900 Rock Avenue, San Jose, CA 95131, USA

JLink LTE

User Manual

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Regulatory Information

The following sections provide information on this product's compliance with government regulations.

FCC Class B Compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

This device may not cause harmful interference, and this device must accept any interference received, including interference that may cause undesired operation.

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 residential installations. 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 interference to radio or television equipment 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.

Move the equipment away from the JLink LTE.

Plug the equipment into an outlet on a circuit different from that to which the unit is powered.

Consult the dealer or an experienced radio/television technician for additional suggestions.

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void your authority to operate such equipment.

Canadian Emissions Labeling Requirements

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

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.

Screen Captures

This manual includes sample screen captures. Your actual screen can look slightly different from the sample screen due to the unit 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 support 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

JLink LTE is a family of devices designed for organizing a local network between different devices via WiFi, Ethernet, and Bluetooth, connecting to the Internet using 4G cellular digital communication services.

JLink LTE provides a robust solution linking the field GNSS equipment to RTN, where no cell phone cover is available. JLink LTE devices may contain 1 W either UHF (406 to 470 MHz) or VHF (138-174 MHz), or ISM license free USA band (902-928 MHz) and European CEPT license free (868-870 MHz) radio transceiver. Marine Radiobeacon receiver (283.5 to 325 kHz) can be built-in into JLink LTE device.

JLink LTE can be configured and supported using web-interface through Internet, and this makes the setup mechanism simple and accessible from anywhere in the world.

JLink LTE LED Functionality

The table below describes the LED indicators and device state:

<table>
<tr><th>LED</th><th>Symbol</th><th colspan="9">Device State</th></tr>
<tr><td rowspan="3">POWER/BAT</td><td rowspan="3"></td><td colspan="3">External Power ON</td><td colspan="6">External Power OFF</td></tr>
<tr><td colspan="2">BAT Charged</td><td colspan="2">BAT Half</td><td>BAT Empty</td><td colspan="2">BAT Full</td><td colspan="2">BAT Half</td><td>BAT Empty</td></tr>
<tr><td colspan="2"></td><td colspan="2"></td><td></td><td colspan="2">BLINK</td><td colspan="2">BLINK</td><td>BLINK</td></tr>
<tr><td rowspan="5">UHF</td><td rowspan="5"></td><td colspan="4"></td><td rowspan="2">Error</td><td colspan="2">RX</td><td colspan="2">TX</td></tr>
<tr><td colspan="2">TR and RX</td><td colspan="2">TX</td><td colspan="2">RX</td><td colspan="2">TX</td></tr>
<tr><td colspan="2" rowspan="3">SEARCH</td><td colspan="2" rowspan="3"></td><td rowspan="3"></td><td colspan="2">LOW RSSI
(< -90 dBm)
(BLINK)</td><td colspan="2">LOW OUTPUT POWER
(<20dBm)
(BLINK)</td></tr>
<tr><td colspan="2">MIDDLE RSSII
(-90 .. -50dBm)
(BLINK)</td><td colspan="2">MIDDLE OUTPUT
POWER(20..27dBm)
(BLINK)</td></tr>
<tr><td colspan="2">HIGH RSSI
(> -50 dBm)
(BLINK)</td><td colspan="2">HIGH OUTPUT
POWER(27dBm)
(BLINK)</td></tr>
<tr><td rowspan="4">GSM</td><td rowspan="4"></td><td colspan="4"></td><td>Error</td><td colspan="4">Active</td></tr>
<tr><td colspan="4">REGISTRATION</td><td rowspan="3"></td><td colspan="4">2G (BLINK)</td></tr>
<tr><td colspan="4">2G</td><td colspan="4">3G (BLINK)</td></tr>
<tr><td colspan="4">3G</td><td colspan="4" rowspan="2">4G (BLINK)</td></tr>
<tr><td colspan="4">4G</td></tr>
<tr><td rowspan="4">BT/WIFI</td><td rowspan="4"></td><td colspan="4" rowspan="2">BT</td><td colspan="5">WIFI</td></tr>
<tr><td colspan="3">Client</td><td colspan="2">Access Point</td></tr>
<tr><td></td><td>Error</td><td>Active</td><td></td><td>Error</td><td>Active</td><td></td><td>Error</td><td>Active</td></tr>
<tr><td></td><td></td><td>BLINK</td><td></td><td></td><td>BLINK</td><td></td><td></td><td>BLINK</td></tr>
</table>

LED indication

Installation

1. Connect Bluetooth and GSM antennas to JLink LTE as shown on the picture below.

2. Connect JLink LTE to external power supply (10...30 V).

3. Insert SIM card to the SIM card slot and SD card to the SD card slot.

Figure 1. Card installation

4. Plug in LAN cable if you would like to use Ethernet connection to connect to Internet.

5. Plug in COM PORT cable if you would like to use CLI interface to communicate with device.

Setup and Configuration

1. Turn on power of JLink LTE.

2. Wait for complete loading. When it is complete, Power LED will blink.

3. Connect to the device and configure it using web-browser.

Connection can be established in one o the following ways:

- via Bluetooth interface: the device (PC, handheld/pad) should be with Bluetooth interface with PAN profile support. JLink LTE Bluetooth-interface is in visibility mode, has the name “Jlink LTE” and PIN code 0000. When connection is established open the web-browser and enter the address 10.1.11.1:8080.
- via WiFi interface: The device (PC, handheld/pad) should be with WiFi interface. JLink LTE WiFi-interface has the name “Jlink LTE” and password “testtest”. When connection is established open the web-browser and enter the address 10.1.10.1:8080.
- via Ethernet: JLink LTE LAN static IP adress is 192.168.0.200 and network mask is 255.255.255.0. On the PC connected to the same LAN, open the web browser and enter the address 192.168.0.200:8080. The dialog window appears with login/password request. Enter login and password (jlink/jlink).

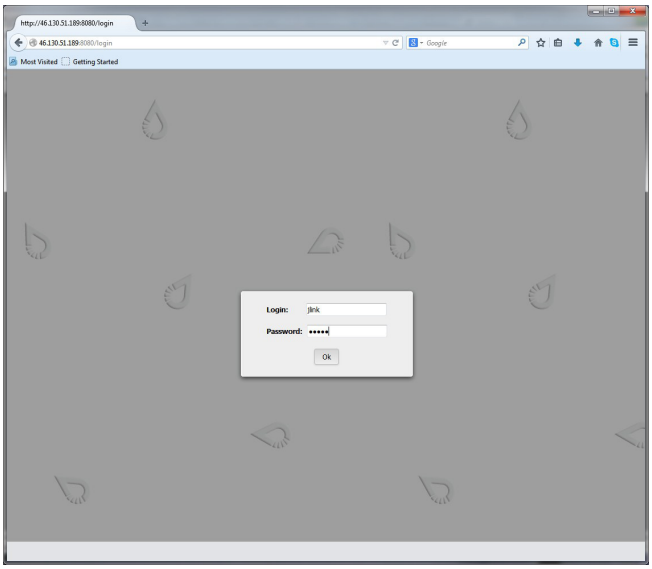


Figure 2. Login and password entering

Thereafter the device is ready for setup and configuration.

4. Select the interface which will be used to connect to Internet and configure it. The following interfaces are available:

Ethernet: Configure Ethernet interface in the Communication/LAN tab. Set the network parameters and reboot the device using Reboot button in the Administration/Management tab see figure below.

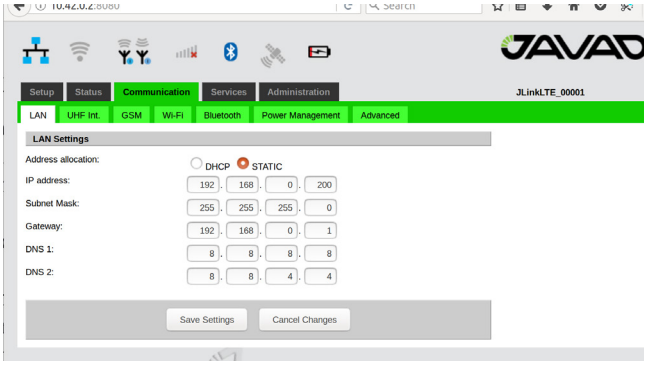


Figure 3. LAN configuration tab

GSM/LTE/4G: Configure this interface using Communication/GSM tab. Set the APN parameters (if necessary) and select the SIM-card slot. In the Communication/Power Management tab activate the interface and wait for registering in the network and Internet access availability. More detailed connection status you can check in Status/GSM tab see below.

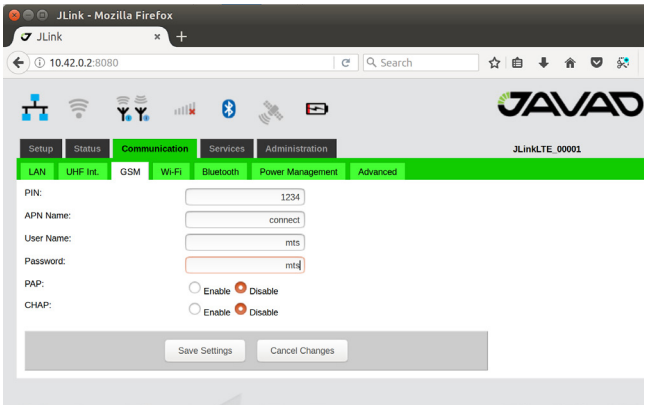


Figure 4. GSM configuration tab

WiFi client: In the Communication/WiFi it is necessary to switch the interface to the client mode. In the Communication/Power Management tab turn the WiFi interface on. Select the network you would like to connect in the Communication/WiFi tab, enter password to get access and wait for the connection see below. More detailed connection status you can check in Status/WiFi tab.

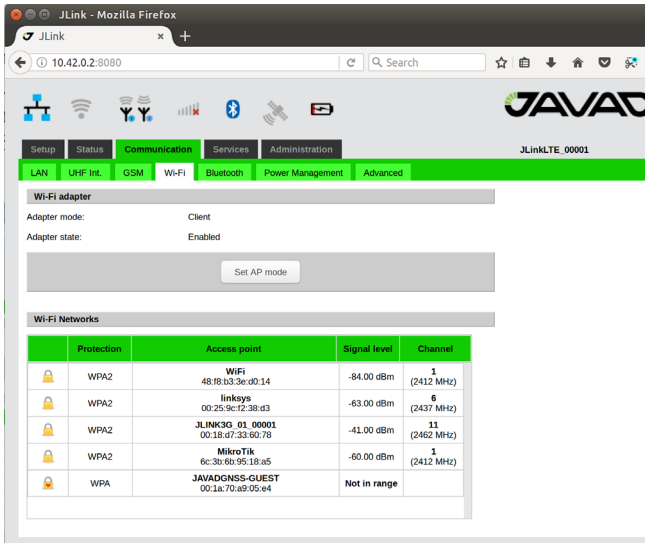


Figure 5. WiFi client configuration tab

Access to Serial port via Network: In the Communication/Advanced tab it is necessary to select Serial port as Console (see figure below) and reboot deice from Administration/Management or do power cycle. After reboot the device is ready for connection to serial port CLI interface with username “jlink” password “jLTEXXXXX” where “XXXXX” is serial number of device which is written in device label. For connecting to JLink LTE serial port needed to setup with following parameters:

- Baudrate 115200
- Parity none
- Data Bits 8
- Stop Bits 1
- Handshake hardware

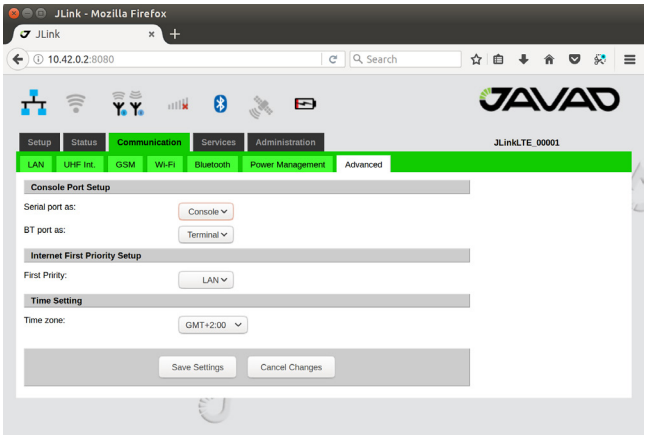


Figure 6. Advanced configuration tab

• Access to Serial port via Network:

In the Communication/Advanced tab it is necessary to select Serial port as Network (see figure below) and reboot device from Administration/Management or do power cycle.

After reboot device is ready for telnet connection to serial port using “Ser2Net” as login and “jlinklte” as password. For connecting to JLink LTE serial port needed to setup with following parameters:

- Baudrate 115200
- Parity none
- Data Bits 8
- Stop Bits 1
- Handshake hardware

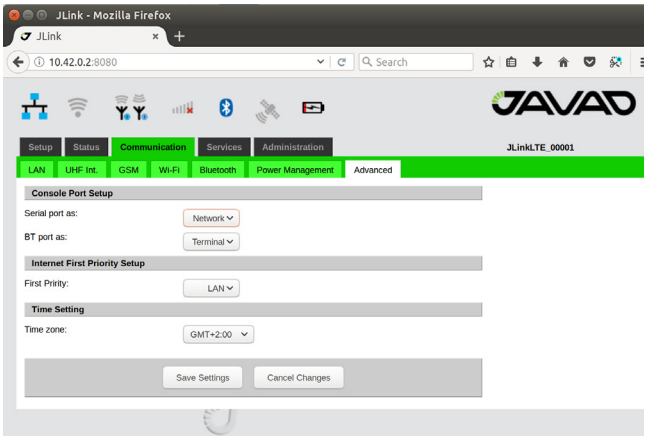


Figure 7. Advanced configuration tab

How to...

...Setup JLink LTE to provide RTK data received via NTRIP Client to Serial Port

The following are the steps of configuration of JLink LTE:

1. Connect to JLink LTE via web interface as described above.

2. Configure the Cellular (GSM):

In the Communication/GSM tab set the PIN code and APN parameters (if necessary);

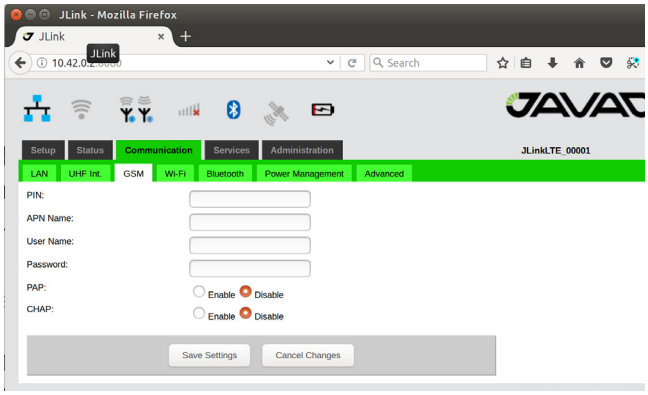


Figure 8. JLink LTE GSM configuration tab

Use tweezers to install or remove micro SIM card.

Insert the SIM card to its slot. The first slot from the green top cover is for micro SIM, the second slot is for micro SD.

In the Communication/Power Management tab activate the GSM interface.

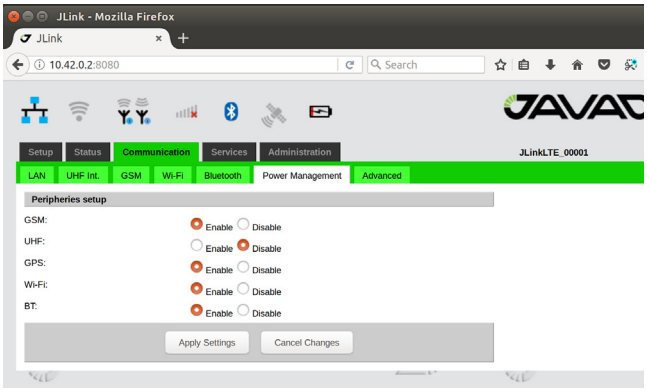


Figure 9. JLink LTE Power Management tab

Wait for registering in the network and Internet access availability . Detailed connection status you can check in Status/GSM tab.

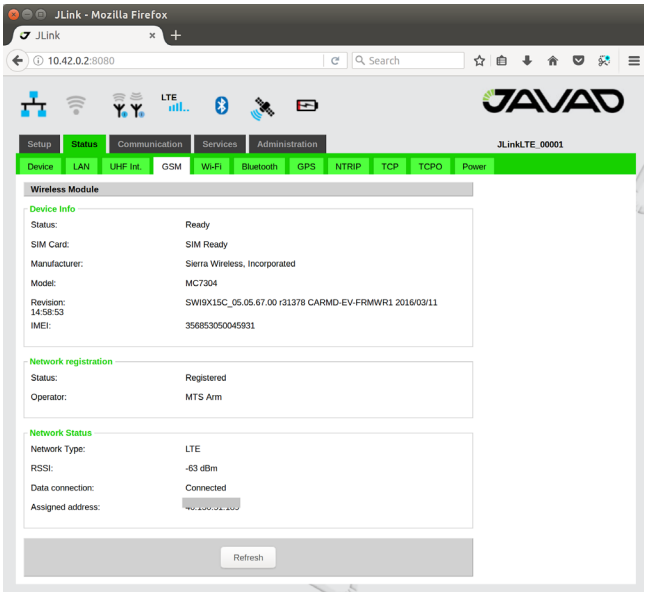


Figure 10. JLink LTE GSM Status tab

It is possible also to connect JLink LTE to Internet via LAN or WiFi using any WiFi router, MiFi device or even smart-phone configured in hot spot mode.

3. Setup Serial Port. In the Communication/ Advanced tab select “Serial port as” parameter as Terminal. Click “Save Setting” button and wait until finish.

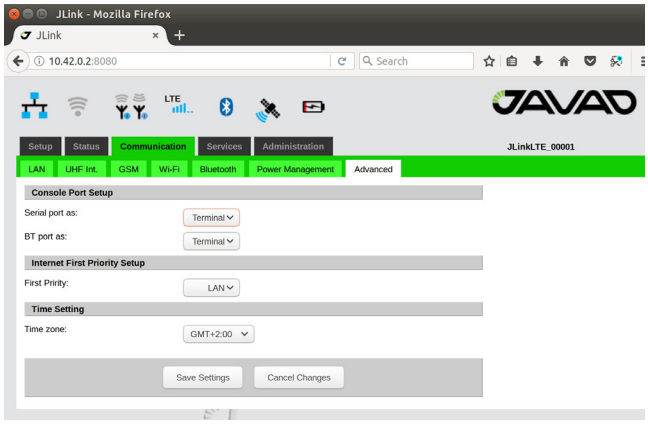


Figure 11. JLink LTE Advanced tab

4. Reboot device. In the Administration/ Management tab click “Reboot” button and wait until reboot.

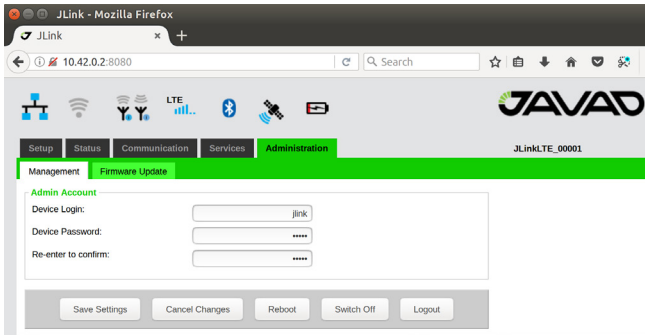


Figure 12. JLink LTE Administration Management tab

5. Setup Router. In the Setup/Router tab select following parameters “NTRIP Client” as Source and “Serial port“ as Destination. Click “Save Setting” button and wait until finish.

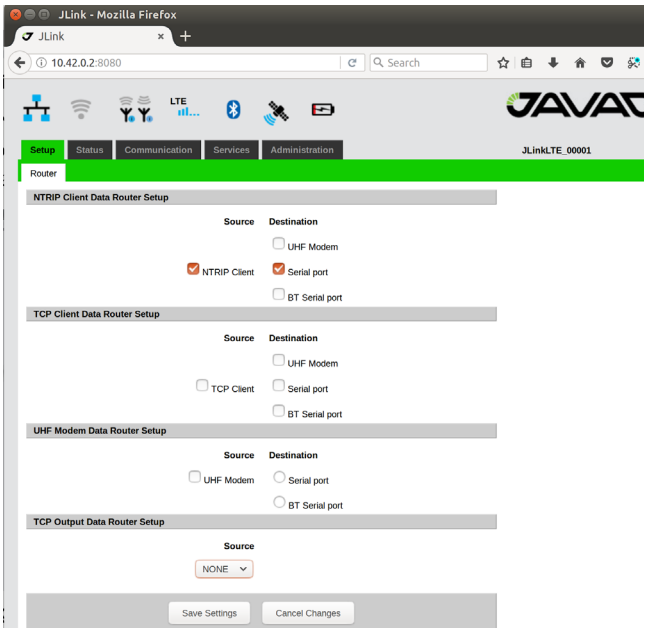


Figure 13. JLink LTE NTRIP Data Router tab

6. Setup NTRIP Client. In the Services/ NTRIP tab set following parameters: “Server name/address”, “Port”, “User” , “Password” .

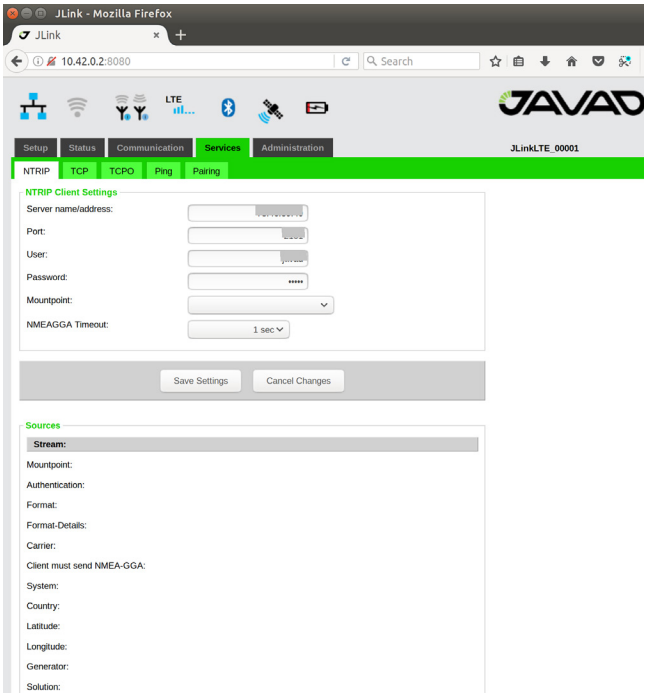
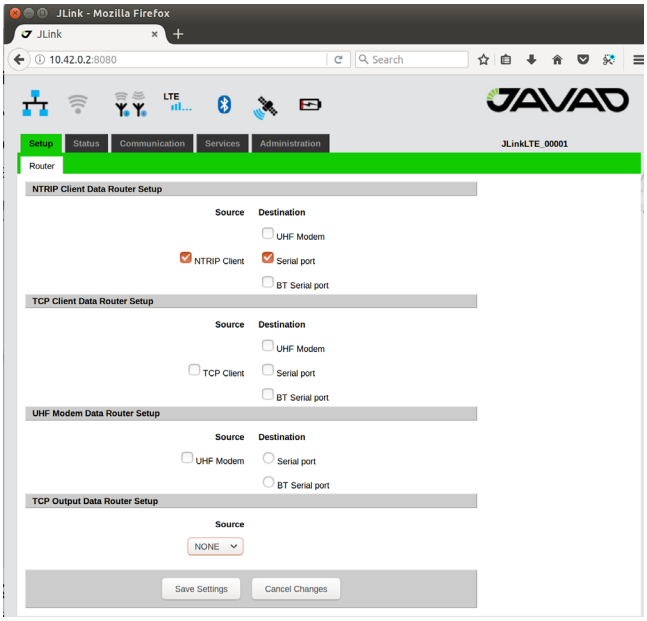


Figure 14. JLink LTE NTRIP configuration tab

Click “Save Setting” button and wait until finish.

Click “”Update” button and select “Mountpoint” .

Click “Save Setting” button and wait until finish. Detailed connection status you can check in Status/NTRIP tab:



JLink LTE Status NTRIP tab

7. Connect Serial Port. se any application to connect serial port of JLink LTE with following parameters:

- Baudrate 115200
- Parity none
- Data Bits 8
- Stop Bits 1
- Handshake hardware

...Setup JLink LTE to provide RTK data received via UHF channel (in Satel mode) to Serial Port

The following are the steps of configuration of JLink LTE:

1. Connect to JLink LTE via web interface as described above.

2. UHF configuration in Satel mode:

In the Communication/UHF Int. tab:

- select operating frequency or add new frequency to the list
- select Protocol type Satel
- select channel bandwidth (spacing) either 25.0 or, 20.0, or 12.5 kHz
- verify FEC (Forward Error Correction) state is correct

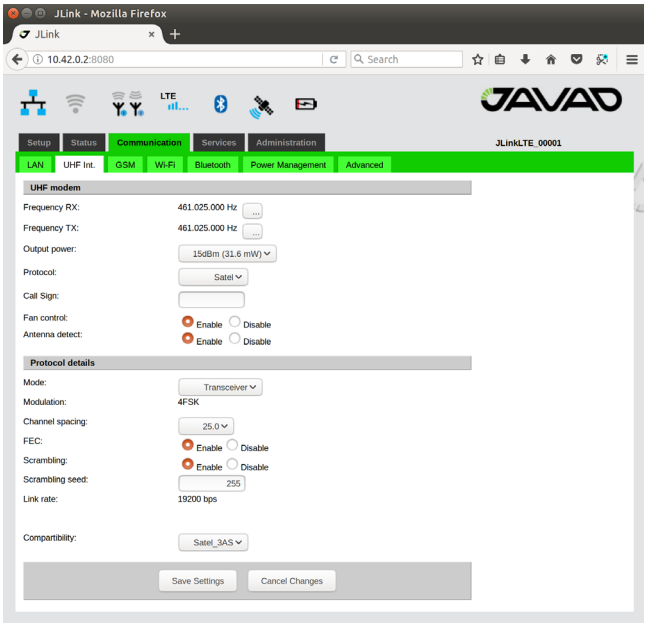


Figure 15. JLink LTE UHF parameters configuration tab

In the Communication/Power Management tab activate the UHF interface:

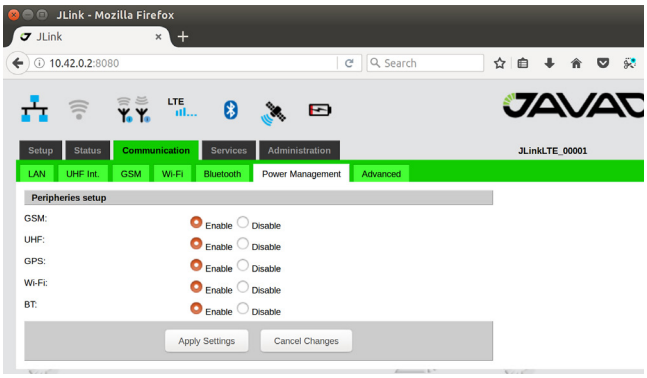


Figure 16. JLink LTE Power Management tab

Detailed connection status you can check in Status/UHF int. tab

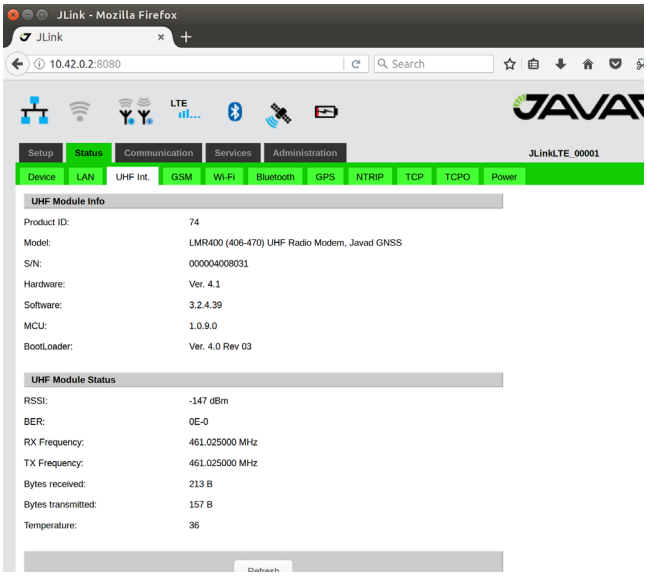


Figure 17. JLink LTE UHF Int. Status tab

3. Setup Serial Port

In the Communication/Advanced tab select “Serial port as” parameter as Terminal.

Click “Save Setting” button and wait until finish.

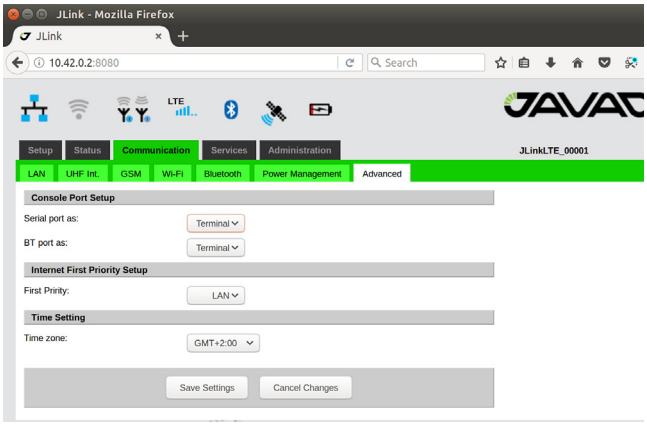


Figure 18. JLink LTE Advanced tab

4. Reboot device

In the Administration/Management tab click "Reboot" button and wait until reboot.

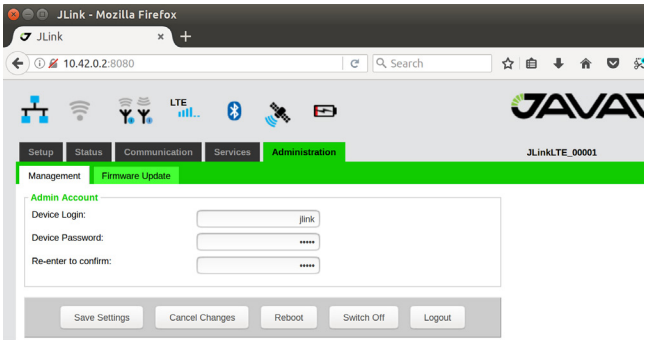


Figure 19. JLink LTE Administration Management tab

5. Setup Router

In the Setup/Router tab select following parameters "UHF Modem" as Source and

"Serial port" as Destination.

Click "Save Setting" button and wait until finish.

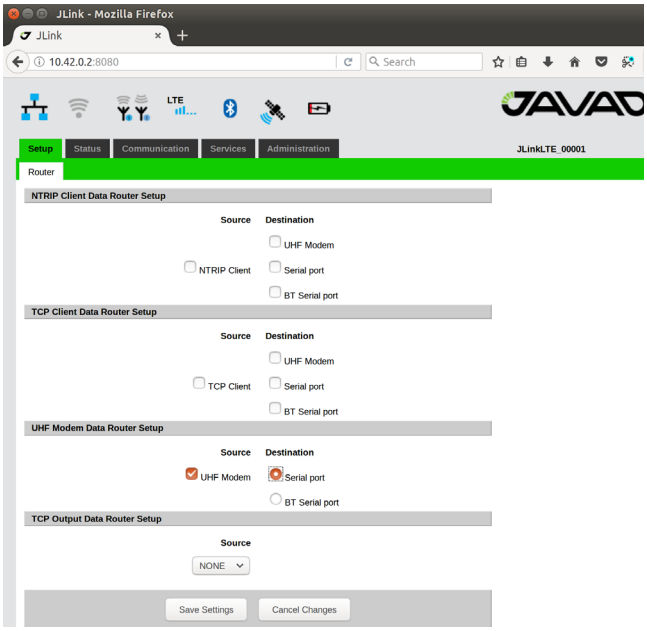


Figure 20. JLink LTE UHF Modem Router tab

6. Connect Serial Port

Use any application to connect serial port of JLink LTE with following parameters:

- Baudrate 115200
- Parity none
- Data Bits 8
- Stop Bits 1
- Handshake hardware

...Configure TRIUMPH-2 and JLink LTE to provide TRIUMPH-2 services through Internet

In this configuration JLink LTE will share its internet connection (established by GSM interface) with TRIUMPH-2 connected to JLink LTE as a WiFi client.

The following are the steps of configuration of JLink LTE:

1. Connect to Jlink LTE via web interface.

2. GSM configuration

In the Communication/GSM tab. Set the APN parameters (if necessary) and insert the SIM card to its slot(SIM card must by provide Static IP).

In the Communication/Power Management tab activate the GSM interface and wait for registering in the network and Internet access availability. Detailed connection status you can check in Status/GSM tab.

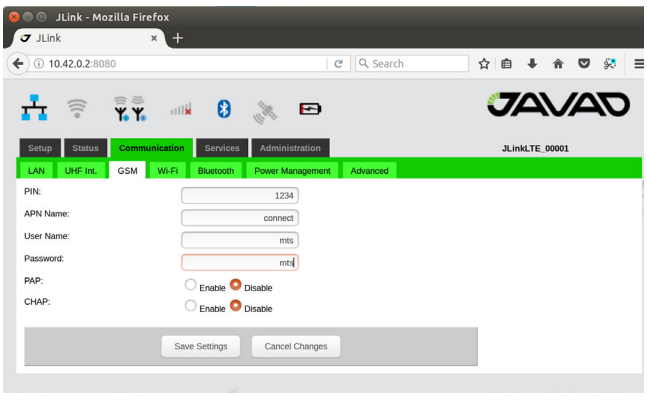


Figure 21. JLink LTE GSM configuration tab

3. Setup WiFi configuration

In the Communication/WiFi tab click on “Set AP mode” button to switch the interface to the AP mode and set following AP parameters: SSID(WiFi Acsses point-name), Protection(WPA2) and Security passphrase(“password”) .

In theCommunication/Power Managment tab turn the WiFi interface on.

Detailed connection status you can check in Status/WiFi tab.

Here JLink LTE provides port forwarding mechanism from internet (GSM interface) to WiFi clients.

Port forwarding mechanism works in a following way: JLink LTE receives data from internet and redirects it to its WiFi clients. Data packets received by 1110-1119 ports will be redirected to Wi-

WiFi client which IP address is 10.1.10.110. Data packets received by 1120-1129 ports will be redirected to WiFi client which IP address is 10.1.10.120.

To receive redirected data of JLink LTE the Triumph2 unit should be connected to JLink LTE through

WiFi interface and TRIUMPH-2’s IP address should be set 10.1.10.110 or 10.1.10.120. (the default gateway is 10.1.10.1).

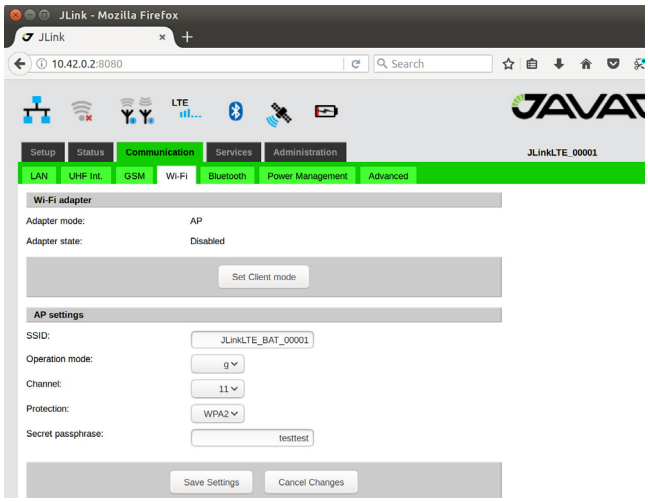


Figure 22. JLink LTE WiFi configuration tab

TRIUMPH-2 configuration steps are the following:

1. Connect TRIUMPH-2 to PC via USB or Bluetooth interface and start NetView.

2. Click Connection, select the connection using port, specify the COM port the receiver is connected to. Click Connect to connect to the receiver.

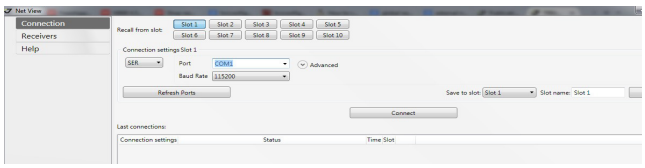


Figure 23. NetView connection tab

3. Select the receiver from the list of the connected receivers and click Parameters/Networking/Server, to setup Service port.

Set the TCP/FTP parameter: TCP Port (1125).

Set the TCP/FTP parameter: TCP Output Base Port (1120).

Click Apply.

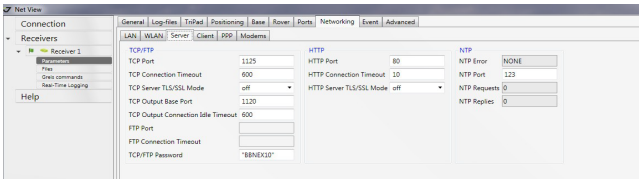


Figure 24. NetView Server tab

4. Select the receiver from the list of the connected receivers and click Parameters/Networking/WLAN, to setup the WiFi connection.

Set the following IP parameters: WLAN Receiver IP Address(10.1.10.120), WLAN Default Gateway (e.g, 10.1.10.1), and WLAN Network Mask (e.g, 255.255.255.0).

Set the AccessPoint parameters: WLAN Access Point ID (enter SSID of JLink LTE), WLAN AP mode(wpa).

Set the WPA parameter: WLAN WPA Passphrase (enter passphrase of JLink LTE).

Set the WLAN Mode to on Click Apply.

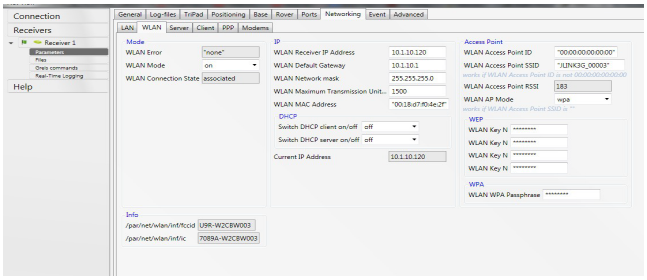


Figure 25. NetView WLAN configuration tab

After Restating the device you can check WiFi connection on web interface Status/WiFi tab of web interface of JLink LTE.

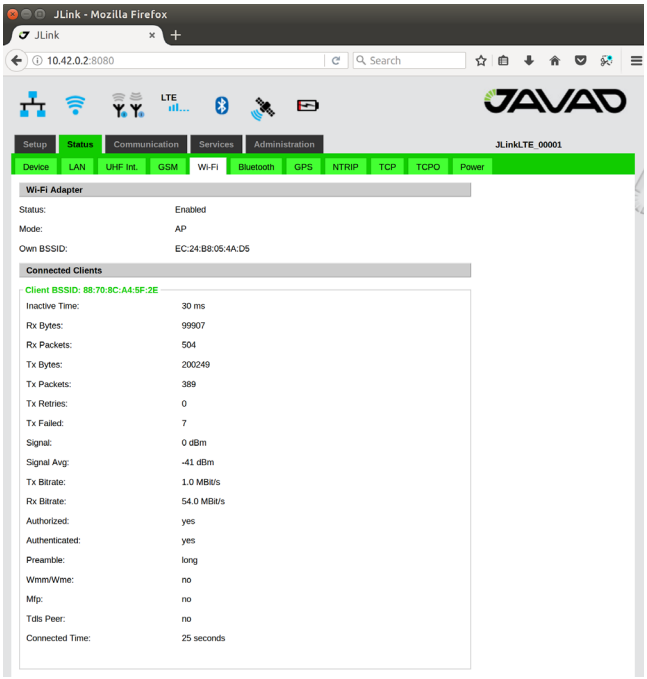


Figure 26. JLink LTE WiFi status tab

Now TRIUMPH-2 can provide services trough Internet by 1120-1125 port.

SPECIFICATIONS

4G cellular module

4G LTE Mini Card (option 1)	LTE, DC-HSPA+, HSPA+, EDGE, GPRS, GSM and CDMA networks
Technology:	
LTE	Bands: 1 (2100 MHz), 3 (1800MHz), 7 (2600 MHz), 8 (900 MHz), 20 (800 MHz) Data Rates: Category 3 Downlink 100 Mbps (20 MHz bandwidth), 50 Mbps (10 MHz bandwidth) Uplink 50 Mbps (20 MHz bandwidth), 25 Mbps (10 MHz bandwidth)
UMTS (WCDMA), HSDPA, HSUPA, HSPA+,DC-HSPA+	Bands: 1 (2100 MHz), 2 (1900 MHz), 5 (850 MHz), 6 (800 MHz), 8 (900 MHz) Data Rates: HSPA+ rates Downlink up to 42 Mbps (category 24) Uplink up to 5.76 Mbps (category 6)
GSM, GPRS, EDGE	GSM 850 (850 MHz), EGSM 900 (900 MHz), DCS 1800 (1800 MHz), PCS 1900 (1900 MHz) Data Rates: EDGE throughput up to 236 kbps
4G LTE Mini Card (option 2)	LTE, DC-HSPA+, HSPA+, EDGE, GPRS, GSM and CDMA networks
Technology:	
LTE	Bands: 2 (1900 MHz), 4 (AWS) (1700/2100MHz), 5 (850 MHz), 13 (700 MHz), 17 (700 MHz), 25 (1900 MHz G Block) Data Rates: Category 3 Downlink 100 Mbps (20 MHz bandwidth), 50 Mbps (10 MHz bandwidth) Uplink 50 Mbps (20 MHz bandwidth), 25 Mbps (10 MHz bandwidth)
CDMA (EVDO Rel. 0 and Rel.A)	Bands: BC0 (Cellular 800 MHz), BC1 (PCS 1900 MHz), BC10 (Secondary 800 MHz) Data Rates: CDMA IS-856 (1xEV-DO Release A) Up to 3.1 Mbps forward channel Up to 1.8 Mbps reverse channel CDMA IS-2000 Up to 153 kbps, simultaneous forward and reverse channels
UMTS (WCDMA), HSDPA, HSUPA, HSPA+,DC-HSPA+	Bands: 1 (2100 MHz), 2 (1900 MHz), 4 (AWS 1700/2100 MHz), 5 (850 MHz),8 (900 MHz) Data Rates: HSPA+ rates Downlink up to 42 Mbps (category 24) Uplink up to 5.76 Mbps (category 6)
GSM, GPRS, EDGE	GSM 850 (850 MHz), EGSM 900 (900 MHz), DCS 1800 (1800 MHz), PCS 1900 (1900 MHz) Data Rates: EDGE throughput up to 236 kbps

UHF/VHF Radio (optional)

Frequency Range	406-470 MHz/138-174 MHz
Channel Bandwidth	25/20/12.5/6.25 kHz
Modulation	DBPSK/DQPSK/D8PSK/D16QAM/4FSK/ GMSK
Transmitter Output Power	1W (+30 dBm)
Communication Mode	Half duplex, simplex, repeater

ISM Radio (optional)

Frequency Range	902-928 MHz (USA)/ 915-928 MHz (Australia)/ 868-870 MHz (EU) with 25/12.5 kHz CS
Modulation	GMSK
Data Rate of Radio Interface (USA/Australia)	64000 bps
Data Rate Radio Interface (EU)	9600 bps
Transmitter Output Power	1W (+30 dBm)
Communication Mode	Half duplex, simplex, repeater

Beacon Receiver (optional)

Frequency Range	283.5- 325 kHz
User Data Rates	50, 100, 200 bps (manual or Auto selection)
Sensitivity	1.5 mV/m for 6 dB SNR (200 bps)

GNSS Receiver

Tracking Channels	GPS/GLONASS L1
Signals Tracked	C/A Code
Cold / Warm Start	42 / 30 seconds
Sensitivity for Reacquisition	- 161dBm

Communication Ports

Wi-Fi 2.4 and 5 GHz (IEEE 802.11 a, b, g, n, d,e,i)
Full-duplex 10BASE-T/100BASE-TX Ethernet port
Bluetooth 4.1 Compliance and CSA2 Support Dual-Mode Bluetooth and Bluetooth LE
High Speed USB 2.0 configurable as Device or Host port
MicroSD card slot (fully sealed)

Environmental

Enclosure	aluminum, IP67
Color	Two-tone Gray / Green
Operating Temperature	-40° C to +70° C *
Storage Temperature	-40° C to +85° C **
Humidity	100% condensing
Weight	468 g / 970 g
Power Supply Voltage	+5.5…36V without battery charging, 4Amax +12…34V when the battery is charged, 3.6Amax
Battery (optional)	One embedded, 7.2V, 5850 mAh

* The operating temperature of Li-Ion batteries is -20 ˚ C to+45˚ C
** The storage temperature range of Li-Ion batteries is -20 ˚ C to +60˚ C

Pinout of JLink LTE power and communication port

Pin #	Signal Name	I/O	Description	Pin #	Signal Name	I/O	Description
1	TX+/RTS_OUT	O	Transmit Data positive line (RS-422) / Request to Send (RS-232)	14	USB0_VBUS	PWR	Power line (USB)
2	RX+/CTS_IN	I	Receive Data positive line (RS-422) / Clear to Send (RS-232)	15	USB0_ID	I	USB0 ID line
3	DTR_OUT	O	Data Terminal Ready (RS-232)	16	ETD-	O	Transmit Data negative line (LAN)
4	USB0_DP	I/O	Data Positive line (USB)	17	ERD-	I	Receive Data negative line (LAN)
5	USB0_DM	I/O	Data Negative line (USB)	18	PWR_IN	PWR	+5.5 to +36 VDC Power Input
6	ELED+	O	LED line (LAN)	19	GND	PWR	Power Ground
7	ETD+	O	Transmit Data positive line (LAN)	20	GND	PWR	Power Ground
8	ERD+	I	Receive Data positive line (LAN)	21	GND	PWR	Power Ground
9	PWR_IN	PWR	+5.5 to +36 VDC Power Input	22	RESERVE	-	Not used. Reserve
10	TX-/TX_OUT	O	Transmit Data negative line (RS-422) / Transmit Data (RS-232)	23	RESERVE	-	Not used. Reserve
11	RX-/RX_IN	I	Receive Data negative line (RS-422) / Receive Data (RS-232)	24	RESERVE	-	Not used. Reserve

Variant 1

Variant 2

Variant 3

Variant 4

1- UHF/VHF/ISM Transceiver / Beacon receiver, cellular module, GPS receiver, Bluetooth, WiFi, Ethernet, USB and Serial port.

2 - Variant 1 with battery.

3 - Cellular module, GPS receiver, Bluetooth, WiFi, Ethernet, USB and Serial port.

4 - Variant 3 with battery.

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 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.

Use only with a pole, cart, stand, or tripod, specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

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.

Storage Precautions

Always clean the instrument after use. Wipe off dust with a cleaning brush, then wipe off dirt with a soft cloth. Store in a location with a temperature of from -40° to +85°C, and no exposure to direct sunlight. Use a clean cloth, moistened with a neutral detergent or water, to clean the receiver. Never use an abrasive cleaner, ether, thinner benzene, or other solvents. Always make sure the instrument is completely dry before storing. Dry the receiver with a soft, clean cloth.

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.
- Without proper safeguards at the measuring site.
- Contrary to applicable laws, rules, and regulations.
- The HPT435BT JL receiver should never be used in dangerous environments. Use in rain or snow for a limited period is permitted.

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.

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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