



# MGW Pico TOUGH

Military Grade HD H.264 Encoder



# MGW Pico TOUGH Encoder

MGW Pico TOUGH is the world's smallest, most power-efficient MIL-STD certified MPEG-4 H.264 HD/SD video encoder. It encodes and streams real-time video with frame-accurate metadata from any video source. MGW Pico TOUGH's fanless, pocket-size enclosure is designed for use on unmanned and manned vehicles, in fly-away kits or hand-carried in extreme conditions.

## Technical Specifications - General

### Video Inputs

- 1 x 3G/HD/SD-SDI (SMPTE 259M-C, SMPTE 292M, SMPTE 274M, SMPTE 296M, SMPTE 424M, SMPTE 425M)
- 1 x Analog Composite RS-170

### Input Resolutions / frame rates:

1920x1080p @ 60, 59.94, 50, 30, 29.97, 25, 24 Hz

1920x1080i @ 60, 59.94, 50 Hz

1280x720p @ 60, 59.94, 50, 30, 29.97, 25 Hz

720x480i @ 59.94 Hz

720x576i @ 50 Hz

### Audio Inputs

- SDI Embedded audio (Stereo and Mono)
- Analog unbalanced audio (Stereo and Mono. Special order)

### Video Output

- H.264 (ISO/IEC 14496-10 AVC MPEG-4 part 10). Modes:
  - o Baseline Profile L3
  - o Main Profile L3 and L4
  - o High Profile L4 and L4.1
- Bit Rate: 100 Kbps - 14 Mbps
- Frame Rate: 5-60 fps. Down sampling modes: third, half, three quarters
- Bit Rate Regulation Modes: Constant (CBR), Variable (VBR)
- Output Resolutions: Configurable from QCIF up to 1920x1080p30 / 1280x720p60
- Encoding Latency: 65 milliseconds

### Audio Output

- MPEG-4 AAC-LC (ISO/IEC 14496-3)
- Stereo and mono modes
- Bit Rate: 32Kbps - 256Kbps in Stereo, 16Kbps - 128Kbps in Mono
- Sampling Rate: 16 kHz - 48 kHz

## PRODUCT HIGHLIGHTS

- Low latency HD/SD streaming from SDI and Composite simultaneously
- Zixi Error Correction and Pro-MPEG FEC built-in
- KLV / STANAG metadata support from serial, IP and SDI VANC
- Hardware based resolution and frame rate scaling
- Motion-adaptive adjustment of bit-rate utilization in static scenes
- Credit card size: 0.87lb weight, 6.5W power for Full HD H.264 streaming
- Fast boot time - 18 seconds from power on to streaming video
- Not controlled under ITAR



## Network Protocols

- Streaming Modes:
  - UDP TS, RTP TS
- Error-Correction Technologies:
  - Pro-MPEG : RTP TS with Forward-Error-Correction (FEC SMPTE 2022)
  - Zixi™ with auto adaptive bitrate stream
- Peripheral:
  - HTTPS, DHCP, NTP, SSH, SAP

## Management

- Secure Web based remote management interface (HTTPS)
- Dashboard with dynamically updating I/O signal detection and streaming stats
- Autostart mode recovers saved configuration after power cycle
- Remote firmware and software upgrade capability via command line / web-GUI
- System and channel event logging
- SSH interface with "get/set" or XML API for integration with 3rd party control software

## Security

- Real-time AES encryption for video, audio and metadata. Interoperability with EZ TV and FITIS systems
- Password protected browser and CLI control interfaces

## Metadata

- CoT over serial RS-232, KLV over serial/IP, KLV over SDI (VANC per SMPTE 336M)
- UAS Datalink Local Metadata Set (MISB STD 0601.5, STD 0902)
- Time Stamping and Transport of Compressed Motion Imagery and Metadata (MISB STD 0604.2)
- Cursor on Target (CoT) Conversions to Key- Length-Value (KLV) Metadata (MISB EG 0805)
- Security Metadata Universal and Local Sets for Digital Motion Imagery (MISB STD 0102.8)
- STANAG 4609 output stream over UDP/IP
- JITC-MIS Compliant streaming of HD/SD ISR video

## Environmental / Regulation

- Operating Temperatures: -40° C to +70° C (-40° F to +158° F)
- Relative Humidity: 5% to 95% (non-condensing)
- MTBF: Ground - 9.00 years. Airborne - 12.70 years. Naval Sheltered 10.30 years. (As per MIL-HDBK-217F)
- MIL-STD-810G Certified
- MIL-STD-461F Certified
- Not controlled under ITAR
- TAA Compliant

## OEM / Integration Ready PCB

MGW Pico TOUGH was designed with industrial, aeronautics and commercial integrators in mind. The Encoder is also available as a PCB-only unit in two optional integration options: mountable board to be attached onto a host board with or board lockable headers exposing all input and output interfaces as well as a comprehensive SDK for command and control over IP.

PCB with secure-lock headers



PCB for mounting onto a main board



## Physical

- 1.20" H x 3.70" W x 2.85" D (30.50mm H x 94mm W x 72.50mm D)  
Additional 20mm D for MIL connectors
- 0.87lb (398g)
- Enclosure: Military-grade rugged aluminum case, composite MIL connectors
- Status LED's for power, network activity, streaming and video source indications
- Fan-less, no moving parts design, 100% silent operation
- Mounting holes for seamless installation in vehicles / flat surface

## Advanced Features

- Low latency HD/SD streaming from SDI and/or Composite sources with metadata
- Hardware based resolution and frame rate scaling
- Motion-adaptive adjustment of bit-rate utilization in static scenes
- PID re-mapping for audio and video and KLV programs
- Forward Error Correction
- Fast boot time - 18 seconds from power on to streaming video

## Power

- DC Input: 16-40VDC, 6.3W (Standard), 7.3W (Max)
- MIL-DTL-38999 series III Circular Connector
- MIL-STD-704

## Ordering Information

- 14917 → MGW Pico TOUGH (System)
- 16519 → MIL-DTL-38999 Cables Kit (Power supply, A/V, network and data cables MIL-DTL-38999 to Commercial plugs)
- 16507 → MGW Pico TOUGH PCB/OEM (PCB for integration into 3rd party systems)
- 16506 → MGW Pico TOUGH PCB/OEM Mountable (PCB for integration into 3rd party systems, stackable boards)
- 16483 → MGW Pico TOUGH Developer Kit (PCB, I/O extension board with stand, Documentation)
- 16706 → MGW Pico TOUGH Developer Kit Mountable (PCB Mountable model, I/O extension board with stand, Documentation)

## Rear Panel Interfaces



- 1 Ethernet, CVBS Analog Video in, RS-232, USB & Reset
- 2 3G, HD/SD-SDI
- 3 Power 16-40VDC MIL-STD-704

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