



HANDBOOK

## CM-TB8

8 Channel Talkback Control Unit



Manufacturers of audio & video  
products for radio & TV broadcasters

**SONIFEX**

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This handbook is for use with the following product:

CM-TB8 8 Channel Talkback Control Unit

Stock Code: 30-267

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# SONIFEX

## Register Online for an Extended 2 Year Warranty

As standard, Sonifex products are supplied with a 1 year back to base warranty.

If you register the product online, you can increase your product warranty to 2 years and we can also keep you informed of any product design improvements or modifications.

Product: \_\_\_\_\_

Serial No: \_\_\_\_\_

To register your product, please go online to [www.sonifex.co.uk/register](http://www.sonifex.co.uk/register)

## Product Warranty - 2 Year Extended

As standard, Sonifex products are supplied with a 1 year back to base warranty. In order to register the date of purchase and so that we can keep you informed of any product design improvements or modifications, it is important to complete the warranty registration online. Additionally, if you register the product on the Sonifex website, you can increase your product warranty to 2 years. Go to the Sonifex website at: <http://www.sonifex.co.uk/technical/register/index.asp> to apply for your 2 year warranty.

**Note:** For your own records the product serial number is recorded on the CE certification page of this handbook.

## Sonifex Warranty & Liability Terms & Conditions

### 1. Definitions

‘the Company’ means Sonifex Ltd and where relevant includes companies within the same group of companies as Sonifex Limited.

‘the Goods’ means the goods or any part thereof supplied by the Company and where relevant includes: work carried out by the Company on items supplied by the Purchaser; services supplied by the Company; and software supplied by the Company.

‘the Purchaser’ means the person or organisation who buys or has agreed to buy the Goods.

‘the Price’ means the Price of the Goods and any other charges incurred by the Company in the supply of the Goods.

‘the Warranty Term’ is the length of the product warranty which is usually 12 months from the date of despatch; except when the product has been registered at the Sonifex website when the Warranty Term is 24 months from the date of despatch.

‘the Contract’ means the quotation, these Conditions of Sale and any other document incorporated in a contract between the Company and the Purchaser.

This is the entire Contract between the parties relating to the subject matter hereof and may not be changed or terminated except in writing in accordance with the provisions of this Contract. A reference to the consent, acknowledgement, authority or agreement of the Company means in writing and only by a director of the Company.

### 2. Warranty

- a. The Company agrees to repair or (at its discretion) replace Goods which are found to be defective (fair wear and tear excepted) and which are returned to the Company within the Warranty Term provided that each of the following are satisfied:
  - i. notification of any defect is given to the Company immediately upon its becoming apparent to the Purchaser;
  - ii. the Goods have only been operated under normal operating conditions and have only been subject to normal use (and in particular the Goods must have been correctly connected and must not have been subject to high voltage or to ionising radiation and must not have been used contrary to the Company’s technical recommendations);
  - iii. the Goods are returned to the Company’s premises at the Purchaser’s expense;
  - iv. any Goods or parts of Goods replaced shall become the property of the Company;
  - v. no work whatsoever (other than normal and proper maintenance) has been carried out to the Goods or any part of the Goods without the Company’s prior written consent;

- vi. the defect has not arisen from a design made, furnished or specified by the Purchaser;
  - vii. the Goods have been assembled or incorporated into other goods only in accordance with any instructions issued by the Company;
  - viii. the defect has not arisen from a design modified by the Purchaser;
  - ix. the defect has not arisen from an item manufactured by a person other than the Company. In respect of any item manufactured by a person other than the Company, the Purchaser shall only be entitled to the benefit of any warranty or guarantee provided by such manufacturer to the Company.
- b. In respect of computer software supplied by the Company the Company does not warrant that the use of the software will be uninterrupted or error free.
- c. The Company accepts liability:
- (i) for death or personal injury to the extent that it results from the negligence of the Company, its employees (whilst in the course of their employment) or its agents (in the course of the agency);
  - (ii) for any breach by the Company of any statutory undertaking as to title, quiet possession and freedom from encumbrance.
- d. Subject to conditions (a) and (c) from the time of despatch of the Goods from the Company's premises the Purchaser shall be responsible for any defect in the Goods or loss, damage, nuisance or interference whatsoever consequential economic or otherwise or wastage of material resulting from or caused by or to the Goods. In particular the Company shall not be liable for any loss of profits or other economic losses. The Company accordingly excludes all liability for the same.
- e. At the request and expense of the Purchaser the Company will test the Goods to ascertain performance levels and provide a report of the results of that test. The report will be accurate at the time of the test, to the best of the belief and knowledge of the Company, and the Company accepts no liability in respect of its accuracy beyond that set out in Condition (a).
- f. Subject to Condition (e) no representation, condition, warranty or other term, express or implied (by statute or otherwise) is given by the Company that the Goods are of any particular quality or standard or will enable the Purchaser to attain any particular performance or result, or will be suitable for any particular purpose or use under specific conditions or will provide any particular capacity, notwithstanding that the requirement for such performance, result or capacity or that such particular purpose or conditions may have been known (or ought to have been known) to the Company, its employees or agents.
- g. (i) To the extent that the Company is held legally liable to the Purchaser for any single breach of contract, tort, representation or other act or default, the Company's liability for the same shall not exceed the price of the Goods.
- (ii) The restriction of liability in Condition (g)(i) shall not apply to any liability accepted by the Seller in Condition (c).
- h. Where the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Purchaser are not affected by these Conditions of Sale.

## Unpacking Your Product

Each product is shipped in protective packaging and should be inspected for damage before use. If there is any transit damage take pictures of the product packaging and notify the carrier immediately with all the relevant

details of the shipment. Packing materials should be kept for inspection and also for if the product needs to be returned.

The product is shipped with the following equipment so please check to ensure that you have all of the items below. If anything is missing, please contact the supplier of your equipment immediately.

Item	Quantity
Product unit	1
IEC mains lead fitted with moulded mains plug	1
Handbook and warranty card	1

If you require a different power lead, please let us know when ordering the product.

## Repairs & Returns

Please contact Sonifex or your supplier if you have any problems with your Sonifex product. Email [technical.support@sonifex.co.uk](mailto:technical.support@sonifex.co.uk) for the repair/upgrade/returns procedure, or for support & questions regarding the product operation.

## CE Conformity

The products in this manual comply with the essential requirements of the relevant European health, safety and environmental protection legislation.

The technical justification file for this product is available at Sonifex Ltd.

The declaration of conformity can be found at:  
<http://www.sonifex.co.uk/declarations>

## Safety & Installation of Mains Operated Equipment

There are no user serviceable parts inside the equipment. If you should ever need to look inside the unit, always disconnect the mains supply before removing the equipment covers. The cover is connected to earth by means of the fixing screws. It is essential to maintain this earth/ground connection to ensure a safe operating environment and provide electromagnetic shielding.

### Voltage Setting Checks

Ensure that the machine operating voltage is correct for your mains power supply by checking the box in which your product was supplied. The voltage is shown on the box label. The available voltage settings are 115V, or 230V. Please note that all products are either switchable between 115V and 230V, or have a universal power supply.

### Fuse Rating





The product is supplied with a single fuse in the live conducting path of the mains power input. For reasons of safety it is important that the correct rating and type of fuse is used. Incorrectly rated fuses could present a possible fire hazard, under equipment fault conditions. The active fuse is fitted on the outside rear panel of the unit.

### Power Cable & Connection

An IEC power connector is supplied with the product which has a moulded plug attached.

The mains plug or IEC power connector is used as the disconnect device. The mains plug and IEC power connector shall remain readily operable to disconnect the apparatus in case of a fault or emergency.

The mains lead is automatically configured for the country that the product is being sent to, from one of:

Territory	Voltage	IEC Lead Type	Image
UK & Middle East	230V	UK 3 pin to IEC lead	
Europe	230V	European Schuko round 2 pin to IEC lead	
USA, Canada and South America	115V	3 flat pin to IEC lead	
Australia & New Zealand	230V	Australasian 3 flat pin to IEC lead	

Connect the equipment in accordance with the connection details and before applying power to the unit, check that the machine has the correct operating voltage for your mains power supply.

This apparatus is of a class I construction. It must be connected to a mains socket outlet with a protective earthing connection.

**Important note:** If there is an earth/ground terminal on the rear panel of the product then it must be connected to Earth.

## WEEE Directive



The Waste Electrical and Electronic Equipment (WEEE) Directive was agreed on 13 February 2003, along with the related Directive 2002/95/EC on Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS). The Waste Electrical and Electronic Equipment Directive (WEEE) aims to minimise the impacts of electrical and electronic equipment on the environment during their life times and when they become waste. All products manufactured by Sonifex Ltd have the WEEE directive label placed on the case. Sonifex Ltd will be happy to give you information about local organisations that can reprocess the product when it reaches its “end of use”, or alternatively all products that have reached “end of use” can be returned to Sonifex and will be reprocessed correctly free of charge.

## Atmosphere/Environment

This apparatus should be installed in an area that is not subject to excessive temperature variation (<0°C, >50°C), moisture, dust or vibration.

This apparatus shall not be exposed to dripping or splashing, and no objects filled with water, such as vases shall be placed on the apparatus.



## Introduction

The CM-TB8 Talkback Control Unit is a powerful and highly flexible self contained communications unit allowing multiple 4-wire and IFB connections within a single 1U rack space. Using the latest DSP technology, the CM-TB8 integrates a high quality, digitally controlled audio system with an intuitive and configurable user interface. It offers easy connection to any industry standard talkback system including the Sonifex CM-TBU line listen unit plus the CM-CU1 and CM-CU21 commentator units.

The CM-TB8 provides 8 channels of 4-wire communication, with 2 additional IFB inputs that can be routed to each channel. The unit has individual connections for a microphone and headset, and the gain for each input can be independently set. Phantom power and a wide gain range ensure support for most microphone types. All of the audio processing is done in the digital domain. This gives greater control of the audio mixing and routing functions and allows smoother changes in signal level. Likewise, the volume potentiometers on the front panel control gain digitally, ensuring noise free operation.

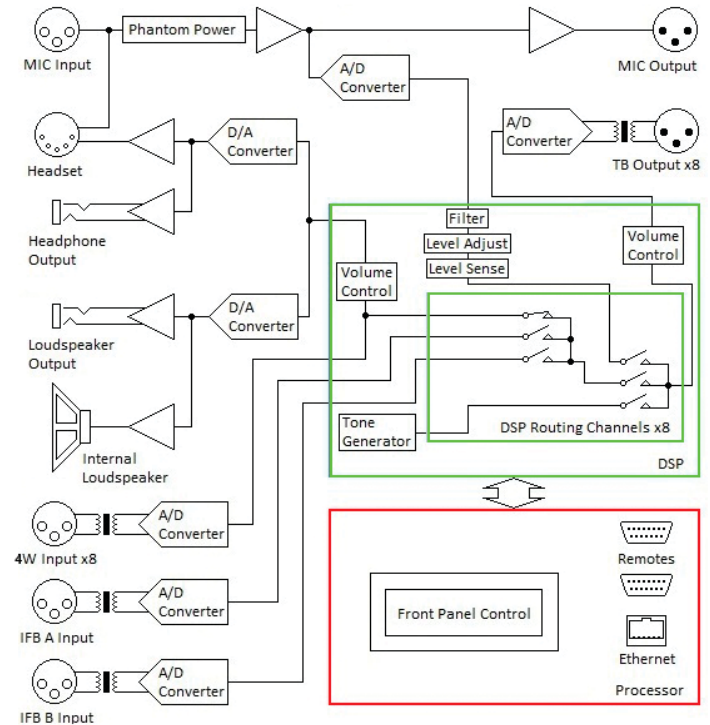


Fig 1-1: System Block Diagram

## Front Panel Controls, Connections & Indicators

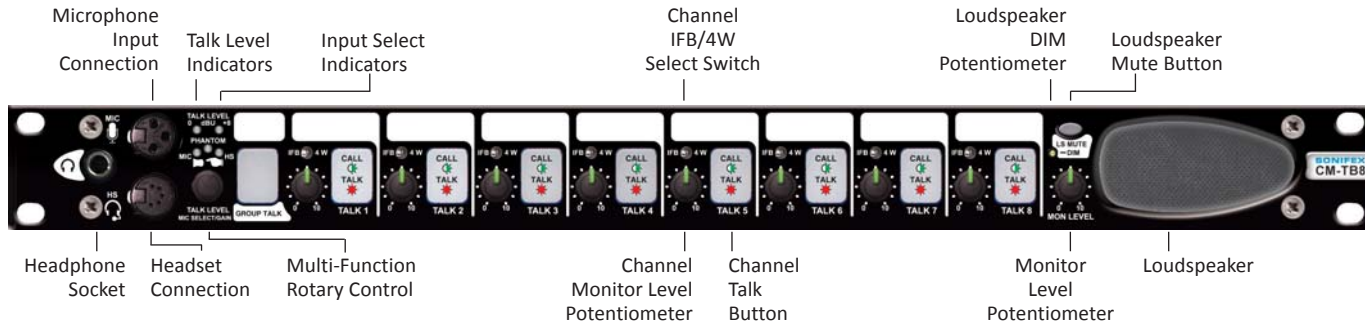


Fig 2-1: CM-TB8 Front Panel

### Headphone Output Connection

The headphone output is via a ¼ inch (6.35mm) stereo jack socket capable of driving 32Ω - 600Ω professional headphones. Lower impedance headphones should not be used.

### Microphone Input Connection

The electronically balanced microphone input is via a 3 pin female XLR-3 connector. The available gain for this input ranges from +6dB to +69dB. Phantom powered microphones are supported on this input.

### Headset Connection

The headset connection is via a 5 pin female XLR-5 connector. It shares the same input and output circuits as the separate microphone and headphone, but the gain settings are independent and the available range is from +6dB to +69dB. Changing the input type automatically selects the corresponding gain settings. Phantom power is also available on this input.

The microphone and headset inputs are protected by a level limiter. The limiter will start to function when the input signal exceeds approximately +8.5dB. When the limiter is active, the input select LED indicators will illuminate red instead of amber. When the input signal is reduced and the limiter turns off, the input select indicators return to amber illumination.

### Talk Level Indicators

In the normal operating mode, the left indicator illuminates green when the gain adjusted microphone signal exceeds 0dB, and the right indicator illuminates red when the signal exceeds +8dB.

### Input Select Indicators

In the normal operating mode, these indicators illuminate amber to show which microphone type is currently selected, and whether phantom power is enabled. They also show when the microphone limiter is actively limiting the level of the signal, by changing from amber to red.

## Multi-Function Rotary Control

The rotary control has various functions which are dependent on the current operating mode.

In the normal operating mode, the rotary control can adjust the talk level. This is the level of the microphone signal routed to the talkback outputs. The selected microphone gain settings and the subsequent microphone output level at the rear panel connector are not changed.

**To adjust the talk level:** first ensure that the function is enabled and the required range of adjustment has been selected. See the Talk Level Settings Page in the Embedded Web Server. Turn the rotary control to increase or decrease the current talk level within the limits set by the talk level adjust options. There is an additional option that requires the rotary control to be pressed before any adjustment to the talk level can be made. With this option selected, the adjustment mode will timeout after 1 second of inactivity of the rotary control.

The rotary control also accesses the microphone select and microphone gain and filter setup modes.

**To access the microphone select and microphone gain and filter setup modes:** press and hold the rotary control for 3 seconds whilst in the normal operating mode. The two talk level LEDs will illuminate red. Turn the rotary control to select the mode to enter, either microphone gain and filter setup mode when the two talk level LEDs are illuminated, or microphone select mode when MIC, Phantom and HS LEDs are illuminated. When the required LEDs are illuminated, press the rotary control to enter the associated mode. If the rotary control is not turned or pressed for 3 seconds, this function will timeout and the unit will return to normal operation. Please note, entering microphone gain and filter setup mode resets the current talk level adjust value to zero.

**To change the selected microphone type:** once in microphone select mode, the currently selected microphone setting LEDs will flash. Turn the rotary

control to change the selection. Both microphone and headset type can be selected with or without phantom power. A brief press on the rotary control will return the unit to normal operation.

**To change the microphone gain and filter:** once in the microphone gain and filter setup mode, the talk buttons on channels 1-8 will illuminate to show the approximate current gain setting for the currently selected microphone. Turn the rotary control to increase or decrease the gain. With no buttons illuminated, the gain is approximately 6dB. The gain increases by approximately 8dB as each talk button is illuminated with the maximum gain of approximately 69dB gain when all talk buttons are illuminated. The talk level LEDs will show the current level of the microphone signal as it exceeds 0dB and +8dB respectively, and the microphone signal can be monitored in the headphones.

The state of the microphone filter is shown on the LS mute button LED. If the LED is illuminated red, the filter is on. Press the LS mute button to enable or disable the filter.

Once the required microphone gain and filter setting has been set, a brief press on the rotary control will return the unit to normal operation.

## Group Talk Button

The group talk button simultaneously activates all of the talk buttons that have been included in the group talk function. By default, all channels are included. When the group talk function is active, the button illuminates red, as do the talk buttons on the channels activated by the group talk function. By default, the button has a momentary action that will automatically latch in the on state if pressed briefly.

## Channel 1 to 8 Talk Buttons

Each talk button routes the currently selected microphone signal to the corresponding talkback output. When a talk button is active, it illuminates red. The channels audio call indication illuminates the talk button green when the signal level on the corresponding 4W IN input rises above -12dB.

The audio call is not shown on talk channels that are active. By default, the talk buttons have a momentary action that will automatically latch in the on state if pressed briefly.

### Channel 1 to 8 IFB/4W Select Switches

These switches select the operating mode for each channel, either 4 wire or interruptible fold back. The IFB input to each channel can be either the channels own 4W IN input, or one of the two dedicated programme inputs, IFB A or IFB B. This selection is made in the configuration options using either the on-board configuration mode or the embedded web server. See the Configuration Options section. As an alternative to the standard IFB modes, where the microphone signal interrupts the IFB signal when the channel is active, an additional option allows the microphone signal to be mixed with the IFB signal. In this mode, when a talk channel is activated, the level of the selected IFB input signal on that channel is reduced by 12dB prior to being mixed with the microphone signal.

**To use a talk channel in 4W mode:** put the IFB/4W switch in the 4W position. In this mode, the signal on the 4W IN input connector is routed to the headphones/headset and loudspeaker at the level set by the channels own monitor level potentiometer, with the overall level controlled by the MON level potentiometer. When the talk button is pressed, the microphone signal is routed to the channels talkback output at the TB OUT connector, and the level of the feed to the loudspeaker (not headphones/headset) is reduced by the level preset by the dim potentiometer.

**To use a talk channel in IFB mode:** put the IFB/4W switch in the IFB position. In this mode, the signal on the 4W IN input connector is routed to the headphones/headset and loudspeaker at the level set by the channels own monitor level potentiometer, with the overall level controlled by the MON level potentiometer. The signal from the selected IFB input, either the channels own 4W IN input or one of the dedicated programme inputs, IFB A or IFB B, is routed to the talkback output at the TB OUT connector. When the talk button is pressed, the signal at the talkback output is either

replaced by or mixed with the microphone signal, and the level of the feed to the loudspeaker (not headphones/headset) is reduced by the level preset by the dim potentiometer.

### Channel 1 to 8 Monitor Level Potentiometers

These controls set the level of the signal that is routed to the monitor headphones/headset and loudspeaker from each channels input.

### Loudspeaker Mute Button

The loudspeaker mute cuts the signal fed to the loudspeaker and the loudspeaker output on the rear panel. The mute can also be activated via a remote input, see the Remote section. The button has a latching action and illuminates red when activated or flashes red to indicate the loudspeaker mute has been activated by the remote input. The button also indicates when the loudspeaker dim is active by illuminating green. The mute button does not affect the signal routed to the headphones.

### Loudspeaker Dim Potentiometer

The loudspeaker dim pre-set potentiometer controls the level of attenuation applied to the signal fed to the loudspeaker and rear panel loudspeaker output when any of the talk channels are active, or the loudspeaker dim remote input is active. The attenuation range is between full on and muted and it is adjusted using a small flat blade screwdriver.

### Monitor Level Potentiometer

The monitor level potentiometer controls the overall level of the signal routed to the headset/headphone outputs, the loudspeaker and the loudspeaker output on the rear panel.

## Rear Panel Connections

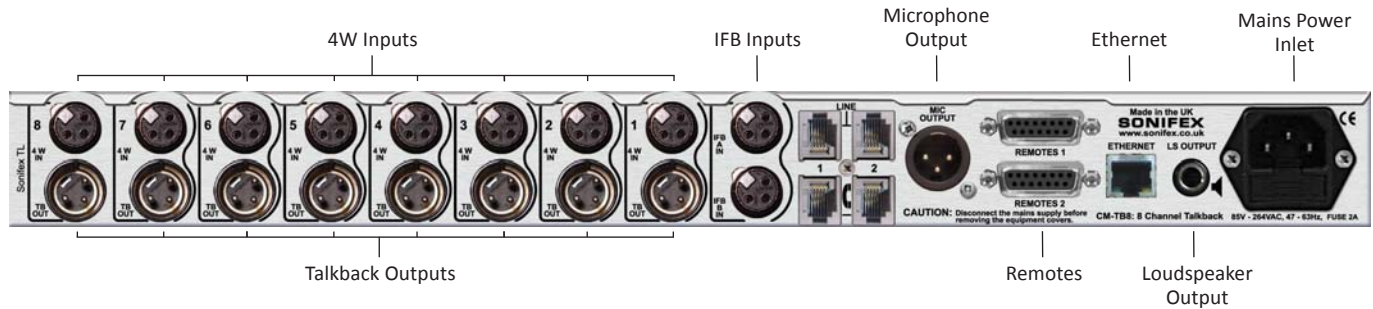


Fig 3-1: CM-TB8 Rear Panel

### 4W IN Input Connections

The transformer balanced 4W IN inputs are via 3 pin female XLR-3 connectors. These are the main audio inputs to each channel.

### TB OUT Output Connections

The transformer balanced TB OUT talkback outputs are via 3 pin male XLR-3 connectors. These are the main audio outputs from each channel.

### IFB A & B Programme Input Connections

The transformer balanced IFB inputs are via 3 pin female XLR-3 connectors.

### MIC Output Connection

The electronically balanced microphone output is via a 3 pin male XLR-3 connector. It outputs the gain adjusted, level limited signal from the selected microphone or headset input.

### Remote Connections

The remote connections are via two 15-way 'D'-type sockets. All of the remote outputs are on the remote 1 connector, whilst the inputs are all on the remote 2 connector. See the Remotes section on for connection details.

### Ethernet Connection

The Ethernet connection provides 100Mb network capabilities via a RJ45 connector.

### LS Output Connection

The loudspeaker output is via a ¼ inch (6.35mm) jack socket. When an external loudspeaker is connected, the internal loudspeaker is muted.

## Line-Up Tone Mode

The CM-TB8 has a built in Test Tone generator which selectively routes a line-up tone of 1kHz at 0dB to all talkback outputs to assist channel identification and cabling checks. There are two test tone modes, manual and auto.

**To enable line-up tone mode:** press and hold the rotary control and the group talk button and channel 1 and 2 talk buttons for 5 seconds. The group talk button will flash amber to indicate the line-up tone mode has been entered. The rotary control, group talk button and talk buttons can now be released. By default, manual mode is enabled.

**To switch between manual and auto tone modes:** turn the rotary control one position in either direction.

In manual line-up tone mode, press the talk buttons on each channel to route test tone to the corresponding talkback output. Each talk button will illuminate amber when pressed. When a button is released, the tone on that talkback output will be muted.

In auto line-up tone mode, each of the eight talkback outputs are automatically identified by a unique number of short tone bursts, lasting 0.25 seconds each, which are repeated every 5 seconds. Each talk button flashes amber to indicate when tone is being routed to that channel, and the number of pulses corresponds to the channel number.

The 4W IN inputs function normally and any signal present is still routed to the loudspeaker and headphone monitor outputs. This could be useful in allowing the user to receive instructions on which channel to output tone to when using the test tone in manual mode.

**To exit the line-up tone mode:** press the rotary control once. The unit will then return to normal operating mode.

## Remotes

The two remote connectors on the rear panel provide a selection of remote inputs and outputs. All of the remote outputs are on the Remotes 1 connector and are open collector outputs, and all of the remote inputs are on the Remotes 2 connector and are active low.

### Remotes 1 – Outputs

- Pin1: Channel 1 Talk active – open collector output
- Pin2: Channel 2 Talk active – open collector output
- Pin3: Channel 3 Talk active – open collector output
- Pin4: Channel 4 Talk active – open collector output
- Pin5: Channel 5 Talk active – open collector output
- Pin6: Channel 6 Talk active – open collector output
- Pin7: Channel 7 Talk active – open collector output
- Pin8: Channel 8 Talk active – open collector output
- Pin9: Group Talk active – open collector output
- Pin10: Loudspeaker Dim active – open collector output
- Pin11: Loudspeaker Mute active – open collector output
- Pin12: Channels 1-8 Audio Call active – open collector output
- Pin13: Ground
- Pin14: Ground
- Pin15: Ground

The remote outputs are “tally” indicators and the talk active outputs indicate when any of the channel talk or group talk buttons are active. The loudspeaker dim and mute outputs indicate the state of the signal routed to the internal and external loudspeakers. The audio call active remote output indicates when the signal level on one or more of the 4W IN inputs is greater than -12dB.

### Remotes 2 – Inputs

- Pin1: Channel 1 Remote Call – active low input
- Pin2: Channel 2 Remote Call – active low input
- Pin3: Channel 3 Remote Call – active low input
- Pin4: Channel 4 Remote Call – active low input
- Pin5: Channel 5 Remote Call – active low input
- Pin6: Channel 6 Remote Call – active low input
- Pin7: Channel 7 Remote Call – active low input
- Pin8: Channel 8 Remote Call – active low input
- Pin9: Loudspeaker Dim enable – active low input
- Pin10: Loudspeaker Mute enable – active low input
- Pin11: no connection
- Pin12: no connection
- Pin13: Ground
- Pin14: Ground
- Pin15: Ground

When a remote call is active, the corresponding talk button flashes amber. This call condition takes priority over the audio level activated call input on each channel. The loudspeaker mute input, when active, takes priority over the mute button operation.

## Configuration Options

The CM-TB8 has a wide range of user configurable options. These options are arranged in sets, with an active set which contains the current working settings, and six configuration set templates that allow settings to be stored and recalled at a later date. Two of the configuration templates, sets 1 and 2, are read only and cannot be modified. The other four, sets 3 to 6, can be used to store customised settings. This allows the unit to be preconfigured for a range of user scenarios which can be instantly recalled. There are two methods available for modifying the configuration settings, the on-board configuration mode and the embedded web server. Any configuration settings that are changed using either of these two methods only affect the active set.

### On-Board Configuration Mode

The on-board configuration mode allows a limited number of configuration options in the active set to be modified without the need of a PC. It also allows the active set to be saved to one of the four editable sets, 3 to 6.

**To enter the on-board configuration mode:** press and hold the rotary control and channel 7 and 8 talk buttons for 5 seconds. The 2 talk level LEDs and the LS mute button LED will flash red to indicate the configuration mode has been entered. The rotary control and talk buttons can now be released.

There are four configuration options available in this mode and the MIC, Phantom and HS LEDs illuminate red in sequence to indicate which option is currently being displayed. Option 4 is shown when all three LEDs are illuminated. The value of the selected option on a channel is shown by a sequence of recurring red flashes on the corresponding talk button, one flash equals mode 1, two flashes equals mode 2 etc.

**To cycle through the options:** press the group talk button once. The MIC, Phantom and HS LEDs will change to indicate which new option is being displayed.

**To change the current option setting:** press the corresponding talk button once. The number of flashes will increase to indicate the new setting. Once the maximum option mode setting has been reached, the value will wrap around to mode 1.

The on-board configuration mode options are listed below:

- Option 1 – Channel inclusion in the group talk function (MIC LED is illuminated)
  - Mode 1 – channel is excluded from the group talk function
  - Mode 2 – channel is included in the group talk function
  
- Option 2 – Channel IFB mode (Phantom LED is illuminated)
  - Mode 1 – 4W IN is IFB, Mic signal interrupts talkback signal when talk is active
  - Mode 2 – IFB A IN is IFB, Mic signal interrupts talkback signal when talk is active
  - Mode 3 – IFB B IN is IFB, Mic signal interrupts talkback signal when talk is active
  - Mode 4 – 4W IN is IFB, Mic signal is mixed with talkback signal when talk is active
  - Mode 5 – IFB A IN is IFB, Mic signal is mixed with talkback signal when talk is active
  - Mode 6 – IFB B IN is IFB, Mic signal is mixed with talkback signal when talk is active
  
- Option 3 – Channel 1 & 2 telephone interface mode (HS LED is illuminated)
  - Mode 1 – Normal mode
  - Mode 2 – Telephone mode (requires telephone expansion card to be fitted)
  
- Option 4 – Save the active set (MIC, Phantom and HS LEDs illuminated)
 

This option allows the current active set to be saved to set 3, 4, 5 or 6 by pressing and holding the talk button on the channel corresponding to the required set number for 3 seconds. The talk button will illuminate will



flash red, then amber, then green to confirm the set has been saved. For example, to save the active set to set 5, press and hold the channel 5 talk button for 3 seconds.

Press and hold channel 3 Talk button for 3 seconds to save the active set to set 3

Press and hold channel 4 Talk button for 3 seconds to save the active set to set 4

Press and hold channel 5 Talk button for 3 seconds to save the active set to set 5

Press and hold channel 6 Talk button for 3 seconds to save the active set to set 6

**To exit the on-board configuration mode:** press and hold the group talk button for 3 seconds. The unit will then return to normal operating mode.

### Embedded Web Server

The CM-TB8 has an embedded web server which provides easy access to all of the configuration options through a web browser. It also gives access to

system settings and allows the firmware to be easily updated when new releases are made available.

To use the embedded web server, the unit needs to be connected to a network via the Ethernet port on the rear panel. By default, the CM-TB8 is configured as a DHCP client and when connected to a network, it will search for a DHCP server in order to obtain its IP address. If no DHCP server is found within 45 seconds, the unit will default to its default static network settings. To order to access the unit on the network, it is first necessary to determine the current active IP address.

**To discover the current active IP address:** press and hold the rotary control and the group talk button for 3 seconds. All the LEDs on the front panel will turn off. The rotary control and group talk button can now be released. For each subsequent press of the rotary control, the current digit within the IP address will be shown on the group talk and talk buttons. The MIC, Phantom and HS LEDs indicate which digit is being shown within the current part of the IP address. The LS mute button LED illuminates to indicate a "dot" which separates each part of the address. For example, for the address 192.168.0.124, the following sequence of LEDs will be illuminated:

Address	MIC	Phantom	HS	Group Talk	Talk 1	Talk 2	Talk 3	Talk 4	Talk 5	Talk 6	Talk 7	Talk 8	LS Mute
1	Green			Red									
9	Green	Green		Red	Red	Red	Red	Red	Red	Red	Red	Red	
2	Green	Green	Green	Red	Red								
.													Red
1	Green			Red									
6	Green	Green		Red	Red	Red	Red	Red	Red				
8	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red		
.													Red
0	Green												
.													Red
1	Green			Red									
2	Green	Green		Red	Red								
4	Green	Green	Green	Red	Red	Red	Red						

After the last digit of the IP address has been displayed, the next press of the rotary control returns the unit to the normal operating mode. If the address is 0.0.0.0, a valid IP address has not yet been obtained from a DHCP server within the 45 second timeout period.

Once the IP address of the unit is known, simply type this into the address bar of a web browser. The home page of the connected CM-TB8 will be displayed.

Each page within the web server is accessed via one of the tabs in the menu bar below the title banner. Some tabs also have drop down sub-menus. Each page follows a similar format, the left side shows the main content of the page, either information or options and settings, and the right side gives a brief description of the each item. Pages that include configuration options also have a submit button. This transfers the new settings on the current page to the connected unit.

### Home Page

**SONIFEX** Manufacturers of audio & video equipment for video & TV studios  
**CM-TB8**

Home | Network | Display | Configuration | Load Settings | Save Settings | Update

### HOME

Unit Name:	CM-TB8
Serial Number:	0000000
Firmware Version:	V1.0.0
Boot Loader Version:	V1.0.0
MAC Address:	00 50 C2 95 A6 B6
IP Address:	192.168.0.183
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.0.149

**Home Page**  
This page shows general information about the connected CM-TB8.

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Fig 6-1: Home Page

The home page provides some general information about the connected CM-TB8. The serial number, firmware and boot loader version numbers should be quoted if you ever need to contact Sonifex Ltd about the unit.

### Network Settings Page

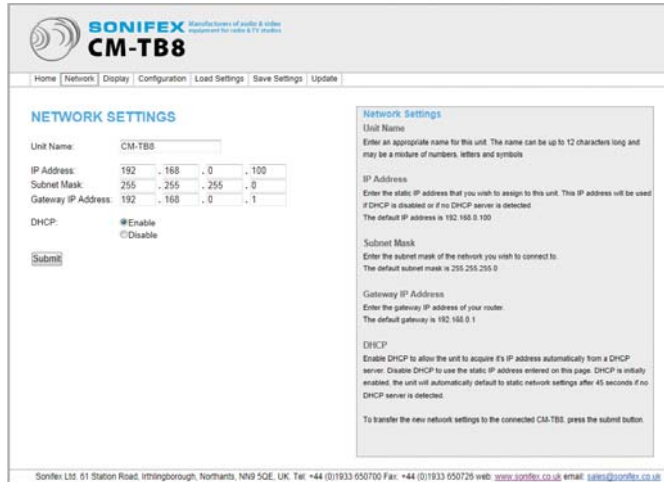


Fig 6-2: Network Settings Page

This page shows the network related settings. The unit name allows the connected CM-TB8 to be easily identified if there is more than one unit on the network. The IP address, subnet mask and gateway IP address are used only if DHCP is disabled, or if a DHCP server is not detected on the network within a timeout period of 45 seconds.

### Display Settings Page

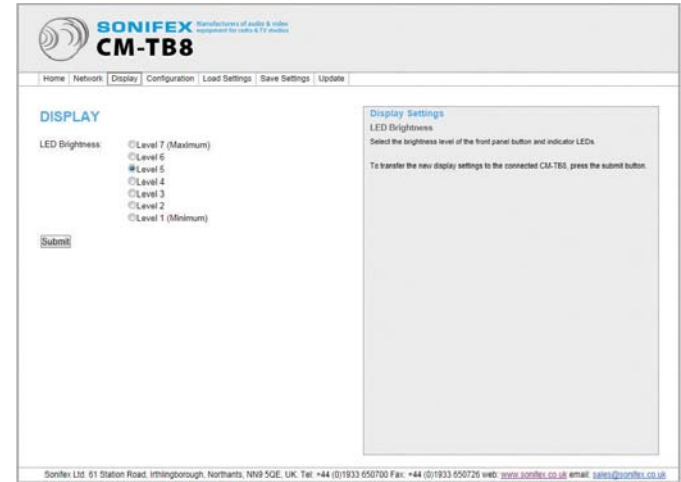


Fig 6-3: Display Settings Page

This page shows the display settings. The LED brightness setting changes the illumination intensity of the front panel buttons and indicators to allow for a range of installation environments.

## Microphone Settings Page

SONIFEX  
CM-TB8

Home | Network | Display | Configuration | Load Settings | Save Settings | Update

### MICROPHONE

Type:  Microphone  
 Headset

Phantom Power:  Enabled  
 Disabled

Filter:  Enabled  
 Disabled

Microphone Gain: 30dB

Headset Gain: 30dB

[Submit](#)

**Microphone Settings**  
Type  
Selects which input gain settings to use. The microphone and headset inputs have individual gain control.

Phantom Power  
Enable this option when using a microphone or headset that requires phantom power.

Filter  
Enables a filter to reduce the level of signals outside of the normal speech bandwidth.

Microphone And Headset Gain  
Selects the gain setting for each input. The available range is from -50dB to +10dB.

To transfer the new microphone settings to the connected CM-TB8, press the submit button.

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Fig 6-4: Microphone Settings Page

The first sub-item under the configuration tab shows the microphone options. Both the microphone and headset inputs have individual gain control, and the type option determines which settings are currently used. Enable the phantom power option when using microphone or headsets that require a 48V dc power supply. The filter option enables a band pass filter that reduces the level of signals outside of the normal speech bandwidth. Please note, updating the options on this page resets the current talk level adjust value to zero.

## Talk Level Settings Page

SONIFEX  
CM-TB8

Home | Network | Display | Configuration | Load Settings | Save Settings | Update

### TALK LEVEL

Talk Level Adjust:  Enable  
 Enable With Control Press  
 Disable

Adjustment Range:  ±30dB  
 ±50dB  
 ±120dB

[Submit](#)

**Talk Level Settings**  
Talk Level Adjust  
Enables this option to allow the talk level to be adjusted using the rotary control on the front panel of the unit. Enable with control press requires the rotary control to be pressed before any adjustment can be made. The adjustment mode will timeout after 1 second of inactivity of the rotary control.

Adjustment Range  
Select the range of talk level adjustment available.

To transfer the new talk level settings to the connected CM-TB8, press the submit button.

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Fig 6-5: Talk Level Settings Page

The talk level adjustment range sets the amount of microphone gain adjustment available. This is the second sub-item under the configuration tab. If this feature is enabled, the adjustment is made by turning the rotary control. An alternative option requires the rotary control to be pressed before any adjustment can be made.

### Group Talk Settings Page

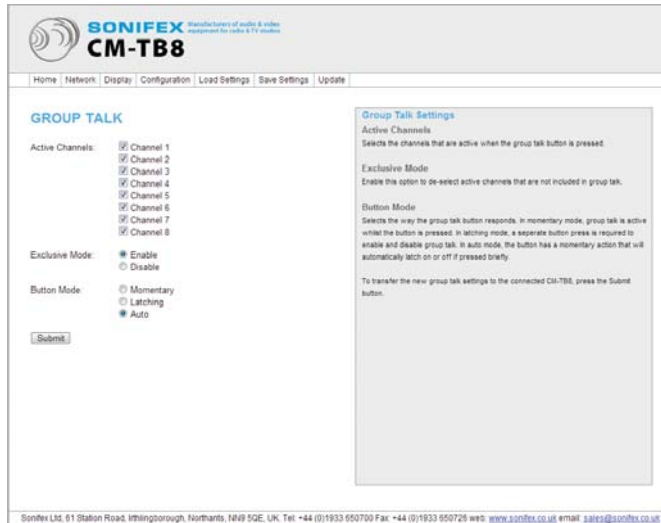


Fig 6-6: Group Talk Settings Page

The third sub-item under the configuration tab shows the group talk settings. These settings determine which channels are active when the group talk button is pressed. The exclusive mode option de-selects active channels that are not included in group talk. With this option disabled active channels are unaffected by group talk. The button mode option selects the way the group talk button responds when pressed. In momentary mode, group talk is active only when the button is pressed. In latching mode, a separate button press is required to enable and disable group talk. With the option set to auto, the button has a momentary action that will automatically latch on or off if pressed briefly.

### Channel Settings Page

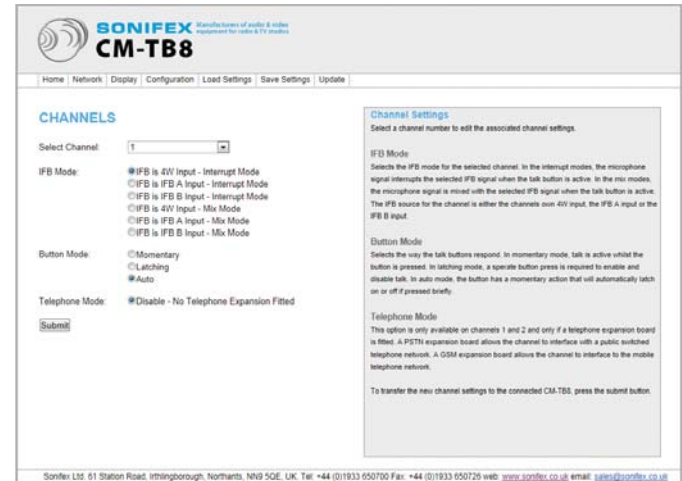


Fig 6-7: Channel Settings Page

The fourth sub-item under the configuration tab shows the individual channel settings. The selected IFB mode is active for each channel when the front panel switch on that channel is in the IFB position. There are three IFB inputs available to each channel, and there are options to allow the microphone signal to be mixed with the IFB input signal rather than interrupt it. The button mode setting provides similar options to the group talk button mode. The telephone mode option is only available on channels 1 and 2 and only if a telephone expansion board is fitted.

## Load Settings Page

SONIFEX CM-TB8

Home | Network | Display | Configuration | Load Settings | Save Settings | Update

### LOAD SETTINGS

Select Set To Load:

Configuration Set 1 Details:  
 Talk Level Adjust: Enable  
 Talk Level Adjustment Range: ±5dB  
 Group Talk Active Channels: 1 2 3 4 5 6 7 8  
 Group Talk Exclusive Mode: Enable  
 Group Talk Button Mode: Auto  
 Channel 1 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 1 Talk Button Mode: Auto  
 Channel 1 Telephone Mode: Disable - No Telephone Expansion Fitted  
 Channel 2 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 2 Talk Button Mode: Auto  
 Channel 2 Telephone Mode: Disable - No Telephone Expansion Fitted  
 Channel 3 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 3 Talk Button Mode: Auto  
 Channel 4 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 4 Talk Button Mode: Auto  
 Channel 5 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 5 Talk Button Mode: Auto  
 Channel 6 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 6 Talk Button Mode: Auto  
 Channel 7 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 7 Talk Button Mode: Auto  
 Channel 8 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 8 Talk Button Mode: Auto

The CM-TB8 stores 6 sets of configuration settings which can be recalled and loaded into the current working configuration. The current working configuration can also be saved back to 4 of the stored sets. Configuration sets 1 and 2 are read only.

To load a configuration set, select the set number from the drop down list and press the Load button.

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Fig 6-8: Load Settings Page

This page allows one of the six configuration set templates to be loaded in the current active set. The details of the selected set are shown. Press the load button to implement the new settings.

## Save Settings Page

SONIFEX CM-TB8

Home | Network | Display | Configuration | Load Settings | Save Settings | Update

### SAVE SETTINGS

Select Set To Save To:

Current Configuration Details:  
 Talk Level Adjust: Enable  
 Talk Level Adjustment Range: ±5dB  
 Group Talk Active Channels: 1 2 3 4 5 6 7 8  
 Group Talk Exclusive Mode: Enable  
 Group Talk Button Mode: Auto  
 Channel 1 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 1 Talk Button Mode: Auto  
 Channel 1 Telephone Mode: Disable - No Telephone Expansion Fitted  
 Channel 2 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 2 Talk Button Mode: Auto  
 Channel 2 Telephone Mode: Disable - No Telephone Expansion Fitted  
 Channel 3 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 3 Talk Button Mode: Auto  
 Channel 4 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 4 Talk Button Mode: Auto  
 Channel 5 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 5 Talk Button Mode: Auto  
 Channel 6 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 6 Talk Button Mode: Auto  
 Channel 7 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 7 Talk Button Mode: Auto  
 Channel 8 IFB Mode: IFB is 4W Input - Interrupt Mode  
 Channel 8 Talk Button Mode: Auto

The CM-TB8 stores 6 sets of configuration settings which can be recalled and loaded into the current working configuration. The current working configuration can also be saved back to 4 of the stored sets. Configuration sets 1 and 2 are read only.

To save the current working configuration, select the set number from the drop down list and press the Save button.

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Fig 6-9: Save Settings Page

This page allows the current active configuration to be saved to one of the four editable configuration set templates. The details of the current active configuration are shown. Press the save button to store the settings in the selected set.

## Update Page

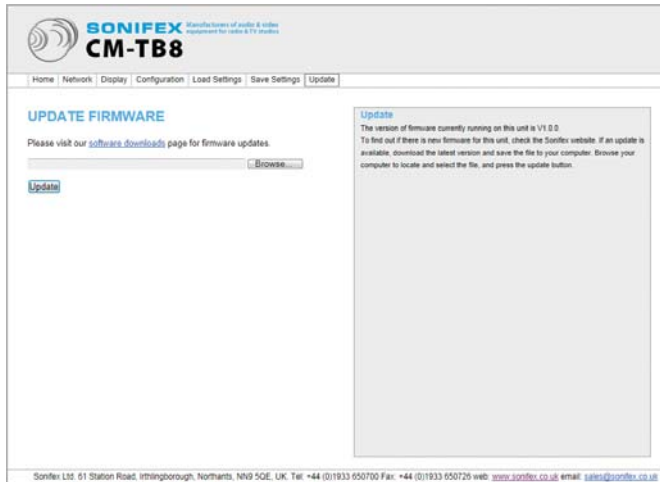


Fig 6-10: Update Page

This page allows the firmware on the connected unit to be updated. Updates will be made available on the Sonifex website for enhancements and bug fixes. If a new version of firmware exists, download the file onto a computer. Press the browse button to locate the file and select it. Then press the update button to transfer the new firmware to the CM-TB8. The update process will take approximately 20 seconds during which time the unit will reboot automatically.

If the unit fails to reboot after a firmware update, this could indicate that an incompatible file was selected or the file was corrupt. Try power cycling the unit first; disconnect the mains power, wait several seconds then re-apply power. If the unit still fails to boot, it is possible to force it into boot loader mode. In this mode, the unit can accept new firmware as the boot loader has its own simplified web server.

**To run the unit in boot loader mode:** power up the unit whilst holding the group talk button and channels 1, 2 and 3 talk buttons. The MIC, Phantom and HS will flash green in a repeating cycle to indicate the unit is in boot loader mode. Type the IP address of the unit into a web browser to access the boot loader web server. Select the update tab, press the browse button to select the firmware file and then press the update button.

## Configuration Option Defaults

It is possible to return all configuration template sets to default settings. Also, by returning the templates sets to defaults, the active set is overwritten with the settings stored in template set 1. The default settings for the templates sets are as follows:

### Configuration Template Set 1 (read only)

Talk Adjust:	Enabled
Talk Adjustment Range:	±6dB
Group Talk Button Action:	Auto
Channel 1 Group Talk Inclusion:	Enabled
Channel 1 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 1 Talk Button Action:	Auto
Channel 1 Telephone Mode:	Disabled
Channel 2 Group Talk Inclusion:	Enabled
Channel 2 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 2 Talk Button Action:	Auto
Channel 2 Telephone Mode:	Disabled
Channel 3 Group Talk Inclusion:	Enabled
Channel 3 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 3 Talk Button Action:	Auto
Channel 4 Group Talk Inclusion:	Enabled
Channel 4 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 4 Talk Button Action:	Auto
Channel 5 Group Talk Inclusion:	Enabled
Channel 5 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal

Channel 5 Talk Button Action:	Auto
Channel 6 Group Talk Inclusion:	Enabled
Channel 6 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 6 Talk Button Action:	Auto
Channel 7 Group Talk Inclusion:	Enabled
Channel 7 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 7 Talk Button Action:	Auto
Channel 8 Group Talk Inclusion:	Enabled
Channel 8 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 8 Talk Button Action:	Auto

### Configuration Template Set 2 (read only)

Talk Adjust:	Enabled
Talk Adjustment Range:	±6dB
Group Talk Button Action:	Auto
Channel 1 Group Talk Inclusion:	Enabled
Channel 1 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 1 Talk Button Action:	Auto
Channel 1 Telephone Mode:	Enabled (disabled in telephone card not fitted)
Channel 2 Group Talk Inclusion:	Enabled
Channel 2 IFB Mode:	4W input is IFB, Mic signal interrupts talkback signal
Channel 2 Talk Button Action:	Auto
Channel 2 Telephone Mode:	Enabled (disabled in telephone card not fitted)



- Channel 3 Group Talk Inclusion: Enabled
- Channel 3 IFB Mode: 4W input is IFB, Mic signal interrupts talkback signal
- Channel 3 Talk Button Action: Auto
- Channel 4 Group Talk Inclusion: Enabled
- Channel 4 IFB Mode: 4W input is IFB, Mic signal interrupts talkback signal
- Channel 4 Talk Button Action: Auto
- Channel 5 Group Talk Inclusion: Enabled
- Channel 5 IFB Mode: IFB A input is IFB, Mic signal interrupts talkback signal
- Channel 5 Talk Button Action: Auto
- Channel 6 Group Talk Inclusion: Enabled
- Channel 6 IFB Mode: IFB A input is IFB, Mic signal interrupts talkback signal
- Channel 6 Talk Button Action: Auto
- Channel 7 Group Talk Inclusion: Enabled
- Channel 7 IFB Mode: IFB B input is IFB, Mic signal interrupts talkback signal
- Channel 7 Talk Button Action: Auto
- Channel 8 Group Talk Inclusion: Enabled
- Channel 8 IFB Mode: IFB B input is IFB, Mic signal interrupts talkback signal
- Channel 8 Talk Button Action: Auto

button will illuminate green when the button press is registered. Continue to keep the button pressed for a further 5 seconds until it flashes green and red. The loudspeaker mute button can now be released and the unit will boot up into the normal operating mode.

### Configuration Template Sets 3 to 6

By default, configuration templates sets 3 to 6 are initialised with the settings from template set 1.

**To return all configuration settings to default values:** remove mains power from the unit and allow it to switch off. Press the loudspeaker mute button and keep it pressed whilst applying mains power. The loudspeaker mute

## Connection Example

The following diagram shows a simple example of how the CM-TB8 can be used in an outside broadcast scenario.

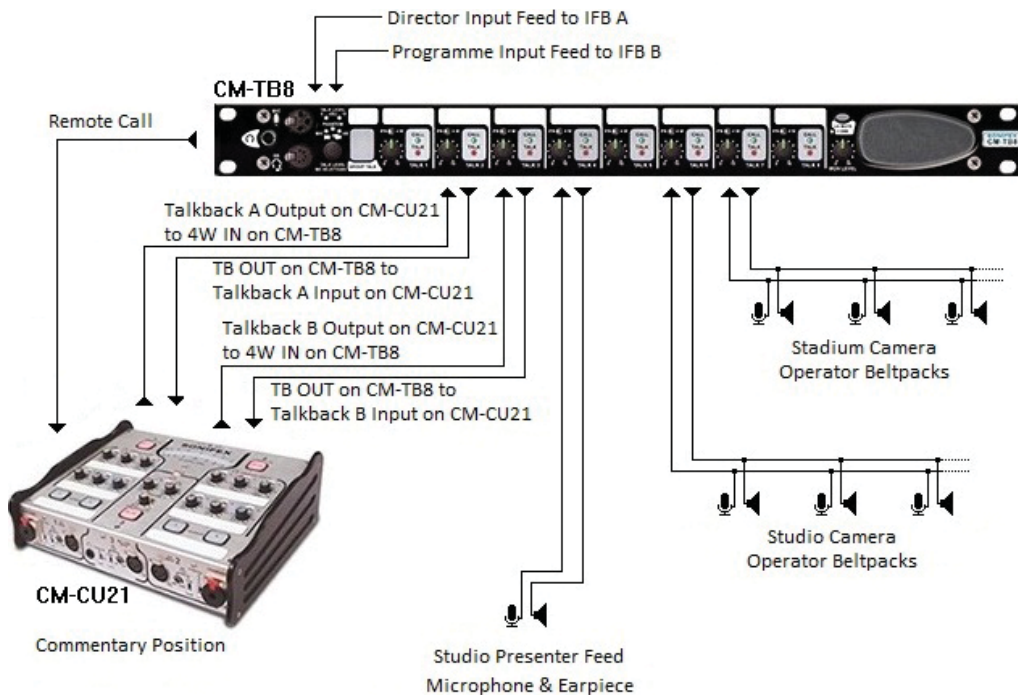


Fig 8-1: Connection Example

In this example, the CM-TB8 is connected to a CM-CU21 Commentator Unit. Any of the CM-TB8 channels can optionally be configured to operate in IFB mode such that they receive either the directors feed on IFB A or the programme feed on IFB B. Direct communication from the CM-TB8 to any of the connected channels can then interrupt the standing feed, by use of the talk buttons. The remote outputs from the two channels on the CM-TB8 that are connected to the commentator unit can be configured to provide a remote call indication when the talk channels on the control unit are active. The return audio talkback channels from the CM-CU21 will then provide a visual signal on the CM-TB8 if a presenter at the commentary position needs to gain the attention of the control unit operator.

## Button Operation Reference

The following table list all the button combination required to enter the various operating modes on the CM-TB8. The duration column details how long the buttons need to be pressed to enter the associated mode.

FUNCTION	ENCODER	GROUP	TALK								LS MUTE	DURATION
			1	2	3	4	5	6	7	8		
Enter MIC Menu												3s
Load Config Set 1 into Active Set												5s
Load Config Set 2 into Active Set												5s
Load Config Set 3 into Active Set												5s
Load Config Set 4 into Active Set												5s
Load Config Set 5 into Active Set												5s
Load Config Set 6 into Active Set												5s
Enter Config Edit Mode												5s
Save Active Set to Config Set 3 (in Config Edit Mode)												3s
Save Active Set to Config Set 4 (in Config Edit Mode)												3s
Save Active Set to Config Set 5 (in Config Edit Mode)												3s
Save Active Set to Config Set 6 (in Config Edit Mode)												3s
Exit Config Edit Mode												3s
Enter Tone Mode												5s
Display IP Address												3s
Force Boot Loader Start (on Power Up)												5s
Reset Config to Defaults (on Power Up)												5s

## Connection Details

### Headphone Output – ¼ inch (6.35mm) stereo jack socket

Tip: Left  
 Ring: Right  
 Sleeve: Ground

### Microphone Input – Electronically balanced 3 pin female XLR-3

Pin1: Ground  
 Pin2: Phase  
 Pin3: Non-Phase

### Headset – 5 pin female XLR-5 (microphone input is electronically balanced)

Pin1: Ground  
 Pin2: Microphone Phase  
 Pin3: Microphone Non-Phase  
 Pin4: Headphone Left  
 Pin5: Headphone Right

### 4-Wire Inputs – Transformer balanced 3 pin female XLR-3

Pin1: Ground  
 Pin2: Phase  
 Pin3: Non-Phase

### Talkback Outputs – Transformer balanced 3 pin male XLR-3

Pin1: Ground  
 Pin2: Phase  
 Pin3: Non-Phase

### IFB Inputs – Transformer balanced 3 pin female XLR-3

Pin1: Ground  
 Pin2: Phase  
 Pin3: Non-Phase

### Microphone Output – Electronically balanced 3 pin male XLR-3

Pin1: Ground  
 Pin2: Phase  
 Pin3: Non-Phase

### Remotes 1 – 15-way 'D'-type socket

Pin1: Channel 1 Talk active – open collector output  
 Pin2: Channel 2 Talk active – open collector output  
 Pin3: Channel 3 Talk active – open collector output  
 Pin4: Channel 4 Talk active – open collector output  
 Pin5: Channel 5 Talk active – open collector output  
 Pin6: Channel 6 Talk active – open collector output  
 Pin7: Channel 7 Talk active – open collector output  
 Pin8: Channel 8 Talk active – open collector output  
 Pin9: Group Talk active – open collector output  
 Pin10: Loudspeaker Dim active – open collector output  
 Pin11: Loudspeaker Mute active – open collector output  
 Pin12: Channels 1-8 Audio Call active – open collector output  
 Pin13: Ground  
 Pin14: Ground  
 Pin15: Ground

### Remotes 2 – 15-way 'D'-type socket

Pin1: Channel 1 Remote Call – active low input  
 Pin2: Channel 2 Remote Call – active low input  
 Pin3: Channel 3 Remote Call – active low input  
 Pin4: Channel 4 Remote Call – active low input  
 Pin5: Channel 5 Remote Call – active low input  
 Pin6: Channel 6 Remote Call – active low input  
 Pin7: Channel 7 Remote Call – active low input  
 Pin8: Channel 8 Remote Call – active low input  
 Pin9: Loudspeaker Dim enable – active low input  
 Pin10: Loudspeaker Mute enable – active low input

Pin11: no connection  
Pin12: no connection  
Pin13: Ground  
Pin14: Ground  
Pin15: Ground

**Loudspeaker Output – ¼ inch (6.35mm) jack socket**

Tip: Speaker Positive  
Ring: Speaker Negative  
Sleeve: Ground

## Technical Specification

### Microphone and Headset Input

Gain Range:	+6dB to +69dB
Maximum Input Level:	-2dBu
Frequency Response:	±0.5dB 20Hz to 15kHz at MIC output Ref. 50dB gain @ 1kHz
Filter Bandwidth:	150Hz to 5500Hz

### Headphone Output

Gain Range:	-80dB to +18dB
Maximum Output Level:	+18dBu
Frequency Response:	±1dB 20Hz to 15kHz

### 4-Wire and IFB Inputs

Maximum Input Level:	+18dBu
Frequency Response:	±1dB 20Hz to 15kHz

### Talkback Output

Maximum Input Level:	+18dBu
Frequency Response:	±1dB 20Hz to 15kHz
Noise:	-85dB Average weighting

### Loudspeaker

Power Output:	6W
Volume:	Mute to full volume via front panel potentiometer
Dim Range:	Mute to full volume via front panel preset potentiometer

### Connections

Microphone:	XLR-3 pin female (electronically balanced)
-------------	--

Headphone:	¼ inch (6.35mm) stereo jack socket
Headset:	XLR-5 pin female (electronically balanced input)
4-Wire Inputs:	8 x XLR-3 pin female (transformer balanced)
IFB Inputs:	2 x XLR-3 pin female (transformer balanced)
Talkback Outputs:	8 x XLR-3 pin male (transformer balanced)
Microphone Output:	XLR-3 pin male (electronically balanced)
Loudspeaker Output:	¼ inch (6.35mm) stereo jack socket
Remote Inputs:	15-way 'D'-type socket
Remote Outputs:	15-way 'D'-type socket
Ethernet:	RJ-45, 10/100Mbps
Telephone:	4 x RJ11 6/4 (2 x line, 2 x handset) CM-TB8T only
Mains Input:	Universal filtered IEC, continuously rated 85-264VAC, 47-63Hz, 25W
Fuse Rating:	Anti-surge fuse 2A 20mm x 5mm

### Equipment Type

CM-TB8:	8 channel talkback control unit
CM-TB8T:	Add-in card with 2 x telephone hybrids
CM-TB8G:	Add-in card with 2 x GSM lines

### Physical Specification

Dimensions - Raw:	48cm (W) x 34.0cm (D) x 4.2cm (H) (1U)
Including Connectors:	19" (W) x 4.3" (D) x 1.7" (H) (1U)
Dimensions (Boxed):	57cm (W) x 52cm (D) x 15cm (H) 22.4" (W) x 20.5" (D) x 5.9" (H)
Weight:	Nett: 5.54kg Gross: 6.5kg Nett: 12.2lbs Gross: 14.3lbs

## CM-TB8T Introduction

The CM-TB8T is a dual PSTN, telephone hybrid expansion card. It extends the talkback capability of the unit by allowing telephone calls to be made and received on two independent analogue direct exchange or PSTN lines. Outgoing calls can be dialled directly from the unit, or from an external telephone handset connected to each of the two telephone channels. Once calls have been connected, the user can talk to each channel individually or conference 2 calls together.

The hybrids are fully configurable and are easy to setup. Simply select your location from a country code list to automatically configure the telephone interface for local line conditions. This setting also configures the relevant auto disconnect mode which can be enabled if required.

### Enabling the Telephone Interface

Before the telephone expansion card can be used, it needs to be enabled. The two telephone lines are assigned to channels 1 and 2 on the CM-TB8 and they can be independently enabled using the embedded web server. See the section on how to connect to the web server.

Once connected to the web server on the relevant CM-TB8, select the Channel Settings page under the Configuration tab. Channels 1 and 2 will have a new “Enable – PSTN Telephone Expansion Fitted” option available as shown in Fig 12-1.

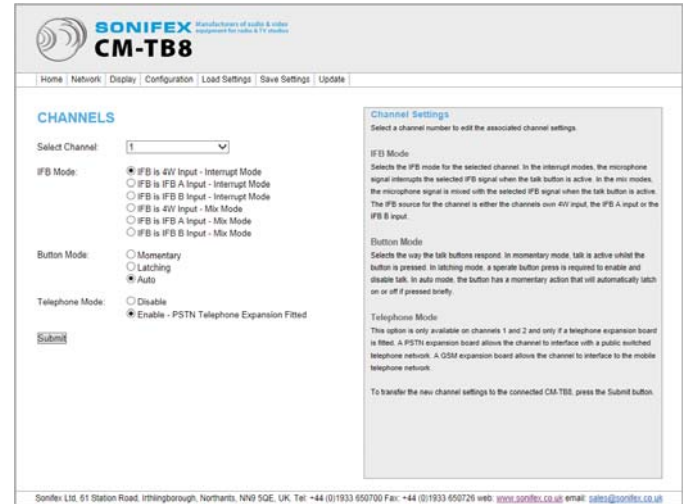


Fig 12-1: Channel Settings Page

Selecting this option will enable the telephone hybrid for the selected channel. The required channel must be connected to an analogue direct exchange line or PSTN line via the rear panel mounted RJ11 connector. An optional telephone handset can also be connected to the RJ11 handset connector. The telephone interface is not accessible unless a valid telephone line connection is made.

Once the telephone interface has been enabled, the relevant country code setting should be selected in the PSTN Settings page. This ensures that all telephone approval parameters are met for operation of this unit in various parts of the world.

## Making a Telephone Call

A telephone call can be made using an external telephone handset, or directly by dialling one of the stored numbers.

### Direct Dialling

The CM-TB8 can store 8 telephone numbers for direct dialling. These are entered using the embedded web server. To dial a stored number, press and hold the rotary control and then briefly press the talk button of the required channel, either 1 or 2. The rotary control can then be released. The talk buttons on channels 1 to 8 will illuminate amber if a valid telephone number has been entered in the corresponding telephone number edit on the PSTN page of the web server. For example, if telephone numbers have previously been entered in positions 4 and 7, then only the talk buttons on channels 4 and 7 will illuminate.

To dial the number, press one of the illuminated talk buttons. If no button is pressed within 3 seconds, the unit reverts to its previous state and the direct dialling mode is cancelled. When a valid number is selected, the unit will connect to the telephone line and dial the number and the corresponding talk button will illuminate amber. The audio on the telephone line can be monitored on the headphone/headset and loudspeaker outputs at the level set by the channels own monitor level potentiometer.

### Dialling Using an External Telephone Handset

Simply lift the receiver and dial the required number. The talk button on the corresponding channel will fast flash amber to indicate the handset is off hook. The talk button can be pressed to open the telephone line connection to the CM-TB8 in parallel with the handset if required. The talk button will then illuminate amber and the audio on the telephone line can be monitored on the headphone/headset and loudspeaker outputs at the level set by the channels own monitor level potentiometer.

## Receiving a Telephone Call

An incoming telephone call will cause the talk button on the corresponding channel to flash in the cadence pattern of the ring signal. If an external telephone handset is connected, this will ring in the normal way. The call can be answered by either pressing the talk button or lifting the handset. If the handset is used to answer the call, the talk button will fast flash amber to indicate the handset is off hook. If the handset is replaced prior to the talk button being pressed, the call is dropped. If the talk button is pressed, the CM-TB8 is connected to the telephone line and the talk button will illuminate amber.

The telephone enabled channel can also be configured to automatically answer an incoming telephone call. This is done in the PSTN settings page of the embedded web server. If enabled, the call will be answered after 2 rings. For double cadence ring tones, both rings in the cadence pattern will be counted.

## Handling a Connected Telephone Call

Once a telephone call is connected to the unit, the talk button on the corresponding channel illuminates amber. The channels audio call indication illuminates the talk button green when the signal from the telephone line rises above -12dB. The routing of audio through a telephone enabled channel depends on the selection of the IFB/4W switch.

**To use a connected telephone channel in 4W mode:** put the IFB/4W switch in the 4W position. In this mode, the signal from the connected telephone call is routed to the headphones/headset and loudspeaker at the level set by the channels own monitor level potentiometer, with the overall level controlled by the MON level potentiometer. The signal is also routed to the talkback output at the TB OUT connector. When the talk button is pressed, the microphone signal is routed to the telephone line, and the level of the feed to the loudspeaker (not headphones/headset) is reduced by the level



preset by the dim potentiometer. The channels 4W input is not used in this mode.

**To use a connected telephone channel in IFB mode:** put the IFB/4W switch in the IFB position. In this mode, the signal from the connected telephone call is routed to the headphones/headset and loudspeaker at the level set by the channels own monitor level potentiometer, with the overall level controlled by the MON level potentiometer. The signal is also routed to the talkback output at the TB OUT connector. The signal from the selected IFB input, either the channels own 4W IN input or one of the dedicated programme inputs, IFB A or IFB, is routed to the telephone line. When the talk button is pressed, the signal routed to the connected telephone line is either replaced by or mixed with the microphone signal, and the level of the feed to the loudspeaker (not headphones/headset) is reduced by the level preset by the dim potentiometer.

Once a telephone enabled channel is active, the corresponding talk button illuminates red and the handset is automatically disconnected from the telephone line.

## Ending a Telephone Call

To end a telephone call, briefly press the channels talk button whilst holding the rotary control. If an external handset is still off hook, the line will not disconnect from it. The handset must be replaced to fully clear the line.

The telephone enabled channel can also be configured to automatically disconnect a telephone call when the predefined line conditions or disconnect tone are detected. These conditions are defined as part of the selected country code settings and do not need to be configured separately. An option to enable auto disconnect is in the PSTN settings page of the embedded web server.

## Embedded Web Server

When the PSTN telephone expansion card is fitted, an additional web page is available for configuring related settings. The PSTN Settings page appears under the Configuration tab.

### PSTN Settings Page

**SONIFEX** Manufacturers of audio & video equipment for radio & TV studios  
**CM-TB8**

Home Network Display Configuration Load Settings Save Settings Update

### PSTN

Stored Telephone Numbers:

1:		5:	
2:		6:	
3:		7:	
4:		8:	

Enable Call Signal:   
 Auto Answer:   
 Auto Disconnect:

Receive Gain: 0dB  
 Transmit Gain: 0dB

Country Code Setting: United Kingdom 2

Edit Settings:

#### PSTN Settings

**Stored Telephone Numbers**  
 This CM-TB8 can store up to 8 telephone numbers which can be used to make outgoing PSTN calls. To make an outgoing call, press the PSTN channel talk button whilst holding the encoder control. Select the required telephone number by pressing the corresponding talk button on channels 1-8. Only channels with assigned telephone numbers will be illuminated.

**Enable Call Signal**  
 This option provides an audible indication of an incoming telephone call. The signal is routed to the monitor loudspeaker and the headphones.

**Auto Answer**  
 Auto answer connects the call after 2 rings. For double cadence ring tones, both rings in the cadence pattern will be counted.

**Auto Disconnect**  
 This option enables the auto disconnect method for the specific country according to the selected country code.

**Receive Gain**  
 Selects the gain setting for the signal coming from the telephone line.

**Transmit Gain**  
 Selects the gain setting for the signal going to the telephone line.

**Country Code Setting**  
 The country code setting configures the telephone interface in the CM-TB8 for the selected country or equipment type. It ensures that all telephone approval parameters

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Fig 12-2: PSTN Settings Page

**Telephone Numbers 1-8:** The CM-TB8 can store up to 8 telephone numbers that can be accessed by both of the telephone interface channels.

**Enable Call Signal:** When an external caller is ringing one of the telephone interface channels, this option routes an internally generated call signal to the monitor headphones/headset and loudspeaker. The signal matches the cadence pattern of the ring signal.

**Auto Answer:** This option automatically answers an incoming telephone call after 2 rings. For double cadence ring tones, both rings in the cadence pattern are counted.

**Auto Disconnect:** This option enables automatic call disconnection. K-break, line polarity reversal and dial tone disconnect modes are supported. The auto disconnect mode is defined by the country code selection.

**Receive Gain:** This trim control adjust the level of the signal from the telephone line in 3dB increments from -6dB to +6dB.

**Transmit Gain:** This trim control adjust the level of the signal routed to the telephone line in 3dB increments from -6dB to +6dB.

**Country Code Setting:** This setting configures the telephone interface in the CM-TB8 for the selected country or equipment type. It ensures that all telephone approval parameters are met for operation in various parts of the world.

**Edit Settings:** This option shows the current telephone interface parameters and allows them to be set manually. This is not required for normal operation and should only be done with settings provided by Sonifex Ltd. Modifying these parameters could make the telephone interface unstable.

## PSTN Telephone Interface Connection Details

### Telephone Line – RJ11 Socket

Pin 1: N/C

Pin 2: Earth Recall

Pin 3: Telephone Line A

Pin 4: Telephone Line B

Pin 5: Ringer

Pin 6: N/C

**Note:** When not used in the UK, connect pins 3 and 4 only for correct operation.

### Telephone Handset – RJ11 Socket

The connection details are the same as for the telephone line connector.

## CM-TB8G Introduction

The CM-TB8G is a dual GSM, mobile telephone expansion card. It extends the talkback capability of the unit by allowing telephone calls to be made and received on two independent mobile telephone lines. Outgoing calls can be dialled directly from the unit from a predefined list of numbers. Once calls have been connected, the user can talk to each channel individually or conference 2 calls together.

The GSM modules are quad band units and can connect to virtually any mobile telephone voice network - worldwide. They are automatically configured to connect to the mobile network designated by a user installed Subscriber Identity Module (SIM). The SIM card readers are internally mounted to prevent unauthorised tampering.

### SIM Card Requirements

Before the GSM telephone expansion card can be used, a valid mini-SIM card needs to be installed for the required channels. In order for a SIM card to work in the CM-TB8, the following requirements must be met:

- The SIM card needs to be enabled and pre-activated for the required network.
- The SIM card must not be locked with a PIN or PIN2 code or be in a state where a PUK or PUK2 code is required.
- In order to make telephone calls, the SIM card should be associated with a suitable mobile telephone contract or pre-loaded with sufficient call time credit. The CM-TB8 GSM interface does not allow management of a "Pay As You Go" style mobile account.

The CM-TB8 does not allow PIN or PUK codes to be entered, so a SIM that is locked with a PIN or PIN2 code, or requires a PUK or PUK2 code cannot be used.

PIN stands for Personal Identification Number, PUK stands for PIN Unlock Key.

### Installing a SIM Card

The SIM card readers for the GSM telephone interface is located inside the unit. To install a SIM card, proceed as follows:

1. Ensure that mains power to the unit is switched off.
2. Remove the 12 small Philips screws from the top panel of the unit and remove the top panel.
3. The GSM telephone expansion card is located toward the front of the unit, and it is mounted on top on the main circuit board.
4. The 2 SIM card readers are on the front of the GSM expansion card and the SIM cards are inserted from the front, with the contacts facing down. The SIM card reader for channel 1 is located on the right, whilst channel 2 is on the left.
5. Reposition the top panel and replace the 12 small Philips screws to secure it.

### Enabling the Telephone Interface

Before the telephone expansion card can be used, it needs to be enabled. The two telephone lines are assigned to channels 1 and 2 on the CM-TB8 and they can be independently enabled using the embedded web server. See the section on how to connect to the web server.

Once connected to the web server on the relevant CM-TB8, select the Channel Settings page under the Configuration tab. Channels 1 and 2 will have a new "Enable – GSM Telephone Expansion Fitted" option available as shown.

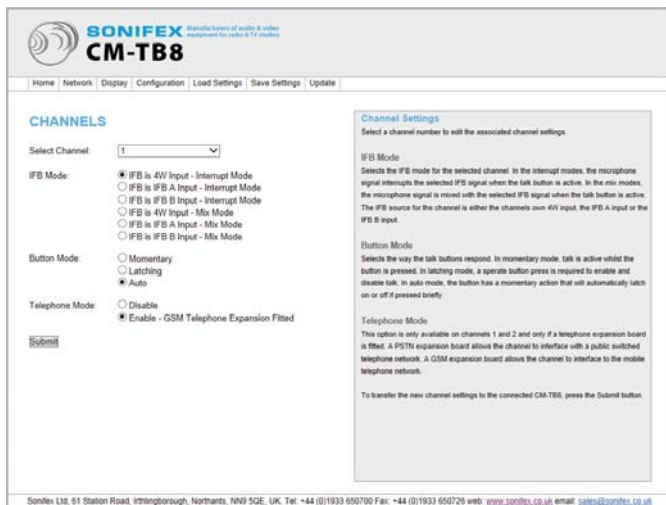


Fig 13-1: Channel Settings Page

Selecting this option will enable the mobile telephone interface for the selected channel. The required channel must have a suitable GSM antenna connected to the rear panel mounted SMA connector, otherwise the channel will not be able connect to the mobile network.

## Making a Telephone Call

A telephone call is made by dialling one of the way the stored numbers. The CM-TB8 can store 8 telephone numbers and these are entered using the GSM settings page of the embedded web server. Calls can be made and received using the web server or directly using the front panel controls.

## Direct Dialling

Press and hold the rotary control and then briefly press the talk button of the required telephone channel, either 1 or 2. The rotary control can then be released. The talk buttons on channels 1 to 8 will illuminate amber if a valid telephone number has been entered in the corresponding telephone number edit on the web page. For example, if telephone numbers have previously been entered in positions 4 and 7, then only the talk buttons on channels 4 and 7 will illuminate. To dial the number, press one of the illuminated talk buttons. If no button is pressed within 3 seconds, the unit reverts to its previous state and the dialling mode is cancelled.

## Dialling Using The Web Server

Use the left/right selection buttons either side of the dial button to select the stored telephone number, and then press the dial button.

When a valid number is selected, the unit will attempt to dial the number if network conditions and signal strength allow. When a number is being dialled, the talk button on the channel will fast flash amber, and the status will be shown on the web page. The audio on the telephone line can be monitored on the headphone/headset and loudspeaker outputs at the level set by the channels own monitor level potentiometer. Once a telephone call is connected the corresponding talk button will illuminate amber.

## Receiving a Telephone Call

An incoming telephone call will cause the talk button on the corresponding channel to flash in the cadence pattern of the ring signal. The call controls on the web page will change to allow handling of the call, and the callers' number will be displayed if available.

**To answer the call using the front panel controls:** briefly press the channels talk button.

**To answer the call using the web server:** press the answer button. Alternatively, press the ignore button to drop the call.

When the call is connected, the channels talk button will illuminate amber. The telephone enabled channel can also be configured to automatically answer an incoming telephone call. This is done in the GSM settings page of the embedded web server. If enabled, the call will be answered after 2 rings.

## Handling a Connected Telephone Call

Once a telephone call is connected to the unit, the talk button on the corresponding channel illuminates amber. The channels audio call indication illuminates the talk button green when the signal from the telephone line rises above -12dB. The routing of audio through a telephone enabled channel depends on the selection of the IFB/4W switch.

**To use a connected telephone channel in 4W mode:** put the IFB/4W switch in the 4W position. In this mode, the signal from the connected telephone call is routed to the headphones/headset and loudspeaker at the level set by the channels own monitor level potentiometer, with the overall level controlled by the MON level potentiometer. The signal is also routed to the talkback output at the TB OUT connector. When the talk button is pressed, the microphone signal is routed to the telephone line, and the level of the feed to the loudspeaker (not headphones/headset) is reduced by the level pre-set by the dim potentiometer. The channels 4W input is not used in this mode.

**To use a connected telephone channel in IFB mode:** put the IFB/4W switch in the IFB position. In this mode, the signal from the connected telephone call is routed to the headphones/headset and loudspeaker at the level set

by the channels own monitor level potentiometer, with the overall level controlled by the MON level potentiometer. The signal is also routed to the talkback output at the TB OUT connector. The signal from the selected IFB input, either the channels own 4W IN input or one of the dedicated programme inputs, IFB A or IFB, is routed to the telephone line. When the talk button is pressed, the signal routed to the connected telephone line is either replaced by or mixed with the microphone signal, and the level of the feed to the loudspeaker (not headphones/headset) is reduced by the level pre-set by the dim potentiometer.

Once a telephone enabled talk channel is active, the corresponding talk button illuminates red.

## Ending a Telephone Call

**To end a call using the front panel controls:** briefly press the channels talk button whilst holding the rotary control.

**To end a call using the web server:** press the end call button.

The telephone call will be cleared and the talk button will return to the un-illuminated state.

## Embedded Web Server

When the GSM mobile telephone expansion card is fitted, an additional web page is available for configuring related settings. The GSM Settings page appears under the Configuration tab.

## GSM Settings Page

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**CM-TB8**

Home Network Display Configuration Load Settings Save Settings Update

### GSM

**Channel 1**

Own Number:

Operator: vodafone UK

Signal Strength: -57dBm (excellent)

Status: Ready to dial 01933650700

Call Control:

**Channel 2**

Own Number:

Operator: vodafone UK

Signal Strength: -99dBm (poor)

Status: Ready to dial 01933651856

Call Control:

**Stored Telephone Numbers**

1:	01933650700	5:	
2:		6:	
3:	01933651856	7:	
4:		8:	

Enable Call Signal:

Enable End Signal:

Auto Answer:

Receive Gain:

Transmit Gain:

**GSM Information & Control**

Own Number  
The telephone number of the channel can be entered here for reference purposes only. It does not change the registered number.

Operator  
This is the name of the mobile telephone network operator that the channel is currently registered to.

Signal Strength  
This shows the approximate strength of the mobile telephone network signal.  
Below -95dBm is very poor and is below the level required to make and receive calls.  
Between -95dBm and -85dBm is poor and may lead to voice break up or dropped calls.  
Between -85dBm and -75dBm is ok.  
Between -75dBm and -70dBm is good.  
Above -70dBm is excellent.

Status  
This shows the current status of the mobile telephone connection.

Call Control  
These controls can be used to make and receive telephone calls. To make a telephone call, select the stored telephone number entry using the left right buttons and press the dial button. Incoming calls can be answered or ignored by pressing the appropriate button. To end a telephone call, press the end call button.

Reset  
This button resets the GSM module and should only be used if the telephone channel becomes unresponsive. Please note: the GSM reset process takes several seconds to complete. However, calls from the channel will be disconnected.

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Fig 13-2: GSM Settings Page

The top section of the page shows information for Number, Operator, Signal Strength and Status for each channel, and various controls for operating the GSM telephone channel.

**Number:** The mobile telephone number of the channel can be entered here for reference purposes only, it does not change the actual number assigned to the SIM card. The mobile number given by the operator is not stored on the SIM card, it is resolved at network level when required. Therefore, it is not possible to show the number automatically.

**Operator:** This shows the network operators name that the channel is registered to. If the channel registration failed, "Not Registered" will be shown. An error code may also be shown to indicate why the channel could not access the network. If an error code is not shown, registration failure could be due to the quality of the network signal strength. Check the antenna connection and position. A list of common error codes is shown below:

Error code 18: The SIM card for this channel is absent or is not working.

Error code 19: The SIM is locked with a Personal Identification Number (PIN). Please see SIM Card Requirements.

Error code 20: The SIM is locked and requires a Pin Unlock Key (PUK). Please see SIM Card Requirements.

Error Code 21: The SIM card has a fault.

Error Code 25: The SIM is locked with a Personal Identification Number (PIN2). Please see SIM Card Requirements.

Error Code 26: The SIM is locked and requires a Pin Unlock Key (PUK2). Please see SIM Card Requirements.

**Signal Strength:** This shows the quality of the signal from the registered network. Adjusting the position of the antenna can significantly affect the signal strength.

**Status:** This shows the current status of the telephone channel. When receiving an incoming call, the callers' number will be shown here if available.

**Call Control:** The controls shown will depend on the current status of the telephone channel. When the channel is idle, the dial controls are shown. When an incoming call is ringing, controls to either answer or ignore the call are shown. When a call is connected, the end call control is shown.

**Reset:** The reset button is used to re-initialise the GSM telephone channel if it becomes unresponsive. Please note: the reset process can take up to 30 second to complete during which time the channel will be disabled.

**Show Call Log:** This button shows the call log for the selected channel which details the last 10 telephone calls. Each entry will show the telephone number (if available), the date and time of the call and an indication of whether the call was dialled (out), received (in) or missed (miss). At the bottom of the call log is the delete call log button which clears all log entries.

**Telephone Numbers 1-8:** The CM-TB8 can stored up to 8 telephone numbers that can be accessed by both of the telephone interface channels.

**Enable Call Signal:** When an external caller is ringing one of the mobile telephone channels, this option routes an internally generated call signal to the monitor headphones/headset and loudspeaker. The signal matches the cadence pattern of the ring signal.

**Enable End Signal:** This option routes an internally generated audible signal to the monitor headphones/headset and loudspeaker when a call is ended.

**Auto Answer:** This option automatically answers an incoming telephone call after 2 rings.

**Receive Gain:** This trim control adjust the level of the signal from the telephone line in 3dB increments from -6dB to +6dB.

**Transmit Gain:** This trim control adjust the level of the signal routed to the telephone line in 3dB increments from -6dB to +6dB.

Once the required changes to the GSM options have been made, press the Submit button to implement them.

## GSM Specifications

Operating Frequency:	Quad Band 850 / 900 / 1800 / 1900 MHz
Output Power:	Class 4 (2W) @ 850 / 900 MHz Class 1 (1W) @ 1800 / 1900 MHz
Sensitivity:	-107 dBm (typ.) @ 850 / 900 MHz -106 dBm (typ.) @ 1800 / 1900 MHz

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