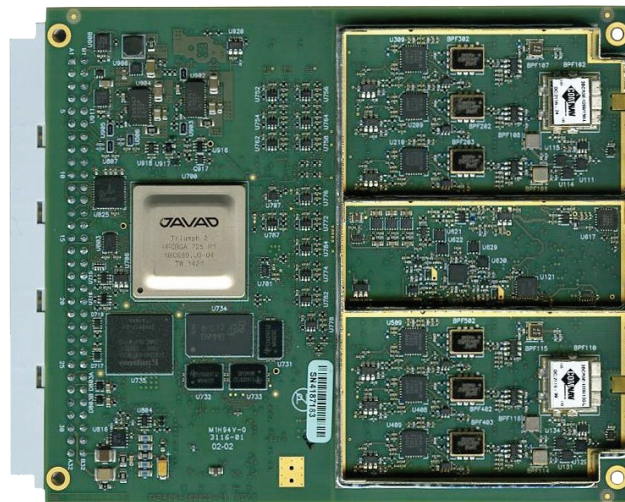




# TRE-DUO

GPS L1/L2/L5, GLONASS L1/L2/L3  
GALILEO E1/E5A/E5B/ALTBOC, BeiDou B1/B2



864 GNSS channels of this board allow tracking all current and future satellite signals. TRE-DUO is a board that accepts inputs from up to two antennas. It is equivalent of two receivers which operate synchronously with a common oscillator and central processor to coordinate all communications and other activities.

The board allows determining 2D attitude including pitch and heading. Heading option includes RTK. The board is capable of calculating both RTK of the antenna A relative to the external base and B - A base line resulting in the heading and pitch.

TRE-DUO can be used in positioning applications where a single antenna is not sufficient to observe satellites in all orientations and positions: in machine navigation and control in road construction, precise agriculture, other land, aerial, and marine applications.

TRE-DUO is ideal for heading applications. Dual frequency GPS, GLONASS, Galileo, QZSS, and BeiDou can provide very fast and reliable solutions due to very short baseline between antennas and the fact that typical applications are in open fields.

Simply stated, additional functions are not needed to incorporate any of our TRE-DUO OEM board in most applications. In addition to timing strobes and event markers, the TRE-DUO OEM board includes the option of complete IRIG timing system.

# TRE-DUO

Description	I/O	Signal name	Pin #	Pin #	Signal name	I/O	Description
Power Ground		PGND	<b>A1</b>	<b>B1</b>	PGND		Power Ground
+6.0 to +40 VDC Power Input	I	PWR_IN	<b>A2</b>	<b>B2</b>	PWR_IN	I	+6.0 to +40 VDC Power Input
Factory use only, must be left open		FUO	<b>A3</b>	<b>B3</b>	COMMSW#	I	Active Low Command Input (FN Button) *1
Reserved		-	<b>A4</b>	<b>B4</b>	KA_PWR	I	Keep-Alive Power input for Real-Time Clock (+4.5 to +40 VDC, 10µA typ)
External LED Control *2	0	LED2_RED	<b>A5</b>	<b>B5</b>	LED1_RED	0	External LED Control *2
External LED Control *2	0	LED2_GRN	<b>A6</b>	<b>B6</b>	LED1_GRN	0	External LED Control *2
Signal Ground		GND	<b>A7</b>	<b>B7</b>	USB_PWR	I	USB port Power Input line
USB port D- line	I/O	USB_D-	<b>A8</b>	<b>B8</b>	USB_D+	I/O	USB port D+ line
Serial port A TXD line	0	TXDA	<b>A9</b>	<b>B9</b>	CTSA	I	Serial port A CTS line
Serial port A RXD line	I	RXDA	<b>A10</b>	<b>B10</b>	RTSA	0	Serial port A RTS line
Serial port C: RS232 TXD line or RS422 TX- line	0	TXDC/TXC-	<b>A11</b>	<b>B11</b>	CTSC/RXC+	I	Serial port C: RS232 CTS line or RS422 RX+ line
Serial port C: RS232 RXD line or RS422 RX- line	I	RXDC/RXC-	<b>A12</b>	<b>B12</b>	RTSC/TXC+	0	Serial port C: RS232 RTS line or RS422 TX+ line
Serial Port D: RS232 RTS line or RS422 TX+ line	0	RTSD/TXD+	<b>A13</b>	<b>B13</b>	TXDD/TXD-	0	Serial Port D: RS232 TXD line or RS422 TX- line
Serial Port D: RS232 CTS line or RS422 RX+ line	I	CTSD/RXD+	<b>A14</b>	<b>B14</b>	RXDD/RXD-	I	Serial Port D: RS232 RXD line or RS422 RX- line
Signal Ground		GND	<b>A15</b>	<b>B15</b>	-		Reserved
Reserved		-	<b>A16</b>	<b>B16</b>	-		Reserved
Serial port B TXD line	0	TXDB	<b>A17</b>	<b>B17</b>	CTSB	I	Serial port B CTS line
Serial port B RXD line	I	RXDB	<b>A18</b>	<b>B18</b>	RTSB	0	Serial port B RTS line
CAN1 port CAN-H line	I/O	CAN1H	<b>A19</b>	<b>B19</b>	CAN1L	I/O	CAN1 port CAN-L line
CAN2 port CAN-H line	I/O	CAN2H	<b>A20</b>	<b>B20</b>	CAN2L	I/O	CAN2 port CAN-L line
Factory use only, must be left open		FUO	<b>A21</b>	<b>B21</b>	-		Reserved
Signal Ground		GND	<b>A22</b>	<b>B22</b>	1PPSA	0	1 Pulse Per Second output A *3
Signal Ground		GND	<b>A23</b>	<b>B23</b>	1PPSB	0	1 Pulse Per Second output B *3
Signal Ground		GND	<b>A24</b>	<b>B24</b>	EVENTA	I	Event input A *4
Signal Ground		GND	<b>A25</b>	<b>B25</b>	EVENTB	I	Event input B *4
Configurable Logic-Level I/O 0 line	I/O	GPIO0	<b>A26</b>	<b>B26</b>	GPIO1	I/O	Configurable Logic-Level I/O 1 line
Configurable Logic-Level I/O 2 line	I/O	GPIO2	<b>A27</b>	<b>B27</b>	GPIO3	I/O	Configurable Logic-Level I/O 3 line
Signal Ground		GND	<b>A28</b>	<b>B28</b>	RESET_IN#	I	Active Low Reset input *5
Ethernet port TX+ line	0	LAN_TX+	<b>A29</b>	<b>B29</b>	LAN_TX-	0	Ethernet port TX- line
Signal Ground		GND	<b>A30</b>	<b>B30</b>	LAN_LED	0	Ethernet port control for external LED
Ethernet port RX+ line	I	LAN_RX+	<b>A31</b>	<b>B31</b>	LAN_RX-	I	Ethernet port RX- line
Active Low input for ON/OFF switch *7	I	ONOFFSW#	<b>A32</b>	<b>B32</b>	IRIG_OUT	0	IRIG port output line *6

\*1. Active Low input from the FN button of the MinPad. Must be left open if not used.

\*2. LED1\_GRN and LED1\_RED are used to control the STAT LED of the MinPad. LED2\_GRN and LED2\_RED are equivalent to the REC LED of the MinPad. The output is a +3.3V driver in series with 100 Ohm resistor for each LED. LEDs should be with common cathode.

\*3. Voh>1,8V at 50 Ohm load.

\*4. Internal pull-up 5 kOhm to +3.3V

\*5. Connect to ground to activate. Internal pull-up 2 kOhm to +3.3V.

\*6. AM sine-wave signal; 2.1Vp-p (Mark), 0.7Vp-p (Space).

\*7. Active Low input which is equivalent to ON/OFF button of the MinPad. The pin must be connected to GND permanently if the board is required to turn on automatically any time external power is applied to pins A2 and B2.

## Tracking Features

- Total 864 channels: all-in-view
- GPS: C/A, L1C (P+D), P1, P2, L2C (L+M), L5(I+Q)
- GLONASS: C/A, L2C, P1, P2, L3 (I+Q)
- Galileo: E1 (B+C), E5A (I+Q), E5B (I+Q), AltBoc
- BeiDou: B1, B1-2, B1C(P+D), B5A (I+Q), B2, B5B (I+Q)
- QZSS: C/A, L1C (P+D), L2C (L+M), L5 (I+Q), SAIF
- SBAS\*: L1, L5
- IRNSS L5
- Advanced Multipath Reduction
- Fast acquisition channels
- High accuracy velocity measurement
- Almost unlimited altitude and velocity(for authorized users)

## Data Features

- Up to 100 Hz update rate for real time position and raw data (code and carrier)
- 10 cm code phase and 1 mm carrier phase precision
- IEEE 1588 protocol support
- Hardware Viterbi decoder
- RTCM SC104 versions 2.x and 3.x Input/Output
- NMEA 0183 versions 2.x and 3.0 Output
- Code Differential Rover
- Code Differential Base
- Geoid and Magnetic Variation models
- RAIM
- Different DATUMs support
- Output of grid coordinates

## Data Storage

- Up to 16 GB of onboard non-removable memory for data storage

## Input/Output

- Two high speed RS232 serial ports (up to 460.8 Kbps)
- Two high speed configurable RS232/RS422 serial ports (up to 460.8 Kbps)
- High speed USB 2.0 device port (480 Mbps)
- Full-duplex 10BASE-T/100BASE-TX Ethernet port
- Two CAN 2.0 A/B ports
- IRIG timecode output
- Two 1 PPS outputs synchronized to GPS or UTC
- Two Event Marker inputs
- MinPad interface: Four external LED drivers, ON/OFF control and External Command inputs
- Four Configurable Logic-Level GPIO ports

## Electrical

- On-board power supply accepts any unregulated voltage between +6.0 to +40 Volts
- Keep-Alive Power input accepts any unregulated voltage between +4.5 to +40 Volts
- The central pin of the antenna connector outputs +5 VDC to power LNA. The sourced current is 0.12 A max
- Power consumption: 4.3 W typ

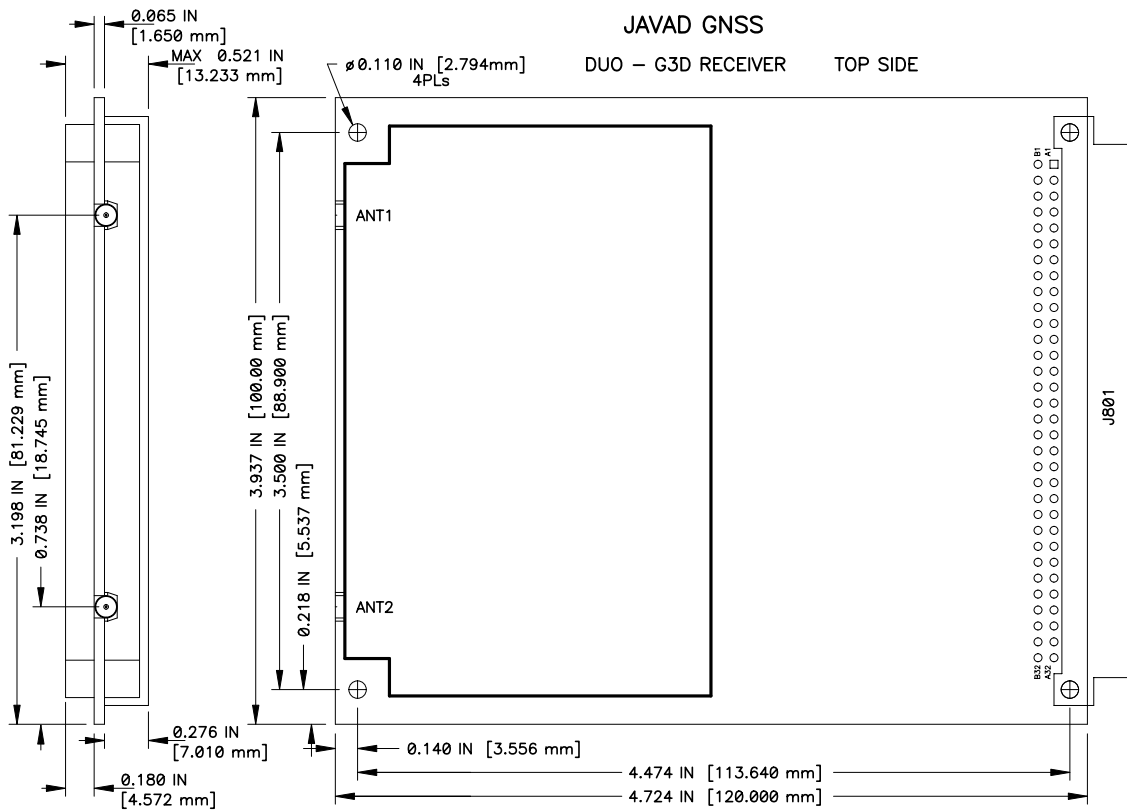
## Environmental

- Operating Temperature: -35°C to +75°C
- Storage Temperature: -40°C to +85°C
- Vibration: MIL-STD-810G (Category 24 7.7g RMS)
- Shock: MIL-STD-810G (40g)

## Physical

- Dimensions: 100x120 mm
- Weight: 120 g
- Digital connector: 64-pin DIN41612 type B Right Angle, AMP p/n 536052-5.
- RF connectors: MMCX Jack, edge mount, AMPHENOL, P/N 908-22100

# TRE-DUO



Specifications are subject to change without notice



**JAVAD GNSS**  
**www.javad.com**  
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