Nordic ID RF650*Direct*

User Manual

Bluetooth®

1 Copyright

Nordic ID reserves the right to change the technical specifications or functions of its products or to discontinue manufacturing of any of its products without any written announcement and urges customers to ensure that the information at their disposal is valid.

2 Disclaimer

Nordic ID products have not been designed, intended nor inspected to be used in any life support related applications nor as a part of any other critical system and are not granted functional warranty if used in any such applications.

RF650*Direct* contains a Class II laser device, which may cause injuries unless safety regulations and instructions are observed. Nordic ID will not be held responsible for any injuries or damage resulting from use in contradiction with the safety related instructions stated elsewhere within this manual or which are in contradiction to the general safety Manuallines relating to Class II laser devices.

Nordic ID urges its customers to arrange proper and adequate user training, which includes safety issues for any personnel using, programming or otherwise handling RF650*Direct* handheld terminals.

The sale, transfer and use of Nordic ID RF650*Direct* is subject to the Nordic ID General Conditions of Sale and the Nordic ID End User License Agreement, in force at the time of purchase.

3 Trademarks

Nordic ID and the Nordic ID logo are all registered trademarks of Nordic ID Oy.

All terms mentioned in this User's Manual that are known to be trademarks or service marks have been appropriately marked in the list below with either the ©, ® or the ™ symbol. Nordic ID cannot attest to the accuracy of this information. Use of a term in this User's Manual should not be regarded as affecting the validity of any trademark or copyright.

Company / Owner of the Trademark	**Trademark**
Bluetooth SIG (Special Interest Group)	Bluetooth
Nordic ID	Oy Nordic ID Nordic ID RF650 Nordic ID RF650*Direct* Nordic ID Port Router

Table: Identified trademarks used in this User's Manual
Other trademarks are the property of their corresponding owners.

4 Latest information

For latest information on the RF650Direct and on possible changes to this manual please consult our web site at http://www.nordicid.com.

Nordic ID RF650*Direct*

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5 EU Declaration of Conformity

Nordic ID hereby declares, that the Nordic ID RF650*Direct* handheld terminal has been tested according to the standards EN 300 328-2 and EN 301 489-17. The equipment conforms with the essential requirements of the Directive 1999/5/EC.

Salo 23.05.2005

6 FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

6.1 FCC NOTICE

- Use only the power cord and connector cables supplied by Nordic ID to connect the equipment and power supply.
- Use only shielded cables to connect I/O devices to this equipment.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The RF650Direct complies with FCC requirements. The FCC ID information is printed on the back side of the Handheld Terminal under the laser caution label.

7 IC Related Information

This equipment complies with RSS-210 of Industry Canada.

Operation is subject to the following two conditions:

- The RF650Direct may not cause harmful interference, and
- The RF650Direct must accept any interference received, including interference that may cause undesired operation.

8 Warranty and Safety Warnings

Please read these warranty and safety related warnings carefully before using the product.

Nordic ID RF650*Direct* is a radio device and should not be used in any environments where radio transmitting may cause any harm. Typical but not limited to are the following types of environments: environments with explosive materials, gases, demolition sites, hospitals, emergency care rooms, airplanes and areas with highly sensitive measurement instrumentation.

Users with pacemakers are to be informed about the possible safety hazards posed by radio emitting devices. Placing any radio emitting device near to a pacemakers is not recommended. Consult the pacemaker documentation for further safety regulations and requirements set by the manufacturer of the pacemaker.

NOTICE: Persons using pacemakers should be aware that RF emissions from the RF650*Direct* may cause unwanted interference if positioned too close to the pacemaker.

NOTICE: The RF650*Direct* has not been designed, intended nor inspected to be used in any life support related device or system related function nor as a part of any other critical system and is granted no functional warranty if used in any such applications.

The use of any radio emitting device in explosive environments and especially near explosives may pose serious threats.
The RF650*Direct* models contain a laser barcode reader. Users are advised to follow the general safety procedures relating to the use of such laser devices.

The Nordic ID RF650*Direct* should not be used in critical systems where continuous operation is required and where the possible loss of data or unwanted changes to data contents are not acceptable, such as in life support related systems.

Warranty will be void, if the product is used in any way which is in contradiction with the instructions given in this User's Manual, or if the housing of the RF650*Direct* has been opened or has been tampered.

The devices mentioned in this manual are to be used only according to the instructions described in this manual. Faultless and safe operation of the devices can be guaranteed only if the transport, storage, operation and handling of the devices are followed. This also applies to the maintenance of the products.

The RF650*Direct* contains no user serviceable parts inside the actual case apart from the batteries, which may be replaced if required.

NOTICE: Use only AA-type alkaline or rechargeable batteries type: GB Batteriers, Model GB ISO AAHC (GPI International). Do not mix batteries (do not use simultaneously batteries of different capacity, brand, age or type). Observe correct polarity indicated on the label inside the battery compartment. Do not attempt to recharge alkaline or other non-rechargeable battery types using the handheld terminal and the desktop charger or any other charger. When charging batteries inside the terminal, use only Nordic ID charger type DTC05.

NOTICE: With use of desktop charger use only applicable power supplies: JORDEN ELECTRON Co., Ltd, Models: JOD-4101-031, JOD-41B-029, JOD-41U-14A or POWERBOX, Model: EBH01 119-B1.

WARNING: The batteries must be discarded according to the local environmental laws and regulations. The batteries may contain harmful, dangerous or lethal substances, and may cause injury or loss of life if handled recklessly. Never dispose the batteries in a fire due to a risk of explosion.

Any repair of the RF650*Direct* must be done by an authorised service partner of Nordic ID.

WARNING: The RF650Direct handheld terminal, desktop charger and power supply contain no user serviceable parts. Opening the cases will void the warranty and may cause injury. The handheld terminal contains batteries, which may be changed by opening the battery cover.

The RF650*Direct* contains a Class II laser device which may cause eye injury if the beam is directed straight or via a shining surface to the eye. The laser beam should never be pointed at the eye or eyes of people or animals. Note that mirrors and reflecting surfaces may cause the beam to deflect in harmful ways. Never look directly into the laser module when the beam is active.

Nordic ID RF650*Direct*

In Accordance with
EN 60825-1 / A2:2001
(IEC 60825-1 Ed.1.2,2001-08)
650 nm laser
max. 1 mW output

ENGLISH
LASER LIGHT
DO NOT STARE INTO BEAM
CLASS 2 LASER

DEUTSCH
LASERSTRAHLEN
NICHT DIREKTIN DEN LASERSTRAHL
SCHAUEN LASERPRODUKT DER KLASSE 2

DANSK
LASERLYF
SE IKKE IND I STRÅLEN
KLASSE 2 LASER

FRANÇAIS
LUMIERE LASER NE PAS
REGARDER LE RAYON FIXEMENT
PRODUIT LASER DE CLASSE 2

NEDERLANDS
LASERLICHT NIET IN
STRAAL STAREN
KLASSE-2 LASER

PORTUGUÊS
LUZ DE LASER NÃO
FIXAR O RAIO LUMINOSO
PRODUTO LASER DA CLASSE 2

SUOMI
VAARA LASERSATEILYÄ
ÄLÄ TUIJOTA SÄTEESEEN
LUOKKA 2 LASER

SVENSKA
VARNING LASERSTÅLNING
STIRRA EJ IN I STRÅLEN
KLASS 2 LASER

ITALIANO
LUCE LASER NON FISSARE
IL RAGGIOPRODOTTO
AL LASER DI CLASSE 2

ESPAÑOL
LUZ LASER NO MIRE
FIJAMENTE EL HAZ
PRODUCTO LASER DE LA CLASE 2

NORSK
LASERLYS IKKE STIRR
INN I LYSSTRÅLEN
LASER, KLASSE 2

9 User Safety

CAUTION: The RF650*Direct* barcode scanner contains an integrated class II laser product. Direct eye contact with the laser beam or with a reflected beam from a shiny surface may cause permanent damage to the eyes. To avoid risks, please make sure that the following instructions are followed by anyone operating the RF650Direct:

- Hold the RF650*Direct* at a slight angle about 10 – 30 cm (few inches) from the barcode label to be read. If the surface of the barcode label is very reflective, scanning from directly above (90° angle) may cause reading errors.

- Push the <**SCAN**> button on the keypad while directing the beam so that the beam covers all of the bars on the label. A beep or audio signal will be generated indicating that the scanner has successfully read the label. The scanner will stay on or it will automatically turn off depending on the scanning options, which have been selected prior to activating the scan function. During normal operation the beam will be switched off immediately after the barcode has been read succesfully.

9.1 Medical Equipment Compatibility

Medical devices, such as pacemakers, hearing aids, etc. are usually manufactured according to the IEC 601-1-2 standard. This requires that devices must operate properly in an EM (Electromagnetic) field which has a strength of 3V/m over a frequency band from 26 to 1000 MHz. The RF650*Direct* Bluetooth radio module is transmitting at a frequency of 2.4 GHz. All electric appliances may emit spurious RF signals at other than specified frequencies.

WARNING: Persons using pacemakers should be aware of the possible risk of interference from any electronic device if positioned too close to the pacemaker.

10 Care and Cleaning of the RF650*Direct*

The RF650*Direct* display window and the laser scanner window may be cleaned with a clean, non-abrasive, lint-free cloth. Under no circumstance use alcohol or detergents, as these may harm the materials of the casing or remove markings.

11 Nordic ID Company Introduction

Nordic ID is a leading Finnish high-tech company founded in 1986. Nordic ID develops, manufactures and markets handheld terminals for wireless communications and automatic identification. Nordic ID is located in Salo, in the Southwestern part of Finland, which is also called the "Mobile Phone Valley" of Finland.

Nordic ID is a strongly growing company. Today the company is operating in most European countries and operations are expanding further towards global business.

An increasing part of the company's turnover is invested in Research and Development. Thus, Nordic ID products are characterised by high quality, stylish design and excellent ergonomics.

12 The System

12.1 What is Bluetooth?

Bluetooth is an open specification for seamless wireless short-range communications of data and voice between both mobile and stationary devices. For instance, the standard specifies how mobile phones, computers and PDAs interconnect with each other and with computers or with office or home phones.

The first generation of the Bluetooth standard permits the exchange of data up to a rate of 1 Mbps per second, even in areas with much electromagnetic disturbance. It transmits and receives via a short-range radio link using a globally defined frequency band (2.4 GHz ISM band).

It has been specifically designed as a low cost and low power radio technology, which is particularly suited to short range Personal Area Network (PAN) applications. It is the design focus on low cost, low size and low power which distinguishes it from the IEEE 802.11 wireless LAN technology. For more information please see the Internet addresses www.bluetooth.com and www.bluetooth.org.

12.2 System Description

The Nordic ID RF650*Direct* Wireless Data Collection System consists of three principal components:

- Nordic ID RF650*Direct* Hand Terminal
- USB **Bluetooth** adapter (Dongle) or **Bluetooth** Access Server(s).
- The application software running on the Host Computer

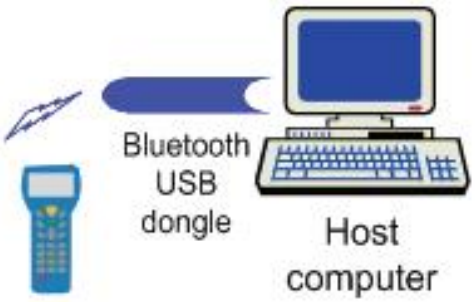


Fig. Using a RF650*Direct* with Bluetooth USB adapter

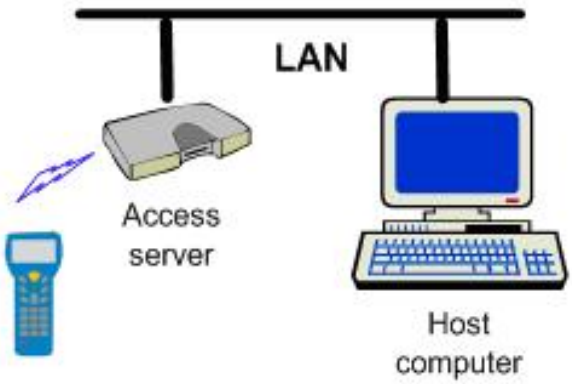


Fig. Using a RF650*Direct* with Access Server.

12.3 Principles of Operation

The RF650*Direct* is a Hand Terminal equipped with a Bluetooth radio which allows connection with PC application software through a USB Bluetooth adapter or Bluetooth Access Server. The USB Bluetooth adapter is packed in a Dongle which is connected to any free USB port of the Host Computer (USB 1.1 or 2.0 compatible port). Bluetooth Access Servers are connected to the Host Application using Local Area Network.

A Bluetooth connection will be established between the Hand Terminal and a USB Bluetooth adapter or an Access Server. When the RF650*Direct* user sends data over the Bluetooth link, the USB adapter or the Access Server will pass the data to the Host Application.

The user starts the transaction by using the Hand Terminal keyboard to make an entry, or by reading a barcode. The Hand Terminal then sends this data to the Host Computer and waits for a message from the Host Application. If the Hand Terminal does not receive a correct (check summed) message within the specified time-out period, it will resend the original data as many times (retries) as it has been instructed to do.

Note: When no entry is made on the Hand Terminal by the user, it will remain in a standby state and will not be able to receive data from the Host Computer.

12.4 Operation of the Handheld Terminal

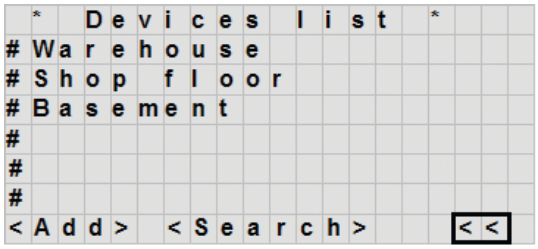
The RF650*Direct* Hand Terminal is designed to use application specific forms i.e. fields in the virtual display. This helps to make the user interface of the Hand Terminal flexible and easy-to-use. The commands used to generate, modify, read and write the forms are described in a document called ***"RF6xx Communication Protocol"***.

When no forms are used, the initial screen of the Hand Terminal shows as a prompt a user writeable header and an input field. This field can be filled with data from the keyboard or from a laser scanner. Any text sent by the Host Computer will clear the screen and show the text that was sent to the Hand Terminal. Any user input (from the keyboard or a laser scanner) will clear the text and the initial screen will be displayed again.

The user of the RF650*Direct* Hand Terminal activates the connection between the RF650*Direct* and the USB Bluetooth adapter or the Access Server. Available Bluetooth devices can be searched from within the coverage area of the Hand Terminal Bluetooth radio and the discovered Bluetooth devices answering the search can be saved onto a device list contained in the memory of the Hand Terminal. The user can then proceed to create the actual connection with the selected device. It is also possible to have the Hand Terminal wait for a connection from a Bluetooth USB Dongle.

Each Bluetooth device (USB Bluetooth adapter) has a unique Bluetooth Address (BT_ADDR) and a "Friendly Name". Usually the Host Computer name is used as the “Friendly Name”. When the Nordic ID RF650*Direct* Hand Terminal searches for Bluetooth devices, the user will see a list which will display the “Friendly Name" of all discovered Bluetooth devices. The user can select from the list, in which device the Hand Terminal is trying to connect.

After Reset, power-up or after changing the batteries, the Nordic ID RF650*Direct* will try to connect to the last device, in which it was connected before switching off the power. If this device is not found, the device list (“Friendly Name”) will appear on the screen and the user can select another device to connect.



Connection will be maintained until RF650*Direct* goes to sleep, which will happen if no keys are pressed within 90 seconds, or alternatively the RF650*Direct* will maintain the connection also during the sleep (only display will be switched to sleep mode). The user may select the type of operation by a special keyboard combination command (<SHIFT> + <1> will toggle between the two different operation modes). When the user wakes the device up by pressing any key, the Bluetooth connection will be established again if it was disconnected during entry into sleep mode.

12.5 Security

Bluetooth technology offers a high level of data transfer security. It is necessary that no external party without proper authentication is able to access the network with a Bluetooth capable device.

Security implementation on the Nordic ID RF650*Direct* system is based on three factors:

- **PIN code** (0000-9999). The PIN code defines the Nordic ID RF650*Direct* network. The PIN code must be the same in the Bluetooth Dongle installed into the Host Computer or on the Bluetooth Access Server(s) and in the Hand Terminal before they can communicate with each other.
- Bluetooth data link encryption
- Authorizing scheme at the application side

This may include a password and user name input screen defined by the Host Application and displayed as the first screen visible to the user trying to connect to the Host Application. Thus even with an authorized Bluetooth Hand Terminal the user will have to identify him/herself. Furthermore the CommID of the Hand Terminal may also be used to distinguish between an allowed and rejected Hand Terminal.

13 RF650*Direct* Handheld Terminal

13.1 RF650*Direct* Main Features

- Fast transactions with the Host Application over a Bluetooth connection (approximately 200 ms).
- Connects automatically to the last connected device after reset.
- Class 1 RF output power (100 metres).

The Nordic ID RF650Direct Hand Terminal is like a “Remote control” of the Host Application. No programming is required in the Hand Terminal and the displayed screens (text) are defined by the Host Application. The Host Application defines the user interface elements of the Hand Terminal screens.

User interface (UI) elements are:

- Text strings
- Input fields
- Buttons
- Pop Messages

Using these UI elements it is possible to build flexible user interfaces, which are used to control and input data or read data to and from the Host Application.

13.2 Communication Requirements

The RF650Direct Hand Terminal can communicate with a Host Application when all of the following requirements are met:

- When using the Bluetooth Dongle: The Bluetooth Dongle is connected to the Host Computer’s USB-port and the Dongle driver and software are installed and configured properly.
- When using an Access Server(s): The Access Server(s) is connected to the LAN and is installed and configured properly.
- A Bluetooth radio connection has been established between the Dongle or Access Server(s) and the Hand Terminal.
- Host application connection to the USB Dongle or the Access Server(s).

13.3 Label

The label is located inside the Hand Terminal battery compartment and may be read by removing the battery compartment cover and the batteries. The label also contains markings to indicate the correct orientation and polarity of the batteries or re-chargeable batteries.

Label includes the following information:

- Bluetooth address (on the sidewall)
- Type of the Hand Terminal
- Serial number of the Hand Terminal
- CommID (a communications identification number, which can be used by the Host Application to identify a particular Hand Terminal)

Please note that there might be several types of Hand Terminals with different configuration. For further details please contact Nordic ID or your local reseller.

The CommID (Communication ID) is a fixed number, which is used to identify transmissions. In RF600 system this number was the same as the serial number of the device. CommID range is 0 - 65535.

13.4 Laser Scanner

This status message is visible when the laser reader module is activated by pressing the

yellow <**SCAN**> button. 

Note: The laser scanner will not always be activated upon presing the <**SCAN**> button. The activation of the laser scanner is also controlled by the currently active input field (allow reader activation / do not allow reader activation).

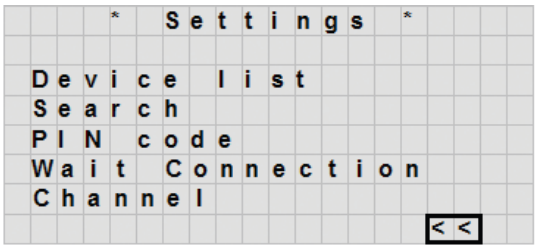
13.5 Laser Safety Label

The RF650 Hand Terminals contain a Class II laser device. The required caution label is located at the back side of the Hand Terminal.

14 Using the RF650*Direct*

14.1 First Time Activation

After inserting batteries (2 x AA 1,5 V alkaline or NiMH batteries – note that alkaline batteries may not be charged) to the Hand Terminal for the first time or if no connections have been previously defined, the following Settings screen will be displayed:



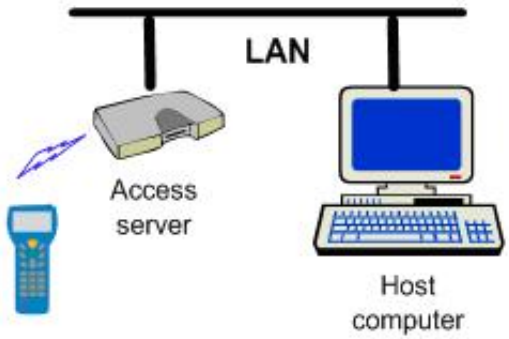
- **Device list** Access Servers defined as a part of the system.
- **Search** Activate the search for nearby Bluetooth devices,
- **PIN Code** 4-digit PIN code setting
- **Wait Connection** Waits for a Bluetooth connection from another device.
- **Channel** Bluetooth service channel.

The RF650*Direct* needs to be set up for the Bluetooth connection with the USB adapter or the Access Server.

Use <•'3f•'3f> keys to highlight a specific item from the list and press **<OK>** key to select it.

14.2 Connecting to the Access Server

This section describes how to create the Bluetooth connection with the Access Server. It is assumed that all configurations and settings are already made in the Access Server and the Host Application side (for further information see Access Server related documentation).



One dongle may support upto seven Nordic ID RF650Direct Hand Terminals.

Access Servers may support either 1-7, 1-14 or 1-21 RF650Direct Hand Terminal connections simultaneously (model dependent feature).

The RF650Direct Hand Terminal is always connected to only one Dongle or Access Server per time.

In order to connect to the Access Server, the following requirements must be fulfilled:

- **PIN Code**: Default PIN code in Hand Terminals is “1234”. The PIN code must be the same in the Hand Terminal and in the Access Server(s) before they can connect to each other. For security reasons, it is recommended to change the PIN code to something differing from the often used “0000” or “1234”.

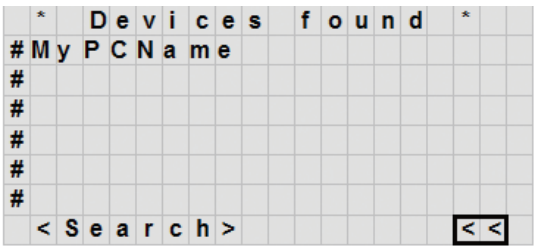
- **Channel:** The Hand Terminal user creates the connection to the Access Server. In order to allow several Hand Terminal connections simultaneously with an Access Server, each of the Hand Terminals must use a different channel. Channel numbers can be between 5 and 31.

- **Access server:** Must be properly configured.

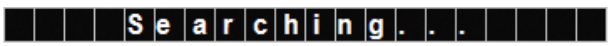
14.2.1 Searching and Adding the Access Server(s) to the Device List

Before a Hand Terminal can connect to the Access Server, the Bluetooth address of the Access Server must be known.

Inquiring Access Servers within the coverage area of the Hand Terminal:



Select <Search> and press the <OK> button in order to start the inquiry process. Inquiry will take approximately 10 - 20 seconds.



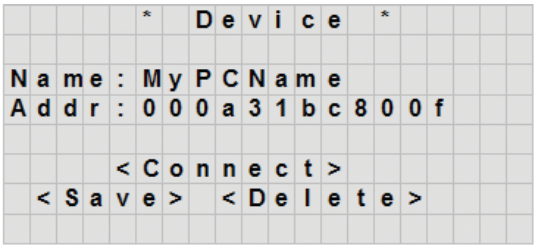
Bluetooth radio module inside the Hand Terminal will now search ALL available Bluetooth devices within the coverage area.

Please note that unwanted Bluetooth devices might also be found and listed.

When the desired Access Server is found, select it and save it to the device list. The search procedure may need to be activated several times before the desired Access Server is detected.

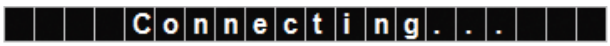
Save all desired Access Servers to be included in the system by selecting <**Save**> and pressing **<OK>**.

The user can also add Access Servers manually to the Device list by editing **Name**: and **Addr**: fields. In this case the Bluetooth address of the Access Server must be known.



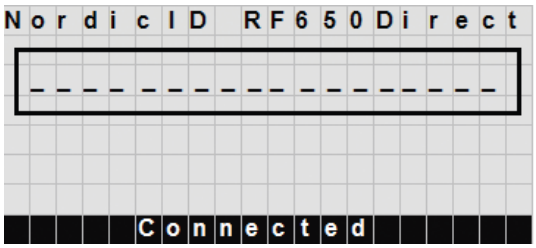
In order to create a connection with the selected Access Server, the user must select the Access Server from the "**Device list**". After selecting the <**Connect>** choice and pressing the <**OK**> button, the Hand Terminal will try to establish a connection with the Access Server. This typically takes approximately 5 seconds.

While connecting, the message below will be displayed:



Status message appears in bottom of the display while connecting.

If the connection cannot be established with the Access Server, try again by selecting <**Connect**> and pressing the <**OK**> button.



After successful connection, the Hand Terminal is ready for communicating with the Host Application. Initial screen appears and the user can start to use the Host Application by pressing <**OK**> or any <**F**> key for sending data to the Host Application for the first time. Usually the Host Application returns a user interface screen for using the actual business application.

The RF650*Direct* remembers the Access Server which was connected to the Hand Terminal previously (before terminating connection). If batteries are taken off and placed back again, the Hand Terminal resets first and then connects to the previously connected device automatically.

14.3 Using RF650*Direct* with the USB Bluetooth Adapter

This section describes how to create the Bluetooth connection with the USB adapter (Dongle). It is assumed that all configurations and settings are already made on the Dongle and Host Application side.

The RF650*Direct* Hand Terminal (HT) can communicate via a Bluetooth USB adapter (Dongle). In order to use more than one RF650*Direct* device via a single Dongle, the **Nordic ID Port Router** software must be used.

The **Nordic ID Port Router** software allows a maximum of seven simultaneous Bluetooth connections via a single Dongle. If not using Port Router, only one RF650*Direct* Hand Terminal at a time can be used with the Dongle.

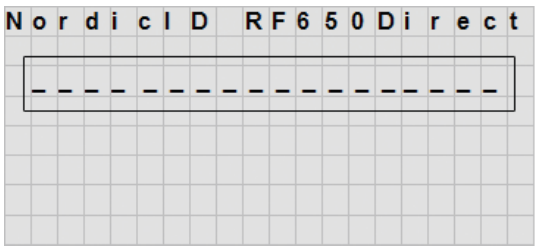
14.3.1 Preparing theRF650*Direct* for connection without a Port Router

- Set Channel to 0
- Set proper PIN code
- Search and add Dongle Name (PC name) and Bluetooth address to the device list.
- Choose Dongle from the device list for connection, select <**Connect**> and press **<OK>**.

14.3.2 Preparing the RF650*Direct* for connection with a Port Router

- Set Channel 0
- Set proper PIN code
- Select <**Wait connection**>, press **<OK>** and wait until Port Router establishes connection.

14.4 Initial Display



The Initial screen will appear when a Bluetooth link between the RF650Direct Hand Terminal and an Access Server or a Dongle has been established.

The user can start to communicate with the Host Application. Connection to the Host Application is started by pressing the <OK> button or any <F> key.

The Initial display screen will always appear in the display if no fields are defined in Host Application. This is usually the case when the Hand Terminal is activated after a reset and the Bluetooth connection has been established.

The Initial display includes a header, the text of which can be defined by the user, and an input field (max. length 18 characters). The user may input a text string or read a barcode by pressing the <SCAN> button and then send the data to the Host Application by pressing the <OK> button.

Actual display (form) size is 12 rows with 20 characters per row. The visible area is always 8 rows with 4 rows not visible. These “virtual rows” may be scrolled on to the screen by pressing the •'3f•'3f keys accordingly.

When sending first time data from the Initial screen to the Host Application , the Host Application returns in the Main Menu of in the Host Application Server or Workstation running business application.

14.4.1 Display Symbols

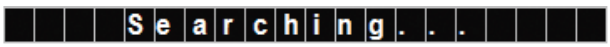
In some cases the following symbols are shown on the right side of the display:

SHIFTLOCK
This symbol indicates the status of the **<SHIFTLOCK>** key. The status can be changed by pressing the <**SHIFT**> key. When visible, the shift function of the keyboard is active, making it possible to enter letters instead of numbers.

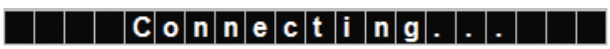
TRANSACTION
This sign shows up, when the Hand Terminal is communicating with the HOST. When the Host Application is processing data the user has to wait for the answer and the flash sign will appear on the lower right corner of the display. The user must wait for an answer from the Host Application. The default waiting time setting is 3 seconds.

14.4.2 Status Messages

Status messages are shown in the bottom of the display. The complete row of text is highlighted, which will show as white text on black background. Status messages appear and disappear automatically.



The Hand Terminal is searching for the Bluetooth devices. The Hand Terminal tries to find the devices for approximately 20 - 30 seconds.

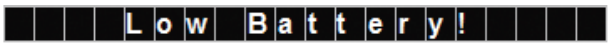


The RF650*Direct* will try to connect to the selected Bluetooth device (Access Server).

Bluetooth connection is established and the user can start to use the Host Application.

If no answer from the Host Application is received within the specified time, the above message will appear on the status line and three error beeps will also be generated. This situation arises usually when the Host Application is being maintained or the server is down or the LAN network connections are broken.

When the user moves outside of the radio coverage area, the above message will appear on the status line.



When the battery voltage level drops below the minimum required level, the above message will appear on the status line. The Hand Terminal should be placed in the Desk Top Charger when using rechargeable batteries or the batteries must be changed to new ones if using alkaline batteries.

Key	Function with SHIFT-key (keep SHIFT down and press the other key)	Function with SHIFTLOCK	Normal function
Laser	***	External reader will be activated if allowed by the current input field (definition)	Toggle: “Scanner” The Laser reader will be activated if allowed by the current input field. Toggle: “Light” The bright LED will be lit while holding key down.
F1	***	F6	F1
F2	***	F7	F2
F3	***	F8	F3
F4	***	F9	F4
F5	***	F10	F5
<OK>	Key lock ON/OFF	Normal function	The cursor will be moved to the next field and/or the content of the field sent to the HOST if allowed by the current field.
∆	Scrolls display upward	Moves the cursor step by step to the left.	The cursor will be moved to the previous field of the form.
∇	Scrolls display downward	Moves the cursor step by step to the right.	The cursor will be moved to the next field of the form.
Shift	***	SHIFTLOCK OFF	SHIFTLOCK ON
7	***	ABC abc	7
8	***	DEF def	8
9	***	GHI ghi	9
4	* * *	JKL jkl	4
5	***	MNO mno	5
6	***	PQR pqr	6
1	Toggling between BT ON/OF During sleep	STU stu	1
2	***	VWX vwx	2
3	***	YZÅÄÖ yzåäö	3
.	Toggling between Scanner and Light see: Laser & Normal function	: ; ! ? " # & @ |	.
0	MENU	< > [ ] Ü { } ( ) ü	0
_	Backlight (option)	Spc + * / % = $ £ ± ½	-
DEL	Reset	Normal function	Removes a character from the current field.
	Keyboard lock ON and OFF		

14.6 Function Keys

The F-Keys <F1> - <F10> can be programmed with a special configuration program to include recurring strings. For more information regarding the configuration program, please contact Nordic ID's Technical Support (support@nordicid.com).

The F-Keys function in two different ways:

- By pressing an F-key, the string of characters is sent to the Host Application. This is the default setting.

  Example: When the user presses F1-key, the string "F1" will be sent to the Host Application.

- By pressing an F-Key, a string is printed in the current field. If the length of the string exceeds the length of the field, the excess characters will be omitted. If the field already contains text, it will be replaced by the new text.

14.7 Input Fields

The Nordic ID RF650*Direct* Hand Terminal has a virtual display page of 12 x 20 characters. The actual display size is 8 x 20 characters, thus 2/3 of the virtual page can be viewed at a time. Rows may be scrolled by pressing the •'3f•'3f keys accordingly.

Depending on the Host Application, the Host Application can send fields to the Hand Terminal. These fields may be filled by using the keyboard or the laser scanner. Fields are underlined.

14.7.1 F illing Fields using the Laser Scanner

It is possible to define input fields to have different behaviour when filling an input field with the laser scanner: Typically, the scanning result goes to the active input field (where the cursor is). Alternatively, if the form has an input field which is defined as a "DEFAULT_LASER" field, the scanning result is copied into that field regardless of whether it is active or not. **If the field already contains text, it will be replaced by the new text.**

1. A field can be filled using the laser scanner and be sent to the HOST immediately, *Example:* typical stock taking situation
2. A field can be filled using the laser scanner but **not** sent to the HOST. *Example:* the user needs to verify the text string contents before sending to the Host Application.
3. A field cannot be filled with a laser scanner. *Example:* the field requires the user to input other information, for example numbers.

14.7.2 Locked Fields (Buttons)

Fields can generally be filled with text using the keyboard. Locked fields are an exception to this rule. When a locked field is active, the text in the field is highlighted (black background with white text). The laser scanner cannot be used to fill a locked field neither. A locked field functions like a button and the contents of the field can be sent to the Host Application by pressing the <OK> key.

14.7.3 Writing Text in the Field

An active field is indicated by the cursor. An active field can be filled with text using the keyboard and/or using the laser scanner.

You can move the cursor in the field step-by-step using the •'3f•'3f keys if SHIFTLOCK-function is ON (the symbol will be visible in the right lower part of the display).

14.7.4 Writing Letters

Letters can be written into a field when the SHIFTLOCK is ON (the symbol will be visible in the lower right part of the display) by pressing the proper number keys (the letters are also printed into the keys). When a key is pressed once the first printed letter on the key will be generated. When pressed quickly twice the second letter printed on the key will be generated etc.

Pressing a key for at least 1.2 seconds will change the letter from uppercase to lowercase and vice versa.

14.7.5 Removing Letters

Letters can be removed from a field with the <DEL> key.
Pressing the <DEL> key for at least 0.5 seconds can clear the entire field of any text.

14.7.6 Moving between Fields

You can move between the fields using the <•'3f•'3f> keys. By pressing the <OK> key, you can move to the next field.

14.7.7 Locking the Keyboard

The keyboard may be locked by pressing the <SHIFT> key first down and while keeping it pressed down by pressing the key (second function of the <OK> button).

15 Built-in Menu

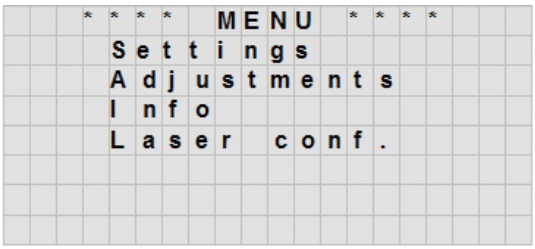
The settings of the Hand Terminal can be changed through the built-in Menu. The Menu can be activated on by pressing the keys <**SHIFT> + <0>.**

Note: While the Hand Terminal is trying to connect or is waiting for a connection, keep pressing <**SHIFT> + <0>** until the Main Menu appears.

You can move in the Menu by using the <•'3f•'3f> keys. The desired item is selected by pressing the <**OK>** key. You can move backwards in the Menu by selecting the **<<** choice and pressing <**OK**>.

For changing existing settings values, delete previous value using the <**DEL**> button. Type in the new value and press <**OK>**.

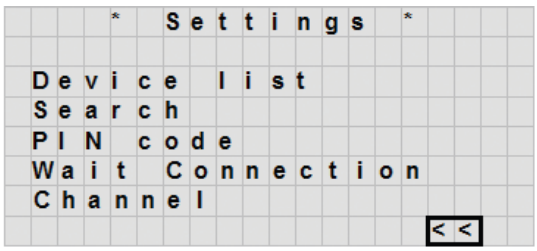
After choosing an item in the Menu, confirm the selection by pressing the <**OK>** key. A changed setting will be signalled by a beep.



Settings	Managing Bluetooth connections.
Adjustments	Contrast, Volume, Keypad tone and Battery type adjustments.
Info	Firmware version info and battery status.
Laser conf.	Configuring and testing the laser scanner.

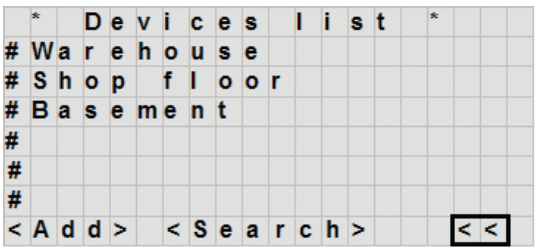
15.1 Settings

Settings contains functionalities for managing Bluetooth connections. After selecting Settings from the Main Menu, a 4-digit password is required. Usually only a representative of the system integrator has access to these settings. By default there is no password defined, so just pressing <OK> will open Settings menu.



15.1.1 Device List

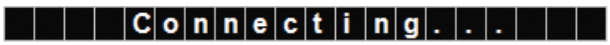
Device list contains all Bluetooth devices (Access Servers or USB Dongle) which are used in the system. Normally the system integrator will input the devices in to the list and the user can then select the device for connection. Devices are usually Bluetooth Access Servers or a USB Dongle.



<Add> User (system integrator) can add Bluetooth devices to the device list manually. By selecting <**Add**> and pressing **<OK>** button the user can edit the Name and the Bluetooth address of the device and select <**Save**> and press **<OK>** to add it to the device list.

<Search>User (or a representative of the system integrator) can inquire existing and active Bluetooth devices from within the coverage area. Detected devices can be added to the device list by selecting the desired device from the "founded devices" list.

<Connect>The RF650*Direct* starts to call the selected device in order to create a Bluetooth connection. Connection time will be about 5 seconds and a short beep sounds once per second while connection is being established.



After the connection is established, the Initial screen appears and the user can start to use the Host Application.

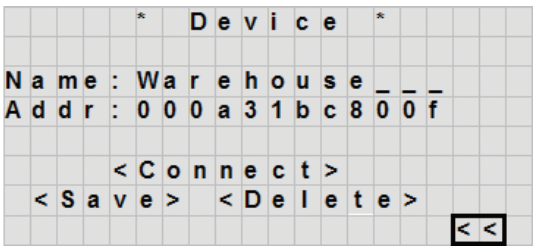
If connection cannot be established with the selected device, an "out of range" status message flashes shortly and three short beeps are generated by the Hand Terminal.

Try to establish the connection again by selecting <**Connect**> and pressing the <**OK**> button again. It may be necessary to repeat this procedure several times before the selected device is actually detected.

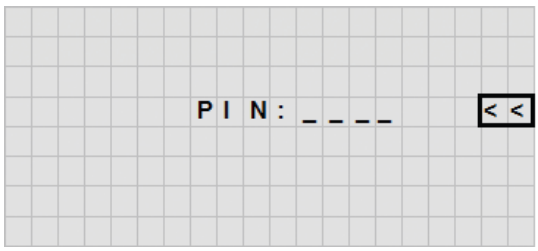
<Save> The user can edit Name and Addr: field manually. After modifying, the user can save information of the device in to the Hand Terminal memory. Device list appears after selecting <**Save**> and pressing <**OK**> button.

<Delete>Deleting a device from the Device list. Device list appears after selecting <**Delete**> and pressing <**OK**> button.

After selecting the desired choice from the list, the user may edit the fields (see below). Edited changes may be saved by selecting <**Save**> and pressing the <**OK**> button, connection procedure may be initiated by selecting <**Connect**> and by pressing <**OK**> and the information may be deleted by selecting <**Delete**> and pressing <**OK**>. To move back to the previous menu level, select << and press <**OK**>.



15.1.2 PIN Code



The default PIN code (factory setting) in Hand Terminals is "**1234**". The PIN codes of the Hand Terminal and the Access Server(s) or Dongle must be the same, before they can connect to each other.

Note: For security reasons, it is recommended to change the PIN code to something different from the too often used "0000" or "1234".

15.1.3 Wait Connection

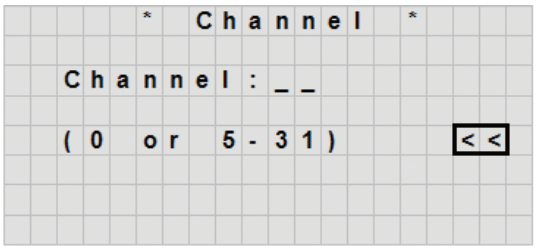
The Hand Terminal user can wait until the Bluetooth connection has been established with the Bluetooth USB adapter. When a USB Dongle is actively trying to connect to the Hand Terminal, the connection will been established usually after a few seconds.

Note: Channel must be set to 0.

After selecting “Wait connection” from the Settings Menu, Hand Terminal resets and starts to wait connection. The status message below will appear:

If connection is not established within 99 seconds, the device goes to sleep. When the user presses any key for waking up the device, the Hand Terminal starts to wait for the connection again. When the connection is established, the Initial screen appears and the user can start to use the Host Application.

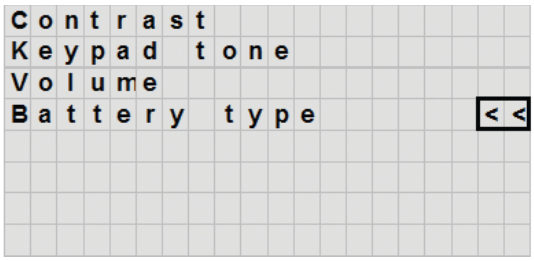
15.1.4 Channel



When using several Hand Terminals simultaneously with an Access Server, each of the Hand Terminals must use different channels. Channel numbers between 5 and 31 may be used.

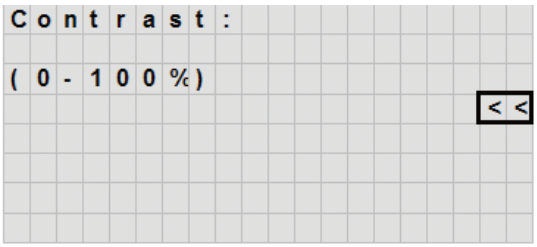
15.2 Adjustments

Adjustments contain general settings of the Hand Terminal



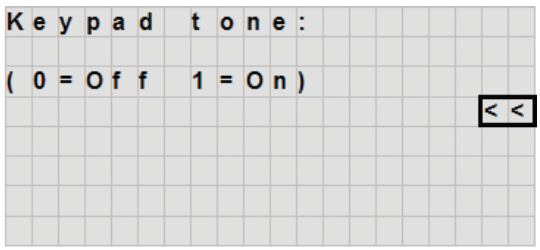
Contrast: Display contrast (0 - 100%)
Keypad tone: Key click on/off
Volume: Beeper volume level and frequency
Battery type: Battery type used in the Hand Terminal.

15.2.1 Contrast



Contrast adjustments of display.
Default value is 25%, darkest settings corresponds to 100%.

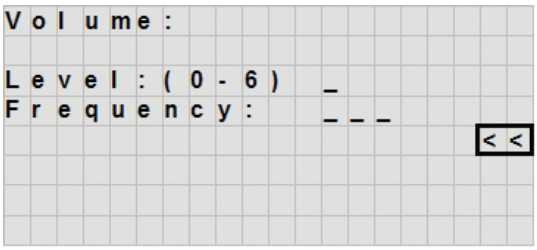
15.2.2 Keypad Tone



Keypad tone ON/OFF

0 = OFF No key click sound when key is pressed.
1 (default) = ON Click sound generated when key is pressed.

15.2.3 Volume

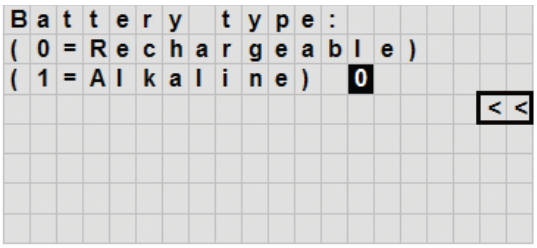


Volume level and frequency
Level 3 is default

Level 0 = No sounds at all
Level 6 = Highest possible sound level

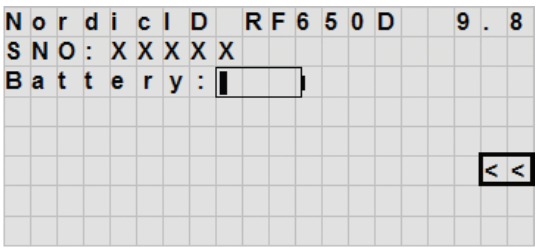
Frequency: 0 - 255 (Default 82)

15.2.4 Battery Type



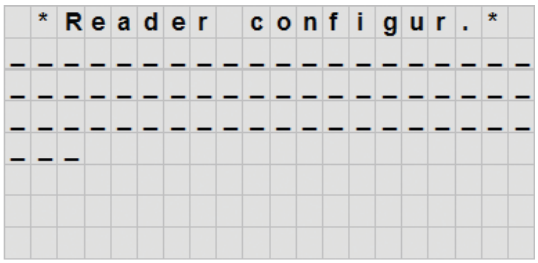
Battery type: Set to "0" when using NiMH rechargeable batteries. Set to "1" when using normal alkaline (non-rechargeable) batteries.

15.3 Information



Header: Device name and Firmware Version.
SNO: Communication ID (CommID) is the serial number of the unit.
Battery: Battery charge level.

15.4 Reader Test



The user can fill this input field by activating the laser scanner and by using the laser scanner to read a barcode.

This feature may be used to test the laser reader functionality even if the Bluetooth connection is not active and also in cases in which the Host Application is not available.

A special use of this feature relates to the programming of the laser module with the help of special programming barcodes provided by the manufacturer of the laser module. For further information about programming the laser module, please contact Nordic ID Technical Support (support@nordicid.com).

16 Desktop Charger (DTC05)

The Nordic IDRF650*Direct* Hand Terminal may be powered either by using alkaline batteries (AA-type 1.5 V batteries) or by using NiMH-type AA-size rechargeable batteries Note that the only approved type of rechargeale batteries is: GB batteries(GPI International) Model: GP180AAHC.

When using NiMH-type batteries an optional Desk Top Charger is available. The information in this chapter applies to the single Hand Terminal Desk Top Charger (DTC05) but applies also basically to the Multiple Desk Top Charger unit, with which it is possible to charge up to five Hand Terminals simultaneously.

16.1 General information

The Desk Top Charger (model DTC05) is used for charging the rechargeable batteries of the Nordic ID RF650*Direct* Hand Terminal. It is a fast charger which reduces the charging time. By using the Desk Top Charger the batteries may be charged without removing them from the Hand Terminal. The charging procedure is controlled by the Hand Terminal.

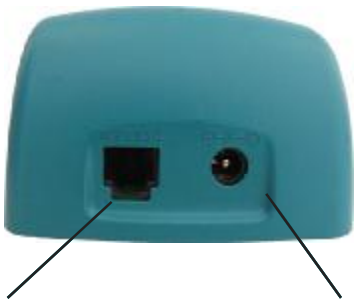
16.2 Equipment

- Desk Top Charger (DTC05)
- Power Supply: **JORDEN ELECTRON Co., Ltd, Models: JOD-4101-031, JOD-41B-029, JOD-41U-14A or POWERBOX, Model: EBH01 119-B1.**
- Power supply cable (EU, UK, US versions available)
- AA-size rechargeable batteries, GB batteries(GPI International) Model: GP180AAHC.
- Nordic ID RF650*Direct* Hand Terminal

16.3 Connectors

The charger includes 3 connectors:

- Hand Terminal connector
- Power supply connector
- RS-232C serial port connector



RS-232C connector

7,5 VDC Power supply connector

16.4 Indicators

The Desk Top Charger has a charging indicator, which shows the charging status of the batteries. For more information see section 16.5.2.

16.5 Charging the Batteries

WARNING! Do not attempt to charge regular or alkaline batteries as this may cause an explosion. Do not place a defective Hand Terminal into the charger.

NOTICE! The Desk Top Charger may only be used with the Power Supply types JORDEN ELECTRON Co., Ltd, Models: JOD-4101-031, JOD-41B-029, JOD-41U-14A or POWERBOX, Model: EBH01 119-B1. The Hand Terminal cannot be used during battery charging. It is normal for the base of the charger to become warm during charging.

Charging rechargeable NiMH-batteries using the DTC05 Desk Top Charger:

- Batteries must be placed inside the Hand Terminal to allow charging.
- Check that the Hand Terminal batteries are of rechargeable type (NiMH).
- Check that the settings for the Hand Terminal have been configured as follows: MENU > ADJUSTMENTS > BATTERY > 0.
  (See User´s Manual: MENU).
- Connect the power supply adapter (9525) to the power supply connector of the charger (see picture of the charger).
- Place the Hand Terminal in the charger.
- The Hand Terminal will beep and start to charge the batteries in full charge mode.
- If the rechargeable batteries are already fully loaded, the charger goes into trickle mode automatically.
- The charging indicator LED will remain ON during quick charging.
- The LED will start to blink when the battery is fully charged. The charger will switch over to trickle charge mode.

16.5.1 "Charging Failure" Message

When placing the Hand Terminal into the charger, the Hand Terminal will check the functionality of the charger. If the Hand Terminal notices that the charging procedure cannot be started normally, a **"Charging Failure"** message appears to the display along with three successive beeps. In this case, remove the Hand Terminal from the charger immediately and check the batteries (they should be of rechargeable type and of similar manufacture and capacity rating and installed observing the correct polarity marked on the Hand Terminal label inside the battery compartment) and then try again. If **"Charging failure"** message appears every time when placing the Hand Terminal into the charger, it is possible that the Desk Top Charger does not work properly. It is also possible that the Hand Terminal causes the **"Charging Failure"** message.

16.5.2 Audible Signals and the LED Indicator on the Charger

The status of the Desk Top Charger charging process is indicated by the LED indicator located on the front side of the Desk Top Charger base and by audio signals generated by the Hand Terminal.

CHARGING INDICATOR LED

Quick charge – the red LED remains on and batteries are charged with full charging current
Trickle charge - the red LED blinks and trickle charger mode will maintain the charge level of the batteries at full level.

AUDIBLE SIGNALS

Three successive beeps - charging not allowed (the Hand Terminal does not contain rechargeable type batteries.
Two successive beeps (long beep followed by short beep) - The battery is being charged.

NOTICE! TO AVOID DAMAGE OR ACCIDENTS, THE DESK TOP CHARGER MUST NOT BE USED FOR ANY OTHER PURPOSE THAN THAT STATED IN THIS MANUAL. USE FOR OTHER PURPOSES NOT STATED IN THIS USER'S MANUAL MAY VOID WARRANTY.

17 Application Development

The Software Development Kit (SDK) for the Nordic ID RF650*Direct* is available by request. To register and order the SDK-package please contact Nordic ID by email using the address or via your sales contact.

The package contains demo applications and some configuration software applications required e.g. if updating the firmware of the RF650*Direct*.

Contents of the SDK:

- Nordic IDRF650*Direct* Hand Terminal
- USB Bluetooth Dongle OR Access Server
- RF650*Direct* System Integrators Manual
- RF650*Direct* User's Manual
- CD-ROM containg the following software
  - Various demo software
  - Configuration software
  - Programming examples (code examples)
  - Nordic ID Port Router
- Desk Top Charger with power supply and mains cable (EU, UK or US version)
- Configuration cable
- Boot cable
- Rechargeable batteries

18 Warranty, Support & Service

Should you encounter problems during the use of the Nordic ID RF650*Direct*, please contact your system integrator or local Nordic ID dealer.

18.1 Warranty Coverage

Nordic ID grants warranty to its products according to Nordic ID General Sales Conditions.

Only service companies authorized by Nordic ID have the qualified service maintenance facilities and know-how for the servicing of RF650*Direct*.

NOTE: Service attempts by unauthorised personnel will void warranty.

18.2 Returning the Unit for Service

The Product shall be returned to the Manufacturer for repair in case the System Integrator or the local Nordic ID dealer cannot help with the problem. Each party will bear the cost of freight of the Product to be repaired to the intended destination.

Please include a detailed description of the problem encountered and a copy of the original purchase order / receipt together with full return address and contact information (name of the sender, contact phone number, email address) with the shipment and send it to authorized service location.

18.3 Extending the Normal Warranty

Repair service done by the Manufacturer after the warranty period will be charged according to the valid service price list. The repair service is valid for five years after shipping the Product to the System Integrator or the local Nordic ID dealer.

Upon request the Manufacturer may extend the normal warranty period. This must be requested using a separate quotation request addressed and sent to the System Integrator or local Nordic ID dealer.

19 Technical Support

The System Integrator or your local Nordic ID dealer primarily provides all non-service related technical support. Nordic ID as a hardware manufacturer provides the hardware repair related technical support.

Please use the e-mail address below when technical support is required:

Nordic ID Head Office in Finland
Myllojankatu 2A
FIN-24100 SALO
FINLAND
Telephone +358 – 2 – 727 7700
Fax +358 – 2 – 727 7720

Technical Support
Telephone +358 – 2 – 727 7736 direct
Fax +358 – 2 – 727 7720
support@nordicid.com (7 – 16 CET)

Nordic ID International Ltd in the UK
Nordic ID House, Clifford Mill, Clifford Chambers
Stratford-upon-Avon. WARWICKSHIRE
CV37 8HW, UNITED KINGDOM
Telephone +44 – 1789 294 799
Fax +44 – 1789 294 739
technical@nordicid.co.uk (10 – 19 Central European Time)

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32051 HERFORD, GERMANY
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Fax +46 31 700 98 95
info@nordicid.se

www.nordicid.com

APPENDIX A - Technical Specifications

TECHNICAL INFORMATION	
Operating frequency	Bluetooth 2,4 GHz, Class 1
Data transfer rate	Up to 1 Mbit/s
Used standards	EN 300 328-2 and EN 301 489-17 FCC, Part 15, Subpart B (2003) and Subpart C (2003) RSS-210, issue 5 (November 2001) EN60825-1 + A1:2002+A2:2001 Class 2
Encryption	128/56 bit (market area dependent characteristic)
Dimensions (L) x (H) x (W)	173 x 22 (41) x 54 (79) [mm]
Weight with batteries	250 g
Power source	2 x AA batteries NiMH or Alkaline type
Display	LCD-display, 8 x 20 characters, backlight
Keys	22 rubber silicone keys
Encryption	128/56 bit (market area dependent characteristic)
Data input	Numeric keyboard (with alfabetic input via SHIFT-function), barcode scanner
Barcode support	All common types
Reading distance	60 to 700 mm
Drop resistance	1 m on to concrete
Standard colours	Sapphire Blue or Granite
Operating temperature	-20°C to +55°C
Bluetooth connection (to optional Access Server)	Optional Access Point connects to Ethernet/RS-232 Connection from one Access Point to 1 – 7, 1 – 14 or 1 – 21 Hand Terminals (Access Server model dependent feature)
Bluetooth connection (to optional Bluetooth Dongle)	Dongle attaches to USB-port (USB 1.1 or later) Connection from one Dongle to 1 Hand Terminal Or Connection from one Dongle to 1 – 7 Hand Terminals (requires optional Nordic ID Port Router Software)
Sensitivity	20 dBm maximum, Class 1
Operating time in normal daily use	48 hours
Recharging time (NiMH batteries with 1600 mAh capacity	1,5 - 3 hours to full-charge

OPTIONS / ACCESSORIES	
Desk Top Charger	Operating voltage 230 VAC / 50 Hz and 110 VAC / 60 Hz
Multi Charger (up to 5 Hand Terminals)	Operating voltage 230 VAC / 50 Hz and 110 VAC / 60 Hz
Holster and carrying case	Leather
Rubber outer casing	Rubber
AA-type NiMH batteries (2 required per Hand Terminal)	1,2 V 1200 / 1600 / 1800 / 2300 mAh capacity
Configuration cable	See Piccopla software below
Boot cable	See Piccopla software below
SOFTWARE	
Nordic ID Port Router	Enables upto 7 Hand Terminals per Bluetooth Dongle
Demo software	Check availability
Piccopla software	Configuration and firmware update possibility of the Hand Terminal

Table: RF650*Direct* physical and environmental specifications

APPENDIX B - Troubleshooting

In case of problems encountered during the use of the RF650*Direct*, please contact your system integrator or your local Nordic ID dealer.

The following Guidelines are to be followed when optimal working distance needs to be determined or if barcode decoding related problem is encountered.

NOTE: Due to the large variety of symbol sizes, densities, print quality, etc., there is no simple formula to calculate the optimum symbol distance.

1. Measure the maximum and minimum distance at which your symbols can be read.
2. Locate the scan engine so that the symbol is near the middle of this range when being scanned.
3. Check the near and far range on several symbols. If they are not reasonably consistent there may be a printing quality problem that can degrade the performance of your system.
4. Center the symbol (left to right) in the scan line whenever possible.
5. Position the symbol so that the scan line is as near as possible to perpendicular to the bars and spaces in the symbol.
6. Avoid specular reflection (glare) off the symbol by tilting the top or bottom of the symbol away from the engine. The exact angle is not critical but should be large enough to allow the reflected scan line to miss the window of the laser engine.
7. Check that the window is clean.
8. Give the scan engine time to dwell on the symbol for several scans. Poor quality symbols may not read on the first scan. When first enabled, the scan engine may take two or three scans before it reaches maximum performance. Enable the scan engine before the symbol is presented, if possible.

Should you have some more questions or problems, please go to our website at www.nordicid.com . If you cannot find the answer for your problem there, please contact Technical Support by sending email to support@nordicid.com .

APPENDIX C - Introduction to the Laser Engine

A laser diode produces a single beam of coherent light which deflects off a mirror, and is emitted from the laser engine used inside the RF650*Direct*. The total deflection of the single beam is 53° (standard version), and the scan frequency is 39 scans per second.

When the laser beam strikes a barcode, the dark bars absorb most of the light while the light spaces reflect most of it. Thus, changes in the reflected light can be used to deduce the barcode into electronic format. A photo diode is used to sense the reflected laser light and generate a current proportional to the reflected light signal. The current then produces an analogue voltage, which is further amplified, filtered to minimise noise related problems and then finally sent to a digitiser, which transforms the analogue signal into digital form representing the barcode. This is called the Digitised Bar Pattern (DBP).

The DBP data is then sent to the decoder board for processing into a host-compatible format and further applications are based on the software used. The technical specifications of the laser engine used in the RF650*Direct* are listed in the table below.

ITEM	SPECIFICATION
Scan repetition rate	39 (± 3) scans/sec (bi-directional)
Laser power	1.2mW nominal (Scanning Mode) 0.8mW nominal (Aim Mode)
Laser Class	IEC Class 2 devices
Print contrast	Minimum 25% absolute dark/light reflectance measured at 650nm
Scan angle	53° (typical)
Ambient Light Immunity • Sunlight • Artificial light	 10 000 ft. candles / 107.640 lux 450 ft. candles / 4.844 lux

Table: Laser engine technical specifications

Usable scan distance depends on the barcode size and pitch, quality of the barcode print and ambient light conditions as well as the pitch and angle of the laser beam in reference to the barcode surface. Further information is available from Nordic ID Technical Support upon request (support@nordicid.com).

APPENDIX D - Programming the Laser Engine

The laser engine used in the RF650*Direct* is programmed during the manufacturing process by defining certain operational parameters with default values. These values may be changed by special programming barcodes (detailed information available upon request from Nordic ID Technical Support).

NOTE: RF650*Direct* laser module default factory settings may be activated by scanning the barcode shown below. Factory default settings are listed in APPENDIX E.

SET ALL DEFAULTS

DEFAULT PARAMETER SETTINGS OF RF650*Direct* LASER ENGINE		
Parameter	**Parameter number**	**Default setting**
Linear Code Type Security Levels	0x4E	1
UPC-A	0x01	Enable
UPC-E	0x02	Enable
UPC-E1	0x0C	Disable
EAN-8	0x04	Enable
EAN-13	0x03	Enable
Bo<OK>land EAN	0x53	Disable
Decode UPC/EAN Supplementals	0x10	Ignore
Decode UPC/EAN Supplemental redundancy	0x50	7
Transmit UPC-A Check Digit	0x28	Enable
Transmit UPC-E Check Digit	0x29	Enable
Transmit UPC-E1 Check Digit	0x2A	Enable
UPC-A Preamble	0x22	System Character
UPC-E Preamble	0x23	System Character
UPC-E1 Preamble	0x24	System Character
Convert UPC-E to A	0x25	Disable
Convert UPC-E1 to A	0x26	Disable
EAN-8 Zero Extend	0x27	Disable
Convert EAN-8 to EAN-13 Type	0xE0	Type is EAN-13
UPC/EAN Security Level	0x4D	0
UPC/EAN Coupon Code	0x55	Disable
USS-128	0x08	Enable
UCC/EAN-128	0x0E	Enable
ISBT 128	0x54	Enable
Code 39	0x00	Enable
Trioptic Code 39	0x0D	Disable
Convert Code 39 to Code 32	0x56	' Disable
Code 32 Prefix	0xE7	Disable
Set Length(s) for Code 39	0x12 / 0x13	2-55
Code 39 Full Ascii Conversion	0x11	Disable
Code 93	0x09	Disable
Set Length(s) for Code 93	0x1A / 0x1B	4-55

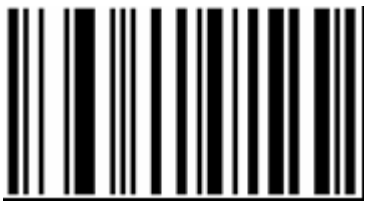
Interleaved 2 of 5	0x06	Enable
Set Length(s) for I 2 of 5	0x16 / 0x17	14
Interleaved 2 of 5 Check Digit Verification	0x31	Disable
Transmit Interleaved 2 of 5 Check Digit	0x2C	Disable
Convert Interleaved 2 of 5 EAN 13	0x52	Disable
Discrete 2 of 5	0x05	Disable
Set Length(s) for Discrete 2 of 5	0x14 / 0x15	12
Codabar	0x07	Disable
Set Lengths for Codabar	0x18 / 0x19	5-55
CLSI Editing	0x36	Disable
NOTIS Editing	0x37	Disable
MSI Plessey	0x0B	Disable
Set Length(s) for MSI Plessey	0x1E / 0x1F	6-55
MSI Plessey Check Digits	0x32	One
Transmit MSI Plessey Check Digit	0x2E	Disable
MSI Plessey Check Digit Algorithm	0x33	Mod 10 / Mod 10
Transmit Code ID Character	0x2D	None

Table: Default factory settings of the laser module.

APPENDIX F - Numeric Barcodes

The following numeric barcodes may be used to input numerical data with the help of the laser scanner built into the RF650*Direct*.

0



3

1

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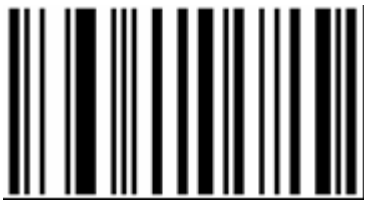

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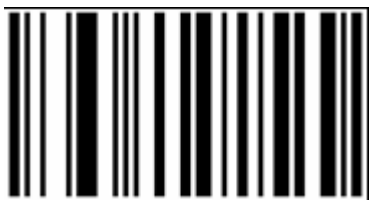

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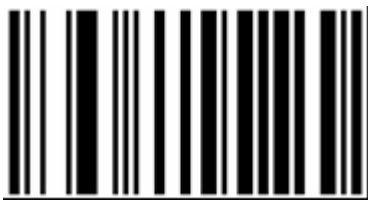

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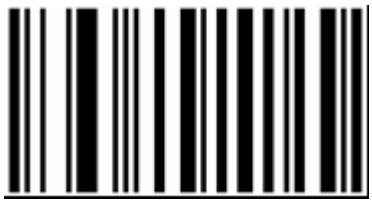

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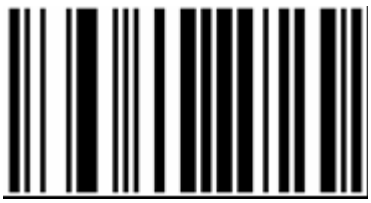

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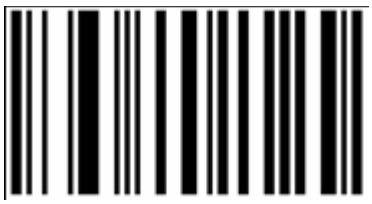

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