

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

GPON

FTTH

PON
installation

OPM

OFF

OTDR

FIT

OLS

VFL

G.fast

VDSL

ADSL

SHDSL

Bonding

2.5GigE

10GigE

SFP

WLAN

Data
101101011011

POTS

IP TV

ISDN

Vo IP

Cu

Speed test

TDR

Ookla®

RFL

RFC 6349

Remote kit

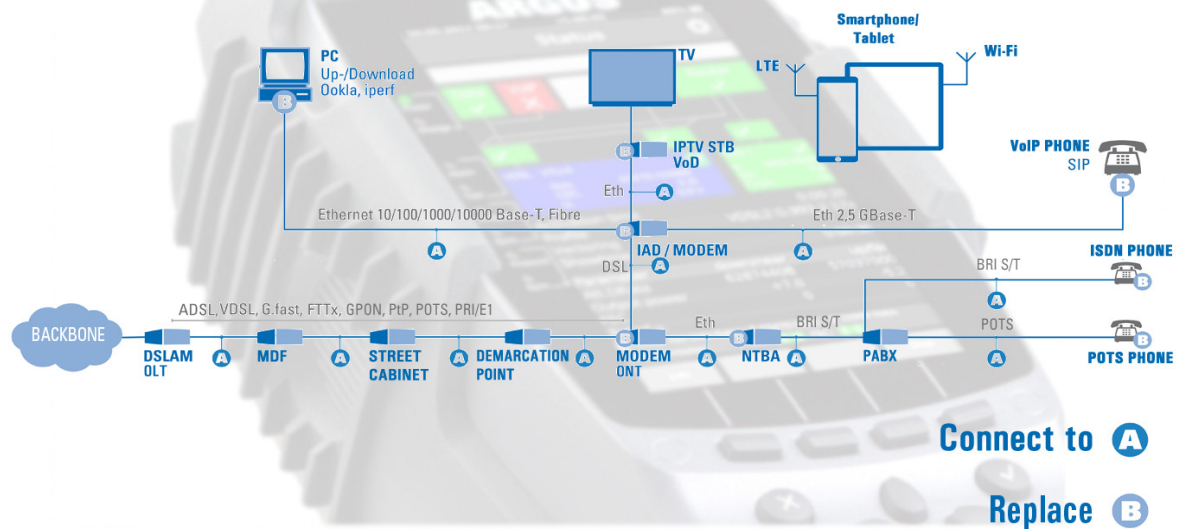
RFC 2544

Line Scope

Y.1564



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 concept

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 environment 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".



Specification Broadband Interfaces:

General:		Application, Settings + Results:	
G.fast Tester 	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 Evaluation: 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 		
	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 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+)	- 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)
	SHDSL Tester 		
	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		
GigE Tester 	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)
	GigE Tester 		
	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)		

General:		Application, Settings + Results:	
GPON tester 	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 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 - Authentication - 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

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 (Download 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, Out-bound Proxy/SBC, Domain, Listen + Remote Port, Authentication, 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]

Preliminary Data sheet: Technical data subject to change without notice

Specifications Fiber Tests:

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 300.000 points - Resolution: 5 cm to 2 m - Accuracy: $\pm (1 + 0.003 \% \cdot \text{distance} + \text{resolution})$ - 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
VFL Visual Fault Locator	- Mini Visual Laser Source - Output Power: ≥ 1 mW - Detecting Range: about 5 km - Wavelength: 650 nm	- Laser Level: Class IIIA - Connector: Un/FC (optional) - 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 $< \pm 0,05$ dB 1490 nm $< \pm 0,10$ dB 1550 nm $< \pm 0,05$ dB 1625 nm $< \pm 0,10$ dB - Long term (5 hours): 1310 nm $< \pm 0,10$ dB 1490 nm $< \pm 0,20$ dB 1550 nm $< \pm 0,10$ dB 1625 nm $< \pm 0,20$ 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

Preliminary Data sheet: Technical data subject to change without notice

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 Oscilloscope 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 (Oscilloscope) - 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	
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	

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)

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, Speedtest® by Ookla), 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
• 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 RF Current Clamp		Order number: 000265
• 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 GBase-T (1/10 Gbit/s)	Order number: 030030
• ARGUS SAM/Service Activation Test (ITU-T Y.1564)	incl. NBase-T/10 GBase-T (RJ45) (1/2.5/5/10 Gbit/s) incl. SFP+/10 GBase-T (1/10 Gbit/s)	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 measurement	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



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Internet: www.argus.info

• Optical Light Source		Order number: 000280
• 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		

Preliminary Data sheet: Technical data subject to change without notice



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