JAVAD JLink LTE Beacon OEM Receiver User Manual

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Preface

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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.

SCREEN CAPTURES

This manual includes sample screen captures. Your actual screen can look slightly different from the sample screen due to the receiver you have connected, operating system used and settings you have specified. This is normal and not a cause for concern.

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 sup-port using the JAVAD GNSS World Wide Web site at: **www.javad.com**
To contact JAVAD GNSS Customer Support use the QUESTIONS button available on the **www.javad.com**.

Description and Operation

INTRODUCTION

Marine Radiobeacon receiver (283.5 to 325 kHz) or Beacon receiver complies with Broadcast Standard for the USCG DGPS Navigation Service COMDTINST M16577.1. Beacon receiver is designed to receive pseudorange corrections transmitting by Radiobeacon stations. Maritime Radiobeacon DGNSS systems according to RTCM SC-104 version 2.3 are usually capable of broadcasting the following RTCM messages: 1, 2, 3, 5, 6, 7, 9, 15 (sel-dom), and 16. Radiobeacons are widely used throughout the world.
GNSS Radiobeacon transmissions meet stringent integrity and reliability requirements mandated by the International Association of Lighthouse Authorities.
The delivered product is a wireless system, which includes:

- Beacon Receiver – Beacon receiver OEM board;
- AWLaunch – Windows based Unit Configuration and Maintenance Software Application running on a IBM PC compatible computer and connecting to the device over RS-232 interface or USB- to-Serial adapter. The setting can be done through the built-in Command Line interface (CLI), or through the configuration and maintenance application software running either on PC – AWLaunch.

The diagnostic feature of the Beacon Receiver system provides the information to monitor and maintain user's communications link. The product is designed for maximum performance and reliability even in the hardest environments. Plug and play at its best, robust, withstanding the most adverse of conditions.

Media Access Control (MAC)
The following Media Access protocols are available for Beacon OEM Receiver modem:

1. Beacon protocols

2. Sleep mode1 is an investment provided by MAC sub-layer that provides additional power saving. The wakeup from Sleep mode is user selectable either by an internal real-time clock, or by an external controller through the data interface control lines (RTS or DTR), or by SLEEP input line (CMOS/TTL compatible input lines).

Management Tools
The built-in management tools along with AWLaunch (configuration and monitoring software application) will provide the following benefits: Easy user's interface for system configuration and monitoring using well developed CLI or intui- tive GUI. An ability to monitor status, alarms and radio performance through the intuitive GUI. Software upgrades and improvements can be downloaded from AWLaunch to the units connected with PC/PDA.

GENERAL DESCRIPTION

Serial Data Interface
The serial asynchronous interface allows connection to external serial devices through RS232 interface. It is shared between user data and unit's command/status information. The following options of serial port parameters are supported:

Parameter	**Options**
Baud rate	115200, 57600, 38400, 19200, 14400, 9600, 4800, 2400, 1200 bauds per second
Flow control	None, Hardware
Data bits	8
Stop bits	1, 2
Parity	None

Power Interface
The power interface allows connection to an unregulated DC power source. The DC power source (third party or user supplied) must provide DC power of 4.2V±5% DC.
Power Consumption
Power consumption of the Beacon OEM receiver at receiving mode is 1400 mW (refer to Table below for details).

Operating Mode / Description	**Consumption**
Maximum for Rx Full Operation Mode	1400 mW
Sleep Mode	300mW
Standby Mode, ordered by SLEEP input pin	500 mW

Antenna
The Beacon receiver should be used with 283.5 – 325 kHz antenna with following parameters:

- LNA Gain P30 dB
- LNA Noise Figure 1.5 dB

TECHNICAL SPECIFICATION

GENERAL SPECIFICATION

- Input Voltage: 4.2 V ± 5%
- PowerConsumption: <1W
- Temperature: Operation: -40 oF… 140 oF (-40 oC… +60 oC) Storage: -40 oF … 176 oF (-40 oC… +80 oC)
- Dimensions: 3.18 x 1.80 x 0.29/0.37 in (80.8 x 45.7 x 7.4/9.4 mm
- Weight: 0.090 lbs (41 g)

FEATURES

- DSP-Modem
- Multi-Modulation Technologies
- Zero-IF Technologies
- Up to 115200 bps Serial Interface
- Data Rate
- CompactDesign

EXTERNAL CONNECTORS

- J300 Beacon/GNSS RF Input Connector MMCX RIGHT ANGLE PCB JACK, AMPHENOL P/N 908-24100.
- Through the central pin of the connector J300 the power is being supplied to the antenna LNA. The internal power supply provides 4.2 V DC and max 0.2 A. If an antenna needs another voltage, the exter-nal power supply should be connected to the pin 10 of main connector J1. If jumper R117 is installed, the an-tenna supply voltage through the central pin of J300 is equal to the external voltage applied to this pin. The external voltage should be in range +5 … +15 VDC and the current is less than 0.2 A.

MAIN CONNECTOR

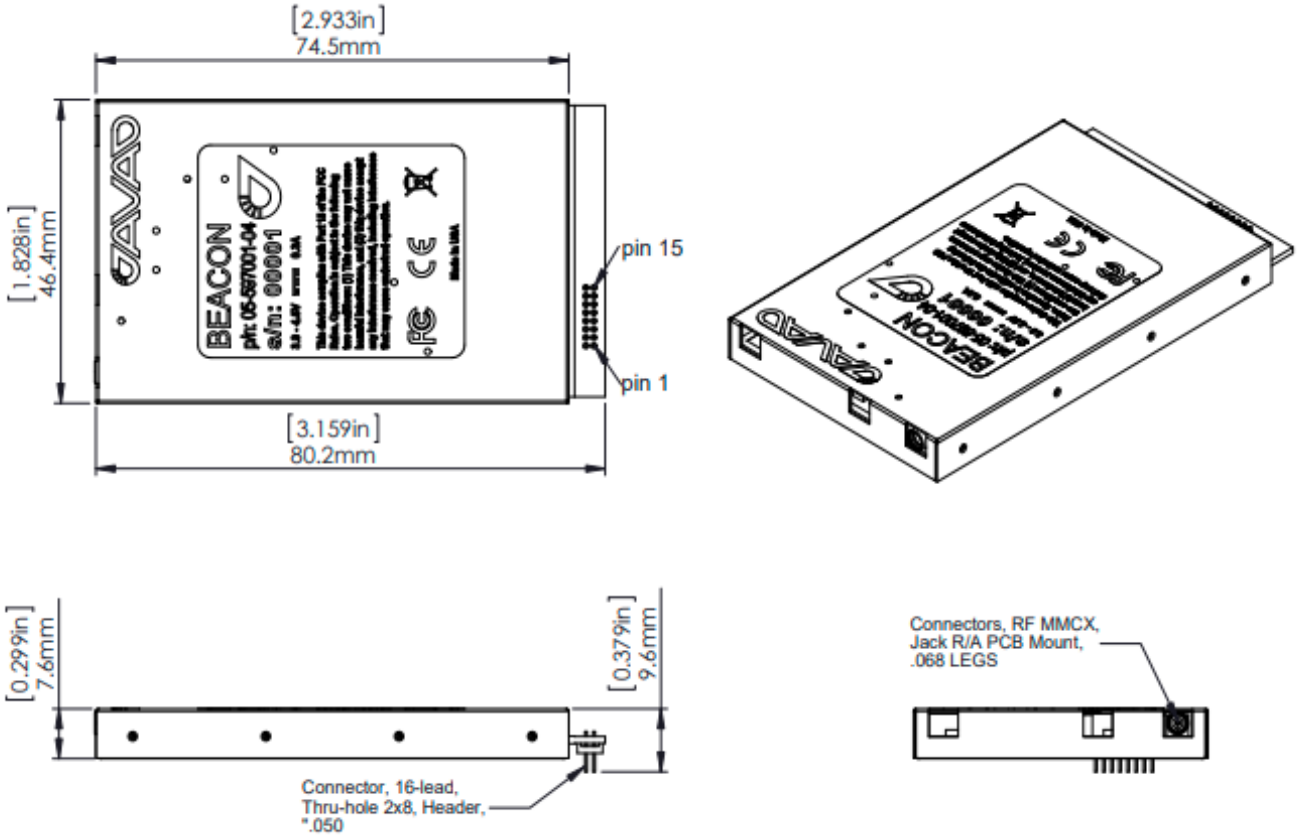
- Main Connector – 285209LF CONN, 16LEAD, HEADER, 5.84CONT COMM CON INC 3913-16G2

BEACON RECEIVER SPECIFICATION

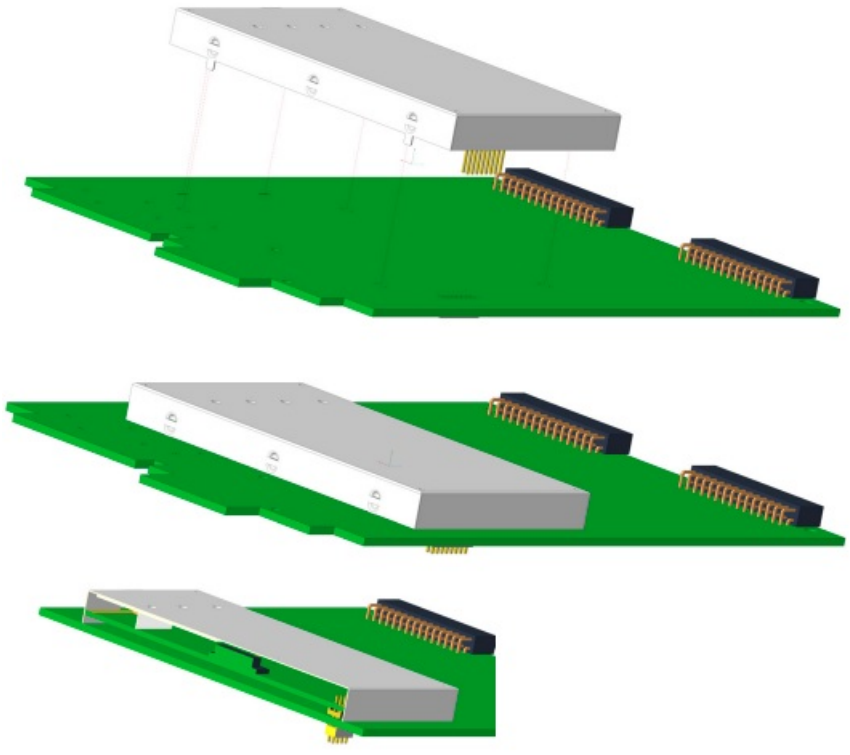
- Frequency Range: 283.5 – 325 kHz
- Channel Spacing: 500 Hz
- Bit Rates: 50, 100, 200 bps (manual or Auto selection)
- 2-channel, parallel operating
- Manual/automatic Operation Mode
- Adjacent Channel Rejection: 65 dB ± 1 dB @ for± 400 Hz
- Cold Start Time <1 min
- Warm Start Time <2 seconds
- Modulation: Minimum Shift Keying (MSK)
- Sensitivity: 1.5 µV/m
- Dynamic Range: 100 dB
- Frequency Offset: ± 0.5 Hz (~ 1.5 ppm)

- Correction Output Protocol RTCM SC-104

Dimensions



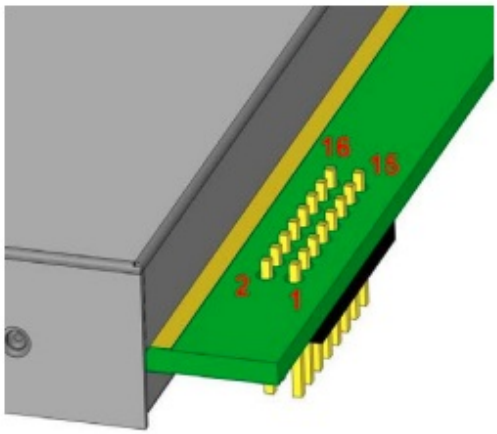
HOW TO INSTALL BEACON OEM RECEIVER



Lead Header Connector Pinout

Pin #	Signal desig- nator	Signal name	I/O	Description	Description
1	GND	GND	–	Ground	Signal and Chassis Ground
2	DSP UART 1	TXD	TTL Input	Transmitted Data	Serial Data Input
3	DSP UART 2	RXD	TTL Output	Received Data	Output for received serial data
4	DPORT5	DTR or DP/ MP	TTL Input	Data Terminal Ready	Control line can be used as a backup method for entering Command mode: (0V) – Maintenance Mode; (3.3V) – Data Mode An internal 100K pull-up enables Data Mode if this signal is left unconnected. Maintenance Mode is also accessible by transmitting an escape sequence.
5	DPORT1	CTS	TTL Output	Clear to Send	Used to control transmit flow from the user to the radio: (0V) – Transmit buffer not full, continue transmitting (3.3V) – Transmit buffer full, stop transmitting
6	TTLI1	SLEEP	TTL Input	Sleeps/wakes radio Receive only	In sleep mode, all radio functions are disabled consuming less than 50µA. An internal 10K pull-down wakes up the radio if this signal is left unconnected. At wake up, any user programmed configuration settings are refreshed from flash memory, clearing any temporary settings that may have been set: (3.3V) – Sleep Radio; (0V) – Wake Radio As an option could be used as TTL Input Line 1.
7	DPORT3	MDM_GRN	TTL Output	Data Carrier Detect	Used by remotes to indicate that the remote has success- fully acquired the signal from base station: (0V) – Carrier detected (synchronized) (3.3V) – No carrier detected (not synchronized)
8	DPORT4	RTS	TTL Input	Request to Send	Gates the flow of receive data from the radio to the user on or off. An internal 10K pull-down enables data receive if this signal is left unconnected. In normal operation, this signal should be asserted: (0V) – Receive data (RxD) enabled (3.3V) – Receive data (RxD) disabled

9	DPORT2	DSR	TTL Output	Data Set Ready	Used to control transmit flow from the user to the radio: (0V) – Receive buffer has data to transfer; (3.3V) – Receive buffer is empty
10	ANT_DC	ANT_DC	Power Input	External Power for Antenna LNA	External Power for Antenna LNA +5…+15 V DC
11	TTLO1	TTLOUT1	TTL Output	TTL Output Line 1	Reserve line
12	TTLO2	TTLOUT2	TTL Output	TTL Output Line 2	Reserve line
13	GND	GND	–	Ground	Signal and Chassis Ground
14	TTLI2	TTLIN	TTL Input	TTL Input line	An internal 100K pull-up resistor is applied.
15	VCC42	PWR	External	Power Supply	Regulated positive 4.2V DC from ext. Power Supply.
16	VCC42	PWR	External	Power Supply	Regulated positive 4.2V DC from ext. Power Supply.



COMMAND LINE INTERFACE

The built-in user-friendly Command Line Interface (CLI) allows user to perform a full configuration of the unit and read the statistics and alarm status. It is the most powerful tool to configure the unit. It makes changes to all possible settings that system will not be able to determine automatically.
The CLI commands allow user to configure and reconfigure the unit's settings. The user configuration parameters that could be changed through the CLI are:

- Data Port Settings
  - Baud Rate
  - Flow control (None or RTS/CTS)
  - Stop bits
- Alarm Settings1

- Radio operation modes
- Scanning modes
- Sleep modes2
    - On/Off
    - Activate by internal real-time clock
    - Activate through RTS/CTS lines
    - Activate by external sense lines
    - Activate by any combination of the parameters mentioned before

Note: The unit's configuration that is set or modified through the CLI will be lost after unit's reboot, unless the saving operation is used to store a new setting in the unit's configuration file. The CLI commands also provide filing operations, which include:

- Downloading
    - Unit's Configuration files
    - Software Images
- Uploading Unit's Configuration files
- Saving into the configuration files the configuration parameters modified through the CLI.

Command Line Interface Convention

The following convention is implemented in Beacon Receiver Command Line Interface (CLI):

- The Carriage Return/Line Feed (CR/LF, 0x0D/0x0A) is a command delimiter.
- The Carriage Return/Line Feed (CR/LF, 0x0D/0x0A) is a reply delimiter followed by the "CLI>"
- prompt if Echo option is On.
- The Carriage Return/Line Feed (CR/LF, 0x0D/0x0A) is a reply delimiter if Echo option is Off
- (default option).
- The 2-digit number followed by "@" in the unit's reply indicates the error code (refer to Table 3-
- 1 for description).
- A successfully performed command is replied by @00 code for both Echo ON and OFF modes.
- A command with the certain [Parameter Name] and blank [Parameter List] displays the current settings for a given parameter.
- To set the mode ordered by CLI commands as permanent User Setting (the setting automatically selected for the boot-up unit) the SAVE command must be asserted.
- [/?] orders to show the help information for the given command.
- Commands are not key sensitive; small, none capital characters can be used to enter CLI commands.

Error Code	Short Description
0x01	Command Syntax Error. A command followed by “/?” displays a command usage.
0x02	The parameter has a format error. A command with the certain [Parameter Name] fol- lowed by “/
?”	displays the format and range of the variable.
0x03	The parameter is out of allowed range. A command with the certain [Parameter Name] followed by “/?” displays the format and range of the variable.
0x04	The command is not valid for specific radio model. To display the list of available com- mands,t he HELP command must be used (see “Software Switching to Maintenance Mode”).
0x05	Unspecified Error

SOFTWARE SWITCHING TO MAINTENANCE MODE
To switch to Maintenance mode the special byte-sequences with special meanings are used:

- Escape-Sequence: “+++” with 20 ms guard time before and after the command characters
- Escape-Acknowledge: “@00<CR><LF>” 20 ms toggling on CTS control line needed to acknowledge switching from Data to Maintenance mode and vice versa. In Maintenance mode, the unit’s serial port must keep CTS line always active.

Happy Flow

1. In data-mode the unit starts looking for the Escape-sequence if there is no data from DTE for more than 20 ms (Start Guard Time).
2. If the unit detects the Escape-Sequence:
   The Receiver immediately stops forwarding to DTE the data received over the air and buffers it instead.
3. The radio unit waits for 20 ms and then sends Escape-Acknowledge to DTE if there is no data from DTE during 20 ms of Stop Guard Time.
4. The unit goes to Maintenance mode and discards Escape-Sequence from input buffer. The modem is immediately ready to receive commands. At the same time it continues buffering the data received over the air since step 2.

HARDWARE SWITCHING TO MAINTENANCE MODE
As alternative to Software Switching, the switching through the MP/DP control line can be used (this control line can be also used as Data Terminal Ready, DTR). To set Maintenance mode, the DTE must assert DTR signal active (0v level). By falling edge of DTR signal the unit goes to Maintenance mode and then sends Escape-Acknowledge to DTE („@00<CR><LF>“).
20 ms toggling on CTS control line followed by Escape-Acknowledge response is needed to acknowledge switching from Data to Maintenance mode and vice versa. In Maintenance Mode, the unit’s serial port must keep Clear to Send (CTS) line always active.

Note: The powered up radio modem always goes to data mode.

SWITCHING TO DATA MODE

- DTE sends the CLI command „DATAMODE<CR><LF>“to the unit.
- Unit immediately goes to data mode without Escape Acknowledge.
- If no valid CLI commands received from DTE within 1 minute, the unit will automatically switch back to data-mode.

Note: The data received over the air could be lost due to Rx buffer overflow if the unit stays in Maintenance mode longer than 15 seconds.

Networking Commands

LINK
The LINK command is responsible for configuring ra-dio’s operation mode. It has parameters listed below. LINK [Parameter Name] [Parameters List] [/?]

Parameter Name	Parameter List
CHAN	Sets/gets the current frequency channel num- ber. Up to 32 channels are availa ble in the channel map (example LINK CHAN 24). Refer to MAP command about creating and modifying the channel map.
SIGTYPE	Sets/gets the signal type 1 – 100 bps 2 – 200 bps 3 – 50 bps

MAP
The MAP command is used to create, modify and save the frequency channel map of the Beacon receiver.
MAP [C<Parameter>][F<Parameter>][SAVE]

Parameter Name	Parameter List
C	Channel number (1- 32)
F	Carrier frequency in Hz
SAVE	Saves the channel map

The MAP command without parameters displays the channel map of the active receiver.:
Example:
MAP c1 F314000 – sets the 314 kHz frequency to channel number 1;
MAP SAVE – saves the channel map.
SCAN
The SCAN command is used to set/configure scan-ning modes. For Automatic scanning mode it is possi-ble to select the Frequency scanning and Signal type scanning criteria.
SCAN [Parameter Name] [Parameters List]

Parameter Name	Parameter List
MODE	Sets/gets the scanning mode 0 – Manual 1 – Automatic Refer to “Beacon scanning modes” for scan- ning modes description.
FREQ	Sets/gets the frequency scanning criterion 1 – Full range scanning with 500 Hz s tep 2 – Channel map scanning Parameter FREQ is available for Automatic scanning mode only.
SIGTYPE	Sets/gets the signal type scanning mode 1 – 100 bps signals are scanned 2 – 200 bps signals are scanned 3 – 50 bps signals are scanned 4 – All signal types (200 bps, 100 bps, 50 bps) are scanned Parameter SIGTYPE is available for Automatic scanning mode only.
ALMANAC	Returns the Almanac table of available Beacon reference stations scanned by s econd (Slave) Beacon receiver. Each line of the table contains information (Freq uency, RSSI, Signal type, Ref- erence station ID) about one Beacon reference s tation. The following is the structure of the Al- manac table’s line: <Frequency in Hz> <TAB> <RSSI in dBm> <TAB> <Signal type> <TAB> <REF Station ID> <CR> <LF>

BEACON SCANNING MODES

Beacon has the following two scanning modes:

1. Automatic (searching Beacon reference stations) In this mode two independent Beacon channels start cooperative searching of Beacon reference stations using the selected criteria in 1.1 and 1.2. Each found reference station is recorded in the Almanac table where the following parameters of found station are specified: frequency, signal type, RSSI and Reference station ID. The RSSI parameter is recorded to determine the station providing the best RTCM signal. If no Beacon reference station is available the searching cycle is continued until one reference station is found.
   The Master Beacon locks to the first found reference station and starts RTCM data demodulation while the Slave Beacon continues searching in the background. If a synchronization loss occurs on Master Beacon then it switches to the best
   RTCM signal (which has the highest RSSI) from the list of Beacon reference stations recorded by Slave Bea-

con.

The following are the Beacon reference station searching criteria used in the algorithm of Automatic scanning mode.

Frequency scanning criteria

• Full range scanning with 500 Hz step – full fre-quency range is scanned with 500 Hz step (83 steps in the range from 283.5 kHz to 325 kHz);

• Frequency map scanning – only the frequencies defined in the frequency map are scanned.

Signal type scanning criteria

• All – On each step of frequency scanning all sig-nal types are scanned (200bps, 100bps, 50bps)

• 200 bps – only 200 bps signals are taken into ac-count;

• 100 bps – only 100 bps signals are taken into ac-count;

• 50 bps – only 50 bps signals are taken into ac-count.

Note:

If in Automatic scanning mode the frequency channel or signal type is selected (by LINK CHAN and LINK SIGTYPE com-mands correspondingly) then the scanning mode is switched to Manual by the firmware automatically.

2. **Manual**

In this mode operator specifies the frequency (in the range from 283.5 kHz to 325 kHz) and signal type (200 bps, 100 bps or 50 bps) for Master Beacon to tune. The Slave Beacon performs Full range scanning for all sig-nal types and fills the Almanac table in parallel.

ANTENNA
The ANTENNA command is used to set the antenna power state of the external connector.
ANTENNA [Parameter Name] [Parameters List] [/?]

Parameter Name	Parameter List
POWER	0 – Switches off the antenna power on connector 1 – Switches on the antenna power on connector

Serial Interfacing Commands

- **ALARM**

  The ALARM command is intended to set up the alarm indication mode and alarm control lines' behavior.

  ALARM [Parameter Name] [Parameters List] [/?]

Parameter Name	Parameter List
TTL1	0 – TTL_OUT1 = logic “1” 1 – TTL_OUT1 = TTL_IN, received from remote unit (default settings)
TTL2	0 – TTL_OUT2 = logic “1” 1 – TTL_OUT2 = TTL_IN2, received from remote unit (default settings) 2 – TTL_OUT2 = SYNC Loss

- **BOOT**

  The BOOT command is intended to reboot the unit using selected user settings.
- **HELP**

  The HELP command types the list of all available commands:

  HELP – Display this usage

  XMOD – Activate X-Modem Protocol

  BOOT – Reboot the unit

  LINK – Set RF Link Operation Mode

  SCAN – Set scanning options and criteria PORT – Set Data Port Configuration

  STATE – Display Status and Statistics SAVE – Save Current Configuration into Con-figuration File

  INFO – Display Product ID along with Hard-ware/Software Versions

  MAP – Operate with Channel Map

  ANTENNA – Set the State of antenna power

  and selects the RF connector

  for Beacon receiver

  DATAMODE – Exit Command Mode COMMAND /? – Display Command Usage
- **SAVE**

  The SAVE command is intended to store the unit’s currently used configuration into the User Configuration file. The configuration stored in the User Configuration file is used for next boots.
- **SLEEP**

  The SLEEP command determines the sleep mode pa-rameters. The sleeping Beacon OEM Receiver can be activated by real-time CLK, DTR/RTS lines, and command received through TTL inputs. The user can select one, two, or all three conditions.

  SLEEP [Parameter Name] [Parameters List] [/?]

Parameter Name	Parameter List
CLK	0 – Do not activate by internal real-time clock (1 – 255) – Activate by internal real-time clock after 100 to 25500 msec of sleeping
HW	0 – Do not activate through DTR/RTS lines 1 – Activate through DTR/RTS lines
TTL	0 – Do not activate by external sense lines 1 – Activate by external sense lines
GTS	0 – Disable Sleep mode (default) (1 – 255) – Go to sleep mode if there is no activity in 10 to 2550 msec Example: SLEEP GTS 100 (go to sleep if there is no activity in 1000 ms)

Diagnostics and Identification Commands

INFO
The INFO command is used to retrieve the Radio ID along with its Hardware version, the loaded realtime software version/revision and BootLoader's version/revision.
INFO [Parameter Name] [Parameters List] [/?]

Parameter Name	Parameter List
ID	Retrieves the device identifier.
SN	Retrieves the serial number of the modem (unique for each unit).
HW	Retrieves the version string of the hardware. 1.0 – hardware version in numeric "Major.Minor" format
SW	Retrieves the version string of the current firm- ware. Ver. 1.0 Rev. A – displays software's version in numeric "Major.Minor" format an d revision in numeric format (range from 01 to 99) for engi- neering releases an d alphabetic format (A to Z) for manufacturing engineering releases and alphabetic format (A to Z) for ma nufacturing re- leases.

Parameter Name	Parameter List
BL	Retrieves the version string of the BootLoader. Ver. 1.0 Rev. A – displays BootL oader's version in numeric "Major.Minor"format and revision in numeric format (r ange from 01 to 99) for engi- neering releases and alphabetic format (A to Z) for manufacturing releases.

The INFO command without Parameter Name indi-cates all values:
Beacon Receiver
Product ID = 69
S/N = 000000 020303
Hardware = Ver 3.1
Software = Ver. 1.8 Rev 05
BootLoader = Ver. 3.0 Rev. 02
STATE
The STATE command is used to check the wireless link state of the Beacon receiver.
STATE [Parameter Name] [Parameters List] [/?]

Parameter Name	Parameter List
RSSI	RSSI Retrieves the calculated received signal level in dBm.
SYNC	SYNC Indicates the synchronization status: 0 – no synchronization 1 – synchronization established
FREQ	Retrieves the current channel frequency in Hz.
FREQOFFSET	Retrieves the tuned frequency offset relative to the set frequency after the synchronization established.
SYMRATE	Retrieves the current symbol rate.
TEMP	-30oC to +100oC retrieves the temperature in- side enclosure.

Safety Warnings

Read these instructions.

- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Clean only with a damp cloth.
- Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radia-tors, 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.
- 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.

GENERAL WARNINGS
This product should never be used: Without the user thoroughly understanding operator's manual.

- After disabling safety systems or altering the prod-uct.
- With unauthorized accessories.
- Contrary to applicable laws, rules, and regulations. DANGER: THE AW400TX SHOULD NEVER BE USED IN DANGEROUS ENVIRONMENTS.

Warranty terms

JAVAD GNSS Inc. ("Company") warrants, to the end-user only, that the Narrow Band Radio Modems ("Radios") purchased (a) conforms to the Company's published specifications for the model purchased, and (b) is free from defects in material or workman-ship.
The duration of this warranty is twelve (12) months from date of purchase and any claim for breach of warranty must be brought to the Company's attention within such twelve (12) month period and the Receiver must be returned for action on any such claim within twelve (12) months
from the date of purchase.

Within a reasonable period of time after a claim, the Company will correct any failure of the Radio to conform to specifications or any defect in materials or workmanship, or replace the Radio, or, at its option, provide a full refund of the purchase price. A repaired or replaced product is war-ranted for 90 days from the date of return shipment to the buyer, or for the balance of the original warranty period, whichever is longer.

These remedies are the buyer's exclusive remedies for breach of warranty.
To obtain warranty service, the buyer must return the Radio, postage-paid, with proof of the date of original purchase and the buyer's return address to the Company or an authorized service center. The Company will not be responsible for any loss or damage to the product incurred while it is in transit or is being shipped for repair. It is the buyer's responsibility to arrange for insurance, if the buyer so desires.

The Company does not warrant (a) any product, components or parts not manufactured by the Company, (b) defects caused by failure to provide a suitable installation environment for the Radio, (c) damage caused by disasters such as fire, flood, wind, and lightning, (e) damage caused by unauthorized attachments or modification, (f) damage during shipment,(g) any other abuse or misuse by the buyer, (h) that the Radio will be free from any claim for infringement of any patent, trademark, copyright or other proprietary right, including trade secrets.
THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUD-ING BUT NOT LIMITED TO THE IMPLIED ARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR

PURPOSE, AND IF APPLICABLE, IMPLIED WARRANTIES UNDER ARTICLE 35 OF THE UNITED NATIONS CON-VENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS. IN NO CASE SHALL THE COMPANY BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAG-ES ARISING DIRECTLY OR INDIRECTLY OUT OF THE OWNERSHIP, USE OR OPERATION OF THE RADIO RE-GARDLESS OF WHETHER SUCH DAMAGES ARE PRED-ICATED OR BASED UPON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT, OR ANY OTHER LEGAL THEORY.

SUCH DAMAGES IN-CLUDE, BUT ARE NOT LIMITED TO, LOSS OF PROF-ITS, LOSS OF SAVINGS OR REVENUE, LOSS OF USE OF THE RADIO OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF ANY SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICES, THE CLAIMS OF THIRD PAR-TIES, INCLUDING CUSTOMERS AND INJURY TO PROP-ERTY. THIS LIMITATION DOES NOT APPLY TO CLAIMS FOR PERSONAL INJURY. SOME STATES DO NOT AL-LOW LIMITS ON WARRANTIES, OR ON REMEDIES FOR BREACH IN CERTAIN TRANSACTIONS. IN SUCH STATES, THE LIMITS IN THIS PARAGRAPH AND THE PRECEDING PARAGRAPH MAY NOT APPLY.

No employee of the Company, or any other party, is authorized to make any warranty in addition to those made in this document. This warranty allocates the risks of product failure between the Company and the buyer. This allocation is recognized by both par-ties and is reflected in the price of the goods.

The buyer acknowledges that it has read this warranty, understands it, and is bound by its terms. This lim-ited warranty is governed by the laws of the State of California, without reference to its conflict of law pro-visions or the U.N. Convention on Contracts for the International Sale of Goods.
with a hardware device

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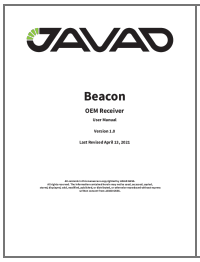
Documents / Resources

	JAVAD JLink LTE Beacon OEM Receiver [pdf] User Manual JLink LTE, Beacon OEM Receiver

References

- JAVAD GNSS
- JAVAD GNSS