

BRADY FR22 LITE

RFID FIXED READER



USER GUIDE

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1. GETTING STARTED

1.1. GENERAL

The Brady FR22 Lite is an UHF RFID Fixed reader providing USB, Ethernet and RFID connectivity. It also has an embedded computer with Linux OS enables installation and operation of 3rd party applications and makes the system much more scalable and manageable than conventional RFID readers.

Highlights of the Brady FR22 Lite:

- Fast and reliable edge computing with support for custom embedded applications
- New UHF RFID engine based on the very latest technology, the Nordic ID NUR3-1W6
- Develop embedded web apps with user interface. Eliminating the need for external PC/tablet
- Connect external devices, sensors, triggers, lights and buzzers
- Full set of API's available for controlling the reader

1.2. ANTENNAS AND ACCESSORIES

Brady FR22 Lite needs external RFID antennas to operate. It can work with any standard UHF RFID antenna, but we suggest using a Brady RAIN RFID antennas like:

- Brady GA30, a general-purpose antenna with high gain and IP rating, that allows the Brady FR22 Lite to be mounted behind it to create an integrated RFID reader+antenna solution.

Model and quantity (up to 4) of antennas depend on the use case.

1.3. PACKAGE CONTENT

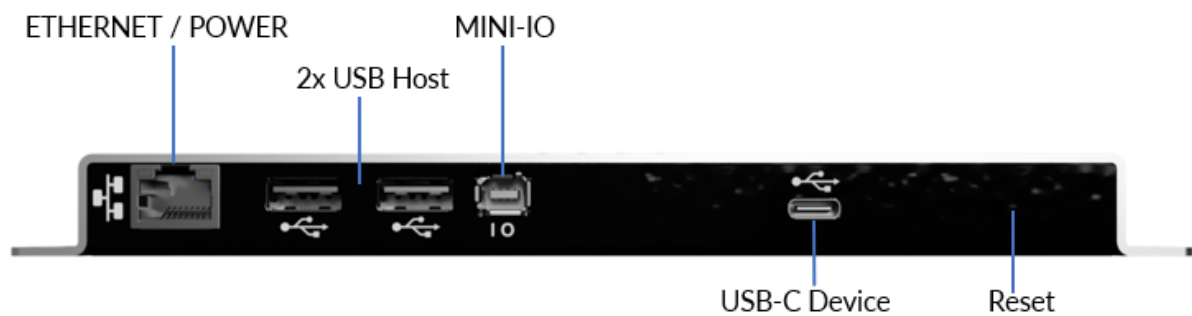
Brady FR22 Lite package contains the following items

- Brady FR22 Lite
- Safety and regulations card
- Additional product label with product information (*keep this safe*)

NOTE! Power supply not included.

2. USING THE DEVICE

2.1. FEATURES AND CONNECTORS OVERVIEW



Picture 1 Rear panel of BRADY FR22 Lite



Picture 2 Front panel of Brady FR22 Lite

2.2. PHYSICAL CONNECTORS

Brady FR22 Lite includes the following physical connectors:

- Ethernet 10/100Mbps with PoE 802.3at support.
- 2 pcs USB 2.0 host Type A connectors
- USB 2.0 device Type C connector
- Industrial Mini-IO connector (4pcs of IO's)
- 4 pcs RP-SMA antenna connectors for connecting external RFID antennas to the reader

2.2.1. ETHERNET / POWER

Brady FR22 Lite includes a standard RJ-45 ethernet connector. The reader supports 10/100Mbps speed class and 802.3at PoE.

There is no DC connector for an external power supply. The Brady FR22 Lite is powered via Ethernet.

A shielded Ethernet cable is suggested.

2.2.2. USB 2.0 HOST WITH TYPE A CONNECTOR

Brady FR22 Lite includes two USB 2.0 host Type A connectors for connecting peripheral USB devices such as barcode scanners, memory sticks, keyboards, sensors etc to expand its functionalities. Maximum current out from the USB 2.0 host Type A connectors is 500mA.

2.2.3. USB 2.0 DEVICE WITH TYPE C CONNECTOR

Brady FR22 Lite includes one USB 2.0 device Type C connector for connecting it to a host device, e.g., PC or laptop.

NOTE! The web management interface cannot be accessed using a USB connector. Web management interface can only be accessed using ethernet.

2.2.4. GPIO CONNECTOR

Brady FR22 Lite has an Industrial Mini-IO type I connector that contains the following functionalities:

- I2C bus (with internal pull-up resistors)
- 4 x inputs / outputs (TTL 1.8VDC)
- 5VDC supply (output)
- GND level



Picture 3 and Figure 1 Pin-out of the mini-IO connector on the Brady FR22 Lite rear panel

The following table describes the pin-out and signals of the mini-IO connector:

PIN	SIGNAL NAME	DESCRIPTION	DEFAULT STATE
1	VCC_5V	Power 5V output	
2	GND	Ground	
3	GPIO3	general purpose IO	output, low
4	GPIO4	general purpose IO	output, low
5	GPIO1	general purpose IO	input, low
6	GPIO2	general purpose IO	input, low
7	I2C_CLK	I2C master bus clock	
8	I2C_DATA	I2C master bus data	

And this table indicates the electrical specifications of the signals:

SIGNAL NAME	VOLTAGE MIN (V)	VOLTAGE NOMINAL (V)	VOLTAGE MAX (V)	CONDITIONS
VCC_5V		5		< 500mA
GPIO 1-4 inputs, low	-0.3	0	0.6	
GPIO 1-4 inputs, high	1.3	1.8	2.1	
GPIO 1-4 outputs, low		0	0.45	<2mA
GPIO 1-4 outputs, high	1.4	1.8		<2mA
I2C_CLK		1.8		

I2C_DATA

1.8

To build a custom cable to connect to the mini-IO port in the Brady FR22 Lite, it's important to take the positions of the pins/wires on the cable plug into account.

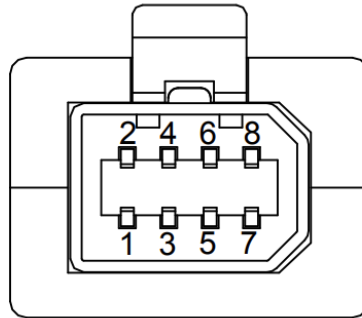


Figure 2 Mini-IO cable plug Brady FR22 Lite front view

NOTE! These GPIO are not opto-isolated. They are digital inputs/outputs. Wrong usage or higher voltages might damage the Brady FR22 Lite unit.

2.2.5. RFID ANTENNA PORTS

Brady FR22 Lite includes 4 RP-SMA female antenna connectors for connecting external RFID antennas to the device. Impedance of antenna ports is 50Ω and maximum conducted output power is 32dBm (30dBm in FCC region).

The antenna ports can be configured independently via NUR API.

2.3. MOUNTING

Brady FR22 Lite can be mounted using the four holes as seen in the picture.



Picture 4 Mounting holes in BRADY FR22 Lite

Here is a 1:1 size template that can be printed and used to drill holes before mounting the device in place.

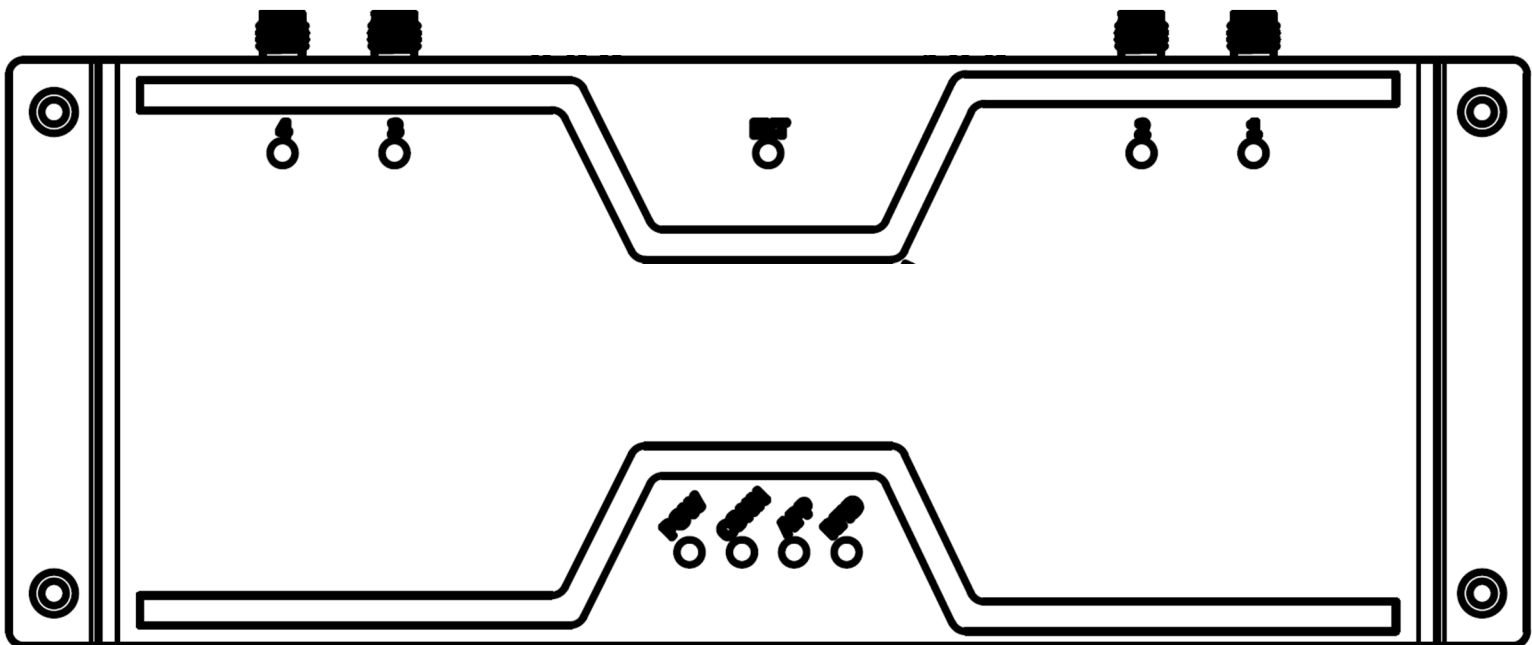


Figure 3 Template for drilling holes

2.4. POWERING THE READER

Brady FR22 Lite can be powered via a DC ethernet port if the network supports power over Ethernet (PoE) feature or using a PoE+ power supply (sold separately).

Regardless of what powering method is used, the data communication can be handled via USB connection, or if IP connectivity is required, then ethernet.

Brady FR22 Lite powers up automatically when connected to PoE power supply or network.

The rated maximum power consumption for Brady FR22 Lite reader is:

- 18W with maximum RFID transmission level (communication via Ethernet or USB).
- 4W in idle state, with RFID disabled.

2.5. LED INDICATORS

The user interface of Brady FR22 Lite consists of 8 active LED indicators:

- 4 LEDs for user indications
 - Power LED
 - Connection LED
 - Application LED
 - RFID LED
- 4 LEDs to indicate the antenna ports status,

The extension LED is inactive in the Brady FR22 Lite.

The location of the LEDs can be seen in Picture 5.



Picture 5 Location of LEDs

2.5.1. POWER LED

By default, the Power LED indicates if power is supplied to the device.

-  Green indicates that the device is powered.
-  No light indicates that the PoE port is not powering the device.
-  The Power LED turns yellow during the upgrade procedure. **DO NOT POWER OFF THE DEVICE DURING THIS PROCESS.**

During the boot sequence after powering the device, the Application LED will also flash red and/or green (see 2.5.3).

2.5.2. CONNECTION LED

Connection LED indicates whether the reader has established a network (TCP/IP) connection.

-  Off: All the communication interfaces are disabled.
-  Stable green: The communication interface is connected and ready to communicate, i.e., the reader has an IP address.

2.5.3. APPLICATION LED

The Application LED indicates whether the RFID module is connected to an application (software) or not.

-  Stable red: RFID module firmware (NUR service) not running.
-  Slow blinking green: RFID module running, ready to be used.
-  Stable green: An application is connected to the RFID module.
-  Fast blinking green: An application is sending commands to the RFID module, it's in use.

When the Brady FR22 Lite is in "ready" status, the Power, Connection and Application LEDs are all green at the same time (App LED can be blinking green if the host application is not using the RFID module yet).

2.5.4. RFID LED

RFID LED indicates whether the RFID reading is ON or OFF.

- Off: The RFID module is not transmitting.
- ● ● Fast blinking/stable green: The RFID module is transmitting RF commands (read, write, inventory, etc).

2.5.5. ANTENNA LEDS

Antenna LEDs are used to indicate the antenna ports configuration, i.e., whether an RFID antenna port is enabled or not, even if an antenna is not connected or is not reading.

- Off: Antenna port disabled.
- Green: Antenna port enabled.

2.6. FACTORY DEFAULT

Brady FR22 Lite can be reset via the Reset button as follows:

- **Factory reset**
 - Keep the Reset button pressed while powering up the Brady FR22 Lite.
 - After first lighting up and then turning off, The Power, Connection and Application LEDs will again turn green in this order.
 - Wait until the Application LED lights on (it will take 10-15 seconds after you pressed the button) and then release the Reset button.

NOTE! If reset button is pressed over 15s after the Connection LED has turned on, releasing the reset button will perform a normal reboot.

3. RF PROFILES

Nordic ID NUR3-1W6 UHF RFID engine supports three different kind of RF profiles. The profiles are Robust, Nominal and High speed. It is important to select the correct RF profile based on use case and environment. More detailed description about the RF profiles can be found below:

- **Robust (max sensitivity)**
 - Robust RF profile is intended to be used in challenging environments. It provides the best filtering against the interfering signals coming from nearby reader(s), other signal sources and from reflective environment. This profile uses link frequency of 160 kHz and Miller 8 coding scheme providing read rates up to 100 tags/s. Due to the low data speed and best filtering the Robust RF profile provides the best sensitivity.
- **Nominal**
 - Nominal RF-profile is the default setting of readers containing Nordic ID NUR3-1W6 UHF RFID engine such as the Brady FR22 Lite. It uses link frequency of 300 kHz and Miller 4 coding providing read rates up to 300 tags/s.
- **High speed**
 - High speed RF profile is intended to be used in use cases where the highest read rates are required. It uses link frequency of 640 kHz and FM0 coding and provides read rates up to 1000 tags/s. Due to the high data speed this profile is quite sensitive to interferences.

NOTE! Read rates will depend on the environment, reader settings, tag population and tag type.

4. THERMAL MANAGEMENT

The Brady FR22 Lite reader includes sophisticated thermal management features that prevent overheating issues if the reader is used in too warm environments. The reader monitors temperatures of the onboard computer and adjusts operation points based on the temperature information.

The reader starts a mitigation scheme (for example the clock frequencies of the CPUs are dropped) when temperature of the main CPU reaches 85°C.

The thermal mitigation scheme of the UHF RFID engine starts when it reaches 80°C. From that moment on, UHF RFID reading operations are suspended for 100ms and suspend time is increased 20ms by every °C temperature rise. The thermal mitigation scheme is turned off once the temperature drops below 80°C. High temperature warning message (TEMP_HIGH) is sent via NUR API to host. The warning message contains also the current temperature information.

5. SOFTWARE

All documentation about software and application development can be found from GitHub.

https://github.com/NordicID/fr22_samples

5.1. RFID APPLICATIONS FOR BRADY FR22 LITE

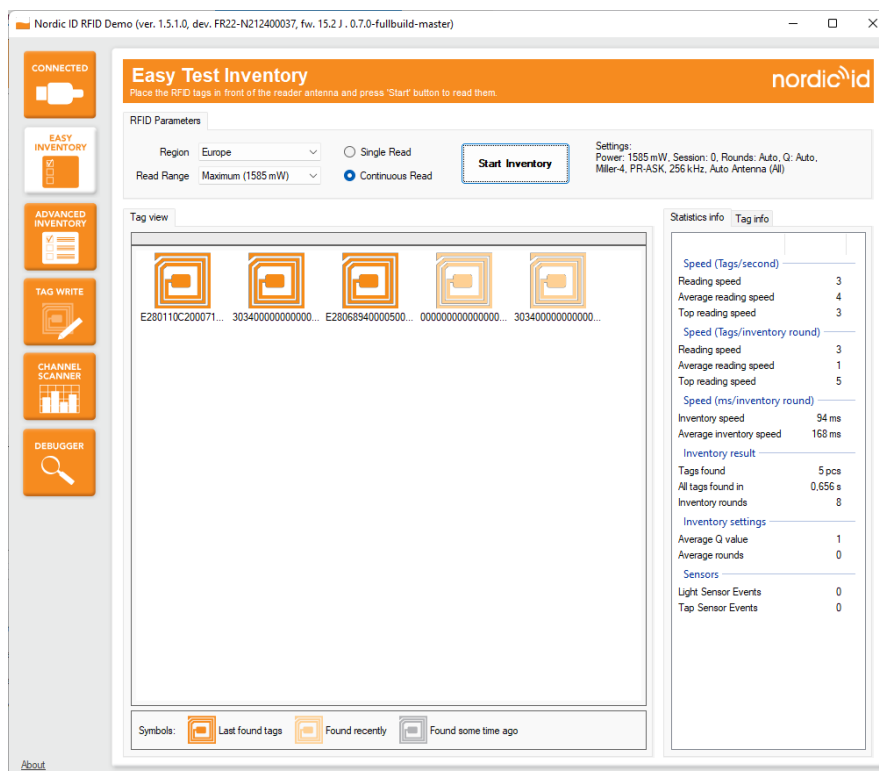
Brady and Nordic ID provide the following Windows tools to test and configure the reader. The tools are available via Nordic ID Support pages:

<https://www.nordicid.com/support/devices-downloads/nordic-id-FR22/>

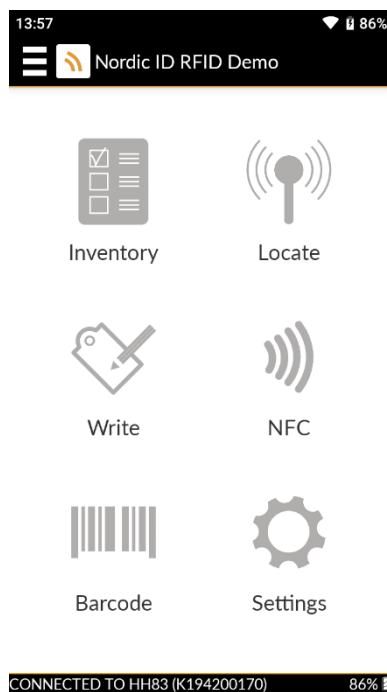
5.1.1. RFID DEMO

The RFID Demo application is used to perform RFID reading and writing tests. The application provides statistics on the reading performance and logging capabilities for more thorough evaluation. It is available for Microsoft Windows and Android OS.

This application also allows adjusting the RFID parameters on the fly for better understanding how they impact on the reading performance. Note that altered settings cannot be stored permanently into the device. The settings are reverted to defaults upon power cycle. For permanent settings, please use the Nordic ID Configurator application



Screenshot 1 Demo for Microsoft Windows

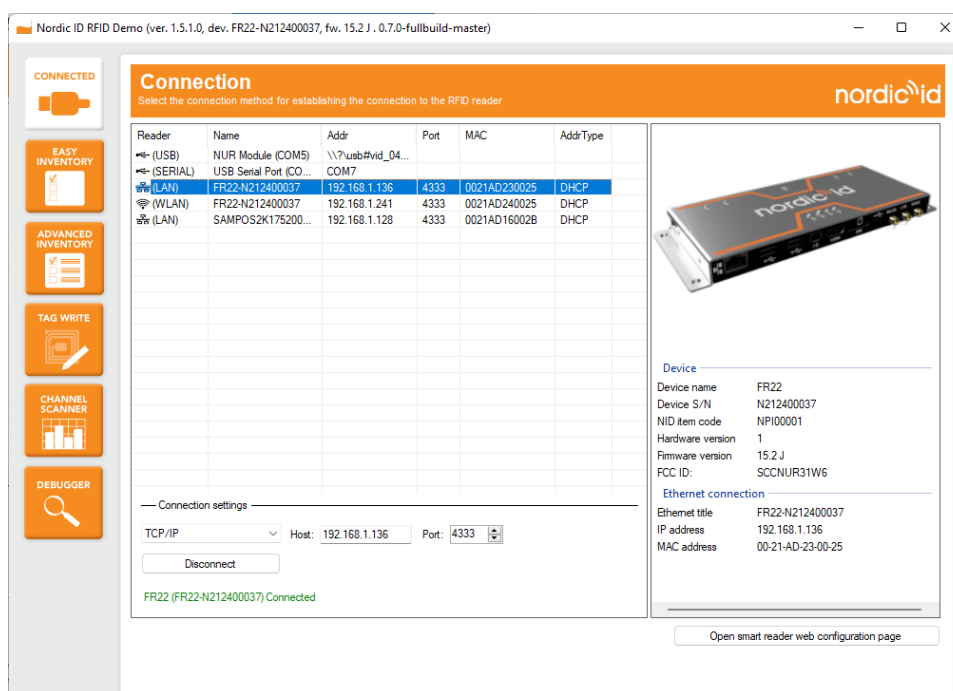


Screenshot 2 Demo for Android

5.1.2. RFID CONFIGURATOR

The Nordic ID RFID Configurator is meant for making non-volatile configuration of the reader's RFID settings. If settings are stored using the Nordic ID RFID Configurator, they will be retained even after the ON-OFF-ON power cycle.

Note that the RFID reading parameters can be assigned to the reader by the host application (installed on Brady FR22 Lite or running on a host device such as a computer) after successfully connected to the device also, overriding any previous configuration.



Screenshot 3 RFID Configurator for Microsoft Windows

NOTE! Network settings cannot be configured using this software. Please use the web user interface instead. See section 6.6

5.1.3. APPLICATION SIGNING TOOL

To provide more security to the SW platform, the application zip-files need to be signed with the Nordic ID provided signing tool. The public key generated to the zip-file will be then verified against the list of files when installing the zip-file to the reader. This makes sure that only valid content from the zip-file can be installed.

The tool in question is called the Nordic ID FR Application Signing Tool. It can be used to sign pre-built zip-files, as also to create new zip-files from scratch.

The Nordic ID FR Application Signing Tool can be downloaded from [this link](#).



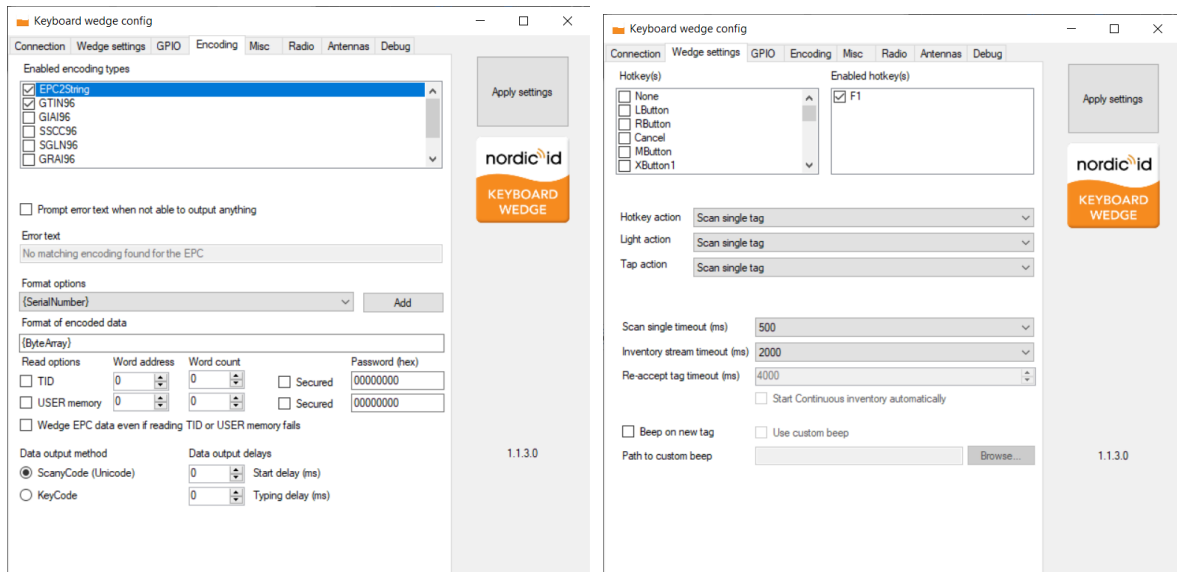
2023-10-18
BRADY FR22 LITE User Guide
Version 0.1

5.1.4. KEYBOARD WEDGE

Nordic ID Keyboard Wedge software allows to read tags and feed the tag data into an active input field, emulating a keyboard input.

This is extremely useful when you want to use 3rd party applications that support manual input or barcode scanners. Using BRADY keyboard wedge, you can use these same applications with the Brady RFID readers as the data source.

These 3rd party applications can be for example word processors, spreadsheets, web forms or even an existing ERP.



Screenshot 4 Nordic ID NUR Wedge for Microsoft Windows

6. WEB MANAGEMENT INTERFACE

The Brady FR22 Lite includes a web management interface which can be accessed with a web browser. The web user interface has a responsive design, which makes it fully usable from web browsers in computers, tablets, and smartphones.

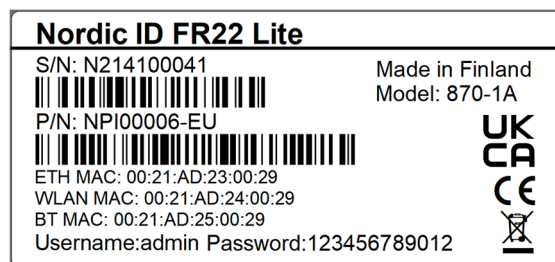
The Brady FR22 Lite web management interface is used for:

- Applications and plugins management.
- System health monitor
- System logs
- Hardware settings
- RFID configuration
- Network configuration
- Firewall configuration
- Firmware update
- Access management
- Application management
- Configure public web user interface (application, admin, web page, display...)
- Factory reset

6.1. LOG IN

Although the Brady FR22 Lite can be connected via USB, the built-in administrator web interface can only be accessed via Ethernet.

Therefore, it is important to make sure that the network interface is configured to be used as expected. By default, the network interface is set to DHCP mode, and the MAC address of the interface is indicated on the printed product label. This will help to find the Brady FR22 Lite in the DHCP table of the network router or modem.



Picture 6 Type label on the back of the Brady FR22 Lite

Nordic ID Configurator software or the Nordic ID RFID Demo software can also discover the Brady devices on the same network and indicate their IP address.

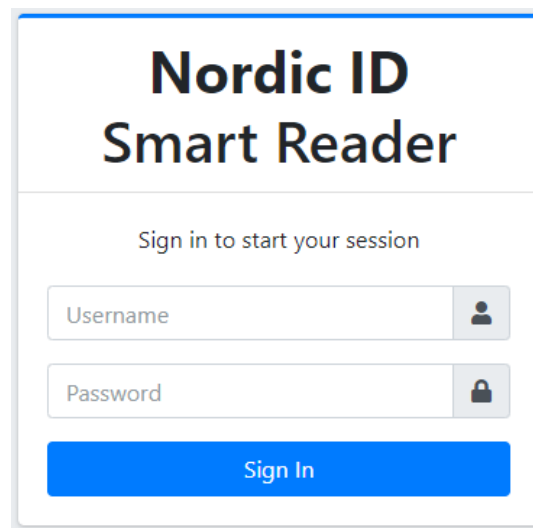
Once the IP address of the Brady FR22 Lite is known, typing it in the address bar of a web browser will open the log in screen of the Web UI.

If the network and host device support it, the connection can also be established typing the Brady FR22 Lite's hostname in the address bar of a web browser. Default hostname for the Brady FR22 Lite is:

FR22-Lite-serialnumber

For example, the device on Picture 6 can be accessed via the url <https://fr22-lite-n214100041/>

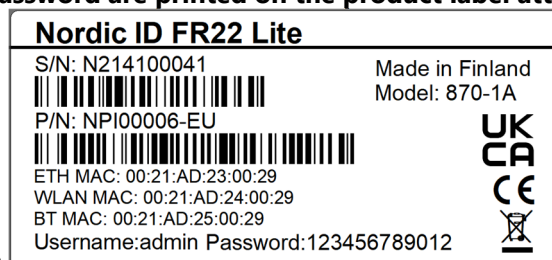
Note that a security alert will pop up on the browser the first time that you connect to the device, as the connection is forced to be secure. This alert will disappear as soon as you install a certificate on your device (see section 6.6).



Screenshot 5 Web UI log in form

The default username ("admin") and password are printed on the product label attached to the back

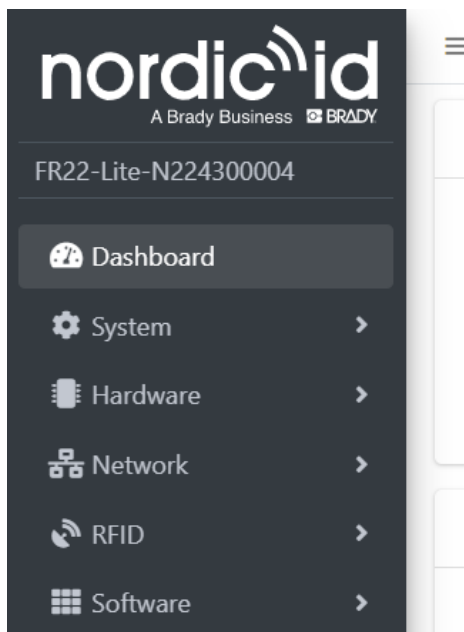
side of the device (see



Picture). You will find another identical product label inside the box, so that you can keep this important information visible in case the Brady FR22 Lite is mounted against a surface that may cover the label.

6.2. MAIN MENU

The Brady FR22 Lite Web UI displays a side navigation menu to access all the different available options to manage the device. The menu pane can also be hidden.



Screenshot 6 Side menu in web UI

There are also four icons always accessible on the top right corner of the screen, to:

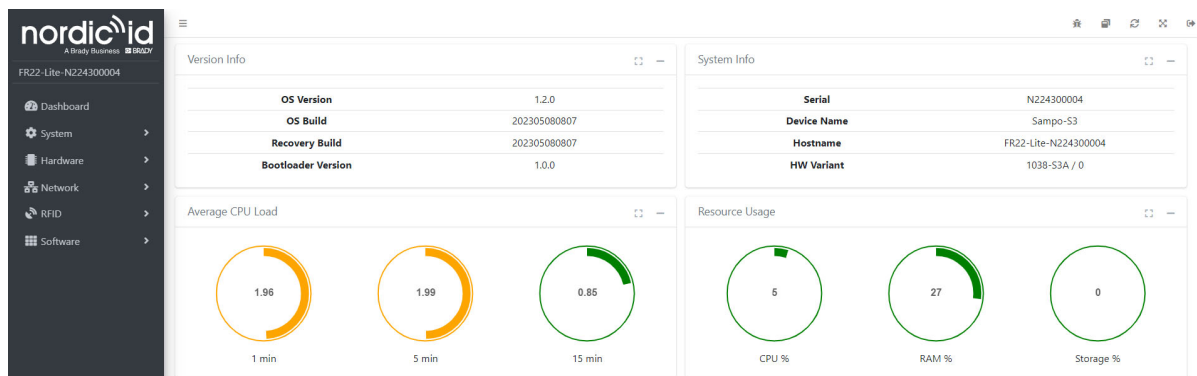
- Download debug logs
- Reboot the device
- Toggle full screen mode
- Logout



6.3. DASHBOARD

The default landing page is the dashboard, where you can see the system status and health monitor in real time. Visually, green metrics indicate that the device is behaving as expected. Red metrics would require immediate action on the physical device, environment, or software applications to solve the issues.

This page is shown every time you connect to the device Web UI, but you can configure any other page or application to be shown by default instead of the dashboard, as explained in section 6.4.2.



Screenshot 7 Main dashboard in web UI

6.4. SYSTEM MENU

The system menu has six sections, most of them meant for developers.

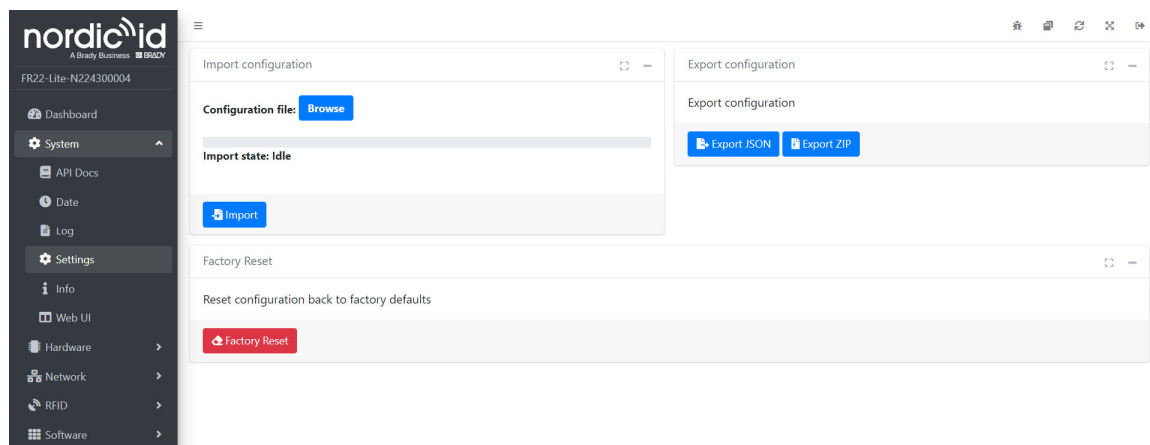
- API docs
 - Describes the functions of the system APIs to control the reader.
- Date.
 - Shows the current system time and allows adjusting the date and time settings.
 - Date and time can be adjusted manually or automatically using NTP servers.
 - Time zone must be set manually.
- Log.
 - Shows the logged events and allow to download them for debug purposes.
 - Events can be filtered by severity and application/service (started by user, Brady or system) that created the event.
- Settings.
 - The settings in the Brady FR22 Lite can be exported to a file, which can later be imported to the same or another Brady FR22 Lite unit to apply the same settings. This enables an easy mass configuration and roll out of Brady FR22 Lite devices.

- Factory Reset (see section 6.4.1).
- Info.
 - Contains more detailed information about the data shown in the dashboard page: hardware versions, software versions and performance metrics.
 - It also shows persistent hardware parameters such as device variant, serial number or MAC addresses.
- Web UI
 - See section 6.4.2.

6.4.1. FACTORY RESET

As the Brady FR22 Lite includes an operative system where you can install applications and plugins, sometimes you may want to reset the device back to its original settings. Factory reset helps solve unknown issues caused by accidentally changed settings or to start from scratch after having installed several apps, especially if these applications were under development.

For this purpose, there is an option to reset the device back to factory defaults under System > Settings.



Screenshot 8 System settings screen in the Web UI

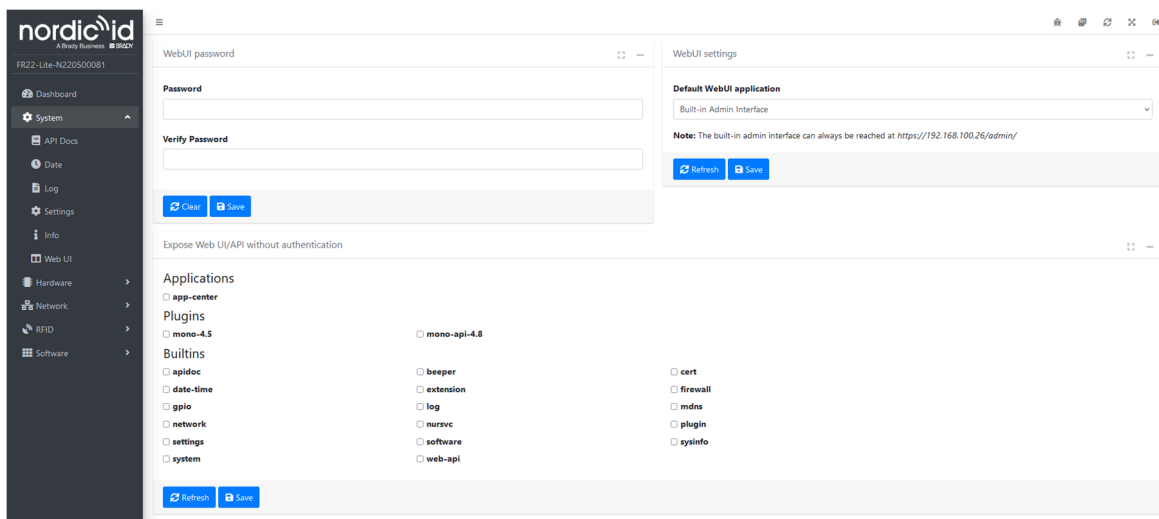
6.4.2. WEB USER INTERFACE

The web user interface is the tool to get most of the Brady FR22 Lite. Managing how it is accessed is a key to keep it secure without impacting the user experience.

This tab allows the change of password to access the administrator web UI. The default password is printed in the product label on the device and on its package, and the administrator username is always "admin".

This settings tab also allows the setting of the default landing page (when accessing <https://{device IP}>). By default, the landing page of the web UI is the dashboard of the administrator interface, but it can be any installed application, plugin page or a settings page other than the dashboard.

The built-in administrator interface can always be reached at <https://{device IP}/admin/> even after changing the default landing page.



Screenshot 9 Web UI settings screen

Note that the administrator Web UI will always prompt for username ("admin") and password.

If you want to bypass the authentication step when accessing the landing page, you can select which

NOTE! Be careful when exposing administrator pages without authentication to avoid unwanted changes on your device!

applications, plugins or pages will be exposed without authentication.

6.5. HARDWARE SETTINGS

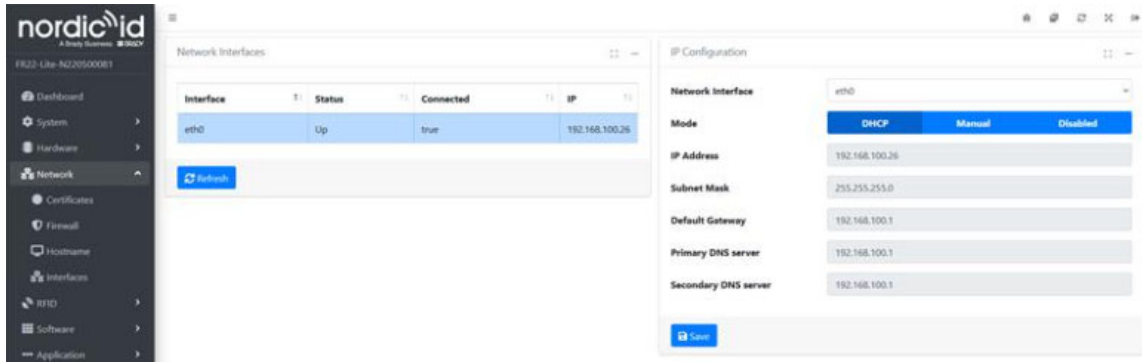
This section includes all the configuration parameters related to the Brady FR22 Lite device.

- Beeper.
 - Internal beeper can be enabled / disabled.
 - It's possible to test the beeper with a certain frequency and duration, and to test all frequencies.
- GPIO.
 - There are 4 GPIOs in the mini-IO port in Brady FR22 Lite.
 - The mini-IO port can be enabled and disabled, and also each GPIO can be configured as input or output (with default state high or low)
 - If a connected external module has GPIOs, they can also be configured in this screen.
 - This screen also shows the current state of each GPIO and allows to changes.
- USB.
 - There are 3 USB ports in the Brady FR22 Lite:
 - 2 USB-A host ports that can be enabled or disabled.
 - 1 USB-C port to connect the Brady FR22 Lite to a host. The available modes are:
 - "NUR serial", to communicate with the device using the Brady NUR API. Default baud rate 1Mbps
 - "Serial console", to access the console interface for e.g., debug purposes. Default baud rate 115200bps.
 - "Serial (Application)", to let applications communicate in TTY mode.

6.6. NETWORK SETTINGS

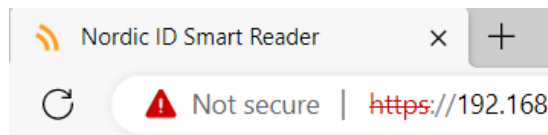
The network settings is the most important section of the Brady FR22 Lite setup, as the reader will be connected to a network most of the time. Even if it will be connected via USB, the network interface must be configured beforehand, as network is the only way to access the administrator web user interface.

The Brady FR22 Lite network parameters: DHCP mode, IP address, gateway, and DNS, can be enabled and disabled on this tab.



Screenshot 10 Network settings screen

To increase the security of the network connection with the Brady FR22 Lite and to avoid security warnings, you can install your own web server **certificates** in this section.



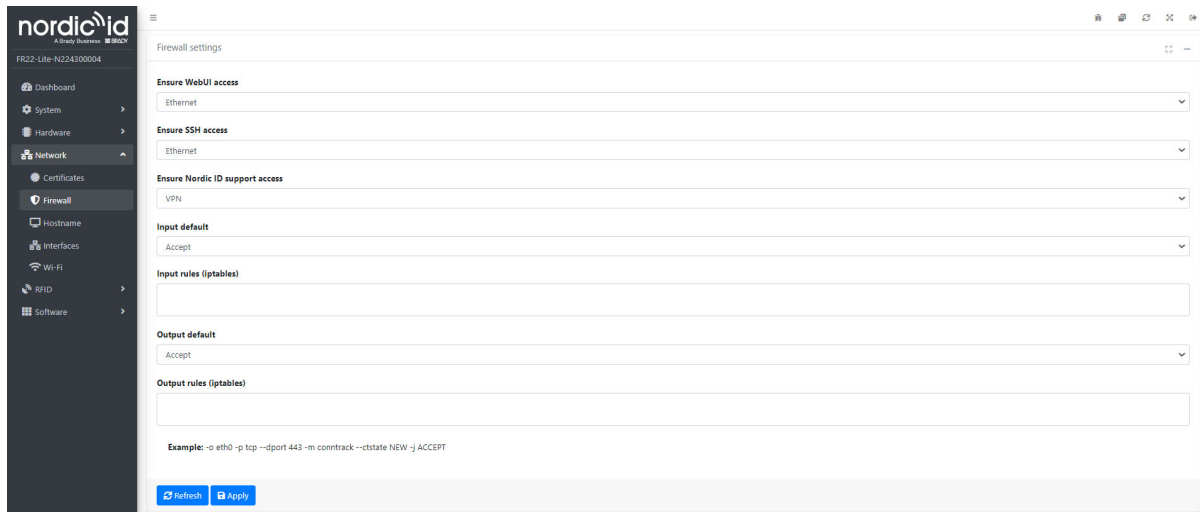
Screenshot 11 Security warning on the web navigation bar

The web server certificates and SSH public keys can also be exported from this screen.

The firewall settings tab gives a chance to regulate or block the traffic that passes to and from the system following set iptables rules.

For example, if the user wants to block connections from a specific IP address "198.168.156.24", they add into input rules the following command: `-s 198.168.156.24 -j DROP`

Note that iptables rules are transitory, they need to be saved for them to persist after reboot.



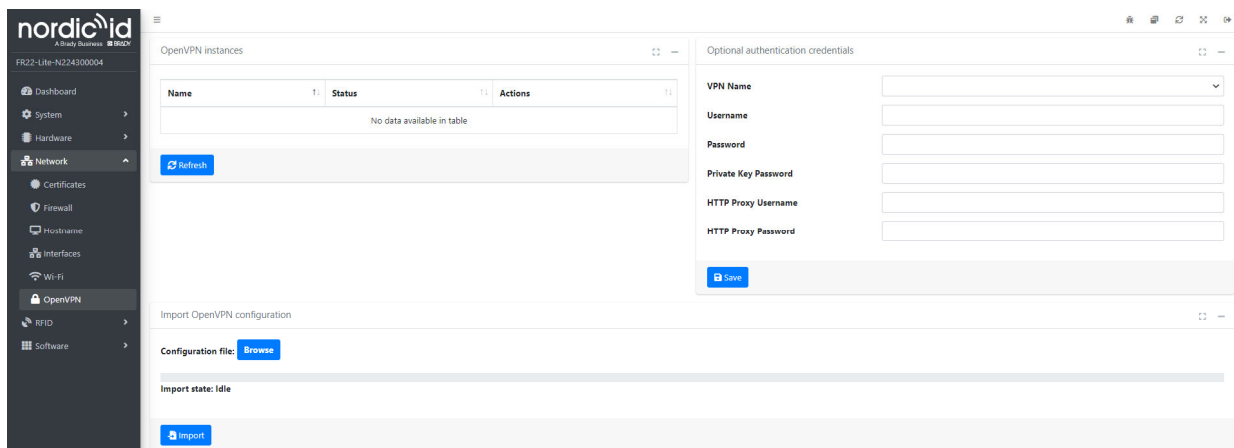
Screenshot 12 Firewall settings configuration page

In network settings the Hostname tab enables a change of **hostname** for the Nordic ID Sampo S3 device. It can be accessed by using this hostname instead of its IP address.

6.6.1. VPN

The OpenVPN plugin can be installed from the App Center (see section 6.8.3) and its settings page can be found on the Network section !

OpenVPN is a robust and highly flexible tunneling application to enable the configuration of a virtual private network in the Brady FR22 Lite. The VPN extends a private network across a public network and enables users to send and receive data across shared or public networks (e.g. Internet) as if their computing devices were directly connected to the private network (e.g., the local company LAN).

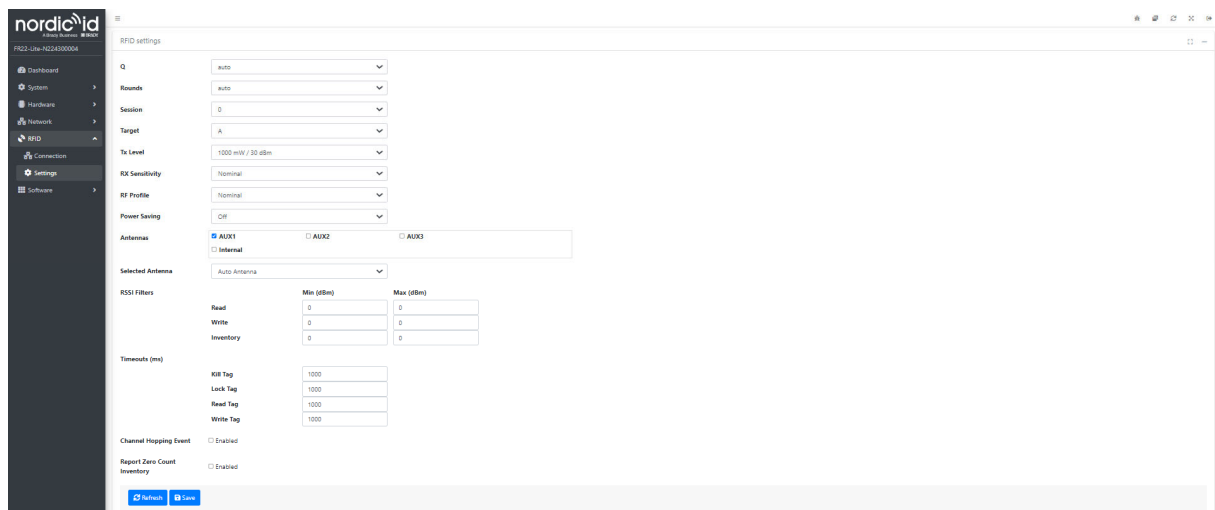


Screenshot 10 OpenVPN configuration page

6.7. RFID

The RFID section on the Web UI allows to change the connection settings to the internal RFID NUR module and all the RFID parameters of the reader:

- Q: auto, 1, 2 ... 15
- Rounds: auto, 1, 2 10
- Session: 0, 1, 2, 3
- Target: A, B, dual
- Tx level: 1dBm / 1mW - 30dBm / 1000mW (30 steps of 1dBm)
- RX Sensitivity: nominal, low, high
- RF Profile: nominal, robust, high speed (see section 3)
- Power saving mode: off, 100ms, 500ms, 1000ms (see section 4)
- Active antennas
- Selected antenna: auto or specific antenna
- RSSI filters: min / max for read / write / inventory
- Timeouts for different commands (read, write, kill, lock)
- Channel hopping event: enabled or disabled
- Report Zero Count Inventory: enabled or disabled



Screenshot 14 RFID settings screen

A demonstration application is available in the App Center (see section 6.8.3) to test the RFID functionality of the Brady FR22 Lite without using an external host, as the application is installed and executed on the Brady FR22 Lite.

6.8. SOFTWARE

The software is a important part of the Brady FR22 Lite as it is not only a RFID reader.

In this section you can update the operative system of the device, but also manage applications and plugins.

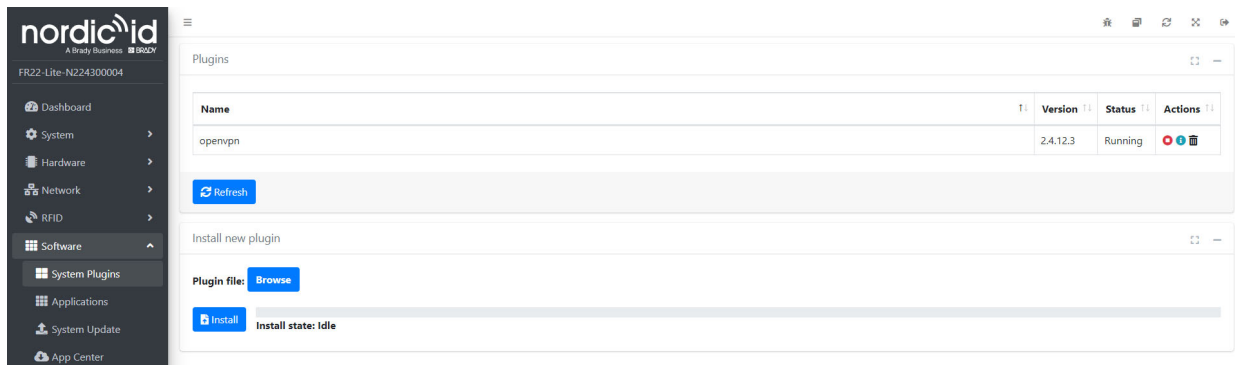
6.8.1. PLUGINS

A plugin in Brady FR22 Lite is a service that runs internally in the device to enable certain features.

For example, the RFID functionality is a system plugin (named "nur3") that is installed by default, and it cannot be removed. Other available plugins are a media player (API for playing video files) and C# runtime engine (Mono).

You can manually install other plugins (or other versions of installed plugins) and uninstall the installed plugins using this interface.

Note that as the RFID module is considered as a plugin, the firmware updates are now plugin updates.



Screenshot 15 System plugins screen

6.8.2. APPS

An application in Brady FR22 Lite can be any application that you develop for your customers, or applications provided by Brady and Nordic ID to help during your development and implementation process.

Not all the applications have a user interface. For example, an application can just read the data from RFID tags, consolidate it, add additional information such as location or timestamp, and send it to a server in the cloud.

Other applications do have an interface. For example, the web browser (see section 6.4.2), the SSH terminal or the remote desktop app (see section 6.9).

If you want to develop your own embedded app in Brady FR22 Lite, you can find the documentation from https://github.com/NordicID/FR22_samples.

From this tab you can also directly access your app files and edit them.



Screenshot 16 Files tab from application info

6.8.3. APP CENTER

The App Center provides a repository of apps and plugins selected by Brady and Nordic ID to help you to get most of the Brady FR22 Lite.

It enables the installation and automatic update of apps and plugins, which is a must have nowadays when deployments include a high number of devices, and you need to update or roll out your app to all the devices at once.

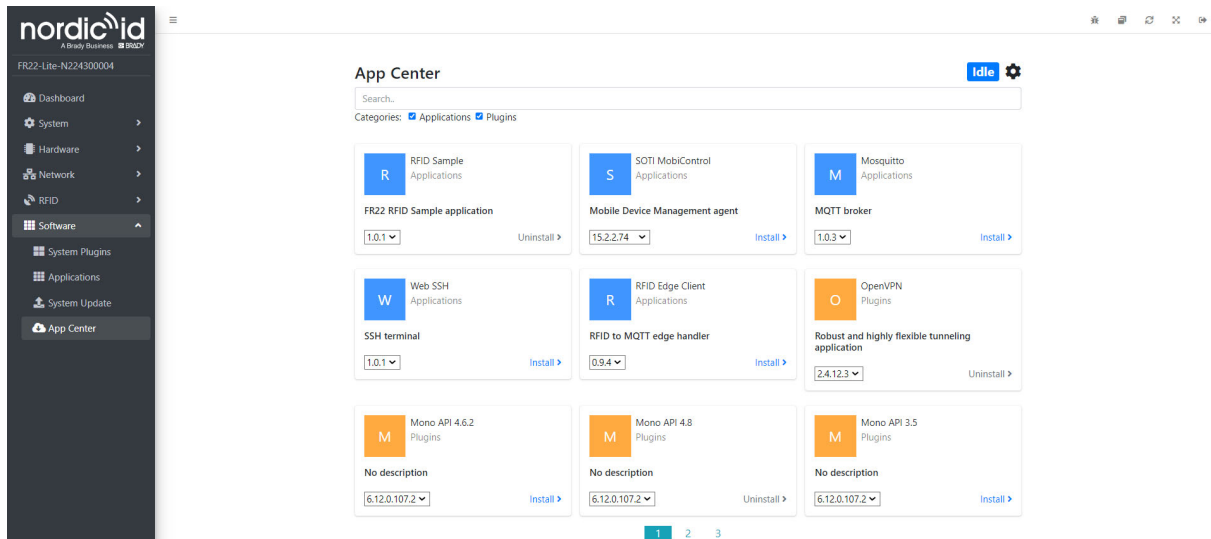
With App Center, the administrator has full control of the available repositories and can add new ones to extend the number of available apps.

Advanced users can also create their own app repository and upload their own apps, to make them accessible and distribute updates. Also, firmware updates can be included in this repository as plugins, in case that specific versions (and not always the latest one) are required.

Instructions to create an App Center repository for the Brady FR22 Lite can be found here https://github.com/NordicID/FR22_samples

Note that although the App Center includes new versions of installed apps or firmware, these won't be updated automatically, manual update is always required.

If automatic updates or installations are needed, 3rd party MDM/EMM (Mobile Device Management / Enterprise Mobility Management) platforms must be used (see section 6.9).



Screenshot 11 App Center

6.8.4. APPS/PLUGINS CREDENTIALS

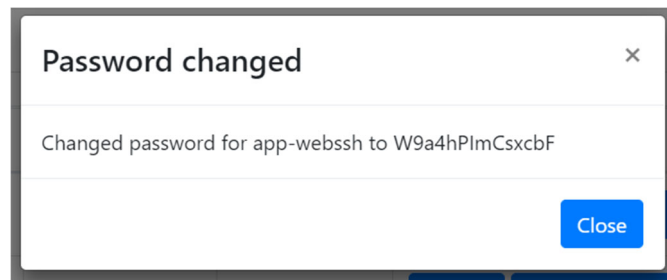
For applications or plugins that need credentials to work, you can create an application specific password from the System Plugins or Applications screen.

Go to the application or plugin that needs credentials, click Show info button and click the "New Password" button.

A message will appear indicating the username and the created password (see Screenshot 13).



Screenshot 12 Action buttons for installed apps and plugins



Screenshot 13 Message indicating the username and the new password created for a certain app

The username is the internal app or plugin name (e.g., *app-webssh*) and the password is generated randomly (e.g. *W9a4hPlmCsxcBF*).

6.9. REMOTE TOOLS

There are several developer tools (applications) available in the App Center to be downloaded to the Brady FR22 Lite that make debugging and providing remote assistance much easier.

- SSH, that opens a secure terminal connection with the local machine, to access the command prompt without using an external computer with a telnet software connected to the same network.

To create a username and password to use the console check the instructions at section 6.8.4.



Screenshot 14 Terminal console in web UI

- SOTI MobiControl™, the Enterprise Mobility Management (EMM) solution created by SOTI that gives you visibility and control over where the Brady FR22 Lite devices are, what they are doing, how they are performing, and what security or compliance risks they are facing. Remote installation and updates of applications and plugins is possible using this tool. Note that a SOTI license per FR22 Lite device is required to make this work.

7. REGIONAL SETTINGS

Brady UHF RFID readers support operating frequency range between 860 - 960MHz. Some of the readers cover full operating frequency band and some of them have two sub bands that are:

- 868 ETSI lower band (865.6 - 867.6 MHz) and
- 915 FCC band (902 - 928 MHz) and ETSI upper band (915 – 921 MHz).

Regional organizations as ETSI and FCC have set rules and requirements for operating frequencies, output power and other RF parameters for the UHF RFID readers to comply local regional requirements.

Brady has created a set of regional settings in order to fulfil local regulations. Brady is required to ensure that compliance of Brady products will remain after production. Solution for this is that products including UHF RFID functionality are set and locked in production based on customer order e.g. if a product is ordered to Europe, it will be locked to ETSI region. And, if a product is ordered to Australia region, it is locked to Australia region. When a product is locked to individual region, it will comply local regulations of the region.

8. COMPLIANCE STATEMENTS

8.1. CE

Hereby, Nordic ID Oyj, a Brady Company, declares that this device is in compliance with the essential requirements and other relevant provisions of:

- RED: 2014/53/EU
- EMC: 2014/30/EU
- LVD: 2014/35/EU
- RoHS: 2011/65/EU

8.2. FCC/IC

The Brady FR22 Lite device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The Brady FR22 Lite device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- 1) L'appareil ne doit pas produire de brouillage;
- 2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

8.3. RF EXPOSURE

This equipment complies with EU, FCC and IC's RF radiation exposure limits set forth for an uncontrolled environment under the following conditions:

The Brady FR22 Lite device should be installed and operated such that a minimum separation distance of 20mm is maintained between the antenna and user's/nearby person's body at all times.

Brady FR22 Lite doit être installé et utilisé de manière à ce qu'une distance de séparation minimale de 20 mm soit maintenue à tout moment entre l'antenne et le corps de l'utilisateur / de la personne proche.

8.4. HEAT EXPOSURE



Note that after a long time in use, the Brady FR22 Lite chassis might be hot.

Please wait for 30 minutes after switching the unit off before handling parts with your hands.

9. SERVICE AND SUPPORT

For technical enquiries regarding Brady devices or software development, please contact our Technical Support:

E-mail: tseurope@bradycorp.com
Telephone: +44 333 333 1111

As a manufacturer, Brady stands responsible for providing repair services for its devices during and after the warranty period. Together with partners Brady serves customers globally. When your Brady device needs repair, always use Brady Service or our authorized service partners. We want to make sure that your Brady product serves you the best possible way, and by using our preferred service partners the quality of the service is trustworthy and the spare parts are original. This way the existing product warranty remains, and you receive a 3-month service warranty for the repaired devices.

Brady works together with full support and primary support partners. Full support partners can handle both warranty and non-warranty repairs on behalf of Brady in their own regions. In addition, Brady has a network of smaller repair centers, primary support partners, who offer the first line of support to their customers locally.

For any enquiries about Brady repair service please contact:

E-mail: tseurope@bradycorp.com
Telephone: +44 333 333 1111

10. WARRANTY

Our products are sold with the understanding that the buyer will test them in actual use and determine for themselves the adaptability to their intended uses. Brady warrants to the buyer that its products are free from defects in material and workmanship but limits its obligation under this warranty to replacement of the product shown to Brady's satisfaction to have been defective at the time Brady sold it. This warranty does not extend to any persons obtaining the product from the buyer.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATIONS OR LIABILITY ON BRADY'S PART. UNDER NO CIRCUMSTANCES WILL BRADY BE LIABLE FOR ANY LOSS, DAMAGE, EXPENSE OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING IN CONNECTION WITH THE USE, OR INABILITY TO USE, BRADY'S PRODUCTS.

11. RELATED DOCUMENTS AND CONTENT

Documents mentioned below can be found from Brady Support pages:

- Brady FR22 Lite Informational Sheet
- Brady Safety and Regulations card
- Nordic ID GitHub account for developers (<https://github.com/NordicID>)

12. VERSION HISTORY

<u>Version</u>	<u>Date</u>	<u>Modifications</u>
0.1	05.2023	