

# FOCUS-AIX

**Mil-Aero H.265/H.264 CODEC  
STANAG 4609 metadata multiplexer  
Streamer, Transcoder, OSD with overlay  
Raw / compressed Recorder & Replay  
time Image Processing & Deep Learning**



The **FOCUS-AI** is a new rugged image processing hardware featuring video, audio, photo and metadata CODEC, streaming & recording. **FOCUS-AI** is ready to link multi sensors EO/IR turret to onboard datalink with streaming optimization of latency / quality / bandwidth (IP, LOS, satellite, GSM). **Image Processing** (e.g., stabilization, tracking, ROI) and **Deep Learning** capabilities can be tuned according to customer application.

**FOCUS-AI** includes a Hosting Platform allowing to develop, install, tweak and execute **your** Image Processing algorithms and **your** Artificial Intelligence algorithms on the FOCUS-AI hardware.

**FOCUS-AI** includes a **metadata** multiplexer with picture synchronization and KLV generation supporting industry standard **MIPS** specifications. An embedded recorder, using **Solid-State Disk**, stores each generated media streams and replays them for direct display or VOD.

### KEY FEATURES:

SD/HD HEVC/H.265, H.264 high profile  
Real time Image Processing  
Analytics, Artificial Intelligence, Deep Learning  
Image Processing and Artificial Intelligence hosting  
(IP&AI)  
Metadata multiplexing, streaming and transcoding  
Very low latency mode, Ultra low data rate, CBR  
Uncompressed HD video with KLV Recording  
Multi-profile streaming (LOS, LAN, SATCOM, GSM)  
JPEG Burst photo with KLV (Step & Stare)  
Remote control & monitoring  
Rugged DO160 design  
Installation NATO rail mounting compliant  
Software upgradeability



## VIDEO & PHOTO SPEC

### Video Input

Digital input: SDI (up to 4)

- SMPTE259M-C or 292M, 424M
- Format: 1080p 720p 576i 480i
- 75  $\Omega$ , common mode

Digital input: DisplayPort (up to 1) (\*)

- DP 1.2 (2 lanes) with EDID 1.3
- Progressive video up to 1200p60

Analog input: PAL/NTSC (up to 4) (\*)

- 100  $\Omega$ , differential mode (ITU-R BT.1700)

Digital input: over IP (up to 6) (\*)

- Multicast streams (un)subscribing using IGMP protocol
- Video (H.265/H.264) or STANAG 4609 (MISP 2020.1) or photo (JPEG) MPEGTS or RTSP over RTP or UDP

### Video Output

Digital video: SDI (up to 4)

- SMPTE259M-C or 292M or 424M
- Format: 1080p 720p 576i 480i
- 75  $\Omega$ , common mode

Digital output: DisplayPort (up to 1) (\*)

- DP 1.2 (2 lanes) with EDID
- Progressive video up to 1200p60

Analog video: PAL/NTSC (up to 4) (\*)

- 100 Ohms, differential mode

### Image & Video Processing (\*)

- Video frame timestamping: based on "System Time Synchronization", using metadata and/or OSD; - Video crossbar (copy, mosaic, ...); - Resize / Reframe; - Augmented reality & OSD; - SD de-interlacing; - Video Snapshot: generated as MJPEG up to 30 Hz in RT with associated metadata.

### Analytics (\*)

- Image enhancement & stabilization
- Object recognition, tracking & ROI
- Person/posture detection & counting
- Deep Learning on request
- IP & AI Hosting Platform resources: 2xGPU@1.1 GHz [42 TOPS, 768 cores, 4 DLA] 2x6 CPU core@2.0 GHz [RAM 2x6 GB]



### Video encoder / decoder

- Multiple Profiles:

- For SATCOM (down to 32 Kbit/s low bitrate with resize & reframe) (\*)
- For LOS datalink with low latency (>160 ms +/- 1 frame : glass to glass)
- For Recording with High Quality (up to 15 Mbit/s or uncompressed)

Encoding/Decoding algorithm:

- HEVC/H.265 / MPEG-4 AVC/H.264 (\*)
- Bitrate & framerate changes are applied on the fly ( $\leq 100$ ms) without live stream interruption (\*)
- JPEG snapshot & photo (\*)

## METADATA SPEC (\*)

### Metadata Input

- KLV (SMPTE 336) over SDI Ancillary data (SMPTE RP214) or Ethernet or RS or ESD line 21
- NMEA 0183 over RS
- Suggested MISB dictionaries: ST601, ST102, ST806, ST903, ST902
- Other metadata input on request

### Metadata Processing

- KLV generation with on-the-fly metadata filtering / insertion / modification
- Multiplexing metadata as KLV: MPEG-TS or STANAG 4609 (MISP 2020.1): synchronous (exact KLV time / picture time association) or asynchronous
- Multiplexing metadata as subtitles:

**Compliant with ETSI TS 126 245 V10**



## AUDIO SPEC (\*)

**Input** over IP:

- Audio (MP3 / AAC): MPEGTS or RTSP over RTP or UDP

**Output** over IP: (cf. §MEDIA STREAM)

**Input/Output** over analog: 2x

- 1,0Vpp/600  $\Omega$ , 48kHz/16bits sampling

### Audio encoding

- MPEG-1 Layer III: 32 to 128 Kbit/s

## SYSTEM TIME SYNCHRO

System time based on:

- SDI input ancillary data or VITC (\*)
- PTP/NTP external server
- GNSS external server (PPS) (\*)
- NMEA 0183 over RS (\*)
- MPEGTS Video input (SCTE 127) (\*)

## MEDIA TRANSCODING (\*)

- Video decoding of a STANAG 4609 stream (from IP or from flash media) and reencoding with a different algorithm, bitrate, ...

- Metadata processing & filtering with respect to output network security level.
- transcoded streams are generated over IP or recorded on flash media.

## MEDIA STREAMS OVER IP

**Input (up to 6) / Output (up to 12) (\*)**

Timecoded Video, Audio, Metadata, Snapshot & Photo captured / streamed over RTP/UDP (broadcast / unicast / multicast):

- Video & Metadata (KLV): MPEG-TS or STANAG 4609
- Video & Metadata (subtitles): MPEG-TS
- Snapshot & photo with associated metadata (KLV): over IP (RFC 2435 & RFC 3550)
- Audio (with/without video synchro): MPEG-TS or STANAG 4609

## RECORDING (\*)

Up to 2x internal storage media for:

- "Uncompressed timecoded video" media (1x media of  $\leq 8$  TB): after operation, files can be downloaded to PC for derushing & analyzing (\*)
- "output streams" media (cf. §MEDIA STREAMS) (1x media of  $\leq 1$  TB removable). All streams can be recorded as files which can be read/write by standard PC (windows / linux / mac). Recorded files can be viewed with COTS player such as VLC.
- Auto segmenting files for secured records

## REPLAYING files by the FOCUS-AI (\*)

- Files are read from "output streams" media: generated over IP as MPEG-TS / RTSP streams (Video On Demand) or decoded and generated over HD-SDI for direct display.

## IT SPECIFICATIONS

- up to 2x 1000 BT Ethernet ports
- up to 1x WIFI 802.11a/b/g/n/ac (\*)
- up to 1x RS and 1x USB 2.0 (\*)
- up to 2x ARINC429 (\*)
- Discrete: 2x inputs & 2x outputs

## REMOTE CONTROL / COMMAND

Via Ethernet Copper/Wifi (SNMP) or Discrete I/O:

- Stream: Bit rate/ Frame rate (\*)
- Record: Start/Stop, Mark Event, Media infos, ...
- Replay: Play, Pause, Next/Prev event, ...

## REMOTE CONFIGURATION

- SNMP V3 or embedded web interface (\*) via Ethernet Copper/Wifi: IP config (FOCUS-AI equipment address, streams I/O addresses), encoding profiles, recording file prefix, ...

## PHYSICAL & ENVIRONMENTAL

### NATO installation (DZUS):

- DO160 qualification
  - Connector: MIL STD-38999
  - Size: (L)225 x (W)145 x (H)95 mm
  - Power: 28 VDC x 30-60 W,
  - Weight: 3 kg
  - Temperature: -40°C to +55°C (with heatsink and/or airflow).
  - Hold-up: 140 ms@30W (\*)
- Customized H/W configuration available: with/wo front panel, with/wo heatsink, with/wo holdup, ...



(\*): option