# TW163

CALIAN
Confidence. Engineered.

## TW163 1-to-2 Port Smart Power GNSS Signal Splitter (10 dB gain)

Frequency Coverage: Full GNSS Spectrum

The Calian TW163 is a professional-grade full GNSS band signal splitter that connects one antenna to two receivers, and supports GPS/QZSS-L1/L2/L5, QZSS-L6, GLONASS-G1/G2/G3, BeiDou-B1/B2/B2a/B3, Galileo-E1/E5a/E5b/E6, NavIC-L5, and L-Band correction services.

GNSS has become a critical component in safety, security, timing, and infrastructure applications, all of which require very high availability. As a result, resilient fault-tolerant components are essential to avoid service interruptions.

The design of first-generation GNSS signal splitters suffered from a single point of failure: only one attached receiver powered the splitter and the antenna. If this receiver failed or was unplugged, all attached receivers also failed.

Calian's current-generation TW163 Smart Power GNSS signal splitter provides two additional key features:

First, it accepts power from all attached GNSS receivers and selects power from a receiver using the following protocol. Port #1 is given priority if its voltage is within the specified range (3.3 V - 12.5 VDC). However, if port #1's receiver is disconnected or if its receiver power goes below the under-voltage or above the over-voltage specification, the TW163 will switch to the next port in numerical order, as long as its power and voltage are within the expected range. The switching and port selection is, therefore, deterministic.

Second, if the antenna fails and does not draw current, the TW163 will provide all connectors with a current draw lower than 1 mA, indicating an antenna fault.

The TW163 offers the best in-class performance in terms of noise figure, isolation, and linearity. In addition, it is packaged in a robust, compact, lightweight, and water-proof (IP67) corrosion-protected aluminum housing.

The TW163 is available with SMA, TNC, or type-N connectors and offers 10 dB gain over the splitting-loss.

It is recommended that unused ports should be terminated with a 50 Ohm load.




### Applications

- GNSS signal distribution
- GNSS receiver testing
- High-availability applications
- Network and infrastructure timing

### Features

- Accepts power from all attached receivers
- Automatically switches on power failure of one receiver
- Antenna failure detection/indication
- Rugged military-grade aluminum enclosure
- Amplification to compensate for signal-splitting loss
- Very low noise figure
- IP67-compliant

### Benefits

- Allows two GNSS receivers to share a single antenna
- Fits in-line with antenna cable
- Robust package
- Ideal for harsh environments

**About Calian:** With global headquarters and manufacturing in Ottawa, Canada, Calian is a leading manufacturer of high-precision antennas and components for Global Navigation Satellite System (GNSS) applications. Calian's mission is to support the needs of a new generation of positioning systems by delivering unprecedented antenna precision at competitive prices. Learn more at www.calian.com/gnss

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Revision: 202610

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## Electrical Specifications

| Parameter | Conditions / Description | Minimum | Typical | Maximum | Units |
|---|---|---|---|---|---|
| **Frequency Range** | Bandwidth supported | 1100 | - | 1700 | MHz |
| **Gain** | Measured within range: -40 °C to 85 °C | 9 | 10 | 11 | dB |
| **Impedance** | - | - | 50 | - | Ω |
| **Noise Figure** | All Receiver Ports | - | 1.7 | 2 | dB |
| **Output Isolation** | - | 27 | - | - | dB |
| **Input/Output SWR** | - | - | 1.3:1 \| 1.1:1 | 1.5:1 \| 1.2:1 | ratio |
| **Gain Compression Point (P1dB)** | Gain of 0 dB | -20 | -17 | -14 | dBm |
| **3rd Order Intercept (IIP3)** | Gain of 0 dB | -10 | -7 | -4 | dBm |
| **RF Input (Damage Threshold)** | Maximum RF Input without damage | - | - | 5 | dBm |
| **Amplitude Balance** | Between Ports | - | 0.1 | 0.5 | dB |
| **Phase Balance** | Between Ports | - | 2 | 5 | degrees (°) |
| **DC Input Range** | DC input on any receiver port | 3.3 | - | 12.5 | VDC |
| **Receiver Over-Voltage** | - | 12.7 | 14.9 | 16.9 | VDC |
| **Receiver Under-Voltage** | - | 2.3 | 2.5 | 2.8 | VDC |
| **Splitter Current** | Current consumed by splitter | - | 15 | 25 | mA |
| **Antenna Through Current** | Maximum current provided to the antenna | - | - | 230 | mA |
| **Group Delay Variation** | Antenna to Ports | 1 | 1.4 | 2 | ns |
| | Adjacent Ports | 0 | 0.3 | 0.5 | ns |
| | Opposite Ports | 0 | 0.5 | 1 | ns |

## Mechanicals

| | |
|---|---|
| Size | 117.0 mm (l.) x 111.6 mm (w.) x 38.0 mm (h.) |
| Weight | 320 g (type-N) or 270 g (TNC) |
| Connectors | SMA, TNC or type-N (all female) |
| Enclosure | Aluminum 6061-T6 |

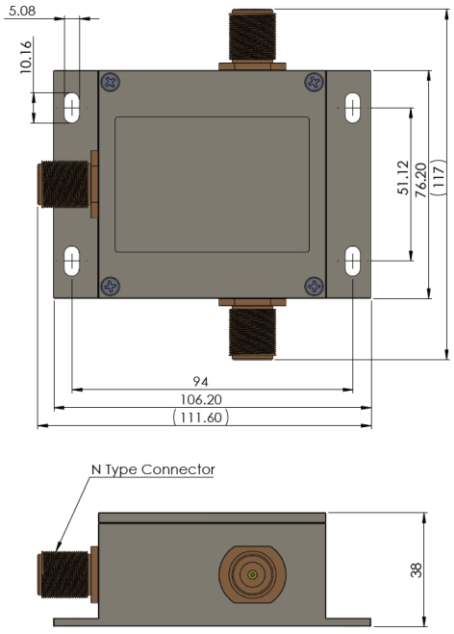
## Environmental

| | |
|---|---|
| Operating Temperature | -40 °C to 85 °C |
| Storage Temperature | -55 °C to 95 °C |
| Vibration | - |
| Shock | - |
| Salt Fog | - |
| IP Rating | IP67 |
| Compliance | RoHS, and REACH,<br>EN60950-1, RED / CE Certified,<br>FCC Part 15B and R&TTE equivalent. |

## Warranty

| | |
|---|---|
| Parts and Labour | 3-year standard warranty |

## Mechanical Diagram




## Ordering Information

**Part Number** **32-0163-xx**

where xx = connector:
14 = type-N (female), 01 = TNC (female), 20 = SMA (female)

Please refer to our **Ordering Guide** to review available radomes and connectors at:
https://at.calian.com/gnss/information-support/part-number-ordering-guide/

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Revision: 202610