

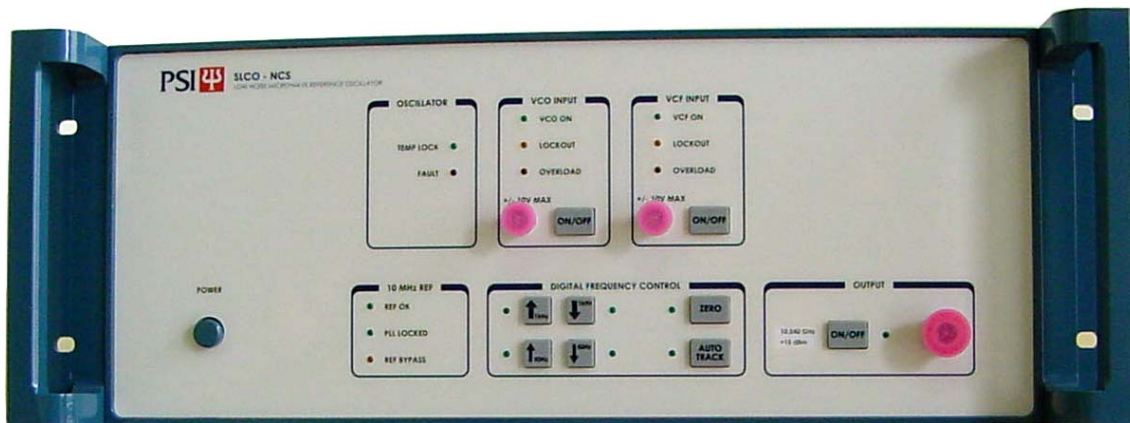


Rack-Format SLCO-10.240-NCS-PLL Oscillator

Poseidon Scientific Instruments
17 Queen Victoria Street
Fremantle WA 6160 AUSTRALIA
Ph: +61 8 9430 6693 **Fax:** +61 8 9335 4650
Email: sales@psi.com.au **Web:** www.psi.com.au



Rack-Format SLCO-10.240-NCS-PLL Oscillator



PSI ODIN © 2003, Beta

PM10G

Sun 06/11/2005 23:18

Tce A*: CH 1, PM Noise Spect., L(f), (Mag), 215, dBc/Hz, RBW: 29.30 k

Measurement Paused

Rev 0.098 12/08/2003

Tce B*: CH 2, PM Noise Spect., L(f), (Mag), 215, dBc/Hz, RBW: 29.30 k

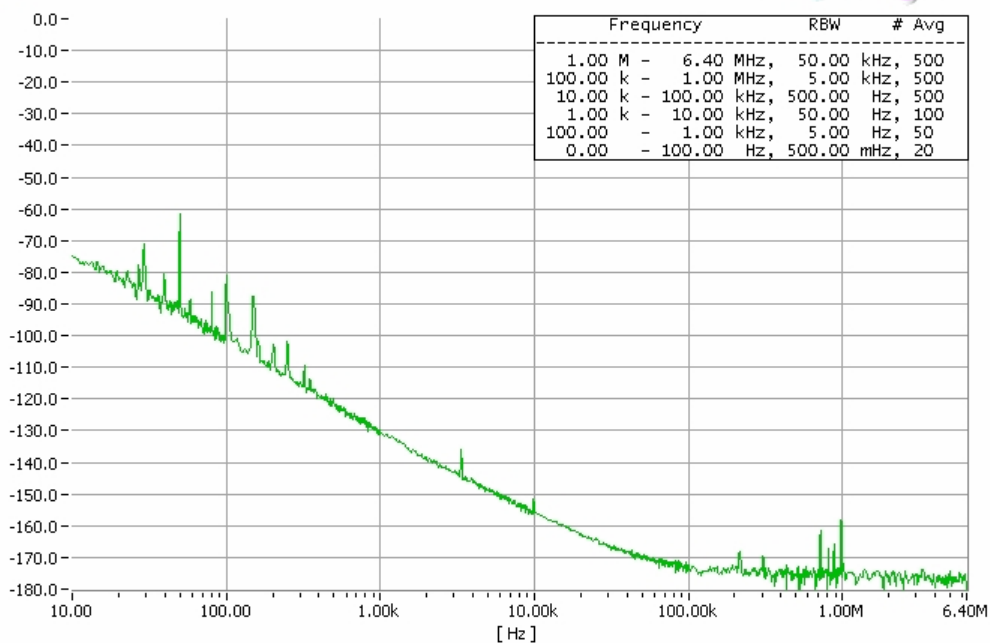
Overload Normal CH1

.38

Tce C*: CH 1&2, PM Noise XSpec., L(f), (Mag), 215, dBc/Hz, RBW: 29.30 k

Overload Normal CH2

Tce D:



Select Directory

To CD (D:)

To Network (F:)

To Network (G:)

To Network (H:)

To Network (I:)

Return ...

Status: Measurements Done.

Currently: [Directory Name Format: YYMMDD_HHMMSS]

M1: 0.000 , 0.000 , Tce: A *
M2: 0.000 , 0.000 , Tce: A
DM: 0.000 , 0.000 , 1/DM:

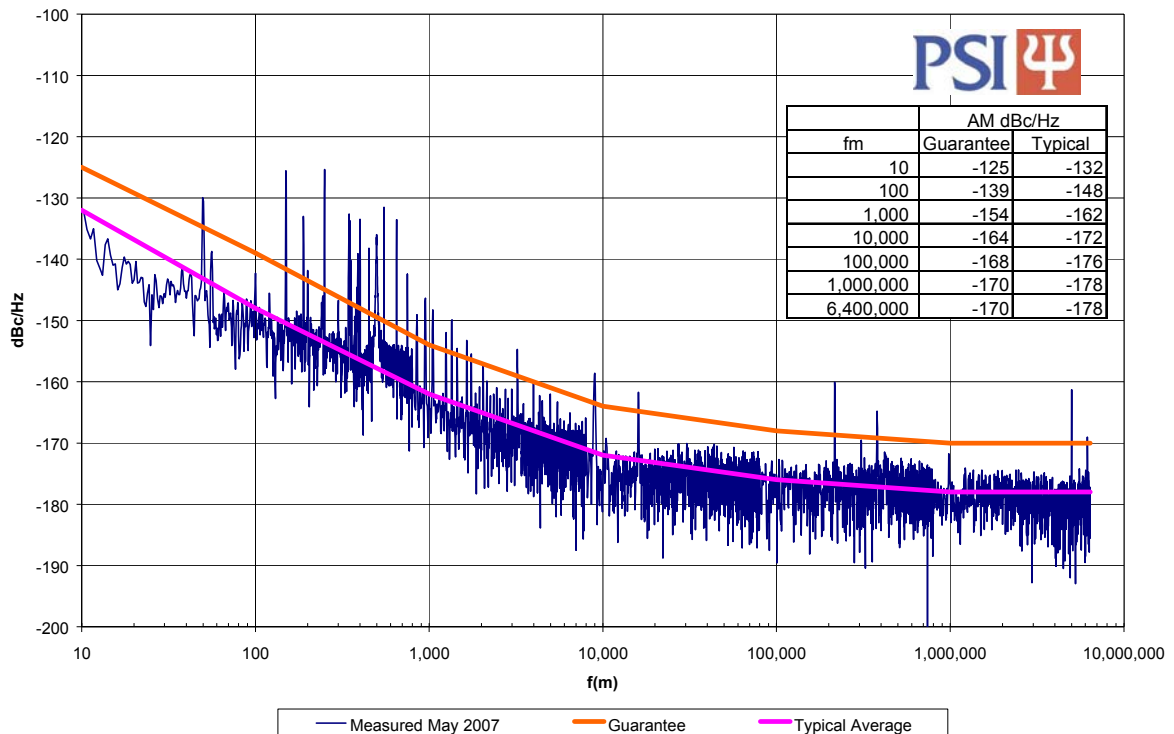
Inf

Measured phase noise (preliminary) SLCO-10.240-NCS vs SLCO-10.240-ACS

SLCO-10.240-NCS OSCILLATOR PERFORMANCE SPECIFICATIONS

<u>Output Frequency:</u>	10.240 GHz																		
<u>Factory Set Accuracy:</u> @ 25°C	Better than 2 ppm (Typically <1 ppm) <i>See also -PLL specification schedule</i>																		
<u>Output Power, unfiltered:</u>	Greater than +10 dBm (+17 dBm Typ.)																		
<u>Discrete Spurious Tones:</u> <i>All oscillator spurs are shown in PSI measurements, no "Spur removal" used in measurement software</i>	Typical < -10 - 30 log(f_m) dBc; $f_m < 4,650$ Hz < -120 dBc; $4,650 \text{ Hz} < f_m < 100 \text{ kHz}$																		
<u>VCO Tuning Range:</u> <i>This Tuning Range is not applicable if the -PLL option is active.</i>	15 kHz (Typical), +/- 10 Volts DC (See Notes)																		
<u>Frequency Control:</u> <i>Via front panel button control, and incorporating an "Autotrack" function. This Tuning Range is not applicable if the -PLL option is active.</i>	Typical: +/- 20 ppm In ~1 kHz (Course) & ~50Hz (Fine) Steps																		
<u>Phase Noise Performance:</u> <i>Specified Phase Noise is quoted as a "single oscillator" measurement and equals the measured two oscillator noise with 3 dB subtracted, unless noted otherwise.</i>	<table border="1"> <thead> <tr> <th>Offset</th> <th>Guaranteed</th> <th>Typical</th> </tr> </thead> <tbody> <tr> <td>@100 Hz</td> <td>-96 dBc/Hz</td> <td>-100 dBc/Hz</td> </tr> <tr> <td>@1 kHz</td> <td>-126 dBc/Hz</td> <td>-130 dBc/Hz</td> </tr> <tr> <td>@10 kHz</td> <td>-152dBc/Hz</td> <td>-155 dBc/Hz</td> </tr> <tr> <td>@100 kHz</td> <td>-165 dBc/Hz</td> <td>-170 dBc/Hz</td> </tr> <tr> <td>@1 MHz</td> <td>-168 dBc/Hz</td> <td>-173 dBc/Hz</td> </tr> </tbody> </table>	Offset	Guaranteed	Typical	@100 Hz	-96 dBc/Hz	-100 dBc/Hz	@1 kHz	-126 dBc/Hz	-130 dBc/Hz	@10 kHz	-152dBc/Hz	-155 dBc/Hz	@100 kHz	-165 dBc/Hz	-170 dBc/Hz	@1 MHz	-168 dBc/Hz	-173 dBc/Hz
Offset	Guaranteed	Typical																	
@100 Hz	-96 dBc/Hz	-100 dBc/Hz																	
@1 kHz	-126 dBc/Hz	-130 dBc/Hz																	
@10 kHz	-152dBc/Hz	-155 dBc/Hz																	
@100 kHz	-165 dBc/Hz	-170 dBc/Hz																	
@1 MHz	-168 dBc/Hz	-173 dBc/Hz																	
<u>Amplitude Noise Performance:</u> <i>Note: Specified AM Noise is quoted for the SLCO-NCS in Free-Running mode – not locked to an external crystal reference. As the reference noise may affect the AM close to the carrier.</i>	<table border="1"> <thead> <tr> <th>Offset</th> <th>Guaranteed</th> <th>Typical</th> </tr> </thead> <tbody> <tr> <td>@100 Hz</td> <td>-139 dBc/Hz</td> <td>-148 dBc/Hz</td> </tr> <tr> <td>@1 kHz</td> <td>-154 dBc/Hz</td> <td>-162 dBc/Hz</td> </tr> <tr> <td>@10 kHz</td> <td>-164 dBc/Hz</td> <td>-172 dBc/Hz</td> </tr> <tr> <td>@100 kHz</td> <td>-168 dBc/Hz</td> <td>-176 dBc/Hz</td> </tr> <tr> <td>@1 MHz</td> <td>-170 dBc/Hz</td> <td>-178 dBc/Hz</td> </tr> </tbody> </table>	Offset	Guaranteed	Typical	@100 Hz	-139 dBc/Hz	-148 dBc/Hz	@1 kHz	-154 dBc/Hz	-162 dBc/Hz	@10 kHz	-164 dBc/Hz	-172 dBc/Hz	@100 kHz	-168 dBc/Hz	-176 dBc/Hz	@1 MHz	-170 dBc/Hz	-178 dBc/Hz
Offset	Guaranteed	Typical																	
@100 Hz	-139 dBc/Hz	-148 dBc/Hz																	
@1 kHz	-154 dBc/Hz	-162 dBc/Hz																	
@10 kHz	-164 dBc/Hz	-172 dBc/Hz																	
@100 kHz	-168 dBc/Hz	-176 dBc/Hz																	
@1 MHz	-170 dBc/Hz	-178 dBc/Hz																	
<u>Power Supply:</u>	110/220 VAC, 50/60Hz Less than 200 Watts																		
<u>Operating Environment:</u>	+10°C to +40°C (Non Condensing)																		
<u>Storage Environment:</u>	-25°C to +71°C (Non Condensing)																		
<u>Dimensions:</u>	Rack mountable, 4U High 19" Rack unit presented as a bench style instrument. (See accompanying drawings)																		

SLCO-NCS AM Noise



Notes to Oscillator Performance Specifications

1. **Phase Locking for phase noise verification:** Phase locking the oscillator to an external source for phase noise verification is achieved by applying a control voltage to the VCO input port connection on the front panel.

Phase Locking to an external reference can seriously degrade the oscillator phase noise if not controlled properly. Correct control allows the oscillator to meet full phase noise specification.

External frequency comparison, PLL phase detection, and PLL VCO servo electronics are the responsibility of the customer.

Oscillator Standard Accessories

Standard accessories shipped with every PSI SLCO-NCS oscillator are:

- 1) Front and Rear Instrument Handles.
- 2) IEC Power Cable compatible with your country's electrical standards

Oscillator Operation Manual

Supplied as a standard no cost item, the SLCO-NCS Oscillator Operations and Technical Manual is custom written to specifically address the particular features of the purchaser's oscillator.

SCHEDULE "B": -PLL OPTION
INTEGRATED PHASE LOCK LOOP

The -PLL option integrated a phase lock loop that locks the SLCO-NCS to an external 10MHz source. Phase locking the oscillator to an external 10 MHz reference is achieved by applying a low phase noise, sinusoidal signal to the PLL BNC connector on the rear panel.

Phase Locking to an external reference with poor performance can seriously degrade the oscillator phase noise.

The external 10 MHz reference oscillator should have properties and phase noise which is similar to the following:

10 MHz Low Noise Crystal Source;

Power In: +10 dBm (nominal); +6 dBm min., +12 dBm max.

50 Ohms, Input VSWR 1.30 max.

Harmonics < -30 dBc

BNC (F) Connector, with high isolation 50 ohm cable

Phase Noise: Less than

-132 dBc/Hz @ 10 Hz offset

-162 dBc/Hz @ 100 Hz offset

-168 dBc/Hz @ 1 kHz offset

The phase lock to the 10MHz source may be disabled, and the oscillator's centre frequency may be controlled by front panel buttons in increments of ~1 kHz or ~50 Hz, in this case it also may be used as a true VCO using the VCO input on the front panel.

This allows the user the greatest flexibility in his measurements, where the SLCO may be either the Master or Slave oscillator in a system. (SLCO oscillators have been successfully used in both of these manners, and been phase locked to Caesium standards for long periods of time with an accuracy of 1 part in 10^{15} .)