



DIGITAL MIXING CONSOLE

TF5 SERIES

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A man in a blue t-shirt is shown in profile, singing into a microphone on a stage. The background is dark with silhouettes of a crowd and stage lights. The overall mood is energetic and professional.

Design Meets Intuition

Yamaha has always made it a mission to stay in touch with the needs of sound engineers world and the flagship RIVAGE PM10. The key to success has always been in supporting the user's and now Yamaha has created a new digital mixing console that gives the user's intuition even the user to respond to the music and artists on stage with unprecedented speed and freedom. With the TouchFlow Operation interface optimized for touch panel control, experienced engine Recalable D-PRE™ preamplifiers support sound quality that will satisfy the most discerning pro with high-performance I/O racks give these compact digital mixers capabilities that make them Experience the intuitive control and creative freedom that a truly evolved digital console can

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wide. The outcome is evident in the success of the recent CL and QL series digital mixing consoles, creativity. Creativity is most effective when unrestricted, freer rein. TouchFlow Operation™ introduced in the TF series consoles allows taking live sound reinforcement to a new level of refinement. eers as well as newcomers to the field will find it easier than ever to achieve the ideal mix. fessional ears, while advanced live recording features and seamless operation outstanding choices for a wide range of applications. provide.

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TouchFlow Operation™ – Smooth, Natural Control Flow

Yamaha digital consoles have always been designed with input from leading engineers worldwide to ensure that the most efficient, intuitive operation is achieved. The highly regarded Selected Channel and Centralogic™ interfaces attest to the success of that approach. The TF series combines Yamaha know-how with new input from the field and the latest touch-screen technology to deliver an evolved experience in console operation. Smooth setup and operation, practical presets and scenes, refined design, and software applications that integrate seamlessly with the entire system: these elements comprise TouchFlow Operation, a new concept in console interfaces that offers unprecedented comfort and convenience in small consoles, for a wide range of users and applications.



Intuitive User Interface Optimized for Touch Panel Control



New Features for Smooth Setup and Operation



Practical Presets and Scenes – Shortcuts to Great Sound



Design for Superior Visibility and Quick Operation



Applications that Work Seamlessly with the Console

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Intuitive User Interface Optimized for Touch Panel Operation

In developing the TF series Yamaha engineers built from their existing base of acclaimed high-end mixer interfaces, adding intuitive control in an interface optimized for the type of touch panel control that has become a familiar feature in a wide range of applications. Allowing most operations to be carried out via the touch panel alone, the innovative TF series interface will quickly become second nature to a broad spectrum of users. Whether you have experience with Yamaha digital consoles, work with other digital consoles, operate analog consoles, or have never operated a mixer before, TF consoles will lead you to the desired results quickly and effortlessly through a smooth, efficient workflow. The availability of physical controls surrounding the touch panel further enhances control versatility and precision.



Touch Operation for Intimate Control

Refined for the smoothest possible operation via touch-panel control, the TF user interface offers a smooth workflow that can be an advantage in any mixing situation.

The display content has been specifically designed for easy, direct accessibility, with a layout that promotes the most natural, efficient mixing. Touch panel operation is as easy as shaping the sound with your fingertips.



Touch & Turn Knob Offers Extra Control Precision

When you need extra precision for a fine EQ or other adjustment, the physical Touch & Turn knob is always available right beside the touch panel. There are also four User Defined Knobs below the panel that can be assigned to control compressor threshold, EQ gain, or other parameters you need fast, direct access to while mixing. The knobs always affect the currently selected channel.



Traditional Overview and Selected Channel Interfaces

Like the CL series consoles, operation is based around Overview and Selected Channel windows. The overview display shows the parameters for eight channels at a time, while the Touch & Turn knob provides direct access to gain, 1-knob EQ™, 1-knob COMP™, gate threshold, effect send level, pan, and other parameters. Touch the highlighted parameter a second time to switch to the Selected Channel display when you need access to detailed parameters for finer control.



Overview



Selected ch



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New Features for Smooth Setup and Operation

Effective gain, compressor, and EQ setup requires a considerable degree of skill and experience. Even veteran engineers need to spend time on these important basic settings. In addition to their intuitive user interfaces, TF consoles include a number of features that contribute to faster, smoother setup of these essential parameters.



1-knob COMP™ & 1-knob EQ™: One Knob to Dial In the Ideal Sound

An experienced engineer can do a lot with a compressor: bring a guitar to life, add punch to bass, tighten up a snare, and make vocals ride clearly on the mix. The 1-knob COMP can do all of this quickly and easily, without the need to juggle multiple parameters to achieve the desired effect. Originally introduced in Yamaha analog mixers, the 1-knob COMP quickly became a popular and valued feature. It has now been further refined in a digital version that adds new setup ease and efficiency to the TF consoles.

The same concept has been applied in a new 1-knob EQ feature that provides notably improved speed and smooth operation. 1-knob EQ has been painstakingly fine-tuned by Yamaha R&D staff in cooperation with distinguished sound engineers, to ensure that you can achieve outstanding results with minimum effort in the shortest possible time. A Vocal Mode makes it easier than ever to achieve a clear, well defined vocal sound, while an Intensity Mode offers 1-knob “intensity” control over EQ curves you either select from the presets or create from scratch.

But there’s more: the 1-knob COMP and 1-knob EQ are provided on the output channels too, so you can quickly achieve overall output compression or EQ that ideally matches the room and audience size. The output 1-knob EQ has a Loudness Mode in place of the Vocal Mode, effectively increasing the sound pressure level while maintaining optimum sound as you rotate the knob.

Both the 1-knob COMP and 1-knob EQ provide quick access to the full compressor and EQ displays, so you can fine tune settings as required.

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GainFinder™ Supports Precision Gain Setup

Gain is the first adjustment the input signal sees, and the way it is set up influences how subsequent parameters will affect the signal. Yamaha has developed a way to make fast, accurate setup of this important basic parameter easier than ever. The new GainFinder feature facilitates optimum gain setup for individual input signals so that ideal overall operation and signal quality is achieved. The user only has to set channel gain so that the central green indicator in the level meter remains lit for the longest possible time. Of course the level meters also perform their traditional function, so standard gain setup procedure can be followed if preferred.



Practical Presets and Scenes – Shortcuts to Great Sound

The familiar Yamaha scene memory that stores mix settings for instant recall when needed is included as always. There's also a range of channel presets that have been created in cooperation with leading microphone manufacturers and eminent sound engineers, providing starting points that take you a long way towards achieving great sound. The channel presets cover parameters such as HA gain, EQ, dynamics, and much more, right down to details like channel name and color. Less time needs to be spent on basic setup so that more time is available for refining the mix and communicating with the performers.

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Comment from Audio-Technica Corporation Keisuke Kobayashi, CMO & CTO audio-technica

"Each Audio-Technica microphone is painstakingly designed to give a truly accurate reproduction within the application it has been selected for. We strive to provide the best possible tools allowing the user to realise the expression of their work. Collaborating closely with the TF engineers on the instrument specific presets means that we can be sure our microphones deliver their best performance, while leaving the user free to focus on the creativity and character of the production."



Comment from Sennheiser

Michael Polten, Product Management & Marketing,
Live Performance & Music

"The presets in the Yamaha TF series digital mixers provide users set the EQ for a wide variety of instrument/microphone combination the sound technician a solid basis to start from. All that is needed room and the instruments."



QuickPro Presets™ Provide Instant Access to Pro Sound Setups

Working with microphone manufacturers such as Audio-Technica, Sennheiser and Shure as well as respected engineers, and evaluating a large number of microphones, musical instruments, speaker systems, and in-ear monitors, the Yamaha R&D team focused on creating a range of shortcuts to great sound that would be effective in a wide variety of live-sound situations. Armed with these practical presets even the novice engineer can get very close to the ideal sound, while experienced engineers will appreciate the significant time savings they can provide starting points for further adjustments.

The QuickPro Presets can be searched by instrument type and recalled quickly and easily. The presets include HA gain, EQ, Comp and other settings, right down to the channel name and color. The 1-knob EQ and 1-knob COMP can be used with QuickPro Presets, providing a super streamlined way to tweak the sound.

The output channel preset library includes parameter sets optimized for Yamaha powered speakers, with several variations to match different environments and room sizes. Presets are provided for in-ear monitors too. All of these can be used as is when time is tight, but they are also great starting points for manual fine tuning. Setups created from the presets or from scratch can be saved as additional presets too.



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Two Scene Memory Banks

The scene memory features banks A and B, each capable of holding up to 100 scenes.

That's a total of 200 scenes that can be set up and instantly recalled whenever needed.

A number of scenes are pre-programmed to give users a head start: scenes with the 1-knob COMP and 1-knob EQ controls engaged for the easiest possible operation, and scenes with the 1-knob features disabled for experienced engineers who might want to follow an established procedure. The banks are great for organizing different types of scenes: one for scenes categorized by music type, and the other by event type, for example.

A: Band



B: Event



Comment from Shure Matt Engstrom, Category Director, Wired Products

"We're thrilled to be offering QuickPro presets of our most popular SM, Beta, KSM and PG Alta microphones in the new TF mixer. When you combine Shure's 90 years of microphone experience with the versatile new TF digital mixer and exceptional Yamaha speakers, these presets allow engineers at any level of experience to leverage our combined technical expertise for quick, simple and effective sound checks and performances that sound amazing. Engineers can focus on mixing great quality audio instead of chasing problems. It's an incredibly powerful solution."



with an accurate indication of how to adapt the EQ-ing to the specific

Design for Superior Visibility and Quick Operation

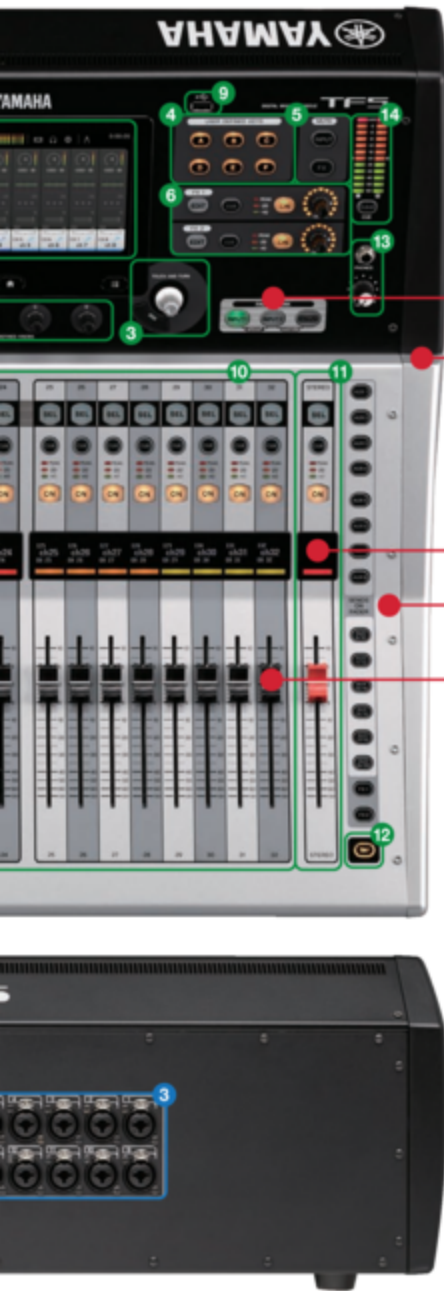
The TF series hardware is packed with features that contribute to superior operability and convenience. Faders, knobs, and buttons with outstanding fit and feel work seamlessly with state-of-the-art display technology, including high-visibility channel name and color displays. The touch panel itself offers an ideal blend of comprehensive visual feedback and fast response. The physical layout of these components brings everything together in a system that offers surprisingly efficient workflow.

Panel Layout Maximizes Workflow Efficiency

Careful analysis of the workflows favored by a large number of engineers has led to a highly efficient panel layout. Rather than simply providing a long list of advanced features, the TF consoles present meaningful features in the most logical and accessible way through an overall design that maximizes visibility and operability.

- 1 Display section:** The 7" multi-touch display, positioned and angled for optimum operability, features a high-luminance backlight that affords excellent visibility indoors or out.
 - 2 USER DEFINED KNOBS section:** Frequently used parameters such as compressor threshold and EQ gain, for example, can be assigned for direct, instant access when needed.
 - 3 TOUCH and TURN section:** Smooth operation with a very simple concept: touch a parameter on the screen to select, then turn the knob to adjust.
 - 4 USER DEFINED KEYS section:** Assign mixer settings that you use often to these six buttons for instant access, such as direct one-touch recall of specified scenes.
 - 5 MUTE section:** Multiple inputs or effects can be muted with a single operation.
 - 6 FX section:** A dedicated channel offers easy effect ON/OFF switching, cue monitor ON/OFF switching, level adjustment, and effect parameter editing.
 - 7 ST IN section:** In addition to allowing digital playback from an iPad or iPhone or recording/playback with a USB device, you have fingertip control of BGM playback and other audio files.
 - 8 iPad connector** **9 USB connector** **10 Channel Strip section**
 - 11 STEREO/MASTER section** **12 TAP key** **13 PHONES section** **14 METER section**
-
- 1 OMNI OUT jacks** **2 ST IN jacks** **3 INPUT jacks** **4 NETWORK connector**
 - 5 USB TO HOST connector** **6 FOOT SW jack** **7 Expansion slot**





Comprehensive Fader Bank section

Two INPUT banks and one OUTPUT bank are provided, and the GROUP bank can be selected by pressing both the INPUT bank buttons simultaneously. The GROUP bank allows the levels of multiple channels to be controlled from a single DCA fader. There's also a CUSTOM fader bank where you can assign any input, output, and DCA group to any fader.

DCA Roll-out Enhances Group Control

When the GROUP fader bank is selected, all faders other than DCA masters 1 through 8 function as Roll-out faders. Selecting one of the DCA groups instantly "rolls out" the input channels belonging to that group to the Roll-out faders. This useful function makes it easy to adjust the level and other parameters of individual channels while using the eight DCA faders for overall mixing.

Channel Name and Color

A display panel located above each channel fader shows the assigned channel name or ID, the port name, and the current fader setting. Phantom power status as well as gate and comp operation can also be displayed. A color bar that shows the assigned channel color makes visual navigation a breeze, and prevents confusion when fader banks are changed or scenes are recalled.



Motorized Faders

Faders Provide a Clear View of All Inputs

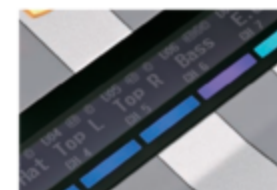
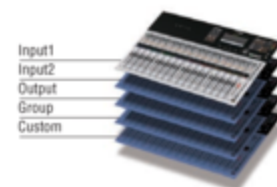
The TF5 has 33 motor faders, the TF3 has 25, and the TF1 has 17. All rear-panel inputs have individual faders so their status can be verified at a glance and they can be directly and immediately accessed for control.

SENDS ON FADER section

The SENDS ON FADER buttons instantly bring the specified AUX or FX bus levels up on the faders for easy verification and adjustment. When a SENDS ON FADER button is engaged the MASTER fader acts as the master for the corresponding bus, so AUX levels can be checked and controlled without having to switch fader banks.

Advanced Design Promotes Smooth, Comfortable Operation

The upper section of the panel is designed to double as a rest for an iPad, set list, score, memos, and/or other small items. The panel consists of three angled sections that give the operator maximum visibility and access.





Applications that Work Seamlessly with the Console

Separate software applications that allow wireless mixing, personal monitor mixing, or offline setup of digital live mixing consoles have become fairly common.

The TF series goes a step further with three dedicated apps – TF Editor, TF StageMix, and MonitorMix – that feature user interfaces that seamlessly extend the console's own on any device.



TF Editor Facilitates Offline Editing Plus Showtime Control

The TF Editor application for Windows and Mac computers provides a complete interface for offline editing and setup of TF consoles, with scene and preset management capabilities plus convenient keyboard entry of channel names. In addition to being able to set up the console offline at any convenient location and time, the TF Editor can be used online at the same time as the TF StageMix and MonitorMix applications. A Windows 8 PC with a multi-touch screen can use the same gestures as on the console itself. And if using Wi-Fi, a PC can function as a convenient remote-mixing device. Up to three devices running TF Editor or StageMix can be connected at the same time.



TF StageMix™ for Wireless Mixing

TF StageMix is an iPad application that provides wireless control of TF series consoles, allowing remote mixing from audience seating, in front of floor monitors, or any other listening position. It can also be used at the console as an extension of the console's own interface. The TF StageMix interface is designed for similar operation and flow to the console display, making it easier than ever to refine the mix from any location.

StageMix

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Personal Monitoring with MonitorMix

The MonitorMix application for the TF Series allows individual wireless AUX mixing from up to 10 iPhone, iPad or iPod touch devices simultaneously. Each performer can have convenient control over the AUX buses assigned to them, without having to deal with complex settings or parameters. They can also create personal Group settings for even easier adjustment: all levels on just one fader, for example. Since up to three devices running TF Editor or StageMix and up to 10 devices running MonitorMix can be connected at the same time, even large bands can have the personal control they need, reducing demands on the sound engineer.



* TF StageMix and MonitorMix can be downloaded from Apple's App Store at no charge.
* Apple, the Apple logo, iPad, iPhone, iPod touch and Mac are trademarks of Apple Inc., registered in the U.S. and other countries. App Store is a service mark of Apple Inc.

A person is seen from behind, standing at a concert. The crowd in front of them has their arms raised, and the stage is lit with bright, hazy lights. The overall atmosphere is energetic and vibrant.

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A Natural Sound Foundation with Extra Creative Freedom

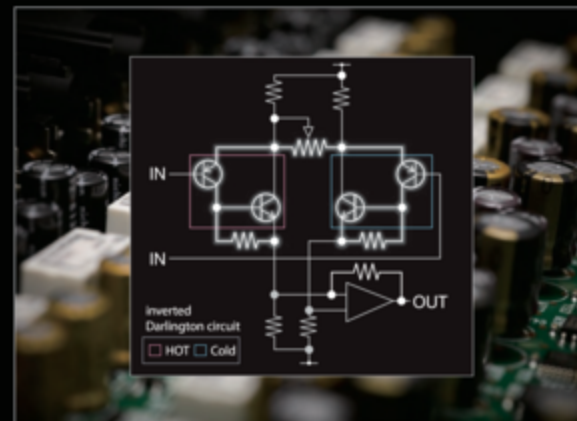
Faithful reproduction of the on-stage sound is the foundation, then creativity can take over. Yamaha's unswerving approach to live sound reinforcement is alive and well in the TF series. The input stage of any console has a notable effect on its sonic character.

The TF consoles feature acclaimed D-PRE™ microphone preamplifiers that not only deliver outstanding quality, but are recallable as well. Circuitry and individual components have been reassessed and redesigned where necessary to achieve extraordinarily pure, natural sound. That solid sonic foundation is backed up by an updated selection of high-performance processors and effects. Input and output channel processors such as EQ, gates, and compressors are complemented by eight processors that provide a broad spectrum of creative capabilities.



Recallable D-PRE™ Microphone Preamplifiers

The TF series consoles feature new recallable versions of Yamaha's acclaimed D-PRE microphone preamplifier. The preamplifiers, or head amplifiers in any console play a significant role in defining the sound of the final mix, so Yamaha engineers spared no effort in developing and refining the D-PRE design to ensure that every nuance and subtlety of the original signal is effectively captured. The circuit is based on a discrete inverted Darlington pair configuration that achieves clean, precise amplification with consistently low noise and distortion at all signal levels. While some microphone preamps are built specifically to impart a unique character of their own, the D-PRE preamplifier has been painstakingly designed with a flat, wide frequency response that retains the tone and nuance of the original sound so that the essence of the performer's art is captured intact.



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Powerful Processors and Effects

In addition to EQ and two dynamics processors on each channel, the TF consoles offer eight powerful processors for wide-ranging sonic control. The globally accessible FX 1 and 2 feature the same type of SPX processors that have become standards in recording and live sound applications, offering 17 programs ranging from reverb and delay through modulation effects such as flanger and chorus to 3-band multiband compression. The panel EDIT key opens the effect parameter display where detailed parameters such as reverb time and delay feedback can be adjusted as required.

The remaining six processors are available in the AUX 9/10-19/20 master channels. All effects other than reverb are provided.* Multiband compression is ideal for in-ear monitor level control, delay can be used for speaker alignment, and much more. And since these AUX buses can be sent to the main stereo bus, the effects can be used to supplement the available input channel processing when FX 1 and 2 aren't quite enough. The AUX 1-8 buses and main output channels include the same 4-band parametric EQ as provided on the input channels, plus 31-band Flex12 GEQ. Both types of EQ are invaluable for optimizing speaker response and eliminating feedback.

* Reverb is available for AUX 9/10 and 11/12.



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A Versatile Live Recording and Playback Solution for Any Application

Live recording capability is becoming increasingly important in live sound systems. From simple 2-track recording and playback using a USB storage device* to all-out multitrack recording with a computer based DAW (Digital Audio Workstation), the TF series is ready to roll. TF consoles come supplied with Steinberg's Cubase AI DAW application, providing an easy way to simultaneously record up to 16 tracks to a computer connected to the console via USB 2.0. For more complex recording requirements an optional DAW such as Steinberg's Nuendo Live application allows up to 34 tracks to be recorded simultaneously. MP3 and WAV files can be played back from USB storage devices, and audio from an iPhone or iPad can be played back via a direct digital connection. When playing back from a DAW, analog input or DAW input can be individually selected for each channel so that pre-recorded material can be mixed with live input for virtual sound checks or rehearsals. Of course BGM and sound effects can be played back too.

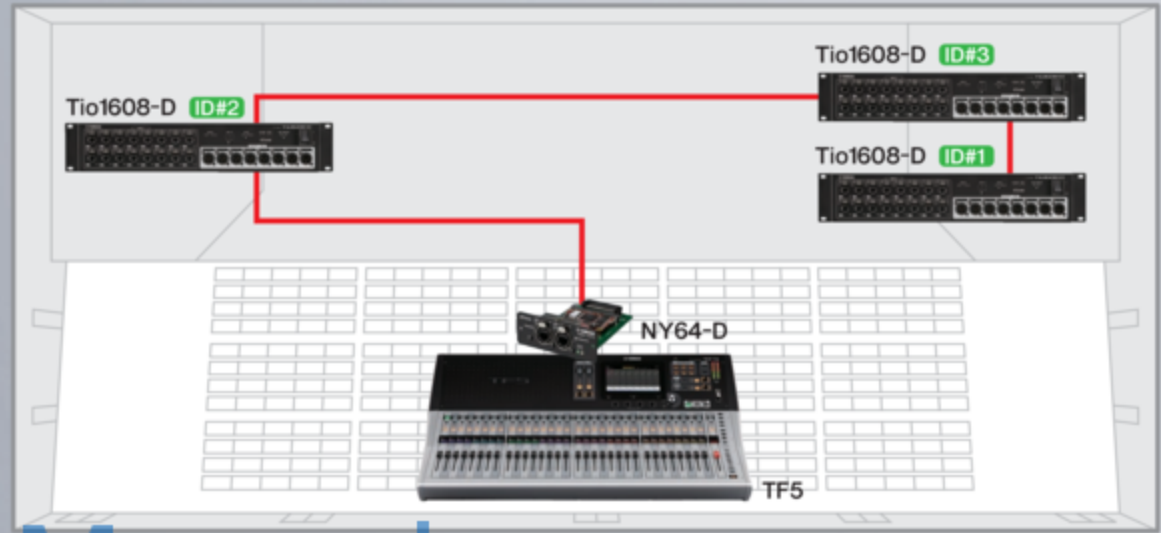
 **CUBASE AI**

*Please refer to www.yamahaproaudio.com for compatible hard disks.

A High-performance Stagebox Solution that's Simple to Set Up



The natural, musical sound that was a key element of the TF Series design policy is carried on without compromise in the Tio1608-D I/O Rack (details on following page). Mechanical construction, circuit board layout, power supply, grounding, and parts selection have all been executed with meticulous attention to detail and quality, and exhaustive performance and listening tests were carried out at each stage of development. For networking the same Dante protocol implemented in higher end Yamaha digital consoles is used for precise synchronization, low latency, low jitter, and high sample accuracy. In addition to superior performance, a Tio1608-D stage box system can be set up in just three easy steps.



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A Groundbreaking Approach to Compact Live Sound

The three consoles in the TF series have 32, 24, or 16 mono input channels with motor faders, plus one master motor fader. All models also have dual stereo inputs that allow selection between a USB source such as an iPad, iPhone, USB storage device, PC, or an analog source. The status of all of the above inputs, plus two dedicated effect return channels, can be simultaneously verified directly via the control panel. The rear-panel analog inputs feature recallable Yamaha D-PRE microphone preamplifiers for the first time in a digital console. This allows preamp setup to be recalled from scene memory along with other console settings, providing improved support for live music and events where full-console changes need to be made on the fly. In addition to all-around performance that is ideal for installations or live sound reinforcement, the TF series consoles are lightweight and compact for unrivalled portability and space savings.

DIGITAL MIXING CONSOLE

TF3

Ample input capacity and hands-on control in a compact console that can handle a wide range of applications.

- 25 motor faders (24 channels + 1 master)
- 48 input mixing channels (40 mono + 2 stereo + 2 return)
- 20 AUX (8 mono + 6 stereo) + stereo + sub buses
- 8 DCA groups with Roll-out
- 24 analog XLR/TRS combo mic/line inputs + 2 analog RCA pin stereo line inputs
- 16 analog XLR outputs
- 34 x 34 digital record/playback channels via USB 2.0 + 2 x 2 via a USB storage device
- 1 expansion slot for NY64-D audio interface card



DIGITAL MIXING CONSOLE

TF5

High input capacity
ideal for larger ap

- 33 motor faders (32 channels + 1 master)
- 48 input mixing channels (40 mono + 2 stereo + 2 return)
- 20 AUX (8 mono + 6 stereo) + stereo + sub buses
- 8 DCA groups with Roll-out



Tio1608-D I/O Rack

The Tio1608-D is a Dante equipped I/O rack with 16 microphone/line inputs and 8 line outputs. The Tio1608-D preamplifiers can be remotely controlled from a TF series console. Connection from an on-stage Tio1608-D to a TF console at the mixing position only requires a CAT5e LAN cable for high-quality low-latency audio transfer. No bulky, heavy multi-cables and connector boxes are required. What's more, basic patches are pre-programmed for fast, easy setup. Up to three Tio1608-D units can be connected simultaneously, providing a high-performance, high capacity stage box system with as many as 48 inputs and 24 outputs. The network connections can be daisy-chained when Tio1608-D units are used with a TF series console, eliminating the need for network switches.



ity and fader count makes this powerful console applications.

- 32 analog XLR/TRS combo mic/line inputs + 2 analog RCA pin stereo line inputs
- 16 analog XLR outputs
- 34 x 34 digital record/playback channels via USB 2.0 + 2 x 2 via a USB storage device
- 1 expansion slot for NY64-D audio interface card



DIGITAL MIXING CONSOLE

TF1

Compact, portable, and even rack mountable, the TF1 offers impressive capability and versatility for smaller systems.

- 17 motor faders (16 channels + 1 master)
- 40 input mixing channels (32 mono + 2 stereo + 2 return)
- 20 AUX buses (8 mono + 6 stereo) + stereo + sub
- 8 DCA groups with Roll-out
- 16 analog XLR/TRS combo mic/line inputs + 2 analog RCA pin stereo line inputs
- 16 analog XLR outputs
- 34 x 34 digital record/playback channels via USB 2.0 + 2 x 2 via a USB storage device
- 1 expansion slot for NY64-D audio interface card

NY64-D Audio Interface Card

The NY64-D is an I/O expansion card for TF series consoles that allows transmission and reception of up to 128 channels (64 in/64 out) of uncompressed 48 kHz 24 bit digital audio data via a Dante™ audio network. Used in conjunction with the Tio1608-D I/O it becomes possible to create a versatile stage box system with up to 48 inputs and 24 outputs.

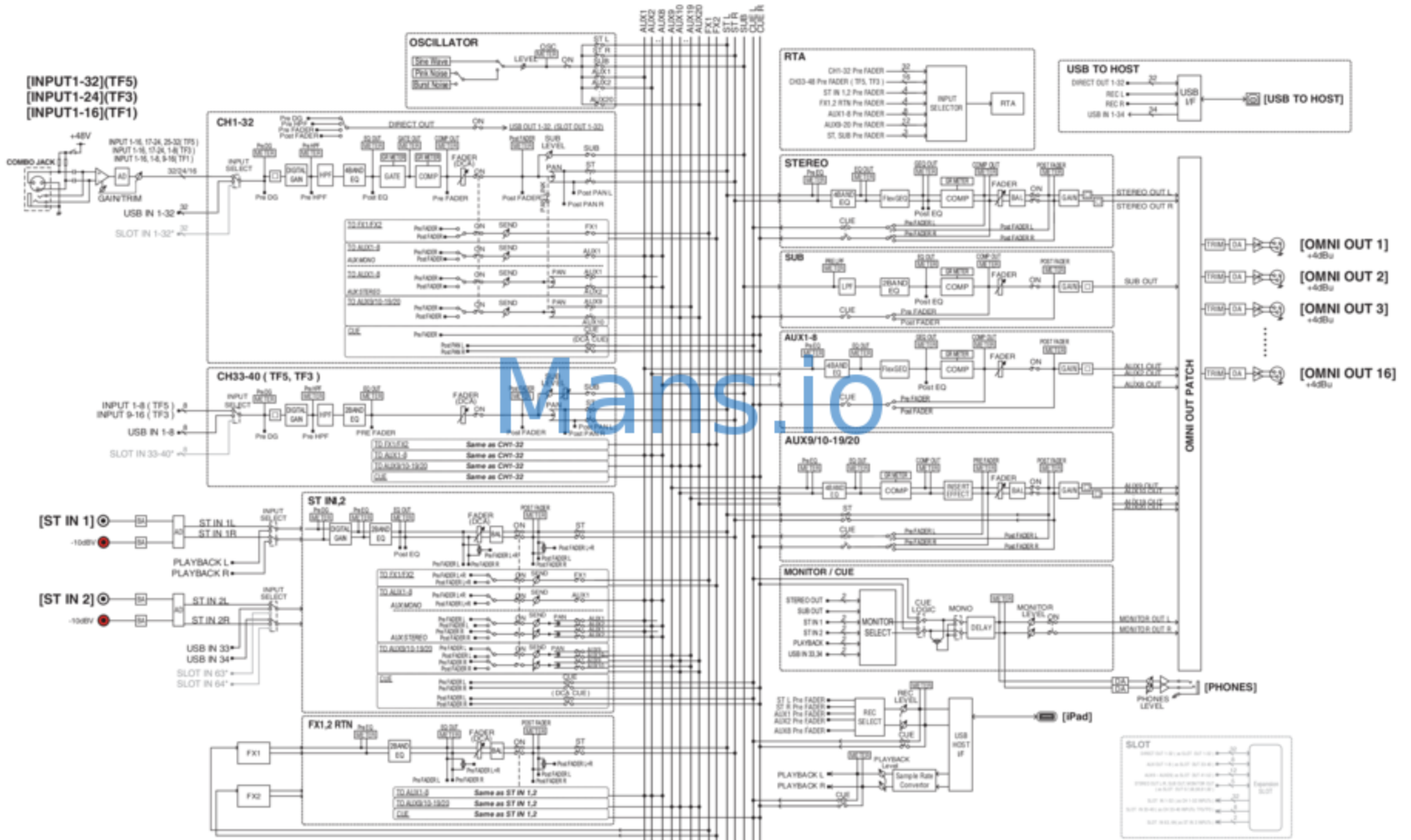


RK5014 Rack Mount Kit

The RK5014 Rack Mount Kit can be used to mount the TF1 console in a standard 19-inch EIA equipment rack of the type commonly used in live sound, studio, and installed applications.



Block Diagram



* SLOT will be available with firmware update

Specifications

General Specifications

	TF5	TF3	TF1
Fader Configuration	32 + 1 (Master)	24 + 1 (Master)	16 + 1 (Master)
Mixing Capacity	Input Channels: 48 (40 mono + 2 stereo + 2 return) Main Buses: Stereo + Sub Aux Buses: 20 (8 mono + 6 stereo) Groups: 8 DCA Groups	Input Channels: 24 (20 mono + 4 stereo) Main Buses: Stereo + Sub Aux Buses: 20 (8 mono + 6 stereo) Groups: 8 DCA Groups	Input Channels: 40 (32 mono + 2 stereo + 2 return) Main Buses: Stereo + Sub Aux Buses: 20 (8 mono + 6 stereo) Groups: 8 DCA Groups
I/O Connectors	Inputs: 32 mic/line (XLR/TRS combo) + 2 stereo line (RCA pin) Outputs: 16 (XLR) Expansion Slot: 1	Inputs: 24 mic/line (XLR/TRS combo) + 2 stereo line (RCA pin) Outputs: 16 (XLR) Expansion Slot: 1	Inputs: 16 mic/line (XLR/TRS combo) + 2 stereo line (RCA pin) Outputs: 16 (XLR) Expansion Slot: 1
Signal Processors	via Windows/Mac	8 Effects + 10 GEQ	34x34 USB Audio Interface
Recording	via USB Storage Device	2-track	48 kHz
Sampling Frequency	Internal Clock	Less than 2.6 ms, INPUT to OMNI OUT, Fs=48 kHz	Less than 2.6 ms, INPUT to OMNI OUT, Fs=48 kHz
Signal Delays		100 mm motorized, Resolution = 10-bit, +10 dB to -158 dB, --- dB all faders	100 mm motorized, Resolution = 10-bit, +10 dB to -158 dB, --- dB all faders
Fader		-0.5, -1.5 dB 20 Hz-20 kHz, refer to -4 dBu output @1kHz, INPUT to OMNI OUT	-0.5, -1.5 dB 20 Hz-20 kHz, refer to -4 dBu output @1kHz, INPUT to OMNI OUT
Frequency Response		Less than 0.05% 20 Hz-20 kHz @+4 dBu into 600 Ω, INPUT to OMNI OUT, Input Gain=Min.	Less than 0.05% 20 Hz-20 kHz @+4 dBu into 600 Ω, INPUT to OMNI OUT, Input Gain=Min.
Total Harmonic Distortion ²		-128 dBu typ., Equivalent Input Noise, Input Gain=Max., -85 dBu, Residual output noise, ST master off	-128 dBu typ., Equivalent Input Noise, Input Gain=Max., -85 dBu, Residual output noise, ST master off
Hum & Noise ³		110 dB typ., DA Converter, 107 dB typ., INPUT to OMNI OUT, Input Gain=Min.	110 dB typ., DA Converter, 107 dB typ., INPUT to OMNI OUT, Input Gain=Min.
Dynamic Range		-100 dB ¹ , adjacent INPUT/OMNI OUT channels, Input Gain=Min.	-100 dB ¹ , adjacent INPUT/OMNI OUT channels, Input Gain=Min.
Crosstalk@1 kHz		866 mm x 225 mm x 599 mm (34.1in x 8.9in x 23.6in)	716 mm x 225 mm x 599 mm (28.2in x 8.9in x 23.6in)
Dimensions (W x H x D)		510 mm x 225 mm x 599 mm (20.1in x 8.9in x 23.6in)	510 mm x 225 mm x 599 mm (20.1in x 8.9in x 23.6in)
Net Weight	20.0 kg (44.1lb)	17.0 kg (37.5lb)	13.5 kg (29.8lb)
Power Requirements (wattage)	120 W	110 W	100 W
Power Requirements (voltage and hertz)		100-240 V 50/60 Hz	100-240 V 50/60 Hz
Temperature Range		Operating temperature range: 0-40 °C Storage temperature range: -20-60 °C	Operating temperature range: 0-40 °C Storage temperature range: -20-60 °C
Included Accessories		Quick Guide, Power Cord, CUBASE AI download information	Quick Guide, Power Cord, CUBASE AI download information
Options		Rack-mount Kit RK5014 (for TF1), Expansion Card, Foot Switch (FS5)	Rack-mount Kit RK5014 (for TF1), Expansion Card, Foot Switch (FS5)

¹ Crosstalk is measured with a -30 dB/octave filter@22 kHz. ² Total Harmonic Distortion is measured with a -18 dB/octave filter@60 kHz.
³ Hum & Noise are measured with an A-Weight filter.

Input / Output Specifications

Analogue input characteristics

Input Terminals	GAIN	Load Impedance	For Use With Nominal	Input Level			Connector	Balanced / Unbalanced
				Sensitivity ¹	Nominal	Max. before clip		
INPUT1-32 (TF5)	+66dB	7.5kΩ	50-6000 Mics or 6000 Lines	-62dBu (0.1μV)	-62dBu (0.616mV)	-42dBu (0.16mV)	Combo Jack (XLR-3-31 type ¹ or TRS phone ¹)	Balanced
INPUT1-24 (TF3)	-6dB		6000 Lines	-10dBu (245mV)	+10dBu (2.45V)	+30dBu (24.5V)		
INPUT1-16 (TF1)	---	10kΩ	6000 Lines	-30dBV (31.6μV)	-10dBV (3.16mV)	+10dBV (3.16V)	RCA Pin Jack	Unbalanced
ST IN 1,2	---							

¹ Sensitivity is the lowest level that will produce an output of +4dBu (1.23V) or the nominal output level when the unit is set to maximum gain. All faders and level controls are at maximum position.
² 1: GND, 2: HOT, 3: COLD ³ Tip: HOT, Ring: COLD, Sleeve: GND ⁴ In these specifications, 0dBu = 0.775Vrms.
⁵ +48V DC (phantom power) can be supplied to INPUT XLR type connectors via each individual software controlled switch.

Analogue output characteristics

Output Terminals	Source Impedance	For Use With Nominal	GAIN SW	Output Level			Connector	Balanced / Unbalanced
				Nominal	Max. before clip	Power		
OMNI OUT 1-16	75Ω	6000 Lines	+24dBu ¹ position (default)	+4dBu (1.23 V)	+24dBu (12.3 V)	3mW	XLR-3-32 type ¹	Balanced
PHONES ²	100Ω	400 Phones	---	---	---	75mW	Stereo Phone Jack (TRS) ¹	Unbalanced

¹ 1: GND, 2: HOT, 3: COLD ² Tip: LEFT, Ring: RIGHT, Sleeve: GND ³ In these specifications, 0dBu = 0.775Vrms. ⁴ All output DA converters are 24bit, 128times oversampling.
⁵ The position of the level control is lowered by 16dB from the maximum.

Digital input / output specifications

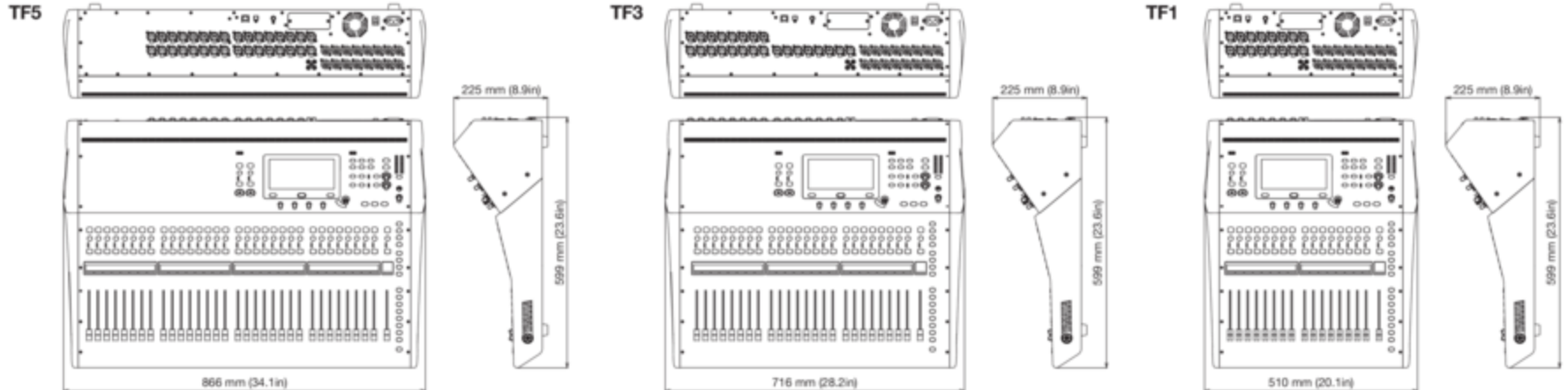
Terminals	Format	Data length	Audio	Connector
USB (TO HOST)	USB	24bit	34ch input / 34ch output, PCM	USB (B type)
iPad	USB	---	Playback: MP3 or WAV file data / Record: WAV file data	USB (A type)

Control I/O specifications

Terminals	Format	Level	Connector
NETWORK	IEEE802.3	10BASE-T/100Base-TX	RJ-45
FOOT SW	---	---	TS Phone

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Dimensions



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