

# ALS series

Product Leaflet



siae microelettronica

## 4 to 42 GHz Microwave System Packet and Hybrid Configuration

Backhaul network requires a transport solution with great flexibility to support multiple access technologies.

ALS Series provides Native IP, Native PDH and SDH connections to address in a single equipment solution all traffic needs. It covers any market segment ranging from cost-sensitive applications to advanced network implementations in which high capacities, complex protection schemes and excellent reliability are mandatory.



Firenze, Italy

# MICROWAVE RADIO



ALS superior mix of Packet and TDM interfaces allows easy network evolution from pure TDM to pure IP with circuit emulation option. Its advanced packet capabilities are certified to comply with LTE transport requirements.

A complete range of user interfaces (E1, Gigabit/Fast Ethernet and STM1) and a high degree of versatility allows for a very easy network planning and management.



## MAIN FEATURES

- 4 QAM to 256 QAM modulations
- ACM adaptive code and modulation
- MultiLayer Header Compression
- XPIC configuration in a 1U IDU
- 1 Gbits throughput radio
- Native/PWE3 TDM services defined by software
- CISCO Microwave Adaptive Bandwidth feature interworking
- Mixed TDM/Ethernet interfaces for dual native transport
- Synchronous Ethernet support
- IEEE 1588 v2 support
- Extended buffer for maximum TCP/IP efficiency in LTE networks
- Integrate antennae up to 1.8 m
- Single Universal ODU for any capacity and modulations
- Layer one Radio Link Aggregation
- Unified Network Management System – NMS5

## LAYER 2 MAIN FUNCTIONALITIES

- MEF-9 and MEF-14 certified
- 8 queues with flexible scheduler (Strict WFQ and mixed)
- Flexible QoS definition based on VLAN, IPv4, IPv6, MPLS exp bits
- Per queue WRED congestion avoidance
- Flow Based Ingress Policing (CIR & EIR definition)
- Egress shaping
- ERP Support G.8032 v.2
- Flow Control IEEE 802.3x
- RMON Statistics
- VLAN/VLAN STACK ING (IEEE 802.1q with QinQ)
- Link Aggregation IEEE 802.3ad
- ETH OAM IEEE 802.1ag/ITU-T Y 1731
- Jumbo Frames up to 10 Kbytes

## TYPICAL APPLICATIONS

- 2G/3G/4G Cellular Network backhauling infrastructure
- Leased Lines replacement
- Utility Networks (Railways, Oil&Gas)
- Private Data Networks (WANs, LANs, etc)
- WiMAX Backhauling
- Fibre Optics extension, termination and backup
- RMON Statistic
- Spur Links for Backbones/Rings
- High capacity Broadband Access Networks

## Nodal Configuration

Real “pay as you grow” approach. Thanks to the NBUS connectivity it is possible to incrementally expand from one to sixteen independent radio directions. This solution allows deployment of a common platform regardless of the number of directions employed day one, or required in the future. Single element management allows easy cross connections.



COMPANY WITH QUALITY MANAGEMENT  
SYSTEM CERTIFIED BY DNV  
= ISO 9001:2008 =

## ALS Series

### INDOOR UNIT

IDU Model	ALCplus2e	
AGS20 version	ALCplus2e : IDU 1RU	ALCplus2e : N x IDU 1RU NODE
Configuration	1+0 / 1+1 / 2x(1+0) / XPIC	2Nx(1+0), Nx( 1+1), NxXPIC Node up to 16 Radio directions
TDM Transmission Capacity	Up to 164xE1 (per radio direction)	Nx164xE1
Ethernet Throughput Capacity	1Gbps w/o Header Compression 2Gbps with Header Compression	Nx Gbps w/o Header Compression Nx2 Gbps with Header Compression
Modulation	4QAMs / 4QAM / 8QAM / 16QAM / 32QAM / 64QAM / 128QAM / 256QAM with ACM	
Tributary Interfaces	6xGbE* + 18xE1 + 2xSTM1 + NBUS 6xGbE* + 34xE1 + 2xSTM1 6xGbE* + 2xE1  TDM/PWE3 mode software selectable Non blocking TDM Cross Connections 6 Gbps switching capability Synchronous Ethernet +1588v2 Support	2NxSTM1, 18xNxE1, 4xNxGbE* N equal to number of stacked IDUs  TDM/PWE3 mode software selectable Non blocking TDM Cross Connections Single Node SW management Synchronous Ethernet +1588v2 Support
Security features	HTTPs / SNMPv3 / SFTP / SSH	
Maintenance Interfaces	2x10BaseT + USB + G704 (E1)	2Nx10BaseT + USB + G704 (E1)

\* 6xGbE = 4GbE Electrical + 2GbE Optical



ALCplus2e IDU  
6xGbE + 34xE1 + 2xSTM1  
Up to 2Gbps



ALCplus2e IDU  
6xGbE + 2xE1  
Up to 2Gbps



ALCplus2e Nodal IDU  
6xGbE + 18xE1 + 2xSTM1 + Nodal Bus  
Up to 16 directions

### OUTDOOR UNIT

- Supporting any IDU configuration
- Best class power consumption (12 W)
- Outstanding transmit power performance with top class power consumption
- Small form factor: 1.7 liters volume
- Easy and quick deployment



## ALS Series Technical specification

Frequency Band	4 GHz	6L/6U GHz	7/8 GHz	10/11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	26 GHz	28 GHz	32 GHz	38 GHz	42 GHz
Frequency Range	4.4-5	5.9-7.1	7.11-8.5	10.2-11.7	12.75-13.25	14.4-15.35	17.7-19.7	21.2-23.6	24.5-26.5	27.5-29.5	31.8-33.4	37-39.5	40.5-43.5
Modulation Schemes	4 QAM / 8 QAM / 16 QAM / 32 QAM / 64 QAM / 128 QAM / 256 QAM												
Channel Spacing	3.5 MHz / 7 MHz / 14 MHz / 28 MHz / 40 MHz / 56 MHz												
Ethernet Throughput	Up to 1 Gbps per radio channel												
Supported Configurations	Terminal applications	1+0 / 1+1 / 1+1 SD / 1+1 FD / 2+0 / 2x(1+1) / XPIC											
	Nodal applications	Up to 8x(1+1) or up to 16x(1+0)											
Supported Capacities	2xE1 to 82xE1 / 160xE1 / 2xSTM1												

Output Power (dBm) at Point C\*  
ODU

4 QAM	+28	+32	+32	+31	+28	+28	+23	+23	+22	+21	+20	+19	+17
8 QAM	+28	+32	+32	+31	+28	+28	+23	+23	+22	+21	+20	+19	+17
16 QAM	+25	+29	+29	+28	+25	+25	+21	+21	+20	+19	+18	+17	+15
32 QAM	+25	+29	+29	+28	+25	+25	+21	+21	+20	+19	+18	+17	+15
64 QAM	+24	+28	+28	+27	+24	+24	+19	+19	+18	+17	+16	+15	+13
128 QAM	+24	+28	+28	+27	+24	+24	+19	+19	+18	+17	+16	+15	+13
256 QAM	+23	+27	+27	+26	+23	+23	+18	+18	+17	+16	+15	+14	+12

Receiver Sensitivity (dBm) at BER 10<sup>-6</sup> at Point C (1+0, 28 MHz BW, RF filter losses included)  
ALCplus2,ALCplus2e (see indoor unit table)

4 QAM	-89.5	-89.5	-89.5	-89	-89	-89	-88.5	-88.5	-88	-87.5	-86	-86.5	-85.5
8 QAM	-85.5	-82.5	-82.5	-82	-82	-82	-81.5	-81.5	-81	-80.5	-79	-79.5	-78.5
16 QAM	-81	-81	-81	-80.5	-80.5	-80.5	-80	-80	-79.5	-79	-77.5	-78	-77
32 QAM	-77.5	-77.5	-77.5	-77	-77	-77	-76.5	-76.5	-76	-75.5	-74	-74.5	-73.5
64 QAM	-75.5	-75.5	-75.5	-75	-75	-75	-74.5	-74.5	-74	-73	-72	-72.5	-71.5
128 QAM	-73.5	-73.5	-73.5	-73	-73	-73	-72.5	-72.5	-72	-71.5	-70	-70.5	-69.5
256 QAM	-70.5	-70.5	-70.5	-70	-70	-70	-69.5	-69.5	-69	-68.5	-67	-67.5	-66.5

Frequency Stability	±5 ppm												
Frequency Agility	250 KHz (software programmable)												
RTPC	Up to 30 in 1 dB steps												
ATPC	Up to 30 in 1 dB steps												
IDU/ODU Interconnection per terminal	50Ω Coaxial Cable per RT												
Dimensions (WxHxD)	1RU Compact IDU	480x45x212 (mm)											
	ODU (below 18 GHz)	254 x 254 x 114 (mm)											
	ODU (18 to 42 GHz)	182 x 182 x 65 (mm)											
Power Supply	-48 Vdc ( -15%, +20%)												
Overall Power Consumption	1+0 terminal	≤ 45 W											
	1+1 terminal	≤ 60 W											
Environmental Performance	ODU Weather Proofing Class: IP65						IDU Temperature Range: -5°C to +50°C ODU Temperature Range: -35°C to +55° Working Temperature range with performance not guaranteed: -45°C to +60°C						
Altitude	3000m												
Compliant with	ETSI EN 302 217												

(\*) Typical values