



ABN 43 064 478 842

231 Osborne Avenue Clayton South, VIC 3169
PO Box 1548, Clayton South, VIC 3169
t 03 9265 7400 f 03 9558 0875
freecall 1800 680 680
www.tmgtestequipment.com.au

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FTB-8105

Transport Blazer

NETWORK TESTING – TRANSPORT AND DATACOM



Single-slot electrical test module supporting DSn/PDH and SONET/SDH electrical rates up to 155 Mbit/s

- Supports DSn, PDH, SONET and SDH electrical rates up to 155 Mbit/s in a single-slot module
- Dual Rx DSn
- Intuitive, feature-rich user interface with automated test scripting with multi-user remote management capabilities

Platform Compatibility

- FTB-200 Compact Platform
- FTB-400 Universal Test System



Testing Traditional and Packet-Based Ethernet TDM Services

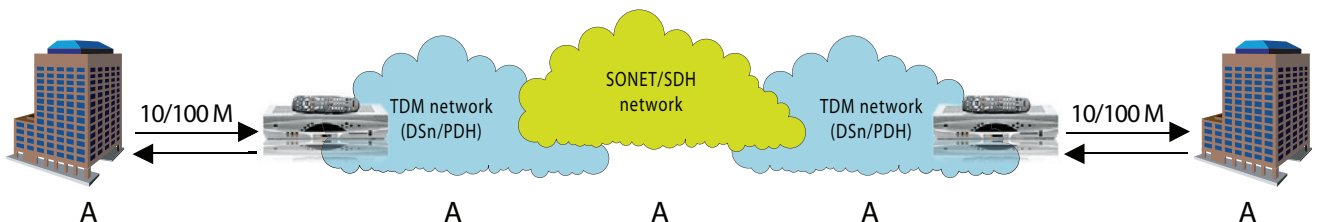
Compatible with both the FTB-200 Compact Platform and FTB-400 Universal Test System, the FTB-8105 Transport Blazer is ideally suited for TDM field service deployment and maintenance activities. This test module offers capabilities to test traditional TDM DSn and PDH electrical rates as well as the SONET and SDH electrical rates of up to 155 Mbit/s.

The growing demand for Ethernet-based services to small and medium sized enterprises is driving the need for new, cost-effective transmission technologies such as Ethernet-over-TDM. This in turn creates the need for solutions to test traditional TDM services with packet-based Ethernet test functions. The combined test capabilities of the FTB-8105 Transport Blazer and the FTB-8510B Packet Blazer modules provide customers with an integrated test solution to efficiently achieve such deployments.

DSn/PDH and SONET/SDH Service Turn-up and Troubleshooting

The FTB-8105 Transport Blazer module offers a wide range of TDM and SONET/SDH test functions, allowing users to perform tests ranging from simple bit error rate (BER) testing to advanced characterization and troubleshooting procedures. These functions include:

- Mixed and bulk payload generation and analysis from 64 kbit/s to 155 Mbit/s
- High-order mappings: STS-1/3c and AU-3/AU-4
- Low-order mappings: VT1.5/2/6 and VC-11/12/2/3
- Section/RS, line/MS, high-order (HO) and low-order (LO) path overhead manipulation and monitoring
- Section/RS, line/MS, high-order and low-order path alarm/error generation and monitoring
- High-order and low-order pointer generation and monitoring
- Tandem connection monitoring
- Performance monitoring: G.821, G.826, G.828, G.829, M.2100, M.2101
- Frequency analysis and power measurement
- Frequency offset generation
- Automatic protection switching and service disruption time measurements
- Round-trip delay measurements
- Independent transmitter and receiver testing
- Through mode analysis
- Dual DS1/DS3 receiver testing
- DS1 FDL
- DS1 in-band loopcodes
- Fractional T1/E1 testing
- DS3 FEAC

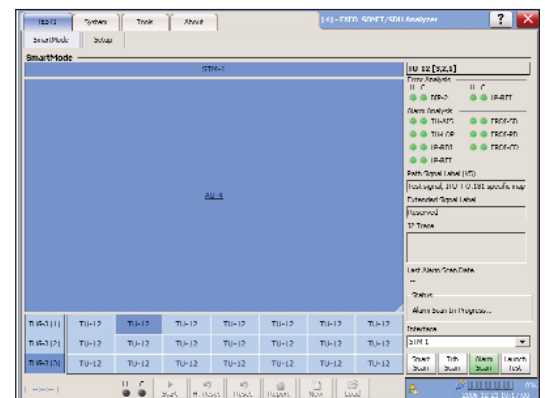


Housed in either the FTB-400 or FTB-200 platform and coupled with the FTB-8510B Packet Blazer is the ideal solution for Ethernet over TDM circuit turn-up and troubleshooting.

SmartMode: Real-Time Signal Structure Discovery and Monitoring

EXFO's FTB-8105 Transport Blazer module offers a unique feature called SmartMode. This provides users with full visibility of all high-order (STS/AU) and low-order (VT/TU) mixed mappings within the incoming SONET/SDH electrical test signal.

SmartMode automatically discovers the signal structure of the STS-n/STM-n electrical rate line, including mixed mappings and virtual concatenation (VCAT) members. In addition to this in-depth multichannel visibility, SmartMode performs real-time monitoring of all discovered high-order paths and user selected low-order paths simultaneously, providing users with the industry's most powerful SONET/SDH multichannel monitoring and troubleshooting solution. Real-time monitoring allows users to easily isolate network faults, saving valuable time and minimizing service disruption. SmartMode also provides one-touch test case start, allowing users to quickly configure a desired test path.



FTB-8105 SmartMode: multichannel signal discovery with real-time alarm scan (shown in the FTB-400 user interface).

Unsurpassed Configuration and Operational Flexibility

Multiplatform Support and Versatility

The FTB-8105 Transport Blazer module, similar to the FTB-8120/8130 modules, is supported and interchangeable on both the FTB-400 Universal Test System and the FTB-200 Compact Platform. This cross-platform support provides users with added flexibility by enabling them to select the appropriate platform that suits their testing needs. EXFO is the sole test solution provider to offer this versatility, delivering single to multi-application test solutions with the same hardware module, which in turn dramatically reduces capital expenditures.

Inserted in the FTB-200 Compact Platform, the FTB-8105 Transport Blazer module delivers DSn/PDH and SONET/SDH electrical test functions up to 155 Mbit/s in a small, lightweight platform, ideal for field technicians' installation and commissioning needs.

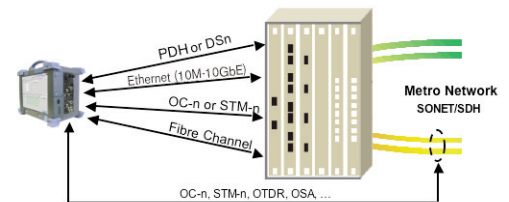
The FTB-400 platform configuration—used with either the four-slot (GP-404) or eight-slot (GP-408) receptacle—provides users with an all-in-one solution, supporting a mix of SONET/SDH/OTN, Ethernet, Fibre Channel and optical-layer test modules, making it the industry's first truly integrated network testing platform. This modularity enables users to upgrade their systems in the field, according to their testing needs. This multiservice test platform is the ideal solution for field, central office and lab applications.



The FTB-8105 module is supported on both the FTB-200 and the FTB-400 platforms.

Remote Management

Through the optional Visual Guardian Lite™ management software, the FTB-8105 Transport Blazer module allows users to perform remote testing and data analysis, as well as remote monitoring via standard Ethernet or remote dial-up connections.



With its modular, multislot design, the FTB-400 platform enables users to configure and upgrade their systems in the field according to their testing needs, minimizing capital expenditures.

Automated Test Scripting

When configured for the FTB-400 platform, the FTB-8105 Transport Blazer comes with a built-in macrorecorder, allowing users to easily record their test actions and automatically create test scripts. This also allows them to build standard test routines that can be easily accessed and run by field technicians with little or no manual intervention.

Test Logger and Reporting

EXFO's FTB-8105 Transport Blazer module supports a detailed test logger and test reporting tools, enabling users to view any errors/alarms that occurred during the test interval, which can then be used for post-processing of results or SLA conformance validation.

ID	Date/Time	Data Path	Event	Duration
17	00:01:40	AU-4	HP-ROI	00:00:03
18	00:01:43	AU-4	BS	00:00:01
19	00:01:47	AU-4	HP-REI	00:00:01
20	00:01:56	TU-12	TU-LOP	00:00:04
21	00:02:00	TU-12	BIP-2	00:00:01
22	00:02:02	TU-12	LP-REI	00:00:01
23	00:02:08	Pattern	BR Error	00:00:01
24	00:02:09	Pattern	LSS	00:00:02
25	00:02:19	Pattern	BR Error	00:00:01
26	00:02:34		TEST 1	Test Stopped

ID	Date/Time	Event
19	00:01:47	HP-REI

Data Path: [BNC (1)]/STM-1e/AU-4 [0,0]

Duration	Count	Rate
00:00:01	1	7.00E-11

Test logger: a detailed, time-stamped list of all events occurring during test execution.

Electrical Interfaces

The following section provides detailed information on all supported electrical interfaces.

		DS1	E1/2M		E2/8M	E3/34M	DS3/45M		STS-1e/STM-0e/52M	E4/140M	STS-3e/STM-1e/155M	
Tx Pulse Amplitude		2.4 to 3.6 V	3.0 V	2.37 V	2.37 V	1.0 ± 0.1 V	0.36 to 0.85 V			1.0 ± 0.1 V _{pp}	0.5 V	
Tx Pulse Mask		GR-499 Figure 9.5	G.703 Figure 15	G.703 Figure 15	G.703 Figure 16	G.703 Figure 17	DS-3 GR-499 Figure 9-8	45M G.703 Figure 14	GR-253 Figure 4-10/4-11	G.703 Figure 18/19	STS-3e GR-253 Figure 4-12, 4-13, 4-14	STM-1e/155M G.703 Figure 4-14/22, 23
Tx LBO Preamplification		Power dBdsx +0.6 dBdsx (0-133 ft) +1.2 dBdsx (133-266 ft) +1.8 dBdsx (266-399 ft) +2.4 dBdsx (399-533 ft) +3.0 dBdsx (533-655 ft)					0 to 225 ft 225 to 450 ft		0 to 225 ft 225 to 450 ft		0 to 225 ft	
Cable Simulation		Power dBdsx -22.5 dBdsx -15.0 dBdsx -7.5 dBdsx 0 dBdsx					450 to 900 (927) ft		450 to 900 (927) ft			
Rx Level Sensitivity		For 772 KHz: TERM: ≤ 26 dB (cable loss only) at 0 dBdsx Tx DSX-MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only) Note: measurement units = dBdsx	For 1024 KHz: TERM: ≤ 6 dB (cable loss only) MON: ≤ 25 dB (20 dB resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only) Note: measurement units = dBm	For 1024 KHz: TERM: ≤ 6 dB (cable loss only) MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only) Note: measurement units = dBm	For 4224 KHz: TERM: ≤ 6 dB (cable loss only) MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Note: measurement units = dBm	For 17184 MHz: TERM: ≤ 12 dB (coaxial cable loss only) MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Note: measurement units = dBm	For 22.368 MHz: TERM: ≤ 10 dB (cable loss only) DSX-MON: ≤ 26.5 dB (21.5 dB resistive loss + cable loss ≤ 5 dB) Note: measurement units = dBm	For 25.92 MHz: TERM: ≤ 10 dB (cable loss only) MON: ≤ 25 dB (20 dB resistive loss + cable loss ≤ 5 dB) Note: measurement units = dBm	For 70 MHz: TERM: ≤ 12 dB (coaxial cable loss only) MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Note: measurement units = dBm	For 78 MHz: TERM: ≤ 12.7 dB (coaxial cable loss only) MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Note: measurement units = dBm		
Transmit Bit Rate		1.544 Mbit/s ± 4.6 ppm	2.048 Mbit/s ± 4.6 ppm	2.048 Mbit/s ± 4.6 ppm	8.448 Mbit/s ± 4.6 ppm	34.368 Mbit/s ± 4.6 ppm	44.736 Mbit/s ± 4.6 ppm		51.84 Mbit/s ± 4.6 ppm	139.264 Mbit/s ± 4.6 ppm	155.52 Mbit/s ± 4.6 ppm	
Receive Bit Rate		1.544 Mbit/s ± 140 ppm	2.048 Mbit/s ± 100ppm	2.048 Mbit/s ± 100ppm	8.448 Mbit/s ± 100 ppm	34.368 Mbit/s ± 100 ppm	44.736 Mbit/s ± 100 ppm		51.84 Mbit/s ± 100 ppm	139.264 Mbit/s ± 100 ppm	155.52 Mbit/s ± 100 ppm	
Measurement Accuracy	Frequency	± 4.6 ppm	± 4.6 ppm	± 4.6 ppm	± 4.6 ppm	± 4.6 ppm	± 4.6 ppm		± 4.6 ppm	± 4.6 ppm	± 4.6 ppm	
	Electrical Power	DSX range: ± 1.0 dB DSX-MON range: ± 2.0 dB	NORMAL: ± 1.0 dB MONITOR: ± 2.0 dB	NORMAL: ± 1.0 dB MONITOR: ± 2.0 dB	NORMAL: ± 1.0 dB MONITOR: ± 2.0 dB	NORMAL: ± 1.0 dB MONITOR: ± 2.0 dB	DSX range: ± 1.0 dB DSX-MON range: ± 2.0 dB		DSX range: ± 1.0 dB DSX-MON range: ± 2.0 dB	NORMAL: ± 1.0 dB MONITOR: ± 2.0 dB	NORMAL: ± 1.0 dB MONITOR: ± 2.0 dB	
Peak-to-Peak Voltage		± 10% down to 500 mV _{pp}	± 10% down to 500 mV _{pp}	± 10% down to 500 mV _{pp}	± 10% down to 500 mV _{pp}	± 10% down to 200 mV _{pp}	± 10% down to 200 mV _{pp}		± 10% down to 200 mV _{pp}	± 10% down to 200 mV _{pp}	± 10% down to 200 mV _{pp}	
Frequency Offset Generation		1.544 Mbit/s ± 140 ppm	2.048 Mbit/s ± 70 ppm	2.048 Mbit/s ± 70 ppm	8.448 Mbit/s ± 50 ppm	34.368 Mbit/s ± 50 ppm	44.736 Mbit/s ± 50 ppm		51.84 Mbit/s ± 50 ppm	139.264 Mbit/s ± 50 ppm	155.52 Mbit/s ± 50 ppm	
Intrinsic Jitter (Tx)		ANSI T1.403 section 6.3 GR-499 section 7.3	G.823 section 5.1	G.823 section 5.1	G.823 section 5.1	G.823 section 5.1 G.751 section 2.3	GR-449 section 7.3 (categories I and II)		GR-253 section 5.6.2.2 (category II)	G.823 section 5.1	G.825 section 5.1 GR-253 section 5.6.2.2	
Input Jitter Tolerance		AT&T PUB 62411 GR-499 section 7.3	G.823 section 7.1	G.823 section 7.1	G.823 section 7.1	G.823 section 7.1	GR-449 section 7.3 (categories I and II)		GR-253 section 5.6.2.2 (category II)	G.823 section 7.1 G.751 section 3.3	G.825 section 5.2 GR-253 section 5.6.2.3	
Line Coding		AMI and B8ZS	AMI and HDB3	AMI and HDB3	HDB3	HDB3	B3ZS		B3ZS	CM1	CM1	
Input Impedance (Resistive Termination)		100 ohms ± 5%, balanced	120 ohms ± 5%, balanced	75 ohms ± 5%, unbalanced	75 ohms ± 5%, unbalanced	75 ohms ± 5%, unbalanced	75 ohms ± 5%, unbalanced		75 ohms ± 5%, unbalanced	75 ohms ± 10%, unbalanced	75 ohms ± 5%, unbalanced	
Connector Type		BANTAM and RJ-48C	BANTAM and RJ-48C	BNC	BNC	BNC	BNC		BNC	BNC	BNC	

SYNCHRONIZATION INTERFACES

	External Clock DS1/1.5M	External Clock E1/2M	External Clock E1/2M	2 MHz
Tx Pulse Amplitude	2.4 to 3.6 V	3.0 V	2.37 V	0.75 to 1.5 V
Tx Pulse Mask	GR-499 figure 9.5	G.703 figure 15	G.703 figure 15	G.703 figure 20
Tx LBO Preamplification	Typical power dBdsx +0.6 dBdsx (0-133 ft) +1.2 dBdsx (133-266 ft) +1.8 dBdsx (266-399 ft) +2.4 dBdsx (399-533 ft) +3.0 dBdsx (533-655 ft)			
Rx Level Sensitivity	TERM: ≤ 6 dB (cable loss only) (at 772 KHz for T1) DSX-MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only)	TERM: ≤ 6 dB (cable loss only) MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only)	TERM: ≤ 6 dB (cable loss only) MON: ≤ 26 dB (resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only)	≤ 6 dB (cable loss only)
Transmission Bit Rate	1.544 Mbit/s ± 4.6 ppm	2.048 Mbit/s ± 4.6 ppm	2.048 Mbit/s ± 4.6 ppm	
Reception Bit Rate	1.544 Mbit/s ± 50 ppm	2.048 Mbit/s ± 50 ppm	2.048 Mbit/s ± 50 ppm	
Intrinsic Jitter (Tx)	ANSI T1.403 section 6.3 GR-499 section 7.3	G.823 section 6.1	G.823 section 6.1	G.703 table 11
Input Jitter Tolerance	AT&T PUB 62411 GR-499 SECTION 7.3	G.823 section 7.2 G.813	G.823 section 7.2 G.813	
Line Coding	AMI and B8ZS	AMI and HDB3	AMI and HDB3	
Input Impedance (Resistive Termination)	75 ohms ± 5%, unbalanced	75 ohms ± 5%, unbalanced	75 ohms ± 5%, unbalanced	75 ohms ± 5%, unbalanced
Connector Type	BNC ^a	BNC ^a	BNC	BNC

Note

a. Adaptation cable required for BANTAM.

FUNCTIONAL SPECIFICATIONS

SONET and DSn		SDH and PDH	
Electrical interfaces	DS1, DS3, STS-1e, STS-3e	Electrical interfaces ^a	1.5M (DS1), 2M (E1), 8M (E2), 34M (E3), 45M (DS3), 140M (E4), STM-0e, STM-1e
DS1 framing	Unframed, SF, ESF	2M framing	Unframed, PCM30, PCM31, PCM30 CRC-4, PCM31 CRC-4
DS3 framing	Unframed, M13, C-bit parity	8M, 34M, 140M framing	Unframed, framed
Clocking	Internal, loop-timed, external (BITS), inter-module	Clocking	Internal, loop-timed, external (MTS/SETS), 2 MHz, inter-module
Mappings		Mappings	
VT1.5	Bulk, DS1	TU-11-AU-3, TU-11-AU-4	Bulk, 1.5M
VT2	Bulk, E1	TU-12-AU-3, TU-12-AU-4	Bulk, 2M
VT6	Bulk	TU-3-AU-4	Bulk, 34M, 45M
STS-1	Bulk, DS3	TU-2-AU-3, TU-2-AU-4	Bulk
STS-3c	Bulk	AU-4	Bulk, 140M
SONET overhead analysis and manipulation	A1, A2, J0, E1, F1, D1-D12, K1, K2, S1, M0, E2, J1, C2, G1, F2, H4, Z3, Z4, Z5, N1, N2	SDH overhead analysis and manipulation	A1, A2, J0, E1, F1, D1-D12, K1, K2, S1, M0, E2, J1, C2, G1, F2, F3, K3, N1, N2
Error insertion		Error insertion	
DS1	Framing bit, BPV, CRC-6, bit error	E1 (2M)	FAS, CV, CRC-4, E-bit, bit error
DS3	BPV, C-bit, F-bit, P-bit, FEBE, bit error	E2 (8M), E3 (34M), E4 (140M)	FAS, CV, bit error
STS-1e, STS-3e	Section BIP (B1), line BIP (B2), path BIP (B3), BIP-2, REI-L, REI-P, REI-V, BPV, bit error	STM-0e, STM-1e	RS-BIP (B1), MS-BIP (B2), HP-BIP (B3), MS-REI, HP-REI, LP-BIP-2, LP-REI, CV, bit error
Error measurement		Error measurement	
DS1	Framing bit, BPV, CRC-6, bit error	E1 (2M)	FAS, CV, CRC-4, E-bit, bit error
DS3	BPV, C-bit, F-bit, P-bit, FEBE, bit error	E2 (8M), E3 (34M), E4 (140M)	FAS, CV, bit error
STS-1e, STS-3e	Section BIP (B1), line BIP (B2), path BIP (B3), BIP-2, REI-L, REI-P, REI-V, BPV, bit error	STM-0e, STM-1e	RS-BIP (B1), MS-BIP (B2), HP-BIP (B3), MS-REI, HP-REI, LP-BIP-2, LP-REI, CV, bit error
Alarm insertion		Alarm insertion	
DS1	LOS, RAI, AIS, OOF, pattern loss	E1 (2M)	LOS, LOS Mframe, LOS CRC Mframe, LOF, AIS, TS16 AIS, RAI, RAI Mframe, pattern loss
DS3	LOS, RDI, AIS, OOF, DS3 idle, pattern loss	E2 (8M), E3 (34M), E4 (140M)	LOS, LOF, RAI, AIS, pattern loss
STS-1e, STS-3e	LOS, LOF, SEF, AIS-L, RDI-L, AIS-P, LOP-P, LOM, PDI-P, RDI-P, ERDI-PCD, ERDI-PPD, ERDI-PSD, UNEQ-P, AIS-V, LOP-V, RDI-V, ERDI-VCD, ERDI-VPD, ERDI-VSD, RFI-V, UNEQ-V, pattern loss	STM-0e, STM-1e	LOS, LOF, OOF, MS-AIS, MS-RDI, AU-AIS, AU-LOP, H4-LOM, HP-PDI, ERDI-PSD, ERDI-PCD, ERDI-PPD, HP-UNEQ, TU-AIS, LP-RFI, LP-RDI, ERDI-VCD, ERDI-VPD, ERDI-VSD, LP-RFI, LP-UNEQ, pattern loss
Alarm detection		Alarm detection	
DS1	LOS, loss of clock (LOC), RAI, AIS, OOF, pattern loss	E1 (2M)	LOS, LOS Mframe, LOS CRC Mframe, LOC, LOF, AIS, TS16 AIS, RAI, RAI Mframe, pattern loss
DS3	LOS, LOC, RDI, AIS, OOF, DS3 idle, pattern loss	E2 (8M), E3 (34M), E4 (140M)	LOS, LOC, LOF, RAI, AIS, pattern loss
STS-1e, STS-3e	LOS, LOC, LOF, SEF, TIM-S, AIS-L, RDI-L, AIS-P, LOP-P, LOM, PDI-P, RDI-P, ERDI-PCD, ERDI-PPD, ERDI-PSD, PLM/SLM-P, UNEQ-P, TIM-P, AIS-V, LOP-V, RDI-V, ERDI-VCD, ERDI-VPD, ERDI-VSD, RFI-V, UNEQ-V, TIM-V, PLM/SLM-V, pattern loss	STM-0e, STM-1	LOS, LOF, LOC, OOF, RS-TIM, MS-AIS, MS-RDI, AU-AIS, AU-LOP, H4-LOM, HP-RDI, ERDI-PSD, ERDI-PCD, ERDI-PPD, HP-PLM/SLM, HP-UNEQ, HP-TIM, TU-AIS, LP-RFI, LP-RDI, ERDI-VCD, ERDI-VPD, ERDI-VSD, LP-RFI, LP-UNEQ, LP-TIM, LP-PLM/SLM, pattern loss
<i>Frequency alarm on all supported interfaces.</i>			
Patterns		Patterns	
DS0	2E9-1, 2E11-1, 2E20-1, 1100, 1010, 1111, 0000, 1-in-8, 1-in-16, 3-in-24, 32 bit programmable (inverted or non-inverted), bit errors	E0 (64K)	2E9-1, 2E11-1, 2E20-1, 1010, 1100, 1111, 0000, 1-in-8, 1-in-16, 3-in-24, 32 bit programmable (inverted or non-inverted), bit errors
DS1	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, QRSS, 1-in-8, 1-in-16, 3-in-24, 32 bit programmable (inverted or non-inverted), T1-DALY, 55-Octet, bit errors	E1 (2M)	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, 1-in-8, 1-in-16, 3-in-24, 32 bit programmable (inverted or non-inverted), bit errors
DS3	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, QRSS, 1-in-8, 1-in-16, 3-in-24, 32 bit programmable (inverted or non-inverted), bit errors	E2 (8M), E3 (34M), E4 (140M)	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, 1-in-8, 1-in-16, 3-in-24 ^b , 32 bit programmable (inverted or non-inverted), bit errors
VT1.5/2/6	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, QRSS, 1-in-8, 1-in-16, 32 bit programmable (inverted or non-inverted), bit errors	TU-11/12/2/3	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, 1-in-8, 1-in-16, 32 bit programmable (inverted or non-inverted), bit errors
STS-1, STS-3c	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, 1-in-8, 1-in-16, 32 bit programmable (inverted or non-inverted), bit errors	AU-3/AU-4	2E9-1, 2E11-1, 2E15-1, 2E20-1, 2E23-1, 2E31-1, 1100, 1010, 1111, 0000, 1-in-8, 1-in-16, 32 bit programmable (inverted or non-inverted), bit errors

Pattern loss and bit error generation and analysis supported on all patterns.

Notes

- a. 1.5M (DS1) and 45M (DS3) interfaces described under SONET and DSn column.
- b. Not supported for E4 (140M).

ADDITIONAL TEST AND MEASUREMENT FUNCTIONS

Power measurements	Supports power measurements, displayed in dBm (dBdsx for DS1), for optical and electrical interfaces.
Frequency measurements	Supports clock frequency measurements (i.e., received frequency and deviation of the input signal clock from nominal frequency), displayed in ppm and b/s (bps), for optical and electrical interfaces.
Frequency offset generation	Supports offsetting the clock of the transmitted signal on a selected interface to exercise clock recovery circuitry on network elements.
Dual DSn receivers	Supports two DS1 or DS3 receivers, allowing users to simultaneously monitor two directions of a circuit under test in parallel, resulting in quick isolation of the source of errors.
Performance monitoring	
The following ITU-T recommendations, and corresponding performance monitoring parameters, are supported on the FTB-8105.	
ITU-T recommendation	Performance monitoring statistics
G.821	ES, EFS, EC, SES, UAS, ESR, SESR, DM
G.826	ES, EFS, EB, SES, BBE, UAS, ERS, SESR, BBER
G.828	ES, EFS, EB, SES, BBE, SEP, UAS, ESR, SESR, BBER, SEPI
G.829	ES, EFS, EB, SES, BBE, UAS, ESR, SESR, BBER
M.2100	ES, SES, UAS, ESR, SESR
M.2101	ES, SES, BBE, UAS, ESR, SESR, BBER
Pointer adjustment and analysis	
Generation and analysis of HO/AU and LO/TU pointer adjustments as per GR-253, and ITU-T G.703	
Generation	Analysis
<ul style="list-style-type: none"> • Pointer increment and decrement • Pointer jump with or without NDF • Pointer value 	<ul style="list-style-type: none"> • Pointer increments • Pointer decrements • Pointer jumps (NDF, no NDF) • Pointer value and cumulative offset
Service disruption time (SDT) measurements	The service disruption time test tool measures the time during which there is a disruption of service due to the network switching from the active channels to the backup channels. User-selectable triggers: All supported alarms and errors. Measurements: last disruption, shortest disruption, longest disruption, average disruption, total disruption, and service disruption count.
Round-trip delay (RTD) measurements	The round-trip delay test tool measures the time required for a bit to travel from the FTB-8105 transmitter back to its receiver after crossing a far-end loopback. Measurements are supported on all supported FTB-8105 interfaces and mappings. Measurements: last RTD time, minimum, maximum, average, measurement count (no. of successful RTD tests), failed measurement count.
APS message control and monitoring	Ability to monitor and set up automatic protection switching messages (K1/K2 byte of SONET/SDH overhead).
Synchronization status	Ability to monitor and set up synchronization status messages (S1 byte of SONET/SDH overhead).
Signal label control and monitoring	Ability to monitor and set up payload signal labels (C2, V5 byte of SONET/SDH overhead).
Through mode	Ability to perform Through mode analysis of any incoming electrical (DSn, PDH) and STS-1/3e, STM-1e.
M13 mux/demux	Ability to multiplex/demultiplex a DS1 signal into/from a DS3 signal. (Note: E1 to DS3 mux/demux available with G.747 software option.)
DS1 FDL	Support for DS1 Facility Data Link testing.
DS1 loopcodes	Support for generation of DS1 in-band loopcodes.
DS3 FEAC	Support for DS3 far-end alarms and loopback codewords.
Tandem connection monitoring (TCM) ^a	Tandem connection monitoring (TCM) is used to monitor the performance of a subsection of a SONET/SDH path routed via different network providers. The FTB-8105 supports transmitting and receiving alarms and errors on a TCM link; also, transmission and monitoring of the tandem connection (TC) trace can be generated to verify the connection between TCM equipment. Error generation: TC-IEC, TC-BIP, TC-REI, OEI Error analysis: TC-IEC, TC-REI, OEI, TC-VIOL Alarm generation: TC-RDI, TC-UNEQ, ODI, TC-LTC, TC-IAIS Alarm analysis: TC-TIM, TC-RDI, TC-UNEQ, ODI, TC-LTC, TC-IAIS

ADDITIONAL FEATURES

Scripting	The built-in scripting engine and embedded macro-recorder provide a simple means of automating test cases and routines. Embedded scripting routines provide a powerful means of creating advanced test scripts. Available for the FTB-400 platform.
Reports	Supports generation of test reports in .html, .csv, .txt, .pdf formats. Contents or reports are customizable by the user.
Power-up and restore	In the event of a power failure to the unit, the active test configuration and test logger are saved and restored upon bootup.
Store and load configurations	Ability to store and load test configurations to/from non-volatile memory.
Alarm hierarchy	Alarms are displayed according to a hierarchy based on root cause. Secondary effects are not displayed. This hierarchy serves to facilitate alarm analysis.
Configurable test views	This allows users to customize their test views; i.e., to dynamically insert or remove test tabs/windows, in addition to creating new test windows, so as to accurately match their testing needs.
Configurable test timer	Provides the ability for a user to set pre-defined test start and stop times.
Remote control	Remote management software. This allows users to remotely monitor and control the FTB-8105 module via standard Ethernet connection.

Note

a. HOP and LOP supported.

SPECIFICATIONS

FTB-8105

DSn/PDH

Electrical analyzer module supporting up to 155 Mbit/s rates

Test Interfaces

DSn: DS1, DS3, Dual DS1 Rx, Dual DS3 Rx

PDH: E1, E2, E3, E4

SONET: STS-1, STS-3

SDH: STM-0e, STM-1e

GENERAL SPECIFICATIONS

FTB-8105

Weight (without transceiver)	0.5 kg (1.1 lb)
Size (H x W x D)	25 mm x 96 mm x 288 mm (1 in x 3 3/4 in x 11 3/8 in)
Temperature	
operating	0 °C to 40 °C (32 °F to 104 °F)
storage	-40 °C to 60 °C (-40 °F to 140 °F)

ORDERING INFORMATION

FTB-8105-XX

Model ■

■ Other options ^a

- DSN
- PDH
- G.747 ^{b, c}
- DUAL-RX ^b
- DS1-FDL ^b
- SONET
- SDH
- SONET-SDH
- DS3-FEAC ^b

Example: FTB-8105-DSN-DUAL-RX

Notes

- a. Multiple options can be purchased to suit the required test application
- b. Available with DSn only.
- c. Available with PDH only.

Complementary Products

FTB-8080 Sync Analyzer

The FTB-8080 Synch Analyzer is a comprehensive test solution for telecom network synchronization assurance, monitoring and troubleshooting applications. It offers a full range of wander and sync testing functionalities, including graphical display of TIE, MTIE and TDEV parameters, as well as comparison to ITU/ANSI/TS standards and user-definable masks. The companion Sync View software suite allows remote data retrieval and test case setup, eliminating the need to visit test sites during prolonged monitoring periods. The FTB-8080 can be used in conjunction with an FTB-8105, FTB-8115 and FTB-8120/8130 module to provide wander measurements up to OC-192/STM-64 rates.

For more information on the FTB-8080, please refer to its detailed product specification sheet at <http://documents.EXFO.com/specsheets/FTB-8080-ang.pdf>

FTB-8115 Transport Blazer SONET/SDH Test Module

EXFO's FTB-8115 Transport Blazer test module combines advanced DSn/PDH and SONET/SDH test functions in a single unit, eliminating the need for multiple, purpose-built test platforms for the commissioning or troubleshooting of T1/E1 to OC-48/STM-16 circuits. The extensive list of DSn, SONET, PDH and SDH features available on the FTB-8115 Transport Blazer allows users to perform a wide range of tests from simple bit-error-rate (BER) analysis to more advanced network characterization and troubleshooting.

For more information on the FTB-8115, please refer to its detailed product specification sheet at <http://documents.EXFO.com/specsheets/FTB-8115-ang.pdf>

FTB-8120/8130 Transport Blazer Next-Generation SONET/SDH Test Modules

The FTB-8120 (2.5/2.7 Gbit/s) and FTB-8130 (10/10.7 Gbit/s) Transport Blazer test modules combine advanced DSn/PDH, SONET/SDH, next-generation SONET/SDH and optical transport network (OTN) test functions, eliminating the need for multiple purpose-built test platforms when commissioning or troubleshooting SONET/SDH, OTN and new data-aware SONET/SDH circuits. These modules offer DS0/E0 to OC-192/STM-64 testing in a single unit, and they perform Ethernet-over-SONET/SDH (EoS) testing via optional support for GFP, VCAT and LCAS. Thanks to the SmartMode functionality, they also enable signal structure discovery for rates of up to 10 Gbit/s, with simultaneous monitoring of all discovered STS/AU and user selected VT/TU channels.

For details on the FTB-8120/8130 modules, please refer to the detailed product specification sheet at <http://documents.EXFO.com/specsheets/FTB-8120-8130-ang.pdf>

Rugged Handheld Solutions		Platform-Based Solutions		
OPTICAL - OTDRs - OLTSS - Power meters - Light sources - Talk sets	COPPER ACCESS - ADSL/ADSL2+, SHDSL, VDSL test sets - VoIP and IPTV test sets - Ethernet test sets - POTS test sets	OPTICAL FIBER - OTDRs - OLTSS - ORL meters - Variable attenuators	DWDM TEST SYSTEMS - OSAs - PMD analyzers - Chromatic dispersion analyzer	TRANSPORT AND DATACOM - Next-generation SONET/SDH and OTN testers - SONET/DSn (DS0 to OC-192) testers - SDH/PDH (64 kbit/s to STM-64) testers - T1/T3, E1 testers - 10/100 Mbit/s and Gigabit Ethernet testers - Fibre Channel testers - 10 Gigabit Ethernet testers

EXFO Corporate Headquarters > 400 Godin Avenue, Quebec City (Quebec) G1M 2K2 CANADA | Tel.: 1 418 683-0211 | Fax: 1 418 683-2170 | info@EXFO.com

Toll-free: 1 800 663-3936 (USA and Canada) | www.EXFO.com

EXFO America	3701 Plano Parkway, Suite 160 Plano, TX 75075 USA	Tel.: 1 800 663-3936	Fax: 1 972 836-0164
EXFO Europe	Omega Enterprise Park, Electron Way Chandlers Ford, Hampshire S053 4SE ENGLAND	Tel.: +44 2380 246810	Fax: +44 2380 246801
EXFO Asia	151 Chin Swee Road, #03-29 Manhattan House SINGAPORE 169876	Tel.: +65 6333 8241	Fax: +65 6333 8242
EXFO China	No. 88 Fuhua, First Road, Central Tower, Room 801 Futian District Beijing New Century Hotel Office Tower, Room 1754-1755 No. 6 Southern Capital Gym Road Beijing 100044 P. R. CHINA	Shenzhen 518048 P. R. CHINA Tel.: +86 (755) 8203 2300 Tel.: +86 (10) 6849 2738	Fax: +86 (755) 8203 2306 Fax: +86 (10) 6849 2662

EXFO is certified ISO 9001 and attests to the quality of these products. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. EXFO has made every effort to ensure that the information contained in this specification sheet is accurate. However, we accept no responsibility for any errors or omissions, and we reserve the right to modify design, characteristics and products at any time without obligation. Units of measurement in this document conform to SI standards and practices. In addition, all of EXFO's manufactured products are compliant with the European Union's WEEE directive. For more information, please visit www.EXFO.com/recycle. Contact EXFO for prices and availability or to obtain the phone number of your local EXFO distributor.

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