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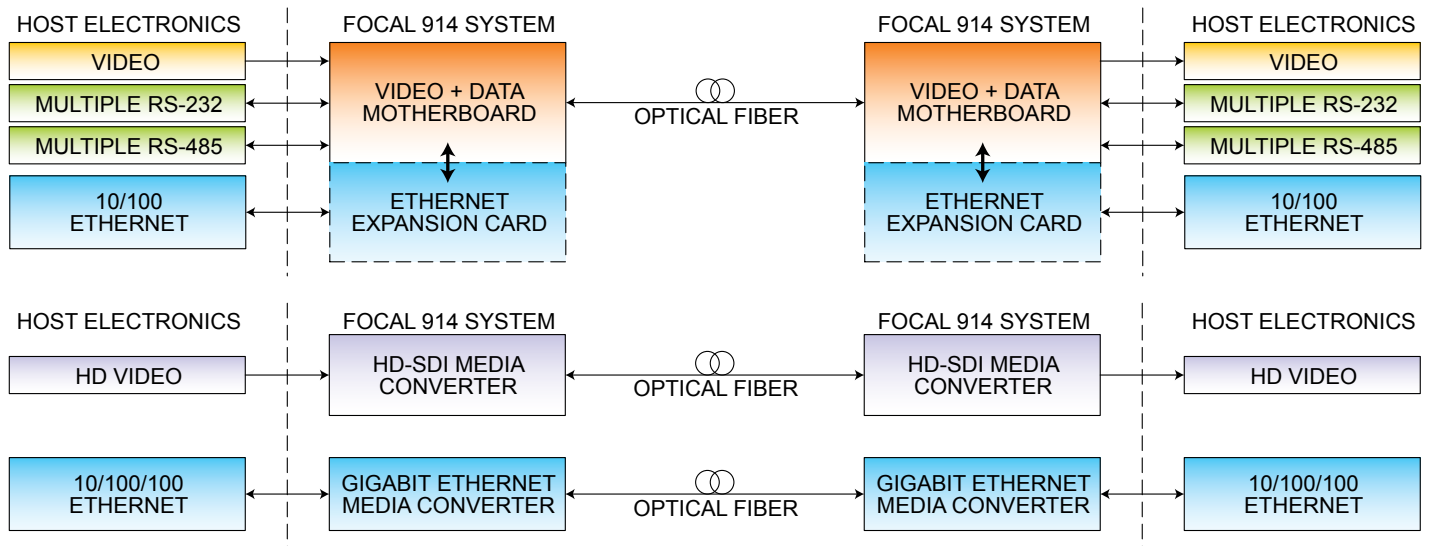
Model 914 systems are assembled from four main categories of cards:

- Multiplexer motherboards
- Media converters
- Expansion cards
- Optics cards
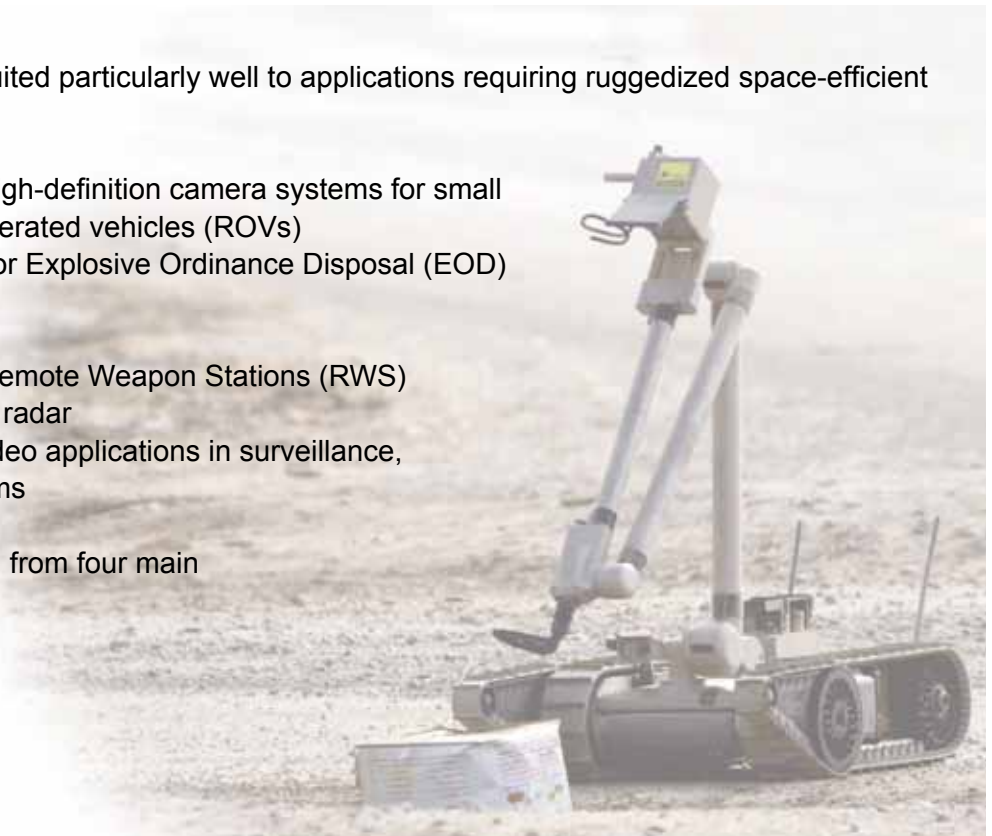
Model 914

Multiplexers, Media Converters, and Expansion 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.

Model	914-R/C	914-EIBS	914-MCS	914-GBE	914-HDV	914-HDM
Description	Video/Data Multiplexer	Ethernet Switch Expansion Card	Fast Ethernet Media Converter	Gigabit Ethernet Media Converter	HD-SDI Media Converter	HD-SDI/ Data Mux
Part Number	914-0001-xx (R) 914-0002-xx (C)	914-0202-00	914-0014-xx	914-0021-xx	914-0018-04	914-0023-xx (R) 914-0024-xx (C)
Supported Video Format	NTSC, PAL	None	None	None	HD-SDI (SMPTE 292)	HD-SDI (SMPTE 292)
Video Channels	1	None	None	None	1 x HD-SDI	1 x HD-SDI
Supported Data Formats	RS-232, RS 485/422, Expansion card	10/100 Base T(X) Ethernet*	10/100 Base T(X) Ethernet	10/100/1000 Base T Ethernet	None	RS-232, RS 485/422, Expansion Card
On-board Data Channels	4 Serial	2 Ethernet	2 Ethernet	1 Ethernet	None	2 Serial

*Total maximum aggregate throughput of both 10/100 Ethernet ports is 10Mbps.
R – Remote, C – Console
-xx Variant depends on optical configuration (i.e. Dual LC, Bidi, CWDM wavelength)
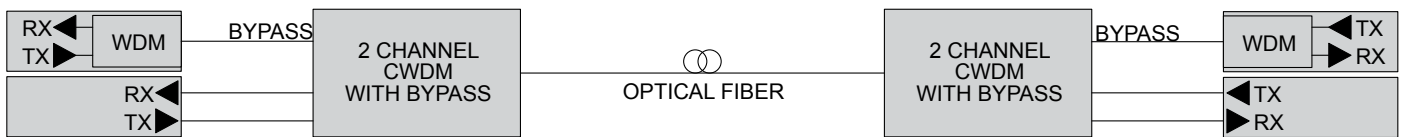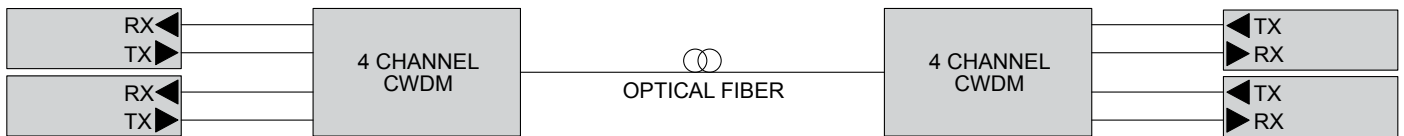
Optical Cards

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

Optical Card	914-CWDM	914-CWDM-4R1	907-CWDM-8R
Description	2-Channel CWDM Optics Card, 1471/1491 nm with 1310/1550 nm Bypass, Singlemode	4-Channel CWDM Optics Card, 1471 - 1531 nm, Singlemode, 20 nm Spacing	8- Channel CWDM Optics Card, 1471 - 1611 nm, Singlemode, 20 nm Spacing
Part Number	914-0006-00	914-0017-00	914-0017-02
Features/Options	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	Optional 1310 nm Bypass Port	Optional 1310 nm Bypass Port

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.

914-AIB Adaptor Board Supports Any AIB Daughter-card Plug-in

AIB plug-in modules are used to convert the signal interface format to a TTL format, which is then accessed through the expansion port on the 914 motherboard. AIB plug-ins support standard serial data interfaces (RS-232/485/422), hydrophone and other audio signals, various digital and analog sonar telemetry, and control networks, such as CAN Bus and Profibus.

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

Model 914

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

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

Model 914