

Messenger 2 Compact High-Power Transmitter (M2CHPT)

COBHAM

The most important thing we build is trust.

Applications

- Helicopter Links
- UAV/UGV Applications
- High-Security Surveillance Applications
- Repeater Transmitter
- Mobile and Portable AV Applications

Key System Features

- Up to 15W Linearized Output Power
- Robust Link Performance with COFDM
- Small, Rugged Enclosure
- No External Heat Sink Required
- Secure – Optional 128/256-bit Scrambling Option (AES)
- Output Frequency: 1 to 7 GHz (In-Bands)
- Low System Latency (down to ~44mS)
- Built-in ACV/H.264 Encoder
- Composite and S-Video, or Component Video In
- SD/HD SDI formats up to 1080p
- DVB_ASI Compressed Audio/Video Out
- User Data Option
- High-Throughput Option
- 12 VDC or 28 VDC Option
- Companion COFDM Receiver with Maximal-Pre-Detect Diversity Reception



The Messenger 2 Series (M2) product line incorporates many of the original “Messenger” product line capabilities with two major upgrades. The M2 series incorporates the AVC compression technology with one frame delay that replaces the MPEG-2 compression, and they cover all the SD and HD formats up to 1080P.

The Messenger 2 Compact High Power Transmitter (M2CHPT) accepts Standard Definition (SD) or High Definition (HD) 4:2:2 digital video or analog SD video, composite and S-Video, or just Component, and analog stereo audio inputs (Mic or Line level) or optional Embedded Audio. The video is compressed according to the Advanced Video Compression (AVC) / h.264 specifications. The low-latency AVC Encoder supports the Baseline Profiles with resolutions from 480 to 1080 with support for either interlaced or progressive formats. The audio is compressed using MPEG Layer II compression. Low rate user data up to 38.4 kBaud can be optionally supported. The audio, video and user data packets PES streams are multiplexed with basic service data to indicate the service name. The stream can be scrambled with optional AES scrambling system to provide protection in sensitive applications.

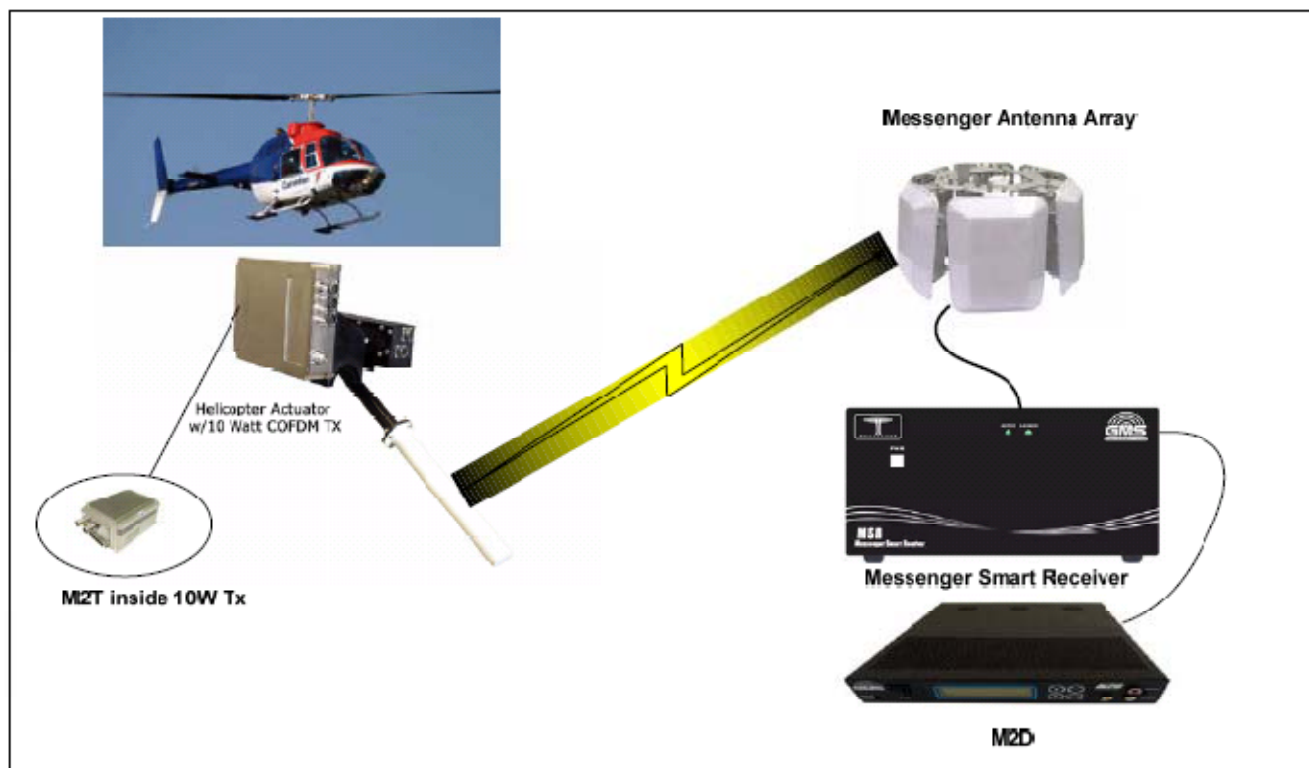
The 4K HIGH-THROUGHPUT OPTION enables user-selectable options to set bandwidths from 6 MHz to 16 MHz and to double the throughput of our standard M2T (Up to 63 Mbps!). Using 4K carriers and the 16 MHz bandwidth, the

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link can support HD operation with >12 Mbps while running QPSK and 1/2 FEC. This increases link robustness and provides an additional 13.5 dB increase in link margin (>4.7 x increase in operating range!) for the same throughput rate in a standard HD MPEG-2 DVB-T system! With the 4K HIGH-THROUGHPUT OPTION you can run with fully DVB-T compliant 2K carriers and bandwidths of 6, 7, or 8 MHz.

When you switch to 4K carriers you can select 12, 14 or 16 MHz bandwidth. The 4K HIGH-THROUGHPUT OPTION is also useful when transmitting multiple video streams through one transmitter. This option requires a special receiver configuration. Please contact GMS Sales for additional information.



GMS' Messenger 2 Link (M2L) includes the Messenger 2 High Power Transmitter (M2CHPT), the Messenger Smart Receiver (MSR), Messenger 2 Decoder (M2D) and several external Down-Converters. The M2CHPT provides professional Audio/Video (A/V) interfaces and processing. All versions of the Messenger Link family use a robust digital modulation system known as Coded Orthogonal Frequency Division Multiplexed (COFDM) that provides frequency diversity and powerful Forward Error Correction (FEC) algorithms. The Messenger Smart Receiver (MSR) provides for Spatial Pre-Detect Maximal-Ratio Diversity Combining of up to six independent antennas per MSR to increase the Signal Strength, Signal to Noise Ratio and combat short delay spread multipath reflections found in indoor environments. There is a dramatic increase in the operating threshold when multiple high-gain antennas and Block Down-Converters are used with the MSR, which greatly enhances link robustness when operating at the high data rates required for HD transmission. The MSR outputs a transport stream simultaneously over ASI and SPI parallel interfaces. External Audio/Video/Data AVC Decoders are sold separately that support HD and SD AVC Decoding.

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There is an optional Remote Control Unit (RCU) available so the operator can conveniently access all features of the M2CHPT while you are in the cockpit or other remote location.

One of the biggest problems encountered in the transition from an analog to a digital A/V platform has been the inherent digital coding delay that in some digital systems are 1.5 seconds or more for HD. The M2CHPT employs a specially designed 'Ultra-Low Delay' coding technology, which provides down to ~44 mS (~ 1 frame) end-to-end system delay when using GMS's AVC Decoder with the M2T.

This ensures that the picture you see is what is happening *now!* Crucial for applications such as sports coverage, surveillance, and law enforcement, where personnel are reacting to real-time events.

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Specifications:

COFDM RF Output

Output Frequency: 1 to 7 GHz
(In-Bands)

Bandwidth: Selectable 6, 7, 8 MHz
6, 7, 8, 12, 14, 16 MHz 4K Option*
RF Output Power: Up to 15W (Model
Dependant)

Video Encoding (HD)

Interfaces: HD-SDI
Standards: SMPTE-274M, -293M, -294M, -296M
Compression Standard: AVC / h.264
(Per ISO/IEC 14496-10)
Motion Est. Range: +/-192 Horiz., +/-128 Vert.
Video formats/resolutions supported:

Format	Resolution @ Frame Rate
1080i	1920x1080 @ 23.98/24/25/29.97/30 fps
1080PsF	1920x1080 @ 23.98/24/25/29.97/30 fps
1080p	1920x1080 @ 23.98/24/25/29.97/30 fps
720p	1280x720 @ 50/59.94/60 fps

Profiles supported: BP@HL with Interlaced
Extensions.

**Video bit rates: HDTV to 50 Mbps
***System Latency: <44 mS (Ultra-Low Mode)
Connector: BNC-F

Video Encoding (SD)

Interfaces: SDI, Composite, S-Video, or
Component
Standards: SMPTE-292M
Compression Standard: AVC / h.264
(Per ISO/IEC 14496-10)
Motion Est. Range: +/-192 Horiz., +/-128 Vert.
Video format standards: NTSC or PAL

Format	Resolution @ Frame Rate
576i	720x576 @ 25 fps (PAL)
480i	720x480 @ 29.97 fps (NTSC)

Variable GOP Structure: I-only and IP
Profiles: BP@ML with interlaced extensions
**Video bit rates: to 50 Mbps
***System Latency: <44mS (Ultra-Low Mode)

**** In Development (Future Option)

Audio Encoding

Analogue Audio Inputs:
Dual, Line-Level or Mic-Level, Single-Ended or Differential,
Clip Level 12 dB
Input Impedance: 600 Ohms (Mic), 2K
Ohms (Line)
Standards: SMPTE-272M, -299M
Embedded Audio
Compression Standard: MPEG Layer II
Bit rates: 256 kbit/s/ch
Sampling Frequency: 32 kHz, 44.1 kHz, or 48 kHz
THD: < 0.1 % max.
Response: 20 Hz to 12 kHz, +/- 0.25 dB
Crosstalk: >55 dB min
S/N: >60 dB RMS
Connector: XLR-F p/o 10-PTO

RS232 Control Port

Protocol: RS-232C, Asynchronous, 8 Bits, No Parity, 1 Stop
Bit Baud Rate: Up to 115 Kbaud.

Security\Scrambling Option

Type: 128/256 Bit Advanced Encryption Standard (AES)
Key Storage: User Controlled, Local or Remote
Implementation: Only video, audio and ancillary data is
encrypted.

Modulation

Modulation Type: COFDM w/QPSK, 16QAM, or 64QAM
FEC²: 1/2, 2/3, 3/4, 5/6, 7/8
Guard Intervals²: 1/32, 1/16, 1/8, 1/4
Spurious: 52 dBc
COFDM Carriers: 2k & 4K Carriers

User Data Option

Protocol: RS-232C, Asynchronous, 8 Bits, No Parity, 1 Stop
Bit
Data Rate: Selectable, Up to 38.4 kbaud
User Data PID: Selectable
Connector: p/o DB-44F

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Connectors

RF Output: N-F
Video Composite/ Y: BNC-F
Video C/Pr: BNC-F
Video Pb: BNC-F
Video SD/HD SDI in: BNC-F
DVB_ASI out: BNC-F
Audio: p/o PT02E-12-10P, J7
Control: p/o PT02E-12-10P, J6
DC Power: PT02E-12-4P, J8
Pin A & B: +VCC
Pin C & D: GND

Physical Dimensions:

5.98" (W) x 11.1" (D) x 5.15" (H)

15.19 cm x 28.2 cm x 13.09 cm

Weight: 8.45 lbs (3.83 kgs)

Environmental:

Operational Temperature: -10 to 70 C

Humidity: Up to 95% non-condensing

DC Power

DC Voltage Range³: 24 - 32 V @ 5 Amps (opt)

9 - 15 V @ 10 Amps (opt)

Control

M2CHPT can be controlled through its USB-1 or RS-232 control port via the supplied MS Windows based control application. A GMS remote control unit (RCU) is available.

¹ Modulation mode and decoder dependant

² May be limited in certain modes

³ Model dependant