Model 912 Media Converter Product Guide

FOCAL™

The family of Focal™ 912 Optical/Electrical/Optical (OEO) converters provides a wide range of optical conversion solutions.

Moog's family of low latency Optical/Electrical/Optical (OEO) converters provide a range of options for repeating optical data signals, converting them to other optical or electrical formats, or combining multiple fibers onto a single fiber via Coarse Wavelength Division Multiplexing (CWDM). Each product in the 912-OEO product family employs high-reliability design and production processes, including environmental stress screening (ESS) to ensure reliable performance over a long life, even in harsh environments.

The conversion of optical wavelength or fiber type - singlemode to multimode or vice versa - is often a cost effective solution when integrating off-the-shelf optical equipment in nonstandard configurations (e.g. operation over long distances or through mixed fiber systems). Each converter supports multiple data rates and signal formats, including Ethernet (10 Mbps, 100 Mbps, 1 Gbps), ATM, SONET, Fiber Channel, SDI/HD-SDI and many industrial protocols. Multiple converters of differing types may be combined into single racks, boxes or explosion proof enclosures.

Key Features

- Modular optical and mechanical design
- Wide range of supported data formats and data rates
- Link diagnostic monitoring
- High reliability and long life

Benefits

- Easy extension of maximum distances and optical budget for optical telemetry
- Reduced number of fibers required in cables and fiber optic rotary joints
- Improve incoming signal integrity and jitter performance
- Extremely customizable to your application (optical wavelength, fiber-type, channel count)

Typical Applications

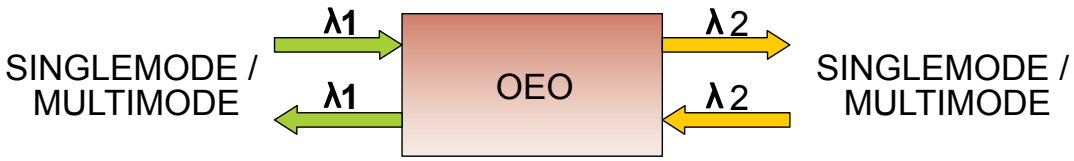
Optical Repeating (Boosting)

Moog 912 products can all be used to optically regenerate an incoming optical signal, providing increased optical budget, and extending transmission distance. Optical signals are received at low signal levels with a sensitive photo-detector and transmitted with a high optical output signal, providing a 15 to 25 dB boost in optical power. Shown here is an example of a two-channel (1 bidirectional channel) using the same wavelength on each channel.

2 channel (1 bidirectional channel)
Optical Boosting

Wavelength Conversion

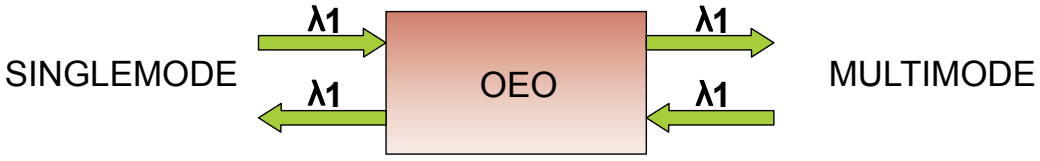
The 912 family has been designed using plug-and-play optical transmitters and receivers, allowing for simple factory configuration to meet a wide range of system architectures. This modularity allows users to easily customize the incoming and outgoing optical wavelengths for each channel, providing a simple means for wavelength conversion.



2 channel (1 bidirectional channel)
Wavelength Conversion

Fiber-type Conversion (SMF-MMF/MMF-SMF)

The modular design of the 912 product family allows for simple conversion from singlemode to-multimode fiber, or vice versa. This can be used for example to utilize an existing multimode fiber link with components designed for singlemode fiber.

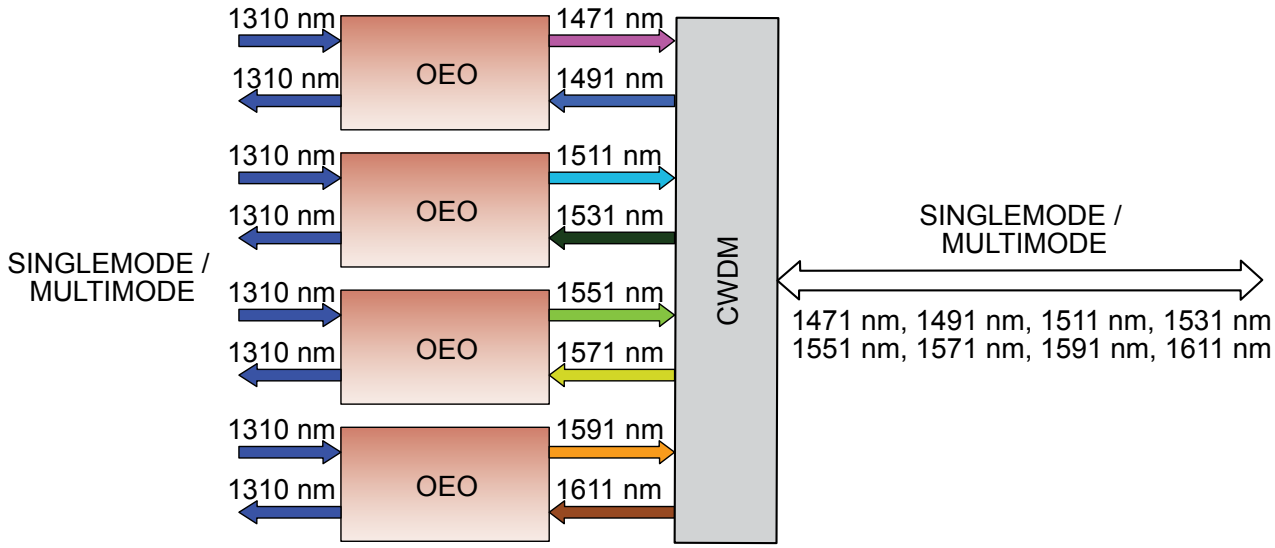


2 channel (1 bidirectional channel)
Singlemode to Multimode Fiber Conversion

Wavelength Conversion, Fiber Conversion and Optical Multiplexing

With the additional integration of Coarse Wavelength Division Multiplexing (CWDM) optical components into the 912 architecture, the 912-OEO can also be used to aggregate multiple incoming optical signals onto one singlemode fiber. The use of modular optical components within the 912 product family allow for factory selection of channel wavelength and inherently supports multimode-to-singlemode fiber conversion if required.

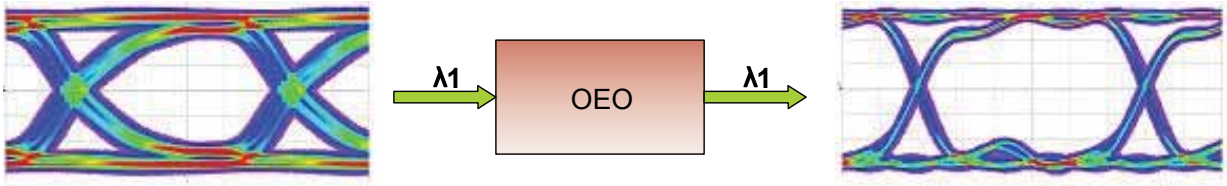
Each highly integrated and configurable assembly can be used to simplify fiber channel count within cable assemblies or over a fiber optic rotary joint, reducing weight and total system cost.



8 channel (4 bidirectional channel)
Wavelength Conversion, Fiber Conversion, and Optical Multiplexing

Signal Re-Clocking

One of the inherent advantages of the 912-OEO architecture, whereby an incoming optical signal is first converted to the electrical domain, is it allows for clock-recovery and re-generation before the signal is again converted to an optical signal for re-transmission. The clock-recovery and re-generation technique used in the 912 product family improves the timing and jitter performance of an incoming signal, effectively 'resetting' the jitter, allowing for extended transmission distances and improved signal integrity and error performance.



Other Architectures

Another feature of the 912 product family architecture is that it supports optical-to-electrical conversion using modular plug-and-play Copper transceivers. This allows for a diverse range of configurations for conversion between copper channels (such as 10/100/1000 Base-T(X) Ethernet, and SMPTE 292M HD SDI) and fiber optic channels.

Key Specifications



Optical Options

- Support for 850 nm, 1310 nm , 1550 nm, and ITU-T G.694.2 CWDM wavelengths
- Optical Fiber: multimode (50/125 µm)/(62.5/125 µm) and singlemode (9/125 µm)
- Flux Budget: 20 dB minimum standard (others available)
- Optical Connectors: LC, ST are standard (depending on card), SC, FC options available

Environmental

- 0 to +60 °C standard
- -45 to +85 °C optional
- Environmental stress screening

Signal Rates

- DC to 3 Gbaud per channel, depending on card
- 10/100/1000 Base-T(X) Ethernet encoding, 8b/10b encoding, others
- Latency <10 ns
- Jitter reduction with re-clocking

Reliability

- MTBF = 200,000 hours minimum

Form Factors

- Eurocard (100 mm x 160 mm, 4 HP) with or without front panels
- Multiple cards mounted in 19” 3U Chassis
- IP66 Ingress Protected and Explosion Proof Housing for use in Class 1 hazardous locations
- Custom

Power Requirements

- Input Voltage: +5 VDC ± 10%, regulated, 0.5-1.0 A draw typical per card
- 110/220 VAC or +24 VDC for chassis mounted systems
- Input Protection: over-voltage, reverse polarity, over-current

Other Options

- SFP diagnostics available via backplane (temperature, bias-current, voltage rail, Rx/Tx power, etc.)

Call or email our knowledgeable Application Engineers for more information: 902-468-2263 or focal@moog.com