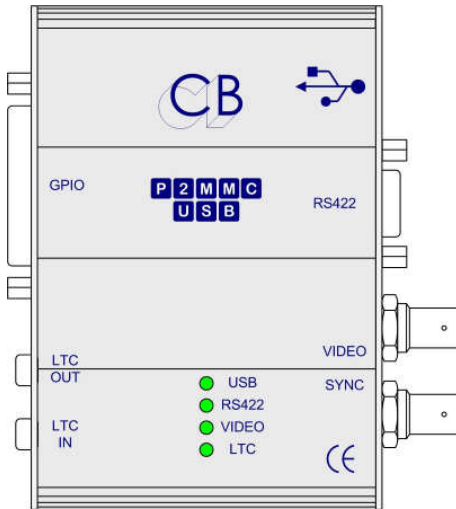# P2MMC-USB

- USB Midi: Plug and Play
- Six different operational modes
- Windows and Mac GUI Provided for Machine Control and Setup
- Track arming of DAW from RS422 Controller
- Track arming of RS422 Machine from DAW or GUI
- RS422 Port configured as Input (Emulation) or Output (Control)
- Virtual Machine: Locked to Video Syncs
- LTC Timecode Input: LTC -> MTC, LTC -> RS422
- LTC Timecode Output: MTC -> LTC, RS422 -> LTC
- GPIO: 8 Inputs, 8 Outputs
- Video Sync Input: Bi-Level (SD) or Tri-Level (HD)
- HUI Protocol – Transport and Track arming

Based on our P2MMC but using USB Midi. the P2MMC-USB may be used in a number of different configurations allowing DAW's with Midi In/Out to be resolved to Video Syncs and be controlled by or control RS422 devices.

The P2MMC-USB is ideal to connect MIDI systems (Protools LE, Nuendo, Sequoia, Ardour, Logic Pro, Cubase, Cakewalk) with timecode and video locked RS422 devices. The P2MMC-USB may also be used as a USB timecode interface providing GP Outputs against timecode or logging events to timecode. Eg. CB "EDL Recorder" using the P2MMC-USB to record live edit decisions to increase efficiency in post production

External Control of DAW
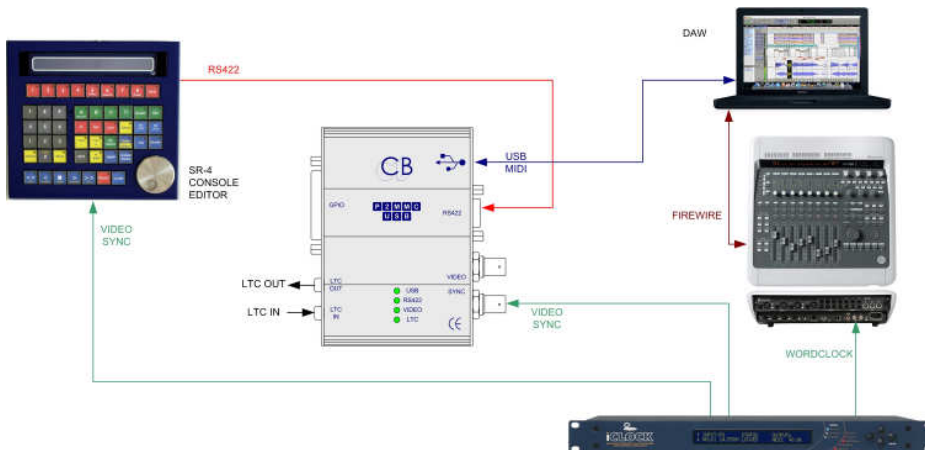
RS422 as Input

Virtual Machine 1:
DAW follows VM
VM controlled by DAW
VM controlled by RS422
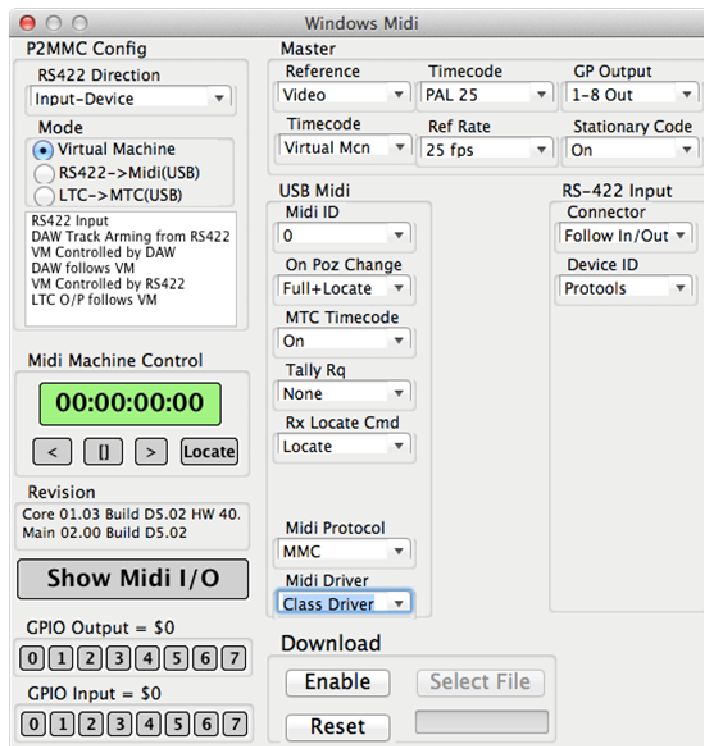DAW Track Arming from RS422

P2 -> MMC:
DAW motion and Track Arming controlled by RS422

LTC -> MTC1:
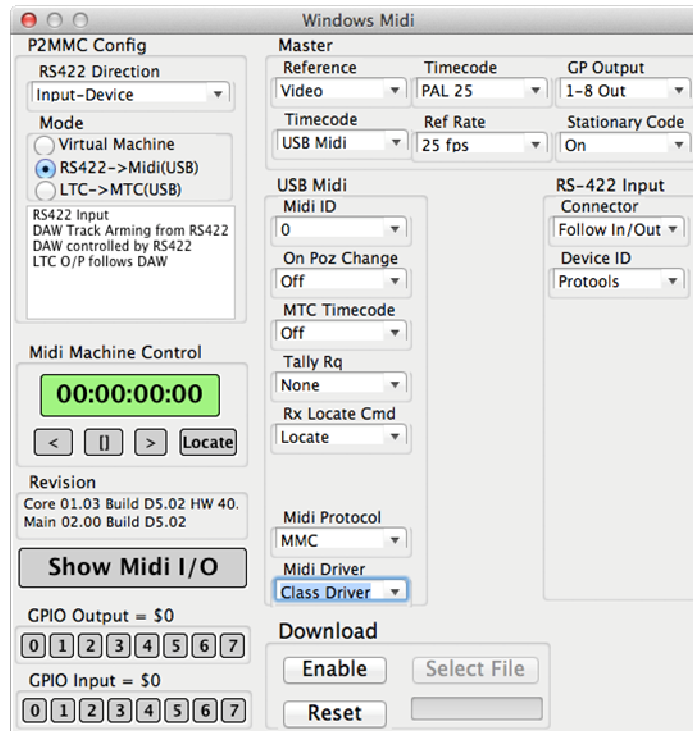DAW follows LTC Input, DAW Track Arming from RS422

There are two possible setups for External control of a DAW depending on the MMC c ommands accepted by the DAW.

When Controlling a DAW that accepts MMC Commands it is possible to directly control the DAW, especially when no servo control is required. When the DAW does not accept MMC commands but will follow MTC use the Virtual machine mode. In this mode the RS422 controlled the Virtual machine which generates both MMC and LTC. The DAW can then follow the MTC. Examples of both stups can be seen on the following page

1) P2MMC Setup for DAW to follow **Virtual** Machine

2) P2MMC Setup to directly control DAW (Only **available** if DAW accepts MMC Commands!)

Control of Video Machine from DAW
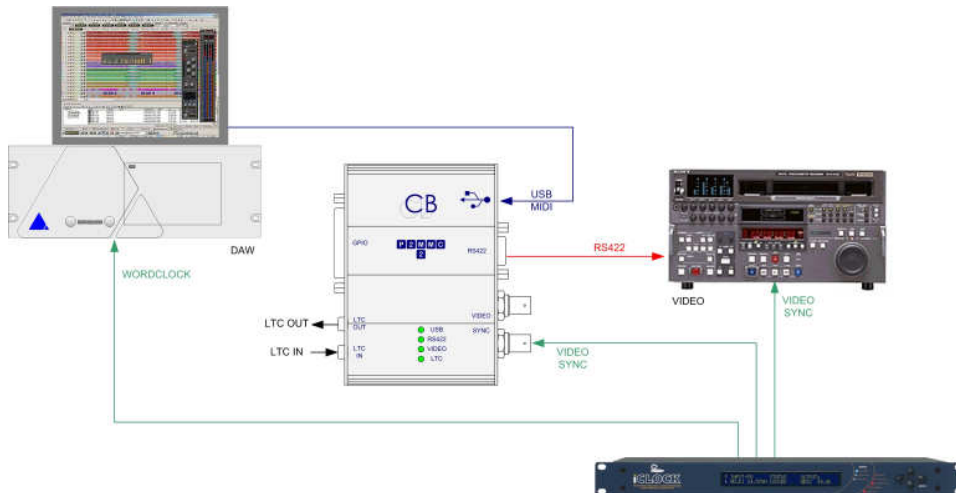
RS422 as Output

Virtual Machine 2:
DAW follows VM
VM controlled by DAW,
Device follows LTC O/P
RS422 Track Arming from DAW

MMC -> P2
DAW control of RS422 Device

LTC -> MTC2
DAW follows LTC
DAW control of RS422 Machine

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3) P2MMC Setup to control a RS422 machine from the MIDI output of a DAW

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Four LED Indicators

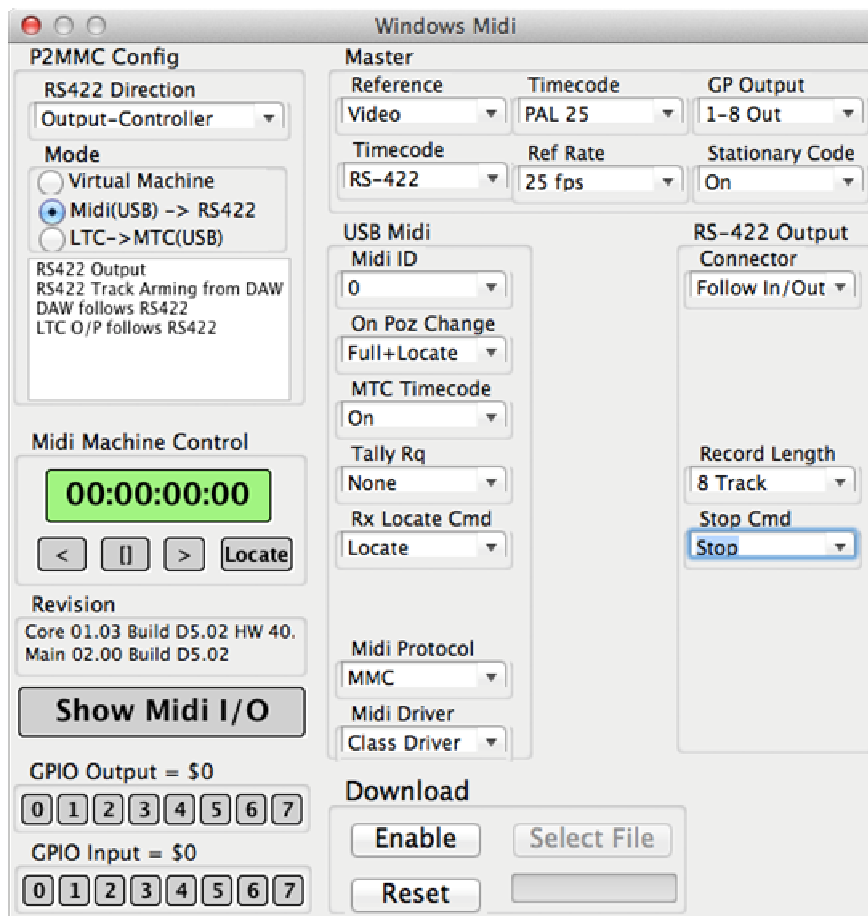**USB**
- Off USB not recognised
- Flash USB Connected, no MIDI communications received for 4 seconds
- On USB Connected, MIDI communications received within the last 4 seconds

RS422
- Off No communications received on RS422 Port for one second
- On Communications received within the last second

Video
- Off No Video Syncs
- Flash Video Syncs, Time Code Generator Not Locked to frame edge
- On Video Syncs, Time Code Generator Locked to frame edge

LTC
- Off No Timecode Input
- Flash Stationary or discontinuous Timecode
- On Incrementing/Decrementing Timecode for more than one second

RS422 Port

This port is User selectable to Output (Device Control) or Input (Device Emulation) the tx-Rx connections are User defined as Input, Output or Follow Mode.

USB Port

The USB Port uses MIDI Class drivers that are pre-installed in Windows, MAC and Linux operating systems.

GUI

Communication via the USB port the GUI provides three main functions
- Machine control and track arming on any device connected to the RS422 port.
- User defined settings: Mode, Timecode Standard, GPIO….
- Software Update: Updates may be downloaded from our web site and installed

LTC Timecode Output

When Video syncs are connected the timecode standard switches automatically with the frame rate of the Video. When NTSC syncs are detected the selection of Drop or Non-Drop Timecode is determined by a user setting. When no video syncs are connected the timecode standard is user definable using the provided GUI. The timecode output reflects the position of the current controlled device.

GPIO

Eight Open Collector Outputs may be controlled by Midi Note On / Note Off Commands or triggered by internally controlled timecode values.

Eight protected CMOS inputs generate Midi Note On / Note Off events. CB Electronics will be releasing different application software to use these events. See CB EDL Recorder for recording live decisions for use on later highlights transmissions.

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GPIO Connections				
Pin	Pin	Function	Input	Output
1		GPI-Input 1	RS22 Edit ON Momentary	
	14	GPO-Output 1		RS422 Record On
2		GPI-Input 2	USB-MMC Edit On Momentary	
	15	GPO-Output 2		RS422 Lock
3		GPI-Input 3	RS422 Edit OFF	
	16	GPO-Output 3		
4		GPI-Input 4	USB-MMC Edit OFF Momentary	
	17	GPO-Output 4		
5		GPI-Input 5		
	18	GPO-Output 5		
6		GPI-Input 6		
	19	GPO-Output 6		
7		GPI-Input 7		
	20	GPO-Output 7		
8		GPI-Input 8		
	21	GPO-Output 8		
9				
	22			
10		0v		
	23	+5v		
11		0v		
	24	+5v		
12		0v		
	25	+5v		
13				

For Further information, software updates and configuration program access

http://www.colinbroad.com/cbsoft/p2mmc2.html

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Appendix-A: Cable Diagrams

T5.03 RS422 (Sony 9 pin) CABLE			
Function SR-4 (Controller)	9 pin 'D' Male on cable (Both Ends)	Cable Colour	Function (Controlled Device)
	1		
Rx-	2	Red	Tx-
Tx+	3	Yellow	Rx+
Ground	4	Screen	Ground
	5		
	6		
Rx+	7	Blue	Tx+
Tx-	8	White	Rx-
	9		

T5.04 Tx-Rx Invert Sony 9 pin CABLE			
Function SR-24 port E	9 pin 'D' Male on Cable	9 pin 'D' Male on cable	Cable Colour
	1	1	
Tx-	2	8	Red
Rx+	3	7	Yellow
Ground	4	4	Screen
	5	5	
	6	6	
Tx+	7	3	Blue
Rx-	8	2	White
	9	9	

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Appendix-B: DAW Configuration

Protools LE
"Peripherals – Synchronisation – MTC reader port- Any" "Peripherals – Machine Control – Midi Machine Control Master – Enable – p2mmc2 (2) (emulated) – id127 Notes: 1) MMC Track Arming is not implemented on Protools use HUI protocol 2) There is a bug on the MTC out from Protools when looping – The timecode does not restart but continues from the end of the loop!

VVTR

There are two ways of using P2MMC-USB with virtual VTR
 	
For Both configure the RS422 port as an input
 	
1) P2 MMC: VVTR Controlled by MMC,
      RS422 Commands are translated to MMC and sent to the VVTR,
      VVTR MTC is converted to TC
            -> LTC Timecode Output
            -> Read by RS422
 	
2) Virtual Machine: VVTR follows external MTC
      RS422 Commands control the Virtual machine,
      Virtual Machine timecode output
            -> MTC to the VVTR
            -> LTC Timecode Output
            -> Read by RS422
 	
There is no advantage in using 1) as the VVTR will work just as well using the USB-422 interface.
 	
2) The Virtual machine is locked to video syncs, VVTR will lock to video tighter using MTC than when running with the USB422

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Nuendo-4

Using the P2MMC in Virtual Machine Mode

Open "Transport – Project Synchronisation Setup"

To enable MTC chase input:
  Timecode Source - Midi Timecode - p2mmc-usb Port 1

To enable track arming:
  MIDI Machine Control Slave - Midi Control Slave Device - Midi Machine Control -
  Machine Control Slave settings MMC Input - p2mmc-usb Port 1

To enable Record (P2MMC will only put machine into record if it is playing):
  MIDI Timecode Out: p2mmc-usb Port 1