

# ARGUS® 163

V D S L + A D S L C O M B I T E S T E R

G.fast

VDSL

ADSL

SFP

GigE

LTE·))

ISDN

POTS

Cu

TDR

Copper  
Box

LAN

Data  
101101011011

IP  
TV

Vo  
IP

MOS

PESQ

USB

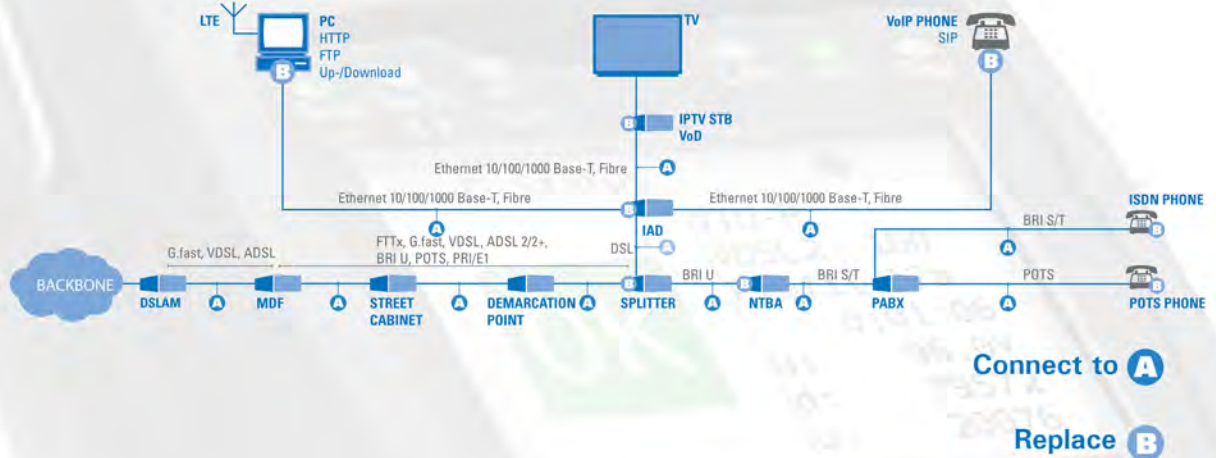
WLAN·))



**intec**

GESELLSCHAFT FÜR  
INFORMATIONSTECHNIK mbH

## Where to use the ARGUS?



### The combined instrument for high-speed internet

The ARGUS 163 offers all modern high-speed interfaces in a single instrument, including G.fast, VDSL2 super vectoring and profile 35b bonding, as well as an SFP port for FTTx or GPON.

The ARGUS 163 combines the capabilities of a tester for everyday installations with those of an instrument for modern high-speed interfaces. It is the only measuring device in its class that offers LAN cabling tests, and also the only one on the market that combines this with G.fast and VDSL2 profile 35b bonding. This not only enables technicians to localise in-house cable faults (short-circuits, swapped connections, wiring faults, etc.) quickly and easily, but also to verify the availability of power over Ethernet (PoE/PoE+).

By means of concurrent triple-play tests, the ARGUS 163 can perform authentic stress tests on copper (DSL, ETH) or glass fibre-based interfaces. Thanks to its multiple DSL chipsets, it offers maximum interoperability with G.fast, VDSL2 super vectoring, profile 35b bonding, VDSL and ADSL – yet another feature that no other tester offers. If desired, this instrument can also test telephony (VoIP/ISDN/POTS), as well as copper (TDR, DMM, etc.) and wireless (WLAN, LTE).

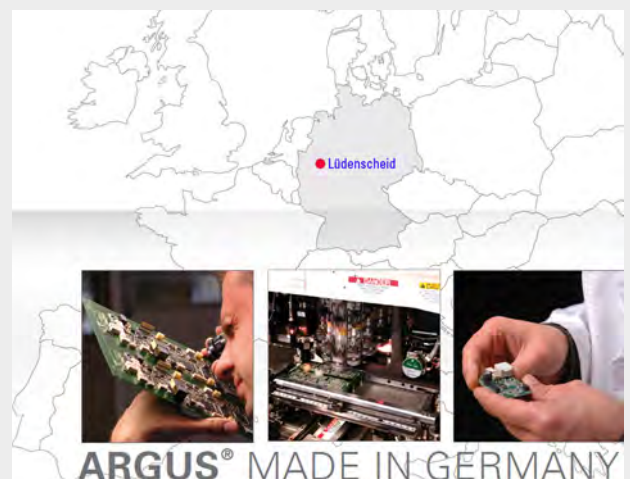
**Your advantage:** With its low weight, handy size and broad range of functions, the ARGUS 163 is an all-purpose tester that can deliver long hours of field use thanks to its powerful Li-ion battery pack.

### intec Gesellschaft für Informationstechnik mbH








With over 25 years of experience in this sector, intec GmbH can be considered to be one of the leading providers of xDSL, ISDN and IP-measurement technology in Europe.

The ARGUS product range provides a convenient solution for commissioning and troubleshooting on xDSL and ISDN 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".



Specifications broadband interfaces:

General:		Application, Settings + Results:	
<p><b>G.fast Tester</b></p> <p> G.fast Modem Simulation, FTU-R, CPE G.fast Bridge + G.fast Router ITU-T G. 9700/9701 Profile 106a Time Division Duplexing (TDD)</p> <p><b>VDSL Tester</b></p> <p> 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 (Bonding) 8, 12, 17a, 30a and 35b Bonding</p> <p><b>ADSL Tester</b></p> <p> ADSL Modem Simulation, ATU-R, CPE ADSL Bridge + ADSL Router ITU-T G.922.1, Annex A+B (ADSL) ITU-T G.922.2, Annex A (G.lite) ITU-T G.922.3, Annex A+B+L+M (ADSL2) ITU-T G.922.5, Annex A+B+J+M (ADSL2+)</p>	<p><b>G.fast / VDSL / ADSL</b></p> <ul style="list-style-type: none"> <li>• Net Data Rate [kBit/s]</li> <li>• Attainable Data Rate [kBit/s]</li> <li>• Relative Capacity [%]</li> <li>• SNR Margin / Loop Attenuation [dB]</li> <li>• Output Power [dBm]</li> <li>• Interleave Delay [ms]</li> <li>• Impulse Noise Protection [Symbols]</li> <li>• FEC + CRC, Far/Near [Errors]</li> <li>• ES, SES, LOSS + UAS, Far/Near [sec]</li> <li>• Reset / Resync [Number]</li> <li>• Bitswap Events</li> <li>• Seamless Rate Adaption (SRA)</li> <li>• Retransmission (G.INP)</li> <li>• Vendor, Far/Near [Name]</li> <li>• Version, Far/Near [Number]</li> <li>• Modem Trace</li> <li>• Bits/SNR/QLN/Hlog Tone/Freq. Graphs</li> <li>• OK/Fail Evaluation: Bitrate, CRC, FEC</li> <li>• DC Voltage, UDC</li> </ul>	<p><b>G.fast / VDSL</b></p> <ul style="list-style-type: none"> <li>• Signal Attenuation [dB]</li> <li>• Showtime No Sync [Number]</li> <li>• Seamless Rate Adaption (SRA)</li> <li>• Data Transmission Unit (DTU)</li> <li>• INP REIN + INP SHINE [Symbols]</li> <li>• Expected Throughput Rate (ETR) [kBit/s]</li> <li>• Electrical Length @1 MHz [dB]</li> <li>• EFM Statistics: Frames + Bytes</li> </ul> <p><b>VDSL</b></p> <ul style="list-style-type: none"> <li>• Vectoring Mode</li> <li>• Graphic Long-time Trace In ARGUS</li> </ul> <p><b>ADSL</b></p> <ul style="list-style-type: none"> <li>• Latency Mode</li> <li>• Graphic Long-time Trace In ARGUS</li> <li>• ATM Statistics: OAM Cells, User VCCs, AAL5 PDUs, Unmapped Cells/VPI/VCI</li> </ul>	
<p><b>GigE Tester</b></p> <p> Ethernet According to IEEE 802.3 2 x 10/100/1000 Base-T (RJ45/8P8C) 1x SFP Interface, Supports:</p> <ul style="list-style-type: none"> <li>• 100 Base-FX/LX</li> <li>• 1000 Base-BX/LX/SX/ZX</li> </ul> <p>DDM According to SFF-8472</p>	<ul style="list-style-type: none"> <li>• Link Status / Autonegotiation, Far/Near</li> <li>• Auto-MDIX) Function</li> <li>• Speed (10, 100, 1000 Mbit/s)</li> <li>• Duplex Mode (Full, Half) / Flow Control</li> <li>• Polarity/Wire Pair (+/-)</li> <li>• Pair skew/Wire Pair [ns]</li> <li>• Frames, Bytes (Rx/Tx) [Number]</li> <li>• Errors, Collisions [Number]</li> </ul>	<ul style="list-style-type: none"> <li>• SFP: Digital Diagnostic Mode (DDM): - Manufacturer Name, OUI, Item Number, Revision, Serial Number, Date, Coding, Medium, Speed</li> <li>- Optical Level (Tx/Rx), ±3 dB</li> <li>- Optical, PWR (Tx/Rx), ±3 dB</li> <li>- Temperature, Voltage, Current (Tx)</li> <li>• Max. Cable Length (Cu, SM, MM/OM1-4)</li> </ul>	
<p><b>GPON Tester</b></p> <p> GPON Modem Simulation, ONT, CPE GPON Terminal Device ITU-T G.984 Via GPON-SFP-ONT DDM According to SFF-8472 (See Ethernet)</p>	<ul style="list-style-type: none"> <li>• Link Status / Link Speed / ONT Status</li> <li>• Optical Network Unit ID (ONU ID)</li> <li>• ODN Class</li> <li>• OLT Tx Power</li> <li>• Passive Optical Network ID (PON ID)</li> <li>• Vendor + Equipment ID / Version</li> </ul>	<ul style="list-style-type: none"> <li>• GPON Modem Trace</li> <li>• Serial Number Configurable</li> <li>• Password Configurable</li> <li>• Scan PLOAM message (ONU ID, S/N)*</li> <li>• SFP: Digital Diagnostic Mode (DDM): - See Ethernet</li> </ul>	
<p><b>LTE Scanner</b></p> <p> LTE Tester Via LTE USB Stick</p> <ul style="list-style-type: none"> <li>• Long Term Evolution (3.9G)</li> <li>• 800, 1600 and 2600 MHz</li> <li>• 2 x Ext. Antenna Connection (CRC-9)*</li> </ul>	<ul style="list-style-type: none"> <li>• Automatic Frequency Band Selection</li> <li>• SIM and PIN Necessary*</li> <li>• LTE Provider [Name]</li> <li>• Frequency (d/u) / Frequency Band [MHz]</li> <li>• Codes and IDs: MCC, MNC, TAC, GCID</li> </ul>	<ul style="list-style-type: none"> <li>• EARFC (EUTRA abs. RF channel no.)</li> <li>• Signal Strength (RSRP) [dB]</li> <li>• Signal Quality (RSRQ) [dB]</li> <li>• SNR Margin (SINR) [dB]</li> <li>- Color Evaluation of RSRP, RSRQ, SINR</li> </ul>	
<p><b>WLAN Scanner</b></p> <p> WLAN Tester WLAN Access Point Mode IEEE 802.11a/b/g/n (2,4 GHz) IEEE 802.11ac (5 GHz)* Via WLAN USB Stick</p> <ul style="list-style-type: none"> <li>• Internal FPC Antenna or</li> <li>• External Antenna (RP SMA Socket)*</li> </ul> <p>WEP To WPA2 Enterprise</p>	<ul style="list-style-type: none"> <li>• Access Point Mode (WLAN Router)</li> <li>WLAN for Smartphones/Laptops for: - Downloading via xDSL/Ethernet - Browsing via xDSL/Ethernet</li> <li>• WLAN Scan (WLAN Terminal)</li> <li>• Counter: Found Access Points</li> <li>• List: Found Access Points</li> <li>• Number 2.4 GHz / 5 GHz Networks</li> </ul>	<ul style="list-style-type: none"> <li>• Network/Name (SSID)</li> <li>• Signal Strength (RSSI) [dBm]</li> <li>• Signal Quality [%]</li> <li>• MAC Address of Access Points</li> <li>• Used Channel/Frequency</li> <li>• Used Protocol</li> <li>• Negotiated Encryption / Authentication</li> <li>• Group Cipher / Pairwise Cipher</li> </ul>	

Specifications Protocol + IP tests (Triple Play):

General:	Applications, Settings + Results:	
<b>Protocol Tests</b>	<ul style="list-style-type: none"> <li>Configurable MAC Address</li> <li>Use of Virtual Lines (VL): Maximum Flexibility as Well as Control and Priorization under Real Conditions by Several VLS simultaneously</li> <li>One VL/Service Each (Data, VoIP, IPTV, opt.)</li> <li>VL Configurable in Profiles (20)                             <ul style="list-style-type: none"> <li>IP, PPPoE via xDSL, G.fast + Eth (PPTP)</li> <li>EoA, IPoA, PPPoA via ADSL</li> <li>VPI/VCI, VLAN (Modus, ID, Prio., TPID)</li> <li>PPP Profiles (Username, Password)</li> </ul> </li> <li>IP Version (IPv4, IPv6, Dual) + DHCP</li> </ul>	<ul style="list-style-type: none"> <li>Display of BRAS Information                             <ul style="list-style-type: none"> <li>AC Name, Service Name, Session ID</li> </ul> </li> <li>Display of PPP Information                             <ul style="list-style-type: none"> <li>PPP Packets/Bytes (Tx/Rx)</li> <li>PPP Trace (PPP Commands, Time)</li> </ul> </li> <li>Display of IP Information                             <ul style="list-style-type: none"> <li>IPv6: Global Unicast/Link Local Address</li> <li>IPv4: Assigned IP, Gateway, DNS</li> </ul> </li> <li>Recording of a Data Log for Evaluation on PC (e. g. Wireshark)</li> </ul>
<b>Data Tests (Data Tester)</b> PC/Terminal Simulation IP Ping Test Traceroute Test http Up-/Download Test ftp Up-/Download Test ftp Server Test Textbrowser	<ul style="list-style-type: none"> <li>Memory with up to 10 IP Addresses, IPv4/6 Address as Number or Name</li> <li>Number of Pings, Pause Configurable (Ping), Packet Size + Fragmentation Configurable</li> <li>Traceroute: Max. Hops, Probes + Timeout Conf.</li> <li>Down-/Upload Server Profiles (10): Server Addr., File Name/Size, Number, Number of Parallel Downloads Configurable                             <ul style="list-style-type: none"> <li>FTP: Username + Password</li> </ul> </li> <li>Display Results IP-Ping                             <ul style="list-style-type: none"> <li>Display of Packets (Tx/Rx/repeated)</li> <li>Checksum Error [Number]</li> <li>Error Packets [Number]</li> <li>Round Tripe Time (min/max/avg) [ms]</li> </ul> </li> <li>Display Results Traceroute</li> </ul>	<ul style="list-style-type: none"> <li>Display Results Traceroute                             <ul style="list-style-type: none"> <li>Current Hop + Probe / List of Hops</li> <li>Response Time of Hops [s]</li> <li>IP Address of Current Hops</li> </ul> </li> <li>Display Results Down-/Upload                             <ul style="list-style-type: none"> <li>Current/Total Number [Number]</li> <li>Already Loaded Data [%]</li> <li>Average Speed [Mbit/s]</li> <li>Loaded Bytes [MB]</li> </ul> </li> <li>Transfer Time/Remaining Time [h:min:s]</li> </ul>
<b>VoIP Tests (VoIP Tester)</b> IP Telephone Simulation Testing of VoIP Connections incl. Acoustics (dif. Codecs) MOS Evaluation (ITU-T P.800) PESQ Analysis (ITU-T P.862)* - additional Server Software Call Generator (up to 30 Calls)	<ul style="list-style-type: none"> <li>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</li> <li>Phone Settings: RTP Port Area, Silence Detection, Jitterbuffer, Codecs, DTMF</li> <li>STUN Server</li> <li>MOS Threshold for OK/Fail Evaluation</li> <li>VoIP QoS, Layer 3 Diffserv: RTP/SIP: ToS, DSCP</li> <li>VoIP QoS, Layer 2 VLAN Prio.: RTP/SIP: VLAN Prio.</li> <li>Codecs: G.726 (16/24/32/40), G.729 (A/B), G.711 (a-law/<math>\mu</math>-law), G.722</li> <li>Display of Own Number, Number of Called Person</li> </ul>	<ul style="list-style-type: none"> <li>Duration of Connection [h:min:s]</li> <li>MOS Plain Text Evaluation, According to E Model R Factor, ITU-T G. 107 (current/avg), MOS (current/avg/min/max/ideal)</li> <li>Statistics: RTP Packets (Tx/Rx),</li> <li>Error Counter: RTP Drop, RTP Error</li> <li>RTP Jitter Rx (current/avg/min/max)</li> <li>Lost RTP Packages (avg/min/max)</li> <li>RTCP Contents:                             <ul style="list-style-type: none"> <li>RTP Jitter far (current/avg/min/max) [ms]</li> <li>Lost RTP Packets of Remote Side</li> <li>Network Delay (current/avg/min/max) [ms]</li> </ul> </li> <li>Display of Registration Details: SIP Codes, Registrar IP, Proxy, URI</li> </ul>
<b>IPTV Tests (IPTV Tester)</b> IPTV STB Simulation (Settopbox) OK/Fail Evaluation IPTV Channel Scan IPTV Monitor (IPTV passive) VoD Test*	<ul style="list-style-type: none"> <li>Configuration in IPTV Profiles (up to 3): Editable Channel List (up to 250 Channels) Multicast IP + Port, Channel Name, IGMP version</li> <li>Limits 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</li> <li>Different VLS for IGMP + RTP</li> <li>Scan Profiles (3) Configurable: max. Zapping Time</li> <li>VoD Profiles (3) Configurable: Type of Stream, Server Address + Port, File Name, RTSP Type + Server Type, Jitterbuffer</li> <li>Limits for VoD OK/Fail Evaluation: PCR Jitter, Continuity Error</li> <li>Display of Selected IPTV Channel, Test Duration, current Bitrate, OK or Fail Evaluation</li> </ul>	<ul style="list-style-type: none"> <li>Packets Loss (current/min/max/avg) [Number]</li> <li>RTP/UDP Packet Loss Rate [%]</li> <li>Delay [ms] + Delay Factor [ms]</li> <li>Media Loss Rate (MLR) [%]</li> <li>IP Address of Channel + Port</li> <li>IGMP Latency (Activation Time) [ms]</li> <li>For Correlation: xDSL CRC Counters</li> <li>RTP Errors, RTP Sequence Errors</li> <li>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</li> <li>Codecs and PIDs (Packet Identifier)</li> <li>Channel Zapping Time (min/max/avg) [ms]</li> <li>VoD Error Status, Container Type, Packets, Bytes, Cont. Error, Bitrate and many more</li> </ul>

## Specifications Ethernet:

General:	Applications, Settings + Results:	
<b>Ethernet Cable Tests</b>	<ul style="list-style-type: none"> <li>Ethernet Port LED Flash</li> <li>Ethernet TDR: Modus (First + Max Peak) Cable Type from Cable Type List (VoP, R, C)</li> <li>Ethernet Cabling Test up to 100 programmable Active ARGUS LAN Probes</li> <li>Ethernet PoE Test: Automode + Performance Class Configurable</li> </ul>	<ul style="list-style-type: none"> <li>Port LED Flash with Timing</li> <li>Eth TDR up to 150 m: Pin Pair + Status, Distance to Error, Reflection Factor</li> <li>Graphic Wiremap According to TIA/EIA-568A Wires Changed, Short-Circuit, open and many more</li> <li>PoE: Display of Class, Mode + Polarity Voltage (<math>\pm 1\%</math>) [V], Performance (<math>\pm 2.5\%</math>) [W]</li> </ul>
<b>Network Scan</b>	<ul style="list-style-type: none"> <li>Auto Mode (manual, autom.)</li> <li>Network Address + Net Mask Configurable</li> <li>Display of DHCP Discovery, Gateway, DHCP + DNS Server, Net Mask, No. of Detected Clients/Subnet</li> </ul>	<ul style="list-style-type: none"> <li>Number of Open Ports/Clients</li> <li>Client Information: IP + Open Ports, MAC, Computer Name, NetBIOS Name</li> <li>Display of Detected Services, e. g. Mail, Print, Web, File, Database and many more</li> </ul>
<b>Loop</b>	<ul style="list-style-type: none"> <li>Layer Configurable (L1 to L3): MAC Modus (own MAC or all), VLAN Mode + ID, Prio., TPID Configurable, IP Mode and own IP Address</li> </ul>	<ul style="list-style-type: none"> <li>Duration of Loop [h:min:s]</li> <li>Looped Packets, Looped Packets/Second [Number]</li> <li>Throughput [Mbit/s]</li> <li>MAC Address</li> </ul>












## Specifications ISDN:

General:	Applications, Settings + Results:	
<b>BRI U Interface</b> ETR 80/ANSI T1.601 ISDN BRI U TE Simulation	<ul style="list-style-type: none"> <li>Line Coding: 4B3T or 2B1Q</li> <li>ISDN BRI U TE Mode, ISDN BRI U Leased Line</li> <li>ISDN BRI U Voltage Measurement (OK/Fail)</li> </ul>	<ul style="list-style-type: none"> <li>Details about Tests, Functions and Results, see BRI S TE Interface</li> <li>High-Impedance listening, see POTS</li> </ul>
<b>BRI S Interface</b> ITU-T I.430 BRI S Terminal BRI S Telephone BRI S TE Simulation BRI S Signal Simulation BRI S Monitoring	<ul style="list-style-type: none"> <li>BRI S TE Mode, NT Mode, Leased line</li> <li>BRI S Monitor Mode</li> <li>Autom. Detection of Connection Configuration</li> <li>L2 Mode: automatic, P-P, P-MP</li> <li>Test Availability of B Channels</li> <li>BRI S Level and Voltage Evaluation</li> <li>Different Protocols configurable: Auto., DSS1, CorNet-N/T/NQ, QSIG, VN4</li> <li>Setting: Alerting Mode, Clocking, BRI S Connection, Call Parameters, Services, Call Acceptance, Codec (A-law/<math>\mu</math>-law), DTMF, CUG Index, Prefix, AOC, ...</li> <li>X.31 Test, configurable in Profiles (3): Packet Number, TEI, LCN, Size, Throughput, User Data, CUG/ Index, D-Bit, Facilities</li> <li>Non-intrusive listening (Monitoring not active)</li> </ul>	<ul style="list-style-type: none"> <li>Level Measurement (Bus Supply, Phantom)</li> <li>Display of L1 Information (Info 0 to 4)</li> <li>Display L1, L2 and L3 of B Channel Status</li> <li>Bit Error Rate Test (BERT) ITU-T, G.821, Data, Time, LOS, Errors, HRX, EFS, SES and many more</li> <li>Request of Supplementary Services DSS1: TP, HOLD, CLIP (CLIR, COLP, COLR), DDI, MSN, CF, CW, CCBS, CCNR, 3PTY, ECT, CUG, CD, AOC, SUB, UUS, CLIP no Screening (TE)</li> <li>Service Tests: Language, DFU, Audio, Fax, Mixed, OSI, Telephony, Teletex and many more</li> <li>Request of Call Forwarding (CF), Activating and Deleting</li> <li>Connection: Call (Single/Block Dial)</li> <li>Connection: Call Acceptance (Display of Number)</li> <li>Time Measurements: Duration, Interchannel Delay</li> <li>Loopbox for Leased Line</li> </ul>
<b>PRI interface</b> ITU-T I.431 ITU-T G.703, HDB3-Code ETS 300 011 E1 Interface PRI TE Simulation PRI Signal Simulation PRI Monitoring	<ul style="list-style-type: none"> <li>Details about Tests, Functions und Results, see BRI S Interface</li> <li>Additional Functions/Settings: L1 Alarms: CRC-4, AIS, FAS, E-Bit, A-Bit, Sax</li> <li>Layer 1 Master/Slave Operation, TE/NT with Sax Instructions</li> <li>D Channel Trace, TE/NT Mode in PC/ARGUS</li> <li>Testing of PRI/E1 Leased Lines</li> </ul>	<ul style="list-style-type: none"> <li>Bit Error Rate Test (BERT), ITU-T G.821 - in Extended Self Call and End-End-Distance-BERT</li> <li>Display of Bit Errors and Bit Error Rate</li> <li>OK/NOK Evaluation (see BRI S)</li> <li>Services Configurable (see BRI S)</li> <li>Manual Interspersion of Bit Errors</li> <li>Bit Pattern ITU-T O.150: 2E11-1/E15-1, free</li> <li>E1-BERT via all B Channels (MegaBERT)</li> </ul>

## Specifications POTS:

General:	Applications, Settings + Results:	
<b>POTS Tester</b> Analogue Tester POTS Butt Set POTS Terminal Simulation POTS Monitor	<ul style="list-style-type: none"> <li>Fully-fledged POTS Butt Set, POTS Phone</li> <li>POTS Terminal Equipment (TE)</li> <li>Analogue Phone w/ DTMF + Pulse Dial</li> <li>Incl. Fully-fledged Analogue Acoustics</li> <li>High-impedance Listening on POTS</li> <li>Configurable DTMF Signal Level</li> </ul>	<ul style="list-style-type: none"> <li>Voltage measurement + Display Polarity when Hook-on and Hook-off</li> <li>CLIP + Caller-ID acc. ETS 300 659/778</li> <li>Supports FSK + Display of DTMF Caller ID</li> <li>FLASH Function (40 up to 1000 ms)</li> <li>PESQ Analysis (ITU-T P.862)*</li> </ul>

## Specifications ARGUS Copper Box:

General:			
	Measuring Range	Resolution	Accuracy
<b>DC Voltage; UDC (U =):</b> 	<ul style="list-style-type: none"> <li>0 V to 9.99 V</li> <li>10 V to 220 V</li> </ul>	<ul style="list-style-type: none"> <li>0.01 V</li> <li>0.1 V</li> </ul>	<ul style="list-style-type: none"> <li>± (0.5 % + 2 digits)</li> <li>± (0.5 % + 2 digits)</li> </ul>
<b>AC Voltage; UAC (U ~):</b> 	<ul style="list-style-type: none"> <li>0 V to 9.99 V</li> <li>10 V to 210 V</li> </ul> <p>Frequency: 10 Hz to 200 Hz; 0.2 Hz; ±(1.5 % + 2 digits), sinus</p>	<ul style="list-style-type: none"> <li>0.01 V</li> <li>0.1 V</li> </ul>	<ul style="list-style-type: none"> <li>± (2 % + 2 digits)</li> <li>± (1.5 % + 2 digits)</li> </ul>
<b>Capacitive Symmetry Balance; CSym:</b> 	<ul style="list-style-type: none"> <li>10 nF to 4 µF</li> </ul> <p>Dielectric strength for external voltage up to 17 V DC or 17 V AC (with a load 200 kΩ)</p>	<ul style="list-style-type: none"> <li>0.01 nF</li> </ul>	<ul style="list-style-type: none"> <li>relative capacity ± 0.1 %</li> </ul>
<b>Capacitance; C:</b> 	<ul style="list-style-type: none"> <li>0.01 nF to 9.99 nF</li> <li>10 nF to 99.99 nF</li> <li>100 nF to 999.9 nF</li> <li>1 µF to 8 µF</li> </ul> <p>Dielectric strength for external voltage up to 17 V DC or 17 V AC (with a load 200 kΩ). Measured by film capacitors</p>	<ul style="list-style-type: none"> <li>0.01 nF</li> <li>0.01 nF</li> <li>0.1 nF</li> <li>1 nF</li> </ul>	<ul style="list-style-type: none"> <li>± (4 % + 4 digits)</li> <li>± (4 % + 4 digits)</li> <li>± (3 % + 1 digit)</li> <li>± (3 % + 1 digit)</li> </ul>
<b>Isolation Resistance (105 V, max. 2 mA); Iso:</b> 	<ul style="list-style-type: none"> <li>0.1 kΩ to 99.9 kΩ</li> <li>100 kΩ to 999 kΩ</li> <li>1 MΩ to 9.99 MΩ</li> <li>10 MΩ to 99.9 MΩ</li> <li>100 MΩ to 1 GΩ</li> </ul> <p>Dielectric strength for external voltage up to 5 V DC or 30 V AC (with a load 200 kΩ)</p>	<ul style="list-style-type: none"> <li>0.1 kΩ</li> <li>1 kΩ</li> <li>10 kΩ</li> <li>100 kΩ</li> <li>100 kΩ</li> </ul>	<ul style="list-style-type: none"> <li>± (2 % + 1 digit)</li> <li>± (2 % + 1 digit)</li> <li>± (2 % + 1 digit)</li> <li>± (5 % + 1 digit)</li> <li>± (5 % + 1 digit)</li> </ul>
<b>Isolation Resistance (8 V, max. 9 mA); Iso:</b> 	<ul style="list-style-type: none"> <li>0.1 kΩ to 99.9 kΩ</li> <li>100 kΩ to 999 kΩ</li> <li>1 MΩ to 9.99 MΩ</li> <li>10 MΩ to 40 MΩ</li> </ul> <p>Dielectric strength for external voltage up to 5 V DC or 30 V AC (with a load 200 kΩ)</p>	<ul style="list-style-type: none"> <li>0.1 kΩ</li> <li>1 kΩ</li> <li>10 kΩ</li> <li>100 kΩ</li> </ul>	<ul style="list-style-type: none"> <li>± (2 % + 1 digit)</li> <li>± (2 % + 1 digit)</li> <li>± (2 % + 1 digit)</li> <li>± (5 % + 1 digit)</li> </ul>
<b>Resistive Symmetry Balance; RSym:</b> 	<ul style="list-style-type: none"> <li>10 Ω to 5 kΩ</li> </ul> <p>Dielectric strength for external voltage up to 30 V DC or 30 V AC (with a load 200 kΩ)</p>	<ul style="list-style-type: none"> <li>0.1 Ω</li> </ul>	<ul style="list-style-type: none"> <li>0.2 % of Rs ± 0.2 Ω</li> </ul>
<b>Loop Resistance; R:</b> 	<ul style="list-style-type: none"> <li>1 Ω to 999.9 Ω</li> <li>1 kΩ to 9.999 kΩ</li> <li>10 kΩ to 99.99 kΩ</li> <li>100 kΩ to 999.9 kΩ</li> <li>1 MΩ to 9.999 MΩ</li> <li>10 MΩ to 4.0 MΩ</li> </ul>	<ul style="list-style-type: none"> <li>0.1 Ω</li> <li>1 Ω</li> <li>10 Ω</li> <li>100 Ω</li> <li>1 kΩ</li> <li>10 kΩ</li> </ul>	<ul style="list-style-type: none"> <li>± (1 % + 3 digits)</li> <li>± (1 % + 1 digit)</li> <li>± (1 % + 1 digit)</li> <li>± (1 % + 1 digit)</li> <li>± (2 % + 1 digit)</li> <li>± (5 % + 1 digit)</li> </ul>
<b>DC Current; IDC (I =):</b> 	<ul style="list-style-type: none"> <li>0.1 mA to 500 mA</li> </ul>	<ul style="list-style-type: none"> <li>0.1 mA</li> </ul>	<ul style="list-style-type: none"> <li>± (2.5 % + 3 digits)</li> </ul>
<b>Unbalance at 1 MHz; LCL:</b> 	<ul style="list-style-type: none"> <li>0 dB to 55 dB</li> <li>55.1 dB to 65 dB</li> </ul> <p>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.</p>	<ul style="list-style-type: none"> <li>0.1 dB</li> <li>0.1 dB</li> </ul>	<ul style="list-style-type: none"> <li>± 1.5 dB</li> <li>± 3 dB</li> </ul>
<b>NEXT at 1 MHz; NEXT:</b> 	<ul style="list-style-type: none"> <li>0 dB to 65 dB</li> </ul> <p>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.</p>	<ul style="list-style-type: none"> <li>0.1 dB</li> </ul>	<ul style="list-style-type: none"> <li>± 1 dB</li> </ul>
<b>Remote Kit Control:</b>	<ul style="list-style-type: none"> <li>Use ARGUS and ARGUS Copper Box to control different Remote Kits to switch the Line on the remote side.</li> </ul>		
<b>Other Functions:</b>	<ul style="list-style-type: none"> <li>Autotest</li> </ul>	<ul style="list-style-type: none"> <li>Signature detection (e. g. PPA)</li> </ul>	<ul style="list-style-type: none"> <li>Fast cable check</li> </ul>
<b>Reference Conditions (calibration):</b>	<ul style="list-style-type: none"> <li>Temperature: 23 °C ± 5 °C</li> <li>Relative humidity: 50 % ± 20 % relative humidity, non-condensing</li> </ul>		<ul style="list-style-type: none"> <li>Frequency of measurement type: 50 Hz ± 5 Hz, sinus</li> </ul>

## Specifications Copper Tests:

General:	Applications, Settings + Results:	
<b>TDR Test</b> Time Domain Reflectometer	<ul style="list-style-type: none"> <li>Determination of the Loop Length</li> <li>For Identification and Detection of Shorts, Opens, Impedance Mismatch, Bridged Taps/Stubs, Moisture, Loading Coils, Loose Contacts and more</li> <li>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</li> <li>Graphic Display of Reflection Course</li> </ul>	<ul style="list-style-type: none"> <li>Measurement Range: 3.5 up to 6000 m</li> <li>Res.: 0.025 % of Measurement Range; Accuracy: ±2 %</li> <li>Configureable gain: -26 dB up to +44 dB</li> <li>Config. Pulse: 5 ns up to 3.2 μs, Pulse Height: 5 V and 20 V</li> <li>Dynamic range: 60 dB / Amplification Level</li> <li>Zoom + Cursor for a Detailed Analysis</li> <li>Save + Set of Reference Curve</li> <li>Start/Stop Function (Realtime Mode)</li> </ul>
<b>Line Scope</b> DSL Spectrum Analysis DSL Oszilloscope	<ul style="list-style-type: none"> <li>Monitoring in Time/Frequency Domain on all Types of Lines for Telecommunications</li> <li>Monitoring on active Lines with up to 200 VDC and 40 Vpp</li> <li>For Identification and Detection of different Access Types (DSL, ISDN, ...)</li> <li>Modem Finder, via Handshake Tones</li> <li>Detection of Disturbances/Disturbing Signals</li> <li>Frequency Range: 20 kHz up to 35 MHz</li> <li>Resolution: 67 Hz up to 8.625 kHz or 0.025 % of Measurement Range, Accuracy: ±2 dB</li> <li>Config. Gain FFT: -26 dB up to +20 dB</li> </ul>	<ul style="list-style-type: none"> <li>High-impedance or Line Termination:                             <ul style="list-style-type: none"> <li>- Input Impedance: 3,6 kΩ, &lt;10 pF</li> <li>- Switchable 100 Ω Input Resistance</li> </ul> </li> <li>Graphic Display of FFT [dBm/Hz] and of Time (Oszilloscope)</li> <li>Configureable X-Axis: FFT or Time [μs]</li> <li>Automatic Trigger in Time Domain</li> <li>Zoom + Cursor for a Detailed Analysis</li> <li>Save + Set of Reference Curve</li> <li>Start/Stop Function (Realtime Mode)</li> <li>Peak Hold Function (Min/Max Trailing)</li> <li>Symmetry Toggling (see Active Probe)</li> </ul>
<b>ARGUS Active Probe II*</b>	<ul style="list-style-type: none"> <li>ARGUS Active Probe II for Passive, High-impedance Intrusion on Active Connections (xDSL, POTS, ...)</li> <li>Input Impedance: 70 kΩ, &lt;1 pF</li> <li>Frequency Range: 10 kHz bis 35 MHz</li> </ul>	<ul style="list-style-type: none"> <li>Hiding the Useful Signal Symmetry/Asymmetry Toggling</li> <li>- Attenuation Symmetric: 14,5 dB</li> <li>2 x 4 mm Banana Jacks</li> <li>Data Transfer to ARGUS via RJ45</li> </ul>

Documentation and Analysis
<ul style="list-style-type: none"> <li><b>Documentation</b> of all parameters recorded to test reports (in device and on PC) via automatic access tests</li> </ul>
<ul style="list-style-type: none"> <li>Transfer of test results via <b>QR code</b> to a smartphone or via WLAN, ETH or DSL to cloud (FTP server).</li> </ul>
<ul style="list-style-type: none"> <li>Free of charge firmware updates via <b>cloud</b> or <b>ARGUS update tool</b></li> </ul>
<ul style="list-style-type: none"> <li>WLAN extension for transferring test results to systems of an electronic order processing system, remote control via smartphone.</li> </ul>
<ul style="list-style-type: none"> <li>Free firmware and software updates available via <a href="http://www.argus.info">www.argus.info</a></li> </ul>

Device Specifications	
<b>Technical Features:</b> <ul style="list-style-type: none"> <li>Power supply</li> <li>Hotkey</li> <li>Power management</li> <li>Keypad</li> <li>LCD colour display</li> <li>6 LEDs</li> <li>Handset</li> <li>CE marking</li> <li>User safety</li> <li>RoHS conformance</li> </ul>	Li-ion battery pack or mains adaptor Quick start of various tests User configurable 18 keys, 4 cursor keys, 3 context-sensitive softkeys QVGA - 320 x 240 pixels, backlit Indicating the status + Ethernet port LEDs Integrated earpiece and microphone Complies with CE directives Fulfills EN 60950-1:2006-11 Conformance according to WEEE directive
<b>Interfaces:</b> <ul style="list-style-type: none"> <li>2x RJ-45</li> <li>2x Ethernet</li> <li>SFP port</li> <li>USB client interface</li> <li>2x USB host interface</li> <li>WLAN</li> <li>Headset</li> </ul>	For xDSL, G.fast, ISDN and POTS 10/100/1000 Base-T, RJ-45 test ports 100 Base-FX/LX, 1000 Base-SX/LX/ZX/BX Type mini B Type A IEEE802.11a/b/g/n Jack (TRS 2.5 mm, approx. 3/32")
<b>Environmental conditions:</b> <ul style="list-style-type: none"> <li>Operating temperature</li> <li>Storing temperature</li> <li>Relative humidity</li> </ul>	0 °C (+32 °F) up to +50 °C (+122 °F) -20 °C (-4 °F) up to +60 °C (+140 °F) Up to 95 %, non-condensing
<b>Dimensions:</b> <ul style="list-style-type: none"> <li>Size</li> <li>Weight</li> </ul>	H x W x D: 254 x 99 x 73 mm (10.0 x 3.9 x 2.9 in) approx. 920 g (2.03 lbs, ARGUS incl. battery pack)

Standard package:	
xDSL basic package with Bridge/router mode, IP ping and traceroute test, IPv6, Line scope, Network scan, Text browser, Cloud services, WINplus license (download version), The hardware is ready for the use of SFP, Lithium-Ion battery pack, Carrying case, Mini USB cable, Test leads, Carrying strap, Mains adaptor, Hand strap, English manual and menu map	
<b>Basic package:</b>	
• ARGUS 163 VDSL2 (inkl. profile 35b / Super Vectoring)	Order number 116312
<b>Additional interface:</b> (test leads included)	
• G.fast interface	Order number 016313
• VDSL2 Bonding (up to profile 35b)	Order number 016309
• ADSL Annex A + L + M interface	Order number 016305
• ADSL Annex B + J interface	Order number 016306
• GPON	Order number 016392
• POTS TE interface	Order number 016315
• ISDN BRI S/T TE interface	Order number 016316
• ISDN BRI S/T NT interface	Order number 016319
• ISDN BRI U (TE) interface	Order number 016371 (2B1Q) or 016370 (4B3T*)
• ISDN PRI/E1 (TE/NT) interface	Order number 016320
<b>Additional test features:</b> (depends on existing interface)	
• LAN cabling tests (incl. PoE/PoE+, 2 ARGUS LAN Probes)*	Order number 016361
• SFP using	Order number 016390
• WLAN option	Order number 016359
• LTE option	Order number 016356
• PESQ (VoIP, ISDN and POTS)	Order number 016331
• Download Package (HTTP/FTP Download, FTP Upload/Server via xDSL, G.fast, Ethernet)	Order number 016329
• VoIP test (ADSL, VDSL2, Ethernet)	Order number 016330
• IPTV test / IPTV ext. (ADSL, VDSL2, G.fast, Ethernet)	Order number 016337 / 016339
• VoIP + IPTV package (ADSL, VDSL2, G.fast, Ethernet)	Order number 016333
• Loop Function for Ethernet Interface	Order number 016328
• TDR (Time Domain Reflectometer)	Order number 016351
• ARGUS Active Probe II	Order number 015091
• ARGUS Copper Box	Order number 015099
• WINplus (incl. CD and manual)	Order number 010012
• WINanalyse license (Download version)	Order number 016562
• WINanalyse (incl. CD and manual)	Order number 015042
* We would be glad to provide further details and information about additional accessories on request.	



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