

VETA Miniature Transmitter (VMT)

COBHAM

The most important thing we build is trust.

Applications

- High Security Audio/video Surveillance
 - Concealments
 - Body worn
- UAS/UGV

Key System Features

- Very Small (2 cu-inches)
- Low Power Consumption ~ 4 Watts
- COFDM Modulation (2K or *400 Carriers)
- Bandwidths from *1.25 MHz to 8 MHz
- Output Frequency: 0.9 to 8.5 GHz (In-Bands)
- Dual L/S Band Capability
- Built-in MPEG-2/*4 Encoder
- Low End to End System Latency (~44 mS)
- SDI input Option
- Secure – ABS/ *AES 128/256 Encryption
- *Companion Miniature, High-Efficiency 2 W PA
- Complete Local Control via 16 Position Rotary Switch
- *Wireless Control unit (WCU)
 - *Note: Optional



GMS' Very Efficient Transmission Apparatus (VETA) Product Line provides several key features that enable high-quality and low-latency wireless Audio/Video (A/V) transmission for the most demanding short or long distance point to point or point to multipoint transmission applications. VETA uses a robust Digital modulation system known as Coded Orthogonal Frequency Division Multiplexed (COFDM) that provides a robust link that is immune to multipath interference and provides crisp, clear pictures in the most difficult of terrains!

The VETA product line supports optional 1.25 MHz or 2.5 MHz RF bandwidth with 400 carriers that allow a large quantity of simultaneous A/V links to operate in the same frequency band. Additionally, the standard DVB-T 2K carriers with bandwidths of 6, 7, or 8 MHz may be user selected. These higher bandwidths provide greater throughput that allow the system to transfer the highest quality Video.

One of the biggest problems encountered in the transition from Analog to Digital A/V systems has been the inherent Digital coding/decoding delays that in some digital systems are 400 ms or more. The VETA Transmitters & Receivers employ internal MPEG-2 or MPEG-4 (User Selectable) Encoders and Decoders with specially designed 'Low-Delay' coding technology, which provides an end to end latency of approximately 44 ms *without* the introduction of any further MPEG encoding artifacts. 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.

The VMT is a VETA Miniature Transmitter that has been designed to be as small and power efficient as possible. It is an ideal fit for concealment and body worn applications and small-unmanned vehicles. The VMT accepts a composite or S-Video Input, Analog Stereo Audio Inputs (with MIC Bias) and a RS232 User Data Input. There is also an option to accept SDI Video. The Video is compressed according to MPEG-2 or MPEG-4 (Optional) specifications. The Audio is sampled and compressed. The Audio, Video and Data packet streams are multiplexed with basic service data to indicate the service name. The stream can be scrambled with a simple fixed key scrambling system (ABS standard) to give basic protection in sensitive applications. Additional security is accomplished with the optional AES scrambling system. The transport stream is sent for FEC pre-processing and COFDM modulation. The modulated signal is amplified and output through a SMA-F connector.

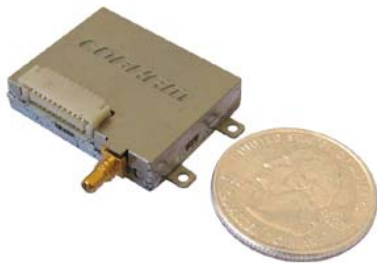
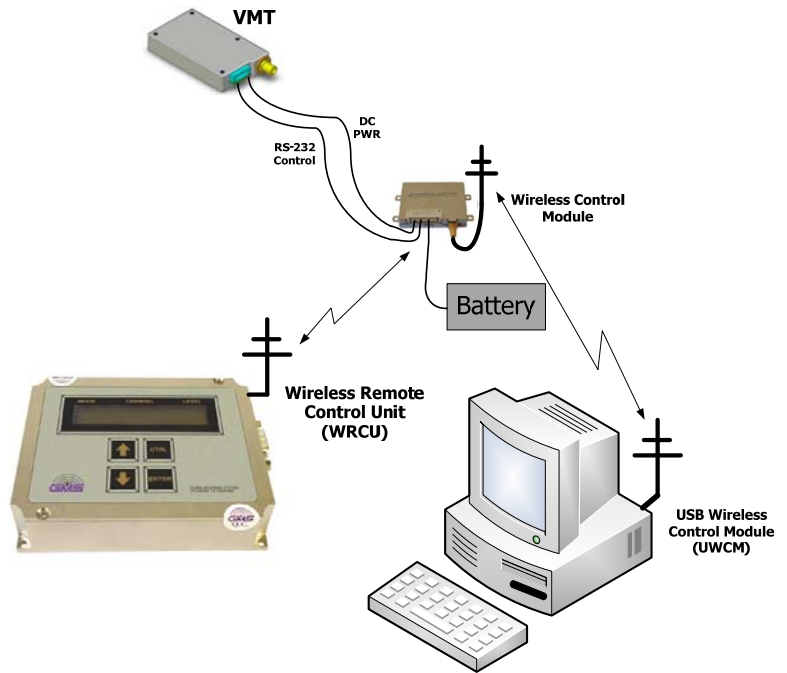
Local control is available via a 16 position rotary switch. Each position of this switch represents a Configuration Group or Set of Presets that completely define the operating mode of the VMT. This includes 99% of the controllable parameters in the transmitter including frequency, RF power level, all modulation parameters and all encoding parameters plus optional features like encryption. These set-up groups are configured via simple to use M.S. Windows applications usually by technical leads. GMS' receivers have a similar control scheme. This approach allows pre-configuration of the link such that all you need to do is set-up the TX and RX to the same configuration group number and the link is properly set-up. This control approach provides system-level ease of operation.

This Transmitter is designed to be integrated into small covert enclosures or to be used in Body Worn Applications. Because of this GMS developed a unique optional Wireless Control System (WCS) shown in the following figure.

WCS Features

Remote capabilities:

- DC PWR Control
- TX Control
- Via WCU
 - * Set-up "Group" select
 - * Change Freq
 - * RF PWR Control
- Via IBM PC
 - * Full Control
 - * Alter Set-up GRPS
 - * Mimic WCU
- Battery Monitoring
"Hard to Detect"
- Ability to listen before transmitting
- Unit remains idle until commanded to respond
- Low emissions
- Very small size
- Low Power Consumption



A tiny Low Data Rate Transceiver called the Wireless Remote Control Module (WRCM) is installed between the VMT and the battery. The WRCM can control the DC power to the VMT, monitor the battery's status and completely control all functions within the VMT. This transceiver is designed to have very low RF emissions and does not transmit unless commanded to by the Command Module. This makes it ideal for covert operations.

There are two options for the Command Module. First, the Wireless Command Unit (WRCU), a small DC operated module that allows operators control of the system thru a simple user interface. Second option, the Wireless USB Command Unit is a USB card that can plug into any IBM PC and running GMS' application software the user can either perform system configuration operations to establish set-up groups (password protected) or perform the same control and monitoring functions as the VWRCU. The later is normally used for field operatives.

The WRCS's Command units include simple control panel that allows the selection of up to 8 set-up configurations, Encryption Enable/Disable and selection of 4 RF power levels. Status indicators are provided for battery level monitoring and for the presence of Input Video and RF Output.

VETA Miniature Transmitter



Specifications

COFDM RF Output

Output Frequency: 0.9 to 8.5 GHz (In-Bands)
Frequency Accuracy: (+/-) 2 ppm
Bandwidth: Selectable 6, 7, 8 MHz (1.25 or 2.5 MHz Optional)
Max RF Output Power: 50 mW or 100 mW
(Optional VEPA PA boosts PWR to 2W)
Connector: SMA-F

Video Encoding

Video Input: Composite or S-Video
Standards: NTSC (with and without pedestal) or PAL
SDI Option Available
Compression Standard: MPEG-2 or MPEG-4
Chrominance Profile: 4:2:0 or 4:2:2
Line Standard: 525 and 625
Horizontal Resolution: 704 pixels
Vertical Resolution: 576(625 line) and 480(525 line)
Systems Latency end to end delay: ~40ms

Audio Encoding

Analogue Audio Inputs:
Dual, Line Level or Mic Level, Single Ended, Clip Level 12 dBm
User Selectable MPEG or NICAM encoding

RS232 Data Input

Baud Rate: Up to 115 Kbaud.

Security Option

The VMT can optionally be provided with Advanced Encryption System (AES) 128/256 for protecting the signal in sensitive applications.

Modulation

Modulation Type: COFDM w/QPSK or 16 QAM
FEC: $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$
Guard Intervals: 1/32, 1/16, 1/8, 1/4
Spurious: 52 dBc
COFDM Carriers: 2K Carriers
COFDM MER: Better Than 23 dB

Physical

Dimensions: 2.64" W x 1.57"L x 0.5"H
67.1 mm W x 40 mm L x 13 mm H
Weight: 0.114 lbs (52 grams)

Environmental

Operational Temperature: -20° C to 70° C
Humidity: Up to 95% non-condensing

DC Power

DC Voltage Range: 5.9 -18 V
Power Consumption:

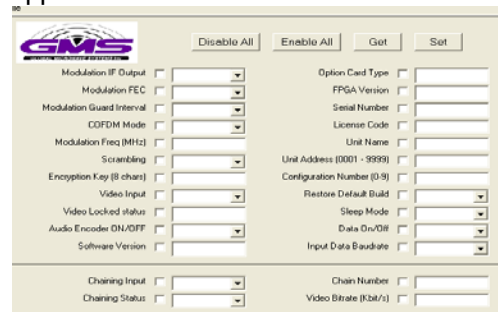
@ 50 mW RF PWR: 4.1 W L & S Band
4.4 W C Band
5 W X Band

@ 100 mW RF PWR: 4.3 W L & S Band
4.6 W C Band
5.4 W X Band

Control

Local – Provided by local 16 position rotary switch or optional Wireless Control System. Easy to use, up to 16 user-defined operating modes covering all programmable.

Remote – VMT can be controlled through its RS-232 control port via an optional MS Windows-based control application.



Connectors

SMA (f): RF Output
21 pin SHLV Series JST: Video, Audio, RS232 Data, RS232 Control, DC Power, General Purpose I/O