

TDR-F-XX Digital Microwave Radio Equipment Series

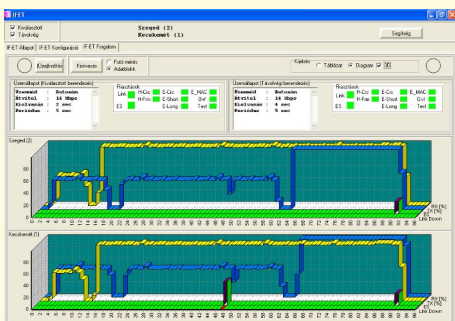
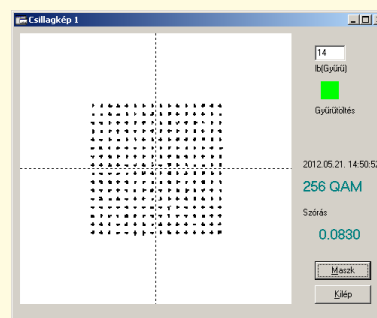
for Gigabit Ethernet/Ethernet and nxE1 transmission

in the 1.5, 4.5, 15, 18 and 38 GHz frequency bands



Features:

- Fixed / adaptive modulation
- 4 / 8 / 16 / 32 / 64 / 128 / 256 QAM modes
- Data rate independent ODU
- Frequency band independent IDU / Full IDU
- Software configurable
 - transmit power and channel frequency
- GbE interfaces to copper and fibre
- Local control from notebook (PC)
- SNMP based management
- 48 VDC / 230 VAC power



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TDR-F-XX

DIGITAL MICROWAVE RADIO EQUIPMENT SERIES

The Totaltel Digital Radio Equipment Series for medium and high data rate point-to-point transmission operate in the 1.5-38 GHz communication bands. Their transmission rate may be varied between 2 – 350 Mbps. They are suitable for the transmission of Ethernet, Gigabit Ethernet and/or E1 channel(s) or the split-mount versions (4.5 GHz and up) linking LANs as Ethernet bridges. Over the range depending on the frequency band applied, they provide cost effective realization of medium to high capacity links in public and private networks.

The excellent transmission performance, considerable flexibility, ease of handling, low power consumption and high reliability make up the important equipment feature. The split-mount equipment, comprising of the indoor and outdoor equipment parts are interconnected by a coaxial cable of length up to 300 m. The outdoor equipment and the antenna may be integrated. The indoor part is mounted to a 19" rack of 1U height, like the full indoor 1.5GHz radio.

In the split-mount versions the outdoor part is data-rate independent, and depends only on the frequency band of operation. Coverage of each frequency band is provided by a minimum number of outdoor equipment versions. The channel frequency and transmit power are software configured. The split-mount indoor unit is frequency band independent. By sharing the radio channel bandwidth among the gigabit and E1 interfaces of appropriate numbers, the built-in multiplexer provides the simultaneous transmission of the respective signals. Radio channel interfacing is provided by the configurable 4-256 QAM modem based on DSP, applying forward error correction and adaptive equalization as well. The adaptive modulation mode, if selected, adjusts modulation scheme to correspond to the actual state of the radio channel, thus maximizing the data rate of the actual traffic, that is, the transmission reliability. To the signals transmitted over the gigabit interfaces for fibre or copper QoS functions may be assigned. Equipment and interface characteristics correspond to the relevant ITU recommendations as well as to the ETSI/IEEE standards.

Equipment maintenance and supervisory functions are built in: order wire with selective call, test loopbacks for diagnostic purposes, continuous BER indication and registration of the transmission performance statistics. Control of the supervisory functions may take place by local PC or via SNMP from the network management centre.

The design and production techniques applied result in excellent equipment reliability.

Model:	TDR-F-1.5		TDR-F-W-5		TDR-F-W-15A		TDR-F-W-18A		TDR-F-W-38A		
Frequency Band (GHz)	1.5 GHz		4.5 GHz		15 GHz		18 GHz		38 GHz		
	1.427-1.525		4.4-4.8		4.5-15.35		17.7-19.7		37.0-39.5		
Duplex spacing (MHz)	49		200		420		1010		1260		
Electronic Retunability (MHz)	14		80		80		470		570		
Channel spacing-Step size (MHz)	0.5/2 – 0.25		14/28 – 1.75		14/28 – 3.5		27.5/55 – 3.5		28/56 – 1.75		
Frequency stability	± 3 ppm		± 5 ppm								
Modulation	4/16/32QAM		Fixed 4/8/16/32/64/128/256QAM or adaptive								
Transmit Power (dBm)	4QAM	33	30		23		23		20		
	32QAM	30	26		19		19		16		
	256QAM	-	23		16		16		13		
RTPC, ATPC range (dBr)	0 .. -26		4QAM: 0 .. -20				256QAM: 0 .. -13				
Bandwidth (MHz)	0.5	2	14	28	14	28	27.5	55	28	56	
Data Rate (Mbps)	4QAM	2.048	22	44	22	44	44	88	44	88	
	32QAM	-	55	110	55	110	110	220	110	220	
	256QAM	-	88	176	88	176	176	350	176	350	
Receiver threshold (dBm) @BER 10 ⁻⁶	4QAM	-95	-88	-85	-87	-84	-84	-81	-83	-80	
	32QAM	-91	-78	-75	-77	-74	-74	-71	-73	-70	
	256QAM	-	-68	-65	-67	-64	-64	-61	-63	-60	
Dynamic range (dB)	>61		>45		>44		>41		>40		
Forward Error Correction	Reed-Solomon										
Spurious and Harmonic Suppression	< -60 dBc										
Ethernet interface	RJ45: 10/100/1000 Mbps, optical: SFP VLAN support (802.1q), QoS: 802.1p, Q-in-Q, IPv4 ToS										
E1 interface	G.703, 75 Ohm unbal./120 Ohm bal. (1x and opt. 8x/16x E1)										
Auxiliary Data (Service) Channel	RS232 @ 9600 bps										
Management	Browser, LCT, SNMP, Web server, MXMSS Order Wire										
Ambient temperature (operation)	-10...+50 °C		Outdoor Unit: -40...+55 °C Indoor Unit: -10... +50 °C								
EMI/EMC	ETSI EN 301 489-1, 301-489-4										
Supply	230VAC±10%		30... 60 V DC								
Consumption	50W (1+0) 110W (1+1)		35 – 80 W, depending on frequency band and configuration								
Dimensions	1U (1+0) 3U (1+1)		Outdoor Unit: 230 mm x 230 mm x 75 mm Indoor Unit: 484 mm x 44 mm x 195 mm (1U)								
Mass	6 kg (1+0)		Outdoor Unit: 5 kg				Indoor Unit: 4.5 kg				