

## TDR-F-W

### DIGITAL MICROWAVE RADIO EQUIPMENT

Members of the Totaltel Digital Radio Equipment Family for high data rate point-to-point transmission operate in the 13-38 GHz communication bands. Their transmission rate may be varied between 22 – 350 Mbps. They are suitable for linking LANs as Ethernet bridges, additionally providing the transmission of 1-17 E1 channels. Over the range depending on the frequency band applied, they provide cost effective realisation 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 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.

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 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.

Frequency Band (GHz)		13 GHz		18 GHz		26 GHz		38 GHz	
		12.75-13.25		17.7-19.7		24.6-26.45		37.0-39.5	
Duplex spacing (MHz)		266		1010		1008		1260	
Electronic Retunability (MHz)		80		470		480		570	
Channel spacing (MHz)		14/28		27.5/55		28/56		28/56	
Frequency stability		± 5 ppm							
Modulation		Fixed 4/8/16/32/64/128/256QAM or adaptive							
Transmit Power (dBm)	4QAM	23		23		23		20	
	32QAM	19		19		19		16	
	256QAM	16		16		16		13	
RTPC, ATPC range (dBr)		4QAM: 0 .. -20				256QAM: 0 .. -13			
Bandwidth (MHz)		14	28	27.5	55	28	56	28	56
Data Rate (Mbps)	4QAM	22	44	44	88	44	88	44	88
	32QAM	55	110	110	220	110	220	110	220
	256QAM	88	176	176	350	176	350	176	350
Receiver threshold (dBm) @BER 10 <sup>-6</sup>	4QAM	-89	-86	-85	-82	-85	-82	-84	-81
	32QAM	-79	-76	-75	-72	-75	-72	-74	-71
	256QAM	-69	-66	-65	-62	-65	-62	-64	-61
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.. (opt. 8/16 E1)							
Management		Browser, LCT, SNMP, MXMSS Engineering Order Wire							
Ambient temperature		Outdoor Unit: -40 .. +55 °C				Indoor Unit: -5 .. +45 °C			
Supply		30 .. 60 V DC							
Consumption		35 – 80 W, depending on frequency band and configuration							
Dimensions		Outdoor Unit: 230 mm x 230 mm x 75 mm Indoor Unit: 484 mm x 44 mm x 195 mm							
Mass		Outdoor Unit: 5 kg				Indoor Unit: 4.5 kg			

# TDR-F-W Digital Microwave Equipment

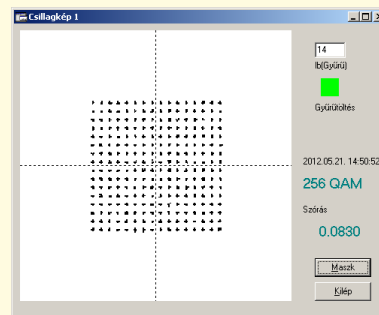
for Gigabit Ethernet and nxE1 transmission

in the 13, 18, 26 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
- Software configurable
  - transmit power and channel frequency
- GbE interfaces to copper and fibre
- Local control from notebook (PC)
- SNMP based management



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