

# Single/Dual Channel Digital RF Receiver

## Model 4425

### Features

- Form Factor
  - ◆ 2U Rack-Mountable Chassis
- Noise Figure
  - ◆ < 10 dB
- Wide Dynamic Range
  - ◆ > 80 dB
- RF Frequencies
  - ◆ 2185 MHz to 2485 MHz
  - ◆ 1700 MHz to 1850 MHz
  - ◆ 1427 MHz to 1545 MHz
  - ◆ 550 MHz to 1100 MHz \*
- 4 Selectable IF Bandwidths
- Multi-Waveform Demodulation
  - ◆ BPSK
  - ◆ QPSK
  - ◆ OQPSK
  - ◆ UQPSK \*
  - ◆ AQPSK \*
  - ◆ SOQPSK (ARTM Tier 1) \*
  - ◆ Analog FM & PCM/FM \*
  - ◆ GMSK \*
- 3 Demodulators (Per Channel)
  - ◆ PCM / PSK \*
  - ◆ 1 RF, 2 SC \* (Per Channel)
- 2 Bit Synchronizers \*
  - ◆ 50 bps to 10 Mbps BPSK (20 Mbps \*)
  - ◆ 50 bps to 20 Mbps QPSK (40 Mbps \*)
  - ◆ Viterbi Decoders \*
  - ◆ Reed-Solomon \*
- 2 Frame Synchronizers
- Byte Aligned Ethernet Data Output\*
- Remote Control
  - ◆ Ethernet (Std)
  - ◆ RS-232 \*, IEEE 488 \*

\* OPTIONAL

### General Description

The Model 4425 Digital RF Receiver is available in



single or dual channel configurations in a 2U rack-mounted chassis. Each channel is completely independent and includes an integrated solution consisting of an RF Signal Processor, 2 Demodulators, 2 optional Bit Synchronizers and 2 Frame Synchronizers. This state-of-the art receiver provides a compact, cost competitive, flexible solution to a wide variety of communications link scenarios.

The Model 4425 processes 3 RF Bands: S Band, 2185 MHz to 2485 MHz; Upper L Band, 1700 MHz to 1850 MHz; Lower L Band 1427 MHz to 1545 MHz. Additional RF bands are available (i.e. P Band 550 MHz to 1100 MHz). Depending upon specific user requirements, a choice of 4 IF filters are available.

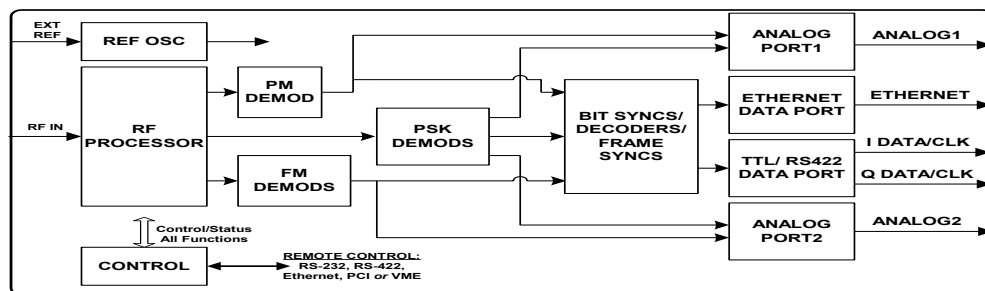
The demodulation process, as well as the baseband bit synchronization process, is totally performed in the digital domain. Signal acquisition is performed by scanning the IF within the programmed acquisition band centered about the selected Carrier frequency. PM / PSK waveforms are additionally scanned for acquisition at the subcarrier frequencies. Once signal acquisition is complete, synchronized signal tracking is performed whereby continuous validation of the lock state is maintained.

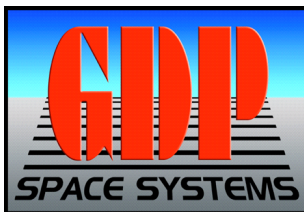
A variety of optional FEC decoders are available and two fully programmable frame synchronizers (pattern detection) are provided with the bit synchronizer option.

With the Bit Synchronizer option, data is output via a pair of TTL and RS-422 outputs. The unit supports an optional Ethernet output mode in which frame synchronized byte aligned data can be output via an Ethernet port with start of frame identified.

An Encapsulated data and data quality output may be included that supports the GDP Best Source Selector products.

CHANNEL BLOCK DIAGRAM





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### CHANNEL SPECIFICATIONS

**Input:**

RF Frequency	2185 MHz to 2485 MHz & 1700 MHz to 1850 MHz & 1427 MHz to 1545 MHz or 550 MHz to 1100 MHz *
Noise Figure	< 10 dB
IF Filters	4 selectable filter bandwidths (Standard set provided)
Dynamic Range	> 80 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 15 MHz
Modulation Index	0 to 2.8 Radians
PSK Demodulators	
Types	1 IF, 1 SC *
Modulation Waveforms	BPSK, QPSK, OQPSK, UQPSK *, AQPSK *, GMSK *, SOQOSK ARTM Tier 1 *
Locking Threshold	6 dB Eb/No
PCM/FM Demodulator *	
Data Rate	1 kHz to 20 Mbps (30 Mbps *)

**Bit Synchronizer(s): (Option)**

Bit Rate	50 bps to 10 Mbps BPSK (20 Mbps *) 100 bps to 20 Mbps QPSK (40 Mbps *)
Input Codes	NRZ-L,M,S; B1Φ-L,M,S
Output Codes	NRZ-L
Viterbi Decoder *	Rate 1/2, 1/3, 3/4, 7/8, ...options
Decrambler	V.35 / V.36 (CCITT/ Intelsat)

**Data Output**

Analog	
TTL, RS422 (Standard)	
Ethernet Data Output *	
Encapsulated Data & Quality that supports GDP Best Source Selector *	

**Control Interface:**

Ethernet & RS-232 (Standard)	
IEEE 488 *	

**Environment:**

Temperature	10°C to 50°C Operational; -40°C to 85°C Storage
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**Status Output:**

Signal Present, Carrier Lock, Bit Synchronization Lock, Viterbi Lock, Frame Lock, Doppler	* <b>OPTIONAL</b>
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### Ordering Information

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MD4425-00	Basic Unit (Single Channel)	OP4425-40	Bit Syncs w/Frame Sync's (Pattern Detectors)
OP4425-01	2nd Channel Card (Dual Channel Unit)	OP4425-41	Extended Bit Rate (20 Mbps BPSK, 40 Mbps QPSK)
OP4425-02	Viterbi (R 1/2) (Requires OP-40)	OP4425-45	Ethernet Data Output (Byte Aligned Data)
OP4425-03	Analog FM & PCM/FM	OP4425-7X	Filters (Selectable BW Filters)
OP4425-04	Viterbi (R 3/4) (Requires OP-40)	OP4425-8X	Special Frequency Bands
OP4425-05	SOQPSK	OP4425-81	P-Band (550 to 1100 MHz)
OP4425-07	PM/PSK	OP4425-89	Chassis Slides
OP4425-08	GMSK	OP4425-93	Reed Solomon
OP4425-09	A/UQPSK w/Ambiguity Resolution	OP4425-VI	Remote Control VI Software
OP4425-21	IEEE-488 Remote Control		

Recognizing that no standard product can meet all the needs of all users, GDP stands ready to provide units tailored to unique applications.

The statements in this data sheet are not intended to create any warranty, expressed or implied. Equipment specifications are subject to change without notice.