The Focal™ 914 media converter and multiplexer technology enables the transfer of analog component video, high definition HD-SDI video, 10/100/1000 Base-T(X) Ethernet, and serial data signals over a fiber-optic communication channel.

The Model 914 media converter and multiplexer technology enables the transfer of analog component video (NTSC, PAL), high definition HD-SDI (SMPTE-292) video, 10/100/1000 Base-T(X) Ethernet, and serial data signals (RS-232, RS-485, TTL, etc.) over a fiber-optic communication channel. These credit-card sized electronic cards have been designed specifically for use in harsh marine and industrial environments.

Typical Applications
The Model 914 product family is suited particularly well to applications requiring ruggedized space-efficient fiber-optic converters, such as:

- Supporting NSTC/PAL and high-definition camera systems for small to medium sized remotely operated vehicles (ROVs)
- Video and control signaling for Explosive Ordinance Disposal (EOD) and pipe inspection robots
- Industrial sensors
- Ground vehicle turrets and Remote Weapon Stations (RWS)
- Naval, weather, and defense radar
- Many other high definition video applications in surveillance, defense and industrial systems

Model 914 systems are assembled from four main categories of cards:

- Multiplexer motherboards
- Media converters
- Expansion cards
- Optics cards
Focal 914 media converter technology converts data, HD-video, or Ethernet signals to optical format. Focal 914 multiplexers electrically combine serial data (RS-232, RS-422/485 and others) with video, providing simultaneous support for video and data signals over a single optical fiber.
Optical Cards

Systems with only one motherboard or media converter typically transmit at an optical wavelength of 1310 nm for uplink and 1550 nm for downlink. Bidirectional (Bidi) optical transceivers with built-in wavelength division multiplexers (WDMs) can be used to combine uplink and downlink wavelengths onto a single fiber. In larger systems with multiple 914 motherboards, media converters and expansion cards, fiber-optic signals may be combined on a single fiber using a Coarse Wavelength Division Multiplexer (CWDM) to take advantage of the high bandwidth of optical fiber. CWDM optical wavelengths are separated by 20 nm and range from 1471 nm to 1611 nm. Bidirectional optical signals require two distinct wavelengths. For example a 914-GbE Media converter using CWDM wavelengths may use 1471 nm for uplink traffic, and 1491 nm for downlink traffic.

### Integrated WDM for 1310/1550 nm on One Fiber

### Daisy-chain 1471/1491 nm with 1310/1550 nm on One Fiber

### 4-Wavelength CWDM

<table>
<thead>
<tr>
<th>Optical Card</th>
<th>914-CWDM</th>
<th>914-CWDM-4R1</th>
<th>907-CWDM-8R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>2-Channel CWDM Optics Card, 1471/1491 nm with 1310/1550 nm Bypass, Singlemode</td>
<td>4-Channel CWDM Optics Card, 1471 - 1531 nm, Singlemode, 20 nm Spacing</td>
<td>8- Channel CWDM Optics Card, 1471 - 1611 nm, Singlemode, 20 nm Spacing</td>
</tr>
<tr>
<td>Part Number</td>
<td>914-0006-00</td>
<td>914-0017-00</td>
<td>914-0017-02</td>
</tr>
<tr>
<td>Features/Options</td>
<td>1310/1550 bypass port allows dual CWDM 914 motherboard or media converter to be daisy-chained to an existing Focal 1310/1550 motherboard or media converter</td>
<td>Optional 1310 nm Bypass Port</td>
<td>Optional 1310 nm Bypass Port</td>
</tr>
</tbody>
</table>
Adaptable Interface Boards (AIB)

AIB plug-in modules are compatible with the Model 903, the Model 907, and the Model 914 product lines. The 914-AIB has one socket for any AIB plug-in module. AIB plug-in modules are available for a variety of low speed data signals.

<table>
<thead>
<tr>
<th>AIB Card</th>
<th>AIB-232</th>
<th>AIB-485</th>
<th>AIB-HYDRO</th>
<th>AIB-ARCNET</th>
<th>AIB-MS900</th>
<th>AIB-CAN Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>1 x RS-232</td>
<td>1 x RS-485/422</td>
<td>1 x Hydrophone</td>
<td>1 x Tritech ARCNET</td>
<td>1 x MS-900 Analog Sonar</td>
<td>1 x CAN Bus Bridge</td>
</tr>
<tr>
<td>Part Number</td>
<td>903-0251-00</td>
<td>903-0252-00</td>
<td>903-0244-00</td>
<td>903-0261-00</td>
<td>903-0250-00</td>
<td>903-0297-00</td>
</tr>
<tr>
<td>Channel Direction</td>
<td>Bidirectional</td>
<td>Bidirectional</td>
<td>Unidirectional</td>
<td>Bidirectional</td>
<td>Bidirectional</td>
<td>Bidirectional</td>
</tr>
<tr>
<td>NRZ Data Rate</td>
<td>120 kbps</td>
<td>2.5 Mbps</td>
<td>30 Hz - 30 kHz BW</td>
<td>156 kbps/78 kbps</td>
<td>5 - 30 kHz, 380 - 580 kHz</td>
<td>62.5 kbps - 1 Mbps</td>
</tr>
<tr>
<td>I/O Connectors</td>
<td>4-pin WAGO headers on 907-AIB adapter card</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Options</td>
<td>Responder Trigger</td>
<td>AC-Coupled 485, TTL</td>
<td>IRIG-B, Audio</td>
<td>Terminations</td>
<td>Low Speed Telemetry (LF)</td>
<td>Repeater Mode</td>
</tr>
</tbody>
</table>
## Key Specifications

### HD-SDI Video Options
- Format: HD-SDI (SMPTE-292M), 3G-SDI (SMPTE-424M)
- Electrical Data Rate: 1.485 Gbps (3 Gbps option)
- Voltage: 800 mVP-P nominal
- Impedance: 75 Ω, SMB connectors

### Standard Video Options
- Format: NTSC or PAL
- 10-bit digitization, 6 MHz bandwidth
- Voltage: 1.2 VP-P maximum
- Impedance: 75 Ω, SMB connectors

### 914 Ethernet Options
- Two switched 10/100 Base-T(X) ports, with 10 Mbps aggregated throughput available via 914-EIBS expansion header of 914-R/C video/data multiplexer
- The 914-GBE standalone Gigabit Ethernet media converter offers a single channel of 10/100/1000 Base-T(X) Ethernet
- 914-MCS is a switched, two-port 10/100 Base-T(X) Ethernet converter with standard 100 Base FX optical output

### Data Options (914-R/C or via AIB expansion cards)
- RS-232: 2 isolated bidirectional channels, 120 kbps maximum
- RS-422/485: 5 Mbps NRZ
- AIB expansion daughter-cards support additional channels of RS-232, RS 422/485, TriTech Arcnet and CAN Bus
- Connectors: 2 x 8-pin Molex on standard 914

### 914 Power Requirements
- Input Voltage: +5 VDC ± 10%, regulated, 0.5 - 1.0 A draw typical
- Input Protection: over-voltage, reverse polarity, over-current
- Connector: 2-pin Molex

### Optical Options
- Optical Fiber: 1 or 2 singlemode (9/125 µm)
- Wavelengths: 1310/1550 nm standard, CWDM options available
- Flux Budget: 16 dB min. standard, 20 dB for CWDM, others available
- Connectors: LC or ST, depending on card

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