RA70K - Keyed Remote Access Router

Quick Start Guide (V 6.2.0 Sept 15th, 2020)

RKH210, RKH216, and RKH259 - from **HW03** and **FW 6.2.0**

LP1164A

PROG. CNTLR.
E482663

Contents

1   IMPORTANT! - Read This

This Quick Start Guide provides a quick overview of selected operating procedures and functions of the keyed industrial router (RKH210, RKH216, and RKH259) from hardware version **HW03*** and firmware version from V 6.2.0.
However, the detailed manual with the important Notes and safety instructions can NOT be replaced by this document.
Read the following instructions carefully and keep them in a safe place. For the latest information, updates and the complete Manual, visit our website at www.redlion.net.

The *SIMPLY.connect* function is only available for devices with the **Simplify³** logo * S³

* see device nameplate

```
Type:RKH 2XX
S/N:02198340XXXXXX
WAN,VPN,1xMPI/PROFIBUS
Item#: RA70KR0010V1S0D0  HW: 03
LAN MAC:70:B3:D5:XX:XX:XX
WAN MAC:70:B3:D5:XX:XX:XX

                                    c(UL)us LISTED
                                    PROG. CNTLR.
                                    E482663

                                    C E

(MB)  MB Connect Line GmbH
      Winnetter Str.6
      D-91550 Dinkelsbühl     www.mbconnectline.com
```

2   Using Open Source Software

2.1 General Information

Our products contain, amongst others, open-source software that is provided by third parties and has been published for free public use. The open-source software is subject to special open-source software licenses and the copyright of third parties. Basically, each customer can use the open-source software freely in compliance with the licensing terms of the respective producers.

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To the extent programs contained in our products are subject to the GNU General Public License (GPL), GNU Lesser General Public License (LGPL), the Berkeley Software Distribution (BSD), the Massachusetts Institute of Technology (MIT) or another open-source software license, which regulates that the source code must be made available, and if this software is not already delivered in source code on a data carrier with our product, we will send you such code at any time upon request. Our offer to send the source code upon request ceases automatically 3 years after delivery of our product to the customer.

Requests must be directed to the following address, if possible under specification of the serial number:

Red Lion Controls, Inc.	Tel: Inside US: +1 (877) 432-9908
20 Willow Springs Circle	Outside US: +1 (717) 767-6511
York, PA 17406	Website: www.redlion.net
	Support: support.redlion.net

2.2 Special Liability Regulations

We do not assume any warranty or liability, if the open-source software programs contained in our product are used by the customer in a manner that does not comply any more with the purpose of the contract, which is the basis of the acquisition of our product. This concerns in particular any use of the open-source software programs outside of our product. The warranty and liability regulations that are provided by the respective effective open-source software license for the respective open-source software as listed in the following are effective for the use of the open-source software beyond the purpose of the contract. In particular, we are not liable, if the open-source software in our product or the complete software configuration in our product is changed. The warranty granted with the contract, which is the basis of the acquisition of our product, is only effective for the unchanged open-source software and the unchanged software configuration in our product.

Used Open-Source Software

For a list of the open-source software used in this product see

https://www.mbconnectline.com/downloads/open-source-software-licenses.txt

3   Included In Delivery

Please check that your delivery is complete:

All device types

1 x *keyed router*
Includes two keys
(1 pc. red, 1 pc black)
Fig. representative

1 x Ethernet cabel, 2 m

1 x Quick Start Guide

1 x Device information card

Types with GSM modem

RA70K-R4A00V-1S0D0 (RKH259 AT&T)

1 x GSM antenna

If any of these parts are missing or damaged, please contact the following address:

Red Lion Controls, Inc.
20 Willow Springs Circle
York, PA 17406

Tel: Inside US: +1 (877) 432-9908
     Outside US: +1 (717) 767-6511
Website: www.redlion.net
Support: support.redlion.net

4   Performance Characteristics

- On-board 2-level remote access key
  - Pos. REM: trigger remote access connection
  - Pos. ONL: alarms, dashboards & router administration
  - Pos. OFF: no connection with RLCONNECT24
- The router can be fully configured via the portal RLCONNECT24 or using the web interface via locally connected computer, or remotely.
- Deployable in North America using GSM modem connections, plus access via LAN and Internet.
- Secure connection using an integrated firewall with IP filter, NAT and port forwarding, VPN with AES, DES/3DES/DESX, Blowfish or RC2 encryption, and authentication via pre-shared key (PSK), static key or certificate (X.509).
- Alarm management:
  - Fully configurable digital inputs and outputs, and the ability to send via email, SMS or Internet dial-up.
  - Via remote output switching in the event of a fault or with an active Internet connection.
- Integrated server secures all settings, keys and certificates and allows data sharing within the network via connected USB flash or hard drive.
- Variable RS232, RS485, RS422 RS interface.
- Multi-colored LEDs for clear state-signaling.

5   Safety Instructions

NOTE:
elctrostatic discharge!
Observe the necessary safety precautions when handling components that are vulnerable to electrostatic discharge (EN 61340-5-1 and IEC 61340-5-1)!

The keyed routers are maintenance-free units. If a keyed router has damage or malfunctions, the device must be immediately taken out of service and secured against inadvert operation.

Safety instructions - continued

- Only qualified specialist personnel may install, start up, and operate the router. The national safety and accident prevention regulations must be observed.

- The router is built to the latest technological standards and recognized safety standards (see Declaration of Conformity).

- The router is only intended for operation in the control cabinet and with SELV according to IEC 60950/EN 60950/VDE 0805.

- The router may only be connected to devices, which meet the requirements of EN 60950.

- The router is for indoor use only.

- Never open the router chassis. Unauthorized opening and improper repair can pose a danger to the user. Unauthorized modifications are not covered by the manufacturer's warranty.

Opening up the device voids the warranty!

6   Router Installation

6.1 Installation position / minimum distances

The router is intended for mounting on DIN rails (according to DIN EN 50 022) and for installation in a control cabinet. Installation and mounting must be in accordance with VDE 0100 / IEC 364. The router may only be mounted in a vertical position as described.

| *NOTICE* |
|---|
| Non-compliance with the minimum distances can destroy the device at high ambient temperatures! |
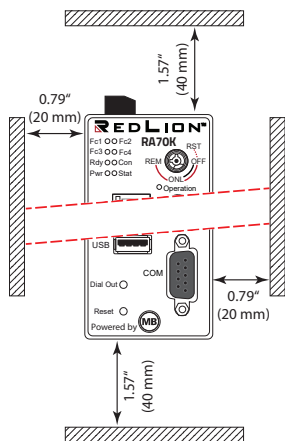
6.2 Device Dimensions in inches (mm)
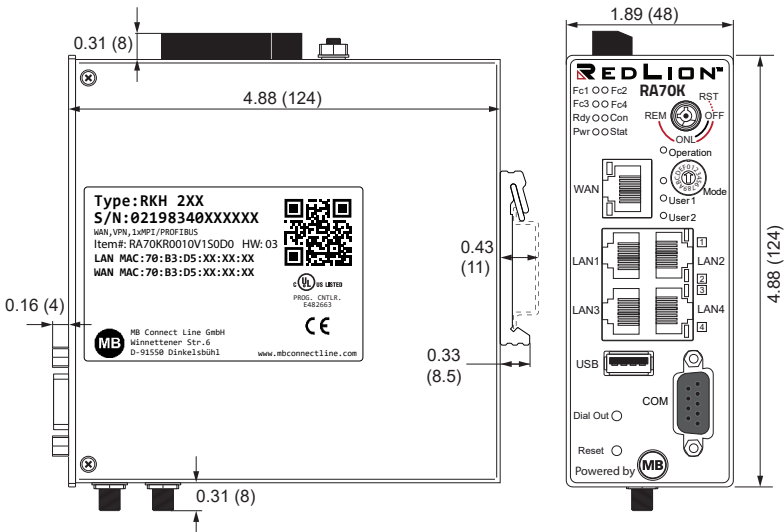
7   Displays, Controls and Connections

X1	+	Power supply connection 10-30 VDC
	−	0V DC connection
X2	4	Digital input I4 (10-30 V)
	3	Digital input I3 (10-30 V)
	2	Digital input I2 (10-30 V)
	1	Digital input I1 (10-30 V)
	P	Fuse-protection 10-30 VDC
	M	0V DC connection
	O2	Digital output O2
	O1	Digital output O1
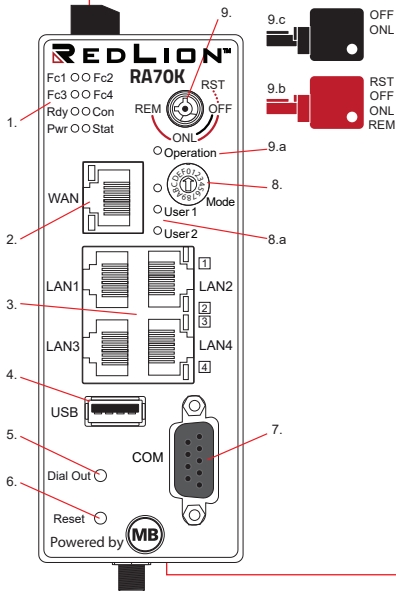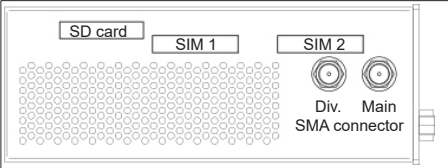
1. Function / status LEDs
2. WAN interface
3. LAN interfaces 1 – 4
4. USB Host 2.0
5. Dial Out button
6. Reset button
7. Serial interface COM

8. Coding switch hexadecimal
8.a Function / status LEDs for coding switch
9. Key switch
9.a Function / status LEDs for key switch
9.b **Key (red) for switch positions OFF, ONL, RST*, REM****
9.c Key (black) for switch positions **OFF**, **ONL**

* The switch position RST has just a tactile function.
** In the switch position REM, the key can not be removed.

Model: RA70K-R4A00V-1S0D0

Note: Cellular coverage for AT&T carrier only

Type	Equipment features
RKH 259	1 x SD card slot
	2 x SIM card slot
	2 x SMA connector for GSM antenna (MIMO)

Models: RA70K-R0010V-1S0D0
RA70C-R0000V-1S0D0

Type	Equipment features
RKH 210	1 x SD card slot
RKH 216	

Function / status LEDs

LED	Colour	Status	Description
Fc1	**green**	flashes (**5 Hz**)	*SIMPLY.connect* * ready and **disabled** This function is only available if the device is set to its factory settings.
		on	*SIMPLY.connect* * ready and **activated** - activation takes place by pressing the **Dial Out** button.
Fc2	**orange**	flashes	(**1 Hz**) Data received at COM
	green	flashes	(**1 Hz**) Data transmission to COM
Fc3	**orange**	off	GSM devices: no reception
		flashes	(**1 Hz**) GSM devices: == 20% - 50%
	green	off	GSM devices: reception depending on Fc4
		lights up	GSM devices: (+ Fc4 green): 71 - 100%
Fc4	**orange**	off	GSM devices: no reception
		flashes	(1 Hz) GSM devices:(+Fc3 Orange) == 51 % – 70 %
	green	off	GSM devices: reception depending on Fc3
		on	GSM devices: (+Fc3 green) 71 – 100 %
		flashes	After completion of activation at a frequency of **1.5 Hz** (slow).

SIMPLY.connect is a web application that helps you to set up a device
in the **R**emote **S**ervice **P**ortal *RLCONNECT24*.
To activate the function, press the **Dial Out** button until Fc1 lights up.
If you do not want to use *SIMPLY.connect*, simply ignore the flashing LED Fc1.
More information is available at: **https://simplyconnect.mbconnectline.com/**

LED	Colour	Status	Description
Rdy	**orange**	off	Waiting for bootloader or signature successfully checked.
		on	Check signature, loads kernel
	green	off	Waiting for kernel
		flashes	(**1 Hz**) Loads rootFs
		on	Boot process completed - device is ready for use used.
Con	**orange**	off	No VPN connection started
		on	Internet connection established + VPN connection started
		flashes	Flashing frequency 1.5 Hz: VPN connection established.
	green	off	No Internet connection
		flashes	Flashing frequency 3 Hz: Internet connection is being made.
		on	Internet connection is established.
Pwr	**green**	off	The power supply to the router is interrupted / the router is not connected to the power supply.
		on	Power supply is connected to the terminal block and switched on.
Stat	**red**	flashes	(**1 Hz**) Error in the error memory
		on	Found fault - the error type can be viewed on the WebGUI of the router under **System> Info> "Last error message"**.
	green	on	In connection with the portal RLCONNECT24: User is connected to device
Operation	**red**	on	For key position: **RST** and **REM**
	green	on	For key position: **OFF** and **ONL**
User 1	**-**	-	Currently without function.
User 2	**-**	-	Currently without function.

Interfaces and buttons

Label	Status	Description
WAN	–	Router WAN port (customer network, DSL modem ...)
WAN-LED	LED green	lights = Network connection available
	LED orange	flashing = Network data transfer active
LAN 1 - 4	–	Local network ports (e.g. machine network)
LAN-LED 1- 4 (Dual LED)	LED green	lights = Network connection available
	LED orange	flashing = Network data transfer active
USB	–	Portable USB drive port
COM	–	COM port is for either connecting to devices with MPI interface or to devices with RS232 / RS485, RS422 interface. This depends on your device type.
Dial Out	–	Button for activating the SIMPLY.connect function (if the LED Fc1 flashes (5 Hz)).
Reset	–	Pushing this button restarts the router (so-called cold start).

Key switch

Switch position	Key color	Description
RST	red	Loading the factory settings
OFF	red / black	It is **not** possible to establish a VPN connection. Modem devices can **not** connect to the Internet.
ONL	red / black	It **can** be established a VPN connection. With modem devices an Internet connection **can** be established.
REM	red	It **can** be established a VPN connection. Including routing to the LAN side of the router. With modem devices an Internet connection **can** be established. Including routing to the LAN side of the router.

8 First Time Operation

Connect, depending on device type, an antenna, and insert a SIM card.

Before connecting the router to a network or PC, first ensure that it is properly connected to a power supply, otherwise it may cause damage to other equipment.

- Connect equipotential bonding
  to the grounding lug on the router's top panel.

X1   X2 galvanically isolated

+ - |I4 I3 I2 I1 P M O2 O1|

- Connect the (10-30 VDC) power supply to the
  X1 terminal of the router.

  Make sure that the polarity is correct.

  ◦ After switching on the supply voltage the Pwr LED lights up and the device performs a system check.

  ◦ After about 90 sec., both LED Pwr and Rdy light up and Fc1 is flashing green (5 Hz).

  The *Keyed Remote Access Router* is now ready for operation.

The flashing LED Fc1 signals that the function *SIMPLY.connect* *
is ready but not yet activated.

Fc1 ⚡ Fc2
Fc3 ○○ Fc4
Rdy ● ○ Con
Pwr ● ○ Stat

To activate the function, press the Dial Out button until Fc1 lights up.

Fc1 ⚡● Fc2   =>   Dial Out ●   =   Fc1 ●● Fc2

If you do not want to use the function, simply ignore the flashing LED Fc1.

SIMPLY.connect is a web application that helps you to set up a device
in the **R**emote **S**ervice **P**ortal *RLCONNECT24*.
More information is available at: **https://simplyconnect.mbconnectline.com/**

9   Initial Configuration

Requirements:

• You have a user account on the **R**emote **S**ervice **P**ortal *RLCONNECT24* V 2.x

If you do not have a user account on *RLCONNECT24*, please contact your system administrator or authorized sales partner.
For more information about *RLCONNECT24* see **www.redlion.net** in our Support Portal.

• Windows PC with remote client software *RLDialUp* * installed .
  With *RLDialUp* you establish a secure VPN connection to *RLCONNECT24*.

* The latest version can be downloaded on **www.redlion.net**

Generally following procedure applies:

• Add the router in the portal *RLCONNECT24* as a new device.

• Enter the necessary basic data, so that the device can connect to the portal (for example, device name, network settings, connection information, etc.).

• Transfer the device configuration from the portal into the *router*.

• After the *router* has been connected to the portal, it can be configured completely there.

More information about configuring devices, see the *Keyed Remote Access Router* Manual (download at www.redlion.net) or in the *RLCONNECT24* online help.

9.1 Initial configuration via RSP RLCONNECT24 V 2.x

9.1.1 Login RLCONNECT24
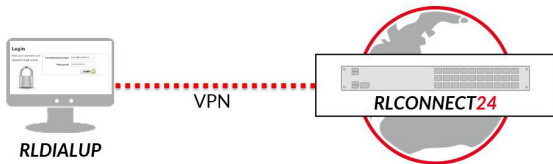
> **ADVICE:** Upon first login, please change the default login information!
> **Navigation:** Administration > Users

9.1.2 Creating a project

Navigation: Administration > Projects

In the project overview, click the plus and assign the next screen a Project **Name** (all other inputs / information can be made up later).

9.1.3 Create a device

Navigation: Administration > Projects > *Project 2 (selected project)*

In the selected project, click the plus and select "Create new device".
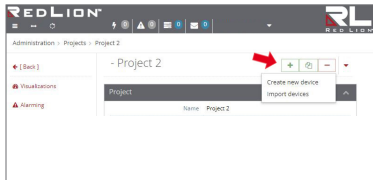
For the basic configuration, you only need to select your "Device Type" and enter a unique device "Name".

You can create your own name for the Device.

Following are allowed:
Numbers: 0 to 9, A to Z, a to z (avoid blanks)
Letters: A to Z and a to z
Characters: Point, hyphens and underscores

After saving your settings you will be automatically redirected to the device settings.

For the initial configuration here the "**Interfaces**" menu is relevant.
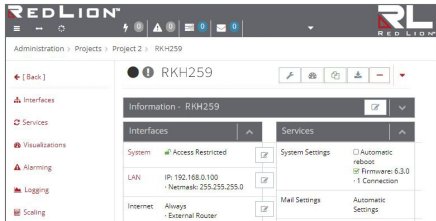
9.1.4 Configuring the device (connection data)

Navigation: Administration > Projects > *Project 2 (selected project)* > *New Device (selected device)*

Here the following menus are relevant for the initial configuration:

• **LAN** (all devices)
Make sure that the LAN IP and the WAN IP are in different address ranges.

• **Internet** (all devices)
*For the initial configuration, it is advisable to select "**Always**" in the selection field "**Connect to Server at**". Only in this setting, the device automatically tries to establish a connection to the portal.*

Interfaces		^
LAN	IP: 192.168.0.100 · Netmask: 255.255.255.0	☑
Internet	Always · External Router	☑
WAN	DHCP · DNS Server: 8.8.8.8	☑
Modem		☑

• **WAN** (devices with WAN interface)
Make sure that the WAN IP and the LAN IP are in different address ranges.

• **Modem** (devices with 4G modem)

Click the edit icon ☑ to edit the settings of the respective sub-menus.

9.1.5 Creating a configuration

Navigation: Administration > Projects > *Project 2 (selected project)* > *NewDevice (selected device)*

After entering all necessary data, you must transfer the configuration to the router.
Therefore connect a USB stick to your configuration PC (*the USB stick must have the file format FAT!*).
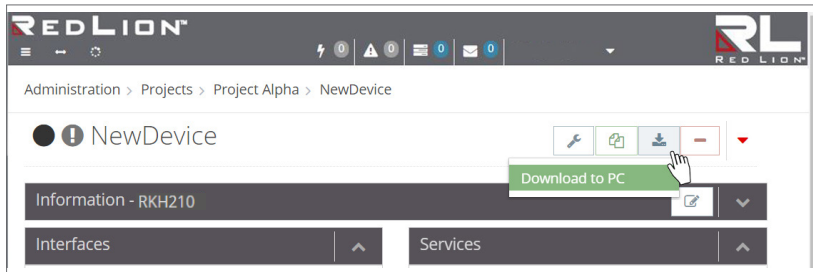
Click the Sync icon 🖳 and select "**Download to PC**".

The configuration file "mbconnect24.mbnx" can now be downloaded to the USB stick.

IMPORTANT: The downloaded configuration file "mbconnect24.mbnx" must not be renamed   and must be in the root directory of the USB stick!

9.1.6 Transfer configuration to the Keyed Remote Access Router

When the router is ready to operate, insert the USB stick into the USB port of the device.

As soon the *router* recognizes the configuration file, both LED **Fc1** + LED **Fc2** are **flashing**.

Now press and hold down the **Dial Out** button ❶ until **LED Fc3 flashes** ❷.

Release the **Dial Out** button ❸.

The settings from *RLCONNECT24* are now automatically copied to the *router* and the device reboots.

If the *router* is able to connect to the Internet (e.g. network, telephone cable, SIM card, antennae installed), the device will subsequently log in to your account.
This is displayed by the flashing LED Con ❹.
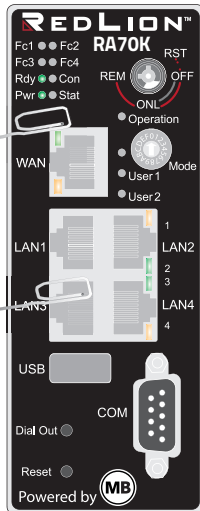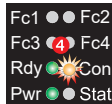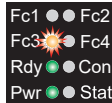
NOTICE
The key switch must be in the ONL or REM position so that the *router* can connect to the portal.

If the flashing frequency of the LED Con is 3 Hz, the device is attempting to log into the portal. If the login has been successful, the flashing frequency is reduced to 1.5 Hz.

10 Access the Web Interface of the Keyed Router

On the web interface of the *router* a Status page and a Diagnostic page is available.

On the **Status** page, five steps with additional information are displayed, which must be run through when connecting the *router* with the portal.
The **Diagnostic** page helps you in case of a failed connection establishment in trobleshooting.

Requirements:

• The configuration PC and the *router* must be in the same IP address range.
  Depending on the LAN IP that you assigned to the device in the portal, you may need to assign the configuration PC to the same address range.
  If you assigned the *router* e.g. the LAN IP 192.168.2.200, you need the configuration PC to assign the same address range (192.168.2.X). This applies to both the IP address and subnet mask.

• The *router* must be accessible via the LAN interface of the configuration PC.

Start a browser and enter the LAN IP you have assigned in the portal to the *router*.

To log on to *router* enter the following data:

Username: admin

Password: The default password is located on the back of the device.
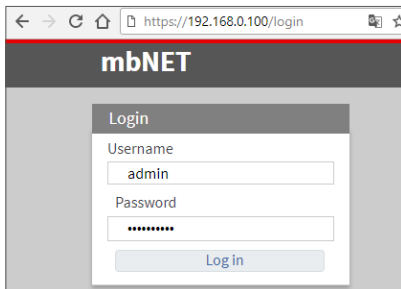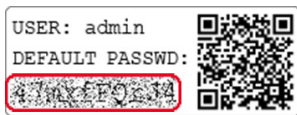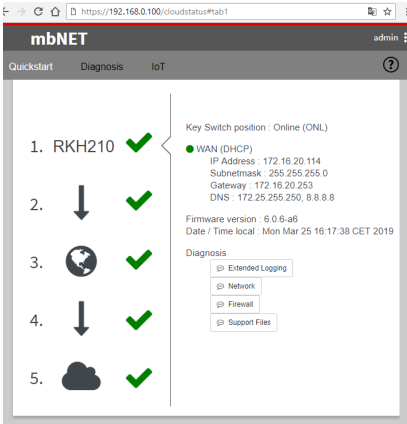
10.1   Quick Start

After a successful login you will see in the Quick Start menu the device state.
Here, five steps are displayed that are required so that the device can connect to the portal.

1. RKH210 ✔   = everything OK

2. ↓ ⟳   = processing

3. 🌐 ⚠   = Error

Click on the icon to the right of each progress to get details / information about this step.
If all five steps have been completed successfully, the *router* is connected to the portal *RLCONNECT24*.

10.2　　　Diagnostics

In case of a failed connection setup, the Diagnostic page provides support for trobleshooting.
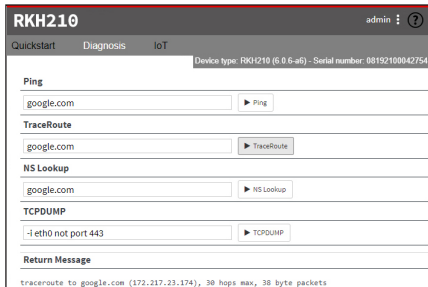
11 Factory Settings On Delivery

The *router* is delivered with the following factory settings:

IP address	192.168.0.100
Subnet mask	255.255.255.0
Username	admin
Password	The default password is located on the back of the device.

ADVICE:
Upon first login, please change the default login information!
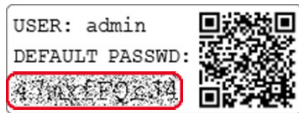
NOTICE
Keep the device default password in a safe place.
You need the default password during the initial configuration and after each loading the factory settings.

12 Loading the Factory Settings

NOTICE
Before you configure the device to its factory defaults, you should note the following: • Save your configuration first. After restoring the factory defaults, all of your settings/ changes will be deleted. • The IP address of the device is reset to the original IP address (192.168.0.100). • You may also need to modify the network settings of the configuration PC accordingly. • The device password is reset to its individual default password. The default password can be found on the back of the unit. • No USB stick/USB storage medium should be connected to the device. • For this action you need the red key for the key switch.

Load the factory settings - continued

1. a) Switch on the router **or**

   b) if the router is ready for operation,
   press the Reset button.

2. When the LED **Rdy flashes (**green), turn the
   red key switch - with the red key - to the switch
   position **RST** and hold this key position.

3. When LED Fc3 is flashing (orange), release the
   key.

   When both the **Pwr** and **Rdy** LEDs **light up**, the
   router is reset to its "factory settings at the time
   of delivery" and can/must be reconfigured.

13 Technical Data (extracts)

Performance data	
Voltage V (DC)	10 – 30 VDC (external Power Supply or other SELV Power Supply Source, rated 10-30 VDC, max. 40 A)
Power consumption	max. 500 mA @ 24 V
IP protection class	IP 30*
Area of application	Dry environments
Operating temperature	-40 – +75 °C
Storage temperature	-40 – +85 °C
Humidity	0 – 95% (non condensing)
Dimensions (max.)	48 mm x 137 mm x 140 mm (W x D x H)
Weight (max.)	650 g
Housing / material	metal
Mounting	DIN rail mounting (based on DIN EN 50022)

* at full occupancy of all connections and interfaces
Alternatively, unused interfaces can be covered with dust protection plugs.

I/Os and standard interfaces	
Digital inputs	4 pcs. digital inputs, 10–30 VDC (galv. isolated), (Low 0-3.2 VDC, High 8-30 VDC)
Digital outputs	2 pcs. digital outputs, 10 – 30 V DC (galvanically isolated), max. 1.5 A / output
LAN interfaces	4 pcs. 10/100 Mbit/s full and half duplex operation, autodetection patch cable / crossover cable
USB interface	USB Host 2.0
SD card slot	For SD cards (32.0 mm x 24.0 mm x 2.1 mm) max. 64 GB; Format FAT / FAT32.

VPN	
VPN protocol	IPsec/PPTP/OpenVPN, 64 Tunnel
Encryption method	Blowfish, AES, DES/3DES
Encryption algorithms	MD5, SHA1
Authentication	Pre-Shared-Key, X.509

Network/security	
Firewall	1:1 NAT, IP-Filter, Port forwarding, stateful inspektion
IP router	NAT-IP, TCP/IP routing, IP forwarding
Services	DHCP server, DHCP client, DNS server, NTP client, PPP server, DynDNS
Time levelling	NTP server

Optional Interfaces	
COM	RS-232/485 (software-switchable) (RKH 210)
SIM card slots	2 pieces SIM card reader with ejector (for mini-SIM)

Communication

Devices with LTE (4G) modems - AT&T (RKH 259 AT&T)	
Countries where used	North America
GSM/GPRS/EDGE	850, 1900 MHz; max. 236 kbps
HSxPA	1900 (B2), 850 (B5) MHz; Downlink max. 21 Mbps, Uplink max. 5,76 Mbps
LTE	1900 (B2), AWS 1700 (B4), 850 (B5), 700 (B17) MHz; Downlink max. 100 Mbps, Uplink max. 50 Mbps
Transmission output power	Class 4 (2 W, 33 dBm) @ GSM 850 / 900 Class 1 (1 W, 30 dBm) @ GSM 1800 / 1900 Class E2 (0.5 W, 27 dBm) @ EDGE 850 / 900 Class E2 (0.4 W, 26 dBm) @ EDGE 1800 /1900 Class 3 (0.25 W, 24 dBm) @ UMTS; Class 3 (0.2 W, 23 dBm) @ LTE
FCC	Contains FCC ID: R17LE910NA

14 Technical Support

For technical support (FAQ, troubleshooting, most recent information, etc.)
see our website www.redlion.net.
For support enquiries, always give the serial number of your router.
Support: support.redlion.net
Tel: Inside US: +1 (877) 432-9908   Outside US: +1 (717) 767-6511

NOTICE
Device type RKH 259 AT&T bears no CE marking and may not be used or put into operation in the European economic area (EEA)!

www.redlion.net