# TMG5020

## Time Code Generator

### - UTC, 1PPS, IRIG-B

## Frequency Generator

### - 10 MHz

### - 8 programmable Outputs

*Multi sources synchronization:*
*GNSS, IRIG-B12X, External 1PPS*

*Low noise 10 MHz output*
*Long term stability per day <1x10$^{-09}$*

*8 programmable outputs*
*1PPS, IRIGB, 10MHz & sub-multiples*

*Monitoring through HTTP/HTTPS using a Web interface or via SNMP V2c/V3*

*Easy software update through embedded SDCard*

*NTP V4*

*Services*

- *SYSLOG*
- *802.1X*
- *SSH*
- *RTC*

TMG5020 is a time and frequency generator disciplined by an external reference and based on a high stability pilot to guarantee hold over performance when losing its external reference.

Its 8 programmable outputs can be selected amongst IRIGB, 1 PPS, 10MHz, adjustable 1 PPS (Start and width) and adjustable digital clock (within a selection of available frequency).

The equipment is housed in 1U 19" standard rack

## GNSS

The internal GNSS receiver is a specific receiver dedicated to local and mobile time applications.
It is available with multi-constellations as GPS, GLONASS, GALILEO & BEIDOU receivers. Single or a max of 2 constellations at a time with GPS + 1 other.
It delivers an extremely high precision UTC second reference pulse.

## Irig-B generator

The equipment includes a IRIG-B time code generator that provides:

- An IRIG-B12x signal (amplitude modulated analog signal)
- An unmodulated IRIG-B00x signal (DCLS)

These signals are in phase with the internal 1PPS equipment itself synchronized on the 1PPS of reference time source.

## Multi-sources synchronization (IRIG-B12X, GNSS, 1PPS IN)

The equipment synchronizes on the available input source: GNSS, IRIG-B12X or 1PPSIN
Source priority can be setup.

## Oscillator

An internal OCXO type oscillator provides a 10 MHz frequency used to maintain time. The stability of this oscillator is better than 1x10$^{-9}$ per day in case of loss of external time sourcing.
When disciplined by the GNSS, the long term stability remains better than 5x10$^{-11}$.

## NTP Service

The TMG5020 includes a time service implementing standard NTP protocol (Network Time Protocol) allowing any computer or equipment linked to the network to synchronize. NTP client software must be installed on each client for its synchronization with the server.

## Remote monitoring

The remote monitoring of the equipment is done via the network, using:

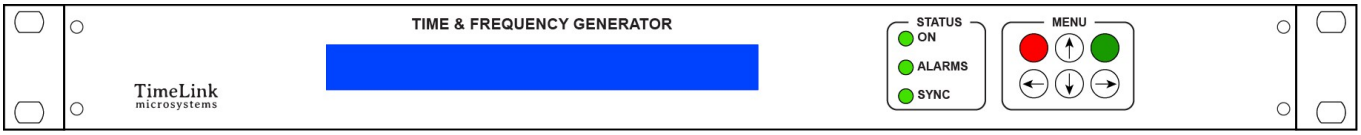
- The SNMP standard protocol (MIB provided)
- A web interface using HTTP or HTTPS
- A proprietary UDP or TCP protocol adding control features

## Configuration

The overall configuration of the unit is stored on a removable SDCARD memory which allows remote software update easily.

## Options

- 2nd power supply AC / DC
- Enhanced Internal pilot
- Additional NTP port
- 1 Standard NMEA GGA and RMC Emission at 4800 bauds




*TMG5020 front panel*

# Specifications

## NTP

(Network Time Protocol)
NTP (RFC 1305) SNTP (RFC 1361) using UDP 123 port.
Server configuration V3, V4 or automatic V3/V4.

## SNMP

(Simple Network Management)
(RFC 1155, 1157, 1213) V2c or V3
SNMP provides to the network administrator the equipment status.

## HTTP/HTTPS

The integrated web server allows monitoring the equipment.

## TCP / UDP

Remote in "push" mode (UDP / TCP) or "request / response" mode (TCP).

## Connectors

1 x TNC for the GNSS antenna input
1x BNC for 1PPS output
8 x BNC output for programmable outputs: 1PPS, IRIG B12x, IRIG B00x, 10MHz & digital frequencies
1 x USB for serial console link.
1 x RJ45 network connection
1 x BNC input for 1PPS IN
1 x BNC input for IRIGB IN
2 x SUBD 9 for options

## Network Interface

Ethernet IEEE 802.3. 10/100/1000

## 1 PPS output

TTL level. Accuracy of ± 100 ns relative to UTC when locked to GNSS.

## Programable outputs

### • IRIGB outputs

Selectable format on both types of outputs: B12x, or IEEE1344
**IRIG B12x**
Modulated code (B12x): up to 8V ±0.5 V peak-peak 1/1: 1/3 ratio isolated by transformer. BNC connectors (analog)
**IRIG B00x**
No modulated (B00x), DCLS interface

### • Digital signals

Pulse signals: programmable start & Width
Frequency: 1Hz , 1Khz, 10Khz, 100Khz,1MHz with a level of 0 to 5 volts.

### • 10 MHz Outputs

Level +13 dBm ±1 dBm, 50 Ω
**Guaranteed** Phase noise:

| | |
|---|---|
| 1Hz | -90 dBc/Hz |
| 10Hz | -110 dBc/Hz |
| 100Hz | -130 dBc/Hz |
| 1 KHz | -140 dBc/Hz |
| ≥ 10KHz | -145 dBc/Hz |

## Internal reference

OCXO type Oscillator, 10 MHz
**Free running mode**:
Short term stability:

| | |
|---|---|
| 1s | < 2.10-11 |
| 10s - 100s | < 2.10-11 |

Long term stability:

| | |
|---|---|
| 1 day | < 1.10-9 |
| 1 month | < 3.10-8 |
| 1 year | < 2.10-7 |

**Locked running mode:**
Long term stability: < 5.10-11

## Console

USB compliant
Console for configuration & maintenance

## Temperature

Temperature: 0 ° to 60 ° C
Storage temperature: -20 ° to 70 ° C
Relative Humidity range: 10% to 90% (non-condensing)
Storage Relative Humidity: 5% to 95% (non-condensing)

## Power supply:

Single 230V AC mains supply
EEC socket 2P + with filter & On / Off switch
voltage: 90-264VAC / 47-63Hz
Power consumption x 1: <20W AC or DC
Power consumption x 2: <40W AC or DC

## Certification:

Certified Hardware CE, ROHS Reach
ITAR free & EAR 99

## Dimensions:

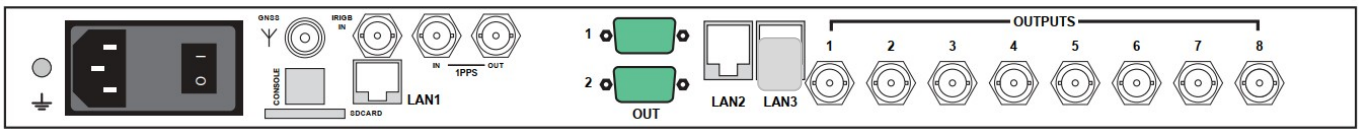
Standard 19" 1U with Depth of 350 mm
Rack 1U 19" L =483 x l =350 x H= 44 mm
OPT1: Standard 19" 2U

## Weight

< 3 kg

## MTBF :

> 100 000 h
> 150 000 h with OPT1




*Example of **TMG5020-OPT02.1** back panel*

## Order code:

| | |
|---|---|
| *TMG5020:* | *Standard* |
| *TMG5020 OPT1.X:* | *REDUNDANT AC(1.1) & DC(1.2) Power Supply (with 2U rack)* |
| *TMG5020 OPT2.N:* | *N Additional NTP ports, N=1 or N=2* |

*Please contact us for any further information or function needed*