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9520-240

Operating Manual

TimeView Display



datum

Timing, Test & Measurement



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9520-647 Airborne Serial Time Display

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Chapter One

INTRODUCTION/PRODUCT OVERVIEW

The Model 9520-240 TimeView Display is a standalone time code reader and LED display that automatically detects, decodes and displays any of several common time codes. It has the following key features:

- Automatically detects and decodes IRIG A, IRIG B, IRIG E (100 Hz), NASA 36, 2137 and XR3 time codes. Supports modulated and DCLS (DC Level Shift) forms, single-ended +5 V or RS-232, and RS-422 differential DCLS signals.
- Maintains or stops time (depending on the parameter selection) during the loss of time code signal. A front panel indicator lights up to show the loss of the input signal.
- Displays the time of the input time code signal or the local offset time. A front panel indicator lights up to show that local offset time has been selected.
- Displays decoded time code on red seven-segment LED's (0.56 inch high characters).
- Automatically adjusts display brightness to changes in ambient light levels. The minimum brightness level is user adjustable.
- Provides a user programmable time display offset from –12 hours to +12 hours in 30 minute increments.
- The user can turn the DAYS field off and on.
- The user can save parameters (time code type, time offset, etc.) in non-volatile (EEPROM) memory for retention during loss of power.

OPERATING MANUAL SUMMARY

This Operating Manual is divided into the following chapters:

A. CHAPTER ONE – INTRODUCTION/PRODUCT OVERVIEW
Provides a general description of the TimeView Display and some basic product information.

B. CHAPTER TWO – OPERATION
Provides information on manual controls and indicators.

C. CHAPTER THREE – SPECIFICATIONS
Provides detailed specifications for all aspects of the TimeView Display.

D. REFERENCE DOCUMENTS
Provides internet links to reference documents that may be of interest to the user of the Datum 9520-240 TimeView Display.

PURPOSE OF EQUIPMENT

The TimeView Display provides a cost-effective solution to the problem of displaying time that is derived from a serial time code.

FIGURE 1-1. DATUM TIMEVIEW DISPLAY



PREPARATION FOR SHIPMENT

To turn off the TimeView Display prior to shipment, remove the power from the plug on the rear panel. Package the instrument in its original packing if possible. If the original packing materials are not available, pack in a reinforced cardboard carton using foam to take up any space inside the carton. Do not use foam popcorn or crushed paper for packing.

If the instrument is being returned to Datum, contact the Service Department 1-800-938-9888 to advise of the product return.

TYPOGRAPHICAL AND OTHER CONVENTIONS

This Operating Manual uses the following conventions:

Acronyms and Abbreviations – Terms are spelled out the first time they appear in this Operating Manual. Thereafter, only the acronym or abbreviation is used.

Table 1-1 describes the typographical conventions that this Operating Manual uses to distinguish between the different types of information according to how they are used.

TABLE 1-1. TYPOGRAPHICAL CONVENTIONS

WHEN TEXT APPEARS THIS WAY...	IT MEANS...
9520-240 Operating Manual	The title of a document or the name of a product
CRITICAL PORT-1 J1	An operating mode, alarm state, status, or chassis label.
Press the **Enter** key. Press the **Print Scrn** key.	An named keyboard key. The key name is shown as it appears on the keyboard. An explanation of the key's acronym or function immediately follows the first reference to the key, if required.
A re-timing application...	A term or a word being emphasized.
Datum does not recommend...	A word or term given special emphasis so that you do not miss the idea being presented.

WARNINGS, CAUTIONS, RECOMMENDATIONS, AND NOTES

Warnings, Cautions, Recommendations, and Notes attract attention to essential or critical information in this Operating Manual. The types of information included in each are explained as follows:



WARNING …

All warnings have this symbol. Do not disregard warnings. They are installation, operation, or maintenance procedures, practices, or statements that if not strictly observed, may result in personal injury or loss of life.



ELECTRICAL SHOCK HAZARD …

All electrical shock hazard warnings have this symbol. To avoid serious personal injury or death, do not disregard electrical shock hazard warnings. They are installation, operation, or maintenance procedures, practices, or statements that if not strictly observed, may result in personal injury or loss of life.



CAUTION …

All cautions have this symbol. Do not disregard cautions. They are installation, operation, or maintenance procedures, practices, conditions, or statements that if not strictly observed, may result in damage to or destruction of equipment or may cause a long-term health hazard.



CAUTION …

All Electrostatic Discharge (ESD) cautions have this symbol. They are installation, operation, or maintenance procedures, practices, conditions, or statements that if not strictly observed, may result in electrostatic discharge damage to, or destruction of, static sensitive components of the equipment.



RECOMMENDATION …

All recommendations have this symbol. Recommendations indicate manufacturer-tested methods or known functionality. They contain installation, operation, or maintenance procedures, practices, conditions, or statements that provide you with important information for optimum performance results.



NOTE …

All notes have this symbol. Notes contain installation, operation, or maintenance procedures, practices, conditions, or statements that alert you to important information which may make your task easier or increase your understanding.



WHERE TO FIND ANSWERS TO PRODUCT AND DOCUMENT QUESTIONS

If you believe that this product is not performing as expected, or if you have comments about this Operating Manual, please contact your Datum representative or sales office.

We appreciate your suggestions on ways to improve this Operating Manual. Please mark or write your suggestions on a copy of the page and mail or fax it to …

Datum – Timing, Test & Measurement
34 Tozer Road
Beverly, MA 01915-5510
US Toll Free: 1-800-544-0233
Phone: +1-978-927-8220
Fax: +1-978-927-4099
E-mail: ttmsales@datum.com

Thank you for providing the information.

NOTE …

Datum offers a number of applicable training courses designed to enhance product usability. Contact your Datum representative or sales office for a complete list of courses and outlines.

Chapter Two

OPERATION

The TimeView display is powered on by plugging the wall-mount AC adapter into the J4 power connector. At power on, the unit does a LED test by lighting all digits and colons at maximum brightness for two to three seconds and then begins decoding the input time code signal. The user applies the time code signal to the unit via the rear panel BNC or RJ-11 connectors. Modulated time code signals use either the J1 BNC or the J3 RJ-11 connector. Single-ended DCLS and RS-232 signals use the J3 RJ-11 connector, and RS-422 differential signals use the J2 RJ-11 connector.

The unit can manually be set to a particular time code and input type via the user interface. It begins displaying the correct time a few seconds after detecting a valid time code signal (The IRIG E time code requires about 30 seconds). The front panel LED indicator labeled NO SIGNAL lights whenever the input signal is not present or is unusable. Depending on the setup parameters, the display time will either continue updating the time or stop.

FIGURE 2-1. TIMEVIEW FRONT

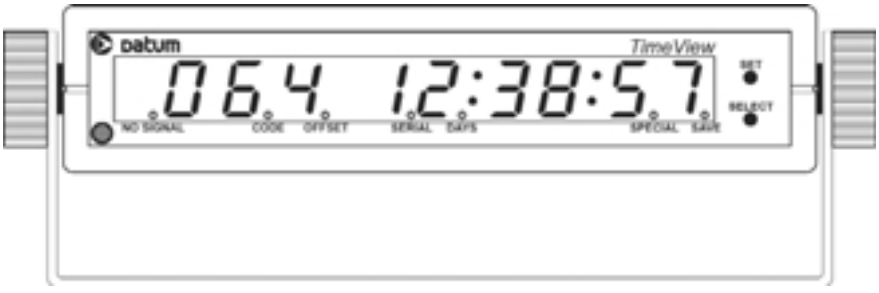
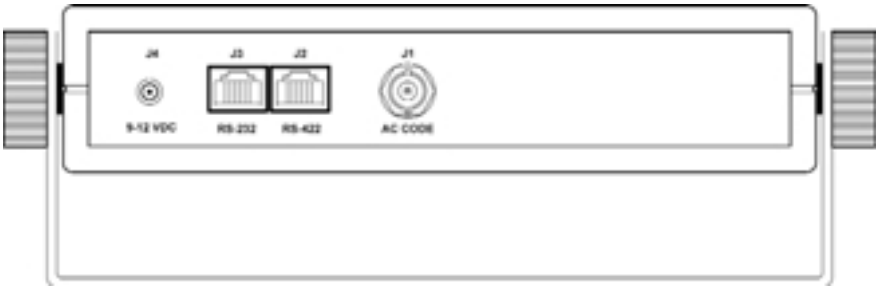


FIGURE 2-2. TIMEVIEW REAR



If the user enables automatic time code detection (SCAN mode), the unit first tries to detect a time code using the parameters currently saved in non-volatile RAM. If unsuccessful, the unit will begin scanning for a new time code and input type. The unit typically requires less than one minute to detect and decode the new time code. It continues to maintain time while scanning. After detecting a particular time code, it stops scanning and turns off the NO SIGNAL indicator. If the time code or input type has changed, the unit automatically saves the new setup in non-volatile memory. It will detect the new time code immediately (without scanning) following power up.

The TimeView displays decoded time on seven segment LED's (0.56" high characters) using the day of year, and "hours : minutes : seconds" format. The display uses decimal points for status indication and user setup purposes. The two pushbutton switches labeled SET and SELECT along with the LED digits and decimal points, provide a simple user interface for setting operation parameters. The user can select the input time code format, enable or disable SCAN mode, change the input type (modulated, or one of three DCLS types), turn the days display on and off, set a time display offset from –12 hours to +12 hours, adjust the display's minimum brightness level, select between input code time or adjusted input code time and control and SPECIAL options. The user can save these parameters in nonvolatile (EEPROM) memory for retention during power loss.

TABLE 2-1. TIME CODE INPUT

Formats	IRIG A, IRIG B, IRIG E (100 Hz), NASA 36, 2137, XR3
Type	Modulated, single ended (TTL) DCLS, RS-232, RS-422 (differential)
Modulated Amplitude	0.5 V to 5.0 V peak-to-peak
Modulated Input Impedance	10 kΩ
RS-422 Input Impedance	>4 kΩ (unterminated)

PARAMETER SETUP

To set up the TimeView operating parameters, the user must enter the programming mode by simultaneously pressing the SET and SELECT buttons for about three seconds. While in the programming mode, the unit will light the decimal point above an operating parameter keyword (i.e., CODE, OFFSET, etc.) and will display current setting of that parameter. Press the SET button to cycle through the available parameter options. Press the SELECT button to change to the next parameter. The following text describes the operating parameters and their settings.

CODE

This parameter selects the desired code format, type (modulated or DCLS), and (indirectly) the input connector. The first menu cycles through the following time code formats:

TABLE 2-2. TIME CODE FORMATS

Display	Description
IRIG A	Use the IRIG A time code format
IRIG B	Use the IRIG B time code format
IRIG E	Use the IRIG E time code format
NASA 36	Use the NASA 36 time code format
2137	Use the 2137 time code format
XR3	Use the XR3 time code format

When the unit operates in the CDØ code, the following display format is used:

TABLE 2-3. COUNTDOWN DISPLAY

Display	Description
+	Count up
-	Count down
H	Hold status
L	No input signal detected

Press the SELECT key to display the input type menu (the CODE indicator remains lit). The following table describes the available input type settings:

TABLE 2-4. SIGNAL INPUT TYPES

Display	Description
AC	Use the modulated input
DCLS	Use the single-ended DCLS input
422	Use the RS-422 input
232	Use the RS-232 input

OFFSET

This parameter sets the displayed time offset from –12 hours to +12 hours in 30 minute increments. The displayed time is the decoded time plus the time offset. Use the SET key to cycle the offset from 0:00 to 0:30 … to 12:00 to –12:00 to – 11:30 … to –0.30 to 0:00. Hold down the SET key to rapidly cycle through the offset values.



SERIAL

This parameter is not used at this time.

DAYS

This parameter turns the displayed day of year digits on and off. Use the SET key to toggle between the on and off setting. Use the ON setting to display the day of year digits, and the OFF setting to turn them off.

SPECIAL

This parameter is used to control special options. Use the SELECT button to cycle through the special options and the SET button to choose the desired mode of operation.

TABLE 2-5. SPECIAL OPTION 1

Special Option Number	Description
1	**ON:** Freezes display while input is lost or not readable (Also while scanning if SCAN is selected)
1	**OFF:** Normal operation (updates at all times)

FIGURE 2-6. SPECIAL OPTION 2

Special Option Number	Description
2	**ON:** Enables **SET** and **SELECT** buttons to be used as LED intensity controls (default setting)
2	**OFF:** Disabled

FIGURE 2-7. SPECIAL OPTION 3

Special Option Number	Description
3	**ON:** Enables the **SET** button to alternate the time viewed between local time and input code time. When the time is changed the new setting is saved in EEPROM. The **SELECT** button is used for adjusting the LED intensity.
3	**OFF:** Disabled

FIGURE 2-8. SPECIAL OPTION 4

Special Option Number	Description
4	**ON:** Enables the **SET** button to display the local time when pressed and change back to code input time when released. The **SELECT** button is used for adjusting the LED intensity.
4	**OFF:** Disabled

SAVE

After the last parameter option has been selected, the unit lights the SAVE led and displays the letter P. Press the SET button to save the parameters in non-volatile memory. The P flashes if the parameters have changed since the last update, and the unit displays the number of updates of nonvolatile memory (the EEPROM memory will support a minimum of 10,000 update cycles). Press the SELECT button to exit the programming mode without saving the parameters.

DISPLAY BRIGHTNESS CONTROL

The unit uses a photo-detector to provide automatic display brightness control based on changes in ambient light conditions. Additionally, the user may adjust the intensity via the user interface. The user brightness setting and the automatic intensity adjustment work together to determine the actual display brightness.

Depending on which special function is active (two, three or four), the front panel buttons change. Special Function Two allows the user to increase the intensity of the display by pressing the SET button. The SELECT button is used to decrease the intensity of the display. Special Functions Three and Four work as follows; during time displaying operation, the SELECT button is used to decrease or increase the intensity of the display. Each time the SELECT button is pressed the intensity will increase or decrease in one direction until the maximum or minimum intensity is reached. When the maximum or minimum is reached, the intensity will change direction and move the opposite intensity. This setting affects display brightness only in low ambient light conditions. In normal ambient light, the unit always displays the time at maximum or near maximum brightness. The intensity adjustment feature can be used to prevent the display from dimming in normal light due to blockage of the photo-detector. The unit saves the minimum display brightness setting whenever the user saves the operating parameters in non-volatile memory.

TIME DISPLAY CONTROL

This unit can display either the input time code or the input time code with local offset time added. When the local time is displayed the offset LED is illuminated. Depending on which special function is active, the SET button will react differently. Special Functions Three and Four enable the "SET" button to control the time being displayed. Special Function Three saves the time display mode in non-volatile memory every time the mode is changed. When the mode is being saved the unit stops tracking the incoming code and the NO SIGNAL LED will be illuminated. When the unit has completed the mode save it will decode the time again. Special Function Four only displays the local time when the SET button is pressed and changes back to the input time code when the SET button is released.



CONNECTORS

All connectors are located on the rear panel, and are described below.

J1 BNC

This connector is an input for the serial modulated time code signal. This connector does not support time code in the DCLS format.

J3 RJ-11

This six pin connector carries the RS-232 data I/O, modulated time code and single-ended DCLS time code. Table 2-9 and Figure 2-3 show the pinout and pin orientation for this connector.

TABLE 2-9. J3 PIN ASSIGNMENTS

Pin	Description
1	Single-ended DCLS time code input
2	Ground
3	RS-232 Tx data output
4	RS-232 Rx data input
5	Modulated time code input (same as BNC)
6	Not connected

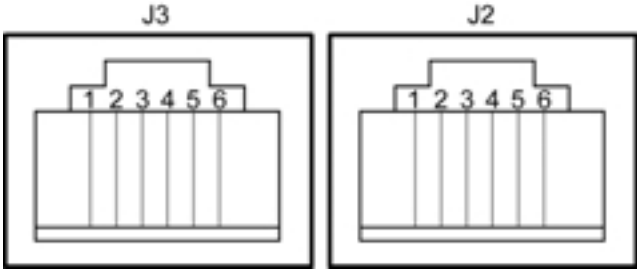
J2 RJ-11

This six pin connector carries one RS-422 input and one RS-422 output. The RS-422 input is used for the differential DCLS time code signal and the RS-422 output is not currently used. The RS-422 input is not terminated. Table 2-10 and Figure 2-3 show the pinout and pin orientation for this connector.

TABLE 2-10. J2 PIN ASSIGNMENTS

Pin	Description
1	Ground
2	RS-422 Output (+)
3	RS-422 Output (-)
4	RS-422 Input (+)
5	RS-422 Input (-)
6	Not connected

FIGURE 2-3. J2 & J3 (RJ-11)



J4 POWER IN

The AC wall-mount adapter plugs into J4 to provide input power for the unit. The unit is powered on whenever the AC adapter is plugged in.



Chapter Three

SPECIFICATIONS

Code Input:	IRIG A, IRIG B, IRIG E (100 Hz), NASA 36, XR3, 2137 (either modulated or DC level shift)
Code Input Level:	0.5 V to 5.0 V P-P (for modulated code via J1)
Controls:	Front panel pushbuttons
Display:	Days – Seconds via 0.6" red LED's
Dimensions:	1.6"H x 7.4"W x 1.8"D
Power Input:	9-12 VDC @ 500 mA (max) via a furnished AC adapter (an AC power adapter is provided for either 115 VAC or 220 VAC, as specified at the time of the order)
Temperature:	Operating: 0° C to 50° C Storage: 0° C to 70° C
Humidity:	0 to 95% relative humidity (non-condensing)



Appendix

REFERENCE DOCUMENTS

Please visit Datum's web site at www.datum.com. There you will find information and specifications for all of Datum's many time and frequency products. In addition, there are many reference documents and application notes that are designed to help users get the most out of Datum products.

Timing & Time Code Reference Book
www.datum.com/TTM/pdf/timeref.pdf

Glossary of Terms
www.datum.com/glossary.html

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