RA50C - Compact Remote Access Router
Quick Start Guide (V 2.2.9 Feb 25th, 2022)

MDH 860, MDH 866 EU, MDH 866 AT&T, MDH 867

from hardware version **HW 02** with firmware from **V 2.2.9**

LP1165C

CE

c(UL)us PROG. CNTLR.
LISTED E482663

Contents

This Quick Start Guide provides a quick Overview of selected operating procedures and functions of the Compact Remote Access industrial router. 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 this document in a safe place. For the latest information, updates and the complete Manual, visit our website at www.redlion.net.

1 Safety Instructions

- 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!

NOTE: electrostatic 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 compact routers are maintenance-free units.
If a compact router has damage or malfunctions, the device must be immediately taken out of service and secured against inadvertent operation.

The complete manual of the router as well as the conformity declaration can be found in the download area on our website www.redlion.net

2 Maintenance

If a Compact Remote Access Router is damaged or malfunctions, the device must be taken out of operation immediately and secured against unintentional operation.

3 Using Open Source Software

3.1 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.

The rights of the customer to use the open-source software beyond the purpose of our products are regulated in detail by the respective concerned open-source software licenses. The customer may use the open-source software freely, as provided in the respective effective license, beyond the purpose that the open-source software has in our products. In case there is a contradiction between the licensing terms for one of our products and the respective open-source software license, the respective relevant open-source software license takes priority over our licensing terms, as far as the respective open-source software is concerned by this.

The use of the used open-source software is free of charge. We do not demand usage fees or any comparable fees for the use of the open-source software contained in our products. The use of the open-source software in our products by the customer is not part of any product pricing.

All open-source software programs contained in our products can be taken from the available list. The most important open-source software licenses are listed in the Licenses section at the end of this publication.

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

3.2 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.

3.3 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

4 Included In Delivery

Please check that your delivery is complete:

All device types

1 x *Router*
(Fig. representative)

1 x Quick Start Guide

1 x Device information card

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

Suitable accessories for ...

... types with GSM modem
MDH 866

GSM antenna

... types with Wi-Fi modem
MDH 867

Wi-Fi antenna

... all device types

Ethernet cable

You can find more accessories at www.mbconnectline.com

5   Performance Characteristics

• The router can be fully configured via the portal RLCONNECT24.
• Can connect to machines and systems via LAN, WAN, or Wi-Fi.
• Deployable in North America using mobile communications plus access via LAN and Internet.
• Secure connection using an integrated firewall with IP filter, NAT, port forwarding and VPN with Blowfish encryption.
• 2 pieces I/Os. These connectors can be independently configured as a digital input or digital output.

6   Getting Started

Depending on the device, connect an antenna, and insert a SIM card.

Before connecting the device 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 functional earth (FE).

Connect the Compact Router to a power supply (10 – 30 VDC).

Make sure the polarity is correct!
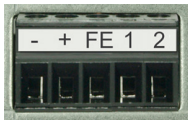
Start sequence

1. After turning on the power supply, the LED **Pwr** lights up.

2. As soon as the system has been checked and started (duration approx. 25 sec), the **Rdy** LED flashes for the duration of the starting up process (approx. 90 sec).

3. When both LEDs - Pwr and Rdy - light up, the RA50C is ready for operation.

4. With *SIMPLY.connect* * capable devices, the Usr LED flashes briefly at intervals (500 msec ON - 1500 msec OFF). That means: *SIMPLY.connect* is available but deactivated.

* The *SIMPLY.connect* function is only available for devices with the Simplify³ logo * (see device nameplate).

SIMPLY.connect is a web application that supports you when creating a *Compact Router* in the *RLCONNECT24*. You can find more information at: https://www.redlion.net/remote-access-software

NOTICE
If you want to forego the support of SIMPLY.connect, ignore the flashing LED **Usr** and continue with the commissioning / configuration of the device.

For further support on the **RA50C**, visit our website on **www.redlion.net**

7   Initial Configuration

Requirements:

• You have a user account on the Remote Service Portal (RSP) *RLCONNECT24* V 2.x

If you do not yet have a user account on **RL*CONNECT24***, you can apply for your
access at **www.redlion.net** - free of charge.

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

<p align="right">* The latest version can be downloaded at www.redlion.net</p>

Generally following procedure applies:

• Add the *Compact 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 *Compact Router*.

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

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

7.1 Initial configuration via RSP *RLCONNECT24* V 2.x

7.2 Login *RLCONNECT24*

RLDIALUP   VPN   RLCONNECT24
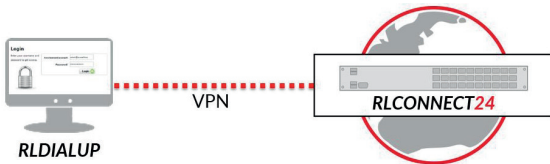
> **ADVICE!** Upon first login, please change the default login information!

The procedure described relates to the ad view = **Simple**.
You can find the currently used setting in the footer of the portal display.

View: Simple | Extended
RLCONNECT24 - V2.9.0 · 01.06.2021 17:09 (UTC +02:00)
powered by mbconnectline

7.3 Creating a project

Navigation: Administration

Click the " + Create new project" button in the structure tree.
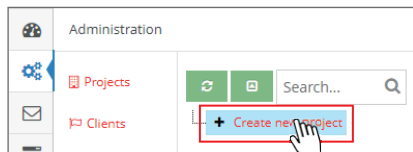
Enter a project name in the following input field.
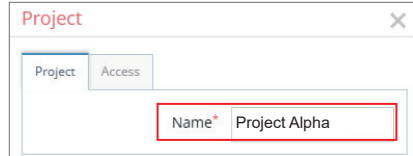
7.3.1 Create a device

Navigation: Administration

Now click on "+ Create new device" under the new project.

A configuration wizard then appears, which guides you in 3 steps when creating a basic configuration.
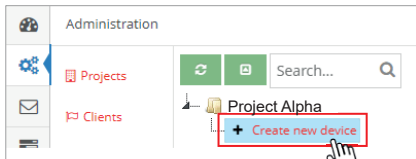
7.3.2 Step 1 - Device

Select your device type from the selection field Type (e.g. MDH860).

Enter a device name under Name* so that you can find and assign the device later in the portal.
The name is freely selectable but only a - z, A - Z, 0 - 9, dashes and dots are allowed.

7.3.3 Step 2 - Internet

Here you assign a LAN IP address for the device and determine how the device should connect to the Internet.
Depending on the device type, you have to make the necessary settings and / or enter the required access data.

Step 2 - Internet

NOTICE
Make sure that the WAN-IP and the LAN-IP are in different address ranges.

NOTICE
In the initial configuration, the device is configured so that it always tries to connect to the Internet. You can change this setting later at any time.
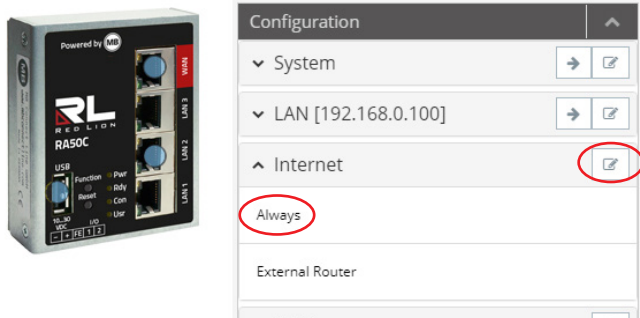
Fig. 1: Navigation: Administration > *selected device* > Configuration > Internet

7.3.4 Step 3 - Configuration

Click on the download icon to download the basic configuration you just created.

Save the configuration file "mbconnect24. mbn" on a USB stick.

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

You can now transfer the configuration data to the *Compact Router*.

7.3.5 Transfer configuration to the *Compact Router*

When the Compact Router is ready to operate, insert the USB stick into the USB port of the device.
The device will recognize the configuration file and show that through the slowly flashing LED **Usr** (flashing frequency: 1.5 Hz).

As soon as the LED **Usr starts to flash ❶**, you must press the **Function button** within 10 seconds.

Hold down until the LED **Usr lights**.

Now release the Function button ❷.

When the LED **Usr goes off** and the LED **Pwr + Rdy light up**, then the configuration transfer is complete.

When the *Compact Router* can connect to the Internet
(e.g. network cable, SIM card, antennae installed), the device will subsequently log in to your account. This is displayed by the **flashing** LED **Con**.

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.
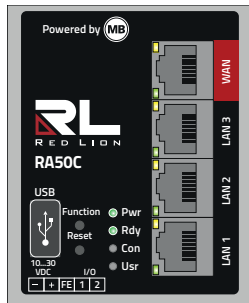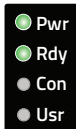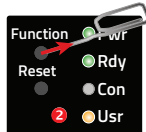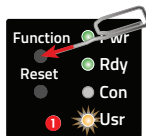
8   Access the Web Interface of the *Compact Router*

On the web interface of the Compact 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 *Compact Router* with the portal.
The **Diagnostic** page helps you in case of a failed connection establishment in troubleshooting.

Requirements:

• The configuration PC and the *Compact 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 *Compact 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 *Compact 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 *Compact Router*.

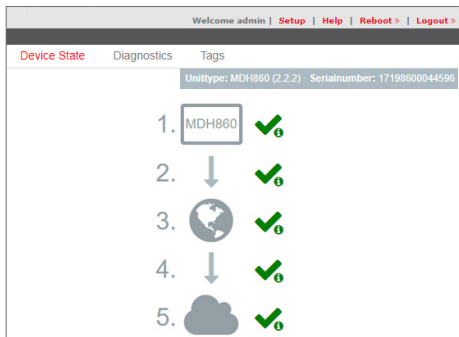To log on to *Compact Router* enter the following data:

Username: admin
Password: The **Default Password** is on the back of the device.
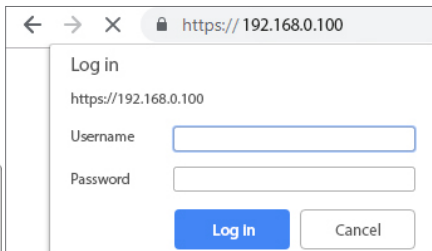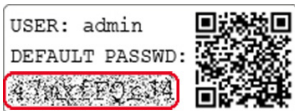
8.1 Device State

After a successful login you will see on the status page the "Device State". Among other things, the five steps are displayed that are required so that the device can connect to the portal.

1. [MDH861] ✔ = 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 *Compact Router* is connected to the portal *RLCONNECT24*.

8.2 Diagnostics

In case of a failed connection setup, the diagnostic page provides support for troubleshooting.
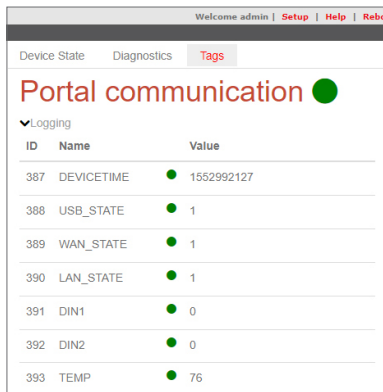
8.3 Tags

If the *Compact Router* has established a
connection to the portal (indicated by the green
LED symbol next to "Portal communication"), all
available Tags for the portal are listed here.
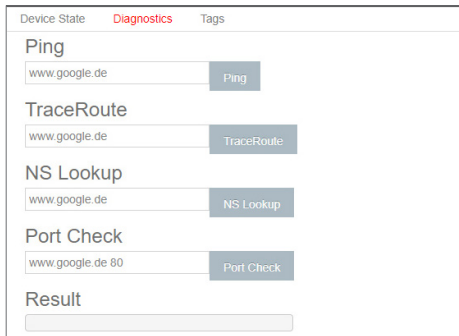In addition to the name of a Tag, its status (using
the LED symbol)* and the respective Tag value are
displayed.

* green LED symbol = data point can be read
  grey LED symbol = data point cannot be read

Logging

In case of difficulties, possible causes of errors can
be detected by "Logging".
This data is for further support in case of problems
or hints in our FAQ

9   Loading The Factory Settings

Before you reset the device to its factory defaults, note the following:

- The device must be operational (LED Pwr + Rdy light up).
- The IP address of the router is reset to 192.168.0.100.
  You may have to adjust the network settings of the configuration computer accordingly.

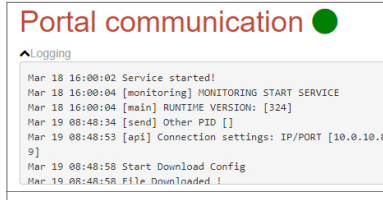To reset the *Compact Router* to factory defaults, proceed as follows:

Click the button **Reset** once ❶.

Then press **Function** straight afterwards and keep it pressed down ❷.

After about 60-90 seconds, the **Rdy LED** starts flashing ❸.

As soon as the **Usr LED** starts to flash, release the button **Function** ❹.

When the LED **Pwr** and **Rdy** light up and the LED **Usr** flashes*, the factory settings have been loaded ❺.
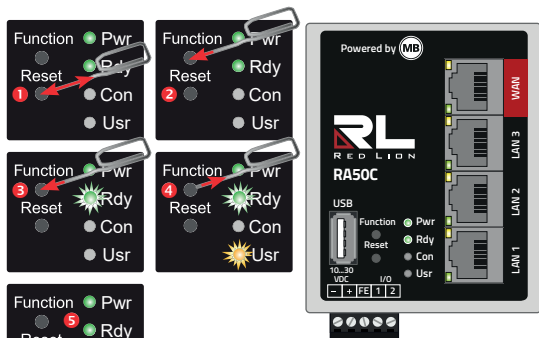
* flashes briefly at intervals (500 msec on - 1500 msec off)

The *Compact Router* is now ready for operation and to be configured again.

10 Factory Settings On Delivery

The *Compact 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 on the back of the device.

```
USER: admin
DEFAULT PASSWD:
▓▒░▒▓░▒░▓▒
```
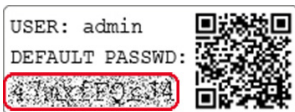
ADVICE!
Upon first login, please change the default login information!

NOTICE
Keep the device default password in a safe place.
You need the default password during the initial configuration and after each loading of the factory settings.

11 Technical Data (extracts)

Performance data	
Voltage V (DC)	10 - 30 V DC (SELV and Limited Energy circuit)
Power consumption	250 mA (max. 1.8 A *) @ 24 V
IP protection class	IP 30 **
Area of application	Dry environments
Operating temperature	-40 – +75 °C (Type: MDH 860, MDH 866) -40 – +75 °C (Type: MDH 867 - **HW 03**)
	0 – +60 °C (Type: MDH 867 - **HW 02**)
Storage temperature	-40 – +85 °C (All types)
Humidity	0 – 95% (non condensing)

* 250 mA = operating current, max. 1.8 A under full load (USB interface + switched outputs I/O 1 and I/O 2).

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

Communication

Devices with **LTE (4G)** module **- EU** (MDH 866 EU) hardware version: **HW 04**	
Target region	EMEA
GSM/GPRS/EDGE	900 (B8), 1800 (B3) MHz; max. 236 kbps
HSxPA	900 (B8), 1800 (B3), 2100 (B1) MHz; Downlink max. 42 Mbps, Uplink max. 5,76 Mbps
LTE	800 (B20), 900 (B8),1800 (B3), 2100 (B1), 2600 (B7), 700 (B28A) MHz; Downlink max. 150 Mbps, Uplink max. 50 Mbps
Output power **(**typical) 2G: LB: 33 dBm; HB: 30 dBm 3G/TD-SCDMA: 24dBm 4G (FDD & TDD): 23dBm @1RB	Sensivity (typical) -108 dBm @ 2G -113.5 dBm @ 3G -103 dBm @ 4G FDD (BW=5 MHz)
TAC	35162610

Devices with **LTE (4G)** module - **AT&T** (MDH 866 AT&T) hardware version: **from HW 03**	
Target region	North America (Public safety, AT&T, FirstNet, T-Mobile, Canada)
HSxPA	1900 PCS (B2), AWS (B4), 850 (B5) MHz; Downlink max. 42 Mbps
LTE	700 Lower (B12), 700 PS (B14), AWS (B4), 1900 PCS (B2), 850 (B5), 700 Upper (B13), AWS-3 (B66), 600 (B71) MHz; Downlink max. 150 Mbps, Uplink max. 50 Mbps
RF parameters	

Output power - typical values for max output level > 2G: LB 33 dBm; HB: 30 dBm > 3G/TD-SCDMA: 24dBm > 4G (FDD & TDD): 23dBm @1RB	**Sensitivity** - typical sensitivity levels > -108 dBm @ 2G > -113.5 dBm @ 3G > -103 dBm @ 4G FDD (BW=5 MHz)
TAC	35034498; 35432809; 35604311
FCC	Contains FCC ID: RI7LE910CxNF

Devices with **LTE (4G)** module - **AT&T** (MDH 866 AT&T) hardware version: **HW 02**	
Target region	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	FCC ID: R17LE910NA

Devices with **Wi-Fi** module (MDH 867) hardware version: **HW 02**	
Wi-Fi	IEEE802.11b/g & 802.11n (1T1R mode), up to 150 MBit/s
Wi-Fi specification	· EU (2.412 GHz-2.472 GHz, 1-13 channel) · USA (2.412 GHz-2.462 GHz, 1-11 channel) · WPA/WP2, 64/128/152bit WEP, WPS · 802.11b: 1, 2, 5.5, 11 Mbps · 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps · 802.11n: (20 MHz) MCS0-7, up to 72 Mbps · 802.11n: (40 MHz) MCS0-7, up to 150 Mbps
Transmission output power (typical)	11b: 19+/- 1.0 dBm @ 11 Mbps; 11g: 16+/- 1 dBm @ 54 mbps 802.11n: (HT20), 15 +/- 1dBm, 802.11n: (HT40), 15 +/- 1dBm
Reception sensitivity (typical)	11b: -84dBm @ 11 Mbps; 11g: -70dBm @ 54 Mbps 802.11n: (HT20), -66 dBm @ MSC7, (HT40), -62 dBm @ MSC7
FCC	FCC ID: YWTWFXM05

Devices with **Wi-Fi** module (MDH 867) hardware version: **HW 03**	
Wi-Fi	IEEE 802.11b/g/n
Frequency bands	2.4 GHz, channel 1 - 13* (2.412 GHz - 2.472*)
Channel bandwidth	20 MHz
Data rates	802.11b: 1, 2, 5.5 and 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48 and 54 Mbps 802.11n: MCS0-MCS7 (max 72.2Mbps)
Hardware supported Encryptions/Decryption	AES/CCMP, AES/CMAC, WAPI, WEP/TKIP
Max. output power	19 dBm EIRP**
Max. sensitivity	-97 dBm EIRP**
FCC	FCC ID: XPYLILYW1 IC: 8595A-LILYW1
IC	IC: 8595A-LILYW1

* Maximum, depends on the region. ** RF power including maximum antenna gain (3 dBi).

NOTICE
The device type MDH 866 AT&T is not CE marked and must not be operated or commissioned in the European Economic Area (EEA)!

SIMPLIFIED EU DECLARATION OF CONFORMITY

Red Lion declares that the radio equipment type MDH 866 EU; MDH 867 is manufactured in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at **www.redlion.net**

12 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

13 Disposal

In the interests of environmental protection, final holders must collect old devices separately from unsorted municipal waste at the end of their service life.

Old batteries and accumulators that are not enclosed by the old device, as well as lamps that can be removed from the old device without destroying them, must be separated from the old device in a non-destructive manner before they are handed over to a collection point.

The final holder is responsible for deleting personal data on the old devices to be disposed of.

Do not despose of old devices into household waste!

Only for EU countries:

Dispose of the device in accordance with the Waste Electrical and Electronic Equipment Directive 2012/19/EU - WEEE.

www.redlion.net