ARGUS®300

U N I V E R S A L - B R O A D B A N D - T E S T E R

G.fast

VDSL

ADSL

SHDSL

GPON

SFP

10 GigE

OPM

OFF

OTDR

FIT

FTTH
FTTx

POTS
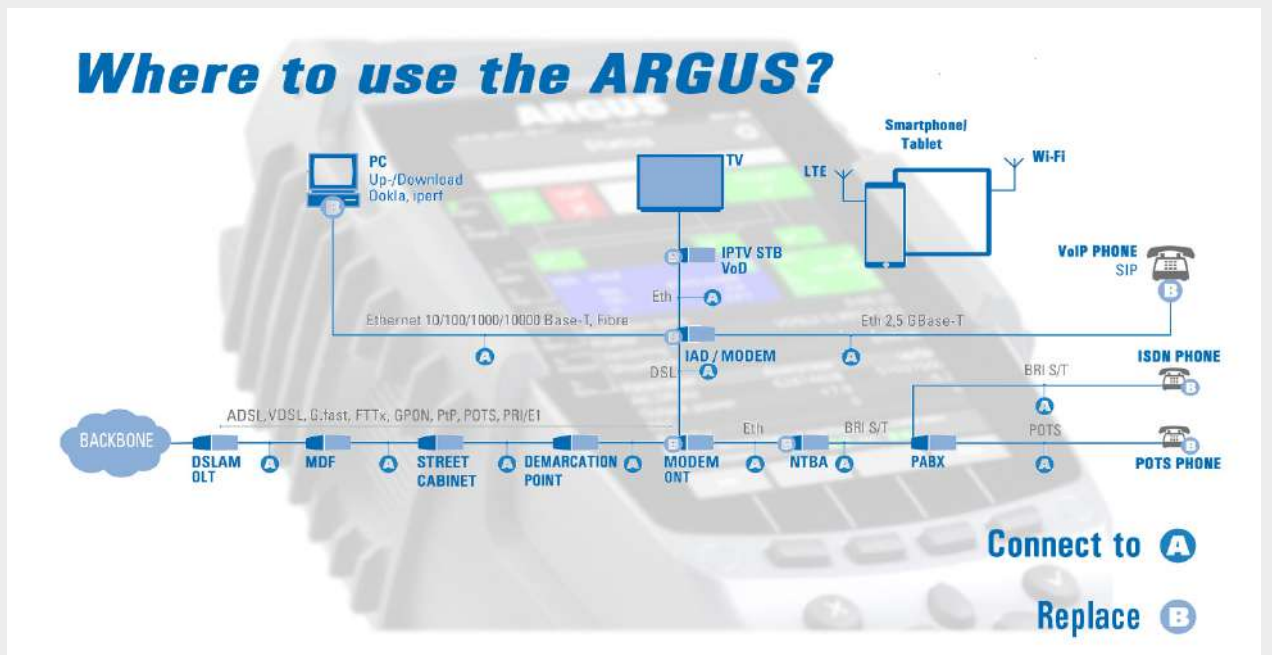
ISDN

Cu

TDR

RFL

Data
10110101011

IP
TV

Vo
IP

USB

WLAN

Premilinary Data sheet: Technical data subject to change without notice

intec

GESELLSCHAFT FÜR
INFORMATIONSTECHNIK mbH

Where to use the ARGUS?

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 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 30 years. Meanwhile specialized in high-quality telecommunication measuring devices, we belong to the leading suppliers of xDSL, IP and fiber optic measuring technology in Europe and beyond.

The ARGUS® product range provides a convenient solution for commissioning and troubleshooting on xDSL and Ethernet connections. Specifically designed for user requirements in daily, praxis-related operations for international network operators, service providers and installation companies. The ARGUS® measuring devices have already been purchased more than 100,000 times.

Companies such as Deutsche Telekom, Vodafone, Telefonica, KPN, British Telecom and Telekom Austria put their trust in the quality of the intec products, "Made in Germany".

ARGUS® MADE IN GERMANY

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)

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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
PON installa-tion 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
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

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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 Ookla iPerf ARGUS® Real Speed	• 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] • Speedtest® by Ookla 　- Download /Upload Speed 　- Latency, Jitter, Packet Loss 　- Server Selection via Server ID • iPerf v2 /3 　- Client /Server Mode 　- TCP Throughput Down- /Upload 　- ARGUS® against ARGUS® • ARGUS® Real Speed 　- Evaluation 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]

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Specifications Ethernet and Fiber Tests:

General:	Applications, Settings + Results:	
Ethernet Cable Tests	• Ethernet Port LED Flash	• Port LED Flash with Timing
Network Scan	• Auto Mode (manual, autom.) • Network Address + Net Mask Configurable • Client Information: IP + Open Ports, MAC, Computer Name, NetBIOS Name	• Display of Detected Services, e. g. Mail, Print, Web, File, Database and many more • Display of DHCP Discovery, Gateway, DHCP + DNS Server, Net Mask, No. of Detected Clients/Subnet • Number of Open Ports/Clients
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

General:	Applications, Settings + Results:	
OTDR Optical Time Domain Reflectometry	• for troubleshooting on optical lines • Acceptance measurement and route analysis to the 1st splitter • Automatic, Expert or Real Time Mode (up to 4 Hz) • Wavelengths: 1310 and 1650 nm (± 20nm) • Dynamic range: 20 dB at 100 ns • Event dead zone: 0.8 m	• Attenuation dead zone: 3.5 m (at 50 dB reflection) • Pulse width: 5, 10, 20, 30, 50, 100 ns • Display range: 1, 2, 5, 10, 15, 20, 40 km • Measuring points: up to 300 points • Resolution: 5 cm to 2 m • Accuracy: ± (1 + 0.003 % * distance + resolution) • Linearity: ± 0.05 dB
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 • Output in QR code • Robust and protected by use in SFP slot • Optional Calibration at 1310, 1490 and 1550 nm (-20 dBm), 20 °C
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

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. 1,05 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)

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General:			
Isolation Resistance; Iso: (8 V, max. 8 mA)	• 0.1 kΩ to 99.9 kΩ	• 0.1 kΩ	• ± (2 % + 1 digit)
	• 100 kΩ to 999 kΩ	• 1 kΩ	• ± (2 % + 1 digit)
	• 1 MΩ to 9.99 MΩ	• 10 kΩ	• ± (2 % + 1 digit)
	• 10 MΩ to 40 MΩ	• 100 kΩ	• ± (5 % + 1 digit)
	Dielectric strength for external voltage up to 5 V DC or 30 V AC (with a load 200 kΩ)		
Resistive Symmetry Balance; RSym:	• 10 Ω to 5 kΩ	• 0.1 Ω	• 0.2 % of Rs ± 0.2 Ω
	Dielectric strength for external voltage up to 30 V DC or 30 V AC (with a load 200 kΩ)		
Loop Resistance; R: (13 V, max. 13 mA)	• 1 Ω to 999.9 Ω	• 0.1 Ω	• ± (1 % + 3 digits)
	• 1 kΩ to 9.999 kΩ	• 1 Ω	• ± (1 % + 1 digit)
	• 10 kΩ to 99.99 kΩ	• 10 Ω	• ± (1 % + 1 digit)
	• 100 kΩ to 999.9 kΩ	• 100 Ω	• ± (1 % + 1 digit)
	• 1 MΩ to 9,999 MΩ	• 1 kΩ	• ± (2 % + 1 digit)
	• 10 MΩ to 4.0 MΩ	• 10 kΩ	• ± (5 % + 1 digit)
DC Current; IDC (I =):	• 0.1 mA to 149,9 mA	• 0.1 mA	• ± (2.5 % + 3 digits)
Unbalance @1 MHz; LCL:	• 0 dB to 55 dB	• 0.1 dB	• ± 1.5 dB
	• 55.1 dB to 65 dB	• 0.1 dB	• ± 3 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.		
NEXT @1 MHz; NEXT:	• 0 dB to 65 dB	• 0.1 dB	• ± 1dB
	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.		
RFL Resistance troubleshooting	• 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 $L_x/L = 0.1$ - $R_s = 2000\ \Omega$: ± 0.3 % ± 0.05 Ω - $R_s = 200\ \Omega$: ± 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:

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 (see Active Probe)
		• Detection of Disturbers/Disturbing Signals

Line qualification WB symmetry measurement	• Idealized DSL Data Rate Estimation (Slave/Master) • Receiver (Rx), Sensitivity: up to -150 dBm/Hz • Frequency Range: 4.3125 kHz up to 30 MHz (±2 dB) • Impedance: 100 W, 120 W and 135 W, Configurable	• Bandwidth (ADSL, VDSL2) + Bandplan (VDSL2) Config. • Transmitter (Tx), Power: 12 dBm, 6 dBm, 0 dBm, Config. • Supports Bits, SNR, QLN and Hlog per Tone Diagrams • Display of Bits, SNR, QLN and Hlog per tone graph
ARGUS Active Probe II* Passive, High-impedance Intrusion	• Input Impedance: 70 kΩ, <1 pF • Frequency Range: 10 kHz bis 35 MHz • 2 x 4 mm Banana Jacks	• Hiding the Useful Signal Symmetry/Asymmetry Toggling - Attenuation Symmetric: 14.5 dB • Data Transfer to ARGUS via RJ45

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.

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 60950-1:2006-11
• **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)

Premilinary Data sheet: Technical data subject to change without notice

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, Speedtest® by Ookla), Router Mode, Line scope, Network scan, 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:

Option	Details	Order number
• **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. 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
• **RFL Option**	requires Art.No.: 030010	Order number: 030055
• **Copper Wideband Package (up to 35 MHz)****	incl. Adv. TDR+Adv. Line Scope, LQ, LCL, NEXT	Order number: 030015
• **ARGUS Active Probe II (High Impedance Probe for Line Scope)**		Order number: 015091
• **ARGUS RF Current Clamp**		Order number: 000265
• **Optical Light Source (OLS)**		Order number: 000280
• **2.5 Gigabit Ethernet Interface**	10/100/1000/2.5 GigE via RJ45 and SFP	Order number: 030035
• **10 GigE Package (RFC 2544, 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
• **Service Activation Test (ITU-T Y.1564)**	for up to 10 GBase-T	Order number: 030057

Option	Description	Order number
• **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**		Order number: 030087
• **PON Installation Test**	incl. Art.No.: 030077	Order number: 030078
• **OPM Option**	incl. ARGUS Optical Power Meter (SFP), type 6006	Order number: 030080
• **Optical Fault Finder Option**	w/o OFF SFP (000275)	Order number: 030083
• **OTDR Package**	incl. opt. adaptor + opt. measuring strip	Order number: 030040
• **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 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
• **Entertain Package**	incl. VoIP and IPTV option	Order number: 030067
• **ARGUS Real Speed**	RFC 6349, incl. iPerf v2 / v3	Order number: 030056
• **iPerf v2/ v3**	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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