RMDE-01 reliability monitoring device
Product manual

Product manual

RMDE-01 reliability monitoring device

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1

Introduction to the manual

What this chapter contains

This chapter contains general information of the manual, a list of related manuals, and a list of terms and abbreviations.

Compatibility

The RMDE-01 reliability monitoring device is compatible with drives equipped either with an Ethernet interface (as standard or as an option), or the ABB Drives DDCS communication interface (as standard or as an option). For example, ACS880 and ACS800 drives.

Safety instructions

Read and obey the complete safety instructions before installation, commissioning or use. The complete safety instructions are either part of the drive hardware manual (single drives), or a separate document (multidrives). You must be a qualified electrician to do installation, start-up and service work.

Target audience

This manual is intended for people who plan the installation, install, start up, use and service the reliability monitoring device. Read the manual before working on the device. You are expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

Categorization by option code

The content which only concerns certain optional selection is marked with an option code (e.g. +G304). You can identify the options included in the device from the type designation

label. The option selections are described in section *Example of type designation label (page 17)*.

Use of component designations

Some device names in the manual includes the item designation in brackets, for example (A10), to identify the components in the circuit diagrams of the drive.

Related documents

Manual	Code
Appropriate drive hardware manual	
Appropriate drive firmware manual	
NETA-21 remote monitoring tool User's manual	*3AUA0000096939*
Cybersecurity technical guide	*3AXD10000492137*
eWON Cosy 131 Installation Guide	*https://ewon.biz/*

Terms and abbreviations

Term	Description
BCU	Type of control unit
DDCS	Distributed drives communication system protocol
DHCP	Dynamic Host Control Protocol. A protocol for automating the configuration of IP devices. DHCP can be used to automatically assign IP addresses and related network information.
HCS	Hard Clad Silica. A type of fiber optic cable.
INU	Inverter unit
ISU	IGBT supply unit
NETA-21	Remote monitoring tool
NEXA-21	Extension unit for the NETA-21 remote monitoring tool
POF	Plastic Optical Fibre. A type of fiber optic cable.
RDCO-0x	DDCS communication module
RDCU	Type of control unit
RH	Relative humidity
RMDE	Reliability Monitoring Device
SD card	Secure digital memory card (maximum 4 GB)
SDHC card	Secure digital high capacity memory card (4 GB to 32 GB)
TCP	Transmission Control Protocol
UTC	Coordinated Universal Time
ZCU	Type of control unit

Cybersecurity disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is Customer's sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

2

Operation principle and hardware description

What this chapter contains

This chapter describes the operation principle and construction of the RMDE-01 reliability monitoring device.

RMDE-01 reliability monitoring device

The RMDE-01 reliability monitoring device collects operation and fault data from the drive control units and the environmental sensors. The device sends the data to ABB Ability cloud or customer data center.

The RMDE-01 enclosure contains NETA-21 modules (remote monitoring tool) and NEXA-21 modules (extension unit for the remote monitoring tool). The modules set a gateway that converts drive communication protocols into Modbus/TCP and conveys the data to a cellular modem and antenna for mobile data transfer to the server.

The number of the NETA and NEXA modules vary from two to four depending on the customer order:

- a two-module version contains two NETA-21 and two NEXA-21 modules
- a four-module version contains four NETA-21 and four NEXA-21 modules.

The sensors are connected to the NEXA modules via a USB link. Drives must be connected to NETA modules via the Ethernet link or using a DDCS fibre optic link.

A node is a control unit of the drive. In large drives, there are several control units: one for the supply unit, and one for each inverter units.

The RMDE-01 delivery includes antenna, ambient temperature and humidity sensors. These must be installed and connected by the user on site.

■ Example 1: RMDE-01 connected to a large single drive via Ethernet link

The figure below shows an installation example of the RMDE-01 connected to ACS880-37 drive via Ethernet link.
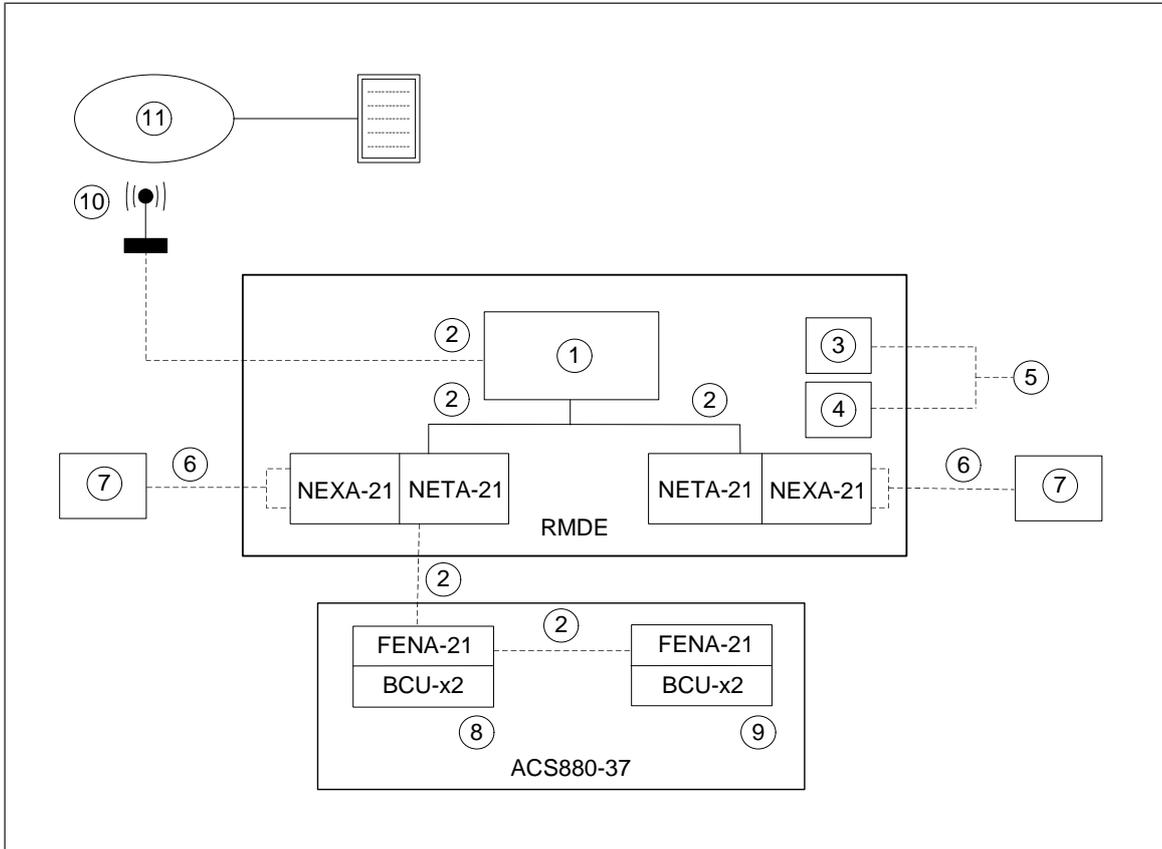
1	Cellular modem
2	Ethernet connection
3	24 V DC power
4	Fan
5	115/230 V AC
6	USB connection
7	RH, temperature
8	IGBT supply unit
9	Inverter unit
10	Antenna
11	ABB Ability Cloud

The dashed connection lines indicate the on-site user connections:

- the connections to the RMDE-01 enclosure
- the Ethernet connections between the supply and inverter unit of the drive.

The continuous connection lines indicate internal connections of the RMDE-01 enclosure done by ABB at the factory.

The RMDE-01 collects data from control unit through Ethernet cable connection at the drive side with FENA-21 option module and at the RMDE-01 side with NETA-21 module.

■ Example 2: RMDE-01 connected to four large single drives via a DDCS fibre optic link

The figure below shows an installation example of the RMDE-01 connected to ACS800-37 drives via a DDCS fibre optic link.

1	Cellular modem
2	Ethernet connection
3	230 V AC/24 V DC power
4	Fan
5	230 V AC
6	USB connection
7	RH, temperature
8	DDCS fibre HCS
9	DDCS fibre POF
10	IGBT supply unit
11	Inverter unit
12	Antenna
13	ABB Ability Cloud
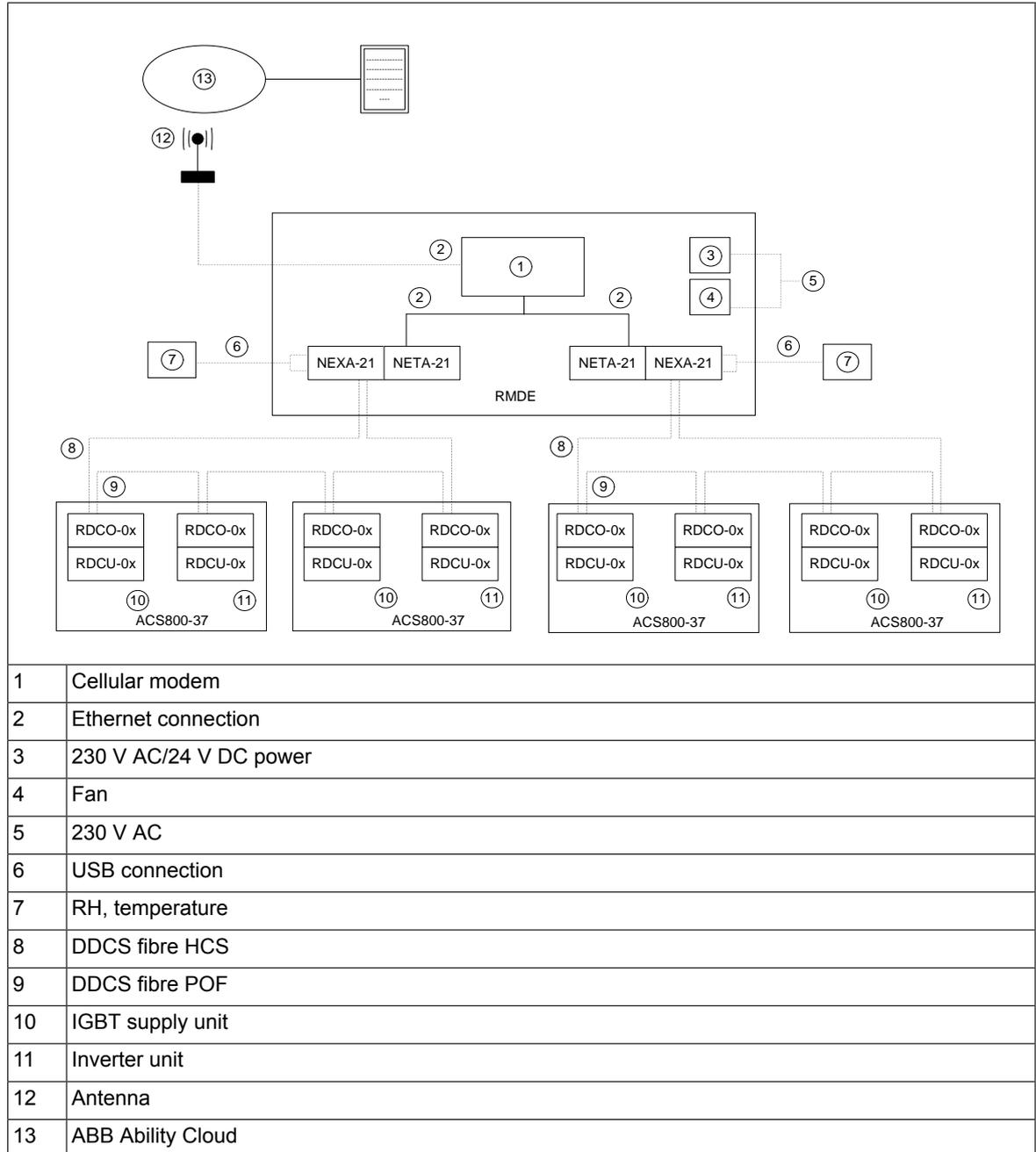
The dashed connection lines indicate the on-site user connections:

- the sensor and antenna connections to the RMDE-01 enclosure
- the connections between the RMDE-01 enlosure and the nodes (drives, and/or supply and inverters units of the drives).

The continuous connection lines indicate internal connections of the RMDE-01 enclosure done by ABB at the factory.

Layout of the RMDE-01

The following figure describes the RMDE-01 layout. The component designations are also used in *Circuit diagrams (page 53)*.
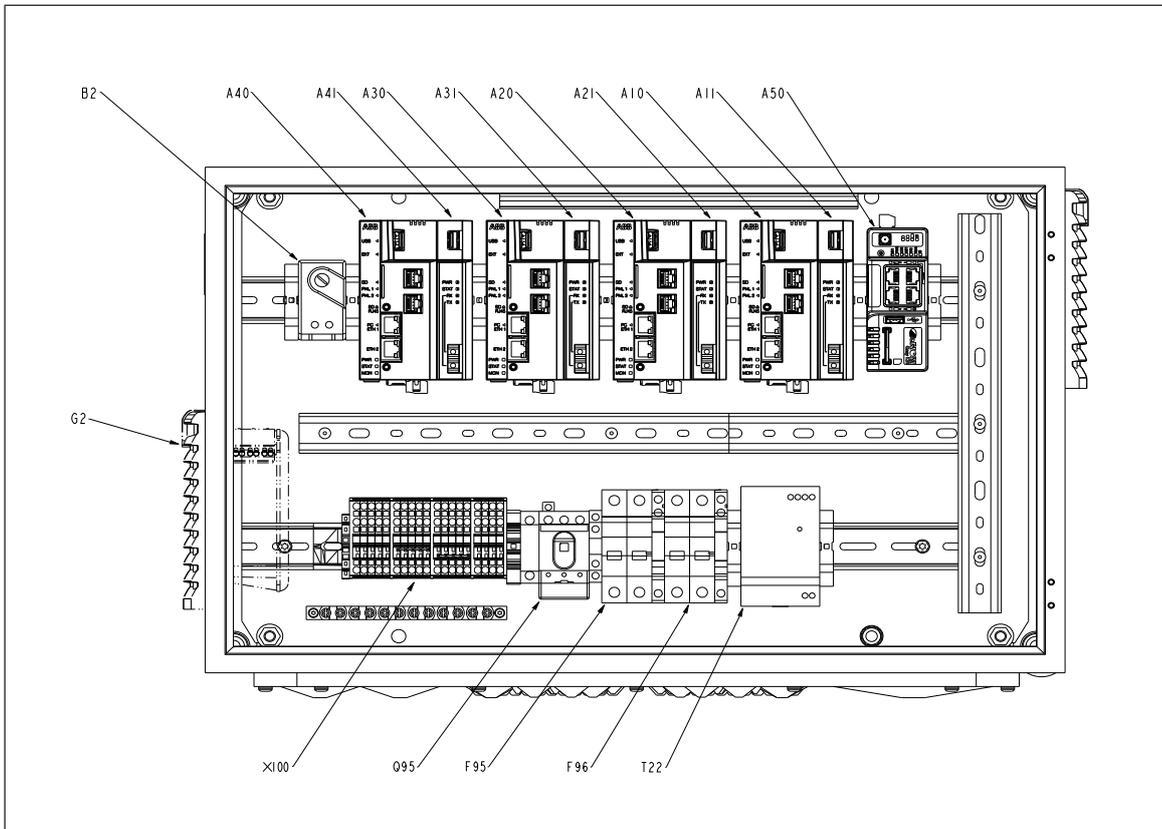
A10, A11, A20, A21, A30, A31, A40, A41	NETA-21 module and NEXA-21 module. Number of modules vary depending on the customer order.
A50	Cellular modem
B2	Fan thermostat
G2	Filter fan
F95, F96	Miniature circuit breakers
Q95	Main switch
T22	Power supply unit
X100	Terminal blocks

Ordering fibre optic cables for DDCS

The table below shows the ABB order codes.

Type	Description	Ordering code
HCS 50m	Hard clad silica (HCS) optical fibre set, duplex. Used for long distance runs. Cable includes mechanical protection.	3AXD50000125258
HCS 150m		3AXD50000131907
HCS 200m		3AXD50000132416
POF 2m	Plastic optical fibre (POF) set, zipcord dublex. Used for optical chains inside drive cabinets. Zipcord dublex cable can be separated into two single core cables.	3AXD50000132423
POF 20m		3AXD50000132430

Note:

The RMDE-01 delivery does not contain any fibre optic cables, but you must acquire them separately.

Example of type designation label

1	Type designation, see section *Type designation key (page 17)*.
2	Name and address of the manufacturer
3	Degree of protection
4	Nominal ratings in the supply voltage range
5	Valid markings
6	S/N: Serial number of format MYYWWXXXX, where
	M: Manufacturer
	YY: 16, 17, 18, … for 2016, 2017, 2018, …
	WW: 01, 02, 03, … for week 1, week 2, week 3, …
	XXXXX: Integer starting every week from 0001

Type designation key

The type code of the RMDE-01 reliability monitoring device is indicated on its type designation label. The type code contains information of specifications and configuration of the device. The first digits from left and separated with hyphens express the basic configuration. The optional selections are given thereafter separated by plus signs.

▪ Type code of the basic configuration

Digit	Name/Description	Alternatives
1...4	Product type	RMDE
5...11	Product version	-01-1-1

▪ Option codes

Class	Code	Description
Supply voltage	G304	115 V AC auxiliary voltage (230 V AC is standard)
Number of NETA-21 modules	4K496	Two NETA modules (standard) Four NETA modules
Language	R700, R701, R708	English, German, Spanish

3
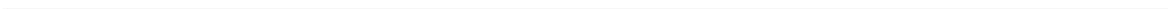
Mechanical installation

What this chapter contains

This chapter contains a delivery checklist and instructions to install the RMDE-01 reliability monitoring device.

⚠️ **WARNING!**

Obey the safety instructions given in this manual and the drive documentation.

Checking the installation site

Check the ambient conditions at the installation site. See the temperature limitations in section *Ambient conditions (page 47)*.

Unpacking the delivery

1. Open the package.
2. Make sure that the package contains all the items listed in the below delivery list. See *Checking the delivery*.
3. Check that there are no signs of damage.

Checking the delivery

The RMDE-01 delivery contains:

- RMDE-01 enclosure
- Wall mounting brackets
- Enclosure key
- Cellular antenna with cable

- Support plates for sensors
- Sensors with USB cables
- Cable glands.

Before attempting the installation and operation, check the information on type designation label to verify that the delivery is of the correct type. See section *Example of type designation label (page 17)*.

Installing the reliability monitoring device

1. Select the appropriate mounting location for RMDE-01.
   - See section *Ambient conditions (page 47)*.
   - Make sure there is 500 mm clearance on both sides of the enclosure for cooling.

⚠ **WARNING!**
RMDE-01 is a heavy device. Be careful when you lift it.

2. Install the mounting brackets to the enclosure.
3. Mount the enclosure using M8 bolts and washers.
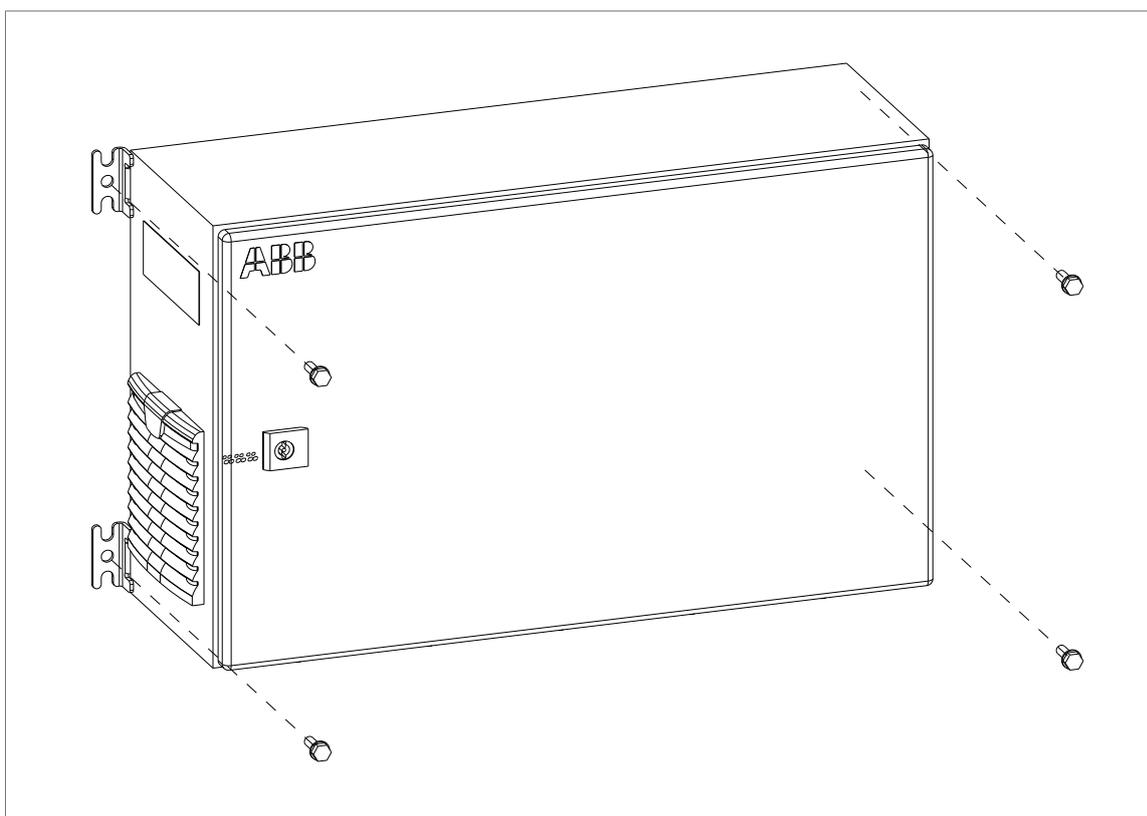
Installing the antenna

⚠ **WARNING!**

Parts of the antenna are an electrical conductor. Contact with power lines can result in death or serious injury. The antenna installation location must not be close to any power lines. If the antenna is elevated and at risk from lightning strike it must be ensured that the antenna is mounted and earthed appropriately by a trained professional in accordance with the relevant standards.

The antenna can be mounted inside the electrical room. It is also possible to install antenna outside the electrical room if the cellular coverage is not appropriate.

1. Select a suitable location to mount the antenna.
   - Make sure to maintain 200 mm space between the antenna and the metal objects and surfaces. The minimum distance from the antenna to the user is 200 mm.
2. Drill holes for the fastening the M4 screws of the antenna bracket.
3. Fasten the antenna bracket.
4. Mount the antenna to the bracket using the supplied nut and washer.

5. Ground the antenna mounting bracket with 6 mm^2 earthing conductor.

Installing the sensor

1. Select the installation place for mounting the sensors which represents the ambient conditions of the drives.

    • Do not place the sensors near heat sources, cold, draught or direct sunlight which could lead to false measurement, for example near the drive air outlet.

    • Do not install sensors in the area closer than 500 mm to the RMDE-01 right side air output filter.

2. Install sensors on support plates in chosen location.

4

Electrical installation

What this chapter contains

This chapter describes the electrical installation procedure of the RMDE-01 reliability monitoring device.

General cabling instructions

- Arrange the cables as far from the power cables as possible.
- Avoid parallel runs with the power cables.
- Do not route the data or antenna cables in the cable ducts inside RMDE-01 (no space for external cables).

For information on cable types, see section *Cable data (page 49)*.

Connections between the components inside the RMDE-01

These connections are done by the manufacturer. Do not change the connections on site. See chapter *Circuit diagrams (page 53)*. These connections are drawn in normal continuous line.

User connections

⚠ **WARNING!**

Only qualified electricians are allowed to do the work described in this section. Read the complete safety instructions delivered with the drive before you install, commission, use or service the drive or the reliability control enclosure.

Make these connections on the installation site:

- Sensor connection

- Antenna connection
- Drive connection
- PC connection
- Factory Ethernet link connection (optional)
- Power supply connection including the protective earth (ground connection).

For the drive connections, see section *Connecting drives to the reliability monitoring device (page 24)*. For the other connections, see chapter *Circuit diagrams (page 53)*.

■ Connecting drives to the reliability monitoring device

Connecting via Ethernet link

In the Ethernet tool network, each drive/unit is connected to the network through a FENA-21 Ethernet adapter module.

1, 2, 3	ABB drive
4	Other slave device
5	NETA-21 ETH1 port
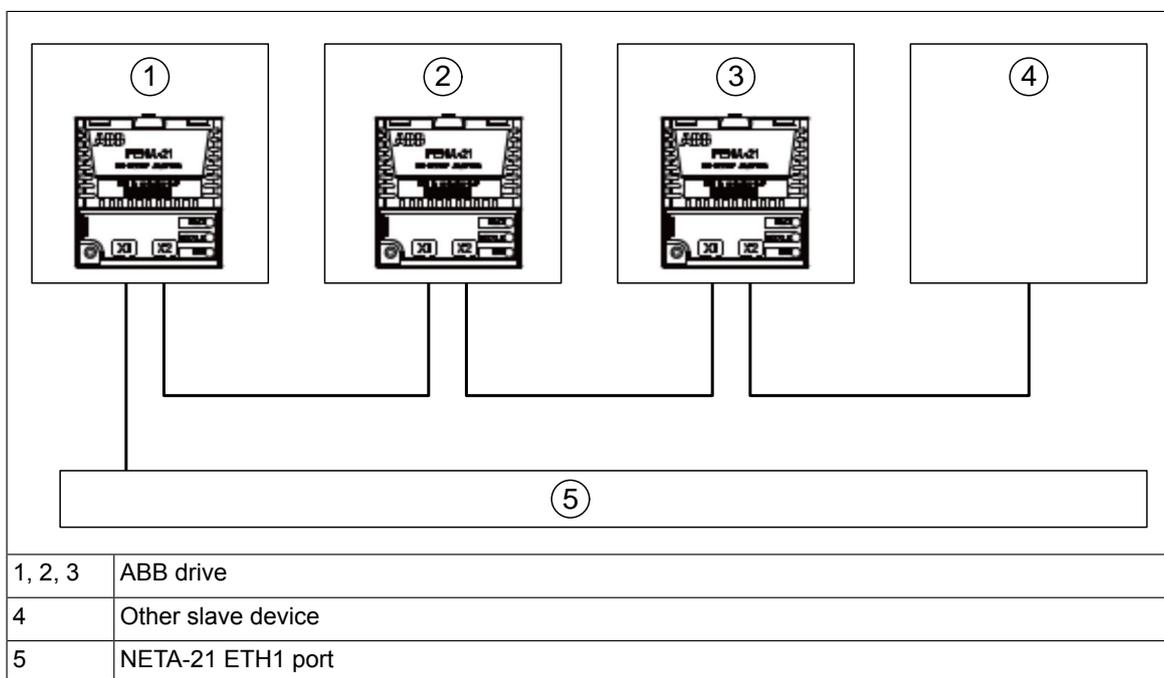
One of the Ethernet port of a NETA-21 must be connected to internet (cellular modem) and the other Ethernet port can be connected for local monitoring (FENA-21 adapters in drives). The gateway is configured only for the Ethernet link which is connected to the internet.

Note:

ACS880 drive series is compatible with FENA-21. For the other drive types, check the compatibility from ABB.

Connecting via a fibre optic link

The diagram below shows the connection via the DDCS fibre optic link for a drive which is equipped with an RDCU control unit, and a RDCO DDCS adapter (eg, ACS800 drive). The connection principle is also valid for other types of control units that support the DDCS link with or without an additional DDCS adapter (eg, ACS880 drives).

1	PC (only during start-up and commissioning)
2	ETH2 port
3	Link to Cellular modem (A50) Ethernet ports
4	DDCS optical fibre transmitter
5	DDCS optical fibre receiver
6	ABB drive (or supply unit or inverter unit)
7	RDCO-02 (C)[1]; Connection terminal point is CH3, DDCS (PC) adapter module.
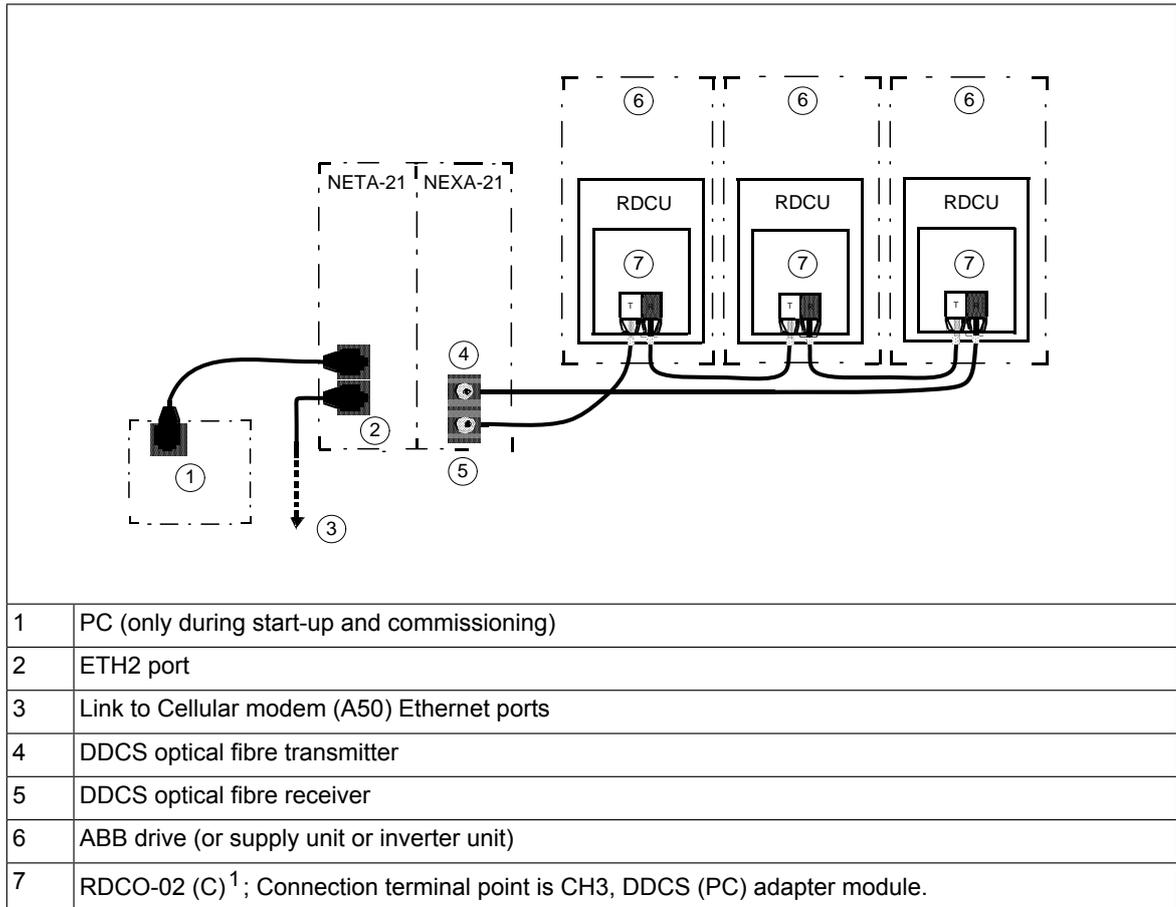
Connect the NEXA-21 primarily to fiber optic channel CH3 on the RDCO-02 (C) module.

The default NETA-21 settings for a DDCS network is ring topology and 1 Mbit/s communication speed. NETA-21 automatically detects the connected devices when the fibre optic channel is connected for the first time. If reconfiguration is needed at a later stage, it can be done using the web interface.

Each drive connected through the RDCO-02 (C) CH3 must have a unique node ID configured for the DDCS fibre optic link. The settings can be done using control panel of the drive. Typically the node IDs are configured in group 70 DDCS CONTROL. Check both the node ID and used communication speed.

The changes to DDCS node ID is effective only after you power down and power up the drive.

⚠️ **WARNING!**

If two or more connected drives use the same node ID (default DDCS ID is 1) then NETA-21 and RMDE-01 does not properly detect all the connected drives, and the analyzed data can become corrupt.

---

[1] In addition to the RDCU, also other control units are compatible with DDCS adapters, for example, the control units in the ACS880 series have these options available:

- ZCU-xx can be equipped with FDCO adapter (option +xxxx)
- BCU can be equipped with FDCO adapter (option +xxxx) or RDCO adapter (option +xxxx).

■ Connection procedure

<div>

⚠ **WARNING!**

Only qualified electricians are allowed to do the work described in this section. Read the complete safety instructions delivered with the drive before you install, commission, use or service the drive or the reliability control enclosure.

</div>

1. Disconnect all possible voltage sources.
   - Open the supply cable main switch at the power supply of the enclosure.
   - Lock the switch to open position and attach a warning notice to it.
2. Open the enclosure cover with triangle key.
   - Make sure by measuring that there is no voltage connected to the main switch (Q95).
3. Pierce the plastic of cable gland plate with a sharp object and pull through the cables.
4. Strip the cables and prepare the ends of the wires.
5. Fasten cables to strain relief bar below terminals.
6. Connect the cables:
   - Remove plastic cover from the main switch (Q95).
   - Connect main supply wires to main switch (Q95). Tighten the main switch screws to 0.8 Nm. Reconnect the plastic cover to main switch. For connections, see chapter *Circuit diagrams (page 53)*.
   - Connect the protective earth (PE) conductor to earthing point in assembly plate. Tighten the nut to 5 Nm.
   - Connect the antenna cable to the modem. For connections, see chapter *Circuit diagrams (page 53)*.
   - Connect the environmental sensor USB cables to NEXA-21 modules.

Do not route the data or antenna cables in the cable ducts inside RMDE-01 (no space for external cables). Connect cables directly to connection point. For connection points, see chapter *Circuit diagrams (page 53)*.

■ Inserting SIM card into the 3G modem

1. Unlock modem from the DIN rail mounting with a screw driver.
2. Press the transparent plastic lock down and remove the module from the rail to get access to the SIM card slot.
3. Insert the SIM card in the open slot of the modem.
4. Mount the modem to the DIN rail.

5

Start-up

What this chapter contains

This chapter instructs how to start-up monitoring and how to secure the connected devices.

Configuring SIM card settings for the modem

ABB pre-configures the cellular modem at the factory with these default settings:

- PIN code - 1234
- APN address - internet
- 3G connection operator specific username and password are empty
- Forwarding of outgoing traffic from Ethernet ports (NETA-21 monitoring tools) to internet instead of default settings to forward traffic only via Talk2M VPN.

> ⚠ **WARNING!**
>
> The default factory configuration of the modem expects that the PIN code for the SIM card is 1234. If you have another PIN code, then do not power on and off the RMDE-01 and the cellular modem without doing the start-up setup after the first power up of the RMDE-01. Three consecutive power cycles may lock the SIM card if the PIN code is different than 1234 and start-up has not been done.

If you want to modify any of the above mentioned settings, import new configuration using an SD card. The SD card can be taken from the NETA-21 module. Any SD/SDHC card of size 2 GB to 32 GB can be used for the Cellular modem configuration.

■ Changing configuration in the modem using SD card

If the default settings are valid for the chosen operator and SIM card, then this step can be skipped. However, if you need to change the settings, make the changes before inserting the SIM card in the Cellular modem.

1. Create a configuration file (*comcfg.txt*) on SD card using a local computer.
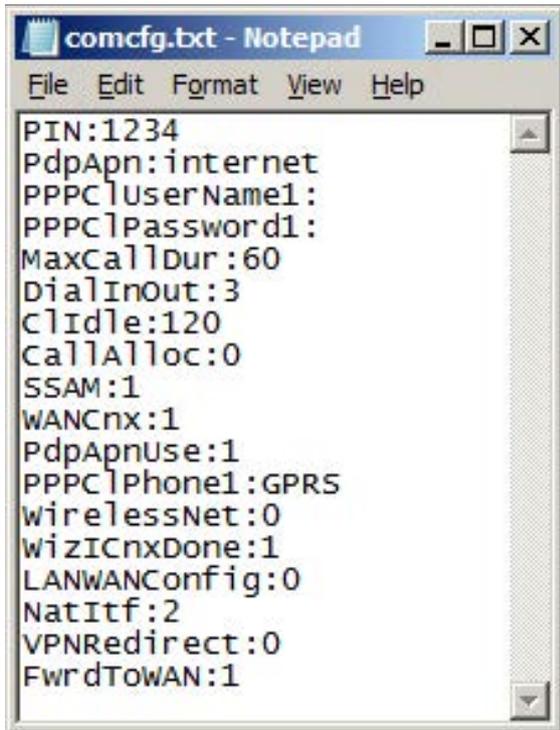
```
comcfg.txt - Notepad                    _ □ X
File  Edit  Format  View  Help
PIN:1234
PdpApn:internet
PPPClUserName1:
PPPClPassword1:
MaxCallDur:60
DialInOut:3
ClIdle:120
CallAlloc:0
SSAM:1
WANCnx:1
PdpApnUse:1
PPPClPhone1:GPRS
WirelessNet:0
WizICnxDone:1
LANWANConfig:0
NatItf:2
VPNRedirect:0
FwrdToWAN:1
```

Note:

You can download the configuration sample file from ABB download center.

2. Power on the Cellular modem.
3. Wait a minute so that the Cellular modem will start-up.
4. Place the SD card (with *comcfg.txt* file) in the modem SD card slot.
    - Within five seconds, the modem displays a slow blinking pattern of the USR LED. After processing the SD card, the modem displays the result on the USR LED. Solid green indicates a success and Solid red indicates a failure.
    - If the modem was configured previously with identical configuration, the LEDs do not change their color during SD card processing. Installation step is still valid if the connectivity testing is successful.
5. Remove the SD card.
    - The modem will reboot and apply the new settings.

    Note:

    In this special case, you must remove the SD card while the modem is power on.

6. After reboot all the Ethernet ports must show green. In case SIM card is configured, the signal and ST LED must be in orange without blinking.

For further information on troubleshooting, see *https://ewon.biz/*.

Connecting a PC to the 3G modem

The modem consists of four Ethernet ports which can be used to connect the local computer. In case all the ports are connected to NETA-21 modules, release one for the PC.

Note:

There is no DHCP sever running on RMDE-01 Ethernet devices connected ports. Hence, you need to set PC IP address to *10.0.0.x* network. The recommended IP address is between *10.0.0.54* to *10.0.0.254*.

▪ Setting the IP address in local PC

1. In the Windows Control Panel, open the Network Connections interfaces view or you can open the Windows Start menu and type *ncpa.cpl* and press Enter key.
2. Right-click **Local Area Configuration** and select **Properties**.
    *   Local Area Connection Properties dialog is displayed.
3. Double-click on **Internet Protocol Version 4 (TCP/IPv4)**.
4. In the Internet Protocol Version 4 (TCP/IPv4) Properties dialog, click **Alternate configuration** and select **User configured** option.
5. Enter the following values:

IP address	10.0.0.100
Subnet mask	255.255.255.0
Default gateway	10.0.0.53
Preferred DNS server	8.8.8.8 or operator specific DNS server
Alternate DNS server	<empty>
Preferred WINS server	<empty>
Alternate WINS server	<empty>

6. Click **OK** to close the dialog.
7. Click **OK** again to close the network interface configuration.

▪ Testing the modem configuration

1. Connect Ethernet cable between PC and modem.
2. Navigate to modem IP address through web browser (for example, *https://10.0.0.53*).
    *   Configuration wizard is displayed.
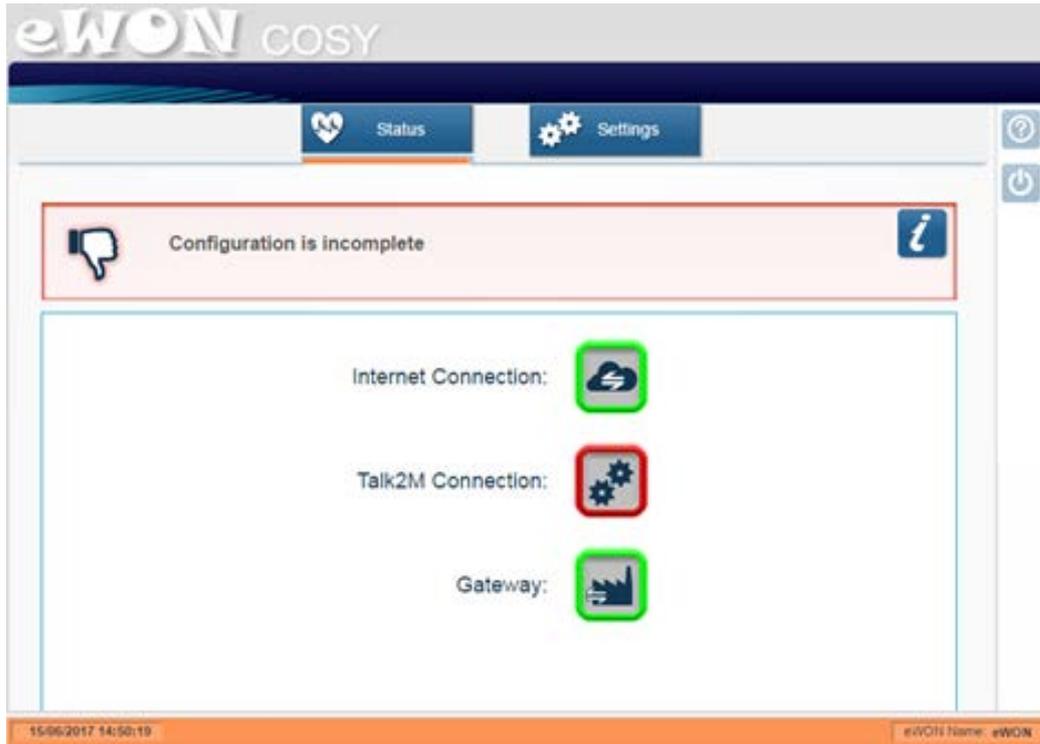
- If the Internet Connection is red, re-check the settings in section *Connecting a PC to the 3G modem (page 29)*.
- Talk2M Connection can remain red unless 2-way remote access is desired.

■ Testing internet connection

You can browse and test the internet connection. Make sure that the Ethernet cable is connected between PC and modem. If the internet connection fails, refer section *Troubleshooting cellular modem (page 43)*.

Changing password for modem

You must change the default password of the modem to maximize the security of the remote connection.

1. Navigate to web address *https://10.0.0.53*.
    - Modem configuration wizard is displayed on the web browser.
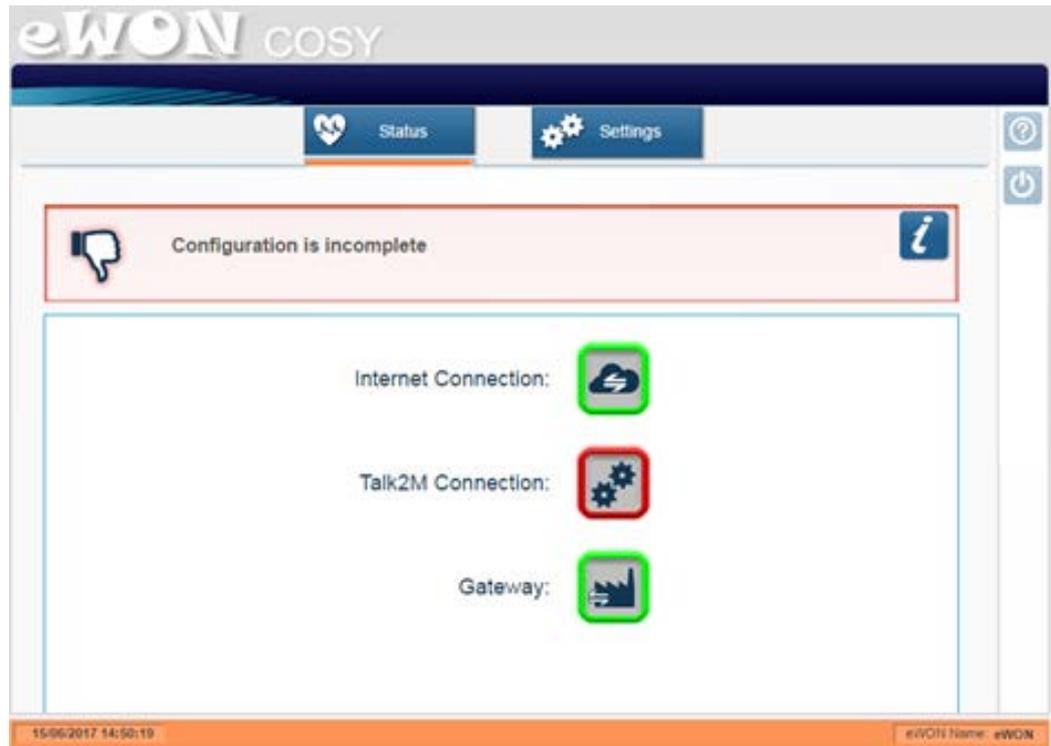
- If the Internet Connection is red, re-check the settings in section *Connecting a PC to the 3G modem (page 29)*.
- Talk2M Connection is not required for ABB Ability monitoring.

2. In the modem configuration wizard, click **Settings**.
3. Enter the user credentials and click **Log In**.
   - The default Username is **adm** and the Password is **adm**.
   - Quick launch wizard is displayed.
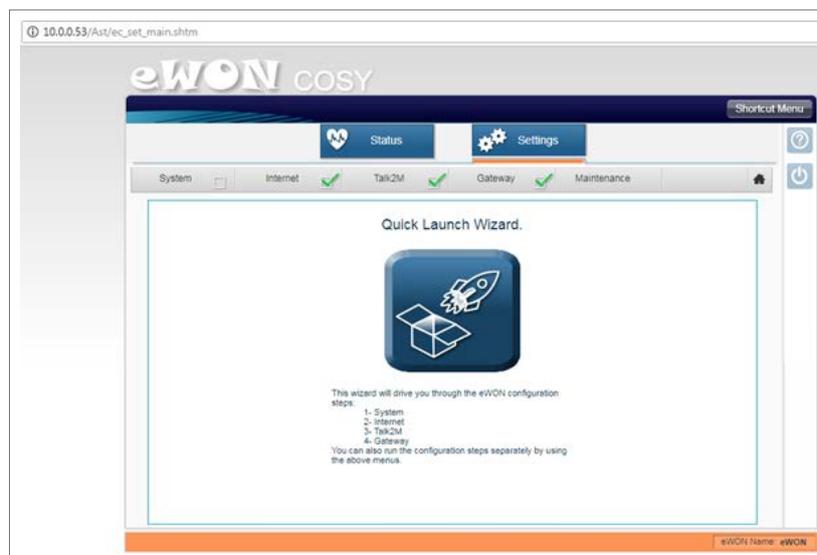
4. Press Quick launch button to start the setup wizard.
5. Change the modem name, User name and Password and then click **Next**.
   - Uncheck **Erase all first** check box.
   - Make sure that the password is secured enough to protect the connection.

6. Check the time and date and then click **Next**.

   • LAN/WAN configuration screen is displayed.

7. Click on the red Ethernet port to switch it to green.

8. Click **Save** to save the LAN/WAN configuration.

The password is changed and the system settings of the modem is completed. You can disconnect Ethernet cable and PC from the RMDE-01.

Note:

Setup wizard suggests to process internet settings. This is not required since the internet configuration is already configured.

For further information on modem, see manufacturers document delivered with the product.

Connecting PC to NETA-21

The NETA-21 monitoring tool consists of two Ethernet ports. The ETH2 port is connected through an Ethernet wire to the modem and has fixed IP address. See section *Connecting via Ethernet link (page 24)*. The ETH1/PC port is available for on-site access to the NETA-21 or to connect ACS880 drives using FENA-21.

The NETA-21 module can enable a DHCP server in the Ethernet1 network (PC ETH 1 terminal), which allows connecting a PC with automatic IP address settings.

To access NETA-21 in the DHCP mode, the PC must contain automatically assigned IP address settings. The connection between the PC and NETA-21 ETH1 port needs to be point to point.

◼ Logging on to NETA-21

1. Make sure that the RMDE-01 is power on.
2. Press and hold NETA-21 SD/RJ45 button for five seconds.
3. Connect an Ethernet cable between the NETA-21 ETH1 port and a PC.
4. Navigate to *https://192.168.230.1*.
5. Enter default Username and Password for the first time login.
   - The default Username is **admin** and the Password is **admin**.
6. Change the Username name and Password after the first login.

After login, the system prompts with the NETA-21 license dialog. Click **Close** to exit the license dialog.
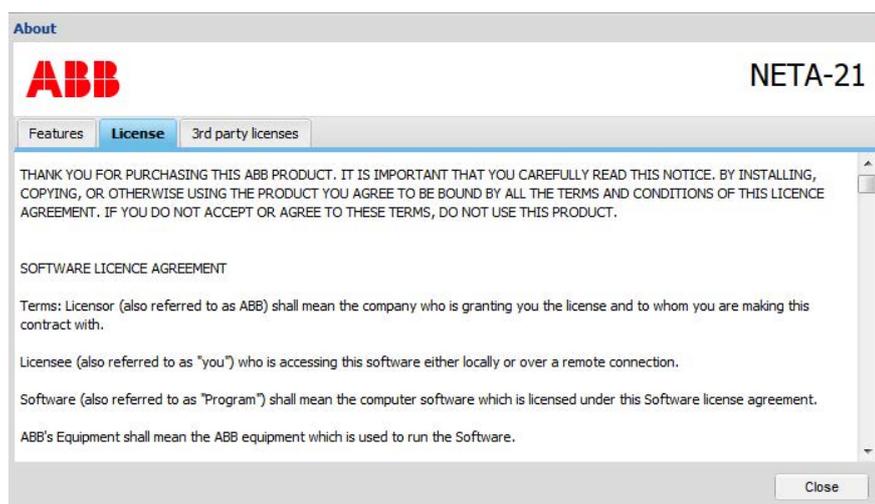
■ **NETA-21 cloud connection status**

After login to NETA-21, the front page of the NETA-21 portal displays the connectivity status.
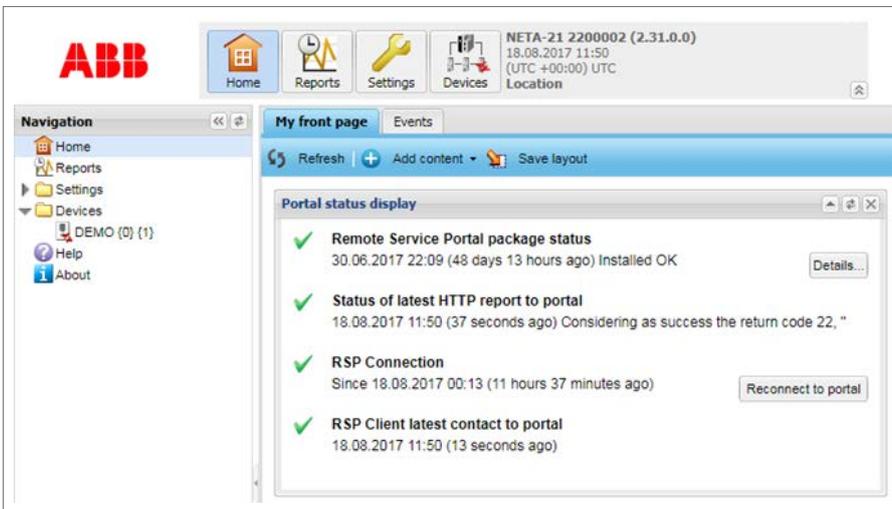
In the Navigation window, click **Reports** ˃ **Report events** to view the data which is sent to the cloud.
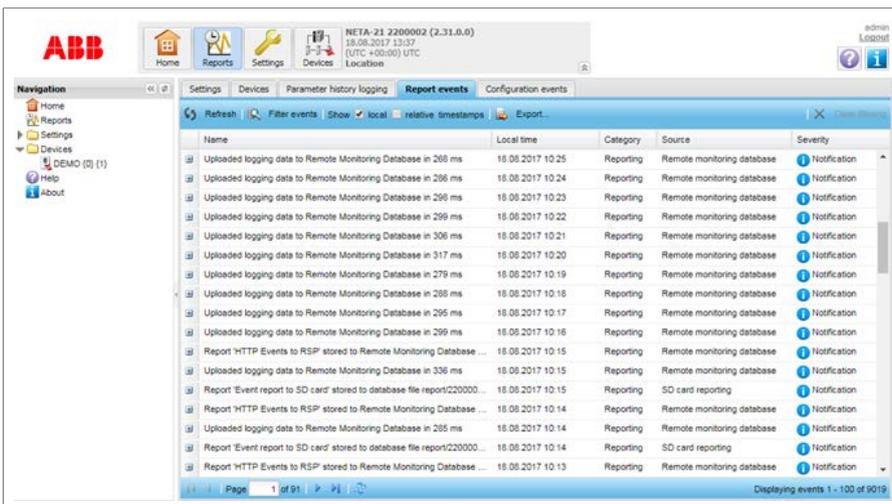
You can export the collected detailed data as an attachment if you want to see which raw data the NETA-21 is sending to the cloud.
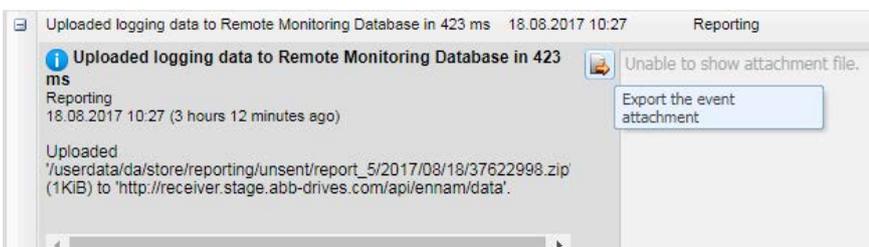
■ NETA-21 firmware update

You can update the latest firmware version by clicking **Software update** in the Unconfigured settings. This update provides latest security updates and monitoring features.

The NETA-21 portal will check and display the available software updates. Click **Update** to start updating the software.
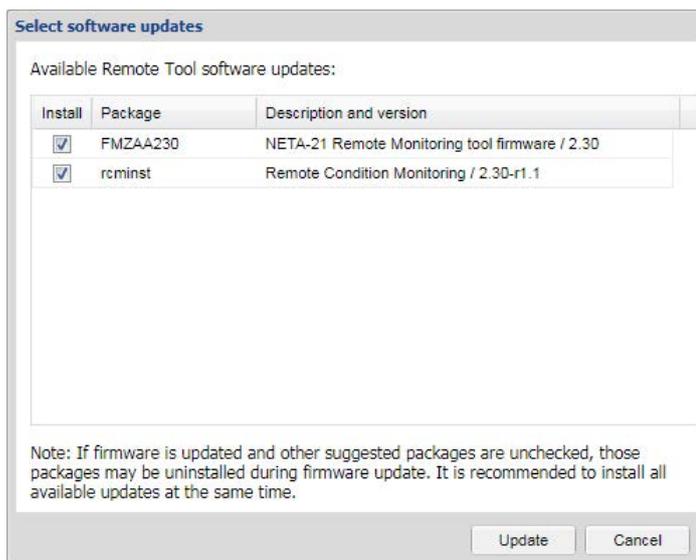
If there are no updates, a dialog is displayed.
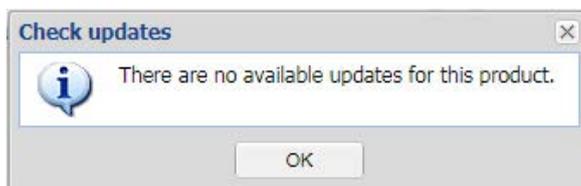
Using ABB Ability cloud with NETA-21 and RMDE-01

Contact your local ABB sales representative for a service agreement or a trial version to use ABB Ability services.

For user access to portals and online support of the existing agreed pilots and contracts, contact Global Remote Services support at *CH-Drive.Remote.Support@abb.com*.

The connection setup form consists of system information such as:

• Customer and site details

• Connected NETA-21 and RMDE-01 serial numbers

• Connected drives; serial numbers and types, preferably software versions of the drives cross-checked against compatibility table to verify that the signal logging templates and customer portal views are provided for the connected drives.

The connected drives must be registered in ABB installed base systems, such as ServIS. For further information on drive registration, see http://new.abb.com/drives/services/drive-registration.

To use ABB Ability Services for drives, the user must contain MyABB account. MyABB account can be created for external email address.
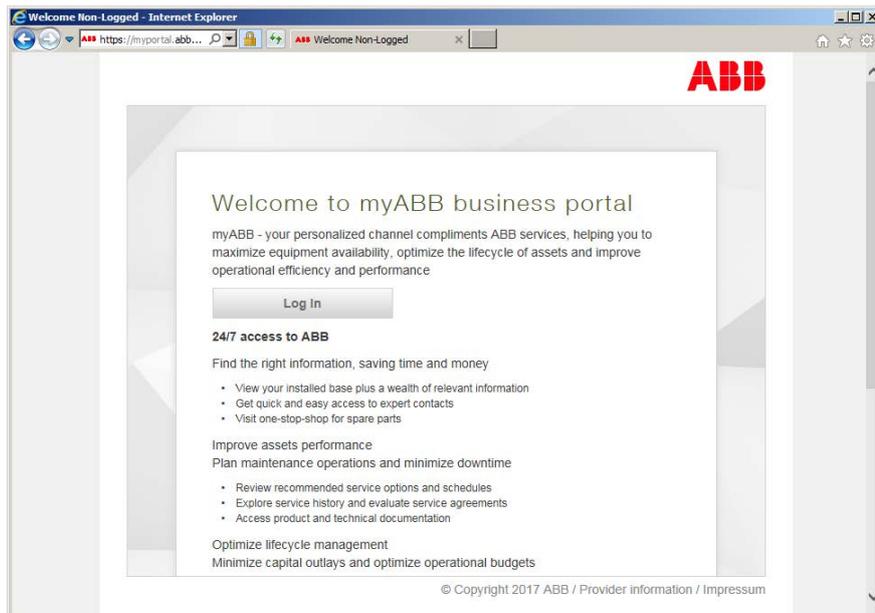
If the services are enabled for the specific MyABB account, the condition monitoring portal becomes visible.

myABB business portal Dashboard

The condition monitoring portal shows an overview of the monitoring equipment condition, reports about the condition of the drives and allow setting email alerts.

6

Maintenance

What this chapter contains

This chapter contains instructions for maintenance of the RMDE-01.

Reconfiguring 3G modem

Pre-requisite

- Make sure that you have a SD card with a *comfcfg.txt* file that contains the appropriate configuration data. See section *Changing configuration in the modem using SD card (page 27)*.
- Also, make sure you have a valid 3G data in hand:
    - pin code of the SIM card
    - APN address of the 3G operator
    - PPCL user name and password
    - Telephone operators 3G user name and password.

1. Edit the configuration file (*comcfg.txt*) on the SD card using a local computer.
2. Remove the SD card from a local computer safely.
3. Power on the RMDE-01 enclosure.
4. Wait a minute to start-up the Cellular modem (A50).
5. Place the SD card in the Cellular modem (A50) SD card slot.
6. Wait until the setup completes and USR LED of the Cellular modem (A50) starts blinking slowly.
7. After processing the SD card, modem displays the result on USR LED.
    - Green LED indicates success.
    - Red LED indicates failure.
    - If the Cellular modem (A50) was configured already, the LEDs do not change their colors while inserting the SD card.

8. Remove the SD card to reboot.

    •   After rebooting, all the Ethernet ports will display green. If the SIM card is configured, the signal and the ST LED will show orange without blinking.

Verifying 3G modem settings

1. Connect a PC to Cellular modem (A50) through Ethernet cable.
2. Open web browser and navigate to *https://10.0.0.53*

    •   Verify that the Cellular modem (A50) connection is active and indicated with green LED.

    •   Talk2M connection is indicated with red LED.

    •   Enter user credentials if required.

After verifying 3G modem settings, test that the internet connection is working through the Cellular modem (A50). While checking the internet connection, disable WiFi. Enable it again after the testing is completed.

Configuring NETA-21 module

■ Setting fixed IP address for NETA-21

1. Connect a local PC to NETA-21 module via Ethernet cable. Disconnect all other cables from NETA-21 (except the power supply cable).

    •   For instructions on how to connect a PC to NETA-21, see section *Connecting PC to NETA-21 (page 33)*.

    •   Login dialog is displayed.

2. Enter user name and password and click **Login**.

    •   License dialog is displayed for the first login after loading the software.

3. Close the license dialog to launch NETA-21 dashboard.

4. In NETA-21 web UI, navigate to **Settings** > **Network Interface** > **Ethernet 2** (tab).

5. Enter the fixed IP address *10.58.0.x0* where x0 is same as the specific NETA-21 identifier (.10, .20, .30 or .40).

    •   Note that each NETA-21 within RMDE-01 must have different unique IP address.

6. Enter *10.0.0.53* as gateway address, *255.255.255.0* as Netmask and *8.8.8.8* (or operator specific value) as DNS server.

7. Save Ethernet 2 settings.

    •   The settings will take effect immediately. You can test the connectivity using Test connection button (e.g. ping *www.abb.com*).

Updating NETA-21 and cellular modem software

To maintain a good level of security for the cellular modem and NETA-21, it is important to periodically update NETA-21 and cellular modem software.

For instructions on how to update the NETA-21 software, refer *NETA-21 remote monitoring tool User's manual* (3AUA0000096939 [English]).

The firmware update check procedure can be repeated using NETA-21 web interface. If the NETA-21 tools are managed under service contract, then ABB reserves the possibility to update critical security patches to the NETA-21 tools.

The cellular modem firmware is updated using an external tool eBuddy. The cellular modem may update its own firmware automatically if the Talk2M VPN connection is enabled.
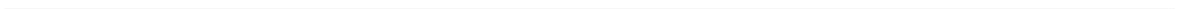
7

Troubleshooting

What this chapter contains

This chapter explains how to trace faults with the status LEDs on the Cellular modem (A50).

Cellular modem LED indicators

Name	Status	Function
USB	Off	No USB mass storage device is attached.
	Green	USB storage device is attached.
	Blinking green	Device attached, initializing in progress.
	Red	USB storage device is not attached or has failed to detect.
	Orange	SIM card is configured.

Troubleshooting cellular modem

Follow the instructions below, when internet connectivity through modem fails while testing with a PC.

- Disable Wifi in the PC so that the PC uses only wired Ethernet.
- Disable proxy on the web browser to make sure that the connection is direct.
- Try using a different web browser.
- Check the security software settings on the PC.
- Re-check the previously modified Ethernet settings and reboot PC if there were errors during the IP address setup.
- Check the IP address "ping 10.0.0.53" gets reply from the host. If the ping returns reply but the web browser does not open the page, restart RMDE-01.
- Ping external site, for example "ping www.abb.com" to verify that the external site is working correctly.

- Check that the SIM card and provided settings are working, i.e. with another modem or mobile phone, the SIM card provides internet connectivity.

- If the modem is reachable, but the internet access does not work, then try to import the settings from the SD card and check the customized options. For troubleshooting instructions, see section *Troubleshooting modem internet connection*.

- By default, if the modem does not allow internet access then try to import the settings from the SD card. To import the settings, see section *Changing configuration in the modem using SD card (page 27)*.

  - If the internet connectivity does not work, login to the cellular modem and check customized options one by one.

Troubleshooting modem internet connection

Follow the instructions below, if the modem internet connection fails.

1. Connect a PC to Cellular modem (A50) via Ethernet cable.
2. Navigate with web browser onto the Cellular modem (A50) web interface (*https://10.0.0.53*).

   - Login with Cellular modem user credentials (Username - Adm, Password - Adm).
   - Configuration dashboard is displayed.
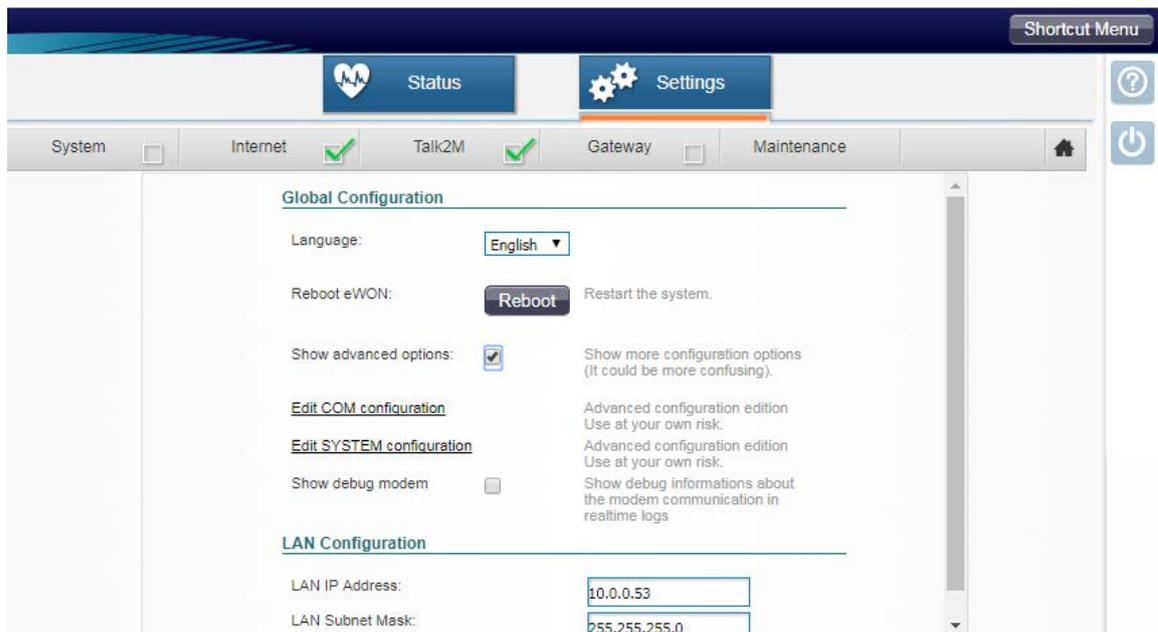
3. Navigate to **Settings** ˃ **Maintenance**.
4. Check **Show advanced options:** check box.
5. Click **Edit COM configurations** link.
6. Search and modify the options available in the list if required.

   - NatItf = 2 (Nat and TF on WAN)
   - VPNRedirect = 0 (Allow traffic outside the VPN tunnel)
   - FwrdToWAN = 1 (Forward LAN traffic to WAN).

7. Save the COM configuration settings.
8. Reboot the Cellular modem so that the settings will take effect.

If there is a disruption in 3G modem signal, the 3G modem will make an effort to resend the data within a minute.

8
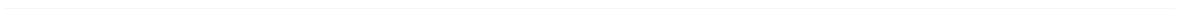
Technical data

What this chapter contains

This chapter contains the technical specifications of the RMDE-01, e.g. technical requirements, provisions for fulfilling the requirements for CE and other markings.

Dimensions and weights

Dimensions	Values
Height	399 mm
Width	654 mm
Depth	232 mm

Weight	Value
Weight	21 kg

Ambient conditions

Ambient conditions	Operation	Storage	Transportation
Operating temperature	0...55°C	-	-
Air temperature (storage and transportation in the protective package)	-40°C...+70°C	-	-
Relative humidity	5...95%	Maximum 95%	Maximum 95%

Ambient conditions	Operation	Storage	Transportation
Contamination levels (IEC 60721-3-x)	IEC 60721-3-3:2002: Classification of environmental conditions. Part 3-3: Classification of groups of environmental parameters and their severities. Stationary use of weather protected locations.	IEC 60721-3-1:1997	IEC 60721-3-2:1997
Chemical gases	Class 3C2	Class 1C2	Class 2C2
Solid particles	Class 3S2 No conductive dust allowed.	Class 1S3 Packing must support this, otherwise 1S2.	Class 2S2
Pollution degree (IEC/EN 61800-5-1)	Pollution degree 2	-	-
Atmospheric pressure	70...106 kPa	70...106 kPa	60...106 kPa
Vibration (IEC 60068-2)	Maximum 1 mm; 5...13.2 Hz Maximum 7 m/s^2; 13.2...150 Hz sinusoidal	Maximum 1 mm; 5...13.2 Hz Maximum 7 m/s^2; 13.2...150 Hz sinusoidal	Maximum 3.5 mm; 2...9 Hz Maximum 15 m/s^2; 9...200 Hz sinusoidal
Drop (ISTA)	-	RMDE-01 (ISTA 1A): Drop, 6 faces, 3 edges and 1 corner.	-

Protection classes

Protection classes	Values
Degree of protection (IEC/EN 60529)	IP 54
Enclosure type (UL 50 12th edition 2007)	4
Over voltage category (IEC 60664-1)	II
Protective class (IEC/EN 61800-5-1)	I

Materials

Materials	Descriptions
Enclosure	Enclosure steel sheet 1.38 mm Door 1.5 mm Mounting plate 2.5 mm Enclosure and door dipcoat primed, powder-coated on the outside Mounting plate zinc-plated Enclosure color RAL 7035
Package	Cardboard and foam cushions PE

Materials	Descriptions
Disposal	The main parts of the drive can be recycled to preserve natural resources and energy. Product parts and materials should be dismantled and separated. Generally all metals, such as steel, aluminum, copper and its alloys, and precious metals can be recycled as material. Plastics, rubber, cardboard and other packaging material can be used in energy recovery. Printed circuit boards and large electrolytic capacitors need selective treatment according to IEC 62635 guidelines. To aid recycling, plastic parts are marked with an appropriate identification code. Contact your local ABB distributor for further information on environmental aspects and recycling instructions for professional recyclers. End of life treatment must follow international and local regulations.

Losses cooling data and noise

Losses cooling data and noise	Values
Losses	60 W
Air throughout	55 m^3/h
Noise pressure level	49 dB (A)

Cable data

Cable	Size
External supply cable	3×2.5 mm^2 (max fuse 16 A)
Separate enclosure grounding and antenna mounting bracket grounding	6 mm^2 (green/yellow)
Ethernet cable	Category 5e/6, jacket insulation PVC or FEP

Modem and antenna technical data

■ Modem

Manufacturer	Type
eWON	COSY 131

■ Antenna

Manufacturer	Type
Panorama Antennas	B4BE-7-27, 2G/3G/4G frequencies (698-960/1710-2700MHz)

Open ports

For information on open TCP and UDP ports which are available locally on the RMDE-01, refer *NETA-21 remote monitoring tool User's manual* (3AUA0000096939 [English]).

The Cellular modem masks most of the in-bound ports behind a firewall and only allows some of the out-bound traffic from the NETA-21.

Applicable standards

- EN 301 511 V9.0.2
- EN 301 489-1 V2.1.1
- EN 301 489-52 V1.1.0
- EN 62311:2008
- EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013
- UL 508A 2nd edition:2014 - Industrial Control Panels

Markings

CE mark.

■ Compliance with the European Low Voltage Directive

The EU Declaration of Conformity can be downloaded from [ABB download center](#).

WEEE mark

	WEEE mark At the end of life the product should enter the recycling system at an appropriate collection point and not placed in the normal waste stream.

FCC Compliance

Product contain FCC ID: RI7HE910

9

Dimension drawings

What this chapter contains

This chapter contains dimension drawings of the RMDE-01.

Dimension drawing of the RMDE-01

10
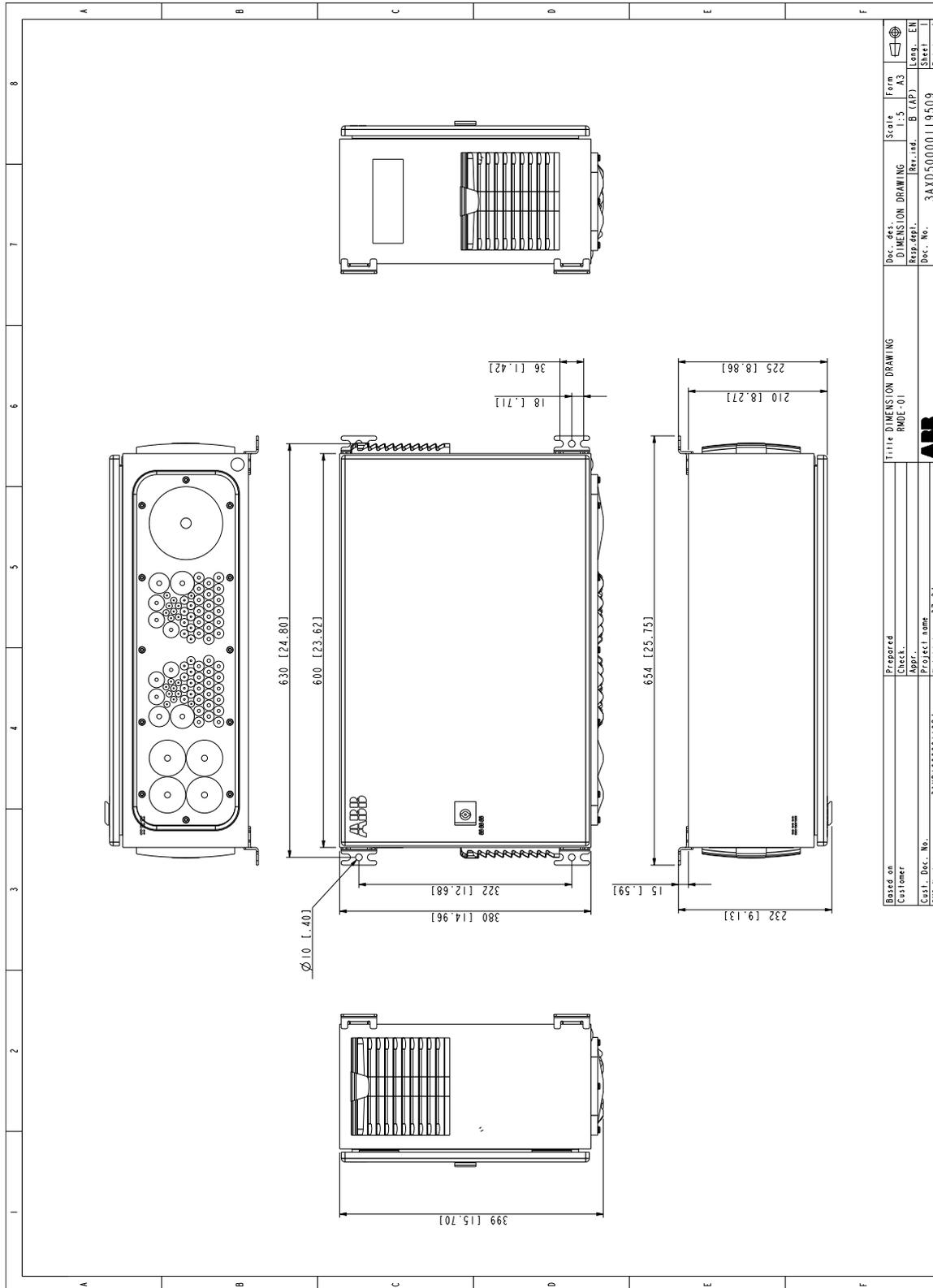
Circuit diagrams

What this chapter contains

This chapter contains RMDE-01 circuit diagrams.

RMDE-01 circuit diagrams

CUSTOMER CONNECTIONS DRAWN WITH DASHED LINE

-A50
Cosy 131 3G
Cellular modem

Power Supply
12-24 DC

X1
+
BK
1,5
-X100:21
/1/6D

-
BK
1,5
-X100:26
/1/7D

PE
GNYE
1,5
-X100
PE4

ANT
1

Ethernet 1
1
-A10:ETH2:1-8
/3/2C

Ethernet 2
2
-A20:ETH2:1-8
/3/2E

Ethernet 3
3
-A30:ETH2:1-8
/4/2C

Ethernet 4
4
-A40:ETH2:1-8
/4/2E

OPTION
+4K496

-W50
2x
2

-T50
ANT

Cu 6mm²

MOUNTING
PLATE
GROUNDING

Cust. Doc. No.	Prep.		Title	Modem	Circuit diagram	EFS2	Item Des.
Cust. Ref. No.	App.				SAP Doc. No.	3AXD1000063B396	= RMDE
Customer	Project	Reliability Monitoring Device			EPLAN Doc. No.	010	
		RMDE-01			ABB Ref. No.		Rev. B Sheet 2
					Resp. Dept.		Cont. 3

ABB

OPTION
+4K496

-A30

X1 -X100:24 /1/6D BK 1,5
X1 -X100:29 /1/7D BK 1,5

NETA-21
ETHERNET ADAPTER

ABB

PNL1 1-8 Panel bus port 1
PLN2 1-8 Panel bus port 2
ETH1 1-8 Ethernet port 1
ETH2 1-8 Ethernet port 2

Power Supply
10...30V DC, max. 2A

X3 1 2 3 4

EIA-485 port

X2 1-9 EIA-232 port

X4 1-4 USB

NETA-21 X21 2x18 Termination Jumper

-W4 8x -A50:3:1-8 /2/3C

ETHERNET
CONNECTION
FENA-21
MAX 4 NODES

-A31

X11 1 2

Secondary Power Supply
AC/DC 24 V ± 10%, max. 1 A (rms)

NETA-21 X21 2x18

NEXA-21

DDCS
Rx Tx

X4 1-4 USB

DDCS CONNECTION
RDCO-02(C)
MAX 4 NODES

-A40

X1 -X100:25 /1/6D BK 1,5
X1 -X100:30 /1/8D BK 1,5

NETA-21
ETHERNET ADAPTER

ABB

PNL1 1-8 Panel bus port 1
PLN2 1-8 Panel bus port 2
ETH1 1-8 Ethernet port 1
ETH2 1-8 Ethernet port 2

Power Supply
10...30V DC, max. 2A

X3 1 2 3 4

EIA-485 port

X2 1-9 EIA-232 port

X4 1-4 USB

NETA-21 X21 2x18 Termination Jumper

-W5 8x -A50:4:1-8 /2/3C

ETHERNET
CONNECTION
FENA-21
MAX 4 NODES

-A41

X11 1 2

Secondary Power Supply
AC/DC 24 V ± 10%, max. 1 A (rms)

NETA-21 X21 2x18

NEXA-21

DDCS
Rx Tx

X4 1-4 USB

DDCS CONNECTION
RDCO-02(C)
MAX 4 NODES

CUSTOMER CONNECTIONS DRAWN WITH DASHED LINE

Cust. Doc. No.		Prep.		Title	NETA	Circuit diagram	EFS2	Item Des.
Cust. Ref. No.		App.				S4P Doc. No. 3AXD1000063896		= RMDE
Customer		Project	Reliability Monitoring Device			EPLAN Doc. No. 010		
			RMDE-01	**ABB**		ABB Ref. No.	Rev. B Sheet 8	
						Resp. Dept.	Cont.	4

— Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

You can find manuals and other product documents in PDF format on the Internet at www.abb.com/drives/documents.

ABB

www.abb.com/drives

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