



DIGITAL MIXING ENGINE

# DME Series

DME-N Series

DME64N

DME24N

DME Satellite Series

DME8i-C DME8i-ES

DME8o-C DME8o-ES

DME4io-C DME4io-ES



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# The DME Advantage for Commercial Audio Installations

Whether it's for a meeting room, shopping center, theme park, or sports stadium, the design, construction, and operation of an audio installation is a complex undertaking. And since the needs of each facility and operator are rarely the same, each system must be flexibly crafted to suit the application. The traditional method of using discrete components is not only expensive, labor intensive and time consuming, but it also provides very little leeway for alterations once the job is done. That's why system designers and contractors are rapidly adopting versatile, networkable digital alternatives. Of those alternatives, Yamaha's DME devices, networking solutions and software are clearly at the forefront.

## DIGITAL MIXING ENGINE DME Series



### DME is ...

"DME" stands for "Digital Mixing Engine," which is actually a bit of an understatement when applied to Yamaha's extraordinary DME processors. They are, in fact, digital processing engines that can be configured to perform the functions of multiple audio processors – mixers, equalizers, compressors, crossovers, speaker processors, effects, feedback suppressors, wav file players, and much more – that can easily and quickly be interconnected as required via an intuitive software interface, and just as easily reconfigured whenever a change is needed.

### Yamaha DME Advantages

Compared to the alternatives, Yamaha DME systems offer significant advantages for all concerned with the creation and operation of commercial audio installations.

#### Processing Power

The first is processing power. Yamaha DME devices employ Yamaha's own DSP7 digital signal processing LSIs, designed and manufactured in-house under the highest manufacturing standards and quality control. This advanced LSI has gone through several generations of development over the years, and currently stands as one of the most capable and powerful for audio processing applications. Stated in simple terms this means you can do more, and more varied processing, without exhausting the system's resources.

#### Sound Quality, Reliability & Economy

Another important advantage is sound quality. Yamaha is first and foremost a music and sound company, with a history of more than 35 years in the production of industry-leading pro audio electronics, including more than 20 years in the production of digital audio gear. The fact that discerning professionals throughout the world continue to choose Yamaha audio gear for the most demanding, critical applications on stage and in the studio attests to the uncompromising sound quality and reliability that go with the Yamaha name. And unlike other high-performance "solutions," Yamaha DME systems actually deliver superior sonic quality at surprisingly low initial cost, with minimal outlay required for future upgrades and expansion.

#### Networking & I/O

Yamaha provides a number of networking options for DME systems that make it easy to construct systems of just about any size and scope. All audio and control can be transmitted via CobraNet or EtherSound network protocols, using standard digital network cables and hardware. This dramatically simplifies cabling requirements while reducing cost and facilitating modifications. DME devices are also compatible with Yamaha's plentiful

catalog of MY-series expansion cards, providing a broad variety of input and output options in a wide range of formats. Additional control capability is provided in the form of MIDI, GPI, RS232C/422, and USB interfaces.

#### Programmability

All aspects of system design, creation, and management other than actual physical hardware installation can be carried out via a unified, intuitive software interface provided by Yamaha's DME Designer software application that will run on most Windows-based computers. This one application can be used to graphically block out the initial design, create and wire the required audio components, create specialized graphical interfaces for the end user, and control the system when it is complete. Of course this means that changes and additions are just as easy to implement at any time.

#### Scalability

Not all audio systems require networking or a complex infrastructure, and the DME lineup offers efficient solutions for such applications as well. For a minimal system all you need is a single 2U rack-mountable DME24N unit and the associated audio input and output devices. But from there on the sky's the limit. Multiple DME and DME Satellite units can be networked with flexible grouping and zoning capabilities so that systems of just about any size and complexity can be created and managed with the utmost efficiency. Yamaha offers a range of convenient remote control units, and third-party remote control devices such as those available from AMX and Crestron can be easily accommodated as well. Of course the entire system, no matter how large, can be configured, controlled, and modified from a central computer running the DME Designer application.

# The DME Lineup

Although there are a number of peripheral and accessory components that can be used to enhance and expand any DME system, the core of any system will be one of Yamaha's DME processing engines or satellite interfaces.

## DME-N Series



DME64N



DME24N

### DME64N & DME24N

These versatile mixing engines allow an impressive array of DSP components to be combined and programmed to accommodate just about any audio requirement. Superior sound quality, generous DSP power, extensive scalability, and network capability — all supported by an intuitive interface — offer unprecedented freedom and efficiency for designing audio systems for installations and live sound. Both the DME64N and DME24N deliver faultless precision and reproduction fidelity with optimally-tuned 24-bit, 96-kHz digital processing, and the DME24N also features high-performance analog head amplifiers that equal the sound and quality of those found in top-line mixing consoles.

### Abundant DSP Power

The DME64N offer processing power that is on a par with Yamaha's acclaimed DM1000 Digital Mixing Console, and the smaller DME24N has about half that processing capability while offering built-in analog I/O for simple, more compact systems. Plenty of DSP power also means that advanced configurations that previously required multiple hardware units can now run comfortably on just one DME64N or DME24N. All of this translates into significant time, energy, and cost savings for the design, installation, and operation of DME-based systems.

### Exceptional I/O Flexibility and Networking

The DME64N has four Mini-YGDAL card slots that allow up to a total of 64 input and output channels to be added as required. The DME24N has 8 channels of analog I/O built-in, and a single Mini-YGDAL expansion slot that allows the addition of up to 16 more input and output channels for a total of 24. For applications requiring greater flexibility, both the DME64N and DME24N can be fitted with

audio network interface cards such as Yamaha's MY16-CII CobraNet card, Auvitran AVY16-ES EtherSound card or other 3rd party cards developed by supporting the Mini-YGDAL open architecture design for full compatibility with most general audio networks.

### GPI, RS232C/RS422, USB, and MIDI Interfaces

Both the DME64N and DME24N offer a comprehensive selection of control interfaces for use with a wide variety of equipment. The DME64N has 16 GPI input and output terminals while the DME24N has eight to facilitate interfacing with other GPI-equipped devices. RS232C/RS422 ports allow direct connection to remote control units and computers, USB ports allow direct hookup with most modern computers, and MIDI terminals can be used for synchronization and control with musical instruments, sequencers, and lighting controllers.

### Large LCD Display with Comprehensive Panel Controls

Large, easy-to-read LCD display panels and a comprehensive selection of panel controls make the DME64N and DME24N easy to operate. The front panel even includes a headphone jack and level control for convenient monitoring. The DME24N additionally provides signal and peak LEDs for its eight analog inputs and outputs. The DME64N and DME24N, as well as the ICP1 Intelligent Control Panel, can display scene and function names in 5 languages: English, Japanese, French, German, and Spanish. All three models offer a user-friendly interface for smooth operation regardless of the user's level of skill or experience.



## DME Satellite Series

### CobraNet™ DME Satellite Models for CobraNet Networking

CobraNet has become the choice for audio networking in complex, large-scale sound systems. Up to 64 channels of audio data can be carried via a single CAT5 Ethernet cable. CobraNet offers high reliability via its redundancy system with primary and secondary ports offered as standard.



### EtherSound™ DME Satellite Models for EtherSound Networking

EtherSound offers extremely low latency, and has become choice particularly for the temporary live applications. Up to 64 channels of audio data can be carried via a single CAT5 Ethernet cable so that the connection is easy and cost-effective.



### DME Satellite for Flexible Expansion

The DME Satellite models vastly expand the capabilities and capacity of a DME-based sound system, or any other networked audio devices that use CobraNet or EtherSound protocol. In addition to providing controllable remote I/O, they include powerful DSP processing capability allowing distributed processing for unprecedented system design flexibility and power. Satellite I/O also reduces system cabling costs while maximizing overall reliability. The DME Satellite series can also be used as stand-alone processors in smaller systems.

### Analog I/O & Network Capability

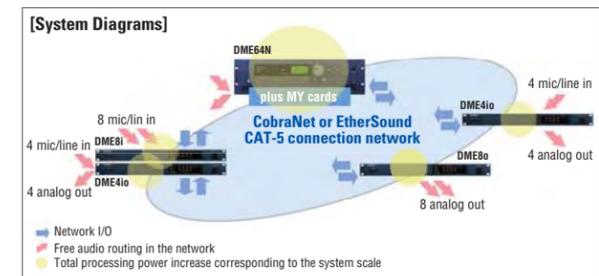
DME Satellite units are network interfaces that provide analog inputs, outputs, or both. Select the 8-input DME8i, the 8-output DME8o, or the DME4io with 4 inputs and 4 outputs according to the remote I/O configuration you need. You also have a choice of CobraNet ("-C" suffix) or EtherSound ("-ES" suffix) networking to optimally match the requirements of your application or an existing network infrastructure.

### DSP7-powered for Plenty of Processing Capacity

The DME Satellite units incorporate the same original Yamaha DSP7 digital signal processing LSI that powers the DME64N and DME24N, as well as top-of-the-line Yamaha digital mixers, delivering plenty of processing power for complex applications. In fact, in a single 1U rack space the DME Satellites offer approximately 80% of the processing power provided by the DME24N Digital Mixing Engine.

### Ideal for Small Systems as well as Large Distributed I/O Systems

All three models in each series include a 16-in/16-out CobraNet or



EtherSound interface. The DME8i and DME4io analog inputs feature remotely controllable microphone preamplifiers. Whether it's a minimal system based on the DME4io, a delay tower distribution system using DME8io units directly fed from the mixer, or a large scale system based on DME64N or DME24N Digital Mixing Engines with DME Satellite units used for distributed I/O and processing, the DME Satellite series offer scalable solutions that make setup fast, flexible, and reliable. Of course you can also combine the DME4io with DME8i or DME8o units to create 12-in/4-out or 4-in/12-out configurations as required.

### Comprehensive Control Terminals

The DME Satellite rear panels feature RS232C/422 terminals that can be used to connect AMX, CRESTRON, or similar external remote controllers, as well as providing gain control for Yamaha AD8HR AD converters with remotely controllable microphone preamplifiers. An 8-in/4-out GPI terminal allows connection of GPI interfaces or external switches, and an Ethernet connector is provided for connection to an ICP1 Intelligent Control Panel or a computer running the DME Designer application. A USB port is also provided specifically for communication with DME Designer.



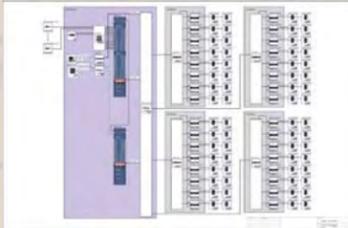
# From Concept to Completion the DME Way

Creating even a small audio installation can be a complex process, but Yamaha DME hardware and software provides a unified solution that takes you from conception to completion with maximum speed and efficiency.



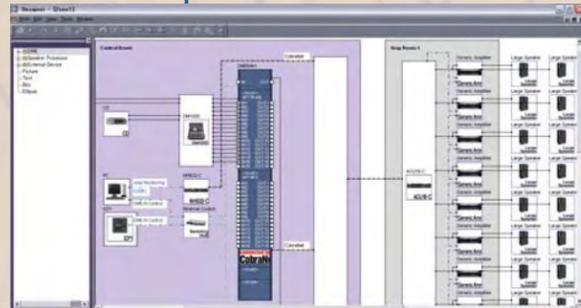
## Planning and Pictorial Layout

The first step in creating any audio installation is a pictorial layout that shows all the components and devices to be used, and how they are basically to be connected, in comprehensive graphic form. Traditionally this has been done using CAD software, but Yamaha's DME Designer application makes it easy to create pictorial layouts complete with area, zone, and device group system levels. This greatly facilitates project design and management, and layouts created using DME Designer can be exported in .dxf format for further processing in standard CAD applications, as required.



Printable in proposal sheet format

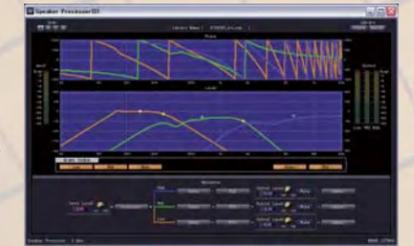
Compatible with Windows XP/2000



Zone Window

## Final Adjustment & Tuning

When the hardware is set up it's back to the DME Designer for final system testing and tuning. Now you can make adjustments to equalizers, compressors, and other parameters based on actual measurements and listening tests. The DME Designer's advanced interface and system-wide communication capability make critical tuning operations smooth and efficient.



Component editor for Speaker Processor



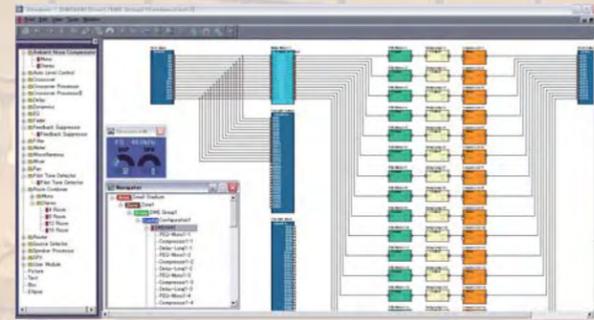
Component editor for Auto Mixer II



Component editor for Router

## Schematic Design

Once the system design is complete and/or has been approved, it's time to start combining and "wiring" the required components. Once again the DME Designer application is all you need to configure and connect the entire system, and you can do it all before actually installing and setting up the hardware. You have an extensive range of processing components to choose from, and plenty of processing power to handle even complex multi-component applications. If any last-minute changes are called for, you can implement them quickly and efficiently. And since physical inputs and outputs are configurable via the DME64N/DME24N expansion slots or via DME Satellite units, you can easily accommodate changes to the I/O configuration and equipment prior to committing to the hardware.



Configuration Window

## Hardware Installation

Since the DME processors themselves are remarkably compact rack-mountable units, hardware installation is easy and doesn't require any specialized infrastructure. In networked systems the audio and control signals can all be carried by standard Ethernet cables, so cabling is easy and cost-effective. The Yamaha ICP1 Intelligent Control Panel is an ideal wall-mountable interface for user control, and a range of simpler GPI-based control units are also available.



## Operation

The end user can control the completed system via simple switch and/or fader panels, the more versatile Yamaha ICP1 Intelligent Control Panel, sophisticated AMX touch-panel controllers, or "User Control Panels" created by and accessed via the DME Designer application. User Control Panels can be created to give the user as much or as little control as required, and can be easily reconfigured to meet changing needs.



DME series processors are participants in the AMX Duet Partner Program, and offer full support for Dynamic Device Discovery. DME processors, with their extensive feature set and versatility, offer a familiar Duet programming and control environment for smooth integration with other Duet devices.

### Wall-Mount Remote Control Panels



## PM5D Digital Mixing Console Control Integration

Selected DME parameters can be directly controlled from the Yamaha PM5D Digital Mixing Console for seamless, efficient operation, particularly in live sound applications. This capability is invaluable in situations where the DME unit is located away from the optimum listening position, allowing parameters to be adjusted without having to leave the main console. DME components that can be remotely controlled from the PM5D include GEQ, PEQ, Crossover, Long Delay, Short Delay, and Matrix Mixer.



DME64N

PM5D

# A Component Approach to Versatile System Design

In the same way that you might select and connect physical components – equalizers, compressors, mixers, etc. – for a conventional audio installation, you can select and connect a wide range of processing components for any DME system. The big differences are that all of the “components” are contained within the DME processing engine, and that they can be easily interconnected and adjusted via Yamaha’s very intuitive DME Designer software application. This means that you have total control over the equivalent of many racks of advanced audio gear in a compact, easily modifiable system.

Below is a list of some of the major components provided in the various DME devices available. Below that we’ll briefly describe some of them.

## Component List

Category	NEW	Component	DME64N	DME24N	DME Satellite
		Remote Controlled Internal HA		Yes	Yes
		Delay	Long, Short	Yes	Yes
		Dynamics	Gate, Ducking, Expander, Compressor, Compressor, De-Esser, Limiter	Yes	Yes
		Filter	BPF, HPF, LPF, Notch	Yes	Yes
		EQ	PEQ, GEQ	Yes	Yes
		Fader		Yes	Yes
		Pan	LR, LCR, 3-1, 5.1, 6.1	Yes	Yes
		Meter		Yes	Yes
Mixers	V3	Simple Mixer	Yes	Yes	Yes
	V3	Auto Mixer (II)	Yes	Yes	Yes
	V3*	Matrix Mixer	Yes	Yes	Yes
	V3*	Delay Matrix	Yes	Yes	Yes
I/O functions		Analog I/O		Yes	Yes
		Cascade I/O	Yes		
		MY card I/O	Yes	Yes	
	V2	CobraNet I/O (16IN/16OUT)			Yes
	V3	EtherSound I/O (16IN/16OUT)			Yes
Source		Oscillator	Yes	Yes	Yes
		Wav File Player	Yes	Yes	Yes
Routing functions		Source Selector	Yes	Yes	Yes
	V3*	Router	Yes	Yes	Yes
Crossover		Crossover	Yes	Yes	Yes
		Crossover processor (II)	Yes	Yes	Yes
Speaker Processor		Speaker processor	Yes	Yes	Yes
Other functions	V3	Room Combiner	Yes	Yes	Yes
	V2	Feedback suppressor	Yes	Yes	
	V3	Ambient Noise Compensator	Yes	Yes	Yes
	V3	Audio Detector	Yes	Yes	Yes
		Auto Gain Control	Yes	Yes	Yes
		Event Scheduler	Yes	Yes	Yes
		SPX	Yes	Yes	

V2: Components added in Version 2.

V3: Components added in version 3.

V3\*: Additional component variations added in Version 3.



### Equalization

Some form of equalization will be required at the time of installation. If your system covers more than one acoustic space you’ll undoubtedly need precisely controllable EQ at several points throughout. In addition to versatile mono and stereo 7-band, 15-band, and 31-band graphic equalizers, all DME processing engines provide precision mono and stereo parametric equalizers in 2-band, 3-band, 4-band, 6-band, and 8-band configurations. And of course you can use as many instances as your system requires.



### Dynamics

Dynamics processing requirements can be complex, and designers/engineers are often forced to compromise when using hardware components that provide part of the functionality required while falling short in other areas ... often requiring supplementation with more equipment. DME processing engines offer an outstanding range of dynamics functions that should cover all your needs: mono and stereo compander, compressor, de-esser, ducking, expander, gate, and limiter components can be used singly or in combination, as required.

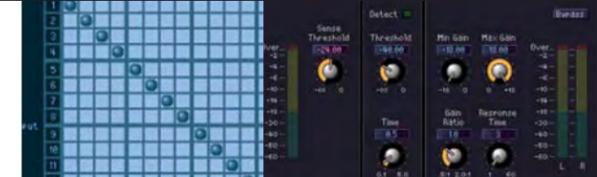


### Feedback Suppressor

This simple but effective feedback suppressor can effectively eliminate feedback from speech or music sources. The conventional technology applied to this problem involves a frequency detector and notch filters that are applied automatically to suppress feedback frequencies. The drawback of this approach is that the sharp filters used adversely affect the phase characteristics of the audio signal, and therefore degrade the final sound output. The DME processors employ a different approach, applying a slight amount of pitch shift (just a few cents) to interrupt the feedback loop, effectively stopping feedback while maintaining maximum sound quality.

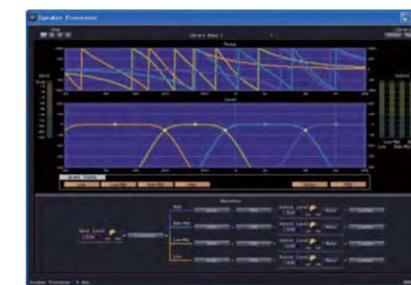
### Router

These remarkably useful components allow routing (patching) multiple inputs to multiple outputs as required. You can route 1, 2, 4, 8, 12, or 16 inputs to 2, 4, 8, 12, or 16 outputs depending on the router configuration selected. A 32-input/32-output router is also available. Versatile routing capability not only makes it easy to mix and route music and announcement sources appropriately to multiple areas or zones, but it can also be used, for example, to implement HPF components for speaker protection, equalizers for intelligibility processing, delay for speaker distance compensation, and many other applications without having to reconfigure the hardware.



### SPX Effects

Yamaha SPX effects are recognized as being some of the best and most “musical” in the industry. In the DME processing engines you have full-featured SPX multi-effect processors that are on a par with those provided in top-line Yamaha production and live sound consoles.



### Speaker Processing & Y-S<sup>3</sup> Support

Speaker processing can be essential for achieving maximum performance from professional speaker systems as well as for delivering optimum sound quality throughout the listening area. DME processors include everything needed for precision speaker tuning and room matching: versatile crossover processors with APF (All Pass Filter for phase control), horn EQ, delay, limiter functions, and more. And to streamline the complex acoustic measurement and analysis procedures required to achieve the best possible performance, DME processors can use configurations created automatically by Yamaha’s Y-S<sup>3</sup> software application (a free download from <http://www.yamahaproaudio.com/>). Y-S<sup>3</sup> (Yamaha Sound System Simulator) is an innovative software application that provides precise, easy-to-use simulation of sound pressure level distribution, frequency response, and other attributes that must be taken into account when installing speakers in any type of venue. The Y-S<sup>3</sup> software automatically generates an output configuration for all specified speaker arrays and saves it in a format that can be directly read and used by DME Designer. This makes it possible to get through one of the most difficult and critical stages of sound system construction with greater accuracy and minimal effort.

### Latency Display & Compensation

The extraordinary design freedom and flexibility provided by DME processing engines does require that careful attention be paid to latency. If you have multiple signal buses using different numbers and types of processors, delay differentials caused by unequal latencies need to be taken into consideration. The DME processing engines make this as easy and efficient as possible by providing sample-accurate latency displays as well as adjustable output port delays that can be used to bring all signals into precise alignment.



## A Component Approach to Versatile System Design

### Audio Detector

The Audio Detector generates GPI output based on whether or not an input audio signal is detected. This capability could be used, for example, to automatically pan a camera to the current speaker during a conference, control lighting, or perform other advanced functions. Conversely, it could be used to detect when an audio input has stopped and change scenes accordingly.

### Auto Gain Control

This function automatically adjusts gain to maintain a consistent level even if the volume of a speaker's voice varies, for example. An indispensable function for meeting rooms and conferences.

### Ambient Noise Compensator



DME processing engines include a gap-sensing ambient noise compensator component that adjusts the level of music and speech program sources in response to ambient sound levels detected by one or more carefully placed microphones. A comprehensive range of parameters makes it possible to precisely tailor the compensation response to your needs. This type of capability can significantly enhance the quality of sound service in facilities with fluctuating ambient sound levels.



### Auto Mixer II

With over-ride function and automatic output level control, this mixer component can be valuable in meeting rooms.



### Simple Mixer

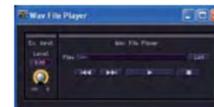
A simple but very useful stereo mixer available in 16-input and 24-input variations, both with dual auxiliary sends. This component can significantly enhance system design flexibility in a wide range of applications.

### Room Combiner



The Room Combiner component adds multiple audio signals to "virtually" combine the acoustic spaces of multiple rooms. Mono and stereo components that combine 4, 8, 12, or 16 rooms are available. This component provides an effective solution for situations in which several rooms or areas can be physically partitioned or combined to handle different types of events or numbers of participants. Sources and outputs can easily be switched as required, and the processing for multiple areas can be handled by a single DME unit.

### Event Scheduler & Wav File Player



As their names imply the Wav File Player component plays specified Wav audio files, and the Event Scheduler can be used to trigger it at predefined times and repeating cycles. This could be used to play opening and closing themes for a retail outlet or mall, for example. Event Scheduler triggering is not limited to Wav File Player operation, however, and it could be used to schedule a GPI output that could start an external CD player or other device, for example. Programming the scheduler is easy, and can be done by the end user simple via wall-mounted remote control units or other remote controllers. Playback level and on/off switching can also be accomplished via the same type of controller.

## About CobraNet and EtherSound

The choice of CobraNet or EtherSound networking will depend on the type and scale of the network you intend to use. CobraNet networking offers maximum advantage in redundant or VLAN type switched networks, and is primarily suited to large installed systems. EtherSound offers exceptionally low latency and easy setup that makes it the perfect choice for live sound reinforcement applications.

**CobraNet™** CobraNet allows distribution of many channels of real-time, high quality digital audio over an Ethernet network. CobraNet uses standard Ethernet packets and network infrastructure (controllers, switches, cabling, media converters, etc.), and provides the functionality and reliability required for large, complex networks.



**EtherSound** EtherSound provides easy setup and extremely low latency for relatively straightforward audio networks. SSI in to SSI out transmission time is six samples (125 microseconds at 48 kHz), regardless of the number of channels transmitted. EtherSound provides bi-directional transmission, high data capacity at mixed sample rates and powerful control functions.



## DME Series Rear Panels



## Wall-Mount Remote Control Panels



### Intelligent Control Panel

The most sophisticated of the DME series remotes, the ICP1 connects via Ethernet. Functions include scene recall and six user-defined keys at the top and bottom of the LCD screen, which can be assigned to DME parameters such as microphone and music source levels. Up to 4 sets of "pages" are available - giving up to 24 parameters. LCD display shows names and scenes and function keys in five languages - English, German, French, Spanish and Japanese.



Note: Use a standard (US-type) wall box: 3-gang with depth 44mm for ICP1 and CP4SF, 1-gang with depth 44mm for CP4SW and CP1SF. It is necessary to use the included frame plate to install these remote control panels in standard wall boxes.

## Amplifier Control Unit

### ACU16-C 16-channel DA Converter and Monitoring / Control Unit



The ACU16-C amplifier control unit supports CobraNet for maximum efficiency control of Yamaha's Tn Series and PC-1N Series power amplifiers. The ACU16-C converts digital audio signals from CobraNet with its integrated 16-channel high-precision DA converter, then distributes the converted analog sound to the amplifiers. What's more, Yamaha's dedicated NetworkAmp Manager software lets users control and monitor up to 32 amplifier units.

## Network Hub and Bridge

### NHB32-C 32 IN / 32 OUT Channel Audio and Control Interface



The NHB32-C network hub and bridge works as a networking interface to send/receive digital audio signals and control signals to and from CobraNet. A single NHB32-C unit can support up to 32-channels of digital audio I/O and one control signal I/O (remote control of AD8HR head amps, or amp control, or MIDI). Network Amp Manager software allows central control of both audio and control signals.

## Network Audio Interface

### NAI48-ES



The NAI48-ES Network Audio Interface uses EtherSound network protocol to transfer 48 channels of digital audio bi-directionally over a single CAT-5 Ethernet cable. Yamaha digital mixing consoles or DME processors can be connected to remote head amps or AD/DA converters via the NAI48-ES for analog input or output interfacing wherever needed. This eliminates noise problems that are unavoidable with conventional analog gear and multi-cable type setups, and dramatically reduces analog cable length for superior sound quality.

## Power Amplifiers

### Tn Series



Power rating at 2 or 4  $\Omega$  per channel  
**T5n** 230V: 2500W [ @ 2  $\Omega$  ], 2350W [ @ 4  $\Omega$  ], 120V: 2500W [ @ 2  $\Omega$  ], 2200W [ @ 4  $\Omega$  ]  
**T4n** 230V: 2200W [ @ 2  $\Omega$  ], 2050W [ @ 4  $\Omega$  ], 120V: 2200W [ @ 2  $\Omega$  ], 1950W [ @ 4  $\Omega$  ]  
**T3n** 230V: 1900W [ @ 2  $\Omega$  ], 1400W [ @ 4  $\Omega$  ], 120V: 1900W [ @ 2  $\Omega$  ], 1400W [ @ 4  $\Omega$  ]

The Tn series amplifiers are designed to deliver optimum performance under tortuous tour conditions, while offering sonic quality befitting a top-line model with up to 2500 watts power output per channel. The ability to stably drive load impedances as low as 2 ohms makes the Tn series amplifiers ideal for powering line-array systems on the road. Of course the Tn Series includes on-board networking capability for remote control and monitoring.

### PC-1N Series



Power rating at 4  $\Omega$  per channel  
**PC9501N** 230V: 1650W, 120V/240V: 1600W  
**PC6501N** 230V: 1150W, 120V/240V: 1100W  
**PC4801N** 230V: 800W, 120V/240V: 850W  
**PC3301N** 230V: 700W, 120V/240V: 600W  
**PC2001N** 230V: 450W, 120V/240V: 400W

The PC-1N Series amplifiers feature an extraordinarily solid low end, rich midrange, and superbly defined highs. They also deliver fast response and exceptional stability even in the face of serious power supply limitations. Refinements throughout this expanded five-model lineup make these amplifiers the new benchmarks for quality, reliability, and versatility in professional applications.

## Mic Line Amplifier

### MLA8



The MLA8 mic/line amplifier is an 8-channel preamplifier featuring unparalleled articulation and sound quality descended from Yamaha's internationally acclaimed digital mixing consoles. It not only offers such practical features as PAD, HPF and PHANTOM, but packs them into the compact convenience of a 1U chassis. The MLA8 also comes with a Euroblock output connector for installed sound systems and a Dsub-25pin connector compatible with the MY8-AD96 8-channel mini-YGDAI AD card — for maximum affinity with Yamaha digital mixers.

## AD Converter with Remote Preamplifier

### AD8HR



The AD8HR is a remotely controllable 8-channel AD converter with 96 kHz processing. It features head amplifier technology descended from our PM5000 high-end analog PA console — so you can count on the highest quality sound around. Two output connectors enable 2x 8-channel digital audio output in the AES/EBU format. What's more, users can take advantage of the AD8HR's head amplifier remote control function to operate the unit as a stage box.

## DA Converter



### DA824

The DA824 is a DA converter that converts 8-channel digital audio inputs into 24 bit/48 kHz analog outputs. It includes an expansion slot to support optional mini-YGDAI cards with AES/EBU, ADAT and TASCAM digital formats.

## Yamaha Mini-YGDAI cards

Each expansion slot – four on the DME64N and one on the DME24N – can be used to add up to 16 analog or digital I/O channels in a variety of formats by simply plugging in the appropriate mini-YGDAI expansion card including CobraNet and EtherSound audio network interface cards.

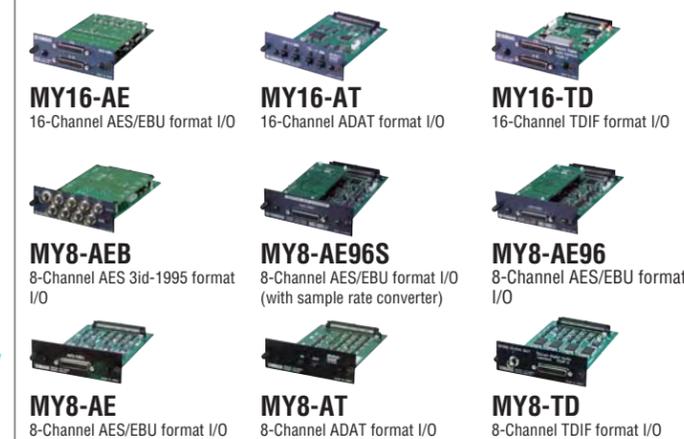
### Network I/O Series



**MY16-CII**  
16-Channel Audio CobraNet format I/O and Control I/O

**AVY16-ES**  
16-Channel EtherSound format I/O

### Digital I/O Series



**MY16-AE** 16-Channel AES/EBU format I/O

**MY16-AT** 16-Channel ADAT format I/O

**MY16-TD** 16-Channel TDIF format I/O

**MY8-AEB** 8-Channel AES 3id-1995 format I/O

**MY8-AE96S** 8-Channel AES/EBU format I/O (with sample rate converter)

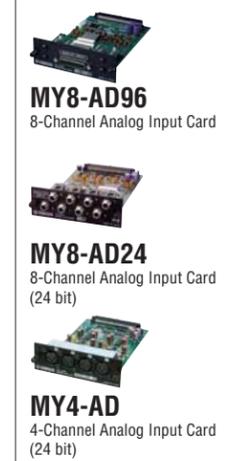
**MY8-AE96** 8-Channel AES/EBU format I/O

**MY8-AE** 8-Channel AES/EBU format I/O

**MY8-AT** 8-Channel ADAT format I/O

**MY8-TD** 8-Channel TDIF format I/O

### AD Series



**MY8-AD96** 8-Channel Analog Input Card

**MY8-AD24** 8-Channel Analog Input Card (24 bit)

**MY4-AD** 4-Channel Analog Input Card (24 bit)

### DA Series



**MY8-DA96** 8-Channel Analog Output Card

**MY4-DA** 4-Channel Analog Output Card (20 bit)

**ADDA Series**

**MY8-ADDA96** 8-Channel Analog Input/Output Card

# Specifications



## General specifications

		DME64N	DME24N	DME Satellite (C ver.)	DME Satellite (ES ver.)
Sampling rate	Internal	44.1kHz, 48kHz, 88.2kHz, 96kHz			48kHz, 96kHz
	External	44.1kHz (-10%) ~ 48kHz (+6%) 88.2kHz (-10%) ~ 96kHz (+6%)			44.1kHz, 48kHz, 88.2kHz, 96kHz
Signal delay (Ch input to Ch output@96kHz)		≤ 0.5msec	≤ 0.85ms	-	-
Total harmonic distortion		-	≤ 0.05	-	-
Frequency response		-	0, +0.5, -1.5dB	-	-
Dynamic range		-	106dB	-	-
Hum & noise level		-	-128dBu (EIN), -82dBu (Residual output noise)	-	-
Crosstalk		-	-80dB	-	-
Power requirements		100V-240V 50Hz/60Hz			
Power consumption		80W	75W	40W	-
Dimension (WxHxD; mm)		480 x 145 x 411.5, 3U	480 x 101 x 411.5, 2U	480 x 44 x 361, 1U	-
Weight		9.5kg	8kg	4.4kg	-

## DME64N control and audio I/O specifications

### Control I/O specifications

Terminal	Format	Level	Connector
GPI	IN	-	Euroblock
	OUT	TTL	Euroblock
	+V	5V	Euroblock
ETHERNET	IEEE802.3	-	RJ45
USB	USB1.1	0V-3.3V	B type USB
REMOTE	-	RS232C/422	D-sub 9pin (male)
MIDI	IN	MIDI	DIN-5pin
	OUT	MIDI	DIN-5pin
	THRU	MIDI	DIN-5pin
WORD CLOCK	IN	-	TTL/75Ω(ON/OFF) BNC
	OUT	-	TTL/75Ω BNC

### Digital audio I/O specifications

Terminal	Format/Level	IN/OUT	Connector
CASCADE IN	from PM5D	RS422	32 IN
	from DME64N	RS422	32 IN / 32 OUT
CASCADE OUT	from PM5D	RS422	32 IN
	from DME64N	RS422	32 IN / 32 OUT
SLOT 1-4	Mini-YGDAI	16 IN / 16 OUT	Mini-YGDAI

## DME24N control and audio I/O specifications

### Control I/O specifications

Terminal	Format	Level	Connector
GPI	IN	-	Euroblock
	OUT	TTL	Euroblock
	+V	5V	Euroblock
ETHERNET	IEEE802.3	-	RJ45
USB	USB1.1	0V-3.3V	B type USB
REMOTE	-	RS232C/422	D-sub 9pin (male)
MIDI	IN	MIDI	DIN-5pin
	OUT	MIDI	DIN-5pin
	THRU	MIDI	DIN-5pin
WORD CLOCK	IN	-	TTL/75Ω(ON/OFF) BNC
	OUT	-	TTL/75Ω BNC

### Analog audio input specifications

Input terminal	Gain	Actual load impedance	For use with nominal	Input level		Connector
				Nominal	Max. before clip	
CH INPUT 1-8	-58dB	3kΩ	50-600ΩMics & 600ΩLines	-58dBu	-38dBu	Euroblock
	+10dB			+10dBu	+30dBu	

### Analog audio output specifications

Output terminal	Actual source impedance	For use with nominal	Output level		Connector
			Nominal	Max. before clip	
OUTPUT 1-8	150Ω	600ΩLines	+4dBu	+24dBu	Euroblock
			-2dBu	+18dB	
PHONES	15Ω	8Ω	75mW	150mW	Stereo
		40Ω	65mW	150mW	

### Digital audio I/O specifications

Terminal	Format/Level	IN/OUT	Connector
SLOT	Mini-YGDAI	16 IN / 16 OUT	Mini-YGDAI

## DME Satellite control and audio I/O specifications

### Control I/O specifications

Terminal	Format	Level	Connector
GPI	IN	-	Euroblock
	OUT	TTL	Euroblock
	+V	5V	Euroblock
ETHERNET	IEEE802.3	-	RJ45
USB	USB1.1	0V-3.3V	B type USB
REMOTE	-	RS232C/422	D-sub 9pin (male)

### Analog input specifications

Input terminal	Gain	Actual load impedance	For use with nominal	Input level		Connector
				Nominal	Max. before clip	
CH INPUT	-60dB	3kΩ	50-600ΩMics & 600ΩLines	-60dBu	-40dBu	Euroblock
	+10dB			+10dBu	+30dBu	

### Analog output specifications

Output terminal	Actual source impedance	For use with nominal	Input level		Connector
			Nominal	Max. before clip	
OUTPUT	75Ω	600ΩLines	+4dBu	+24dBu	Euroblock

### Digital I/O specifications

Terminal	Format/Level	IN/OUT	Connector
CobraNet (C version)	CobraNet / 100base-TX	16 IN / 16 OUT	RJ-45 x2 (Primary, Secondary)
EtherSound (ES version)	EtherSound / 100base-TX	16 IN / 16 OUT	RJ-45 x2 (In, Out)

## Dimensions unit : mm

