Remote Maintenance Gateway

RMG/941(L,N)

with DNP/9535

Hardware Reference

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Document Revision: 1.0
Date: 2019-12-10

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1 INTRODUCTION

This document describes the basic hardware components of the Remote Maintenance Gateway RMG/941(L,N).

1.1 Safety Guidelines

Please read the following safety guidelines carefully! In case of property or personal damage by not paying attention to this manual and/or by incorrect handling, we do not assume liability. In such cases any warranty claim expires.

- The power supply should be in immediate proximity to the device.
- The power supply must provide a stable output voltage at 11..28 VDC ±10%. The output power should be at least 10 W.
- Please pay attention that the power cord or other cables are not squeezed or damaged in any way when you set up the device.
- Do NOT turn on the power supply while connecting any cables, especially the power cables. This could cause damaged device components! First connect the cables and THEN turn the power supply on.
- The installation of the device should be done only by qualified personnel.
- Discharge yourself electrostatic before you work with the device, e.g. by touching a heater of metal, to avoid damages.
- Stay grounded while working with the device to avoid damage through electrostatic discharge.
- The case of the device should be opened only by qualified personnel.

1.2 Conventions

Convention	Usage
bold	Important terms and information
monospace	Filenames, Pathnames, program code, command lines

Table 1: Conventions used in this document

1.3 Features and Technical Data

Processor	
Manufacturer / Type	Atmel ATSAM-A5D35 SoC
Clock speed	528 MHz
Memory	
RAM	256 MB SDRAM
Flash	4 MB NOR memory
Storage media	1x internal microSD card holder
Interfaces	
Ethernet	1x 10/100 Mbps (RJ45)
Serial I/Os	1x RS485 serial port (screw terminal)
COM (Service Port)	1x 6-pin connector
Antenna	1x SMA male connector for LTE antenna
Special Functions	
Watchdog	1x Timer watchdog (hardware-based, software-configurable) 1x Power supervisor (hardware-based)
SIM card	1x Mini-SIM card holder (accessible from the outside)
Displays / Control Elements	
LEDs	1x Power 1x System status (programmable) 2x LAN LED for Ethernet interface
Electrical Characteristics	
Power supply range	11 .. 28 VDC from external power supply
Power consumption	< 15 W
Mechanical Characteristics	
Protection class	IP20 industrial case for 35 mm DIN-rail mounting
Mass	< 150 g
Dimensions	112 mm x 100 mm x 22.5 mm
Operating temperature	0 .. 60 °C
Storage temperature	-40 .. 85 °C
Standards and Certifications	
EMC	CE
Environmental standards	RoHS, WEEE

Table 2: Features and technical data

1.4 RMG/941L: Features LTE Module

LTE Module	
Mobile radio standards	GSM/UMTS/HSPA+/LTE
Transfer rates	150 Mbps peak download, 50 Mbps peak upload
Frequency bands LTE	B1/B3/B5/B7/B8/B20
Frequency bands WCDMA	B1/B5/B8
Frequency bands GSM/GPRS	GSM850/GSM900/DCS1800/PCS1900
Authentication	PAP, CHAP, CHAT, none
Supported APNs	Telekom, Vodafone, 02, E-Plus, user-defined

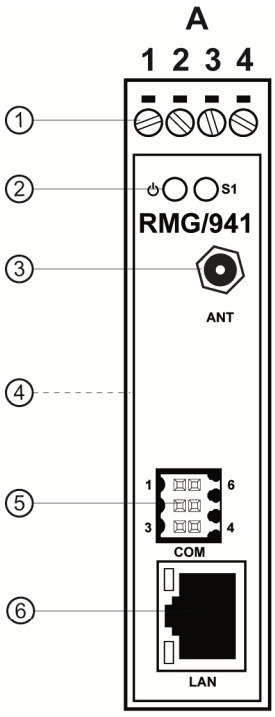
Table 3: Features LTE module

1.5 RMG/941N: Features NB-IoT Module

NB-IoT (LTE Cat NB1) Module	
Mobile radio standards	GSM/LTE
Transfer rates LTE Cat M1	375 Kbps peak download, 375 Kbps peak upload
Transfer rates LTE Cat NB1	32 Kbps peak download, 70 Kbps peak upload
Transfer rates GSM	**GPRS:** 107 Kbps peak download, 85.6 Kbps peak upload **EDGE:** 296 Kbps peak download, 236.8 Kbps peak upload
Frequency bands LTE Cat NB1	**LTE FDD:** B1/B2/B3/B4/B5/B8/B12(B17)/B13/B18/B19/B20/B26/B28
Frequency bands LTE Cat M1	**LTE FDD:** B1/B2/B3/B4/B5/B8/B12(B17)/B13/B18/B19/B20/B26/B28 **LTE TDD:** B39
Frequency bands GSM/GPRS	GSM850/GSM900/DCS1800/PCS1900
Authentication	PAP, CHAP, none
Supported APNs	1nce

Table 4: Features NB-IoT module

2 OVERVIEW

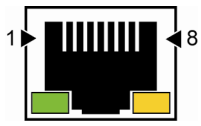


① Screw Terminals A1 - A4 (Power + RS485)
② Power LED + User LED S1 (programmable)
③ Antenna Connector (RMG/941L,N)
④ DIN-rail Mounting (backside)
⑤ Service Port
⑥ Ethernet Interface LAN1

Figure 1: Overview RMG/941(L,N)

3 PINOUTS

3.1 Ethernet Interface



Pin	Name	Function
1	TX+	10/100 Mbps LAN, TX+
2	TX-	10/100 Mbps LAN, TX-
3	RX+	10/100 Mbps LAN, RX+
4	---	Bob-Smith Termination
5	---	Bob-Smith Termination
6	RX-	10/100 Mbps LAN, RX-
7	---	Bob-Smith Termination
8	---	Bob-Smith Termination

Table 5: Pinout Ethernet interface

LED	Function
Green (left)	10/100BASE-T link/activity
Yellow (right)	Not Connected

Table 6: Ethernet LED functions

3.2 Screw Terminals

Terminal	Function
A1	COM2 Serial Port: RS485 RX /TX+
A2	COM2 Serial Port: RS485 RX /TX-
A3	Vin 24 VDC ±10%
A4	Ground

Table 7: Pinout screw terminals

3.3 Service Port

Pin	Name	Function
1	RXD1	COM1 Serial Port: RS232 RXD
2	TXD1	COM1 Serial Port: RS232 TXD
3	GND	Ground
4	RCM	COM1 Serial Port: Remote Console Mode
5	CTS1	COM1 Serial Port: RS232 CTS
6	RTS1	COM1 Serial Port: RS232 RTS

Table 8: Pinout service port

⊐ = Cable bridge

To create a **serial connection** between the RMG/941 and a PC an **adapter cable** and a **null modem cable** are necessary.

The adapter cable is connected with the PC via the null modem cable like shown in **fig. 2**.

Table 9 shows which service port pins must be connected with the pins of a Sub-D male connector (DTE, data terminal equipment) to build an adapter cable.

Service Port	Sub-D Male Connector (DTE)
Pin 1 (RXD)	Pin 2 (RXD)
Pin 2 (TXD)	Pin 3 (TXD)
Pin 3 (GND) ⊐	Pin 5 (GND)
Pin 4 (RCM) ⊐	---
All other pins are not connected.	

Table 9: Pinout adapter cable

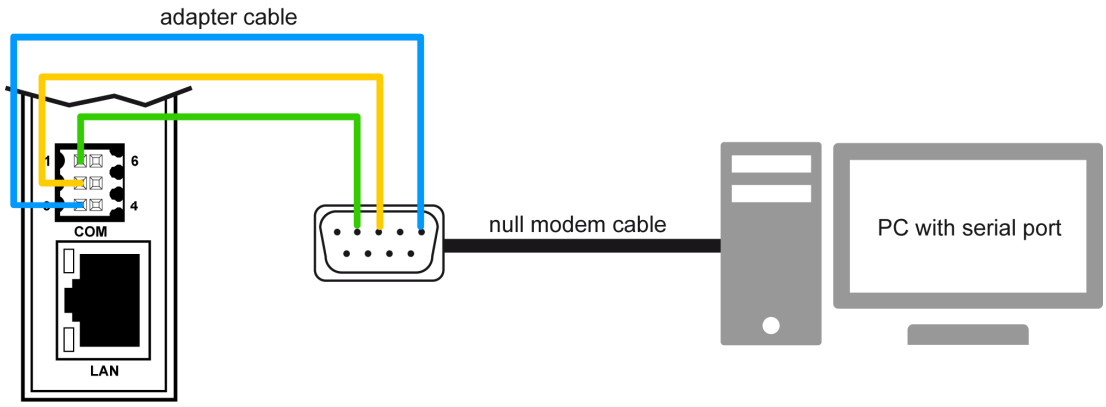


Figure 2: Serial connection between RMG/941 and PC

4 SIM CARD

The internal SIM card of the RMG/941L and RMG/941N can be changed through the slot on the backside.

To remove the SIM card just push it gently with a screw driver until you hear a soft "click". The SIM card is ejected a few millimeters and can be pulled out easily.

Figure 3: Removing the SIM card

To insert the SIM card just push it by hand as deep as possible into the slot.

Please note:
Pay attention to the correct orientation of the SIM card like shown in **fig. 4**!

Then use a screw driver to push it gently further into the slot until you here a soft "click".

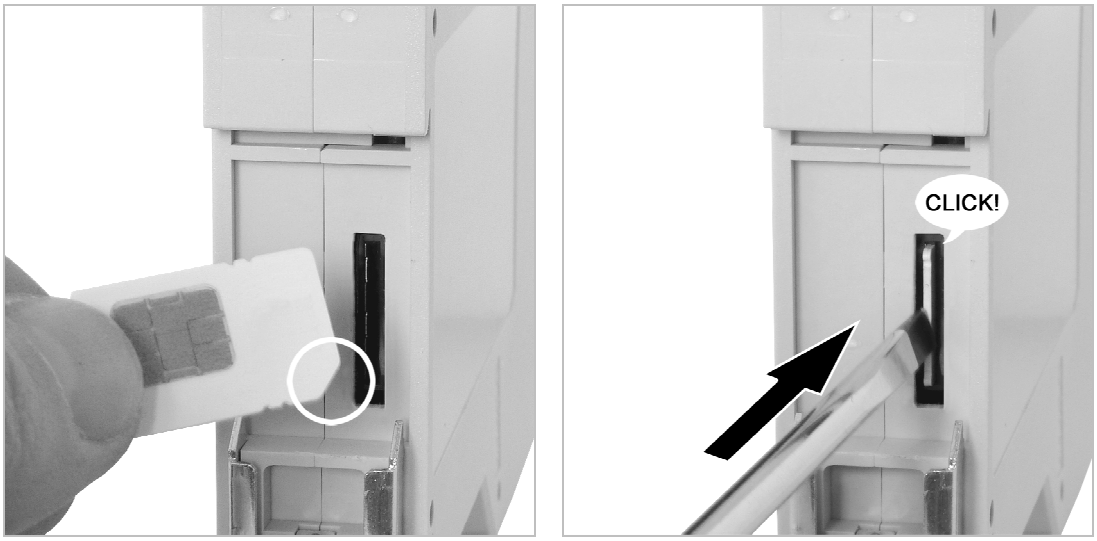


Figure 4: Inserting the SIM card

5 HELPFUL LITERATURE

- RMG/941 first steps
- DNP/9535 hardware reference
- SSV Web ConfigTool User Manual

CONTACT

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DOCUMENT HISTORY

Revision	Date	Remarks	Name	Review
1.0	2019-12-10	First version	WBU	SSC

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