UniPRO MGig1
Carrier-grade Ethernet tester

UniPRO SEL1
Intelligent loopback device

Ordering Information

UniPRO MGig1 Solo *- single port Ethernet tester*	
Part No.	**Kit Contents**
R152001	***UniPRO MGig1 Solo*** GbE transmission tester with single copper port. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cat 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
R152002	***UniPRO MGig1 Solo PLUS*** GbE Multi stream Bi-Directional transmission tester with single copper and optical ports. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cat 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
R152003	***UniPRO MGig1 Solo PRO*** GbE Multi stream Bi-Directional transmission tester with single copper and optical ports, MPLS and Y.1564. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cat 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

UniPRO MGig1 Duo *- dual port Ethernet tester*	
Part No.	**Kit Contents**
R152008	***UniPRO MGig1 Duo*** GbE transmission tester with dual copper ports. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cat 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
R152009	***UniPRO MGig1 Duo PLUS*** GbE Multi stream Bi-Directional transmission tester with dual copper and optical ports. Includes 1 x NiMH Battery, 2 x Patch cables - 30cm, Cat 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
R152010	***UniPRO MGig1 Duo PRO*** GbE Multi stream Bi-Directional transmission tester with dual copper and optical ports, MPLS and Y.1564. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cat 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

UniPRO SEL1 *- intelligent loopback device*	
Part No.	**Kit Contents**
R154000	***UniPRO SEL1*** GbE loopback device with single copper and optical ports. Includes 1 x NiMH battery, 2 x Patch cables - 30cm, Cat 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

Dealer Stamp

UniPRO MGig1

Optional Accessories

Part No.	Description
150051	1 x UniPRO MGig1 carry case
150053	1 x NiMH battery
150055	2 x Patch cables - 30cm, Cat. 5e STP
150056	1 x Optical fibre multimode 2m duplex cable with LC-LC connectors
150057	1 x Optical fibre singlemode 2m duplex cable with LC-LC connectors
150058	1 x RJ45 insert extraction tool, 10 x Lifejack RJ45 inserts
150060	4 x Stylus
150402	1 x UniPRO MGig1 carry strap
151051	1 x Power supply with EU/UK/US adaptor
151052	1 x UniPRO SEL1 alkaline battery module
151053	1 x UniPRO SEL1 NiMH battery
151054	1 x UniPRO SEL1 carry case
MGKLX2	1 x 1000BASE-SX Fibre kit. Includes 850nm SFP (Small Form factor Pluggable) SX transceiver, LC/LC and LC/SC duplex multimode cables and SC/SC duplex adaptor
MGKSX1	1 x 1000BASE-LX Fibre kit. Includes 1310nm SFP (Small Form factor Pluggable) LX transceiver, LC/LC and LC/SC duplex singlemode cables and SC/SC duplex adaptor
MGKZX3	1 x 1000BASE-ZX Fibre kit. Includes 1550nm SFP (Small Form factor Pluggable) ZX transceiver, LC/LC and LC/SC duplex singlemode cables and SC/SC duplex adaptor
33-963-10	1 x Fibre cleaning pen for SC, ST and FC adaptor
33-963-11	1 x Fibre cleaning pen for LC and MU adaptor
150062	1 x UniPRO MGig1 alkaline battery holder

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Specification subject to change without notice
E&OE

UniPRO MGig1
Carrier-grade Ethernet tester

UniPRO SEL1
Intelligent loopback device

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***

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

Mobile backhaul installation

Ethernet microwave link test

Backhaul test for microcell base station and public access WiFi coverage

SLA policing

Ethernet is everywhere...

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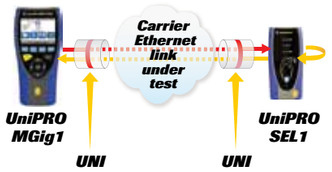
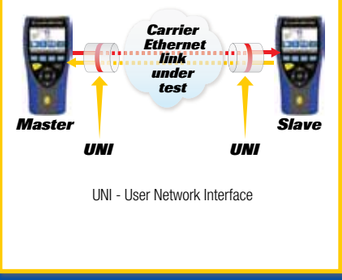
Loopback testing with UniPRO MGig1 plus UniPRO SEL1 (or second UniPRO MGig1)



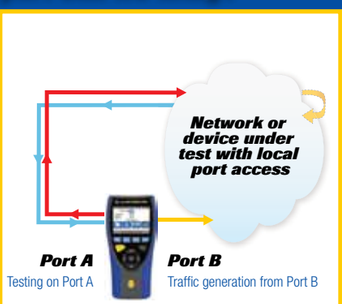
UNI - User Network Interface

Bi-Directional testing with two x UniPRO MGig1



UNI - User Network Interface

End point testing with dual port UniPRO MGig1



Typical Users

Telco, cable TV, broadband, WAN and metro Ethernet plus leased line service providers

- WAN installation testing and maintenance
- Leased 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

- Fibre 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

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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 signalling, 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 line powered devices like WiFi Access Points (AP), microcell 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 high-ways, 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.

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

Mobile backhaul installation

Ethernet microwave link

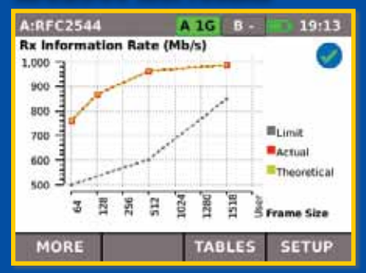
Backhaul test for microcell base station and public access WiFi coverage

SLA policing

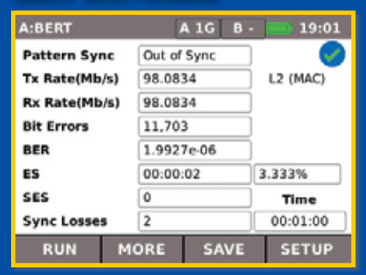
Ethernet is everywhere...

Test Functions

RFC2544 test results



BERT test results



VLAN setup

MPLS setup

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

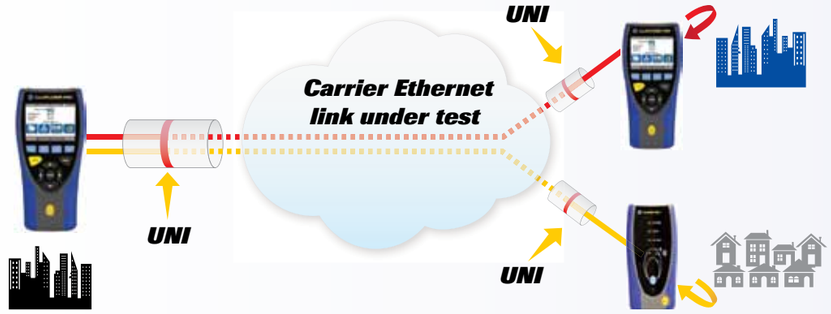
Many Ethernet services are delivered now using not only VLANs but also VLANs within VLANs (often known as QinQ).

Further nesting of VLANs within 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.



UNI - User Network Interface

Why single engineer loopback testing is important

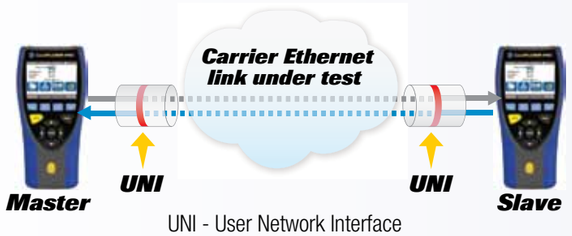
*Using the **UniPRO SEL1** intelligent loopback device means you don't need a fully-fledged Ethernet tester at the distant end of the leased line or backhaul. Even better, you don't need to deploy a field engineer to the distant end either - instantly halving the labour cost of the testing.*

Many operators simply mail a **UniPRO SEL1** to the distant end with instructions to the recipient 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.



UNI - User Network Interface

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 such as with ADSL or VDSL variants - 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/EIR).

UniPRO MGig1 can also test colour aware networks.

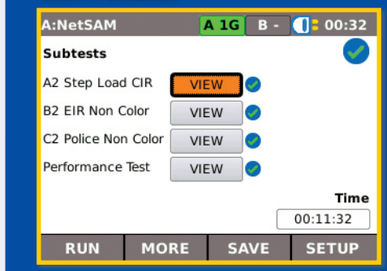
Single and multi service (stream) SLA-Tick test

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.

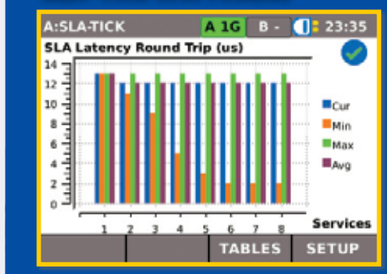
All models of **UniPRO MGig1** have a simplified version of Y.1564 which is called SLA-Tick. This synthesises up to eight concurrent services or streams - with error injection - and measures information rate, frame loss, jitter, latency and error performance availability.

Autotest setup

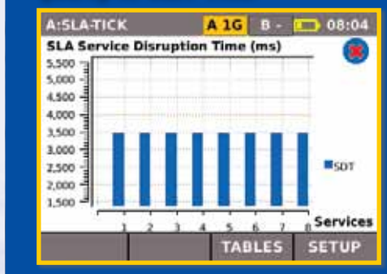
Y.1564 (NetSAM) test results



SLA-Tick test results



Service Disruption Time (SDT) in SLA-Tick



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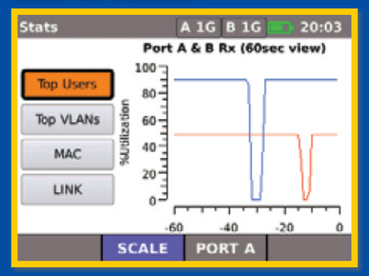
Top ten bandwidth usage in both directions



PoE detection and results in pass through (In-Line) mode

PoE test

Hub Blink test

Test Functions

Top ten bandwidth users

UniPRO MGig1's top ten bandwidth talkers and listeners test function (with VLAN ID 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 (particular 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 pairs. This means there is no need to carry separate multimeters, adaptors and 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 Ping and Trace Route plus Hub Blink functions and LLDP/EDP/CDP, the engineer can rapidly establish whether the problem is a network configuration or cable patching problem - for example being connected to the wrong switch port at the central office (CO). Conventionally hours of cable tracing would have been needed at the CO. Using **UniPRO MGig1** could frequently save half a day of non-productive and waiting time on site.

Cable test and optical power indicator are additional functions the field engineer will find beneficial, as is the ISDN and PBX detection and warning of foreign services like ISDN or PBX.

Field engineers know that RJ45 contacts have a limited life. As the RJ45 contacts on **UniPRO MGig1** are user-exchangeable in the field, there is no need to return **UniPRO MGig1** to the service centre when this happens, as is the case with other testers.

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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)
- Simple pre-configured setup load/store with graphic ✓pass / ✘fail 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 - to significantly 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.

Additional features to UniPRO MGig 1

- 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**) 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 (NetSAM) 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 MGig 1 PLUS

- Single ended Y.1564 (NetSAM) testing
- Bi-Directional Y.1564 (NetSAM) testing
- MPLS testing 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 SEL1**s 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.

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

*All models of **UniPRO MGig1** testers and the **UniPRO SEL1** have copper (RJ45) Ethernet connectivity as standard for end point testing. Additionally SFP port for fibre adaptors is on **UniPRO MGig1 PLUS** and **UniPRO MGig1 PRO** models.*

*Dual port models have two copper ports to enable through mode testing as well as end point. (And two fibre ports on PLUS and PRO models). **UniPRO MGig1** dual port models have a media conversion function in pass through (In-Line) mode allowing:*

- *Copper to copper*
- *Copper to fibre*
- *Fibre to copper*
- *Fibre to fibre*