logic IO
The M2M Enabler

Technical Manual for the Bluetooth Smart-antenna

Version 1.07

Introduction

This manual contains technical documentation allowing easy installation and use of the Bluetooth Smart Antenna (BSA). For information on the software programming please refer to the RTCU IDE on-line help.

The BSA is an intelligent Bluetooth antenna, which adds Class 2 Bluetooth network support to certain RTCU X32 units. The BSA supports up to four simultaneously connections that allow connections to headset, printer, pc etc. without needing to close an existing connection. The BSA is easy to use through the dedicated functions in the RTCU IDE development software. The functions add support for network discovery/scan, inbound and outbound connections, and connection information such as signal level, address, type, name etc.

Two versions of the BSA are available for order and both supports Bluetooth **S**erial **P**ort **P**rofile (SPP)

Headset connection is available on the RT-O-BT1-MX2 so **H**ands-**F**ree **P**rofile **A**udio **G**ateway (HFP-AG) is easily used and installed on RTCU X32 units with headset connector.

Supported RTCU X32 units

Ordering information and supported RTCU X32 units.

RT-O-BT1-MX2	RT-O-BT1-DX4	RT-O-BT1-AX9
MX2i pro	DX4 pro	AX9 pro
MX2i pro+	MX2i pro (no audio)	
	MX2i pro+ (no audio)	

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Graphical view

RT-O-BT1-MX2

RT-O-BT1-DX4
RT-O-BT1-AX9

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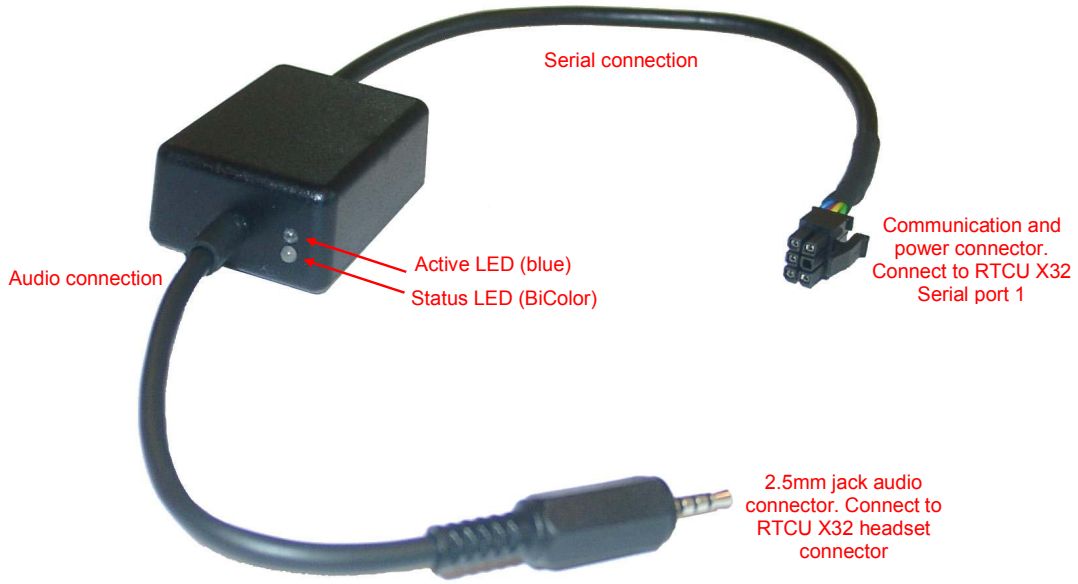
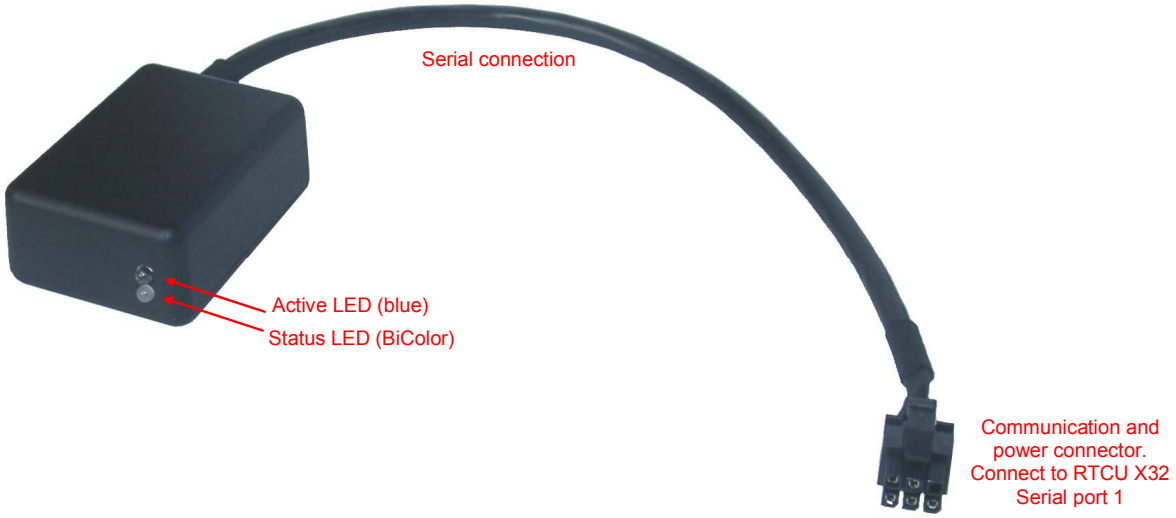
External connections

Connections to the RTCU X32 unit are very easy as only one connections is necessary, and the BSA is ready to be connected directly to the RTCU X32 unit at delivery.

The BSA is connected to the Serial Port 1 (service port on MX2i and DX4, Serial Port 1 on AX9) on the RTCU X32 unit.



RT-O-BT1-MX2



RT-O-BT1-DX4

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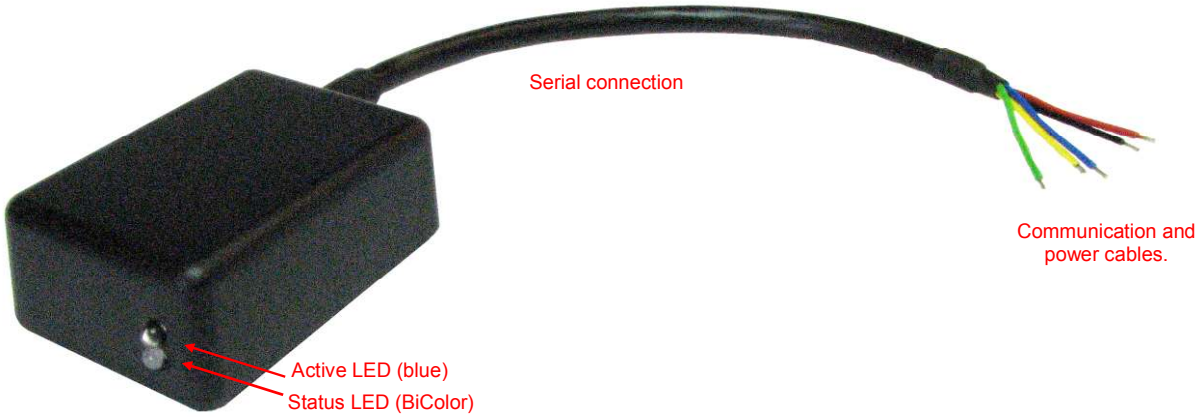

RT-O-BT1-AX9

Power supply

The BSA is supplied directly from the RTCU X32 unit via the DC-OUT pin in the service port connector / screw terminals. When the BSA is connected no other devices may be connected to the DC-OUT due its output current handling capabilities.

The BSA must be supplied with 3.3VDC.

Communication

Communication between the RTCU X32 unit and the BSA is via RS232. When the BSA receives data from a connected Bluetooth device, the data will be passed trough to the RTCU X32 unit, which will buffer the data until the application retrieves it. However, as the buffers in the RTCU X32 are limited, the application must retrieve the data as fast as possible; otherwise data will be lost – especially when large amount of data flows.

If a connection to a BSA device is poor, for example due long distance between the BSA and the device, the data transmission speed to the device will be lowered, as the data is re-transmitted. When this occurs the BSA will start to buffer the data until its internal buffers are filled. As this may happen during a call to a Bluetooth function from the application, the function will wait until the BSA buffers are ready again.
Please refer to the RTCU IDE online help for further information.

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Headset connector *(RT-O-BT1-MX2 only)*

The supplied cable comes with a 4-pole 2.5mm jack connector with standard Nokia pin-out. The connector can be inserted directly into supported X32 units with headset connector.

The BSA supports a single audio connection to for example a Bluetooth headset. The audio connection uses two of the four possible connections; one for control and one for audio.

The audio input and output are differential signals, and must be handled as such to suppress noise from GSM among others.

4 pin headset connector overview.

Pin	Name	Description
1	Out +	Audio output positive (microphone level)
2	In +	Audio input positive (speaker level)
3	Out -	Audio out negative (microphone level)
4	In -	Audio input negative (speaker level)

Installation

BSA modules are designed to make the installation easiest possible for the user. Following describes briefly how to connect the BSA to different supported RTCU units.

MX2i Pro/Pro+

There are two connection cables to the MX2i from the BSA; one 2,5 mm jack headset connector (RT-O-BT1-MX2 only), and one 6-poled tyco connector for supply and communication.

1. If an application program for using the BSA not already uploaded to the MX2i unit, be sure to choose the Serial Port 2 as alternative service port, as BSA will occupy the default service port.
2. Connect the jack headset male connector to the female jack connector on the MX2i
3. Connect the 6-poled tyco connector to the service port.

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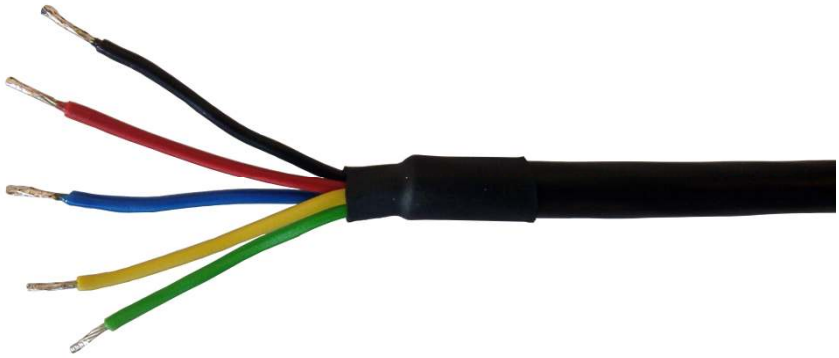
DX4 Pro

There is only one connection cable to the DX4 Pro from the BSA; 6-poled tyco connector for supply and communication.

1. If an application program for using the BSA not already uploaded to the MX2i unit, be sure to choose the Serial Port 2 as alternative service port, as BSA will occupy the default service port.
2. Connect the 6-poled tyco connector to the service port.

AX9 Pro

There is only one connection cable to the AX9 Pro from the BSA, but as there isn't any easy-to-plug connector at the end of the cable, each connection to the AX9 Pro needs to be made manually. Cables are color coded, and these colors will be used in the following description:



As seen on the above picture, there are 5 signals to be connected to the AX9 Pro. The cable colors and the signal names on the AX9 Pro are given in the following table:

Color	Signal Name
Black	SGND
Yellow	SER1_RXD
Blue	SER1_TXD
Red	DCOUT33
Green	DEV_DET

Connect the 5 colored cables to their respective labeled angled screw terminals as mentioned in the above table. Please refer to AX9 Pro Technical Manual to locate the terminals. As the cable length doesn't allow the module to be mounted outside of the enclosure, the recommended mounting location inside the enclosure is as following:

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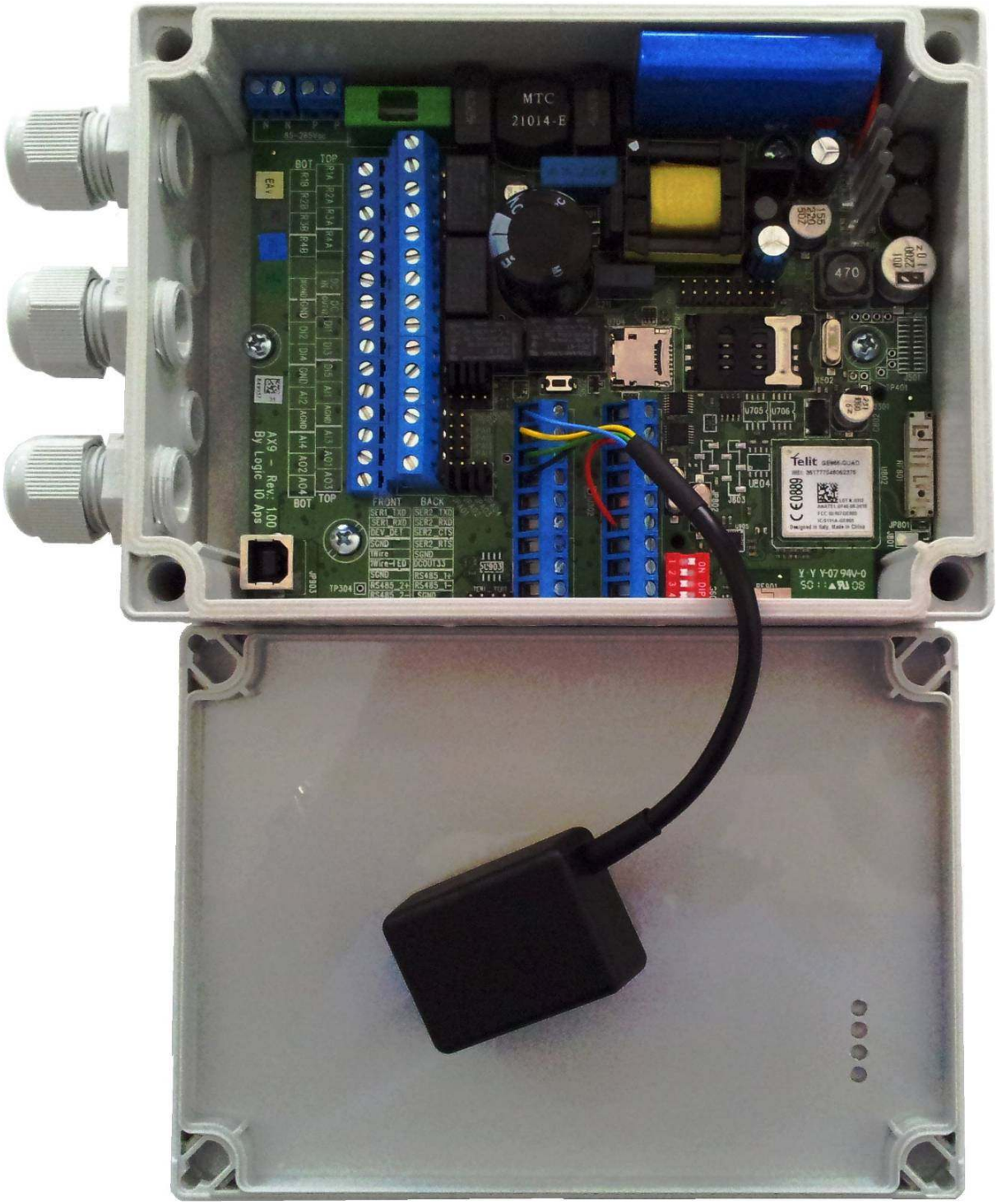

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Indicators (LED's)

The blue LED will indicate the BSA is active. It is connected to the TXD pin on the module. When no communication exists the LED is on and when heavy communication exists the LED will blink in short intervals.

The bicolor status-LED is can be controlled by the VPL application to indicate different states of the BSA. Please refer to the RTCU IDE online help for further information.

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Specifications for the Bluetooth Smart Antenna

Bluetooth					
Compliance	Bluetooth specification version 2.0 + EDR				
Class	2				
Profiles	SPP, HFP-AG				
Power supply	Min	Typ	Max		
Operating Voltage		3.3		VDC	
Current			130	mA	@3.3VDC
Storage temperature	-40	-	+85	°C	External interface: • Headset connector *(RT-O-BT1-MX2 only)* • RTCU X32 interface with supply and control • Activity LED (blue) • One user controllable Bi-Color LED
Operating temperature	-40	-	+85	°C	
Weight	25			g	
External dimensions	W 50 x H 20 x D 35 mm				
Enclosure	Black GP ABS material				

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