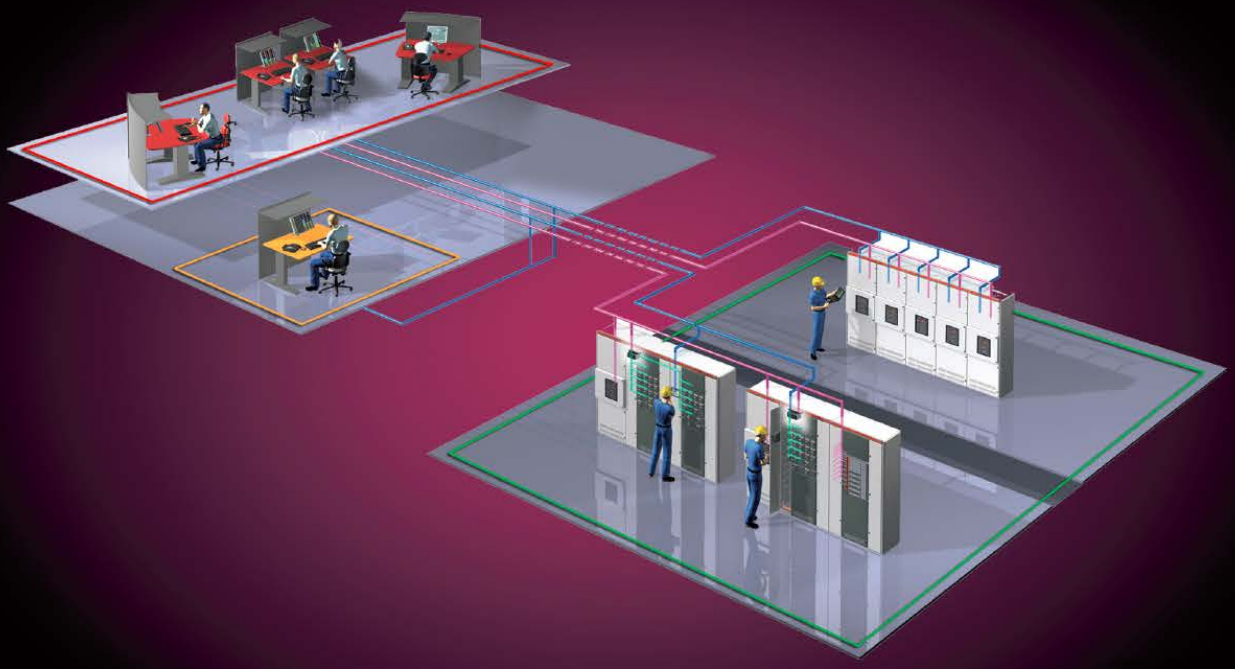

Medium voltage service (Rev 1.0, June 2012)

MyRemoteCare Gateway Operation Manual

Power and productivity
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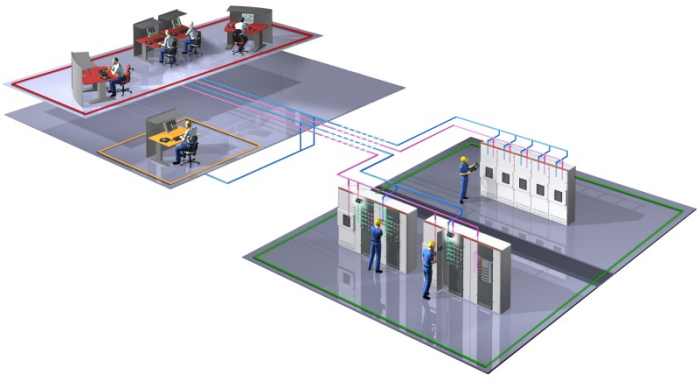

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Warranty

Please inquire about the terms of warranty from your nearest ABB representative.

ABB SPA
PPMV Service
IT-24044 Dalmine, Italy
Telephone: +39 035 695 2600
Facsimile: +39 035 695 2792

Disclaimer

The data, examples and diagrams in this manual are included solely for the concept or product description and are not to be deemed as a statement of guaranteed properties. All persons responsible for applying the equipment addressed in this manual must satisfy themselves that each intended application is suitable and acceptable, including that any applicable safety or other operational requirements are complied with. In particular, any risks in applications where a system failure and/or product failure would create a risk for harm to property or persons (including but not limited to personal injuries or death) shall be the sole responsibility of the person or entity applying the equipment, and those so responsible are hereby requested to ensure that all measures are taken to exclude or mitigate such risks.

This document has been carefully checked by ABB but deviations cannot be completely ruled out. In case any errors are detected, the reader is kindly requested to notify the manufacturer. Other than under explicit contractual commitments, in no event shall ABB be responsible or liable for any loss or damage resulting from the use of this manual or the application of the equipment.

Conformity

The products listed in the document complies with the directive of the Council of the European Communities on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive 2004/108/EC) and concerning electrical equipment for use within specified voltage limits (Low-voltage directive 2006/95/EC). This conformity is the result of tests conducted by ABB in accordance with: EN55022 (2006, A1/2007), EN55024 (1998, A1/2001, A2/2003), EN60950-1 (2006), EN61000-4.

Safety Information

Dangerous voltages can occur on the connectors, even though the auxiliary voltage has been disconnected.

Non-observance can result in death, personal injury or substantial property damage.

Only a competent electrician is allowed to carry out the electrical installation.

National and local electrical safety regulations must always be followed.

The frame of the Gateway shall be earthed.

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1. Introduction

The operation manual contains instructions on how to operate MyRemoteCare Gateway (later called only Gateway) once it has been commissioned. The manual provides instructions for monitoring, controlling, and setting the Gateway. The manual also describes how to determine the cause of a fault.

Intended audience

This manual addresses the operator (service personnel) who operates the Gateway. Usually operation on the gateway is needed during commissioning, or plant modification, or trouble shooting a problem.

The operator must be trained in and have a basic knowledge of how to operate the MyRemoteCare diagnostic system. The manual contains terms and expressions commonly used to describe this kind of equipment.

Product documentation set

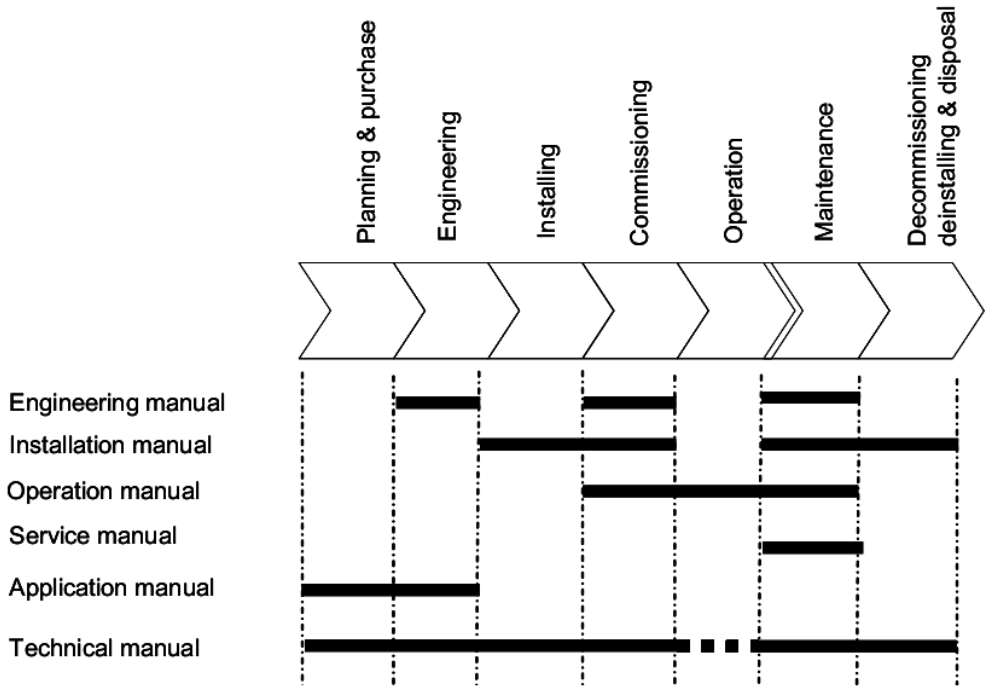

Figure 1: The intended use of manuals in different lifecycles

The Installation manual contains instructions on how to install the Gateway. The manual provides procedures for mechanical and electrical installation. The chapters are organized in chronological order in which the Gateway should be installed.

The Technical manual contains application and functionality descriptions and lists functions, input and output signals, setting parameters and technical data. The manual can be used as a technical reference during the engineering phase, installation and commissioning phase, and during normal service.

The Operation manual contains instructions on how to operate the Gateway once it has been commissioned. The manual provides instructions for monitoring, controlling and setting the Gateway. The manual also describes how to identify errors or problems to determine the cause of a fault.

The Service manual contains instructions on how to service and maintain the Gateway. The manual also provides procedures for de-energizing, de-commissioning and disposal of the Gateway.

The Application manual contains application descriptions and setting guidelines sorted per function. The manual can be used to find out when and for what purpose a typical diagnostic function can be analyzed. The manual can also be used when calculating settings, thresholds, etc.

Some of the manuals are not available yet.

Revision history

Document revision/date	Product series version	History
2012-06-30	1.0	First release

Download the latest documents from the ABB web site.

Related documentation

Product series- and product specific manuals can be downloaded from the ABB web site.

Symbols

The electrical warning icon indicates the presence of a hazard which could result in electrical shock.

The warning icon indicates the presence of a hazard which could result in personal injury

The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.

The information icon alerts the reader of important facts and conditions.

The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

2. Environmental aspects

Sustainable development

Sustainability has been taken into account from the beginning of the product design including the pro-environmental manufacturing process, long life time, operation reliability and disposing of the Gateway.

The choice of materials and the suppliers have been made according to the EU RoHS directive 2011/65/EU of the European Parliament and of the council of 8 June 2011 on the Restriction of Hazardous Substances in electrical and electronic equipment (RoHS Directive).

The Gateway comply the maximum values for lead (Pb), mercury, hexavalent chromium, polybrominated biphenyls (PBB), polybrominated diphenyl ethers (PBDE) and cadmium.

In the sense of EU-regulation REACH that entered into force the 1st June of 2007, the products are solely non-chemical products. Moreover and under normal and reasonably foreseeable circumstances of application, the goods supplied to you shall not release any substance.

Disposing of the product

Definitions and regulations of hazardous materials are country-specific and change when the knowledge of materials increases. The materials used in this product are typical for electric and electronic devices.

All parts used in this product are recyclable. When disposing of a Gateway or its parts contact a local waste handler who is authorized and specialized in disposing electronic waste. These handlers can sort the material by using dedicated sorting processes and dispose of the product according to the local requirements.

Table 1: Product composition

Gateway	Parts	Material
Case	Metallic plates, parts and screws	Steel
	Electronic modules	Various
Package	Box	Cardboard
Attached material	Manuals	Paper

Applicable directives, standards and compliance

The following directives, standard and compliances are applicable to the Gateway:

- 93/68/EEC European directive for CE-mark
- 73/23/EEC European directive for the safety of low voltage equipment (LVD) – Applicable standard is EN60950 A1+A4+A11
- 89/336/EEC amended by 92/31/EEC European directives for the electromagnetic compatibility (EMC) – Applicable standards EN55022:94 A1, A2 (emissions) and EN55024:98 (immunity)
- EN 60950-1:2006: Information technology equipment – safety
- EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6: Immunity according to EN55024
- EN550022 Class A: radiated interference
- UL/CSA certification (UL60950)
- Vibrations and climatic tests (IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14, IEC 60068-2-30, IEC 60068-2-29, IEC 60068-2-64)

3. MyRemoteCare Gateway overview

Overview

ABB proposes a condition-based maintenance approach by the on-line equipment monitoring. The infrastructure is dedicated to this task and decoupled from any control system.

The relevant ABB specialists take care of the equipment:

- Monitoring on-line the real condition
- Managing and evaluating wear and performance level
- Defining the proper maintenance at the right time based on the analysis of operating parameters trends

ABB MyRemoteCare solution therefore brings many advantages:

- Reduce operational costs optimizing maintenance, scheduled only when needed
- Reduce downtime and increase production
- Reduce failure risk by the generation of warning messages at early stage
- Increase plant availability, reliability and safety
- Professional operation maintenance assistance

ABB MyRemoteCare solution allows a worldwide remote monitoring of your equipments. The remote connection is guaranteed by mobile network connections, which shall be present on the plant.

Every connected plant has its own MyRemoteCare Gateway already provided with a Private SIM card, which guarantees a secure connection to the ABB Data Center (Remote Service Centre).

ABB considers carefully all the cyber security details securing the communication channel between plants and server.

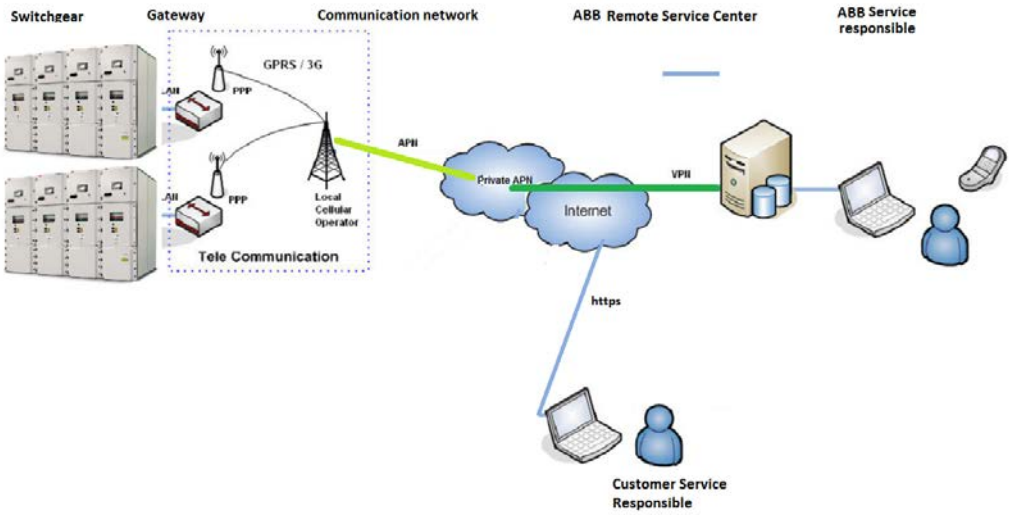

Figure 1: Communication Architecture

Local LEDs

MyRemoteCare Gateway has LEDs on front in order to analyze the status of the device, connection to the server, and communication to the diagnostic equipments.

Normal operation is identified by the following LEDs:

- PWR: power supply, green fixed
- RDY: run mode, green blinking (every second) – after about 30sec from start-up
- MDM: mobile connection, green fixed – after about 2min from start-up
- SER: serial channel, green blinking every about 5 seconds (if serial devices are configured)

Figure 2: Local Front LEDs

Web HMI

MyRemoteCare Gateway has a web HMI in order to enable the user to access the Gateway via a web browser. The supported web browser version is Microsoft Internet Explorer 7.0 or later, Mozilla Firefox, Google Chrome, etc.

Web HMI is enabled by default and cannot be disabled. To access the Web HMI, an authentication is needed.

Web HMI offers several functions:

- Server connection status
- Configuration status
- General information on the device, firmware and application
- Report about configured diagnostic equipment
- Configuration pages, about:
    - Users
    - Ports (Ethernet LAN, Serial port, modem)
    - HTTP server (ABB data collector server)
    - Diagnostic equipments (field devices)
    - Configuration management

Launch your preferred browser and insert the following URL:

http://<ip_address>

where <ip_address> is the address of the LAN ports of the gateway.

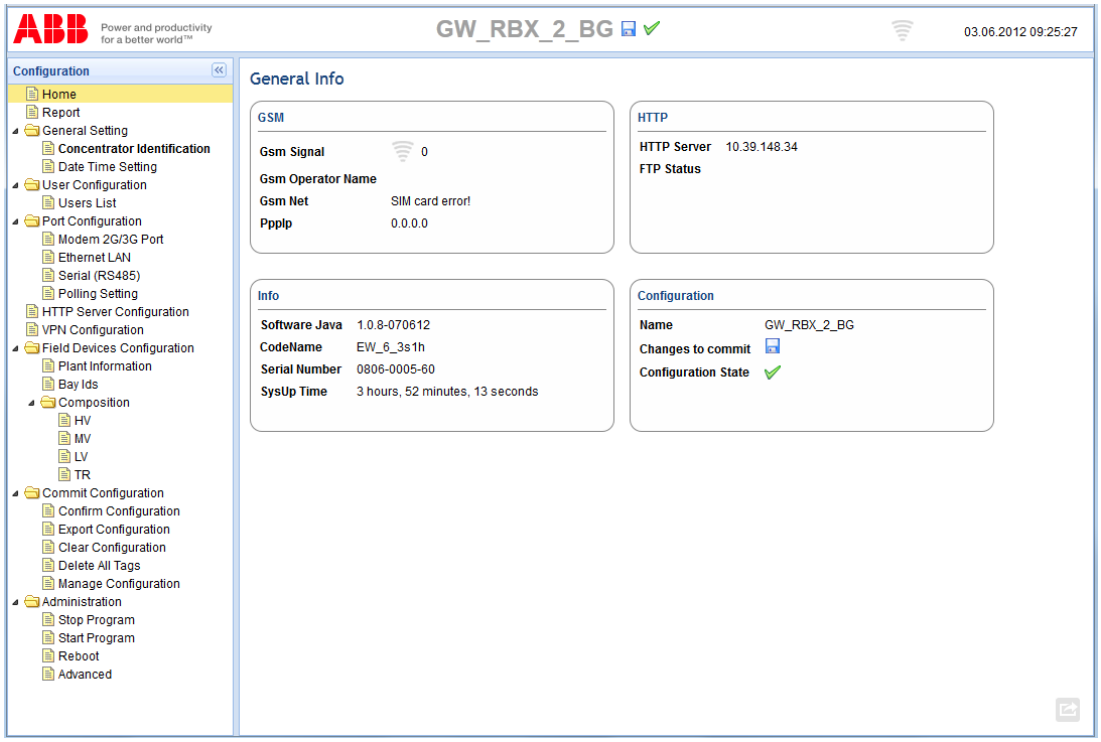

Figure 3: Web HMI example

The Web HMI can be accessed locally and remotely:

- Locally, by connecting your laptop to the Gateway via the Ethernet LAN ports
- Remotely, over secure IP connection through the ABB secure connection (available only for specific ABB service personnel)

The Web HMI has common command buttons which can be used to edit parameters and control information.

Table 2: Web HMI Command buttons

Button	Description
Enable Write	Enabling parameter editing
Disable Write	Disabling parameter editing
Refresh Values	Refreshing parameters values
Save	Save parameters, ready to commit
Add	Add an item to the list (e.g. user, devices)

Modify	Modify an item of the list
Delete	Delete an item from the list

Authorization

The Gateway is accessible using a special ABB Service user in order to configure and commission the plant.

In order to allow an access also for the customer, it is possible to create new users via Web HMI.

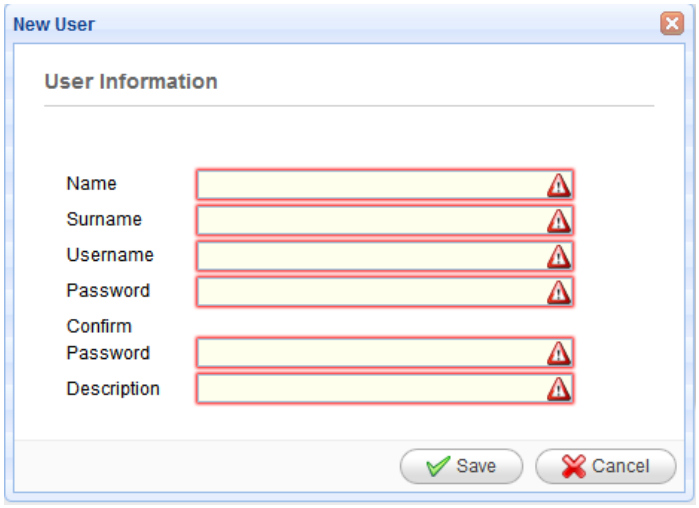

Figure 4: User creation

Normally the new users are able to access the application level of the Gateway, but not the base software and the operating system level.

Normally, the Gateway Web HMI is used only for configuration and commissioning, therefore there is no need for additional users for the customer.

Customers shall access to diagnostic information on the MyRemoteCare portal.

Communication to field devices

The Gateway supports a range of communication protocols including Modbus®. Operational information are available through these protocols.

The protocols are available on serial channel (RS485) and on Ethernet channel. The Gateway can support both channels active at the same time. Moreover, on Ethernet it can manage more simultaneous protocols.

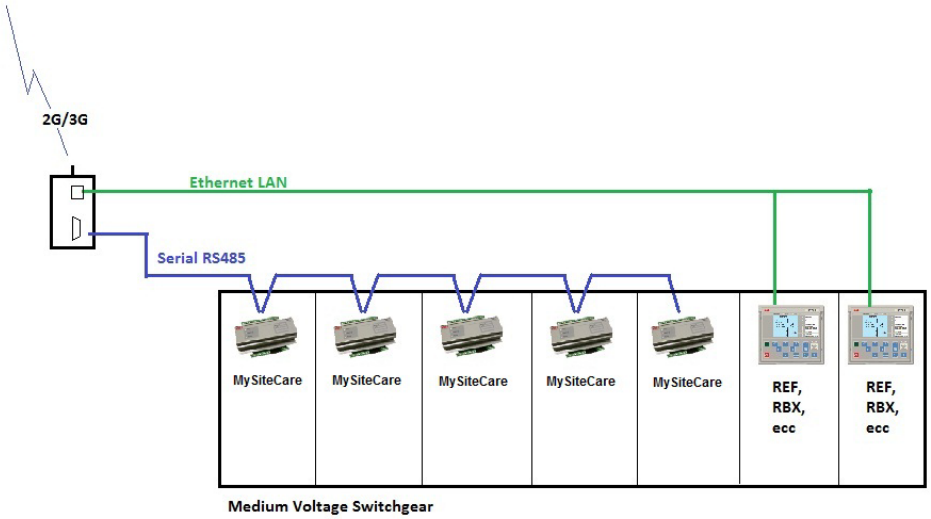

Figure 5: Communication architecture example

The Gateway acts as a Modbus® Master RTU and/or Modbus® TCP Client in order to read information from the diagnostic equipments.

The Gateway only reads data from the equipment devices. Write functions are not foreseen neither implemented.

During commissioning the protocol selection is automatically configured by the Gateway itself. Therefore, only field devices configuration is needed.

4. Using the Web HMI

Logging in

Connect the PC locally to the Ethernet LAN port of the device. Open the web browser and point to the default IP address of the Gateway.

A popup dialog will appear.

1. Enter the username
2. Enter the password (case sensitive)
3. Click **OK**

Figure 6: Entering username and password to use the Web HMI

Logging out

The logged in web session is valid until the PC is connected to the device and the browser is open. To logout, close the browser.

Identifying the device

The **Home** page of the the Gateway includes detailed information about the device, such as revision and serial number.

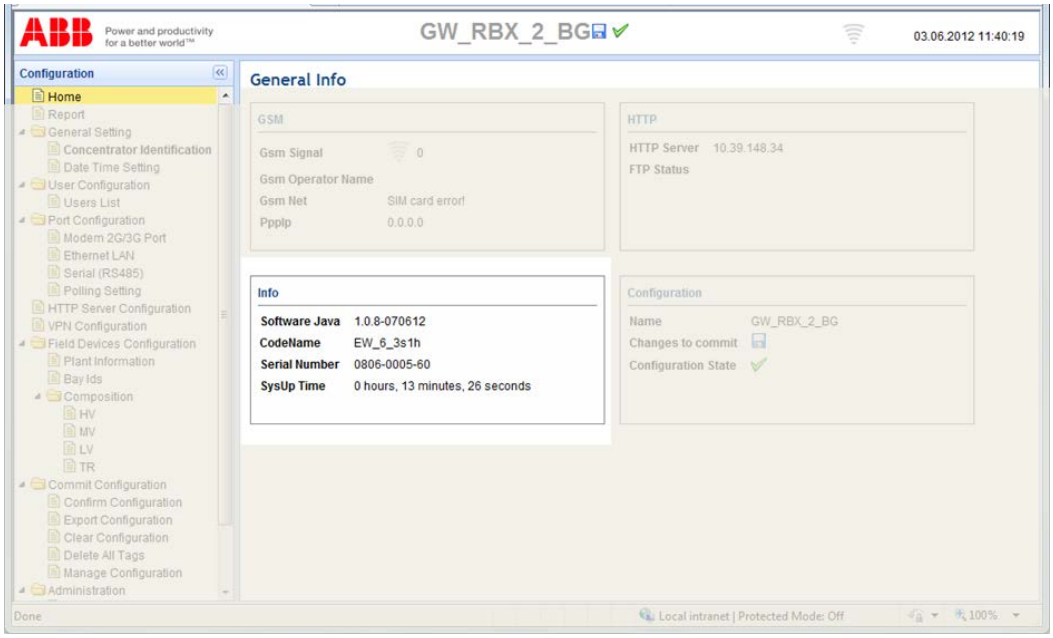

Figure 7: Device information

The identification name and the serial number of the Gateway is also reported to the ABB MyRemoteCare server for traceability.

The serial number is also present on the label attached to the device.

Menu structure

On the left side of the web page you can find the menu.

- **Home** menu shows general status and information of the device
- **Report** menu shows the communication status with diagnostic equipment
- **General Settings** menu is used to configure the name of the device and date-time settings
- **User Configuration** menu allows user management
- **Port configuration** menu contains the settings for: modem, Ethernet LAN, serial port, and data polling settings
- **HTTP server configuration** refers to ABB concentrator address
- **Field Devices configuration menu** allows the diagnostic equipment management (plant and bay configuration)
- **Commit configuration menu** manages the configuration: validation, export, clear and general management
- **Administration** menu has special function for administration purposes

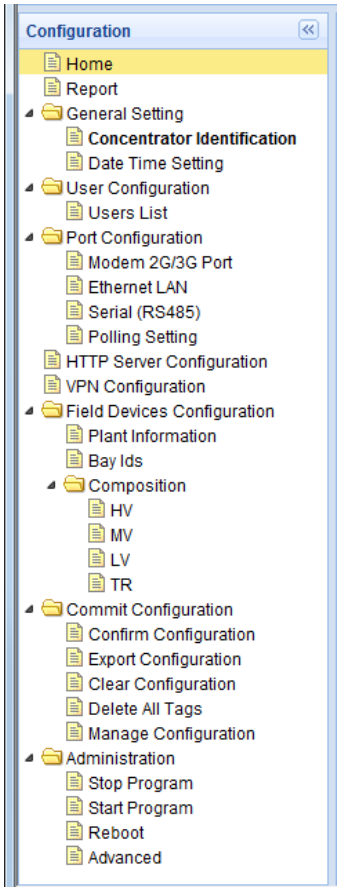

Figure 8: Web HMI Menu Structure

Editing values

Every web page with parameters allows editing new values.

1. Click the menu in the tree structure
2. Click a submenu to see the parameters on the right
3. Click **Enable Write**

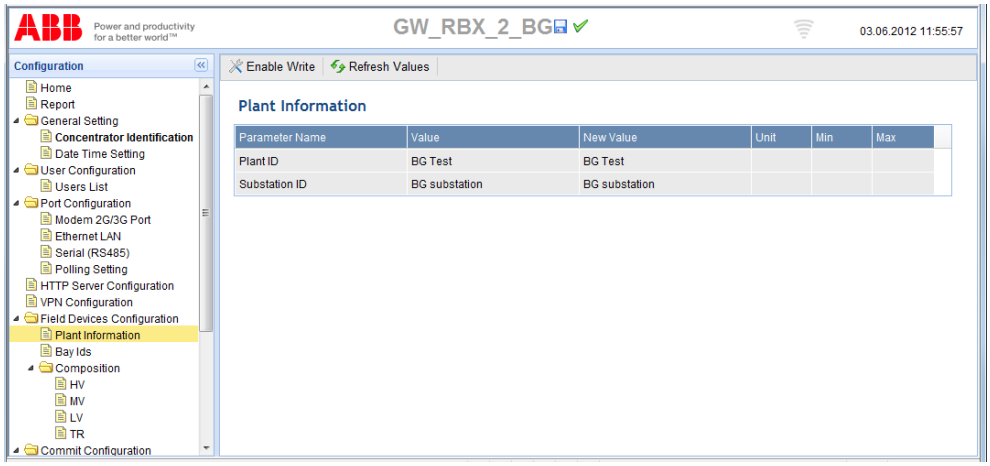

Figure 9: Edit parameters, enable write

4. Edit New Values in the **New Value** fields

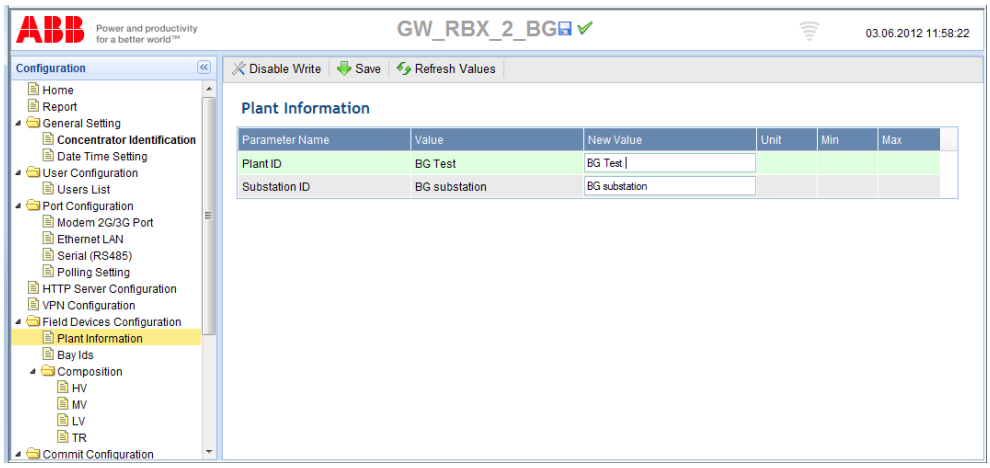

Figure 10: Edit parameters, new values

5. Press **Save** button to save temporarily the new values (these values are save in the web session, therefore they have to be committed to the device before disconnecting)

   A message on top of the page appears in order to remember that new values have not yet been stored permanently on the device.

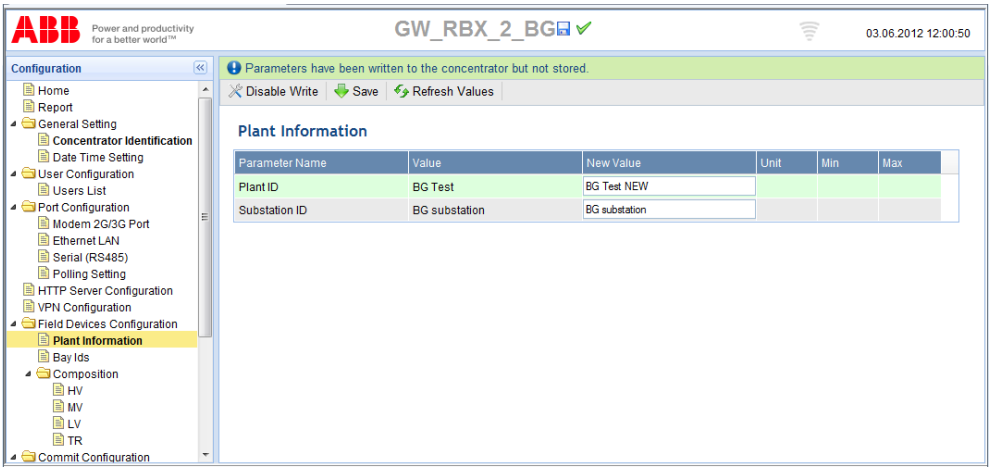

Figure 11: Edit values, save

Since the Gateway shall be delivered already with communication parameters configured, be aware that changing these values (especially Port configuration, HTTP Server configuration and VPN configuration) might disrupt the connection to MyRemoteCare system, and then corrupt diagnostic data collection for that plant.

Committing configuration

Editable values are stored in the web session. Therefore in order to save permanently in flash memory the values a confirmation and commit is required. Values stored in flash effect after a reboot.

1. In the **Commit Configuration** menu, click **Confirm Configuration**
2. In the page, click the button **Confirm** to proceed

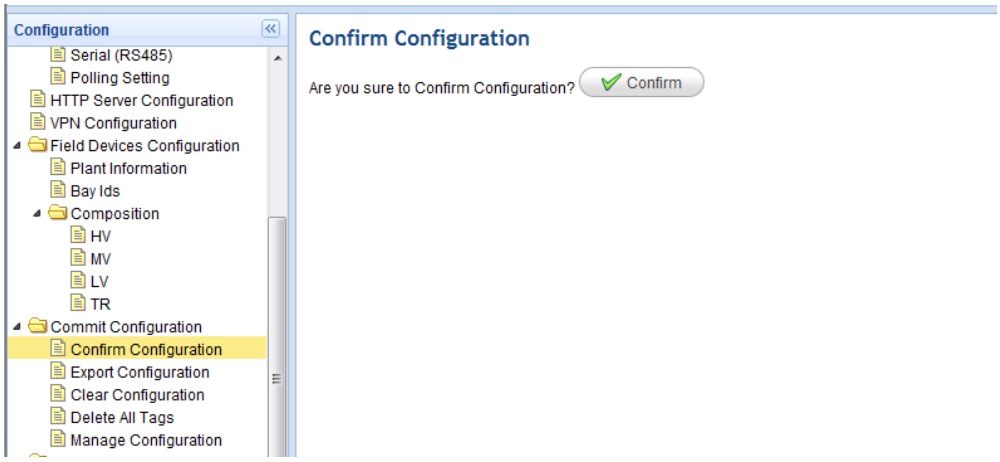

Figure 12: Commit, confirm configuration

3. After the validation and confirmation of the configuration, the export to the server is required. This step is mandatory, but can be performed later (e.g. when the mobile network is up and running).

During confirmation, an information page is displayed where all the operations and checks are listed.

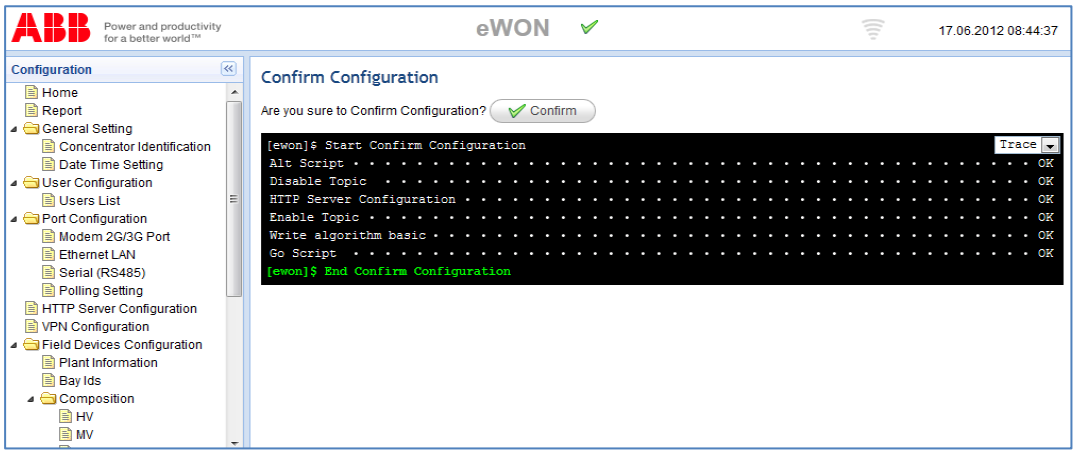

Figure 13: Commit terminated successfully

In case of error, please refer to the corresponding text lines, and check the related parameters.

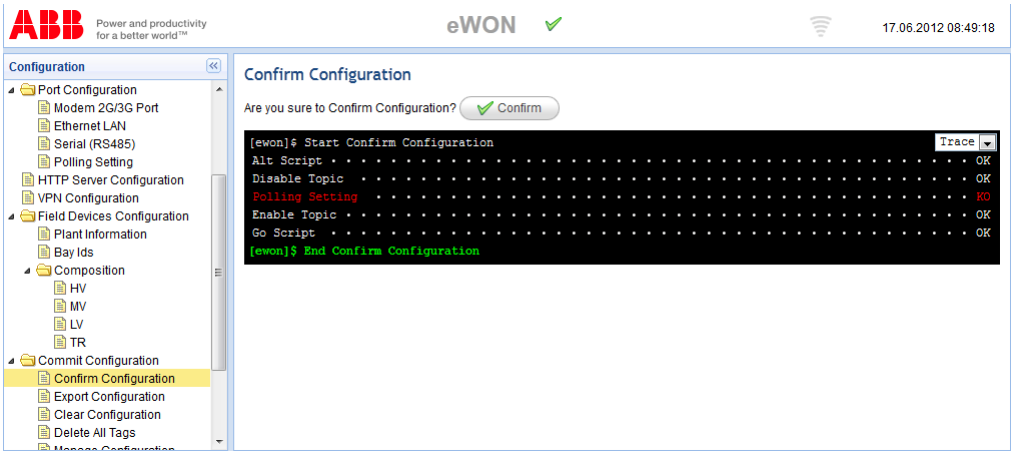

Figure 14: Commit terminated with errors

Cancel Changes Configuration

The changes of configuration are not persistent yet. To store permanently the values execute the Commit of configuration, or cancel all changes by clicking on button **Rollback Configuration** in page **Commit Configuration**

Export configuration

Once the configuration is confirmed and validated, it must be exported to the ABB MyRemoteCare server, in order to start to track the plant data.

Once the export is performed, immediately on the ABB MyRemoteCare server it is shown a message of “new plant” configuration required. Refer to the MyRemoteCare Operation manual.

Resetting configuration

In the **Manage Configuration** menu is possible to:

- **Load Default Values**: in order to restore an initial configuration
- **Rollback Configuration**: cancel all changed not committed
- **Force Devices Rewrite**: it forces again a confirmation process, writing into the device the final configuration

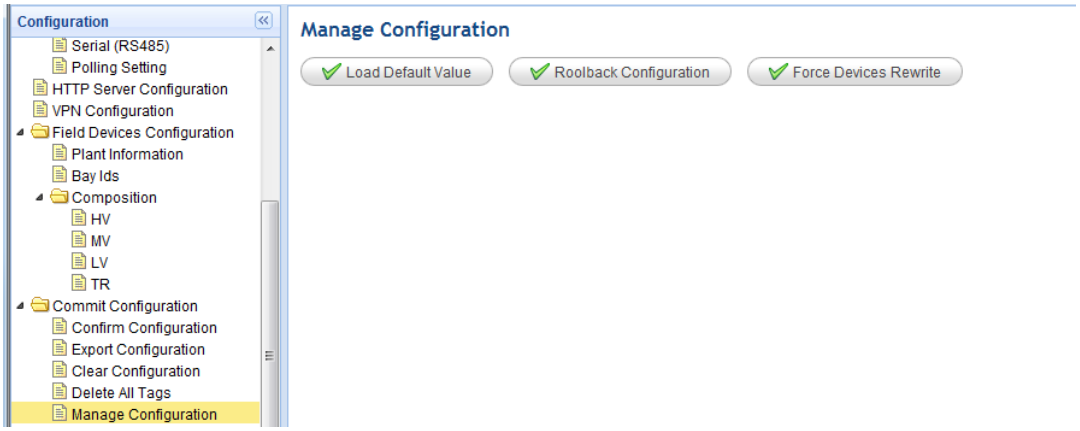

Figure 15: Manage configuration menu

5. Operating procedures

Monitoring plant equipments

In order to monitor the status of the plant diagnostic equipments, please refer to the **Report** menu.

Click the **Report** menu, and the list of configured devices can be checked.

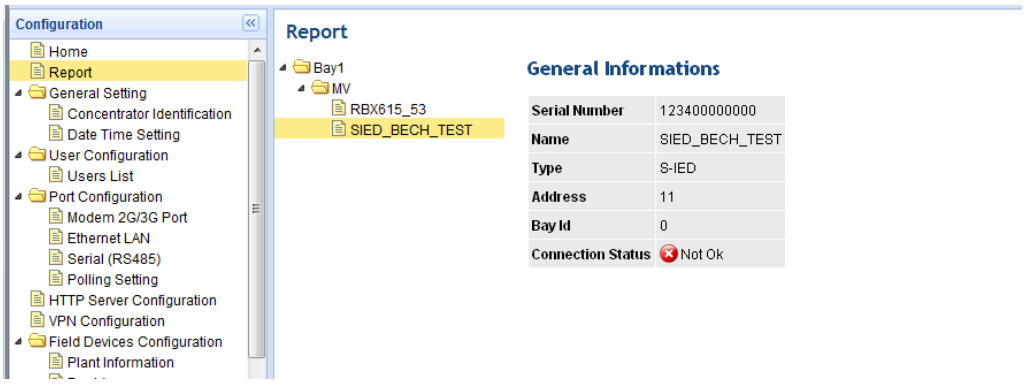

Figure 16: Plant report

The main parameters of the selected device are listed, and the **Connection Status** is shown. Possible values are: **Ok**, or **Not Ok**. This last value usually refers to:

- The device is off
- The device is not connected to the Gateway
- The device address is not configured properly
- The communication channel is not working (cable problem, disturbs, etc)

Monitoring server connection

The Gateway connection to the MyRemoteCare service can be monitored on the **Home** menu. The “home page” or “general info” shows the actual status of the telecommunication service. In particular it refers to the mobile network connection.

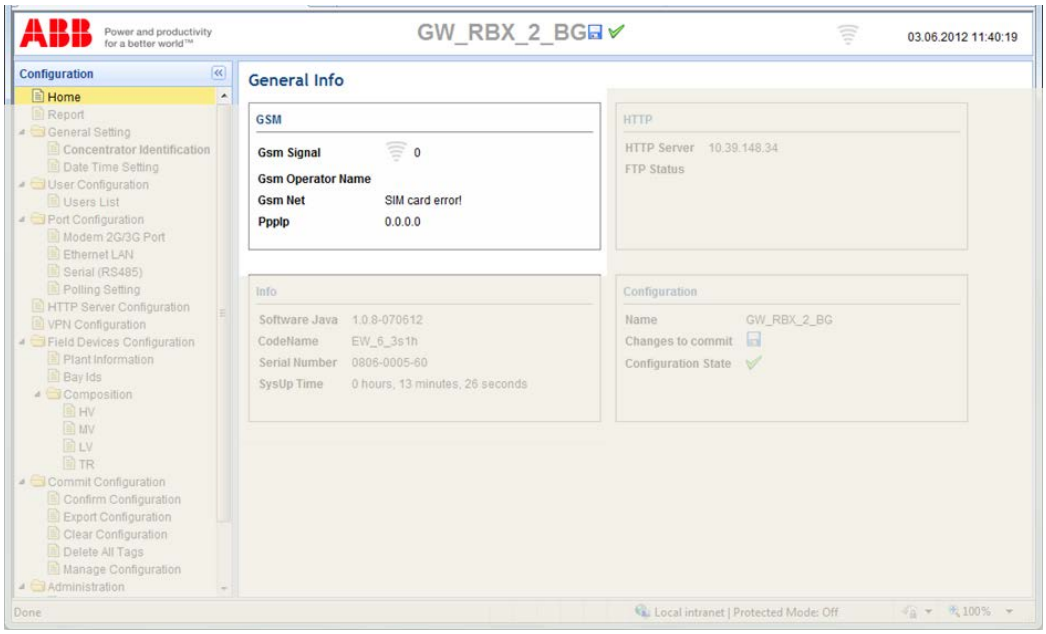

Figure 17: Home menu, GSM info

Moreover, it is possible to know the status of the TCP connection to the MyRemoteCare server, looking at the HTTP icon.

Figure 18: Home menu, http connection status

On ABB MyRemoteCare server it is always possible to see that connection status of a certain Gateway. Please remember that information are uploaded to the server on event or scheduled base, therefore the connection status could refer to the last information upload (e.g. every 1 hours).

6. Troubleshooting

Identifying hardware errors

Item	Status	Description	Action
PWR Led	Off	Check the power supply.	In case the power supply is working, then returns the device for repair.
RDY Led	Off (not blinking green)	If after about 30 sec from power-up, the LED is not yet blinking green, it means that an internal system fault occurred	Return the device for repair
RDY Led	Blinking Red	An IP address conflict on LAN network	Please check the IP addresses and reboot the Gateway.
MDM Led	Off	If after 3 min from the power-up, the led is not yet fixed green, it means that the Gateway is not able to connect to the mobile network.	Check that antenna is connected Check the signal on the Home page. Shall be > 10. Check that the PPPIp is different from 0.0.0.0 If the problem persists contact the ABB support team
MDM Led	Blinking randomly	If after 3 min from the power-up the led is not fixed green, but blinking randomly, it means that the mobile network APN server is not authenticating the SIM card. The Gateway tries indefinitely to connect, therefore you will see the led goes on and then off after some seconds.	If the problem persists contact the ABB support team.

Identifying plant communication errors

Item	Status	Description	Action
SER Led	Never blink	The Led shall blink every about 5 second, if the serial communication works.	
Ethernet LAN led	Off	If the Ethernet cable is inserted, the corresponding LED must be on.	Check the Ethernet cable. Check that the connected device is turned on.
Web page, report connection status	Not Ok or Error	The address or the cable might be wrong	Check the address of the device into the configuration Check the cable, terminations, etc. In case of Ethernet device, connect the PC to the gateway switch and tries to reach the device (ping function or something else depending on the connected device).

Identifying server connection errors

Item	Status	Description	Action
HTTP Status on report web page	Error symbol, or no symbol	The connection to the server is not working (3min after power-up)	Check the signal level >10. Else, move the antenna in another place. Check the PPPIp different from 0.0.0.0. Else call the support team Check HTTP server IP address must be set. Else call the support team.

7. Commissioning

Commissioning checklist

Familiarize yourself with MyRemoteCare architecture and its functionality before you start the commissioning work.

- Ensure that you have all the needed drawings such as wiring diagrams
- Ensure that your version of technical manual applies to the Gateway version you test
- Ensure that your PC, and browser works with the Gateway you test
- Ensure you have the plant settings (e.g. MySiteCare devices address)
- Check the settings to ensure that they are correct (e.g. field devices address must be unique in the plant)
- Ensure that you have the correct cable to connect your PC to the Gateway Ethernet LAN port. The RJ45 port supports any CAT 5 Ethernet cable
- Test your PC's communication Ethernet port before you go to the site
- Find out who to contact if you have trouble and make sure you have a means to contact them (e.g. technical support team)

Consider always that MyRemoteCare solution and MySiteCare device are not interacting with the control and protection system of the switchgear. However, ensure that you know how to operate in emergency situations. Find out where the first aid and safety materials and exit routes are.

Checking the installation

1. Check the power supply of the MyRemoteCare Gateway

   Check that the auxiliary supply voltage remains within the permissible input voltage range under all operating conditions. Check that the polarity is correct before powering the Gateway. Once you start-up the Gateway, the PWR led must stay green, and USR led flashing green (after 30 seconds from power-up).

2. Check serial communication cable

   Serial cable shall be connected to the Sub-D port. The cable is an RS485 cable (A+, B-, GND) and is must be shielded.

3. Check Ethernet communication cable

   Ethernet cables to the plant must be connected to the LAN Ethernet ports, or to an optional Ethernet switch. This switch can be an unmanaged one.

   Ethernet cables can be standard CAT5, preferably STP.

4. Check GSM antenna

   The GSM antenna shall be connected to the SMA connector. The antenna shall be placed out of the cabinet, in order to get as much signal as possible. Please check the signal level once connected to the Gateway device.

User authorizations

The user categories are:

- ABB Service personnel only. This is predefined and not modifiable on the Web HMI
- Customer service personnel. This users shall be created, if needed.

For each user it is possible to set the “user name” and the “password”.

Only the following characters are accepted:

- Numbers 0-9
- Letters a-z, A-Z
- Special characters *-+=_?! "£$%&\/

Using the web interface

The communication between the Gateway and the browser is independent of the used communication protocol within the plant. It can be sees as a second channel for communication.

The communication media is always Ethernet and the protocol is HTTP (TCP/IP).

Each Gateway has an Ethernet LAN port available for local web browser access. Depending on the configuration more Ethernet LAN ports could be available.

To set up a standard PC with Microsoft Windows operating system for Ethernet communication:

1. To open Network Connections, click **Start**, point to **Settings**, click **Control Panel**, and then double-click **Network Connections**

2. Double-click the connection that you want to configure, and then click **Properties**

3. Select the TCP/IP protocol from the list of configured components using this connection and click **Properties**.

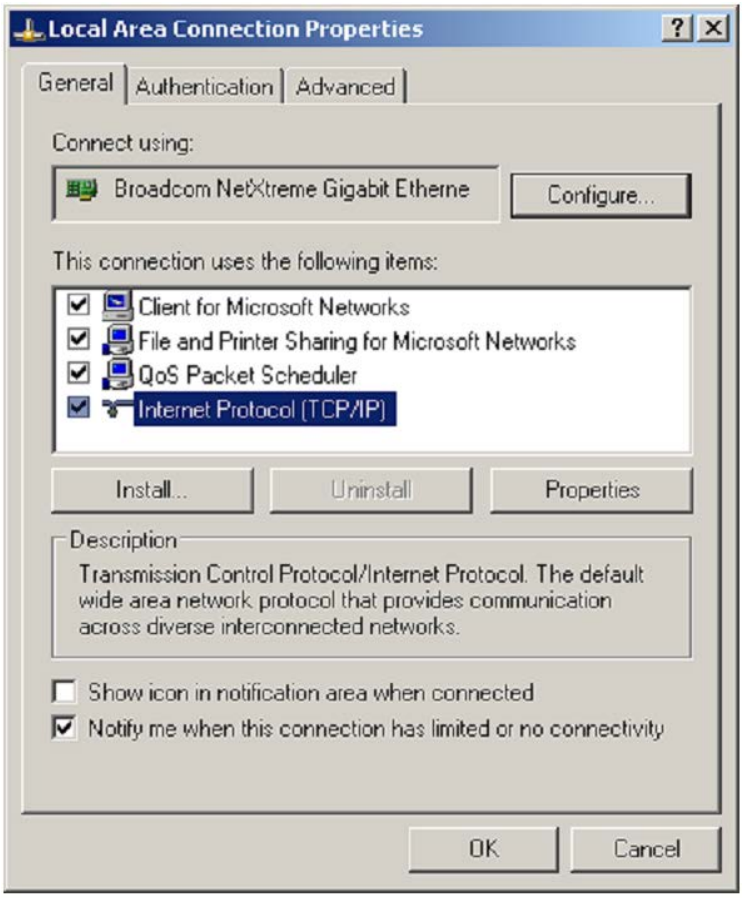

Figure 19: Selecting TCP/IP protocol

4. Select **Use the following IP address** and insert an IP address which is in the same subnet of the Gateway. Make sure that the IP address is unique, that is not used by any other Gateway or devices on the network.

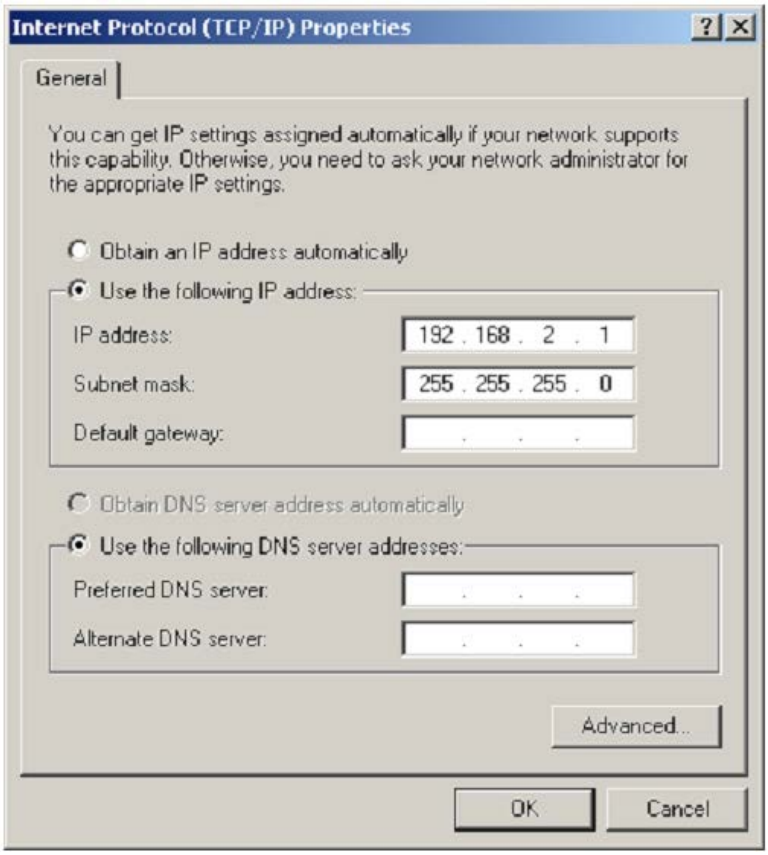

Figure 20: Setting IP address and subnet mask

Administration rights are requested to change the configuration as described above.

5. Close all open windows by clicking **OK** and start the browser
6. Insert in the browser address bar the IP address of the Gateway.

For more information about communication details, please refer to the technical manual.

8. Glossary

ARP	Address Resolution Protocol
CAT 5	A twisted pair cable type designed for high signal integrity
CPU	Central processing unit
CT	Current transformer
DHCP	Dynamic Host Configuration Protocol
EMC	Electromagnetic compatibility
Ethernet	A standard for connecting a family of frame-based computer networking technologies into a LAN
Firmware	System software or hardware that has been written and stored in a device's memory that controls the device
HMI	Human-machine interface
HW	Hardware
IEC	International Electrotechnical Commission
IEC 61850	International standard for substation communication and modeling
IED	Intelligent electronic device
IP	Internet Protocol
IP address	A set of numbers between 0 and 255, separated by periods. Each server connected to the Internet is assigned a unique IP address that specifies the location for the IP protocol.
LCD	Liquid crystal display
LCP	Liquid crystal polymer
LED	Light-emitting diode
LHMI	Local human-machine interface
Modbus	A serial communication protocol developed by the Modicon company in 1979. Originally used for communication in PLCs and RTU devices.
Modbus RTU	Modbus link mode. Character length 11 bits.
Modbus TCP/IP	Modbus RTU protocol which uses TCP/IP and Ethernet to carry data between devices

PA	Polyamide
PBT	Polybutylene terephthalate
PC	Personal computer; Polycarbonate
PCM600	Protection and Control IED Manager
RJ-45	Galvanic connector type
RoHS	Restriction of the use of certain hazardous substances in electrical and electronic equipment
RS485	Serial link according to EIA standard RS485
STP	Shielded twisted-pair
SW	Software
TCP/IP	Transmission Control Protocol/Internet Protocol
VT	Voltage transformer
WAN	Wide Area network
WHMI	Web human-machine interface

Contact us

ABB SPA
Medium Voltage Service
IT-24044 Dalmine, Italy
Phone +39 035 695 2600
Fax +39 035 695 2792