

CB-2000



CB-2000 Networked 8-Button Classroom Control Panel

- Easy Install and Setup (browser based)
- Scheduled Projector turn on / off
- Serial, Network, IR and GPI ports
- Onboard IR learner
- Tactile buttons w / audible feedback
- Security pass-code for Access/Lockout
- Real Time clock (w/battery backup)
- File based cloning / backup
- Integrates with Calypso Software :
 - Encore!, desktop control software
 - Maestro, Room monitoring software

Calypso Systems :

The CB-2000 expands on the features of the previously popular CB-1000 by adding the following:

- 1+ 1 RJ45 connections (1 x Quick connection port, 1 x CLAN)
- Extra timer Events, now up to 8
- GPI input (switchable IR output / GPI input)
- Macro Definition table for IP/alias mapping to cater for mass replication
- Save/ Restore now includes remote IP configuration
- Increased sensitivity IR receiver. Allows wall mounting before learning.

- 1) Network port. This provides even simpler connectivity and works incredibly well with the CM-3000's on board CLAN port as it not only provides the LAN connection but Power for the CB-2000 also.
- 2) Zero software install. No Java any more. The CB-2000 is now accessed via a web browser.
- 3) Comes with a new default IP address 192.168.1.104
- 4) Two rubber button sets, so there is sure to be the button you need
- 5) CB-2000 Event list increased to 16 (sixteen)
- 6) Event List reflects the first 8 Events as buttons 1-8
- 7) Additional 8 (eight) Events that can be used as Timers
- 8) Macro feature to allow "IP to Name" mapping for ease of use with multiple CM-3000's sites
- 9) GPI port which if not needed, can be configured to be 2nd IR output.
- 10) Simple large format, graphical "Quick Guide" pages (x3) rather than PDF manual on CDROM
- 11) Remote locking / unlocking of front panel

Introduction

The CB-2000 conforms to the "browser" configuration method that the other Calypso controllers feature. This significantly simplifies the integration and ease of use of the wall controller by allowing direct connection to the new CM-3000 devices CLAN port and from there to a standard computer via the other on board LAN ports.

The CLAN ports on the CM-3000 provide not only LAN connectivity but also the low voltage power needed by the Calypso devices, albeit at a non-standard lower voltage, 12 volts.

The default IP address of the CB-2000 is 192.168.1.104 and importantly for network administrators, the Calypso Remote Management port has been changed from port 5000 to port 7262.

Additionally port 7262 has been "registered" as a safe port with the IANA, for both TCP and UDP traffic.

```
cnap      7262/tcp  Calypso Network Access Protocol
cnap      7262/udp  Calypso Network Access Protocol
#         Scott Halberg <eng&calypsosystems.com> 02 June 2009
```

Pasted from <<http://www.iana.org/assignments/port-numbers>> where a complete port listing can be viewed.

Connect the CB-2000 network port to one of the two (2) CLAN ports on the CM-3000 and connect a PC to any one of the remaining LAN ports on the CM-3000.

Open a browser to 192.168.1.104 and the configuration screen will be displayed.

If the CB-2000 is being used "stand alone" or without a CM-3000 then configuration is done either with a LAN cross over cable to a PC or a standard cable via a switch/hub.

Select the required task from the menu on the left to make changes to such things as Ethernet, Serial port, learn commands and setup Events.

The CB-2000 has a total of 16 Events that can be configured

The first 8 Events are directly mapped to the 8 physical buttons while the remaining 8 Events can be used for Timer functions.

A new feature is being able to define Macro definitions.

These are used when multiple CB-2000's are used across a single site to simplify the configuration and installation when using NET commands.

By defining a "name" the Macro Definition is able to substitute in a target IP address or command.

e.g. A "Macro Name" might be Ion-LT.

By using "Ion-LT" in the command instead of the actual IP address of the Ion in the NET commands, allows the same configuration file to be used in any number of installations and have them work with any Ion-LT simply by changing the Macro Definition to reflect the target Ion-LT's IP address.

Change only the IP address that is typed into the Macro Definition rather than having to change the IP address in all Actions within the Events.

[Decora Screwless wallplate solution](http://cableorganizer.com/leviton/decora-wallplates.htm)

<http://cableorganizer.com/leviton/decora-wallplates.htm>

Jumpers & Daylight Saving

Default Jumper Position = GPI function



Jumper Position for IR2 function



GPI functionality is handled by Events 9 and 10 and utilise the Yellow wire and the Brown wire on a standard TB-8.

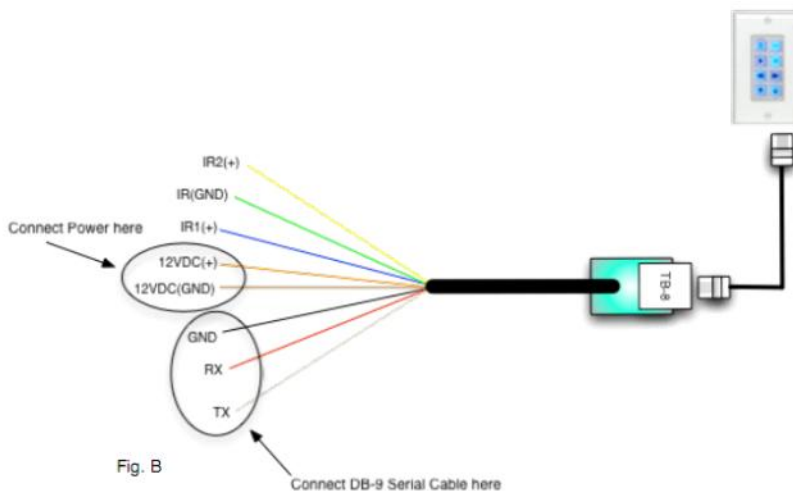
Daylight Saving Table

The Daylight Saving Table is custom encoded by Calypso and not user editable. The web page loads 10 years within the *.CFG file, and shows the current 4 years in a shifting window

A corrected Daylight Savings config file for Australia was released on 19/07/2010 and can be obtained from www.idt.com.au, then located under Calypso.

File name: cb2000-defaults-dbv1-ausDST.cfg

The real time clock is good for 25 years on backup – ie no power.



IR Capture

IR Capture

The CB2000 can be installed on a wall and IR signals learned without removing it. No longer does the CB-2000 have to be removed from the wall to learn IR codes.

This detector is VERY sensitive. IR learning was not optimal on the CB-1000, hence the new code allows IR codes to be learned in the same scale as ION_LT2, although not the same sensitivity.

The IR capture on the CB-2000 will always report 0x40 as the frequency, regardless of what it actually is (the CB learn does not do frequency analysis like the ION). But it should be the case that the rest of the data is essentially the same as an ION capture.

When IR is *output*, the frequency used will be that in the data given. So if, in the #XRO.. command you change that first byte to something else, like 38 or 56, it will use the new setting. In brief, frequency is locked on input, but is variable on output.

Background of IR :

We are either hard wiring or our interfaces use a wired IR emitter that is typically attached very close to the detector (1" or 2" away) This is a very important difference that essentially negates any frequency issues, and increases wavelength tolerance (less dependent).

We have selected a mid range detector (our sensor is tuned to 38Khz) and we play back at 40Khz (default). I am not aware of any detector that when we place a IR emitter next to it (1") – would not detect 40Khz, even if technically it is set to either 28Khz, or 56Khz range. We are centered and work with everyone.

Yes – you can replace any frequency in the header.

0x00 = no carrier (typically used by Sony for hard wired applications)

0x28 = 28Khz

0x30 = 30kHz

0x32 = 32Khz

0x38 = 38Khz * default detect

0x40 = 40Khz * default playback (short over air distance)

0x56 = 56Khz

NOTE:

There has been a case where a captured code was of a particular character length which caused the buffer to lock up.

This occurred on a Somfy 5remote device and required FFFF being appended to the end of the captured IR code

Commands

1. 'NET' Commands are used to control CM-3000's and devices connected to LAN ports

Using NET commands allows the features or capabilities of connected devices to be exploited.

e.g. Serial command sent from CB-2000 through the CM-3000 to a serial device connected to COM1

```
#NET[F1, 192.168.1.106, P7262, '#COM1[T1,"!KEY_MUTE\r"];'];
```

Serial command sent from CB-2000 to an lon-LT2 connected to a LAN port on a CM-3000

```
#NET[F1, 192.168.1.105, P7262, '#COM2[T1,"!KEY_Vol+\r"];'];
```

Here the command is sent to the specific IP address of the lon-LT and out it's com port. The HUB on the CM-3000 just connects all the LAN traffic

2. Add a “hold button for x seconds” event to CB and controller system

Basically it requires 4 Events to work:

Event 1 relies on the Controller getting a CIRT code from a CB-1000. CIRT code in this example is 01E1 and then adds a value of +1 to #VAL1.

Event 2 tests VAL1 to see if it is greater than 5. IF it is then it sets VAL1 to 0 and closes a GPO

Event 3 tests VAL1 to see if it is equal to 1 and if it is then calls Event4 after waiting 7 seconds.

Event 4 sets Val1 = 0

3. Alter the Serial header to add delay before sending

Byte 2 of the Serial header can be changed to provide a delay in 100ms steps to the sending of the string. It must be represented as hex.

Eg. To achieve a 5 sec delay -- $5000\text{ms} / 100\text{ms} = 50$ (32 Hex)

Header = 01**32**0000000

4. Adding Delays to IR

Change the second byte of the IR header to allow for delays. FF is the largest value which translates into about 1.27 seconds.

If this isn't a large enough delay for you just add another play command with a delay as well. Or you could change the repeat on the play command to stretch it out long enough to where it finally accepts it. The repeat is the third byte. So the following string has a delay of 1.27 seconds with a repeat of 10.

380003000344D803410B.....before

38FF10000344D803410B.....after

5. Reset to Factory Default

Remove power from the CB-2000 then hold Tx and Rx (red and white wire on TB-8) together.

Power up CB-2000, wait 1 sec and then separate or remove the short on Tx and Rx. The CB-2000 should beep several times to indicate that it has been reset.

NOTE: only the IP address will be reset to 192.168.1.104

Commands Cont.

Volume DOWN command from CB-2000 to CM-3000 with IP of 192.168.1.106

```
#NET[F1, I192.168.1.106, P7262, '#AUD1[V-];'];
```

Volume UP command from CB-2000 to CM-3000 with IP of 192.168.1.106

```
#NET[F1, I192.168.1.106, P7262, '#AUD1[V+];'];
```

Volume **MUTE ON** command from CB-2000 to CM-3000 with IP of 192.168.1.106

```
#NET[F1, I192.168.1.106, P7262, '#AUD1[M1,V25];'];
```

Note: this also presets volume to 25%

Volume **MUTE OFF** command from CB-2000 to CM-3000 with IP of 192.168.1.106

```
#NET[F1, I192.168.1.106, P7262, '#AUD1[M0,V75];'];
```

Note: this also presets volume to 75%

Next Input selection command from CB-2000 to CM-3000 with IP of 192.168.1.106

```
#NET[F1, I192.168.1.106, P7262, '#AUD1[I+];'];
```

Note: each time command is sent the next Input is selected. Use #AUD1[I-] to go back to the previous input

Direct **Input selection** (Input 1) command from CB-2000 to CM-3000 with IP of 192.168.1.106

```
#NET[F1, I192.168.1.106, P7262, '#AUD1[I1];'];
```

Direct **Input selection** (Input 3) command from CB-2000 to CM-3000 with IP of 192.168.1.106

```
#NET[F1, I192.168.1.106, P7262, '#AUD1[I3];'];
```

There are also ways to get to features of the Webpages such as

an example of the NET command you would use to get a CB-5000 to lock a CB-2000.

Example: sending to CB-2000 at 192.168.1.104 from a CB-5000 event action:

```
#NET[I192.168.1.104,P80,"POST /seclck.cgi HTTP/1.1\r\nHost: 192.168.1.104\r\nContent-Type: application/x-www-form-urlencoded\r\nContent-Length: 10\r\n\r\nLockSet=1&\r\n\r\n"];
```

Note that the CB's IP address must appear in TWO location in this command (one is part of the NET parameters and the other is part of the HTTP POST info)

Finally, to unlock, simply change the value near the end of the string to 0 instead of 1 (e.g. ..LockSet=0&\r\n..).

Commands Cont.

Remotely Lock / Unlock

Below is an example of the NET command you would use to get a CB-5000 to lock a CB-2000.

Example: sending to CB-2000 at 192.168.1.104 from a CB-5000 event action:

```
#NET[I192.168.1.104,P80,"POST /seclck.cgi HTTP/1.1\r\nHost: 192.168.1.104\r\nContent-Type: application/x-www-form-urlencoded\r\nContent-Length: 10\r\n\r\nLockSet=1&\r\n\r\n"];
```

Note that the CB-2000's IP address must appear in TWO location in this command (one is part of the NET parameters and the other is part of the HTTP POST info).

Finally, to unlock, simply change the value near the end of the string to 0 instead of 1 (e.g. ..LockSet=0&\r\n..).

Call Button for Intercom session

Here is an example of a script if you would like to add a "Call" button to the CB5000/CB2000/Encore for a teacher to initiate an intercom session:

```
#NET[F1,I10.3.5.1,P80,"GET /calypso/conductor/?/call/10.3.5.55 HTTP/1.1\r\nHost: 10.3.5.1\r\n\r\n"];
```

Highlighted in red is the rooms CM3000 (the source), the other devices act more or less as a "proxy" for that CM3000

Serial Delay

Serial Delay for CB-1000

Issue where a CB-1000 with RS232 is reacting to a reply from the projector causing us problems. Discovered with Epson where the CB and the Epson got into an endless loop that basically hung up all controls. Test for this by removing the TX line from the projector and see if the problem is resolved. The fix is to insert a delay into the serial command where the CB is "off line" for a bit and the reply from the projector is ignored.

Serial header for the CB-1000

Note 1: it is recommended that delay values are inserted while in the HEX mode. It is much easier to understand how to set a time. When switching to the ASCII mode the values will still be accurate.

Note 2: serial delays do not affect other buttons but do have an affect on actions within a button. If a button needs a serial delay and a non delayed action then the non delayed actions should be placed before the delayed serial action.

HEX: 01**00**00000007505752204F4E0D no delay
HEX: 01**14**00000007505752204F4E0D 2 second delay
HEX: 01**64**00000007505752204F4E0D 10 second delay
HEX: 01**FA**00000007505752204F4E0D 25 second delay

Bytes that remain unchanged 01FA**000000**07505752204F4E0D
These Bytes are there as place holders so that the serial and IR formats are identical.

Delay examples:

1 second 0A
2 seconds 14
5 seconds 32
10 seconds 64
15 seconds 96
20 seconds C8
25 seconds FA

Delays are in increments of 100ms

Delays are inserted as HEX values

Example – for a 25 second delay you would need to add 250 x 100ms, 250 is represented in HEX as FA

Macro Definition

Macro's allow config files to be created to simplify the roll-out of many devices.

Macro's can be used, as below, to allow a single change to be made for each installation of a new IP device.

Additionally the example below shows what we've called Generic Functions (Mute, Vol + etc.) to be made up and again changes to the target device need only be made on the Macro Definition page NOT each and every Event/Action.

Example showing Macro definitions

Macro Definitions		
Mac#	Macro Name	Macro Value Field
1	CM-3000	I192.168.1.106, P7262
2	MUTE	#COM1[T1."!KEY_MUTEv"];
3	Vol_UP	#COM1[T1."!KEY_VOL+"];
4	Vol_DOWN	#COM1[T1."!KEY_VOL-"];
5		
6		
7		

Note: the "I" before the IP address in Macro #1

Example of Event list showing Macros in Actions

Evt#	Event Description	Trigger	Time	Action 1	Action 2	Action 3	Action 4	Test
1	Proj. mute	Button 1		#NET[F1, I192.16	#NOP[];	#NOP[];	#NOP[];	✓
2	generic mute	Button 2		#NET[@{CM-3000},	#NOP[];	#NOP[];	#NOP[];	✓
3	generic Vol+	Button 3		#NET[@{CM-3000},	#NOP[];	#NOP[];	#NOP[];	✓
4	Generic Vol-	Button 4		#NET[@{CM-3000},	#NOP[];	#NOP[];	#NOP[];	✓
5	-Event 5-	Button 5		#NOP[];	#NOP[];	#NOP[];	#NOP[];	✓
6	-Event 6-	Button 6		#NOP[];	#NOP[];	#NOP[];	#NOP[];	✓
7	-Event 7-	Button 7		#NOP[];	#NOP[];	#NOP[];	#NOP[];	✓
8	-Event 8-	Button 8		#NET[@{CM-3000},	#NOP[];	#NOP[];	#NOP[];	✓
9	-Event 9-	Proj (In1)-open		#NET[F1, I192.16	#NOP[];	#NOP[];	#NOP[];	✓
10	-Event 10-	Proj (In1)-close		#NOP[];	#NOP[];	#NOP[];	#NOP[];	✓
11	-Event 11-	-		#NOP[];	#NOP[];	#NOP[];	#NOP[];	✓
12	-Event 12-	-		#NOP[];	#NOP[];	#NOP[];	#NOP[];	✓

Example of an Event showing Macro substitution for the IP address as well as RS-232 Serial command

Currently editing Event Number 2 **Button 2**

Save Event Test Event

Event Description:

Trigger Options: Repeat on hold

Time Start: Enable: Hour: (mid) 0 Minute: 00

How to run the defined actions: All (in parallel) One per call (in series)

Action 1

(Select an entry) ▼

```
#NET[@{CM-3000}, @{MUTE}];
```

Command

Macro cont.

Monday, 31 January 2011
2:35 PM

For the CB-2000, the original (and probably most common) use for macros was to abstract IP addresses for #NET commands. The basic idea is that in a CB-2000 you'll define a bunch of #NET commands each pointed at, say, a CM-3000. If you have many rooms with a CB-2000 + CM-3000 combination, then it can be difficult to maintain a "common" config file which can be used in every room because each room will have a different CM-3000 (with a different IP address). To make things a little easier to maintain, we added the macro definition so that the per-room customization could be done in only one place instead of for every #NET command on every CB-2000.

So, for example, if you have the following Room setups:

Room	CB-2000 IP	CM 3000 IP
102	10.1.2.102	10.1.2.202
103	10.1.2.103	10.1.2.203
110	10.1.2.110	10.1.2.210

(Of course the IP addresses could be anything as long as they are valid and unique.)

And suppose you want to setup a "Vol up", "Vol down", and a "Mute toggle" command set for the CB-2000 to control the corresponding CM-3000, then you could use a common config file with these event definitions (only 1 action needed for each in this case):

Event #	Action 1
2	#NET[@cm3000,' #AUD1[V+, MD];'];
4	#NET[@cm3000,' #AUD1[V-, MD];'];
6	#NET[@cm3000,' #AUD1[M#];'];

The above config could be loaded on all 3 CB's in our example, and then a macro definition edited for each like this:

Room	Macro Name	Macro Definition
102	cm3000	10.1.2.202, P7262
103	cm3000	10.1.2.203, P7262
210	cm3000	10.1.2.210, P7262

Note that the macro name is the SAME for every CB (i.e. for every room)--it is the definition which changes. Hence the power of the macro for abstraction.

Text label (16 characters) text label (letters, numbers and underscore only)

Text Substitution (48 characters) @{text label}

Intended to be used inside brackets of commands, e.g. #CMDx[<macro here...>];

Macros don't work inside quotes.

IR Universal Commands for CA-1000e

Channel 1 – 0880 (CIRT code)

4000030001348D11E203C004CE03A304FB03A704D4039F04FC03A704DB03C804CD03A704E103EF08FC03A704DD03C604CD03A704E4031A094DB3

Channel 2 – 0881 (CIRT code)

4000030001348D11E303EE08ED03A704DE03C504CD03A704FC03A704D103A304FB03A704D703F908FB03A704D203A104FC03A604D903F70873B3

Channel 3 – 0882 (CIRT code)

400003000134B611CD03A704FB030309CD03A704E203C104CD03A604FB03A704D403A004FB030309CF03A404FC03A704D6039E04FB03030959B3

Channel 4 - 0883

4000030001348D11E203EE08FB030309D203A204FB03A704D903CA04CD03A604E003C404CD030309DB03C704CD03A704E203C104CD03020974B3

Channel Forward - 08B0

4000030001348D11E203C004CE03A604FB03A704D403A004FC030309CF030009DF03C304CD030309DB03C704CD03A704E203C204CE03020973B3

Channel Reverse - 08B1

4000030001348D11E203EE08FB03A704DD03C504FB037904DB031B09CD030309D503A004FB030309D003A404FC03A704D7039D04FB0303095AB3

Volume Up 1 step - 0892

400003000134B811CD03A704FB030309DB039904E003C204CD030309DC03C704CD03A704E203EE08FB03A704DF03C504CD03A704FC0303094EB3

Volume Down 1 step - 0893

400003000134B711CD030309DA03F508FC03A704D6039E04FB030309D103A304FB03A704D803F808FC03A704D403A104FB03A704D903F70874B3

Volume Up 2 step - 08B4

400003000134B711CD03A704FB03A704D103FF08E003C204CD030309DD03F408FB03A704D803F808FC03A804D403A004FB03A704DA03F60873B3

Volume Down 2 step - 08B3

400003000134B711CD030409DB03F508FB03A704D6039E04FB030309D203FE08E203C104CE030309DD03C504CD03A704E403C004CF03000974B3

Mute Toggle - 08B2

400003000134B711CD03A704FC030409CD03A704E103C104CD030309DE03F308FC03A704D903F808FB03A704D403A104FC03A704DB03F60873B3

Mute On - 08B8

400003000134B811CD03A704FC03A704D103A304FA030309CD030309DB03F408FC03A704D803F908FB03A704D303A104F803A704DA03F60874B3

Mute Off - 08B9

4000030001348D11E203EE08FB03A704DE03C504CD030309DA03F608FB030309CD03A704FB030309CD03A704E003C204CD03A704FB0303094FB3