

Rapco 1804 Series -- GPS Precision Time & Frequency sources



TYPICAL FRONT PANEL

- **USES SIGNALS FROM THE GPS SATELLITE CONSTELLATION AVAILABLE WORLDWIDE.**
- **VOLTAGE-CONTROLLED QUARTZ OR RUBIDIUM OSCILLATOR CONSTANTLY DRIFT-CORRECTED WITH RESPECT TO THE GPS TRANSMISSION.**
- **VERY-LONG-TERM ACCURACY OF THE OUTPUT APPROACHES THAT OF THE SATELLITES' ATOMIC REFERENCE OSCILLATORS.**
- **UNITS DO NOT REQUIRE CALIBRATION OF INTERNAL OSCILLATORS IN ORDER TO MAINTAIN FULL PERFORMANCE.**
- **RELATIONSHIP BETWEEN 1HZ TIMING OUTPUT AND UTC IS MAINTAINED SO THAT PRECISE RELATIVE TIMING CAN BE ACHIEVED BETWEEN DISTANT INSTALLATIONS.**

Designed and manufactured under strict quality control conditions, the 1804 can be used with confidence as a frequency reference for both analogue and digital T.V. & radio transmission, in Cellular networks and for Telecommunications timing. Other applications include military communication systems, satellite ground stations and calibration-laboratory systems, particularly in connection with the development and manufacture of high-technology products. With over 1,400 installations worldwide, the 1804, now in its third-generation, continues to offer an unmatched combination of accuracy, functionality and reliability.

PRODUCT IDENTIFICATION

Products in this family are divided into two main groups, which are:

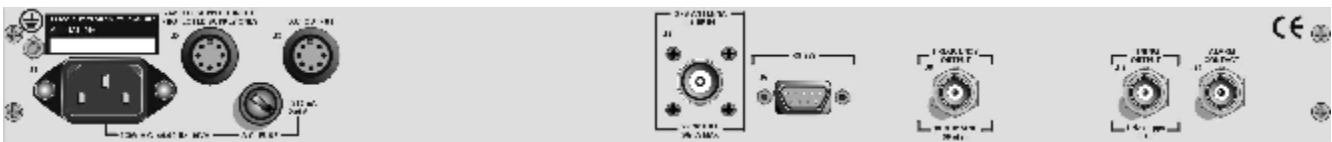
1804L25xxx - Quartz referenced units

1804L26xxx - Rubidium referenced units

The 1804 is available with a wide range of options; identified by a two or three-character suffix in the type number [xxx in the above examples]

The 1804L25E8A, described below has become virtually an industry standard for numerous broadcast applications, In particular it has been successful for Digital Audio Broadcast (DAB) and Digital Video Broadcast (DVB) in Single Frequency Networks where the control of both Frequency and Timing is crucial.

The Rubidium-reference 1804L26xxx versions offer exceptional accuracy for calibration-standard work or as a Master clock for satellite control centres or Telecommunications Timing. The 'stand-alone' accuracy of the reference oscillator is more than two orders-of-magnitude higher than a Quartz-referenced unit.



REAR PANEL 1804L25E8A

SPECIFICATIONS 1804L25E8A

FREQUENCY OUTPUT

Reference Frequency 10 MHz
 Number of Outputs 1 x Sinewave on BNC
 Amplitude, Sine output +10dBm in 50 ohm. factory setting, (+7 to +13dB available)

TIMING OUTPUT

Type Square wave, +ve edge on-time 1Hz, derived from the internal drift-corrected oscillator and phase-locked to the average position of the GPS 1pps (UTC).
 Number of Outputs 1 x BNC
 Signal Level TTL >+4V o/c, >+2.4V into 50 ohm
 Accuracy (uncalibrated) Leading edge on-time to UTC-USNO to within ± 300 nanosecond
 Stability ± 100 nS typical, 95% probability

SERIAL DATA INTERFACE RS232

Connector 9 Way 'D' socket.

Two operating modes are provided. a) Terminal Mode. Unit powers up in this mode. Data are formatted to directly drive a 'dumb' terminal, or a PC running a terminal emulator. This provides a continuous, rolling display of Date and Time plus Position and Satellite-acquisition data. b) Remote Mode. A range of commands is available providing comprehensive control and interrogation of the unit's functions.

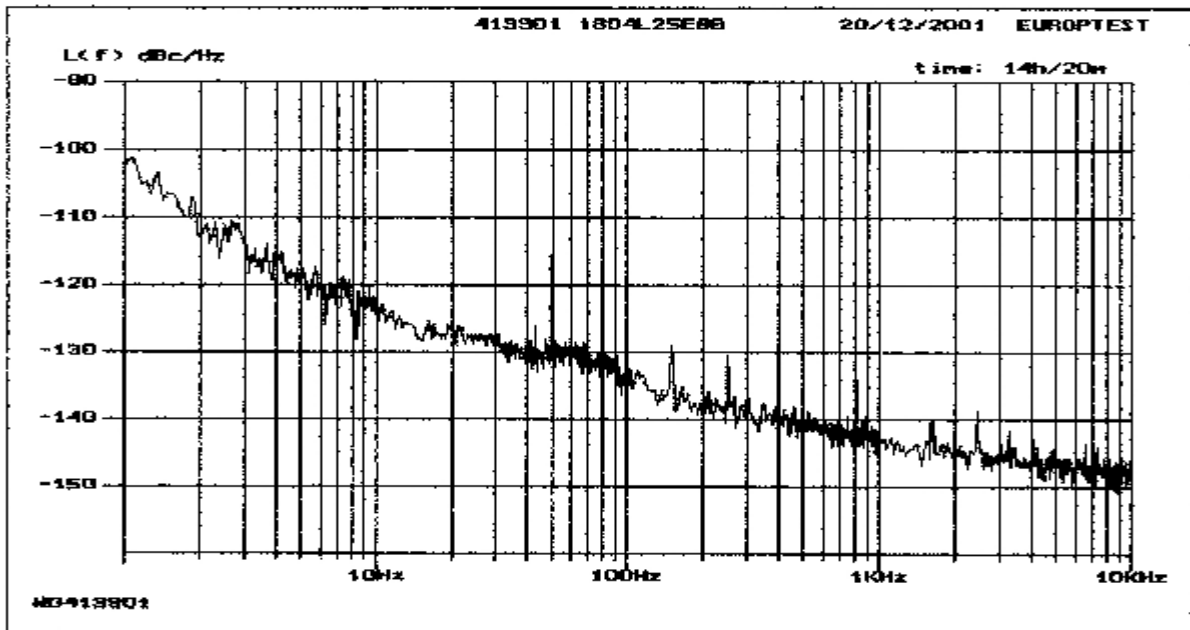
ALARM OUTPUT

Provides an alarm indication in the event of: Loss of GPS lock
 Oscillator control loss
 Power supply failure.

Relay Contacts Normally-closed, Voltage-free (but BNC connector shell grounded)
 Contact rating 30V 0.5A d.c. max.
 Alarm Hold-off delay user programmable 1 sec to 18 hours for GPS and Control Alarms (Separate settings)
 Immediate alarm on power failure.

FREQUENCY ACCURACY 7 days min. continuous power up and GPS. Averaging Period 24 hours min. Temperature Quasi-Constant, Range 26°C \pm 10°C	1804L25E8A SC-Quartz OCXO	1804L26A Rubidium
Absolute Frequency Error, Ref: USNO	$\pm 5E-11$	$\pm 1E-11$
Short Term Stability (Allan Variance 1 sec)	1E-11	3E-11
REFERENCE OSCILLATOR stand alone performance (without GPS)		
Long Term Stability (drift rate, ageing)	$< \pm 2E-10$ /day	$\pm 5E-11$ /month
Frequency vs. Temperature (25°C \pm 10°C)	$\pm 5E-10$	$\pm 2E-10$

1804L25E8 series GPS/Qz UNIT ---- TYPICAL PHASE NOISE PLOT



POWER SUPPLY

Voltage 220/230/240V ac $\pm 10\%$ 45 to 66 Hz.
Power loading 15VA typical up to 40VA dependent on options fitted.
Connector 3 pin IEC, 2 m LSF cable & connector supplier
A dc option is fitted to many models.

FRONT PANEL INDICATORS

ac, dc (power), Alarm1, Alarm2, GPS, Control, Status, Antenna Fault plus others depending on options fitted.

ANTENNA

A weatherproof GPS Antenna assembly is supplied with each unit. Download cables should be ordered separately. Non-standard lengths available to order.

TEMPERATURE RANGE

	Rack Mount Unit.	Aerial Assembly
Operating	0 to +50°C RH 90% (non-condens.)	-40 to +70°C RH100%
Storage	-40 to +70°C RH 30%	-55 to +85°C RH 30%.

DIMENSIONS

Width	483mm. Standard 19" rack mount format.
Height	43.6mm. Standard (1U).
Depth	350mm (excluding connectors).

CONSTRUCTION

Fully enclosed aluminium alloy case plated Alocrom 1000. Front panel painted parchment white with black legends. Standard rack fixing holes in front panel.

SAFETY

The 1804 Series is compliant with European Directive 73/23/EEC
Standard : EN 61010-1

EMC

The 1804 Series is compliant with European Directive 89/336/EEC,
Standards : EN 50081-1 (Emissions)
EN 50082-1 (Immunity)

OPTIONAL FEATURES

A number of optional features are available for the 1804 series. With a few exceptions, these are factory-fit items (specify at time of order) and are supplied at extra-cost. Further details available on request.