



810 Reference Video System

10-megapixel digital projector & scaler



For over ten years, Meridian has been developing and manufacturing award-winning video products – from DVD players to projectors – that, together with the company's advanced digital audio components, create the Meridian Digital Theatre, offering the highest quality reproduction of both image and sound.

Now, Meridian takes the next step towards perfecting the home viewing experience with the introduction of the Meridian 810 Reference Video System.

The 810 system comprises two primary elements: the Ultra High Definition 810 Reference Video Projector, an entirely new D-ILA-based digital projector offering a previously impossible 10 megapixels – exceeding the resolution even of commercial digital cinema projectors – and the 810 Reference Video Scaler, a special processor designed to optimise the imaging of HD and standard resolution inputs for the vast new possibilities offered by a 10 megapixel projection environment.

The result is a system that, Meridian believes, represents the most realistic home theatre performance in the world.

Using a brand new light engine, the Meridian 810 Reference Video Projector offers an effective resolution of 4096 x 2400 pixels, or 9,830,400 pixels. In comparison, a conventional HDTV image at 720p represents just one megapixel, while full-spec HD (1080p) is still only twice that.

The Meridian 810 Reference Video Projector also has extremely high light output capability. Powered by a PKI Xenon lamp, the projector is capable of delivering up to 4000 lumens, enough to light even the very largest grey or white screen to the SMPTE standard Hollywood reference level of 16 foot-Lamberts reflected light.

In addition, the projector has a native contrast ratio of 10,000:1, ensuring that even in the most difficult scenes, such as those combining bright light and shadow, detail is never lost.

Product highlights

10 megapixel (4096 x 2400) Ultra High Definition display derived from three 1.27in diagonal 4096 x 2400 D-ILA chips for smooth, flicker-free, beyond-cinema-quality images

Light output up to 4000 lumens delivers SMPTE cinema reference level for reflected light (16 foot-Lamberts) from grey or white screens

Native 10,000:1 contrast with organic polarization grid for superb shadow detail and true blacks

Painstakingly calibrated at Meridian's dedicated facilities over a period of four days using exclusive calibration technology developed by William Phelps. Separate calibration for SD and HD sources

System includes both projector and specially-designed scaler for 480i–1080p inputs

High performance interchangeable lenses: short, medium and long-throw package systems include motorised 2.35:1 (Cinemascope®) anamorphic lens; very short-throw package available for back-projection and simulator applications

Contents of this document are subject to change.

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Calibration: the key to quality

Trained staff at Meridian's dedicated facilities individually calibrate each projector in a procedure that takes over four days to complete, mainly as a result of the sheer number of pixels to be calibrated. Different calibration steps require different groupings of pixels to be considered: for example flat field calibration is carried out for every group of four adjacent pixels; other parameters may require adjustment at the individual pixel level. The 810's calibration technology was developed exclusively for Meridian by William Phelps.

It is not sufficient to calibrate a projector in isolation – especially one that offers such a high-resolution, high-quality image. Instead, the projector and its accompanying scaler are considered as a complete, indivisible system – for example, different calibration procedures are carried out to suit Standard and High Definition signals; the scaler determines the signal format and automatically activates the appropriate calibration profiles in the projector.

In addition, calibration bears in mind the conditions in the viewing environment. The aim of a projector is not to get the maximum light on to the screen: on the contrary, most dedicated home cinema rooms are darkened, and it is all too easy, with a powerful projection system, to get an image that is *too* bright – which apart from losing visual detail can lead to a tiring viewing experience.

The correct approach is to standardise the amount of light *reflected from* the screen. This is the method employed by the Society of Motion Picture and Television Engineers (SMPTE), and used throughout the film industry. Their standard requires a light level of a nominal 16 foot-Lamberts to be

reflected from the screen when no film is in the projector gate. In practice, the average brightness of a bright scene in a cinema is around 60% to 75% of this amount.

Thus the projector must be individually calibrated for the specific space in which

810 Projector Outline Technical Specification

All information is subject to revision

Display device

- Aspect ratio 17:10 (Approx.)
- Display size (diagonal) 1.27"
- Effective Resolution 4096 x 2400

Lamp

- PKI Xenon
- Output up to 4000 lumens/825W
- Power output determined by calibration process for the application
- Accumulated lamp time counter and lamp replacement warning

Projection Lenses

- Several lens options available from very short throw (back-projection) to long throw
- Anamorphic 2.35:1 (Cinemascope®) capability

Optical system

- ON/OFF contrast 10,000:1 (typical)
- ANSI contrast 300:1 (typical)
- Peripheral brightness > 80%

Installation capability

- Vertical ±90 degrees
- Horizontal ±5 degrees
- Noise level <45dB(A)

System features

- Associated 810 scaler accepts RGB480i–1080p 24/48/50/60
- Direct DVI inputs for 4k x 2k native
- Low-delay mode
- Display resolution 4096 x 2400

Connections

- Up to 4 DVI
- RS232 (for control)
- Ethernet
- USB

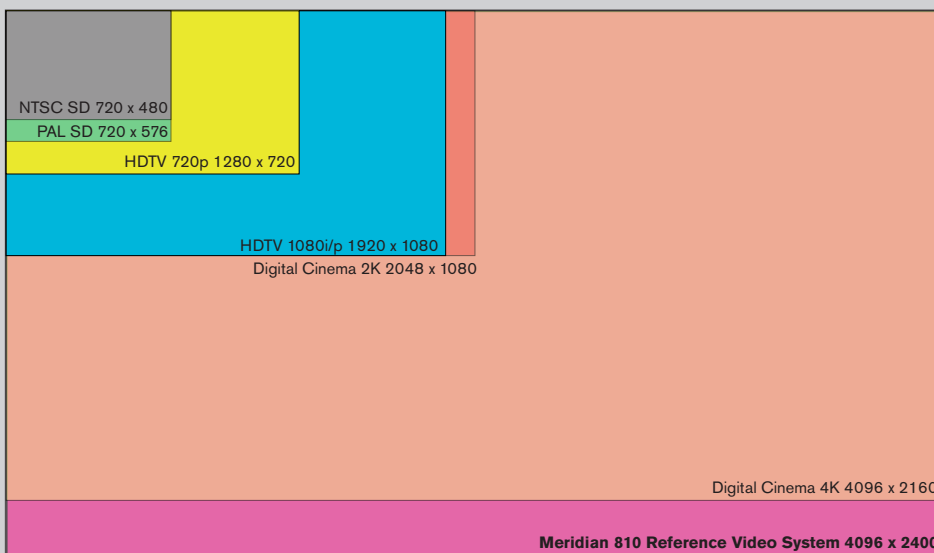
Power

- Input 100–120V, 200–240VAC
- Single-phase, 50/60Hz
- Max current <15A
- Power Consumption <1,500W
- Power Consumption (Standby) <2.7W

Physical characteristics

- Dimensions 663 x 793 x 342–362 mm W D H (including lens and foot)
- Mass: Net 59kg Gross 69kg
- Operation Environment (Temperature): +10°C – +35°C
- Operation Environment (Humidity): Less than 80% (No condensation)
- Storage Temperature: –5°C – +60°C

Beyond High Definition... way beyond.



This diagram provides a comparison of video resolutions, from standard definition to the Ultra High Definition 4096 x 2400 resolution of the Meridian 810 system – significantly higher than four full-spec HD screens laid side by side. The purple and green rectangles (top left) indicate the resolution of a Standard Definition (SD) image – 720 pixels wide by 480 (NTSC) or 576 (PAL) high and generally interlaced. A 720p HDTV image is 1280 pixels wide by 720 high and progressive-scan, while a 'full spec' HDTV image is 1920 x 1080 progressive ('1080p') – 1080i (interlaced) images are also common. A standard Digital Cinema specification, generally referred to as '2K', delivers 2048 x 1080 pixels progressive. The latest '4K2K' Digital Cinema spec is 4096 x 2160, delivering an 8-megapixel image. The 810 projector goes beyond this to deliver a 10-megapixel. 4096 x 2400 image.

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it will be used. The installation contractor provides Meridian with full details of the operating environment including the specifications and colour of the screen (the 810 will support both grey and white screens, though the latter is recommended), as the reflected light level depends on several factors, including the throw length and the gain of the screen, as well as the light brightness. The 810 light output is controlled as part of a calibration process that meets international cinema standards every step of the way.

The calibration of the 810 projector is therefore part of an integrated installation and configuration process, including every aspect of the home cinema environment.

Calibration is often a multi-dimensional process. For example, a conventional setup approach simply aligns a projector's white reference to a given colour temperature. But colour temperature alone does not tell you how accurate the colour *rendering* is. Only one point in the colour measurement coordinate system (D65) is actually correct – and our projectors are calibrated specifically to that point. The optimisation process provides both accurate colour temperature and Gamma tracking.

Similarly, it is not enough just to set up a projector to give a uniformly white screen at full output. It has to remain uniform across different luminance levels. In the 810, the flat field uniformity is superbly aligned for virtually zero deviation for an extraordinarily wide range of luminance values.

The fundamental intention behind the Meridian 810 Reference Video System is to give you, the viewer, the impression of looking through a window into the cinematographer's world, with all its detail and three-dimensionality: and calibration is an important part of achieving that goal.

If you forget that you are looking at a screen illuminated by a complex chain of art and technology, and instead are connected directly to the film-maker's visual imagination, then – and only then – have we truly succeeded. And this is exactly what you will experience with the 810. At last, the cinematographer's dream is realised.

810 Scaler completes the system

To display an image with a resolution of 10 megapixels requires some very special scaling. To meet this requirement, Meridian has developed the 810 Reference Video Scaler.

Where some scaling technologies still rely on copying adjacent pixels to handle upconversion, the 810 scaler is fully interpolative, and offers a significantly higher level of processing.

A brand new design, featuring powerful processing technology, the scaler converts any digital source (480i to 1080p) up to full 10 megapixel resolution. Its quiet and natural video processing produces images that are free from noise and devoid of artefacts whether operating in 4:3, 16:9 or 2.35:1 modes.

810 Scaler

Outline Technical Specification

All information is subject to revision

Supported formats

- Input formats: RGB 480i, 576i, 720p, 1080i, 1080p; 24/48/50/60 f/s
- Colour formats: RGB, YCbCr444, and YCbCr422.
- Output formats: up to 4096 x 2400 to drive projector inputs

Processor technology

- Multiple video processors under microprocessor control

Connections

- HDMI In
- DVI In
- Quad DVI Out
- RS232 Projector socket
- RS232 Control socket
- Maintenance RS232 socket for firmware upgrades
- USB port for firmware upgrades via memory stick
- Meridian Comms BNC
- Ethernet port (RJ45) allows access to inbuilt web server for configuration
- IR sensor port for connection of G12 remote sensor
- Trigger output x 3: one controls anamorphic lens slide; others user configurable

Controls

- Reset, Home and More front panel buttons
- Soft Buttons x 5: take on different functions according to context, eg Setup, Projector Settings, Scaler Settings etc.

Enclosure

- 2U, 19in rack mounting, uniform with C Series
- 17.25 x 13.5 x 3.5in / 437 x 343 x 87mm (W D H) approx, not including protuberances



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The 810 scaler includes a new class of adaptive video format conversion technologies, accepting video resolutions from 480i to 1080p, 24–60 frames per second.

Incorporated in the technology is a complete set of noise and artefact reduction technologies. Per-pixel noise and compression artefact reduction removes noise typically inherent in digital video, while per-pixel motion-adaptive 3-D de-interlacing removes jaggies and eliminates feathering. Marvell's Adaptive Contrast Enhancement (ACE) and Intelligent Color Remapping (ICR) render rich and vivid images, optimising texture, detail, edges, contrast and colour, providing a consistent, immersive viewing experience for all types of content.

Projector and scaler are operated as a single system. Serial data commands flow between the two units to select the appropriate projection and image processing

parameters at both ends of the chain, so that the image will always be at its best, whether it is receiving it from DVD, HDTV, Blu-ray Disc or alternative sources. The projector is also configured from the scaler interface, which includes a built-in configuration web server, accessed via the scaler's Ethernet connection.

The scaler accepts both HDMI and DVI inputs and delivers a quad DVI path to the projector. In addition the unit features Meridian comms for full integration with a Meridian Digital Theatre system, RS232 and USB maintenance ports for firmware upgrades (the latter allowing an update to be loaded via a memory stick) and an RS232 connection to the projector.

The scaler is a rack-mounting unit in the same style as Meridian's existing C Series of installation products and includes a vacuum fluorescent front-panel display with soft buttons that can be used to operate and

configure the unit. Modelled on Meridian's successful G Series user interface, the display labels the buttons according to context.

Complete projection systems

The Meridian 810 Reference Video System is available as a package consisting of both projector and scaler, which will not be available separately. Four different packages are offered, featuring lens systems with differing throw lengths. Short, Medium and Long-Throw packages include a special motorized 2.35:1 (Cinemascope®) lens assembly, while a Very Short Throw package, designed for back-projection and simulator applications, will also be available.

See separate sheets for dimensioned drawings and RS232 communications codes.

Lens information supplied separately.