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CS30
Pennywise™ Cinema Status Panel
Operating Manual

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Pennywise Peripherals Pty Ltd
518 Camberwell Rd, Camberwell, Vic, 3124, Australia
Phone +61 3 9809 2877, Fax +61 3 9889 5361
e-mail pennywise@pennywise.com.au

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1 Introduction

The Pennywise CS30 Status Panel is intended for use with the Pennywise CA21 Cinema Automation Unit. Each CS30 displays the status of up to ten cinemas each controlled by CA21s.

CS30s are connected to CA21s using a simple three wire daisy chained connection. Up to 32 units (a mixture of CA21s and CS30s) can be interconnected on the one cable.

CS30s with Rev 2.50 firmware and later can also be used with Pennywise CA-Link central control. (CA-Link enables a PC running Windows to control a group of CA21s.)

Each CS30 Status Panel can be set to display the status of a particular group of ten cinemas: 1-10, 11-20, 21-30 or 31-40. When there are more than ten cinemas in a complex, different CS30s can be used for groups of different cinemas.

By using Pennywise SPD1s (Status Panel Drivers), CS30s can also display the status of cinema equipment not controlled by CA21s.

The features of the CS30 include

- (1) Three LEDs per cinema to display information such as film not threaded, session running, slides, previews, main feature, fault condition.
- (2) An audible beeper sounds when a fault condition occurs (film break, xenon fail, etc.). The beeper can be stopped either by pushing the red button on the CS30 or by pressing a key on the CA21 which detected the fault.

2 Installation and Set Up Procedure

2.1 Mains Supply Voltage

The CS30 is provided with a dual voltage transformer allowing operation from either 110VAC or 230VAC.

On the Revision A circuit board of the CS30, the mains voltage is selected by links made to screw terminals in accordance with the diagram on the circuit board.

On Revision B circuit boards and later, a switch is provided for selecting the mains voltage.

To avoid damage to the CS30, ensure that the correct mains voltage is set before switching it on.

The CS30 also has a mains fuse labelled F2. A 250mA fuse must be installed for correct operation.

2.2 The RS-485 Electrical Interface

CS30 Status Panels and CA21 Automation Units are interconnected using an RS-485 interface.

RS-485 is a differential serial interface which drives a balanced 120ohm transmission line. It has a range of over several hundred feet.

Up to 32 transceivers can be daisy chained on an RS-485 line. In other words, up to 32 units (a mixture of CA21s and CS30s) can be interconnected on the one cable.

(Lower power RS-485 ICs are now available which allow more than 32 transceivers to be daisy chained. Future CS30s may be equipped with these ICs.)

The cable for RS-485 must be a shielded twisted pair with an 120ohm characteristic impedance. The shield is grounded.

The cable should be a single run with no T-connections (stubs). Each end of the cable must be terminated with an 120ohm resistor across the signal lines.

2.2.1 Providing Terminating Resistors

Both the CA21 and CS30 are provided with 120ohm resistors for terminating the RS-485 line. The resistor can be enabled (connected across the RS-485 line) using a jumper on the relevant circuit board.

On the CA21 Processor Board the terminating resistor is enabled by linking J12.

On the CS30 circuit board, the terminating resistor is enabled by linking J5.

There must be exactly one 120ohm terminating resistor at each end of the RS-485 line.

2.2.2 Bias Resistors

Is recommended that one pair of bias resistors is connected across the RS-485 cable. 1.5K is connected between the RT+ line and +5V, and 1.5K is connected between RT- and signal ground.

Each CA21 and CS30 is provided with a pair of bias resistors.

On the narrow version of the CA21 Processor Board, installing links on J24 and J25 enables the bias resistors.

On Revisions B and C of the 19" version of the CA21 Processor Board, bias resistors are already present. To remove them, it is necessary to physically cut resistors R35 and R37 from the board.

Later revisions of the 19" CA21 board have bias resistors which can be enabled by installing links on J18 and J19.

The bias resistors on the CS30 are enabled by links on J6 and J7.

There must only be one set of bias resistors on the RS-485 line and the unit containing the bias resistors must be powered on for correct operation of the network of CA21s and CS30s.

2.2.3 RS-485 Fuse

Fuse F1 is a "Ground Fault Fuse" for the RS-485 interface. Its purpose is to protect the CS30 from large differences in ground potential from one CS30 or CA21 to another. Such differences will normally only be caused by faults.

If it is necessary to replace the fuse, use a type M205 with a 1A rating.

Revision C and later of the CS30 circuit board do not have an RS-485 fuse.

2.2.4 RS-485 Connections

The RS-485 cable is an 120ohm twisted pair with a shield.

RS-485 uses differential signals. The two signal lines (on the twisted pair) are receive/transmit + (RT+) and receive/transmit - (RT-). The shield is signal ground.

Connections are made to the CS30 via the three screw terminals J3 (see Appendix A).

Ensure that RT+ is connected to RT+, and RT- is connected to RT- on all units (CS30s and CA21s).

Do not connect the shield to earth.

2.3 Setting the RS-485 Baud Rate

Versions 2.5 and later of the CS30 firmware allow two different RS-485 baud rates to be set using a jumper on the CS30 circuit board. The position of this jumper on the circuit board is shown in Appendix A.

The baud rate is selected for the environment in which the CS30 is operating.

When CS30s are used with CA-Link, a baud rate of 38.4KB must be used. To select this situation install the jumper.

Earlier versions of the CS30 firmware always operate at 9600 bauds. CS30s with this firmware cannot be used with CA-Link.

Other equipment on the RS-485 line must also be set to match the baud rate used by the CS30s.

After altering the baud rate jumper, the CS30 must be switched off and on again.

The above details are summarised in the following Table.

CS30 Baud Rates

Baud Rate	Environment	Jumper
9600 Baud	When CS30s are not used with CA-Link	Out
38.4 Kbaud	When CS30s are used with CA-Link.	In

2.4 CS30 Cinema Numbers

Each CS30 can display the status of up to ten cinemas out of a total of forty cinemas.

The range of cinema numbers, whose status is displayed by a CS30, is set by two jumpers (A0 and A1) on its circuit board, as shown in the following Table. The position of the jumpers on the circuit board is shown in Appendix A.

After altering the jumpers, the CS30 must be switched off and on again before the new setting will be recognised.

CS30 Cinema Number Range

Cinema Number Range	A0	A1
1-10	Out	Out
11-20	In	Out
21-30	Out	In
31-40	In	In

2.5 CA21 Cinema Number

Each CA21 must be set to the number of the cinema it controls. The cinema number is entered using the CA21 Setup procedure. The Setup option is “Cn”.

Setting the cinema number to zero prevents the CA21 from transmitting any status information.

Setting the CA21 cinema number to a non zero value will cause status information to be transmitted by the CA21. The information will be displayed on those CS30s which are set to the appropriate cinema number range and, of course, wired to the particular CA21.

2.6 Beeper Volume

The beeper is used to indicate when a fault has been detected by a CA21. Two beeper volumes are available using jumper J14. The louder setting is obtained by linking J14.

3 Operation

3.1 Set Up

There is very little to operate on the CS30 once it has been installed and set up. The only control is the red push button which is used to cancel the beeper when a fault is displayed.

Before CS30s, CA21s and CA-Link will operate properly together the following items must be set.

- (1) The RS-485 baud rate must be set on CS30s with revision 2.5 firmware and later. The baud rate selected depends on whether or not CA-Link is also installed on the RS-485 line.

CS30s running firmware earlier than revision 2.5 always operate at 9600bauds and cannot be run with CA-Link.

All other equipment on the RS-485 line must be set to the same baud rate as the CS30s. On CA21s this is achieved with the “CA” setup option.

Section 2.3 explains the CS30 baud rate jumper settings, and Appendix A shows the position of the jumpers on the circuit board.

- (2) Each CS30 displays the status of a single group of ten cinemas. The group is selected using jumpers A0 and A1 on the CS30 circuit board. (Section 2.4 explains the jumper settings, and Appendix A shows the position of the jumpers on the circuit board.)
- (3) Each CA21 must have its cinema number set using the “Cn” option in the Setup procedure. (See Section 2.5).

Whenever any alterations are made to the jumper settings on the CS30 circuit board, the power to the CS30 must be switched off and on again.

3.2 Status Displayed

The CS30s provide the following information.

- (1) Each column of three LEDs displays the current status of one cinema. The meaning of the LEDs is detailed later in Section 4.
- (2) If a column of LEDs is blank, the CS30 has not received any status information from the corresponding CA21 for some time. There may be no such numbered CA21, or the CA21 may not be switched on.

- (3) If a fault condition (film break etc.) is detected in a cinema by a CA21, the beeper sounds on all CS30s which are displaying the status of that cinema. The red LED flashes on the CS30s in the column of the cinema which has the fault.

The CS30 beepers can be stopped by pressing the red button on any CS30 which is displaying the status of the faulty cinema, or by pressing any key on the CA21 which detected the fault.

4 Status Indication

The three LEDs in each column of a CS30 indicate the state of a single cinema according to the scheme described in the Tables below.

If no LEDs in a column are illuminated, no status information has been received from the corresponding cinema for some time.

If the cinema does exist but no status is being displayed, check the items listed in Section 3.1 (Set Up).

The Meaning of Each Status LED

Description	Colour	Off	Flashing	On
Run (session)	Green	No Session	Slides or Previews	Main Feature
Start-End (of session)	Yellow	Session Running	Start/End of Session including Slides	CA21 Idle
Fault	Red	No Fault	Fault (Film Break, Xenon Fail, etc.)	Film Not Threaded

Status Panel States

State	Green	Yellow	Red
CA21 Idle Film not threaded	Off	On	On
CA21 Idle Film threaded	Off	On	Off
CA21 timer on Film not threaded	Off	Flashing	On
CA21 timer on Film threaded	Off	Flashing	Off
Slides showing	Flashing	Flashing	Off
Previews showing (Session running without House Lights off)	Flashing	Off	Off
Main Feature showing (Session running with House Lights off)	On	Off	Off
Session nearly ended (Session running without House Lights, off but after they have been off during the main feature)	On	Flashing	Off
Fault (Film Break, Xenon Fail, etc.)	Anything	Anything	Flashing
Cinema not responding	Off	Off	Off

5 CS30 Diagnostic Tests

Versions 1.3 and later of the CS30 firmware have a built in diagnostic test feature. The version number is displayed on a label on the CS30 microprocessor.

If the red push button is held down when the CS30 is switched on, the test procedure is entered. Testing commences after the button is released.

The tests are described below. Pushing the red button advances to the next test.

To return to normal operation, the CS30 must be switched off and then on again without holding down the red button.

Tests Performed

Test	Description
LED March Test	The LEDs are flashed row at a time and then column at a time.
All LEDs on	All LEDs are turned on.
Some LEDs on	Some LEDs are turned on.
Jumper Check	The five address jumpers on the back of the circuit board are read. When a jumper is installed, the three LEDs in the corresponding column will be illuminated. For example if jumpers A0 and A3 are installed, the LEDs in column 1 and 4 will be on. (Jumpers count from zero.)
RS-485 Interface Test	<p>A loop-back test is performed on the RS-485 interface used to connect the CS30 to other CS30s and CS21s. Characters are transmitted then read back and checked.</p> <p>The LEDs in a column indicate how the test is proceeding. After every 256 characters are checked, the illuminated column advances. If an error is detected either the column will not advance or all LEDs will flash. Power the CS30 off and on again to clear the error condition.</p> <p>The test should be performed with the CS30 disconnected from the RS-485 cable.</p>
Beeper Test	The fault beeper is pulsed until the red button is pressed. Testing is then repeated again from the LED March.

Appendix A CS30 Circuit Board (Rev B)

