

GPS Time Reference



The 4g T420 provides highly accurate, satellite-based clock reference signals for synchronizing the protection, control, and monitoring systems installed in power plants and process plants and substations. The device combines accuracy, flexibility and ease of use in a single and compact enclosure. 4g's GPS-based solution has several signal formats and interface configurations programmable via software.

The T420 is IEC 61850 compliant, including an internal NTP/SNTP server with programmable offset compensation. 4g's GPS can also be synchronized via IRIG-B optical input when the unit is operated as a time repeater.

The T420 has a typical accuracy of 100 ns, meeting the most demanding applications, including protective relays, fault recorders, PMU, RTU, SCADA systems, computers, DCS, PLC traveling wave fault locators and more.

The TTL-level and open collector outputs can be configured by software to IRIG-B, 100PPS, 1PPS, 1 PPM, or a programmable pulse. The programmable pulse generator can be configured as sequence of pulses (from 1 pulse every two seconds to 1 pulse every 24 hours), pulse-on-time or pulse-on-date. All of the outputs have substantial drive capability.

The T420 can be ordered with up to 8 optical IRIG-B time code outputs, which allow synchronizing multiple devices up to a distance of 1500 meters (5000 feet) without ground loop and interference problems.

The RS232 output allows the selection of built-in datagrams or a custom-defined one. A one pulse-per-second (PPS) output is also provided.

The Amplitude-modulated outputs provides IRIG-B120 format signal. The IRIG-B000 and IRIG-B120 time codes are compliant with IEEE C37.118 Standard.

The T420 was designed to work in harsh substation environments and can be powered from a wide range of AC and DC power sources. The unit has 6 indicators for status and alarm. A large time display always shows local time.

The following is the standard configuration of the T420:

- Up to 8 TTL-level IRIG-B outputs
- 2 amplitude-modulated IRIG-B outputs
- 3 open collector outputs 1 optical output
- 1 user programmable RS-232C
- 1 dry contact relay to indicate a "Locked" condition
- GPS data backup battery
- Internal NTP/SNTP server

Represented by:

SPECIFICATIONS



BACK PANEL

- Up to 8 TTL electric outputs, individually programmable (IRIG-B, 100PPS, 1PPS, 1PPM, custom-defined low frequency, pulse-on-time and pulse-on-date, either normal or inverted output), 80 mA, 15 ohms internal impedance and optional BNC adaptor
- 8 IRIG-B optical outputs
- 3 open collector outputs, individually pro-grammable (IRIG-B, 100PPS, 1PPS, 1PPM, custom-defined low frequency, pulse-on-time and pulse-on-date, either normal or inverted output), to drive up to 150 volt signals, 200 mA without delays
- 2 modulated IRIG-B120 BNC outputs, 4 Vpp, 15 ohms internal impedance
- 1 RS232 Male DB9, DTE layout serial port with user configurable frames, 1200-38400 bps, 7 or 8 databits, 1 or 2 stopbits, including PPS in RS232 level
- 1 RJ45 10/100Base-T Ethernet output (NTP/SNTP servers and configuration)
- 1 dry contact relay to indicate "Locked" condition

FRONT PANEL

- Time display
- 3 Status Indicators: MAINS (green), READY (green), LOCKED (green)
- 3 Alarm Indicators: ANTENNA OPEN (red), ANTENNA SHORT (red), ALARM (red)

USER SETUP OPTIONS

- The user setups are done via the Ethernet Port, using either SSH or TELNET protocol
- Communication (IP address, network mask, broadcast, gateway addresses, and password)
- Time Zone and user-configurable rules for day-light-saving-time (DST)
- Clock signal source: GPS or IRIG-B
- Time delay compensation for antenna cables and optical-fiber cables
- TTL-level and Open collector output signal
- Programmable pulse: from 1 pulse every two seconds to 1 pulse every 24 hours, pulse-on-time or pulse-on-date signals
- RS232 serial port (type of datagram, bitrate, number of data bits, parity, number of stopbits, and PPS output)

GENERAL SPECIFICATIONS

- Voltage: 88 to 264 Vac or 80 to 275 Vdc, 15 VA max
- Dimensions: 430 mm W x 44 mm H x 180 mm D (16.9 in x 1.7 in x 7.1 in, respectively)
- Weight: 2.7 kg (5.9 lbs), net
- Antenna Cable: 15 m (50 ft) provided; longer cables are available
- Operating temperature: 5 to 50°C (41 to 122°F)
- Humidity: 5 to 95%, non-condensing