ELPROMA

Time & Frequency Distribution

TFD-100 series

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

- frequency from 1Hz up to 60MHz
- time code signals IRIG, AFNOR, NASA
- decoded signals GNSS

... and many others

This including most popular standards:

1PPS, 10MHz, IRIG-B, IRIG-DCLS, IRIG-B AM

Datasheet v2.3
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Time code and frequency

- 10PPS, 1PPS, PP5S, PPM, PPQH, PPHH, PPH, PPD
- 10MHz, 5MHz, 2.048MHz, 1.544MHz
- IRIG DCLS, IRIG-A AM, 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
- Remote management through RJ45 RS232 console interface (Cisco console compatible connector)

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

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The TFD-100 series is a 1U, rack mount, modular time and frequency distributor. It provides the precise distribution of any frequency from 1Hz up to 60MHz include most popular standards: 1PPS (TTL), IRIG-DCLS (TTL), IRIG-B AM, 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. 1x input, 8x output. Sockets: BNC (TFM-1228BNC) or SMA (TFM-1228SMA).

Technical data

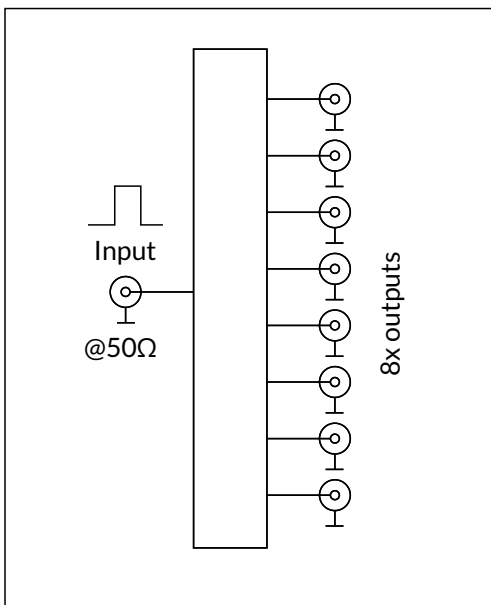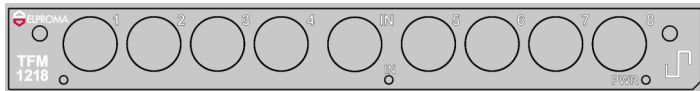| Model	TFD-100, Modular Time & Frequency distributor
Inputs	10PPS, 1PPS (TTL), 10 MHz (Sin), 10MHz (TTL), IRIG-DCLS (TTL), IRIB-B AM
Outputs	1PPS (TTL), 10 MHz (Sin), 10MHz (TTL), IRIG-DCLS (TTL), IRIB-B AM
Frequency	1 Hz up to 60 Mhz
Input/Output impedance	50 Ω
Input/output connectors	BNC or SMA, Terminal 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	Two-Year Warranty

it depends on type of module

TFM-1218

The TFM-1218 module is a 1Hz to 60MHz (TTL) high precision 1/8 distributor module.
It provides the precise distribution of any:

- Frequency from 1Hz up to 60MHz
- Time code signals IRIG-DCLS (TTL) 1PPS, 10PPS etc.

Technical data

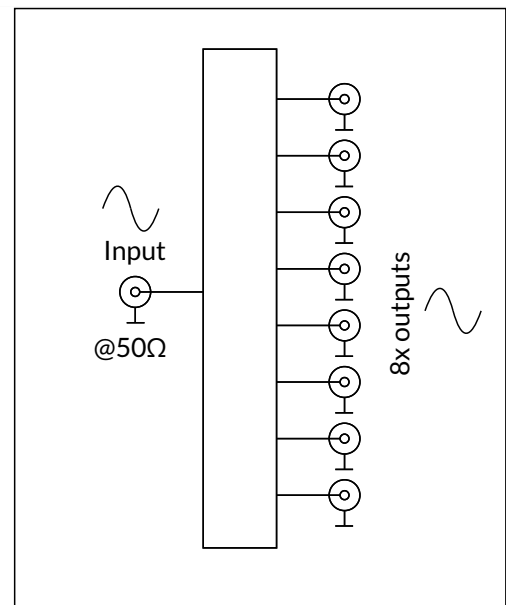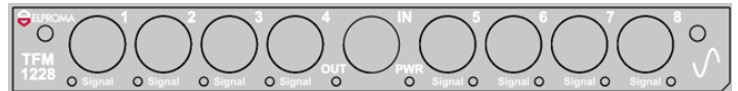| Model	TFM-1218
Input	1x @ 50Ω (TTL)
Outputs	8x 2.5V @ 50Ω,
Frequency	1 Hz up to 60 MHz
Input/output connectors	BNC or SMA
Rise/Fall time	~ 1 ns
Delay input-output	<7.3 ns (typicical 6.5ns)
Outputs phase dispersion	<0.7ns (typical 0.3ns)
Dimensions	168x160x20mm
Warranty	Two-Year Warranty

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)
- Signal presence indicators
- Phase Noise for 5MHz: 1Hz -110dBc/Hz 10Hz -130dBc/Hz 100Hz -143dBc/Hz 1kHz -150dBc/Hz 10kHz -152dBc/Hz for 10MHz: 1Hz -104.83 dBc/Hz 10Hz -124.57 dBc/Hz 100 Hz -142.67 dBc/Hz 1kHz -146.26 dBc/Hz 10 kHz -148.36 dBc/Hz 100 kHz -147.87 dBc/Hz 1 MHz -143.70 dBc/Hz

Technical data

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

TFM-2010

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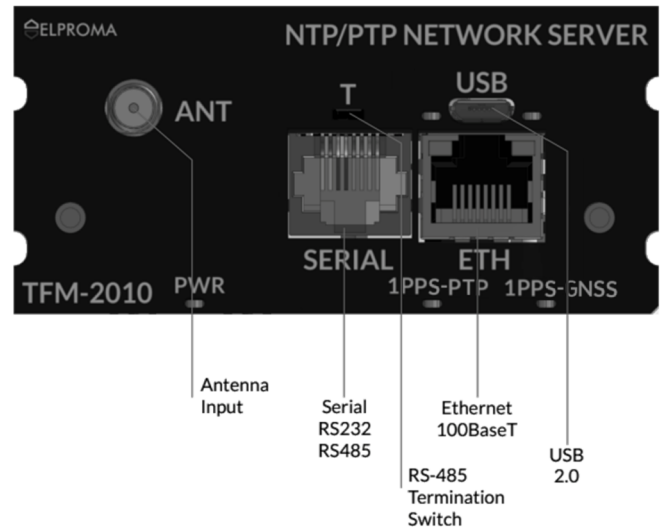
Server has multi-satellites receiver simultaneously supporting: GPS, GLONASS. It is GALIELO*, BEIDOU* ready.

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, GLONASS
#CHANNELS	32
hardware STAMP*	accuracy < 200 ns
software STAMP	accuracy < 800us
1PPS OUTPUT	from output module i.e. TFM-1218
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

TFM-2022

 TFM-2022 is the new universal module compatible with analog and digital signals with 2 x inputs supports redundancy. Redundancy mode can be change using front pannel button or by special commands send to RS232 console connector (Cisco console compatible).

There are 3 modes of the redundancy:
Channel-A - hard-fixed input from Input A,
Channel-B - hard-fixed input from Input B,
Auto-switching - autodetection of the signal on both inputs, where the signal A is the primary input.

The TFM-2022 module supports signal presence detection and signal type: 1PPS, IRIG or HF signal detection.

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