

# M15 HD AV Surround Sound Preamp



## MASTER PERFORMANCE IN HIGH DEFINITION

When the M15 was introduced in 2005 it redefined the performance and value expectations for consumers worldwide. With a string of rave reviews and awards including the prestigious EISA Award for 'Best Home Cinema', the M15 has become a classic in its own right. There is now a new generation of video source and display products that support high resolution video and high definition audio. The new M15 HD has been re-engineered to take full advantage of these new High Definition formats. We have also added some interesting new features to enhance your enjoyment and protect your investment.

### > FEATURES



- 4 Digital HD AV Inputs with HDMI Repeating
- 4 Analogue AV Inputs with Composite and S-Video
- 3 HD Component Video Inputs
- 4 Coax and 4 Optical Digital inputs
- 3 Analogue Stereo Inputs
- 7.1 Direct Analogue Input
- Dolby TrueHD, DTS HD Master Audio, Linear PCM will run at 192kHz; Dolby Digital Plus, DTS HD High Resolution Audio, DTS 96/24
- DTS Neo:6 [Cinema/Music], Dolby ProLogic IIx [Movies/Music], EARS, Enhanced Stereo
- Audyssey MultEQ Pro
- Video upconversion; Composite and S-Video inputs available on Component Video output and HDMI output
- Sigma VXP Image Processing with HD scaling to 1080p
- MP Data Port for connection to NAD Dock for iPod
- Lip sync compensation - (option to 200ms)
- Flexible Bass Management including individual crossover frequencies for Front, Centre, and Surround speakers
- Tone controls
- RS-232 interface for advanced custom installations
- 12V Triggers for advanced control options, 1 In and 3 Out
- 3.5mm IR Control jacks, 1 In and 4 Out
- Zone 2 Independent AV output
- Zone 3 and Zone 4 Independent Audio output
- Dual differential 24-bit, 192 kHz DACs
- Dynamic Headroom Scaling for optimum resolution and S/N ratio for all program and decoding combinations
- Switch Mode Power Supply for Digital Audio and Video Stages
- Linear Power Supply with Custom C-Core Transformer for Analogue Audio Stages
- Detachable AC cord
- 8 Device HTRM Illuminated Learning Remote control with LCD display
- ZR 5 Second Zone Remote

### > SIMPLE CONVENIENCE, OPTIMUM FLEXIBILITY

The surround preamp processor serves as the 'brains' of your surround sound system. It takes the raw, unprocessed digital audio signals, decodes them into multiple (5.1, 6.1, or 7.1) analogue channels, and sends them on downstream to your amplifier and speakers. Compatibility is an important issue, as there is a multitude of different audio and video formats that must be catered to, with provision for several different types of signal transmission. Whether it is digital or analogue, the M15 HD has the flexibility to accept all the popular formats, including the latest, HDMI (High Definition Digital Interface).

Once the signal arrives at the M15 HD's input, it must be buffered, identified, decoded, and any 'post processing' routines (like Audyssey XT Pro) must be applied before the signal is converted from digital to analogue and sent to the outputs. There is also a requirement to 'redirect' bass frequencies, depending on the capabilities of the particular speakers used in your system. All this processing is controlled in the M15 HD by the latest high speed DSPs, loaded with NAD's proprietary software. These DSPs are capable of 100s of millions of operations per second!

Fortunately, we use all this processing power to keep the everyday operation of the M15 HD as simple and intuitive as possible. Once the system and user preferences are set, the M15 HD operates very much like our stereo preamplifiers.

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Just select the desired source – audio or video – set the volume, and hang onto your hat as the M15 HD takes you deep into the essence of the music or movie you are about to experience.

Our User Interface uses a clear front panel display as well as an 'on screen display' that provides setup information directly on your connected TV screen. This is where the M15 HD can be customized to reflect your specific needs and desires. Surround format preferences, level matching of inputs (so there won't be an annoying jump in volume when you switch sources), and even the renaming of inputs can all be set in these simple two layer menus.

### ONE REMOTE

The M15 HD is supplied with the latest iteration of NAD's renowned remote control, the HTRM (Home Theatre Remote – Masters Series). This 'smart' remote can learn the commands of any IR remote for any other component. The innovative learning circuit can easily memorize any command (including many that other remotes fail on), and can also memorize a sequence of commands (we call this a macro) to simplify the operation of your entire audio video system.

We use a logical layout of keys that are supplemented by a two-line LCD display to keep you informed of which component you are controlling and which command is being sent. We strongly believe that this combination of keys and display creates the easiest and most satisfying user interface of any remote control. Once familiar, most operations can be completed using the sense of touch alone, allowing you to stay focused on the video picture of your program. In darkened rooms, the HTRM automatically illuminates its keys and display for easy viewing.

The HTRM also includes a PC interface for advanced programming and easy backup or cloning of your particular HTRM setup. Simply connect via USB cable to a computer running MS Windows and load the supplied program. Commands for various components can be stored, and complex macros can be easily configured and downloaded into the HTRM.

### LUXURIOUS DESIGN

The design brief reads: "The industrial design must create a physical presence that is powerful, dynamic, and solid, yet refined and elegant". We wanted a design that will still look fresh and new a decade from now a design with classic proportions and understated details.

Intelligent use of aluminium extrusions, zinc castings, and heavy gauge steel results in a chassis that is as rugged as it is handsome. Innovative use of specialized coatings and plating results in a product that will retain its good looks for many, many years to come.

### COMPATIBLE AND UPGRADABLE— MODULAR DESIGN CONSTRUCTION

The M15 HD interfaces perfectly with the majority of consumer audio and video formats including the latest, HDMI. But we know that as digital technology

evolves there will probably be different requirements in the future. To remove the 'obsolescence factor' we have placed all audio and video input circuitry on individual modules that can be easily upgraded in the future if desired.

Additionally, the operating and decoding software can be upgraded via serial port when new features and formats become available. The M15 HD has four times the processing power of the original M15 and is using the latest ultra high speed 32-bit floating point DSPs for all decoding and post processing.

The M15 HD also supports NAD's optional Dock for iPod, allowing complete control of your iPod with your M15 HD remote control and On Screen Display.

With rear panel IR remote input and outputs, programmable 12V triggers, and an RS-232 port, the M15 HD is highly compatible with many of the advanced control systems such as AMX and Crestron.

### THREE INDEPENDENT REMOTE ZONES

Three completely independent audio 'zones' are available, each with its own remote control codes, as part of the M15 HD package. These line level outputs have independent source and volume selection, and are ready to interface with outboard amplifiers and controllers to send music to other rooms in your home. One zone also has an independent video feed. A small Zone Remote is provided to control Zone 2. Zone 3 and 4 codes are included in the HTRM remote library.

### POWER SUPPLIES

The heart of every electronic component is its power supply. Taking the raw current from the wall socket and creating stable, clean DC voltages is crucial to obtain the maximum performance of every circuit in the M15 HD. The M15 HD uses two different power supply technologies to provide performance without compromise. A very tightly regulated Switch Mode Supply provides the high current and stable voltages required by the ultra high speed video and audio processing in the new HD circuits. The audio circuits utilize a linear supply fed by a custom designed C-Core Transformer. This feeds into independent rectifiers and multi-stage regulators to obtain pure and stable voltages for each individual audio circuit. By keeping analogue and digital completely separate, any possible cross contamination is prevented.

### AUDIO PERFORMANCE FEATURES

Tone controls, AV presets, and direct access to sub, centre, and surround levels allow unprecedented control of the sound field. Centre channel tone control operates in the 'presence' region of the human voice to improve the intelligibility of dialogue. This is especially effective for many Dolby processed recordings. AV Presets take a 'snapshot' of any combination of speaker selection, level, and crossover frequency, to be recalled with just a couple of button presses of the remote control. You could, for example, have different setups for music and movies, or even settings for different types of music or different surround modes. Direct access to the subwoofer, centre, and surround speaker levels, without calling up menus, allow for 'on-the-fly' adjustments without interrupting the video program.

# M15 HD AV Surround Sound Preamp

Premium parts from renowned suppliers like Burr-Brown and Texas Instruments, are used in classic NAD circuit configurations to provide the low distortion and sonic realism for which NAD is famous. With full 24-bit 192kHz analogue-to-digital and digital-to-analogue conversion, the M15 HD can fully exploit the best source material available today and for the foreseeable future. Unusually, the M15 HD uses multiple 2-channel DACs rather than the 8-channel DACs favoured by many of today's surround sound processors. We have found that the sonic performance of the 2-channel DACs used in a dual differential mode is well worth the extra cost of this configuration.

Unprocessed analogue inputs, whether stereo or via the 7.1 input, remain in the analogue mode, sometimes known as 'bypass' mode. If a digital processing mode is selected, these signals are digitized using a 128x over-sampling Sigma/Delta ADC that employs a linear phase digital anti-aliasing filter to prevent any trace of ripple in the audio band.

Super high-speed (8 MHz bandwidth) low distortion (0.00008% THD) amplifiers are used for analogue input and output buffers. These FET OPamps feature high slew rate and are capable of the high output current required by this application. Low noise and superb dynamics are assured.

## VIDEO PERFORMANCE FEATURES

The M15 HD features NAD's newly developed HDMI repeater featuring Sigma's VXP Image Processor. Both analogue and digital video sources can be selectively processed using Sigma's advanced VXP algorithms. This is the best performing image processing engine we could find, using custom algorithms developed for the broadcasting industry. These algorithms are embedded in one of the most advanced high speed DSPs on the market which results in class leading processing latency of less than 1/50th of a second, or about one frame of video!

The new VXP video board features video conversion to resolutions as high as 1080p and supports all SD and HD formats up to 2048 x 2048 pixels. Motion adaptive de-interlacing with edge interpolation eliminates the jagged edge effects common in lesser image processors. Film mode detection with output cadence generation endows the video picture with a film-like smoothness of motion. The programmable scaling engine also allows for aspect ratio conversion to perfectly match the video source with the video display. Advanced noise reduction and detail enhancement improve legacy analogue video sources to near HD quality.

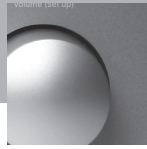
All SD analogue sources can be processed to HD output via analogue Component Video or Digital HDMI. This allows true 'one cable' convenience by converting all the different input source components to one HD video format to send to your TV display or projector. OSD is also available on all video formats.

## DIGITAL PERFORMANCE, PERFECTED

The M15 HD is a clean sheet design, evolved over several years of intense development. New thinking about D/A and A/D conversion processes led to a

circuit design that offers a level of technical precision and sonic performance unprecedented at this price level.

The M15 HD also supports Audyssey MultEQ Pro, an exciting new room correction technology that uses actual measurements of your room to create precision digital filters to correct for the effects of room boundaries. Unlike tone controls or even multi-band equalizers, Audyssey can correct for time (phase) as well as frequency errors. And unlike previous digital room correction technologies that sounded great in the sweet spot but worse outside the sweet spot, the Audyssey system creates a wide, 'family-sized' sweet spot where the sound is uniformly excellent for all listeners. Audyssey MultEQ Pro must be professionally calibrated by a specially trained professional sound engineer. The result of this calibration is a complex digital filter that is stored in the M15 HD's memory and is applied to all audio signals.



## > SPECIFICATIONS

### Line Level Input

Input impedance (R and C)	56k $\Omega$ + 220pF
Input sensitivity	40mV (ref. 500mV out)
Maximum input signal	>8Vrms
Signal/Noise ratio, A-weighted	>105dB (ref. 500mV in 500mV out, volume set to unity gain) >100dB (ref. 2Vout, Volume maximum)
Channel Separation	>90dB (ref. 1kHz / 10kHz)
Frequency response	$\pm$ 0.3dB (ref. 20Hz - 20kHz, Tone Active) $\pm$ 0.3dB (ref. 20Hz - 20kHz, Tone Defeat)
Frequency response (subwoofer out)	10 - 200Hz (ref. -3dB)

### Output

Maximum output level	>10Vrms into 600 $\Omega$
THD (CCIF IMD, DIM 100)	<0.005% (ref. 20Hz - 20kHz, 2V out)

### Tone Controls

Treble	$\pm$ 12dB at 10kHz (ref. 2V in 2V out)
Bass	$\pm$ 12dB at 100Hz (ref. 2V in 2V out)
Centre	$\pm$ 6dB at 3Hz (ref. 2V in 2V out)

Power Consumption	
Normal operation	45W
Standby mode	<1W

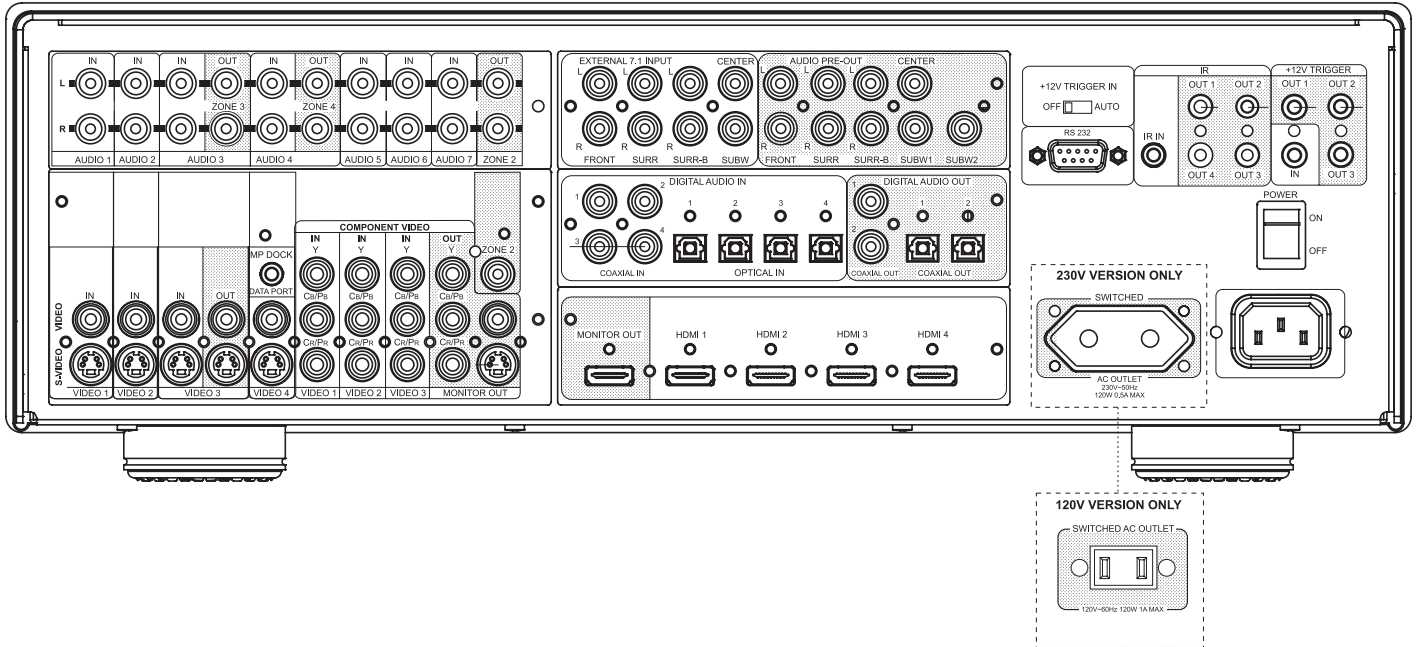
### Dimension and Weight

Unit dimensions (W x H x D)	
Gross*	435 x 145 x 385mm
Net weight	13.1kg
Shipping weight	22kg

\* Gross dimensions include feet, volume control and extended rear panel terminals.

# M15 HD AV Surround Sound Preamplifier

## > REAR LINE DRAWING



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