



# TSC 4402

## Time Transfer Modem

### KEY FEATURES

- CDMA Architecture Allows Multiple Systems to Operate at the Same Frequency
- Operates in Mobile and Airborne Applications
- 2U Form Factor Requires Minimal Space
- Accepts Standard Timing Inputs (1 PPS, 5 or 10 MHz, NTP)
- Cross-Site Command and Control (C&C) Channel Available to User
- Status Information via Ethernet

The TSC 4402 enables many applications in which stringent cross-site timing requirements rendered them previously unfeasible. Using two-way time transfer, the TSC 4402 measures and reports the time offset between two timing systems with sub-nanosecond accuracy. This measurement accuracy and capability to operate over large geographic distances allow the TSC 4402 to introduce a new level of cross-site synchronization to your application.

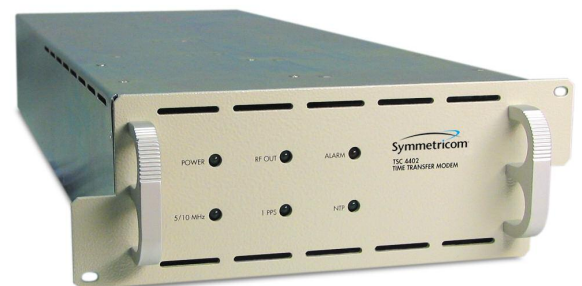
The TSC 4402 operates over a RF link established between two sites. It accepts standard timing references (1PPS, 5 or 10 MHz, and NTP) and produces a modulated timing signal at 70 MHz. This 70 MHz signal serves as the input to the user's RF communication link. Most link types are supported by the modem and the low data rate (2.5 kbps) of the TSC 4402 enables satellite communication (SatCom) links to be established using low power VSAT terminals. In addition, the CDMA architecture of the timing signal allows multiple systems to utilize the same frequency allocation and reduce the user's cost of bandwidth.

Undaunted by mobile applications, the TSC 4402 is capable of accepting positioning information from an external device (e.g. TSC 4400 "GPS Time and Frequency Standard") and automatically correcting for the dynamics of platform motion. This capability allows the TSC 4402 to maintain its sub-nanosecond accuracy even when installed on an aircraft and exceed the level of synchronization possible when using GPS techniques such as common-view.

Health and status information is available over the Ethernet connection on the TSC 4402. Additionally, a low data rate (1 kbps) channel is established over the RF link to allow the user to pass command and control information specific to their application.

The TSC 4402 can be configured to custom requirements.

Please contact Symmetricom with any specific requirements.



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## TSC 4402 Specifications

### ELECTRICAL SPECIFICATIONS

- 5/10 MHz Input
  - Connector: SMA female
  - Level: 8 -13 dBm
  - Impedance:  $50 \pm 5 \text{ } \Omega$
- 1PPS Input
  - Connector: SMA female
  - Level: 2.5 V - 5.0 V
  - Impedance:  $50 \pm 5 \text{ } \Omega$
- IF Output
  - Connector: SMA female
  - Frequency: 70 MHz
  - Bandwidth: 2.5 MHz
  - Level: -10 dBm to -30 dBm (1 dB steps)
  - Level Accuracy: 1 dB
- IF Input
  - Connector: SMA female
  - Frequency: 70 MHz
  - Bandwidth: 2.5 MHz
  - Input Level: -10 dBm to -50 dBm

### ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

- Temperature: 0°C to 30°C
- Humidity: 0 to 95% non-condensing
- AC Input: 90 – 260 V AC, 110 W, 47 – 63 Hz
- Dimensions: 3.5" (8.89 cm) H x 9.5" (24.13 cm)W x 22" (55.88 cm) D
- Weight: 13.2 lb (5.5 kg)
- Color: Parchment White

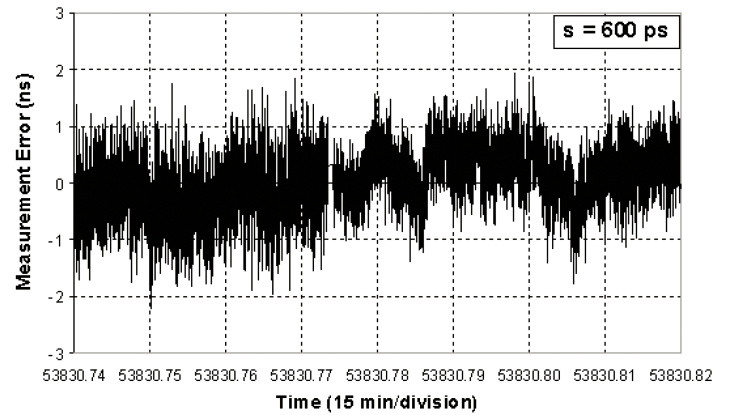
### CONFIGURATION OPTIONS

- 4402 Time transfer modem
- 4402-01 With rack mountable shelf
- 4402-DC Time transfer modem (28 V DC operation)

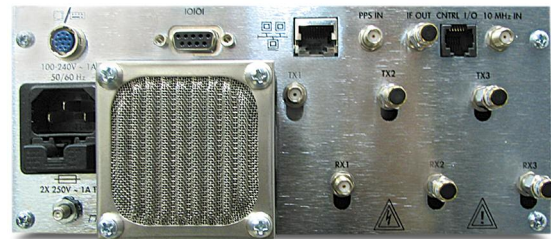
### ACCESSORIES

- OP001 L-band interface (950 – 1450 MHz)
- OP010 Ku-band terminal (transceiver & dish)

## TSC 4402 - Real-time Performance to Aircraft



Real-time Performance to Aircraft



Rear View



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