1200 Series
Analog Clock Displays

Instruction Manual

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INFORMATION TO USERS IN EUROPE

NOTE

CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INFORMATION TO USERS IN THE U.S.A.

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used.

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Release	Jul 02

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Tables

1. OVERVIEW

The1200 Series Analog Clock Displays take master and slave clock technology to new levels of convenience and excellence. The clocks are microprocessor controlled and employ separate direct drive motors for each hand. This means that, as well as being able to set the time almost instantaneously, the new displays are also silent in operation. The hands of the clocks can be programmed to move in sweep mode or in steps.

Each clock can be programmed for automatic Daylight Saving Time adjustment, as well as for any time zone offset using a laptop computer. It is then only necessary to supply the clock system with Universal Coordinated Time (UTC) from the master clock. Daylight Saving Time changes will be automatic, as will adjustments for different time zones.

Each clock can be used as a master or slave clock. When used as a slave clock, it reads SMPTE/EBU linear timecode (LTC) from a master clock. When used as a master, it generates LTC for distribution to other slave clocks. In fact, any clock in the chain can generate timecode as soon as it looses timecode input from the master. The system is therefore extremely robust and reliable.

The problems of power distribution have also been considerably simplified. With other clock products, it is necessary to install power outlets wherever clocks are to be located. With the Evertz system slave clocks are powered from a single feed that distributes both power and modulated timecode. The power is introduced at one of the 1200 series clocks running in Master mode and from there it is distributed to the other downstream clocks running in slave mode. If the system is large, power can be introduced at multiple convenient clock locations.

Internal crystal oscillators ensure that the clocks will continue to operate in the absence of input timecode. Internal battery backup ensures that each clock will continue to keep time in the absence of timecode and power. When power resumes, the hands will immediately reset to the correct time.

The 1200 series clock displays are offered in two sizes. Backlighting is available for all models.

Model	Description
1212	12″ diameter clock display
1212L	12″ diameter clock display with back lighting
1216	16″ diameter clock display
1216L	16″ diameter clock display with back lighting

Throughout this manual the model *1200* will be used to describe the clocks when describing common features. When necessary, the specific model numbers will be used to distinguish features only available on some models.

Features:

- Automatic detection of 30 Fps or 25 Fps SMPTE/EBU timecode input
- Three motors for quiet operation and rapid hand setting - sets to time in 10 seconds.
- Automatic Daylight Saving Time adjustment
- Addressable slave clocks with programmable time offsets of 0 to 23.5 hours in 0.5 hour increments - set via DIP switches or RS-232 control.
- Accepts date information from LTC User Bits using SMPTE 309M or Leitch™ protocol
- Master or Slave operation with battery backed up clock

- Single cable distribution for both power and timecode
- In master mode, outputs 12 VDC modulated with timecode.
- In slave mode, can operate off 12VDC modulated with timecode. This allows multiple clocks to run off a single 110/220 AC power outlet.
- Sweep or Step second hand movement
- Optional back lighting of clock face
- Two sizes 12” or 16”
- Time may be set manually via pushbutton switches, or through the RS-232 serial port.

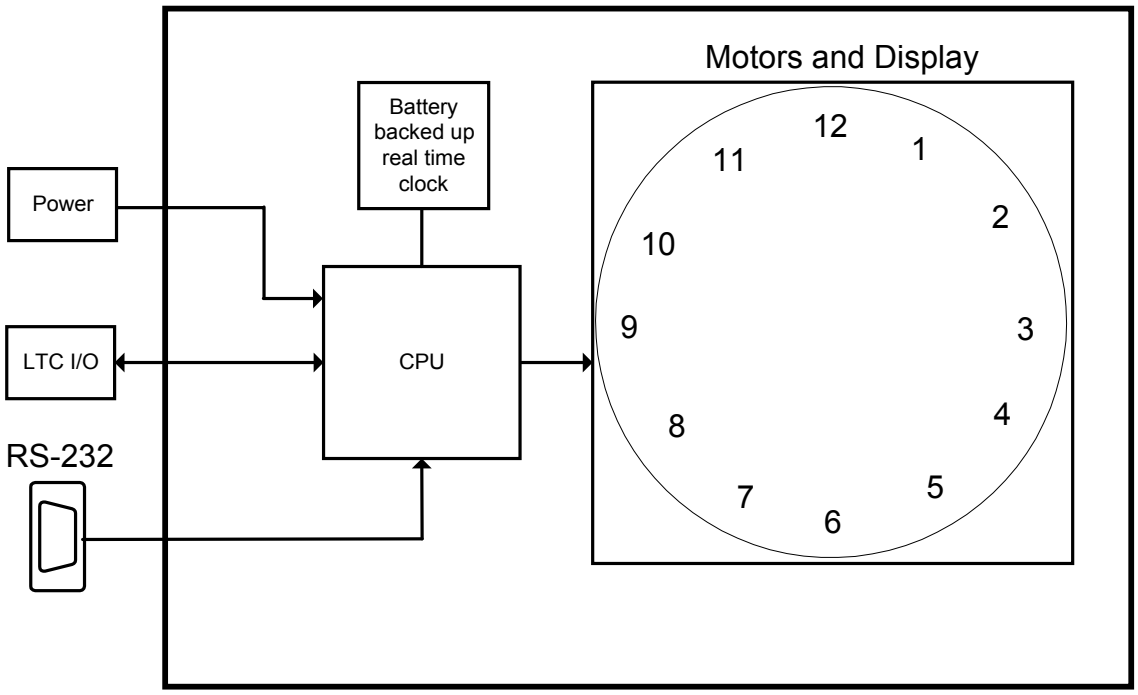


Figure 1: Clock Block Diagram

2. INSTALLATION

The 1200 series clocks have keyhole slots for mounting. They have a 4 pin connector for timecode input and output. They have a power jack for 12 VDC input and there is a 12 VDC adapter supplied which is installed in a slot in the rear panel. This allows the clock to run on 12 VDC, 110/220 VAC or to receive power from another upstream 1200 series clock operating in master mode. There is a DB-9 connector for RS-232 communications from a PC.

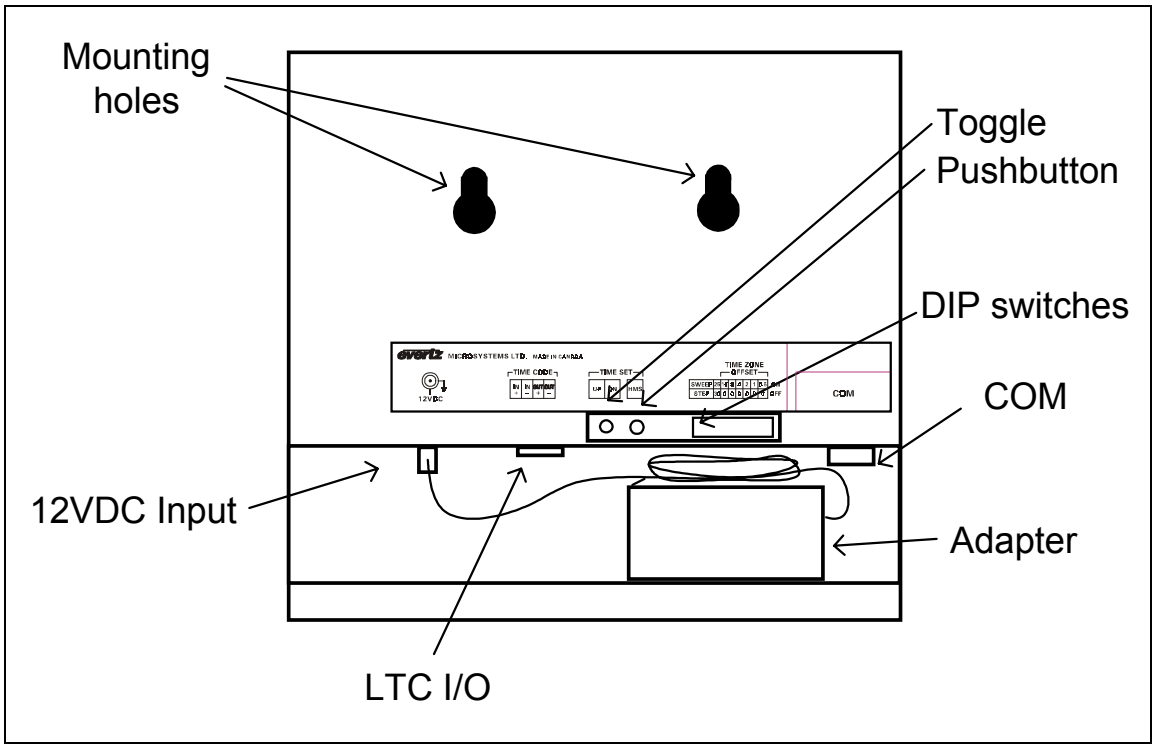


Figure 2: Rear Panel Overview

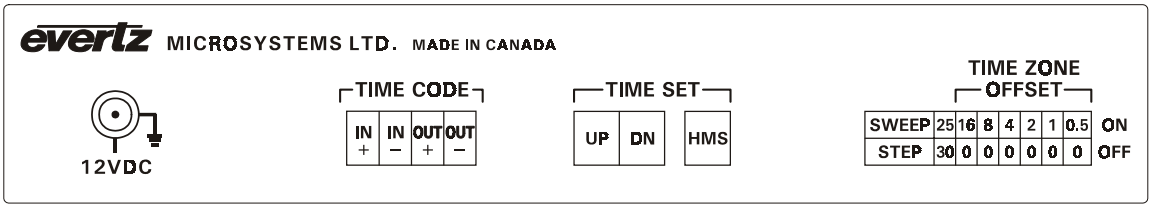


Figure 3: Rear Panel Connections and Controls

2.1. TIMECODE INPUTS AND OUTPUTS

There is a terminal block at the rear of the clock that can contains the time code inputs and outputs.

IN+, IN- These two input pins are for connecting SMPTE/EBU linear timecode (LTC) to the clock.

OUT+, OUT- These two output pins are for connecting LTC and 12VDC to other clocks.

In slave mode these pins are looped through from the respective input pins. In master mode these pins contain a reclocked copy of the input LTC modulated on 12VDC. See section 6.4 for information on selecting Master or Slave mode.

Time code output pins may contain 12 VDC. Do not connect the time code outputs to anything other than another 1200 series clock operating in slave mode, or damage may occur to the other device.

2.2. RS-232 COMMUNICATIONS PORT

The **COM** connector is a female 9 pin D connector used for connecting a computer to control the 1200 series clocks. This port is wired at the factory as an RS232 DCE port as shown in Table 1 and can be connected directly to most PC COM ports using a 'straight through' cable. The RS-232 communication is 2400 baud, 8 bits, no parity, 1 stop bit, no flow control. See section 7 for information on controlling the clock using the serial port.

Pin #	Name	Description
1		Not connected
2	TxD	RS-232 Transmit Output
3	RxD	RS-232 Receive Input
4		Not connected
5	Sig Gnd	RS-232 Signal Ground
6		Not connected
7		Not connected
8		Not connected
9		Not connected

Table 1: COM Port Pinout

2.3. POWER

The 1200 series clocks come with an auto-ranging DC voltage adapter that automatically senses the input voltage. This power adapter should be used when the clock is operating in Master mode. Power should be applied by connecting a 3-wire grounding type power supply cord to the power entry module on the DC voltage adapter. The power cord should be minimum 18 AWG wire size; type SST marked VW-1, maximum 2.5 m in length. The DC cable of the voltage adapter should be connected to the DC power jack on the rear panel.

When the clock is operating in Slave mode, it receives power from upstream 1200 series clocks. See section 6.4 for information on selecting Master or Slave mode.

2.4. MOUNTING

The 1200 series clocks are designed to be surface mounted on a wall using two screws in the keyhole slots provided. The rear panel drawing shown in Figure 4 shows the location of the keyhole slots for the 1212 and 1216 clocks.

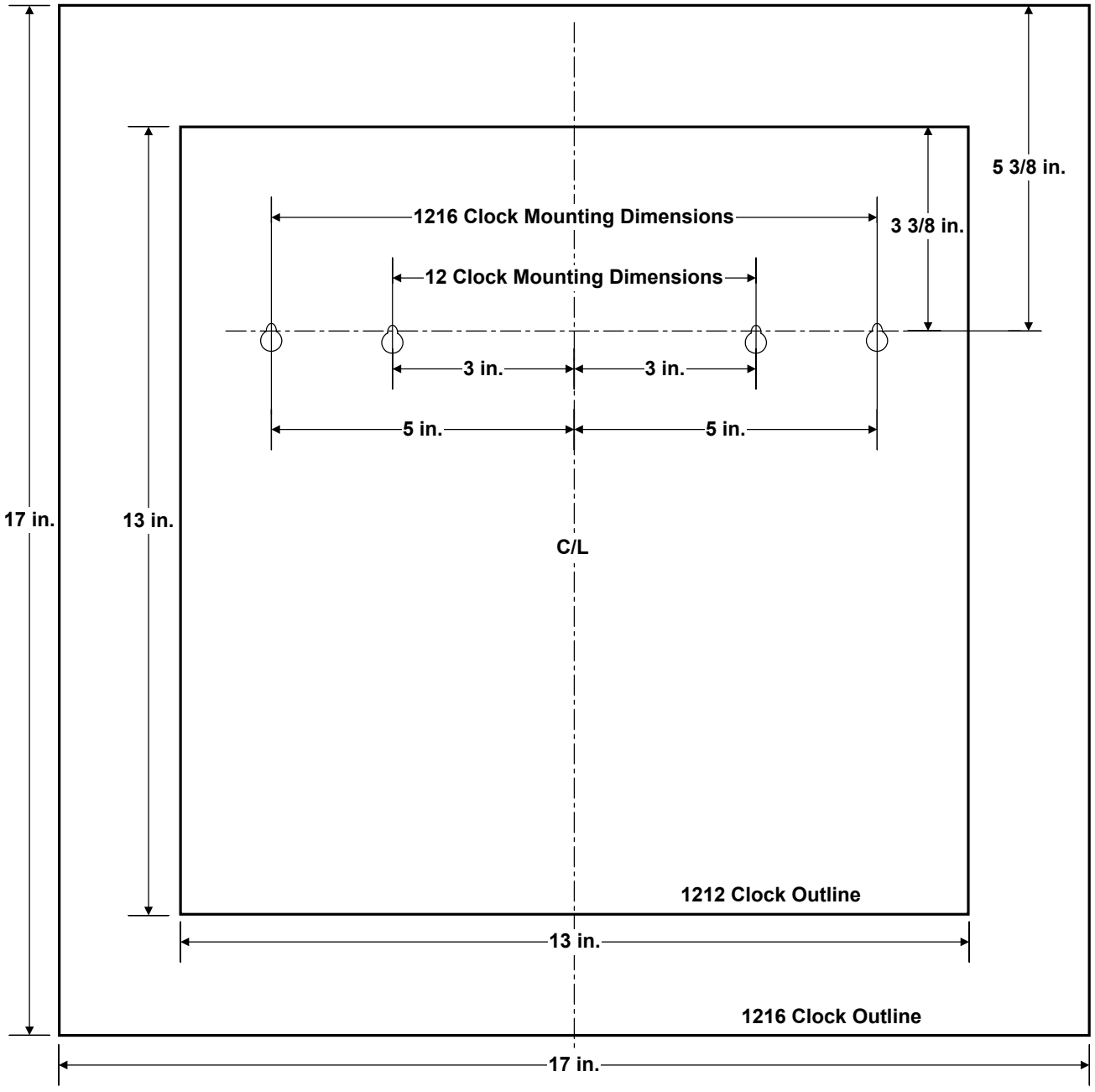


Figure 4: Rear Panel Mounting Template

3. SPECIFICATIONS

3.1. LTC INPUT

Standard: SMPTE 12M linear time code - 25 or 30 Fps nominal.
Connector: Phoenix 4 pin terminal connector.
Signal Level: 1 Vp-p nominal.
Input impedance: > 30K Ohm

3.2. LTC OUTPUT

Standard:
- **Slave Mode:** same as input.
- **Master Mode:** same as input
  Set by DIP switch when input not present - 25 Fps or Non drop-frame 30 Fps.

Connector: Phoenix 4 pin terminal connector.
Signal Level:
- **Slave Mode:** looped through from input
- **Master Mode:** 1 Vp-p nominal with 11.5VDC nominal offset to drive downstream slave clocks.

3.3. TIME KEEPING

Accuracy: < 2 seconds per day with power on, no timecode present.
< 10 seconds / day with power removed.
Time Zone Offset: 0 to 23½ hours in ½ hour increments
Set with DIP switches or serial port command.

3.4. BACKUP BATTERY

Type: CR-2032 3 volt lithium cell.
Life expectancy: > 5 years

3.5. ELECTRICAL

Voltage: 115/230 VAC 50/60 Hz with adapter or
12 VDC from upstream powered clocks
Power:
- **Standard:** 1.33 Watts (plus power for downstream slave clocks)
- **Backlit models:** 3.00 Watts (plus power for downstream slave clocks)

3.6. PHYSICAL

Outside Dimensions:

1212, 1212L: 13" W x 13" H x 2.5" D
(330 mm W x 330 mm H x 64 mm D)

1216, 1216L: 17" W x 17" H x 2.5" D
(432 mm W x 432 mm H x 64 mm D)

Clock Face:

1212, 1212L: 12” diameter

1216, 1216L: 16” diameter

Weight:

1212, 1212L: 6.5 lb (2.9 Kg)

1216, 1216L: 10.5 lb (4.75 Kg)

4. STATUS LED

The 1200 series clocks are fitted with a red status LED located at the bottom of the front face of the clock, just below the number “**6**”. The LED has three modes:

OFF: The clock is running normally and has input LTC.

ON: The clock is running normally but has no LTC input.

FLASHING: The clock is in manual time setting mode.

5. REAR PANEL CONTROLS

The 1200 series clocks are equipped with a three position, return to center toggle switch that is used in conjunction with a momentary pushbutton to set the clock time (see section 5.4). An 8 position DIP switch allows the user to select various functions. DIP switch 1 is located at the right of the DIP switch, and the On position is Up. Table 2 gives an overview of the DIP switch functions. Sections 5.1 to 5.3 describe the DIP switch functions in more detail.

DIP Switch	Function
1	Sets Time zone Offset
2	
3	
4	
5	
6	
7	Sets Time Code mode when no input
8	Sets Second Hand mode

Table 2: DIP Switch Functions Overview

5.1. SETTING THE TIME ZONE OFFSET

DIP switches 1 to 6 are used to set the time zone offset for the clock. The Time zone offsets can be set from 0 to 23.5 hours in one half our intervals and will be added to the LTC time being received. Table 3 shows the settings for the various time zones. When the switches are all in the On position the time zone must be set by software control (see section 7.2.8 for more information).

6	5	4	3	2	1	Time Offset	Time Zone Code (Hex)
Off	Off	Off	Off	Off	Off	+ 0 hours	0x00
Off	Off	Off	Off	Off	On	+ ½ hours	0x01
Off	Off	Off	Off	On	Off	+ 1 hours	0x02
Off	Off	Off	Off	On	On	+ 1½ hours	0x03
Off	Off	Off	On	Off	Off	+ 2 hours	0x04
Off	Off	Off	On	Off	On	+ 2½ hours	0x05
Off	Off	Off	On	On	Off	+ 3 hours	0x06
Off	Off	Off	On	On	On	+ 3½ hours	0x07
Off	Off	On	Off	Off	Off	+ 4 hours	0x08
Off	Off	On	Off	Off	On	+ 4½ hours	0x09
Off	Off	On	Off	On	Off	+ 5 hours	0x0A
Off	Off	On	Off	On	On	+ 5½ hours	0X0B
Off	Off	On	On	Off	Off	+ 6 hours	0X0C
Off	Off	On	On	Off	On	+ 6½ hours	0X0D
Off	Off	On	On	On	Off	+ 7 hours	0X0E
Off	Off	On	On	On	On	+ 7½ hours	0X0F
Off	On	Off	Off	Off	Off	+ 8 hours	0x10
Off	On	Off	Off	Off	On	+ 8½ hours	0x11
Off	On	Off	Off	On	Off	+ 9 hours	0x12
Off	On	Off	Off	On	On	+ 9½ hours	0x13
Off	On	Off	On	Off	Off	+ 10 hours	0x14
Off	On	Off	On	Off	On	+ 10½ hours	0x15
Off	On	Off	On	On	Off	+ 11 hours	0x16
Off	On	Off	On	On	On	+ 11½ hours	0x17
Off	On	On	Off	Off	Off	+ 12 hours	0x18
Off	On	On	Off	Off	On	+ 12½ hours	0x19
Off	On	On	Off	On	Off	+ 13 hours	0x1A
Off	On	On	Off	On	On	+ 13½ hours	0X1B
Off	On	On	On	Off	Off	+ 14 hours	0X1C
Off	On	On	On	Off	On	+ 14½ hours	0X1D
Off	On	On	On	On	Off	+ 15 hours	0X1E
Off	On	On	On	On	On	+ 15½ hours	0X1F
On	Off	Off	Off	Off	Off	+ 16 hours	0x20
On	Off	Off	Off	Off	On	+ 16½ hours	0x21
On	Off	Off	Off	On	Off	+ 17 hours	0x22
On	Off	Off	Off	On	On	+ 17½ hours	0x23
On	Off	Off	On	Off	Off	+ 18 hours	0x24
On	Off	Off	On	Off	On	+ 18½ hours	0x25
On	Off	Off	On	On	Off	+ 19 hours	0x26
On	Off	Off	On	On	On	+ 19½ hours	0x27
On	Off	On	Off	Off	Off	+ 20 hours	0x28
On	Off	On	Off	Off	On	+ 20½ hours	0x29
On	Off	On	Off	On	Off	+ 21 hours	0x2A
On	Off	On	Off	On	On	+ 21½ hours	0X2B
On	Off	On	On	Off	Off	+ 22 hours	0X2C
On	Off	On	On	Off	On	+ 22½ hours	0X2D
On	Off	On	On	On	Off	+ 23 hours	0X2E
On	Off	On	On	On	On	+ 23½ hours	0X2F
On	On	On	On	On	On	Software control	0X3F

Table 3: Time Zone Offset Switch Settings

5.2. SETTING THE DEFAULT TIME CODE FRAME RATE

DIP switch 7 is used to set the default rate of the time code output when there has been no timecode input to the clock since it was powered up. If a time code input has been detected, the output time code rate will be set to match the rate of the input code.

DIP 7	FUNCTION
Off (default)	Set Time Code rate to 30 Fps
On	Set Time Code rate to 25 Fps

Table 4: Default Time Code Rate DIP Switch Functions

5.3. SETTING THE SECOND HAND MODE

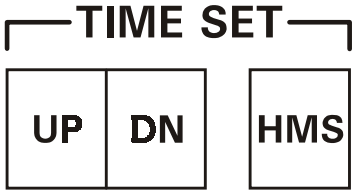
DIP switch 8 is used to set the second hand mode

DIP 7	FUNCTION
Off (default)	Set the second hand to Step mode. The second hand will advance and then stop once per second.
On	Set the second hand to Sweep mode. The second hand will move continuously.

Table 5: Second Hand Mode DIP Switch Functions

5.4. SETTING TIME MANUALLY

The 1200 series clocks are equipped with a three position, return to center, toggle switch that is used in conjunction with a momentary pushbutton to manually set the time.



To set the time, press the **HMS** pushbutton once. The LED on the front panel will flash, and the hour hand will wiggle once. Press the toggle switch in the **UP** or **DN** position to set the hour hand to the correct time. If you are finished setting time, do not perform any further action. In 60 seconds, the clock will exit the time setting mode and the LED will stop flashing.

To set the minutes press the **HMS** pushbutton again, and the minute hand will wiggle. Press the toggle switch in the **UP** or **DN** position to set the minute hand to the correct time. If you are finished setting time, do not perform any further action. In 60 seconds, the clock will exit the time setting mode and the LED will stop flashing.

To set the seconds press the **HMS** pushbutton again, and the second hand will wiggle and stop. Press the toggle switch in the **UP** or **DN** position to set the second hand to the correct time. Press the **HMS**

pushbutton again to restart the second hand. Note that you can set the second hand to a future time, and wait for that time to occur. Pressing the **HMS** pushbutton will then restart the second hand at the correct time.

6. JUMPERS AND BATTERY REPLACEMENT

In order to set the MASTER/Slave mode jumpers or replace the lithium battery you will need to remove the back cover of the clock using the procedure outlined in sections 6.1 and 6.2

6.1. REMOVING THE BACK COVER:

1. Unplug the power cord.
2. Unplug the LTC input/output connector.
3. Unplug the RS-232 connector.
4. Unplug the power adapter from the 12 VDC input
5. On the 1216 and 1216L clocks, remove 4 small black screws from the outside edges of the clock.
6. Remove 4 screws from the corners of the back panel.
7. Slide the back panel downwards about 1 cm / 3/8 inch, while lifting the bottom edge slightly.
8. When the 12 VDC power jack is clear of the rear panel, lift the rear panel off of the clock. **Be careful not to damage the cable running from the rear panel DB-9 to the circuit board.**
9. Remove the ribbon connector from the COM connector to the circuit board.

6.2. REPLACING THE BACK COVER:

1. Replace the cable from the COM connector to the circuit board. Note that the cable runs toward the black motor chassis.
2. Place the rear cover over the clock.
3. Insert the top of the rear panel in the clock with it in place about 1 cm / 3/8 inch downwards.
4. Place the bottom of the rear panel in the clock. **Be careful to not damage the 12 VDC power jack.**
5. Slide the rear panel into position while lifting the bottom edge of the rear panel slightly.
6. On the 1216 and 1216L clocks replace the 4 small black screws around the outside edges of the clock.
7. Replace 4 screws around the corners of the rear panel.
8. Replace any connectors removed during removal of the back cover.

6.3. CHANGING THE BATTERY:

1. Remove the back cover of the clock as described in section 6.1
2. The battery is located in a socket on the main circuit board.
3. Carefully remove battery.
4. Replace with a new CR-2032 or equivalent 3 volt lithium cell. Note that the + is up on the battery.
5. Replace the back cover of the clock as described in section 6.2

6.4. SELECTING MASTER/SLAVE MODE:

There are 4 jumpers located inside the clock that must be changed to select whether the clock will operate in Master or Slave mode. Table 6 shows a comparison of Master and Slave modes for the clock. Figure 5 gives an overview of the schematic for the Master/Slave Jumpers.

Feature	Master Mode	Slave Mode
Clock Power	External power Adapter	Upstream Clocks
LTC Input	Input to LTC Reader	Input to LTC Reader with 12VDC to power clock
LTC Output	Regenerated LTC, Slaved to LTC Input or clock time, with 12 VDC to power downstream clocks	Passive loop-through of LTC input.

Table 6: Comparison of Master and Slave Modes

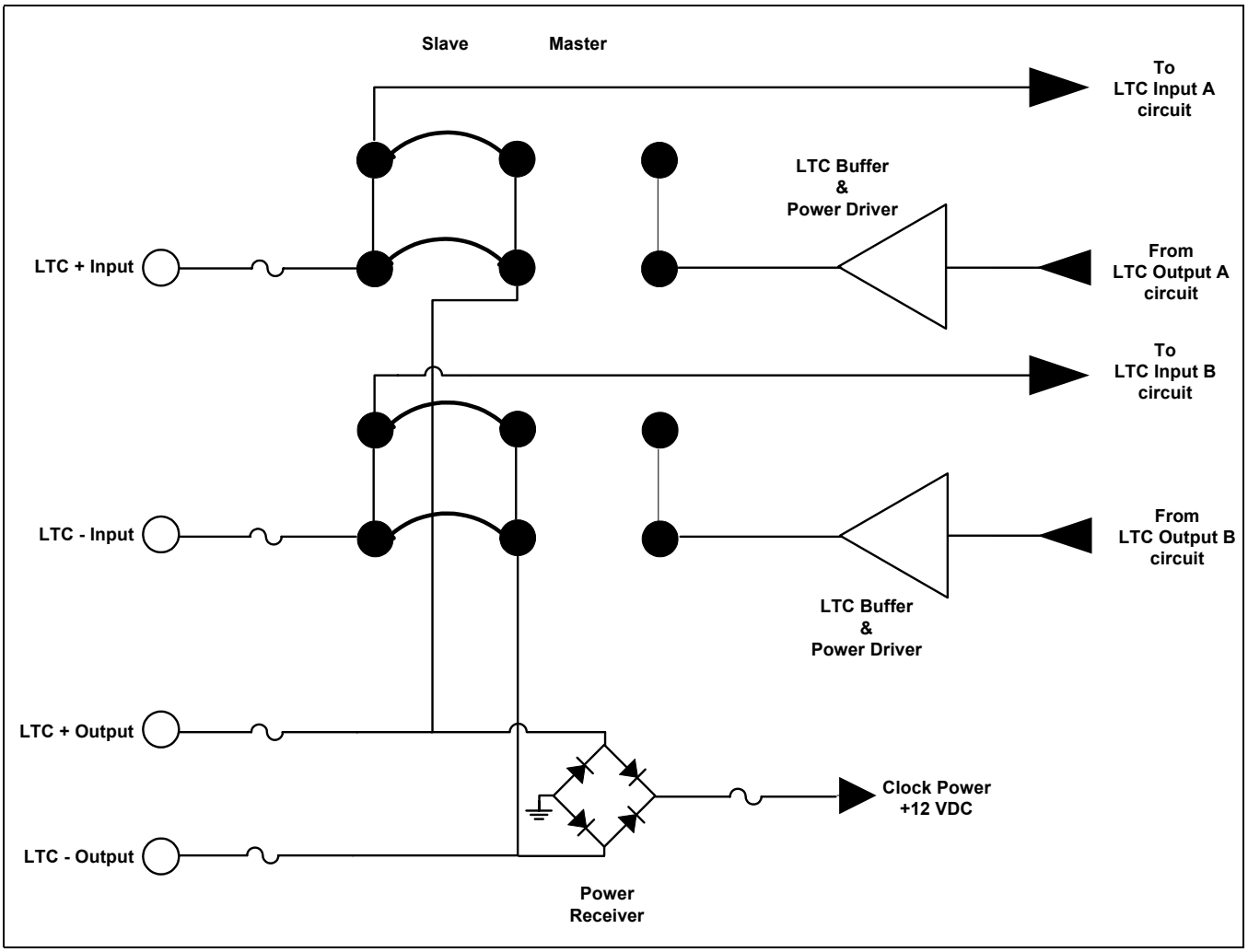


Figure 5: Master/Slave Mode Schematic

Use the following procedure to change the mode of the clock.

1. Remove the back cover of the clock as described in section 6.1
2. Remove 4 jumpers.
3. Replace 4 jumpers in master or slave position as shown in Figure 6 or Figure 7.
4. Replace the back cover of the clock as described in section 6.2

Note that all jumpers must all be in slave mode or master mode. They must not have some in slave, and some in master mode.

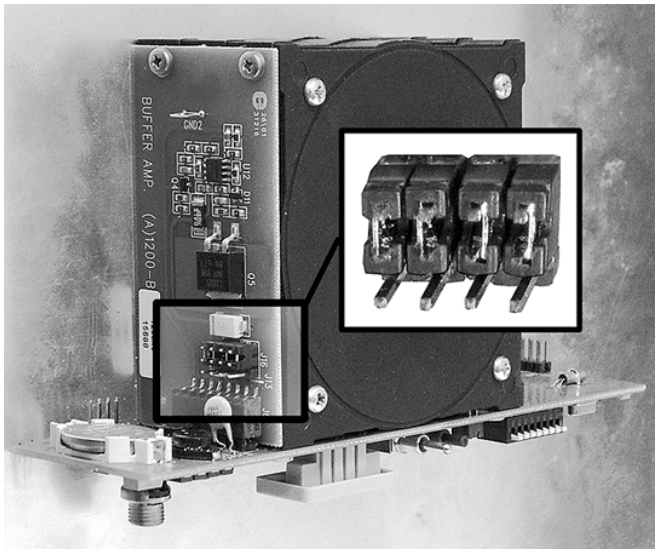


Figure 6: Setting the Clock to Master Mode

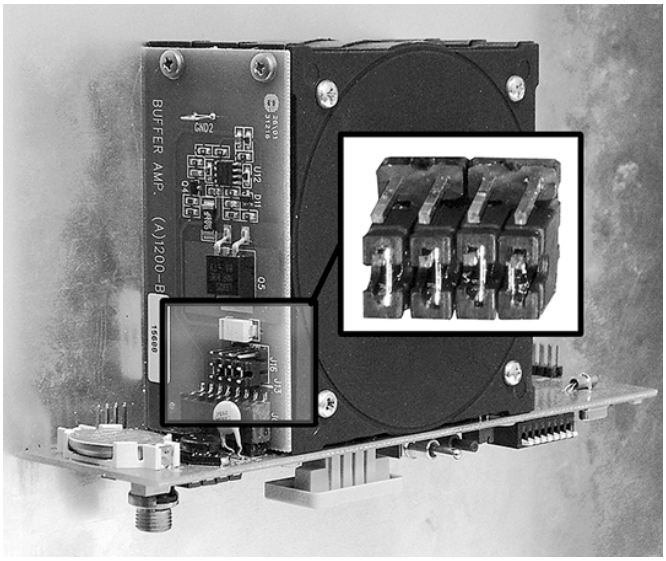


Figure 7: Setting the Clock to Slave Mode

7. SOFTWARE CONTROL

The 1200 series clocks can be programmed using commands from the COM port, or received as user bits on the Time Code input from upstream clocks. This means that in large systems, a computer can be connected to the COM port of the clock operating as the Master, and commands can be sent to all the other clocks, by addressing them individually by their serial number, or by assigning them to a group and then addressing all clocks in the group. This procedure simplifies setting

7.1. CONNECTING THE CLOCK TO A COMPUTER

7.1.1. Requirements

You will need the following equipment in order to communicate with the 1200 series clocks

- PC with available communications port.
- "Straight-thru" serial extension cable (DB9 female to DB9 male) or (DB25 female to DB9 male)
- Terminal program such as HyperTerminal

7.1.2. Connecting the COM Port

1. Connect the 9 pin male connector on the straight through serial extension cable to the COM port on the back of the 1200 series clock. Connect the 9 pin female connector to the PCs' RS-232 communications port

7.1.3. Terminal Program Setup

2. Start the terminal program.

3. Configure the port settings of the terminal program as follows:

Baud	**2400**
Parity	**no**
Data bits	**8**
Stop bits	**1**
Flow Control	**None**

7.2. COMMAND DESCRIPTIONS

The following conventions are used in describing the command interface to the clocks.

- Hexadecimal [hex] numbers are represented with the prefix "0x."
- Unless otherwise noted, all commands must be followed by a carriage return <cr> (0x0d)
- All numbers sent as Hex ASCII values. This means that each byte of the hexadecimal value is sent as two ASCII characters. For example the hexadecimal value 0x20 is sent as the ASCII character '2' followed by the ASCII character '0'.

7.2.1. Parameters

Some commands use parameters with variable values. The command descriptions use a generic designator to indicate these parameters. The chart below shows each of the designators with their meanings and the permitted values. The values shown are the actual characters to be inserted into the command message. Leading zeros are required.

Designator	Name	Description
<ssssssss>	Serial number	An 8 digit hexadecimal number that uniquely identifies one of the clocks. These serial numbers are programmed into the clock at the factory and can not be changed.
<gg>	Group number	A 2 digit hexadecimal number that identifies a group of clocks within a system.
<hh>	Hours	A two digit hour value from 00 to 23
<mm>	Minutes	A two digit minute value from 00 to 59
<ss>	Seconds	A two digit seconds value from 00 to 59
<zz>	Time Zone Offset	A two hexadecimal digit coded value from 0x00 to 0x2F indicating the time zone offset that is to be used to display the local time. See Table 3 for a list of the Time zone offset code values for various time zone offsets.
<YY>	Year	A two digit value from 00 to 99 representing the two least significant digits of the year.
<MM>	Month	A two digit value from 01 to 12 representing the month of the year.
<DD>	Day of Month	A two digit value from 01 to 31 representing the day of the month.
<dd>	Day of Week	A two digit value from 01 to 07 representing the day of the week. Sunday is day 01, Saturday is day 07. This value is used in setting the Daylight Saving Time observance dates in week mode.
<W>	Week of Month	A one digit value from 0 to 4 representing the week of the month. The week beginning with the first Sunday of the month is week 1. Week value 0 is used to designate the last week of the month that may be either week 4 or week 5 depending on the calendar. This value is used in setting the Daylight Saving Time observance dates in week mode.

7.2.2. System Overview.

Messages can be sent directly to the clock that is connected to the computer or to downstream clocks. To send a message to the clock that is connected directly to the PC use the command syntax defined in sections 7.2.7 to 7.2.10. Each of these messages can also be sent to downstream clocks that are connected using LTC. The downstream clocks can be addressed as individual clocks by specifying a clock serial number. Clock serial numbers are assigned at the factory and can be queried by using the **?S** command.

Clocks can also be assigned to groups (e.g. all the clocks on a particular section of a building, all the clock displaying a specific time zone, etc.) or as groups by specifying a group number. Messages for downstream clocks can then be designated for all the clocks in a particular group.

Clocks that are connected to the PC will return a message indicating successful completion of each of the commands. Commands sent to downstream clocks using the **Y** or **G** command will not be acknowledged.

7.2.3. Assigning A Clock To A Specific Group

Command: **A<ssssssss><gg><cr>**

This command will assign a clock to the specified group if its serial number matches. Use the command **?S** to read back the serial number of the clock.

7.2.4. Sending A Message To Specific Downstream Clocks

Command: **Y<ssssssss><message><cr>**

This command sends a <message> to downstream clocks with a matching serial number. <message> is one of the commands with its parameters specified in sections 7.2.7 to 7.2.10.

7.2.5. Sending A Message To a Group of Downstream Clocks

Command: **G<gg><message><cr>**

This command sends a <message> to downstream clocks with a matching group number. <message> is one of the commands with its parameters specified in sections 7.2.7 to 7.2.10.

7.2.6. Reading Register Values From A Clock

The Register values of the clock directly connected to the PC can be read by using one of the **?** commands. Register values can not be read back from downstream clocks. Table 7 summarizes the read back command available.

Readback Command	Description
?S	Returns the clock serial number
?G	Returns the clock group number
?T	Returns the current clock time
?D	Returns the current clock date
?DE	Returns the current setting of the DST Enable register
?DO	Returns the current setting of the DST Offset register
?DW	Returns the current setting of the DST Date Mode register
?DSH	Returns the current setting of the DST Start Hours register
?DSM	Returns the current setting of the DST Start Month register
?DSD	Returns the current setting of the DST Start Day register
?DSW	Returns the current setting of the DST Start Week register (Week Mode Only)
?DPH	Returns the current setting of the DST Stop Hours register
?DPM	Returns the current setting of the DST Stop Month register
?DPD	Returns the current setting of the DST Stop Day register
?DPW	Returns the current setting of the DST Stop Week register (Week Mode Only)
?DST	Returns the entire set of DST register values

Table 7: Read Back Commands

7.2.7. Setting the Clock time

Command: **T<hh>:<mm>:<ss><cr>**

This command sets the clock to the specified time. Note that this command is only useful if there is no timecode input, as the timecode will immediately override the time entered.

7.2.8. Setting the Time Zone Offset

Command: **TZ<zz><cr>**

This command sets the time zone offset to be applied to the time. Note that this command is only useful if the Time Zone DIP switches are all set to the ON position, otherwise the DIP switch Time zone setting will immediately override the value entered. See Table 3 for a list of the time zone code values to be sent.

7.2.9. Setting the Clock Date

Command: **D<DD>:<MM>:<YY><cr>**

This command sets the clock to the specified date. Note that this command is only useful if there is no timecode input with dates encodes in the user bits, as the as the user bit date value will immediately override the date entered. The date must be entered either from the User Bits or by using this command if you want to use the automatic Daylight Saving Time Adjust mode.

7.2.10. Automatic Daylight Saving Mode

The 1200 series clocks can be programmed to automatically switch between Daylight Saving Time and Standard time. When auto DST mode is enabled, the clock will automatically add the number of hours specified by the *DST offset* register to the clock time beginning at the time and date specified by the *DST Start* registers and ending at the time and date specified by the *DSP Stop* registers. These registers are programmed with the default values for North America at the factory, but can be programmed by serial port commands to the correct values for your local region. Note that the date must be entered either from the User Bits or by using this command if you want to use the automatic Daylight Saving Time Adjust mode. Table 8 shows the default values for each register. Individual commands used to set these registers are described in sections 7.2.10.1 to 7.2.10.7.

Register Name	Factory Default Value	Description
DST Enable	Off	Auto DST adjust mode is disabled
DST Mode	Week	Week mode will be used to set the DST Start and Stop Dates
DST Offset	1	The number of hours of offset to be applied when Daylight Saving Time is in Effect.
DST Start Month	04 (April)	Month of the Start Date for DST
DST Start Week	1 (First Week)	Week of the Start Date for DST
DST Start Day	01 (Sunday)	Day of Week of the Start Date for DST
DST Start Hour	02 (02:00:00)	Hour of the Start Time for DST
DST End Month	10 (October)	Month of the End Date for DST
DST End Week	0 (Last week)	Week of the End Date for DST
DST End Day	01 (Sunday)	Day of Week of the End Date for DST
DST End Hour	02 (02:00:00)	Hour of the End Time for DST

Table 8: DST Register Default Values

7.2.10.1. Enabling Automatic Daylight Saving Adjust Mode

Command: **DE<cr>**

This command enables Automatic Daylight Saving Mode.

7.2.10.2. Disabling Automatic Daylight Saving Adjust Mode

Command: **DD<cr>**

This command disables Automatic Daylight Saving Mode.

7.2.10.3. Setting the Daylight Saving Time Offset Value

Command: **DOx<cr>**
X is the value 0, 1, or 2

This command sets the number of hours of offset to be used when Daylight Saving Time is in effect.

7.2.10.4. Setting the Daylight Saving Time Date Mode

There are two commands that set the time mode for entering the DST Start Date and DST Stop Date.

Command: **DW<cr>**

This command sets the DST date format to Week mode. The DST Start and Stop Dates are a set of rules for the date (*Week of a Month, Day of the Week*.) that will change the specific dates depending on the calendar year – e.g. First Sunday of April, Last Sunday of October.

Command: **DM<cr>**

This command sets the DST date format to Month mode. The DST Start and Stop Dates are set as specific dates (*Month, Day of the month).*

7.2.10.5. Setting the Daylight Saving Time Start and Stop Hour

Command: **DSH<hh><cr>**

This command sets the hour of the day when Daylight Saving Time will start.

Command: **DPH<hh><cr>**

This command sets the hour of the day when Daylight Saving Time will stop.

7.2.10.6. Setting the Daylight Saving Time Dates – Week Mode

In Week mode the DST Start and Stop Dates are entered as a set of rules for the date (*Week of a Month, Day of the Week*.) that will change the specific dates depending on the calendar year – e.g. First Sunday of April, Last Sunday of October.

Command: **DSW<W><cr>**

This command sets the week of the month when Daylight Saving Time will start. The week beginning with the first Sunday of the month is week 1. Week value 0 is used to designate the last week of the month that may be either week 4 or week 5 depending on the calendar.

Command: **DSD<dd><cr>**

This command sets the day of the week in the week designated by the *DSW* command, when Daylight Saving Time will start. Day values from 01 to 07 are valid.

Command: **DPW<W><cr>**

This command sets the week of the month when Daylight Saving Time will stop. The week beginning with the first Sunday of the month is week 1. Week value 0 is used to designate the last week of the month that may be either week 4 or week 5 depending on the calendar.

Command: **DPD<dd><cr>**

This command sets the day of the week in the week designated by the *DSW* command, when Daylight Saving Time will stop. Day values from 01 to 07 are valid.

7.2.10.7. Setting the Daylight Saving Time Dates – Month Mode

In Month mode the DST Start and Stop Dates are entered as specific dates (*Month, Day of the month).*

Command: **DSM<MM><cr>**

This command sets the month when Daylight Saving Time will start.

Command: **DSD<dd><cr>**

This command sets the day of the month designated by the *DSM* command, when Daylight Saving Time will start. Day value 00 is used to designate the last day of the month (e.g. Feb 28, or Feb 29 depending on the calendar year.)

Command: **DPM<MM><cr>**

This command sets the month when Daylight Saving Time will stop.

Command: **DPD<dd><cr>**

This command sets the day of the month designated by the *DSM* command, when Daylight Saving Time will stop. Day value 00 is used to designate the last day of the month (e.g. Feb 28, or Feb 29 depending on the calendar year.)

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