IDBLUE®

MOBILE | RFID | SOLUTIONS

IDBLUE R8.UHF Operating Description

IDBlue ™ is a mobile Bluetooth-enabled RFID reader of the pen-type form factor. It is designed for use where mobility is of high importance. As such, it is best used with a pocket pc, mobile phone, or any other Bluetooth enabled host, but is also capable of operating in standalone mode and storing data onboard.

IDBlue™ is designed to read RFID tags in the UHF frequency domain, which is centered around 915 MHz. When capturing tag data, IDBlue™ can either store this tag data locally on its onboard EEPROM, or can forward this data back over either its Bluetooth or USB connections, depending on the application and device configuration.

To achieve this, the IDBlue™ device uses an Atmel ARM7 microprocessor that is driven by a 20 MHz crystal. The microprocessor controls a UHF RFID module using a serial interface, which is responsible for all RFID data modulation, demodulation, encoding and decoding. This chip drives a PCB-based loop antenna through a single ended, balanced driving circuit matched to a 50 ohm impedance.

The microcontroller has an integrated USB data interface that communicates to a USB host using the USB 2.0 (or less) protocol.

The microcontroller also controls a dedicated Bluetooth module that is responsible for managing all Bluetooth discovery and connection states. Once the Bluetooth connection is established, the microcontroller sends data over this connection using a serial interface. This Bluetooth module adheres to the Bluetooth 2.0 specification.

The device is powered using a 550mAH Lithium-Ion battery that is charged using a dedicated Li-Ion charge chip (ISL6292). This charge chip monitors the health of the battery and charges accordingly through power supplied from the USB cable. This charge chip allows the IDBlue™ design to meet the USB charging requirements, which limit the amount of current that can be drawn from a USB host

source. The microcontroller controls the amount of current that the charge chip is allowed to draw from a source.

The device also has an internal real time clock (RTC) that maintains real time (once set), even when the device is powered down. This allows the device to store a timestamp along with a tag read, to ensure data integrity.

As mentioned previously, the device contains a 128k EEPROM that is used to store tag data and timestamp information. This is necessary for applications where there is no connection to a host (through Bluetooth or USB) and allows the user to gather data locally which can later be uploaded for processing.

The device contains multiple user interfaces, including two tri-color LEDs, an audio buzzer, and two button inputs. The two buttons are multi-function inputs that can be configured to various applications. From an off state, these buttons will turn the device on, and the rear button can also be used to power down the device by simply pressing and holding for more than 2 seconds. The front button typically triggers an RFID tag read, but can change depending on the device configuration. The LEDs display the three primary colors (Red, Green and Blue), or any combination of them. The front LED is responsible for providing visual feedback on any RFID related operation (e.g. busy, successful tag read, failed tag read, etc.). The rear LED is responsible for providing visual feedback on the state of the device (e.g. low battery, active Bluetooth connection, active USB connection, etc.). The audio buzzer is responsible for providing audible feedback on various operations. (e.g. successful tag read, successful Bluetooth connection, successful USB connection, etc.). Please see user guide for detailed user feedback information.

Use Case Example:

Scenario: Starting from an off state, the IDBlue™ device will be powered on, and a Bluetooth connection will be established before reading a tag.

Description: From an off state, the user would press either of the buttons to power the device on. Upon pressing the button, the device would initiate its boot-up sequence and display a flashing green rear led to let the user know when it is fully powered up. The flashing green led indicates that the device is active, but does not yet have any type of connection established to a host. The user would initiate a Bluetooth connection from a host (e.g. ppc, laptop, etc.). When the Bluetooth connection has been established, the device would emit a low-to-high tone on the buzzer to indicate a connection state change. The device would also change its rear LED pattern to flash an alternate green/blue flash to indicate an active Bluetooth connection. Once the connection has been established, the user would initiate a tag read by pressing and releasing the front button. The device will display a solid blue front LED to let the user know that it is busy trying to scan and RFID tag. The user would then place the tip of the reader in proximity of the tag they are trying to scan. When the device is close enough, and has captured the tag, it will sound a single high tone on the buzzer and display a solid green on the front LED to let the user know that the tag read was successful. If for some reason the tag cannot be read, the device would display a solid red front LED to warn the user. The user would repeat this process for multiple tag scans.