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WHY YOU SHOULD BUY YOUR NEXT BIT SYNCHRONIZER FROM GDP (THE GOLD STANDARD FOR BIT SYNCHRONIZERS)

As you may already know, GDP Space Systems is an industry leader in the development and manufacture of high performance Bit Synchronizers and other telemetry and signal acquisition products. We pride ourselves on performance, quality, service and customer support.

Our Bit Synchronizers have World Class Performance and Functionality, which has been proven over and over again in real-life testing by our customers. Aside from GDP's commitment to service, support and quality, the key reason to buy a GDP Bit Synchronizer is performance. GDP's bit synchronizers are truly superior in the presence of noise and/or jitter. Our bit synchronizers are better than 1dB from theory all the way down to -3dB Eb/No , at input signal levels down to 100mV. Above all of the other performance items, this is a major discriminator between the GDP bit synchronizer and other bit synchronizers on the market today. This translates to significantly less lock dropouts on downstream frame synchronizers and decommutators. This means significantly more usable data during receiver fade and multi-path situations, which typically occurs at the most critical part of the mission, when the aircraft is performing the test maneuver.

GDP bit synchronizers truly have superior performance. You do not have to take our word on this. GDP can demonstrate this to you (on-site) using test equipment that can measure these parameters. GDP bit synchronizers can also support ARTM Tier 1 (option) and real-time Best Source Selection (option). A more detailed description of this performance benefit is provided at the end of this email.

Below are just a few more reasons that you should consider buying your next Bit Synchronizer from GDP.

1. **Industry Performance Leader**
 - a) NASA's BER Winner in Side-by-Side testing
 - b) ESA (European Space Agency) Winner in Side-by-Side testing for a High Noise application (1db off the curve all the way down to negative 3dB Eb/No)
 - c) Vandenberg AFB Side-by-Side testing (2/3 fewer frame sync dropouts than competitors)

- 2) **Special Unique Data Quality Monitor Features Displayed on Front Panel and Available via Remote Port for Each Channel**
 - a) Real-Time On-Line Eb/No Data Quality Measurement on Live Stream
 - b) Bit Error Rate Measurement on Live Stream
 1. PCM Frame Sync Pattern Bit Error Count on Live Stream
 2. Viterbi Bit Error Count on Live Stream
 - c) Internal PRN Bit Error Rate (BERT) Function (Off-line PRN Link Test)

3) Other Unique Features

- a) Auto Scan Option- Scan multiple bit rates and lock when stream of interest is found.
- b) Improve System Performance (Error Correction) with Diversity Combining Best Source Selection Option (automatic switch to the best quality stream without dropping lock on downstream frame synchronizers)
 - (1) Multiple Streams Automatically Correlated in Time
 - (2) Error Correction on a bit-by-bit basis
 - (3) Majority Vote Weighted by Bit-by-Bit Signal Quality
 - (4) Works on Encrypted Data
- c) Advanced Bit Sync Lock Detection Circuitry
- d) Viterbi Decoder
- e) Frame Sync Pattern Detector

4) Variety of Configurations Requiring Less Rack Space

- a) Single, Dual or Quad Channel Configurations in a 2U Chassis
- b) Up to 16 Bit Sync Channels in a 4U Chassis with Matrix Switching Capability (Redundant Power Supplies)
- c) Up to 8 Channels in a 1U Remote Control Chassis
- d) Up to 8 channels in a 3U PC Version with a touch screen display on the front panel.
- e) Other Configurations available with up to 16 channels per box, including a Touch Screen front panel control version
- f) Single and Dual Card Level Products (VME, cPCI, PCI)\Dual PCI Bit Synchronizer

5) Compatible with Modern Modulation Waveforms (Optional)

- a) Dual Bit Sync Processes ARTM Tier I SOQPSK Waveform
- b) QPSK & OQPSK Option on Dual Unit
- c) Add QPSK, BPSK, PSK Demodulator to same unit

6) Interchangeable (Drop-in Replacement) with Obsolete Aydin and DSI Units

- a) Remote Control Backwards Compatible (Option)

AVAILABLE BIT SYNCHRONIZER PRODUCTS

MD265	Single/Dual Bit Sync Configurations	2U Chassis Up to 20Mbps	< MD265 >
MD2265	Single/Dual/Quad Bit Sync Configurations	2U Chassis Up to 40Mbps	< MD2265 >
MD2266	Multi-Channel Bit Sync Up to 16 Channels	4U Chassis, Up to 40Mbps	< MD2266 >
MD2266B	Multi-Channel Bit Sync/ Best Source Selector Up to 8 Channels	4U Chassis, Up to 40Mbps	< MD2266B >
BSM002	Single Channel Bit Sync	VME Module Up to 20Mbps	< BSM002 >
BSM202	Single/Dual Bit Sync Up to 40Mbps	PCI Module Up to 40Mbps	< BSM202 >
BSM601	Single Channel Bit Sync Up to 20Mbps	cPCI Module Up to 20Mbps	< BSM601 >
BSM602	Single/Dual Bit Sync	cPCI Module Up to 40Mbps	< BSM602 >
RDM021	Receiver/Demod/Bit Sync	VME Module	< RDM021 >
RDM201	Receiver/Demod/Bit Sync	PCI Module	< RDM201 >
MD421	Receiver/Demod/Bit Sync	2U Chassis	< MD421 >

NOTE: Eb/No down to -3dB Eb/No at signal levels down to 100mv.

There are many important reasons that Bit Synchronizers must maintain phase lock when the input signals have a negative Eb/No. Maintaining phase lock during negative Eb/No's implies that there are no bit-slips (no additional or lost bits). This is very important to the equipment connected to the bit synchronizer such as decryptors, Frame Synchronizers and Decommunators. It is also extremely important in situations where the user has embedded video in the PCM downlink. Slips that occur in Bit Synchronizers cause re-synchronization issues for the downstream equipment. Re-synchronizations that occur in Frame Synchronizers and Decommunators do not just waste bits, they waste frames of data. The more negative Eb/No that a bit synchronizer can support, the more reliable the Bit Synchronizer can be considered. The GDP Model 265, and the next generation GDP Model 2265 handle -2dB and -3dB Eb/No respectively, along with an advanced synchronization detector for an extremely reliable synchronization indication. Synchronization indication is also important since bit synchronizers rely on this signal in their synchronization strategy. Users also rely on Bit Synchronizer synchronization status to determine if the recovered data is correct. In noisy applications this translates to 2/3 less lock dropouts over the best bit synchronizers on the market today.

Another important Bit Synchronizer specification is its ability to handle small input signals levels with noise. This is important because the Bit Synchronizer receives signals that experience fades due to signal path obstructions and fades due to multi-path. The fades cause the input signal to be reduced in peak-to-peak amplitude and the Eb/No ratio of the faded signal get smaller and possibly negative. A Bit Synchronizer that can maintain lock and have reliable synchronization when the input is small and Eb/No is negative is a very robust Bit Synchronizer. The GDP Model 265 and the next generation Model 2265 are just such Bit Synchronizers. The Model 265 and the Model 2265 handle input signal down to 200mVpp and 100mvpp with an Eb/No of -2dB Eb/No and -3dB respectively.

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