



# **BT4EX8M Evaluation Kit**

## **Application Notes**

**Version 1.0**

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# PREFACE

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**SAFETY** – Improper use of the OEM boards can lead to injury to persons or property and/or malfunction of the product. The BT4EX8M Evaluation Kit should only be repaired by authorized JAVAD GNSS warranty service center. Users should review and heed the safety warnings in Appendix A on page 17.

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## Regulatory 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.

“Changes or modifications not expressly approved by the manufacturer could void the user’s authority to operate the equipment”.

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

## WEEE Directive

The following information is for EU-member states only:

The use of the symbol indicates that this product may not be treated as household waste. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about the take-back

and recycling of this product, please contact your supplier where you purchased the product or consult.



## Technical Assistance

If you have a problem and cannot find the information you need in the product documentation, contact your local dealer. Alternatively, request technical support using the JAVAD GNSS World Wide Web site at: [www.javad.com](http://www.javad.com)

To contact JAVAD GNSS Customer Support use the QUESTIONS button available on the [www.javad.com](http://www.javad.com).





# INTRODUCTION

The Evaluation Kit is designed for use in laboratories and allows:

- JAVAD GNSS BT4EX8M Bluetooth module testing;
- evaluating all the features of BT4EX8M Bluetooth module;
- developing applications using BT4EX8M Bluetooth module.

The kit consists of:

1. BT4EX8M Test Board:

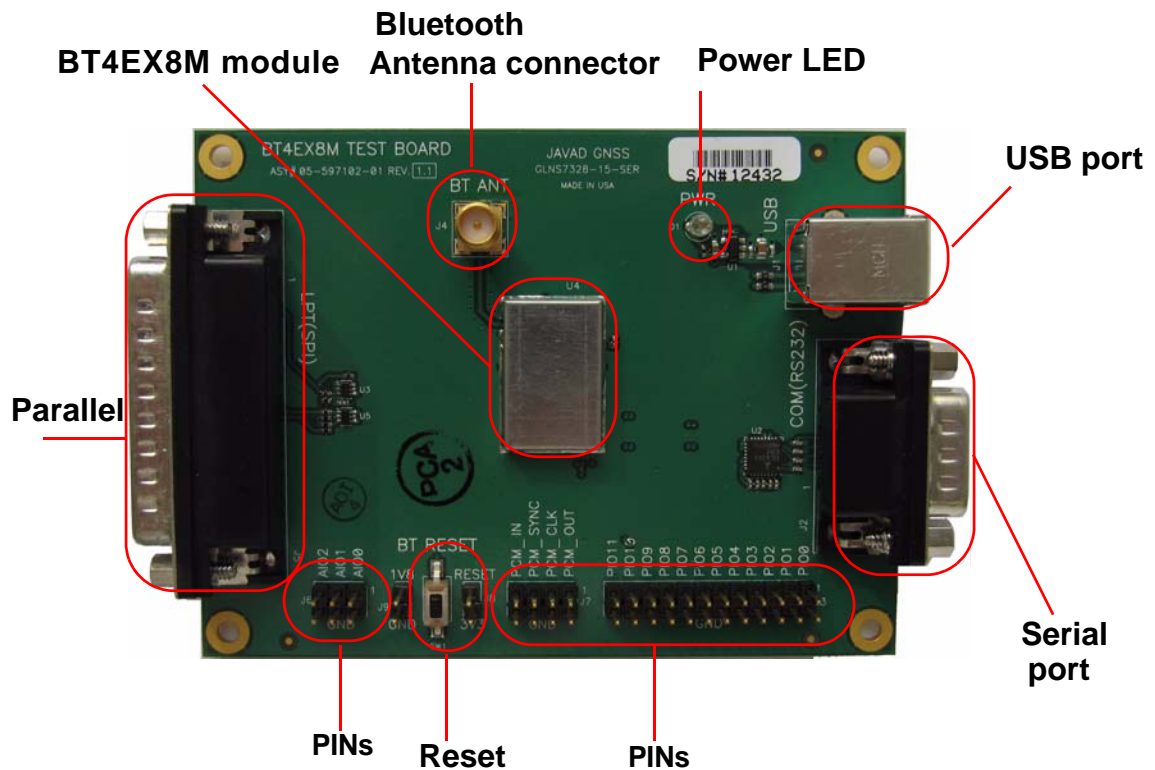


Figure 1-1. Test board

**Table 1-1. Test Board Pinout**

<b>PIN</b>	<b>I/O</b>	<b>PIN Type</b>	<b>Description</b>
AIO2	I/O	Bi-directional	Programmable input/output line
AIO1	I/O	Bi-directional	Programmable input/output line
AIO0	I/O	Bi-directional	Programmable input/output line
PIO0	I/O	Bi-directional with programmable strength internal pull-up/down	Control output for external LNA (if fitted)
PIO1	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO2	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO3	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO4	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line or optional BT_Priority/Ch_Clk output for co-existence signaling
PIO5	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line or optional BT_Active output for co-existence signaling
PIO6	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line or optional WLAN_Active/Ch_Data input for co-existence signaling
PIO7	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO8	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO9	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
PIO10	I/O	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line

## 2. Bluetooth Antenna:

**Figure 1-2. Bluetooth Antenna**

3. USB cable:



**Figure 1-3. USB cable**

4. DB9 Female - DB9 Female Serial Cable.



**Figure 1-4. DB9 Serial Cable**

5. Plug for USB AC Adapter:



**Figure 1-5. Plug for USB AC Adapter**

# CONNECTION

## 2.1. Powering the Evaluation board

The BT4EX8M Evaluation board can be powered in two ways, using USB cable:

1. When the board is connected to PC via USB cable no additional powering required;
2. When the serial or parallel connection to PC is used, power the test board using USB cable connected to plug, as depicted on Figure 2-1:

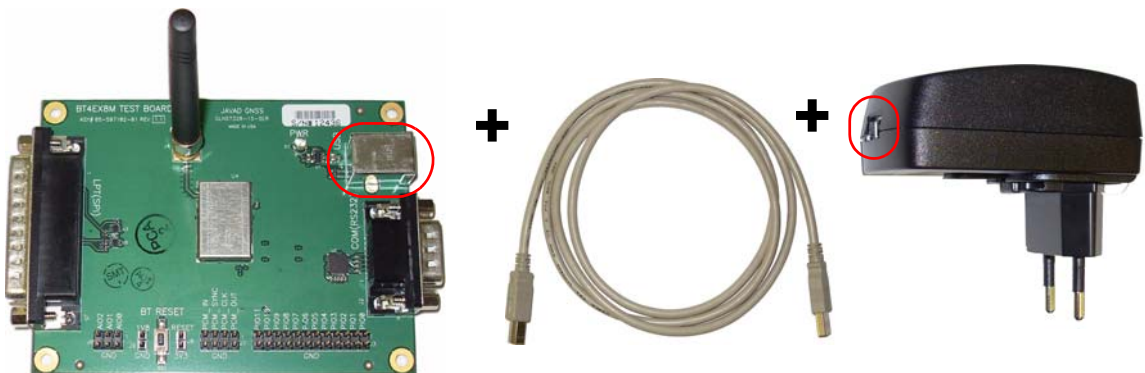


Figure 2-1. Powering

## 2.2. Bluetooth Antenna Connection

Connect the Bluetooth antenna to the Bluetooth antenna connector, as depicted on Figure 2-1.

## 2.3. USB Connection

A standard USB cable (included in Kit) may be used to connect PC USB port with USB port on adapter.

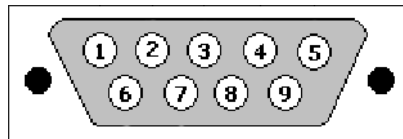
**Table 2-1. USB Connector Specification**

Pin	Signal Name	Dir	Description
1	5V_USB	I	+5 VDC Power Input
2	USB_D-	I/O	USB data minus
3	USB_D+	I/O	USB data plus
4	GND	-	Ground
5	GND	-	Ground

## 2.4. Serial RS-232 connection

A standard Null-Modem cable (included in Kit) with DB-9 Female connectors on both ends may be used to connect PC COM\_X port with Serial port on adapter.

Adapter’s DB-9 male connector external view and pinout is shown on the Figure 2-2.



**Figure 2-2. DB-9 Male connector**

**Table 2-2. DB-9 Male Connector Specification**

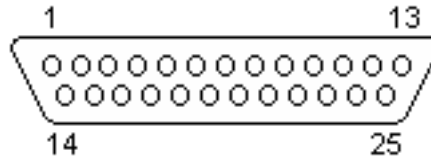
Pin	Signal Name	Dir	Description
1	N/C <sup>1</sup>	-	
2	RX_IN	I	RS232 data input
3	TX_OUT	O	RS232 data output
4	N/C	O	
5	GND	-	Ground
6	N/C	-	
7	RTS_OUT	O	RS232 request to send active low
8	CTS_IN	I	RS232 clear to send active low
9	N/C	-	

1. N/C - Not connected

## 2.5. Parallel connection

A standard parallel cable (not included in Kit) with DB-25 Female connectors on both ends may be used to connect PC LPT\_X port with LPT port on test board.

Test board's DB-25 male connector external view and pinout is shown on the Figure 2-2.



**Figure 2-3. DB-25 Male connector**

**Table 2-3. Connector Specification**

Pin	Signal Name	Dir	Description	Pin	Signal Name	Dir	Description
1	N/C <sup>1</sup>			14	N/C		
2	SPI_CSB	I	Chip select for Synchronous Serial Interface. Active low.	15	N/C		
3	N/C			16	N/C		
4	N/C			17	N/C		
5	N/C			18	GND	-	Ground
6	N/C			19	GND	-	Ground
7	N/C			20	GND	-	Ground
8	SPI_MOSI	I	Serial Peripheral Interface data input	21	GND	-	Ground
9	SPI_CLK	I	Serial Peripheral Interface clock	22	GND	-	Ground
10	SPI_MISO	O	Serial Peripheral Interface data output	23	GND	-	Ground
11	N/C			24	GND	-	Ground
12	N/C			25	GND	-	Ground
13	N/C						

1. N/C - Not connected

Please, refer to particular external device parallel port specification to select and use right Serial cable for proper connection.

## Connection

Parallel connection



# SAFETY WARNINGS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Clean only with a damp cloth.
- Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, or has been dropped.
- Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, shall be placed on the apparatus.

## **A.1. General Warnings**

This product should never be used:

- Without the user thoroughly understanding operator's manual.
- After disabling safety systems or altering the product.
- With unauthorized accessories.
- Contrary to applicable laws, rules, and regulations.

**DANGER: THE EVALUATION KIT SHOULD NEVER BE USED IN DANGEROUS ENVIRONMENTS.**

# WARRANTY TERMS

JAVAD GNSS electronic equipment are guaranteed against defective material and workmanship under normal use and application consistent with this Manual. The equipment is guaranteed for the period indicated, on the warranty card accompanying the product, starting from the date that the product is sold to the original purchaser by JAVAD GNSS' Authorized Dealers<sup>1</sup>.

During the warranty period, JAVAD GNSS will, at its option, repair or replace this product at no additional charge. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. This limited warranty does not include service to repair damage to the product resulting from an accident, disaster, misuses, abuse or modification of the product.

Warranty service may be obtained from an authorized JAVAD GNSS warranty service dealer. If this product is delivered by mail, purchaser agrees to insure the product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location and to use the original shipping container or equivalent. A letter should accompany the package furnishing a description of the problem and/or defect.

The purchaser's sole remedy shall be replacement as provided above. In no event shall JAVAD GNSS be liable for any damages or other claim including any claim for lost profits, lost savings or other incidental or consequential damages arising out of the use of, or inability to use, the product.

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1. The warranty against defects in JAVAD GNSS battery, charger, or cable is 90 days.



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