



Orbital Phase Locked Oscillator

subject in properties:, User Guide

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NOTE: This document refers to multiple configurations and is not intended to be used as the sole installation guide for cable connections.

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1 OVERVIEW

Orbital Research introduces our Phase Locked Oscillator (PLO) for communications systems requiring extremely accurate timing. High modulation and coding techniques (ModCods) require extremely low phase noise. The Orbital Research PLO Phase locks to the stations 10 MHz reference, reduces system Phase Noise and filters out any extraneous signals.

This allows a 10 MHz station reference to be distributed to non-located equipment like modems and up and down converters while maintaining or enhancing the station clock phase noise. Perfect for applications that require all equipment to use the same reference clock but require that clock to be distributed without phase noise degradation.

1.1 Design Functions

The Orbital Research PLO provides a highly stable and accurate 10 MHz reference for critical communications systems. The device comes with either a 2 port or 6 port 10 MHz built in splitter for easy distribution to equipment

Some of the design criteria are:

General

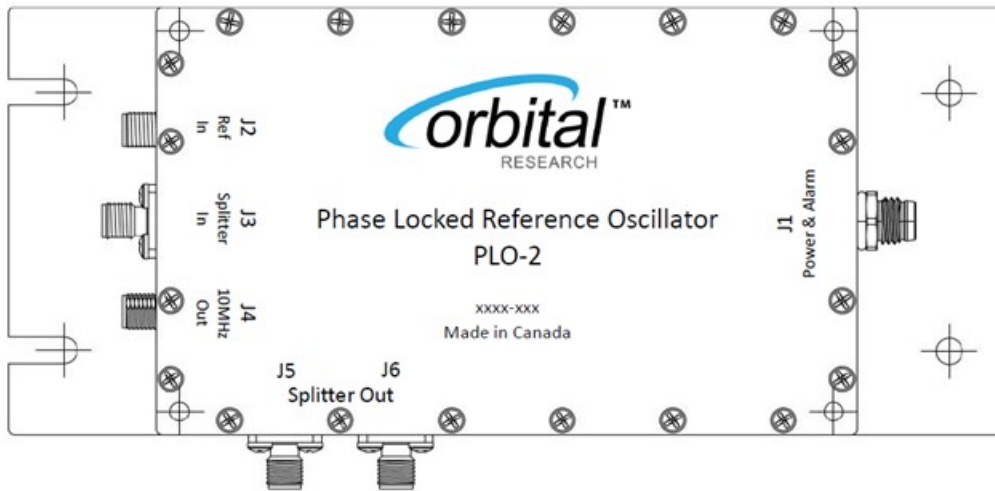
1. Margins designed in to assure consistent performance up to maximum specifications
2. IP67 Rated for ruggedized conditions

DC

1. Input voltage can range between 18 and 24 VDC
2. M8 connector

The PLO can be mounted using the mounting plate provided.

Port Descriptions



J1: Power and Alarm – 18 to 24 VDC – M8-4 Connector

Pin	Description
1	Ground
2	No Connection
3	Lock Alarm +5V = Good
4	DC In +18 to +24 VDC

- J2: 10 MHz Reference In
- J3: Splitter In
- J4: 10 MHz Reference Out
- J5: Splitter Out – Port 1
- J6: Splitter Out – Port 2
- J7: Splitter Out – Port 3 (6 port PLO Only)
- J8: Splitter Out – Port 4 (6 port PLO Only)
- J9: Splitter Out – Port 5 (6 port PLO Only)
- J10: Splitter Out – Port 6 (6 port PLO Only)

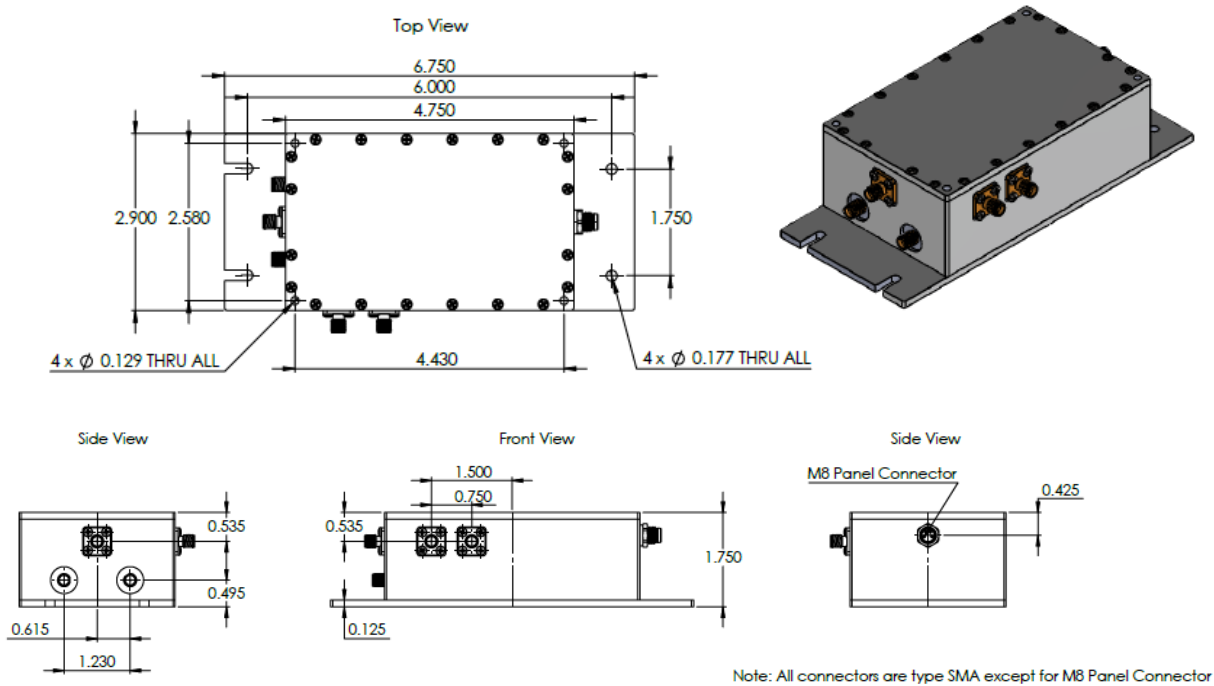
1.2 Installation Tips

1. Do not exceed DC input voltage range – 18 to 24 VDC.
2. Do not connect or disconnect equipment with power applied. Transients and surges can damage your equipment and can be hazardous.
3. While we take every measure to ensure proper sealing of our product, proper sealing of the cable and connector to the device is your responsibility – please ensure that butyl tape or its equivalent is used on all outdoor connectors, or if you are operating in a very humid environment.
4. Depending on your environment, install all necessary lightning arrestors, grounding protection, etc.
5. Ensure sound and stable mechanical integrity of all cable connectors. Ensure proper lead dress to minimize vibration and avoid crimping of cables.
6. When attaching connectors, (especially 'N' type connectors) be careful not to under/over tighten. Proper torque is just a bit more than finger tight – 6-9 inch-pounds of torque.
7. Ensure that connectors are installed dry. Use of dielectrics is good practice but not mandatory.
8. To help ensure good connections, use Q tips and Isopropyl alcohol to prepare connections. An artist's foam or bristle brush can be used to clean female connectors – remember that we are dealing in very weak signals in the satellite industry – good connections are essential.

2 APPLICATIONS

- One station clock can be distributed while maintaining or enhancing phase noise
- Critical for higher order ModCods
- Provides a stable free running 10 MHz source if master reference is lost
- Two or Six Output ports
- Plug and Play operation – no configuration required
- Extremely low Phase Noise
- Loss of Lock Indication on M8 Connector

3 MECHANICAL DRAWING



4 WARRANTY

All products are warranted for 5 years. Any product that becomes defective within the warranty period will be repaired or replaced. If product was damaged because of natural disaster or using the product out of specification, it can be returned for repair at the customer's expense.

To confirm that you have a defective product look through the Orbital Research Troubleshooting section below or contact us for assistance.

To return defective or damaged product for repair or replacement, please do the following:

- 1) Contact Orbital Research for an RMA number
- 2) Give as detailed as possible, a description of the problem found and any related information.
- 3) Send the defective product back with the description of the problems encountered (address below).
 - Product is returned at the customer's expense.
 - If it is a warranty issue, Orbit Research will return the product at its expense.
- 4) Make sure to inform Orbital Research of the return using the Contact Information below.

Return address:
Orbital Research Ltd
c/o Fedex Trade Networks
8676 Commerce Court
Burnaby, BC Canada
V5A 4N6

604-419-8585
sales@orbitalresearch.net
www.orbitalresearch.net

5 TROUBLESHOOTING

1. No 10 MHz Output

Solution: Check that DC is applied to J3 on Pins 4 and 1. Disconnect jumper between J2 (10 MHz Out) and J4 (Splitter In) and check for 10 MHz signal at J2. Reconnect jumper to J2 and confirm 10 MHz is present at the unterminated port of the jumper. Reconnect unterminated port of jumper cable to J4 (Splitter In) and check splitter output ports (J5 to J10). If there is still a problem, contact Orbital Research for assistance.

2. Other problem

Solution: Please contact your Orbital Research Sales Representative

6 MODEL NUMBER DESCRIPTION

PLO-2: Orbital Phase Locked Oscillator – 2 Output Ports

PLO-6: Orbital Phase Locked Oscillator – 6 Output Ports

7 SPECIFICATIONS

Reference Input Frequency	10 MHz +/- 2 ppm
Input Level	+7 dBm +/- 6 dB
Input Connector/Impedance	SMA/50 ohms
Reference Output Frequency	10 MHz
Free Running Stability	5 x 10 ⁻¹⁰ /day
5 x 10 ⁻⁸ /year	
Output Level (2 Port)	+10 dBm +/- 2 dB
Output Level (6 Port)	+4 dBm +/- 2 dB
Output Connectors/Impedance	SMA/50 ohms
Phase Noise (Typical)	
10 Hz	-130 dBc/Hz
100 Hz	-152 dBc/Hz
1K Hz	-162 dBc/Hz
10K Hz	-172 dBc/Hz
100K Hz	-173 dBc/Hz
DC Input	18 to 28 VDC
DC Input Connector	M8-4
Operating Temperature	-40C to +60C
Humidity	100%, Condensation and Frost
RoHS and REACH Compliance	