

ARGUS® 156

XDSL - TESTER

G.fast

VDSL

ADSL

SHDSL

GigE

LTE·))

ISDN

POTS

Cu

TDR

LQ

Copper
Box

Data
101101011011

IP
TV

Vo
IP

PESQ

USB

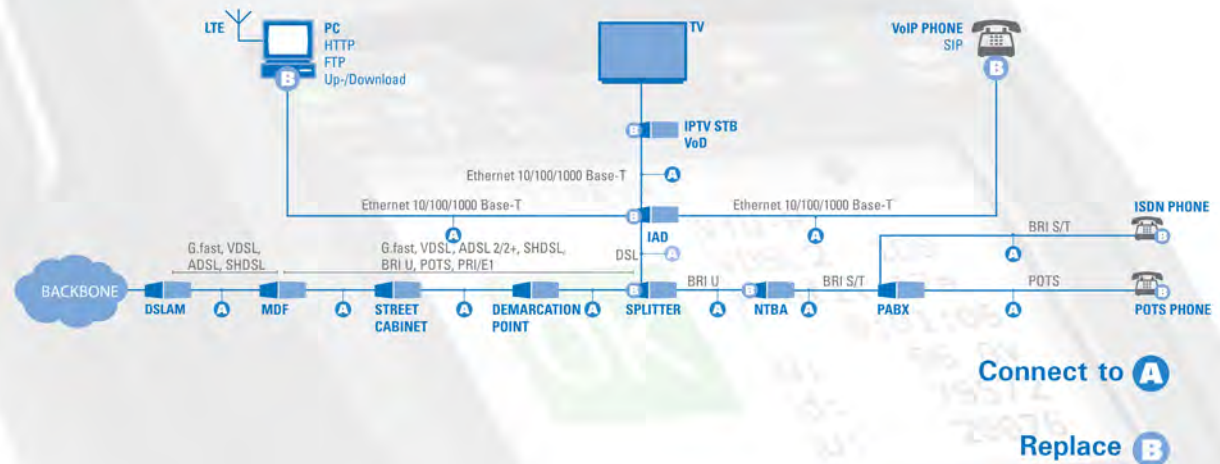
WLAN·))



intec

GESELLSCHAFT FÜR
INFORMATIONSTECHNIK mbH

Where to use the ARGUS?



The handy all-rounder for SHDSL measuring

The ARGUS 156 triple-play and xDSL combi tester is a low-cost, hand-held device for all xDSL interfaces, such as G.fast, VDSL (super vectoring + profile 35b bonding), ADSL and SHDSL.

It is the ideal entry-level meter for high-end SHDSL measuring technology and for servicing and commissioning business and backbone accesses through a combination of E1 interface (PRI) and SHDSL-TDM/ATM/EFM. The built-in interfaces can be flexibly expanded as needed to add additional functions, for instance telephony (ISDN/POTS), copper (TDR, DMM etc.) or wireless (WLAN, LTE).

Copper tests for physical line qualification

The ARGUS 156 also enables (advanced) copper tests for physical line qualification without synchronising with the remote station. Triple-play testing (Data, VoIP and IPTV) is also available as an option).

Your advantage

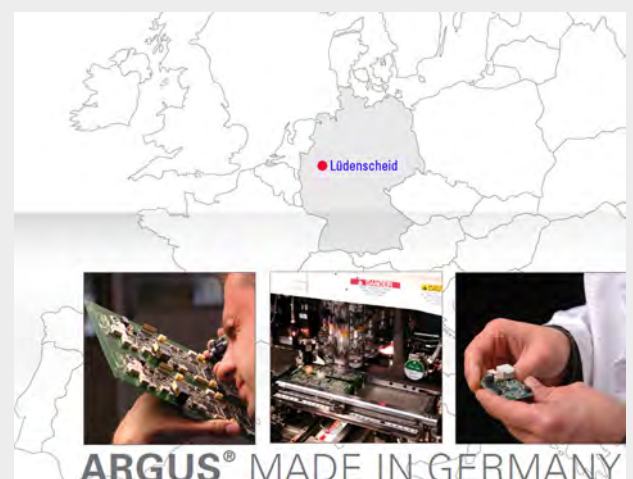
As a handy all-rounder with a wide range of interfaces and expansion options, the ARGUS 156 is the ideal mix of an all-in-one and single-interface tester.

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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>G.fast Tester </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>VDSL Tester </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)</p>	<p>ADSL Tester </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>G.fast / VDSL / ADSL</p> <ul style="list-style-type: none"> • Net Data Rate [kBit/s] • Attainable Data Rate [kBit/s] • Relative Capacity [%] • SNR Margin / Loop Attenuation [dB] • Output Power [dBm] • Interleave Delay [ms] • Impulse Noise Protection [Symbols] • FEC + CRC, Far/Near [Errors] • ES, SES, LOSS + UAS, Far/Near [sec] • Reset / Resync [Number] • Bitswap Events • Seamless Rate Adaption (SRA) • Retransmission (G.INP) • Vendor, Far/Near [Name] • Version, Far/Near [Number] • Modem Trace • Bits/SNR/QLN/Hlog Tone/Freq. Graphs • OK/Fail Evaluation: Bitrate, CRC, FEC • DC Voltage, UDC 	<p>G.fast / VDSL</p> <ul style="list-style-type: none"> • 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 <p>VDSL</p> <ul style="list-style-type: none"> • Vectoring Mode • Graphic Long-time Trace In ARGUS <p>ADSL</p> <ul style="list-style-type: none"> • Latency Mode • Graphic Long-time Trace In ARGUS • ATM Statistics: OAM Cells, User VCCs, AAL5 PDUs, Unmapped Cells/VPI/VCI 	
<p>SHDSL Tester </p> <p>SHDSL Modem Simulation, STU-R, CPE SHDSL Terminal Device 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</p>	<p>GigE Tester </p> <p>Ethernet According to IEEE 802.3 10/100/1000 Base-T (RJ45/8P8C)</p>	<p>LTE Scanner </p> <p>LTE Tester Via LTE USB Stick</p> <ul style="list-style-type: none"> • Long Term Evolution (3.9G) • 800, 1600 and 2600 MHz • 2 x Ext. Antenna Connection (CRC-9)* 	<p>WLAN Scanner </p> <p>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"> • Internal FPC Antenna or • External Antenna (RP SMA Socket)* • WEP To WPA2 Enterprise 	<ul style="list-style-type: none"> • TC Sublayer: ATM, TDM, HDLC, EFM • 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] <ul style="list-style-type: none"> • 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: OAM Cells, User VCCs, AAL5 PDUs • Parameters/Segment (for SRU) 	<ul style="list-style-type: none"> • Link Status / Autonegotiation, Far/Near • Auto-MDI(X) Function • Speed (10, 100, 1000 Mbit/s) • Duplex Mode (Full, Half) / Flow Control <ul style="list-style-type: none"> • Polarity/Wire Pair (+/-) • Pair skew/Wire Pair [ns] • Frames, Bytes (Rx/Tx) [Number] • Errors, Collisions [Number]
<p>WLAN Scanner </p> <p>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"> • Internal FPC Antenna or • External Antenna (RP SMA Socket)* • WEP To WPA2 Enterprise 	<ul style="list-style-type: none"> • Access Point Mode (WLAN Router) • WLAN for Smartphones/Laptops for: <ul style="list-style-type: none"> - Downloading via xDSL/Ethernet - Browsing via xDSL/Ethernet • WLAN Scan (WLAN Terminal) • Counter: Found Access Points • List: Found Access Points • Number 2.4 GHz / 5 GHz Networks 	<ul style="list-style-type: none"> • Network/Name (SSID) • Signal Strength (RSSI) [dBm] • Signal Quality [%] • MAC Address of AP • Used Channel/Frequency • Used Protocol • Negotiated Encryption / Authentication <ul style="list-style-type: none"> - Group Cipher / Pairwise Cipher 			

Specifications Protocol + IP Tests (Triple Play):

General:	Applications, Settings + Results:	
Protocol Tests	<ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Display of BRAS Information <ul style="list-style-type: none"> AC Name, Service Name, Session ID Display of PPP Information <ul style="list-style-type: none"> PPP Packets/Bytes (Tx/Rx) PPP Trace (PPP Commands, Time) Display of IP Information <ul style="list-style-type: none"> 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 (Data Tester) 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"> 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 <ul style="list-style-type: none"> FTP: Username + Password Display Results IP-Ping <ul style="list-style-type: none"> Display of Packets (Tx/Rx/repeated) Checksum Error [Number] Error Packets [Number] Round Tripe Time (min/max/avg) [ms] Display Results Traceroute 	<ul style="list-style-type: none"> Display Results Traceroute <ul style="list-style-type: none"> Current Hop + Probe / List of Hops Response Time of Hops [s] IP Address of Current Hops Display Results Down-/Upload <ul style="list-style-type: none"> Current/Total Number [Number] Already Loaded Data [%] Average Speed [Mbit/s] Loaded Bytes [MB] Transfer Time/Remaining Time [h:min:s]
VoIP Tests (VoIP Tester) 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 Necessary Call Generator (up to 30 Calls)	<ul style="list-style-type: none"> 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.726 (16/24/32/40), G.729 (A/B), G.711 (a-law/μ-law), G.722 Display of Own Number, Number of Called Person 	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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
IPTV Tests (IPTV Tester) IPTV STB Simulation (Settopbox) OK/Fail Evaluation IPTV Channel Scan IPTV Monitor (IPTV passive) VoD Test*	<ul style="list-style-type: none"> Configuration in IPTV Profiles (up to 3): Editable Channel List (up to 250 Channels) Multicast IP + Port, Channel Name, IGMP version 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 Different VLS for IGMP + RTP Scan Profiles (3) Configurable: max. Zapping Time VoD Profiles (3) Configurable: Type of Stream, Server Address + Port, File Name, RTSP Type + Server Type, Jitterbuffer Limits for VoD OK/Fail Evaluation: PCR Jitter, Continuity Error Display of Selected IPTV Channel, Test Duration, current Bitrate, OK or Fail Evaluation 	<ul style="list-style-type: none"> 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] VoD Error Status, Container Type, Packets, Bytes, Cont. Error, Bitrate and many more

Specifications Ethernet Tests:

General:	Applications, Settings + Results:	
Ethernet Cable Tests	<ul style="list-style-type: none"> Ethernet Port LED Flash 	<ul style="list-style-type: none"> Port LED Flash with Timing
Network Scan	<ul style="list-style-type: none"> Auto Mode (manual, autom.) Network Address + Net Mask Configurable Display of DHCP Discovery, Gateway, DHCP + DNS Server, Net Mask, No. of Detected Clients/Subnet 	<ul style="list-style-type: none"> Number of Open Ports/Clients Client Information: IP + Open Ports, MAC, Computer Name, NetBIOS Name Display of Detected Services, e. g. Mail, Print, Web, File, Database and many more
Loop	<ul style="list-style-type: none"> Layer Configurable (L1 to L3): MAC Modus (own MAC or all), VLAN Mode + ID, Prio., TPID Configurable, IP Mode and own IP Address Loop DSL/SHDSL (ATM): VPI/VCI Configurable 	<ul style="list-style-type: none"> Duration of Loop [h:min:s] Looped Packets, Looped Packets/Second [Number] Throughput [Mbit/s] MAC Address












Specifications ISDN:

General:	Applications, Settings + Results:	
BRI U Interface ETR 80/ANSI T1.601 ISDN BRI U TE Simulation	<ul style="list-style-type: none"> Line Coding: 4B3T or 2B1Q ISDN BRI U TE Mode, ISDN BRI U Leased Line ISDN BRI U Voltage Measurement (OK/Fail) 	<ul style="list-style-type: none"> Details about Tests, Functions and Results, see BRI S TE Interface High-Impedance listening, see POTS
BRI S Interface 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"> BRI S TE Mode, NT Mode, Leased line BRI S Monitor Mode Autom. Detection of Connection Configuration L2 Mode: automatic, P-P, P-MP Test Availability of B Channels BRI S Level and Voltage Evaluation Different Protocols configurable: Auto., DSS1, CorNet-N/T/NQ, QSIG, VN4 Setting: Alerting Mode, Clocking, BRI S Connection, Call Parameters, Services, Call Acceptance, Codec (A-law/μ-law), DTMF, CUG Index, Prefix, AOC, ... X.31 Test, configurable in Profiles (3): Packet Number, TEI, LCN, Size, Throughput, User Data, CUG/ Index, D-Bit, Facilities Non-intrusive listening (Monitoring not active) 	<ul style="list-style-type: none"> Level Measurement (Bus Supply, Phantom) Display of L1 Information (Info 0 to 4) Display L1, L2 and L3 of B Channel Status Bit Error Rate Test (BERT) ITU-T, G.821, Data, Time, LOS, Errors, HRX, EFS, SES and many more 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) Service Tests: Language, DFU, Audio, Fax, Mixed, OSI, Telephony, Teletex and many more Request of Call Forwarding (CF), Activating and Deleting Connection: Call (Single/Block Dial) Connection: Call Acceptance (Display of Number) Time Measurements: Duration, Interchannel Delay Loopbox for Leased Line
PRI interface 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"> Details about Tests, Functions und Results, see BRI S Interface Additional Functions/Settings: L1 Alarms: CRC-4, AIS, FAS, E-Bit, A-Bit, Sax Layer 1 Master/Slave Operation, TE/NT with Sax Instructions D Channel Trace, TE/NT Mode in PC/ARGUS Testing of PRI/E1 Leased Lines 	<ul style="list-style-type: none"> Bit Error Rate Test (BERT), ITU-T G.821 - in Extended Self Call and End-End-Distance-BERT Display of Bit Errors and Bit Error Rate OK/NOK Evaluation (see BRI S) Services Configurable (see BRI S) Manual Interspersing of Bit Errors Bit Pattern ITU-T O.150: 2E11-1/E15-1, free E1-BERT via all B Channels (MegaBERT)

Specifications POTS:

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

Specifications ARGUS Copper Box:

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

Specifications Copper Tests:

General:	Applications, Settings + Results:	
TDR Test Time Domain Reflectometer	<ul style="list-style-type: none"> 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 Graphic Display of Reflection Course 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Monitoring in Time/Frequency Domain on all Types of Lines for Telecommunications as well as on active Lines with up to 200 VDC and 40 Vpp For Identification and Detection of different Access Types Modem Finder, via Handshake Tones Detection of Disturbances/Disturbing Signals 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 Config. Gain FFT: -26 dB up to +20 dB 	<ul style="list-style-type: none"> High-impedance or Line Termination: <ul style="list-style-type: none"> - Input Impedance: 3.6 kΩ, <10 pF - Switchable 100 Ω Input Resistance Graphic Display of FFT [dBm/Hz] and of Time (Oscilloscope) Config. X-Axis: FFT or Time [μs], Auto. Trigger in Time Domain Zoom + Cursor for a Detailed Analysis Save + Set of Reference Curve Start/Stop Function (Realtime Mode) Peak Hold Function (Min/Max Trailing) Symmetry Toggling (see Active Probe)
Line Qualification (LQ)* Qualifying Local Loops	<ul style="list-style-type: none"> DSL Data Rate Estimation, Idealized with Slave + Master Bandwidth (ADSL, VDSL2) + Bandplan (VDSL2) Config. Sender, Tx Power: 12 dBm, 6 dBm, 0 dBm, Configurable Receiver (Rx), Sensitivity: up to -150 dBm/Hz 	<ul style="list-style-type: none"> Frequency Range: 4.3125 kHz up to 30 MHz (±2 dB) Impedance: 100 W, 120 W and 135 W, Configurable Supports Bits, SNR, QLN and Hlog per Tone Diagrams WB Symmetry Measurement
ARGUS Active Probe II*	<ul style="list-style-type: none"> ARGUS Active Probe II for Passive, High-impedance Intrusion on Active Connections (xDSL, POTS, ...) Input Impedance: 70 kΩ, <1 pF Frequency Range: 10 kHz bis 35 MHz 	<ul style="list-style-type: none"> Hiding the Useful Signal Symmetry/Asymmetry Toggling <ul style="list-style-type: none"> - Attenuation Symmetric: 14,5 dB 2 x 4 mm Banana Jacks 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**
- WLAN Extension for Transferring Test Results to Systems of an Electronic Order Processing System, Remote Control via Smartphone.
- Free Firmware and Software Updates Available via www.argus.info

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, 3 Context-Sensitive Softkeys
- **LCD Colour Display** QVGA - 320 x 240 Pixels, Backlit
- **6 LEDS** Indicating the Status + Ethernet Port LEDS
- **Handset** Integrated Earpiece and Microphone
- **CE Marking** Complies with CE Directives
- **User Safety** Fulfills EN 60950-1:2006-11
- **RoHS Conformance** Conformance According to WEEE Directive

Interfaces:

- **RJ-45** For xDSL, G.fast, ISDN and POTS
- **Ethernet** 10/100/1000 Base-T, RJ-45 Test Ports
- **USB Client Interface** Type Mini B
- **2x USB Host Interface** Type A
- **WLAN** IEEE802.11a/b/g/n
- **Headset** Jack (TRS 2.5 mm, approx. 3/32")

Environmental Conditions:

- **Operating Temperature** 0 °C (+32 °F) up to +50 °C (+122 °F)
- **Storing Temperature** -20 °C (-4 °F) up to +60 °C (+140 °F)
- **Relative Humidity** Up to 95 %, Non-Condensing

Dimensions:

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

Standard Package:	
xDSL Basic Package (incl. GigE Use) with Bridge/Router Mode, IP Tests (IP Ping, IP Traceroute, HTTP/FTP Download, FTP Upload/Server), IPv6, Line Scope, Text Browser, Cloud Services, WINplus PC-Software (Download Version), Carrying Case (Large), Lithium-Ion Battery Pack, Mini USB Cable, Test Leads, Mains Adaptor, Carrying Strap, Hand Strap, English Manual and Menu Map	
Basic Package:	
• ARGUS 156 VDSL2 (inkl. Profile 35b / Super Vectoring)	Order Number 115402
• ARGUS 156 SHDSL 2-Wire	Order Number 115422
• ARGUS 156 ISDN PRI TE/NT/Monitor	Order Number 115452
Additional Interfaces: (Test Leads Included)	
• G.fast Interface	Order Number 015413
• VDSL2 Bonding (up to Profile 35b)	Order Number 015409
• VDSL2 Interface (incl. Profile 35b / Super Vectoring)	Order Number 015408
• ADSL Annex A + L + M Interface	Order Number 015405
• ADSL Annex B + J Interface	Order Number 015406
• SHDSL 2-Wire Interface	Order Number 015412
• SHDSL 4-Wire Interface	Order Number 015414
• SHDSL 8-Wire Interface	Order Number 015418
• POTS TE Interface	Order Number 015415
• ISDN BRI S/T (TE/NT/Monitor) Interface	Order Number 015419
• ISDN BRI U (TE) Interface	Order Number 015471 (2B1Q) or 015470 (4B3T*)
• ISDN PRI/E1 (TE/NT) Interface	Order Number 015420
Additional Test Features: (Depends on Existing Interface)	
• WLAN Option	Order Number 015459
• LTE Option	Order Number 015456
• Line Qualification (LQ)*	Order Number 015460
• PESQ (VoIP, ISDN and POTS)	Order Number 015427
• VoIP Test (ADSL, VDSL2, SHDSL, Ethernet)	Order Number 015430
• IPTV Test / IPTV ext. (ADSL, VDSL2, SHDSL, Ethernet)	Order Number 015437 / 015439
• VoIP + IPTV Package (ADSL, VDSL2, SHDSL, Ethernet)	Order Number 015433
• TDR (Time Domain Reflectometer)	Order Number 015451
• ARGUS Active Probe II	Order Number 015091
• ARGUS Copper Box	Order Number 015098
• 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.	



GESELLSCHAFT FÜR
INFORMATIONSTECHNIK mbH

Rahmedestraße 90
D-58507 Lüdenscheid

Tel: +49 2351 9070-0

Fax: +49 2351 9070-70

E-Mail: sales@argus.info

Internet: www.argus.info

For More Information: Vicom Australia

1064 Centre Rd
Oakleigh South Vic 3167
Australia
1300 360 251
info@vicom.com.au
www.vicom.com.au



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