RFID CONFIGURATOR
INSTRUCTIONS

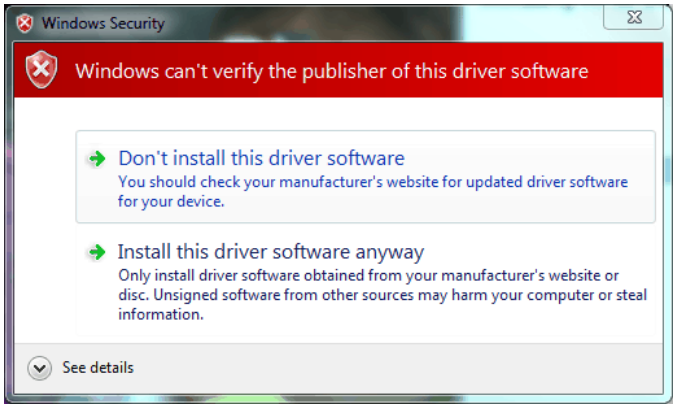
NORDICID

1. INSTALLING NORDIC ID RFID CONFIGURATOR SOFTWARE

For configuring the NUR-05W module or Nordic ID Sampo S1 RFID reader install the latest Nordic ID RFID Configurator software. The newest release of the application is available for download in Nordic ID extranet pages at http://extranet.nordicid.com/

In case there is a previous version of the Nordic ID RFID Configurator software installed on the PC, it must be uninstalled prior to installing the newer one. The uninstallation can be done in Windows Remove programs and features utility.

The Nordic ID RFID Configurator installer packet will also install the USB driver for the Windows system. The user will be prompted during the installation with a pop-up window confirming the driver installation. Select 'install this driver anyway' to proceed with the driver installation (example picture from Windows 7).



2. STARTING THE APPLICATION FOR THE FIRST TIME

When the Nordic ID RFID Configurator is launched for the first time it will ask the user whether the application checks for updates online during the application startup. If enabled the Nordic ID RFID Configurator application will check and download the newest updated application installer locally to the computer. After this the user has to install the new application version manually.

The user can change the auto update setting later under ‘About’ window.

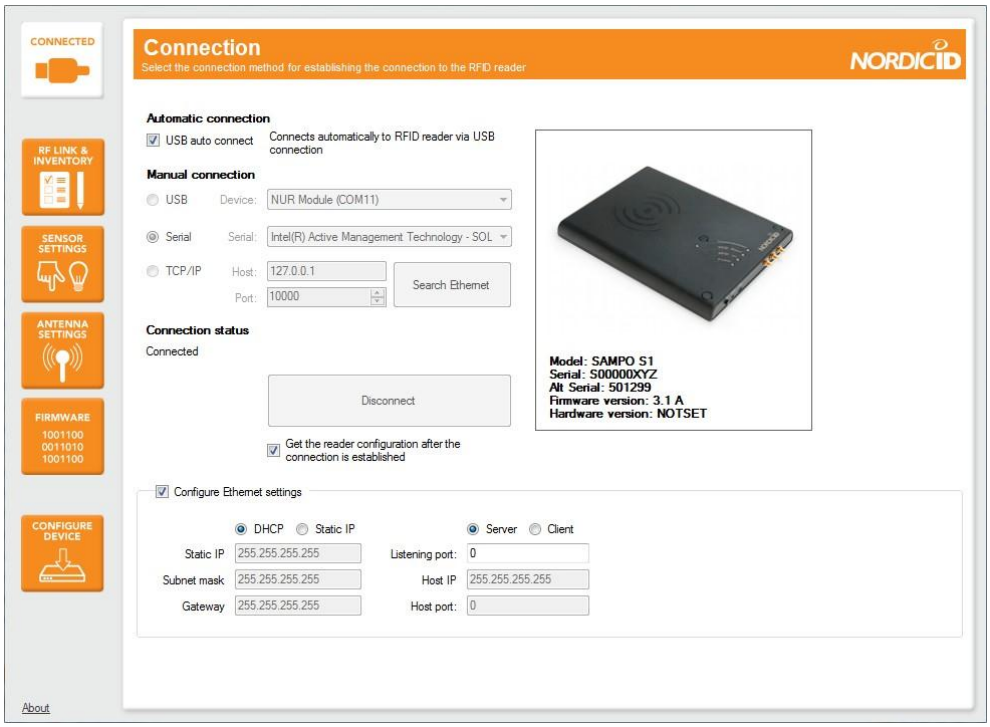
3. GENERAL TIPS FOR THE APPLICATION USE

All the configurable settings are divided into several segments. If you want to apply particular settings in the RFID reader, you need to check the box in the upper left corner of the corresponding segment. The actual RFID reader configuration is done under Configure the Device –segment by pressing the 'Configure Device' –button.

Note that some of the configurable settings that are shown to the user depend on the device which is connected. This manual describes the use of the application when Nordic ID Sampo is connected.

4. ESTABLISHING THE CONNECTION

After launching the Nordic ID RFID Configurator software the first thing to do is to establish the connection between the computer and the RFID reader. Press the 'Connection' button on the side bar and select the connection method. The connection can be established via USB, Serial or TCP/IP connection depending on the model of your the RFID reader.



4.1. AUTOMATIC CONNECTION

USB auto connect: If the RFID reader is connected via the USB connection, 'USB auto connection' can be used for automatic connection. When the connection is successfully established, the picture of the RFID reader together with the model name, serial number and version details are shown in the information box.

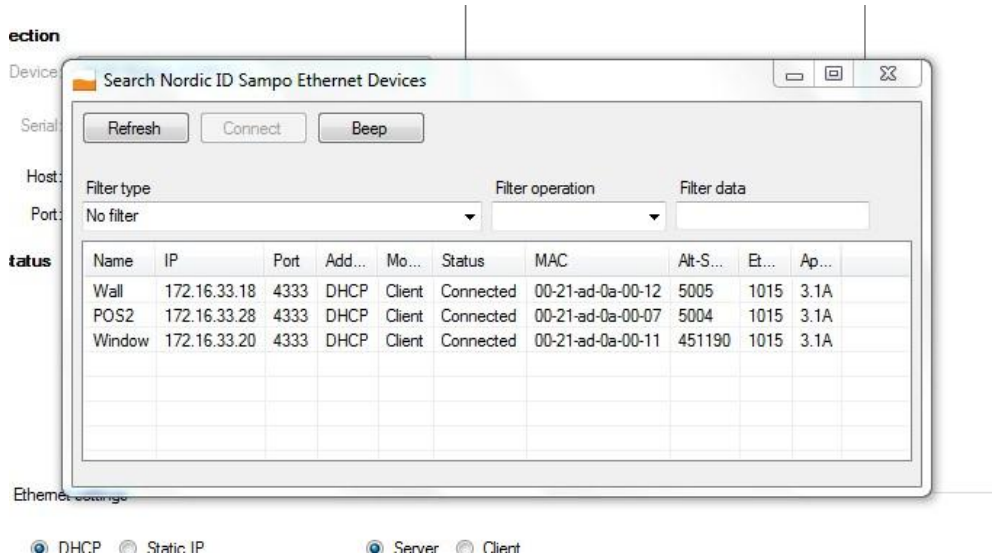
4.2. MANUAL CONNECTION

USB: The user can manually select the USB connection. If there are multiple RFID readers connected to the PC, the user can select which one of them to use. After

selecting the RFID reader from the drop down list, press the ‘Connect’ button to establish the connection.

Serial: Connect the RFID reader with the serial cable and select the device from the drop down list. After this press the ‘Connect’ button

TCP/IP: In order to connect the RFID reader over a network, select TCP/IP. Then for the ‘Host’ enter the IP address of the RFID reader and the correct port number. Now press the ‘Connect’ button to establish the connection. Note that the RFID has to be in client mode in order to be able to connect it. You can also search the reader from the network by clicking ´Search Eth`-button. This will open a dialog Window (picture below).



Select the RFID Reader from the list you want to connect and press the ‘Connect’ –button.

When the connection is successfully established, the picture of the RFID reader together with the model name, serial number and version details are shown in the information box.

Configure Ethernet settings: When connected to a Nordic ID Sampo reader via Ethernet, it's possible to configure network settings:

DHCP: The Nordic ID Sampo gets the IP address information automatically from the network.

Static IP: The user can manually define the IP address information for the Nordic Sampo.

Network modes

Server: When operating in Server mode, the host application needs to establish the connection to Nordic ID Sampo. Therefore the user has to define a listening port which Nordic ID Sampo opens for incoming connections.

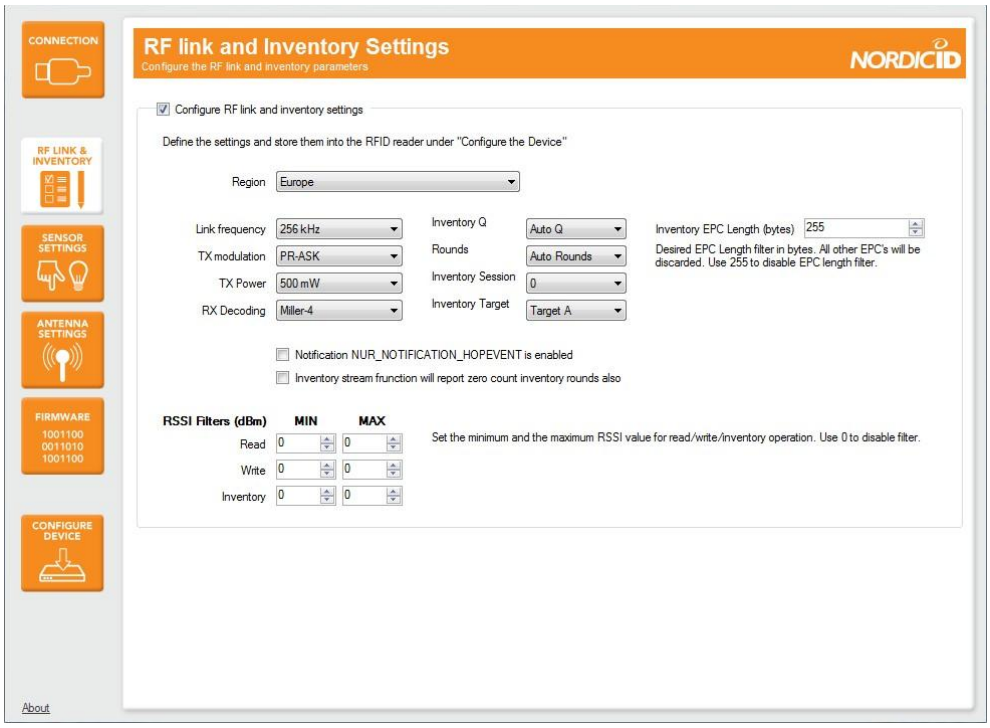
Client: When operating in Client mode, the Nordic ID Sampo establishes the connection to the host application. Therefore the user has to define an IP address and port of the host application for Nordic ID Sampo.

4.3. CONNECTION STATUS

Connection status shows whether the RFID Configurator application is connected or disconnected to the reader. When using manual connection and the connection is established the user can disconnect the reader with the disconnect button.

5. RF LINK AND INVENTORY SETTINGS

Under this segment the user can set the reading related settings for the RFID reader. The optimum settings depend on the use case and these can be found with the Nordic ID RFID Demo software.



Region: Globally the radio regulations for UHF RFID differ depending on region or country the reader is operated in. These regulations cover the used frequency band, output power, etc. The RFID reader has multiple preset regulatory environments that the user can select from.

Link frequency: The link frequency in tag to reader communication. Higher value enables higher data transmission speeds but is more prone to bit errors. The selectable parameters are 160 kHz, 256 kHz and 320 kHz. Tags that are compliant with ISO18000-6C (EPC C1G2) must support all these parameters.

TX modulation: It is possible to use ASK (amplitude shift keying) or PR-ASK (phase reversed amplitude shift keying) modulation. Tags that are compliant with ISO18000-6C (EPC C1G2) must support both of these modulations. The PR-ASK has lower transmission data rate and because of that it has narrower output spectrum. That's why it is recommended to be used when operating in DRM mode. By default the modulation is set to PR-ASK.

TX level: This setting adjusts the output power of the RFID reader module. Note that this is not the same as radiated power as this also depends on the gain of the attached antenna. The gain of the Nordic ID Sampo's integrated antenna is 8 dBic (5 dBi). Increasing the output power increases the reading distance.

RX decoding: This setting adjusts how the binary data is encoded in tag to reader communication. Four different line encoding schemes are supported. FM0 provides the highest data rate but is more prone to bit errors. On the other hand Miller-8 is the most robust encoding method and therefore suits well for environments with high level of radio interference but the downside is the lower data rate it offers. This slows down the inventory speed.

Inventory Q: Defines the number of time slots in which the tag randomly places the answer. Use higher Q-values when there are multiple tags in the reader's range simultaneously. This reduces the inventory speed but makes reading large quantities of tags faster as there are less data collisions.

The number of slots can be calculated with the following formula: 2^Q. It is recommended that the number of available time slots should be double the number of tags in the reading range. By selecting 'AUTO', the RFID reader automatically adjusts the Q-value which is optimized for the current tag population in the reading range.

Rounds: The rounds setting defines how many query rounds is done inside one inventory round. If data collisions occur during the inventory round, additional rounds are needed in order to read all the tags successfully. After each inventory round the RFID

reader will send data to the host application. The 'AUTO' setting makes the RFID reader to automatically decide after every query round whether another round is necessary based on the number of data collisions.

Session and Target: There are four session options which can be used for reading tags. Every session has two target states A and B. By default Gen2 tags are in state A if the tag has not been read recently. When tag is read it flips to state B and doesn't reply to readers query. The table below describes the persistence of the tag's state machine when using different session values.

Flag	Persistence: tag power ON	Persistence: tag power OFF
S0	indefinite	none
S1	500ms < t < 5s	500ms < t < 5s
S2	indefinite	t > 2s
S3	indefinite	t > 2s

For example when using session 0 the tag will come back to state A immediately after the tag gets unpowered. Usually the tag loses the power when the reader stops the inventory round or changes the channel. With session 1 the tag will keep its state over 500ms but less than 5s. With session values 2 and 3 the tag will keep its state over 2s when tag power is lost. The time can vary depending on what tag IC is used.

By changing the target setting from A target to B target the reader is able to also read tags which have flipped their state into B state. This would happen if tags would have been read recently using session 1, 2 or 3. The RFID reader also supports dual target mode. In that mode the reader will change the target mode automatically between the inventory rounds.

Inventory EPC length: Defines the length of the EPC code in bytes which must be written in the tag, otherwise it will be discarded from the inventory results. Setting the value to 255 will disable the filter.

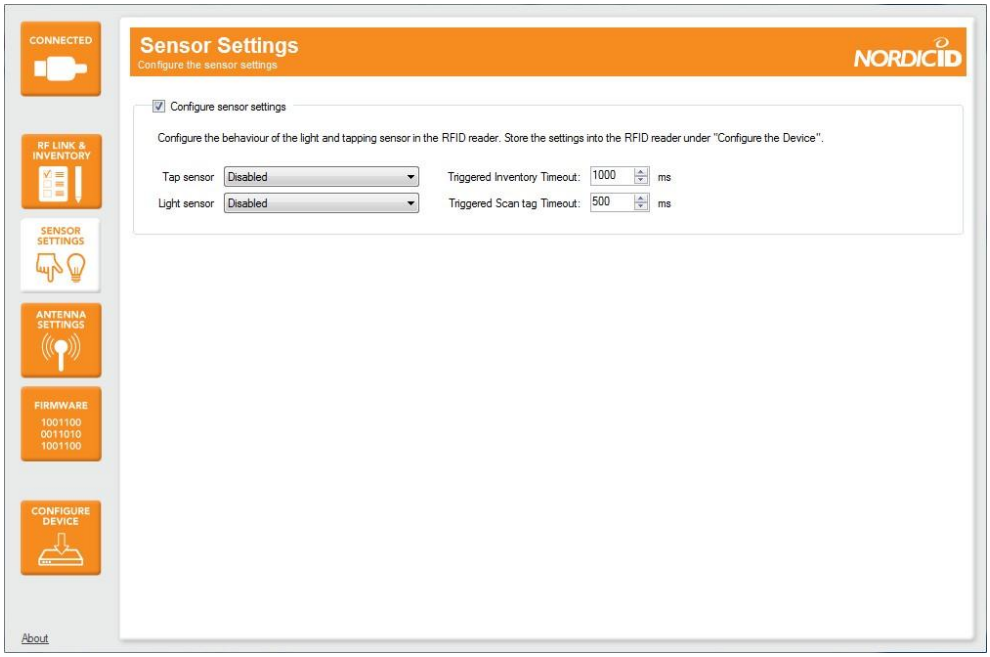
Notification NUR_NOTIFICATION_HOPEVENT is enabled: Enabling this check box will make the RFID reader to send an event to host application every time the channel has been switched.

Inventory stream function will report zero count inventory rounds also: Enabling this check box will make the RFID reader to report the host application even if no tags were found during the inventory round.

RSSI filters: Set the minimum and maximum signal strength thresholds for read, write inventory operations. Can be used i.e. for limiting the maximum reading range.

6. SENSOR SETTINGS (NORDIC ID SAMPO DEVICES)

Under this segment the user can define how the light and tapping sensors work in Nordic ID Sampo device.



The following settings are available for both sensors

Disabled: The onboard sensor is disabled.

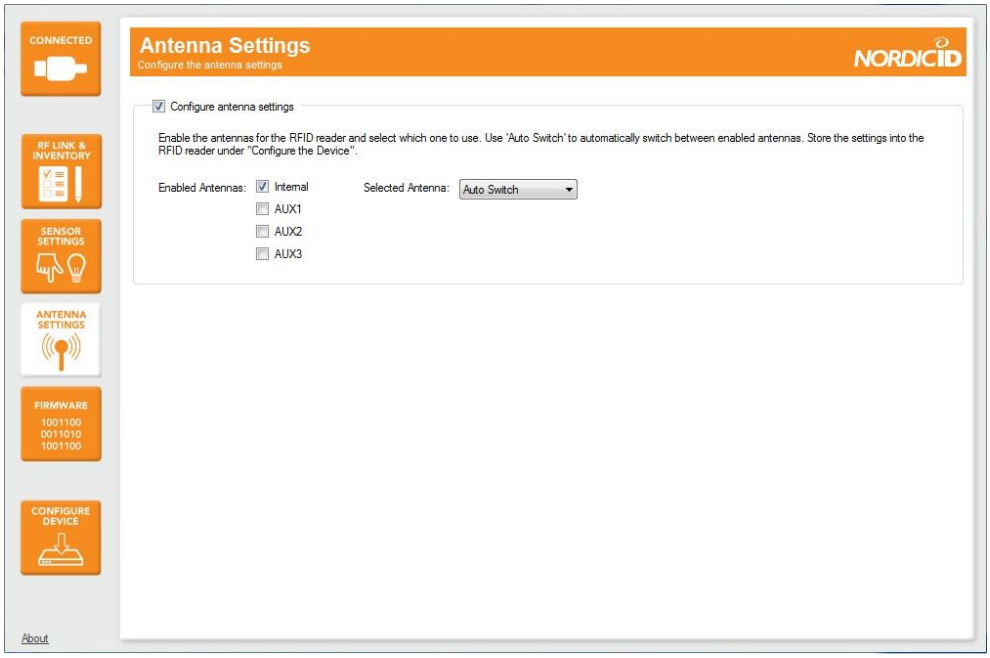
Enabled – Send notification: When the sensor is activated, the Nordic ID Sampo sends an event to the host application. This information can be used for custom purposes.

Enabled - Scan tag: When the sensor is activated, the Nordic ID Sampo reads just one tag in the reading range. If there are multiple tags in the surroundings, the reader will pick up just the first one to answer. For how long the reader tries to scan the tag can be defined with the ‘Scan Tag’ timeout setting.

Enabled - Inventory: When the sensor is activated, the Nordic ID Sampo reads multiple tags in the reading range. For how long the reader tries to scan the new tags in the surroundings can be defined with the ‘Inventory timeout’ setting.

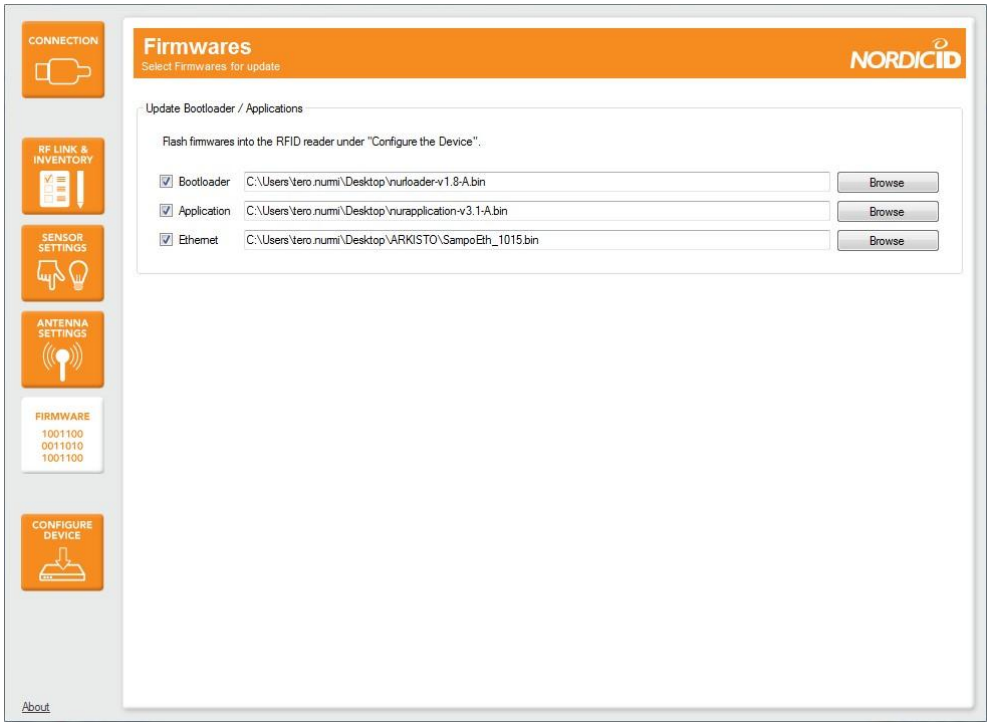
7. ANTENNA SETTINGS (NORDIC ID SAMPO DEVICES)

Under this segment it's possible to select which of the external antenna ports in the Nordic ID Sampo are enabled. Note that all the reader variants do not have external antenna ports. Additionally it's possible to set an enabled antenna as a default one or automatically switch between them.



8. FIRMWARES

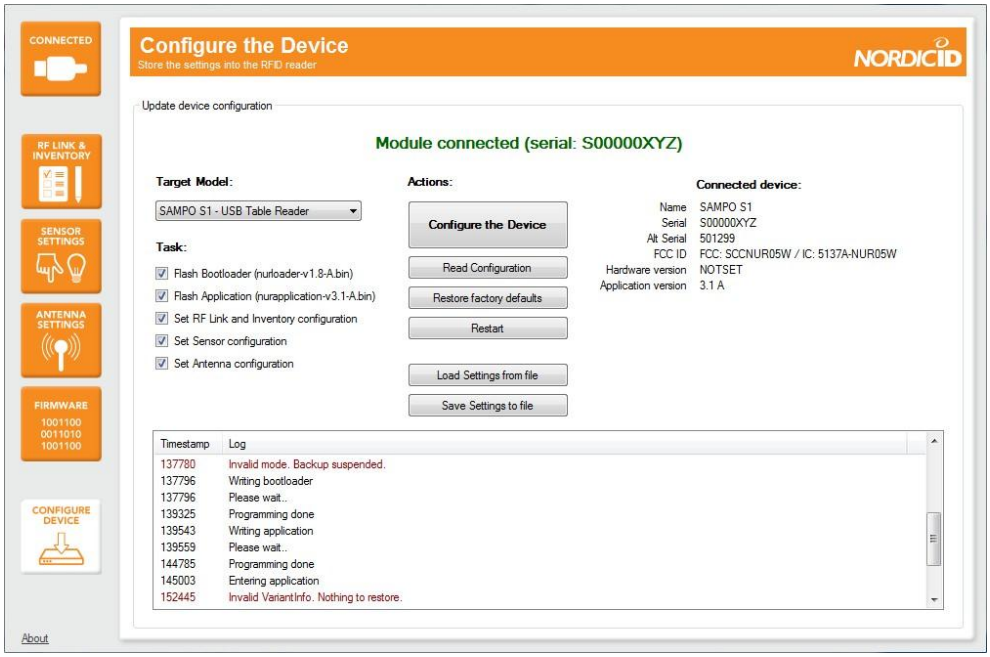
Under this segment the user can define the paths for the firmware files which are to be updated into the reader.



9. CONFIGURE THE DEVICE

Under this segment the user can apply the settings into the RFID reader.

NOTE: If you are going to update a new bootloader, application and Ethernet (Ethernet Sampo variant) firmware into the unit, it is recommended that the bootloader firmware is applied first!



Target Model: This shows the model of the RFID reader which is connected to the configuration software.

Task: A list of settings/updates which can be applied into the RFID reader. A particular set of settings will be applied into the reader if the corresponding check box is checked.

Actions:

- **'Configure the device':** This button will execute and apply the selected settings into the RFID reader.
- **'Read Configuration':** Read the current configuration from the RFID reader.
- **'Restore factory defaults':** This will restore all the altered settings into default values.
- **'Restart':** Restart the RFID reader

- **‘Load Settings from file’:** Load settings from a previously saved file into the RFID Configurator. Note that you still need to press the ‘Configure Device’ -button to apply them into the reader.
- **‘Save Settings to file’:** Save settings into a file for later use.

Connected device: Shows the serial number etc. information retrieved from the connected device.

SUPPORT

http://extranet.nordicid.com/

HEADQUARTERS

support@nordicid.com

Tel: +358 2 7277 790

UK & NORTHERN IRELAND

technicalsupport@nordicid.co.uk

Tel: 0870 062 7601

GERMAN SPEAKING COUNTRIES

support@nordicid.de

Tel: 05221 34222 0