



Analysis of INFO Signals from ISDN Basic Access Interface

Recommendation I.430 from ITU (ex-CCITT) defines signals INFO 0, INFO 1, INFO 2, INFO 3, INFO 4 in table 4/I.430 and frame alignment procedures in paragraphs 6.3.1 to 6.3.3.

1. Analysis Principle

Clarinet ISDN uses, to analyse and simulate on S0 Bus, two widely used SIEMENS PEB2085 chips specified in the reference manual ISAC-S PEB 2085 version 02.92.

The first chip analyses transmission from NT to TE, and enables simulation of a TE. This chip provides indications "NT: lx". The second chip analyses transmission from TE to NT, and enables simulation of an NT. This chip provides indications "TE: lx". In MONITORING or USER mode, the first chip synthesizes clocks from the second chip which operates as a virtual NT, so indications "TE: lx" may be affected with a maximum delay equal to a frame (250 μ s).

A layer 1 analysis event is only generated when a signal INFO 01234 is recognized. The indication "--" corresponds to a signal other than INFO 01234. No layer 1 analysis event is generated when a signal INFO 0/4 is no longer recognized. The indication INFO 1 is used, in the direction TE to NT, on presence of an electric signal other than INFO 3.

On the other hand, since the Basic-Access interface is a BUS, it is important to notice that we will not systematically observe the same indications at two distinct points on the BUS.

2. Detection Delay

TE to NT:

INFO 0 from INFO 3:	2 frames (500 μ s)
INFO 0 from INFO 1:	immediate (PEB 2085)
INFO 1 from INFO 3:	2 frames (500 μ s)
INFO 1 from INFO 0:	immediate (PEB 2085)
INFO 3:	3 frames (750 μ s)

NT to TE:

INFO 0:	16 ms (PEB 2085)
INFO 2:	3 frames (750 μ s)
INFO 3:	3 frames (750 μ s)
INFO 4:	3 frames (750 μ s)
"--" from INFO 0:	immediate (PEB 2085)
"--" from INFO 2:	2 frames (500 μ s)
"--" from INFO 4:	2 frames (500 μ s)





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3. Example of Activation by the TE

.....	1	√TE: I0	NT: I0	
11:44:15/097.7	1	√TE: I1	NT: I0	
11:44:15/097.7		1	√TE: I0	NT: --
11:44:15/098.5	1	TE: I0	√NT: I2	end of emission of INFO 1 due to beginning of emission of INFO 2
11:44:15/099.5	1	√TE: I3	NT: I2	3rd frame INFO 2 received
11:44:15/100.0	1	TE: I3	√NT: I4	3rd frame INFO 3 received
				3rd frame INFO 4 received

4. Example of Activation by the NT

.....	1	√TE: I0	NT: I0	
11:44:05/930.6	1	TE: I0	√NT: I2	3rd frame INFO 2 received
11:44:05/931.5	1	√TE: I1	√NT: I2	beginning of emission of INFO 3
11:44:05/932.6	1	√TE: I3	NT: I2	3rd frame INFO 3 received
11:44:05/933.1	1	TE: I3	√NT: I4	3rd frame INFO 4 received

5. Example of Deactivation by the NT

.....	1	√TE: I3	NT: I4	
11:44:05/014.8	1	√TE: I1	NT: --	desynchronisation INFO 3 due to desynchronisation INFO 4
11:44:05/015.0	1	√TE: I0	NT: --	actual detection of INFO 0
11:44:05/030.0	1	TE: I0	√NT: I0	end of timeout (16 ms) on detection of INFO 0

In this example, the desynchronisation INFO 4 ("NT: --"), which does not generate an analysis event, occurred before the desynchronisation INFO 3 which, on the other hand, generates an analysis event indicating detection of INFO 1.

6. Conclusion

Clarinet ISDN being dependant on the PEB 2085 chip cannot be a true layer 1 analyser for the Basic-Access interface, but indications provided concerning layer 1 are generally sufficient for upper layer interpretation.

