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ARGUS[®] 26

Premium tester with all important interfaces

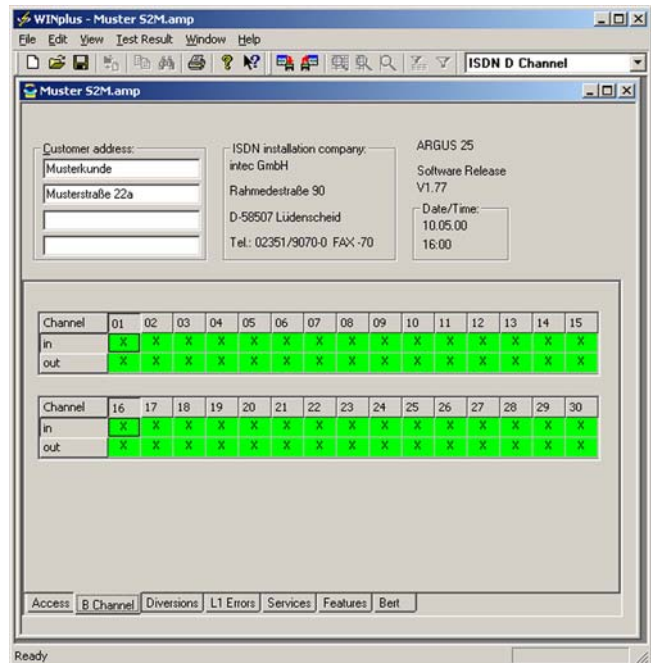
- PRI and BRI interface in TE/NT simulation mode
- D-channel passive monitoring for PRI and BRI
- U interface and POTS interface with CLIP in terminal mode
- POTS monitor with CLIP and DTMF decode
- X.21 interface as option
- 16 M-Byte internal D-channel data memory
- BERT and leased line test (PRI/BRI with/without D-channel)
- n x 64 kBit/s BERT tests
- Support of private PABX protocols
- Intuitive operation with cursor keys and softkeys
- Automatic access test sequence (Autotest) and test reports
- Data transfer to a PC
- Powered by the BRI, battery, accumulator or power supply
- Internal battery charging function
- Remote-Control by a PC
- Flash-ROM technology for software updates via PC (WINplus)
- E1-bit error test option on all time slots (framed/unframed)
- V5.1/V5.2 monitoring (up to 3 time slots / multiple E1 links)
- E1-BERT (MegaBERT) with n x 64kBit/s



ARGUS[®] 26 - The PRI Functions:

- E1-PRI interface in accordance with ETS 300 011, ITU-T G.703-HDB3 Code, automatic CRC detection
- Operation on U interface (LT/NT mode) and protected monitor points
- Operation modes:
 - TE mode (terminal simulation)
 - NT mode (network simulation)
 - D-channel monitor mode (high impedance) with online recording on PC or the internal 4 M-Byte memory, internal decode
 - D-channel trace in TE/NT mode to PC or memory, internal decode
- Automatic detection of protocol and configuration (CRC on/off)
- Protocols:

- DSS1, 1TR6, Cornet-T / N, QSIG(B.C.), X.25(D+B) case A/B, display of Layer 1-2-3 status and B-channel configuration
- Layer 1 alarms (CRC-4, AIS, FAS, E-Bit, A-Bit, frame error, code error, bit slips, Sa_x display)
- Layer 1-Master/Slave operation, LT/NT by Sa_x commands
- Software controlled Rx/Tx permutation
- access test sequence (Autotest) with up to 20 tests saved in memory to create a complete access test report
- Automatic Service Test: determines which ISDN services are available in send and receive direction
- Automatic test of the supplementary services
 - for 1TR6: interrogation of supplementary services
 - for DSS1: automatic tests of CLIP, CLIR, COLP, COLR, CFU, CFB, CFNR, AOC, DDI, SUB, UUS, support of keypad protocol



(Display of the PRI B-channel configuration with WINplus)

- Telephone functions with the Call hot-button
 - call number memory for 10 numbers or keypad protocol commands, X.31 test number, own number
 - displays for incoming calls: calling and called number, B-channel, ISDN service, type of number and numbering plan, display info elements, SUB address and UUS-1 data
 - displays during call: AOC-D in currency or charging units, display info elements, DTMF data
 - at end of call: AOC-E in currency/ charging units, clearing cause by number/text incl. location
- Selectable B-channel, en-bloc or overlap signalling
- Up to 30 concurrent PRI connections
- BERT bit error test with evaluation in accordance to G.821/G.826
 - extended self-call or end-to-end BERT
 - two concurrent BERT on B_x and B_y
 - loop-box for all or selected B-channels
 - displays the bit error count and remaining measuring time
 - manual injection of bit errors
 - measuring time: 1 min.- infinite

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- QRS test pattern acc. O.150: 2E11-1, 2E15-1, user defined
- selectable service for BERT connection
- G.821 analysis: ES, EFS, SES, US, DM and OK evaluation
- G.826 analysis: EB, ES, SES, BBE, SDP and OK evaluation
- adjustable OK/Not-OK bit error rate threshold and evaluation
- audible alarms for bit errors and LOS, LOS counter
- E1 bit error test on all B-channels/time slots simultaneously
- Configuration of type of number and numbering plan
- 3 user defined ISDN services: BC, HLC, LLC
- Tests of ISDN leased lines:
 - Telephone function and BERT
 - selectable B-channel and two concurrent BERT
 - loopbox for all or selected B-channels

ARGUS®26 - The BRI Functions:

- BRI interface in accordance with ITU-T I.430 in various operation modes:
 - TE mode (terminal simulation)
 - NT mode (network simulation)
 - monitor mode (passively monitor the BRI with online recording of the data on a PC or saving in the 4 M-Byte internal D-channel data memory)
- BRI-NT/TE functions like PRI
- Automatic detection of access configuration and protocol:
 - Point-to-point (P-P) or point-to-multipoint (P-MP)
 - DSS1, 1TR6, BILINGUAL, Cornet-T or NO protocol
- Protocols: DSS1, 1TR6, Cornet-T / N, QSIG(B.C.), X.25(D+B)
- Display of Layers 1-2-3 and the B-channel status (free/busy)
- Display of Layer 1 Info S0-S4
- Automatic test of ISDN services
- Automatic test of the supplementary services
 - for 1TR6: interrogation of supplementary services
 - for DSS1: automatic tests of CLIP, CLIR, COLP, COLR, HOLD, TP, CFU, CFB, CFNR, AOC-D/E, CCBS, CCNR, ECT, 3Pty, DDI, SUB, UUS, support of keypad protocol
- Bus status test with interrogation, display and clearing of the active call diversions CFU, CFB, CFNR for all services
- Using of two connections simultaneously
- Automatic X.31(D) test:
 - "Packet data in D-channel" available ?
 - automatic detection of the TEIs activated in the frame handler
 - simulation of X.31(D) terminal to X.25 network
- measurement of round trip delay and interchannel delay
- Layer 1 tests: measurement and evaluation of the phantom feed (OK, NORMAL or Restricted Power) and the L1 signal level

ARGUS®26 - The U interface and POTS Functions:

- U interface acc. ETR 80 / ANSI T1.601
- line coding: 4B3T or 2B1Q available, RJ 45 @ 150 Ohms
- automatic detection of U interface
- test in TE mode at U interface same as at S/T
- measurement of U interface voltage
- progr. D.C. load (up to 1200 mW incl. U/I measurement) for LT line card test
- POTS (a/b) interface with DTMF and pulse dial mode
- flash function (40-1000 ms)

- loop resistance: appr. 400 Ohm
- POTS voltage measurement incl. polarity for hook-on / hook-off)
- automatic detection of POTS interface
- CLIP and other caller ID services acc. ETS 300 659/778
- supports FSK and DTMF caller ID vers. incl. line reversal
- display of charging information (12 and 16 kHz)
- adjustable DTMF signal level, signal and interval length
- high-Z monitor with non-intrusive listen-to on POTS and U
 - measurement of voltage incl. polarity (up to 130 V)
 - online display of CLIP, date, time,... caller ID services
 - online display of DTMF dialing tones incl. A, B, C, D, *, #
 - works as receiver for tone generators

Technical Features:

- Power Supply: alternatively supplied from ISDN BRI, standard batteries (3x 1.5V Mignon AA), accumulators or the power supply
- low power consumption: 180-350 mW (POTS, S/T) battery lifetime: 15-33h (POTS,S/T), depends on type of battery
- Keypad: 16-keys, 2 cursor keys, 3 context-specific softkeys
- LCD Display: 4 lines with 16 characters each, backlit
- 5 LEDs to indicate status (ISDN Layers 1-2-3, PC Trace, power supply)
- Interfaces: RJ-45 line input for POTS / U / ISDN, RJ-45 serial interface to PC, RJ-11 for optional headset
- Dimensions: H 230 mm W 72 mm D 30mm
- Weight: 395g (without batteries)
- Environmental conditions:
 - Operating temperature: -10° - + 50 ° C
 - Storing temperature (under shade): - 15° - + 70°
 - Relative Humidity: up to 95 % , non-condensing
- CE marking: complies with CE directives
- User safety: EN 61010-1, EN 60950

Standard package: Tester incl. batteries, plug-in power supply, RJ-45-BRI and PRI connection cable, U/POTS interface connection cable, test adapter for S-bus wiring tests, WINplus PC software package, manual, shock-absorbing PVC jacket, carrying case

Optional accessories:

- WINanalyse PC-Software (ASN.1 D-channel decoding software for Windows 95,98,NT, 2000, ME)
- U interface
- V5.x monitor
- Printer option
- Headset
- Calibration certificate
- Special PRI cables (BNC-, Banana-plug-, Siemens-NTPM-cable.....)

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MegaBERT

The ARGUS 26 MegaBERT is a feature that does allow to do advanced tests on E1 / 2Mbps lines.

The standard BERT does already cover the major tests to evaluate the performance of 2 Mbp leased lines including:

- Interface:
 - Symmetric (120 Ohms) with RJ45 or banana/bantam connector
 - Asymmetric (75 Ohms) with BNC or 1/6-5/6 type of coax connector
- Transmission code:
 - HDB3, automatic detection of CRC-4 on /off
- Operating modes:
 - E1 Terminal Equipment (TE with Rx,Tx), E1 Monitor (Rx1, Rx2)
- L1-Errors and Alarms:
 - Signal/LOS, FAS, NFAS, MFAS, A-bit, AIS, CRC-4 error counter (abs./rel.), E bits (E1, E2), E bit error counter, Code and Frame error counter, display of Sa5 and Sa6 bits
- Monitormode:
 - display of alarms and errors for both directions (TE/NT)
- Loop commands:
 - selectable Sa6: 1111, 0000 = LE loop, 1010 = NT loop
 - selectable A-bit : 0 or 1 to switch HDSL repeater loops
- Direction bit :
 - Sa5 : 0000 or 1111 (user selectable)

Standard BERT features :

- BERT on 1 or 2*64kbps timeslot (2 concurrent BERT)
- BERT pattern: 2E15-11, 2E11-1
- HRX value: user programmable, default: 15 %
- Evaluation:
 - G. 821, G.826 analysis, programmable BER threshold
 - Passed / Failed evaluation
 - G.821: EFS, ES, SES, US, AS, DM, loss of pattern synchr.
 - Manual injection of errors
 - Accoustic alarm upon bit errors and loss of pattern synchronization
 - Output via WINplus/WINanalyse software or printer option
- Duration: 1 min, up to infinite
- Loop box mode: all B channels or selected B channels
- BERT on PRI (framed,unframed) and BRI (incl. D channel) leased lines
- Modes: end-to-end, compatible with standard PRI/E1 tester
- Test via remote loops or LT/NT/repeater loops activated Sax commands
- Concurrent BERT(s) and concurrent calls in the various timeslots
- Switchable input sensitivity (> + 32 dB) allows operation on protected monitor points and Uk2/V2m

MegaBERT features:

MegaBERT provides the BERT function over the entire 2 Mbps bandwidth over all timeslots of the G.703 / G.704 based line. One can either do a 2048 kbps BERT on the 32 timeslots of the unframed G.703 line or a 1984 kbps BERT on the 1-31 timeslots on the framed G.704 Line. These tests, that are done before the line is put into ser-

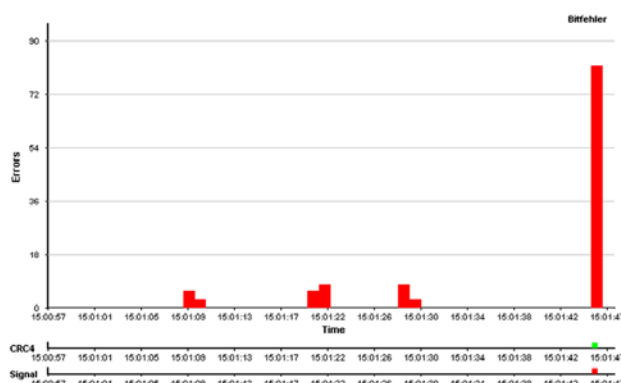
vice, are end-to-end compatible with standard E1 testers like Acterna PA-25, PFA-35 or the Interceptor series.

All the layer 1 alarms, errors messages and bit errors are transferred online to the MegabERT PC software for realtime display or can be stored with time-stamp in the ARGUS 26 internal 16 Mbyte memory for later evaluation.

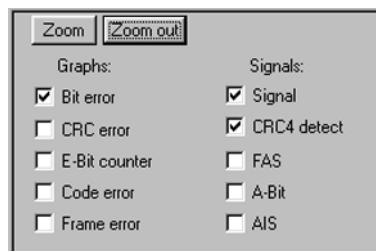
Multiple histograms and the display of the various signal states easily allow to find correlations among the data. Details can be zoomed into view on the time scale.

Histogramm of bit errors

Screenshots of the PC-Software WINanalyse



Bit errors over time in correlation with CRC-4 and input signal state.



Select the histograms and signals to be displayed

- Bit pattern: 2E15-1, 2E15-1 inverted, 2E20-1, 2E20-1 inverted, all 1s , all 0
- Analysis:
 - Acc. G.821 and G.826 standards, programmable BER threshold
 - Manual insertion of errors and audible alarms
 - Output by PC or direct printout via Argus printer option on standard parallel printer
 - Histogramms of CRC and bit errors, E bit, Code and Frame errors (multiple display of all combinations)
- Leased line BERT modes: end-to-end, via remote loop, via NT/LE/repeater loop
- L1 clock: recovered from receive clock or internal (slave and master mode)

Optional:

- clock signal analysis: output of internal receiver Rx1 and receiver Rx2 clock signals synchronized to different sources (send and receive clock, different E1 links from same/different carriers, public and private network clock) to external precision counters via special RJ11 to 2* BNC cable