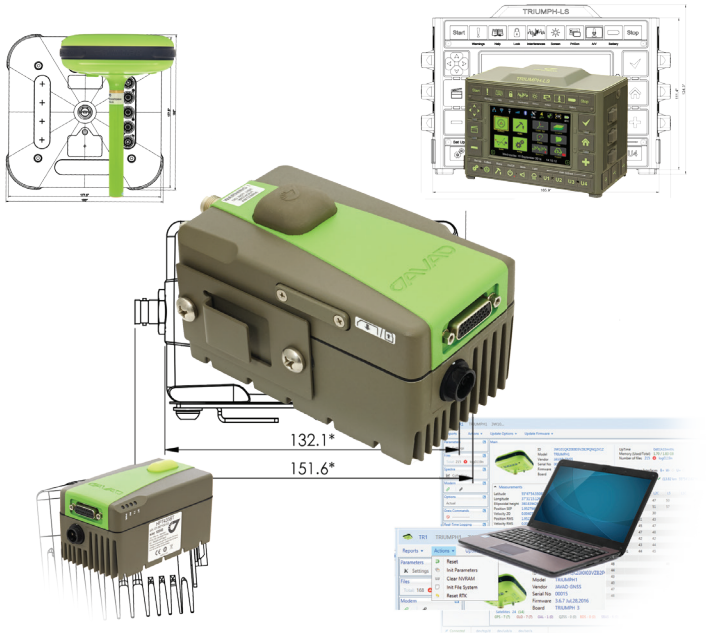


HPT135BT JL

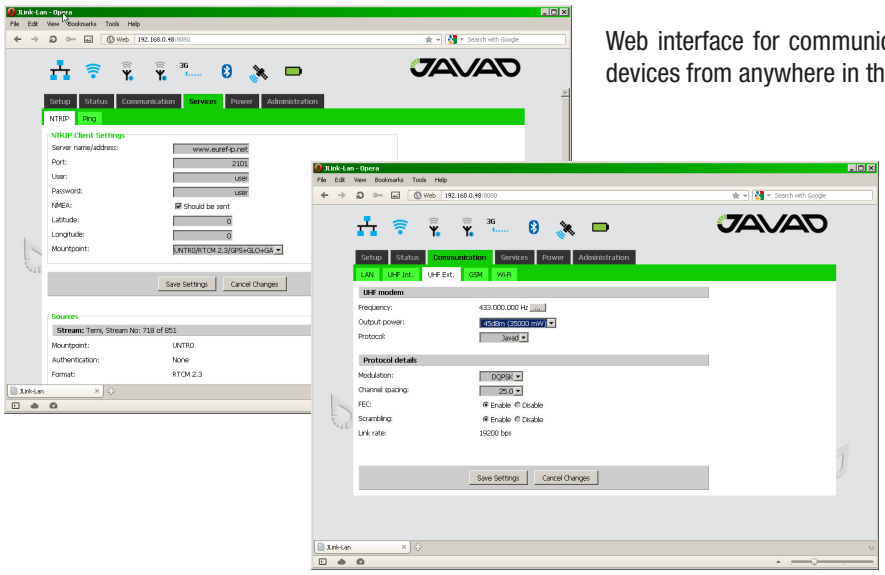
HPT135BT JL is the up-to-date unsurpassed 35 W VHF radio transceiver with USB, Ethernet and Wi-Fi/Bluetooth® capacity. The unmatched features of HPT135BT include:

- Data speed via VHF channel up to 38400 bps
- Programmable VHF Output Power up to 35 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 HPT135BT JL radio transceiver provides a high-speed point-to-point and point-to-multipoint wireless data transfer at up to 38.4 kbps. HPT135BT 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 48 miles/77 km). It also includes a selectable error correction, which improves the functioning of the radio modem under interference. The sophisticated features of HPT135BT 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.

HPT135BT JL could be a part of a local/global network connected to the Internet via WiFi, Ethernet, Bluetooth, or 4G cellular module (optional). HPT135BT JL provides a robust solution linking the field GNSS equipment to RTN, where no cell phone cover is available. HPT135BT 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.

HPT135BT JL



Web interface for communication, monitoring and setup HPT135BT 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
System Gain for DBPSK modulation (Antenna gain is not included)	161 dB (for 25 kHz Channel Spacing) 163 dB (for 12.5 kHz Channel Spacing) 164 dB (for 6.25 kHz Channel Spacing)
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	48 miles/77 km

Transmitter Specification

Parameter		Specification
Output Power	USA, Canada	25 dBm to 45.44 dB m in 1 dB step (320 mW to 35W)
	EU	25 dBm to 41.76 dBm in 1 dB step (320 mW to 15W)
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	DBPSK	-116 dBm 25kHz / -117 dBm 12.5kHz
(BER $1x10^{-4}$, 25 kHz CS)	DQPSK	-115 dBm 25kHz / -116 dBm 12.5kHz
	D8PSK	-110 dBm 25kHz / -111 dBm 12.5kHz
	D16QAM	-106 dBm 25kHz / -107 dBm 12.5kHz
	GMSK	-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 Bandwidth -8 dB for 20 kHz Channel Bandwidth -12 dB for 12.5 kHz Channel Bandwidth -16 dB for 6.25 kHz Channel Bandwidth
Adjacent Channel Selectivity		70 dB for 25 kHz Channel Bandwidth 70 dB for 20 kHz Channel Bandwidth 60 dB for 12.5 kHz Channel Bandwidth 50 dB for 6.25 kHz Channel Bandwidth

HPT135BT 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

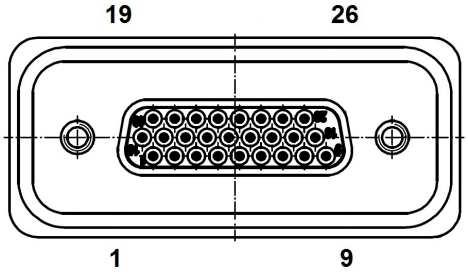
Environmental

Parameter	**Specification**
Temperature	Operating –40° C to +60° C Storage –40° C to +85° C
Environmental	IP 67
Dimensions (H x W x D)	5.98 x 3.3 x 2.84 inches (152 x 84 x72 mm)
Weight	1.98 lbs (900 g)
Power Supply Voltage	+9 to +16 VDC nominal
Power Consumption (Average): Continuous Transmit/ Transmit with 30% duty cycle / Sleep	1120W/38W/300mW (USA, Canada) 60/20/300mW (EU)
Housing/Color	Aluminum / Two-tone Green / Gray
Antenna Connector	TNC, 50Ω - for VHF Transceiver SMA, 50Ω - for 4G cellular data module RP-SMA, 50Ω - for WiFi/BT
GNSS L1 Antenna	internal

HPT135BT JL

Variant 1: 35 W VHF Transceiver, Bluetooth, WiFi, Ethernet, USB and Serial port.

Variant 2: 35 W VHF Transceiver, 4G cellular data module, GNSS receiver, Bluetooth, WiFi, Ethernet, USB and Serial port.



Pinout of HPT135BT 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	RESERVE	-	Not used. Reserve
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	RESERVE	-	Not used. Reserve
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	PWR_OUT	O	Power for FAN
25	RESERVE	-	Not used. Reserve
26	RESERVE	-	Not used. Reserve

Specifications are subject to change without notice

JAVAD GNSS

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