

# CL & QL External Surround Metering Guide



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## 1.0 Introduction

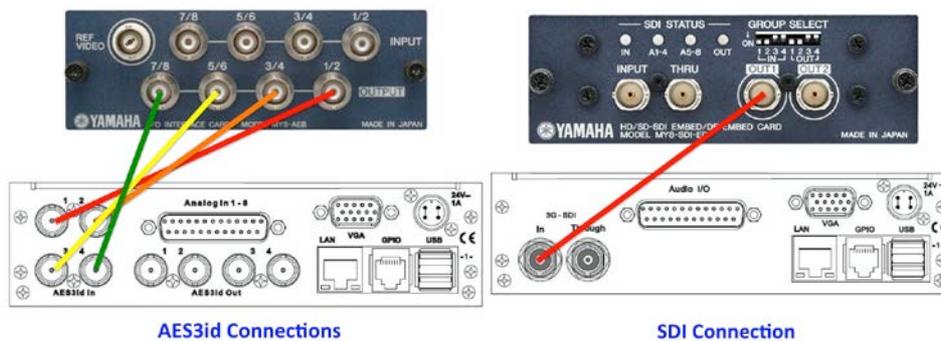
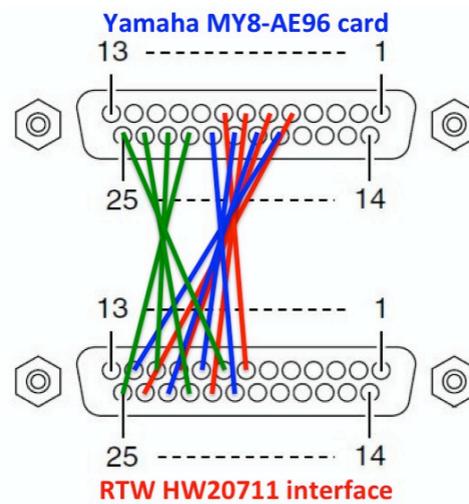
CL and QL-series Version 3 firmware introduces Surround Sound features for 5.1 panning and monitoring. As a part of the feature set, a sophisticated external Surround Metering device can be connected to the mixing console. Some GPI control can be setup from the User Defined keys. The TouchMonitor TM7 unit from RTW is the Surround Metering device used in this setup guide. The RTW TM9 will also work in a similar way. These units support useful features such as EBU R 128 Loudness metering, a Surround Sound Analyzer, audio Vectorscopes, and BLITS 5.1 test signals. This guide provides a step-by-step solution for connecting the TM7 with a Yamaha CL or QL digital mixing console. For other device functions, the product manuals or help files should be referred to.

## 2.0 Preparing the cables

### 2.1 Audio Connection

The Surround Metering device should be connected to one of the console's optional "MY" slots, and the correct card should be chosen to match the rear panel configuration of the TM7 unit. There are three choices:

1. If the TM7 has the **HW20711** audio interface installed, with 4x AES3 inputs on a 25-pin D-sub connection, then a Yamaha card such as **MY8-AE96** or **MY16-AE** should be installed in the console. See below for the pin configuration table, because both devices do not share the same layout. A custom 110Ω multi-pin cable should be created.
2. If the TM7 has the **HW20712** audio interface installed, with 4x AES3id connections, then a Yamaha **MY8-AEB** card should be installed in the console. 4x 75Ω BNC cables will be required.
3. If the TM7 has the **HW20714** audio interface installed, with a 3G-SDI connection, then a Yamaha **MY8-SDI-ED** must be installed in the console. 1x 75Ω BNC cable will be required.



Pin configuration table for AES/EBU connection from Yamaha MY8-AE96 or MY16-AE to TM7, using 25-pin D-sub connectors:

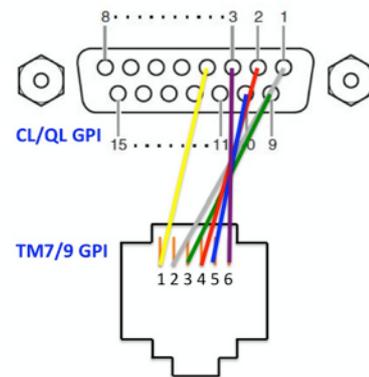
Yamaha	MY8-AE96	TM7	HW20711
Output 1+	5	24	Input 1+
Output 1-	18	12	Input 1-
Gnd	22	25	Gnd
Output 2+	6	10	Input 2+
Output 2-	19	23	Input 2-
Gnd	23	11	Gnd
Output 3+	7	21	Input 3+
Output 3-	20	9	Input 3-
Gnd	24	22	Gnd
Output 4+	8	7	Input 4+
Output 4-	21	20	Input 4-
Gnd	25	8	Gnd

## 2.2 GPI Connection

It is possible to use the CL or QL User Defined Keys to control the RTW device’s display settings. This requires a GPI connection. Both devices use different types of connector, so a custom cable will need to be manufactured. The RTW device uses an RJ11 connector with 6 pins (6p6c type). The Yamaha console uses a 15-pin D-sub connection (the type with 2 rows of pins, not the VGA type with 3 rows). Below is the connection table.

Yamaha CL/QL	15-pin D-sub	RTW TM7	RJ11 6p6c
Gnd	4	1	Gnd
GPI out 1	1	2	GPI in 1
GPI out 2	9	3	GPI in 2
GPI out 3	2	4	GPI in 3
GPI out 4	10	5	GPI in 4
GPI out 5	3	6	GPI in 5

*(Pin 1 is on the left-side of the RJ11 socket while looking at the rear panel of the TM7).*



### 3.0 Setting up the CL/QL Console

On the console, several settings need to be made before surround monitoring can be achieved successfully. These include selecting Surround Mode for the Bus Setup, patching the Monitor Matrix to the Slot Output Ports, and configuring the User Defined Keys for GPI control.

#### 3.1 CL/QL Surround Mode

To setup the console in Surround Mode, open the SETUP menu and press the SURROUND SETUP function on the screen.



Next, select “5.1 SURROUND”, and check the SURROUND BUS selections are as required. The default setting is shown in the picture below:



### 3.2 CL/QL Monitor Source

To select which sources to monitor in the surround speaker system, open the MONITOR menu, and select the required SOURCE. During normal surround mix operation, MIX1-6 will be selected. These MIX buses are used as the Surround Buses.



### 3.3 CL/QL Output Port Patch

The surround monitor outputs need to be patched to the RTW TM7, so it can correctly display the audio levels. In the SETUP menu, select OUTPUT PORT. This will display a new window that shows 8 output ports at a time.



Along the bottom of the screen, a different set of outputs can be chosen. Select the correct SLOT that is used to connect to the TM7. Then press the assign button for Slot Port 1.



In the left column of the CH SELECT screen, which has now appeared, select ST/MONO MONI/CUE. Then the various Surround Monitor outputs will be shown on the screen. For this first output, select MMTX L. This is the Monitor Matrix Left output. The signal is taken from the Monitor Matrix (Downmix) output, and is not affected by the Monitor Level adjustment. So the metering is independent of listening level.

Press the “+” button at the top of the window, to access the next output. Assign MMTX R. Continue until all 6 MMTX outputs are assigned to the Slot outputs 1-6:



### 3.4 CL/QL USER DEFINED KEYS & GPI

Firmware version 3 introduces layers for the console User Defined Keys, so more functions can be accessed from these buttons. They can be used to send GPI triggers to the RTW TM7, which can change the metering view, or start/stop certain features.

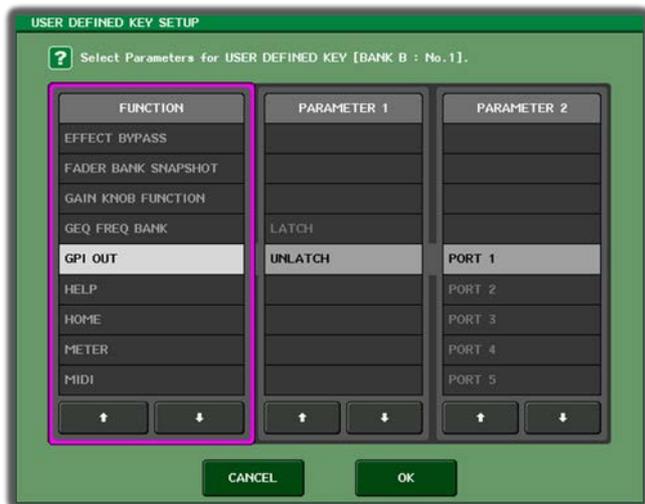
Firstly, access the SETUP menu, and select the USER SETUP.



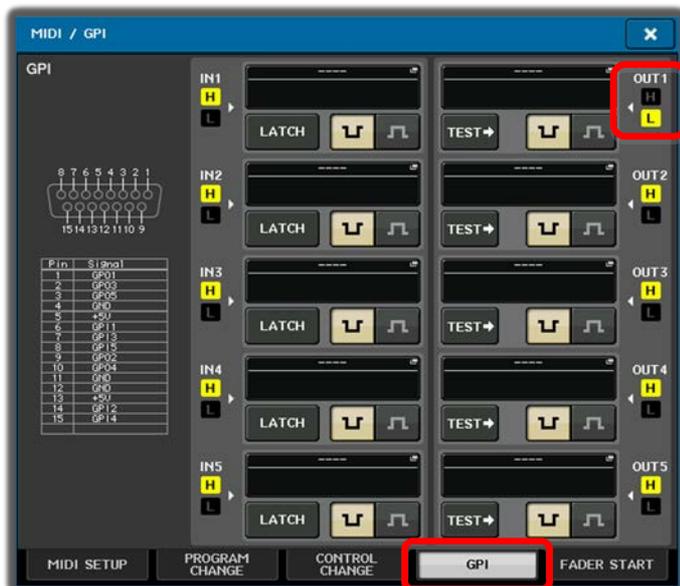
Then select the USER DEFINED KEYS page. By default BANK A already has functions assigned, but Banks B, C and D are all blank. So BANK B is selected in this example. Press button #1 to assign a function.



Scroll through the list of functions in the USER DEFINED KEY SETUP window to find GPI OUT. Select UNLATCH and PORT1. Then select GPI PORT 2 for UDK #2, and so on until all 5 are assigned, as shown above.



The default settings for GPI outputs can be used. To check them, go to the SETUP menu, and press the MIDI/GPI button. Look at the GPI tab. The GPI outputs should normally be high, and only go low when the correct USER DEFINED KEY is pressed: check the output “H” indicators are yellow while the buttons are off.



Also check that no other functions are assigned to the GPI outputs. If they are, they would be indicated in this screen.

Now the console setup is complete. Next, the RTW TM7 needs to be configured.

## 4.0 RTW TM7 Setup

The RTW TM7 is a sophisticated metering tool, and is very flexible with the type of level information to display, and with the screen layout. The GPI inputs can be used to change the view on the display, or they can be used to start/stop certain measurement functions. But firstly, a few system settings need to be checked. The settings mentioned here are appropriate to TM7 firmware version 5.11. They may vary with different versions.

### 4.1 Audio Sync Reference

Firstly, open the main MENU at the bottom of the TM7 touch-screen. If it is not currently visible, touch the lower part of the screen first. Select “Menu”, then select “System”.

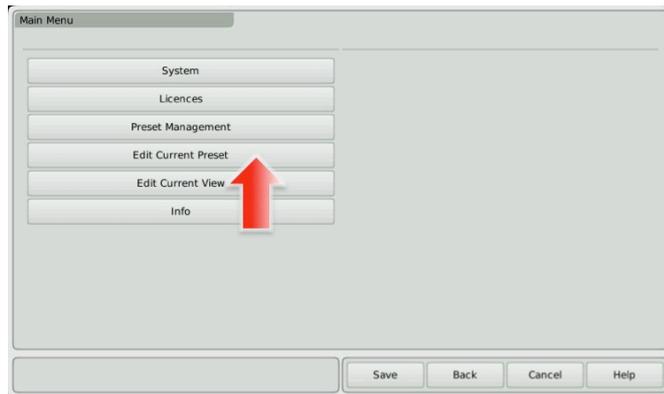


Press “Audio” at the bottom of the screen, and then edit the “Sync Reference”. The selected setting should be one of the digital audio inputs that is connected, such as “AES 1a/1b”. Otherwise, the “Auto” setting should work well in most cases.

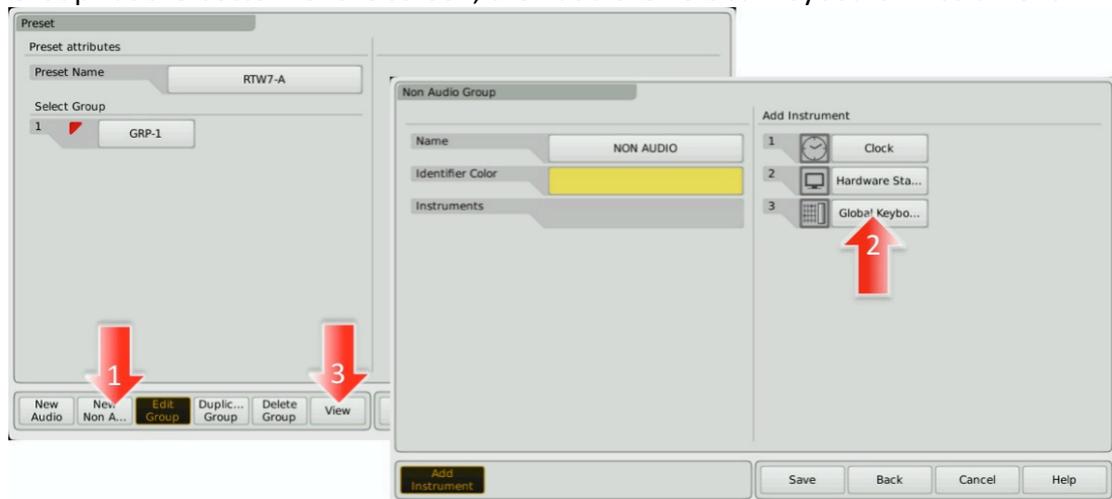


#### 4.2 Using the “Global Keyboard”

The default GPI settings for the TM7 are for various metering instrument functions such as START, STOP, RESET, etc. However, they are not enabled until a “Global Keyboard” instrument is added to the preset. To do this, enter the main MENU again, and select “Edit Current Preset”.

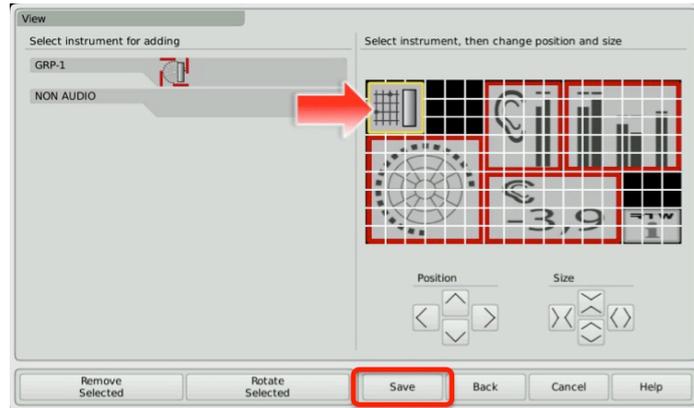


If there are no “Non Audio” groups present in the preset, press “New Non Audio Group” at the bottom of the screen, then add the “Global Keyboard” instrument.



If a “Non Audio” group already exists, select it and then press “Add Instrument”. Add the “Global Keyboard”. Press “Done”, and then press “View”. Add the Global

Instrument to the view in whichever position and size is convenient. Don't forget to "Save"!

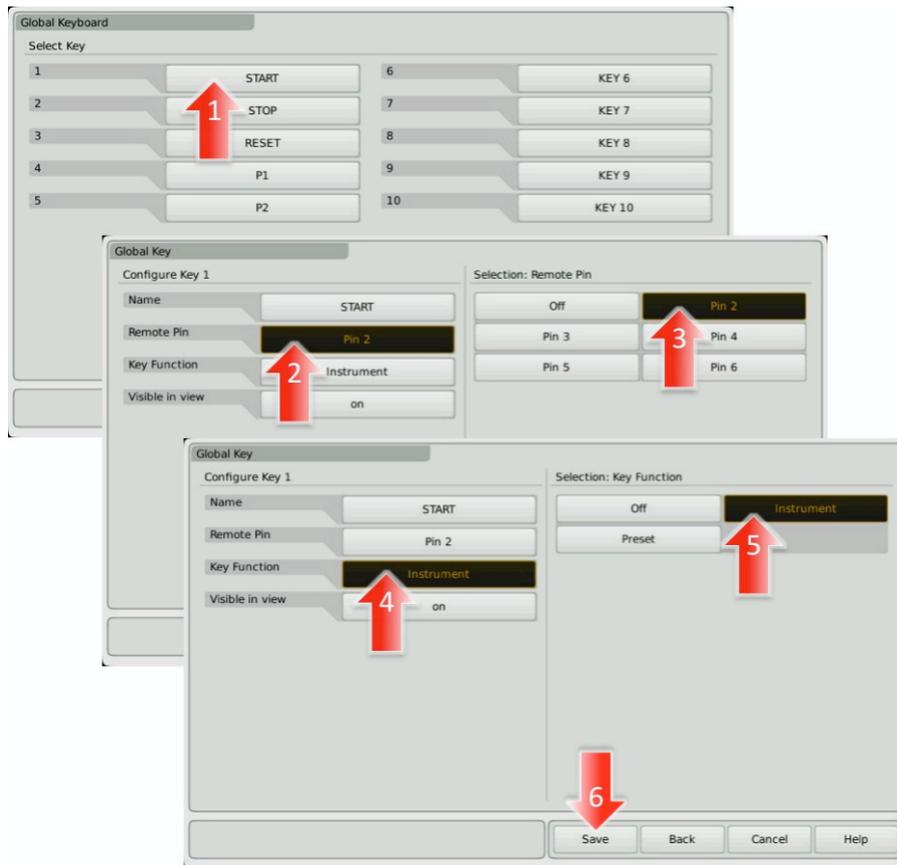


Now some "Global Keyboard" functions will be visible on the screen, as seen below. Highlight them, and press "Edit Instrument" in the bottom-row menu.



The Global Keyboard allows for 10 keys, but only 5 can be assigned to GPI. Follow the 6 steps below.

- 1) Select one of the keys, then its name can be edited.
- 2) Assign a Remote Pin to the key.
- 3) Remember GPI port Pin 1 is Ground, so Pin 2 corresponds to GPI 1...
- 4) Next, select the Key Function.
- 5) The "Instrument" function will make the GPI input control a function of another metering instrument, such as "Start" or "Stop". The "Preset" function can be used to recall a different metering preset to the screen.
- 6) How about using Keys 1-3 as Start, Stop and Reset (their default settings), and use Keys 4-5 for Presets? Once the "Preset" function has been assigned, the actual preset to recall can be selected. To complete the Global Keyboard editing, press "Save".



**NOTE:**

Each Preset can have different settings for the Global Keyboard, so the GPI functions may change after recalling another Preset. Edit the Global Keyboard settings in each Preset to complete the required setup.

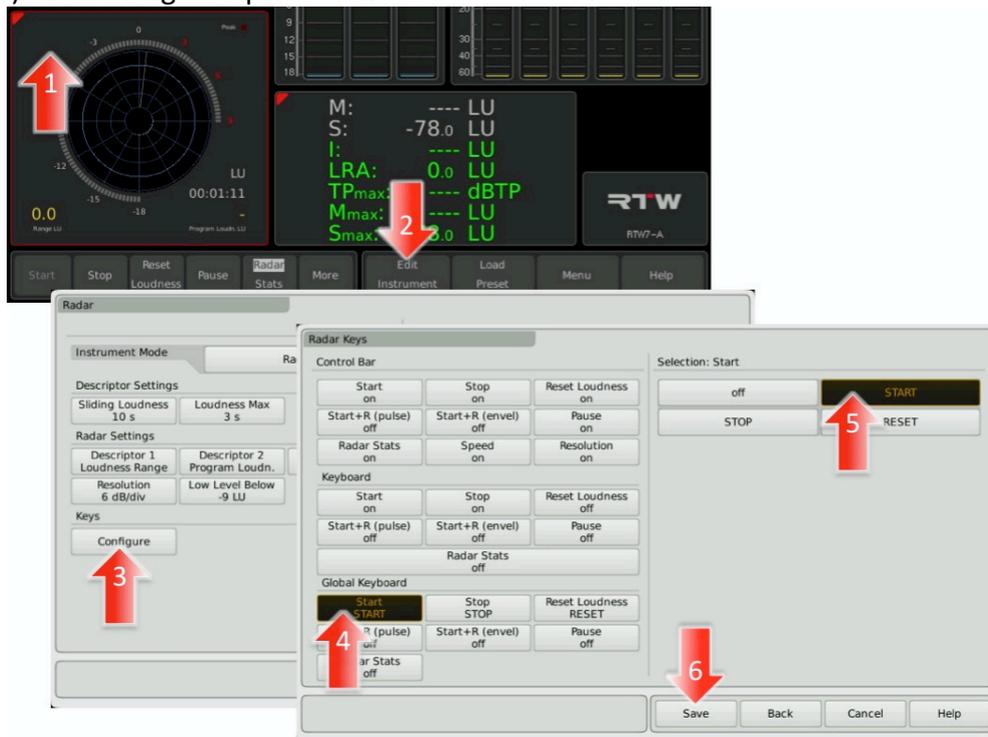
Check that GPI 4&5 from the CL/QL console are now recalling the required Preset on the TM7.



**4.3 Instrument START / STOP / RESET**

Some metering instruments such as “Radar”, “Loudness Sum” and “Loudness Numeric” include useful Start/Stop/Reset functions. These can all be controlled together by the Global Keyboard controls, which have just been assigned to GPI inputs. Follow these steps to achieve it:

- 1) Highlight the metering instrument that needs to be controlled by touching it on the screen.
- 2) Press “Edit Instrument” at the bottom of the screen.
- 3) In this Edit menu, press the “Configure” button in the Keys section. Now the Global Keyboard assignments will be shown, but they will be off by default.
- 4) To activate a button, press the Global Keyboard function in the lower-left of the display,
- 5) and then assign one of the GPI functions in the top-right of the display.
- 6) Don’t forget to press “Save”!



## 5.0 Conclusion

Now all the GPI functions are set and ready to be controlled. The User Defined Keys on the console are now set to control the functions of the RTW TouchMonitor TM7. Enjoy the extra visual information and control this provides to create a more refined and consistent mix.

For more information, go to:

[www.yamahaproaudio.com](http://www.yamahaproaudio.com)

[www.rtw.com/en](http://www.rtw.com/en)