

**MODEL 6475
TIME CODE DISPLAY**

Revised
June 1, 2007

**ITS MODEL 6475
TIME CODE DISPLAY**

Table of Contents

<u>Paragraph</u>	<u>Description</u>	<u>Page</u>
1.0	GENERAL	1
2.0	CHARACTERISTICS	2
2.1	TIME DISPLAY MODE	2
2.2	COUNTER DISPLAY MODE	2
2.3	SERIAL I/O OPERATION	3
3.0	MECHANICAL CONFIGURATION	5
4.0	CONTROLS, CONNECTORS, AND INDICATORS	6
4.1	Power	6
4.2	Intensity.....	6
4.3	Time Code In.....	6
4.4	Serial Input.....	6
4.5	Time Code Select	6
4.6	Counter/Reader/Remote.....	6
4.7	Power In.....	6
5.0	SPECIFICATIONS	7
5.1	Time Code	7
5.2	Display	7
5.3	Serial Input.....	7
5.4	Internal Reference.....	7
5.5	Non-volatile Memory	7
5.6	External Power	7
5.7	Enclosure	7
<u>Figure</u>	<u>Description</u>	<u>Page</u>
1	Model 6475 (Enclosure).....	5

ITS MODEL 6475 TIME CODE DISPLAY

1.0 GENERAL

The ITS Model 6475 Time Code Display is a two function unit that decodes the NASA 36 or IRIG B Serial Time Code and also performs a counter function. The unit displays the time or alternatively the counter state as selected. Features include:

1. *Decodes NASA 36 or IRIG B Serial Time Code, selectable.*
2. *Nine digit time display, 4" high LED characters.*
3. *Internal crystal controlled clock maintains timing in the event of a loss of serial time code input.*
5. *Serial RS-232 control input.*
6. *Non-volatile memory retains set-up in the event of power failure.*
7. *Offset feature allows different time zones to be displayed from common time code input.*

The unit is housed in a 39.75" x 6.5" x 2" enclosure and is powered by 12VDC. A 100 to 240 VAC, 50/60Hz power converter is provided.

2.0 CHARACTERISTICS

2.1 TIME DISPLAY MODE

When set to time display mode the 6475 displays the applied time code, or in the absence of an applied signal, the internal clock. Display is nine digits, DDD:HH:MM:SS. The time display may be offset to display a time zone other than the applied time code (see Par 2.3).

If there is a loss of serial time code input, the displayed colons flash at a 1Hz rate to alert the operator that the 6475 is operating on the internal clock.

2.2 COUNTER DISPLAY MODE

When set to counter display mode the 6475 will display the state of an internal up-down counter. The counter is always active regardless of the display mode selected and functions as follows:

The 6475 will increment or decrement a preset time display, as commanded by the operator, synchronized with the applied Serial Time Code. A preset value may be set into the 6475 via the serial port. Once entered, the value is immediately displayed and the counter will be in the 'Hold' mode. Counting will begin on receipt of either a 'Count-Up' or 'Count-Down' command. These commands are only active while the counter is in the 'Hold' mode after preset. If a 'Count-Down' command is issued, a minus sign will be displayed to the left of the displayed value (in the hundreds-of-days position) and the display will begin to decrement at a one count per second rate. When the displayed count reaches zero the minus sign will turn off and the display will begin to increment at the one-second rate. It will continue to increment until a new preset value is input, until the days display reaches 999, or if a 'Hold' command is received via the serial port. If a 'Count-Up' command is issued, no sign will be displayed and the display will begin counting up from its preset value. If a 'Hold' command is issued, the displayed value will stop counting. It will continue counting from the current displayed value upon receipt of a 'Resume' command.

2.2 COUNTER DISPLAY MODE (continued)

Note that the maximum negative value that can be used is 99 days. This limitation is due to the fact that the most significant digit is used to display the minus sign. If a value greater than 99 is entered, the MS digit will be discarded when the countdown is started.

The counter, or the IRIG time display if selected, will continue to operate in the event of a loss of the applied serial time code, operating on the internal clock. The unit will re-synchronize to the serial time code when re-applied.

2.3 SERIAL I/O OPERATION

The 6475 Serial interface provides the means of fully controlling the unit over a single 9600 baud asynchronous RS232C line. The following functions are implemented:

<u>Function</u>	<u>ASCII Message (ignore commas)</u>	<u>Notes</u>
Load clock time (immediate)	CNTL A,DDDHHMMSS<CR>	1, 2
Load Counter Time (count hold)	CNTLB, DDDHHMMSS<CR>	1
Start Count-Up	+	
Start Count-Down	-	
Hold counter	CNTL H	
Resume counter	CNTL R	
Select Time Display	CNTL E	
Select Counter Display	CNTL F	
Load year	CNTL Y,#,N,# or CNTL Y,#,NN,#	3
Load time zone offset	CNTL O, HH+/-	4
Set display intensity	CNTL I, N	5

2.3 SERIAL I/O OPERATION (continued)

- NOTE 1: Where DDDHHMMSS = days, hours, minutes and seconds.
- NOTE 2: This function is not active when a time code is present. It is used only when the 6475 is acting as a stand alone time reference.
- NOTE 3: The "Load year" command is used to reference the 6475 to leap year. N = '0' to '3' and represents the number of years between the current year and the last leap year. i.e. '0' = leap year, '1' = one year past leap year, etc. Optionally the user can enter 2 digit value NN where NN is the last 2 digits of year. Incorrect year setting will cause an error at leap year roll over. This value is saved in NV memory but is not automatically adjusted. It should be set at least once each year.
- NOTE 4: This function is used to offset the displayed time from the applied time code or manual time set. Offset values are 00 to 12. If the offset is followed by '-', the value is subtracted from the time, if it is '+' it is added.
- NOTE 5: This function is used to remotely set the display intensity. Intensity values N are '0' through '9' (minimum to maximum intensity respectively) or '-' to return control to rear panel pot.

If an invalid message or character is received, the 6475 returns an ASCII "BELL" character. Valid message returns ASCII "*". Invalid messages include:

1. Invalid time value ie. more than 365 days (366 in leap year) in clock Time load or more than 999 days in counter time load or more than 23 hours, 59 min, 59 seconds, etc.
2. Too long or too short a message where a carriage return (<CR>) is used as a terminator.
3. Any unused characters.
4. Attempt to set clock time with time code applied.

3.0 MECHANICAL CONFIGURATION (Figure 1)

The 6475 is housed in an aluminum sheet metal enclosure, 39.75 inches wide, 6.5 inches high and 2 inches deep, not including mounting bracket. All circuitry is on a single printed circuit assembly. The assembly contains a wall mounting yoke which when mounted allows for a +/- 90 degree vertical tilt.

All connectors and controls are on the rear panel.

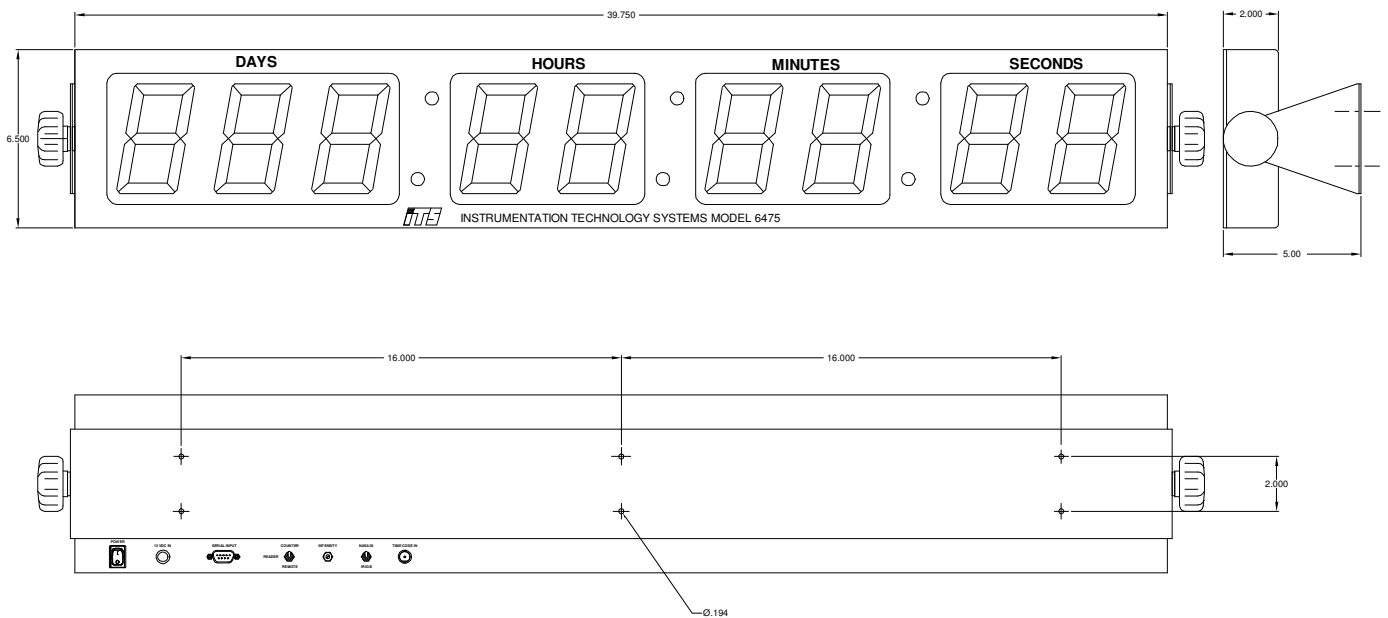


Figure 1
6475 Enclosure

4.0 CONTROLS, CONNECTORS, AND INDICATORS

- 4.1 Power Two Position Rocker Switch - Turns unit power ON
- 4.2 Intensity Potentiometer - Controls intensity of LED display.
- 4.3 Time Code In BNC Connector - Receives NASA 36 Serial Time Code or IRIG B time code.
- 4.4 Serial Input One DA9P Connector - Receives RS232 serial messages used to set time and message displays and provide count control. Handshake lines connected but not implemented.
- | <u>Pin</u> | <u>Function</u> |
|------------|-----------------|
| 1 | DTR/DSR/DCD |
| 2 | TX (from 6475) |
| 3 | RX (to 6475) |
| 4 | DTR/DSR/DCD |
| 5 | GND |
| 6 | DTR/DSR/DCD |
| 7 | CTS |
| 8 | RTS |
| 9 | NU |
- 4.5 Time Code Select Two Position Toggle Switch - Selects NASA 36 or IRIG B time code input.
- 4.6 Counter/Reader/Remote Three Position Toggle Switch - Selects display of time code reader or counter. When in "REMOTE" position display selection is via RS-232 Control Input. (See Par 2.3).
- 4.7 Power In Coaxial Connector – Receives 12VDC from external power supply.

5.0 SPECIFICATIONS

Time Code	NASA 36 serial time code or IRIG B serial time code (switch selectable).
Display	Segmented LED. Red. Numeric: 7 segment. Character height: 4 inches. Segment width 10 mm
Serial Input	RS232C, 9600 baud, 8 data bit, no parity, ASCII message format.
Internal Reference (Active in absence of time code input)	Temperature compensated crystal oscillator (TCXO) $\pm 2 \times 10^{-6}$.
Non-volatile Memory	EEPROM.
External Power	12 VDC @ 1A, 100 to 240VAC 50/60Hz power supply included.
Enclosure	39.75 inches wide, 6.5 inches high, 2 inches deep (not including mounting bracket). Enclosure is black with textured clear coat.