



BROADCASTING



LABORATORY



MILITARY



PHYSICS INSTITUTE

Time code and frequency

- 1PPS, PP5S, PPM, PPQH, PPHH, PPH, PPD
- 10MHz, 5MHz, 2.048MHz, 1.544MHz
- IRIG DCLS, IRIG-B AM
- NASA 20/28/36, AFNOR, STANAG4430
- XR3/2137 25 1PPS 1-Second Time Code
- Bi-level 5-rate slow Code Symmetricom
- GNSS NMEA183 +1PPS Code ELPROMA



Features

- 1 to 32 signal splitter
- Conversion to/from IEEE1344
- Clock recovery from IEEE1588 (LAN)
- Clock disciplined to GNSS
- TTL, Sine support
- High precision and low noise
- Modular construction
- 2 Year Warranty



TFD-100 series

Time & Frequency Distribution

The **TFD-100 series** series is a 1U, rack 19" mount, modular time and frequency distributor unit. It provides the precise distribution of any:

- frequency from 1PPS up to 10MHz
- time code signals IRIG, AFNOR, NASA
- decoded signals GNSS
- ... and many others

This including most popular standards: 1PPS, 10MHz, IRIG-B, IRIG-DCLS

TFD-100 series

Precision distributor modules

TFM-2010

GPS/GLONAS/Beidou network time server (NTP, PTP). Includes high quality TCXO 10MHz frequency source synchronized to GPS.

TFM-2010 is next generation Industry 4.0, time server module. It delivers time directly to network using NTP and IEEE1588 protocols. It is equipped with single 100/10Mbps Ethernet port working with IPv4/IPv6*. Devices supports hardware PTP timestamping.

Unit also has the natural air cooling. It has been designed for autonomous vehicle market. It has very fast clock recovery important to start synchronisation until GNSS not ready (cold/warm start problem). It is equipped with GNSS antenna and 30 meter coax cable (SMA ended).

Server has multi-satellites receiver simultaneously supporting: GPS, GLONASS. It is GALIELO*, BEIDOU* ready.

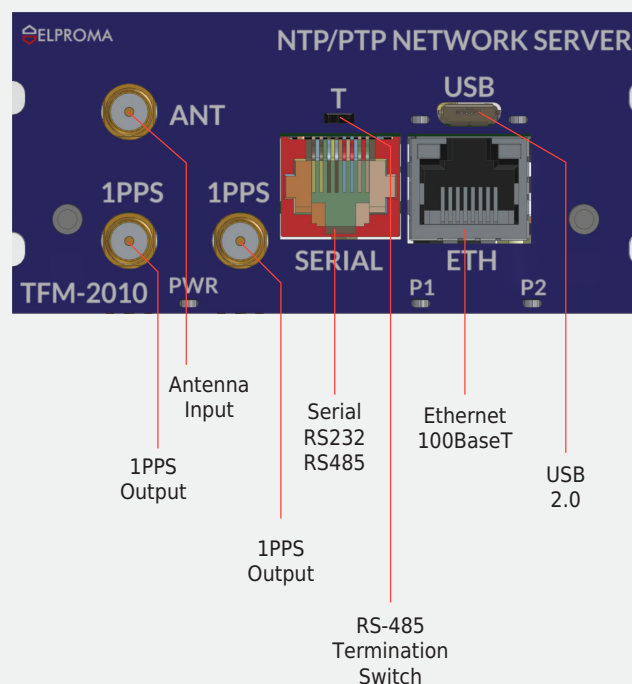
Server module has very fast (less than 0.5ms +/- 1ppm) Time To First Fix TTFF synchronization startup. The GNSS receiver accuracy is better than 15ns (at 2 sigma). Server supports cryptographic authentication for NTP. Holdover mode ensure synchronization accuracy to be better than 4ms in first hour.

After 24h the max. holdover error is not bigger than 100ms on server output. When normally operating its accuracy is better than 200 ns.

Technical data

Model	TFM-2010
Antenna interface	1x SMA, 30m coax H155
Holdover OSC	TCXO
sync PROTOCOL	NTP, PTP IEEE1588
std. GNSS	GPS, GLONAS
#CHANNELS	32
hardware STAMP*	accuracy < 200ns
software STAMP	accuracy < 800us
1PPS OUTPUT	1x SMA
Time/DAYTIME	RFC(867-8)*
#LAN	x1, 100Mbps RJ-45
TCP/IP	Ipv4, Ipv6*, TCP, UDP
MANAGEMENT	HTTP, HTTPS, SSH, TELNET
SECURITY	Autokey, DSA, SSL, MD5, RSA
Interfaces	Rs232, RS485, USB 2.0

* extra feature





TFD-100 series

Modular 1PPS/10MHz/IRIG-B Distribution Unit

The **TFD-100 series** is a 1U, rack mount, modular time and frequency distributor. It provides the precise distribution of any frequency from 1PPS up to 10MHz include most popular standards: 1PPS (TTL), IRIG-DCLS (TTL), 10MHz (TTL and Sine).

You can order the following base modules that differ in power supply:

- TFP-101 - single 85-265VAC/100-370VDC power supply
- TFP-102 - dual, redundant 85-265VAC/100-370VDC power supplies
- TFP-110 - single 48V DC power supply
- TFP-120 - dual, redundant 48V DC power supplies
- TFP-111 - dual, redundant 85-265VAC/100-370VDC and 48VDC power supplies

Input modules:

- TFM-2022 - universal 2 x Inputs module with redundancy
- TFM-2010 - GPS/GLONASS/Beidou network time server (NTP, PTP). Includes high quality OCXO or TCXO 10MHz frequency source synchronized to GPS.

High precision distributor modules:

- TFM-1218 -high precision 1/8 digital distribution module. 1x input, 8x output. Sockets: BNC (TFM-1218BNC) or SMA (TFM-1218SMA).
- TFM-1228 - 1/8 analog distribution module. 1xinput, 8x output. Sockets: BNC (TFM-1228BNC) or SMA (TFM-1228SMA).

Technical data

Model	TFD-100, Modular Time & Frequency distributor
Inputs	1PPS (TTL), 10 MHz (Sin), 10MHz (TTL), IRIG-DCLS (TTL), IRIG-DCLS (RS422/RS485), FO fiber optic
Outputs	1PPS (TTL), 10 MHz (Sin), 10MHz (TTL), IRIG-DCLS (TTL), IRIG-DCLS (RS422/RS485), FO fiber optic
Frequency	1 up to 15 Mhz
Input/Output impedance	50 Ω or 100 Ω *
Input/output connectors	BNC or SMA, Terminal Block 3.5 mm (depends on module version)
Rise/Fall time	1 ns
Ambient temperature	0°C to 50°C
Humidity	0-95% non-condensed
Power supply	Single or redundant, 85...264V AC, 100...370V DC or 48VDC (36-72VDC) or mixed
Dimensions	483 mm (W) x 45mm (H) x 330 mm (B) - 1U - 19 inch rack mount
Weight	3 - 3.5 kg (depends on number of modules)
Safety	IEC61010-1:2010, IEC61850
Warranty	Three-Year Warranty

TFD-100 series

Precision distributor modules

TFM-1218

The TFM-1218 module is a 1PPS to 10MHz (TTL) high precision 1/8 distributor module.

It provides the precise distribution of any:

- frequency from 1PPS up to 50MHz
- time code signals IRIG-DCLS (TTL)

Technical data

Model	TFM-1218
Input	1x @ 50Ω (TTL)
Outputs	8x 2.5V @ 50Ω,
Frequency	0 up to 50 MHz
Input/output connectors	BNC or SMA
Rise/Fall time	~ 1 ns
Delay input-output	<7.3 ns (typical 6.5ns)
Outputs phase dispersion	<0.7ns (typical 0.3ns)
Dimensions	168x160x20mm
Warranty	Three-Year Warranty

TFM-1228

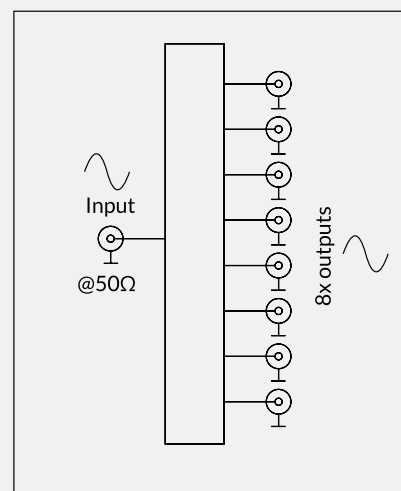
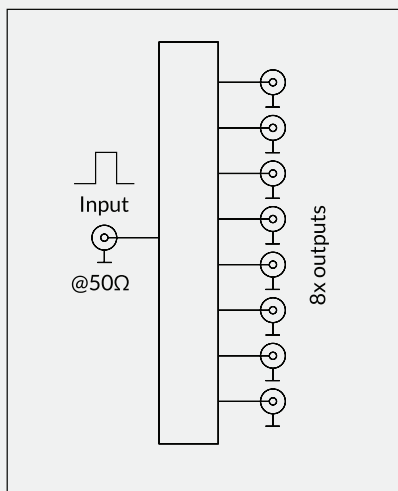
The TFM-1228 module is a 10MHz analog sine 1/8 distributor module.

It provides the distribution of:

- frequency from 1Hz up to 15MHz analog signal
- IRIG time code compatible signals (i.e. IRIG-B AM, IRIG DCLS)

Technical data

Model	TFM-1228
Input	-8dBm to 13dBm @50Ω
Outputs	8x 1Vpp (-8dBm to 17dBm) @ 50Ω
Frequency	1Hz up to 15MHz
Input/output connectors	BNC or SMA
Total Harmonic	<-40dBm (for 10MHz
Distorsion (THD)	filtered outputs option)
Dimensions	168x160x20mm
Warranty	Two-Year Warranty



TFD-100 series

Precision distributor modules

TFM-2022

GPS/GLONAS/Beidou network time server (NTP, PTP). Includes high quality TCXO 10MHz frequency source synchronized to GPS.

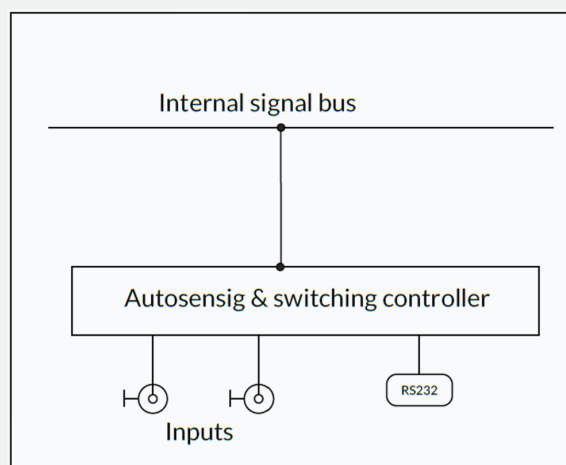
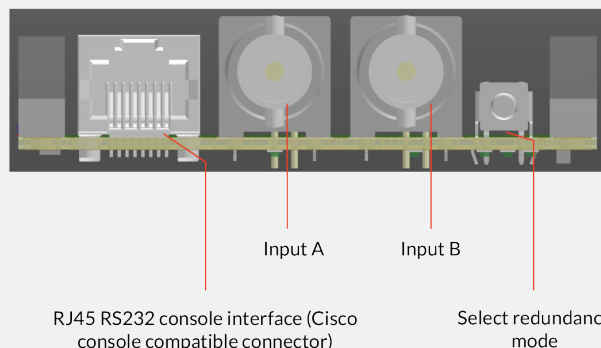
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Server module has very fast (less than 0.5ms +/- 1ppm) Time To First Fix TTFF synchronization startup. The GNSS receiver accuracy is better than 15ns (at 2 sigma). Server supports cryptographic authentication for NTP. Holdover mode ensure synchronization accuracy to be better than 4ms in first hour.

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Technical data

Model	TFM-2022
Input level	From -8dBm to 18dBm
Input level pulse/IRIG	0-6Vpp
Frequency	1Hz up to 15MHz
Input connectors	BNC or SMA
Port to port isolation	100dB@100kHz, 60dB@10MHz
Input redundancy	Channel-A, Channel-B or Auto-switching
Dimensions	168x160x20mm
Warranty	Two-Year Warranty

* extra feature