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910/910R GPS Controlled Frequency Standards Specifications

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Operating Modes	<p>Disciplined Mode: The frequency deviation between the internal timebase oscillator and the received GPS-signal is used to continuously adjust the oscillator (disciplining). The resulting frequency offset and adjustment data is stored in non-volatile memory every 24h, to enable printout of the traceability record. The actual frequency offset (24h mean value) is calculated and displayed on the front panel.</p> <p>Hold-over Mode: The internal oscillator is not adjusted. This mode is normally automatically entered when there is no usable received GPS-signal. This mode can also be selected manually by activating the Manual hold-over key. If Manual hold-over is set together with a valid received GPS signal, the actual frequency offset is calculated and displayed plus stored in non-volatile memory every 24h.</p>
Frequency stability - locked to GPS	<p>910R (GPS-Rb)</p> <p>Frequency offset (24h mean): $< 1 \times 10 >^{-12} *$</p> <p>Short term (Allan dev.): $< 1 \times 10 >^{-12}$ (t = 100s) $< 3 \times 10 >^{-12}$ (t = 100s) $< 1 \times 10 >^{-11}$ (t = 10s) $< 3 \times 10 >^{-11}$ (t = 1s)</p> <p>Warm up (+25°C): 20 mins to lock</p> <p>910 (GPS-OCXO)</p> <p>Frequency offset (24h mean): $< 2 \times 10 >^{-12} *$</p> <p>Short term (Allan dev.): $< 5 \times 10 >^{-11}$ (t = 1000s) $< 3 \times 10 >^{-11}$ (t = 100s) $< 5 \times 10 >^{-12}$ (5 = 10s) $< 5 \times 10 >^{-12}$ (5 = 1s)</p> <p>Warm up (+25°C): 20 minus to lock</p> <p>*At temperatures 23°C + 3°C</p>

<p>Frequency stability – Hold-over</p>	<p>910R (GPS-Rb)</p> <p>Aging/24h: $<2 \times 10>^{-12}$ (typ.) Aging/month: $<5 \times 10>^{-11}$</p> <p>Temp. (0°C...+50°C): $<3 \times 10>^{-10}$ Temp. (23°C ± 3°C): $<2 \times 10>^{-11}$ (typ.)</p> <p>Short term (Allan dev.): $<3 \times 10>^{-12}$ (t = 100s) $<1 \times 10>^{-11}$ (t = 10s) $<3 \times 10>^{-11}$ (t = 1s)</p> <p>Warm up (+ 25°C): 10 minutes to 4×10^{-10}</p> <p>910 (GPS-OCXO)</p> <p>Aging/24h: $<3 \times 10>^{-10}$ Aging/month: $<3 \times 10>^{-9}$</p> <p>Temp. (0°C...+50°C): $<2.5 \times 10>^{-9}$ Temp. (23°C ± 3°C): $<4 \times 10>^{-10}$ (typ.)</p> <p>Short term (Allan dev.): $<5 \times 10>^{-12}$ (t = 100s) $<5 \times 10>^{-12}$ (t = 10s) $<5 \times 10>^{-12}$ (t = 1s)</p> <p>Warm up (+ 25°C): 10 minutes to 5×10^{-9}</p>																												
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<p>Reference outputs (BNC)</p>	<p>10 MHz: sine wave, 0.5V rms in 50Ω</p> <p>5 MHz: Sine wave, 0.5V rms in 50Ω</p> <p>2.048 MHz (opt. 75): +/-1.2V +/-10% in 75 ohms (G.703:10)</p> <p>1 pps: TTL-levels; low < 0.4V, high > 2V in 50Ω load</p> <p>Pulse output (opt. 75): TTL-levels; low < 0.4V, high > 2V in 50Ω load</p>																												
<p>10 MHz and 5 MHz & 2.048 MHz (opt 72) outputs</p>	<p>Freq. Stability: See frequency stability specs for 910 and 910R</p>																												
<p>1-pps output (locked to GPS)</p>	<p>Duty Cycle: Approx. 20%</p> <p>Jitter: <60 or (position to ns utc gps rms on) hold, relative sa></p>																												

Pulse output (option 75)	<p>The frequency is set via the included PC-program</p> <p>Selectable frequency: $\frac{1}{N \times 10^{-7}}$ Hz,</p> <p>N is an integer</p> <p>Factory default setting: 1 Hz</p> <p>Duty cycle: 50%</p> <p>Jitter: < 500 ps rms></p> <p>Freq. Stability: See frequency stability specs for 910 and 910R</p>
Internal data storage	<p>24h-freq. Offset: 2 years data, non-volatile memory</p> <p>Adjustment data: 2 years data, non-volatile memory</p>
Controls	<p>Manual Hold-over: Inhibits automatic GPS-adjustment and forces hold-over operation. This increases the short-term stability, when the internal Rubidium- or OCXO-reference is free running without any correction from the GPS-monitoring system.</p>
LED Indicators	<p>Locked to GPS ON: Disciplined mode OFF: Hold-over mode</p> <p>Alarm ON: Alarm condition reported by instrument hardware. Explanatory text in 7-segment display area advises. OFF: Normal operation</p> <p>Manual Hold-over ON: Forced hold-over mode. If GPS signal is valid, the 24h frequency offset is displayed. Otherwise "-----" is shown. OFF: Automatic choice of disciplined or hold-over mode depending on "Locked to GPS" status.</p>
Display Indicators	<p>7-segment area: 24h mean frequency offset (if valid data exist) "910" or "910R" (if GPS contact not sufficient) Alarm text (plus Alarm LED)</p> <p>REMOTE segment: Local Lock-out (from PC)</p> <p>Analog bar graph: Satellite signal strength</p>
GPS-receiver	<p>Antenna connector: Type N</p> <p>Channels: 8, parallel tracking</p> <p>Carrier, code: L1, C/A</p>
Antenna (option 01)	<p>Type: active L1</p> <p>Operating temp.: -40°C to +70°C</p> <p>Height: 81 mm (3.2") (excl. connector)</p> <p>Weight: 230 g (8 oz.)</p> <p>Gain: >30 dB</p> <p>Connector: TNC</p>

Antenna cable (option 02)	Type: RG213 Length: 20 m Connectors: N-type and TNC (male) Cable delay: 101 ns. Attenuation: Approx. 8 dB at 1.6 GHz
PC-connection	Interface: RS-232, DTE Connector: 9-pin male DB9, Rx on pin 2, Tx on pin 3, GND on pin 5 Baud rate: 9600 bps Data structure: 8 data bits 1 stop bit, no parity
Fan	Temperature controlled
Environmental	Temperature: 0°C...+50°C (operating) -40°C...+70°C (storage) Safety: Compliant to CE: EN 61010-1 + A1 (1992) + A2 (1995) EMI: Compliant to CE: EN 1326-1 (1997)
Power consumption	Line voltage: 100...240 V (± 10%) Line frequency: 47..63 Hz Power 910R: < 75 W at warm-up > < 35 W continuous operation > Power 910: < 25 W at warm-up > < 12 W continuous operation >
Dimensions and weight	WxHxD: 315 x 86 x 395 mm 12.4" x 3.4" x 15.6" Weight: 910R: 4.4 kg net, 7.4 kg shipping (9.7 lb net, 16.3 lb shipping) 910: 3.9 kg net, 6.9 kg shipping (8.6 lb net, 15.2 lb shipping)