

**TDR-F-1P5 Digital Microwave Radio Equipment
with Protection Switching
for 2 Mbps (E1) transmission
in the 1350 - 1525 MHz frequency band**



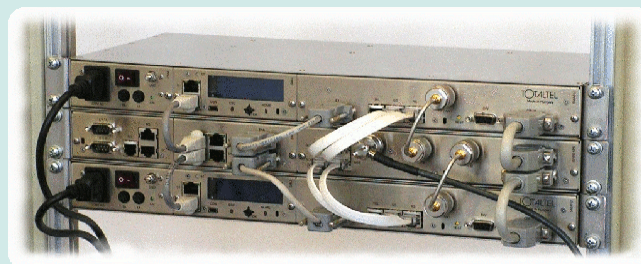
Radio Unit



Protection Switching Unit

Features:

- 1+0, 1+1 (HS, FD, SD) protection
- 4 / 16 / 32 QAM
- Reed-Solomon FEC
- Software configurable transmit power and channel frequency
- Auxiliary data channel
- Engineering order wire
- SNMP based management



1+1 Protected Equipment

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TDR-F-1P5

DIGITAL MICROWAVE RADIO WITH PROTECTION SWITCHING

This member of the Totaltel Digital Radio Equipment Family operating in the 1350 – 1525 MHz frequency band serves for the transmission of digital signals of data rate 2 Mbps.

It is suitable for cost effective realization of low capacity links in public or private networks over ranges up to 40 – 60 km depending on modulation applied. It is especially well suited for modulation transfer of several audio programme channels from the studio to the radio broadcasting transmitter.

The excellent transmission performance, considerable flexibility, ease of handling, low power consumption and high reliability make up the important equipment features.

The single indoor radio equipment housed in an 1U high 19" subrack is interconnected to the antenna by a low-loss coaxial cable of length limited only by the link budget.

The equipment can work with different modulation formats. The software selectable 4 / 16 / 32 QAM modulation yield different frequency efficiency and system gain offering a trade-off among these characteristics. The DSP-based modem applies Reed-Solomon forward error correction and adaptive equalization. Coverage of the frequency band is provided by minimum number of diplexer tuning versions depending on the actual frequency plan. The channel frequency and transmit power are software configured. Equipment and interface characteristics correspond to the relevant ITU recommendations and the ETSI/IEEE standards.

Equipment maintenance and supervisory functions built in: order wire, auxiliary data channel, test loops for diagnostics, continuous BER and Tx power indication and registration of the transmission performance statistics. Control of the supervisory functions may take place using the front panel LCD display or by local PC, or via SNMP from the network management centre.

The design and production techniques applied result in excellent equipment reliability. For particular demand on enhanced availability, in need of uninterrupted service the 1+1 hot standby protection in combination with frequency and space diversity may be applied. This task is accomplished by the protection switching equipment controlling two individual radios. The protection switching equipment is housed in a similar 1U high subrack.

Frequency band	1350 – 1525 MHz		
Duplex spacing	> 48 MHz		
Channel frequency step size	250 kHz		
Frequency stability	better than ± 3 ppm		
Transmission rate	2048 kbps (E1)		
Channel spacing	0.5 MHz	0.875 / 1 MHz	1.75 / 2 MHz
Modulation	32 QAM	16 QAM	4 QAM
Transmit power	30 dBm	30 dBm	33 dBm
Transmit power control range	0 .. -20 dB in 2 dB steps		
Receiver threshold @ 10^{-6} BER	-91 dBm	-93 dBm	-95 dBm
Receiver dynamic range	-30 .. -95 dBm (65 dB)		
Spurious and harmonic emissions	less than -50 dBm (-80 dBc)		
E1 interface	75 Ohm Unbal./120 Ohm Balanced		
Auxiliary data channel	9600 bps, RS232		
Order wire	2W FXS interface		
Diagnostic functions	alarms: TX, RSSI, BER, ISL; test loops: RF, mux		
Insertion loss of protection switching	Tx branch: < 1,8 dB,		Rx branch: < 4,8 dB
Ambient temperature	operation: -10 .. +50 °C		storage: -40 .. +70 °C
Power supply	230 V AC 50 Hz		
Power consumption	1+0: 50 W,		1+1: 110 W
Dimensions Radio / Prot. switch each	484 mm x 44 mm x 345 mm		
Weight	Radio unit: 8 kg / Prot. switch: 2 kg		

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