

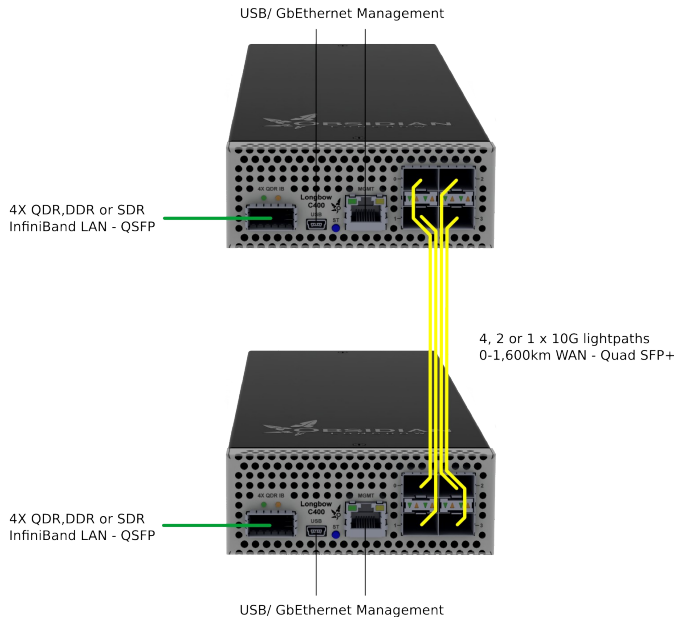
# InfiniBand Range-Extending Switch - Dark Fiber



## Longbow C400 series by Obsidian

### Operation

A pair of Longbow C400 devices communicate over 4, 2 or 1 10Gbits/second WAN light paths at distances of up to 1,600 km (1,000 miles), connecting locally to InfiniBand LAN infrastructure through 4X QDR, DDR or SDR InfiniBand (IB) ports:



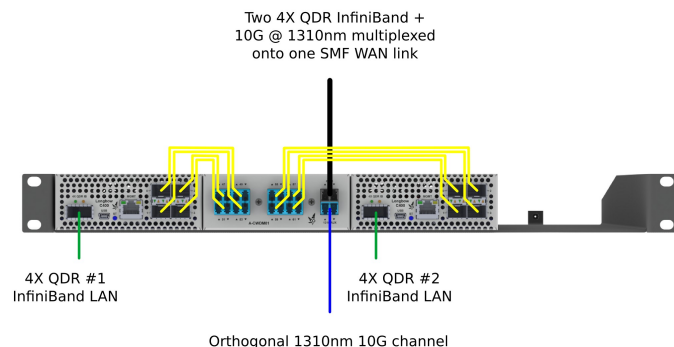
The Longbow C400 series devices report as two-port InfiniBand switches to the subnet manager – the fabrics at each end-point location unify into a single subnet.

**Port 1 (LAN)** QSFP supporting 4X QDR, DDR and SDR InfiniBand LAN interfaces

**Port 2 (WAN)** SFP+ supporting four 10Gbits/second lightpaths

Longbow C400s perform buffer credit extension at the link level and, when combined with up to four 10Gbits/second serialized optical data streams at the physical layer, allow InfiniBand to reach much farther than any other technology.

Since C400 series devices use a proprietary optical WAN encoding, they must be deployed in pairs, connected by direct light paths. Due to skew constraints between parallel optical WAN channels, it is recommended that C400s are deployed with CWDM WAN solutions - such as Obsidian's Rainbow C8 or Rainbow D9 devices, which were designed to carry multiple 4X QDR InfiniBand connections across a single fiber pair:



(C400 gracefully degrades InfiniBand port speeds if 10Gbits/second WAN channels are lost; for example QDR will degrade to DDR if one or two WAN links fail, and DDR to SDR if only a single WAN circuit remains)

**Longbow Products use technology covered by U.S. Patent #7,843,962 - additionally, corresponding patents have been granted in the U.K., Australia, Mexico, Japan, China, Russia, Korea, Israel and Canada, with additional patents pending worldwide.**

### Specifications

#### Chassis

|                      |   |
|----------------------|---|
| Mounting (Quad Pack) | 19" rack-mount shelf, front mounting no-rail system                           |
| Physical             | 1.5"x4.25"x13"  |
| System power         | Max 30W / Typical 20W   |
| Input power          | 80-264 VAC at 47-63 Hz (universal)  |
| Environmental        | 10-45 degrees C (32-113 degrees F) ambient                                    |
| Airflow              | Pressurised, rear to front flow, filtered intake                              |
| External Ports       | 1 AC input, 1 USB, GbE (management), QSFP LAN QDR 4X, 4 SFP+ WAN transceivers |
| Acoustics            | Intelligent fan speed control for quiet operation and long bearing life       |

#### Management

|                  |  |
|------------------|--|
| Ethernet         | Full duplex 10/100/1000 Base-T Ethernet with auto MDI-X                            |
| Protocol Support | IPv4, IPv6, HTTP/HTTPS, SNMP, DNS, ZeroConf and DHCP                               |
| GUI              | Web based interactive management   |
| User Management  | Single user account  |
| HTTP             | SSL v2/v3 and TLS with HTTP digest challenge/response password exchange            |
| Configuration    | Through Web GUI or via a text configuration file                                   |
| Firmware         | Web upgradeable. Primary/Secondary high-availability FLASH storage with scrubbing. |

#### Optics Modules

|             |  |
|-------------|--|
| Type        | SFP+ module; quad transceiver cage               |
| Connector   | Duplex-LC  |
| Wavelength  | (850, 1310, 1550nm, CWDM or DWDM; user provided) |
| Raw Bitrate | 10.3125 Gbits/second per transceiver             |

#### Optical Interface

|                |                                  |
|----------------|----------------------------------|
| Node Type      | Two-port switch                  |
| Physical Layer | SFP+ specification               |
| Payload        | IB link - proprietary encoding   |
| Raw Bandwidth  | 40.0 Gbits/second max (QDR mode) |
| BER control    | Integrated high-gain FEC         |

#### InfiniBand Interface

|                      |   |
|----------------------|---|
| Connector            | IB QSFP 4X, QDR at 32Gbits/second (payload) |
| Node Type            | Two-port switch                             |
| Physical Layer       | InfiniBand Architecture v1.2                |
| Subnet Manager Agent | Integrated InfiniBand Architecture v1.2     |
| VLS                  | 1 data, 1 management                        |
| Port-to-port latency | 350 ns (small packet store-and-forward)     |

#### Longbow C400 Series Ordering Codes

**C400** Base chassis hardware with 300m range enabled w/o optics

C400 license keys unlock required QDR link ranges:

**10km, 40km, 80km, 400km, 1,600km** link ranges available as either annual or lifetime licenses.

**Rainbow C9** Complementary 8+1  $\lambda$  passive CWDM device  
**Rainbow D8** Complementary 8  $\lambda$  passive DWDM device

#### Contacts

For sales or channel partner inquiries:

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