



A DELTA INFORMATION SYSTEMS COMPANY

Model 4455

4TH GEN DIGITAL MULTI-BAND RF RECEIVER DUAL CHANNEL WITH DIVERSITY COMBINER

TOP FEATURES

- Dual Channel w Pre-D* & Post-D Combiner
- Form Factor
 - 1U Rack-Mountable Chassis
- Noise Figure
 - < 8 dB, 4dB Typ.
- Wide Dynamic Range
 - > 90 dB
- RF Frequencies
 - S- Band 2185 MHz to 2485 MHz (Std)
 - UL-Band 1675 MHz to 1850 MHz (Std)
 - LL-Band 1427 MHz to 1545 MHz (Std)
 - P-Band 100 MHz to 1150MHz *
 - C-Band 4400 MHz to 5250 MHz *
 - IF 100Hz to 80 MHz*
 - Others Frequencies Available
- Multi-Waveform Demodulation
 - PCM/FM (ARTM Tier 0)- (Std)
 - SOQPSK (ARTM Tier 1) - (Std)
 - BPSK/QPSK/OQPSK/AUQPSK*
 - Multi-h CPM (ARTM Tier 2)*
 - 8PSK*/16APSK*
 - Space Time Code (STC)*
 - PM*, FM*
- 3 Demodulators (Per Channel)
 - 1 RF, 2 SC* (Per Channel)
 - PM / PSK*, FM/PSK*, FM/FM*
- 2 Bit Synchronizers (Per Channel)*
 - 50 bps to 10 Mbps BPSK (20 Mbps*)
 - 5 bps to 10 Mbps PCM/FM (20 Mbps*)
 - 50 bps to 20 Mbps QPSK (40 Mbps *)
- Independent Bit Sync Input*
- Forward Error Correction (FEC)
 - 2 Viterbi Decoders R=1/2, 2/3*, 3/4*, 7/8*
 - Reed-Solomon -CCSDS*
 - Concatenated Viterbi/Reed-Solomon w interleaving*
 - LDPC- IRIG/CCSDS* R=1/2, 2/3*, 4/5*, 7/8*
- 2 Frame Synchronizers per Channel
- Byte Aligned Ethernet Data Output
- Best Source Selector Compatible Output*
 - GDP & RCC DQE/DQM Output Modes
- 70 MHz, IF Inputs & Outputs
- Tape /Playback (IRIG 106) Inputs & Outputs
- Tracking Antenna Control Support
 - AM/AGC/DQ
- IRIG-B & 10MHz ref. inputs
- Adaptive Equalization – All waveforms*
- Auto AGC/DQ Combining
- BER measurement; test & real time
 - PRN/Frame/FEC/DQM Simulator*: PRN, FS Pattern, Viterbi, RS, LDPC CW, BPSK, QPSK, SOQPSK, PCM/FM, Digital, Video, Tape, 70MHz, Ethernet Out
- IRIG Chapter 10/11 Compatible Output*
- IRIG Chapter 7 Support*
- IRIG 218 –2010 & 2020 Compatible Output
- Remote Control

GENERAL DESCRIPTION



The Model 4455 Digital RF Receiver is a state-of-the-art receiver that provides: a compact, cost competitive, flexible solution to a wide variety of communications link scenarios. The 1U Rack Mountable Chassis is available in a dual channel configuration with diversity combiner. Each channel is completely independent and is able to acquire on three (3) RF Bands: S Band; Upper L Band, Lower L Band, and optional C Band or P (CIF) Band. Other Multi-Band options 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. The Input Waveform is 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.

LINK IMPROVEMENTS & NOISE MITIGATION

A variety of optional FEC decoders are available and two fully programmable frame synchronizers (pattern detection) are provided with the bit synchronizer option. The MD4455 receiver can specifically be configured to mitigate noisy / congested environments through the use of

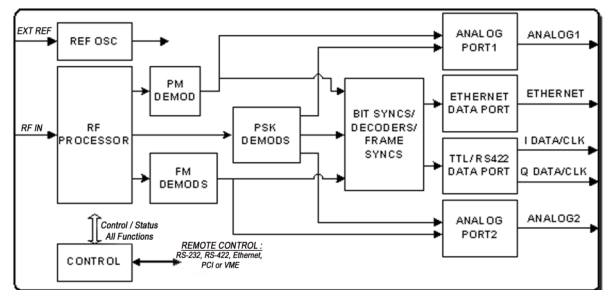
- Low Density Parity Check (LDPC*) coding to improve link margin while using less bandwidth,
- Adaptive Equalization (AEQ*) to mitigate multipath distortion.
- Advanced Diversity Combiner Functions (AGC & Data Quality) for superior performance in the presence of multi-path

An Encapsulated data and data-quality output may be included that supports the GDP Best Source Selector products. RCC DQE/DQM is also supported.

NETWORK DIRECT MODE!

The MD4455 Receiver can optionally be configured to accept your IRIG Chapter 7* downlink, bit/Frame synchronize and output your IRIG Chapter 10/11* UDP packet to your favorite Analysis package or our Acromatics Decoms or Wideband Network recorder simultaneously. IRIG 218-2010 & 2010 can also be accommodated directly. UDP/IP transport is provided for raw data or byte aligned data output.

- Ethernet
- * OPTIONAL FEATURES



Typical Channel (CH 1, CH 2 & Combined*)

Model 4455

4TH GEN DIGITAL MULTI-BAND RF RECEIVER DUAL CHANNEL WITH DIVERSITY COMBINER



CHANNEL SPECS

INPUT

RF Frequency LL, UL, LS, US, and C Bands - see features on page Noise Fig-
ure < 8 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 1IF, 2 SC *
 Modulation Waveforms BPSK, QPSK, OQPSK, AUQPSK *, GMSK *, SOQOSK (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 40Mbps
8PSK*/16APSK* 100kbps to 40Mbps

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*, IRIG-106 Ch-10*, HDLC/AX.25*)
Encapsulated Data & Data Quality that supports GDP & IRIG Best Source Selector *

CONTROL INTERFACE

Ethernet (Standard)

ENVIRONMENT

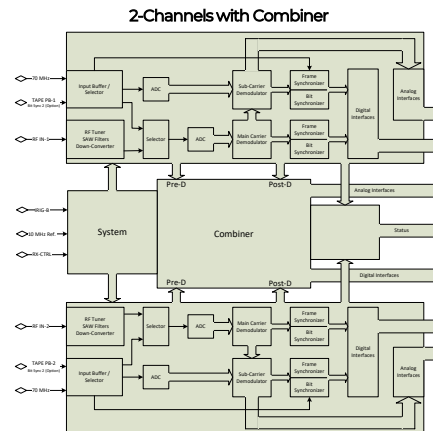
Temperature 10°C to 40°C Operational; -40°C to 70°C Storage (Extended Temperature Ranges available)

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

ORDERING INFO

MD4455-M02C1	Dual Channel with Diversity	OP4455-67	Ethernet CH 7 Decoding
OP4455-04	Viterbi (R 3/4..)	OP4455-68	Adaptive Equalization
OP4455-225	LDPC (IRIG 106 Codes + 7/8)	OP4455-69	STC
OP4455-07	PM/PSK	OP4455-81	P-Band (100 to 1100 MHz)
OP4455-08	GMSK	OP4455-82	L/S/C-Bands
OP4455-09	A/UQPSK w/Ambiguity Resolution	OP4455-83	L/S/C/P(CIF) - Bands
OP4455-15	CPM	OP4455-84	L/S/CIF(P) - Bands
OP4455-41	Extended Bit Rate (20 Mbps BPSK, 40 Mbps QPSK)	OP4455-8X	Special Bands
OP4455-44	2nd Independent Bit Sync Input per Channel	OP4455-93	Reed Solomon
OP4455-65	Ethernet Chapter 10/11 Output	OP4455-95	Diversity Combiner (one per dual channel)
OP4455-66	BSS DQE/DQM (GDP & RCC)	OP4455-VI	Remote Control VI Software (Included)



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. Specifications are subject to change without notice.