

Multichannel HD/SD Video Meter

PRODUCT CODE: **PT0760M**



DK - Technologies



The PT0760M has been designed to meet the increasingly complex demands being placed on the broadcasters of today. In order to reduce space requirements we have introduced the ability to have up to four waveform monitors in a single chassis while keeping each input independent and providing auto formatting and sensing on each channel.

Each of the inputs is completely independent of the other and is able to automatically recognise and adjust to the incoming signal without affecting the other input channels. With this it is possible to either measure High Definition or Standard Definition video on any channel in any of the formats listed.

Available in the meter is the capability to display Waveforms of the constituent parts of the image, R, G, B, C_b and C_r plus luminance (Y) as well as have a thumbnail preview. We have also provided the facility to measure the incoming signals against an external reference through the **STA - Smart Timing Analysis** - which can display timing differences in the SDI inputs from the external reference (Black Burst or Tri-Level).

In order to be able to understand and see any problems the PT0760M employs **SVLC - Smart Video Landscaping Compressor** - which provides highlighting of the detail within the signals. This makes any errors easier to see and improves the user experience.

The PT0760M provides user adjustable Colour Gamut Alarms which are displayed on the screen in a highly visible Red Flash.

The PT0760M is able to display up to 2 video channels on the internal screen and also show up to 16 audio channels which are related to any of the video signals and controlled by the internal matrix.

The embedded audio from each of the 2 input channels can be de-embedded (maximum 16 channels). These audio signals can be routed to the audio metering and to an output card for audio monitoring on an external device. Using the inbuilt DK-Technologies audio matrix, a stereo downmix can be easily achieved removing the requirement for external matrices or mixer.

The meter can optionally be equipped with Dolby E/D (AC3) decoding to allow extraction to the audio meters of all elements of a Dolby encoded signal.



PT0700R - Remote Control Unit

Features...

- Up to 2 Independent Digital Video Inputs
- Each Input Auto Sensing HD/SD
- HD/SD SDI Output
- Waveform Monitor
- Vectorscope
- Colour Gamut Alarms
- Optional Client Panel for Remote Control
- Remote control display via Ethernet
- STA - Smart Timing Analysis
- Analogue Reference Input
- Full HD/SD Audio De-embedding
- Dolby E/D (AC3) Decoder
- **Comprehensive Loudness Measurements**
- **StarFish™ & JellyFish™**
- 5.1/6.1/7.1 Metering
- Simultaneous Audio & Video display
- Surround Sound Downmix capability
- Independent Video & Audio controls
- Assignable DVI Output
- Displays multiple images (Waveform / StarFish™ / Vector / Timing / Picture Thumbnail) on internal and/or external screens.



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Features...

- 19" Rack mount (3U high half-rack unit), short depth for compact installations
- 6.5" high contrast LCD display, Softkey buttons, rotary control, and preset select buttons
- Up to 4 individual multi format SDI video inputs (SD/HD) plus 1 multi-format SDI video outputs (SD/HD)
- A matrix for routing of de-embedded audio from the SDI inputs
- Up to 16 analogue and/or 8 AES3 inputs
- Up to 16 analogue and/or 8 AES3 outputs
- Powerful preset menus with 3 audio and 3 video styles of working allow the PT0760M to be at the heart of both operational and engineering workstations

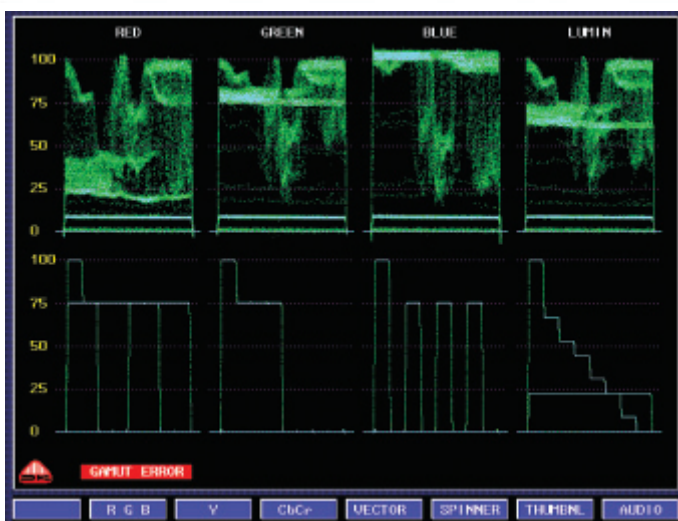
Options...

- 1 or 2 HD/SD SDI inputs
- 1 HD/SD SDI output
- External Reference Input Module including Loop-Through (Black Burst, Tri-Level)
- Full control and display using Ethernet
- PT0700R Client Panel with independent control & display (see separate datasheet)
- Dolby E/D (AC3) Decoder
- Table top stand
- 19" x 3u rack mount frame

The PT0760M is available equipped with 1 or 2 independent auto sensing HD/SD input channels and has 7 expansion slots on the rear to accommodate additional facilities such as external reference input, digital and analogue audio inputs, analogue and digital audio outputs, Dolby E/D (AC3) decoder and audio delay.

The full DK-Technologies audio metering is available as an option where the world renowned JellyFish™ & StarFish™ are available. These features are fully supported by other DK metering options found within the MSD range of products including BLITS Ident Tones for 5.1 Surround, ITU Loudness scales, LEQA & LEQM, Spectrum Analysis (1/3rd Octave and FFT).

VIDEO WAVEFORM



The screen of the PT0760M/2 showing Live video on channels 1 and test signal generator on channel 2. The picture also displays the Gamut Error indicator.

The traditional video waveform display is used to show various aspects of the video components. Available video components are R, G, B, Y, C_b and C_r. The horizontal time base on the waveform display is selectable between line, field and frame and the vertical scale shows the signal level in percentage, voltage or hex values. Horizontal as well as vertical zooming is possible.

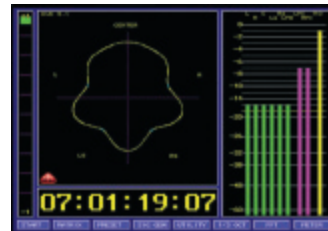
VIDEO WAVEFORM

The parade display is a typical display mode in a monitoring situation. The video components are displayed side by side and amplitude errors are easily detected. In one view, many parameters of the video signal can be monitored to check and optimize the picture quality, e.g. gamut margin, dynamic range, exposure, black level, etc. In parade mode the levels of the different video components can easily be compared - e.g. for checking the white balance. There are three different parade modes which are Y C_b C_r, RGB and RGBY. Video overlay is also possible from selected elements on each channel to provide a combined image.

EXTERNAL REFERENCE

This facility permits the user to individually measure the timing difference between the incoming video signals, 1 & 2, against an external reference. This reference can be Black Burst or Tri-Level. The timing reference measurement has a resolution of 13 nanoseconds.

AUDIO METERING



StarFish™ with phase correlation display, timecode and full 5.1, stereo & mono peak metering.

The PT0760M will display simple audio bargraph metering on the same screen as the waveform. The channels displayed can be selected through the internal Matrix built into the meter. The matrix is accessible via the PT0760M controls or externally on a PC where programming can be achieved offline and downloaded to the meter when convenient. All versions of the PT0760M can display both audio and video on the same screen including the surround sound StarFish™ and loudness measurements.

Allocation of the bargraphs and the phase meter can be for up to 16 incoming audio channels, user-selected from video inputs 1 & 2 and external audio input modules fitted in the PT0760M. Audio can be de-embedded from all 16 paths on each of the video channels. Full audio metering provides all the features known from DK's Audio Meters, such as Peak Programme Meter, Audio Matrix, StarFish™, JellyFish™ Audio Vectorscope (Goniometer), Phase Correlation Meter & FFT Spectrum Analysers.

It is possible to have the bargraph meters displayed on the same page as the video waveform monitor allowing the user to see peak levels of up to 16 channels of audio. This facility is selected via the matrix from both the embedded audio on the HD/SD video signals and also from the analogue or digital input modules. Channels monitored are selected by the user and are independent of each other.

Dolby E/D (AC3) can be decoded from the embedded audio or from external AES3 input signals via the optional digital audio input module. The source for the Dolby E/D (AC3) decoder is controlled via the matrix within the meter. Decoding will be to Dolby E, D & AC3 standards.

Solutions in
Audio & Video



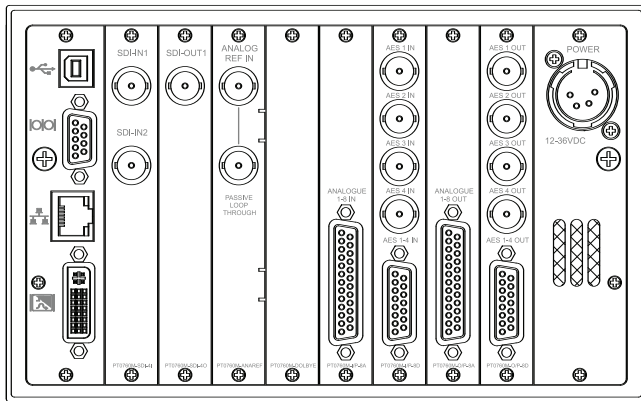
DOLBY E/D (AC3) DECODING

Dolby E encodes up to 8 channels of audio plus consumer and professional metadata information and carries it within a digital audio pair in a SDI stream or on a single AES3 audio channel. The PT0760M de-embeds the Dolby encoded signal, decodes that signal back to its constituent parts and then presents full audio metering of the signal and provides an output.

The PT0760M can deliver an audio downmix of the de-embedded and decoded signals derived using the coefficients set in the Dolby metadata. This can provide a health check as well as quality checking. Dolby metadata can also be shown on-screen.

INPUT/OUTPUT & PROCESSING MODULES

Rear View



- A
- B
- C
- D
- E
- F
- G
- H

- A) PT0760M-SDI-2I** ... 2 Auto sensing HD/SD Inputs.
- B) PT0760M-SDI-10** ... 1 Assignable HD/SD Output.
- C) PT0760M-ANAREF** ... Analogue reference input including loop-through.
- D) PT0760M-DOLBYE** ... Dolby E/D (AC3) decoder.
- E) PT0760M-I/P-8A** ... 8 Channel analogue audio input.
- F) PT0760M-I/P-8D** ... 4 AES3 (8 Channel) audio input.
- G) PT0760M-O/P-8A** ... 8 Channel analogue audio output.
- H) PT0760M-O/P-8D** ... 4 AES3 (8 Channel) audio output.



ORDERING INFORMATION

PT0760M/11

1 HD/SD Channel input, 1 HD/SD Output WFM inc Analogue Reference Input, Vectorscope, Audio De-embedding (16 Ch) Full 5.1 Audio metering inc StarFish™ & DVI/VGA O/P via DVI Connector

PT0760M/21

2 HD/SD Channel input, 1 HD/SD Output WFM inc Analogue Reference Input, Vectorscope, Audio De-embedding (16 Ch) Full 5.1 Audio metering inc StarFish™ & DVI/VGA O/P via DVI Connector

PT0760M/11V

1 HD/SD Channel input, 1 HD/SD Output WFM inc Analogue Reference Input, Vectorscope, & DVI/VGA O/P via DVI connector

PT0760M/21V

2 HD/SD Channel input, 1 HD/SD Output WFM inc Analogue Reference Input, Vectorscope, & DVI/VGA O/P via DVI connector

PT0760M-O/P-8D

4 Channel Digital Audio Output Module (AES3)

PT0760M-I/P-8A

8 Channel Analogue Audio Input Module

PT0760M-I/P-8D

4 Channel Digital Audio Input Module (AES3)

PT0760M-DOLBYE

Dolby E/D (AC3) Decoder Module

PT0760M-DELAY1

Audio delay of each Audio Channel up to a maximum of 16 Channels for monitoring applications only

PT0760M-DT/STAND

Desktop Stand for PT0760M

PT0760M-RM/KIT

19" 3RU Rack cabinet to house 2xPT0760M

PT0760M-RM/BLANK

Blank Panel for PT0760M-RM/KIT

ACCESSORIES/OPTIONS

PT0760M-ANAREF

External Analogue Black Burst/Tri-Level reference with loop-through

PT0760M-SDI-2I

2 Channel HD/SD Input Module

PT0760M-SDI-2-4IU

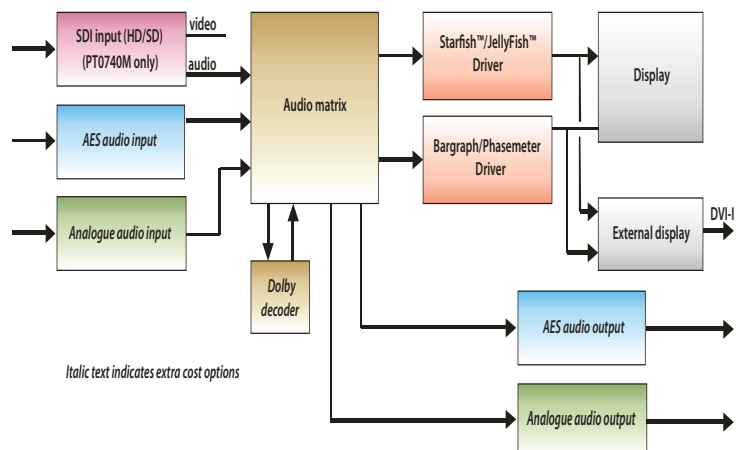
Upgrade from 2-4 Channel HD/SD Video Input Module

PT0760M-O/P-8A

8 Channel Analogue Audio Output Module

HD 1080p	HD 720p
1080p/30	720p/60
1080p/29.97	720p/59.94
1080p/25	720p/50
1080p/24	720p/30
1080p/23.98	720p/29.97
	720p/25
	720p/24
	720p/23.98
HD 1080i	SD
1080i/30	576i/25 (625)
1080i/29.97	487i/29.97 (525)
1080i/25	

BLOCK DIAGRAM

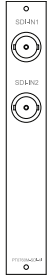


Multichannel HD/SD Video Meter



PT0760M - HARDWARE SPECIFICATIONS

HD/SD VIDEO



PT0760M-SDI-11 & 21

SDI input specifications:

SMPT-Formats: 259M, 292M
 Connector: BNC, 75Ω
 (Internally Terminated)
 Return Loss: > 15dB
 (5MHz - 1.5GHz)
 Input Level: 800mVp-p, ±10%
 (0m Cable)
 Equalization Range: 259M: 0-280m
 (Belden 8281 cable type): 292M: 0-100m



PT0760M-SDI-10

SDI output specifications:

SMPT-Formats: 259M, 292M
 Connector: BNC, 75Ω (Internally Terminated)
 Nominal Output Resistance: 75Ω,
 Return Loss: >15dB
 (5MHz - 1.5GHz)
 Output Level: 800mVp-p, ±10%



PT0760M-ANAREF

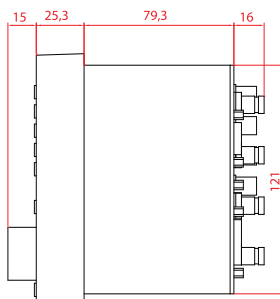
External Analogue Video reference:

Connector: BNC, 75Ω (Not internally terminated)
 Return Loss: >35dB
 (5MHz to 30MHz)
 Input Level: 1Vp-p typical, 2Vp-p (Maximum)

Supports video standards:

SDTV: SMPTE 125M
 SMPTE 267M
 ITU-R BT_601 (480I, 576I)
 HDTV: SMPTE 296M(720P)
 SMPTE 274M(1080I/P)
 SMPTE RP 211 (1080P/3F)

Side View



ANALOGUE & DIGITAL AUDIO



PT0760M-O/P-8A

8 Channel Analogue Audio Output Module:

Connector: 25 pin Female D-Sub.
 Sample Rate with internal Sync: 48kHz
 Max. Output Level at 600Ω: +18dB (VCC=12V)
 +24dB (VCC > 20V)
 Bit Resolution: 24 bits.
 Frequency Range: 30Hz to 20kHz ±0.3dB
 Sample rate range with external sync: 32 kHz to 50 kHz
 Group delay: <0.21 msec
 Dynamic range A-weighted: >101 dB
 Crosstalk at 1 kHz: < -96 dB
 Signal-to-noise ratio: 93 dB (typical)
 Nominal output impedance: < 5 ohm



PT0760M-O/P-8D

4 Channel Digital Output Module (AES3):

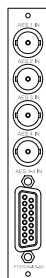
Connectors: 15 pin Female D-Sub (AES3-2003) & 4 x BNC (AES3-id2001)
 Sample rate with internal Sync: 48kHz
 Output Level (BNC), 75Ω: 1V
 Output Level (D-Sub), 110Ω: 5V (balanced)
 Bit Resolution: 24 bits.



PT0760M-I/P-8A

8 Channel Analogue Audio Input Module (balanced):

Connector: 25 pin Female D-Sub.
 Sample Rate with internal Sync: 48kHz
 Max. input Level: +24dB
 Bit Resolution: 24 bits
 Frequency Range: 30Hz to 20kHz ±0.3dB
 Nominal input impedance: > 20kΩ
 Group delay: <0.82 msec
 Dynamic range, A-weighted: >103 dB
 Crosstalk at 1 kHz: < -96 dB
 Signal-to-noise ratio: 93 dB (typical)



PT0760M-I/P-8D

4 Channel Digital Input Module (AES3):

Connectors: 15 pin Female D-Sub (AES3-2003) & 4 BNC (AES3-id-2001)
 Sample rate internal: 48kHz
 Sample rate for input module: 8kHz - 108kHz
 Input Level: >500mV
 Bit Resolution: 24 bits
 Input impedance: 110Ω
 Group delay: 1.75 msec (Max.)
 THD & Noise: -103 dB @ 1 kHz (typical)
 Dynamic range: >120 dB

GENERAL SPECIFICATIONS

General Connectivity:

External Display: DVI-I (DVI or VGA)
 640x480p60
 1280x720p60
 24 bit colour
 Monitor, Control & Update
 RS232 / USB (-A) / (RJ45)

Power Supply:

Power input Connector: XLR4-male
 Input Voltage: 12-36VDC
 Power Usage: 15-40W

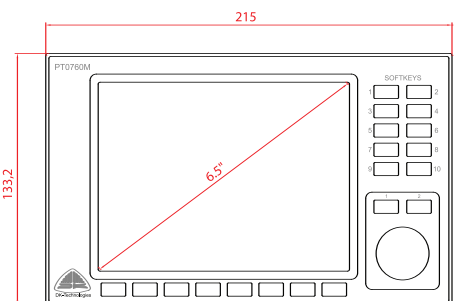
Physical Characteristics:

Height: 133.4 mm
 Width: 215.2 mm
 Depth: 145 mm Max.
 Weight: 2.5kg (typical)

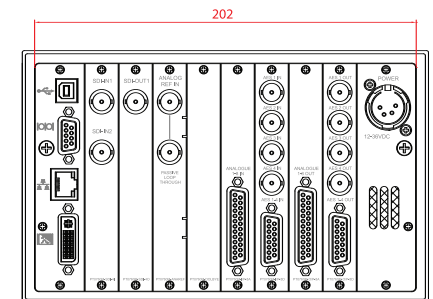
Environmental Conditions:

Storage temperature: -20° to +70°C
 Operating ambient temperature: +5° to +45°C
 Humidity: Non-condensing (IEC 721)

Front View



Rear View



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