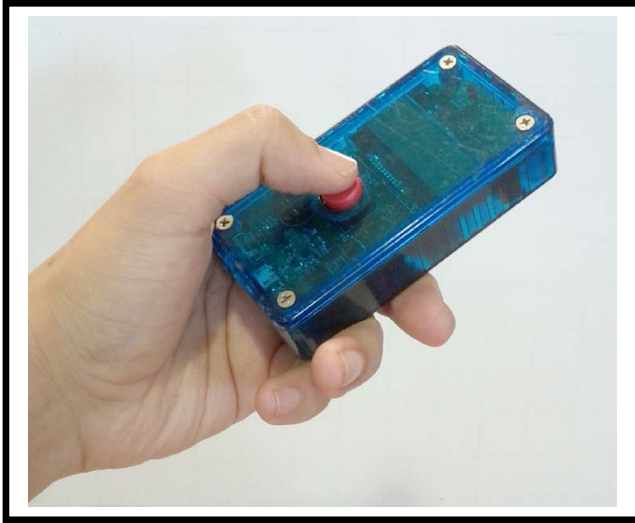


BlueReader™ HF Handheld RFID Reader



BlueReader™ UHF Handheld RFID Reader



The BlueReader HF is a compact, affordable, handheld HF RFID reader. BlueReader contains a Bluetooth wireless link for easy integration with mobile phones. BlueReader contains a USB interface and high-capacity memory card that also enables it to be used as a stand-alone reader.

BlueReader supports the industry standard ISO15693 protocol. However, the ISO14443 protocol (NFC) is available as a customization.

An open Bluetooth API is available from TagSense for easy integration to other software. The BlueReader Mobile application is available for free for the Android phone OS.

RFID SPECIFICATIONS

- ISO15693 Read-Write
- Anti-collision
- Frequency: 13.56 MHz
- Supports tag user memory
- Compact internal antenna

ELECTRICAL SPECIFICATIONS

- USB Rechargeable Lithium Battery
- Long battery life (>20,000 reads per charge)
- Operating Temperature: -25C – 50C
- Bluetooth Serial Port Profile
- On-board memory (micro-SD card) for data-logging
- USB-accessible

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BlueReader-HF

The BlueReader HF is designed to be a simple and easy to use. Below are some unique features of the BlueReader HF.

Unique Features:

- Simple 1-button operation for scanning
- Includes on board memory storage for storing tag IDs. (this can be used to store sensor data for custom applications)
- Bluetooth is included, which supports serial port profile (SPP) for easy integration with user software.
- The TagSense command protocol is simple ASC text (instead of binary) which makes development and programming very simple and easy to test.
- Built-in LCD display for portability
- Built-in rechargeable battery

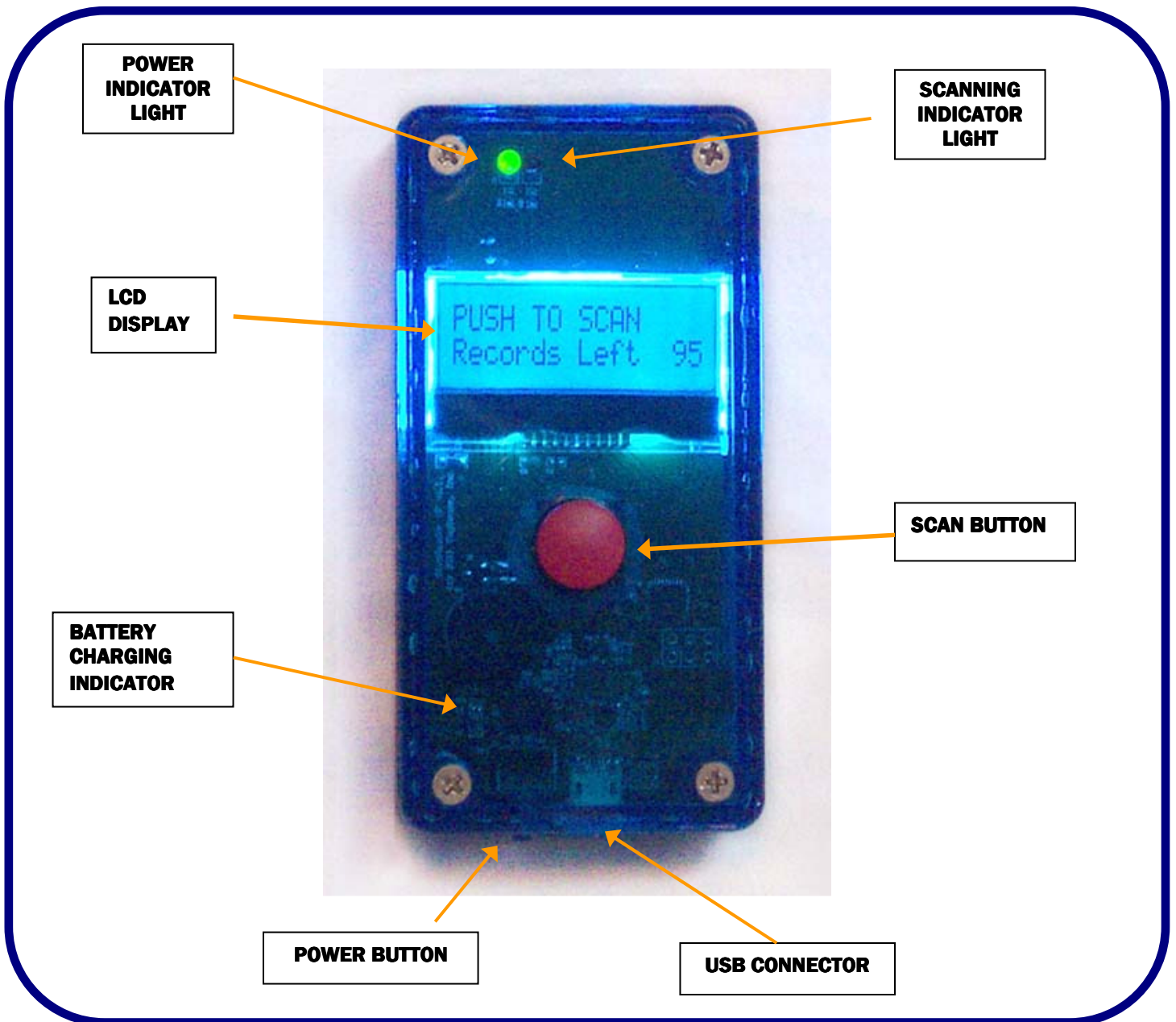
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BlueReader HF Reader



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GETTING STARTED

As a stand-alone RFID reader, the BlueReader-HF is very easy to use:

- 1) To turn on Power by pressing the small blue button on the end of the reader unit.
- 2) Upon power up, you will notice that the reader will display the ID of the last tag that was scanned as well as the number of memory records remaining.
- 3) Press and hold the large red scanning button to scan a tag. The reader will beep when the tag is read. Also the red scanning indicator light will turn on during scanning to indicate that the RFID electromagnetic field is ON.
- 4) To turn OFF power to the reader, press and hold the small power button for 10 seconds.

Charging the battery:

The BlueReader-HF contains a rechargeable, Lithium Polymer battery. Depending on the amount of use, the battery life of the reader should be approximately one week or several thousand scans – whichever is smaller.

To charge the battery simply plug connect the reader to a PC using a USB cable. The BlueReader-HF uses the same battery type and same USB connector and cable that is that is used in most mobile phones today.

When the BlueReader is connected to a charging source, its recharging LED will illuminate when the reader is charging. If the battery is fully charged, the LED will not illuminate or will appear dim. Charging time for a fully drained battery is approximately 4-6 hours. Of course, partial charging will require much less time.

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USING USB

To communicate with the BlueReader-HF via USB, you should install the virtual COM Port (VCP) drivers. If you do not have the TagSense evaluation kit CD, you can find the drivers at <http://www.ftdichip.com>.

Attach the adapter to the USB cable and plug it into your computer. Install the drivers using the Windows Device Manager. Look in the Device Manager under Ports to see which comport the adapter is using (for example COM12).

Once the USB drivers are installed on your PC, the BlueReader-HF will appear as a serial COM port. To communicate with the reader, you can use any terminal program such as Hyperterminal, CoolTerm, Teraterm, or Zterm (Macintosh) with settings of 9600 baud, 8, N, 1, and no flow control.

For better performance on Hyperterminal, set the line delay to 150 ms. In Hyperterminal this setting is found in File > Properties > Settings > ASCII Setup...> Line Delay 150 milliseconds.

Each time the reader reads a tag it will flash the LED and print the tag data. Each line of output data consists of an asterisk (*), followed by the 8 byte reader ID (if enabled), followed by the protocol type 0-5 (if enabled), followed by the tag ID: *`<READER ID><PROTOCOL IDENTIFIER><TAG ID>`
The number of bytes in the tag ID depends on the type of tag used. Each line of data ends with a carriage return and newline character ("`\r\n`").

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USING BLUETOOTH

Each time the reader reads a tag it will flash the LED and print the tag data. Each line of output data consists of an asterisk (*), followed by the 8 byte reader ID (if enabled), followed by the protocol type 0-5 (if enabled), followed by the tag ID: *<READER ID><PROTOCOL IDENTIFIER><TAG ID>
The number of bytes in the tag ID depends on the type of tag used. Each line of data ends with a carriage return and newline character (“\r\n”).

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TAG ID, READER ID, and RECORD ID

Tag ID:

The Tag ID is the permanent and unique serial number of the tag. For ISO15693 tags, the ID number cannot be changed. It is permanently assigned by the factory. However, some ISO15693 tags have user memory. The user memory provides a means for users to write custom data to a tag. The amount of user memory varies depending on the specific tag, but is generally on the order of a few dozen bytes.

Record ID:

The record ID is an abbreviated representation of the tag ID. Since the tag ID is relatively long, the user can use the record ID instead of the tag ID. The record ID number is assigned every time a new tag is scanned. The record ID number is 4 digits. The first 2 digits are the reader ID, and the last 2 digits represents the tag ID. The last 2 digits of the record ID represents a unique tag and starts from 0 and goes up to 99. If the user erases all of the data stored inside the reader, then the record ID numbers will be reset to 0. The reader ID is assigned by the user.

Reader ID:

The reader ID is assigned by the user. The reader ID is provided so that it is possible to have many readers in operation and to be able to distinguish one reader from another. Also, by looking at the record ID, it is possible to see immediately which reader scanned that tag. For example, if Doctor Smith uses scanner #01, and Doctor Patel uses scanner #02, then if we see a record ID = 0236, then we know that this record was scanned by Doctor Patel.

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Command Summary

Below is a summary of all the commands currently supported by the BlueReader-HF. Every command must be followed by a carriage return <CR>, which is also known as ASC(13).

ASCII Command	Description
d<xx>	read record "xx" where "xx" is last two digits of record ID
E<xx>	erase record "xx" where "xx" is last two digits of record ID
E.	erase all records (note the period after the E)
l<yy>	set reader ID to "yy" – these two digits will appear as the first two digits of every record ID
i	read back current reader ID
R<zz>	initiate a scan – the scan will last for "zz" seconds
R.	initiate a scan – the scan will last indefinitely Note: this is an "R" followed by a period.
r	stop current scan – important for conserving power

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EXAMPLE #1: Retrieving a record

The following is an example to illustrate communication with the BlueReader-HF, when using USB or Bluetooth operation:

When a tag is scanned, a four digit record ID will appear on the LCD screen. For example, the record number might be "0424". The first two digits of this record number represent the reader ID for that reader, in this case "04". The second two digits represent the record number itself, in this case "24". The user, in practice, would record these four digits for later use.

Once the reader unit is connected to a computer (either via Bluetooth or USB), the following sequence of commands would be recommended:

- 1) Verify Reader ID

Verify that the reader ID matches the reader id found in the record ID. Sending

```
i<CR><LF>
```

will return the reader ID:

```
i04<CR>
```

- 2) Read back full 8 byte tag ID

Read back the tag ID by retrieving the record using the following:

```
d24<CR>
```

This will return (for example)

```
D0123456789abcdef<CR><LF>
```

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EXAMPLE #1: Retrieving a record (cont'd)

3) Erase record

Now the tag ID has been retrieved, erase the record in order to make room for future scans:

E24<CR>

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EXAMPLE #2: Scanning

A scan can be initiated either by pressing and holding the large red button, or by sending a command via Bluetooth or USB.

To start a scan which will last 20 seconds, the following command can be used:

R24<CR>

Now if a tag is brought to the reader, it will read the tag even though the red button is not being held down. The scan will conclude after 20 seconds. The scan can be stopped earlier by sending the following command:

r<CR>

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