



# DigiTest<sup>®</sup> ICE<sup>®</sup>

*Cost-effective IP Service Assurance Probes*

## ***DigiTest ICE Benefits:***

***Quickly resolve customer issues with rapid fault identification, location, and dispatch of repair crews***

***Proven high dispatch accuracy and no trouble found reporting reduces number of truck rolls***

***Prequalification and reuse of existing lines for high bandwidth IP services increases the number of addressable customers***

The race to provide voice, data, and video IP triple play services to attract and retain subscribers starts with the ability of the existing copper network to support high bandwidth requirements. Network upgrades to converged, next generation networks (NGNs) must be able to support these services and ensure the subscriber's quality of experience (QoE). Service assurance, through remote test systems, verifies the customer's trouble report, and isolates a problem's source at both the physical location in the network and within the many logical and virtual layers that can exist in the NGN. The results are faster service turn ups and resolutions to customer issues that improve customer QoE.

With the high cost of deployment and maintenance associated with T1 and E1 services, a migration is occurring toward business class DSL and Ethernet First Mile (EFM) services that use g.SHDSL technology. The test and management solutions deployed for these business class g.SHDSL networks must be able to support best-in-class service. A service assurance solution will need to provide test and analysis for these subscriber services.

DigiTest ICE test probe provides a cost-effective and efficient service assurance solution for IP Triple Play and business-class g.SHDSL services. With its extended temperature range operation, minimal size and robust feature set, DigiTest ICE is optimized to support the pre-qualification, service verification, and fault isolation needs beyond those provided by DSLAM-embedded SELT/DELT capabilities. Coupled with Tollgrade's LoopCare™ Test OSS, DigiTest ICE proactively tests the network to determine its ability to provide IP triple play services. Once provisioned, DigiTest ICE can verify the copper loop and the services from the DSLAM, the point in the network that most precisely reflects the customer's experience. DigiTest ICE is available in 4 models:



- » **DigiTest ICE.LE:** Metallic narrowband and broadband testing functions that support smart dispatch decisions, either out to the subscriber premises, onto the copper loop, or into the central office.
- » **DigiTest ICE.BA:** Metallic testing plus ADSL/ADSL2/ADSL2+ and VDSL2 customer and network emulation including synchronization and higher level (HTTP, PING, Trace Route, and FTP file transfer) service level test functions.
- » **DigiTest ICE.G:** Metallic testing plus g.SHDSL and g.SHDSL.bis customer and network synchronization service level test functions for both ATM and EFM networks.
- » **DigiTest ICE.BG:** Combined full functionality of both the ICE.BA and ICE.G

## DigiTest ICE Benefits

Tollgrade's DigiTest ICE with LoopCare allows IP triple play service providers to:

- » Maximize service offering
- » Verify service prior to cutover, increasing subscriber's satisfaction while minimizing costly dispatches
- » Proactively identify network issues and faults prior to subscriber trouble reports
- » Reduce trouble ticket volume and handling time via front-end handling and flow through
- » Minimize costly dispatches through expert trouble analysis

## DigiTest ICE Features

DigiTest ICE delivers xDSL and VoIP service assurance from the network DSLAM location, offering a full suite of multi-layered capabilities—all controlled via the LoopCare Test OSS—including:

- » **Network Service Assurance**  
Synchronization of xDSL DSLAM and CPE modems; ATM connectivity to emulate actual network facilities; Verification of PPPoE, PPPoA, and IPoA authentication
- » **IP Service Assurance**  
IP connectivity and verification of layer 2–7 service performance

## DigiTest ICE Specifications

### PHYSICAL

Dimensions (H x W x D) ..... 1.36 x 9.47 x 5.74 in  
..... (35 x 241 x 139 mm)  
Multiple mounting options

### ENVIRONMENTAL

Operating Temperature ..... -40°C to +70°C  
..... (-40°F to +158°F)  
Storage Temperature ..... -40°C to +85°C  
..... (-40°F to +185°F)  
Humidity ..... 5 to 95% (non-condensing)

### POWER REQUIREMENTS

Power ..... -48VDC  
..... 12 watts nominal  
..... 25 watts maximum  
Fusing ..... 2A

### COMMUNICATIONS AND TEST INTERFACES

10/100 Base-T Ethernet Communications  
10/100 Base-T Ethernet Test Port (future application)  
RS-232 Craft Port  
Auxiliary RS-232 port  
2-wire look-in and 2-wire look-out Test Bus for metallic and xDSL testing

### CERTIFICATION

CE Mark (all models)  
NEBS Level 3 (ICE.LE and ICE.BA only)

### DSL COMPATIBILITY

ICE.BA/ICE.BG ..... g.992.1-g.992.5 (ADSL/ADSL2/ADSL2+)  
ICE.BA/ICE.BG ..... g.993.2 (VDSL2)  
ICE.G/ICE.BG ..... G.991.2 (g.SHDSL & g.SHDSL bis)

### XDSL TESTING (ICE.BA, ICE.G, ICE.BG)

XTU-C and XTU-R Synchronization  
Actual and Attainable Data Rate

### PERCENTAGE OF CAPACITY UTILIZED

Interleave Delay and Depth  
Signal to Noise Ratio Margin  
Signal and Transmit Power  
Line and Signal Attenuation  
Actual Impedance  
Vendor Information (ID, Serial Number, Transmission Capabilities)  
Signal to Noise Ratio and Bits per Bin

### ATM TEST SUPPORT (ICE.BA, ICE.BG)

Set-up ATM PVC connection during testing  
ATM F5 Loopback Requester  
ATM F4/F5 Loopback Responder

### IP TEST SUPPORT (ICE.BA, ICE.BG)

User authentication/IP address assignment on all tests (PPPoE, PPPoA, IPoA)  
PING (standard ICMP)  
Traceroute  
FTP Throughput  
HTTP Throughput  
HTTP Connectivity

### METALLIC TESTING

AC/DC Voltage and Resistance  
Capacitance  
Longitudinal Balance  
Load Coil Detection  
Capacitive Balance  
Loop Insertion Loss  
Pair Id Tone  
ADSL Splitter Detection  
Hazardous Potential  
Speech Detection  
Tx/Rx Narrowband and Wideband Tone  
Line Circuit Analysis  
Soak Test  
Weighted Noise (C, D, Flat 3K, Flat 15K, Psophometric, E, F, G)

### ACTIVE VOIP TESTING

*Future application contact  
Tollgrade for availability*  
Protocols ..... SIP, RTP, RTCP  
..... Callback Function via VoIP (SIP)  
Call Quality Impairments ..... Delay, Loss, Jitter, MOS  
Reporting ..... XR Reporting Capabilities  
User Authentication ..... IEEE 802.1q  
Class of Service ..... IEEE 802.1q

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