YAMAHA

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**

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 that 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

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.

DME8i-C

DME8o-C

DME4io-C

EtherSound

DME Satellite Models for EtherSound Networking
EtherSound offers extremely low latency, and has become choice paticularly 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.

DME8i-ES

DME8o-ES

DME4io-ES

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-YGDAI 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-YGDAI expansion slot that allows the addition of up to 16 more input and output channels for a total of 24. For applications requiring greater 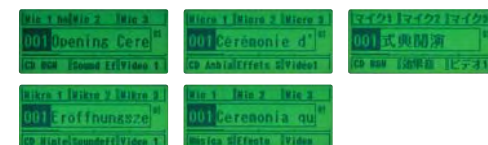flexibility, both the DME64N and DME24N can be fitted with audio network interface cards such as Yamaha's MY16-CII CobraNet card, Auvitran AVY16-ES EtherSound card or other 3rd party cards developed by supporting the Mini-YGDAI open architecture design for full compatibility with most general audio networks.

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 it's 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 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.
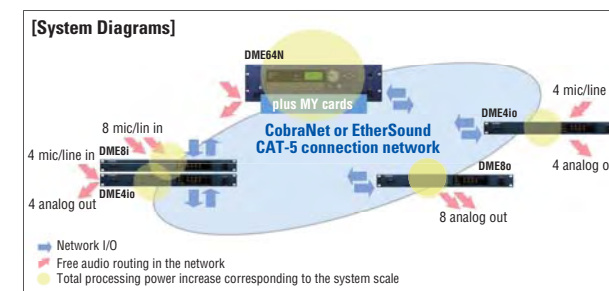
Analog I/O & Network Capability

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

[System Diagrams]

DME64N

plus MY cards

CobraNet or EtherSound
CAT-5 connection network

8 mic/lin in

4 mic/line in DME8i

4 analog out DME4io

4 mic/line in

DME4io

4 analog out

DME8o

8 analog out

- Network I/O
- Audio routing in the network
- Total processing power increase corresponding to the system scale

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.
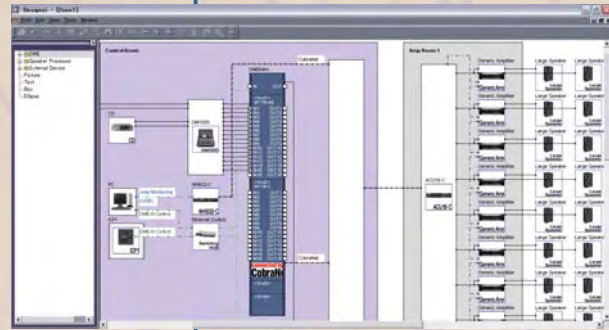
Planning and Pictorial Layout

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.
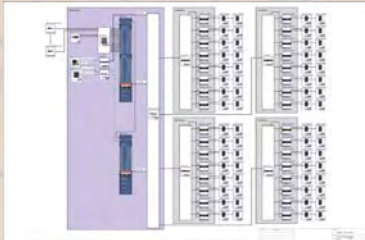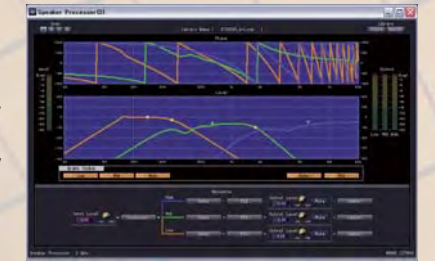
Zone Window

Printable in proposal sheet format

Compatible with Windows XP/2000

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.

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.

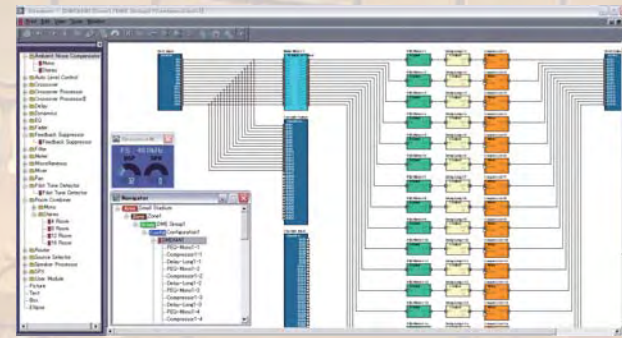Component editor for Speaker Processor

Component editor for Auto Mixer II

Component editor for Router

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.
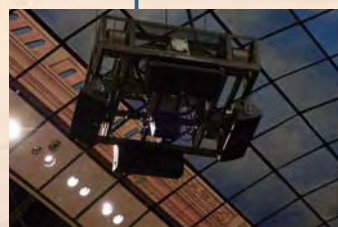
User Control Panel

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

ICP1

CP4SF

CP4SW

CP1SF

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

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	Yes
		Dynamics	Gate, Ducking, Expander, Compander, Compressor, De-Esser, Limiter	Yes	Yes	Yes
		Filter	BPF, HPF, LPF, Notch	Yes	Yes	Yes
		EQ	PEQ, GEQ	Yes	Yes	Yes
		Fader		Yes	Yes	Yes
		Pan	LR, LCR, 3-1, 5.1, 6.1	Yes	Yes	Yes
		Meter		Yes	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
	V3	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.
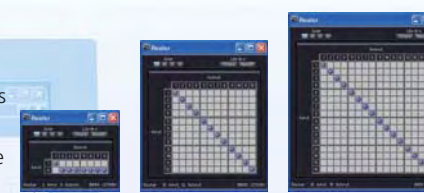
SPX Effects

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.
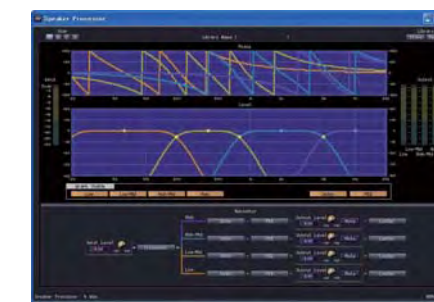
Speaker Processing & Y-S³ Support

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-S³ software application (a free download from http://www.yamahaproaudio.com/). Y-S³ (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-S³ 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 carefully placed microphone. 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 fluctuation 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 reinforcements 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.

Ether ES Sound 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.

MY16-CII
16 channel
CobraNet™ I/O

AVY16-ES
EtherSound Card

AuviTran http://www.auvitran.com/

DME Series Rear Panels

DME64N

DME24N

DME8i-C

DME8i-ES

Wall-Mount Remote Control Panels

## ICP1

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.

CP4SF
Four switches and four faders control panel
Wall-mountable remote control panel for GPI control. Uses a US-type 3 gang wall box.
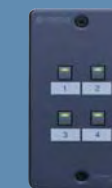
CP4SW
Four switches control panel
Wall-mountable remote control panel for GPI control. Uses a US-type 1 gang wall box.

CP1SF
One switch and one fader control panel
Wall-mountable remote control panel for GPI control. Uses a US-type 1 gang wall box.

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

Rear Panel

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

Rear Panel

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

Rear Panel

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

Rear Panel

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

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

Rear Panel

Power rating at 4 Ω 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

Rear Panel

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

Rear Panel

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

Rear Panel

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	Digital I/O Series			AD Series	DA Series
MY16-CII 16-Channel Audio CobraNet format I/O and Control I/O	**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-AD96** 8-Channel Analog Input Card	**MY8-DA96** 8-Channel Analog Output Card
AVY16-ES 16-Channel EtherSound 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-AD24** 8-Channel Analog Input Card (24 bit)	**MY4-DA** 4-Channel Analog Output Card (20 bit)
AuviTran http://www.auvitran.com/	**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	**MY4-AD** 4-Channel Analog Input Card (24 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	48kHz, 96kHz
	External	44.1kHz (-10%) ~ 48kHz (+6%)		48kHz, 96kHz	44.1kHz, 48kHz,
		88.2kHz (-10%) ~ 96kHz (+6%)			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	-	0V-5V	Euroblock
16IN/16OUT	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	D-sub half pitch
	from DME64N	RS422	32 IN / 32 OUT	68Pin (female)
CASCADE OUT	from PM5D	RS422	32 IN	D-sub half pitch
	from DME64N	RS422	32 IN / 32 OUT	68Pin (female)
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	-	0V-5V	Euroblock
8IN/8OUT	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		Actual load	For use with	Input level		Connector
	Gain	impedance	nominal	Nominal	Max. before clip	
CH INPUT 1-8	-58dB	3kΩ	50-600ΩMics	-58dBu	-38dBu	Euroblock
	+10dB		& 600ΩLines	+10dBu	+30dBu	

Analog audio output specifications

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

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	-	0V-5V	Euroblock
8IN/4OUT	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		Actual load	For use with	Input level		Connector
	Gain	impedance	nominal	Nominal	Max. before clip	
CH INPUT	-60dB	3kΩ	50-600ΩMics	-60dBu	-40dBu	Euroblock
	+10dB		& 600ΩLines	+10dBu	+30dBu	

Analog output specifications

Output terminal	Actual source	For use with	Input level		Connector
	impedance	nominal	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

DME64N

DME24N

DME Satellite

Rubber feet are included in the package.

ICP1

CP4SF

When using the accompanying Euroblock connector.

CP1SF

When using the accompanying Euroblock connector.

CP4SW

When using the accompanying Euroblock connector.