



# For a Powerful and Compact 40G Testing Solution...



## 40/43G Testing Module for NIC Platform

### Technical Specifications

Digital Lightwave has long been the leader in portable transport test instruments. We were first to market with a truly portable 2.5G test set, first again with portable 10G. The 40/43G Testing Module establishes a new industry benchmark for 40/43G testing. The compact NIC 40G chassis, with a single module, is the industry's smallest and lightest 40/43G solution. In the NIC Plus or NIC EP chassis, the 40/43G module can be combined with other modules providing 1.5M to 43G PDH/T-Carrier, SONET, SDH, OTN, ATM plus Ethernet 10M-10G in a single chassis. Now with tunable laser, the NIC is 40/43G leader.

To learn more about Digital Lightwave's 40/43G network testing solutions, visit [www.40GTesting.com](http://www.40GTesting.com).

### PLATFORMS



NIC



NIC Plus



NIC EP

### KEY FEATURES

- Smallest, lightest solution for 40/43G testing in NIC 40G chassis
- Tunable C-band or L-band Laser Option! - First in a portable instrument
- All-in-one solution for 1.5Mbps - 43Gbps testing + Ethernet 10/100/1000/GigE/10GigE and NextGeneration (VCAT/LCAS/GFP) testing, when combined with additional modules in NIC Plus chassis
- NRZ, Duo-Binary, DPSK and DQPSK codings available to support both line-side and client-side testing
- Current NIC products may be upgraded to 40/43Gbps
- Has all the benefits of being part of the NIC family, including three-year warranty, free 24-hour technical support and multi-user remote GUI

### APPLICATIONS

- Research and development
- Manufacturing test
- Field turn up of new network equipment and circuits
- Maintenance
- Troubleshooting

### INTERFACE

Line code	NRZ, Duo-Binary, DPSK or DQPSK	
Bit rates	SDH/SONET: STM- 256/OC-768 39.813 Gbps OTN: OTU-3 43 Gbps	VT/LP OH: V5, J2 (Trace), Z6/N2(TCM), Z7/K4*
Connector type	SC, FC, or ST options available	OTN overhead monitor OTU OH: all bytes ODU OH: all bytes OPU OH: all bytes
Receiver pulling range	±100ppm	
Line frequency offset	±100ppm	OTN overhead control OTU OH: OA1, OA2, GCC0-1, GCC0-2, Res-1, Res-2, SAPI (trace), DAPI (trace), operator specific (trace)
Optical level (TX)	+3 dBm	ODU OH: Forward FTFL, Backward FTFL, SAPI (trace), DAPI (trace), operator specific (trace), STAT, GCC1-1, GCC1-2, GCC2-1, GCC2-2, APS/PCC-1, APS/PCC-2, APS/PCC-3, APS/PCC-3, TCM/ACT, Res-1, Res-2, Res-3, Res-4, Res-5, Res-6, Res-7, Res-8, Res-9

### MISCELLANEOUS SPECIFICATIONS

SDH/SONET overhead monitor	Section/RS, Line/MS OH: all bytes Path/HP OH: all bytes VT/LP OH: all bytes*	
SDH/SONET overhead control	Section/RS, Line/MS OH: A1, A2, J0(Trace)/Z0/C1, D1-D12, E1, E2, F1, K1, K2, S1, M0/M1, Z1, Z2, E2; Path/HP OH: C2, F2, G1, H4, J1 (Trace), Z3/F3, Z4/K3, Z5/N1(TCM);	OPU OH: PT (PSI-0) justification control  *Items in italics are applicable only when the 40G module is combined with NGMR module

# 40/43G Testing Module for NIC Platform

## Technical Specifications

Alarm detection	<p>SONET: LOS, Power Hot, Power Warm, Power Low, Frequency Wide, OPU Generic AIS, LOF, AIS-L, APS(K1/K2 Change), SEF, RDI-L, PATT SYNC, PLM-P, CONCAT, AIS-P, LOP-P, UNEQ-P, RDI-P, TIM-P, TIM-S, <i>AIS-V, LOP-V, LOM-V, UNEQ-V, RDI-V, RFI-V, TIM-V, PLM-V*</i>, TC-RDI-P, TC-ODI-P, TC-AIS-P, TC-UNEQ-P, TC-LOF-P, TC-TIM-P, <i>TC-RDI-V, TC-ODI-V, TC-AIS-V, TC-UNEQ-V, TC-LOF-V, TC-TIM-V*</i>, SS MISMATCH</p> <p>SDH: LOS, Power Hot, Power Warm, Power Low, Frequency Wide, OPU Generic AIS, LOF, MS-AIS, APS(K1/K2 Change), OOF, MS-RDI, PATT SYNC, HP-PLM, CONCAT, AU-AIS, AU-LOP, HP-UNEQ, HP-RDI, HP-TIM, RS-TIM, <i>TU-AIS, TU-LOP, TU-LOM, LP-UNEQ, LP-RDI, LP-RFI, LP-TIM, LP-PLM*</i>, HP-TC-RDI, HP-TC-ODI, HP-TC-AIS, HP-TC-UNEQ, HP-TC-LOF, HP-TC-TIM, <i>LP-TC-RDI, LP-TC-ODI, LP-TC-AIS, LP-TC-UNEQ, LP-TC-LOF, LP-TC-TIM*</i>, SS MISMATCH</p> <p>G.709 OTN: LOS, Power Hot, Power Warm, Power Low, LOF, OOF, OOM, LOM, OTU:AIS, OTU:IAE, OTU:BIAE, OTU:BDI, OTU:SAPI, OTU:DAPI, ODU:AIS, ODU:OCI, ODU:LCK, ODU:BDI, ODU:SAPI, ODU:DAPI, TCM(1-6): BDI, TCM(1-6):SAPI, TCM(1-6):DAPI, TCM(1-6):BIAE, OPU:PLM</p>	<p>Alarm generation</p> <p>SONET: LOS, LOF, AIS-L, RDI-L, LOP-P, AIS-P, RDI-P, UNEQ-P, <i>UNEQ-V, RDI-V, RFI-V, AIS-V, LOP-V, LOM-V*</i>, TC-RDI-P, TC-ODI-P, TC-AIS-P, TC-UNEQ-P, TC-LOF-P, <i>TC-RDI-V, TC-ODI-V, TC-AIS-V, TC-UNEQ-V, TC-LOF-V*</i></p> <p>SDH: LOS, LOF, MS-AIS, MS-RDI, AU-LOP, AU-AIS, HP-RDI, HP-UNEQ, <i>LP-UNEQ, LP-RDI, LP-RFI, TU-AIS, TU-LOP, TU-LOM*</i>, HP-TC-RDI, HP-TC-ODI, HP-TC-AIS, HP-TC-UNEQ, HP-TC-LOF, <i>LP-TC-RDI, LP-TC-ODI, LP-TC-AIS, LP-TC-UNEQ, LP-TC-LOF*</i></p> <p>G.709 OTN: LOS, LOF, OOF, LOM, OOM, OTU:AIS, OTU:IAE, OTU:BIAE, OTU:BDI, ODU:AIS, ODU:OCI, ODU:LCK, ODU:BDI, TCM(1-6):BDI, TCM(1-6):BIAE</p>	<p>Alarm generation</p> <p>SONET: B1, B2, REI-L, B3, REI-P, BIT, TC-IEC-P, TC-REI-P, TC-OEI-P, <i>TC-BIP-V, TC-REI-V, TC-OEI-V*</i></p> <p>SDH: B1, B2, MS-REI, B3, HP-REI, <i>LP-BIP, LP-REI*</i>, BIT, HP-TC-IEC, HP-TC-REI, HP-TC-OEI, <i>LP-TC-BIP, LP-TC-REI, LP-TC-OEI*</i>, AU-NDF, <i>TU-NDF*</i></p> <p>G.709 OTN: Frame (OA1, OA2), MFAS, FEC errors, Uncorrectable FEC errors, OTU:BIP8, OTU:BEI, ODU:BIP8, ODU:BEI, BIT, TCM(1-6):BIP8, TCM(1-6):BEI</p>	<p>Error detection</p> <p>SONET: BPV/LCV, Frame (A1, A2), B1, B2, REI-L, B3, REI-P, <i>BIP-V, REI-V*</i>, BIT, TC-IEC-P, TC-REI-P, <i>TC-OEI-P, TC-BIP-V, TC-REI-V, TC-OEI-V*</i>, NDF-P, <i>NDF-V*</i></p> <p>SDH: BPV/LCV, Frame (A1, A2), B1, B2, MS-REI, B3, HP-REI, <i>LP-BIP, LP-REI*</i>, BIT, HP-TC-IEC, HP-TC-REI, HP-TC-OEI, <i>LP-TC-BIP, LP-TC-REI, LP-TC-OEI*</i>, AU-NDF, <i>TU-NDF*</i></p> <p>G.709 OTN: Frame (OA1, OA2), MFAS, FEC errors, Uncorrectable FEC errors, OTU:BIP8, OTU:BEI, ODU:BIP8, ODU:BEI, BIT, TCM(1-6):BIP8, TCM(1-6):BEI</p>	<p>Error generation</p> <p>SONET: B1, B2, REI-L, B3, REI-P, BIT, TC-IEC-P, TC-REI-P, TC-OEI-P, <i>TC-BIP-V, TC-REI-V, TC-OEI-V*</i></p> <p>SDH: B1, B2, MS-REI, B3, HP-REI, BIT, HP-TC-IEC, HP-TC-REI, HP-TC-OEI, <i>LP-TC-BIP, LP-TC-REI, LP-TC-OEI*</i></p> <p>G.709 OTN: Frame (OA1, OA2), MFAS, FEC errors, Uncorrectable FEC errors, OTU:BIP8, OTU:BEI, ODU:BIP8, ODU:BEI, BIT, TCM(1-6):BIP8, TCM(1-6):BEI</p>	<p>Error/alarm generation</p> <p>Single insert (errors only)</p>	<p>modes</p> <p>Constant generation (alarms only) Programmable rate (errors only) Period m in n frames / m in n ms burst generation</p> <p>TCM (SDH/SONET)</p> <p>In accordance with G.707/Annex D for High Order Path (via N1), Errors/Alarms: TC-IEC, TC-REI, TC-OEI, TC-AIS, TC-UNEQ, TC-RDI, TC-ODI, TC-LOF, TC-API</p> <p>RTD</p> <p>Supported for OTN and SDH/S ONET signals SDH/SONET resolution: 125 microseconds; OTU-3 resolution: 3 microseconds</p> <p>Service Disruption/ Automatic Protection</p> <p>Supported for all mappings; SONET measures on: LOS, LOF, B1, SEF, AIS-L, AIS-P, AIS-V, BIT errors;</p> <p>Switching Measurement</p> <p>resolution is 125 microseconds; SDH measures on: LOS, LOF, B1, OOF, MS-AIS, AU-AIS, TU-AIS, BIT errors; resolution is 125 microseconds; G.709 OTN measures on: LOS, LOF, OOF, OTU:AIS, OTU:BIP8, ODU:AIS, ODU:BIP8, BIT errors; OTU-3 resolution is 3 microseconds;</p> <p>Pointer analysis</p> <p>SONET STS/ <i>VT*</i> and SDH AU/ <i>TU*</i>: Positive Pointer Justification counts, Negative Pointer Justification counts, Pointer Justification seconds, NDF counts, Pointer value (decimal and hexadecimal formats)</p> <p>Pointer control</p> <p>SONET STS/ <i>VT*</i> and SDH AU/ <i>TU*</i>: Increment/decrement single, increment/decrement burst 2-8, new value with NDF, new value without NDF, Pointer sequences (per standards), Payload frequency offset ±100 ppm</p> <p>Overhead capture</p> <p>Triggered capture of up to 256 bytes up to and after the trigger. Configurable capture from RS, MS, HP, LP, OTU, ODU, OPU bytes and pointer movement / OPU justifications. Byte decode performed on all captured data. Trigger event configurable from all errors and alarms or a user specified value within an overhead byte.</p> <p>Performance Monitoring</p> <p>Calculate s network performance in accordance with international standards GR-253, T1.231, G.821, G.826, G.828, G.829, M.2100, M.2101, M.2110, M.2120 (with graphs)</p> <p>Test patterns</p> <p>PRBS 9, PRBS 9 inverted, PRBS 11, PRBS 11 inverted, PRBS 15, PRBS 15 inverted, PRBS 20, PRBS 20 inverted, PRBS 23, PRBS 23 inverted, PRBS 31, PRBS 31 inverted, user-defined (32-bit), all 0's, all 1's</p> <p>Mappings</p> <p>SDH Mappings: <i>AU-4-256c, AU-4-64c, AU-4-16c, AU-4-4c, VC-4, VC-3*</i>, Unframed SONET Mappings: <i>STS-768c, STS-192c, STS-48c, STS-12c, STS-3c, STS-1*</i>, Unframed OTN Mappings: ODU-3, ODU-2, ODU-1, ODU-2 multiplexed into ODU-3, ODU-1 multiplexed into ODU-3, Sync &amp; Async AU-4-256c/STS-768c(and down) mapped into ODU-3, Sync &amp; Async AU-4-64c/STS-192c(and down) mapped into ODU-2, multiplexed into ODU-3, Sync &amp; Async AU-4-16c/STS-48c(and down) mapped into ODU-1, multiplexed into ODU-3*, Unframed</p> <p><i>*Items in italics are applicable only when the 40G module is combined with NGMR module</i></p>
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