A-Series AR-80-OPT
Optical Multi-Mission Receiver

www.work-microwave.com

The A-Series is a family of next generation satellite modem platforms built on versatile FPGA- and software-based architecture. The AX-80 product line supports DVB-S2X/S2 standards with utmost possible throughput up to bandwidths of 500 Msps. Exceptional analog and digital engineering provides teleport-grade devices with future-proof expandability.

Beyond DVB waveforms, A-Series devices can be extended to customized signal and data processing. Through an all-IP structure, the platform supports both native network operation as well as data streaming over IP. Built-in encapsulators provide support for a wide range of formats plus specialized streaming like transparent baseband data, raw IQ information, space data formats and more.

The **AR-80-OPT Optical Multi-Mission Receiver** is a receiver dedicated to support the processing of optical direct-to-earth links. It is designed for multi-mission support to enable effective ground station design. Optical On-Off-Keying (O3K) and High-Photon-Efficiency (HPE) transmissions can be processed via a common input that operates either based on hard-decision decoding or the processing of logarithmic-likelihood-ratios (LLR).

An additional Soft-Decision Front-End (SDFE) device is available for bit synchronization to LLRs in combination with the AR-80-OPT. That will also allow installations of the AR-80-OPT independently from the telescope location.

Key Features

- Multi-Mission support
- Hard-decision and soft-decision decoding
- Optical On-Off Keying (O3K)
- High-Photon-Efficiency (HPE)
  future upgradable extension
- CCSDS 141/142 support
  future upgradable extension
- O3K symbol rate up to 10 Gsps
- User data rate up to 3 Gbit/s
- Customizable processing infrastructure for easy integration into large communication systems
- Flexible software architecture for easy extension and future virtualization of functionality
- Teleport-grade M&C capabilities for seamless integration into professional ground station systems
- **3 years warranty**

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RX Signal Specifications

Signal input O3K hard-decision:	Optical transmission rates:	100 Msps 10 / 5 / 2.5 / 1.25 Gsps / 625 / 312.5 / 156.25 / 78.125 / 39.0625 Msps 8 / 4 / 2 / 1 Gsps / 500 / 250 / 125 / 62.5 / 31.25 Msps ***Contact factory for other rates.*** Optical rates for synchronization and decoding only. See below for user data processing limits.
	Connector:	1x SFP+ ***Contact factory for multi-input support.***
	Data format on SFP+ RX pair:	amplified and limited O3K signal
	Line rates:	identical with optical transmission rate
	Line rate tolerance:	± 800 ppm for <= 1 Gbps ± 200 ppm for > 1 Gbps
Signal input LLR for HPE and O3K soft-decision:	Optical transmission rates:	depending on SDFE device
	Connector:	1x SFP+ ***Contact factory for multi-input support.***
	Data format on SFP+ RX pair:	8-bit LLR values 8B10B-coded, K28.5 sync characters
	Line rates:	10 Gbps ***Contact factory for higher line rates.***
	Line rate tolerance:	± 200 ppm
Reception of space terminal specific signals:	Space segment: Transmission:	Tesat CubeLCT O3K, Reed-Solomon, Interleaver depth = 1..256
	Space segment: Transmission:	Tesat TOSIRIS O3K, Reed-Solomon, Interleaver depth = 1..256 ***Contact factory for adding a specific space terminal here.***
Reception of standardized signals:	CCSDS 141/142 O3K: CCSDS 141/142 HPE:	n/a (future extension, in-field upgradable) n/a (future extension, in-field upgradable) ***Contact factory on progress in standardization.***

Specifications are subject to change

Data Processing and Device Specifications

Device connectors:	Data network:	6x Ethernet RJ-45, 10/100/1000Base-T auto sensing 2x SFP+ adapter slot for optical GbE or optical/copper 10GbE ***Contact factory for available SFP+ modules.***
	M&C network:	1x Ethernet RJ-45, 10/100/1000Base-T auto sensing
Network operation:	IP data rate limits:	3 Gbps per direction, subject to prevailing modem limits maximum rates can vary in combination with complex internal processing
Frontpanel interface:	LCD-Display 2x40 characters, 4 cursor keys, 4 function keys	
Remote monitoring and control:	Protocol: Connection: Protocol: Connection:	SNMP UDP/IP over Ethernet/RJ-45 HTTP web browser interface TCP/IP over Ethernet/RJ-45
Temperature range:	Operating: Storage: Relative humidity:	0°C...50°C -30°C...80°C < 95% non condensing
Mains power:	Input: Consumption: Connector:	100...240 V AC nominal, 90...264 V AC max, 50...60 Hz 150 VA / 150 W typical IEC C14
Dimension and weight:	483 x 98 x 505 mm³ (WxHxD), 2 RU 19" up to approx. 14 kg depending on device type	

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Order information:

AR-80-OPT	Optical Multi-Mission Receiver

Hardware options:

Hardware options have to be defined with the order and are not field-upgradable. Not all device types may support all combinations. Contact factory with specific requests.

n/a	(currently no additional hardware options applicable)

License based functions:

License based functions are field-upgradable by uploading a license file to the device.

n/a	(currently no additional license options applicable)