser without special client software or additional extra-app
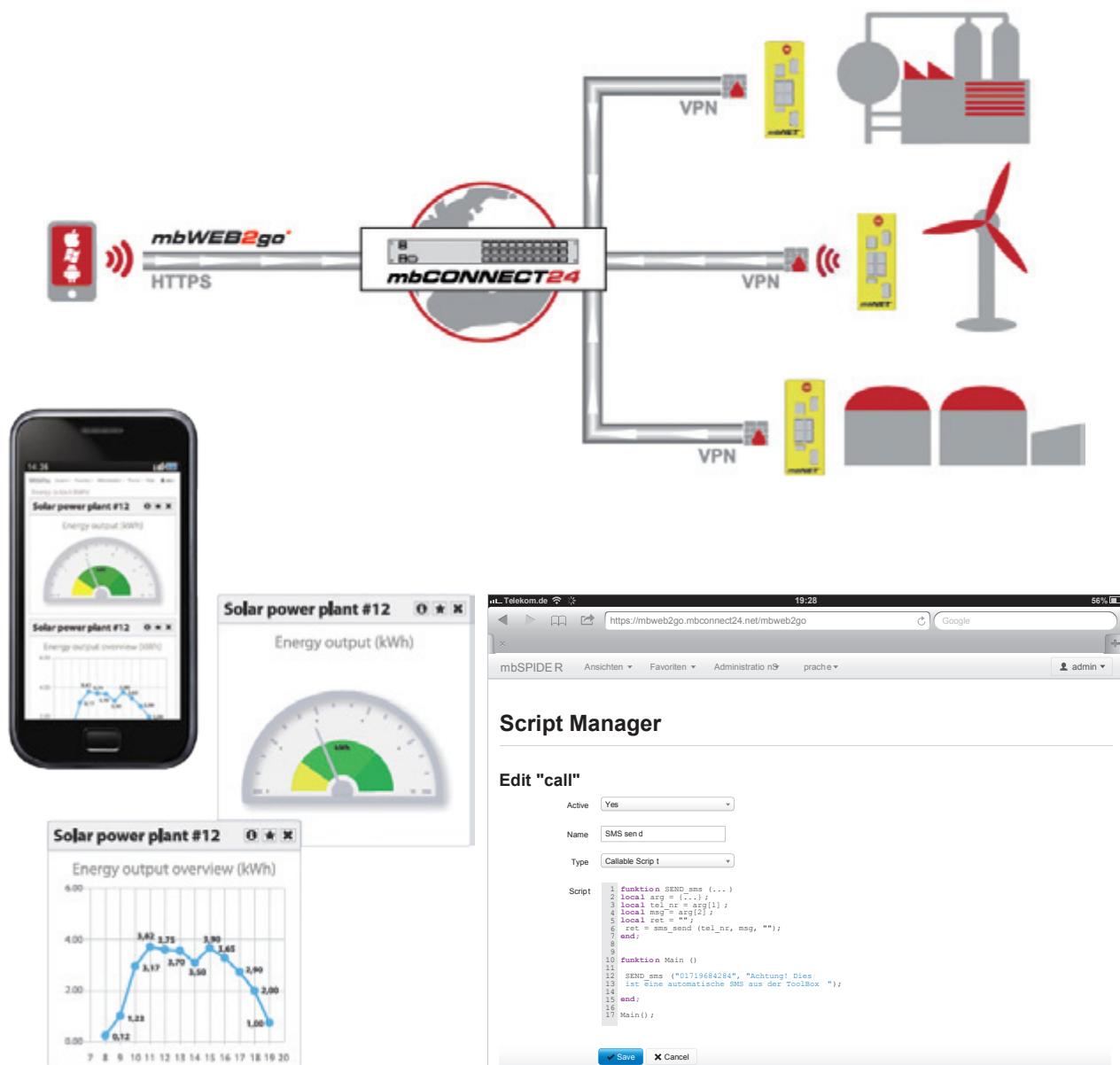
mbNET® Industrial Router
Functionality of the mbNET® router

The mbNET® industrial routers have been designed specifically for industrial applications. They provide a safe and reliable connection of machines and equipment via the Internet. The compact metal housing fits into every cabinet and with its variety of interfaces and device drivers it is the perfect system for remote maintenance of various control systems. There is an appropriate mbNET® router available for any on-site infrastructure.

- Internet connection via network, WAN-interface or modem (PSTN, ISDN, GSM, GPRS, EDGE, UMTS)
- Two serial interfaces, reversible RS232/RS485 or one serial interface and an integrated MPI- / profi bus interface
- Over 90 drivers for different control types
- Secure connection via VPN (PPTP, IPSec, L2TP, OpenVPN)
- Firewall with IP-filter, 1:1 NAT and port forwarding
- Integrated webserver for the convenient configuration
- Digital inputs – for activating the internet dial-in of the router or for sending an alarm-SMS
- Compact metal case in IP20 for top hat rail mounting
- Double-SIM-Card-Slot for GSM/UMTS/LTE devices
- 4-port switch (LAN)

Types of the mbNET® devices

Serial
- 2 RS232/485 Interfaces onboard
- Connection to more than 90 different control systems
- RS-access via virtual COM-port
- Firewall, DynDNS, DHCP, call back via internet, VPN*
- 4 digital inputs, 2 digital outputs

products					
name	modem type	RS232/485	WAN	LAN	VPN*
MDH810	Analog	2x	1x	4x	✔
MDH812	ISDN	2x	1x	4x	✔
MDH813	GSM	2x	1x	4x	✔
MDH814	UMTS	2x	1x	4x	✔
MDH850	LTE	2x	1x	4x	✔

* (IPSEC/PPTP, OpenVPN)

MPI/Profibus
- MPI/PROFIBUS up to 12 Mbit/s onboard
- 2 RS232/485 Interfaces onboard
- RS-access via virtual COM-port
- Connection to more than 90 different control systems
- Firewall, DynDNS, DHCP, call back via the Internet, VPN*
- 4 digital inputs, 2 digital outputs

| products						
name	modem type	RS232/485	MPI/Profibus	WAN	LAN	VPN*
MDH830	Analog	1x	1x	1x	4x	✔
MDH832	ISDN	1x	1x	1x	4x	✔
MDH833	GSM	1x	1x	1x	4x	✔
MDH834	UMTS	1x	1x	1x	4x	✔
MDH855	LTE	1x	1x	1x	4x	✔

* (IPSEC/PPTP, OpenVPN)

mbNET® Basic
- Simple dial-in router
- 4 LAN-interfaces, WAN-interface (optional)
- Firewall, DynDNS, DHCP, call back via internet, OpenVPN
- 4 digital inputs, 2 digital outputs

products				
name	modem type	WAN	LAN	OpenVPN
MDH815	Analog	-	4x	1 Tunnel
MDH816	-	1x	4x	1 Tunnel
MDH817	ISDN	-	4x	1 Tunnel
MDH818	GSM	-	4x	1 Tunnel
MDH819	UMTS	-	4x	1 Tunnel
MDH849	UMTS	1x	4x	1 Tunnel
MDH858	LTE	-	4x	1 Tunnel
MDH859	LTE	1x	4x	1 Tunnel

mbSPIDER data modem
Professional analyzing and monitoring via the internet
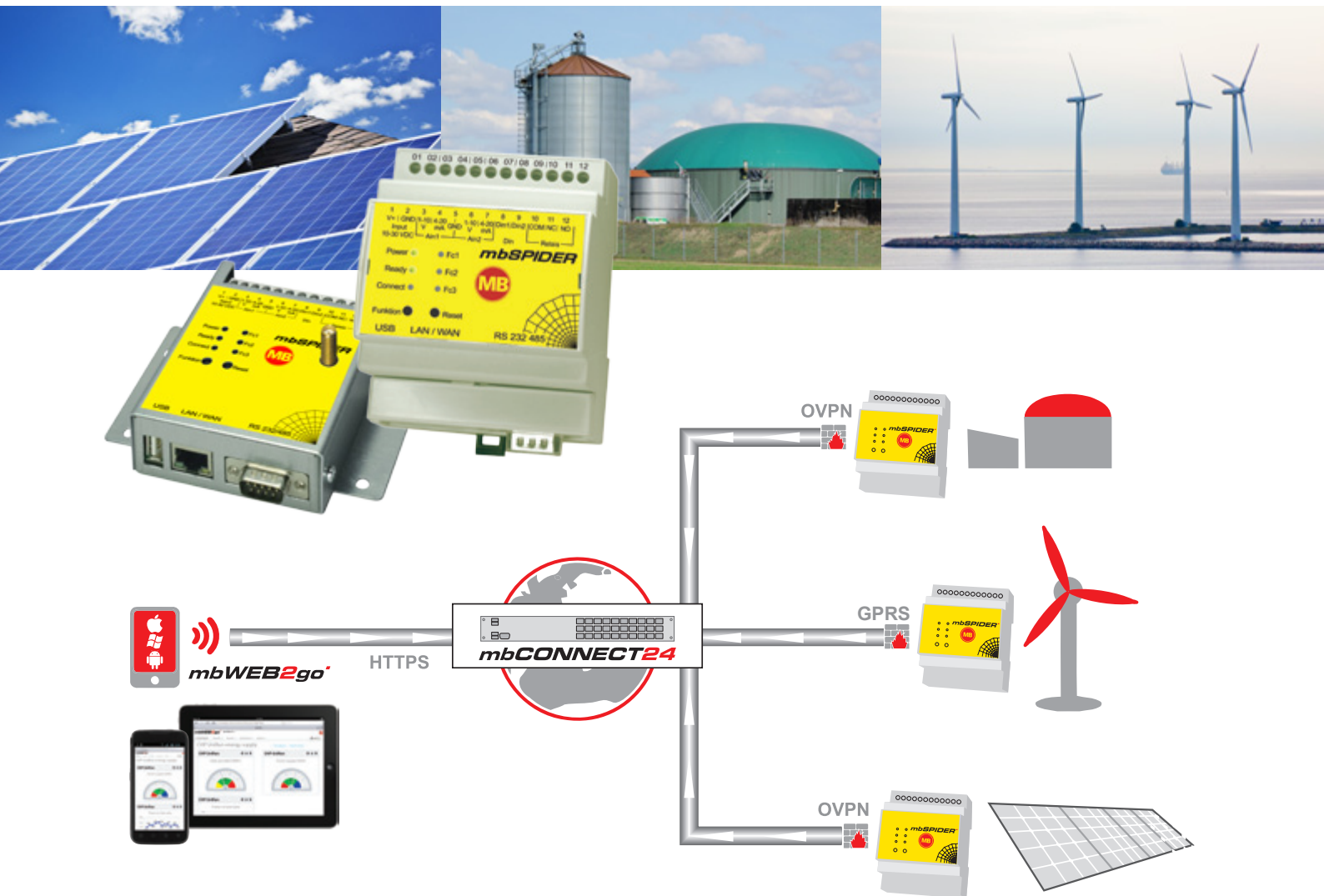
The mbSPIDER receives and stores the current counter readings, measurements, logic states and analog values of systems and individual devices.

All measured values can be viewed, analyzed and visualized on a web browser, even on a smartphone or tablet. All relevant data of the connected devices can be easily saved by executing a script.

Simple, secure and flexible

- Remote monitoring, diagnose and configuration of e.g. solar, biogas and wind turbines
- Data collector for all major asset data
- Quick detection of malfunctions

- Communication service by email or SMS
- Automatic monitoring via ethernet or RS232/485 interface
- Quick and easy setup

mbSPIDER data modem
Professional analyzing and monitoring via the internet

E-Mail   SMS
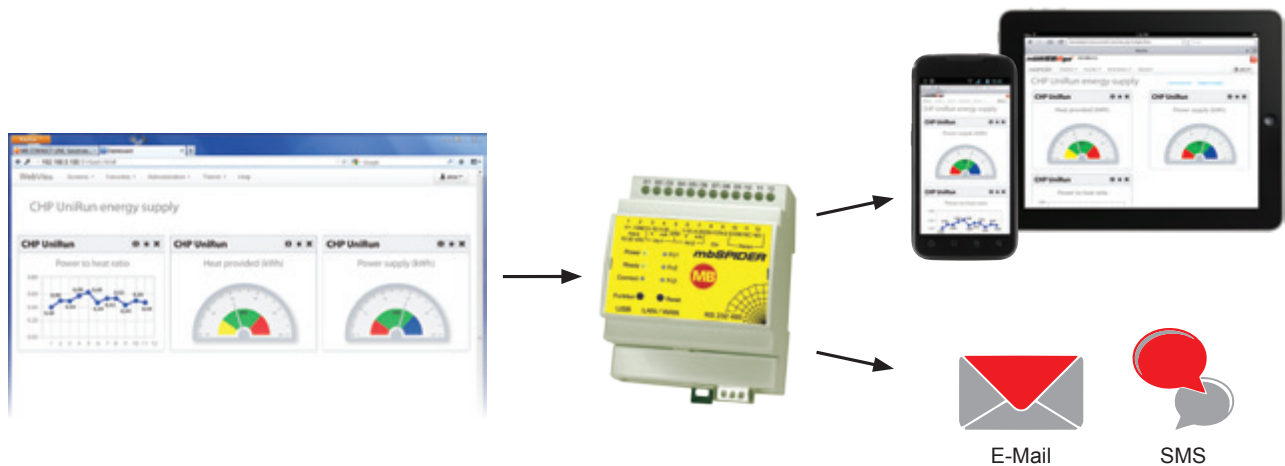
Easily gathering - secure output

With the mbSPIDER counter readings, measured values, logic states and analog values can be continuously recorded. Connection possibilities include a RS 232/485 interface, an Ethernet-port, digital and analog inputs as well as a relay output. The reading of the data and the signal preprocessing are freely programmable via a scripting language. The user can also define which notice or alarm messages should be sent via SMS or e-mail as soon as a specific event occurs or a limit value has been exceeded.

Benefits of mbSPIDER

- Plastic housing (DIN 4388, 4 modules) for top hat rail mounting, IP 20
- Compact metal housing for the wall mounting, IP 20
- The integrated web visualization informs the user via smartphone and tablet-PC about the current status of the values at all times
- Storage of the gathered data on a local USB-stick or transfer to a FTP-server
- Safe and barrier-free access for mobile end devices via the mbWeb2go service
- No HTML- or programming-knowledge necessary
- Ethernet, USB, RS232/485, OpenVPN

Art.-Nr.	type	modem type	housing	mounting
8900	MDH 900	---	plastic housing DIN 43880	top hat rail / wall mounting
8905	MDH 905	GPRS	plastic housing DIN 43880	top hat rail / wall mounting
8910	MDH 910	---	metal	wall mounting (top hat rail mounting optional)
8915	MDH 915	GPRS	metal	wall mounting (top hat rail mounting optional)

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The MB Connect Line GmbH offers universal solutions for worldwide remote maintenance of machinery and equipment. The specialists at MB Connect Line have years of experience and extensive know-how.

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Ideas and solutions for remote maintenance.