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Series

GNS 1000

TIMING REFERENCE GNSS LOCKED (GPS + GLONASS)
1ppS + 10MHz outputs

The high quality, professional and cost-effective solution

The **"GNS 1000"** is a new concept Timing Reference GNSS Locked generator: a high quality, professional, flexible and really cost-effective solution to generate time and frequency signals *(1PPS and 10MHz)* suitable for equipment that need high precision clock reference and for the stable synchronization of telecommunication equipment, including broadcasting Single Frequency Networks (SFN).
This innovative product, able to receive GPS and GLONASS constellations, has unique special features, with proprietary algorithms, to prevent network de-synchronization *(Holdover error recovery, Single satellite operation, Fast cold start-up, Zero cumulated error,* etc.) and is available in redundant configurations as well as OEM part.

Applications

- Digital and Analog Broadcasting Stations
- Instruments and equipment
- R&D and Test Laboratories

Main Features

- GNSS (Global Navigation Satellite System) reception (GPS + GLONASS constellations)
- High sensitivity GNSS receiver with 32 channels
- Fast satellites acquisition
- Single satellite reception operation
- Fast cold start-up function
- High stability and low phase noise 10MHz oven oscillator
- Zero Cumulated error function
- Long hold-over time (up to a pre-set limit)
- Hold-over error recovery (up to a pre-set limit)
- Anti-jamming function
- Up to 12 + 12 outputs (1pps / 10MHz)
- Redundant configurations for GNSS receiver, oven oscillator and power supply
- User friendly local control with front panel LCD display and keypad
- RS485; Ethernet 10/100 Base-T (SNMP, web server, e-mail client) remote control interface options.
- Stand-Alone Unit 19" 1U high.

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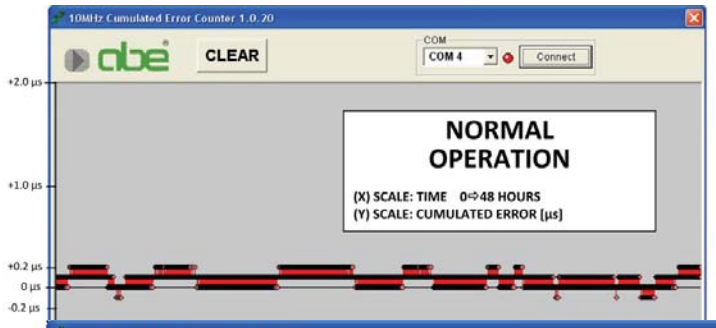
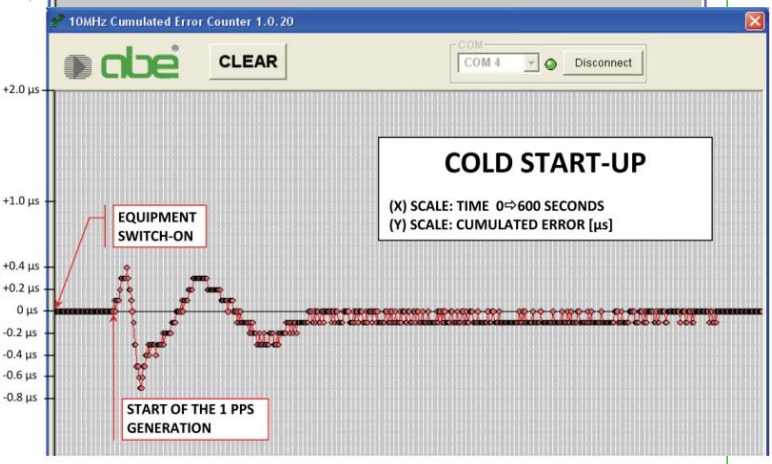
The GNSS receiver, specifically developed for the timing function, can operate also receiving a single satellite and provides the 1pps (one pulse per second) and locks a 10MHz “oven type” reference oscillator.

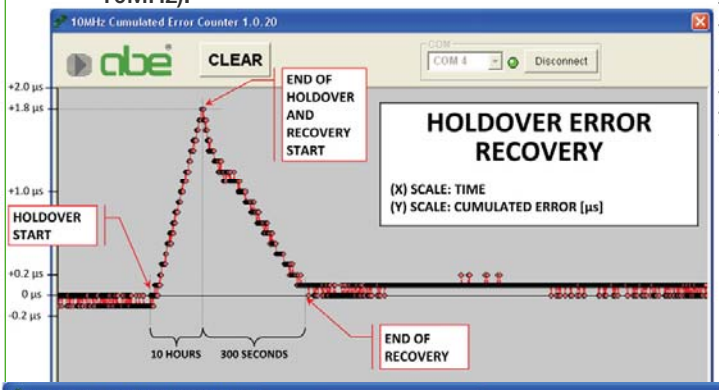
This unit has been designed to minimize synchronization problems (i.e.: cumulated error, wander, holdover error, cold start-up error etc.) for critical applications (e.g.: digital broadcasting SFN networks and analog broadcasting “Precision Offset” operation).

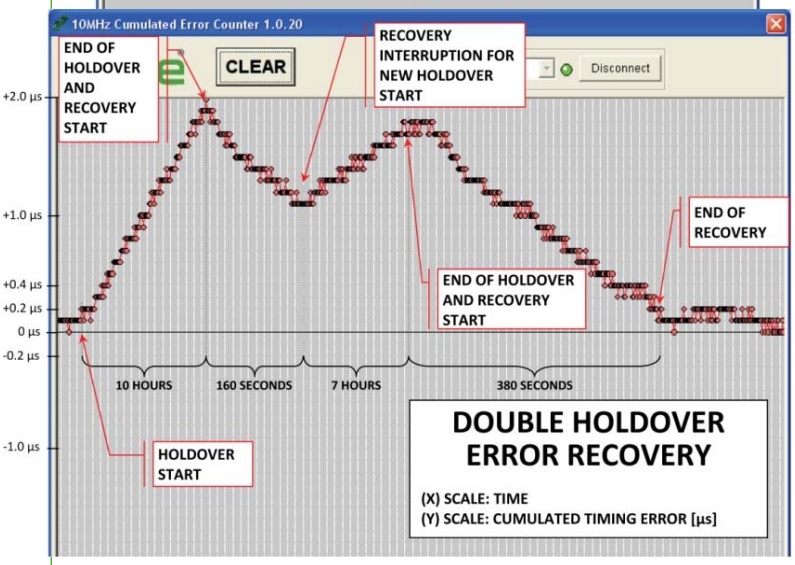
Moreover, the reference high-stability “oven type” oscillator is capable of maintaining the synchronization over long periods when there is an intermittent signal from the GNSS satellites (holdover function).

The unit can be equipped with double (redundant) GNSS receiver, oven oscillator and power supply so to increase reliability.
Equipment configurations include possibility to have up to 12 couples of output signals (1pps and 10MHz).









The innovative management and control board of the equipment is built around a 32 bit micro-controller with the following key characteristics:

- **Local Control** from the front panel, easy and friendly, with LCD graphic display LCD and keypad
- **LAN Interface** (Ethernet Base T 10/100 – RJ45 connector) in addition to RS485
- **Web Server** with access protected by username/password (3 different levels of control) able to read/set all the equipment parameters
- **Event Logger** (recording with date & time of all events of alarms, power-on, fault conditions etc.) with storage of more than 5,000 events and is downloadable through the transmitter’s WEB Server
- **Remote Upgrade Function** for the control board firmware
- **Email Client** for the automated notification, via email to pre-programmed addresses, of changes in alarm conditions
- **SNMP Agent** able to send alarms (“traps”), to read equipment parameters (through the “get” command), to set the equipment (i.e. reset through the “set” command)

The connection between the transmitter’s LAN interface and the control centre can be established by means of a **GPRS** or **UMTS** modem / router, a radio data-link or an **ADSL** or **PSTN** modem.

GNS 1000 - Timing Reference GNSS Locked

SPECIFICATIONS

GNSS Receiver tracking capability:	Up to 32 satellites simultaneously (GPS + GLONASS constellations)
Receiver Sensivity:	-155dBm (tracking)
Input impedance:	50 Ω
Input connector:	TNC female (on request other types)
Power supply (for amplified antenna):	+5V (excludible)
1pps accuracy (when locked):	15nS (1 sigma)
Typical 10MHz output frequency accuracy (when locked):	$1 \bullet 10^{-10}$
Long time typical 10MHz frequency stability (when locked):	Same as GNSS reference ($\geq 1 \bullet 10^{-12}$ daily average)
10MHz oven oscillator stability (free run):	Standard version: $\geq 1 \bullet 10^{-9}$/day; High performance option: $\geq 2 \bullet 10^{-10}$/daily average
10MHz Oven oscillator phase noise:	**Standard version:** ≤-90dBc/Hz @ 1 Hz offset / ≤-120dBc/Hz @ 10 Hz offset ≤-140dBc/Hz @ 100 Hz offset ≤-150dBc/Hz @ 1 KHz offset ≤-155dBc/Hz @ 10 KHz offset **High performance option:** ≤-95dBc/Hz @ 1 Hz offset / ≤-125dBc/Hz @ 10 Hz offset ≤-145dBc/Hz @ 100 Hz offset ≤-150dBc/Hz @ 1 KHz offset ≤-155dBc/Hz @ 10 KHz offset
Output impedance and connector:	50 Ω
Output connectors:	BNC female
1 pps output level:	5Vpp
10MHz output level:	+10dBm (±2dB)

General Specifications

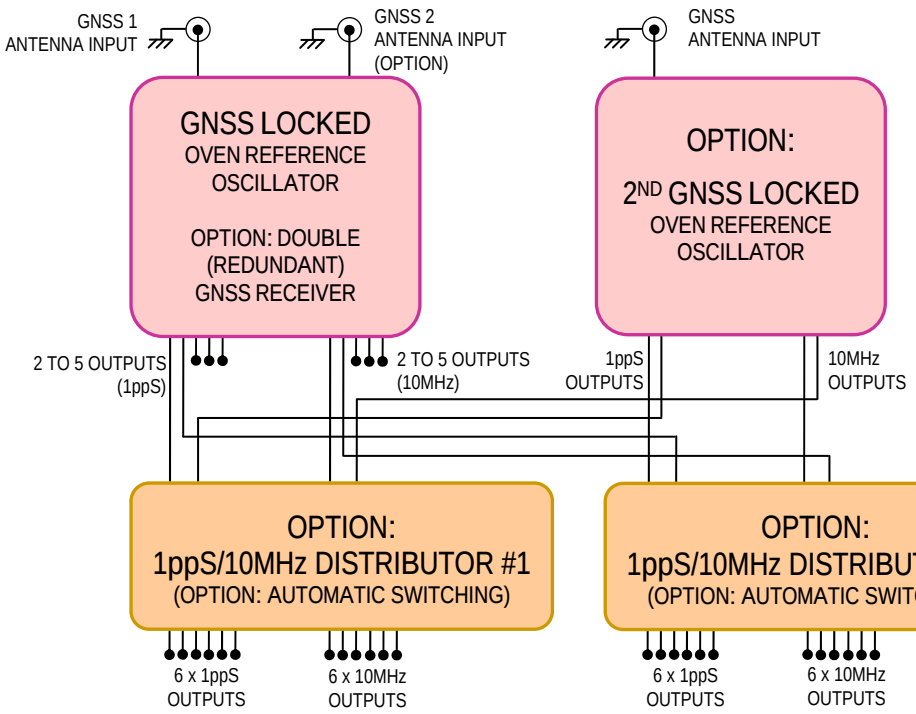
Power supply:	85 to 264Vac 50/60 Hz Option: Double (redundant) power supply; D.C. power supply (also with backup battery)
Remote control interface options:	RS485; Ethernet 10/100 Base-T (SNMP, Web server and e-mail client support)
Housing:	Rack drawer 19" 1U
Operating temperature range:	0 to 45° C.

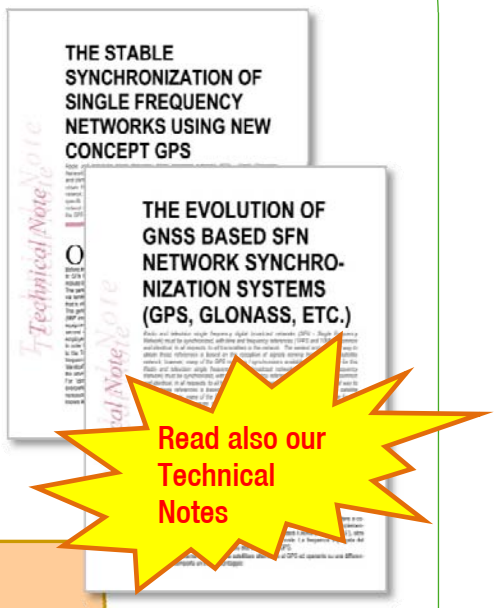
Standard Available Configurations

Model	Number of outputs	Configuration
GNS 1005/S	5x1pps + 5x10MHz	Single GNSS board with single GNSS receiver
GNS 1005/D	5x1pps + 5x10MHz	Single GNSS board with double GNSS receiver
GNS 1010/S	10x1pps + 10x10MHz	Single GNSS board with single GNSS receiver + distributor
GNS 1010/D	10x1pps + 10x10MHz	Single GNSS board with double GNSS receiver + distributor
GNS 1006	6x1pps + 6x10MHz	Double GNSS board (one GNSS receiver and one Oven oscillator each) + distributor with automatic switching
GNS 1012	12x1pps + 12x10MHz	Double GNSS board (one GNSS receiver and one Oven oscillator each) + two distributors with automatic switching

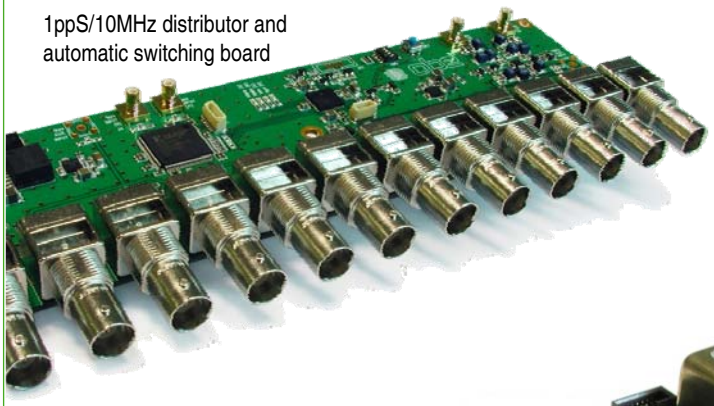
Other configurations available on request

GNS 1000 - Timing Reference GNSS Locked
general block diagram





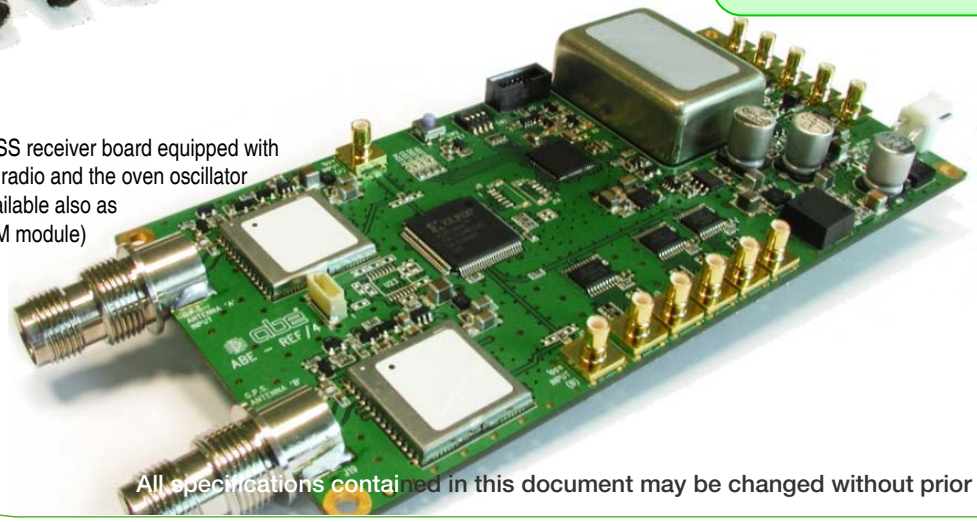
1ppS/10MHz distributor and automatic switching board



Main available options:

- High performance oven reference
- Double (redundant) power supply
- Double (redundant) GNSS receiver
- Double (redundant) GNSS receiver & oven oscillator
- 5 to 12 outputs (10MHz + 1ppS) according to the model
- Receiving antennas and cables
- D.C. power supply (also with backup battery)

GNSS receiver board equipped with two radio and the oven oscillator (available also as OEM module)



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