



3G Level A/B detection using the GS2970/71

There are two methods for detecting if an input signal is Level A or Level B. The first method is simpler, but cannot determine the exact Level B mapping. Also, sources that are not compliant to SMPTE 425, and have missing or corrupt 352M packets, are assumed to be Level B using the first method. The second method requires more steps but can provide the whole SMPTE 352M packet content for both Level A and Level B.

Method 1

This method involves first checking that the input signal is 3G and then reading the SMPTE 352M packet registers. The VIDEO_FORMAT_352_A_X registers can only be used to read SMPTE 352M packets from a Level A signal. If the 352M byte 1 value is not valid for a Level A signal, the stream is assumed to be Level B. This process is expressed in the following logic:

```
if RATE_SEL_READBACK [reg 22h bits 14-15] = 2
    if VIDEO_FORMAT_352_A_1 [reg 019h bits 0-7] is 89h or 88h
        input = level A
    else
        input = level B (or input signal has invalid 352M packet and violates SMPTE)
    endif
else
    input is not 3G
endif
```

Method 2

This method uses the ancillary data extraction features of the GS2970/1 to extract byte 1 of the SMPTE 352M packet which defines the 3G level. The process could be modified to read the full contents of the 352M packet for additional information about the video payload.

Registers Required:

ANC_LINE_A: 00Bh

ANC_LINE_B: 00Ch

ANC_TYPE1_AP2: 00Fh

ANC_DATA_SWITCH: 00Ah bit 3

HD_ANC_C2: 00Ah bit 1

ANC_PACKET_BANK: 800h to BFFh (two banks with the same address)

Steps:

1. ANC_LINE_A programmed with line number of ANC packet. ANC_LINE_B may also be programmed for interlaced formats.
2. ANC_TYPE1_AP2 programmed with DID (41h) and SDID (01h) of ANC packet.
3. ANC_DATA_SWITCH set low.
4. HD_ANC_C2 set high (FIFO begins to fill).
5. Wait for packet to be written into Bank 1.
6. ANC_DATA_SWITCH set high (moves write pointer to Bank 2).
7. Read ANC_PACKET_BANK (read ANC packet from Bank 1).
8. ANC_DATA_SWITCH set low (moves read point to Bank 2, clears Bank 1).
9. Wait for packet to be written into Bank 2.
10. ANC_DATA_SWITCH set high (moves write pointer to Bank 1).
11. Read ANC_PACKET_BANK (read ANC packet from Bank 2).
12. ANC_DATA_SWITCH set low (moves read pointer to Bank 1, clears Bank 2).
13. Go to 5.

Example:

- | | |
|------------------------------------|---|
| 1. Write ADR 00Bh, DATA 00Ah. | Extract 352M packet from line 10 for 1125p line format. |
| 2. Write ADR 00Fh, DATA 4101. | 352M packet DID 41h, SDID 01h. |
| 3. Write ADR 00Ah bit 3, DATA 0b. | |
| 4. Wait. | |
| 5. Write ADR 00Ah bit 3, DATA 1b. | |
| 6. Read ADR 806h bits 0-7. | 352M byte 1 is located at 806h in this example. More addresses could be read here if more information from the 352M packet is required. |
| 7. Write ADR 00Ah bit 3, DATA 0b. | |
| 8. Wait. | |
| 9. Write ADR 00Ah bit 3, DATA 1b. | |
| 10. Read ADR 806h bits 0-7. | Will be the same value unless input has changed. |
| 11. Write ADR 00Ah bit 3, DATA 0b. | |
| 12. Go to 5. | Looping allows for continuous Level A/B detection. |

The 352M packet byte 1 can be interpreted using [Table 1](#). This information can also be found in SMPTE 425.

Table 1: 352M packet byte 1

Mapping Nomenclature	Byte 1 Payload
Level A 750-line	88h
Level A 1125-line	89h
Level B SMPTE 372M dual link	8Ah
Level B 2 x 720-line payload over 3Gb/s SDI	8Bh
Level B 2 x 1080-line payload over 3Gb/s SDI	8Ch
Level B 2 x 483/576-line payload over 3Gb/s SDI	8Dh

Revision History

Version	ECR	Date	Changes and/or Modifications
1	158227	June 2012	Removed step 4 from Example: section.
0	152260	July 2009	New document.



DOCUMENT IDENTIFICATION
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