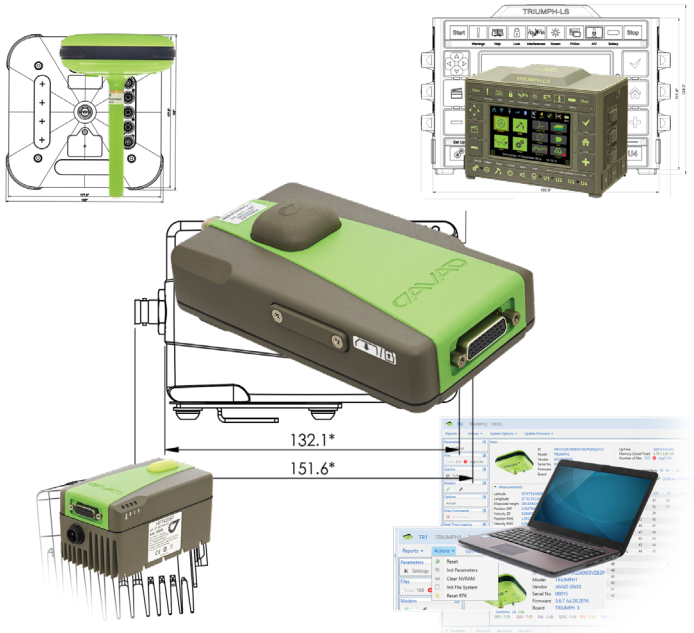


HPT104BT JL

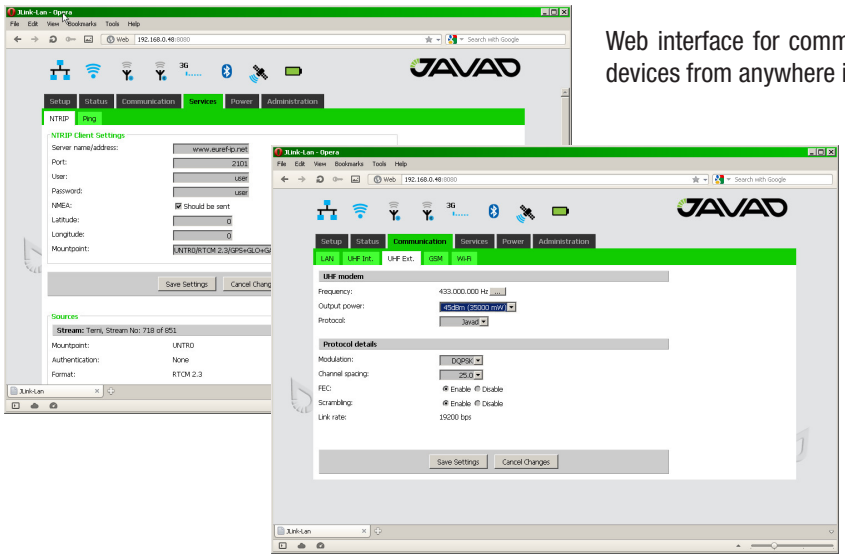
HPT104BT JL is the up-to-date unsurpassed 4 W VHF radio transceiver with USB, Ethernet and Wi-Fi/Bluetooth® capacity. The unmatched features of HPT104BT include:

- Data speed via VHF channel up to 38400 bps
- Programmable VHF Output Power up to 4 W
- Advanced Forward Error Correction
- High speed USB 2.0 device port
- 100 Mb Ethernet port
- Wi-Fi Interface
- Bluetooth® Interface
- 4G Cellular module (optional)
- GNSS L1 receiver (optional)
- WEB interface for remote access and control
- Serial port configurable as RS-232 or RS-422, or RS-485

The HPT104BT JL radio transceiver provides a high-speed point-to-point and point-to-multipoint wireless data transfer at up to 38.4 kbps. HPT104BT JL firmware supports user selectable modulation techniques (GMSK, 4FSK, DBPSK, DQPSK, D8PSK, or D16QAM), which allows the user to achieve the highest data speed for a given range (up to 16 miles/26 km). It also includes a selectable error correction, which improves the functioning of the radio modem under interference. The sophisticated features of HPT104BT JL include data scrambling, frequency hopping, user selectable transmit output power level, low power consumption sleep modes, autoscanning for a base and plug-and-play installation for remote terminals.

The HPT104BT JL could be a part of a local/global network connected to the Internet via WiFi, Ethernet, Bluetooth, or 4G cellular module (optional). This radio provides a robust solution linking the field GNSS equipment to RTN, where no cell phone cover is available. HPT104BT JL can be configured and supported using web-interface through the Internet, and this makes the setup mechanism simple and accessible from anywhere in the world.

HPT104BT JL



Web interface for communication, monitoring and setup HPT104BT JL devices from anywhere in the world.

VHF Radio

Parameter	Specification
Operating Frequency Range	138 - 174 MHz (EU) 150 - 174 MHz (USA) 138 - 144;148-174 MHz (Canada)
Channel Bandwidth	25/12.5/6.25 kHz (USA, Canada) 25/20/12.5 kHz (EU)
Data Rate (25/20/12.5/6.25 kHz Channel Bandwidth)	9600/7500/4800/2400 bps – DBPSK/GMSK 19200/15000/9600/4800 bps – DQPSK/4FSK 28800/22500/14400/7200 bps – D8PSK 38400/30000/19200/9600 bps – D16QAM
Roaming Speed for DBPSK modulation	75 mph / 120 km/h
Modulation	GMSK/4FSK/DBPSK/DQPSK/D8PSK/D16QAM
Nominal Impedance	50 Ohms
End to End delay	60 ms
Communication Mode	Time Division Duplex (TDD) Time Division Multiple Access (TDMA)
Maximum Distance Range	16 miles / 26 km

Transmitter Specification

Parameter	Specification
Output Power USA, Canada EU	15 dBm to 36 dBm in 1 dB steps (32mW to 4W) 15 dBm to 33 dBm in 1 dB steps (32mW to 2W)
Output Power Control Accuracy	±1.5dB (at normal test conditions) +2.0dB and -3.0dB (under extreme test conditions)
Carrier Frequency Stability	±1.5 ppm initial stability over temp with ±3.0 ppm aging/year
Max. Frequency Error	±1.0 kHz (at normal test conditions) ±1.5 kHz (under extreme test conditions)
Adjacent Channel Power 25/12.5/6.25 kHz CB 25/20/12.5 kHz CB	 Part §90.210 (C, D, E) (USA, Canada) 60 dBc (EU)
Spurious Emission (Conducted)	-36 dBm (9 kHz – 1GHz) -30 dBm (1GHz – 4 GHz)
Spurious Emission (Radiated)	-36 dBm (9 kHz to 1 GHz) -30 dBm (1 GHz to 4 GHz)

Receiver Specification

Parameter	Specification
Noise Figure	4 dB
Receiver Sensitivity (BER $1x10^{-4}$, 25 kHz CS) DBPSK DQPSK D8PSK D16QAM GMSK	 -116 dBm 25kHz / -117 dBm 12.5kHz -115 dBm 25kHz / -116 dBm 12.5kHz -110 dBm 25kHz / -111 dBm 12.5kHz -106 dBm 25kHz / -107 dBm 12.5kHz -113 dBm 25kHz / -114 dBm 12.5kHz
Dynamic Range	-115 to –15 dBm
Max. Input Signal Level	-10 dBm
Co-channel Rejection	-8 dB for 25 kHz Channel Bandwith -8 dB for 20 kHz Channel Bandwith -12 dB for 12.5 kHz Channel Bandwith -16 dB for 6.25 kHz Channel Bandwith
Adjacent Channel Selectivity	70 dB for 25 kHz Channel Bandwith 70 dB for 20 kHz Channel Bandwith 60 dB for 12.5 kHz Channel Bandwith 50 dB for 6.25 kHz Channel Bandwith

HPT104BT JL

4G cellular module (optional)

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

GNSS Receiver (optional)

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

Communication ports

Wi-Fi (IEEE 802.11 b, g, n, d, e, i)
Full-duplex 10BASE-T/100BASE-TX Ethernet port
Bluetooth V2.0+EDR Class 2
High Speed USB 2.0 configurable as Device or Host port
MicroSD card slot (fully sealed)
Serial port configurable as RS232/RS422/RS485

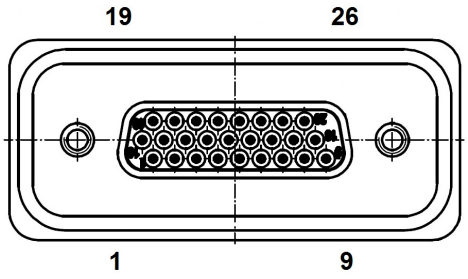
Environmental

Parameter	**Specification**
Temperature	Operating –40° C to +70° C Storage –40° C to +85° C
Environmental	IP 67
Dimensions (H x W x D)	5.75 x 2.95 x1.73 inches (146 x75 x44 mm)
Weight	1.07 lbs (488 g)
Power Supply Voltage	+9 to +36 VDC nominal
Power Consumption Average)	18W / 2W / 0.01W –Transmit / Receive / Sleep
Housing/Color	Aluminum / Two-tone Green / Gray
Antenna Connector	TNC, 50Ω

HPT104BT JL

Variant 1: 4 W VHF Transceiver, Bluetooth, WiFi, Ethernet, USB and Serial port.

Variant 2: 4 W VHF Transceiver, 4G cellular data module, GNSS receiver, Bluetooth, WiFi, Ethernet, USB and Serial port.



Pinout of HPT104BT JL power and communication port

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

Specifications are subject to change without notice

JAVAD GNSS
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