

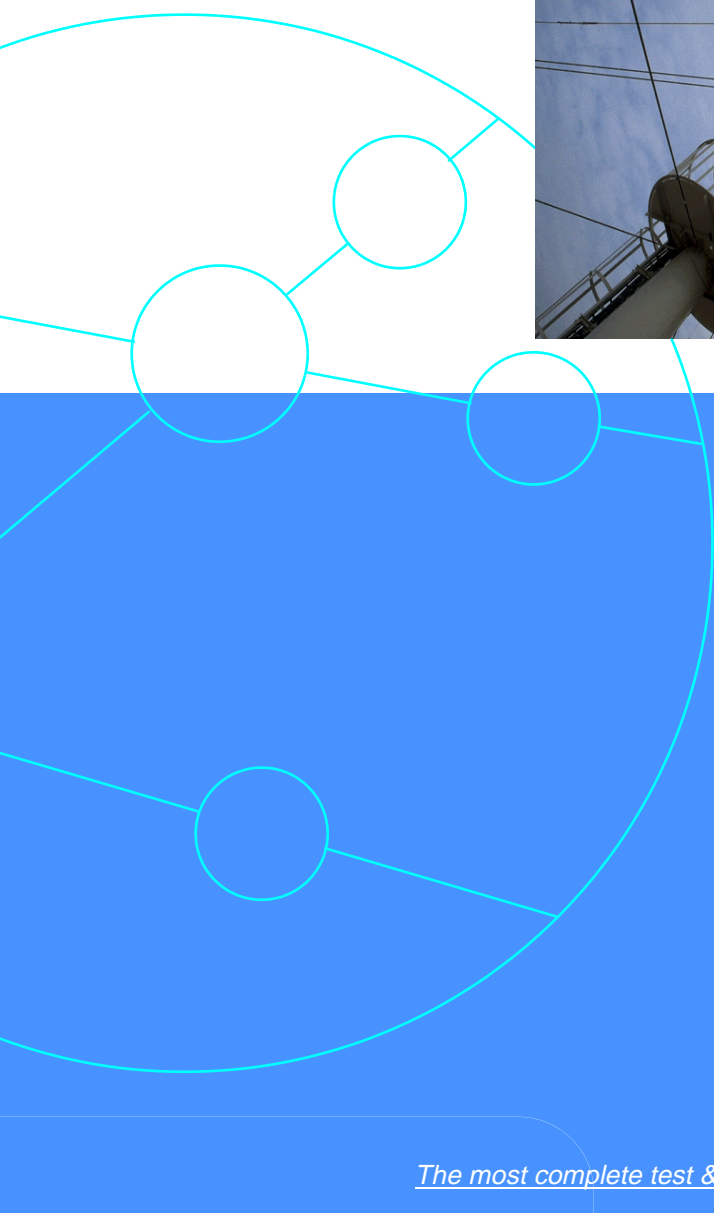


Trail trace tests with Victoria

Trail trace tests are performed on network elements in SDH networks with the aim of checking the ability of these elements to detect loss of source identifiers. Identifying the origin of the signals is necessary if they are to be routed correctly.



Application Note VASDHJX21e



The most complete test & measurement portfolio

In order to interconnect signals in the SDH network correctly, it is first necessary to identify their source. This way a receiver can check the continuity of its connection with the associated transmitter. This is considered a fundamental requirement for the management of SDH networks, in particular for the search algorithms that control routing (for instance, in the tables of connections of the DXC). Each source or *network access point* has an identifier (API) that consists of one or more bytes set out in line with the criteria laid down in the ITU recommendations for the different *trails* (sections or paths).

TRAIL TRACES AND API

In the overheads of SDH signals (frames and virtual containers) there are a series of bytes, called *trail traces*, that define 64 kbit/s bytes for carrying the APIs, which are transmitted repeatedly.

There are regeneration section traces (byte J0 in RSOH) and traces of paths VC3 and VC4 (byte J1 in POH) and paths VC11 and VC12 (byte J2 in POH). The source is identified by sending the API along the 64 kbit/s channels in the form of a string of characters. This string may be a byte (containing a code between 0 and 255), 64 free-form bytes, or a 16 byte frame as defined in ITU-T recommendations G.707, G.831 and E.164. Fifteen bytes are sent in this frame, together with one CRC-7 for the previous frame, and the API begins with the country indicator as defined in ITU-T E.164 or as defined in ISO 3166. The other characters are the responsibility of the organization that has been assigned the country indicator, and their format is defined in ITU-T T.50.

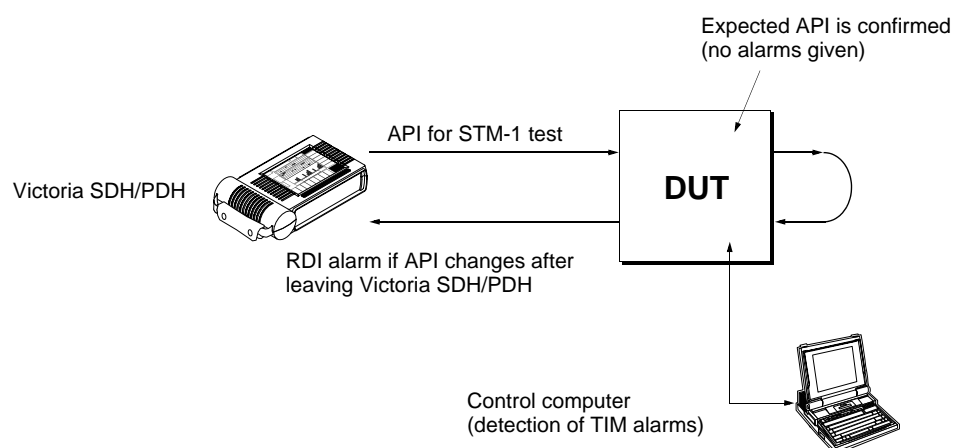
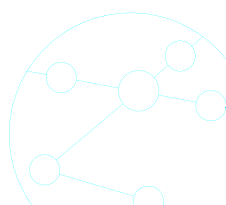


Figure 1

Configuration test for trail trace indicator.



Within a national network or the domain of a single operator, for J0 it is possible to opt for the use of one single byte or a 16 character frame (ITU-T recommendation G.831). For J2 the format used is a 16 byte frame, whereas for J1 it is possible to opt for a free-form string of 64 bytes or 16 bytes.

TRAIL TRACE TESTS

The aim of a trail trace test is that of checking that the API configuration of the network element under test (multiplexer, DXC, DUT in general) is correct. For this, the measurement instrument will generate an API that will be compared with the one expected by the DUT. After checking that there are no discrepancies and that no alarms are given, the identifier generated by the instrument is then changed to cause a TIM (Trace Identifier Mismatch) alarm in the network element, and an RDI (Remote Defect Indication) alarm in the opposite direction. This checks that the trail trace mechanism is working properly.

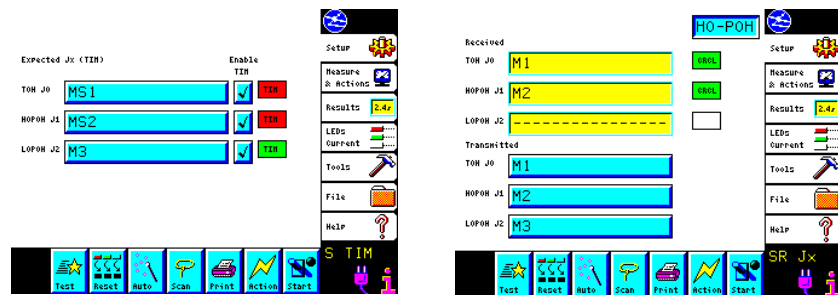
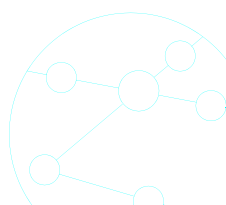


Figure 2

Screens showing trace programming for Victoria SDH/PDH. The expected API values can also be configured in Victoria SDH/PDH. The TIM alarms that are activated when there is a mismatch between the APIs received and those expected are then detected by the instrument.

Victoria SDH/PDH is also able to generate J0, J1 and J2 path trace messages that can be edited in line with ITU-T G.831 in order to perform the test described above. These are basically messages of 16 characters (15 plus one CRC for the block containing the message). Likewise, the analyzer section allows the detection of TIM errors in higher and lower order paths. □



A

API (*Access Point Identifier*) 2

C

CRC (*Cyclic Redundancy Checksum*) 2

D

DUT (*Device Under Test*) 3

DXC (*Digital Crossconnect*) 2

I

ISO (*International Standards Office*) 2

ITU (*International Telecommunications Union*) 2

P

POH (*Path Overhead*) 2

R

RDI (*Remote Defect Indication*) 3

RSOH (*Regeneration Section Overhead*) 2

S

SDH (*Synchronous Digital Hierarchy*) 2

T

TIM (*Trace Identifier Mismatch*) 3

V

VC (*Virtual Container*) 2



TrendCommunications

Trend Communications SL
Pujades, 60
08005 Barcelona (Spain)
www.trendcomms.com
infoline@trendcomms.com

Trend Communications Ltd
Knaves Beech Estate
Loudwater, High Wycombe
Buckinghamshire HP10 9QZ UK

International: +44 1628 524977
España:..... 93 300 3313
UK:..... 01628 524977
Deutschland: 089 32 30 09 11

Italia: 02 73 91 414
France: 01 69 35 54 70
India:..... 22 8597 463/4
US: 256 461 0790