APOGEE LABS

AL2873

REALTIME BEST PCM STREAM SELECTOR

FEATURES

- NRZ-L, M, S, RNRZL-15 data and clock inputs up to 40 Mbps, up to 80 Mbps optional
- Data polarity: normal, invert, APC
- Selectable input impedance (50 Ω or 75 Ω)
- Minor frame sync: 4-32 bits with mask
- Frame synchronizer:
  - ◊ Error tolerances - Search: 0-15; Check: 0-15; Lock: 0-15
  - ◊ Check Frames - 1-15 consecutive good patterns to advance to Lock
  - ◊ Lock / Flywheel Frames - 0-15 consecutive unacceptable patterns to revert to Search
- Minor Frame: up to 128k bits
- Major frame sync: up to 65,536 frames, SFID type, 16 bit counter, up / down, MSB / LSB 1st, start / end 1 / 0 position: any consecutive bits in the minor frame (not limited to word boundaries)

OVERVIEW

This unit provides a means of selecting the best quality PCM signal in real time to support critical Safety of Flight Operations. Each input channel accepts NRZ-L, M, S, RNRZL-15 data and clock at TTL levels with selectable impedances of 50 or 75 ohm on BNC connectors. It is programmed with the Frame Sync Pattern and frame length in number of bits. Each module's input channel contains a Frame Synchronizer (to lock onto and detect errors in the minor Frame Sync code), a Data Quality Monitor which combines synchronization status with errors, and a Quality Factor section which combines the DQM data with a user selected priority to come up with an overall Quality Factor for each stream. All this is accomplished in real time through the use of Field Programmable Gate Arrays. There are no processors or operating systems involved.

A module is designated as the Output Controller and provides the selected PCM data & clock pair as TTL levels on BNC connectors. The OUTCX constantly polls the input channels to monitor their Quality Factor. It then decides which input to route to the output. Again, this is accomplished in real time through the use of Field Programmable Gate Arrays. There are no processors or operating systems involved. The selection process requires a maximum of 250usec to collect the Quality Factors and update the selection decision. Data delay from the selected Input Channel BNC to the Output BNCs on the Output Controller is 4 clock times. In order to achieve this speed, switching between Input Channels does not involve aligning the data from the various inputs.

210 South 3rd Street, North Wales, PA 19454
Tel: 215-699-2060 Fax: 215-699-2061
E-Mail: sales@apogeelabs.com

OVERVIEW (continued)

Each module has 4 BNC connectors that operate as:
J1, Channel A Data Input
J2, Channel A Clock Input

J3, Channel B Data Input (Input mode)
J4, Channel B Clock Input (Input mode)
Or
J3, BEST Data Output (Output Controller mode)
J4, BEST Clock Output(Output Controller mode)

All the modules are the same in the chassis, with the selected data and clock passing in Daisy Chain fashion from the lowest number to the highest number. Once an Output Controller module is encountered, the Daisy Chain is broken and a new subset of Best Stream Selection begins. Therefore, the user has the ability to create many different mission configurations by changing the designation of which modules will perform the Output Controller function. For example, the first 4 cards can implement a 7:1 BSS, while the next two cards implement a 3:1 BSS, followed by three cards performing a 5:1 BSS, etc. The compact, 3 ½" high rack mount chassis can contain up to 14 modules. At the extremes, a single unit can provide a 27:1 BSS, or 14 simple 1:1 Dedicated pass- throughs (with Data Quality Monitoring capability).

The Output Controller's decision is based on the Quality Factor value. This 16 bit value is derived from (listed in decreasing order of importance):

User Specified Channel Priority (scaled 1-8)
Number of Frame sync Bit errors (measured over a user specified number of frames [1-128])
Frame Synchronizer status

CHASSIS SPECIFICATIONS

PHYSICAL

- 3.5" high x 19" wide rack mountable
- 14 card slots
- Plug in modules: 3" high x 5" deep

FRONT PANEL

- High visibility LCD display
- Keypad for data entry and page navigation
- 16 LED channel status indicators (slots 1-8)

REMOTE CONTROL

- Ethernet 10 baseT
- ASCII coded command response
- APEX compatible

ENVIRONMENTAL

- Operating temperature: 0° to 50° C
- Relative humidity: 15% to 95%; non-condensing
- Altitude: Sea level to 10,000 feet

POWER

- +5V from AL2873 chassis backplane
- 105-230 VAC; 47-63 Hz
- Typically < 50W

MEAN TIME BETWEEN FAILURES

- ~ 100,000 hours

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