

PRI (T1/E1) Call Recorder

User Manual

Rev 1.0 (December 2013)



1. Call Recording Architecture Overview

PRI Call recording solution consists of two major components:

Passive T1/E1 Tap Adapter and server based Call Recording software (aka Call Processor)

Passive tap adapter installs between telephone company and PBX giving it ability to ‘tap’ into Rx and Tx pair of T1/E1 line via high impedance interface.

In spite that physically Tap adapter is being wired between Telco and PBX with two separate cables, it is passive internally and can be powered off without any impact to T1/E1 line operation.

Tap Adapter encodes captured T1/E1 frames into UDP packets and sends it to Call Processor via its LAN interface. Call Processor is custom software that can be installed on any Windows platform.

Call Processor receives UDP packets from Tap Adapter and converts it to high quality stereo WAV files. In addition to its ability to record calls Call Processor provides live b-channel audio monitoring functionality and Q.921/Q.931 packet analyzer with ability to save data to PCAP file compatible with Wireshark.

2. Tap Adapter overview



Connecting Tap Adapter to T1/E1 Line

To install Tap Adapter connect port labelled “A” to a Telco RJ45 Jack and connect port labelled “B” to the local office PBX or VoIP Gateway with a regular CAT3/5 straight through cable.

// connection diagram //

“Frame” LED will light up green if framing configured on adapter and T1/E1 line are compatible.

If Frame LED is RED check with your Telco and configure Tap adapter framing to match your Telco settings.

“Sync” LED will light up Green if Tap Adapter is synchronized to DS-1 clock.

“Err” LED will be off under normal conditions and only be red when Tap Adapter detects abnormal condition on T1/E1 Line.

Connecting Tap Adapter to LAN

Connect port labelled “LAN” to your network where Call Processor will be reachable.

Tap Adapter does not have to be on the same IP subnet with server where Call Processor is installed. If there is firewall between Tap Adapter and Call processor make sure that reserved UDP port is opened in a direction from Tap Adapter to the Call Processor.

Tap Adapter pings IP address of the Call Processor on preset intervals and indicates with LED labelled “Server” if Call Processor is not reachable.

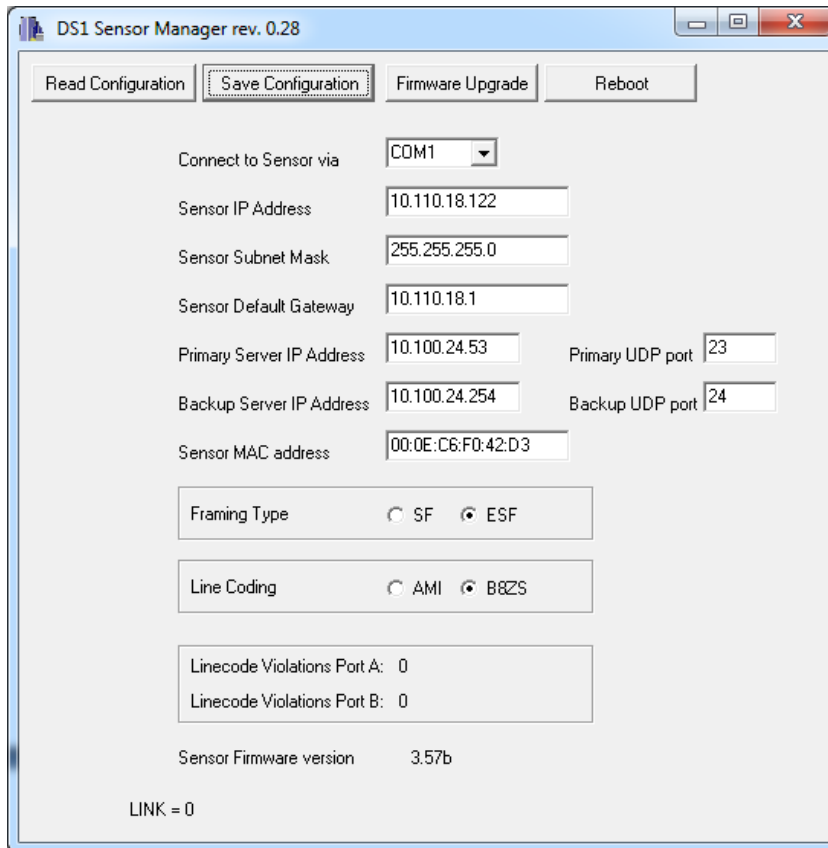
Configuring Tap Adapter

To configure Tap Adapter connect provided straight-through serial cable to a DB9 connector at the back of the Tap Adapter to a COM port on your PC.

USB-to-COM port converter can be used if your PC does not have a COM port.

Start Tap Adapter configuration utility (DS1 Sensor Manager) from the provided CD and select the COM port number where Tap Adapter is connected to.

Press “*Read Configuration*” to retrieve current setting. Message “*Successful*” will appear if configuration was download from Tap Adapter.



Following parameters must be configured on Tap Adapter:

1. Tap Adapter's IP Address, Subnet and Default Gateway
2. Primary Call Processor's IP Address and UDP port

This will be the IP address of the Windows server where you install Call Processor software.

3. Backup Call Processor's IP Address and UDP port (Optional)

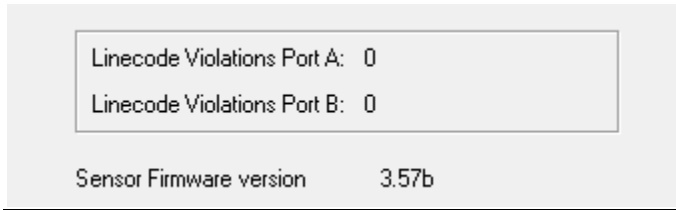
You can choose to send UDP stream to another server for redundancy.

4. DS-1 Line code and Framing

Press "**Save Configuration**" after all parameters has been configured.

Tap Adapter monitoring

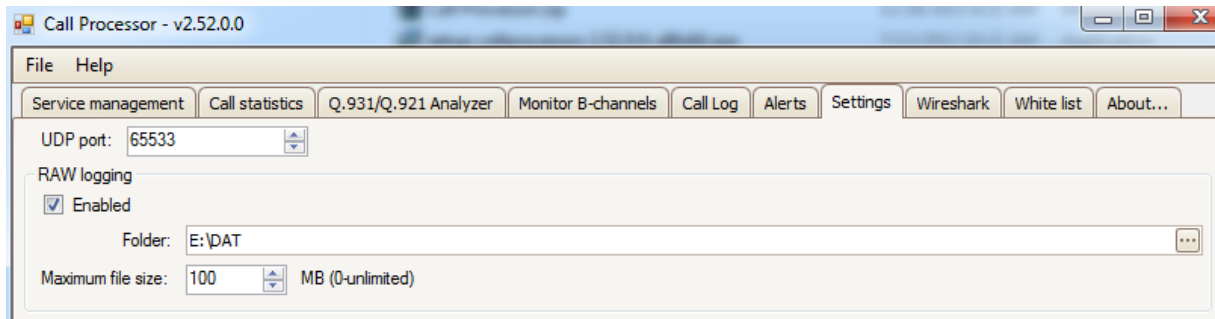
Linecode Violation Counter:



Linecode Violation counter grows should indicate a problem with currently configured linecode or framing. Consult your phone company pr PBX settings for correct parameters.

3. Installation and configuration of the Call Processor software

After installation of Call processor is complete you must configure UDP port value to match the one configured on Tap adapter.



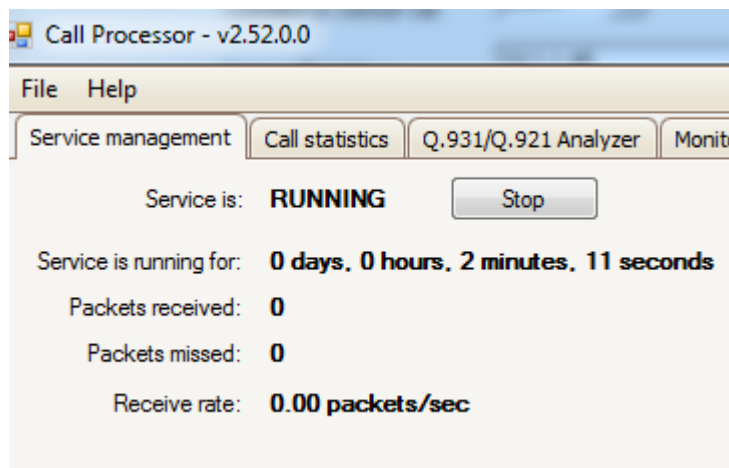
If some of the parameters appear to be not-editable press the Stop button on “Service Management” Tab for those to become editable.

Press “Start” to start call recording after all the configuration is complete

White List

Adding phone number of extension to White List prevent recording of any call To/From this number

Monitoring of UDP flow



If you see steady increment of “Missed Packets” counter on “Service Management” Tab that indicates there is network reliability problems between Tap Adapter and Call Processor or Call Processor’s Server is too busy with other things and not able to keep up with incoming UDP packet flow.

Very often Antivirus software can cause UDP packet loss and it is recommended that AV software to be removed from Call Processor or filter to be configured to allow UDP packets on selected port to be permitted without inspection.

Call Log

#	Start ... ^	Start Time	Stop Date	Stop Time	Call duration	Calling Name	Calling Number	Called Name	Called Number	Call Reference	Call Direction
2	05/30/2013	11:10:02 PM	05/30/2013	11:10:27 PM	0:0:24.826	DUNN 9 WEST NURSE STATION	12092	Dept. 2964 NS- 14936	14936	118E	A<-B
3	05/30/2013	11:10:13 PM	05/30/2013	11:11:52 PM	0:1:39.825	DUNN 4 WEST NURSE STATION	12046	DUNN 4 WEST NURSE STATION	14663	108E	A<-B
4	05/30/2013	11:09:38 PM	05/30/2013	11:09:50 PM	0:0:12.17	NEURO 7 WAITING ROOM	14992		46322	0F8E	A<-B
5	05/30/2013	11:09:41 PM	05/30/2013	11:09:59 PM	0:0:17.676		11822	Radiology Services - 12800	12800	0E8E	A<-B
7	05/30/2013	11:08:27 PM	05/30/2013	11:08:29 PM	0:0:1.952	Nurse Station Main 4 SW	11042	VoiceMail	12624	0C8E	A<-B
8	05/30/2013	11:08:14 PM	05/30/2013	11:08:24 PM	0:0:9.821	FONDREN 10 C.C.U	13100	NS3563 Phone1	10800	0B8E	A<-B
9	05/30/2013	11:07:59 PM	05/30/2013	11:08:49 PM	0:0:50.67	DUNN 9 WEST NURSE STATION	12092	Dunn 9 West 14643	14643	0A8E	A<-B
10	05/30/2013	11:07:10 PM	05/30/2013	11:07:26 PM	0:0:16.503	MAIN 7SW NURSES STATION	57123		46322	098E	A<-B
11	05/30/2013	11:06:58 PM	05/30/2013	11:07:07 PM	0:0:9.18	MAIN 7SW NURSES STATION	57127		46322	088E	A<-B
12	05/30/2013	11:07:04 PM	05/30/2013	11:07:28 PM	0:0:23.878	DUNN 3 O.R. NURSE STATION	12031	Sub Sterile Processing	18386	078E	A<-B
13	05/30/2013	11:06:59 PM	05/30/2013	11:07:07 PM	0:0:7.561	TELEMETRY DEPT.	12405	Dunn 4 West 10781	10781	068E	A<-B
14	05/30/2013	11:06:23 PM	05/30/2013	11:07:03 PM	0:0:40.213	Fondren ICU	13203	Phone10 NS3503	15843	058E	A<-B
15	05/30/2013	11:06:29 PM	05/30/2013	11:06:49 PM	0:0:19.621	MAIN4 NW NURSE STATION	11044	Main 4NW 15808	15808	028E	A<-B
16	05/30/2013	11:06:21 PM	05/30/2013	11:06:31 PM	0:0:10.612	JONES 9TH FLR.NURSE STATION	14092	Jones 9 - 17399	17399	038E	A<-B
17	05/30/2013	11:06:21 PM	05/30/2013	11:07:57 PM	0:1:36.673	DUNN 9 WEST NURSE STATION	12092	Dunn 9 West 14655	14655	048E	A<-B
26	05/30/2013	11:05:51 PM	05/30/2013	11:05:56 PM	0:0:4.102	DUNN 9 WEST NURSE STATION	57715	VoiceMail	15655	798D	A<-B
27	05/30/2013	11:03:25 PM	05/30/2013	11:03:45 PM	0:0:20.20	FONDREN 4 H.E.M.	13042	FB 4 --16008	16008	788D	A<-B
28	05/30/2013	11:02:46 PM	05/30/2013	11:03:31 PM	0:0:45.274	DUNN 6 WEST NURSE STATION	12062	Methodist Hospital	75600	778D	A<-B
29	05/30/2013	11:02:47 PM	05/30/2013	11:03:32 PM	0:0:44.331	DUNN 4 WEST NURSE STATION	12046	Dunn 4 West 10576	10576	768D	A<-B
30	05/30/2013	11:02:33 PM	05/30/2013	11:06:09 PM	0:3:36.485	Alike 8 Nurse Sta.	13082	Dept - 2984 Phone01 12858	12858	758D	A<-B
31	05/30/2013	11:02:24 PM	05/30/2013	11:02:37 PM	0:0:12.981	JONES 11	14112		46322	748D	A<-B
32	05/30/2013	11:02:40 PM	05/30/2013	11:03:32 PM	0:0:51.702	DUNN 4 WEST NURSE STATION	12046	DUNN 4 WEST NURSE STATION	10576	738D	A<-B
33	05/30/2013	11:02:06 PM	05/30/2013	11:02:41 PM	0:0:35.119	MSNW nurse sta.	11054		46322	728D	A<-B
34	05/30/2013	11:02:13 PM	05/30/2013	11:02:27 PM	0:0:13.825	JONES 8 NURSES STATION	52244	10959	10959	718D	A<-B
36	05/30/2013	11:00:39 PM	05/30/2013	11:01:09 PM	0:0:29.67	MAIN4 NW NURSE STATION	11044	Main 4NW 11006	11006	6F8D	A<-B
37	05/30/2013	11:00:39 PM	05/30/2013	11:01:40 PM	0:1:1.143	DR. DAVID CONROW	12247	Radiology Services - 12800	12800	6E8D	A<-B
39	05/30/2013	11:00:10 PM	05/30/2013	11:00:30 PM	0:0:20.271	Main 3 SW Nurse Station	11032		46322	6C8D	A<-B

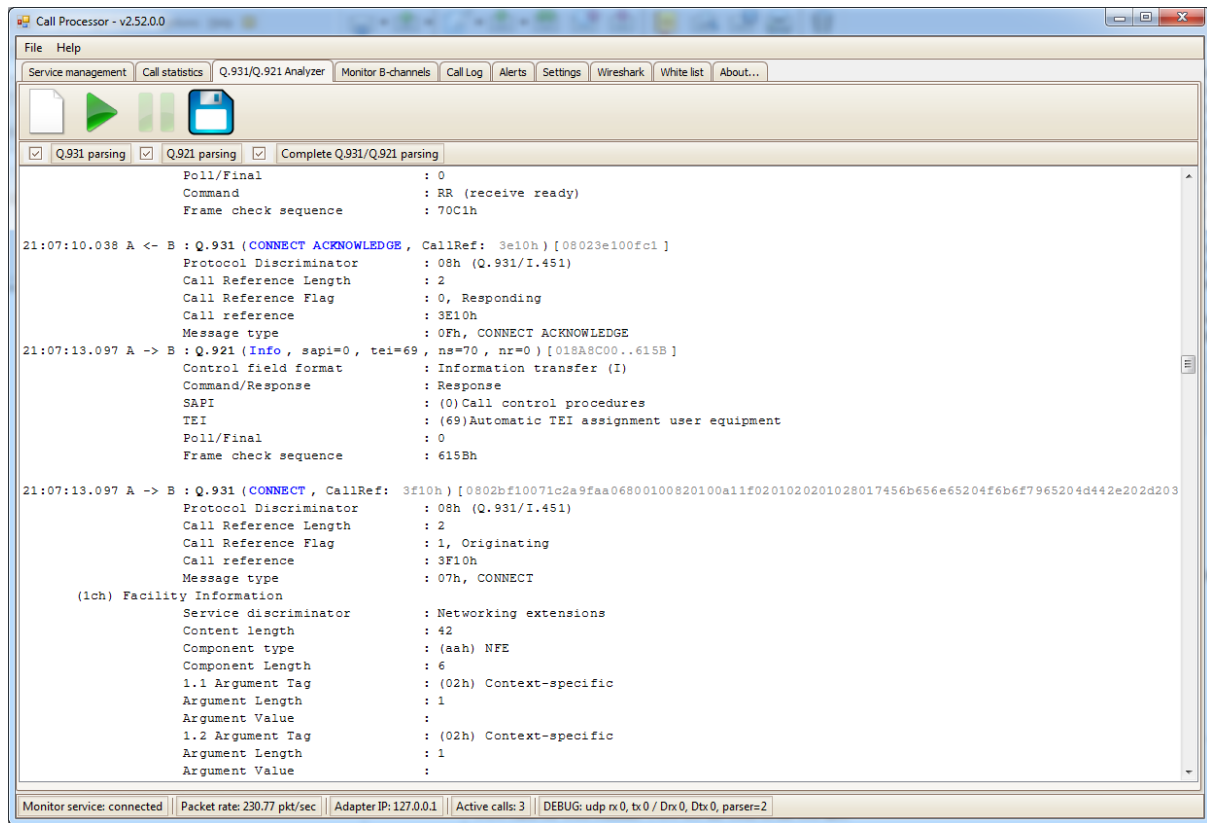
Call Processor contain a SQL database that keeps a log of all Calls with following information recorded:

- Start/Stop Date and Time
- Called/Calling Name
- Called/Calling Number
- Call Reference Value (Hex value from Q.931 trace)
- Call Direction (Incoming or Outgoing)

You can Copy, Delete, Download or Play any call from the call log.

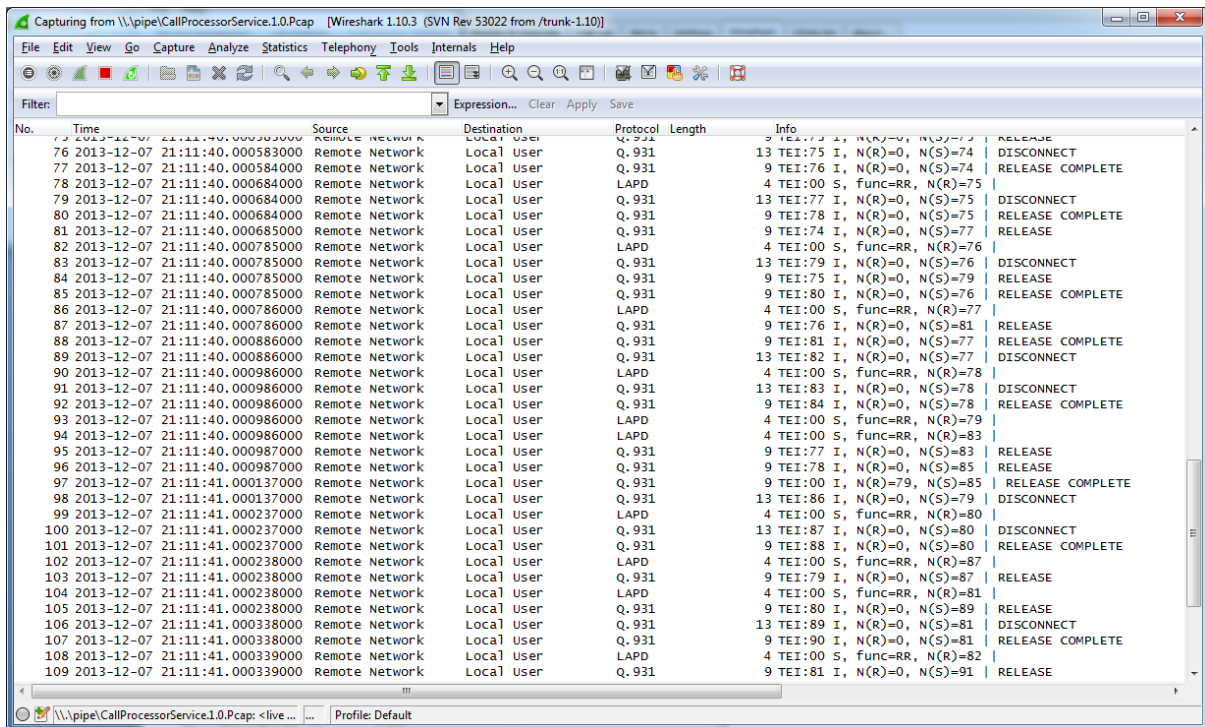
Powerful search tools allows filtering by any call parameter value.

Q.921/Q931 Protocol Analyzer



Complete Q.921/Q.931 protocol analyzer comes with Call Processor with capability to save captured data to PCAP formatted file or redirect UDP packets directly to Wireshark Application

Wireshark Connection from Call Processor



Open source Wireshark application can be linked to Call Processor for real time Q.931 monitoring directly in Wireshark

Live Call Monitoring

23									
12	0		12340	International Reception 12...	B -> A	TALKING	00:02:13	3D10	
11	0		14246	Methodist Hospital	B -> A	TALKING	00:02:04	4B10	
07	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5C10	
13	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5810	
14	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5710	
15	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5610	
16	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5510	
17	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5410	
18	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5310	
19	8326675599	Anthony Lucenio HH - 75599	17977		B -> A	SETUP		5210	
09	11044	MAIN4 NW NURSE STATION	19823	VoiceMail	B -> A	TALKING	00:00:34	5A10	

You can observe in real time all active calls in “Monitor B-channels” Tab and listen to any call directly from your Call Processor Server by pressing “Listen Active Call” Button .

Alerts

Alert can be configured to alarm you on different low disk space conditions or when Call Processor stops receiving UDP packets from Tap Adapter.

Call Statistics

Call statistics Tab give you information on

1. Total number of call in each direction,
2. Total number of minutes
3. Number of rejected calls
4. Top 10 Calling/Called numbers
5. Shortest and Longest Call duration