Point to Point Network Radio Solutions

ALFO Series

IP Radio

ALFO — New Generation of IP Radio Link

Main Characteristics (I)

ALFO is a cost-effective series of Microwave Radio designed for deploying LAN to LAN connections.

Frequency Range:	**7 to 38 GHz**
Mechanical Arrangement	**Full Outdoor**
Ethernet Throughput	**4 to 100 Mbit/s**
Modulation:	**4, 16 and 32 QAM (*)**
Interfaces:	**4 x Ethernet 10/100BaseT + 1xE1**
Configuration:	**Unprotected**

(*) 4/16 Auto-adaptive modulation schemes
32 QAM is only available for 100 Mbit/s version

ALFO — New Generation of IP Radio Link

Main Characteristics (II)

Commonalities	**Up to Four SW versions for each HW configurations**
Supported Antenna	**Integrated or External**
Power Consumption	**About 25 Watt for 1+0 configuration**
Features	**40dB ATPC as standard**
	Base-Band Equalizer as a standard
	FEC (Reed-Solomon) : 153,131 over GF8

ALFO — New Generation of IP Radio Link

Main Characteristics (III)

Advanced Features

- High System Gain
- Automatic Modulation Switch based on Signal Quality
- Integrated High-Performance Layer 2 Ethernet Switch
- Priority management
- Built-in ITU-T 2E15 Pseudo-Random Pattern Generator and Error Detector
- Internal Alarms Recorder (1000 Events)
- Data Cyphering (128 bit)
- Automatic Hop Length Measurement
- E1 Way Side

ALFO — New Generation of IP Radio Link

The ALFO series is made up of a single lightweight outdoor unit that includes:

- **Transceiver Unit** **(RF amplifier and conversion)**
- **Modem Unit** **(Power Supply unit, Controller, Synthesizers, Baseband, Modulator and Demodulator)**
- **Line Interface Unit**
- **Lightning Protection**

Unprotected ODU

ALFO — New Generation of IP Radio Link

ALFO series are available in three capacity versions (1+0 Configuration):

- **Low Capacity version** *LC* **Up to 16 Mbit/s (4x100BaseT+E1)**
- **High Capacity version** *HC* **Up to 68 Mbit/s (4x100BaseT+E1)**
- **Full Rate** *EC* **100 Mbit/s (4x100BaseT)**

Capacity	4Mb	8Mb		16Mb		34Mb		68Mb	100Mb
Modulation	4QAM	4QAM	16QAM	4QAM	16QAM	4QAM	16QAM	16QAM	32QAM
LC	✓	✓	✓		✓				
HC				✓		✓	✓	✓	
EC									✓
Space Channel [MHz]	3.5	3.5	7	14	7	28	14	28	28

ALFO — EQUIPMENT LAYOUT

Diagnostic LED:

- **Radio Terminal is OK**
- **Radio Terminal is OK – Remote terminal not connected**
- **Alarm Condition**

Outdoor

Indoor

Multi-pairs cable or CAT6 cable. Up to 100 mt

Main Voltage

UPS

I/F Panel

Optional wall or rack mounting panel for Interface Termination

- ✓ **RJ-45 (Ethernet)**
- ✓ **Lighting protection for indoor equipment (Router, PBX, ect.)**

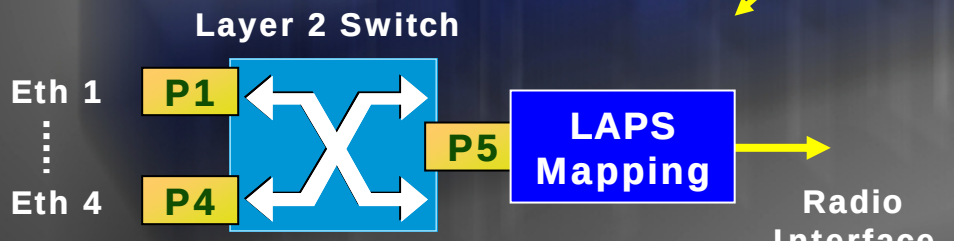
Optional UPS

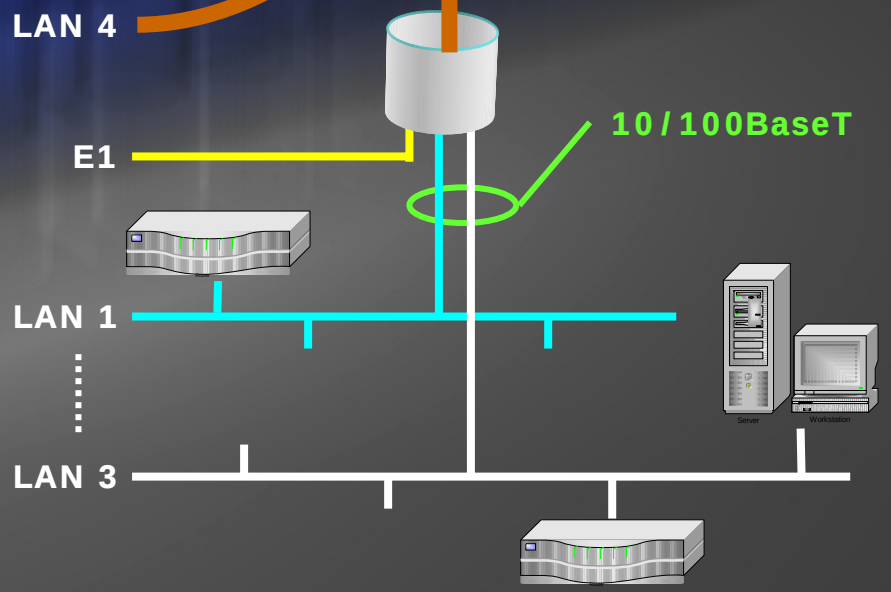
- ✓ **2h or 10h Autonomy**
- ✓ **UPS status and Alarms on NMS**

ALFO — ETHERNET INTERFACE

ALFO provides an integrated high-performance Ethernet switch (Layer 2), with the following functionalities:

- **MAC Switching, Learning, Ageing**
- **IEEE 802.1q VLAN**
- **IEEE 802.1x Flow Control**
- **IEEE 802.1p QoS**
- **IP-V4 ToS**





O&M

ALFO Management

ALFO — *Protocols & DCN*

Management Protocol	**SNMP**
Communication Protocol Stack	**IP**
Layer 2	**Network Management**
TMN ports	**Ethernet**
LCT port	**Ethernet**

ALFO — Local Management

EQUIPMENT SUPERVISORY

LCT Features:

- Radio Link Management
- Full Configuration parameters setup
- Alarm Management and Recording
- Performance Monitoring
- Ethernet Service Channel

Ethernet

Thank you for your attention.

SIAE Microelettronica S.p.A.

Advanced Telecommunication Solutions

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Product	Frequency Band [GHz]
ALFO7	7.11 – 7.90
ALFO13	12.75 – 13.25
ALFO15	14.40 – 15.35
ALFO18	17.70 – 19.70
ALFO23	21.20 – 23.60
ALFO25	25.40 – 26.50
ALFO28	27.50 – 29.50
ALFO38	37.00 – 39.50

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ATPC (Automatic Transmission Power Control)

Maximum ATPC range	**40 dB – This range is limited by the amount of fixed attenuation with respect to the nominal TX power**
Power Control Criteria	**Remote terminal Received Signal Level (RSL) and BER**
Aim	**To counteract the effect of flat fading, minimizing nodal interferences**

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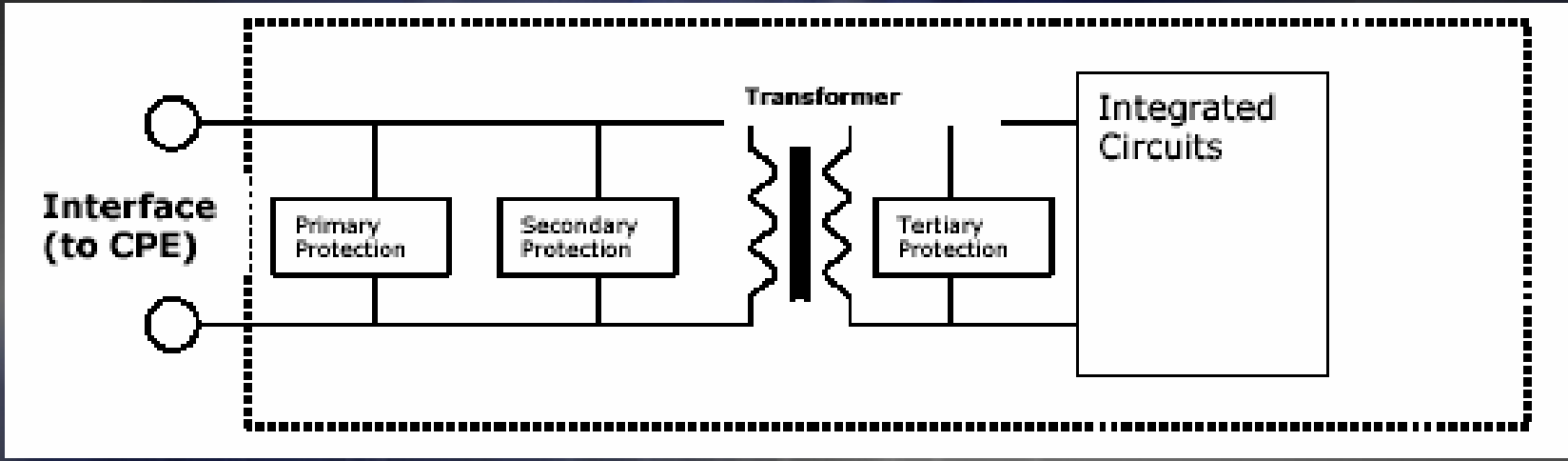
ALFO series is compliant with ITU T-K.21 recommendation, it adopts the following circuital solution



Primary protections are based on “gas arresters”; second and third level protections are based on semiconductor components.