X16

MADI MERGE UNIT

Installation & User Manual

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Introduction

Thank you for purchasing the X16 MADI Merge Unit from Cadac Electronics plc.

The Cadac X16 is a 1U rack mount unit capable of receiving up to four optical MADI (Multitrack Audio Digital Interface) streams from Cadac's M16 Remote Controlled Microphone Amplifiers, or other devices. Each MADI stream received from an M16 consists of 16 required audio channels (Ch1 - Ch16). The X16 combines these channels in order to provide a single combined MADI output stream, in both optical and coaxial formats. This output stream can comprise of a maximum of 64 channels at 48kHz sampling frequency, or 32 channels at 96kHz sampling frequency.

The X16 is designed to operate in Standard and Extended MADI modes, enabling both 56/28 and 64/32 channel operation.

Output connectivity is provided in the form of four paired MADI outputs. Each pair comprising both optical (SC) and coaxial (BNC) interfaces. The X16 is therefore capable of providing up to eight MADI output streams derived from the combination of the 4 x 16 channels sourced from Cadac M16 or other systems. This provides the functionality of an 8-way MADI distribution system.

By offering multiple MADI outputs, the X16 becomes the heart of a centralised digital distribution system. In the case of an M16/X16 Remote Mic-Pre/Stage Rack system, it provides a powerful digital audio distribution system, enabling multiple microphone sources to be routed throughout a fixed installation or live venue completely within the digital domain from a single 1U rack mount enclosure.

An additional mode enables the X16 to operate independently of Cadac M16 units, providing up to four 1 in/2 out MADI distribution amplifiers. This feature enables four independent optical MADI streams (of up to 64 channels each) to be made available on both an optical and coaxial output connector, and is an ideal choice for any space conscious installation requiring multiple MADI interface conversions or additional routing capability.

Finally, the X16 incorporates a very practical wordclock distribution system. Not only can the X16 slave to an external wordclock sync source, it also incorporates a very stable temperature compensated inbuilt wordclock generator, enabling the X16 to become the wordclock master in a digital audio system. Four additional wordclock outputs are also provided as standard, to enable the distribution of stable and buffered sync sources in a star topology. This avoids the need to daisy-chain wordclock signals from device to device.

We trust that the Cadac X16 will bring many years of satisfaction and thank you for your patronage.

The Cadac team

Features

- Ability to merge 4 streams of optical MADI.
- Provides multiple optical and coaxial MADI outputs as standard.
- Operates in both Standard and Extended MADI formats.
- Provides facilities to operate at both 48kHz and 96kHz sampling.
- Integral Master Wordclock Generator.
- Provides multiple buffered Wordclock outputs.
- Uncluttered and intuitive front and rear panel.
- Designed to exceed current EMC directives, and immune from receiving or transmitting radio frequency interference.

Using the X16 Manual

In order to obtain the most out of your X16, please read the User Manual carefully.

Prior to installing and using the X16, it is also important that you have read both **Safety Instructions** and **Important Information.**

If you still have a problem that cannot be resolved by referring to this manual, then please contact your local Cadac distributor.

All information provided within this user manual is provided in good faith. Cadac follows a policy of continual product development; changes to equipment specification may be made without prior notice.

Declaration of Conformity

The Directives covered by this Declaration

89/336/EEC Electromagnetic Compatibility directive, amended by 92/31/EEC & 93/68/EEC

The Products Covered by this Declaration

X16 MADI Merge Unit.

The Basis on which Conformity is being Declared

The products identified above comply with the requirements of the above EU Directives by meeting the following standards:

BS EN 55103-1:1997	Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1 – Emissions
BS EN 55103-2:1997	Electromagnetic Compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2 – Immunity
BS EN 60065:1998	Audio, Video and similar electronic apparatus. Safety requirements.

Signed:.....

Authority: General Manager

Date: 1 March 2006

Attention!

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request, and are also contained in the X16 Installation & User manual.

1 Important Safety Instructions

1.1 Mains Cable

The supplied IEC mains cable must be correctly terminated before use. Use only an approved AC plug or power distribution device. Safety ground must be connected at all times.

Safety Earth = Green/Yellow
Live = Brown
Neutral = Blue

1.2 Changing the Fuse

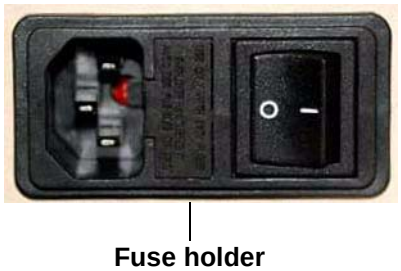
To avoid the risk of fire, use only the recommended fuse type as indicated in this manual and on the X16. Do not short-circuit the fuse holder.

Before changing the fuse, always switch off the unit and remove the IEC mains cable.

NOTE: Both Live and Neutral are fused, therefore the X16 fuse holder contains TWO fuses. Do not make the mistake of thinking that one is a spare!

To replace a fuse, remove the fuse holder (located adjacent to the IEC mains socket) by pulling the tab that projects slightly over the lip of the socket.

FIG 1-1. Remove the fuse holder



Replace the blown fuse with an identical type. See Fuse Types below for further details.

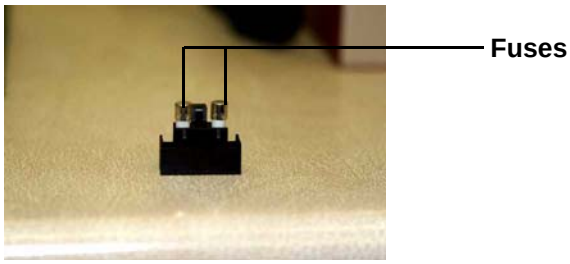


FIG 1-2. Replace the fuse

Refit the fuse holder, taking care to align it properly. The guide arm of the fuse holder slots into the power connector assembly.

Once in place, push the fuse holder home and confirm that it is fully seated.

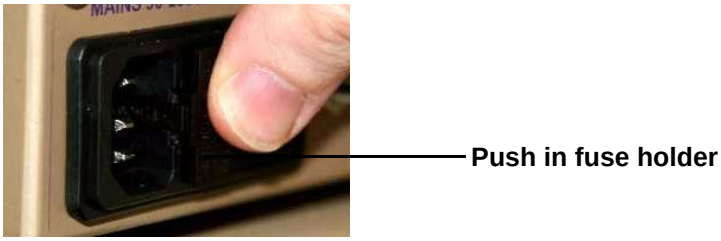


FIG 1-3. Push the fuse holder home

1.3 Fuse Types

Live: 90v - 250v: 1A Type T
Neutral: 90v - 250v: 1A Type T

1.4 Servicing

There are no serviceable parts contained within the X16. Refer all servicing to your Cadac distributor.

1.5 Do not remove any covers

Within the X16 are areas where high and dangerous voltages are present. Removing any covers will invalidate warranty.

1.6 Safety checklist

- Install in accordance with Cadac's instructions.
- Do not place the apparatus on an unstable or uneven surface.
- Do not insert objects through any apertures. Doing so could result in damage to the unit or electric shock.
- Do not use this apparatus near water.
- Do not block any of the ventilation openings
- Do not install near any heat sources.
- Do not install near naked flames.
- Protect the mains cable from being stressed or pinched.
- For optimum results, do not use the X16 on the same electrical circuit as industrial equipment, such as motors, stage machinery or any other equipment that causes noise or switching transients on the mains circuit.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Adjust only those controls that are covered by the operating instructions.
- Use only the mains cable provided with the X16. Other cables may not have sufficient current rating.
- Do not operate this unit with the cover removed.
- Unplug the unit before cleaning.

2 Important information

2.1 Unpacking

The first thing to do when receiving a new X16 is to confirm that the unit hasn't been damaged in transit and that all items are contained within the packaging.

The X16 packaging contains:

- 1 x X16
- 1 x IEC mains cable (either fitted with UK or US style plug, or unwired depending on country of use)
- 1 x operations manual

Please retain packaging until all items are accounted for and found to be operating correctly.

2.2 Operational Considerations

AC mains voltage

The X16 is intended for use throughout the world and therefore the internal power supply allows operation through the following AC mains voltages:

Mains voltage: 90v - 250v AC
Mains frequency: 50/60Hz

AC mains connection

The rear panel of the X16 houses the AC mains inlet on an IEC style connector. The mains cable supplied with the X16 is also fitted with a moulded IEC connector. Excluding UK and USA models, no plug has been fitted to this mains lead, therefore this will need to be wired (see 1.1.Mains Cable). Obtain professional advice from a qualified electrician if unsure.

2.3 Cleaning

Before cleaning the X16, make sure the unit is switched off and the mains plug is removed from the socket.

Only use a mildly damp cloth to clean the X16. Never use any domestic or commercial cleaning agents as these can cause damage to external surfaces and components.

2.4 Installation

When fixing the X16 into any 19” rack mount frame, take into account the stresses that can be exerted on the rack ears if they are the only means of support. Damage to the chassis could especially occur during transportation if the X16 is not supported on rails within a flight case. Cadac strongly recommends that as well as fixing the X16 to the frame via the rack ears, support rails also be employed.

3 The X16 MADI Merge Unit

3.1 X16 Front Panel

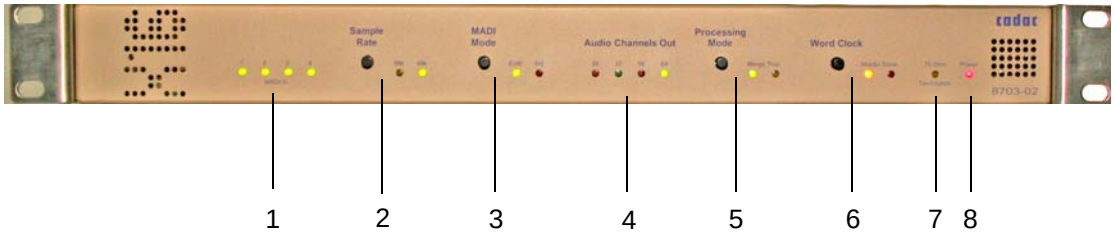


FIG 3-4. X16 front panel layout

1. MADI In LEDs
2. Sample Rate Mode Switch with LED Indication
3. MADI Mode Switch with LED Indication
4. Audio Channels Out LEDs
5. Processing Mode with LED Indication
6. Wordclock Switch with LED Indication
7. 75 Ohm Wordclock Termination LED
8. Mains Power LED

3.2 X16 Rear Panel

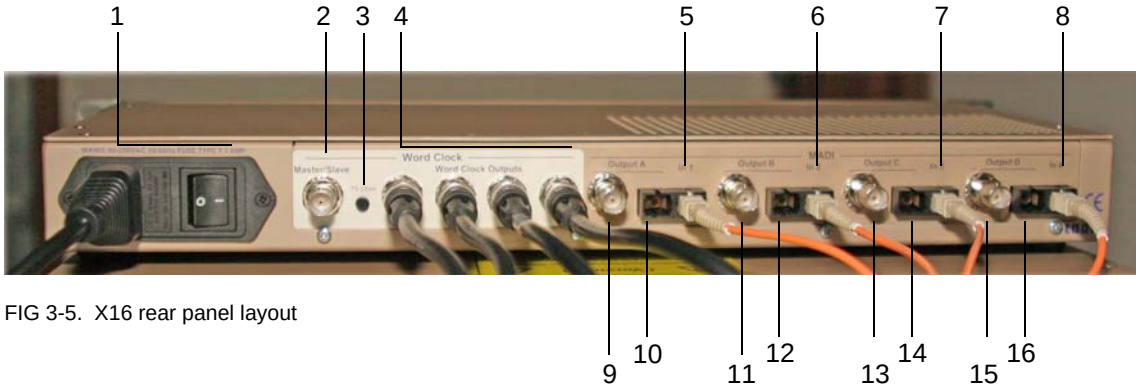


FIG 3-5. X16 rear panel layout

1. Mains Inlet, Fuse and Power Switch
2. Wordclock Master/Slave BNC
3. Wordclock Termination Switch
4. Buffered Wordclock Outputs 1through 4
5. Optical MADI Input #1
6. Optical MADI Input #2
7. Optical MADI Input #3
8. Optical MADI Input #4
9. MADI Output A - BNC
10. MADI Output A - Optical SC
11. MADI Output B - BNC
12. MADI Output B - Optical SC
13. MADI Output C - BNC
14. MADI Output C - Optical SC
15. MADI Output D - BNC
16. MADI Output D - Optical SC

3.3 Connecting up your X16

3.3.1 Mains power

Make sure that your IEC power connector is wired correctly (see 1.1 Mains Cable).

Fit the IEC cable to the rear power connector on the X16, making sure that it is fitted securely and the cable is stress free.

3.3.2 MADI Inputs

The four MADI input connections on the X16 use optical SC housings and are located on the rear panel of the unit. See 3.2 X16 Rear Panel. If using the X16 with multiple M16 devices then optical cables will be routed from the transmit (**Tx**) SC housing of the M16 to one of the MADI input connectors of the X16.

Carefully remove the cover from the duplex SC housings on the X16 rear panel. This will reveal two optical connection points. One is labelled **In#** (where # represents inputs 1, 2, 3 or 4) and the other is labelled **Output*x*** (where *x* represents outputs A, B, C or D.)

NOTE: Take care to store the connector cover in a safe place.

Take the optical cable from the M16, or other device, and carefully insert the mating connector into the receive (**In#**) connector housing on the X16, making sure that the locating key on the cable connector is aligned with the locating slot on the receive (**In#**) connector housing. Once correctly inserted, the optical connector should lock into place. Repeat this process for each input required.

Note: Always work in a sequential order starting from **MADI In1** and working your way to **MADI In4**. It is not a requirement however, to use all four input connectors.

NOTE: Confirm that the optical connector is securely locked in place and that it is correctly located in the receive (In*x*) connector.

3.3.3 MADI Outputs

The X16 provides four optical SC connectors and four coaxial BNC connectors on the rear panel for output connectivity. See 3.2 X16 Rear Panel. These are grouped into pairs with one SC connector and one BNC connector being available for each output group. Specific operation of each output group (OutputA, OutputB, OutputC and OutputD) is dependant on the selected operating mode of the X16. See 3.5 X16 MADI Merge Operation.

To connect to the optical SC housings, repeat the procedure explained in 3.3.2 MADI Inputs, but fit the optical SC connectors in one of the **Output*x*** connector housings.

If using coaxial cables within the MADI system, then these should be fitted with male BNC connectors. Fix these onto the appropriate mating BNC connector on the X16 rear panel and lock them into place by giving the connector shell a quarter turn (clockwise.)

3.3.4 Wordclock Master/Slave

A single BNC connector located on the X16 rear panel can operate either as a wordclock master or slave. See 3.2 X16 Rear Panel. The choice of whether this connector is going to act as a master or slave is dependent on the overall system design and how all the digital equipment within the audio system will be synchronised. If the X16 is to slave to an external workclock source then connect a 75 Ohm coaxial cable, preferably directly from the wordclock master, to the X16 Wordclock Master/Slave BNC connector and lock it into place by giving the connector shell a quarter turn (clockwise.)
If the X16 is to act as the wordclock master then connect the 75 Ohm coaxial cable and run it to the wordclock input of the receiving device.

NOTE: Do not forget to set the X16 to the correct synchronisation mode. See 3.4 Configuring the X16.

NOTE: If the X16 is either the last in a chain of devices, or the only unit to receive an external wordclock synchronisation source, then the 75 Ohm termination will need to be switched into circuit. See 3.3.4 Wordclock Master/Slave

3.3.5 Buffered Wordclock Outputs 1 - 4

The X16 is designed to provide four M16s, or other devices, with high quality wordclock sources designed to improve overall audio performance. These wordclock outputs connect directly to the M16's, or other device's wordclock input connectors.

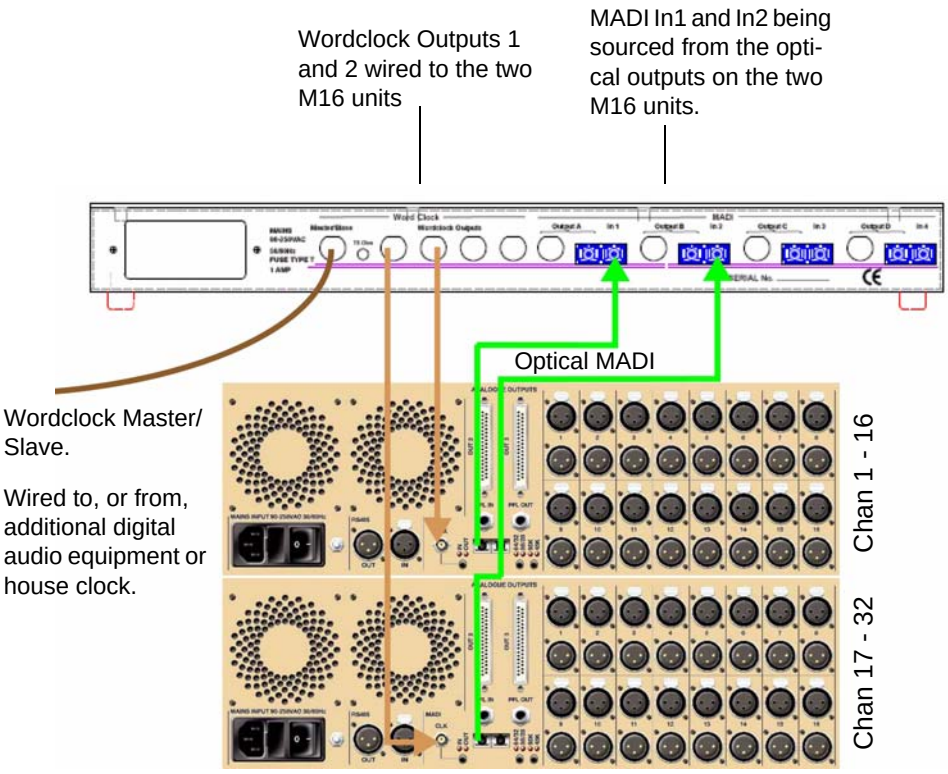
NOTE: If the device receiving the X16 wordclock source is fitted with just one BNC connector, make sure that it is set to Slave.

NOTE: If no 75 Ohm termination switch is provided on the receiving device then a 75 Ohm load should be fitted to a BNC 'T' piece.

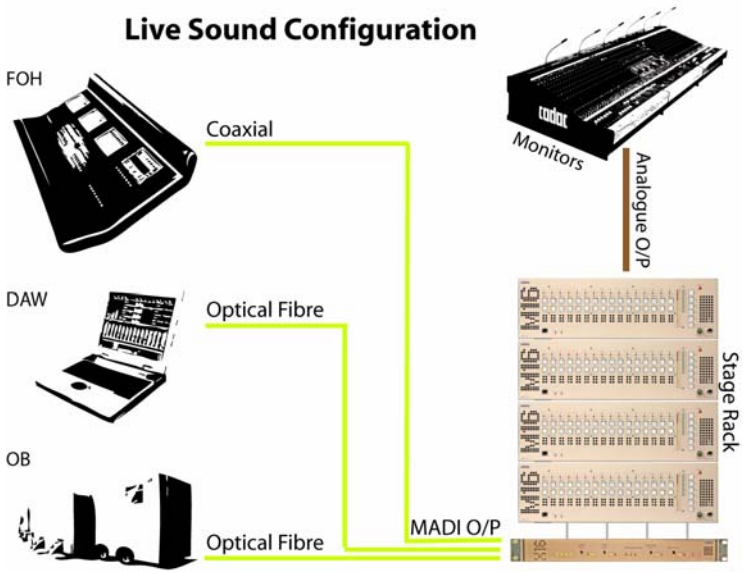
Connect a 75 Ohm coaxial cable to each of the wordclock outputs on the X16 (making sure to securely lock them into place by giving the connector shells a quarter turn clockwise) and repeat the process for the wordclock inputs on the receiving devices.

3.3.6 Connections for M16/X16 Systems.

The following diagram details the interconnects required when configuring a 32 channel M16/X16 Remote Mic-Pre/Stage Box system. Output MADI connections have been omitted for clarity.



Output connections can route to any item of audio equipment that accepts MADI signals, whether they be provided via coaxial cable or fibre optics. An example can be seen below.



3.4 Configuring the X16

3.4.1 Power On

Power on the X16 using the main power switch located on the rear panel adjacent to the IEC connector. The front panel Power LED will illuminate once power is received to the unit.

NOTE: A set power-on sequence is not required for the X16 to operate properly.

3.4.2 MADI Mode

Before the X16 can properly merge audio data, it is important to configure it correctly to meet the configurations of the transmitting audio devices.

NOTE: If the MADI configuration of the transmitting devices differ to the that of the X16 then the X16 will not merge audio data.

- Select the sampling rate. Press the **Sample Rate** switch to select either **48kHz**, or **96kHz** operation. LED indication is provided to confirm selection.

- Select the MADI format. Press the **MADI Mode** switch to select either Standard (**Std**) or Extended (**Ext**) MADI format. LED indication is provided to confirm selection.

The Standard MADI protocol follows the origins of the format and caters for 56 audio channels at 48kHz. The more recent Extended MADI format allows for 64 channels to be streamed down one cable at 48kHz sampling. When operating at the higher sampling frequency of 96kHz, the available channel count is effectively halved, therefore providing 28 channels in Standard MADI mode and 32 channels when operating in Extended MADI mode. You will be able to confirm the number of available channels by looking at the **Audio Channels Out** section.

- **Audio Channels Out**. This section provides visual confirmation of the number of channels that the X16 is configured to work with. One of the four LEDs will illuminate to confirm channel operating conditions. These are: 28; 32; 56 and 64 channels.

- Select the Processing Mode. Press the **Processing Mode** switch to select either **Merge** or **Thru**. LED indication is provided to confirm selection.

Merge configures the X16 to Merge the first 16 channels of each connected MADI input together. See 3.5 X16 MADI Merge Operation for further details.

Thru configures the X16 to pass up to four complete MADI streams directly to a four pairs of output connectors (one SC and one BNC) without affecting the MADI stream itself. See 3.5.3 MADI Thru Mode for further details.

- Select Wordclock Master or Slave. Press the **Wordclock** switch to select either **Master** or **Slave**. LED indication is provided to confirm selection. See 3.5.4 Wordclock Synchronisation for further details on how this operates.

- Select whether Wordclock termination is required if receiving an external clock source. If it is, then press in the 75 Ohm termination switch (located on the rear panel) and the corresponding front panel LED will illuminate.

NOTE: Wordclock termination is only required if the X16 is synchronising to external wordclock and it is either a) the only device connected to the master clock source, or b) at the end of a daisy-chain of connected devices (not best practice!)

If all settings correspond with the connected MADI devices and everything is synchronised properly, the corresponding green MADI In LEDs located on the far left of the front panel (see 3.1 X16 Front Panel) will illuminate. If problems do occur then these LEDs will provide status indication to enable quick trouble shooting. For further information concerning see 3.5.5 X16 LED Error Indication.

3.5 X16 MADI Merge Operation

The following chapters describe in detail the operation of the X16 when configured to merge multiple MADI streams together.

3.5.1 48kHz Mode MADI Merge

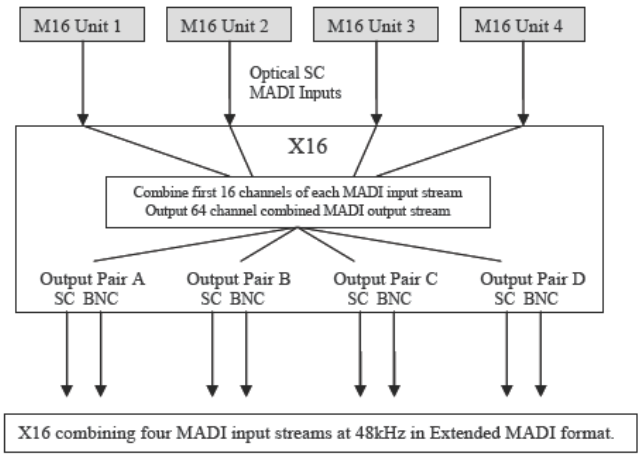
In this mode the X16 can receive up to four optical MADI streams sourced from a maximum of four Cadac M16s, or other devices. The first 16 channels of each MADI stream (channels 1 to channels16) are derived from the sixteen channels of each M16. Subsequent channels within each of the MADI streams (channels 17 and above) are not required and ignored.

The X16 combines the first sixteen channels of each MADI input together, ascending from Input 1 (**In1**) through to Input 4 (**In4**), therefore creating a single stream of 64 channels (when operating in Extended MADI mode.) This combined MADI stream is made available to all eight MADI output connectors.

X16 Optical MADI Input	*1*	*2*	*3*	*4*
M16 Unit Number	*Unit 1*	*Unit 2*	*Unit 3*	*Unit 4*
M16 Channel Number	*1-16*	*1-16*	*1-16*	*1-16*
Combined Channels for Extended MADI outputs.	*1-16*	*17-32*	*33-48*	*49-64*

In Standard 56 channel MADI mode, the last 8 channels from Input 4 (**In4**) - M16 Unit 4/channels 9 through 16 - will not be combined into the MADI output stream.

X16 Optical MADI Input	*1*	*2*	*3*	*4*
M16 Unit Number	*Unit 1*	*Unit 2*	*Unit 3*	*Unit 4*
M16 Channel Number	*1-16*	*1-16*	*1-16*	*1-8*
Combined Channels for Standard MADI output.	*1-16*	*17-32*	*33-48*	*49-56*



X16 combining four MADI input streams at 48kHz in Extended MADI format.

3.5.2 96kHz Mode MADI Merge

In this mode, the X16 can receive up to four optical MADI streams sourced from a maximum of four Cadac M16s, or other devices. However, the maximum number of channels within a MADI stream is 32, therefore in 96kHz operation the X16 will provide two completely independent outputs for two pairs of M16 devices.

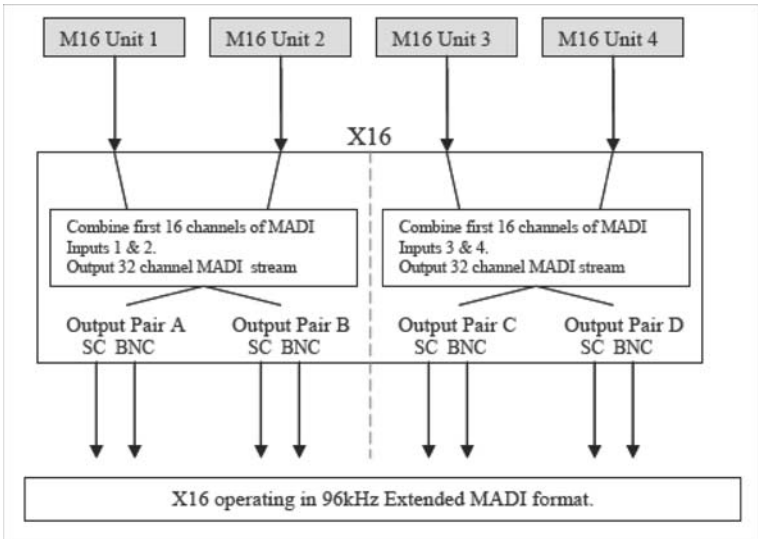
X16 Optical MADI Input	*1*	*2*	*3*	*4*
M16 Unit Number	*Unit 1*	*Unit 2*	*Unit 3*	*Unit 4*
M16 Channel Number	*1-16*	*1-16*	*1-16*	*1-16*
Combined Channels for Extended MADI outputs.	*1-16*	*17-32*	*1-16*	*17-32*

In Standard 28 channel MADI mode, the last 4 channels from MADI Input 2 (**In2**) and MADI Input 4 (**In4**) will not be combined into the MADI output streams.

X16 Optical MADI Input	*1*	*2*	*3*	*4*
M16 Unit Number	*Unit 1*	*Unit 2*	*Unit 3*	*Unit 4*
M16 Channel Number	*1-16*	*1-16*	*1-16*	*1-8*
Combined Channels for Standard MADI outputs.	*1-16*	*17-28*	*1-16*	*17-28*

MADI output pairs **OutputA** and **OutputB** are sourced from the combination of Input 1 (**In1**) and Input 2 (**In2**)

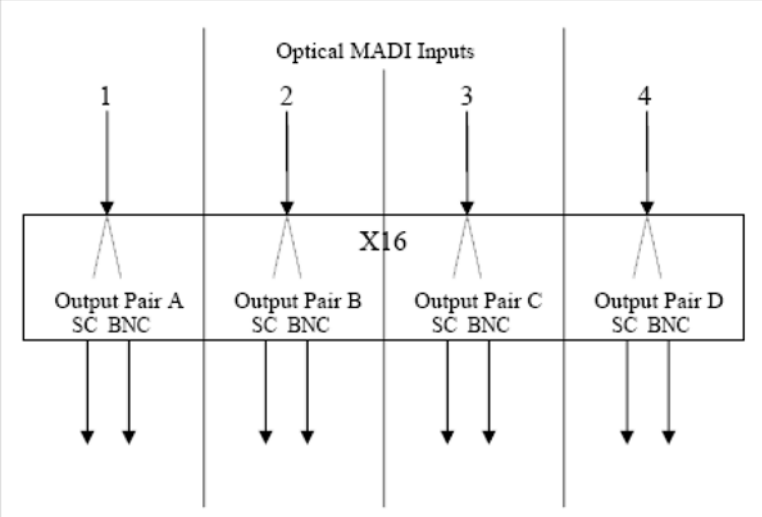
MADI output pairs **OutputC** and **OutputD** are sourced from the combination of Input 3 (**In3**) and Input 4 (**In4**)



3.5.3 MADI Thru Mode

In addition to providing the MADI Merge facilities, the X16 also has the ability of providing a Thru mode. This feature enables the operator to route up to four independent and complete optical MADI input streams directly to the four MADI output pairs. This provides both optical and coaxial MADI conversion, while also providing a two way output split for each of the four MADI input streams.

MADI Thru Mode is selected from the front panel via the **Processing Mode** switch.



3.5.4 Wordclock Synchronisation

The X16 is fitted with five wordclock BNC connectors for synchronisation purposes.

■ **One BNC providing Wordclock Master/Slave connectivity**

Operation of the Wordclock Master/Slave BNC is controlled via the front panel Wordclock switch.

Wordclock Master.
The internally generated wordclock conforms well within Grade 2 specifications (being +/- 3.5ppm).

The wordclock output circuitry driving this BNC connector is capable of driving long cable lengths with minimum degradation of the wordclock signal. This allows the X16 to be the system master reference clock source, while also allowing connection to remote equipment, such as digital consoles. These may be some distance away from the M16/X16, if located stage-side for example.

Wordclock Slave.
When a valid wordclock signal is received, the X16 will generate its own clean internal synchronisation clock from the incoming reference in order to improve overall performance.

If the incoming wordclock does not equate to the sample rate selected via the X16 front panel then the X16 will not output any audio and a visual warning will be presented on the front panel. See 3.5.5 X16 LED Error Indication

A 75 Ohm termination switch is provided adjacent to the Wordclock Master/Slave BNC connector. This should be enabled if an external wordclock source is not passed on to another device.

■ Four BNC Wordclock Outputs

These are buffered wordclock outputs to be used primarily for the purpose of connecting up to four M16s, or other MADI devices, in a star topology to improve synchronisation performance. In slave mode, the four BNC outputs follow the incoming wordclock reference signal, while in master mode, the four BNC outputs follow the main internally generated wordclock signal.

3.5.5 X16 LED Error Indication

In addition to providing general configuration feedback of the X16 modes, specific LEDs on the X16 front panel also provide a level of system status/error information.

Incoming Wordclock Error.

When the wordclock slave LED and **currently selected** sample rate LED both flash, the incoming wordclock frequency is different to the selected frequency on the X16.

When the wordclock slave LED and **both** sample rate LEDs flash, the incoming wordclock frequency is neither 48kHz or 96kHz. It can also indicate that wordclock is not present/connected to the X16, while the X16 is configured in slave mode.

MADI Input Status.

Four MADI In LEDs provide a constant indication of the condition of the overall incoming MADI streams.

If communication from the transmitting device is operating correctly, the related LED will be constantly illuminated.

A flashing LED indicates that the sample-rate within the particular incoming MADI stream does not match that set on the X16. Make sure that sample rate is identical for both the X16 and the transmitting MADI device.

If the LED is not illuminated there is either no transmitting device connected to that particular input, or the transmitting device is not powered. If that particular input is meant to be operating, check connections and the status of the transmitting MADI device.

X16 Specifications

MADI Input

Protocol:	MADI (Multi-channel Audio Digital Interface)
Format:	Compliant to AES-10-2003 Optical 125Mbps FDDI
Sample rate:	
Operational modes	56 channel at 48kHz (±12.5% varispeed) 28 channel at 96kHz (±12.5% varispeed) 64 channel at 48kHz 32 channel at 96kHz

MADI Output

Protocol:	MADI (Multi-channel Audio Digital Interface)
Format:	Compliant to AES-10-2003 Optical 125Mbps FDDI Coaxial 125Mbps (75 Ohm)
Sample rate:	
Operational modes	56 channel at 48kHz (±12.5% varispeed) 28 channel at 96kHz (±12.5% varispeed) 64 channel at 48kHz 32 channel at 96kHz

Synchronisation

Wordclock Master	Optional 48/96kHz provided by +/-3.5ppm temperature compensated oscillator 5v peak-peak over 75 Ohm coaxial cable Duty cycle 50% (TTL level)
Wordclock Slave	Slaves to 48/96kHz clock. 75 Ohm terminated coax (switch). Minimum Input Voltage 2.5v peak-peak.
Wordclock Out	Optional 48/96kHz clock 5v peak - peak over 75 Ohm coaxial cable Duty Cycle 50% (TTL Level) 2.5v peak - peak when load terminated: see page 12 of Annex B AES11-2003

Connectors

MADI Input 1/ MADI Output A	Duplex SC Interface
MADI Input 2/ MADI Output B	Duplex SC Interface
MADI Input 3/ MADI Output C	Duplex SC Interface
MADI Input 4/ MADI Output D	Duplex SC Interface
MADI Output A	BNC
MADI Output B	BNC
MADI Output C	BNC
MADI Output D	BNC
Wordclock Master/Slave	BNC
Wordclock Outputs 1 through 4	BNC

General

Power Requirements:	90 - 250VAC 50/60Hz
Power Consumption:	16W
Operating Temperature:	0° to 40°C
Dimensions in mm (WxHxD):	427mm x 44mm (1U) x 200 (excl. projections)
Unit Weight:	2kG (4.4lbs)
Average Shipping Weight:	2.5kG (5.5lbs)

EMC

Complies with:	EN55103-1: Emissions EN55103: Immunity

Warranty

Dear Customer,

We thank you for having purchased this Cadac product and hope you will have many years of service from it.

Your Cadac product is warranted for a period of 12 months from the date of original purchase to be free from defects in material and workmanship. In the event that the product proves defective and requires service within the 12 month warranty period, Cadac, or its appointed distributor will, without charge for labour or parts, repair or (at Cadac's discretion) replace the product or its defective parts within the terms and conditions set out below.

Conditions

The warranty is valid only at the premises of the manufacturer, or the authorised distributor, and is provided on a pre-paid RTB (return to base) basis.

This warranty will not reimburse nor cover damage sustained as a result of modifications that have been made to the product without the prior written consent of Cadac.

The warranty does NOT cover any of the following:

- Transport costs and all risks of transport relating directly and indirectly.
- Damage resulting from misuse, including but not limited to:

  a) failure to use the product for its normal purpose or in accordance with instructions detailed in the Installation and User manual
  b) installation or use of the product in a manner inconsistent with national technical and safety standards in force.
  c) improper or incorrect installation of software.

- Repair made by the customer himself or a non-authorized repair company.
- Accidents, lightning, water, fire or improper ventilation or any cause beyond the control of Cadac.
- Defects in the system into which this product is incorporated.

Appendices

LED Status Indication

LED Status	Check
One or more of the MADI In green LEDs are not illuminated.	This generally indicates that no external MADI device is connected to the MADI Input connector. Check connections and also the operating status of the MADI transmitting device
One, or more, of the MADI In green LEDs is flashing.	A flashing MADI In LED indicates that the MADI In source sample rate associated with the flashing LED differs from that selected on the X16. Make sure that the chosen sample rates on the X16 and transmitting MADI device are identical.
Wordclock Slave and chosen sample rate LEDs are flashing.	The incoming wordclock frequency differs to that set on the X16. Make sure that these are set to be identical.
Wordclock Slave and both 48kHz and 96kHz sample rate LEDs flash.	The incoming wordclock is neither 48kHz or 96kHz. It can also indicate that external wordclock is either not present or not connected. Make sure that the external wordclock is connected and configured to transmit at either 48kHz or 96kHz. Sample rates between devices should be configured to be identical.

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