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Manual

NEPTUNE
TECHNOLOGY GROUP

R900® Belt Clip Transceiver Users' Manual

NEPTUNE
TECHNOLOGY GROUP

ARB® UTILITY MANAGEMENT SYSTEMS™

R900® Belt Clip Transceiver Users' Manual

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R900 Belt Clip Transceiver

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

RF Exposure

This equipment complies with radiation exposure limits set forth for an uncontrolled environment. This equipment is in direct contact with the body of the user under normal operating conditions. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Warning: Changes or modifications to this device not expressly approved by Neptune Technology Group Inc., could void the user's authority to operate the equipment

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RF Exposure

Cet équipement est conforme aux limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement est en contact direct avec le corps de l'utilisateur dans des conditions de fonctionnement normales. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec tout autre antenne ou transmetteur.

R900® Belt Clip Transceiver
Users' Manual
Literature No. UM R900 BCT 10.17
Part No. 13719-001

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Setting Up the R900 Belt Clip Transceiver

Introduction

This section introduces you to the R900® Belt Clip Transceiver (R900 BCT). It will explain how the R900 BCT is incorporated into the N_SIGHT® R900® host software, and how it will be used by both meter readers and operators. It will also help you become familiar with the basic features and functions the handheld computer offers.

This section provides basic instructions for unpacking and inspecting the R900 BCT. It also gives instructions for setting up the R900 BCT, becoming familiar with the display, pairing it with the handheld, and usage.

R900 Belt Clip Transceiver Overview

The R900 BCT is a software-defined receiver capable of simultaneously receiving R900, Advantage, and Pocket ProReader RF transmissions. The R900 BCT collects readings and then transfers these readings to the handheld through the Bluetooth connection. The R900 BCT also has the capability to receive and store R900 readings that can be imported into the billing system without the use of a handheld. Because the R900 BCT is software-defined, you can apply firmware updates in order to keep your R900 BCT current with new products introduced to the market.

The R900 BCT can be paired with either an Android or an Apple iOS smart mobile device to use for field presentment purposes or as an additional tool for field service personnel using Neptune's NGO™ app. Download Neptune's NGO app on either the Apple Store or Google Play..

Nomad Handheld and R900 BCT

The Trimble® Nomad® (Nomad) handheld utilizes Bluetooth connectivity to Neptune's R900 BCT to receive the meter readings.

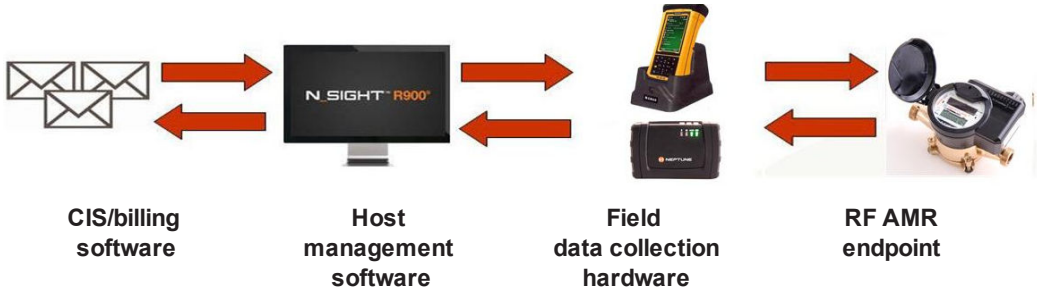

Figure 1 – R900 BCT Meter Reading Cycle

Unpacking and Inspecting Equipment

Besides using normal care, you need no special instructions to unpack the handheld or the equipment that you purchased with it.

Check that you have received all the items you need for the type of system configuration that you are using and inspect the items for shipping damage. If you detect any damage, return the damaged equipment to Neptune. Instructions for shipping the device to Neptune are described in "Returning your Handheld System" in the *Neptune Handheld System Users' Manual*.

Save the packing box that was used to ship the handheld. Should you ever need to ship the handheld, you need to repack the unit in its original shipping box. The handling involved in land and air transport often subjects the handheld to impact beyond that which occurs during normal use. The packing box is designed to absorb shocks and protect the handheld device during shipping.

R900 BCT Components

Figure 2 shows the basic components of the R900 BCT.

Figure 2 – R900 BCT Components

Using the R900 BCT

The following section explains how to use the R900 BCT.

Understanding the R900 BCT Modes

The following tables describe the R900 BCT modes of operation. You change modes on the R900 BCT with a combination of the Mode and Enter buttons. To cycle through available modes, you press the Mode button. The Mode indicator will flash with the color for the mode to enter. To enter the Mode, you press the Enter button within two seconds of pressing the Mode button. If entered, the Mode indicator displays the newly-entered mode. If you do not press Enter within two seconds, the R900 BCT stays in the previous mode. This combination of Mode and the Enter button is done to prevent accidental mode changes during operation,

Table 1 – R900 BCT Power

Function	Explanation
Power ON	Press for two seconds.The backlight turns orange when the power is applied. The unit takes approximately one minute to fully boot. The Mode and RF lights are white during most of boot-up. The unit is fully booted when the Mode and Enter light turn off and the Mode LED displays the previous mode of operation
Power OFF	Press for two seconds. The mode and RF lights blink until off.
Setting Date/Time	The R900 BCT synchronizes the time with the Nomad when the two are paired. The time on the R900 BCT defaults to the time from the last Nomad synchronization.

Table 2 – R900 BCT Modes

Function	LED Color	Explanation
Reading Modes		
Normal	**Green**	*Normal Mode is used to connect through Bluetooth to a host device. Selection between Route (filtered) and RF Test (unfiltered) is made in the host device software.* To enter this mode from other modes. 1. Press MODE until the Mode LED flashes green. 2. Press ENT, and the Mode LED turns green.
Unattended	**Yellow**	*Unfiltered Operations Mode can operate using the battery or when connected to vehicle power.* To enter this mode with battery power: 1. Press MODE until the Mode LED is yellow. 2. Press ENT. To enter from when connected to vehicle power: 1. Press MODE until the Mode LED is yellow.

Table 2 – R900 BCT Modes (continued)

Function	LED Color	Explanation
Installed mode	**Magenta**	1. Press ENT and release. 2. Press ENT again and hold for five seconds, then release. The **Mode LED** is **Magenta**. 3. Connect the USB.
		The USB charger must be capable of suppling 1A of current.
USB mass storage	**White**	The SD card appears as an external drive to the PC.
		To enter this mode: 1. Connect the **USB** to the R900 BCT and to the PC.
		The USB must be connected before the unit can enter the USB mass storage mode.
		Press until Mode LED flashes white. 1. Press MODE until the Mode LED flashes white. 2. Press ENT. The SD card now shows as an external drive attached to the PC.

Accessing the R900 BCT Status Screen

The R900 BCT must first be set to Normal Mode to access the R900 BCT Status screen. The following table explains how to access the status screen on the handheld.

Table 3 – R900 BCT Software Functions

Accessing R900 BCT Status Screen	
While in route	**Neptune Key, System, UTILS, AMR Status =**
	1. Select **Advanced Options**. 2. Select the **check box**. 3. Select **Belt Clip Status**.
From the Synchronize screen	**TAB** twice, **UTILS, Belt Clip Status =** Click
	1. Select . 2. Select Utils. 3. Select Belt Clip Status.

Understanding the R900 BCT LED Operating Modes

To help you better interpret the different colors for the flashing Mode LED, refer to the following table.

Table 4 – R900 BCT LED Operating Modes

State	LED Colors
Unit powered OFF	No color; LEDs off
Power	
On-Battery 100% – 31%	Green
On-Battery 30% – 16%	Yellow
On-Battery 15% – 6%	Red
On-Battery 5% – Critical	Flashes red
Battery – Charging	Flashes yellow
Mode	
Normal mode	Green
Unattended mode	Yellow
Installed mode	Magenta
Mass storage mode	White
RF Mode	
No reading being received	Off
Receive R900/ERT packet	Flashes green when receiving
Receive Advantage packet	Flashes cyan when receiving
No reading received in two + minutes	Solid red

Table 4 – R900 BCT LED Operating Modes (continued)

State	LED Colors
Bluetooth	
Not Connected	Off
Pairing	Flashes blue
Connected	Blue
Error Codes	
Temperature error	Bluetooth and Power LED flash red five times
Hardware error	Bluetooth and Power LED are solid red
Battery error	Power LED flashes red and yellow
Cannot power on - battery too low	Power LED flashes red three times
SD card error	Mode LED is solid red

Understanding the External Battery Charger Status

Refer to the Table 5 on the next page for a description of the external battery LED.

Table 5 – R900 BCT External Battery LEDs

LED	Indicates
Red, yellow, green or OFF	Startup initialization when applying power
OFF	No battery inserted
Yellow	Battery charging
Solid green	Battery charged successfully
Red	Error condition

Battery Disposal/Recycling

Battery disposal/recycling is handled through Call2Recycle® 1-800-822-8837. Customers are encouraged to contact Call2Recycle to find their nearest drop-off location for proper disposal/recycling.

Pairing the Nomad to the R900 BCT through the Bluetooth

Complete these steps only if you are pairing the Nomad to the R900 BCT for the first time.

Pairing the Nomad

To pair the Nomad to the R900 BCT, complete the following steps.

1. Power **ON** the R900 BCT and set to Normal Node, if not already set. See "Understanding the R900 BCT Modes" on page 4.
2. On the Nomad, click MENU.
3. Click 5 – **UTILS**.
4. Click 8 – **Belt Clip Status**.

   The AMR Connection screen appears. The R900 BCT is visible in the **Broadcasting Device** drop-down selection list.

5. Choose the device from the drop-down selection list and click **Bluetooth**.

   The R900 BCT Status screen now displays the device details.

   - If you have previously paired a device, go to the **R900 BCT Status** screen and not the AMR Connection screen.
   - If you want to **Change Devices**, you can click this option on the bottom of the R900 BCT Status screen.

     You then see the AMR Connection screen and can choose the device from the drop-down selection list.

Using the R900 BCT to Read a Route

To begin reading a route using the R900 BCT, you first need to load a route to the Nomad. See “Loading and Unloading Data for Handhelds” in the *N_SIGHT™ R900® Online Help*.

Click

to load a route when you are working in the N_SIGHT R900 host software.Press F1 to see the instructions for loading a route to a handheld.

After the route is loaded and the pairing is complete, you can log in and the unit can receive readings from the R900 BCT. For optimum RF performance, point the R900 BCT's radio antenna towards the direction of the meter.

Neptune recommends meter readers place the belt clip for their R900 BCT with the antenna end pointed forward. Human body and other structures could impede radio transmission between MIUs and the R900 BCT. By wearing the R900 BCT with the antenna side pointed forward that interference is minimized.

R900 BCT Status Screen in N_SIGHT R900

While the Nomad and the R900 BCT are paired, you can access a screen showing the status of the R900 BCT. You can see a message like the one illustrated in Figure 3

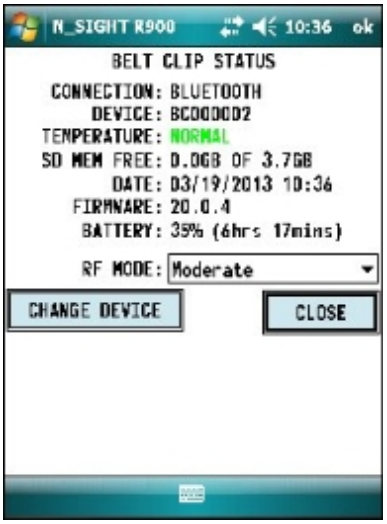

Figure 3 – R900 BCT Status Screen

The following information appears on this screen.

Table 6 – R900 BCT Status Screen Information

Field	Description
Connection	Displays the type of connection used to pair the R900 BCT, such as Bluetooth.
Device	Displays the name of the R900 BCT.
Temperature	Displays the temperature of the R900 BCT, such as normal.
SD MEM Free	Displays the amount of available memory for the SD card.

Table 6 – R900 BCT Status Screen Information (continued)

Field	Description
Date	Displays the date and time as follows: Date: MM/DD/YYYYWorks beautifully. Time: HH:MM
Firmware	Displays the version of the firmware on the R900 BCT.
Battery	Displays the available battery percentages.
RF Mode	Allows you to change the reading mode for the R900 BCT by clicking the drop-down selection list. • *Efficiency* –reduced RF performance and best battery life • *Moderate* – default RF performance • *Performance* – best RF performance and decreased battery life

RF Performance Modes

This Mode can be changed from the R900 BCT Status screen. The unit has three options for the RF performance during a reading:

1	**Efficiency**	Reduces RF performance* and best battery life
2	**Moderate**	Default RF performance*
3	**Performance**	Best RF performance* and decreased battery life

*RF performance refers specifically to the throughput of the receiver which can impact the speed with which readings are processed in high density areas. Range is not impacted by these modes.

Selecting the R900 BCT Reading Mode

To choose the reading mode, complete the following steps.

1. On the Nomad, click MENU.
2. Click 5 – **UTILS**.
3. Click 8 – **Belt Clip Status**.

   The R900 BCT Status screen appears.
4. Tap the drop-down selection list for **RF Mode** and you can choose the reading mode. See the modes listed in "RF Performance Modes" on the previous page.

Using the R900 BCT RF Test Mode

RF Test Mode allows the R900 BCT to go into a continuous receive mode and listens for any and all R900 transmissions.

From the Login Screen

To access RF Test Mode from the Login screen, complete the following steps.

1. On the Nomad, click MENU.
2. Click 5 – **UTILS**.
3. Click 7 – **RF Test**.

   The RF Test Mode screen appears as illustrated in Figure 4.

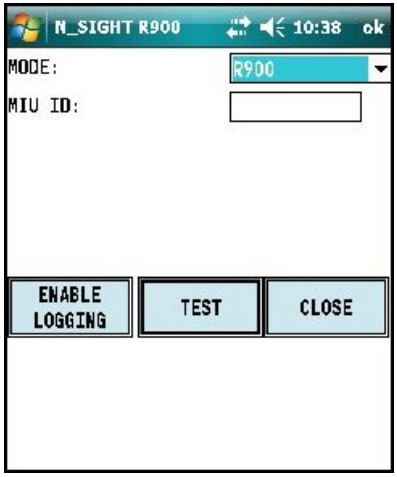

Figure 4 – R900 BCT RF Mode Screen

From the Route Screen

To access RF Test Mode from the Route screen, complete the following steps.

1. In the route, click .
2. Click – **System**.
3. Click – **Utilities**.
4. Click – **RF Test**.

The RF Test Mode screen appears as illustrated in Figure 5.

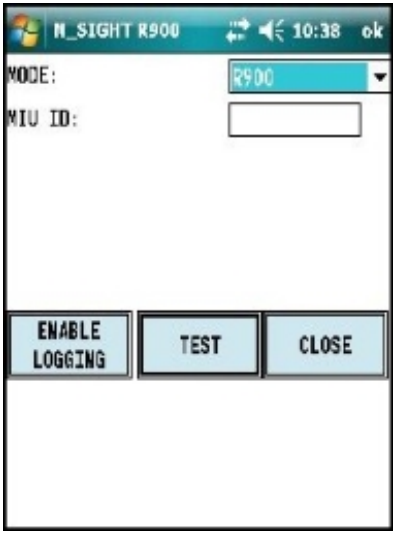

Figure 5 – R900 BCT RF Mode Screen from Route

R900 BCT SD Card Functionality

Any data that is read by the R900 BCT and sent to the handheld is stored on its internal SD card.

The SD card also handles the firmware updates explained in "R900 Belt Clip Transceiver Overview " on page 1.

Using the R900 BCT for Field Presentment and Field Service

In addition to meter reading, the R900 BCT can be paired with an Android or an Apple device and the associated NGO app utility. The R900 BCT can then perform data logging to acquire data on water usage for a particular meter. In addition, the utility's field personnel can utilize the NGO app's RF test functionality to test the MIU's transmission. For additional information, consult the NGO product literature.

Updating R900 BCT Firmware

You cannot update multiple R900 BCTs at once; they must be updated individually.

When there is an update to the R900 BCT firmware, it is available from Neptune through the web updates in the R900 BCT software, or it can be obtained from Neptune Customer Support through email or direct upload to an FTP site.

With either choice for receiving the firmware update, the firmware is updated in the N_SIGHT R900 database and then sent to the R900 BCT through the USB transfer cable or saved to the SD card and installed on the R900 BCT.

To update the R900 BCT firmware update with the USB cable, the R900 BCT must first be connected to the PC and be in Mass Storage Mode. To update through the SD card, the Firmware Update File can be transferred to the SD card by using an SD Card Reader.

To update the R900 BCT firmware, complete the following steps.

1. Connect the R900 BCT to the PC and place in **Mass Storage Mode**.
2. In the N_SIGHT R900 host software, select **Utilities**.
3. Select the **Beltclip Firmware** tab. See Figure 6.

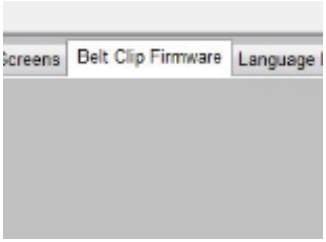

Figure 6 – Tab within N_SIGHT R900 Utilities

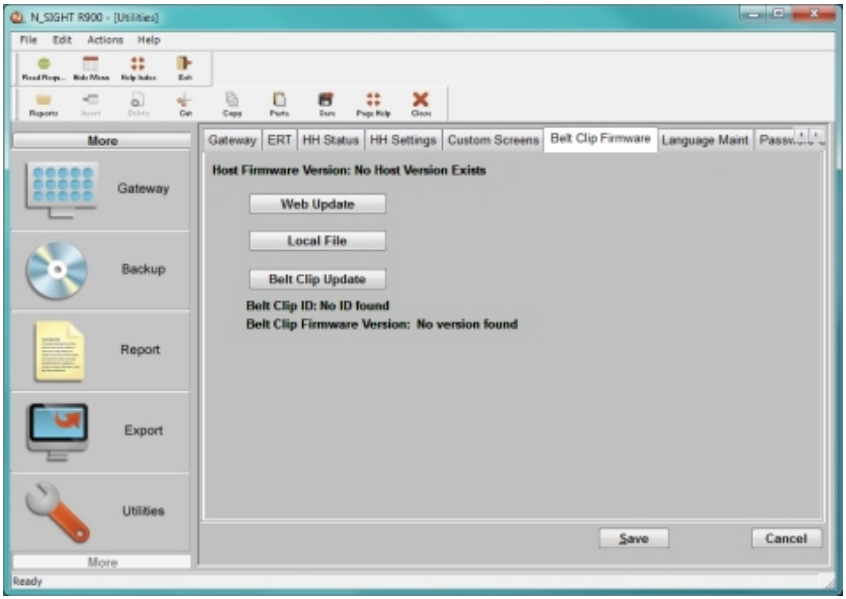

Figure 7 – R900 BCT Firmware Tab with Update Options

The Web Update and Local File buttons perform the same task of updating the database with the updated firmware version depending on where the updated firmware file is located.

How the Firmware Update Works

The following explains how the firmware update works.

- ***Web Update***—looks to the Neptune servers for an updated version of R900 BCT firmware and downloads it to the database.
- ***Local File***—allows you to import updated firmware from a thumb drive, network drive, or FTP site into the database.
- ***Belt Clip Update***—locates the updated firmware file after the updated firmware has been downloaded and sends it to the R900 BCT through the USB transfer cable.

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