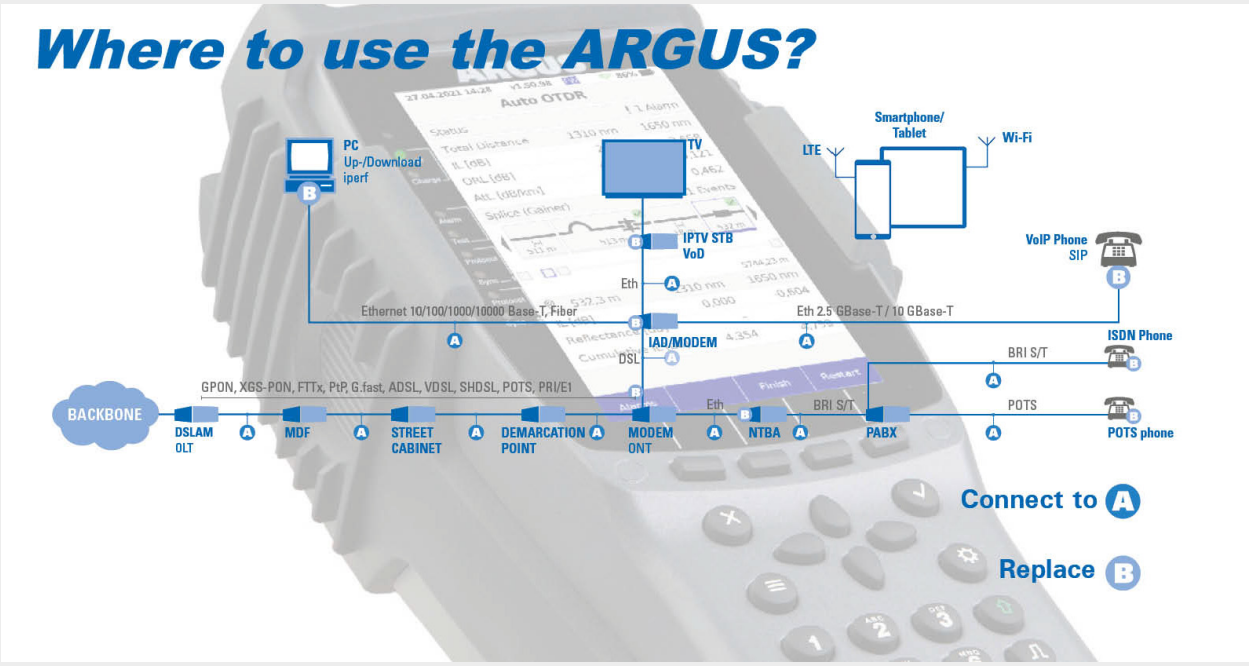
ARGUS® 300

UNIVERSAL BROADBAND TESTER

GPON
FTTH
XGS-PON
xPON-ID
PON installation
Sel. OPM
OFF
OTDR
FIT
OLS
VFL
G.fast
VDSL
ADSL
SHDSL
Bonding
2.5GigE
10GigE
SFP
WLAN
POTS
Data 10110101011
ISDN
IP TV
Cu
Vo IP
TDR
Speed test
RFL
RFC 6349
Remote kit
RFC 2544
Line Scope
Y.1564

intec
GESELLSCHAFT FÜR INFORMATIONSTECHNIK mbH



ARGUS® 300: the universal broadband tester
The new ARGUS® 300 all-in-one tester delivers improved performance for testing broadband interfaces. The high-Quality multifunction tester is ideally equipped for the Expansion of future networks.

Modern design and new housing conecpt
Its robust design combines the requirements for a compact hand-held meter in daily field use with the performance of a high-end tester. The ARGUS® tester with touch-screen display enables intuitive navigation of the familiar ARGUS® menu structure. Thanks to the use of numerous graphical elements, the redesigned GUI makes this sophisticated multifunction tester as easy to use as a smartphone. A new, innovative internal help function supports rapid, reliable interpretation of test results.

All necessary broadband interfaces
The ARGUS® 300 reliably tests all broadband interfaces, from GPON, XGS-PON and G.fast (106 + 212 MHz) to super Vectoring, bonding, ADSL, VDSL and SHDSL accesses, in the uncompromising quality you have come to expect. It is also equipped with a wide range of further interfaces and test functions, such as 2.5 GB Ethernet, WLAN, Copper, TDR, RFL, triple Play and many more. An extremely high-performance hardware is planned specifically for tests in the Gigabit Ethernet range (up to 10 GigE).

Additional features
The integrated WIFI interface enables the ARGUS® 300 to communicate with its enviroment directly – a PC link is no longer required.
Once integrated in your job management system, the ARGUS® 300 marks the advent of a new generation of broadband testing.

intec Gesellschaft für Informationstechnik mbH
intec Gesellschaft für Informationstechnik mbH has been successfully developing products for the international telecom markets for more than 30 years. Meanwhile specialized in high-quality telecommunication measuring devices, we belong to the leading suppliers of fiber optic, G.fast, xDSL and IP measuring technology in Europe and beyond.

Our ARGUS® testers are ideal for developing and documenting new fiber optic infrastructure for the rapid expansion of modern optical networks. They simplify day-to-day work in the maintenance and testing of modern copper-based broadband interfaces as well as in the fiber-optic sector and support troubleshooting and fault location.

Our customers have appreciated the quality of our products and services for many years. This trust in our products has enabled us to supply more than 100,000 ARGUS® testers throughout the world during the last 20 years – a large majority of which have been delivered to international companies such as Deutsche Telekom, Vodafone, Telefonica, KPN or A1 Telekom Austria.

Specification Broadband Interfaces:

General:		Application, Settings + Results:	
G.fast Tester G.fast	G.fast Modem Simulation, FTU-R, CPE G.fast Bridge + G.fast Router ITU-T G. 9700/9701 Profile 106a/212a Time Division Duplexing (TDD)	**G.fast / VDSL / ADSL** • Net Data Rate d/u [kBit/s] • Attainable Data Rate d/u [kBit/s] • Relative Capacity d/u [%] • SNR Margin/Loop Attenuation d/u [dB] • Output Power d/u [dBm] • Interleave Delay d/u [ms] • Impulse Noise Protection d/u [Symbols] • FEC + CRC, far/near [Errors] • ES, SES, LOSS + UAS, far/near [sec] • Reset / Resync [Number] • Bitswap Events d/u • Retransmission d/u (G.INP) • Vendor, far/near [Name/Number] • Modem Trace • Bits/SNR/QLN/Hlog/Noise Graphs • OK/Fail Evalution: Bitrate, CRC, FEC • DC Voltage, UDC	**G.fast / VDSL** • Signal Attenuation [dB] • Showtime No Sync [Number] • Seamless Rate Adaption (SRA) • Data Transmission Unit (DTU) • INP REIN + INP SHINE [Symbols] • Expected Throughput Rate (ETR) [kBit/s] • Electrical Length @1 MHz [dB] • EFM Statistics: Frames + Bytes • Graphical Long-time Trace In ARGUS® **VDSL** • Vectoring Mode • Graphical Long-time Trace In ARGUS® **ADSL** • Latency Mode • Graphical Long-time Trace In ARGUS®
VDSL Tester VDSL	VDSL2 Modem Simulation, VTU-R, CPE VDSL2 Bridge + VDSL2 Router ITU-T G.993.2 (Profiles 8, 12, 17a, 30a) ITU-T G.993.2 Annex Q (Profile 35b), Super Vectoring (Vplus) ITU-T G.993.5, G.vector (Vectoring) ITU-T G.998.4, G.INP (Retransmission) ITU-T G.998.2, G.bond, 35b Bonding		
ADSL Tester ADSL	ADSL Modem Simulation, ATU-R, CPE ADSL Bridge + ADSL Router ITU-T G.992.1, Annex A+B (ADSL) ITU-T G.992.2, Annex A (G.lite) ITU-T G.992.3, Annex A+B+L+M (ADSL2) ITU-T G.992.5, Annex A+B+J+M (ADSL2+)		
SHDSL Tester SHDSL	SHDSL Bridge + SHDSL Router SHDSL DSLAM Simulation, STU-C ITU-T G.991.2, Annex A+B+F+G (G.SHDSL) ETSI TS 101 524 V 1.2.1 (ETSI SHDSL) ETSI TS 101 524 V 1.2.2 (E.SHDSL.bis) ITU-T G.994.1 (G.hs) SHDSL 2, 4 and 8 Wire	• TC Sublayer: ATM, TDM, HDLC, EFM (IEEE 802.3.ah) • Independent TC (ITC) • Line Probing (PMMS) • Data Rate/Line [kBit/s] • Resync/Line [Number] • Used Wire Pair/Line • SNR Margin/Line [dB] • SNR/Line + Attenuation/Line [dB]	• Output Power/Line [dBm] • CRC/Line, far/near [Errors] • LOSWS, ES, SES, US • Display of EFM States/Line • Graphic Long-time Trace In ARGUS • EFM Statistics: Frames + Bytes • ATM Statistics: OAM Cells, User VCCs, AAL5 PDUs, unmapped cells • Parameters/Segment (for SRU)
GigE Tester GigE	Ethernet According to IEEE 802.3 LAN1/LAN2/LAN3: RJ45 interface (8P8C) • 10/100/1000 Base-T • LAN1 additionally with 2.5 GBase-T (2.5GbE), 2500 BASE-T (IEEE 802.3bz, NBase-T) • LAN2 additionally with 5/10 GBASE-T (5/10 GbE), 5000/10000 BASE-T, (MGBASE-T) (IEEE 802.3ak, IEEE 802.3an) SFP1: full SFP interface (FTTx, PtP) • 100 Base-FX/LX (IEEE 802.3 Clause 26/58) • 1000 Base-BX/LX/SX/ZX Active Ethernet (IEEE 802.3 Clause 38 / 802.3z) • 2.5 GBase-X (2.5GigE/2.5GbE) SFP2: full SFP+ interface (FTTx, PtP) • 10 GBASE-X (10GbE/10GE), 10000 BASE-X (IEEE 802.3ae)	• Link Status / Autonegotiation, far/near • Auto-MDI(X) Function • Speed (10, 100, 1000, 10000 Mbit/s) • Duplex Mode (full, half)/Flow Control • Polarity/Wire Pair (+/-) • Pair skew/Wire Pair [ns] • Frames (Rx/Tx) [Number] • Errors, Bytes (Rx/Tx) [Number] • Collisions [Number]	• SFP: Digital Diagnostic Mode (DDM): - DDM According to SFF-8472 - Manufacturer Name, OUI, Item Number, Revision, Serial Number, Date, Coding, Medium, Speed - Optical Level (Tx/Rx), ±3 dB - Optical class of the OLT - Optical, PWR (Tx/Rx), ±3 dB - Temperature, Voltage, Current (Tx) - Max. Cable Length (Cu, SM, MM/OM1-4)

General:		Application, Settings + Results:	
GPON tester GPON	GPON Modem Simulation, ONT, CPE ITU-T G.984 via ARGUS® GPON ONT • GigaBit Passive Optical Network DDM According to SFF-8472 (see Ethernet) GPON Bridge/Router*	• Link Status / Link Speed • ONT Status / OLT Tx Power • Optical Network Unit ID (ONU ID) • Passive Optical Network ID (PON ID, Vendor + Equipment ID / Version)	• GPON Modem Trace • Serial Number / Password Configurable • Scan PLOAM message (ONU ID, S/N)* • SFP: Digital Diagnostic Mode (DDM) • Optical Level (Rx), ±0.5 dB, calibrated • Optical Line Attenuation
XGS-PON tester	XGS-PON Modem Simulation, ONT, CPE ITU-T G.9807.1 via ARGUS® XGPON ONT • GigaBit Passive Optical Network XGS-PON Bridge/Router*	• Link Status • ONT Status / OLT Tx Power • Optical Network Unit ID (ONU ID) • Passive Optical Network ID (PON ID, Vendor + Equipment ID / Version)	• XGS-PON Modem Trace • Serial Number / Password Configurable • Scan PLOAM message (ONU ID, S/N)* • SFP: Digital Diagnostic Mode (DDM) • Optical Level (Rx), ±0.5 dB, calibrated • Optical Line Attenuation
PON installation test	GPON installation test PON level check	• guided measurement sequence • target attenuation can be entered as threshold value • automatic OK /Fail evaluation • PDF measurement protocol • SFP parameters (s. Eth/GPON)	• calibrated measurement of the insertion loss with ±0.5 dB accuracy • Assistance for up to 64 fibers • Evaluation PON-ID • Query of the job data etc.
WLAN WLAN	WLAN Access Point Mode WLAN Client Mode IEEE 802.11b/g/n (2,4 GHz) IEEE 802.11a/an/ac (5 GHz)* • via WLAN USB Stick or • Internal FPC Antenna • WEP To WPA2 Enterprise	• WLAN Access Point Scan - Number / List Access Points - Number 2.4 GHz / 5 GHz Networks - Network/Name (SSID) - Signal Strength (RSSI) [dBm] - Signal Quality [%] - MAC Address of AP - Used Channel/Frequency - Used Protocol - Negotiated Encryption - Authentification - Group Cipher, Pairwise Cipher	• Access Point Mode (WLAN Router) for mobile devices - IP Tests (Data, VoIP, IPTV) • AP Management (save etc.) • Test Result Upload via Web Server, WebDAV and FTP • Configuration Download via WebDAV and FTP • Remote Control via VNC, Web Server - Firmware Update via FTP Download
ARGUS® WLAN Analyzer	• Displaying the networks during existing WLAN connection • Manual evaluation of channels possible in tabular and graphical form	• Searching for networks again during existing WLAN connection	• Advanced automated evaluation of found networks and display of all AP info
WLAN spectrum analysis	• optional: ARGUS® 2G4 Scope graphical WLAN spectrum analysis for 2.4 GHz for the specific WLAN troubleshooting	• Real-time Analysis /Graphics • passive (no WLAN Interference) • Channel Load • Graphical representation	• Detection of - Bluetooth Devices - Motion Sensors - Microwave Ovens - Baby Phones

Specifications Protocol and IP tests (Triple Play):

General:	Applications, Settings + Results:	
Protocol Tests	• Configurable MAC Address • Use of Virtual Lines (VL): Maximum Flexibility as well as Control and Priorization under Real Conditions by Several VLs simultaneously • One VL/Service each (Data, VoIP, IPTV, opt.) • VL Configurable in Profiles (20) - IP, PPPoE via xDSL, G.fast + Eth (PPTP) - EoA, IPoA, PPPoA via ADSL - VPI/VCI, VLAN (Modus, ID, Prio., TPID) - PPP Profiles (Username, Password) - IP Version (IPv4, IPv6, Dual) + DHCP - Automatic receiving of connection-dependent dial-in data: PPP, VoIP (phone number)	• Display of BRAS Information - AC Name, Service Name, Session ID • Display of PPP Information - PPP Packets/Bytes (Tx/Rx) - PPP Trace (PPP Commands, Time) • Display of IP Information - IPv6: Global Unicast/Link Local Address - IPv4: Assigned IP, Gateway, DNS • Recording of a Data Log for Evaluation on PC (e. g. Wireshark)
Data Tests (Dowload Tester) PC/Terminal Simulation IP Ping Test Traceroute Test HTTP Up-/Download Test FTP Up-/Download Test FTP Server Test Webbrowser ARGUS® Real Speed Formal (RFC6349) ARGUS® Real Speed Direct (iperf)	• Memory with up to 10 IP Addresses, (IPv4/6 Address as Number or Name) • Number of Pings, Pause Configurable (Ping), Packet Size + Fragmentation Configurable • Traceroute: Max. Hops, Probes + Timeout Conf. • Down-/Upload: Server Profiles (10): Server Addr., File Name/Size, Number, Number of Parallel Downloads Configurable - FTP: Username + Password • Display Results IP Ping - Display of Packets (Tx/Rx/repeated) - Checksum Error [Number] - Error Packets [Number] • Display Results Traceroute - Current Hop + Probe / List of Hops - Response Time of Hops [s] - IP Address of Current Hops	• Round Trip Time (min/max/avg) [ms] • Display Results Down- /Upload - Current/Total Number [Number] - Already Loaded Data [%] - Average Speed [Mbit/s] - Loaded Bytes [MB] - Transfer Time /Remaining Time [h:min:s] • ARGUS® Real Speed Direct (iperf) - Client /Server Mode - TCP Throughput Down- /Upload - ARGUS® against ARGUS® • ARGUS® Real Speed Formal (RFC6349) - Throughput Test - Evaluation TCP Throughput according to RFC 6349
VoIP Tests (VoIP Tester) IP Telephone Simulation Testing of VoIP Connections incl. Acoustics (dif. Codecs) MOS Evaluation (ITU-T P.800) Call Generator (up to 30 Calls)	• Configuration in VoIP Profiles (20): SIP Username, Password, Registrar Server, Outbound Proxy/SBC, Domain, Listen + Remote Port, Authentification, Caller ID, User Agent, Qualify, Process of Registration • Phone Settings: RTP Port Area, Silence Detection, Jitterbuffer, Codecs, DTMF • STUN Server • MOS Threshold for OK/Fail Evaluation • VoIP QoS, Layer 3 Diffserv: RTP/SIP: ToS, DSCP • VoIP QoS, Layer 2 VLAN Prio.: RTP/SIP: VLAN Prio. • Codecs: G.711 (a-law/µ-law), G.722 • Display of Own Number, Number of Called Person	• Duration of Connection [h:min:s] • MOS Plain Text Evaluation, According to E Model R Factor, ITU-T G. 107 (current/avg), MOS (current/avg/min/max/ideal) • Statistics: RTP Packets (Tx/Rx), • Error Counter: RTP Drop, RTP Error • RTP Jitter Rx (current/avg/min/max) • Lost RTP Packages (avg/min/max) • RTCP Contents: - RTP Jitter far (current/avg/min/max) [ms] - Lost RTP Packets of Remote Side - Network Delay (current/avg/min/max) [ms] • Display of Registration Details: SIP Codes, Registrar IP, Proxy, URI • Simulation (VoIP NT)
IPTV Tests (IPTV Tester) IPTV Device Simulation IPTV STB Simulation (Set-top Box) OK/Fail Evaluation IPTV Channel Scan IPTV Monitor (IPTV passive)	• Configuration in IPTV Profiles (up to 3): Editable Channel List (up to 250 Channels) Multicast IP + Port, Channel Name, IGMP version • Threshold for IPTV OK/Fail Evaluation: IGMP Latency, Sync Error, PCR Jitter, Error Indication, CC Errors, CC Error Rate, Audio + Video Bytes, RTP Jitter, RTP Sequence Error, Current + Total RTP Loss Rate • Different VLs for IGMP + RTP • Scan Profiles (3) Configurable: max. Zapping Time • Display of Selected IPTV Channel, Test Duration, current Bitrate, OK or Fail Evaluation • Packets Loss (current/min/max/avg) [Number]	• RTP/UDP Packet Loss Rate [%] • Delay [ms] + Delay Factor [ms] • Media Loss Rate (MLR) [%] • IP Address of Channel + Port • IGMP Latency (Activation Time) [ms] • For Correlation: xDSL CRC Counters • RTP Errors, RTP Sequence Errors • MPEG Bitrate + Packets (min/max/ …), Bytes (current/min/max/avg/Sum), PCR Jitter (current/min/max/avg) [ms], CC Errors + Error Rate (current/max) [%], Error Sync + Indication • Codecs and PIDs (Packet Identifier) • Channel Zapping Time (min/max/avg) [ms]

Specifications Fiber Tests:

General:	Applications, Settings + Results:	
OTDR Optical Time Domain Reflectometry	• for troubleshooting on optical lines • Acceptance measurement and route analysis • Smart Auto, Expert or Real Time Mode (up to 4 Hz) • Wavelengths: 1310 and 1650 nm (± 20nm) or 1310 and 1550 nm (± 20nm) • Dynamic range: 20 dB at 100 ns; 37 dB at 1310 nm, 20 µs; 35 dB at 1650 nm, 20 µs • Event dead zone: 0.9 m • Attenuation dead zone: 3.5 m • PON dead zone: ≤ 25 m; typical 20 m	• Pulse width: 3, 5, 10, 20, 30, 50, 100, 200, 300, 500 ns; 1, 2, 3, 5, 10, 20 µs • Range settings: 250, 500 m; 1, 2, 5, 10, 15, 20, 40, 80, 160, 240 km* • Measuring points: up to 300.000 points • Resolution: 5 cm to 32 m • Distance Accuracy: ± (1 m + 0.003 % * distance + resolution) • Linearity: ± 0.05 dB/dB * Max. range depends on fiber type (attenuation/km)
ARGUS OPM Optical Power Meter	• Powerful Optical Power Meter in SFP form factor • Powerful InGaAs Photo Diode • Optical Level Measurement with wavelengths from 850, 1300, 1310, 1490, 1550, 1610, 1650 nm • Measuring range: - 60 dBm up to +6 dBm, ± 0.25 dB	• Live display of the level • Storage of the measurement in measurement protocols • Robust and protected by use in SFP slot • Optional Calibration at 1310, 1490 and 1550 nm (-20 dBm), 20 °C
Selective xPON-OPM for GPON / XGS-PON	• Measuring range: • 1577 & 1490 nm (filtered): from -40 to +6 dBm • 1270 to 1625 nm (broadband): from -50 to +10 dBm • Accuracy: ±0,5 dB • Calibration conditions: -20 dBm, 23°C ±5 K • Connector: SC/APC, SFP+, LAN4 10 GBase-T * The network must provide the ID for this.	• Readout of PON ID and XGS-PON ID* via SC/APC, detection up to: • GPON ≥ -30 dBm • XGS-PON ≥ -28 dBm • Full ONT simulation (GPON ONT or XGS-PON ONT) via additional GPON/XGS-PON SFP transceiver module • IP/Performance tests via SFP+, LAN4 10/5/2.5/1 GBase-T, 100Base-Tx with up to 1 Gbit/s (max. 2.5 Gbit/s)
Optical Fault Finder	• simple fault finder • detects different types of optical faults • up to 15 events with one test	• distance to every event • robust and protected by use in SFP slot • quick and easy to use
Fiber Inspection Tool Video Microscope	• USB Microscope for the ARGUS • optical Fiber Inspection • manual Focusing with separate button • optional: Autofocus • digital Zoom • Pass /Fail evaluation according to IEC 61300-3-35	• min. Particle Size 0.5 µm • Defects: Core, Cladding, Adhesive and Contact • Scratches: Core, Cladding, Adhesive and Contact • different Tips /Adapters included in delivery • PC, UPC, APC, others on request • Single Mode /Multi Mode
VFL Visual Fault Locator	• Mini Visual Laser Source • Output Power: 1 mW • Detecting Range: about 5 km • Wavelength: 650 nm	• Laser Level: Class 2 - • Connector: Un/FC • Modulation Frequency: CW / 2 Hz • Power Supply: 2 * AAA batteries
Optical Light Source	• Wavelength: 1310 nm, 1490 nm, 1550 nm +1625 nm (± 20 nm) • Stability: - Short term (15 minutes): 1310 nm < ±0,05 dB 1490 nm < ±0,10 dB 1550 nm < ±0,05 dB 1625 nm < ±0,10 dB - Long term (5 hours): 1310 nm < ±0,10 dB 1490 nm < ±0,20 dB 1550 nm < ±0,10 dB 1625 nm < ±0,20 dB • Connector: SC/APC with dust protection and protection against loss	• Spectral width: 5 nm • Frequency: 270 Hz, 1 KHz, 2 KHz • Auto wavelength: protocol-based wavelength and TX power transmission • Power: -5 dBm ±0.5 dB • Auto power off / backlight • Power supply: 2x Ni-MH AA (2500 mAh), AC/DC charger • Dimension (L x W x H): 160 x 76 x 45 mm • Net weight: 270 g • Accessories: AC/DC charger, 2 x AA battery, calibration report

Specifications Ethernet Tests:

General:	Applications, Settings + Results:	
GigE Loop	• Layer Configurable (L1 to L3): MAC Modus (own MAC or all), VLAN Mode + ID, Prio., TPID Configurable, IP Mode and own IP Address	• Duration of Loop, Throughput [Mbit/s], MAC Address • Looped Packets, Looped Packets/Second [Number]
GigE Traffic Generator Package Generator	• Layer Configurable (L1 to L3): L2: MAC, VLAN Mode + ID, Prio., TPID L3: IP Mode, Address, Gateway, Net Mask • Bandwidth, Endless Mode, Frame Size, Follow-Up Time, Time to Live (TTL)	• Display of Data Rate, Line Rate + Frame Rate (avg) (Tx/Rx) • Frame (OK/Break/Errors) (Tx/Rx) • Frame Errors (Rx): Eth FCS, MAC Not OK/External, Payload • Duration of Traffic Generator - Frame (Tx/Rx), Frame Losses [%]
RFC2544 Test Throughput Test Latency Test Frame Loss Test	• Config. Profiles (20): Netto Frame Size Configurable - IPv4: 64 up to 1596 Byte (1 Port: 10232) - IPv6: 84 up to 1596 Byte (1 Port: 10232) • Tests: Throughput, Latency, Frame Loss - Data Rate, Duration, Limits Configurable • Layer Configurable (L1 to L3): see Traffic Generator - Maximum Data Rate: up to 10 GBase-T)	• Display Pause Frames, Connection/Test Status, Duration • Cur. Tx Frame Size [Byte], Current Tx Rate/Second [Mbit/s] • Graphic Display of All Results: - Throughput: Target/Actual Comparison [%], Tx Frame/s, Throughput Rate [%] - Latency: Latency Rate [Mbit/s], Latency/Frame Size [ms] - Frame Loss: Frame Loss Rate [%], Frame Transmission Rate [%] and many more
Y.1564 specification	• Net frame size adjustable: - IPv4: 64 up to 1596 byte (1-Port: 10232) - IPv6: 84 up to 1596 byte (1-Port: 10232) • Tests: CIR, EIR, Traffic Policing, Service Performance • Layer selectable • Maximum data rate: 10 Gbit/s (10 GBase-T) • Services: up to 8	• Display: IR (min, mean, max), FTD, FDV • Tabular display of all results - CIR: IR, FTD, FDV, FLR - EIR: IR, FTD, FDV, FLR - Traffic Policing: IR, FTD, FDV, FLR - Service Performance: IR, FTD, FDV, FLR, Availability

Specifications ISDN and POTS:

General:	Applications, Settings + Results:	
BRI S Interface ITU-T I.430 BRI S Terminal BRI S Telephone BRI S TE Simulation	• BRI S TE Mode, Terminal device simulation • L2 Mode: P-P, P-MP • Test Availability of B Channels • BRI S Level and Voltage Evaluation • Protocol: DSS1 • Display L1, L2 and L3 of B Channel Status	• incoming /outgoing Call • Display of Call Parameters • own Acoustics • Connection: Call (Single/Block Dial) • configurable services: - Language, Fax G3/G4, Audio, Telephony, Mixed etc.
PRI interface ITU-T I.431, ETS 300 011 ITU-T G.703, HDB3-Code PRI S Terminal PRI S Telephone PRI TE Simulation	• PRI S TE Mode, Terminal device simulation • L2 Mode: P-P, P-MP • Test Availability of B Channels • PRI S Level and Voltage Evaluation • Protocol: DSS1 • Display L1, L2 and L3 of B Channel Status • incoming /outgoing Call	• Display of Call Parameters • own Acoustics • Connection: Call (Single/Block Dial) • configurable services: - Language, Fax G3/G4, Audio, Telephony, Mixed etc. • Additional Functions/Settings: L1 Alarms: CRC-4, AIS, FAS, E-Bit, A-Bit, Sax
POTS Tester Analogue Tester POTS Butt Set POTS Terminal Simulation POTS Monitor	• Fully-fledged POTS Butt Set, POTS Phone • POTS Terminal Equipment (TE) • Analogue Phone with DTMF + Pulse Dial • Incl. Fully-fledged Analogue Acoustics • High-impedance Listening on POTS • Configurable DTMF Signal Level	• Voltage Measurement + Display Polarity when Hook-on and Hook-off • CLIP + Caller-ID according to ETS 300 659/778 • Supports FSK + Display of Caller ID • FLASH Function (40 up to 1000 ms)

Specifications Cable multimeter:

General:	Measuring Range	Resolution	Accuracy
DC Voltage; UDC (U⎓):	• 0 V to 9.99 V • 10 V to 200 V	• 0.01 V • 0.1 V	• ± (0.5 % + 2 digits) • ± (0.5 % + 2 digits)
AC Voltage; UAC (U~):	• 0 V to 9.99 V • 10 V to 200 V Frequency: 10 Hz to 200 Hz; 0.2 Hz; ±(1.5 % + 2 digits), sinus	• 0.01 V • 0.1 V	• ± (2 % + 2 digits) • ± (1.5 % + 2 digits)
Capacitive Symmetry Balance; CSym:	• 10 nF to 4 µF Dielectric strength for external voltage up to 17 V DC or 17 V AC (with a load 200 kΩ)	• 0.01 nF	• 0.1 % of the capacity against ground
Capacitance; C:	• 0.01 nF to 9.99 nF • 10 nF to 99.99 nF • 100 nF to 999.9 nF • 1 µF to 8 µF Dielectric strength for external voltage up to 17 V DC or 17 V AC (with a load 200 kΩ). Measured by film capacitors	• 0.01 nF • 0.01 nF • 0.1 nF • 1 nF	• ± (4 % + 4 digits) • ± (4 % + 4 digits) • ± (3 % + 1 digit) • ± (3 % + 1 digit)
Isolation Resistance; Iso: (105 V, max. 2 mA)	• 0.1 kΩ to 99.9 kΩ • 100 kΩ to 999 kΩ • 1 MΩ to 9.99 MΩ • 10 MΩ to 99.9 MΩ • 100 MΩ to 1 GΩ Dielectric strength for external voltage up to 5 V DC or 30 V AC (with a load 200 kΩ)	• 0.1 kΩ • 1 kΩ • 10 kΩ • 100 kΩ • 100 kΩ	• ± (2 % + 1 digit) • ± (2 % + 1 digit) • ± (2 % + 1 digit) • ± (5 % + 1 digit) • ± (5 % + 1 digit)
Isolation Resistance; Iso: (8 V, max. 8 mA)	• 0.1 kΩ to 99.9 kΩ • 100 kΩ to 999 kΩ • 1 MΩ to 9.99 MΩ • 10 MΩ to 40 MΩ Dielectric strength for external voltage up to 5 V DC or 30 V AC (with a load 200 kΩ)	• 0.1 kΩ • 1 kΩ • 10 kΩ • 100 kΩ	• ± (2 % + 1 digit) • ± (2 % + 1 digit) • ± (2 % + 1 digit) • ± (5 % + 1 digit)
Resistive Symmetry Balance; RSym:	• 10 Ω to 5 kΩ Dielectric strength for external voltage up to 30 V DC or 30 V AC (with a load 200 kΩ)	• 0.1 Ω	• 0.2 % of Rs ± 0.2 Ω
Loop Resistance; R: (13 V, max. 15 mA)	• 1 Ω to 999.9 Ω • 1 kΩ to 9.999 kΩ • 10 kΩ to 99.99 kΩ • 100 kΩ to 999.9 kΩ • 1 MΩ to 9,999 MΩ • 10 MΩ to 4.0 MΩ	• 0.1 Ω • 1 Ω • 10 Ω • 100 Ω • 1 kΩ • 10 kΩ	• ± (1 % + 3 digits) • ± (1 % + 1 digit) • ± (1 % + 1 digit) • ± (1 % + 1 digit) • ± (2 % + 1 digit) • ± (5 % + 1 digit)
DC Current; IDC (I⎓):	• 0 mA to 150 mA	• 0.1 mA	• ± (2.5 % + 3 digits)
Unbalance @1 MHz; LCL:	• 0 dB to 55 dB • 55.1 dB to 65 dB The length of the test leads can influence the accuracy of the measurement. Dielectric strength for external voltage up to 3 V DC or 3 V AC. At an internal resistance of the source of 1 MΩ it will be measured up to 3.5 V DC / AC.	• 0.1 dB • 0.1 dB	• ± 1.5 dB • ± 3 dB
NEXT @1 MHz; NEXT:	• 0 dB to 65 dB Dielectric strength for external voltage up to 3 V DC or 3 V AC. At an internal resistance of the source of 1 MΩ it will be measured up to 3.5 V DC / AC.	• 0.1 dB	• ± 1dB
RFL Resistive Fault Location	• Display of: - Resistance to error (R_x), distance to error - Resistance from fault to short-circuit (R_y) - Loop resistance (R_s), cable length - Fault resistance (R_{fault})	• Measuring ranges: - Loop resistance (R_s): 10..9999 Ω - Fault resistance (R_{fault}): 0..20 MΩ	• Accuracy R_x at L_x/L = 0.1 - R_s = 2000 Ω: ± 0.3 % ± 0.05 Ω - R_s = 200 Ω: ± 1.0 % ± 0.06 Ω
Remote Kit Control:	• Use ARGUS to control different Remote Kits to switch the Line on the remote side, e.g. TX916 - Short-circuit - Exchange connect - Open circuit - Loop - Tone mode - switch 2 ports simultaneously		
Other Functions:	• Autotest	• Fast cable check	• Signature detection (e. g. PPA)
Reference Conditions (calibration):	• Temperature: 23 °C ± 5 °C • Relative humidity: 50 % ± 20 % relative humidity, non-condensing		• Frequency of measurement type: 50 Hz ± 5 Hz, sinus

Specifications Copper Tests (Oscilloscope):

General:	Applications, Settings + Results:	
TDR Test Time Domain Reflectometer	• Determination of the Loop Length • For Identification and Detection of Shorts, Opens, Impedance Mismatch, Bridged Taps/Stubs, Moisture, Loading Coils, Loose Contacts and more • Pre-configured List of Cable Types, Velocity of Propagation (VoP): 30 % (45 m/µs) up to 99.9 % (149.7 m/µs), Line Resistance, Mutual Capacitance • Graphical Display of Reflection Course	• Measurement Range: 3.5 up to 6000 m • Res.: 0.025 % of Measurement Range; Accuracy: ±2 % • Configureable gain: -26 dB up to +44 dB • Config. Pulse: 5 ns up to 3.2 µs, Pulse Height: 5 V and 20 V • Dynamic range: 60 dB / Amplification Level • Zoom + Cursor for a Detailed Analysis • Save + Set of Reference Curve • Start/Stop Function (Realtime Mode)
Line Scope DSL Spectrum Analysis DSL Oszilloscope RF Current Clamp	• Monitoring in Time/Frequency Domain on all Types of Lines for Telecommunications and on active Lines with up to 200 VDC and 40 Vpp • Modem Finder, via Handshake Tones • Frequency Range: 20 kHz up to 35 MHz • Resolution: 67 Hz up to 8.625 kHz or 0.025 % of Measurement Range, Accuracy: ±2 dB • High-impedance or Line Termination: - Input Impedance: 3.6 kΩ, <10 pF - Switchable 100 Ω Input Resistance • Config. Gain FFT: -26 dB up to +20dB	• For Identification and Detection of different Access Types • Graphical Display of FFT [dBm/Hz] and of Time (Oszilloscope) • Config. X-Axis: FFT or Time [µs] • Autom. Trigger in Time Domain • Zoom + Cursor for a Detailed Analysis • Save + Set of Reference Curve • Start/Stop and Peak Hold Function) • Peak Hold Function (Min/Max Trailing) • Symmetry Toggling • Detection of Disturbers/Disturbing Signals

Device Specifications	
Technical Features:	
• **Power supply**	Li-ion battery pack or mains adaptor
• **Hotkey**	Quick start of various tests
• **Power management**	User configurable
• **Keypad**	18 keys, 4 cursor keys, 4 context-sensitive softkeys
• **TFT colour display**	800 x 480 pixels, backlit, incl. touchscreen
• **6 LEDS**	Indicating the status + Ethernet port LEDs
• **Handset**	Integrated earpiece and microphone
• **ARGUSpedia**	Integrated help function
• **CE marking**	Complies with CE directives
• **User safety**	Fulfills EN 62368-1
• **RoHS conformance**	Conformance according to WEEE directive
Interfaces:	
• **1x RJ-45, 1x RJ-11**	For xDSL, G.fast, POTS, U, R and C Measurement
• **3x Ethernet** (RJ-45 test ports)	10/100/1000 Base-T, 2.5 GBase-T, 10000 Base-T / 10 GigE
• **1x SFP port, 1x SFP + port**	100 Base-FX/LX, 1000 Base-SX/LX/ZX/BX, 2.5 GBase-T, 10 GBase-T
• **USB client interface**	Type micro B
• **2x USB host interface**	Type A
• **WLAN**	IEEE802.11a/b/g/n
Environmental conditions:	
• **Temperature range for charging battery pack**	0 °C (+32 °F) up to +40 °C (+104 °F)
• **Max. Operating temperature (endurance tests)**	0 °C (+32 °F) up to +40 °C (+104 °F)
• **Max. Operating temperature (in battery mode)**	-10 °C (+14 °F) up to +50 °C (+122 °F)
• **Operating temperature (with power/car adapter)**	0 °C (+32 °F) up to +40 °C (+104 °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: 300 x 128 x 94 mm (11.81 x 5.04 x 3.70 in)
• **Weight**	approx. <2000 g (4.41 lbs, ARGUS incl. battery pack)

Documentation and Analysis
• **Documentation** of all parameters recorded to test reports (in device and on PC) via automatic access tests
• Transfer of test results via **QR code** to a smartphone or via WLAN, ETH or DSL to cloud (FTP server).
• Free of charge firmware updates via **cloud** or ARGUS® **update tool** (www.argus.info)
• **WLAN** for transf. test results to systems of an electronic order processing system, remote control via smartphone.

Standard Package:		
Basic device incl. Gigabit-Ethernet interface (10/100/1000 Base-T + SFP), Wi-Fi Management, IPv4/IPv6, IP+Download package (IP ping, traceroute test, HTTP/FTP download, FTP upload/server), Router Mode, Line scope, Web browser, Cloud services, SFP support, Lithium-Ion battery pack, Mains adaptor, Shock absorbing rubber jacket, Carrying case, appropriate cable set (depending on selected option, see below), Micro USB cable, Carrying strap, Hand strap and English manual		
Additional options:		
• **xDSL Package** incl. ADSL Annex A+L+M, VDSL2 up to Profile 35b	incl. 2 Wire Cable (020018)+xDSL Adaptor (000048)	Order number: 030005
• **ADSL Annex B + J Enhancement**	only as Enhancement for Art.No.: 030005	Order number: 030008
• **VDSL2 Bonding Enhancement (up to Profile 35b)**	requires Art.No.: 030045+030005, incl. Bonding Cable	Order number: 030050
• **G.fast Enhancement (Profile 106a and 212a)**		Order number: 030045
• **SHDSL package (STU-R/C, 8 wire, EFM/ATM)**	incl. 2/4/8 wire, SHDSL.bis, SHDSL w cable	Order number: 030020
• **Time Domain Reflektometer (TDR)**	up to 6 km	Order number: 030051
• **Copper package (Cable multimeter/DMM)**	incl. banana cable red/black + green	Order number: 030010
• **Resistive Fault Location option (RFL)**	requires Art.No.: 030010	Order number: 030055
• **ARGUS® RF Current Clamp**		Order number: 000265
• **2.5 Gigabit Ethernet Interface**	via Ethernet (LAN1, SFP1)	Order number: 030035
• **10 GigE package (Loop, Traffic-Gen.)**	incl. NBase-T/10 GBase-T (RJ45) (1/2.5/5/10 Gbit/s) incl. SFP+/10 GBas-T (1/10 Gbit/s)	Order number: 030030
• **RFC 2544 option**	requires Art.No.: 030030	Order number: 030033
• **ARGUS® SAM/Service Activation Test (ITU-T Y.1564)**	for up to 10 Gbase-T; requires Art.No.: 030030	Order number: 030057
• **GPON option**	incl. ARGUS® GPON ONT SFP, incl. SC/LC-APC patch cable	Order number: 030076
• **GPON option, calibrated**	incl. Art.No.: 030076 + initial calibration of the level masurement	Order number: 030077
• **GPON Bridge/Router Option**	requires Art.No.: 03076	Order number: 030087
• **PON Installation Test**	w/o stick, requires Art.No. 030077 or 030116 or 030100	Order number: 030097
• **Optical Light Source (OLS)**		Order number: 000280
• **Optical Power Meter option (OPM)**	incl. ARGUS® Optical Power Meter (SFP), type 6006	Order number: 030080
• **xPON OPM + PON ID for GPON/XGS-PON**		Order number: 030100
• **GPON-ONT for xPON-OPM**	incl. GPON Transceiver SFP; requires Art. No. 030100	Order number: 030102
• **XGS-PON-ONT for xPON-OPM**	incl. XGS-PON Transceiver SFP; requires Art. No. 030100	Order number: 030103
• **xPON-5xOPM**	incl. Through Mode + Up-/Downstream level measurement, requires Art. No. 030100	Order number: 030104
• **Speedtests up to 10 Gbit/s**	via Ethernet (LAN4, SFP4) + fiber via transceiver SFP incl. ARGUS RealSpeed Direct (iperf); incl. Ethernet Cat6 Patch Cable 1:1 (red); requires Art. No. 030100 and 030104	Order number: 030106
• **XGS-PON option**	incl. ARGUS® XGS-PON ONT SFP + SC/LC-APC patch cable	Order number: 030115
• **XGS-PON option, calibrated**	incl. Art.No. 030115 + initial calibration of level measurement	Order number: 030116
• **Optical Fault Finder option (OFF)**	w/o OFF SFP (000275)	Order number: 030083
• **OTDR package (1310 nm and 1650 nm)**	incl. opt. adaptor + opt. measuring strip	Order number: 030040

• **OTDR package (1310 nm and 1550 nm)**	incl. opt. adaptor + opt. measuring strip	Order number: 030043
• **OTDR leading fiber**	1000 m, SC/APC-SC/APC	Order number: 030042
• **Fiber Inspection option**	w/o Fiber Inspection Tool	Order number: 030094
• **Wi-Fi test interface**	w/o Wi-Fi USB stick (000250)	Order number: 030059
• **ARGUS® WLAN Analyzer**	requires WLAN basic	Order number: 030054
• **ARGUS 2G4 Scope (2.4 GHz Spectrum Analysis)**	incl. USB 2G4 Scope stick	Order number: 000240
• **VoIP Option**	incl. MOS value, Call generator, NT Sim., SIP trunk	Order number: 030060
• **IPTV Option**	incl. IPTV STB mode, IPTV passive, channel scan	Order number: 030065
• **Triple Play package**	incl. VoIP and IPTV option	Order number: 030067
• **ARGUS® Real Speed Formal (RFC6349)**	incl. ARGUS® Real Speed Direct (iperf)	Order number: 030056
• **ARGUS® Real Speed Direct (iperf)**	Client / Server	Order number: 030069
• **ISDN BRI S/T TE interface**	requires Art.No.: 030045	Order number: 030016
• **ISDN PRI TE interface**	requires Art.No.: 030020	Order number: 030022
• **POTS option**	POTS	Order number: 030070

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

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