

## Acterna ANT-5 SDH Access Tester up to STM-16

### The access network explosion

The modern communications market is challenging network operators in new ways. Because growth from traditional voice services has declined, operators must find new ways to carry more data traffic in order to maintain their revenue stream. However, bandwidth bottlenecks in the access and metro networks have prevented many new high-speed, high-bandwidth services from being deployed.

Field technicians, who are tasked with installing and maintaining these networks, must learn how to test a wide variety of technologies while they strive to reach new levels of productivity. To perform these tasks, technicians need an increased amount of equipment and additional training to operate each device effectively.

In addition, operators must be able to manage the conflicting demands of technicians, who need the proper equipment and training to do their jobs, and executives, who are keeping close control on capital expenses and operating costs.

### The ANT-5 rises to the challenge

Acterna can help meet this challenge with the Acterna ANT-5 SDH Access Tester. Designed for field operations, the small, rugged, battery-powered ANT-5 streamlines installation and maintenance testing. Its advanced features and automated functions enable technicians to perform tests quickly and effectively. And with SDH, PDH, SONET, and ATM combined into a single compact unit, capital investment and training expenses are reduced, minimizing business costs.

### Highlights

- Smallest and lightest test solution for interfaces from 1.544 Mbps up to 2.5 Gbps at 2.2 kg
- Optical testing at dual wavelengths at STM-1/OC-3, STM-4/OC-12, and STM-16/OC-48
- Electrical testing at DS1/E1/E3/DS3/E4 and STM-1/OC-3 interfaces
- Full analysis of concatenated mappings with SDH/SONET signals VC-4-4C/OC-12C, VC-4-16C/OC-48C
- In-depth PDH analysis with Sabit generation and flexible MUX/DEMUX test configuration
- Optical power measurement capability for easy detection of physical layer integrity
- ATM analysis for service verification of ATM and 3G/UMTS networks testing new ATM services carried over PDH, SDH/SONET
- ECL NRZ port enables nonintrusive direct monitoring of optical networks

### The portable solution

The ANT-5's compact, robust design is ideal for field and central office applications. The convenient, built-in stand and comfortable carry strap enable hands-free testing in any location. And its extended battery life means testing can be undertaken even when AC power is not on hand.

Optional carry cases protect the ANT-5 when technicians travel between sites and provide a safe and convenient place for storing cables and accessories.

### Easiest handheld to learn and use

Access technicians need a tester that can simplify their key tasks without extensive training. With its large color screen, graphical user interface, and ergonomic keypad, the ANT-5 is the easiest to learn and use handheld on the market. Other features include:

- Labelled LEDs that show current and historical alarms
- OK results summary and pass/fail results screen displays
- Autosave of test results
- Fast store and recall of key network configurations
- Automatic tests

### Access technicians' tool of choice

The ANT-5 provides all the transmission test functions required in today's access network:

- Optical power measurement
- Bit error rate testing
- G.821, G.826, G.828, G.829, ANSI, M.2100, M.2101 analysis
- Received signal offset measurement
- Transmit signal offset and generation
- Tabular and graphical event recording

### Extensive SDH/SONET features

The ANT-5 is packed with SDH and SONET test features covering all the installation and maintenance tasks up to 2.5 Gbps:

- STM-1e/STS-3 interface
- STM-1/OC-3 to STM-16/OC-48 optical ports
- 1310 nm and 1550 nm wavelengths
- Autoconfiguration
- Anomaly and defect generation and analysis
- APS/service disruption measurement
- Round Trip Delay measurements (RTD)
- SOH and POH generation and analysis (HEX or cleartext format)
- Path trace generation and analysis
- Tandem connection monitoring (TCM)
- Automatic tributary scanning
- Pointer generation and analysis
- K-Byte capture

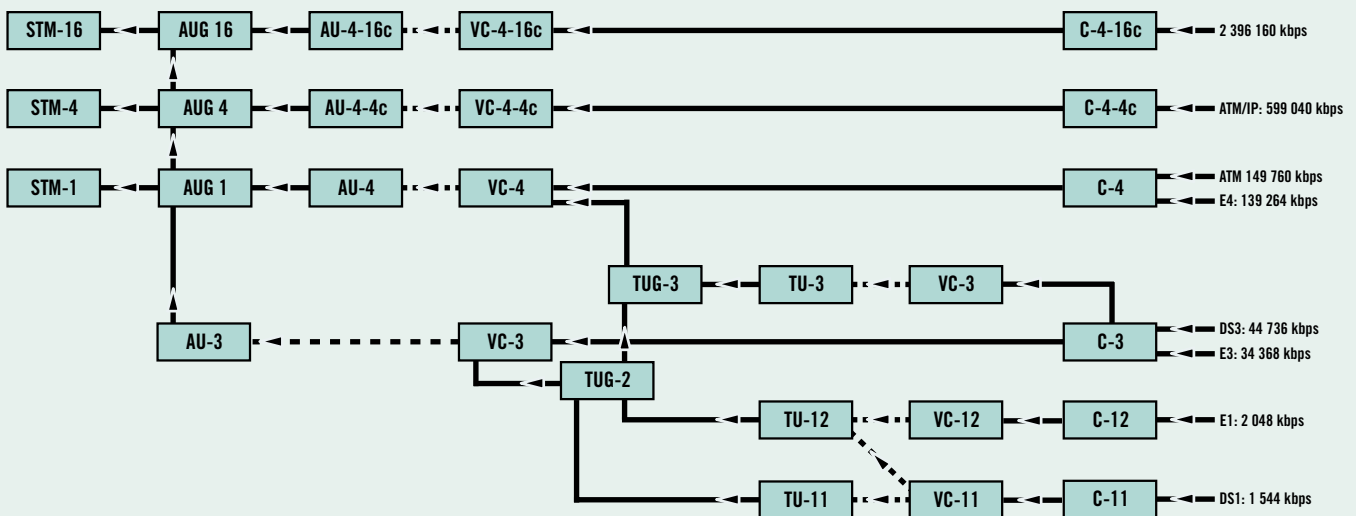


figure 1 STM mapping structure (SDH systems)

### Full PDH support

From 1.5 Mbps to 140 Mbps including Nx64 Kbps, the ANT-5 can test all PDH tributaries and legacy PDH hierarchy transmission systems using high-level functions that include E1 Sa bit generation and display.

### ATM service verification

UMTS network rollout and ADSL growth is increasing the use of ATM in the access network. The ANT-5 enables the installation and maintenance of ATM carried over PDH, SDH, and SONET networks that include:

- DS1, STS-1 SPE, DS3
- E1, E3 (G.832), E4
- VC-4/STS-3c SPE
- VC-4-4c/STS-12c SPE

PVC cells can be generated over UNI and NNI with CBR and VBR traffic load profiles up to STM-4c rates.

Service quality can be checked using BER or O.191 measurements. Link and channel performance can be monitored while traffic statistics are recorded.

Channel Explorer scans automatically for active VCI/VPI and displays the result in tabular form.

### Simple test and results management

Thanks to its built-in Ethernet port, CompactFlash memory card port, and printer port, the ANT-5 can integrate more effectively and more simply with day-to-day operations.

- Export standard test setups to other ANT-5s or PCs via the CompactFlash card
- Exchange results over LANs using Windows-based PCs
- Print test reports

### Advanced remote testing capability

The ANT-5 provides out-of-the-box remote testing capability over Ethernet. As a result, technicians can poll instruments remotely from their offices, simplifying long-term commissioning and maintenance tests and dramatically reducing travel time and costs. Test results can be saved to any network hard disk or printed from any network printer for convenient analysis.

### Flexible, cost-effective platform

The ANT-5's flexible design enables it to be adapted quickly to operators' changing requirements. And its field upgradeable capability, provided by the CompactFlash port, enables technicians in the field to install software in minutes.

Hardware upgrades can be purchased to add optical bandwidths or wavelengths. This protects the initial investment and reduces additional training expenses while allowing operators to match capital expenditures to network rollout plans.

This Acterna offering is an industry-leading access tester that sets new standards for portability, ease of use, and adaptability. The ANT-5 is the ideal device for field technicians who need to test a range of SDH, PDH, SONET, and ATM digital links both on site and from a remote location. As a result, the ANT-5 provides a significant advantage for companies that wish to optimize quality of service using a cost-effective, industry-proven solution.

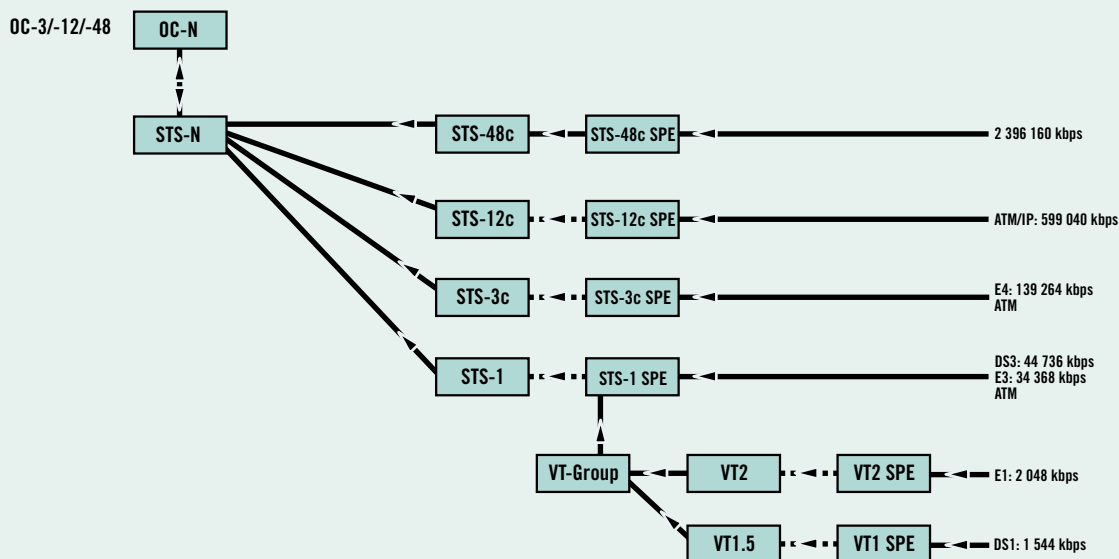


figure 2 STS mapping structure (SONET systems)

## Technical specifications

### G.703 transmitters

#### BNC 75 Ω unbalanced outputs

Bit rates and line codes	
– 2048, 34368 Kbps	HDB3
– 44736 Kbps <sup>(1)</sup>	B3ZS
– 139264, 155520 Kbps	CMI

#### RJ48 120 Ω balanced output

Bit rate and line codes	
– 2048 Kbps	HDB3

### G.703 receivers

#### BNC 75 Ω unbalanced inputs

Bit rates and line codes	
– 2048, 34368 Kbps	HDB3
– 44736 Kbps <sup>(1)</sup>	B3ZS
– 139264, 155520 Kbps	CMI

#### RJ48 120 Ω balanced input

Bit rate and line codes	
– 2048 Kbps	HDB3

### Clock recovery

– Pulling range as G.703

#### Selectable input gain

– 155520 Kbps	20 dB
– 2048, 34368, 44736, 139264 Kbps	26 dB

### T1 interface

Connectors	Bantam
Input impedance	100Ω
Bit rate	1544 Kbps
Line Code	AMI, B8ZS

### E1 Hi-Z input

A high input impedance setting for the E1 75Ω, E1 120Ω and T1 100Ω ports enables these signals to be monitored without a PMP.



<sup>(1)</sup>ANSI T1.101 compliant

## G.957 optical transmitter and receiver (options)

– Class 1 laser product

### Connectors

– FC-PC connectors

### Transmitter wavelengths

– Single wavelength 1310 nm  
– Dual wavelengths 1310 nm and 1550 nm

### Line bit rates

– 155.52 Mbps  
– 622.08 Mbps  
– 2488.32 Mbps

Line code scrambled NRZ

### Optical transmitter specifications

Optical Option	Line rate	Wavelength	Tx Output power @ 1310nm	Tx Output power @ 1550nm
BN4565/00.01	STM1	1310SR	-8dBm to -15dBm	
BN4565/00.03	STM1	1310SR/1550LR	-8dBm to -15dBm	+2dBm to -4dBm
BN4565/91.13	STM1/4	1310SR	-8dBm to -15dBm	
BN4565/00.14	STM1/4	1310SR/1550LR	-8dBm to -15dBm	+2dBm to -4dBm
BN4565/91.15	STM1/4	1310LR/1550LR	+2dBm to -4dBm	+2dBm to -4dBm
BN4565/91.16	STM1/4/16	1310LR/1550 LR	+3dBm to -3dBm	+3dBm to -3dBm

### Optical receiver specifications

Optical Option	Line rate	Wavelength	Rx Dynamic range @ 1100 to 1600nm	Rx Optical overload
BN4565/00.01	STM1	1310SR	-8dBm to -28dBm	N/A
BN4565/00.03	STM1	1310SR/1550LR	-8dBm to -28dBm	N/A
BN4565/91.13	STM1/4	1310SR	-8dBm to -28dBm	N/A
BN4565/00.14	STM1/4	1310SR/1550LR	-8dBm to -28dBm	N/A
BN4565/91.15	STM1/4	1310LR/1550LR	-8dBm to -28dBm	N/A
BN4565/91.16	STM1/4/16	1310LR/1550 LR	-8dBm to -28dBm	-6dBm

### Optical power measurement

Measurement of the received optical signal level

Resolution: 1 dB

### 155/622/2488 Mbps electrical interface

For connecting ANT-5 to STM-1/OC03, STM-4/OC12 and STM-16/OC-48 monitor points

Line code: scrambled NRZ

Input voltage (peak to peak) 0.2 to 1V

Coaxial input

Connector/Impedance SMA/50Ω

### Transmit clock synchronization

Internal stability ±3.6 ppm

Tx Bit Rate offset ±100 ppm

Step size 0.1 ppm

### External clock (SDH transmitter)

Connector BNC 75 Ω  
(120 Ω via external adapter)

Reference clock 2048 kHz

Reference signal 2048 Kbps (HDB3)

### **Mappings (to ITU G.707)**

The following mappings are provided as standard with the instrument

- C12 mapping (2 Mbps in STM-1, AU-4, asynchronous mode)
- C3 mapping (34 Mbps in STM-1, AU-4)
- C3 mapping (45 Mbps in STM-1, AU-4)
- C4 mapping (140 Mbps in STM-1)

### **SDH output signals**

**STM-1 signal consists of one VC-n container with**

- Framed or unframed PDH test pattern
- Test pattern without stuffing bits (bulk signal to 0.181)

**Content of nonselected containers**

- STM-1 PRBS  $2^{15}-1$  (framed/unframed as per selected container)

**STM-4 signal consists of one VC-n container with**

- Framed or unframed PDH test pattern or test pattern without stuffing bits (bulk signal to 0.181)
- Three VC-4 containers each filled with a fixed pattern of 11100110

**STM-16 signal consists of VC-n containers with**

- Framed or unframed PDH test pattern or test pattern without stuffing bits (bulk signal to 0.181)

### **SDH and PDH generation**

The content of all bytes, with the exception of A1/A2, B1/B2/B3 and H1 to H4, is programmable with any byte.

- Selectable synchronization messages (S byte)
- Selectable signal labels (C byte)
- Trace identifier
- J0 programmable 1 byte hexadecimal or 16 byte ASCII sequence with CRC
- J1, J2 programmable 16 byte ASCII sequence with CRC or 64 byte ASCII sequence

### **PDH output signals**

**Signal structures for all bit rates**

- Unframed test pattern
- Framed test pattern (to ITU-T 0.150)
- **Frame types**
- 1544 Kbps unframed, SF, ESF
- 2048 Kbps unframed, PCM31, PCM31CRC
- PCM30, PCM30 CRC (to ITU G.704)
- 34368 Kbps unframed, framed G.751, framed G.832
- 44736 Kbps unframed, framed C-parity, framed M13
- 139264 Kbps unframed, framed G.751

### **Test patterns**

Test patterns may be generated and measured for any of the provided bit rates either directly at the SDH/PDH interface or within the STM-16/STM-4/STM-1 substructure. Additionally, test patterns can be generated and measured at 64 Kbps and nx64 Kbps rates within an E1 frame.

PRBS:  $2^{15}-1$ ,  $2^{20}-1$ ,  $2^{23}-1$ ,  $2^{31}-1$ ,  
 $2^{15}-1$  inv.,  $2^{20}-1$  inv.,  
 $2^{23}-1$  inv.,  $2^{31}-1$  inv.

Programmable word 16 bits

### **Anomaly and defect insertion**

#### **Defect generation**

Static ON/OFF

#### **Anomaly generation**

single or at a continuous error ratio of  $1 \times 10^{-n}$  where the range of n is as indicated below

### **Payload**

Bit errors (TSEs): n=2-9

#### **SDH structure**

##### **Anomalies**

B1, B3 n=4-9  
MS-REI, LP-BIP (except C4),  
LP-REI (except C4) n=3-10  
B2 n=3-9  
HP-REI n=4-10

SDH anomaly burst generation anomalies:

B1, B2, MS-REI, B3, HP-REI, LP-BIP, LP-REI  
Anomalies are injected in n consecutive frames every m frames or seconds

##### **Defects**

LOS, LOF, RS-TIM, MS-AIS, MS-RDI, AU-LOP, AU-AIS, HP-UNEQ, HP-RDI, HP-TIM, HP-PLM, TU-LOP, TU-AIS, TU-LOM, LP-UNEQ, LP-RDI, LP-TIM, LP-PLM, LP-RFI

#### **PDH structure**

##### **Anomalies**

FAS n=3-10  
EBIT (framed 2 Mbps only) n=3-10  
CODE (framed 2 Mbps only) n=3-8  
CRC (framed 2 Mbps and 1.5 Mbps  
ESF only) n=3-9  
P-BIT (framed 45 Mbps only) n=4-8

##### **Defects**

AIS, LOF, RDI, LOS  
Yellow (1.5, 45 Mbps)  
Idle (45 Mbps only)  
DS1 code error inject  
DS3 error code/PVP analysis  
SDH and PDH receive signals  
Signal structures as for generator unit

### **Error measurements**

#### **Error types**

B1, B2, B3, MS-REI, HP-REI, LP-REI, TSE, LP-BIP, PDH, FAS-45, FAS-34, FAS-2, FAS-1.5, REI-45, CP-BIT, EBIT-2, CRC-2, code errors (2 Mbps), HP-IEC, LP-IEC, HP-OEI, HP-TC-DIFF, HP-TC-REI

#### **Alarm detection**

All alarms are monitored and detected simultaneously.

#### **Alarm types**

LOS, OOF, LOF, MS-AIS, MS-RDI, RS-TIM, AU-AIS, AU-LOP, AU-NDF, HP-RDI, HP-UNEQ, HP-TIM, HP-PLM, TU-AIS, TU-LOP, TU-LOM, LP-RDI, LP-PLM, LP-UNEQ, LP-TIM, LSS, LP-RFI, PDH-AIS, PDH-RDI, Yellow (1.5, 45 Mbps only)  
Idle (45 Mbps only)

#### **Receive signal frequency measurement**

Receive signal frequency is displayed and deviation from nominal shown in ppm.

Resolution 0.1ppm

#### **OK summary display**

Display of large OK for error free circuits for fast and simple installation checks. Upon detection of any anomaly or defect the OK is removed and replaced with a hierarchical list of events – allowing easy diagnosis of problems. Display of signal structure with BER or BLER displayed simultaneously.

#### **LED event history**

On screen soft LEDs and defect panel alarms can be set to display historical events. These are displayed yellow to easily distinguish them from current alarms that are displayed red.

#### **Performance analysis**

##### **ITU-T recommendation G.821**

ES, EFS, SES, DM and UAS are evaluated. Pass/fail assessment based on line length allocation of 1 to 100%. Evaluation for higher bit rates (up to 140 Mbps) is obtained using a multiplex factor as per annex D of G.821. Measurements can be made using the following events: bit errors (TSEs), FAS-2, CRC-4 and E bit and code errors (2 Mbps), FAS-34, FAS-140.

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**ITU-T recommendation G.826**

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EB, BBE, ES, EFS, SES, and UAS are evaluated. Pass/fail assessment based on line length allocation of 1 to 100%. The SES and UAS thresholds can be set by users.

**In-service measurement (ISM)**

Simultaneous in-service measurement of the near end and far end of a selected path:

Measurements can be made using the following events: RSOH B1, MSOH B2, HP B3, FAS-140, FAS-34, FAS-2, CRC and code errors (2 Mbps), LP-BIP.

**Out-of-service measurement (OOS)**

Out-of-service measurement using bit errors in the test pattern (for PDH and SDH).

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**ITU-T recommendation G.828 Results**

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ES, EFS, SES, BBE, SEP, UAS

Pass/fail assessment based on path allocation of 1 to 100%.

The SES and UAS thresholds can be set by users.

**Hierarchy**

RSOH B1, MSOH B2, HP B3, LP-BIP, TSE.

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**ITU-T recommendation G.829 Results**

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ES, EFS, SES, BBE, UAS

The SES threshold can be set by users.

**Hierarchy**

RSOH B1, MSOH B2, TSE.

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**ITU-T recommendation M.2100**

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ES, EFS, SES and UAS are evaluated. Pass/fail assessment based on line length allocation of 1 to 100%. The UAS and BISO (bringing into service objectives) thresholds can be set by users.

**PDH systems**

Measurements can be made using the following events: TSEs, FAS-1.5, FAS-2, FAS-34, FAS-140, CRC, and code errors (2 Mbps).

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**ITU-T recommendation M.2101**

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ES, EFS, SES, BBE, SEP, and UAS are evaluated. Pass/fail assessment based on line length allocation of 1 to 100%. The UAS and BISO (bringing into service objectives) thresholds can be set by users. ISM simultaneously for near end and far end of a selected path:

Measurements can be made using the following events: TSE, LP-BIP, HP-B3, MSOH-B2, RSOH-B1.

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**Defect panel**

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On-screen hierarchical LED indication of defects.

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**Event log**

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Tabular display of time stamped events.

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**Anomaly count**

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Table of all anomalies with measured count and ratio.

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**Graphical display (histogram)**

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Display of errors and alarms as bar graphs versus time.

Zoom function allows display resolution of seconds, minutes, hours and days.

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**SOH and POH evaluation**

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Display of complete SOH and POH in hex, binary and ASCII formats.

Text decode of S and C bytes for the trace identifier.

J0 display of 16 byte ASCII sequence.

J1, J2 display of 16 or 64 byte ASCII sequence.

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**Auto protection switching (APS)**

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Operates on SDH and PDH interfaces

**Measurement triggers**

MS-AIS, AU-AIS, TU-AIS, or bit error

**Pass/fail user specified time limit**

– 10 to 2000 ms

– 1 ms resolution

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**Service disruption**

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**Measurement start trigger**

TSE, AIS

**Measurement stop trigger**

Last event

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**K-Byte capture**

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Captures K1 and K2 Byte

**Capture trigger**

User selectable

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**Tandem connection monitoring (TCM)**

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Analysis of N1 and N2 bytes

Monitoring/display of:

TC-IEC, TC-AIS, TC-REI, TC-OEI, TC-UNEQ, LTC,

TC-AIS, TC-RDI, TC-ODI, TC-REI

Online display of TCM access point identifier

TCM error measurement

Incoming B3/computed BIP comparison

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**Round trip delay (RTD)**

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Resolution +/- 1  $\mu$ s

Except for:

E1 PDH +/- 100  $\mu$ s

E1 SDH VC12 +/- 100  $\mu$ s

E2 (when carried within PDH E3 or E4) +/- 10  $\mu$ s

VC11/12bulk +/- 10  $\mu$ s

Measurement range 10 s

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**Pointer analysis and generation**

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**Pointer analysis**

Pointers analysed AU, TU

Current pointer values displayed

Displays counts of:

– pointer increments

– pointer decrements

– increments and decrements, sum and difference

– new data flags (NDFs)

Average deviation (in ppm) of AU and TU

User selectable recording of pointer events into the event log.

**Pointer generation**

Pointer generation in AU, TU

Generation of pointers by:

– single pointer increment

– single pointer decrement

– rated pointer increment

– rated pointer decrement

Frame rate: 100 to 8000

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**Repetitive BER test**

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BER evaluation over user definable period 1-99 seconds

Automatically repeating feature

Progress bar displays the current test period

Large character display of BER result

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**VC-12 tributary scan**

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Enables sequential BER testing of C12 channels using configured test pattern. Automatically scans selected VC-12 containers for defects and anomalies.

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**Concatenated mappings option (BN4565/93.59)**

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Enables measurements of contiguous concatenated signals (STM-4c/16c):

VC-4-4c (requires optical interfaces STM-4 or higher)

VC-4-16c (requires optical interface STM-16)

STS-12c (requires optical interfaces STM-4 or higher and SONET option)

STS-48c (requires optical interface STM-16 and SONET option)

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**PDH mux/demux option (BN4565/93.58)**

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For testing of legacy PDH systems. Generates structured signals from nx64 Kbps to 140 Mbps.

Output signal hierarchy 2, 34, 140 Mbps

Structure depth nx64 Kbps, 2, 8, 34 Mbps

E1 Sa bit Tx generation and Rx display

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**SONET STS-1/STS-3c/OC12c(3) mapping option (BN4565/93.62)**

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Enables to generate and receive STS-3/OC3 and OC12 signals. Transmitter and receiver specifications as defined. Signal structures and measurements as defined for SDH above.

The following mapping is provided:

– 599040 Kbps via STS-12c SPE

– E4 via STS-3c SPE

– DS3/E3 via STS-1 SPE

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**SDH AU-3/SONET VT mapping option (BN 4565/93.53)**

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AU-3 mapping function enables testing of DS-1, E1, E3 and DS3 tributaries mapped into STM-1 signal via VC-3/AU-3:

VC11/TU11 (1544Kbps in STM-1 via TU11, AU3)

VC11/TU12 (1544Kbps in STM-1 via TU12, AU3)

VC12 (2048Kbps in STM-1 via TU12, AU3)

VC3 (34368Kbps in STM-1 via VC3, AU3)

VC3 (44736Kbps in STM-1 via VC3, AU3)

The VT mapping function enables testing of DS-1 and E1 tributaries mapped into an STS-1 SPE via VT-1.5 and VT2 SPEs (requires option

BN 4565/93.62 SONET STS-1/STS-3c/OC12c mapping)

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**ATM (option) (BN4565/93.54)**

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For testing of ATM services carried over PDH, SDH, and SONET

– Tests ATM over DS1, E1, E3, DS3, E4, VC-4/OC12 and VC-4c/OC12c, STS-1SPE

– CBR and VBR traffic generation

– Full cell header editing

– Cell BER tests

– 0.191 QoS measurements

– ATM link and channel statistics

– OAM cell generation and analysis for VC/VP AIS and RDI

– ATM Channel Explorer

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**Remote operation option (BN4565/93.60)**

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Enables ANT-5 to be remotely operated via V.24 or Ethernet from a s/w emulation of the instrument GUI running on a Windows PC.

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**Remote control option (BN4565/93.61)**

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Enables ANT-5 to be remotely controlled over V.24 using SCPI command set.

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**Measurement timers**

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Variable 1 second to 99 days

Measurement start manual or delayed start timer

Measurement stop manual or automatic timer

Display of elapsed time hh:mm:ss

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**Results memory**

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Resolution of error events 1 second

Alarm resolution 100 ms

Memory capacity up to 10,000 entries (approx. seven days at one entry per minute)

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**Alarm notification**

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Anomalies and defects are indicated via LEDs, on-screen graphic icons and via an audio beeper.

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**Printing**

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Setups and measurement results can be printed using printers compatible with DeskJet, Thinkjet, Epson 9, and Epson 24 print drivers.

**Printer/remote interface**

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– Serial V.24/RS 232

– Parallel using adapter cable K1589

– ASCII printing possible

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**Result export**

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Results can be exported to PC in .CSV format using V.24, Ethernet (requires remote operation option BN4565/00.60) or a CompactFlash card. These can be processed using standard PC software, such as Excel™, Word™.

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**Result evaluation (off line)**

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Results (ANT-5 format) can be loaded, analyzed and printed by any Windows™-based PC using the ANT-5 Off-line Viewer SW.

Enables generation of specific setups with easy download to the unit.

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**Ethernet port**

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RJ-45 Connector

10Base T

TCP/IP

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**Display**

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Color TFT LCD screen

Resolution 320 x 240 pixels

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**Languages**

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The user interface can be displayed in the following languages:

English, German, French, Spanish, Portuguese, and Chinese

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**CompactFlash**

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CompactFlash card slot

- Type I and II

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**Power outage function**

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In the event of an AC line power failure during a measurement, continues to perform measurements using its internal batteries.

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**General specifications**

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**Power supply**

AC line voltage using series specific adapter

100 to 240 V

AC line frequency

50/60 Hz

Typical operating time on batteries

3 hours

Safety class to IEC 1010-1 Part 1

(for connection to SELV only)

Pollution environment degree 2

Installation category II (indoor use)

Ambient temperature

Nominal range of use

+5° C to +45° C

Storage and transport range

-20° C to +60° C

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**Weight and dimensions (L x W x H)**

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- 275 mm x 197 mm x 76 mm

- Weight

2.2 kg

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### Ordering information

ANT-5 PDH/SDH Access Tester BN4565/50

### Optical options (equipped with FC/PC interface)

Optics STM-1	1310 SR	BN4565/00.01
Optics STM-1	1310SR/1550LR	BN4565/00.03
Optics STM-1/-4	1310 SR	BN4565/91.13
Optics STM-1/-4	1310SR/1550LR	BN4565/00.14
Optics STM-1/-4	1310LR/1550LR	BN4565/91.15
Optics STM-1/-4/-16	1310LR/1550LR	BN4565/91.16

### Options (New Build)

(applicable when ordering with a new unit)

Concatenated Mappings	BN4565/93.59
PDH Mux/Demux	BN4565/93.58
Remote Operation	BN4565/93.60
Remote Control / SCPI command list	BN4565/96.61
SONET option (STS-1, STS-3c,OC-12c)	BN4565/93.62
SDH AU3/SONET VT mapping	BN4565/93.53
ATM option	BN4565/93.54

### Options (Customer Installed)

(applicable for upgrades of already delivered units)

specify serial number of the instrument when ordering

Concatenated Mappings	BN4565/95.59
PDH Mux/Demux	BN4565/95.58
Remote Operation	BN4565/95.60
Remote Control / SCPI command list	BN4565/96.61
SONET option (STS-1, STS-3c,OC-12c)	BN4565/95.62
SDH AU3/SONET VT mapping	BN4565/95.53
ATM option	BN4565/95.54

### Accessories

*CF card (> 16 MByte) and adapter	BN4565/00.42
*Neckstrap	BN 4562/00.53
*PPS-2 power Supply	BN 4565/00.57
* Power Cord (Select: European, US, Australian, UK)	
* Operating Manual (Select: English, German, French, Spanish, Italian, Chinese)	BN 4565/98.xx

\* included with PDH/SDH Access Tester

### Transportation cases

Hard carrying case	BN4565/00.76
Soft carrying case	BN4518/00.08

### Peripheral cables

Printer cable	K1524
Modem cable	K1550
Serial to parallel printer cable	K1589

### Optical cables (Singlemode, 2 meters)

FC-PC to FC-PC	K1605*
FC-PC to SC/PC	K1606*
DIN 47256 to FC-PC	K1607*
FC-PC to E2000	K1608*
FC-PC to E2000 APC	K1609*
FC-PC to ST-PC	K1610*
FC-PC to Radiall VFO	K1611*
FC-PC to FC-APC	K1612*
FC-APC to FC-APC	K1613*

### Electrical cables

BNC to BNC (2m)	K169*
RJ-48 (M) to 2xCF	K1597
RJ-48 (M) to RJ-48	K1598
RJ-48 (M) to RJ-48 (M)/ (F)	K1599

\* When selecting these cables, please order 2 pcs.  
(one required for Tx, one required for RX)

## Acterna Advantage<sup>SM</sup> – adding value with global services and solutions

From basic instrument support for your field technicians to management of complex, company-wide initiatives, Acterna's service professionals are committed to helping you maximize your return on investment. Whatever your needs – product support, system management, education solutions, tailored test & measurement solutions or refurbished equipment – we offer programs that will give you the competitive edge. To learn more about how Acterna can help your business be more successful, visit the services section on your local web page at [www.acterna.com](http://www.acterna.com).

Acterna is the world's largest provider of communications test solutions for telecommunications and cable network operators. A trusted communications test partner for more than eight decades, Acterna offers an unmatched portfolio of award-winning instruments, systems, software and services that help its customers reduce network costs while improving performance and reliability. Headquartered in Germantown, Maryland, USA – with European and Asia-Pacific operations based in Eningen, Germany and Hong Kong – Acterna serves nearly every major communications service provider and equipment manufacturer around the world through a skilled sales and support organization in 31 countries.

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