

► Communications Simulator and Analyser

The Communications Simulator and Analyser (CSA) is a versatile and generic data communications simulator and analyser. It provides the capability to interactively simulate and analyse message-based communications between any number of system components or sub-systems. The CSA system supports a multitude of protocols and communications media including Fibre Distributed Data Interface (FDDI), Ethernet, RS422 (HDLC) and RS232.

Functions

The functions of the CSA are :

- Support of the verification of correct response of a sub-system to received messages
- Support of the verification of the veracity of messages/parameters generated by the sub-system under test
- Support of the verification of error handling for invalid message formats, invalid parameters and invalid parameter limits
- Support of data interface transaction debugging
- Support of the verification of a sub-system's adherence to data interface specifications
- Support of system communications load testing

Features

The features of the CSA are as follows :

- Interactive creation and manipulation of user data
- Interactive creation and manipulation of message parameters
- Interactive creation and manipulation of message transactions
- Interactive creation and manipulation of function generators and attaching the outputs of the function generators to message fields
- Logging, recording and display of received and transmitted messages
- Message log player
- Real-time message traffic display
- Scripting ability to automate repetitive tests
- Repeatability of tests

CSA Components

The main CSA components are the Man-Machine Interface (MMI) and Data Repository (DR) running under Windows NT and the CSA Engine running on a VxWorks real-time platform. The DR is based on a standard SQL database. All these components are housed in a standard PC-style housing with standard I/O connectors for mouse, keyboard, display monitor and network interfaces.

CSA Architecture



CSA Information Model

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The user can define their own data types, as well as message parameter types. Messages are created by arranging message parameters in the required order. Message parameters can be grouped to provide discrimination for header, trailers, etc. The transmit characteristics for any message are user-definable.

The HMI is Windows NT-based. User-defined function generators can be used to provide variable values for the transmitted parameters.

The screenshot displays the Typical CSA HMI interface with three main windows:

- Log Recorder:** A table showing message logs with columns for Source, ID, Direction, Date-Time, ms, and Lab. The data includes multiple entries for source 1059 and various IDs (188155 to 188168).
- Message Tote:** A table showing message details with columns for Name, Type, Time stamp, and Sou. It lists several messages with timestamps around 15:52:03.
- Communications:** A window showing message parameters. It includes fields for Tot msg (475) and Tot kB (45.5). Below are graphs for Message Rate (/sec) and Data Rate (kB /sec). A table lists fields like 26088_8 through 26088_15 with their respective data types (Integer, Float, String).
- Command:** A window for entering and executing commands. It contains a script for sending messages, including a loop for graphics and video data.

Typical CSA HMI

Applications

- System development
- System integration
- Systems analysis

CSA Specifications

- Static and dynamic parameters in messages
- Transmit and log messages at 100 Kbytes/s
- Log received messages at 200 Kbytes/s