

# TWN4 USB Front Reader

## Technical Handbook

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# 1 Introduction

The TWN4 USB Front Reader is a configurable Reader/Writer for RFID transponders. This addition to the TWN4 family offers the Bluetooth Low Energy (BLE) interface. The module has both low (125kHz, 134.2kHz) and high (13.56MHz) frequency antennas, allowing the User access to a wide range of RFID standards.

This Technical Handbook provides the details needed to get started using the TWN4 USB Front Reader: a functional overview of the board, listing the features and interface options available.

A custom User App can be loaded onto the module using the AppBlaster software. For more information regarding the programming of the TWN4 module please see a dedicated User Guide for AppBlaster.

## 2 TWN4 USB Front Reader

### 2.1 Functional Overview

The TWN4 USB Front Reader is a complete RFID Reader system which can be connected directly to a USB-A host port. The majority of the circuitry responsible for processing the RFID card information and executing the module firmware is shielded as shown on Figure 2.1. The TWN4 USB Front Reader also offers an internal SAM slot and a speaker on board.

The TWN4 USB Front Reader can interact with the User via Bluetooth Low-Energy interface. This development pack contains documentation on BLE protocol and API implemented on the module.

The TWN4 USB Front Reader contains a USB high-speed hub. The two downstream ports of the hub are connecting to the TWN4 module and an additional USB-A port. The additional USB port may be used as a "pass through", to connect USB devices like memory sticks, to the host system.

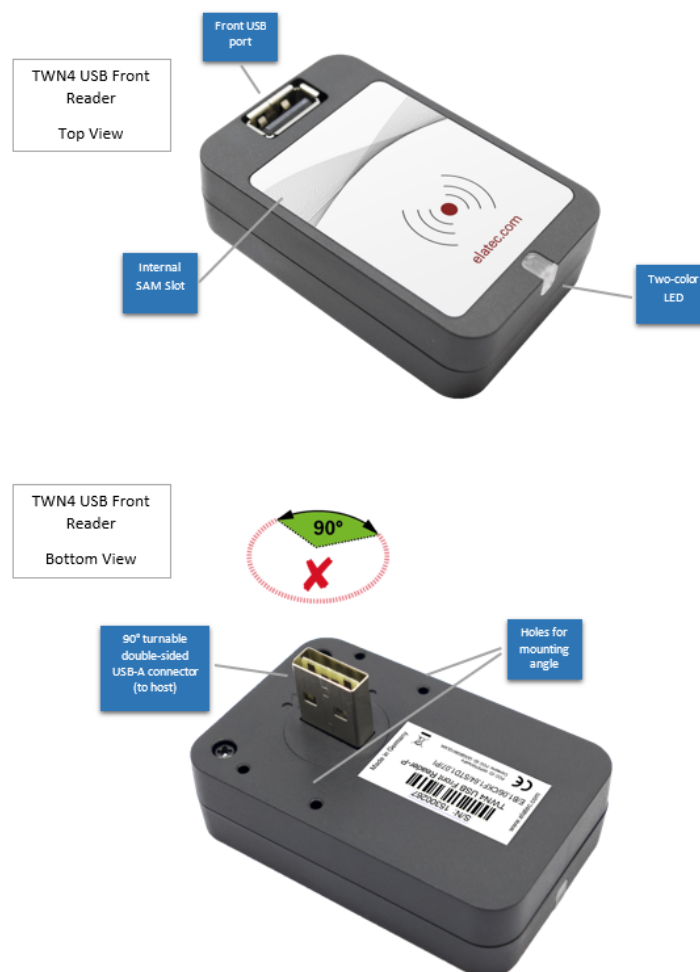


Figure 2.1: TWN4 USB Front Reader View Functional

## 2.2 Dimensions and Pinout

Figure 2.2 provides the physical dimensions of the TWN4 USB Front Reader. All dimensions in mm unless otherwise stated.

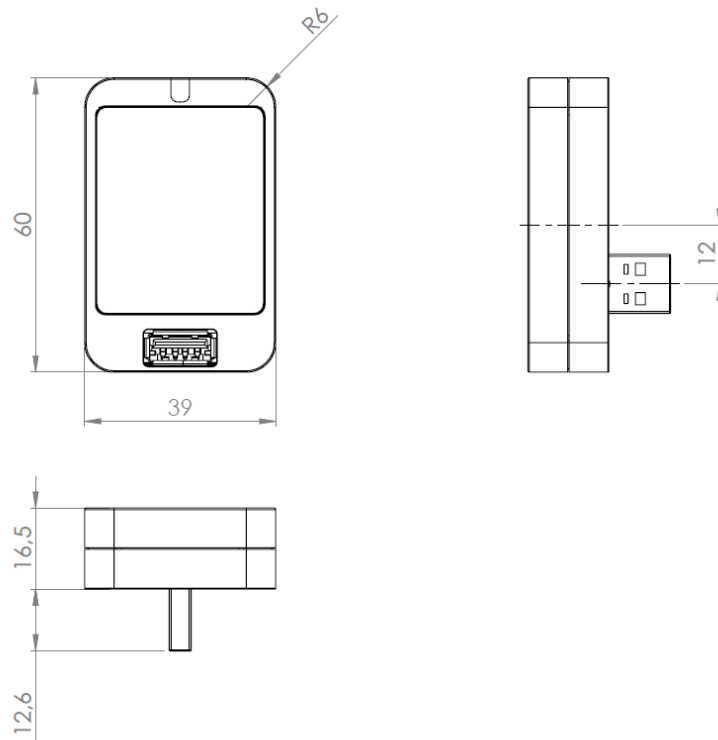


Figure 2.2: Device Dimensions

## 3 Bluetooth Low Energy (BLE) Feature

The traditional Bluetooth standard is convenient for constant-flow media transfer applications such as video streaming. The Bluetooth Low Energy standard was introduced for applications requiring a lower power consumption profile. Data is sent in bursts, followed by periods of electrical idle.

The TWN4 MultiTech 3 BLE uses the BGM121 module from Silicon Labs. The chip implements the Physical, Link and L2CAP Layers of the BLE Protocol. The API is implemented within the firmware of the main TWN4 microcontroller. The two chips interact via the COM2 port and GPIO7 (connected to Reset of BGM121) of the TWN4 microcontroller, thereby making COM2 and GPIO7 unavailable for custom user functions.

For more information about the BLE implementation see document *TWN4 BLE Protocol Specification*.

For more information regarding the Bluetooth Low Energy Standard please see document *"Designing for Bluetooth Low Energy"* from Silicon Labs.

For the description of all the BLE-related commands available, please see the TWN4 API document.

## 4 Power states and current consumption breakdown

The first section of Table 4.1 shows the expected *typical* current draw. The second section of the table lists the *maximum* additional current drawn by the device's peripherals; these values are to be added to those in the "Normal Idle" base state. It is assumed that a +5V DC Power Source is used.

Typical Consumption in Base System States	
Normal Idle	135
Maximum Consumption by Function wrt. Normal Idle System State	
SearchTag-HF	+140
SearchTag-LF	+25
BLE Active Packet Reception	+9
BLE Active Transmission (0 dBm output power)	+9
BLE Active Transmission (8 dBm output power)	+24
Speaker Constant Tone	+80
LED (Red)	+2
LED (Green)	+6
Front USB port (w/o current of connected device)	+10

Table 4.1: Current Consumption Breakdown given +5V DC Supply (mA)

## 5 Disclaimer

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