ACROAMATICS
TELEMETRY SYSTEMS

40 Mbps PCM Bit Synchronizer
Model 2430D

Features:

- Compact and rugged
    * 2u single/dual stream design
- 8 bps to 44 Mbps Data Rate Range
  NRZ and Bi-Phase Codes
- Best in Class Performance
    * within 0.50 db of theory in all modes
- Fast Sync Acquisition
    * within 50 bit transitions, typical
- Best in Class Sync Retention
    * to 1024 bits without transition
- Bit Sync Status Monitors
    * Front Panel IED Lock/Search/Loss
    * On screen Performance Monitor
        - Input Amplitude, Offset, Rate
          Deviation and Lock Status
- Data Quality and Signal Test:
    * BERT/PRN BER Link Test Mode
    * Frame Sync PCM BER Monitor
    * Frame Lock/Loss Monitor
    * Eb/No Signal Quality Analog Out
    * Viterbi Error Monitor/Stats
- Data Simulator/Generator
    * Programmable rate/PRN Code/
      PCM Format and Code - to 40 Mbps
- Processes all IRIG Codes
    * NRZ-L/M/S, DBio-M/S, DM-M/S,
      MDM-M/S, RZ
    * Randomizer/Derandomizer
- Descrambler
    * CCITT V.35, INTELSAT, G2 Invert

Network compatible. Includes Windows 7 & 10
local and remote software.

General Description

The new Model 2430D is a "drop in" replacement for all previous 2430 family 2u rackmount single and dual stream PCM bit synchronizer units. It provides a new signal I/O interface which allows a wide variety of standard unit input and output configurations to be offered at the time of order, making any rear panel connector assignable as to type, signal function and termination. The new Model 2430D is based on an entirely new "best in class" advanced 3rd generation digital bit sync design, yet remains a "drop in" compatible replacement for previous generation Acroamatics. In fact, the 2430D is literally a "drop in" upgrade for any standard 2u rackmount bit sync - while delivering state-of-the-art 40 Mbps rate capabilities, and significant BER, acquisition and signal retention performance improvements. The 2430D is configured with either one or two channels, and for higher count bit sync applications the Model 2950P 4u system supports configurations of up to sixteen (16) - with the same rock solid performance as the Model 2430D

Standard options include Viterbi convolutional encode/decode, Frame Sync Pattern Lock/Bit error Rate Test, dual and quad stream live data best source select/ambiguity resolution. Equipped with a 4.9 inch high brightness color LCD display, the Model 2430D delivers simple and precise menu driven front panel operator set-up control, system and signal quality status feedback. Remote monitoring and programming is supported via provided Ethernet and serial RS-232 interface. Set-up storage and recall is provided at the users option, either locally, via remote networked host, or both.

Windows Remote Bit Synchronizer GUI Operating Software is provided with each Model 2430D to remotely program and operate up to 64 individual bit sync channels over a network. The same software also supports operation of all present and legacy model Acroamatics bit sync products - whether in multi-stream units, standalone PCI card installations, or bit syncs installed with decoms in remote Telemetry Data Processing (TDP) Systems.
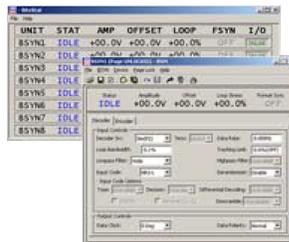
Signal Inputs (Per Bit Sync)

Source	Four (4) Program selectable inputs provided. Choice of input configuration (i.e. three BNC single-ended/one Triax RS-422) at time of order.
Isolation	Greater than 60dB at 40MHz
Impedance	Program selectable: Hi-Z/Lo-Z, Single Ended: 4kΩ /75Ω , Differential: 10kΩ /150Ω
Signal Level	Single Ended: 0.2 to 20V p-p, Differential: 0.2 to 10V p-p
DC Offset	20V max Single-Ended, Hi-Z
Baseline Variation	Tracks sinusoidal offsets to 100% p-p signal amplitude at 0.1% bit rate
PCM Codes	Program selectable: NRZ-L/M/S, Biø-L/M/S, DBiø-M/S, DM-M/S, MDM-M/S, RZ
Derandomizer	Program selectable: RNRZ 9/11/15/17/23, forward/reverse

Synchronization

Bit Rate Range	8 bps to 40 Mbps (all IRIG Codes - includes bi-phase). Each channel individually assignable.
Tuning Resolution	0.1% of bit rate
Capture Range	3 times the programmed loopwidth, typical
Tracking Range	±12% typical, with programmable limiter
Loop Bandwidth	0.1% to 3.2%, program selectable in 0.1% increments
Sync Threshold	0dB for NRZ-L and Biø-L codes
Sync Maintenance	(LW=0.1%) —2dB NRZ-L and Biø-L codes
Sync Acquisition	(LW=1.6%, SNR > 12dB) Typically less than 50 bit pixels
Sync Retention	(LW=0.1%, SNR > 3dB) Retains sync through > 1024 consecutive dropouts
Bit Error Rate	(LW=0.1%) within 0.50 of ideal bit error rate performance curves, in all modes of operation and data rates.

Data/Clock Outputs, NRZ-L (Per Bit Synchronizer)

NRZ-L Data	One each 8 bps to 40 Mbps MRZ-L, TTL - BNC/75Ω. Optional RS-422 or multiple outputs available on request.
Data Clock	One each: 0°, 90°, 180°, 270°, operator program selectable (per Data Output line).
Data Polarity	Program selectable: normal/inverted
Signal Type	BNC Single-ended TTL or Triax RS-422 Differential, specified at time of order per NRZ-L bit sync clk/data output pair
	RS-422 Differential driven Bit Sync NRZ-L and CODED Outputs are also each provided via rear panel DB-35 connector, standard.

Data/Clock Outputs, Code (Per Bit Synchronizer, via Bit Sync Internal dual PCM Encoder)

Data Source	Program selectable: Recovered Data (Bit Sync NRZ-L Data/Clk - DEFAULT) or External data/clock (Program Selectable)
Output	Three each: *One each* TTL data/clk (0° & 180°, selectable) Code (selectable) PCM and Clk, *One each* TTL data RNRZL, *One each* TAPE (code selectable) TTL or ±2Volts balanced output, 50mA drive current
Randomizer	Program selectable: RNRZ 9/11/15/17/23, forward, reverse
PCM Codes	Program selectable: NRZ-L/M/S, Biø-L/M/S, DBiø-M/S, DM-M/S, MDM-M/S, RZ

External Data/Clock PCM Encoder Input (Per Bit Synchronizer)

Signal Type	Jumper selectable: RS-422 or TTL
Impedance	120Ω RS-422, 75Ω TTL
Data Code	Program selectable: NRZ-L/M/S, Biø-L/M/S, DBiø-M/S, DM-M/S, MDM-M/S, RZ
Data Clock	Program selectable: Normal/Inverted, 1x or 2x

New High Contrast Operator Menu Scheme

Convolution Encoder/Decoder (Optional, Per Bit Synchronizer)

Viterbi Decoder	Rate 1/2, k=7: Includes differential decoding, V.35 descrambling, and G2 invert
Symbol Formats	Serial, parallel, and staggered parallel
Convolutional Encoder	Rate 1/2, k=7: Includes differential encoder, V.35 scrambler, and G2 inverter
Symbol Formats	Serial, parallel, and staggered parallel

Format Generators/Synchronizer (Optional, Per Bit Synchronizer)

Format Generator	Programmable frame length, sync pattern and mask, and rate
Synchronizer Source	Recovered data, external data, or test generator (to 64 Mbps in rate)
Synchronizer Strategy	Pattern match in "search", programmable error limits for "check" and "lock" states
Other Features	Bit slip enable, auto polarity enable, data source/ambiguity resolution

Bit Error Rate Tester (Optional, Per Bit Synchronizer)

Transmitter Pattern	PRN sequence: 211-1, 27-1, 29-1, 215-1 (forward/reverse)
Pattern Clock Source	Program selectable: Bit Rate Clock or External Clock
Blanking	Program selectable: 32, 64, 128 bits
BER Sample Period	Program selectable: 103 to 109 bit periods, or continuous accumulate
Other Features	Automatic pattern synchronization, forced error ON/OFF

Physical/Remote Interface

Remote	RS-232 & 10/100/1000BT Ethernet. Windows 7 32/64-bit Remote Bit Sync Software provided at no additional charge.
Power	115/230 VAC 60-50 Hz 3A max
Dimensions	3.48" (8.84cm) H x 19.0" (48.26cm) W x 20.19" (51.28cm) D
Temperature	Operating: 0° to +40° C, Non-Operating: -40° to +86° C
Relative Humidity	Up to 90% non-condensing
Shock	Operating 6G, Non-operating 50G
Vibration	Operating 0.5G, 5 to 2000 Hz, Non-Operating 1.2G, 5 to 500 Hz