OEM Serial Port Adapter™/ OEM Bluetooth Enabler™

Electrical & Mechanical Datasheet

connectBlue

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OEM Bluetooth Enabler™

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Contents

1. **Introduction** **5**
   - 1.1 Block diagram ... 5
2. **Electrical Interface** **6**
   - 2.1 PCM and I^2C connection ... 6
   - 2.2 General Purpose I/O ... 7
   - 2.3 UART-communication ... 8
     - RS232 level UART-communication ... 8
     - Logic level UART-communication ... 8
     - Power connection ... 9
3. **Bluetooth Information** **10**
   - 3.1 Overview ... 10
4. **Antennas** **11**
   - 4.1 1/4λ stub antenna ... 11
   - 4.2 Coaxial cable antenna ... 11
   - 4.3 Surface mounted antenna ... 12
5. **Mounting** **13**
   - 5.1 Instructions ... 13
6. **Mechanics** **14**
   - 6.1 Board outlines ... 14
   - 6.2 Mounting holes ... 15
   - 6.3 Component placements and dimensions ... 16
   - 6.4 Weight ... 16
7. **Regulatory Information** **17**
   - 7.1 Declaration of Conformity ... 17
   - 7.2 FCC ... 17
     - FCC Statement ... 17
     - Labeling Requirements for End Product ... 18
     - Antenna ... 18

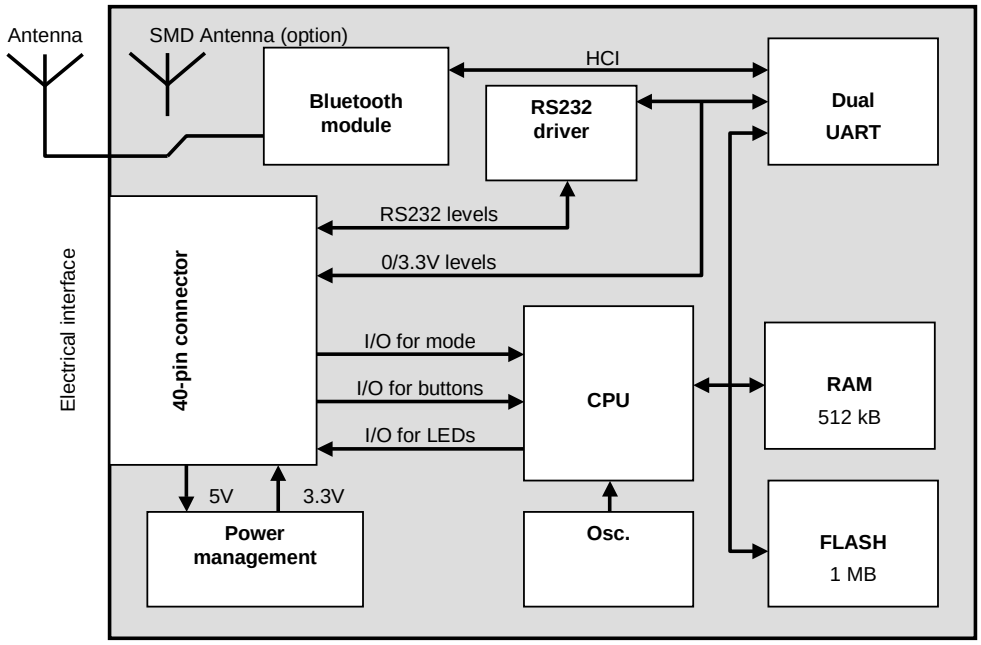
Chapter 1

Introduction

This Electrical and Mechanical datasheet contains information about the OEM Serial Port Adapter and the OEM Bluetooth Enabler. Key features:

- Serial interface RS232 or TTL levels
- Power supply 3.6-6.5 V DC.
- Current consumption: 110mA
- Dimensions 40x65mm
- 3 pins for LEDS indication
- 3 pins for buttons
- 4 pins for PCM coded audio

1.1 Block diagram



Chapter 2

Electrical Interface

The electrical interface of the module is a 2x20 1.27mm micro header list (female). The header list is bottom or top entry. Suited male pin lists are for example available at Samtec (SMD: FW-20-03-F-D-118-162, through hole: FW-20-04-F-D-118-162, min stacker height, 0.118").

There are some positions reserved for future use. See Components placement and dimensions for pin placement.

2.1 PCM and I^2C connection

These pins are directly connected to the on-board Bluetooth unit.

* Pull-up internal

Pin nr.	Pin Name	Type	Description
1	PCM_CLK	In/Out	100kΩ pull-up* to 3.3V, connected to the Bluetooth module PCM interface. Only applicable for OEM Bluetooth Enabler. NC for OEM Serial Port Adapter.
2	PCM_SYNC	In/Out	100kΩ pull-up* to 3.3V, connected to the Bluetooth module PCM interface. Only applicable for OEM Bluetooth Enabler. NC for OEM Serial Port Adapter.
3	PCM_OUT	Output	100kΩ pull-up* to 3.3V, connected to the Bluetooth module PCM interface. Only applicable for OEM Bluetooth Enabler. NC for OEM Serial Port Adapter.
4	PCM_IN	Input	100kΩ pull-up* to 3.3V, connected to the Bluetooth module PCM interface. Only applicable for OEM Bluetooth Enabler. NC for OEM Serial Port Adapter.
5	I2C_CLK	Output	Reserved for future use.
6	I2C_DATA	In/Out	Reserved for future use.

Table 1 - PCM and I^2C connections.

2.2 General Purpose I/O

All General Purpose Input and Output are logic level 0V – 3.3V.
Use VSS as low-level reference and VCC_3V3 as high-level reference.

Maximum load on all GPIO is 2mA.

* Pull-up internal.

Pin nr.	Pin Name	Type	Description
9	Mode 1	GPIO	10kΩ pull-up* to 3.3V, reserved for future use
10	Mode 0	GPIO	10kΩ pull-up* to 3.3V. The level on this pin during power up selects RS-232(H) or logic(L) level UART-communication
11	Reset	Open collector	10kΩ pull-up* to 3.3V. Pulled low by internal reset logic during power up. External logic can pull this pin low to reset module.
12	Firq	GPIO	10kΩ pull-up* to 3.3V, reserved for future use
19	P8	GPIO	Reserved for future use
20	P7	GPIO	Reserved for future use
21	P6	GPIO	Input for switch_0. 3.3V = switch is open, 0V = switch is closed
22	P5	GPIO	Reserved for future use
23	P4	GPIO	Reserved for future use
24	P3	GPIO	Reserved for future use
25	RXD1	GPIO	Reserved for future use
26	TXD1	GPIO	Reserved for future use
27	SCK1	GPIO	Reserved for future use
28	B-LED	GPIO	Output for blue LED driver
29	R-LED	GPIO	Output for red LED driver
30	G-LED	GPIO	Output for green LED driver

Table 2 – I/O-pins

2.3 UART-communication

The “Mode 0” pin (see General Purpose I/O) selects if the UART-communication is with RS232 levels or logic level. “Mode 0” cannot be changed during operation.

RS232 level UART-communication

Mode 0 = H during power up, RS232 level UART-communication selected.				
Pin nr.	Pin Name	Type	Description	Level
14	CTSA	Do NOT connect these pins. When UART-communication with RS232 signal levels is enabled this signals are used internally. RS232 is enabled when Mode 0 (J1 pin nr: 10) is left open or held high during power up.		
15	RXA			
13	RTSA			
16	TXA			
33	RS232-DSR	Input	Data Set Ready	RS232
34	RS232-RX	Input	Receive data	RS232
37	RS232-CTS	Input	Clear To Send	RS232
35	RS232-RTS	Output	Request to Send	RS232
36	RS232-TX	Output	Transmit data	RS232
38	RS232-DTR	Output	Data Terminal Ready	RS232

Logic level UART-communication

Mode 0 = L during power up, Logic level UART-communication selected.				
Pin nr.	Pin Name	Type	Description	Level
14	CTSA	Input	Clear To Send	0V/3,3V
15	RXA	Input	Receive data	0V/3,3V
13	RTSA	Output	Request to Send	0V/3,3V
16	TXA	Output	Transmit data	0V/3,3V
33	RS232-DSR	Input	Inputs accepts RS232 voltage levels but are internally disconnected from the UART when UART-communication with logic level is enabled	
34	RS232-RX	Input		
37	RS232-CTS	Input		
35	RS232-RTS	Output	Although output drivers are active specific output levels can not be guaranteed when UART-communication with logic level is enabled	
36	RS232-TX	Output		
38	RS232-DTR	Output		

Power connection

Pin nr.	Pin Name	Type	Description
7, 8, 17, 31, 32	VSS	I/O-signal return path	Internal signal ground, separated from module power ground with filter.
18	VCC_3V3	Output	Internal regulated supply voltage, Max load 10mA.
39	+5V	Power	Module power supply voltage 3.6 – 6.5V, max current consumption 110mA.
40	0V	Power	Module power ground.
-	CHGND	Power	Two 2.5mm plated mounting holes, connected to filter center tap for EMI suppression (see Mounting holes).

Chapter 3

Bluetooth Information

3.1 Overview

In the table below you find information about Bluetooth.

Bluetooth module	Ericsson ROK 101 107
RF Output power	class 2, min –2dBm type 1.5dBm max +4dBm
Receive sensitive level	-70dBm (0.1% BER)
Output frequency	2.4 –2.5 GHz, ISM band.
Point to multi-point operation	Yes, OEM Bluetooth Enabler No, OEM Serial Port Adapter
Bluetooth stack	HCI, L2CAP, RFCOMM, SDP and profiles
Bluetooth qualification	1.1*

* in progress.

Chapter 4

Antennas

There are 3 different antennas available:

- A internal surface mounted (SMD) antenna.
- A 1/4λ stub antenna for panel montage.
- An antenna attach to a coaxial cable.

See chapter about Mounting for more info about antenna placement.

4.1 1/4λ stub antenna

Frequency range	2400-2484 MHz
Polarization	Linear
Azimuth beam width	Omni directional

Picture 1 - Stub antenna

4.2 Coaxial cable antenna

Frequency range	2400-2484 MHz
Polarization	Linear
Azimuth beam width	Omni directional

Picture 2 - Cable antenna

4.3 Surface mounted antenna

This is a Surface mounted antenna with the dimensions of 15.0x10.0x6.3mm. The unit cannot be mounted in a metal-shielded enclosure with this antenna.

Frequency range	2400-2484 MHz
Polarization	Linear
Azimuth beam width	Omni directional

Picture 3 - SMD antenna

Chapter 5

Mounting

5.1 Instructions

The module cannot be mounted arbitrary, because off the radio communication. The antenna of the module cannot be mounted in a metal enclosure. If a metal enclosure is required, the Stub antenna (see 1/4λ stub antenna) could be mounted through a panel hole or the coaxial antenna could be mounted outside the enclosure via the coaxial cable (see Coaxial cable antenna).

The antenna should NOT to be mounted with a distance of multiple half wavelengths (6cm) from a conductive surface.

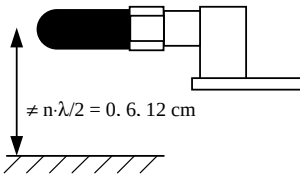
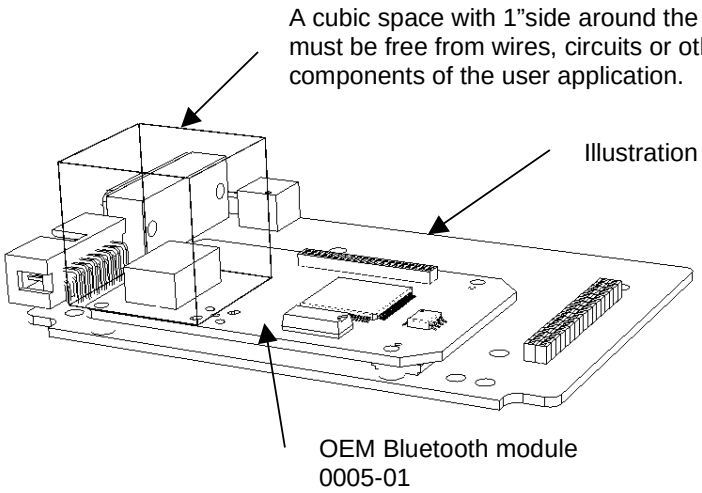


Figure 1 - Antenna placement



The minimum distance between the user application printed circuit board and the OEM-Bluetooth module is 3mm (0.118")

Chapter 6

Mechanics

6.1 Board outlines

The main board is 65.0x40.0x1.6mm excluding the mounting wings. The wings are electrical isolated and can for example be mounted in the mounting rails of a metal enclosure. The wings can be removed by V-Cuts.

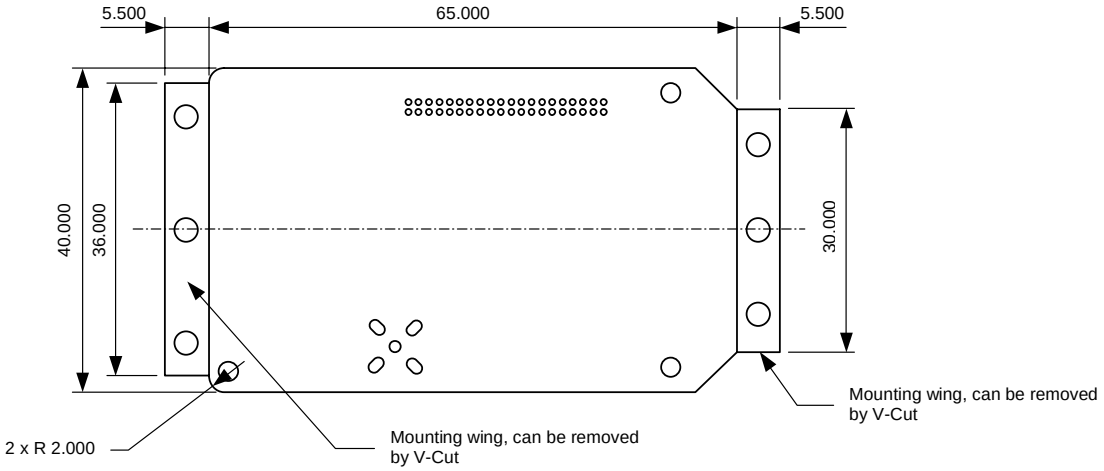


Figure 2 - Board outlines [mm].

6.2 Mounting holes

There are 3 mounting holes on the main board and 3 on each mounting wing.

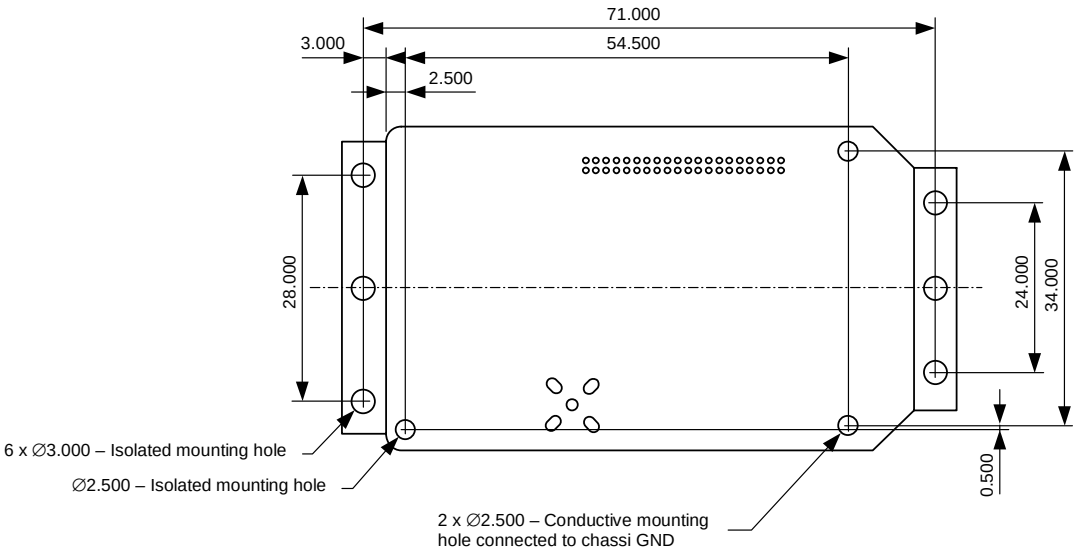


Figure 3 - Mounting holes [mm].

6.3 Component placements and dimensions

Components of important are the electrical interface (2x20 1.27mm header list) and the antenna. There are 3 kinds of antennas (see Antennas) but only one is surface mounted. The height of the components is max 3.0mm on the bottom side and 3.5mm on the topside except the antennas (see Figure 4).

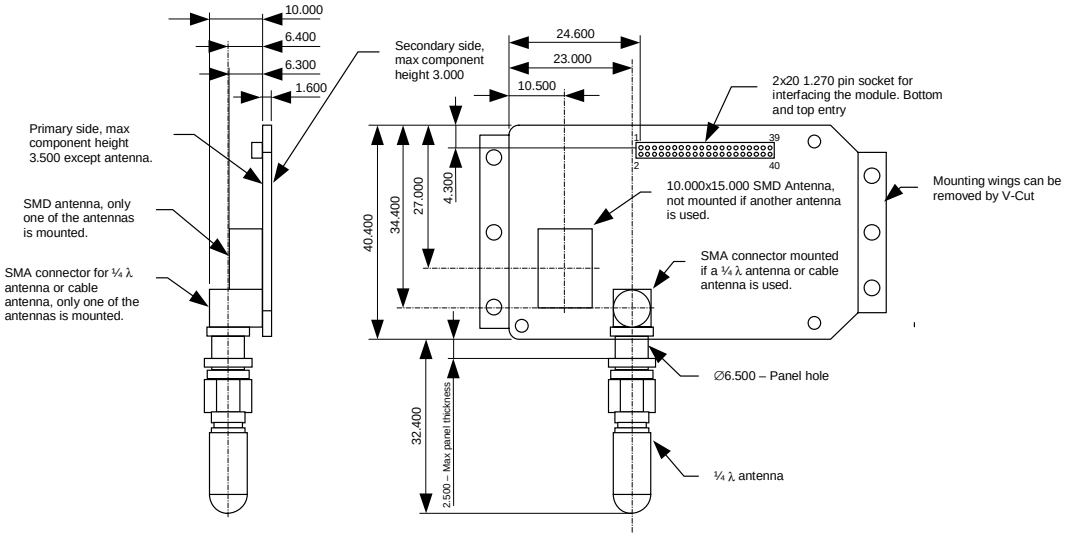


Figure 4 - Connectors and component heights [mm].

6.4 Weight

With internal antenna:	18g
With antenna stub:	24g
With antenna on a cable:	39g

Chapter 7

Regulatory Information

7.1 Declaration of Conformity

We, **connectBlue AB**, of
Stora Varvsgatan 11 N:1
SE-211 19 Malmö, Sweden
declare under our sole responsibility that our product conforms to the following Product Specifications:

R&TTE Directive 1999/5/EC and EMC Directive: 89/336/EEC

ETS 300 826 and EN 300 328-2

Low Voltage Directive: 73/23/EEC

EN 61131-2

7.2 FCC

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 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

Labeling Requirements for End Product

For an end product using the OEM Serial Port Adapter or the OEM Bluetooth Enabler there must be a label containing, at least, the following information:

> This device contains
> FCC ID:PVH000501

The label must be affixed on an exterior surface of the end product such that it will be visible upon inspection in compliance with the modular approval guidelines developed by the FCC.

In addition, the user manual for the end product must contain the following information:

“This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”

RF-exposure statement

This mobile modular transmitter must have a separation distance of at least 20cm between the antenna and the body of the user or nearby persons.

With a separation distance of 20cm or more, the MPE limits are well above the potential this module is capable to produce.

Antenna

When using the module equipped with the “Coaxial cable antenna” or the “Stub antenna” the antenna is fixed and cannot be removed or replaced by the end user.

Caution

Any changes or modifications NOT explicitly APPROVED by connectBlue AB could cause the module to cease to comply with FCC rules part 15, and thus void the user’s authority to operate the equipment.