PROG. CNTLR.
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RA10C - Compact Industrial Firewall

Quick Start Guide (V 1.2.9 Aug 8th, 2023)

NFH 100 - from **HW02**

LP1166D

Contents

This document is valid for the Compact Industrial Firewall RA10C0000000S0D0 and RA10C000000000DA - Also referred to in this guide as NFH100 Hardware version from HW02.

This Quick Start Guide provides a quick overview of selected operating procedures and funtions of the compact industrial firewall (NFH100). 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.

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 device is built to the latest technological standards and recognized safety standards (see Declaration of Conformity).
- The device is only intended for operation in the control cabinet and with SELV according to IEC 60950/EN 60950/VDE 0805.
- The device may only be connected to devices which meet the requirements of EN 60950.
- The device is for indoor use only.
- Never open the device 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)!

2 Maintenance

The Compact Industrial Firewalls are maintenance-free units.
If a Compact Industrial Firewall has damage or malfunctions, the device must be immediately taken out of service and secured against unintentional operation.

NOTE

Regardless of the maintenance-free hardware, there is a need for action in terms of IT security.

- Keep the software / firmware up to date.
- Keep yourself informed about security updates of the product.

Information on this can be found at **www.redlion.net**

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.
35 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

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

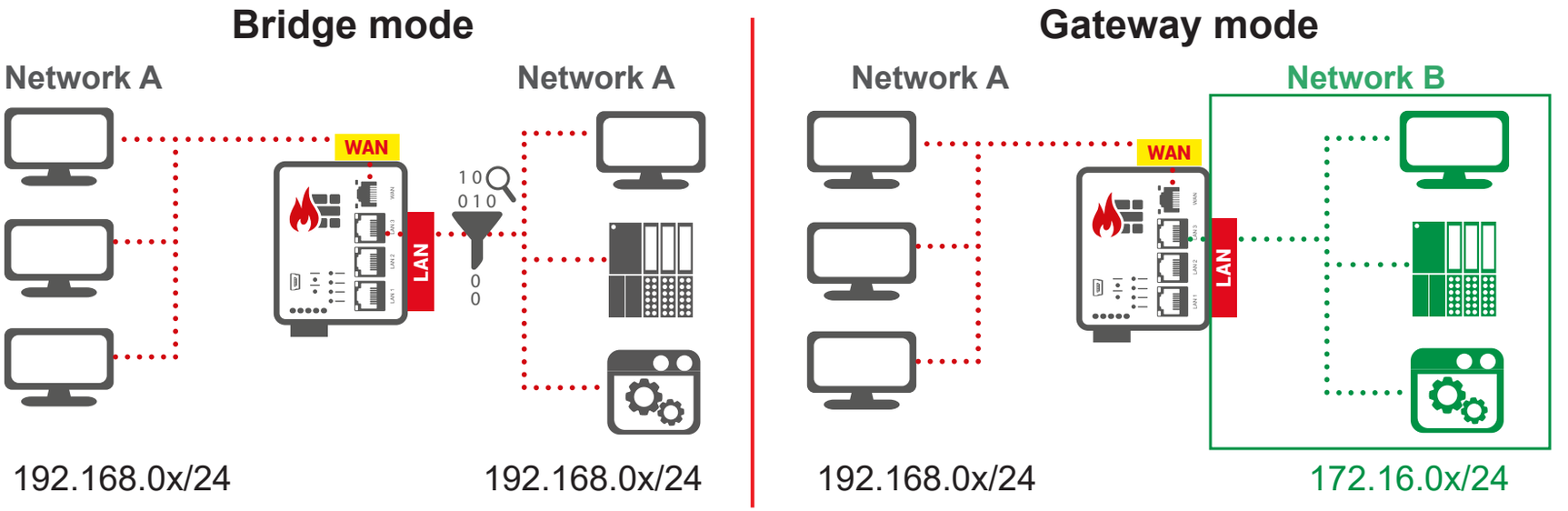
For a list of the open-source software used in this product see

https://mbconnectline.com/download-portal/

https://bit.ly/44XU4wZ

4 Brief Description

The ***RA10C*** is a “self-learning” easy-to-configure industrial firewall.
It can be used in both bridge mode and gateway mode.



The configuration is made via the USB interface using the software **mbNETFIX Manager** (not included in delivery).
The software can be downloaded for free at **www.redlion.net**

5 Performance Characteristics

- Protects the machines in the network from attacks from the Internet.
- Easy network segmentation with controlled routing and NAT.
- Convenient learning mode makes creation of filter tables simple & easy.
- Integration into existing networks.
- Bridge or Gateway mode.
- IP, port, and protocol filters to monitor and restrict traffic.
- Configuration with secure software.
- Less attack vectors by avoiding a web interface.
- Versatile NAT functionalities, eg 1: 1 NAT, SimpleNAT and port forwarding.

6 Include In Delivery

Please check that your delivery is complete:

1 x Firewall

1 x Plug-in bridge

1 x cable USB A - USB-mini B

1 x Quick Start Quide

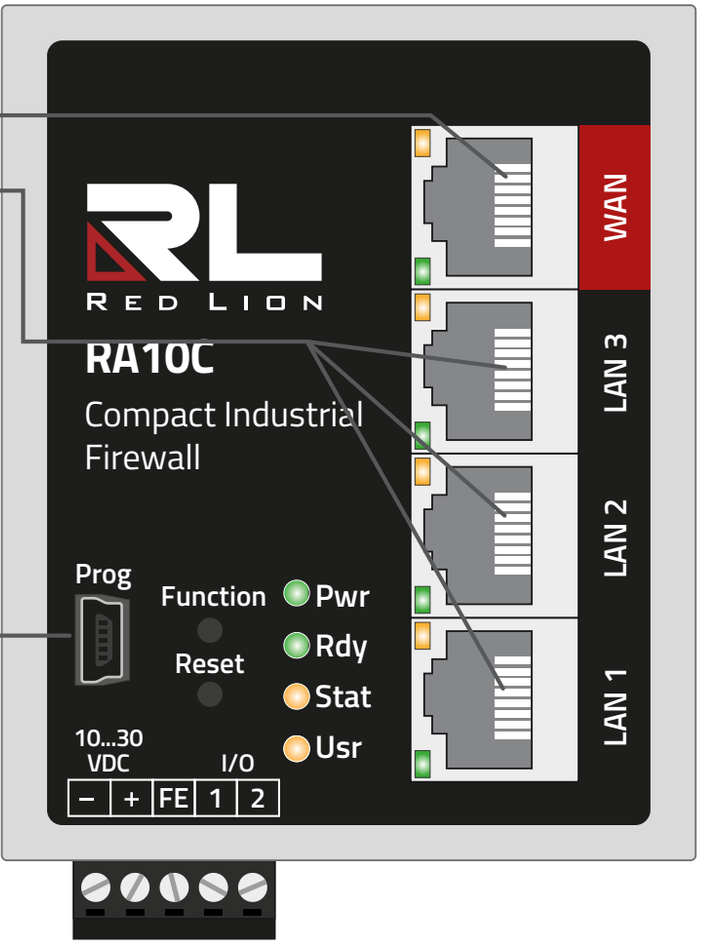
If any of these parts are missing or damaged, please contact the following address:

Red Lion Controls, Inc.
35 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

Please keep the original box and the original packaging in case you need to send the device for repair at a later date.

7 Displays, Controls and Connections



–	0 VDC connection
+	Power source connection 10 - 30 VDC
FE	Functional earth
I/O 1*	Digital input (10-30 VDC) (Low 0 – 3.2 V DC, High 8 – 30 VDC)
I/O 2	Digital input (10-30 VDC) (Low 0 – 3.2 V DC, High 8 – 30 VDC) - Function in preparation -

* Input 1 can be used during initial startup to activate the Bridge mode with the packet filter switched off.
The input is only evaluated until the ***firewall*** has been configured once, then the state of input 1 is ignored.

Designation	Status	Description
Prog (Programming)	–	USB interface mini-B for connecting to the configuration PC.
Function	–	Button - function in preparation.
Reset	–	Button - performing a device restart (cold start).

Designation	Status	Description
Pwr (Power)	LED off	Device power source is switched off or device is not connected to power source / power pack.
	LED on	Power source is connected to terminal block and switched on.
Rdy (Ready)	LED flashing	After the system has been checked and started, the LED flashes for the duration of the starting up process.
	LED on	The device is ready for operation.
Stat (Status)	LED on	The packet filter is active in both directions (WAN > LAN, LAN > WAN).
	LED off	The packet filter is INACTIVE in both directions (WAN > LAN, LAN > WAN).
	LED flashing	The packet filter is INACTIVE in at least one direction (WAN > LAN, LAN > WAN).
Usr (User)	LED on	The device is not configured.
	LED off	The device was configured by the software mbNETFIX Manager.
WAN	-	WAN connection (customer network, DSL router).
WAN LED	orange LED flashing	Network data transfer active.
	green LED on	Transfer rate = 100 MBit/s
	green LED off	Transfer rate = 10 MBit/s
LAN 1 – 3	-	LAN connection (machine network).
LAN LED 1 – 3	orange LED flashing	Network data transfer active.
	green LED on	Transfer rate = 100 MBit/s
	green LED off	Transfer rate = 10 MBit/s

8 Getting Started

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.

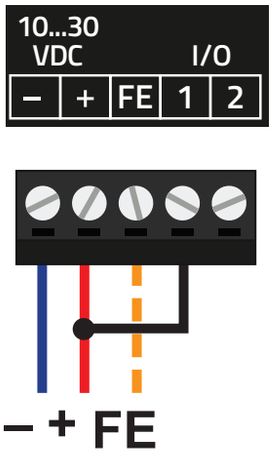
The Compact Industrial Firewall can be operated in two modes (see chapter 4).
During the initial commissioning and after each factory reset, the firewall is always set in Bridge mode, with active packet filter in both directions (Security By Default).
The packet filter can be switched INACTIVE by means of activating input 1 (High 8 – 30 VDC).
You should choose this preference on input 1 if any of these apply to you:

If you want to operate the firewall as a bridge
and want to make the configuration at a later time
and want to do the installation now
and do not want to influence the existing network
OR
Activate the learning function of the firewall in order to be able to read the learned network traffic later during the configuration.

a. Bridge Mode:
After booting, the packet filter is INACTIVE.

That is, the WAN > LAN and LAN > WAN transitions are open. All pending connection attempts / connections are detected.

This mode is only active until the device has been configured for the first time.



1. Connect equipotential bonding to the functional earth (**FE**).

2. Connect the terminals I/O **1** and **+** (=> I1 = high).
   To do this, use the supplied Plug-in bridge.

3. Connect the device to a power supply (**10 – 30 VDC**).

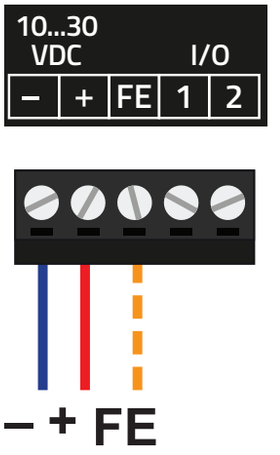
Make sure the polarity is correct!

ADVICE

Input 1 is only evaluated until the Compact Industrial Firewall has been configured once, then the state of input 1 is ignored.

b. **Bridge mode with active packet filter** (Security by default)**:**
After booting, both the packet filter and the learning mode are active.

That is, the WAN > LAN and LAN > WAN transitions are blocked. All pending connection attempts are detected.



1. Connect equipotential bonding to the functional earth (**FE**).
2. Connect the device to a power supply (**10 – 30 VDC**).

Make sure the polarity is correct!

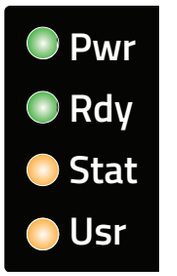
After switching on the power supply the LED Pwr lights up.

As soon as the system has been checked and starts, the LED Rdy flashes for the duration of the boot process (about 90 seconds).

If the ***firewall*** is ready, the LED Pwr + Rdy will light up.

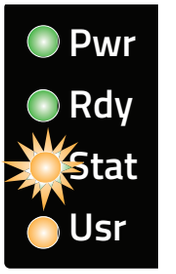
Light code in bridge mode
- packet filter active -

LED Stat on => the firewall is active
LED Usr on => the device has not yet been configured.

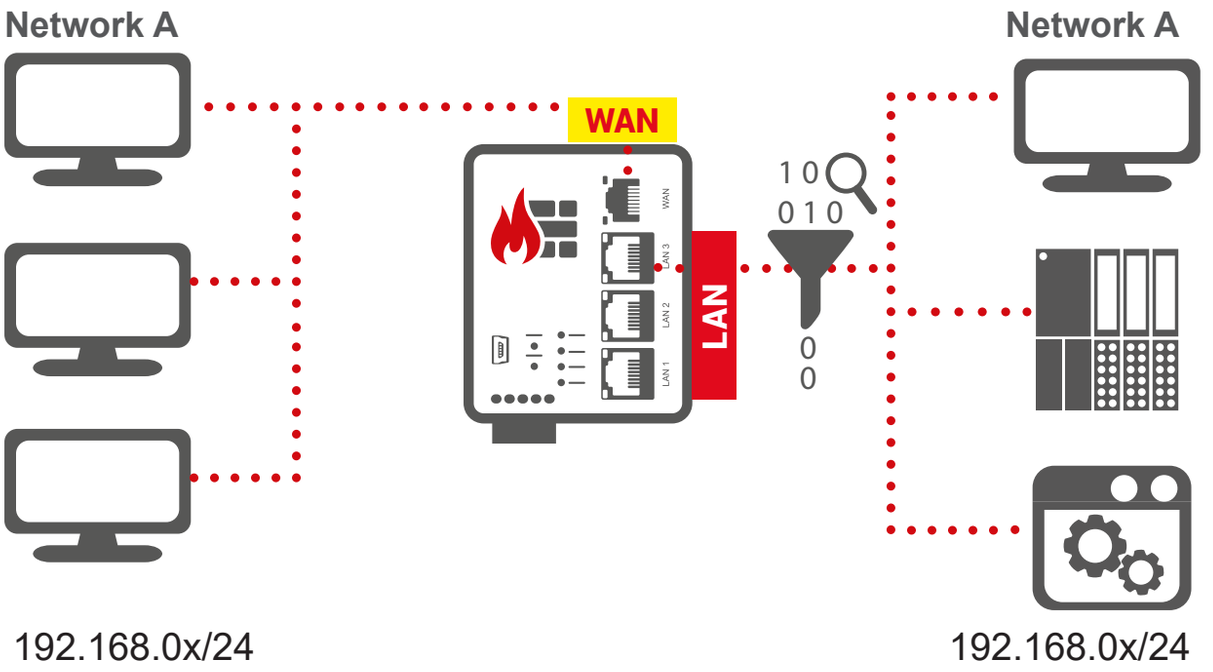


Light code in bridge mode
- packet filter INACTIVE -

LED Stat flashes => the packet filter is inactive
LED Usr on => the device has not yet been configured.



9 Using the Compact Industrial Firewall in Bridge Mode



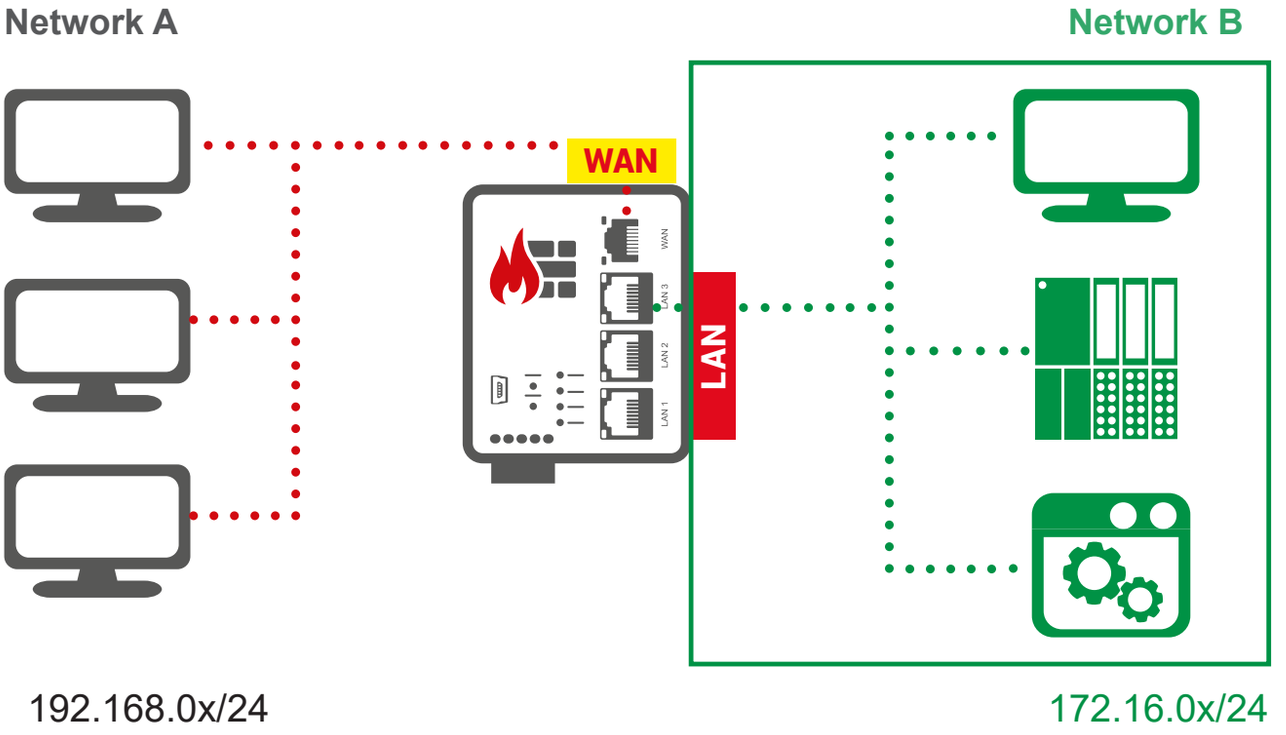
If you use the firewall in bridge mode and install it unconfigured in your network environment, start the device in **bridge mode with packet filter INACTIVE** (input 1 = HIGH).

After booting, the packet filter is inactive and the learning mode is active.
That is, the WAN > LAN and LAN > WAN transitions are open.
All pending connection attempts / connections are detected.

Input 1 is only evaluated until the firewall has been configured once, then the state of input 1 is ignored.

Use bridge mode if your network is on the LAN and WAN side of firewall in the same network segment (see graphic above for example IP addresses).

10 Using the Compact Industrial Firewall in Gateway Mode



If you use the firewall in gateway mode, start the device in Bridge mode with active packet filter.

After booting, both the packet filter and the learning mode are active.
That is, the WAN > LAN and LAN > WAN transitions are blocked.
All pending connection attempts are detected.

Use gateway mode if your network is on the LAN and WAN side of the firewall in different network segments (see graphic above with the IP example addresses).

11 Configuration of the Compact Industrial Firewall

The configuration of the firewall is made via the USB interface using the software **mbNETFIX Manager** (not included in delivery).

In addition to a convenient graphical user interface (GUI) and public-key authentication, the "**mbNETFIX Manager**" offers all the functions that an automation engineer knows from his PLC programming environment (eg export, import, duplicate, online comparison, online functions, etc.).

Download the configuration software "mbNETFIX Manager" **for free** at **www.redlion.net**

After the installation, you can configure the firewall for the respective purpose using a wizard.

12 Factory Settings on Delivery

Default settings ***firewall***:

IP address (USB port):	169.254.0.1
Subnet Mask:	255.255.0.0
User 1:	admin
User 2:	factoryreset
Password:	*The device password is located on the back of the device and applies to both* User 1 *and* User 2*.*

13 Load Factory Defaults (Factory Reset)

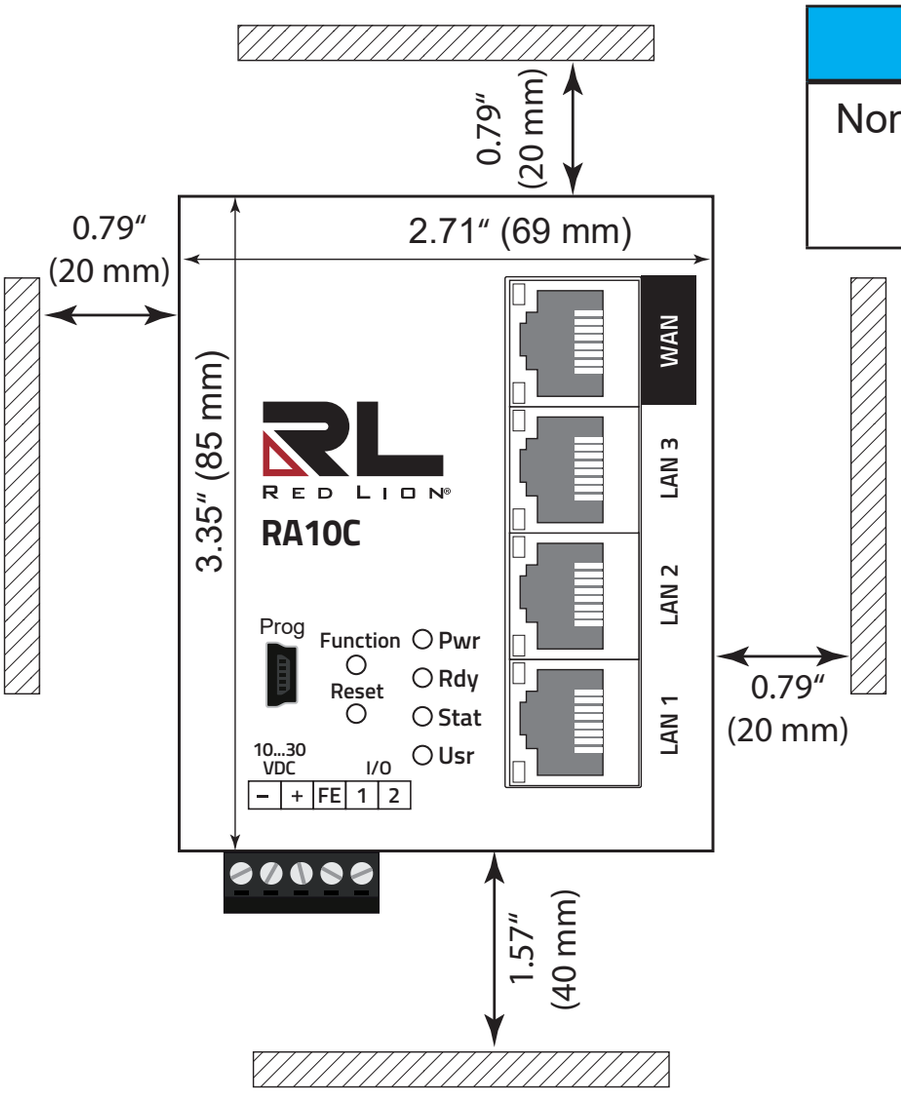
- Open a project in the mbNETFIX Manager with the **user** "**factoryreset**".
- Connect to the firewall ("**Go online**").
- In the "**Device**" menu select the menu item "**Factoryreset**".
- Close the project and log in again with the **user** "**admin**".

The firewall will now be reset to its original factory defaults and must be reconfigured.

14 Device Installation

Installation position / minimum distances

The device 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!

15 Technical Data (extracts)

Excerpt from the technical data sheet.
Find the complete technical data in our support portal at **www.redlion.net**

Performance data	
Voltage V (DC)	10 - 30 VDC (SELV and Limited Energy circuit)
Power consumption	max. 250 mA @ 24 V
Operating temperature	-40 – 75 °C
Dimensions	69 mm x 33.5 mm x 92.5 mm (W x D x H)
Mounting	DIN rail mounting (based on DIN EN 50022)
Housing (material)	metal

Interfaces	**Number**	**Description**
USB interfaces	1 x	USB slave 2.0 mini
Digital inputs	2 x	10 – 30 V DC (low 0 – 3,2 V DC, high 8 – 30 V DC)
LAN interfaces	3 x	10/100 Mbit/s full and half duplex operation, autodetection patch cable / crossover cable
WAN interfaces	1 x	10/100 Mbit/s full and half duplex operation, autodetection patch cable / crossover cable

16 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

17 Information on cyber security

To prevent unauthorized access to facilities and systems, observe the following security recommendations:

General

- Periodically ensure that all relevant components meet these recommendations and any additional internal security policies.
- Perform a security assessment of the entire system. Use a cell protection concept with suitable products. For example, “ICS Security Compendium“ from the BSI (**B**undesamt für **S**icherheit in der **I**nformationstechnik (Federal Office for Security in Information Technology)). https://www.bsi.bund.de/SharedDocs/Downloads/EN/BSI/ICS/ICS-Security_compendium.html. Shortened URL: **http://bit.ly/3Ya4tTH**

Physical access

- Restrict physical access to security-relevant components to qualified personnel.

Security of the software

- Keep software/firmware updated.
  -> Stay informed about security updates for the product.
  -> Stay informed about product updates.

You can find information about this at: **www.redlion.net**.

Passwords

- Define rules for the use of the devices and assigning passwords.
- Change passwords regularly, to increase security.
- Use only passwords with a high password strength. Avoid weak passwords such as “password1“, “123456789“ or the like.
- Make sure that all passwords are protected and inaccessible to unauthorized personnel.
- Do not use the same password for different users and systems.

18 Disposal of old devices

NOTICE
Before you dispose of an old device, make sure that all device data and/or personal data and the device configuration have been completely deleted. 1. Remove/erase **all** storage media connected to the device. 2. Disconnect the device from all networks (LAN and WAN) and **carry out the "Reset to factory settings" directly on the device**. 3. Make sure that removing a device from the network does not result in a security risk!

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.

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