CMA 3000 SPECIFICATIONS

ISDN PRI Call Emulation options

Fixed access network testing has never been easier

CMA 3000 is Anritsu's next-generation portable, compact and user-friendly field tester. It's designed specifically for field technicians who install and maintain mobile-access and fixed-access networks, transmission networks and switching.

The CMA 3000 is a powerful tool for a wide range of applications, including fast first-aid troubleshooting to comprehensive, in-depth and all-layer analysis of transmission problems. With the ISDN Call Emulation option, the battery-powered CMA 3000 is an easy-to-use, easily transportable test instrument for installation, operation and maintenance of the fixed access network 2 Mbps Primary Rate Interfaces (PRI).

The basic CMA 3000 configuration, with its two 2 Mbps receivers and transmitters, supports framed and unframed testing and monitoring of 2 Mbps systems. This makes CMA 3000 the ideal instrument for measuring in- and out-of-service transmission quality.

Futureproof design

The modular design provides you with a clear and cost-effective upgrade path. This allows you to expand the CMA 3000 from a full-featured transmission line quality tester into an advanced signaling analyzer.

By adding options the CMA 3000 becomes a highly flexible field tester with the ability to test a large number of interfaces and technologies, including SDH, ATM, E3/DS3 and Ethernet interfaces, frame relay lines and the Abis interface of GSM and GPRS networks. Other options turn the CMA 3000 into a very powerful signaling analyzer for GSM, GPRS/EDGE, SS7, and ISDN protocols.

Key Features	Key Applications
• Establish speech connection • BER test • Availability of supplementary services • Automated channel test • All-layer protocol analysis options for ISDN and other protocols	• Installation testing • Connectivity testing • Rapid in-service diagnostics and troubleshooting

The ISDN Call Emulation option provides the necessary functionality for testing ISDN connections. The instrument can setup and receive ISDN calls with user-specified parameters such as called number and facilities. When a connection is setup, a voice call or a BER test can be made. Special facilities allow testing the availability of supplementary services.

If ISDN signaling decode options are added, the user gains access to the powerful ISDN protocol functionality of CMA 3000. This includes message monitoring with all-level decode, result presentation in mnemonics, powerful signalling statistics and easy-to-use filter facilities. Measurement functions include supervision of the monitored lines and audio access to the traffic channels, as well as line-status and performance measurement.

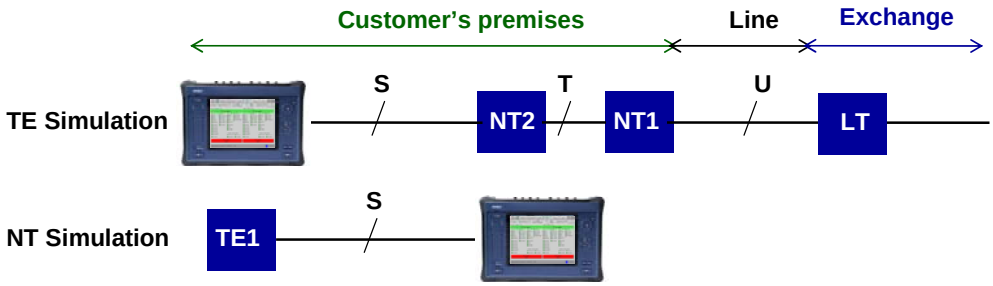

Figure 1 ISDN call emulation configurations.

Call Emulation

The call emulation function permits the user to setup or answer ISDN calls. The user has numerous call setup options which are all easily configured in the call setup display. The number to be called can either be entered on the instrument itself or the optional telephone set. To load an ISDN connection fully, up to 30 calls can be active at the same time.

The user has several options for testing an established connection; a conversation with the called party can be carried out on the optional telephone set or by performing a BER test. The BER test can be made with either a far-end loopback or by applying a self-call test. In this case the instrument makes a call to itself using two B-channels. The test pattern is inserted in one B-channel and transmitted; received, verified and returned in the second B-channel; and finally received and verified in the first B-channel.

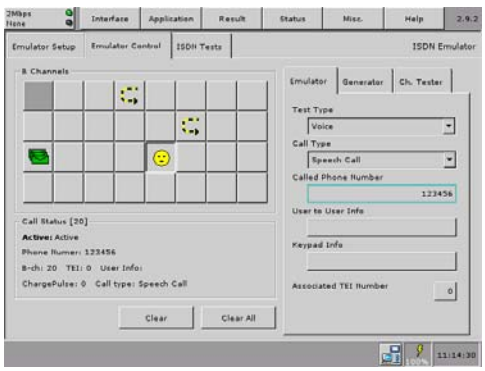

Figure 2 The status of the emulator will be presented to the user on the Emulator Control page. Calls are activated and answered in the same display.

The user can initiate repeated call setups to a set of telephone numbers with the Call Generator feature. The Call generator generates up to 8 concurrent calls. The number(s) called may be those entered into the phone list of the instrument or one entered when the call generator is started.

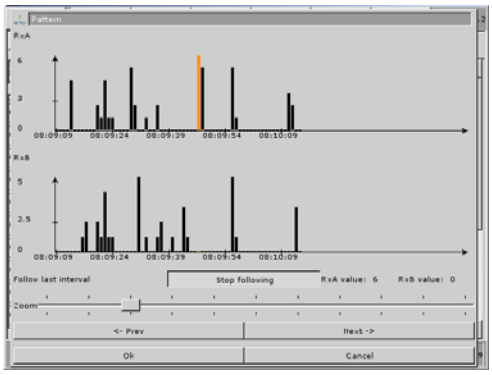

Figure 3 Histogram presentation of the error measurement made on an ISDN connection.

An automated BER test of each of the traffic channels of an ISDN line can be initiated with the ISDN channel test feature. Hereby all B-channels of the line are easily tested for availability and error performance.

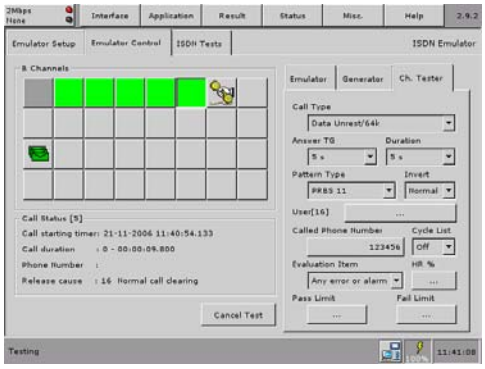

Figure 4 During and after the channel test the status of the test and the results for the individual channels are displayed in the ISDN channel test status display.

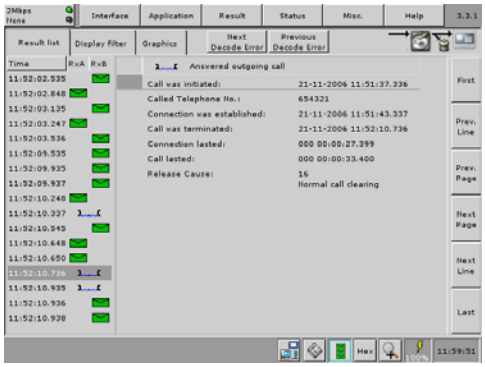

Figure 5 In the log measurement, a Call Data display provides a summary of each call made.

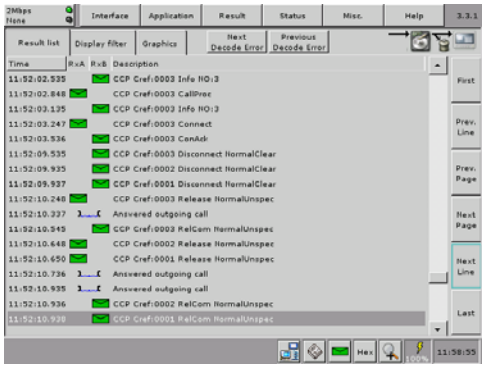

Figure 6 The log list displays signalling details of the call if the CMA 3000 is equipped with the related signalling decode protocol.

Supplementary service test

The instrument allows the user to test the availability of supplementary services on an ISDN line. Calls that require a given supplementary service can be made, and the instrument will inform on the availability of the particular service.

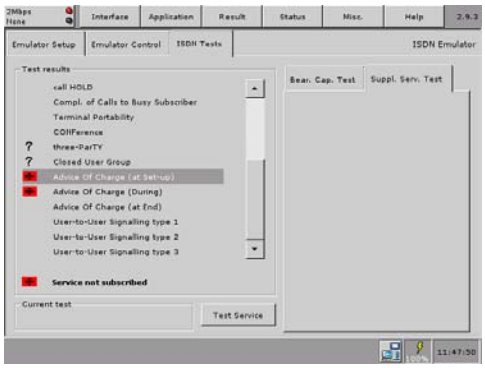

Figure 7 The status display of the CMA 3000 shows the supplementary services detected on the tested line.

Specifications

Below are specifications for a basic CMA 3000 with an ISDN PRI call emulation option. For further information on the basic functionality please consult the CMA 3000 basic instrument specifications sheet.

General	
Emulation modes	The iinstrument supports 2 Mbps PRI: • TE simulation • NT simulation
General functionality	• Setup a call, user conversation through handset, clear call • Setup a call, make an automated BER test, clear call
Emulation settings	• Simulator mode: Emulate terminal, Emulate Network • Configuration: Loopback, self-call, end-to-end • B channel, called number, type of number, numbering plan, calling party number • Test type (e.g. Voice, BERT) • Call type (e.g. speech, data) • Incoming call reply: manual(always), manual(speech), automatic (loopback, pattern, tone), selective (loopback, pattern, tone) • Dial mode: Overlap (digit-by-digit), en-bloc • Answer timer (1, 2, 5, 10, 20, 30, ∞ seconds). • Send charge pulse (off, send in INFO, send in FACILITY), interval (1-50 sec) • TEI: 0 to 63

Called number list	Up to 20 called numbers can be stored in the instruments phone book
Simulator status and result	Each call will provide the following information: • Call state (idle, calling, dialling etc.) • Call type (outgoing, incoming). • Start time: the time the call was initiated. • Release cause. • Call time: the duration of the call. • Connection time: the duration of the connection. • Charging information (if any).
Simultaneous calls	Up to 30 active calls simultaneously
Automatic test of services	General functionality • Setup a call with required service, clear call. After a call, a PASS/FAIL indication will show if the call setup was successful. ISDN bearer capability test: • For ISDN DSS1 (Q.931 etc.) the test includes: Speech call, Data unrestricted/64k, 3.1k audio, 7k call, 3.1k telephony, Fax group 2/3, Fax group 4, Videotext new, Teletext, Mixed mode, OSI, 7k telephony. Supplementary services • For ISDN DSS1 (Q.931 etc.): Call Waiting (CW), Calling-Line Id. Presentation (CLIP), Calling-Line Id. Restriction (CLIR), Multiple Subscriber Number (MSN), SUB-addressing (SUB), Call Forwarding Unconditional/Busy/No Reply (CFU/CFB/CFNR), Malicious Call ID. (MCI), Terminal Portability (SUSPEND/RESUME), Completion of Calls to Busy Subscriber (CCBS), Call Hold (HOLD), Three-PartY service (3TPY), Conference calling (CONF), Closed User Group (CUG), User-to-User Signalling (UUS), Advice Of Charge (AOC)
Measurement of Bit Error Ratio (BERT)	Supported patterns • PRBS 6, PRBS 7, PRBS 9, PRBS 11, PRBS 12, PRBS 15, PRBS 20, PRBS 23 • QRSS 11, QRSS 20 • All 0s, All 1s. • Alternating (1:1), (1:3), (1:7), (3:24). • Quick brown fox • User-defined up to 16 bits. Length in steps of 1 bit. • User-defined up to 2048 bits. Length in steps of 8 bits. • All patterns, except “All 0”, “All 1” and “Fox”, can be inverted. BERT functionality: • Detection of pattern errors and slip-in received signal. • Insertion of pattern errors and slip-in generated signal. Error insertion: • Manual burst. • Burst length: 1-255 consecutive errors. • Continuous: burst length * 10^{-2}, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6} ,10^{-7}. • Provoking of G.821events (ES, SES etc.) Slip insertion: manual.
Call Generator	Continuous generation of calls: • Number of concurrent calls: Up to 8 • Call type: User selectable • Answer time out: User selectable • Call duration: User selectable • Time between calls: User selectable • Number to call: Cyclic from the instruments phone book or defined by the user when the call generator is started.

Channel test	Automated test of the available B-channels: • Call type: User selectable • Answer time out: User selectable • Test duration: User selectable • Pattern type: Available test patterns or none • Pass/fail evaluation: on a user defined parameter or HR% • Time between calls: User selectable • Number to call: Cyclic from phone list or defined by the user when the call generator is started.

Results	
Statistics	User-defined resolution: 1, 2, 5, 10, 15, 30s, 1, 5, 10, 15, 30 min, 1, 2, 4, 6, 12 hours Information logged: • Alarms • Code error count/ratio • Pattern bit (BER), FAS, CRC-4 and E-bit error count/ratio and G.821, G.826 or M.2100 parameters • Frequency deviation information
Event Log	Events are logged with 1 msec resolution time stamps Logged events: Detected alarms and errors. Call emulation logs - Each call will provide the following information: • Call state (idle, calling, dialling etc.) • Call type (outgoing, incoming). • Called or calling phone number if applicable • Start time: the time the call was initiated. • Release cause. • Call time: the duration of the call. • Connection time: the duration of the connection. • Charging information (if any). Filters enable/disable the logging of individual events Display of logged events: • Logged events are shown as text in a table

Miscellaneous	
Phone Interface	RJ-11 with a 6 slot 4 connector configuration AC impedance: Approx. 600Ω. The phone will be supplied with a constant current of approx. 20 mA The following functions are supported: • Detection of ON/OFF hook state. • Generation of dial tone. • Reception and recognition of DTMF digits. • Receiving and transmitting speech signals.

Options related to the ISDN PRI call emulation option	
Available call emulators	• ISDN DSS1 (Q.931) call emulation (requires Basic ISDN protocol functionality) • ETSI Euro ISDN call emulation (requires Basic ISDN protocol functionality) • QSIG call emulation (requires Basic ISDN protocol functionality) • VN6 call emulation (requires Basic ISDN protocol functionality) • 1TR6 call emulation (requires Basic ISDN protocol functionality) • DPNSS call emulation (requires Basic ISDN protocol functionality) • DASS-2 call emulation (requires Basic ISDN protocol functionality)
Storage capabillty	Up to 8 call emulator programs or protocols can be stored in the instrument
Other options	• Basic ISDN protocol functionality • National and international ISDN protocols (requires basic ISDN protocol functionality). For details on available protocols, please contact your local Anritsu representative

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