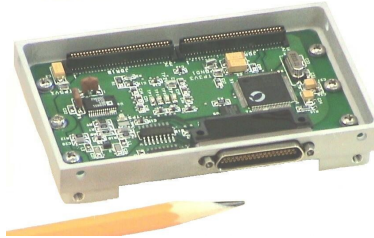# APOGEE LABS

4052
Bit Sync Module

FEATURES

- Clock recovery from data only
- Analog input
    - Bipolar or unipolar; auto detect
    - Accommodates baseline shifts and variations
- Bit rate from 1Kbps to 20 Mbps (NRZ codes)
    - 1 Kbps to 10 Mbps (Bi-phase codes)
- Input and output bit codes
    - NRZ-L,M,S; Bi-Ø-L,M,S; RNRZ

- Acquisition of signal nominally 250 bits
- Loop bandwidth from 0.7% to 6%
- Programmable features
    - Nominal bit rate
    - Tracking limit
    - Data detector type
    - Input code and polarities
    - Output code and polarities

OVERVIEW

The combination of the AL4000 Multiplexer/Demultiplexer and the model 4052 Bit Sync module provides a flexible, cost effective means of reconstructing a clock from data-only signal lines and recovering the data. This module can handle signal corruptions commonly found in cable runs and RF links such as noise, baseline shifts and amplitude variations. Bit code conversion is provided at both the input and output interfaces. IRIG randomizing and derandomizing is also included. For example, the output, when coded, can be used for tape recording or fiber optic link transmission.

Incorporating both Integrate & Dump (I&D) and Filter & Sample (F&S) type data detectors provides the optimum detection type for wideband or pre-modulation filtered data types.

SPECIFICATIONS

GENERAL
- Single height module, 0.40" x 2.5" x 4.0"
- Power consumption: 7.5 watts

INPUT
- Data only
- Amplitude : 0.5Vp-p to 10Vp-p combined signal, baseline shift/variation and noise
- Baseline Shift : up to +/- 10Volts baseline offset

INPUT (continued)
- User-Programmable 11-bit Value
- Baseline Variation : Up to the signal amplitude (p-p) with a frequency up to 0.1% of the bit rate
- Amplitude Variation : Up to the signal amplitude
- Termination: set at factory, options are 75ohm, 50ohm, 10Kohm

SPECIFICATIONS *(CONTINUED)*

INPUT (continued)

- Connector: Micro D-37
- Power consumption: 7.5 watts
- Rate: 1 kb/s to 20 Mb/s - NRZ Codes
       1 kb/s to 10 Mb/s - Bi-Ø Codes
- NRZ-L,M,S; BiØ-L,M,S; RNRZ-15

CLOCK RECOVERY

- Tracking: 6.2%, 3.1%, 1.6%, 0.7%
- Capture: = Tracking range
- Retention: Retains synchronization in input signals with transition gaps up to 100 bits occurring once every 500 bit times

DATA RECOVERY

- Data Detector: Integrate/Dump & Filter/ Sample provided
- Performance: within 1 dB of theoretical at rates to 10 Mbps; within 1.5 dB of theoretical at rates above 10 Mbps
- Signal/Noise Range: Operates to E_b/N_o of less than 1 dB

OUTPUT

- TTL level
- 0° clock and data
- 51/75 ohm driver

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