



SunSet E20 Application Series:

V5.x and 3 C-Path
Monitoring



SUNRISE TELECOM
INCORPORATED

... a step ahead

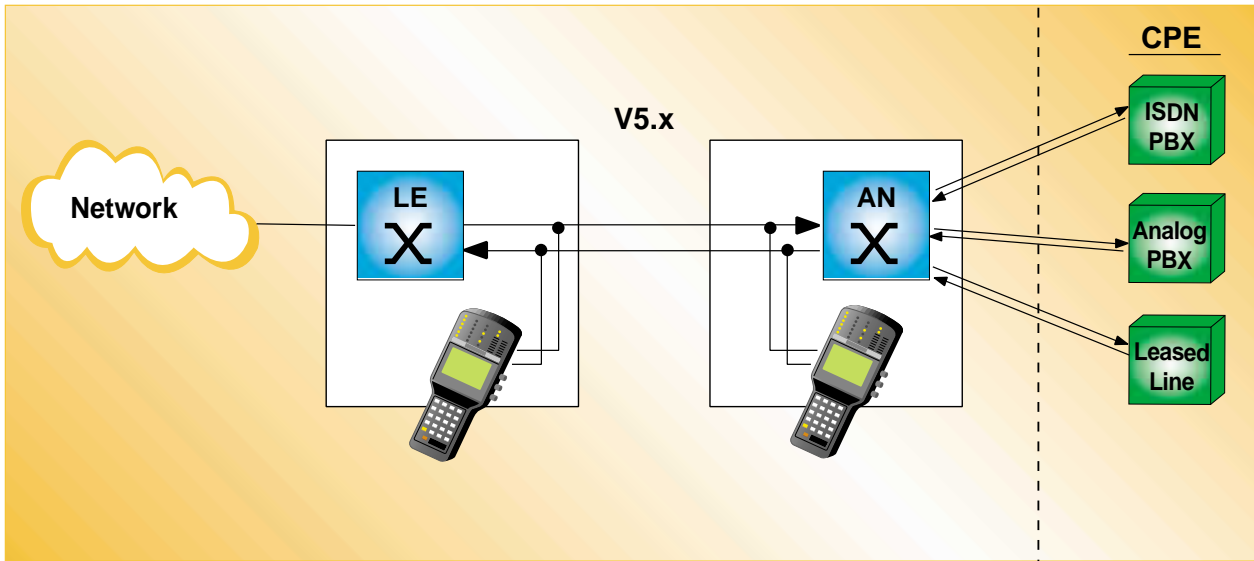


Figure 1

1. Overview

The V5 standards are to provide a common interface between an access network and the local exchange on E1 link(s). There are two forms of V5 interfaces - V5.1 and V5.2. V5.1 operates on a single E1 link while V5.2 operates on a group (up to 16) of E1 links. V5.1 supports 30 user ports with the 30 timeslots in the E1 line; the bearer channels are preassigned and statically allocated. V5.2 can operate on up to 16 E1 links; therefore, it's capable of supporting up to several thousand ports with the support of concentration and dynamical allocation of the bearer channels. AN is the access network; it multiplexes subscribers onto the physical timeslots of the E1 link. LE is the local

exchange; it's responsible for call control by providing circuit switch, DTMF tone generation/decoding, etc. V5.1 supports PSTN, ISDN basic access, and leased line. In addition to the services that V5.1 supports, V5.2 interfaces also supports ISDN PRI. The following protocols are utilized in these two interfaces:

- ISDN
- PSTN
- Control
- BCC (in V5.2 only)
- Link Control (in V5.2 only)
- Protection (in V5.2 only)

2. V5.2 Monitoring (3 C-Path)

E20 is an advanced and powerful test equipment that can be used to monitor the 3 communication channels (timeslots 16, 15, and 31) in the V5 network, simultaneously or one time slot at a time. Monitoring is an essential feature for checking the performance of the V5 network. users can monitor the V5

network either at the network premises or the customer premises; the dual receivers on the E20 can trace the messages conveyed in the 3 time slots. The filter and store-message functions increase the usage of this V5 monitoring feature. In addition, statistics (in both

By following the steps below, users will be able to obtain detail information on the performance of the link:

- Configuration g to set up timeslot
- Protocol analysis g to set up filter, capture tracer, and view & store messages
- Statistics g to view statistics of Layer 2 and Layer 3 messages

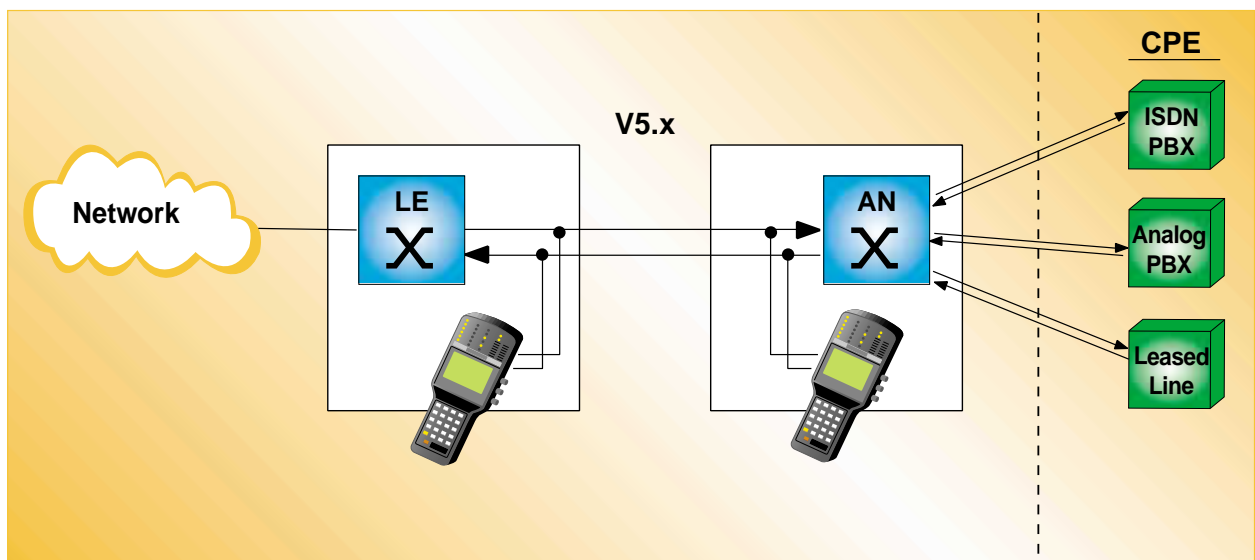


Figure 2

2.1 Configuration Procedure

Remember to select "E1DUAL" test mode and "BRIDGE" or "MONITOR" for L1-Rx and L2-Rx ports (depending on your monitoring connection). To perform V5 monitoring, provide a proper physical connection either at the network or the customer premises (refer to diagram above). Then enter into the V5.1/ V5.2's configuration screen to select the timeslot the user desires to monitor, select from any one of the three time slots or all of the three time slots by using the F-key at the bottom of the screen.

```

08:11:01
> <
> <
CONFIGURATION
TIMESLOT 16 : ON
TIMESLOT 15 : ON
TIMESLOT 31 : ON
ON OFF

```

Figure 3

2.2 Set-up the Filter

The filter implementation is a useful feature, which allows users to select the specific messages he/she desires to capture. Users can capture or reject any or all of the messages appearing in Figure 4. Filtering is possible for Layer 1, Layer 2 messages, and Layer 3 messages. "Capture" allows the unit to capture all the messages; "reject" allows the unit to reject all the messages; and "filter" takes the user to perform further filtering. If "filter" is selected for Layer 3 for time slot 16, user can then select which protocol to capture, reject, or filter.

"Reject" is to reject any messages belonging to that protocol. In case a user selects

"capture" on entry for the ISDN protocol, then all the messages will be captured. If "Filter" is selected for the ISDN protocol, then the screen shown in Figure 5 will be displayed for the user to enter the envelop function address (range from 0-8175). This is to capture ISDN messages in that particular address only.

If "Filter" is selected for the PSTN protocol for time slot 15 in the Filter screen in Figure 5, the screen shown in Figure 6 will be displayed. Users can then select either to capture or reject a particular message in the PSTN protocol. Use the same procedures to filter messages in the other protocols when desired.

```

08:11:01
>
>
          FILTER
TIME SLOT:  16      15      31
LAYER 1   : CAPT
LAYER 2   : REJ      CAPT    REJ
LAYER 3   : FLTR     CAPT    FLTR
  ISDN    : CAPT
  PSTN    : FLTR     REJ
CONTROL  : CAPT     FLTR
BCC      : FLTR     CAPT
PROTECT  : REJ     REJ
LINK     : CAPT     REJ
CAPTURE  REJECT  FILTER  EDIT

```

Figure 4

```

08:11:01
>
>
TS 16      ISDN FILTER
          EF ADDR      : XXXX

```

Figure 5

```

08:11:01
>
> TS 15      PSTN
LAYER 3 ADDR      : ALL
                  : XXXXX
ESTABLISH         : REJECT
ESTABLISH ACK     : CAPTURE
SIGNAL           : CAPTURE
SIGNAL ACK       : REJECT
STATUS           : CAPTURE
STATUS ENQUIRY   : CAPTURE
DISCONNECT       : CAPTURE
DISCONNECT COMPLETE : CAPTURE
PROTOCOL PARAMETER : REJECT
CAPTURE  REJECT

```

Figure 6



2.3 Trace Messages

At this point, after the configuration and filtering selections are done, user can enter the Live Tracer screen to trace the messages on the V5 traffic. Once the E20 captures the V5 messages, the screen in Figure 7 (with information such as the EF address, the link address, message type, etc.) will be displayed. This information can also be displayed in HEX. The messages are stored in a temporary buffer that can be viewed, printed out, or stored as a file.

The trigger function is an option located in the Live Tracer screen. With this option, users are allowed to enter a screen similar to the filtering screen to specify which message or condition he/she wants to occur before capturing the messages.

```

08:11:01
> <
> <
LIVE TRACER

2000-01-05 11:11:33.686 #01818
TS15 AN->LE
EFADR-8176 C-PATH-PSTN
LKADR-8176 C/R: 0
L2 MSGTYPE: I
NS: 063 NR: 043 P/F: 0
L3 MSGTYPE: ESTABLISH
L3ADR-9

PAGE-UP PAGE-DN HEX TRIGGER

```

Figure 7

2.4 Check the Statistics

The E20 contains the following screens to show the statistics information on Layer 2 and Layer 3 messages. This information, displayed in counts or percentage of the total messages, is helpful for technicians to see the long-term

performance and integrity of the V5 network. Statistics information is useful to get an overall picture of the network by looking for specific protocol messages that would indicate trouble.

```

08:11:01
> <
> <
LAYER 2 STATISTICS
ET: 000:04:45

      AN      LE
SABME - 0000000 0000000
UA     - 0000002 0000009
DM     - 0000004 0000007
RR     - 0000005 0000039
RNR    - 0000001 0000005
REJ    - 0000000 0000000
I      - 0000001 0000001
TOTAL  - 0000013 0000051

PAGE-UP PAGE-DN COUNT MORE

```

Figure 8

```

08:11:01
> <
> <
LAYER 3 STATISTICS
ET: 000:04:45

      AN      LE
PSTN  - 0000000 0000000
CONTROL - 0000002 0000009
BCC   - 0000004 0000007
PROTECT - 0000005 0000039
LINK  - 0000001 0000005
TOTAL - 0000012 0000050

PAGE-UP PAGE-DN % MORE

```

Figure 9