



# TimeStandard TS2050

## Cesium Frequency Standard

### Product Highlights:

- Autonomous Primary Reference Source
- 12 Year Cesium Tube Warranty
- T1/1.544 MHz or E1/2.048 MHz Outputs (Selectable)
- 5 and 10 MHz Sinewave Outputs
- Composite Clock Output (G.703/4)
- Supports Sync Status Messaging (SSM)
- Serial RS-232 Communications Port
- Redundant Power Feeds for -48 Vdc
- Meets Industry Standards Including ITU-T, ETSI, ANSI, Telcordia, NEBS and CE/AS
- 19 Inch or 23 Inch Rack Mounting
- Fully "Plug and Play"
- Temperature range: 0 - 50°C

### Applications:

- Emergency back-up
- Master Clock for digital telecommunications networks
- Synchronization of satellite ground terminals and remote stations
- Calibration of secondary quartz and rubidium slave clocks
- Troubleshooting for network synchronization problems

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(P/N 300-01000-012 REV C)

Available in both ANSI and ETSI Configurations



ETSI Version  
Front Access



ANSI Version  
Rear Access

***Ideally suited for operation in Office Primary Reference Clock applications, the CXR Larus Model TS2050 provides superior performance and reliability second to none***

The CXR Larus TimeStandard™ TS2050 Cesium Frequency Standard functions as a standalone Stratum 1 Primary Reference Clock or as a reference clock in Primary Reference Clock applications for telecommunications networks to provide accurate, stable and spectrally pure signals. This Cesium standard clock source is used to synchronize core and metro network offices.

The TS2050's clock is an independent time and frequency source that exceeds ITU-G.811, ETSI TM-3017-6 and ANSI Stratum 1 specifications. Utilizing the latest digital technology the Model TS2050 provides high accuracy and stability without incurring costly maintenance during the life of the Cesium tube

The CXR Larus TimeStandard TS2050 meets both the performance and practical needs of telecommunications timing applications. The output capabilities of the Model TS2050 are two 2.048 MHz signals or 2.048 Mb/s, or two 1.544 MHz or 1.544 Mb/s signals, selectable. Other output signals include 64/8 KHz Composite Clock per G.703, and 5 and 10 MHz sinewave outputs.

Because the TS2050 is autonomous and does not have to rely on the availability of roof access for GPS antennas, installation is a snap, and the clock can be fully operational in less than 45 minutes. Its plug and play architecture provides highly reliable operation over the lifetime of the system.

[www.cxrlarus.com](http://www.cxrlarus.com)

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# CXR Larus TimeStandard TS2050

## Specifications:

### Physical:

#### Dimensions, Weight: (W x D x H):

18.2 in. (462 mm) x 10.1 in. (257 mm) x 10.5 in. (267 mm)  
36.6 lbs (16.6 kg) nominal

### System Supply Voltage

-36 to -62 Vdc, 40 W nominal, 55 watts maximum (warm up)  
Dual redundant power feeds

### Environmental:

Operating Temp: 0°C to 50°C  
Storage Temp: -40°C to 75°C  
Relative humidity: 0-95%, non condensing  
Magnetic Field: 0-2 gauss @ DC, 50, 60 or 400 Hz

### Outputs:

**Telecom Signals** Two framed or unframed

#### Selection of:

1.544 MHz per G.703/13 or  
T1 (1.544 Mb/s) per ANSI T1.102  
AMI, B8ZS Compatible framed All Ones, with Stratum 1 SSM  
100 Ohms or 75 Ohms unbalanced

2.048 MHz per G.703/13 or  
E1 (2.048 Mb/s) per ITU-G.703/9 with G.704 framing  
and Stratum 1 SSM. Framed All Ones, HDB3 Line coding  
120 Ohms or 75 Ohms unbalanced

and One 64/8 KHz Composite Clock per G.703/4, 133 Ohms

#### Connectors:

9 pin D-Sub for balanced signals, BNC for unbalanced

### Sinusoidal Signals

One each at 5 MHz and 10 MHz, 1.0V rms into 50 Ohms, BNC

**Communications Interface Connector:** 9 pin Male D-Sub connector  
Connection to PC or Laptop requires null modem cable (not supplied)

### Performance

**Accuracy over environment:**  $\leq \pm 1 \times 10^{-12}$

**Reproducibility:**  $\leq \pm 1.2 \times 10^{-12}$

#### Stability: Averaging Time

1 s	$1.2 \times 10^{-11}$
10 s	$8.5 \times 10^{-12}$
100 s	$2.7 \times 10^{-12}$
1,000 s	$8.5 \times 10^{-13}$
10,000 s	$2.7 \times 10^{-13}$

Warm up time, typical: 30 minutes

### Frequency Domain Stability:

Frequency Offset	SSB Phase Noise (dBc)
$10^0$	$\leq -85$
$10^1$	$\leq -120$
$10^2$	$\leq -130$
$10^3$	$\leq -140$
$10^4$	$\leq -145$
$10^5$	$\leq -145$

### Harmonic and Subharmonic Signals (typical)

< -40dBc

### Spurious Signals and non harmonic distortion

< -80 dBc

### Alarm Contact Relay Ratings:

#### Critical and Minor Alarms

Switching power, 30 W maximum @220 Vdc or Vac, 1A

### Standards:

Meets or exceeds industry standards, including ITU-T, ETSI, ANSI, Telcordia, NEBS and CE/AS

## Ordering Information:

**TS2050-1** TimeStandard Cesium Frequency Standard, ETSI Front Access  
(Includes configuration software and 3 each DB9 to Wirewrap adapters)

**TS2050-2** TimeStandard Cesium Frequency Standard, ANSI Rear Access  
(Includes configuration software and 3 each DB9 to Wirewrap adapters)



Network Timing, Test and Access Solutions