

# RF Receiver/Demodulator/Bit Sync

## MODEL 4426



### KEY FEATURES

- Up to 4 Channels in a 2U Box
- Wide RF Frequency Coverage Including Lower L, Upper L, S, C & CIF Bands
- Wide Dynamic Range: > 90dB with <4 dB noise figure
- Multi-Waveform Demodulation Including: PCM/FM, SOQPSK, BPSK, QPSK, OQPSK, ARTM Tier 0,1
- Advanced Noise Mitigation & FEC Including: Viterbi, \*LDPC Coding, \*Reed Solomon, \*
- Adaptive Equalization, and Advanced Diversity Combining Functions (AGC & DQ)
- Ethernet Outputs Including IRIG 218-10 & 20, IRIG-106 Chapter 10/11, Chapter 7
- Encapsulated Data Output for Best Source Selection Including RCC DQE/DQM & GDP DQE
- Antenna Tracking & Control Support (AM/AGC/DQ)
- Dual Channel w Pre-D\* & Post-D Combiner

\* Optional

### GENERAL DESCRIPTION

The Model 4426 Digital RF Receiver is a state-of-the-art solution providing a compact, cost-effective, and flexible answer to a wide variety of communications link scenarios. Housed in a 2U rackmount chassis, it supports single, dual, or quad-channel configurations with diversity combining. Each channel operates independently and can acquire S-Band, Upper L-Band, Lower L-Band, and optional C-Band or P (CIF) Band, with other multi-band options available.

Demodulation and baseband bit synchronization are performed entirely in the digital domain. Acquisition is achieved by scanning the IF across the programmed band around the carrier and, when present, at subcarrier frequencies. Once locked, synchronized signal tracking ensures stable operation with continuous validation of lock state.

**LINK Improvements & Noise Mitigation:** To mitigate noise and interference, optional FEC decoders and two programmable frame synchronizers are available. Enhancements include LDPC coding for added margin and bandwidth efficiency, adaptive equalization to counter multipath, and advanced diversity combining using AGC and data-quality metrics. Encapsulated data and quality outputs support GDP Best Source Selector products; RCC DQE/DQM is also supported.

**Network Direct Mode:** The 4426 can accept an IRIG Chapter 7 downlink, perform bit and frame sync, and output IRIG Chapter 10/11 UDP packets directly to analysis software, Acroamatics processors, or Wideband recorders. It also supports IRIG 218 (2007 and 2010). UDP/IP transport is available for raw or byte-aligned data.



### RELATED PRODUCTS

Antenna	RF Recorder	Gateway	Best Source Selector

# RF Receiver/Demodulator/Bit Sync

## MODEL 4426

### TECHNICAL SPECIFICATIONS

#### Channel Specs

##### Input:

RF Frequency:	LL, UL, LS, US, and C Bands - see features on page
Noise Figure:	< 6 dB Max, 4 dB typ.
IF Filters:	Selectable filter bandwidths (Standard set provided)
Dynamic Range:	> 90 dB
Input Impedance:	50 Ohms VSWR < 2:1

##### Demodulation:

IF Acquisition / Tracking Range:	>± 255 kHz
Loop Bandwidth:	0.01% to 1% of Bit Rate (Analog PM 2 Hz to 20 kHz)
PM Demodulator:	Frequency Response: 100 Hz to 20 MHz Modulation Index: 0 to 3.0 Radians
PM Demodulator:	Frequency Response: 100 Hz to 20 MHz Modulation Index: 0.5 to >100% Deemphasis: NTSC/PAL
PSK Demodulators:	Types: 1 IF, 2 SC * Modulation Waveforms: BPSK, QPSK, OQPSK, AUQPSK *, SOQPSK (ARTM Tier 1) Locking Threshold: 6 dB Eb/No
PCM/FM Demodulator (ARTM Tier 0):	Data Rate: 10 bps to 10 Mbps – Standard (20 Mbps *)
Multi-h CPM (ARTM Tier 2) *:	100Kbps to 40 Mbps
Space Time Code (STC) *:	100Kbps to 40 Mbps

##### Bit Synchronizer(s):

Bit Rate:	50 bps to 10 Mbps PCM/FM & BPSK (20 Mbps *) 100 bps to 20 Mbps QPSK/SOQPSK (40 Mbps *)
Input Codes:	NRZ-L/M/S; Bi0-L/M/S, RNRZ (Other codes available as needed)*
Output Codes:	NRZ-L/M/S; Bi0-L/M/S, RNRZ (Other codes available as needed)*
Decoders*:	Viterbi Rate 1/2, 2/3*, 3/4*, 7/8*; Reed Solomon*, Concatenated*, LDPC* 1/2, 2/3, 4/5, 7/8
Derandomizer/Descrambler:	IRIG/CCSDS/V.35/V.36 (CCITT/ Intelsat)

##### Data Output:

Analog
TTL, RS422
Ethernet Data Output (IRIG 218-10 & 20, IRIG-106 Ch-10*, IRIG Chapter 7 Support*)
Encapsulated Data & Data Quality that supports GDP* & IRIG (RCC DQE/DQM) Best Source Selector*

##### Control Interface:

Ethernet (Standard)
---------------------

##### Environment:

Temperature 10°C to 40°C Operational; -40°C to 70°C Storage (Extended Temperature Ranges available)
---

##### Size & Weights

Dimensions:	3.5" H x 19" W x 20" D
Weight:	~30 Lbs
Status Output for Each Channel (Ch1, CH2 & Comb)	Signal Level, Freq Offset, BS Lock, BS Eb/No, FEC Lock, FS Lock, Phase Deviation, Composite Lock, AGC, Carrier Lock, Demod Lock, EQ Cntrl, ERO MDO, Code Word Count, Corrected Count, Decode Fail Count

*Recognizing that no standard product fits every mission, Delta Telemetry Systems is ready to deliver tailored solutions for your unique application requirements.*

*Specifications subject to change without notice.*