

January 8, 2013

Smart, Low-Cost & High-Performance GPS & Rubidium Reference Source

GPSReference[™] -2000

Smart GPS & SRO Rubidium Primary Reference Source
SmarTiming+[®] 1ns-Resolution Disciplining Technology Inside



The GPSReference is a low-cost, high-performance GPS primary reference source. It integrates a smart SRO-100 Rubidium clock and a GPS receiver. It uses the GPS SmarTiming+[®] technology, disciplining the SRO-100 Rb clock with an auto-adaptive loop time constant of 1,000 to 100,000 seconds, depending on the GPS signal quality, at cutting-edge 1ns resolution. It's designed for cross-industry applications, where high stability and timekeeping features is a driving requirement.

Key Features

- Integrated GPS receiver & SRO Rb clock
- Integrated GPS disciplinable SRO Rb clock using SmarTiming+[®] technology at 1ns resolution
- Output Frequencies (4x 10MHz / 4x 1PPS or 8x 10 MHz)
- User programmable SYNTH output
- Integrated smart auto calibration
- Internal Bit Alarm
- RS232 standard interface (9600 b/s)
- Windows 98, XP software application
- GPS antenna types (patch or rooftop)
- Power supply voltage (AC input 85-264VAC / 47-63Hz)
- Compact 1U rack mountable chassis



denk-stein:net

MEASUREMENT TECHNOLOGY

Kaiserin-Augusta-Allee 8 ■ 10553 Berlin ■ Germany

+49-(0)30-398981-0 +49-(0)30-398981-39

sales@denk-stein.com www.denk-stein.com

Vertrieb & Systemintegrator für Carrier + Corporate Networks

APPLICATIONS

Synchronization | Timing | Reference/Test Source | Time/Frequency Source

SPECIFICATIONS

ELECTRICAL

Spec	GPSReference-2000	
Reference module	Standard	Options
RFOUT Frequency Number of Output	10MHz 4x backplane 1x faceplate	10MHz 8x backplane 1x faceplate (ordering code: 8RF)
PPSOUT Functionality Number of Output	1PPS See SMARTIMING+ 4x backplane 1x faceplate	1PPS See SMARTIMING+ 1x faceplate (ordering code: 8RF)
Short Term Stability		1E-11 3E-12 1E-12
Phase Noise (dBc/Hz) (RFOUT: 10 MHz)		1Hz -80 10Hz -100 100Hz -125 1kHz -145 10kHz -145
Aging (Measured after 3 months of continuous operation)		< 5E-11 / month (typical: 3E-11 / month)
Frequency Retrace Off/On (In stable temperature, gravity, pressure and magnetic field conditions)		< 5E-11 24 hr / 1 hr
RFOUT Levels Output Impedance Harmonics Spurious f ₀ ± 100kHz (SYNTH Off)		Sine wave, 0.5 Vrms (±10% / 50 Ω), 1x faceplate **Sine wave, 1.0 Vrms (±10% / 50 Ω), 4x backplane (** ordering code: 8RF 8x) 50 Ω ±20% < -25dBc < -80dBc
SYNTHESIZER SYNTH) Output level Frequency range Resolution Spurious		Square wave 3.3V LV CMOS 0 to 20 MHz 3.97mHz (Fout= N×60'000'000/2 ³³) -35dBc (1-10 MHz) -30dBc (10-20 MHz)
GPS Antenna Connector		SMA

SMARTIMING+® FUNCTIONALITY

Spec	GPSReference-2000
Disciplining module	Standard
PPSOUT Output level Pulse width (PW) or duty cycle	1PPS CMOS 0-5V (+- 20 mA sink/source) User settable, 0 to 1s in 133ns/step
PPSOUT to PPSREF Sync Error In Sync mode	< 50 ns No GPS PPSRef noise, ± 1°C temp fluctuations
PPSOUT to PPSREF (DE) Programmable delay (In Track mode)	0 to 1 s in 133 ns steps
PPSOUT Holdover Time Stability	Within ± 2°C 1 μs/24 hr
Smart Loop Time Constant Phase/Frequency User settable	Auto-adaptive 1000 to 100,000 sec User settable Sync/Track mode ** Selected by RS232 interface ** Sync: phase/time alignment; Track: frequency alignment

GPS ANTENNA

Spec	GPSReference-2000	
Antenna Types	Standard	Option
Cable Length Lightening Surge Protector	Patch antenna kit 5 m / 16.4' Not applicable	Rooftop antenna kit 5+15m / 16.4' + 49' Included (ordering code: RA)

POWER

Spec	GPSReference-2000
Power Supply	Standard
Power Input Fluctuation	AC input 85-264VAC ±10% of nominal supply voltage (230V-)
Input Frequency	47 – 63 HZ
Power Consumption @25°C	< 25W after warm-up
Connector Type	IEC plug

ENVIRONMENT

Spec	GPSReference-2000
Operating Temperature	Standard
Storage	0 to 40°C (Relative humidity: 10-85%)
Transportation	-25 to 55°C -25 to 70°C

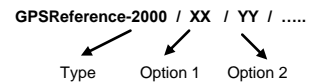
PHYSICAL

Spec	GPSReference-2000	
Size	Standard	Option
Weight	445 x 300 x 44 mm (1U) / 17.52 x 11.81 x 1.73 in. 2.2 kg / 4.85 lbs	
Mounting	Tabletop feet	19" rack mountable ears (ordering code: E)

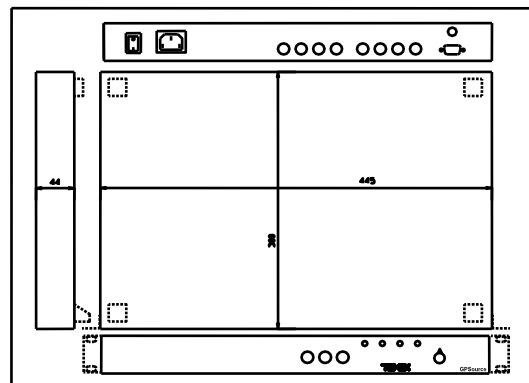
SYSTEM SUPPLY

Type	GPSReference-2000	
1x	GPSReference-2000	
1x	GPS patch antenna kit (with option code RA : Rooftop antenna kit)	
1x	Cables SUB-D male/female for PC serial COM	
2x	19" rack mountable ears or tabletop feet	
1x	iSyncMgr software & Operating manual & specifications	
1x	Euro Power Cable Cable Standard	US Power Cable (ordering code: US) China Power Cable (ordering code: CN) Swiss Power Cable (ordering code: CH) Indian Power Cable (ordering code: IN)

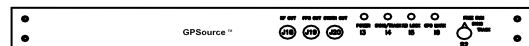
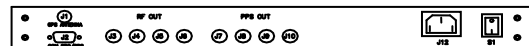
ORDERING INSTRUCTIONS



MECHANICAL LAYOUT



I/O INTERFACES



Back Panel

N°	Type	Definition	I/O
J1	SMA	GPS antenna connection	I
J2	SUB-D9-F	Serial communication RS232	I/O
J3-J6	BNC	4x 10MHz sine reference outputs	O
J7-J10	BNC	4x 1PPS outputs (4x 10 MHz sine reference outputs with option code 8RF)	O
J12	IEC PLUG	Power connection	I
S1	SWITCH	On/Off switch	-

Front Panel

N°	Type	Definition	I/O
J18	BNC	10MHz sine reference output	O
J19	BNC	1PPS output	O
J20	BNC	SYNTH output	O
I3	Green LED	Power indicator	-
I4	Green LED	Sync or Track mode enabled	-
I5	Red LED	Rubidium clock locked alarm	-
I6	Green LED	1PPS GPS applied	-
S2	SWITCH	Free run, Sync or track selection switch	-