

ARGUS[®] 145^{PLUS}

TRIPLE PLAY + xDSL COMBI TESTER



**IPv6
READY**

ADSL

VDSL

SHDSL

ETH

ISDN

POTS

Cu

TDR

Data
101101011011

IP TV

Vo IP

MOS

PESQ

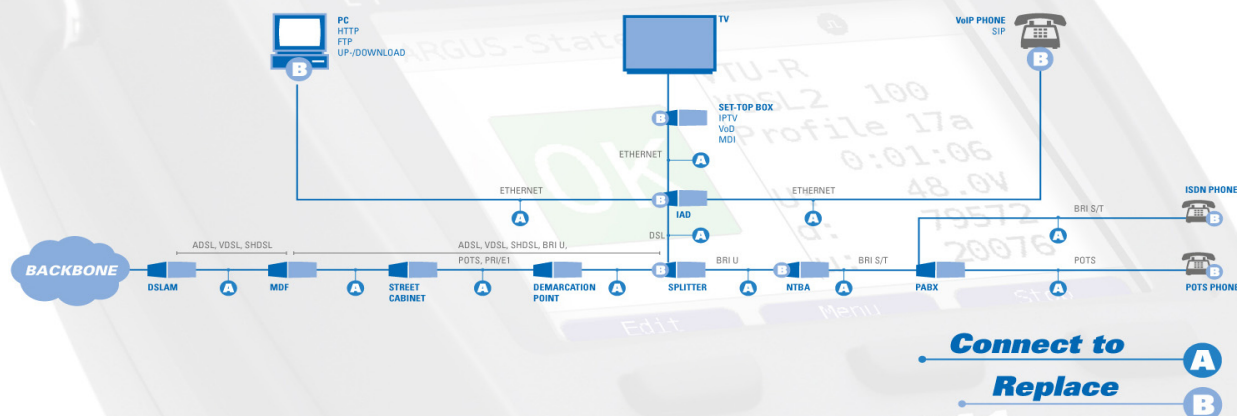
PC

USB

intec

GESELLSCHAFT FÜR
INFORMATIONSTECHNIK mbH

Where to use the ARGUS?



The compact all-rounder

Universal xDSL + Ethernet + ISDN + Triple Play test set

The ARGUS®145 PLUS is a first-class combi tester that meets the highest technical demands. It is the only handheld tester and analyzer to integrate all interfaces for VDSL2 (all profiles), ADSL (Annex A+B+J+L+M) and SHDSL (2-, 4-, 6- and 8-wire), Ethernet, ISDN PRI/E1/BRI S/T/U and POTS in a single device – without having to swap modules.

SHDSL interface

If required, the numerous interfaces can be extended by further functions. For example, the SHDSL interface also operates in SHDSL.bis (Enhanced SHDSL - ESHDSL) mode, therefore various SHDSL modes are available: e. g. ATM, TDM* or EFM mode.

Copper test set (Cu tests)

Copper tests (Cu tests) for physical line qualification without synchronization with the receiver are always included. Using a spectrum analysis (DMT Analysis), the powerspectral density (PSD) and noise can also be measured.

With a high-impedance connection, the Line Scope enables real-time display both in the time and frequency domain (FFT). The optional Active Probe II required for this can also be connected to a DSL connection in use and can be switched between symmetrical and asymmetrical.

The optional TDR function (Time Domain Reflectometer) enables line lengths to be measured and sources of faults to be located.

Triple Play Quality and IPv6*

With its optional Triple Play test functions, the ARGUS®145 PLUS can be used to verify VoIP, IPTV and data services via xDSL and Ethernet. The ARGUS®145 PLUS not only simulates terminal equipment such as a phone, PC or set-top box (STB), it also determines all relevant quality of service parameters and evaluates, as a digital lineman's handset, the voice quality delivering a MOS or a PESQ* value. The IPTV quality of service is tested by means of STB emulation and VoD test, channel scanning, IPTV long-term analysis or using the Media Delivery Index (MDI). Optionally several of these IP tests can be carried out via the new more powerful IPv6* protocol.

Testing E1 and ISDN PRI interfaces

The ISDN PRI/E1 interface also permits comprehensive service testing as it is standard for the ISDN BRI S/T/U interfaces. It provides PRI specific test functions such as a MegaBERT for performing a framed or unframed bit error rate test (BERT) utilizing the entire 2 Mbit/s of bandwidth.

Easy operation

The ARGUS®145 PLUS is also extremely easy to use. It has got a large (320 x 240 pixels) colour display, uses softkeys and has not only a USB client but also a USB host interface*. For a long operation time, the tester is equipped with a powerful, field replaceable Lithium-Ion battery pack.

intec Gesellschaft für Informationstechnik

With more than 20 years of experience, intec GmbH is one of the leading suppliers of xDSL, ISDN and IP measurement technology in Europe. With the ARGUS® range, intec is offering practical solutions for installation and troubleshooting of xDSL and ISDN connections. Developed specifically for the needs and daily use by technicians working for international network operators, service providers and installation companies.

More than 60 000 ARGUS® testers are already in the field with companies such as Deutsche Telekom, Vodafone, Telefonica, KPN, British Telecom and Telekom Austria who are completely satisfied in the quality of "Made in Germany" intec products.

VDSL2, ADSL2+, SHDSL multi-pair, Ethernet, ISDN (BRI S/T/U, PRI, E1), POTS, copper (Cu) and Triple Play services tester

ARGUS®145 PLUS is a compact universal all-in-one handheld device for testing all common customer interfaces.

Broadband interfaces:

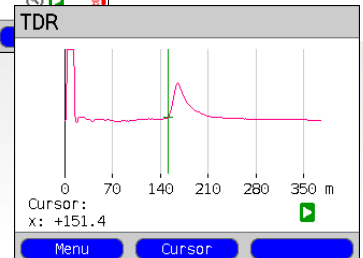
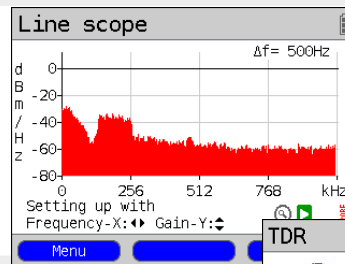
- Synchronisation with DSLAM (xTU-C) and evaluation of all relevant line parameters and error counters
- Including bridge, router and PC replacement modes
- **ADSL2/2+** + modem simulation, ADSL tester, ATU-R
 - Supports ITU-T G.992.5 et alii; Annex A+B+J,+L+M; INP, SRA
 - Display of Bits, SNR, QLN and Hlog/tone graphs
- **VDSL2** modem simulation, VDSL tester, VTU-R
 - Supports ITU-T G.993.2 (8, 12, 17, 30 MHz + var. bandplans)
 - Display of Bits, SNR, QLN and Hlog/tone and stream graphs
- **G.SHDSL** modem simulation, STU-R and STU-C
 - Connection dial-up incl. Line Probing (PMMS) acc. to ITU
 - Available for SHDSL 2-, 4-, 6- and 8-wire interfaces
 - Supports ITU-T G.991.2, G.hs, ETSI 101524, G.SHDSL.bis
 - Supports the following TC sub layers: ATM, EFM, TDM*
- **Ethernet** interfaces for Triple Play and Ethernet tests
 - 1 Ethernet interface (10/100 Base-T), RJ-45
 - Support Ethernet terminal mode (PC replacement)

Triple Play testing via xDSL and Ethernet:

- **ATM layer** tests when using ADSL2/2+ and SHDSL ATM
 - ATM OAM ping and ATM OAM cell loop, VPI/VCI scan
- **Data:** testing the data throughput (IPv4 and IPv6*)
 - IP ping and trace route tests (BRAS info, PPP trace, VLAN)
 - HTTP- and FTP download tests
 - FTP server test, up-/download from ARGUS to ARGUS
- **Voice:** testing of VoIP connections based on SIP standard
 - VoIP terminal simulation, incl. acoustics (various codecs)
 - OK/FAIL evaluation and display of quality parameters
 - Evaluation of the VoIP speech quality (QoS) according to:
 - MOS_{CQE} (ITU-T P.800) based on E model (ITU-T G.107)
 - PESQ* (ITU-T P.862) in combination with PESQ server SW*
- **Video:** testing IPTV and VoD services (STB mode)
 - Stream request (set-top box mode), IPTV channel scan
 - OK/FAIL evaluation and display of quality parameters (QoS)
 - Determination of MDI (Media Delivery Index), RFC 4445

Documentation and Analysis:

- **Documentation** of all parameters recorded to test reports (in device and on PC) via automatic access tests
- **Data transfer** to PC via USB client interface using Mini-USB
- **Update Tool** to carry out FW updates for free
- **WINplus** PC software for generating, saving, archiving and printing test reports and for configuring the ARGUS®
- **WINanalyse** PC software for analysis (including WINplus)
 - Graphical online long-term trace for xDSL and IPTV
 - ISDN D channel clear text decoding* for protocol analysis



Circuit-switched interfaces:

- **ISDN:** integrated comprehensive ISDN test set
 - BRI U interface (2B1Q or 4B3T*) acc. to ANSI T1.601
 - BRI S/T interface acc. to ITU-T I.430, TE and NT modes
 - PRI/E1 interface acc. to ITU-T I.431, TE and NT modes
 - D channel monitoring on BRI and PRI interfaces
 - Testing of BRI S/T and PRI leased lines (E1, 2 Mbit/s)
 - E1 BERT simultaneously using all B channels (MegaBERT)
 - Auto. testing of services and suppl. services, BERT etc.
 - Evaluation of the ISDN speech quality directly on BRI S/T/U:
 - Via PESQ* (ITU-T P.862) + MOS_{LQ0}* w/ PESQ server SW*
- **POTS:** integrated comprehensive POTS butt set (analog)
 - With DTMF and CLIP display, including pulse dial mode
 - Non-intrusive high-Z monitor, incl. voltage measurement
 - Evaluation of the speech quality directly on POTS:
 - Via PESQ* (ITU-T P.862) + MOS_{LQ0}* w/ PESQ server SW*

Copper testing (Cu tests):

- **RC measurement:** resist., capacitance, continuity check
 - Including loop length calculation (distance to open / short)
 - DC voltage measurement: up to +200 V; res.: 0.1 V; acc.: ±2 %
- **Line Scope:** real time, frequency (FFT) and time domain
 - Input impedance: 3.6 kΩ || 35 pF, adjustable gain
 - Frequency range: 20 kHz to 30 MHz; res.: 1 kHz; acc.: ±0.1 %
 - Level range: -120 to +10 dBm/Hz, res.: 0.1 dB; ±2 dB (at 0 dB)
 - Voltage range in time domain, AC: 40 V_{pp}; res.: 2 mV_{pp}
 - Input protection, DC: 220 V; AC: 100 V_{pp} (at 50 Hz)
- **DMT Analysis:** Power spectral density (PSD) assessment helps detecting noise, using 4096 DMT tones (e.g. VDSL2)
 - Impedance: 100 Ω
 - Frequency range: 130 kHz to 30 MHz; 4.3125 kHz; ±0.1 %
 - Level range: -140 to -40 dBm/Hz; resolution: 0.1 dBm/Hz; ±3 dB
- **ARGUS Active Probe II*:** high-impedance probe
 - Impedance: 70 kΩ || <1pF; range: 10 kHz to 30 MHz (±1.5 dB)
 - Switch between sym./asymmetric measurement mode
 - Power supplied by ARGUS USB host interface
- **TDR:** measuring line lengths and locating the faults
 - Measuring range: 3.5 up to 6000 m; res.: 0.15 %/range; ±2 %
 - Pulse width (adjustable): 15 ns to 8 μs, amplitude: 5 or 20 V
 - Velocity of propagation (VoP): 30 % up to 99.9 %

Further highlights:

- Brilliant QVGA colour display (LCD), 320 x 240 pixels
- Lightweight, compact and easy to use
- Intuitive menu navigation and instant readiness for operation
- Free firm- and software updates via www.argus.info/en

Technical Features:

- **Power supply** by a Li-ion battery pack or mains adaptor
- **Hotkeys** for quick start of various tests
- **Power management**, user configurable
- **Keypad**: 18 keys, 4 cursor keys, 3 context-sensitive softkeys
- **LCD colour display** (QVGA - 320 x 240 pixels), backlit
- **6 LEDs** indicating the status + Ethernet port LEDs
- **Handset** with integrated earpiece and microphone
- **CE marking**: complies with CE directives
- **User safety**: fulfils EN 60950-1:2006-11
- **RoHS** conformance according to WEEE directive

Interfaces:

- **2 x RJ-45** jacks for xDSL, copper, ISDN and POTS
- **1 x Ethernet** (10/100 Base-T) , RJ-45 management port
- **1 x Ethernet** (100 BT), RJ-45 test port
- **USB client** interface (type mini B)
- **USB host** interface (type A)
- **Headset** jack (TRS 2.5 mm, approx. 3/32")

Environmental conditions:

- **Operating temperature**: 0 °C (+32 °F) up to +50 °C (+122 °F)
- **Storing temperature**: -20 °C (-4 °F) up to +60 °C (+140 °F)
- **Relative humidity**: up to 95 %, non-condensing

Dimensions:

- **Size**: H x W x D: 235 x 97 x 65 mm (9.25 x 3.8 x 2.56 in)
- **Weight**: approx. 810 g (1.79 lbs) - incl. battery pack

Standard package:

xDSL or PRI basic package with ARGUS®, battery pack, mains adaptor, tailored test leads for chosen interfaces and options, Mini-USB cable, WINplus PC software (with CD and Manual), English manual and carrying case

Basic packages:

ARGUS 145 plus ADSL Annex A + L + M

Order number: 115002

ARGUS 145 plus ADSL Annex B + J

Order number: 115032

ARGUS 145 plus ADSL Annex A + B + J + L + M

Order number: 115052

ARGUS 145 plus VDSL2

Order number: 115102

ARGUS 145 plus SHDSL-2-w

Order number: 115132

ARGUS 145 plus ISDN PRI/E1

Order number: 115162



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* Options:

Additional interfaces:

(Additional test leads included, if required)

ADSL Annex A + L + M interface

Order number: 015005 (interface*) or 015045 (add. SW option*)

ADSL Annex B + J interface

Order number: 015006 (interface*) or 015046 (add. SW option*)

VDSL2 interface

Order number: 015008

SHDSL 2 wire interface

Order number: 015010

SHDSL 4 wire interface

Order number: 015011

SHDSL 8 wire interface

Order number: 015013

ISDN BRI U (TE) interface

Order number: 015051 (2B1Q) or 015050 (4B3T*)

POTS TE interface

Order number: 015016

ISDN BRI S/T (TE/NT) and POTS interface

Order number: 015017 (including ISDN 128kBERT and X.31)

ISDN PRI/E1 (TE/NT) interface

Order number: 015020 (incl. MegaBERT)

Additional test features: (Depends on existing interfaces)

PESQ (VoIP, ISDN and POTS)

Order number: 015025

IP + Download package for ISDN PRI/E1 (115162)

Order number: 015053 (incl. Ethernet interface)

VoIP test (ADSL, VDSL, SHDSL, Ethernet)

Order number: 015030 (in basic package 115162 incl. Ethernet)

IPTV test (ADSL, VDSL, SHDSL, Ethernet)

Order number: 015035 (in basic package 115162 incl. Ethernet)

TDR (Time Domain Reflectometer)

Order number: 015052

ARGUS Active Probe II*

Order number: 015091 (probe for DMT Analysis and Line Scope)

Additional PC software: (for Windows operating systems)

WINanalyse online (only key, no CD and manual)

Order number: 015060

WINanalyse (incl. CD and manual)

Order number: 015042

* We would be glad to provide further details and information about additional accessories on request.