UHF-OMU-V2

UHF Optical Master Unit



Description

SEE Telecom's UHF Optical Master Unit new generation (UHF-OMU-V2) enhances RF coverage in confined areas, such as tunnels, buildings, metros, mines, wind turbines, warehouse, shopping malls, hotels, etc. UHF-OMU-V2 is suitable for any services between 350 and 520 MHz.

The UHF-OMU-V2 consists of a Master station distributing the RF signals to Optical Remote Units (ORU) with optical transmitters and optical receivers, by optical fibers. These ORU transform the optical signal into RF, amplify it and then deliver it to the infrastructure at the appropriate power level.

The UHF-OMU-V2 is composed of an eACSYS (3U) 19" chassis, including optical Quad receivers / Quad transmitters modules to transform the signal from RF to optics and vice versa, power supply and an element management system's module to manage every module present in the chassis. Each eACSYS (3U) 19" chassis can contain up to 24 optical TX/RX pairs (20 in the case of 110-230 VAC Power Supply). The UHF-OMU-V2 also contains a directional coupler and the appropriate duplexer which can be connected directly to the base station or to an off-air repeater (in the case of an off-air link with the BTS). The directional coupler allows to provide signal to the first radiating section to be covered, near to the OMU location.

Monitoring and control can be done locally or remotely (optional) via SNMP or HTTP using a Web browser installed on a PC which gives access to the GUI. This interface contains an easy configuration page.



Applications

- TETRA, TETRAPOL, Analog
- Coverage enhancement
- Confined areas: tunnels, buildings, metros, mines, wind turbines, warehouses, shopping malls, hotels, etc.
- Outdoor: public safety, border patrol, etc.

Key features

- 350-520 MHz
- Up to 24 optical TX/RX pairs
- 19" rackable 3U chassis
- Optical loss compensation
- SNMP agent v2c, v3
- All connections in front face
- Full monitoring and GUI access of the ORU's from the OMU
- Dual duplexing bands (optional)

Benefits

- Scalable number of Optical Remote Units (ORU)
- Easy to extend
- Quick & easy installation



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System architecture of a complete UHF OMU / ORU system



The architecture of the UHF-OMU-V2 is illustrated above: in downlink, the OMU captures the RF signals to retransmit from either a local BTS through the duplexer, or from a remote BTS, off-air. In case of off-air uptake, the radio signals are digitally filtered and amplified, either by band (SC-DIRRAC) or by channel (including TDMA) (MC-DIRRAC) by an off-air repeater.

The RF signals are then transmitted to the ORU by optical fiber using SEE Telecom's wideband chainable optical transmitters and receivers that include functions such as optical AGC, allowing easy configuration of system gains. The optical transmitters and receivers are placed into SEE Telecom's eACSYS chassis (UHF-OMU-V2), allowing to scale the solution, one optical transmitter/receiver pair per ORU, according to the size of the infrastructure taken into consideration. The optical signals are then amplified in the ORU to deliver the RF signals into the infrastructure at the appropriate power level.

In uplink, the signals received from the infrastructure are passed through the ORU's LNA to arrive at the OMU with a noise as low as possible, through the optical fiber. The uplink signals are then being delivered to the BTS either through the duplexer or through the off-air repeater with enough power and digital signal processing in case of a remote BTS.

Technical features

Frequency band	350—520 MHz
Max. input power (DL)	47 dBm (composite power)
Max. output power (UL)	-10 dBm
Spurious and harmonics	< -36 dBm (ETSI EN 300 392-2 v3.4.1)
OTx input attenuator adjustment	20 dB in 0.5 dB steps
ORx output attenuator adjustment	20 dB in 0.5 dB steps
Delay	For TETRA : < 12 μs (< 14 μs at high selectivity)
Impedance	50 Ohms
Input/output return loss	> 12 dB
Optical transmission topology	Star (daisy chain under request)
OTx / ORx wavelength	1310 nm / 1550 nm (WDM)
Optical transmitted power (1310 nm)	3 dBmO (±1.5 dB)
Optical received power AGC range (DL & UL)	+2 to –6 dBmO
Monitoring & Control	RJ45 (HTTP, SNMP)
Dry contact output alarm	One dry contact alarm per eACSYS 3U chassis
Operating temperature	-10 to 55°C
Power consumption	120W max. with 24# TX/RX pairs
Fiber Optics connector	LC/APC8°
RF connectors	SMA F
Dimensions	19" chassis x 3 U x 360 mm
Compliance	RED, ETSI TS 101 789-1, ETSI EN 300 392-2

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Block diagram of the UHF OMU & Extensions



System monitoring & configuration page

Setting up and monitoring the system is made easier through the unified SEE Telecom GUI's. SEE Telecom GUI is accessible through a Web browser by typing in the IP address associated with the chassis (OMU, Off-air repeater or ORU). The screen is divided into three parts; the left and top panes represent the lists and graphical view of the individual modules of the chassis, while the central lower pane is used to set the parameters of the selected module. The off-air repeater is accessible through a first IP

address, and is configured such that the power levels and digital processing functions are set such that the uplink signal power level is enough to reach the BTS, and the uplink and downlink signals are correctly filtered out.

The eACSYS chassis for the optical distribution is accessible through a second IP address, to correctly set up the optical parameters.

The ORU are accessible through an additional IP address from the OMU since the ORU repeaters monitoring data are carried over the optical fiber (optional : "S : Fiber Ethernet (SFP)) both in uplink and downlink on separate wavelengths.

For each chassis, alarms can be activated and are available both on the GUI and by SNMP.

See Telecom eacsys IP Address 10.0.0.1 ters Alarm Settings Advanced Quad Rx Tx Slot 1 [eACSYS] Module Parame 45.2 °C Type: Quad Rx Tx Status : Temperature : S/N: 191340-0001 RX Settings TX Setting: Qued Rx Tx Redundant Mo -Laser Control Output Att.: 0.0 ÷ dB 0,0 - dB RF Input Att. : RX1 RX2 PS 230 Opt. Squelch Thresh. 15,0 🕂 dBm Mode : Enable 💌 Mode : Enable 💌 PS 230 Opt. P : -28.4 Status : 🔴 Opt. P : RY Parameters Status : RX Wavelength 1550 nm TX Wavelength 1310 nm Logout RX3 RX4 RF Output Power : -15.7 dBm Laser Opt. Power 10.0 dBm **Overview** Mode : Enable V Mode : Enable V **RF Laser Power :** -41.9 dBm Global Settings Opt. P : Opt. P : 2.0 dBm -0.1 Backup Input Status : 🧧 **RF Overload Status**: Status :

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Ordering information

UHF-OMU-V2	Model		Frequency bands		Power Supply		Monitoring of ORU's		Frequency inversion	Fiber Optics Connectors	
170210 -	l I		m		0		р		q	r	
	0 N/A	A	UL: 380-385 MHz DL: 390-395 MHz	0	None (external 24 Vdc)	N	Local only (RJ45)	N	No frequency inversion (standard)	0 N/A	
		в	UL: 410-415 MHz DL: 420-425 MHz	1	110-230 Vac (50- 60Hz) / 24VDC	s	Fiber Ethernet (SFP)		Yes (High and Low		
		С	UL: 415-420 MHz DL: 425-430 MHz	2	-48 Vdc / 24VDC				inverted)		
		D	UL: 450-455 MHz DL: 460-465 MHz								
		Е	UL: 455-460 MHz DL: 465-470 MHz								
		к	UL: 380-386.5 MHz DL: 390-396.5 MHz								
		y z	Custom dual duplexer Custom duplexer								

_	Extensions			Model	Frequency bands		Power Supply		Monitoring of ORU's		Frequency inversion		Fiber Optics Connectors		
	170210	-				m		0		р		q		r	
			Q	Quad ORX / Quad OTX	0	N/A	0	N/A	N	Local only (RJ45)	0	N/A	L	LC/APC 8°	
			D	Dual ORX / Dual OTX					S	Fiber Ethernet (SFP)					
			s	Single ORX / Single OTX											

* The SEE Telecom's system architecture offers the possibility to have fully access to the GUI of the ORU from the OMU. In this case, the choice for the "monitoring of the ORU's" must be "S : Fiber Ethernet (SFP)". All the needed material to do that is furnished with the OMU.

Additional Material	Ordering codes	Notes
Optical Remote Units (ORU)		
FF-DIRRAC-UHF 1f - Single Fiber-Fed UHF Repeater	170720-Gmnopqr(-19*)	See appropriate Commercial Sheets for further information
FF-DIRRAC-UHF 2f - Dual Fiber-Fed UHF Repeater	170720-Rmnopqr(-19*)	* (-19) is the 19" rackable version
Off-air Repeaters		
SC-DIRRAC-UHF - Single Channel UHF digital Repeater	170720-Amnopq(-19*)	See appropriate Commercial Sheets for further information
MC-DIRRAC-UHF- Multi Channel UHF digital Repeater	170720-Cmnopq(-19*)	* (-19) is the 19" rackable version

SEE Telecom is a world leader in the provision of scalable, flexible, user-friendly, and cost-effective systems for multi-services radio coverage inside confined areas to enhance safety and facility management. Since 1999, SEE Telecom has equipped more than 1000 km of road tunnels, railway tunnels, and metros all over the world. SEE Telecom solutions are available worldwide through an exclusive network of partners.