# iDirect Hub Infrastructure

The iDirect Hub Infrastructure solution provides the high performance needed for today's IP broadband networks in a high-density package that provides market-leading throughput and reduces the total cost of ownership. Our flexible state-of-the-art hub infrastructure is equipped with the latest virtualization and cloud technologies for strengthened security, streamlined operations, and scalable deployment options. With the iDirect Hub Infrastructure solution, operators can meet the need for high-quality connectivity today and be assured of capacity and scale as bandwidth demand increases. Our architecture is engineered to grow with your demands, ensuring seamless expansion without compromising efficiency.

## Highly Flexible and Scalable

The iDirect Hub Infrastructure is a solution for Dialog gateway deployments, serving a multitude of beams, transponders, or satellites. The use of a baseband matrix brings N:M redundancy for up to 32 multicarrier modulators and/or demodulators in one rack. In addition, the matrix fan in/out capability allows for simple interfacing with the gateway RF infrastructure. Capacity can be extended easily and rapidly by adding additional multicarrier modulators, demodulators, servers, and activation in the Dialog NMS. High-capacity multicarrier modulator units support DVB-S2X carriers, whereas the high-capacity multicarrier demodulator units can support our patented Mx-DMA return link technology. The use of Private Cloud technology enables flexible VNF deployment based on scalable compute and storage resources.

## Best-in-Class Performance

The iDirect Hub Infrastructure is designed for operators seeking high throughput through its 10 Gbps Ethernet switching infrastructure. With support for Forward DVB-S2X carriers up to 500 Msps, they can leverage the high bandwidth transponders provided by High Throughput Satellites (HTS).

## Markets

- Enterprise
- SME
- Cellular Backhaul
- Government / Defense
- Offshore and Maritime
- Aero
- Land Mobility

### Main Advantages:

- Highly flexible and scalable architecture
- Optimized baseband density & flexibility with baseband matrix
- Advanced security with integrated cloud native virtualization layer based on OpenShift
- Up to 500 Msps forward carriers
- Carrier grade reliability with built-in redundancy
- Support for Mx-DMA HRC and MRC return links
- Pay-as-you-grow

## Forward Channel

| | |
|---|---|
| Standard | DVB-S2/DVB-S2X ACM |
| Modulation | QPSK to 256APSK |
| Encapsulation | GSE, MPE |
| Carrier bandwidth | Max. 500 Msps, 525 MHz |
| Roll-off | 5, 10, 15, 20, 25 and 35% |
| Data throughput | 2 Gbps |
| Pre-distortion | Equalink |

## Return Channel

### Mx-DMA High-Resolution Coding (HRC)

| | |
|---|---|
| Modulation | VLSNR, QPSK, 8PSK, 16APSK, 32APSK |
| Carrier bandwidth | 0.030 to 20 Msps |

### Mx-DMA Multi-Resolution Coding (MRC)

| | |
|---|---|
| Modulation | QPSK, 8PSK, 16APSK, 64APSK |
| Carrier bandwidth | 0.1 to 100 Msps |

## Hub Architecture

| | |
|---|---|
| Modulator/Demodulator | Up to 32 slots per rack |
| Modem Hardware | MCM7500 Multicarrier Modulator<br>MCD7500 Multicarrier Demodulator |
| Modem Redundancy | N:M redundancy |
| Fan in/out baseband matrix | |
| Private Cloud Infrastructure | |
| Scalable Compute & Storage options | |

## Hub Interfaces

| | |
|---|---|
| Ethernet User data | 10 GbE (Optical or RJ45) |
| Ethernet Management data | 1 GbE (RJ45) or<br>10 GbE (Optical or RJ45) |
| Out of Band Management | 1 GbE (RJ45) or<br>1 GbE (Optical) |
| RF Output per satellite network | L-band (950 - 2400 MHz) |
| RF Input per satellite network | L-band (950 - 2150 MHz) |
| Reference Input | IEEE1588v2 or 10 MHz |

## Mechanical & Environmental

| | |
|---|---|
| Operating temperature | 10° to 30°C / 50° to 95°F |
| Humidity | 10 to 85% relative, non-condensing |
| Storage temperature | -30° to 60°C / -22° to 140°F |

## Mains Power Supply

| | |
|---|---|
| Power Supply | 380-400 VAC 3PH+N+GND (EU+AUS)<br>208 VAC 3PH + GND (US) |

DBR2000 / DCR2100

# Specifications

## Hub Modulator and Demodulators

The flexible state-of-the-art hub infrastructure is equipped with the latest virtualization and cloud technologies for strengthened security, streamlined operations and scalable deployment option and with modulators and multicarrier demodulators according to the satellite network requirements. Full detailed specifications can be found on the respective product sheets on our website.

### MCM7500 Multi-Carrier Modulator

#### DVB-S2 / DVB-S2X

| | |
|---|---|
| Modulation | QPSK to 256APSK |
| Carrier bandwidth | Max. 500 Msps, 525 MHz |
| Roll-off | 5, 10, 15, 20, 25 and 35% |
| Pre-distortion | Equalink |
| Number of Carriers | 1 |
| Data throughput | 2 Gbps |

### TFR210 PTP Grandmaster

#### Timing Source

| | |
|---|---|
| Reference Clock | Internal: Oven-controlled crystal oscillators (OCXO)<br>External: 10MHz reference input |
| PTP Probe Option | 1588v2 PTP Grandmaster Clock<br>1588v2 PTP Slave Clock |
| Management | 1x GigE management interface supporting WebUI, CLI and REST-API |
| Outputs | 1x GigE output supporting PTP |

### MCD7500 Multi-Carrier Demodulator

#### Mx-DMA High -Resolution Coding (HRC)

| | |
|---|---|
| Modulation | VLSNR, QPSK, 8PSK, 16APSK, 32APSK |
| Carrier Options: | Up to 24 carriers in range 0.03 - 20 Msps |
| Processing bandwidth | 72 MHz |
| Data throughput | 216 Mbps |

#### Mx-DMA Multi-Resolution Coding (MRC)

| | |
|---|---|
| Modulation | QPSK, 8PSK, 16APSK, 64APSK |
| Carrier Options: | Up to 512 carriers in range 0.1 - 100 Msps |
| Processing bandwidth | 105 MHz |
| Data throughput | 400 Mbps |