ELPROMA

Modular Signal Distributor

TFD-200

The TFD-200 is a 1U, rack 19" mount, modular signal distributor unit.
It provides the precise distribution of any:

- frequency from 1PPS up to 10MHz
- decoded signals GNSS - NMEA

... and many others

This including most popular standards:

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

Time code and frequency

- 1PPS, PP5S, PPM, PPQH, PPHH, PPH, PPD
- 10MHz, 5MHz, 2.048MHz, 1.544MHz
- IRIG-B AM, IRIG-DCLS
- GNSS NMEA183 +1PPS Code
- PTP-Slave IEEE1588

... and custom design signals

Features

- 1 to 68* signal splitter
- Clock recovery from IEEE1588 (LAN)
- Clock disciplined to GNSS
- TTL, Sine support
- High precision and low noise
- Modular construction
- 3 Year Warranty

* depends on number of output modules

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The **TFD-200** is a 1U rack mount, modular time and frequency distributor. It provides the precise distribution of any frequency from 1PPS up to 10MHz, including most the popular standards: 1PPS (TTL), 5/10MHz (TTL and Sine).

Input modules:

- **TFM-210.4** – 4 digital inputs (level TTL/50Ω) for 1PPS and 10MHz with input monitoring & signaling. Input sockets: BNC or SMA.
- **TFM-220.2** – 2 analog 10MHz (7dBm) inputs for frequency distribution with input monitoring and signalling. Input sockets: BNC or SMA.
- **TFM-230.2** - 2 digital ToD inputs (RS-232)
- **TFM-240.2** - 2 universal redundant inputs 1PPS(TTL), up to 10MHz TTL, 5/10MHz sine, IRIG-DC, IRIG-AM with auto-sensing, auto-switching, monitoring and signalling via RS232 serial port.
- **TFM-251** – GPS/GLONAS/Beidou network time server (NTP, PTP). Includes high quality OCXO or TCXO 10MHz frequency source synchronized to GPS. PTP-Slave with recovery 1PPS and 10MHz signals.

Output modules:

- **TFM-211.4** – 4x digital outputs module (TTL @50Ω) for 1PPS, IRIG-DCLS, 10MHz. Matrix crospoint switch for max. 4 inputs. Output sockets: BNC or SMA
- **TFM-221.4** – 4x analog 10MHz sinus (7dBm) outputs module. Matrix crospoint switch for max 2 inputs. Output sockets: BNC or SMA
- **TFM-231.4** - 4x digital ToD Serial outputs (RS-232) with monitoring and signalling. Output sockets: terminal block 2.54mm.
- **TFM-241.12** - 12x universal outputs for 1PPS (TTL), up to 10MHz TTL, 5/10MHZ sine, IRIG-DC, IRIG-AM.

High precision distributor modules:

- **TFM-281.8** – high precision 1/8 digital distribution module (TTL @50Ω) for 1PPS, IRIG-DCLS, 5/10MHz. 1x input, 8x output. Sockets: BNC or SMA.
- **TFM-281.16** – high precision 1/16 digital distribution module (TTL @50Ω) for 1PPS, IRIG-DCLS, 5/10MHz. 1x input, 16x output. Sockets: BNC or SMA.
- **TFM-282.8** – 1/8 analog 10MHz sinus (13dBm50Ω) distribution module. 1x input, 8x output. Sockets: BNC or SMA.
- TFM-282.16 – 1/16 analog 10MHz sinus (13dBm50Ω) distribution module. 1x input, 16x output. Sockets: BNC or SMA.

Power supply modules:

- TFP-201 – single 85-265VAC/100-370VDC power supply
- TFP-202 – single 48V DC power supply

For redundant power you must order two power modules.

Technical data

| Model	TFD-200, Modular Signal Distributor
Inputs	1PPS (TTL), 5/10 MHz (Sin), up to 10MHz (TTL), IRIG-DCLS (TTL), IRIG-AM
Outputs	1PPS (TTL), 5/10 MHz (Sin), up to 10MHz (TTL), IRIG-DCLS (TTL), IRIG-AM
Frequency	0 up to 10 MHz *
Input/output connectors	BNC or SMA, (depends on module version)
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	444 mm (W) x 45mm (H) x 350 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
Technical support	Comapany offers free lifetime technical support via email or phone.

*it depends on type of module

TFM-281.8(16)

The module is a 1PPS to 10MHz (TTL) high precision 1/8 (1/16) distributor module. It provides the precise distribution of any:

• frequency from 1PPS up to 10MHz
• time code signals IRIG-DCLS (TTL)

Technical data

Model	TFM-281.8 (16)
Input	1x @ 50Ω (TTL)
Outputs	8x 2.5V @ 50Ω or 16x2.5V @ 50Ω
Frequency	0 up to 10 MHz
Input/output connectors	BNC or SMA
Rise/Fall time	<2 ns (typical 1.5 ns)
Delay input-output	<7.3 ns (typicical 6.5ns)
Outputs phase dispersion	<0.7ns (typical 0.3ns)
Dimensions	168x160x20mm
Warranty	Three-Year Warranty
Technical support	Free lifetime technical support via email or phone.
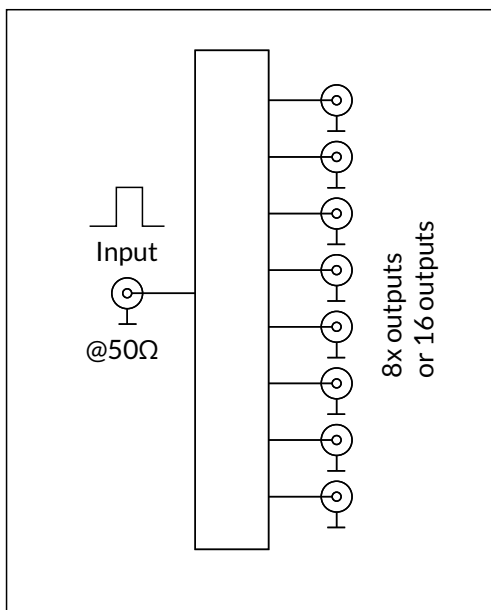
TFM-282.8(16)

The module is a 10MHz analog sine 1/8 (1/16) distributor module.
It provides the distribution of:

▪ frequency from 5/10MHz Sine signal
▪ IRIG-AM

Technical data

| Model	TFM-282.8 (16)
Input	1x 13dBm @ 50Ω
Outputs	8x 13dBm or 16x 13dBm
Frequency	10 MHz
Input/output connectors	BNC or SMA
Total Harmonic Distorsion (THD)	<-40dBm
Dimensions	168x160x20mm
Warranty	Three-Year Warranty
Technical support	Free lifetime technical support via email or phone.
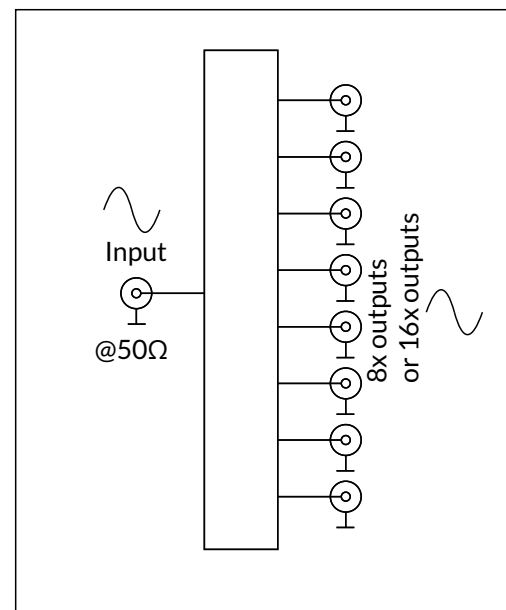
TFD-211.4

The MSD-211.4 module is a 1PPS to 10MHz (TTL) precicision 4 output module with matrix crosspoint switch for 4 internal signal lines. It provides the precise distribution of any:

- frequency from 1PPS up to 10MHz
- time code signals IRIG-DCLS (TTL)

Technical data

| Model	MSD-211.4
Outputs	4x 2.5V @ 50Ω with matrix crospoint switch
Frequency	0 up to 10 MHz
Output connectors	BNC or SMA
Rise/Fall time	<2 ns (typical 1.5 ns)
Delay input-output	<8 ns (typicical 6.5ns)
Outputs phase dispersion	<0.7ns (typical 0.3ns)
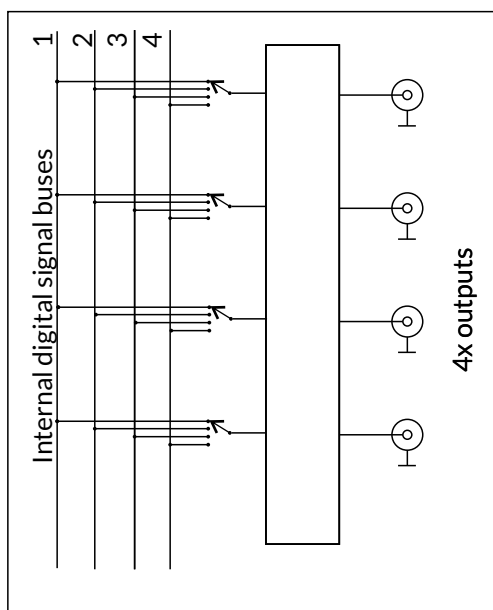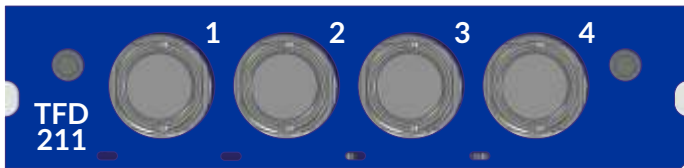
TFD-221.4

The MSD-22214 module is a 10MHz (Sinus) 7dBm 4 output module with matrix crosspoint switch for 2 internal signal lines. It provides the precise distribution of:

- frequency from 5/10MHz Sine signal
- IRIG-AM

Technical data

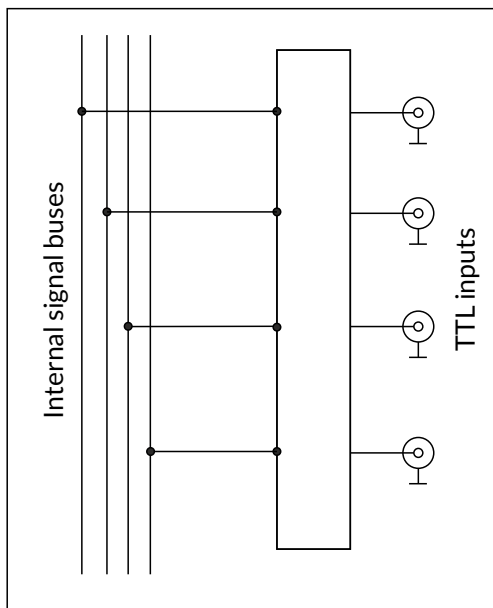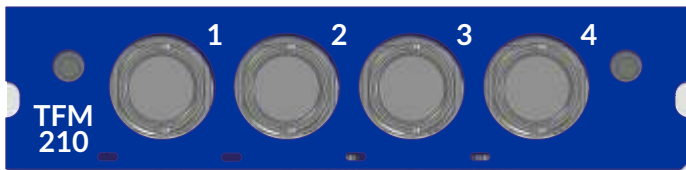| Model	MS-221.4
Outputs	4x 3Vpp(13dBm) @ 50Ω,
Frequency	10 MHz
Output connectors	BNC or SMA
Total Harmonic Distorsion (THD)	-40dBm
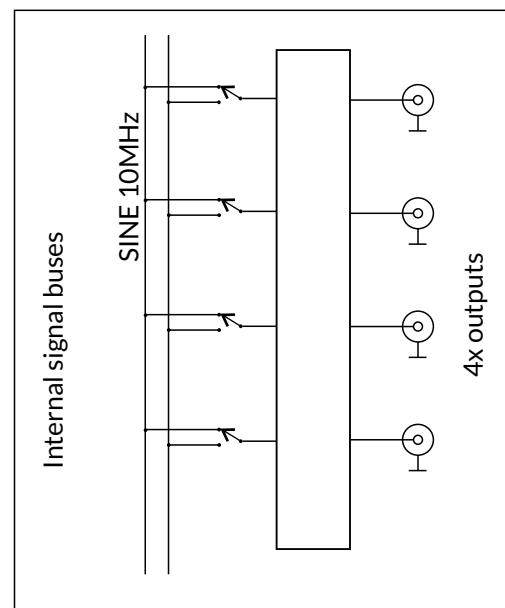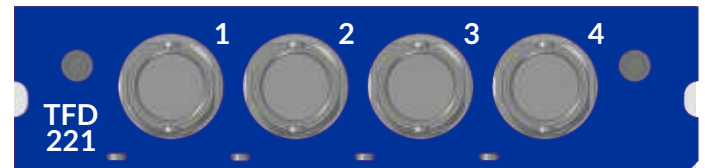
TFM-210.4

The module is a 1PPS and 10MHz (TTL) precicision input module. It enables 1PPS and 10MHZ signals to be provided to the internal signal buses.

TFM-220.2

- It is a 10MHz (Sinus) 2 input module. It provides the inputs o 10MHz Sine signal from two separate sockets to two separate signal buses.

Technical data

Model	TFM-210
Inputs	4x 2.5V @ 50Ω,
Frequency	0 up to 10 MHz
Input connectors	BNC or SMA
Rise/Fall time	<2 ns (typical 1.5 ns)
Delay input-bus	<10 ns (typicical 7ns)

Technical data

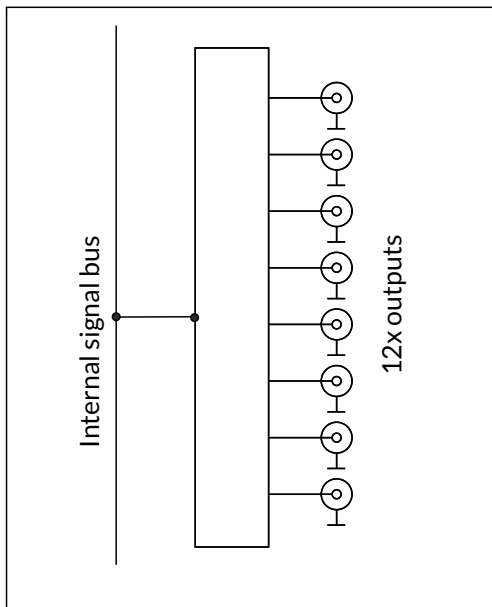| Model	TFM-220
Inputs	2x3Vpp(13dBm) @ 50Ω, monitored
Frequency	up to 10 MHz
Input connectors	BNC or SMA
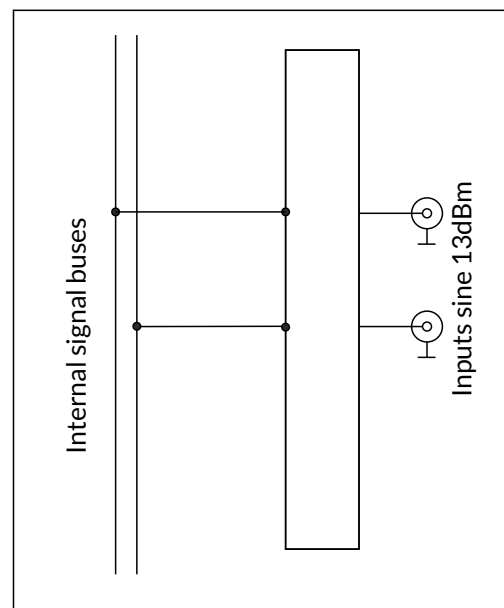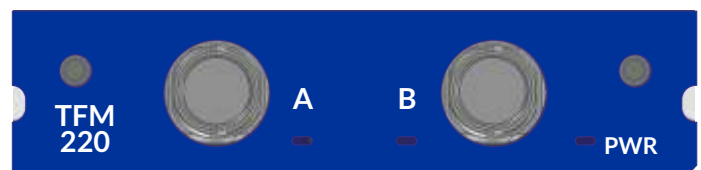
TFM-240.2

2 universal redundant inputs 1PPS(TTL), up to 10MHz TTL, 5/10MHz sine, IRIG-DC, IRIG-AM with autosensing, autoswitching, monitoring and signaling via RS232 serial port.

Technical data

| Model	TFM-240
Inputs	2x 13dBm@ 50Ω (5/10MHz). 0-6V (IRIG-B), TTL@50Ω (1PPS)
Input connectors	BNC or SMA

TFM-241.12

• It is a 12x universal outputs for 1PPS (TTL), up to 10MHz TTL, 5/10MHZ sine, IRIG-DC, IRIG-AM.

Technical data

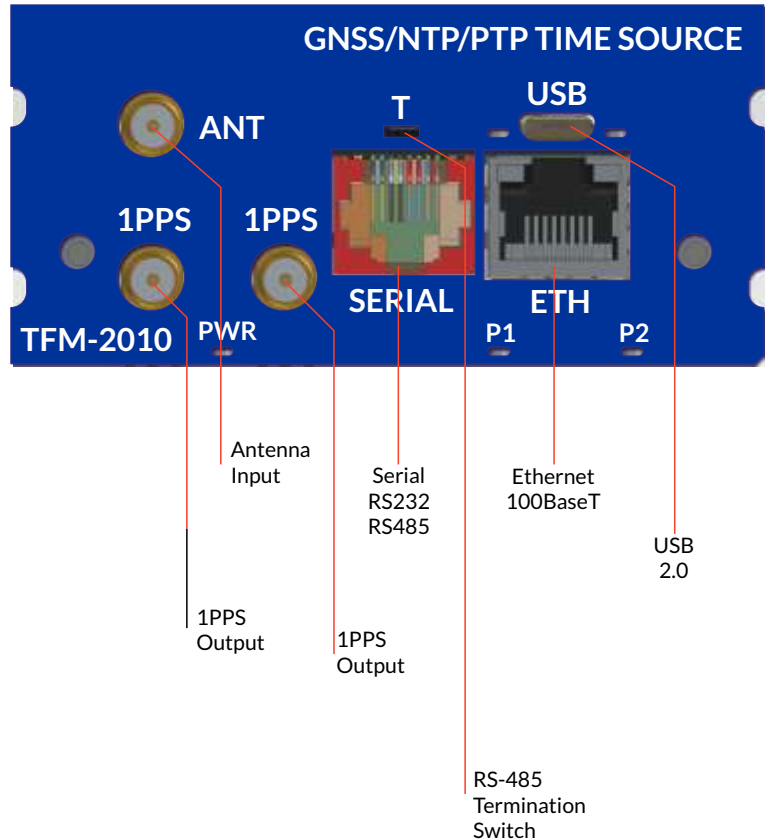| Model	TFM-241
Inputs	2x3Vpp(13dBm) @ 50Ω,
Frequency	up to 10 MHz
Rise/Fall time	<15 ns for 1PPS
Delay input-bus	<15 ns
1PPS Jitter	<200ps RMS
1PPS Skew	<1ns
IRIG Output Level	0-6Vp-p
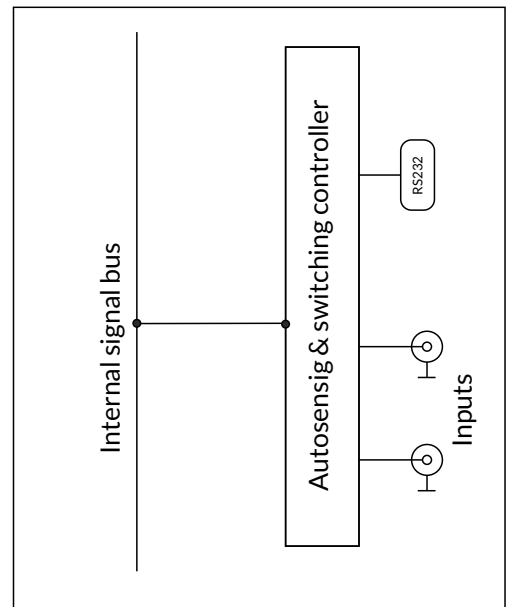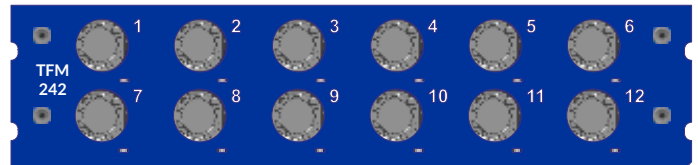
TFM-251

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

MSD-251 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 100Mbps Ethernet port working with IPv4/IPv6*. Devices supports hardware PTP time-stamping. 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. It works also as NTP/PTP slave time signal source.

GNSS/NTP/PTP TIME SOURCE

ANT — Antenna Input
1PPS — 1PPS Output
TFM-2010
PWR
1PPS — 1PPS Output
T
SERIAL — Serial RS232 RS485
RS-485 Termination Switch
USB — USB 2.0
ETH — Ethernet 100BaseT
P1   P2

Technical data

Model	TFM-251
Antenna interface	1x SMA, 30m coax H155
Holdover OSC	TCXO
sync PROTOCOL	NTP, PTP IEEE1588
std. GNSS	GPS, GLONAS
#CHANNELS	32
hardware STAMP*	accuracy < 200 ns
software STAMP	accuracy < 800us
1PPS OUTPUT	1x SMA
Time/DAYTIME	RFC(867-8)*
#LAN	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