RED LION®

a spectris company

CE

c UL us LISTED PROG. CNTLR. E482663

RA70S - Remote Access Router

Quick Start Guide (V 7.0.0 Feb 25th, 2022)

MDH 816 and MDH 859 - from **HW05** and **FW 7.0.0**

LP1163C

Contents

1 IMPORTANT! - Read This

This Quick Start Guide provides a quick overview of selected operating procedures and functions of the Remote Access Router (MDH816 and MDH859) from hardware version **HW05***.
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.

VALIDITY

The document is valid for ***Remote Access Routers***

RA70S-R0000V-0S0D0 - Also referred to in this guide as MDH 816

RA70S-R0000V-0S0DA - Also referred to in this guide as MDH 816

RA70S-R4A00V-1S0D0 - Also referred to in this guide as MDH 859

RA70S-R4A00V-1S0DA - Also referred to in this guide as MDH 859

RA70S-R4E00V-1S0D0 - Also referred to in this guide as MDH 859

RA70S-R4E00V-1S0DA - Also referred to in this guide as MDH 859

from firmware version **V 7.0.0** and from hardware version **HW05**

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

* see device rating plate

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.

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.
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

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 ***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 859

GSM antenna

... all device types

Ethernet cable

You can find more accessories at www.mbconnectline.com

4 Performance Characteristics

- The router can be fully configured via the portal ***RLCONNECT24*** or using the web interface via locally connected computer, or remotely.
- Secure connection using an integrated firewall with IP filter, NAT and port forwarding, VPN with AES (256-, 192-, 128-Bit), Blowfish (128-Bit), 3DES (168-Bit), DES (56-Bit), and authentication via Pre-Shared-Key, 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 for connecting control systems.

5 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.

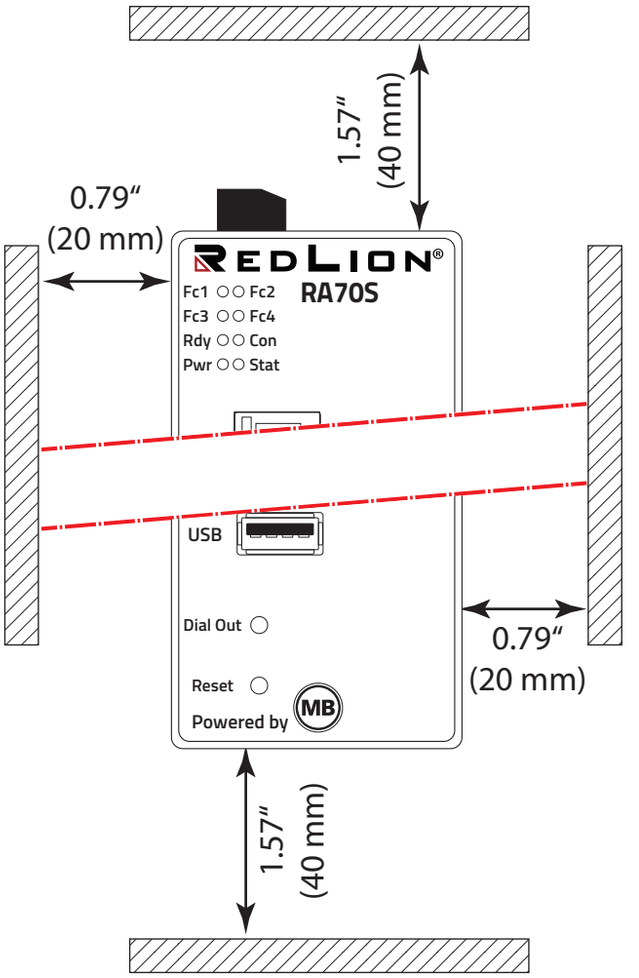
NOTE: electrostatic discharge!
Observe the necessary safety precautions when handling components that are vulnerable to electrostatic discharge (EN 61340-5-1 and IEC 61340-5-1)!

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

6 Router Installation

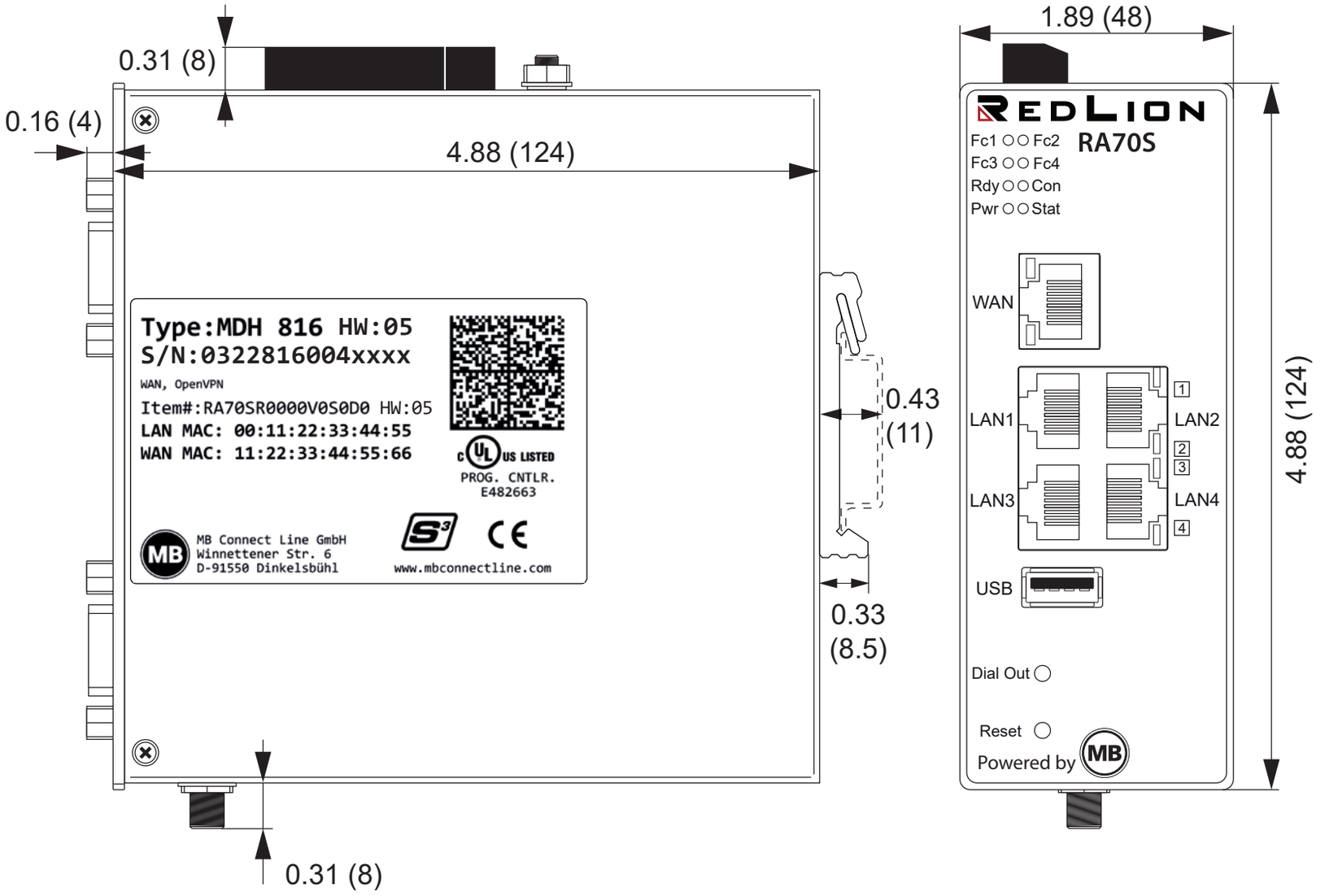
6.1 Installation position / minimum distances

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.

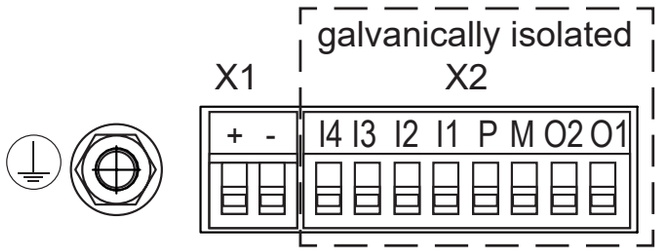


NOTICE
Non-compliance with the minimum distances can destroy the device at high ambient temperatures!

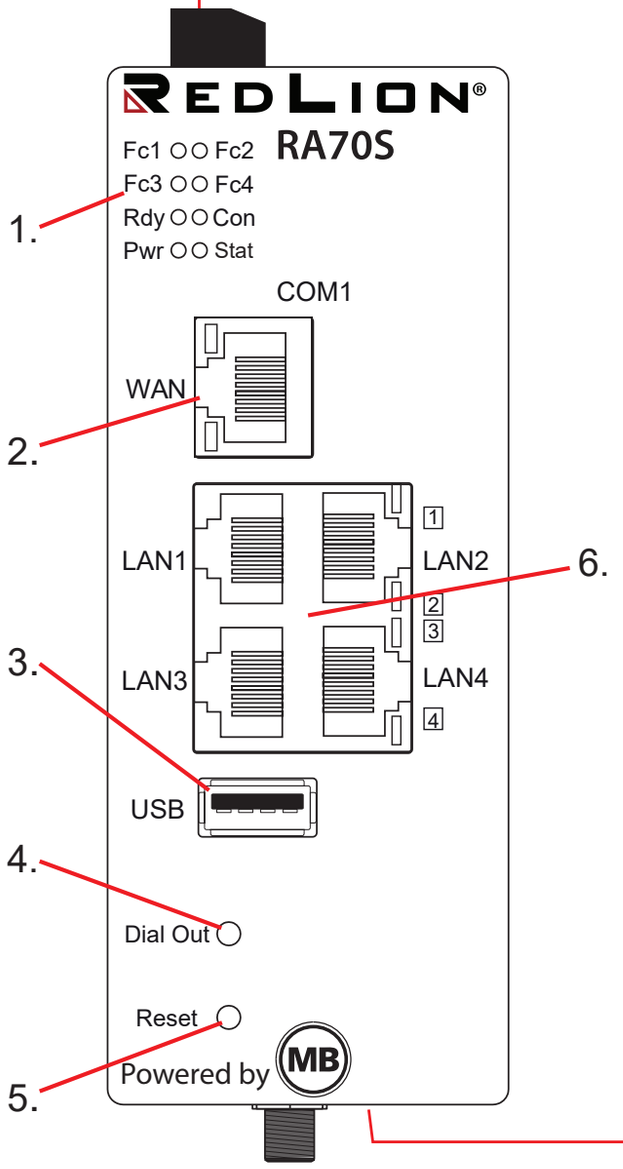
6.2 Device Dimensions in inches (mm)



7 Displays, Controls and Connections



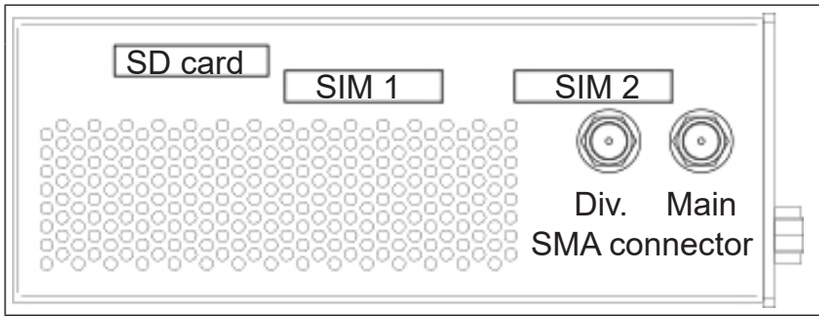
X1	+	Power supply connection 10 - 30 VDC
	–	0 VDC connection
X2	4	Digital input I4 (10 - 30 V)
	3	Digital input I3 (10 - 30 V)
	2	Digital input I2 (10 - 30 V)
	1	Digital input I1 (10 - 30 V)
	P	Fuse-protection 10 -30 VDC
	M	0 VDC connection
	O2	Digital output O2
	O1	Digital output O1



1. Function / status LEDs
2. WAN interface
3. USB Host 2.0
4. Dial Out button
5. Reset button
6. LAN interfaces 1 - 4

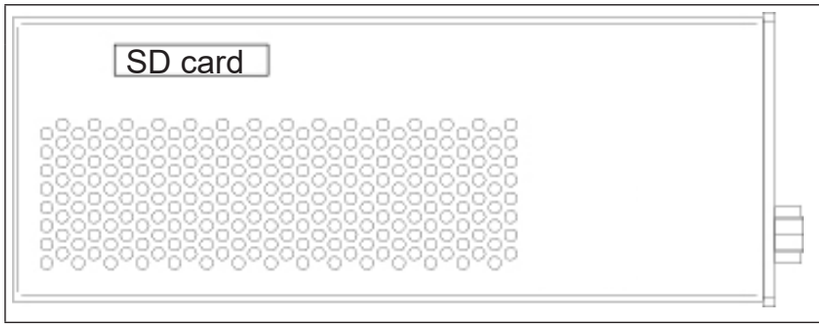
Model: RA70S-R4A00V-1S0D0*
RA70S-R4A00V-1S0DA*
RA70S-R4E00V-1S0D0
RA70S-R4E00V-1S0DA

*Note: Cellular coverage for AT&T carrier only



Devices with LTE (4G) module	
Type MDH 859	Equipment features 1 x SD Card 2 x SIM Card 2 x SMA connector for GSM antenna (MIMO)

Model: RA70S-R0000V-0S0D0
RA70S-R0000V-0S0DA



Devices without module / modem	
Type MDH 816	Equipment features 1 x SD card slot

Function / status LEDs

LED	Colour	Status	Description
Fc1	**orange**	flashes	(**1 Hz**) Data received at COM1
	green	flashes	(**1 Hz**) Data transmission to COM1
		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 COM2
	green	flashes	(**1 Hz**) Data transmission to COM2
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 device: (+Fc3 orange) == 51% – 70%
	green	off	GSM device: reception depending on Fc3
		on	GSM device: (+Fc3 green) == 71% – 100%
		flashes	During the activation phase of mbEDGE the LED Fc4 flashes (3 Hz fast)
			After completion of activation Fc4 flashes 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://www.redlion.net/remote-access-software

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 The device is ready for use
Con	**orange**	on	Internet connection established + VPN connection started
		flashes	(**1.5 Hz**) VPN connection is established
	green	off	No Internet connection
		flashes	(**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 the device

Interfaces and buttons

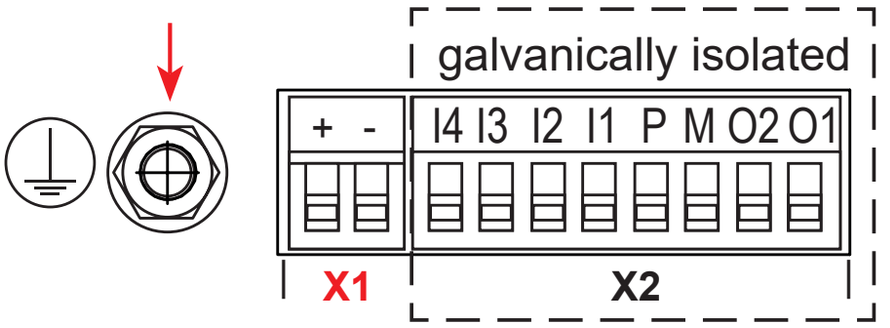
Label	Status	Description
WAN	–	Router WAN port (customer network, DSL modem ...)
WAN-LED	LED green lights	Network connection available
	LED flashing orange	Network data transfer active
LAN 1 - 4	–	Local network ports (e.g. machine network)
LAN-LED 1- 4 (Dual LED)	LED green lights	Network connection available
	LED flashing orange	Network data transfer active
USB	–	Portable USB drive port
COM1	–	COM1 port for connecting to devices with RS232 / RS485, RS422 interface
COM2	–	COM2 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	–	This button a) establishes an Internet or VPN connection **or** b) activates the ***SIMPLY.connect*** function, when LED Fc1 is flashing (5 Hz)
Reset	–	Pushing this button restarts the router (so-called cold start)

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.

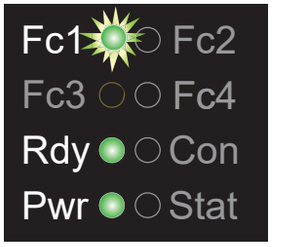


- Connect the (10-30 VDC) power supply to the **X1** terminal of the router.

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 LED Rdy light up and Fc1 is flashing green (5 Hz - very fast).

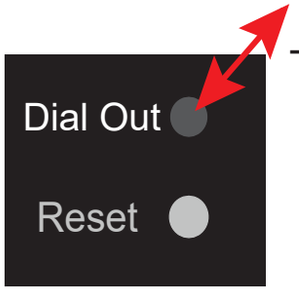


The ***Remote Access Router*** is now ready for operation.

For devices with *SIMPLY.connect* function

The flashing LED Fc1 indicates that the device can be configured for use as a “Cloudserver” device via the ***SIMPLY.connect*** function.

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 button Dial Out => LED **Fc1 lights up**.

If you do not want to use ***SIMPLY.connect***, simply ignore the flashing LED Fc1.

More information is available at: **https://www.redlion.net/remote-access-software**

9 Initial Configuration

Requirements:

- You have a user account on the Remote Service Portal (RSP) ***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 at **www.redlion.net**

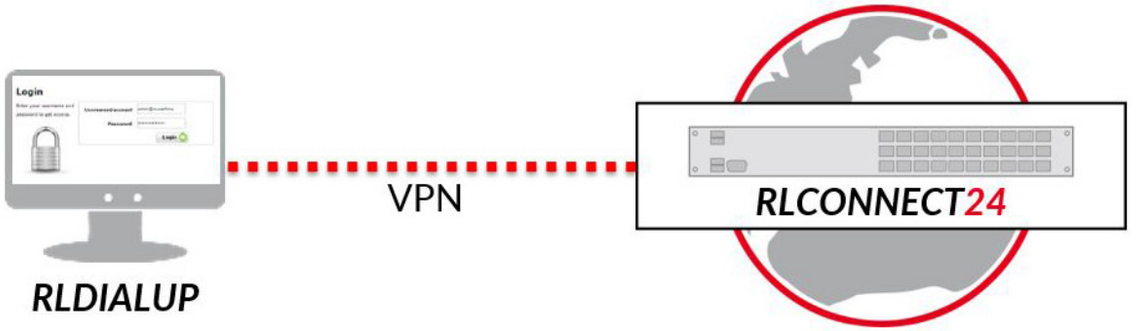
Generally following procedure applies:

- 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.

For more information about configuring devices, see the ***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

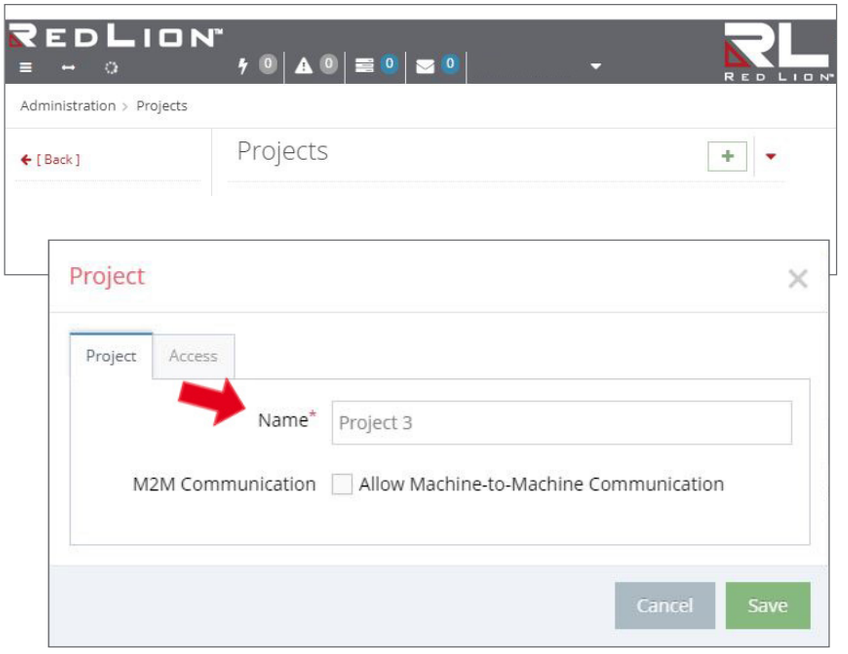


ADVICE: Upon first login, please change the default login information!
Navigation: Administration > Users

9.1.2 Creating a project

Navigation: Administration > Projects

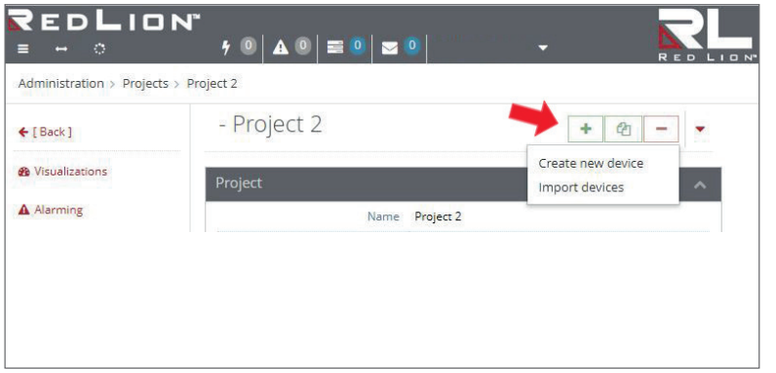
In the project overview, click the plus  and assign the next screen a Project **Name** (all other inputs / information can be made up later).



9.1.3 Create a device

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

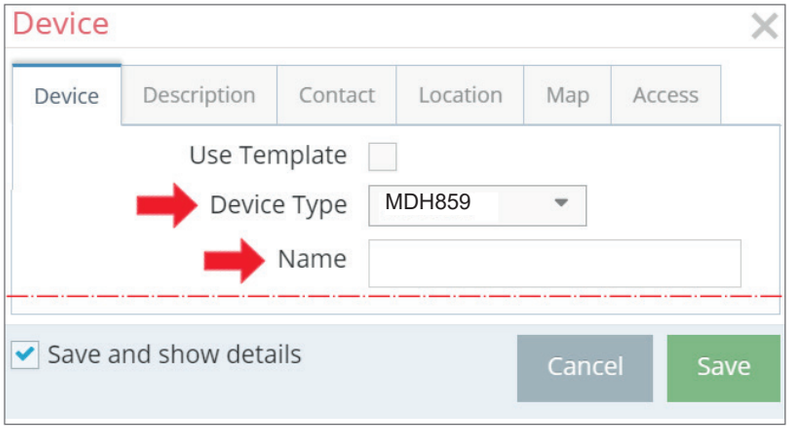
In the selected project, click the plus  and select “Create new device”.



For the basic configuration, you only need to select your “Device Type” and enter a unique device “Name”.

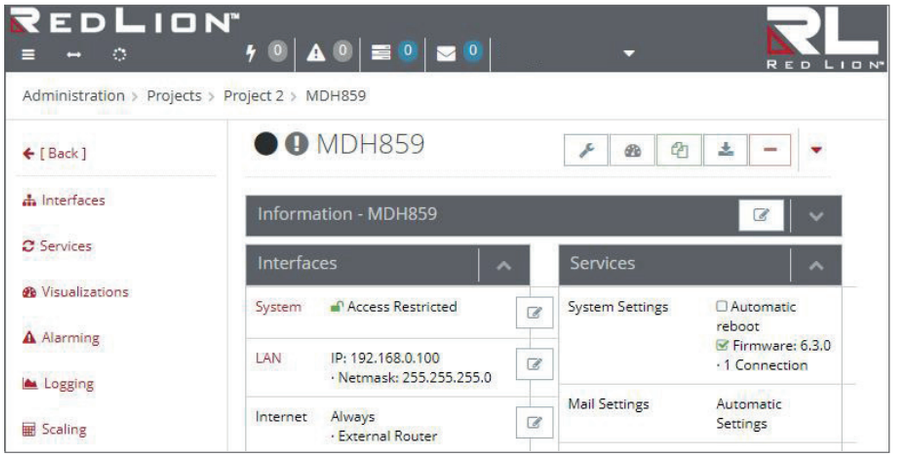
You can create your own name for the Device.

The following numbers and letters are allowed: 0 to 9, A to Z, a to z (avoid blanks).



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)*

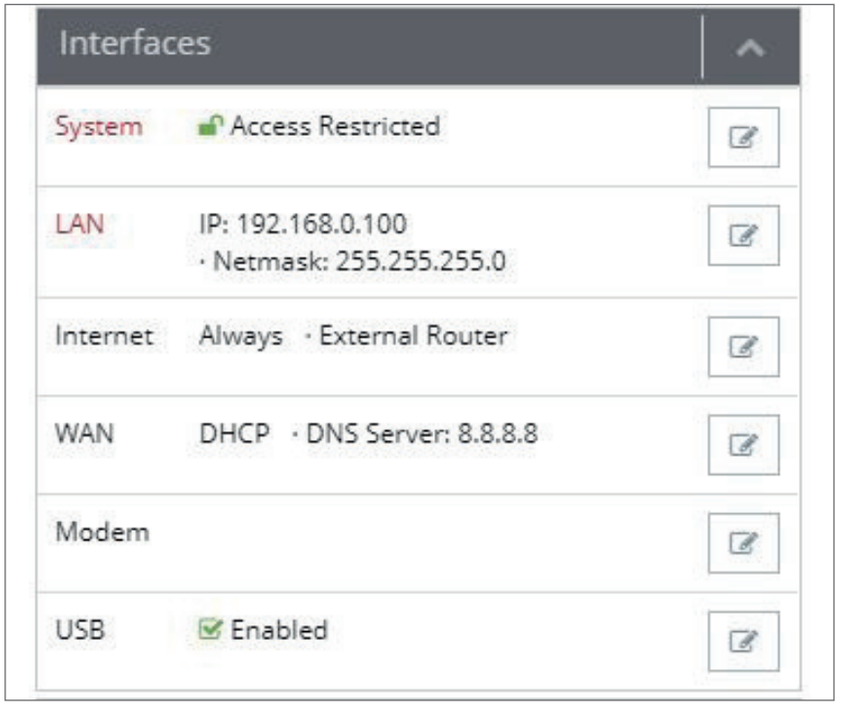
The following menus are relevant for the initial configuration:

- **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.*

- **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)

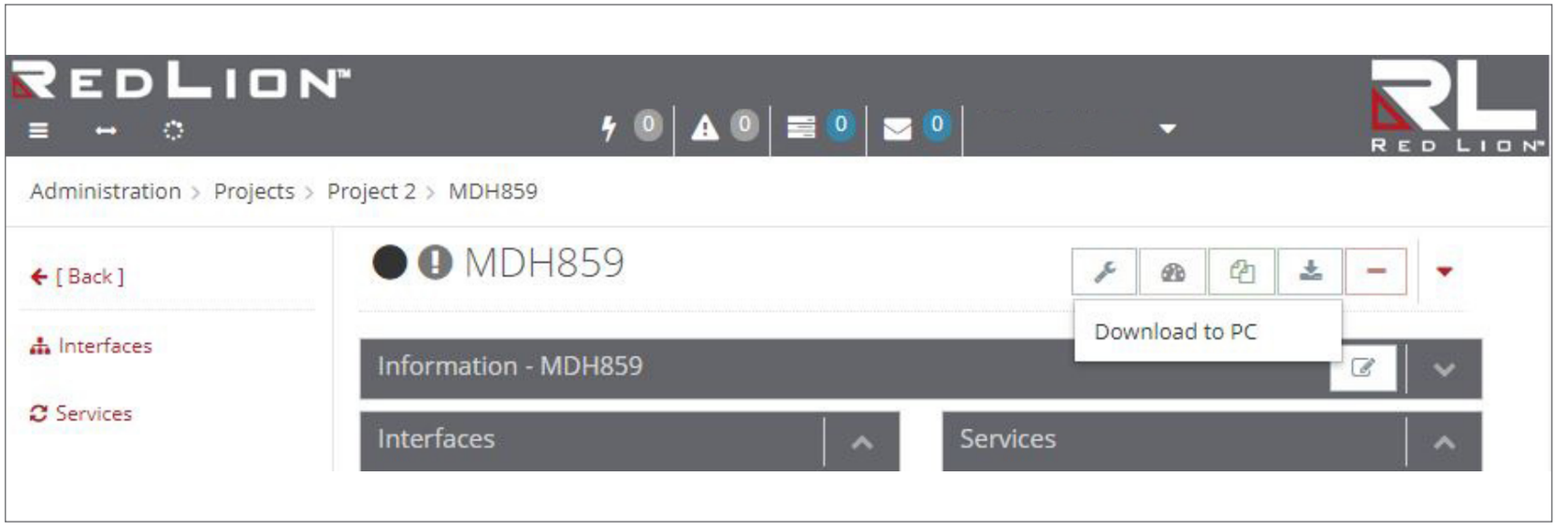


Click the edit icon  to edit the settings of the respective sub-menus.

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.mbn" can now be downloaded to the USB stick.

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

9.1.6 Transfer configuration to the Remote Access Router

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

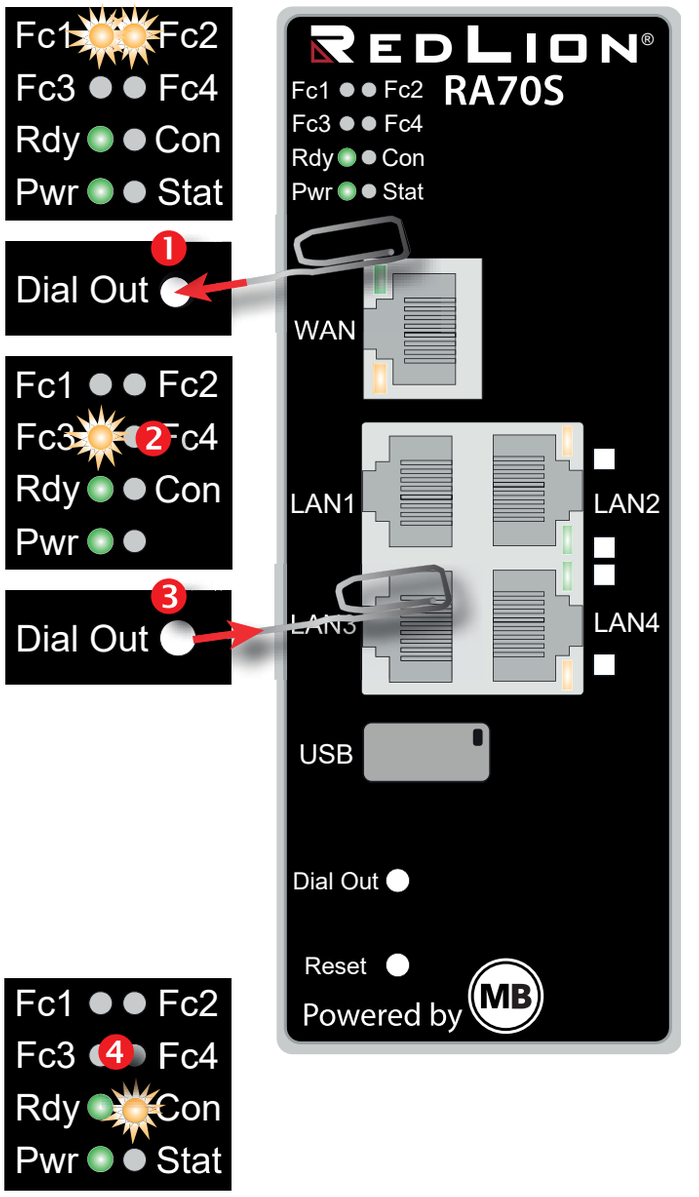
As soon the ***router*** recognizes the configuration file, both LED **Fc1** + LED **Fc2** are **flashing**.

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, SIM card, antenna installed), the device will subsequently log in to your account.
This is displayed by the flashing LED Con ❹.



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 Remote Access Router

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

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

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.

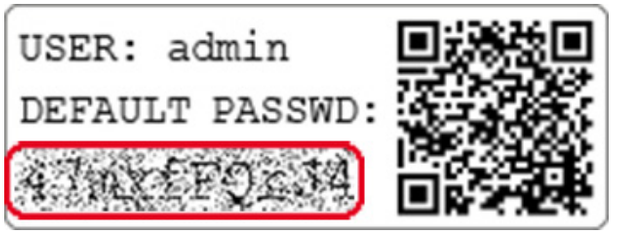
- The ***router*** must be accessible via the LAN interface of the configuration PC.

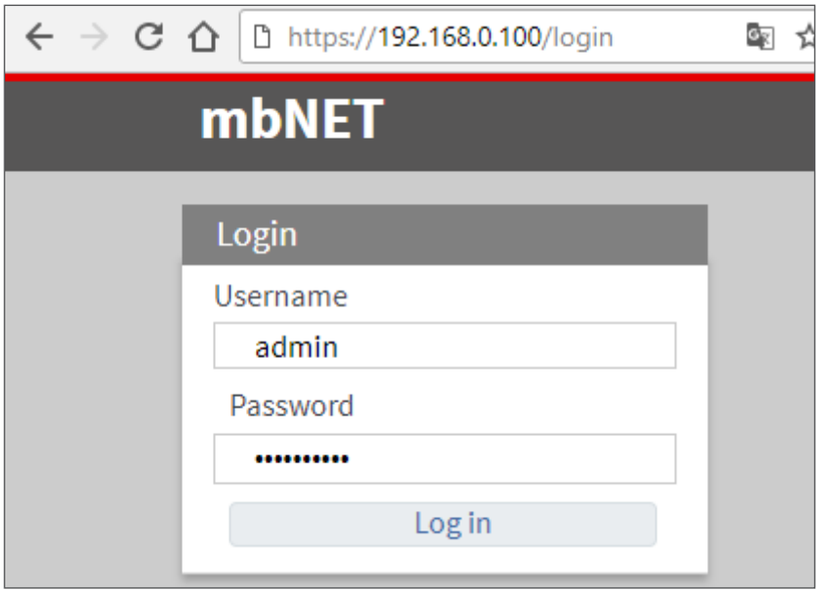
Start a browser and enter the LAN IP you have assigned in the portal to the ***router***.

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

Username: admin

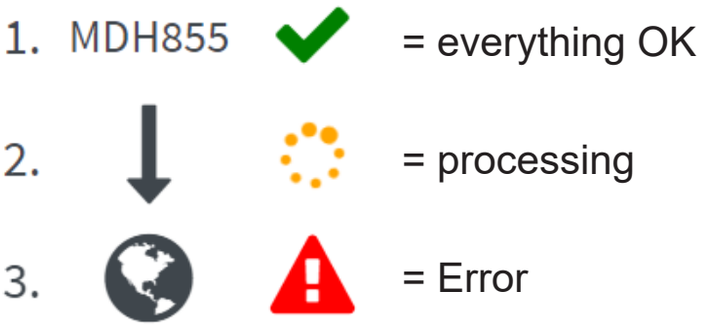
Password: The default password is located on the back of the device.

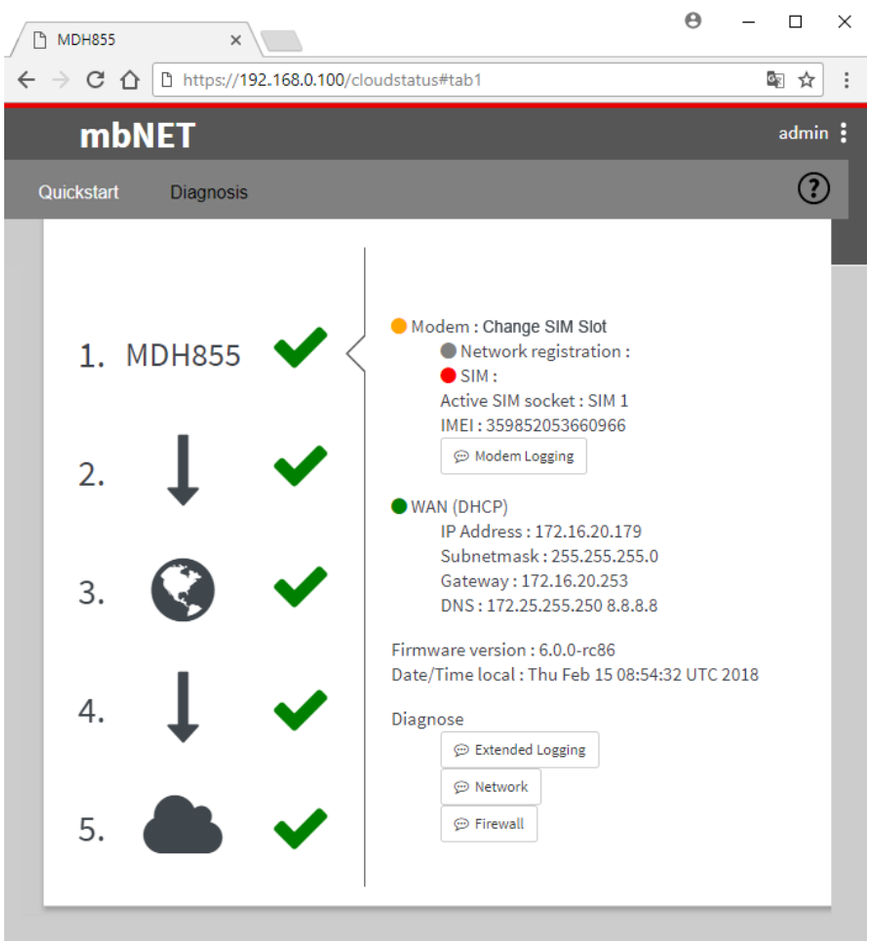




10.1 Quick Start

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.

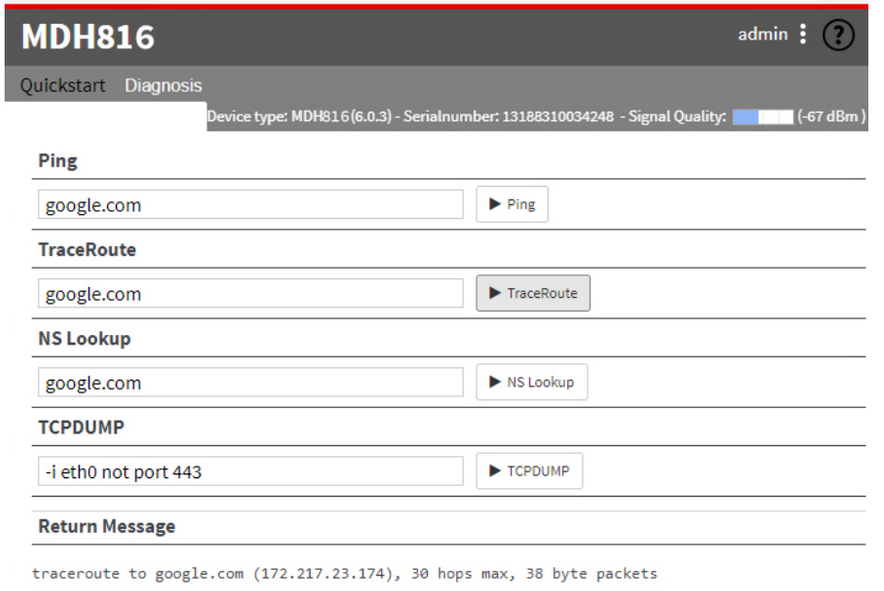




Click on the icon to the right of each progress to get details / information about this step.
If all five steps have been completed successfully, the ***router*** is connected to the portal ***RLCONNECT24***.

10.2 Diagnostics

In case of a failed connection setup, the Diagnostic page provides support for troubleshooting.

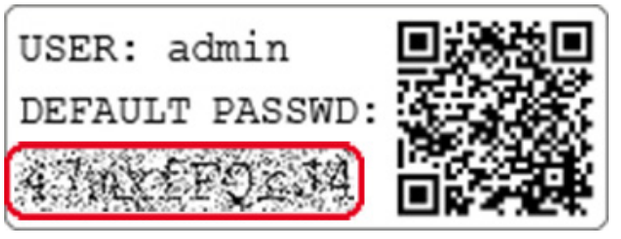


11 Factory Settings On Delivery

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 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/storage medium should be connected to the device.

Execution:

1. Switch on the router or press the **Reset** button.
2. Wait until the LED **Rdy flashes green**.
3. Press and hold the **Dial Out** button until LED **Fc4 is lit**.
4. Press the **Dial Out** button again => LED **Fc3 lights** up.
5. Repeat step 4. => LED **FC2 lights** up.
6. Press the **Dial Out** => button one last time, after approximately 10 - 20 sec. LED **Fc3 flashes**.

When both the Pwr and Rdy LEDs light up and the Fc1 LED flashes* (5Hz), the router is reset to its “factory settings at the time of delivery” and can/must be reconfigured.

* only for devices with ***SIMPLY.connect*** function.

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)

* 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 (galvanically isolated), (Low 0 - 3.2 V DC, High 8 - 30 VDC)
Digital outputs	2 pcs. digital outputs, 10 – 30 VDC (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) SDXC max. 64 GB; Format FAT16/FAT32

Communication

Devices with **LTE (4G)** module - **AT&T** (MDH 859 AT&T) from hardware version **from HW 05**	
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

NOTICE
Device type MDH 859 AT&T bears no CE marking and may not be used or put into operation in the European economic area (EEA)!

Devices with **LTE (4G)** modem - **EU** (MDH 859 EU), from hardware version **HW 05**		
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	
RF parameters		
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	

SIMPLIFIED EU DECLARATION OF CONFORMITY

Red Lion declares that the radio equipment type MDH 859 EU (RA70S-R4E00V-1S0D0 and RA70S-R4E00V-1S0DA) is manufactured in compliance with Directive 2014/53/EU.
The full text of the EU declaration of conformity is available at **www.redlion.net**

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

15 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.

RED LION®
a spectris company
www.redlion.net