UniPRO MGig1
Carrier-grade Ethernet tester

UniPRO SEL1
Intelligent loopback device

Ordering Information

**UniPRO MGig1 Solo - single port Ethernet tester**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Kit Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>R152001</td>
<td>UniPRO MGig1 Solo GBE transmission tester with single copper port. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cal 5e STP, 1 x Power supply with EU/UK/US adaptors, 1 x User manual CD, 1 x English quick reference guide, 1 x Carry case</td>
</tr>
<tr>
<td>R152002</td>
<td>UniPRO MGig1 Solo PLUS GBE transmission tester with single copper and optical ports. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cal 5e STP, 1 x Power supply with EU/UK/US adaptors, 1 x User manual CD, 1 x English quick reference guide, 1 x Carry case</td>
</tr>
<tr>
<td>R152003</td>
<td>UniPRO MGig1 Solo PRO GBE transmission tester with single copper and optical ports. MPLS and 1564. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cal 5e STP, 1 x Power supply with EU/UK/US adaptors, 1 x User manual CD, 1 x English quick reference guide, 1 x Carry case</td>
</tr>
</tbody>
</table>

**UniPRO MGig1 Duo - dual port Ethernet tester**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Kit Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>R152008</td>
<td>UniPRO MGig1 Duo GBE transmission tester with dual copper ports. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cal 5e STP, 1 x Power supply with EU/UK/US adaptors, 1 x User manual CD, 1 x English quick reference guide, 1 x Carry case</td>
</tr>
<tr>
<td>R152009</td>
<td>UniPRO MGig1 Duo PLUS GBE transmission tester with dual copper and optical ports. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cal 5e STP, 1 x Power supply with EU/UK/US adaptors, 1 x User manual CD, 1 x English quick reference guide, 1 x Carry case</td>
</tr>
<tr>
<td>R152010</td>
<td>UniPRO MGig1 Duo PRO GBE transmission tester with dual copper and optical ports. MPLS and 1564. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cal 5e STP, 1 x Power supply with EU/UK/US adaptors, 1 x User manual CD, 1 x English quick reference guide, 1 x Carry case</td>
</tr>
</tbody>
</table>

**UniPRO SEL1 - intelligent loopback device**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Kit Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>R154001</td>
<td>UniPRO SEL1 GBE loopback device with single copper and optical ports. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cal 5e STP, 1 x Power supply with EU/UK/US adaptors, 1 x User manual CD, 1 x English quick reference guide, 1 x Carry case</td>
</tr>
</tbody>
</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>100253</td>
<td>1 x UniPRO MGig1 carry case</td>
</tr>
<tr>
<td>100253</td>
<td>1 x NiMH battery</td>
</tr>
<tr>
<td>100256</td>
<td>1 x Patch cables - 30cm, Cal 5e STP</td>
</tr>
<tr>
<td>100256</td>
<td>1 x Optical fibre multimode 2m duplex cable with LC-LC connectors</td>
</tr>
<tr>
<td>100256</td>
<td>1 x Optical fibre singlemode 2m duplex cable with LC-LC connectors</td>
</tr>
<tr>
<td>100258</td>
<td>1 x RJ45 insert extraction tool, 10 x Lifejack RJ45 inserts</td>
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<tr>
<td>100260</td>
<td>4 x Style</td>
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<tr>
<td>100402</td>
<td>1 x UniPRO MGig1 carry strap</td>
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<tr>
<td>101051</td>
<td>1 x Power supply with EU/UK/US adaptor</td>
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<tr>
<td>101052</td>
<td>1 x UniPRO SEL1 alkaline battery module</td>
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<tr>
<td>101053</td>
<td>1 x UniPRO SEL1 NiMH battery</td>
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<tr>
<td>101054</td>
<td>1 x UniPRO SEL1 carry case</td>
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<tr>
<td>MGKX02</td>
<td>1 x 1000BASE-SX Fibre kit. Includes 850nm SFP</td>
</tr>
<tr>
<td>MGKX02</td>
<td>Small Form factor Pluggable SX transceiver, SC/SC and SC/SC duplex singlemode cables and SC/SC duplex adapter</td>
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<tr>
<td>MGKX03</td>
<td>1 x 1000BASE-LX Fibre kit. Includes 1310nm SFP</td>
</tr>
<tr>
<td>MGKX03</td>
<td>Small Form factor Pluggable LX transceiver, SC/SC and SC/SC duplex singlemode cables and SC/SC duplex adapter</td>
</tr>
<tr>
<td>33-963-10</td>
<td>1 x Fiber cleaning pen for SC, ST and FC adapter</td>
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<tr>
<td>33-963-11</td>
<td>1 x Fiber cleaning pen for LC and MU adapter</td>
</tr>
<tr>
<td>100262</td>
<td>1 x UniPRO MGig1 alkaline battery holder</td>
</tr>
</tbody>
</table>

**UniPRO MGig1**

*Intelligent loopback device*

**UniPRO MGig1**

*Carrier-grade Ethernet tester*

Designed for full Ethernet testing of carrier service turn-up, mobile backhaul link, microwave and wireless link and for enterprise users to monitor carriers’ SLA performance.

- One touch to run multiple tests - unattended
- Y.1564 (NetSAM) and RFC2544
- BERT and SLA-Tick
- Multi service (stream) test
- Simultaneous IPv4 and IPv6 support
- QinQ, Multiple VLAN and MPLS
- Effective for all telcos, service providers, subcontractors, utilities and enterprise users

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Specification subject to change without notice

E&OE

Dealer Stamp

Publication No.: 152820 Rev. 1

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Printed in UK
**Typical Users**

- Telco, cable TV, broadband, WAN and metro Ethernet plus leased line service providers
  - WAN installation testing and maintenance
  - Line installation testing and maintenance
  - SLA dispute resolution
  - Top bandwidth users, VLANs and services check
  - Performance test of transmission media via WiFi, microwave radio link and short reach radio link testing

- Mobile network operators
  - Fiber backhaul installation and maintenance
  - Copper backhaul installation and maintenance
  - Microwave backhaul installation and maintenance

- Data centres
  - WAN SLA policing
  - Leased line SLA policing
  - Dark fibre testing and maintenance

- Enterprise user
  - WAN SLA policing
  - Leased line SLA policing
  - Heavy bandwidth usage monitoring (users and VLANs)

- Installation and maintenance subcontractors
  - Customer specific carrier Ethernet testing regime

- Gas, electricity and water utilities, public sector, petrochemical
  - Cross campus Ethernet installation and maintenance
  - WAN SLA policing
  - Leased line SLA policing

**PLUS Ethernet installation, maintenance and SLA testing for:**
- Distribution and logistics
- Rail-track-side, on-train and underground
- Defence
- Public space – airports, shopping centres
- Highways and transport tunnels
- Original equipment manufacturers

**Test Applications**

**WAN and metro Ethernet access – copper and fibre service turn-up**

Today’s fibre and copper wide area network links are highly complex compared to earlier simple services. Each physical link can be delivering a range of different services (streams) with different Quality of Service (QoS) requirements for services which are sensitive to latency and jitter as each competes with the others for precious bandwidth.

UniPRO MGig1 with concurrent multiple services test allows engineers to ensure that the end to end service complies with the SLA under quasi-real conditions.

**Mobile backhaul installation**

The majority of 3G, 4G or LTE backhaul links whether copper, fibre or microwave radio - from RNC (Radio Node Controller) to Node B (base station) require the tester to generate and measure at least four simultaneous services (or streams) to evaluate the network treatment of different services and priorities such as signaling, management, data and voice.

All UniPRO MGig1 PLUS and UniPRO MGig1 PRO testers can generate and measure the concurrent multiple streams needed for mobile backhaul installation testing with up to eight concurrent services or streams.

**Ethernet microwave link**

Microwave backhaul and other microwave links require particular attention when it comes to transmission testing - being intrinsically less stable than copper or fibre due to the nature of radio wave propagation through the air.

UniPRO MGig1 Ethernet testers are specifically designed to measure frame delay, loss and jitter due to radio propagation effects - to assure the installer and the service provider that the link is optimally set up.

UniPRO MGig1’s multiple service testing gives installers greater confidence.

**Backhaul test for microcell base station and public access WiFi coverage**

When installing free powered devices like WiFi Access Points (AP), miccell base stations and Short Range Radio Link (SRRL) transceivers – you need to be able to test that the PoE (Power over Ethernet) or PoE+ is available, at the right voltage and with sufficient current for the device on full load. As well as the full suite of Ethernet link tests.

UniPRO MGig1 is the only carrier-grade Ethernet tester in the market to test PoE/PoE+ device power consumption under traffic.

**SLA policing**

If you’re a customer - how do you check you’re really getting the bandwidth you’re paying for when things appear to be going slowly?

If you’re the service provider how do you demonstrate to your customer that their ‘slow’ service is actually due to them overloading the link?

UniPRO MGig1 (all dual port models using pass through mode) is ideal and needs no complex setup or training. It can be used by network managers and field engineers alike allowing both to ensure that SLAs are being achieved.

**Ethernet is everywhere...**

It is used on board trains for communication, environmental control and electronic signage. On the highways, in stadiums, shopping centres and airports for signage and communication. Oil and gas platforms, refineries and chemical plants, universities and enterprises with large campus networks and high capacity multi service requirements need a reliable way to test and maintain their networks and police their service provider SLAs. UniPRO MGig1 is the simple to use solution to enable this.
Test Functions

RFC2544
The testing technique in most common usage for service turn-up on access and leased line Ethernet services.
UniPRO MGig1 and UniPRO SEL1 cover all of the requirements for testing:
- Throughput
- Latency
- Jitter
- Frame loss
- Back to back
- System recovery
RFC2544 testing can be very time consuming, so UniPRO MGig1 provides a choice of test profiles from Super Fast to Full.
UniPRO MGig1 can perform RFC2544 testing in loopback or Bi-Directional topologies.

Bit Error Ratio Test - BERT
A traditional test method in many telecommunications transmission systems, BERT is used in Ethernet links to test the frame payload from layer 1 to layer 4.
It does this by putting pre-defined patterns of data into the frames and checking them bit by bit at the receiver. Individual bit errors are counted and expressed as a ratio of the data received.
UniPRO MGig1 will report when the error ratio exceeds pre-defined limits.

Nested VLAN, QinQ and MPLS
Many Ethernet services are delivered now using not only VLANs but also VLANs within VLANs (often known as QinQ).
Further testing of VLANs within VLANs is also sometimes used.
UniPRO MGig1 and UniPRO SEL1 are engineered to allow three to eight levels of VLAN within VLAN nesting for RFC2544, Y.1564 (NetSAM), BERT and SLA-Tick testing.
For links using MPLS, UniPRO MGig1 PRO can test up to three levels with label, class and TTL for each service.
Layer 3 QoS tags ToS and DSCP are also encompassed.

Why single engineer loopback testing is important
Using the UniPRO SEL1 intelligent loopback device means you don’t need a fully-redacted Ethernet tester at the distant end of the leased line or backhaul. Even better, you don’t need to deploy a field engineer to the distant end either - instantly halving the labour cost of the testing.
Many operators simply mail a UniPRO SEL1 to the distant end with instructions to plug it into the demarcation point or a spare switch port, turn the power on and leave it.
They take the view that some will not get returned — but the labour saving by not needing a second engineer covers those costs many times over. So they’re still significantly in profit.
The UniPRO SEL1 loopback unit can be completely remote controlled by the UniPRO MGig1 Ethernet tester at the near end. So its configuration is uploaded across the network within the test path and then its various loopback modes are controlled from a choice of layer 1 (physical or regenerative), 2, 3 or 4 as dictated by the test being performed by the near end UniPRO MGig1.
A second UniPRO MGig1 can also be used at the far end for loopback testing. In slave mode this is also remote controlled by a single engineer from UniPRO MGig1 at the testing site.

Why single engineer Bi-Directional testing is important
To obtain the maximum information on both sides of a link - particularly where the link is asymmetric - it is necessary to undertake Bi-Directional testing.
Although this requires a second UniPRO MGig1 tester at the far end, because all UniPRO MGig1 PLUS and PRO models have master and remote controlled slave modes, it is not necessary for an engineer to be present at the remote end.
Once the master UniPRO MGig1 has established contact with the remote slave unit, it uploads all necessary configuration data and controls it via in-band signalling throughout the testing sequence.
Not requiring a second engineer represents a significant cost saving - particularly where link ends are in different time zones.

Single button Autotest
Many link testing jobs require a whole sequence of tests to be run.
For example, running RFC2544 tests followed by BERT or SLA-Tick for long term performance testing.
UniPRO MGig1 has Autotest - a very easy to set up auto sequence testing function - just tick the items required. This allows unmanned operation once the test sequence has commenced.
Pre-written test sequence configurations can also be uploaded via USB memory stick saving time and errors on-site.

Y.1564 (NetSAM) multi service (stream) test
Unlike RFC2544 which was never intended for access and metro Ethernet link testing, Y.1564 has been developed specifically to be both quicker and more thorough.
NetSAM, IDEAL NETWORKS’ Y.1564 test methodology - built into UniPRO MGig1 PRO models - uniquely tests the configuration for each service individually to trap configuration problems. It then performs rapid sequential testing of up to eight services - to ensure that they will operate without interference and with the correct level of Committed and Excess Information Rates (CIR/ECIR).
UniPRO MGig1 can also test colour aware networks.

SLA-Tick test results
Not all installations and service turn-ups require Y.1564 testing - but with the complexity of most metro, access and backhaul links - multiple services and often multiple VLANs for service priority are needed.
All models of UniPRO MGig1 have a simplified version of Y.1564 which is called SLA-Tick. This synthesises up to eight concurrent services or streams - with error injection - and measures information rate, frame loss, jitter, latency and error performance availability.
**Test Functions**

### Top ten bandwidth users

UniPRO MGig1's top ten bandwidth talkers and listeners test function (with VLAN D and priority) is ideal when users suspect that a link is 'going slow' - but it is actually found to be within the SLA.

It can soon be identified that one or two users or VLAN services – maybe a backup or server to server traffic – are actually hogging most of the Committed Information Rate (CIR) and things are only working adequately when the service provider’s network is not busy and Excess Information Rate (EIR) is available. Frequently the enterprise network manager (particularly those with smaller networks) had no way to be aware of this before using a UniPRO MGig1 Ethernet tester, or being shown the test results by their service provider.

Armed with this knowledge the user can either re-configure so that the background use is limited to quiet times when EIR is available – or the service provider can, with easy justification, sell the user a bandwidth upgrade.

### Power over Ethernet - PoE and PoE+

When installing Power over Ethernet (PoE) supplied devices - like WiFi Access Points (AP), microcell base stations, short range radio link transceivers or IP surveillance cameras – a field engineer needs to be able to test that the PoE or PoE+ is available at the right voltage and with sufficient current for the device on full load, plus the full suite of Ethernet link tests.

UniPRO MGig1 is the only carrier-grade field Ethernet tester in the market to test PoE/PoE+ voltage, current, and available power on different ports. This means there is no need to carry separate measurement adapters, adaptors or dummy loads.

Used in through mode, UniPRO MGig1 dual port models can also display and record the base station or access controller’s PoE power consumption under varying traffic load.

### Essential field engineer tests

Most carrier-grade Ethernet testers simply provide the functions for prescribed tests. However, the field engineer needs some extra functions every day that they need to use other test equipment for - or they have to create workarounds. As UniPRO MGig1 was designed by field engineers for field engineers, it has a list of valuable, practical everyday functions they need to improve their working efficiency.

Field engineers spend a lot of the time on-site conducting trial and error fault finding when the link turns out to be incorrectly configured or patched - or when something in the tester setup is incorrect.

UniPRO MGig1 is designed to simplify this process for engineers of all experience levels.

UniPRO MGig1 does this by separating the target and service setups so that the engineer can work quickly to identify the problem.

Troubleshooting is made easy with network diagnostic checks. Used together with the units’ IPv4 and IPv6 Fping and Trace Route plus Hub Blink functions and LLDP/EPP/CDP, the engineer can rapidly establish whether the problem is a network configuration or cable patching problem - for example being due to significantly reduce trial and error fault finding time.

**UniPRO MGig1 PLUS**

Ideal for skilled engineers who want the ability to augment pre-configured and auto sequence tests with the ability to dig deeper into the troubleshooting of unsatisfactory test results - or who wish to do detailed manual testing.

### Additional features to UniPRO MGig1

- Gigabit SFP (two on dual port models) for optical interfaces - 1310nm or 1550nm singlemode and 850nm multimode
- Multi service (stream) SLA-Tick testing with up to eight concurrent services under test
- Bi-Directional testing (requires second far end UniPRO MGig1/PLUS enabling independent measurement of upstream and downstream on the link to establish which direction is responsible for any impairments. Ideal for testing asymmetric services like ADSL/VDSL with no skilled engineer needed at the far end)
- Traffic generation up to eight services (streams). (Dual traffic generators on dual port models)
- Support for up to eight levels of nested VLANs

### UniPRO MGig1 PRO

Full ITU-T Y.1564 (UniSAM) multi service (stream) testing capability. Retains the simplicity of use, intuitive graphic interface and time saving pre-configured and single button auto sequence testing functions. Adds the independent target and service to cut troubleshooting time.

### Additional features to UniPRO MGig1 PRO

- Single ended Y.1564 (NetSAM) testing
- Bi-Directional Y.1564 (NetSAM) testing
- MPLS testing using up to three tags
- Eight concurrent services (stream) under test in Y.1564 (NetSAM) tests

### UniPRO SEL1

A self contained intelligent loopback device to accompany any of the UniPRO MGig1 units to enable loopback at the distant end of the link.

Single or multiple UniPRO SEL1s can be fully remote controlled by the near end UniPRO MGig1 including the download of all the necessary operating parameters. Other than plugging it into the demarcation point at the far end, no further human intervention is needed.

It can also be used as a manually controlled loopback unit for other manufacturers’ Ethernet testers.

A UniPRO SEL1 can be permanently connected to a spare switch port to enable unmanned loopback testing for network troubleshooting. The link under test is simply bridged to the UniPRO SEL1’s port using the switch’s remote management commands.

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**Which UniPRO model is right for you?**

### UniPRO MGig1

Entry level model for first line users. Ideal for radio link installers, fixed link installers, subcontractors, network maintenance professionals and system integrators.

- 10/100/1000 Mb/s RJ45 copper interface (two on dual port models)
- Single pre-configured setup loadstore with graphic / text indication
- Single button Autotest for complex sequences of automatically run tests. Can be left to run unattended
- Independent target and service function to ensure link properly configured before tests are attempted - this allows to reduce trial and error fault finding time
- RFC2544, BERT and single service (stream), SLA-Tick test and up to three nested VLANs including QinQ even on single port models
- Simultaneous IPv4 and IPv6, PoE/PoE+ test, Hub Blink, Ping and Trace Route
- Service Disruption Time test (SDT)
- Traffic generation on single service (stream). (Twin traffic generators on dual port models to enable network stress testing)
- Single ended testing - enabling traffic sending and results collection in one location (using remote controlled UniPRO SEL1 or UniPRO MGig1) at the far end for loopback

### UniPRO MGig1 PLUS

Ideal for skilled engineers who want the ability to augment pre-configured and auto sequence tests with the ability to dig deeper into the troubleshooting of unsatisfactory test results - or who wish to do detailed manual testing.

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**Single port or dual port?**

Engineers who want to be able to perform pass through mode tests such as top ten bandwidth users need a dual port Duo model.

Where both ends of the network under test are local, dual port Duo model allows testing without the loopback unit.

Copper/fibre media conversion requires a dual port Duo model.

Choose a dual port Duo model to have a second independent traffic generator for network stress testing.

**Copper and fibre interfaces**

<table>
<thead>
<tr>
<th>Feature</th>
<th>UniPRO MGig1</th>
<th>UniPRO MGig1 PLUS</th>
<th>UniPRO MGig1 PRO</th>
</tr>
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<tbody>
<tr>
<td>Copper to copper</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Copper to fibre</td>
<td>✓</td>
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<tr>
<td>Fibre to copper</td>
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