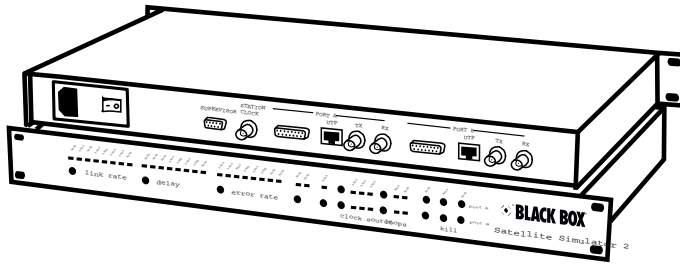


Satellite Simulator 2



**Take the risk out
of satellite
communications**

Key Features

- ▶ Data rates from 9.6 kbps to 2 Mbps
- ▶ Simulated delay to 2 seconds
- ▶ X.21, G.703, V.35, RS-449 and V.24 interfaces
- ▶ Bit or burst error simulation
- ▶ Manual error injection
- ▶ Local and remote loop test facilities
- ▶ Internal, external or station clocks

Overview:

The Satellite Simulator 2 is a high performance synchronous network substitution device capable of representing authentic environmental conditions such as delay, fault and error conditions.

The Simulator 2 provides a digital communications link at speeds up to 2Mbps and allows the testing of systems during development prior to the commitment to expensive satellite networks. Satellite links are perfect for situations where the existing communications infrastructure does not reach, but are inherently prone to delays, which can cause problems for attached equipment. For example: The delay can cause the protocol to fail, preventing any throughput. The delay can reduce throughput as the devices stop transmitting once the maximum number of unacknowledged frames is reached. Your remote database users will perceive double the delay - A 600-ms delay becomes a 1.2 second round-trip delay when a remote user's enquiry and response are both delayed.

Using the Simulator 2, equipment intended for use over links subject to varying fault conditions may be assessed for its failure and recovery modes. In this way the stability and fail-safe operation of customer equipment may be verified prior to installation.

The Satellite Simulator 2 provides a synchronous, digital data link between two interface cards, designated Port A and Port B on the rear panel. Each port is internally fitted with a Universal V.11/V.24, V.35 or G.703 Interface Card and has a DCE presentation. All interface cards are interchangeable, allowing conversion between electrical standards from Port A to Port B.

The unit may be configured using the front panel push buttons and indicators, which provide a complete set of basic functions, or via the supervisory port which gives access to either a formatted configuration display or a teletype mode for remote control.

The unit is housed in a 1U 19" rack-mount metal enclosure. The lid is easily removed but there are no user-serviceable parts inside and option modules should only be fitted by trained personnel.

Typical Application:

A convenient alternative to complex and often costly live system performance testing for Satellite links.

Technically Speaking:

Configuration of the Satellite Simulator 2 is achieved through two methods; basic functions are available on the front panel, but advanced features are selectable through operation via the RS232 supervisory port.

The unit has a BNC port labelled "Station Clock" which may be connected to an external clock source, at TTL signal levels at rates up to 2Mbps. The Station Clock frequency should be entered on the menu and then provides a reference for the internal Phase-Locked Loop (PLL), which may be used to generate the full range of simulation frequencies on Port A and Port B. Alternatively, when the Internal clock option is selected, the simulation frequency is generated directly from the 24.576MHz oscillator for all divisible rates. This is the recommended selection and allows most commonly used bit rates to be provided from a stable source. When a G.703 interface is fitted, only two clock rates are available namely 2.048Mbps (E1) and 1.544Mbps (T1), with the T1 frequency being derived from the PLL. The G.703 interface provides a transparent (unframed) connection using HDB3 coding for E1, B8ZS coding for T1. By fitting one G.703 interface for one port and a Universal interface for the other, it is possible to convert from one standard to another with all simulation parameters applicable between the two.

Link delays of up to 2 seconds may be selected in preset increments using the Delay push button control or to customised values numerically input via the supervisory port with one millisecond resolution. Link error conditions from 1 in 10⁻⁹ to 1 in 10⁻² may be selected from the front panel. It is also possible to select error-free operation. Errors are applied bi-directionally to affect the received data on both ports. Errors may be applied (i) in bit error mode, where single bit errors are continuously and uniformly injected at the prescribed rate, or (ii) in burst error mode, where an error burst of one second duration at the prescribed error rate is followed by a gap of ten error-free seconds. The burst length and burst gap times may be customised by the user via the supervisory port. An Inject Error function is also available to allow the operator to introduce single-bit errors directly into the data streams.

The supervisory port allows the operator to configure all standard settings for the unit and in addition, to program specific intermediate values for link rate, error rate and burst mode parameters. In this way, customised parameters may be applied for detailed performance testing. Numeric values may be entered between limits and the simulator will apply, if not the precise value, the closest achievable settings, accurate to the resolution of the system. Values applied in this way are represented on the front panel by the two illuminated LEDs which straddle the custom value.

Supervisor programming may be performed interactively using either the formatted screen display on a terminal or PC, or using teletype mode for remote control by a network management system. The latter mode can be particularly powerful when used to perform a sequential test program as part of an overall performance analysis suite.

The Complete Package:

Both the TBU1020 and the TBU1021 include:

- Satellite Simulator 2
- Supervisor Cable
- (2) X.21/V.11/RS-449/V.24 Interfaces

The TBU1021 Kit also includes:

- (2) X.21 Cables
- (2) V.35 Interfaces
- (2) V.35 Cables
- (2) G.703 Interfaces
- (2) V.24 Cables

Specifications:

Connectors – Supervisor: (1) DB9 F; X.21/V.35/X.21: (1) DB15F;
Station clock and G.703 (75-ohm): (1) BNC;
G.703 network (120-ohm): (1) RJ-45 (UTP)
Indicators – (5) LEDs: Link Rate, Error Rate, Delay, Clock Source, Loops
Power – 85-240 VAC
Size – 4.4H x 43W x 25D cm
Weight – 1.5 kg
Operating Temperature – 0-40°C
Humidity – 0-90% (non-condensing)

Product Name:

Order Code:

Satellite Simulator 2 for X.21/V.24	TBU1020
Satellite Simulator 2 Kit X.21/V.24/V.35/G.703	TBU1021
Optional Card for TBU1020 (Two required)	
Universal X.21/V.11/RS-449/V.24 Interface Card (Spare)	TBU1024C
V.35 Interface Card	TBU1023C
G.703 Interface Card	TBU1022C
Cables:	
X.21 Straight DB15 to DB15 Cable, 3.0m, M/F	ESX213MF
X.21bis/V.24 Straight DB15 to DB25 Cable, 2.0m	ETNU1020-V24
V.35 Straight DB15 to MRAC 34-Way Cable, 2.0m	ETNU1020-V35