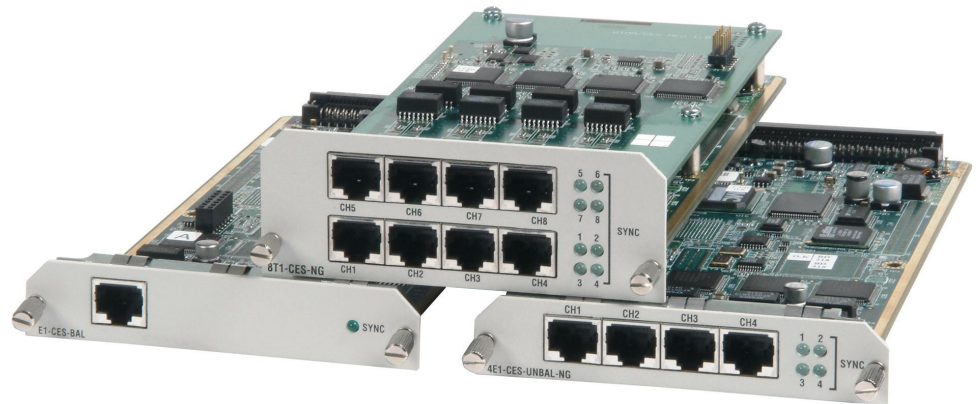


ACE-2002/2002E/202

CES

TDM Interworking Modules



TDM circuit emulation services over ATM

- Enabling TDM devices, such as PBXs, multiplexers and channel banks to interconnect over public ATM networks
- Structured and unstructured services in compliance with circuit emulation service (CES) standards
- Different port schemes available: single port, 4-port and 8-port E1 (balanced/unbalanced) or T1

The CES modules of ACE-2002/2002E/202 create emulated full-duplex E1/T1 links that allow PBXs, TDM multiplexers and video conferencing equipment to interconnect over public ATM networks (see *Figure 1* and *Figure 2*).

The modules, which are available with single, four or eight port E1/T1 interface, support structured (with or without CAS) and unstructured CES (circuit emulation services).

The CES functionality complies with the following standards:

- ATM Forum CES 2.0
- AF-VTOA-0078
- ITU-TI.363.1

Three ATM timing modes are supported:

- Synchronous timing (ATM network derived)
- SRTS (in unstructured mode only) as defined in T1.630
- Adaptive (in unstructured and E1/T1 modes only), as defined in AF-VTOA-0078.

data communications

The Access Company

Specifications

E1 INTERFACE

Data Rate

2.048 Mbps

Compliance

G.703, G.704, G.706, G.732, G.823

Capacity

Structured:

Single-port module; up to 31 VCCs

Four-port module; up to 124 VCCs

Eight-port module; up to 248 VCCs

Unstructured:

Single VCC per port

Line Code

HDB3

Line Impedance

120Ω (balanced), 75Ω (unbalanced)

Jitter Performance

According to G.823

Framing

MF, CRC4 MF, CAS MF, pass-through

Signaling

CAS, CCS (transparent)

Signal Levels

Receive: 10–32 dB / 0–10 dB (selectable)

Balanced E1 transmit: ±3V (±10%)

Unbalanced E1 transmit: ±2.37V (±10%)

Connectors

Balanced E1: RJ-45

Unbalanced E1: RJ-45, via an RJ-45 to BNC adapter cable

T1 INTERFACE

Data Rate

1.544 Mbps

Compliance

G.703, G.704, ANSI T1.403, AT&T TR-62411

Capacity

Structured:

Single-port module; up to 24 VCCs

Four-port module; up to 96 VCCs

Eight-port module; up to 192 VCCs

Unstructured:

Single VCC per port

Line Code

AMI, B8ZS, B7ZS

Line Impedance

100Ω

Jitter Performance

According to G.824, AT&T TR-62411

Framing

SF, ESF, pass-through

Signaling

CAS (bit robbing), CCS (transparent)

Signal Levels

Receive: 0 to -30 dB

Transmit with DSU: ±2.75V (±10%) at 0–655 ft

Transmit with CSU: 0, -7.5, -15, -22.5 dB, user-selectable

Input Signal

0 to 30 dB

Connectors

RJ-45

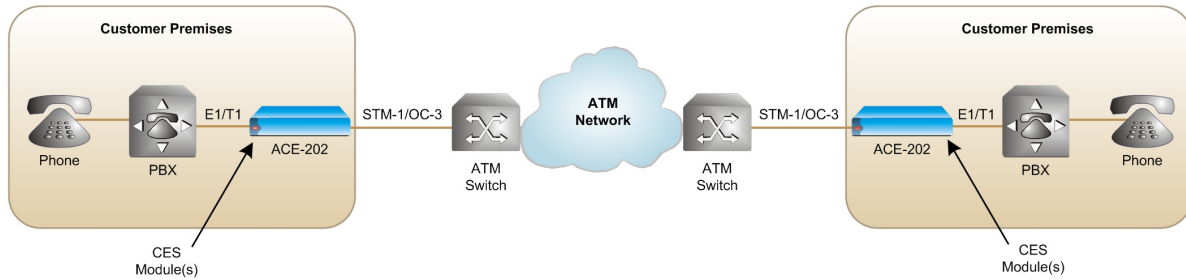


Figure 1. TDM Voice over ATM

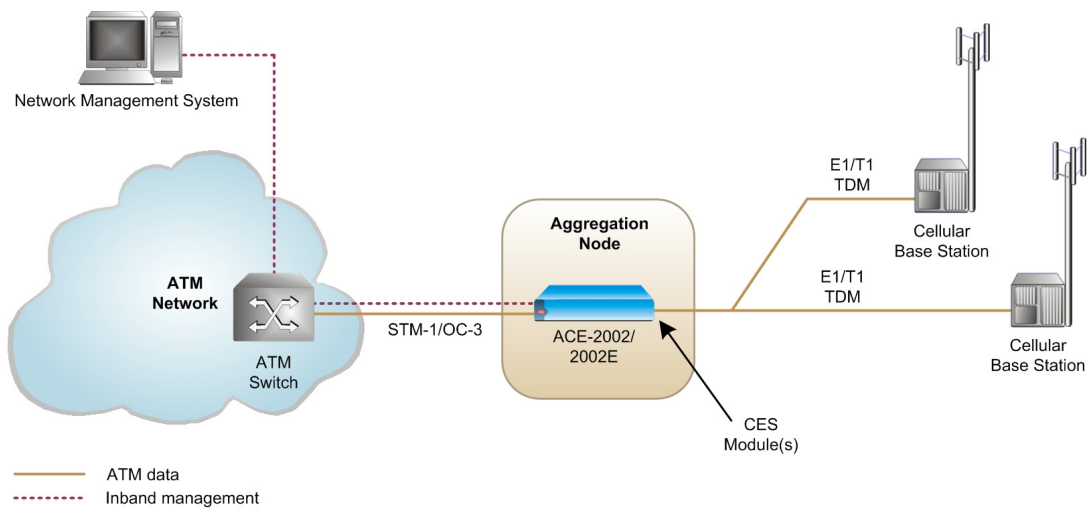


Figure 2. 2G Cellular Backhauling

CES

TDM Interworking Modules

Ordering

ACE-M/+

Legend

+ CES module type:

CES/E1	Single balanced E1 port, RJ-45 connector
CES/E1/UNBAL	Single unbalanced E1 port, BNC 75Ω connector
CES/T1	Single T1 port, RJ-45 connector
CES/4E1	Four balanced E1 ports, RJ-45 connector
CES/4E1/UNBAL	Four unbalanced E1 ports, BNC 75Ω connector
CES/4T1	Four T1 ports, RJ-45 connector
CES/8E1	Eight balanced E1 ports, RJ-45 connector (ACE-2002E only)
CES/8E1/UNBAL	Eight unbalanced E1 ports, BNC 75Ω connector (ACE-2002E only)
CES/8T1	Eight T1 ports, RJ-45 connector (ACE-2002E only)

SUPPLIED ACCESSORIES

CBL-RJ45/2BNC/E1/X

Interface adapter for converting a balanced E1 RJ-45 connector to a pair of BNC unbalanced connectors (if unbalanced E1 interface is ordered)

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