

SmartClass™ E1

Service Installation and Maintenance Tester



Key Features

- Performs E1 service installation and maintenance in easy-to-use, lightweight, and rugged form-factor
- Significantly reduces field technician training with Smart AutoConfiguration (AutoConfig) feature
- Works with PC software—download results for report preparation
- Provides additional E1 testing with available software options
- Includes Event Log and Histogram for troubleshooting
- Capable of bidirectional monitoring and troubleshooting via dual E1 ports
- Offers color graphical user interface (GUI) available in multiple languages

Applications

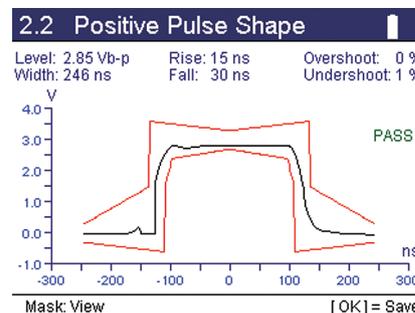
E1

- Provides terminate, monitor, bridge, and local loopback modes
- Provides G.703—2 Mb/s testing
- Conducts 2 M (Bulk), n x 64 kb/s BERT
- Measures performance G.821, G.826, and M.2100
- Provides audio monitor (VF drop)
- Provides transmit frequency offset
- Performs VF level and frequency measurements, VF tone insert
- Measures E1 signal level measurement
- Provides ABCD/Sa monitoring
- Provides round-trip delay
- Offers alarms (defects) and errors (anomalies) insertion
- Pulse shape (optional)
- Jitter (optional)

Others

- Offers remote control (optional)

The JDSU SmartClass E1 is a handheld field tester for the installation and commissioning of E1 service that offers multiple test modes for E1 signal analysis. An economical and easy-to-use point solution, the SmartClass E1 has a Smart AutoConfiguration (AutoConfig) feature and large, easy-to-read color display that make the lightweight, rugged, battery-operated tester ideal for both service provider and contractor field technicians. It also meets the needs of mobile operators in the construction of E1 backhaul infrastructure.



Pulse shape for extra E1 testing capability

Specifications

E1 Circuit Testing

Interfaces

Dual RJ48 ports (port 1 Rx/Tx, port 2 Rx only)

120 balanced RJ48 (by default)

120 balanced CF, 75 unbalanced BNC (via adapter cable)

Line Code AMI, HDB3

Tx Timing Internal

Recovered

External (via adapter cable on Port 2)

Tx Frequency Offset ± 100 ppm in 1 ppm intervals

Framing Unframed, PCM31, PCM31C, PCM30, PCM30C

Test Mode Terminate, monitor, bridge, local loopback

2M (Bulk), n x 64 kbps BERT

AutoConfig for framing and test pattern

LED Indicators SYNC, ALARM, ERROR, DATA, LPBK, BATT

Performance Monitoring

G.821, G.826, and M.2100

ABCD/Sa monitoring

Round-trip delay

Test Patterns

All ones, All zeros

1:1, 1:3 (1 in 4), 1:4 (1 in 5), 1:7 (1 in 8),

63 (2^{6-1}), 511 (2^{9-1}), 2047 (2^{11-1}), ITU INV2¹⁵⁻¹, ITU

INV2²⁰⁻¹, ITU2²⁰⁻¹, ITU INV2²³⁻¹, ITU2²³⁻¹, QBF, QRSS, LIVE

User bit pattern (3 to 32 bits)

User byte pattern (1 to 64 bytes)

Key Results

Loss alarms, LOS seconds

Code error count, code error rate, timing slips, frame slips,

LOF alarms, LOF seconds, AIS alarms, AIS seconds, RDI alarms

RDI seconds, MF AIS alarms, MF AIS seconds, MF RDI alarms,

MF RDI seconds

FAS bit error count, FAS bit error rate, FAS word error count,

MFAS word error count, MFAS word error rate, CRC error Count,

CRC error rate, CRC sync loss count

FAS sync loss count, MFAS sync loss count, remote end block

error (E-Bit/REBE), NFAS word, MFAS word, NMFAS word

Si bit, A bit, Sa-bit sequence (Sa4–Sa8)

TSE/bit error count, TSE/bit error rate, block error count

pattern slips, pattern slip seconds

Pattern synchronization loss count, pattern synchronization

loss seconds, round trip delay (μ s), elapsed time, time,

date/time-slot Rx byte, time-slot signaling data

Errors (Anomalies) Insert

2M code Single

2M FAS Single, 2, 3, 4

2M MFAS Single, 2

2M CRC Single

BERT pattern slip Single

E-Bit/REBE Single, Continuous

Bit (TSE) Single-rate 1e-2, 1e-3, 1e-4, 1e-5, 1e-6, 1e-7,

Multiple 1 to 50

Alarms (Defects) Insertion

LOS Continuous

Loss of frame (LOF) Continuous

AIS

RDI/FAS Dist

MF AIS

MF RDI/MFAS dist

VF Tests

VF level and frequency measurement

VF tone insert 404, 1004, 2713, 2804 Hz,

–13.0, –3.0, 0.0, 3.0 dBm

VF drop to built-in speaker

Pulse Shape (optional)

Parameter Specification

Results Pulse shape graph

G.703 mask Pass/Fail

Pulse width resolution 2.75 ns

Rise time resolution 1 ns

Fall time resolution 1 ns

Undershoot resolution 1% of nominal level

Overshoot resolution 1% of nominal level

Signal level in [V] base-peak

Specifications

Jitter (optional)

Test Modes	Terminal, Monitor, Bridge
Jitter measurements available	Manual Jitter Measurement
	Maximum Tolerable Jitter Measurement (MTJ)
	Fast Maximum Tolerable Jitter Measurement (FMTJ)
	Jitter Transfer Measurement (JTF)

Manual Jitter Measurement

Rx accuracy	0.05UI or 3%, whichever is greater
Rx resolution	1/128UI
Range of Rx jitter amplitude (UIpp)	10UI
Rx clock source	Recovered clock
Tx accuracy	0.03UI or 3%, whichever is greater
Tx resolution	1/64UI
Tx frequency range (nominal)	20 Hz to 100 kHz
Range of Tx jitter amplitude (UIpp)	0.1 to 10UI
Tx clock source	Internal clock

Maximum Tolerable Jitter Measurement

Tx accuracy	0.03UI or 3%, whichever is greater
Tx resolution	1/64UI
Tx frequency points	20 Hz, 120 Hz, 1000 Hz, 2400 Hz, 6 kHz, 18 kHz, 30 kHz, 60 kHz, 100 kHz
Range of Tx jitter amplitude (UIpp)	0.1 to 10UI
Results format	Table and graphical

Fast Maximum Tolerable Jitter Measurement

Tx accuracy	0.03UI or 3%, whichever is greater
Tx resolution	1/64UI
Tx frequency points	20 Hz, 2400 Hz, 18 kHz, 60 kHz, 100 kHz
Range of Tx jitter amplitude (UIpp)	0.1 to 10UI
Results format	Table

Jitter Transfer Measurement

Rx accuracy	0.05UI or 3%, whichever is greater
Rx resolution	1/128UI
Tx accuracy	0.03UI or 3%, whichever is greater
Tx resolution	1/64UI
Range of Tx jitter amplitude (UIpp)	0.1 to 5UI
Tx frequency points	20 Hz, 2400 Hz, 18 kHz, 60 kHz, 100 kHz
Results format	Table and graphical
Intrinsic jitter of instrument	<0.07UI
Results approximate to	ITU-T G.823 and 0.171

Other Software Options

Remote Control (optional)

Lets the user use command lines to control the tester via serial interface. Command guide is available with the option.

General Tester

Languages

English, French, German, Italian, Japanese, Korean, Portuguese, Russian, Simplified Chinese, and Spanish

Power

4 AA field-replaceable batteries (NiMH or Alkaline)

NiMH battery operating (at 25°C) under typical conditions provides up to 5 hours of continuous use for E1 application and 2 hours of continuous use for Datacom application

Supports sleep mode

AC line operation via external adapter

Charging time (at 25°C) under typical conditions for empty to full charge: with unit OFF up to 5 hours; with unit ON up to 7 hours

Permissible Ambient Temperature

Nominal range of use	0 to +50°C
Storage and transport	-10 to +60°C

Humidity

Operating humidity	10 to 90%
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Physical

Size (H x W x D)	230 x 120 x 50 mm
Weight, including batteries	<1 kg (2 lb)
Display	320 x 240 color display

CE Marked

Ordering Information

Order Number	Description
CSC-E1-P1	SmartClass E1 Package (No software options included)
CSC-E1-P2	SmartClass E1 Pulse Shape Package (Pulse Shape software option included)
CSC-E1-P3	SmartClass E1 Jitter Package (Jitter software option included)
CSC-E1-P4	SmartClass E1 Complete Package (Pulse Shape and Jitter software option included)

Accessories included with any package

AC power adapter with plug kit (USA, UK, Australia, Europe)
4 x AA NiMH batteries
CD-ROM (including PC utility, USB driver, and User Guide)
1 x RJ48-to-RJ48 cable
1 x USB cable
Small carrying bag

Miscellaneous

CC-120101	Large Carrying Bag
AC-009801	Large Strand Hook
SCACARCHARGER	Car Adapter Charging Kit
ML-21107607	Printed User Manual SC E1 (English)
ML-21121114	Printed SC E1 Remote Control Reference Guide (English)

Software Options

CSC-E1-PS	Pulse Shape
CSC-E1-JIT	Jitter
CSC-E1-RC	Remote Control

Optional Accessories
E1 Cables

K1597	RJ48 to CFY cable (120 W balanced)
CB-44995	RJ48 to Dual BNC cable (75 W unbalanced)
CB-0045402	2M External Clock Reference cable

Test & Measurement Regional Sales

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