DHDW1410

HIGH DEFINITION RUGGED MONITOR

USER MANUAL

14.1" TFT LCD

i-Tech Company LLC
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OWNER RECORD

Here is an easy-to-locate form to record the Display's serial number. The serial number is located on the back of the enclosure.

From the invoice, record the invoice date, which starts the Display's warranty period.

If the Display ever requires service, please refer to this information when contacting the **iTechLCD Service Center at 1-888-483-2418.**

PRODUCT	SERIAL NUMBER	INVOICE DATE
DHDW	____ ____ ____ ____ ____	_____

.

DHDW1410

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USER MANUAL

14.1" TFT LCD

DHDW

Table of Contents

WELCOME.

With this acquisition of the High Definition Rugged Monitor, the DHDW1410, we welcome you to ITECHLCD's family of harsh-duty mobile display products.

Housed in an ultra-thin milled billet aluminum case, the slim-profile DHDW1410 is light weight and watertight, with fully sealed IP68 connectors, though please note, the Display is listed at IP67.

Engineered to operate on low power consumption, the DHDW1410 manages multiple incoming signals: DVI, HDMI, NTSC/PAL and SDI. A Source Select button allows the user to quickly move between video inputs.

Incorporated into the DHDW1410 is the latest in optical engineering to achieve optimal view-ability in all lighting conditions. This bright sunlight-readable fat panel TFT (Thin Film Transistor) LCD Display is engineered to thrive wherever it is put to work. This Display is specifically designed for rugged mobile computing and handles a wide-range of severe environments, making it the go-to selection of many industries for their mobile applications.

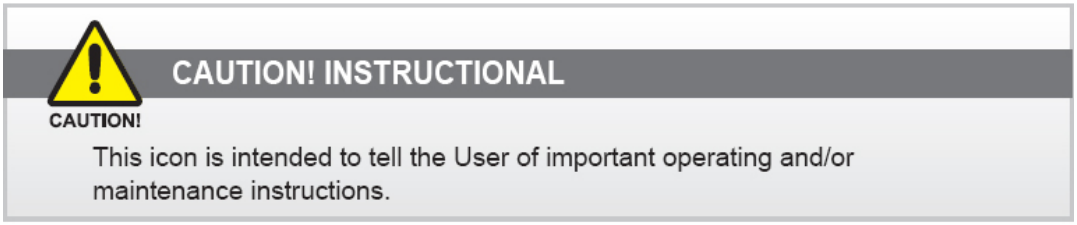
The DHDW1410 offers productivity-oriented options: the Red/Green NVIS Compatible filtering system, and Analog Resistive Touch Screen.

Our Mobile Computing Support Team is here for you – we are ITECHLCD,
keeping **Technology in Motion.**

GENERAL SAFETY

SAFETY ICONS

Safety icons are displayed throughout the DHDW1410 User Manual to draw attention to specific User Caution and Warning statements.

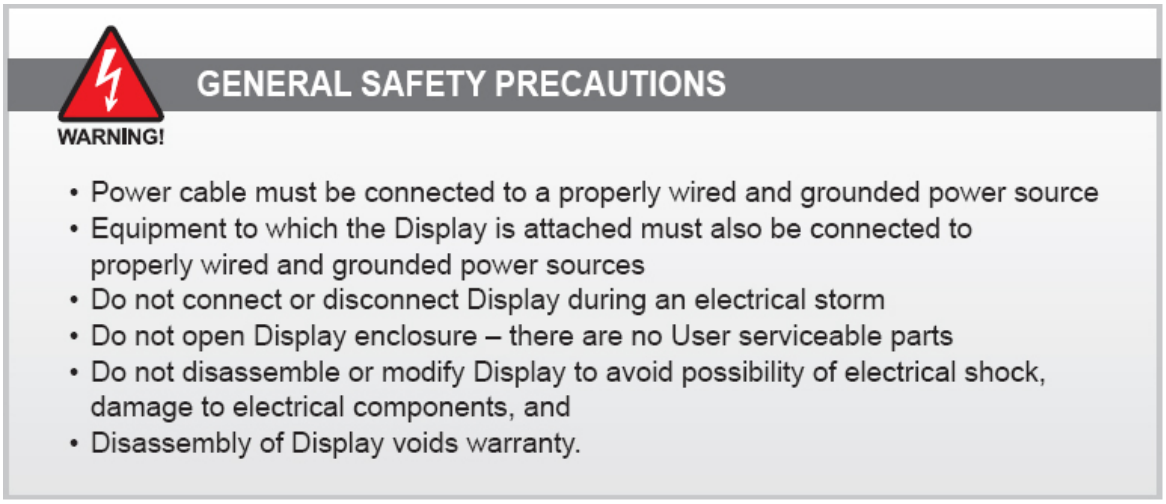


GENERAL SAFETY INSTRUCTIONS

- Before operating the DHDW1410 Display, read this User Manual thoroughly
- Keep this User Manual for future use
- For expeditious installation, follow User Manual instructions in sequence
- Adhere to Caution and warning statements as referred to in this User Manual
- User Manual instructions for installation and operation should be followed precisely
- Adjust only those controls covered by the User Manual's operating instructions; improper adjustment of other controls voids the Display's warranty and may result in Display damage, and
- Adhere to local installation codes.

GENERAL UNIT SAFETY

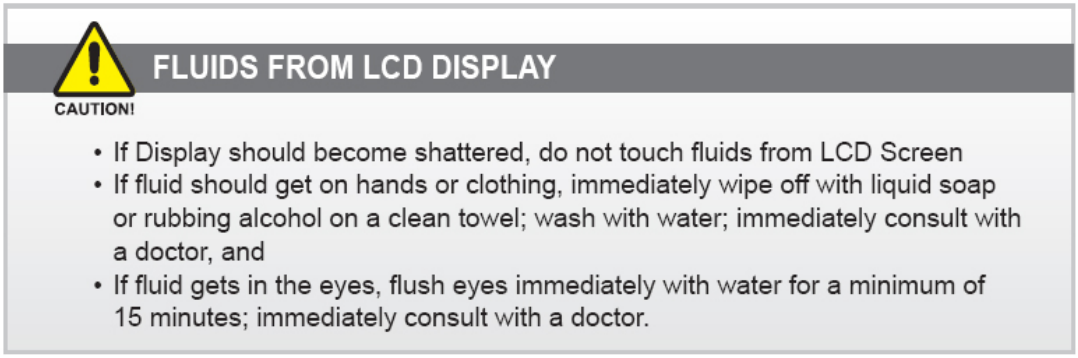
- Always disconnect Display from power source before cleaning
- Do not operate Display with a damaged cable, and
- Do not operate if Display has been dropped or damaged. Unit should be inspected by qualified iTechLCD Service Personnel.



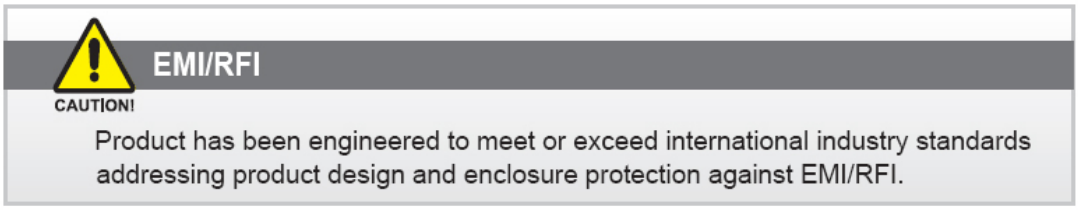
LCD AND ELECTRICAL SAFETY

LCD DISPLAY SAFETY

It is recommended Users adhere to personal safety in the instance the DHDW1410 display screen should be shattered. Aside from obvious glass shards, the fluids in the LCD are a known skin irritant.



ELECTRICAL

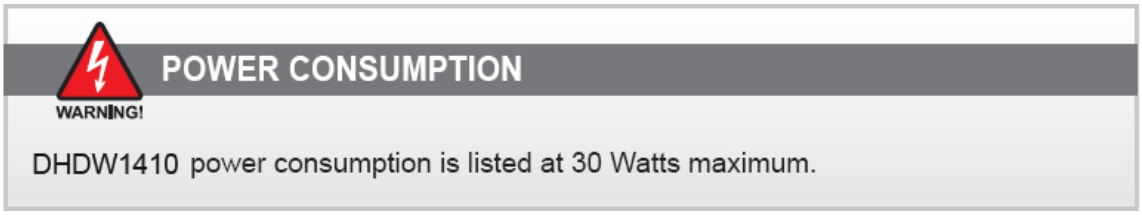


CONNECTING CABLES

- Disconnect power to computer when Display is being installed
- Upon installation, verify power input connector is securely seated on Display
- Position power cable so it is not in contact with hot surfaces
- Do not allow anything to rest on power cable, and
- Protect power cable from extreme heat sources.

POWER SOURCE

- Always connect to a properly grounded DC (standard) power source
- Any equipment to which Display is attached must also be connected to properly wired and grounded power sources
- Operational voltage is 10 - 36 VDC (Input is 12, 24, 28 VDC nominal), and
- power Consumption is: 30 watts maximum.



PRODUCT CARE

This DHDW1410 Display has been designed to provide optimum performance and service without any required scheduled maintenance other than occasional cleaning.

Disconnect Display from power source before cleaning Display, optional Touch Screen or Display's enclosure.

- Do not use abrasive or solvent-based (flammable) cleaners on Display enclosure or any other electrical device (cables, power cable, etc.)
- Do not use paper products as they may scratch Display screen, and
- Do not directly apply cleaning solutions to Display screen.

DISPLAY SCREEN CLEANING

- A vinegar-based cleaner is preferred: prevents streaking, degradation of coatings
- A nonabrasive glass cleaner may be used, as in professional foam glass cleaner
- Apply cleaning solution to a soft clean cloth, dampening slightly
- keep a fresh side of cleaning cloth towards screen surface to avoid scratching it with accumulated grit as Display screen is made of glass, and
- To minimize risk of abrasion to glass screen, air drying is recommended.

DISPLAY ENCLOSURE

- Clean Display enclosure with a soft clean cloth lightly dampened with a general purpose mild detergent solution
- Wipe down with clean water; dry with a soft clean cloth.

In marine or similar environments, a benefit of a vinegar-based cleaner is its effectiveness in dissolving mineral and salt deposits.

LONG-TERM STORAGE

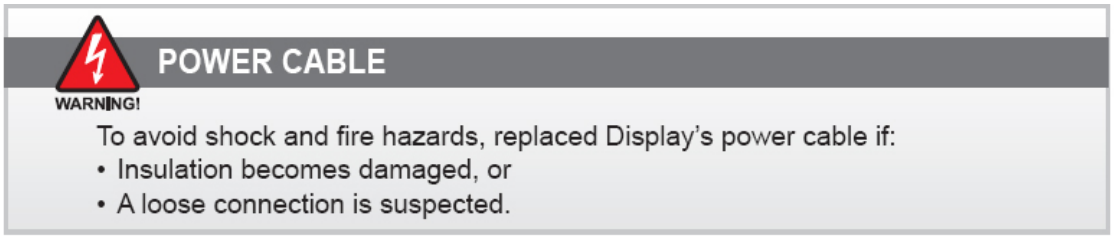
- For long-term storage, it is suggested Display be stored in a normal indoor environment and Display glass be protected from accidental damage
- For pedestal mount units, disconnect cable(s) and loosen arm adjustment to a point where ball can be removed from arm, or
- For Flush or panel Mount units, cover product with a protective covering that will not scratch the Display screen; if equipped with touch, nothing that will transfer dyes.

Disassembling Display voids warranty. To avoid risk of electrical shock, do not disassemble enclosure; Users cannot service. User maintenance is restricted to cleaning or power cable replacement, as explained.

MAINTENANCE

OTHER MAINTENANCE

Only ITECHLCD qualified Service personnel should perform all other maintenance except for cleaning and any cable replacement as described.



PROTECTION ON SERVICING

SERVICING - USER

- User Servicing is limited to cleaning the Display
- Do not disassemble or modify the Display to avoid the possibility of electrical shock, damage to its electrical components or scratching the Display surface, and
- Disassembly voids the warranty.

SERVICING - ITECHLCD

ITECHLCD qualified Service personnel may be required to service the Display if:

- Does not operate normally when installation instructions are followed
- Does not operate normally when operating instructions are followed
- Has been dropped or damaged, or
- Exhibits a distinct change in performance, indicating a need for service.

SHIPPING

If Display should need to be shipped to the ITECHLCD Service Center, the original packing material should be used to ensure safety of Display in shipping. Repack Display as it would have originally been received from manufacturer.

SYSTEM SETUP

SYSTEM REQUIREMENTS

The DHDW1410 accepts DVI, HDMI, NTSC/PAL and SDI video signals.

SHIPPING BOX CONTENTS

The DHDW1410 is shipped in a custom box with enhanced packaging. Installer should save box and all packaging materials in the instance Display is returned to the ITECHLCD Service Center. Shipping box contents are:

• DHDW1410 Display

INSTALLATION

The DHDW1410 can be installed as: Panel Mount (M4); VESA Mount (75mm/M4) or RAM Mount (M4). Follow known-good practices during installation. Do not block the pressure equalizer valve.(See Figure 1, #11)

DISPLAY CONNECTORS

CABLES

All cables are supplied by End User; the DHDW1410 is not shipped with cables.

CAUTION! Use caution when coupling or uncoupling cables and connectors.

CONNECTORS

Connectors are located on the DHDW1410 chassis. From left to right, see Figure 1, Table 1 for connector assignments.

FIGURE 1

POSITION	CONNECTOR	CALL - OUT
1	DVI	J2
2	SMPTE/SDI IN	SDI IN
3	SMPTE/SDI OUT	SDI OUT
4	POWER	J1
5	RS170/PAL	C1 IN
6	RS170/PAL	C2 IN
7	RS170/PAL	C3 IN
8	RS170/PAL	C4 OUT
9	RS232/SERIAL COMM	J3 COM
10	HDMI IN	J4 HDMI
11	PRESSURE REGULATOR	

TABLE 1

DISPLAY CONNECTORS (CONTINUED)

DVI CONNECTOR (J2)

The DVI connector is at J2. See Table 2 (right)

- Align with J2 connector; See Figure 1, #1
- Connector is sealed
- End-user supplies cable

SDI - IN CONNECTOR

A SDI - IN connector is present. This is a center pin BNC connector. See Table 3.

- Align with connector; See Figure 1, #2
- Add a twist to lock
- Connector is sealed
- End-user supplies cable

SDI - IN	
PIN	SIGNAL
CENTER	COAX CORE
SHELL	SHIELDED BRAID

TABLE 3

SDI - OUT CONNECTOR

A SDI - OUT connector is present. This is a center pin BNC connector. See Table 4.

- Align with connector; See Figure 1, #3
- Add a twist to lock
- Connector is sealed
- End-user supplies cables

SDI - OUT	
PIN	SIGNAL
CENTER	COAX CORE
SHELL	SHIELDED BRAID

TABLE 4

DVI RECEPTACLE	
J2 DVI	
PIN	SIGNAL
1	TMDS DATA 2 -
2	TMDS DATA 2 +
3	TMDS DATA 2/4 SHIELD
4	TMDS DATA 4 -
5	TMDS DATA 4 +
6	DDC CLOCK
7	DDC DATA
8	ANALOG VERT SYNC
9	TMDS DATA 1 -
10	TMDS DATA 1 +
11	TMDS DATA 1/3 SHIELD
12	TMDS DATA 3 -
13	TMDS DATA 3 +
14	+5V
15	GROUND
16	HOT PLUG DETECT
17	TMDS DATA 0 -
18	TMDS DATA 0 +
19	TMDS DATA 0/5 SHIELD
20	TMDS DATA 5 -
21	TMDS DATA 5 -
22	TMDS CLOCK SHIELD
23	TMDS CLOCK +
24	TMDS CLOCK -
C1	ANALOG RED
C2	ANALOG GREEN
C3	ANALOG BLUE
C4	ANALOG HOR SYNC
C5	ANALOG GROUND
AMPH	LTWDID-29PFFP-SL8001

TABLE 2

DISPLAY CONNECTORS (CONTINUED)

POWER CONNECTOR(J1)

The military grade sealed power Connector is (J1). See Table 5.

- Align up with J1 connector; See Figure 1, #4
- Add a twist to lock
- Connector is sealed
- End-user supplies cable

POWER CONNECTOR	
J1 PWR	
PIN	SIGNAL
A	28 VOLT DC
B	28 VOLT RTN
C	N/C
AMPH	71-533721-33P
MATE	PT06E-833SSR

TABLE 5

COMPOSITE - IN CONNECTOR (C1, C2, C3 - IN)

The center pin BNC Connectors - IN (C1, C2, C3 - IN) allow input of auxiliary composite video signals. See Table 6.

- Align with C1, C2, or C3 - IN connector; See Figure 1; #5 - 7
- Add a twist to lock
- Connector is sealed
- End-user supplies cables

BNC CONNECTOR - IN	
C1, C2, C3 - IN	
PIN	SIGNAL
CENTER	COAX CORE
SHELL	SHIELDED BRAID

TABLE 6

COMPOSITE - OUT CONNECTOR (C4 - OUT)

The center pin BNC Connector - OUT (C4 - OUT) provides pass-though of sensor or auxiliary composite video signal. See Table 7.

- Align with C4 - OUT connector; See Figure 1, #8
- Add a twist to lock
- Connector is sealed
- End-user supplies cable

BNC CONNECTOR - OUT	
C4 OUT	
PIN	SIGNAL
CENTER	COAX CORE
SHELL	SHIELDED BRAID

TABLE 7

DISPLAY CONNECTORS (CONTINUED)

SERIAL COMMUNICATION CONNECTOR (J3)

The military grade sealed Serial Communication Connector is (J3). The RS232 interface is commonly used for field updates. See Table 8.

- Align with J3 connector; See Figure 1, #9
- Add a twist to lock
- Connector is sealed
- End-user supplies cable

TABLE 8

SERIAL COMM	
J3	
PIN	SIGNAL
1	USB - RS232_TXD (TOUCH)
2	RS232 TxD
3	RS232 RxD
4	GROUND
5	GROUND
6	USB + RS232_TXD (TOUCH)
7	N/C
AMPH	803-015-07ZN6-7PN
MATE	803-001-06ZN6-7SN

HDMI CONNECTOR (J4)

An HDMI connector is located at J4. See Table 9.

- Align up with J4 connector; See Figure 1, #10
- Connector is sealed
- End-user supplies cables

TABLE 9

HDMI	
J4	
PIN	SIGNAL
1	DATA 2+
2	DATA 2 SHIELD
3	DATA 2 -
4	DATA 1+
5	DATA 1 SHIELD
6	DATA 1 -
7	DATA 0+
8	DATA 0 SHIELD
9	DATA 0 -
10	CLOCK+
11	CLOCK SHIELD
12	CLOCK -
13	CEC
14	RESERVED
15	SCL
16	SDA
17	DDC/CEC GROUND
18	+5V POWER
19	N/C
AMPH	LTWHJ-19PFFR-QS7001

PRESSURE EQUALIZER VALVE

There is a pressure Equalizer valve on the chassis, (Figure 1, #11). See Figure 2 for close-up. In the final installation, do not block or constrain this valve.

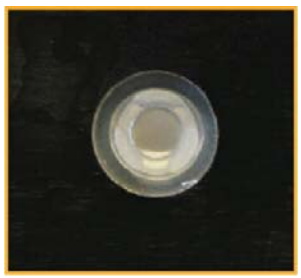


FIGURE 2

MAIN MENU

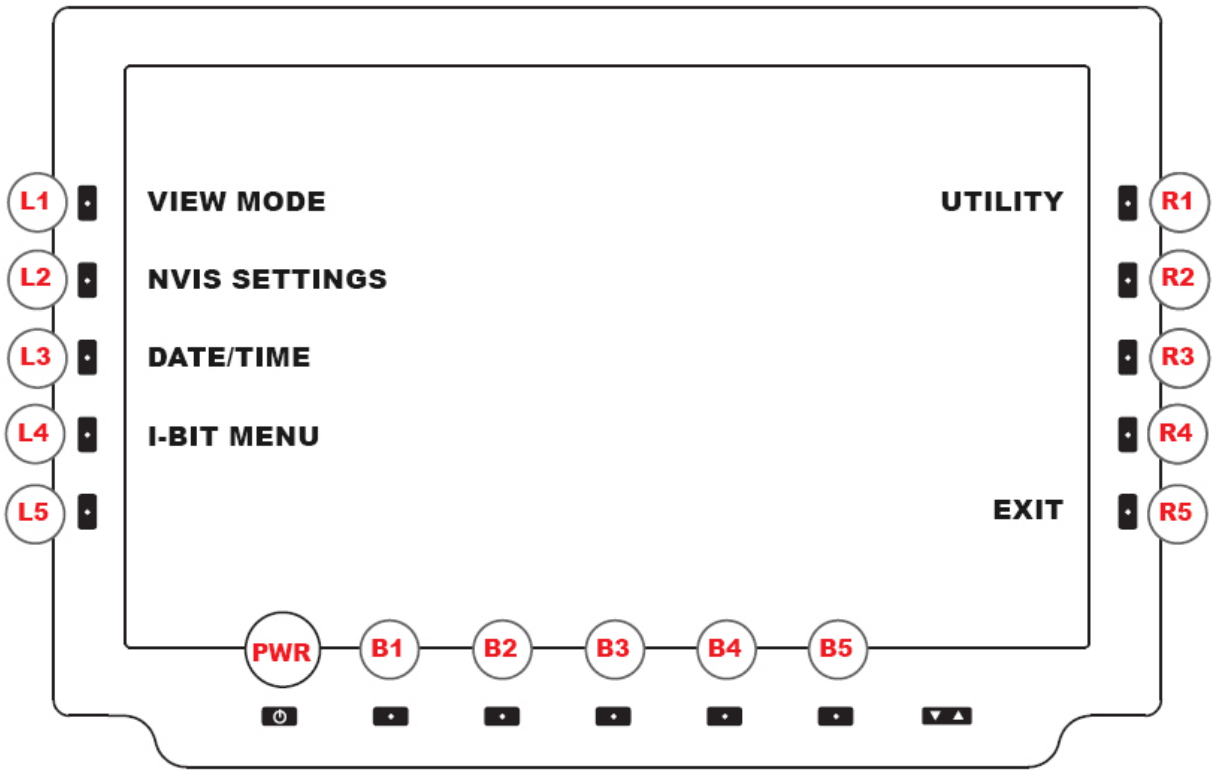


FIGURE 3

MAIN MENU ACCESS

Several User Menus are factory-set in the DHDW1410. To access the Main Menu (Figure 3) which allows access to DHDW1410's submenus, hold down the POWER button for three (3) seconds.

The Power Button (PWR) is located on the bottom row of softkeys, the first button on the left, as indicated in Figure 3. Other softkeys on the bezel's left and right, are explained in following sections.

USER TIP

Hold POWER button for three (3) seconds to enter Main Menu Screen.

MAIN MENU

The MAIN MENU is the user's entry portal to submenus. From this top level, the following submenus are accessed, which opens additional tiers of extended submenus. To access the MAIN MENU, hold the POWER BUTTON down for three (3) seconds.

- VIEW MODE: Manage VIEW settings for each communication port
- NVIS SETTINGS (OPTIONAL): Set NVIS to Red or Green master color
- DATE / TIME: Adjust DATE and TIME settings
- I-BIT: Initiate built-In-Test (I-BIT) checks system functionality, and
- UTILITY: Start-up Options; programmable button Set-up; Factory Reset.

VIEW MODE MENU

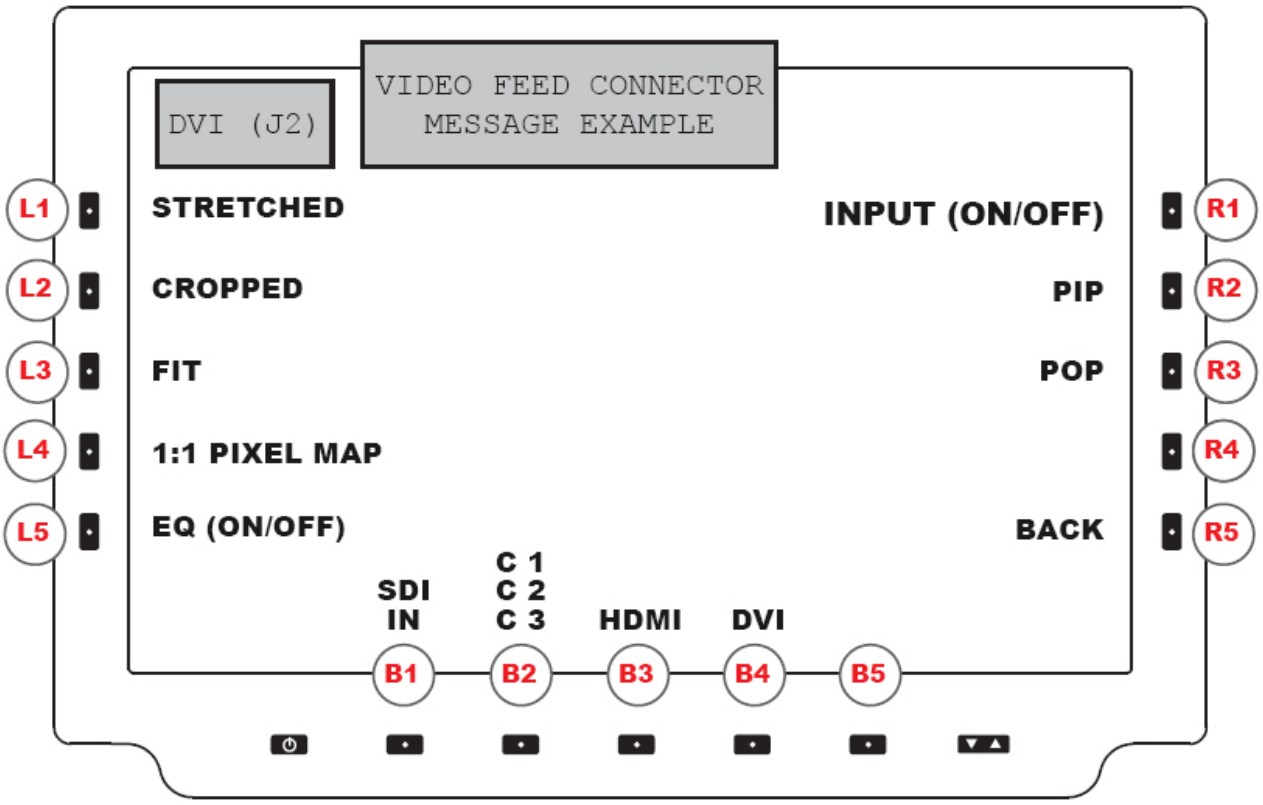


FIGURE 4

VIDEO STATUS MESSAGE

In the upper left corner of the screen a popup information window indicates the VIDEO STATUS when feed is changed from one input to another. (See Figure 4).

This message will list the physical port and resolution detected, or if no feed, the physical port and 'no video'. The video detected information will display for approximately five (5) seconds before closing. If there is no video feed, the message will state 'no video' until video is detected.

VIEW MODE MENU

To enter the VIEW MODE MENU (Figure 4), select L1 from the MAIN MENU (Figure 3). VIEW MODE MENU is dedicated to selecting specific video settings for each physical port. ***Note: View settings of individual video feeds are independent of each other.***

Across the lower edge of the front bezel are the 'b' (bottom) softkeys buttons. Select one of the bottom softkeys to modify that specific physical port: b1: SDI, b2: C1/C2/C3, b3: HDMI and b4: DVI. The button and corresponding port will be highlighted when selected. Any changes made to video mode settings will only affect the highlighted port.

On the left side of the bezel are the 'L' (LEFT) softkeys. These keys (L1 - L4) will be used for adjusting video Scaling for each physical port.

On the right side of the bezel are the 'R' (RIGHT) softkeys. Softkey R1 allows the user to turn ON or OFF specific physical ports. keys (R2 - R3) are used for selecting dual video feeds, and how they display on the screen.

VIDEO MODE MENU (CONTINUED)

Video Feed Settings are set independent of each other.

VIDEO SCALING OPTIONS

There are VIDEO SCALING OPTIONS available to customize the video feed view on the DHDW1410's display screen. These control softkeys are located on the front bezel, left.

STRETCHED (L1). STRETCHED changes the scaling of current input to stretch the video feed across the display screen. Note: Aspect ratio of the video is not maintained.

CROPPED (L2). CROPPED maintains the aspect ratio of video feed to fill the display screen. Note: A small portion of the outer video edges will be cropped (removed) from view in order maintain aspect ratio.

FIT (L3). FIT stretches the video uniformly horizontally and vertically, while maintaining aspect ratio, until video aligns with edge of display screen. FIT is the factory default setting for all video source settings. Note: A black border on the left and right or top and bottom will appear if the video does not have the same aspect ratio as the display.

1:1 PIXEL MAP (L4). PIXEL MAP controls the 1:1 viewing option. Note: when selected, no scaling is applied; video is centered on display screen.

CABLE EQUALIZER (EQ) (L5). Selects button L5 when video feed is SDI (ONLY), to enable (ON) or disable (OFF) the SDI Cable Equalizer. The SDI CABLE EQUALIZER works with the SDI source; it reclocks the video signal to allow for a longer cable length.

INPUT (ON/Off) (Source) (R1). Selects button R1, INPUT, to choose the input source to ENABLE (ON) or DISABLE (OFF) input from the source selection.

PIP/POP (R2/R3). Selects PIP (R2) or POP (R3) to enter into picture-In-picture (PIP) or picture-Over-picture (POP) menus. These two features are reviewed in following menu sections.

BACK (R5). Returns to MAIN MENU (Figure 3).

PICTURE-IN-PICTURE (PIP) OPTIONS MENU

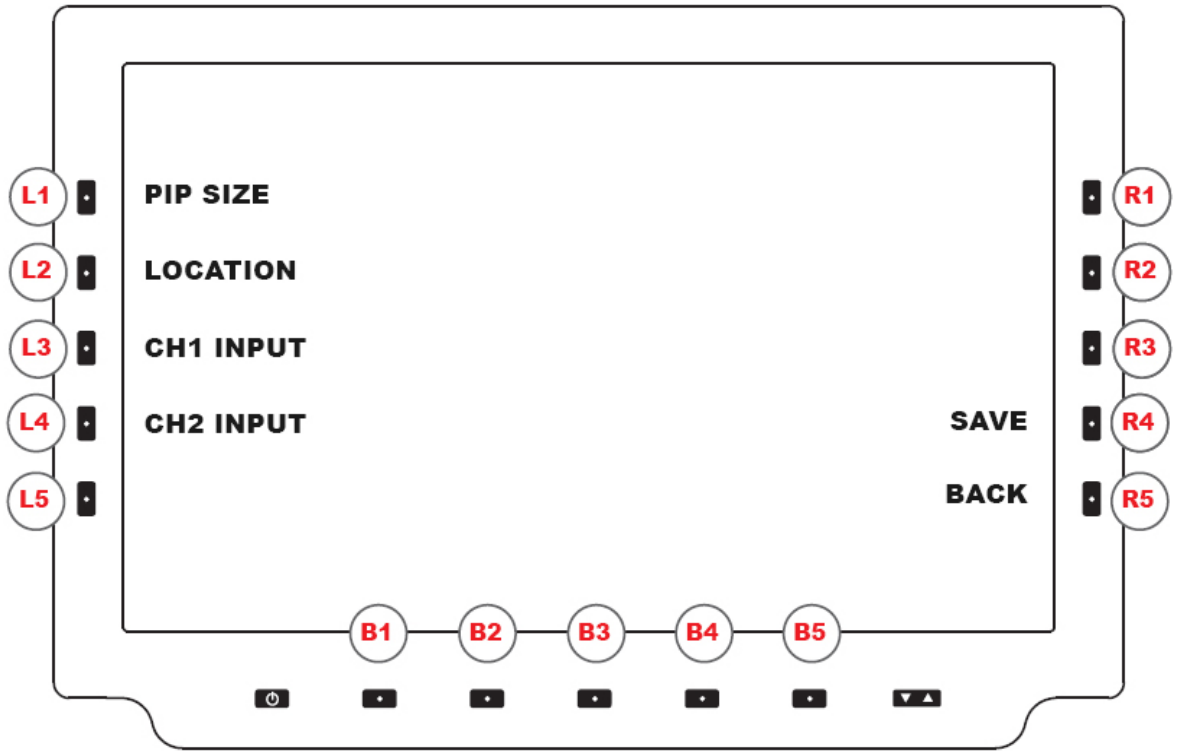


FIGURE 5

PICTURE-IN-PICTURE (PIP) OPTIONS MENU

To enter the PIP (PICTURE-IN-PICTURE) OPTIONS MENU, select PIP (R2) from VIEW MODE MENU (Figure 4). User will determine feeds assigned to a dual-view PIP setting.

PIP SIZE (L1). Cycles through three (3) PIP SIZES: Small; Medium; Large. Each press increases the size to next, then returns PIP to default (Small).

LOCATION (L2). Cycles through five (5) possible screen locations:
Top Left; bottom Left; Top Right; bottom Right; and Center.

CH1 INPUT (L3). Selects CH1 input for configuration in PIP view.

CH2 INPUT (L4). Selects CH2 input for configuration in PIP view.

SAVE (R4). Opens SAVE VIEW MENU (See Section Save view Menu, Figure 7).

BACK (R5). Returns to VIEW MODE MENU (Figure 4).

PICTURE-OVER-PICTURE (POP) OPTIONS MENU

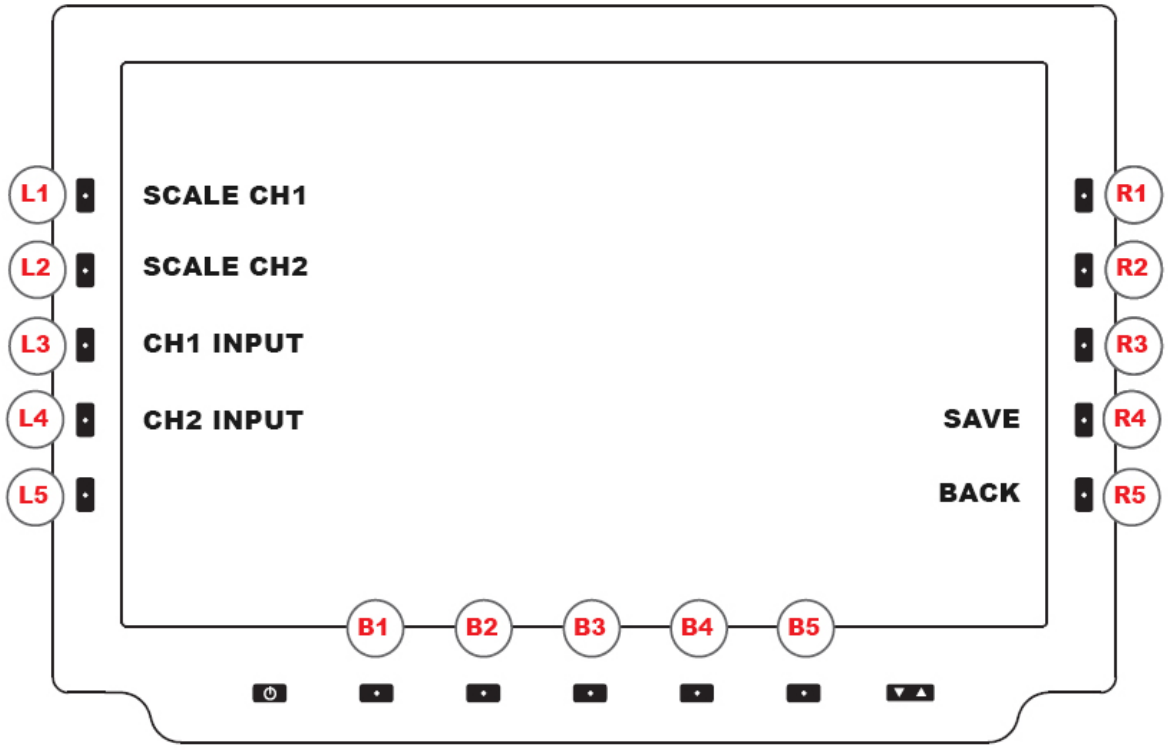


FIGURE 6

PICTURE-OVER-PICTURE (POP) OPTIONS MENU

To enter the POP (PICTURE-OVER-PICTURE) OPTIONS MENU, select POP (R3) from VIEW MODE MENU (Figure 4). User will determine input feeds assigned to a dual-view POP setting.

SCALE CH1 (L1). Cycles Top window options: Stretched; Cropped; Fit; 1:1.

SCALE CH2 (L2). Cycles bottom window options: Stretched; Cropped; Fit; 1:1.

CH1 INPUT (L3). Changes CH1 input source.

CH2 INPUT (L4). Changes CH2 input source.

SAVE (R4). Opens SAVE VIEW MENU (See Section SAVE VIEW MENU, Figure 7).

BACK (R5). Returns to VIEW MODE MENU (Figure 4).

SAVE VIEW MENU

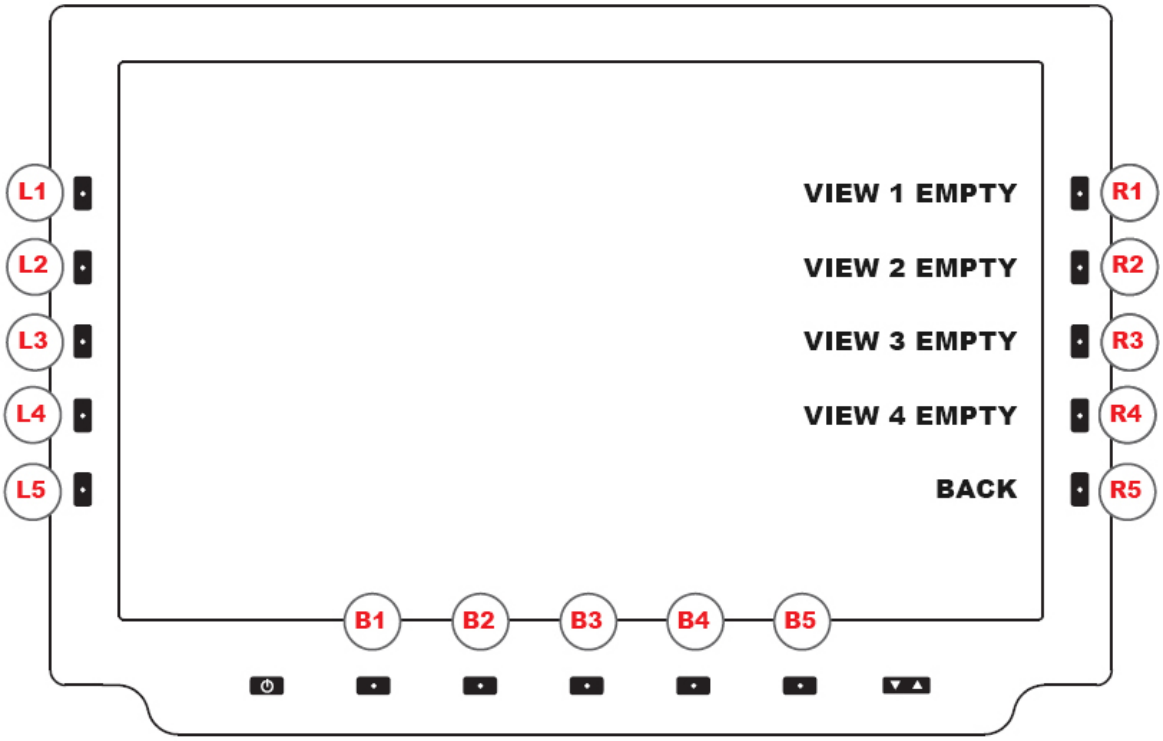


FIGURE 7

SAVE VIEW MENU

Use the SAVE VIEW MENU to save PIP (Figure 5) or POP (Figure 6) configurations. Select entry using R (Right) softkey buttons. Go to section NAME ENTRY MENU (Figure 8) to name views.

VIEW 1 (R1). Saves to PIP/POP VIEW 1 entry. NAME ENTRY MENU opens.

VIEW 2 (R2). Saves to PIP/POP VIEW 2 entry. NAME ENTRY MENU opens.

VIEW 3 (R3). Saves to PIP/POP VIEW 3 entry. NAME ENTRY MENU opens.

VIEW 4 (R4). Saves to PIP/POP VIEW 4 entry. NAME ENTRY MENU opens.

BACK (R5). Returns to PIP or POP MENU (Figure 5 or 6).

NAME ENTRY MENU

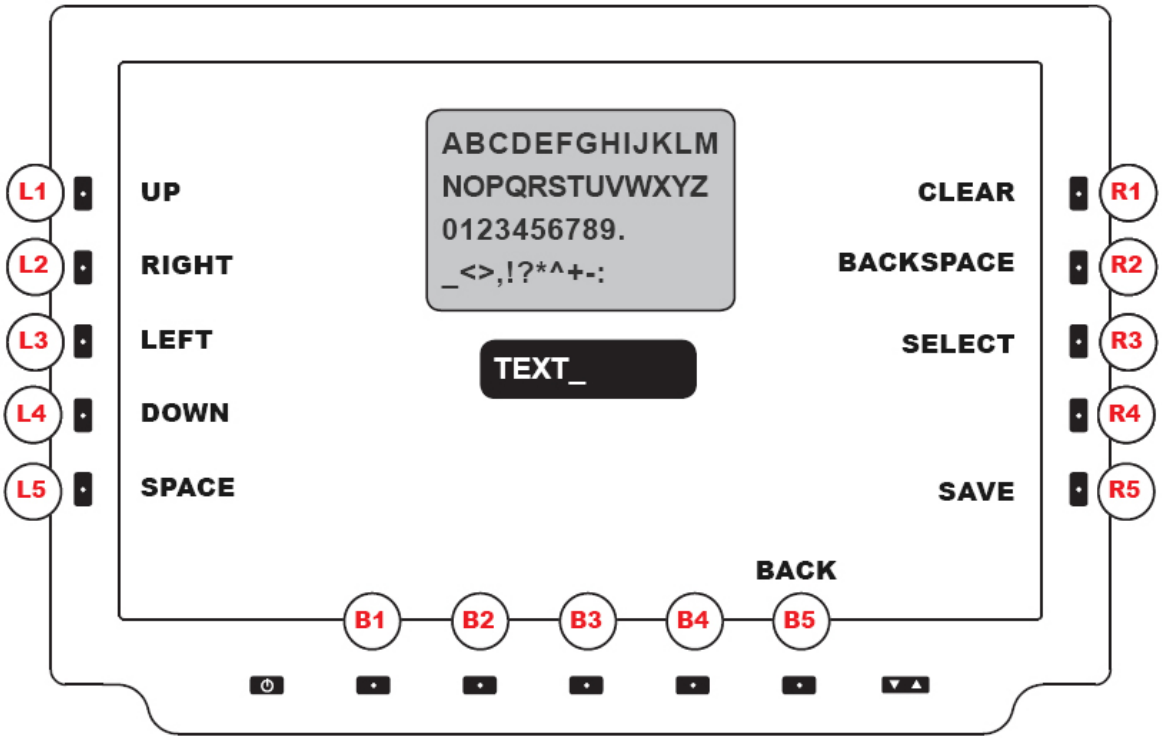


FIGURE 8

NAME ENTRY MENU

The NAME ENTRY MENU is where the user can name the VIEW MODE previously created. (Figure 7). Use the Left and Right softkeys to navigate. Text assigned will appear in the TEXT field on the screen.

LEFT (L3). Navigates Selection Cursor LEFT.

RIGHT (L2). Navigates Selection Cursor RIGHT.

UP (L1). Navigates Selection Cursor Up.

DOWN (L4). Navigates Selection Cursor DOWN.

SPACE (L5). Adds an empty SPACE (as in a spacebar press)

SELECT (R3). Enters Character.

BACKSPACE (R2). Deletes Last Character.

SAVE (R5). Exits Menu while saving changes.

BACK (B5). Returns to SAVE VIEW MENU (Figure 7).

OPTIONAL NVIS SETTINGS MENU

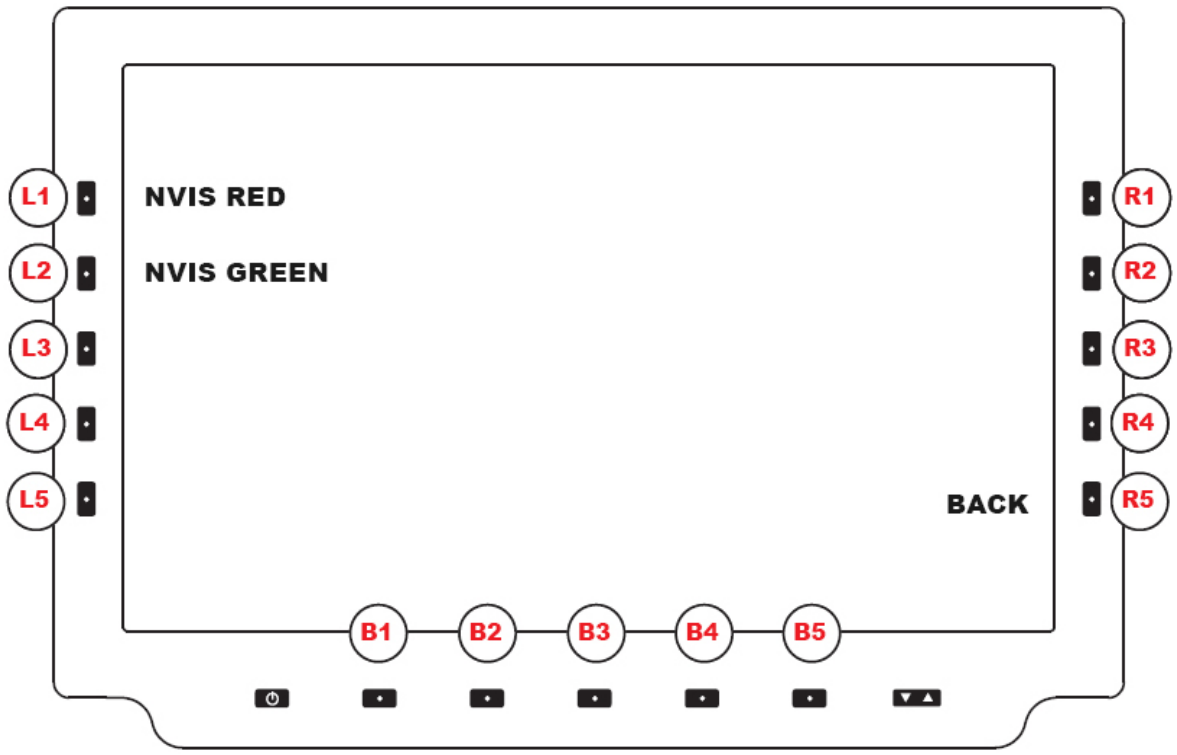


FIGURE 9

NVIS SETTINGS MENU (OPTIONAL)

The optional NVIS GREEN / RED SETTINGS feature provides optimal interfacing with Night vision devices, without adverse effects.

The NVIS SETTINGS MENU is accessed through L2 from the MAIN MENU (Figure 3), and allows the user to make NVIS viewing color selections.

NVIS RED (L1). Selects the NVIS RED view color.

NVIS GREEN (L2). Selects the NVIS GREEN view color. Default is GREEN.

BACK (R5). Returns to MAIN MENU (Figure 3).

DATE / TIME MENU

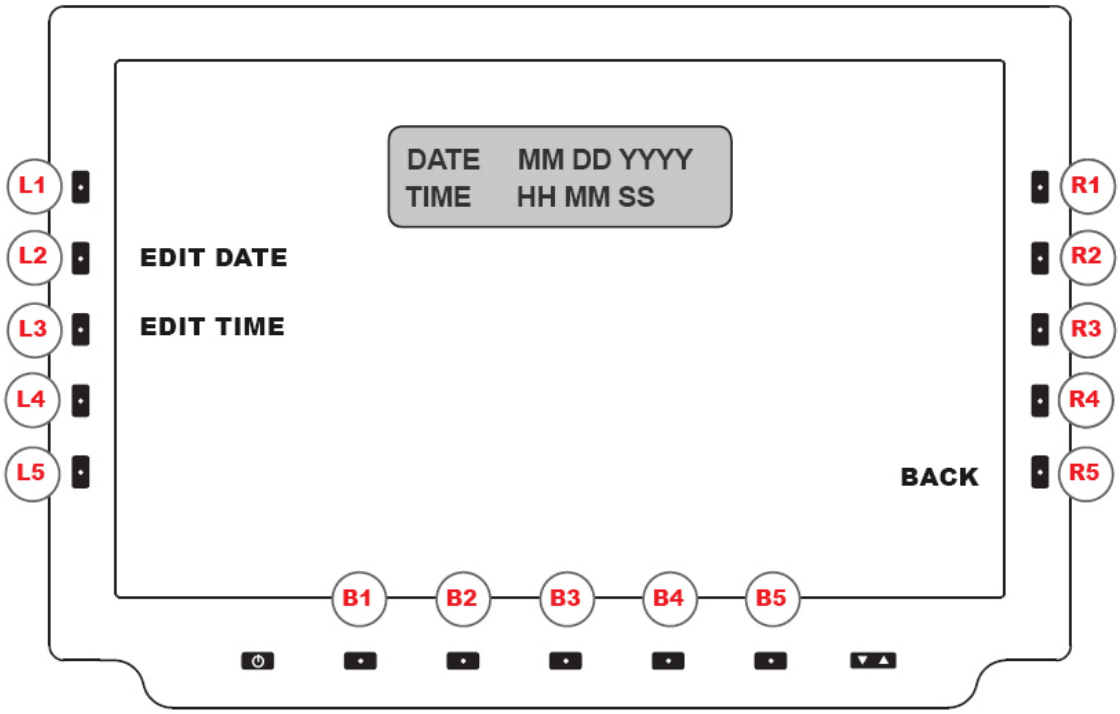


FIGURE 10

DATE / TIME MENU (DEFAULT VIEW)

The DATE / TIME MENU allows the user to adjust the DATE and TIME settings of the DHDW1410 according to the specific geographical region of field use. Figure 10 represents the DEFAULT/NON-EDITING VIEW MENU.

Note: when adjusting the clock, a real-time clock runs in the background, keeping current time. Displayed clock is not redrawn to reflect time changes until adjustments are completed.

EDIT DATE (L2). Selects EDIT DATE to start the customization of DATE field.

EDIT TIME (L3). Selects EDIT TIME, to start the customization of TIME field.

BACK (R5). Returns to MAIN MENU (Figure 3).

DATE / TIME MENU (EDITING VIEW)

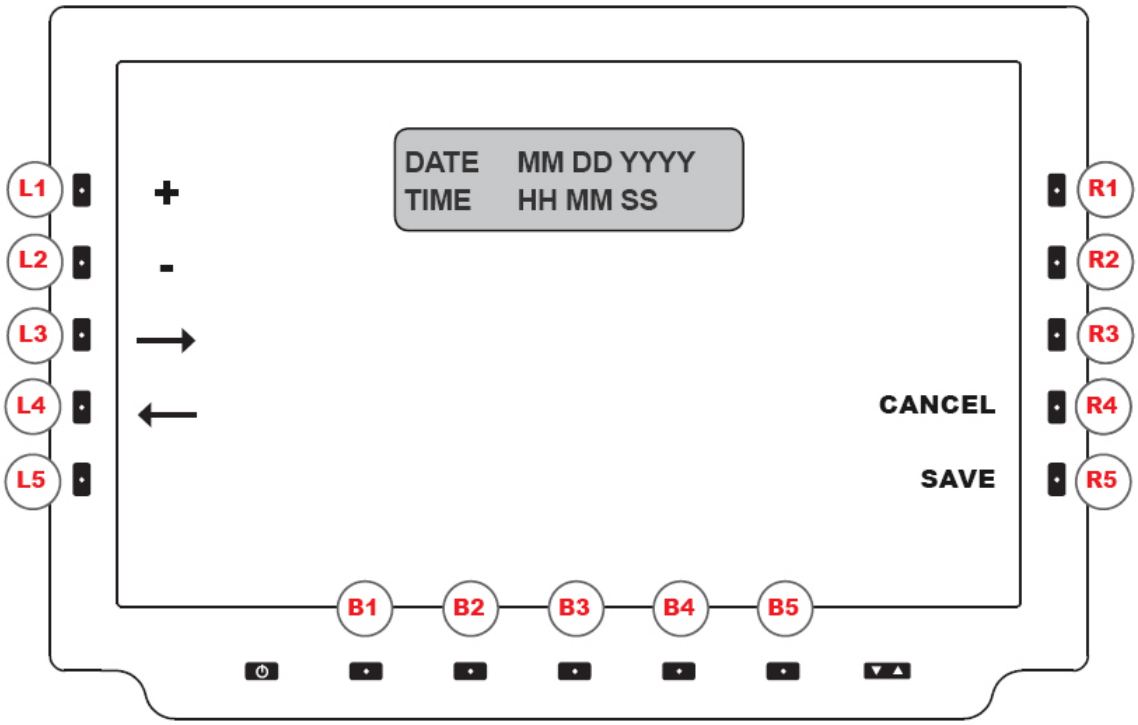


FIGURE 11

DATE / TIME MENU (EDITING VIEW)

The DATE / TIME MENU (Figure 11) allows the user to adjust the DATE and TIME settings of the DHDW1410 according to the specific geographical region of field use.

+ Increment Value (L1). Increases DATE or TIME value.

- Decrement Value (L2). Decreases DATE or TIME value.

→ **Move Cursor Right (L3).** Moves cursor to the right value.

← **Move Cursor Left (L4).** Moves cursor to the left value.

CANCEL (R4). Cancels entry. Returns to DATE TIME MENU - DEFAULT VIEW (Figure 10).

SAVE (R5). Saves the revised Date Time; returns to MAIN MENU (Figure 3).

I-BIT MENU

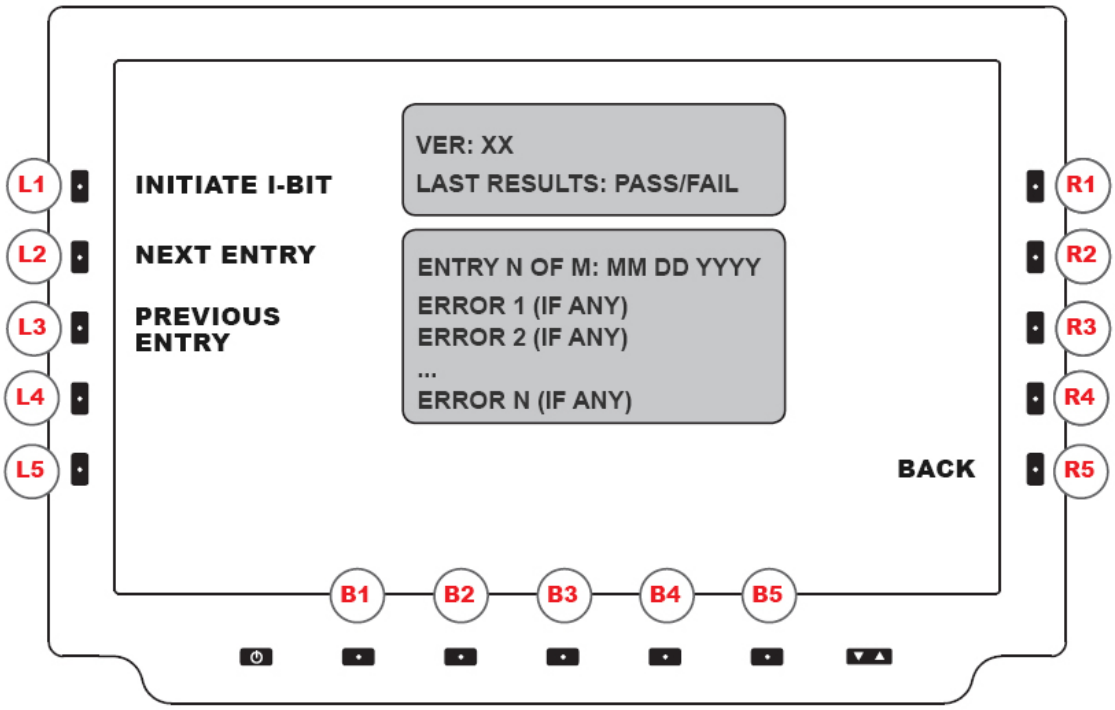


FIGURE 12

I-BIT (INITIATE BIT) MENU

The DHDW1410 supports three (3) built-In-Test (BIT) components: Continuous BIT (C-BIT), Initiated BIT (I-BIT), and power-up BIT (P-BIT). BIT processes detect and isolate faults of the display to help the user identify the operational readiness, or where necessary, identify degraded or failed system conditions. C-BIT runs in the background; P-BIT runs at power ON. Results of BIT failures are stored in memory with time and date stamping, and will list in the Test Log box (Figure 12).

INITIATE I-BIT (L1). Running the I-bIT allows the user to confirm all systems are functioning. Results are shown in the test log box in the center of the display screen. Select INITIATE I-BIT to start the process.

NEXT ENTRY (L2). Select NEXT ENTRY to move to the next I-BIT entry.

PREVIOUS ENTRY (L3). Select PREVIOUS ENTRY to display previous I-BIT result.

TEST LOG BOX FIELDS. The Test Log box Fields indicate the following:

- Version of the I-BIT test run
- Lists the overall result of last I-BIT test: PASS or FAIL
- Lists the Entry Number of the total number, and the date of the last error, and
- Lists an Error Code (See Table 10).

I-BIT MENU (CONTINUED)

ERROR CODES. If there are conflicts within the DHDW1410, they may be indicated by the following ERROR CODES. The Error Code is displayed in bold cap text is displayed in the Error Log Message. Example: “ERROR 1 (IF ANY)”.

BACK (R5). Returns to MAIN MENU (Figure 3).

ERROR CODES	ERROR CODE EXPLANATION
RAM ERROR	RAM Memory Failure
ROM ERROR	Error in CRC or file format of Boot Loader or Main App
EEP ERROR	Error in I2C Communication with EEP Fail or header in data
DEVICE COMM ERROR	RS232 Serial Comm Error
DEVICE (1) ERR	I2C Comm with DHDW1410 Power Module
DEVICE (2) ERR	I2C Comm with DHDW1410 Video Processing
DEVICE (3) ERR	I2C Comm with DHDW1410 Video Receiver
DEVICE (4) ERR	I2C Comm with DHDW1410 Video Display Switch
DEVICE (5) ERR	I2C Comm with DHDW1410 Video Decoder
DEVICE (6) ERR	Reserved for future implementation
DEVICE (7) ERR	I2C Comm with DHDW1410 SMPTE/SDI Receiver (1)
DEVICE (8) ERR	I2C Comm with DHDW1410 SMPTE/SDI Receiver (2)

TABLE 10

This section is intentionally left blank.

UTILITY MENU

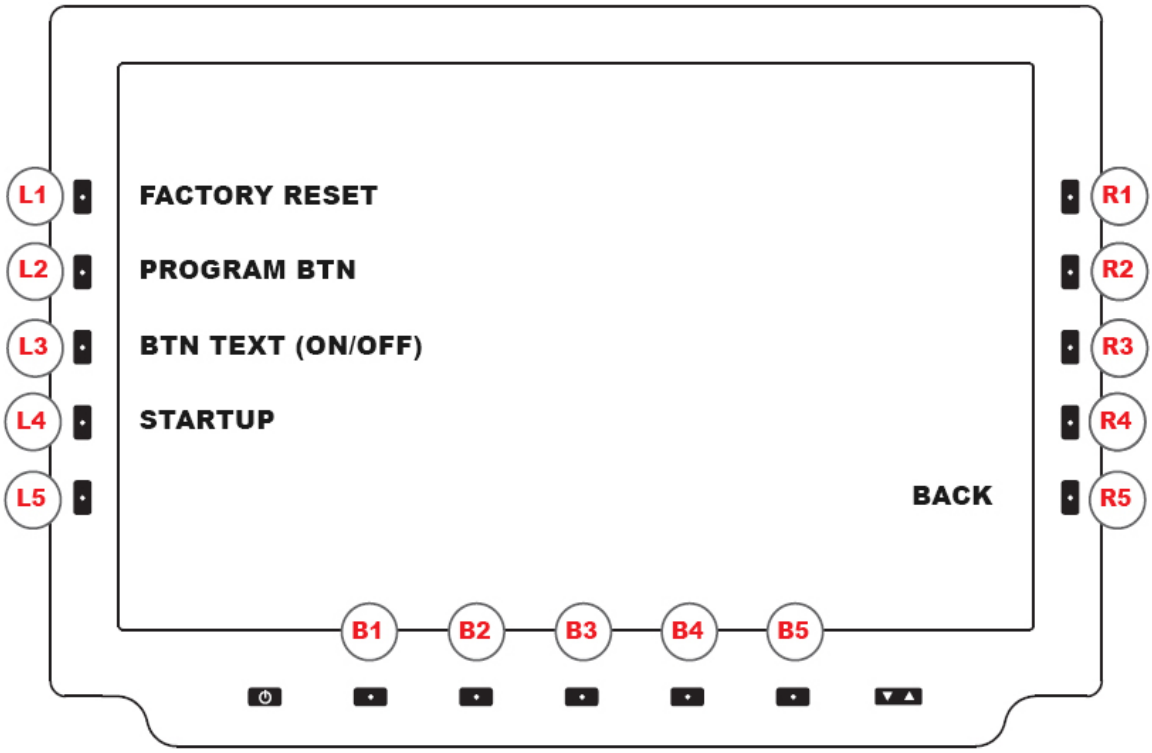


FIGURE 13

UTILITY MENU

From the MAIN MENU (Figure 3), the UTILITY MENU is accessed through R1.

FACTORY RESET (L1). Select FACTORY RESET to reset the DHDW1410 to factory defaults:

- VIDEO SOURCES: All enabled: SDI; Composites (3); HDMI; DVI
- VIDEO FEED VIEW: Sets to FIT
- CABLE EQUALIZER (EQ): Sets to ON
- NVIS COLOR (If Applicable): Sets to GREEN
- CONTRAST: Resets to a predetermined factory setting, and
- KEY DOWN/KEY Up: Restores to Text List (See Section Communication Protocol > Factory Default key Down and key Up Transmit Text).

PROGRAM BTN (L2). Initiates PROGRAMMABLE BUTTON ASSIGNMENT MENU (Figure 18).

BTN TEXT (ON/Off) (L3). Shows/Hides button Label Text.

STARTUP (L4). Opens STARTUP MENU (Figure 14).

BACK (R5). Returns to MAIN MENU (Figure 3).

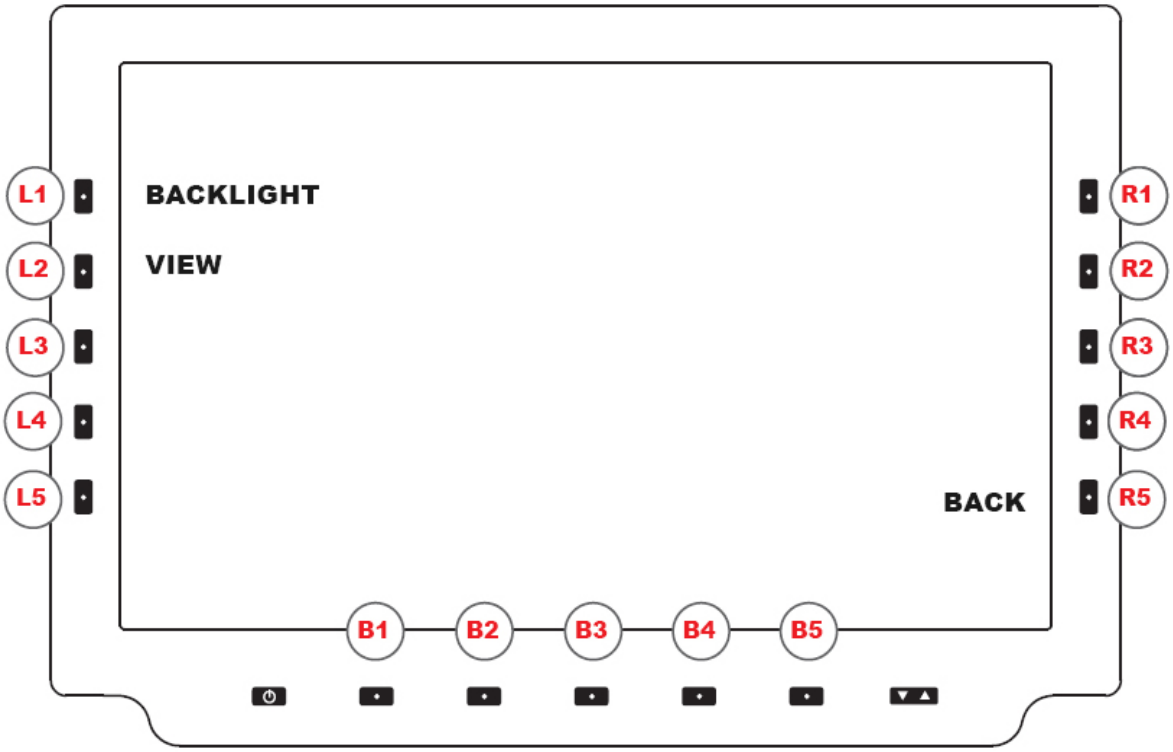


FIGURE 14

STARTUP MENU

From the UTILITY MENU (Figure 13), the STARTUP MENU is accessed through softkey button L4.

BACKLIGHT (L1). Enters BRIGHTNESS STARTUP MENU (Figure 15).

VIEW (L2). Enters VIEW STARTUP MENU (Figure 17).

BACK (R5). Returns to UTILITY MENU (Figure 13).

This section is intentionally left blank.

BRIGHTNESS STARTUP MENU

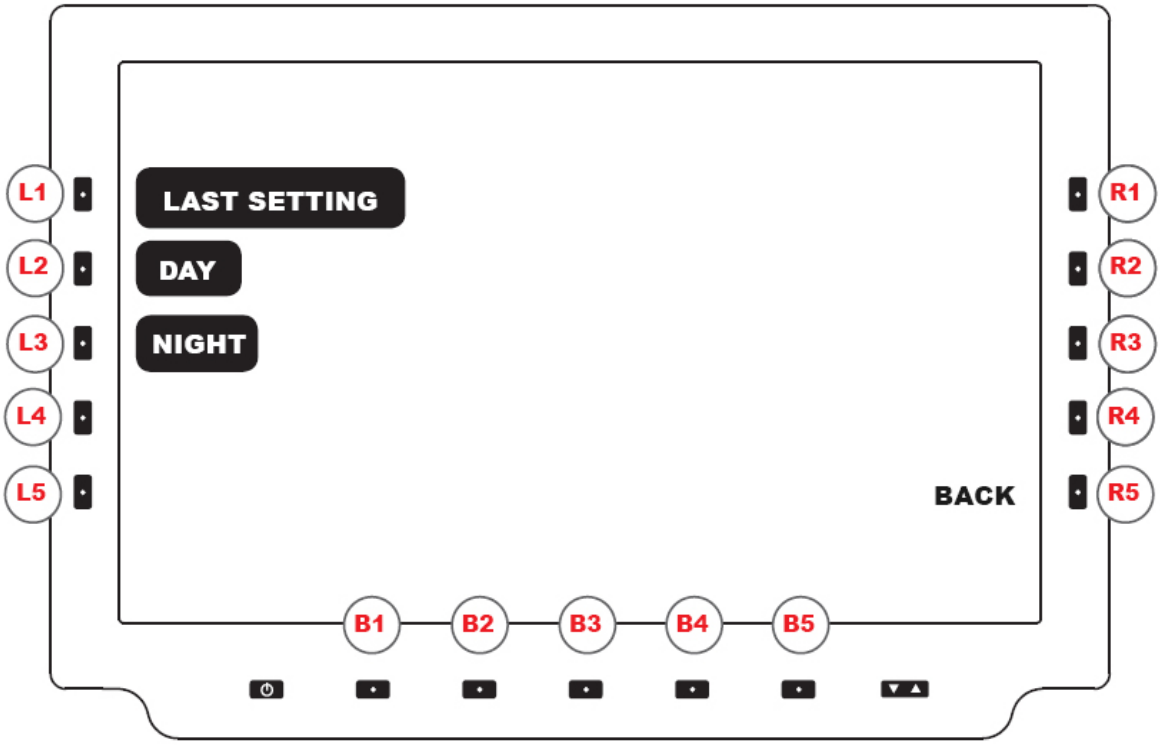


FIGURE 15

BRIGHTNESS STARTUP MENU

From the STARTUP MENU (Figure 14), the BRIGHTNESS STARTUP MENU is accessed through softkey button L1, BACKLIGHT.

LAST SETTING (L1). backlight will power ON at last used brightness setting. Saves setting when button is pressed, and the previous menu, STARTUP (Figure 14) opens.

DAY (L2). Opens BRIGHTNESS ADJUST MENU (Figure 16) with DAY brightness range profile. backlight will start at DAY VALUE on power ON.

NIGHT (L3). Opens DAY / NIGHT BRIGHTNESS ADJUST MENU (Figure 16) with NIGHT brightness range profile. backlight starts at NIGHT VALUE at power ON.

BACK (R5). Returns to STARTUP MENU (Figure 14).

DAY / NIGHT BRIGHTNESS ADJUST MENU

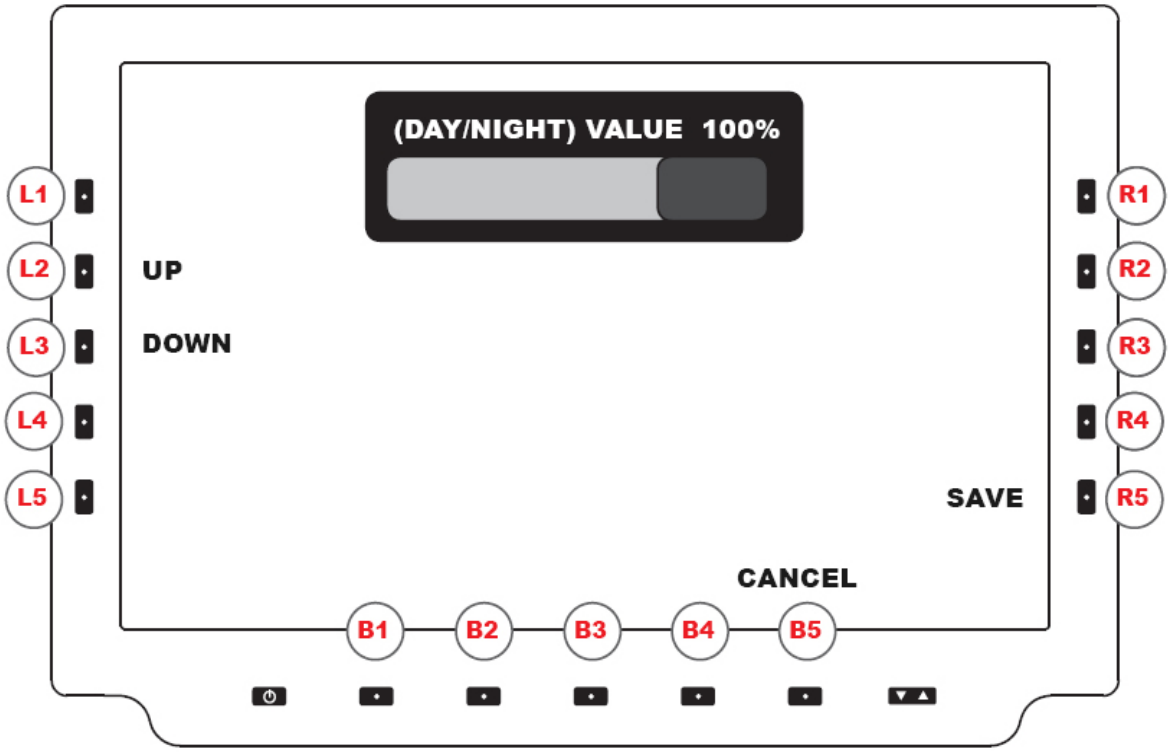


FIGURE 16

DAY / NIGHT BRIGHTNESS ADJUST MENU

The DAY / NIGHT BRIGHTNESS ADJUST MENU (Figure 16) is accessed through L2 (DAY) and L3 (NIGHT) from the BRIGHTNESS STARTUP MENU (Figure 15).

UP (L2). Increases BRIGHTNESS. backlight brightness is changed as value is adjusted.

DOWN (L3). Decreases BRIGHTNESS. backlight brightness is changed as value is adjusted.

SAVE (R5). Saves DAY / NIGHT backlight brightness setting.

CANCEL (B5). Cancels entry. Returns to BRIGHTNESS STARTUP MENU (Figure 15).

VIEW STARTUP MENU

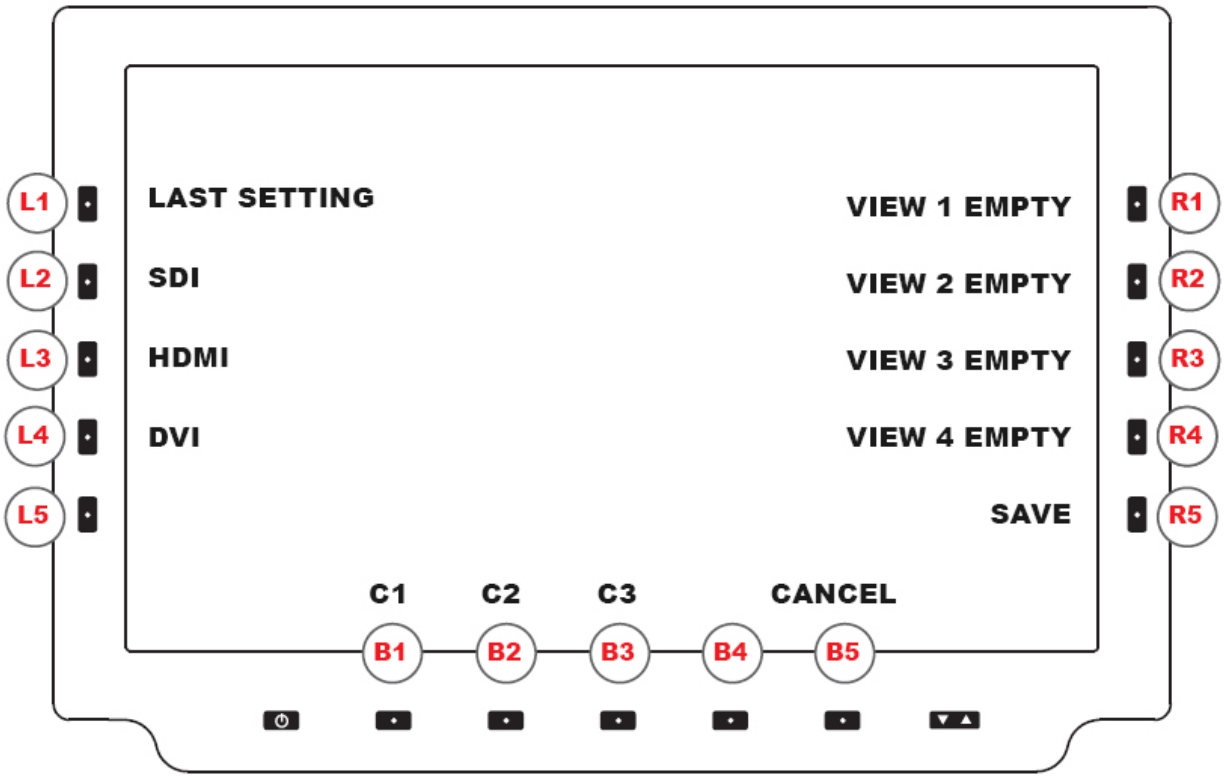


FIGURE 17

VIEW STARTUP MENU

From the STARTUP MENU (Figure 14), the VIEW STARTUP MENU (Figure 17) is accessed through softkey button L2.

LAST SETTING (L1). Starts with last used view.

SDI (L2). Starts with SDI fullscreen.

HDMI (L3). Starts with HDMI fullscreen.

DVI (L4). Starts with DVI fullscreen.

C1 (b1). Starts with Composite 1 fullscreen.

C2 (b2). Starts with Composite 2 fullscreen.

C3 (b3). Starts with Composite 3 fullscreen.

VIEW 1 (R1). Starts with PIP/POP view 1.

VIEW 2 (R2). Starts with PIP/POP view 2.

VIEW 3 (R3). Starts with PIP/POP view 3.

VIEW 4 (R4). Starts with PIP/POP view 4.

SAVE (R5). Saves Selection for power ON screen. Auto-returns to STARTUP MENU.

CANCEL (B5). Cancels entry. Returns to STARTUP MENU (Figure 14).

PROGRAMMABLE BUTTON MENU (SELECT BUTTON)

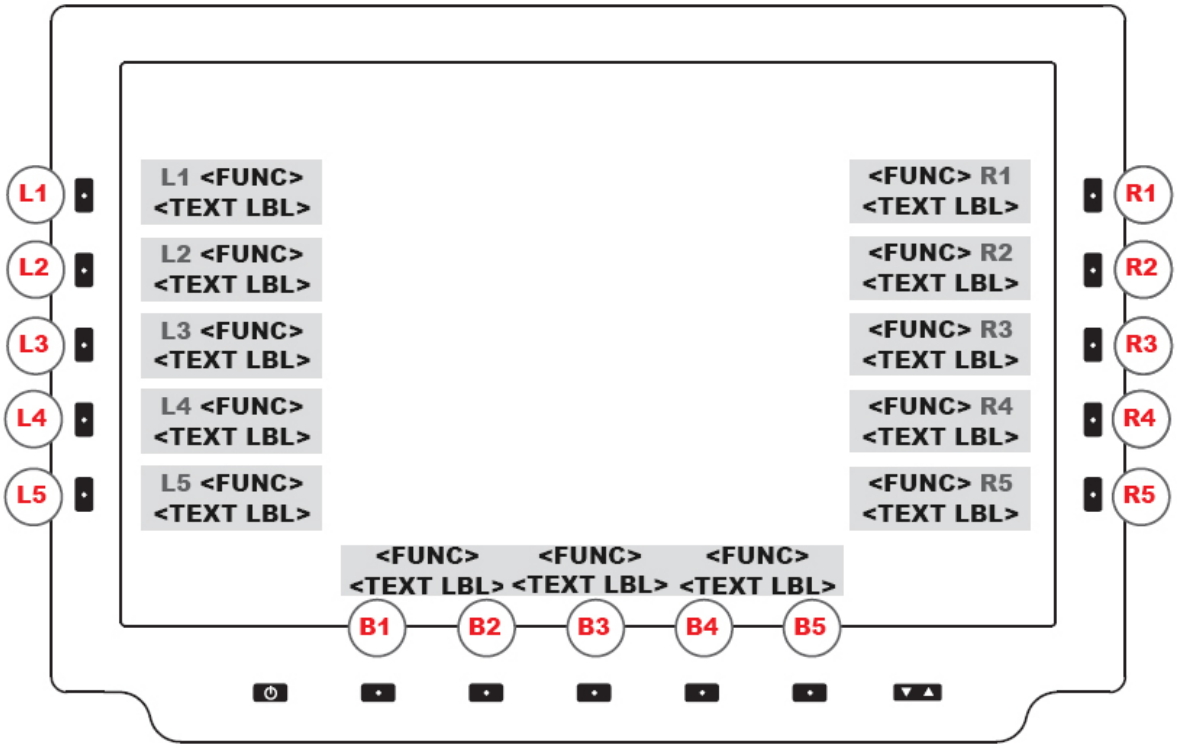


FIGURE 18

PROGRAMMABLE BUTTON ASSIGNMENT MENU (SELECT BUTTON)

There are fifteen (15) soft keys with illuminated center dots on the front bezel, in a layout of five buttons on the left (labeled L1-5), right (labeled R1-5), and along the bottom (labeled B1-5) of the display. (Figure 18) These buttons are used to select the on-screen menu options. User will press the button corresponding to the on-screen menu feature desired.

The softkey buttons are illuminated in Day or Night mode and off in Off mode. Night luminance is subdued to match existing platform night lighting.

Additional softkey information is communicated over the serial communication link as provided by the Host device.

MULTIPLE KEY PRESSES

The Multiple key press feature enables the user to select parallel keys, which if programmed, will support additional choices to the top level 15 softkey buttons.

For example, L1-down (hold) followed by L2-down brings up an additional feature.

ITECHLCD's ALTERNATE PROGRAMMING SOFTWARE

ITECHLCD's Alternate programming Software allows for customizing the OSD labels, button functions, and key Down/Up messages. See ITECHLCD's website for the instructions document or e-mail: info@itechlcd.com for assistance.

PROGRAMMABLE BUTTON (SET FUNCTION)

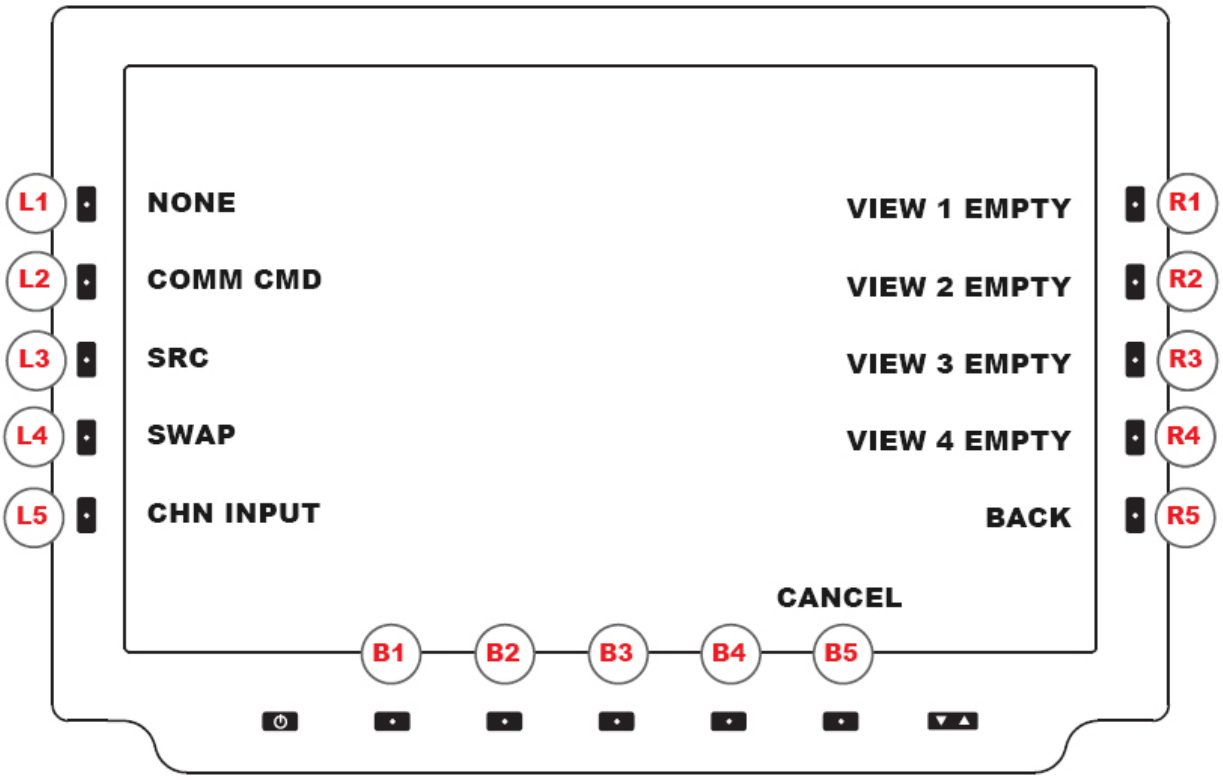


FIGURE 19

PROGRAMMABLE BUTTON MENU (SET FUNCTION)

User selects a button (Figure 19) to set a specific function into the button.

NONE (L1). No action takes place when button is pressed.

COMM CMD (L2). programmed text command transmits when button is pressed.

SRC (L3). CH1 displays the next input.

SWAP (L4). CH1 and CH2 swaps inputs.

CHN INPUT (L5). Opens Input Function Menu.

VIEW 1 (R1). User-configured layout entry 1 toggles ON and OFF. 'Empty' displays or the saved PIP/POP view name.

VIEW 2 (R2). User-configured layout entry 2 toggles ON and OFF. 'Empty' displays or the saved PIP/POP view name.

VIEW 3 (R3). User-configured layout entry 3 toggles ON and OFF. 'Empty' displays or the saved PIP/POP view name.

VIEW 4 (R4). User-configured layout entry 4 toggles ON and OFF. 'Empty' displays or the saved PIP/POP view name.

BACK (R5). Returns to BUTTON ASSIGNMENT MENU, (Figure 18).

CANCEL (B5). Cancels entry. Returns to UTILITY MENU (Figure 13).

PROGRAMMABLE BUTTON (SET INPUT FUNCTION)

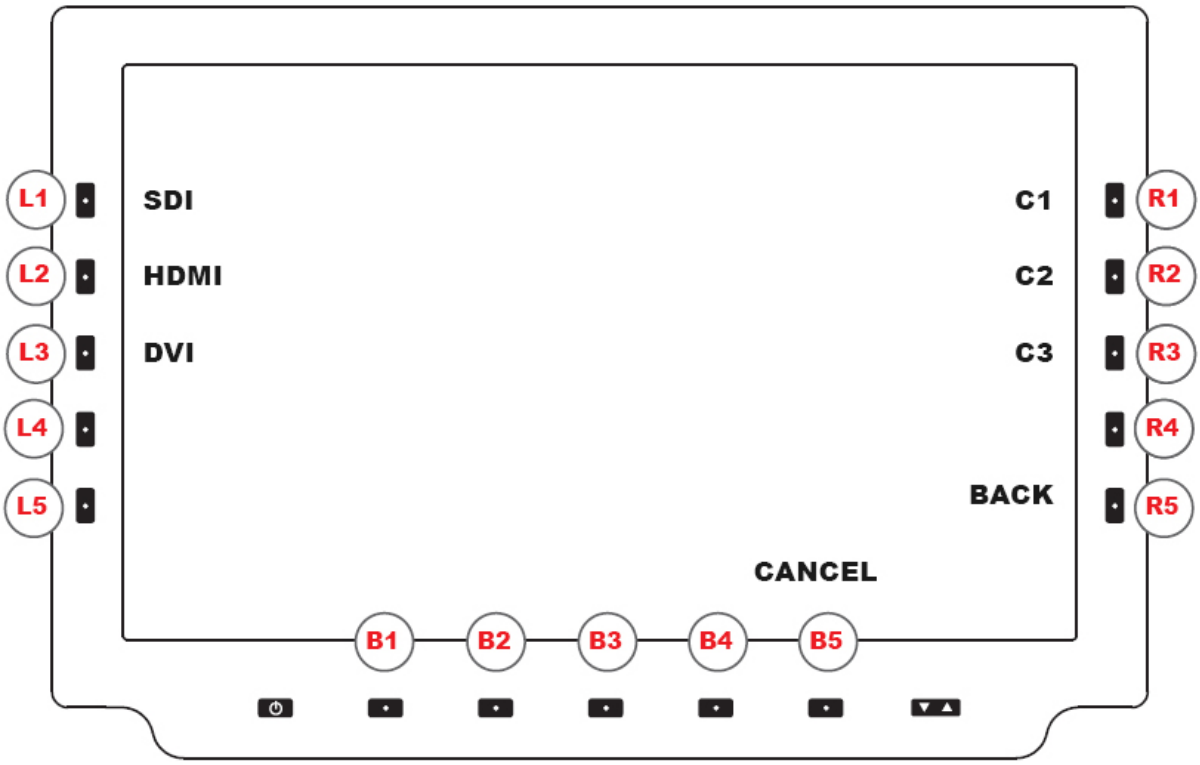


FIGURE 21

PROGRAMMABLE BUTTON MENU (SET INPUT FUNCTION)

User selects a button (Figure 21) to set video feed input.

SDI (L1). CH1 displays the SDI Input.

HDMI (L2). CH1 displays the HDMI Input.

DVI (L3). CH1 displays the DVI Input.

C1 (R1). CH1 displays the Composite 1 Input.

C2 (R2). CH1 displays the Composite 2 Input.

C3 (R3). CH1 displays the Composite 3 Input.

BACK (R5). Returns to SET BUTTON FUNCTION MENU (Figure 19)

CANCEL (B5). Cancels entry; returns to UTILITY MENU (Figure 13).

PROGRAMMABLE BUTTON (ENTER NAME)

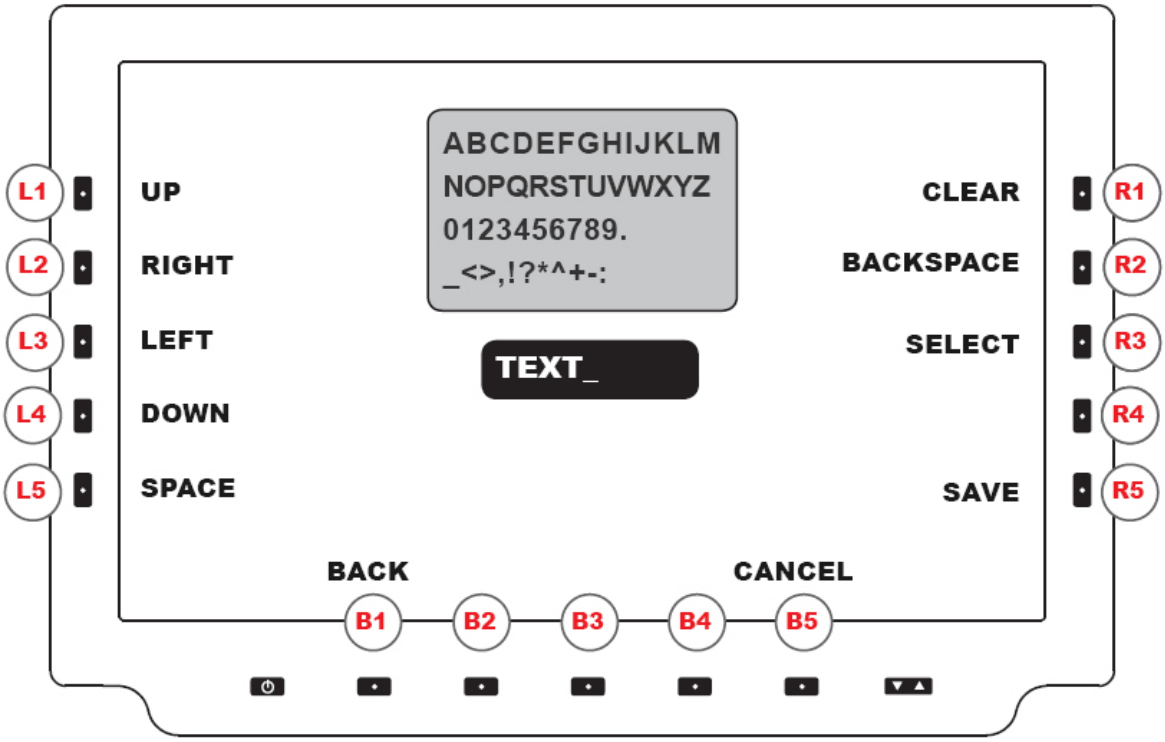


FIGURE 22

PROGRAMMABLE BUTTON MENU (ENTER NAME)

User can enter custom text (Figure 19) for default screen button names. Select button; back-space to clear default test; customize.

SELECT (R3). Enters Character.

BACKSPACE (R2). Deletes Last Character.

CLEAR (R1). Clears the Text Entry.

UP (L1). Navigates Selection Cursor Up.

RIGHT (L2). Navigates Selection Cursor RIGHT.

LEFT (L3). Navigates Selection Cursor LEFT.

DOWN (L4). Navigates Selection Cursor DOWN.

SAVE (R5). Exits Menu and Saves Changes.

BACK (B1). Returns to SET BUTTON FUNCTION MENU (Figure 19).

CANCEL (B5). Cancels entry; returns to UTILITY MENU (Figure 13).

COMMUNICATION PROTOCOL

The DHDW1410 protocol uses packets based on the NMEA message format. This consists of an ID, comma delimited fields, a checksum field and a two-character checksum. A response message is transmitted from the DHDW1410 upon receiving a message. It will either be the specific response for the command, a general DSACK response, or a DSNAK response if the command is not recognized or the packet is invalid.

PHYSICAL AND DATA LINK LAYER

The DHDW1410 communicates via RS232 interface using the following port settings (Table 11).

BAUD RATE	19200 bps
DATA BITS	8
PARITY	NONE
START BITS	1
STOP BITS	1
FLOW CONTROL	NONE

TABLE 11

PACKAGE MESSAGE FORMAT

The NMEA (standard protocol) message format is an ASCII string that consists of a message ID, comma delimited data fields and a checksum field. The message format is described in Table 12.

LENGTH	VALUE	DESCRIPTION
1	'$'	Packet Message Start Byte
	MSGID	Message Identifier; first two characters represents the manufacturer; last three are Command Code
n	Comma Delimited Fields	Field O, Field 1, Field n
1	'*'	Checksum Delimiter Byte
2	Checksum	Checksum is two ASCI characters representing a hexadecimal byte 00 to FF. Value is the exclusive OR (XOR) of all bytes between, but not including characters '$' and '*'
2	[CR][LF]	Carriage Return Character (OxD) and Line Feed (OxA) combination terminates the message

TABLE 12

CHECKSUM CALCULATION

```
unsigned char ComputeChecksum(string text)
{
        unsigned char startInx, endInx, result;

        startInx = Pos('$', text) + 1; //start at character after '$' in string
        endInx = Pos('*', text) - 1;   //end at character before '*' in string
        result = 0;

        for(int n = startInx; n < = endInx; n++)
        {
                result = result^ text[n];
        }

        return result;
}
```

COMMANDS

Continue to the next page for the Table of Commands.

This section is intentionally left blank.

COMMANDS

The following table references the commands the DHDW1410 Supports (Table 13).

COMMAND	DIRECTION	RESPONSE	DESCRIPTION
DSKDN	From DHDW1410	N/A	Key Pressed
DSKUP	From DHDW1410	N/A	Key released (from Press)
DSCDV	To DHDW1410	DSACK/DSNAK	Change Display video
DSIBT	To DHDW1410	DSBTR/DSNAK	Initiates I-BIT System Test (DHDW1410)
DSBTQ	To DHDW1410	DSBTR/DSNAK	Requests last I-BIT Sys Test results
DSBTR	From DHDW1410	N/A	I-BIT System Test Response
DSFWQ	To DHDW1410	DSFWR/DSNAK	Request Firmware version
DSFWR	From DHDW1410	N/A	Firmware version Response
DSPKM	To DHDW1410	DSACK/DSNAK	Program Key Mode
DSPKD	To DHDW1410	DSACK/DSNAK	Program Key Down Text Msg
DSPKU	To DHDW1410	DSACK/DSNAK	Program Key UP Text Msg
DSPKF	To DHDW1410	DSACK/DSNAK	Program Key Function
DSPKT	To DHDW1410	DSACK/DSNAK	Program Key OSD Label Text
DSKDQ	To DHDW1410	DSKDR/DSNAK	Request Program Key Down TX Msg
DSKUQ	To DHDW1410	DSKUR/DSNAK	Request Program Key UP TX Msg
DSKFQ	To DHDW1410	DSKFR/DSNAK	Request Program Key Function
DSKTQ	To DHDW1410	DSKTR/DSNAK	Request Program Key OSD Label Text
DSKDR	To DHDW1410	DSKUR/DSNAK	Request Key Down Transmit Msg Response
DSKUR	To DHDW1410	DSKUR/DSNAK	Request Key UP Transmit Msg Response
DSKFR	To DHDW1410		Request Key Function Response
DSACK	From DHDW1410	N/A	Acknowledge Response; Used if DHDW1410 acknowledges command.
DSNAK	From DHDW1410	N/A	Not Acknowledged Response; Used if command was not recognized by DHDW1410 or the command contained errors.

TABLE 13

PROTOCOL MESSAGE COMMANDS

DSKDN "KEY DOWN" COMMAND

The DSKDN Key Down command will transmit a message after a key has been pressed. The message transmitted can be programmed using the DSPKD (Program Key Down) command. Each key can transmit up to 20 bytes. If a custom message has not been programmed, a factory default message for the key will transmit.

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5

Example: $DSKDN,L1*07[CR][LF]
Factory default transmit message for top left button (L1) on Press Down.

L1D[CR][LF]
Message "$DSPKD,L1,4C31440D0C*47[CR][LF]" used to program key L1 to transmit "L1D" on Press Down.
(Custom message)

0x01 0x02 0x03
Message "$DSPKD,L1,010203*32[CR][LF]" used to program key L1 to transmit the three bytes 0x01, 0x02, and 0x03 on Press Down. (Custom message)

Response: N/A

Warning: A factory reset will revert the key down message to factory default (see "Factory Default Key Down and Key Up Transmit Text" section).

DSKUP "KEY UP" COMMAND

The DSKUP Key Up command transmits a message after a key has been released from Key (press) Down. The message transmitted can be programmed using DSPKU (Program Key Up) command. Each key can transmit up to 20 bytes. If a custom message has not been programmed, a factory default message for the key will transmit.

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5

Example: $DSKUP,L1*08[CR][LF]
Factory default transmit message for top left button (L1) when released (from Press Down).

Response: N/A

Warning: A factory reset will revert the key down message to factory default (see "Factory Default Key Down and Key Up Transmit Text" section).

DSCDV "CHANGE DISPLAYED VIDEO" COMMAND

The DSCDV Change Displayed video command is used to change the input video source.

FIELD	NAME	DATA
0	Source	SDI, C1, C2, C3, HDMI, or DVI

Example: $DSCDV,HDMI*62[CR][LF]
Video changed to HDMI input.

Response: DSACK or DSNAK

DSIBT "INITIATE I-BIT" COMMAND

The DSIBT Initiate I-BIT command starts the I-BIT System Test. Immediately upon receiving DSIBT, the DHDW1410 responds with DSBTR (Request I-BIT Results), indicating the I-BIT test set is incomplete. when I-BIT completes, the DSBTR is transmitted with I-BIT results.
The DHDW1410 is unable to process any commands until the I-BIT test has completed.

FIELD	NAME	DATA
0	Placeholder	00

Example: $DSIBT,00*64[CR][LF]
(Command runs.)

Response: DSIBT: transmits immediately; then DSBTQ following completion, with results
DSNAK: command not recognized or contained errors.

DSBTQ "REQUEST I-BIT RESULTS" COMMAND

The DSBTQ Request I-BIT Results command requests the DHDW1410 to transmit the last I-BIT System Test results. Use DSIBT (Initiate I-BIT) command to run the I-BIT.

FIELD	NAME	DATA
0	Placeholder	00

Example: $DSbTq,00*7C[CR][LF] *Requests an I-BIT response from DHDW1410*

Response: DSBTR or DSNAK

DSBTR "I-BIT RESONSE" COMMAND

The DSBTR I-BIT Response command contains status information and results from running I-BIT System Test. when DSIBT (initiate I-BIT) is received, the DHDW1410 immediately transmits an I-BIT response with status fags BIT 7 set low. Upon completion of DSIBT, the DHDW1410 transmits a second response message with status fags BIT 7 set high, with test results.

FIELD	NAME	DATA
0	BIT Status Flags	BIT 7: 1 I-BIT complete / 0 I-BIT incomplete BIT 6: 1 I-BIT success / 0 I-BIT fail BIT 5: reserved BIT 4: reserved BIT 3: reserved BIT 2: reserved BIT 1: reserved BIT 0: reserved
1	BIT Status Flags	byte order follows big endian format 1 = pass / 0 = fail BIT 15: reserved BIT 14: reserved BIT 13: reserved BIT 12: reserved BIT 11: reserved BIT 10: reserved BIT 9: reserved BIT 8: reserved BIT 7: reserved BIT 6: reserved BIT 5: reserved BIT 4: reserved BIT 3: reserved BIT 2: reserved BIT 1: reserved BIT 0: reserved

Example: $DSBTR,00,0000*53[CR][LF]
I-BIT incomplete response message

Example: $DSBTR,80,0000*5b[CR][LF]
I-BIT complete and failed response message

Example: $DSbTR,C0,0000*20[CR][LF]

I-BIT complete and successful response message

Response: N/A

DSFWQ “REQUEST FIRMWARE VERSION” COMMAND

The DSFWQ Request Firmware version command requests DSFWR (Firmware version Response) from the DHDW1410.

FIELD	NAME	DATA
0	Placeholder	00

Example: $DSFWQ,00*7B[CR][LF]
(Command runs.)

Response: DSFWR or DSNAK

DSFWR "REQUEST FIRMWARE RESPONSE" COMMAND

The DSFWR Request Firmware Response command answers the DSFWA (Request Firmware version) command. The data contains the year, month, and day of month the firmware was compiled.

FIELD	NAME	DATA
0	Year 20xx	00-99
1	Month	01-12
2	Day of Month	01-31

Example: $DSFWR,13,07,08*75[CR][LF]
DHDW1410 reported Firmware version is July 08 2013

Response: N/A

DSPKM "PROGRAM KEY MODE" COMMAND

The DSPKM command can be used to set the DSPKD, DSPKU, DSPKF and DSPKT operating mode. This is useful for disabling drawing until all keys are programmed and for disabling saving key setting to non-volatile storage.

FIELD	NAME	DATA
0	Mode	00 – Resume Normal Operation (Enable Drawing and Save Values). OSD is redrawn if mode was suspending drawing. 01 – Suspend Drawing 02 – Suspend Drawing and do not save

Example:
$DSPKM,01*6C[CR][LF] //Suspend drawing
… program key info
$DSPKM,00*6D[CR][LF] //Resume drawing and force scene to repaint

Response:
DSACK or DSNAK

DSPKD "PROGRAM KEY DOWN TRANSMIT MESSAGE" COMMAND

The DSPKD program key Down Transmit Message command is used to program the message a key will transmit when pressed. The data in Field 1 is encoded in a series of ASCII character pairs representing hex bytes. For example, the ASCII characters "0102"

represent the two hex bytes 0x01 and 0x02; these two hex bytes transmit when the button is pressed.

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5
1	Key Down Message	Hex bytes encoded as an ASCII Hex Character Sequence. Maximum data length is 40 bytes, which will represent up to the 20 hex bytes a key can transmit.

Example: $DSPKD,L1,4C31440D0C*47[CR][LF]
Top left button (L1) set to transmit "L1D\r\n" when pressed. '\r' and '\n' are escape sequences for carriage return and new line characters.

Response: DSACK or DSNAK

DSPKUP "PROGRAM KEY UP TRANSMIT MESSAGE" COMMAND

The DSPKU Program Key Up Transmit Message command is used to program the message a key will transmit when released (from Press). The data in Field 1 is encoded in a series of ASCII character pairs representing hex bytes. For example, the ASCII characters "0102" represent the two hex bytes 0x01 and 0x02; these two hex bytes transmit when the button is released.

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5
1	Key Up Message	Hex bytes encoded as an ASCII Hex Character Sequence. Maximum data length is 40 bytes, which will represent up to the 20 hex bytes a key can transmit.

Example: $DSPKU,L1,4C31550D0C*56[CR][LF]
Top left button (L1) set to transmit "L1U\r\n" when pressed. '\r 'and '\n' are escape sequences for carriage return and newline characters.

Response: DSACK or DSNAK

Maximum key up transmit text is 20 bytes.

DSPKF "PROGRAM KEY FUNCTION" COMMAND

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5
1	Function	NONE, COMM, SRC, SWAP, VIEW1, VIEW2, VIEW3, VIEW4, SDI, HDMI, C1, C2, or C3

Example: $DSPKF, L1, SRC*75
Top left button (L1) set to cycle the video input

Response: DSACK or DSNAK

DSPKT "PROGRAM OSD KEY TEXT" COMMAND

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5
1	Hex ACII Text	Hex bytes encoded as an ASCII Hex character Sequence. The hex string must be less than or equal to 12 bytes representing up to 6 characters.

Example: $DSPFT, L1, 535243*2E
Top left button (L1) set to display the text "SRC"

Response: DSACK or DSNAK

DSKDQ "REQUEST KEY DOWN TRANSMIT MESSAGE" COMMAND

Request a DSKUR response message

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5

Example:
$DSKUQ,L1*09[CR][LF]

Response:
DSKDR or DSNAK

DSKUQ "REQUEST PROGRAM KEY UP TRANSMIT MESSAGE" COMMAND

Request a DSKDR response message

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5

Example:
$DSKDQ,L1*18[CR][LF]

Response:
DSKUR or DSNAK

DSKFQ "REQUEST PROGRAM KEY FUNCTION TRANSMIT MESSAGE" COMMAND

Request a DSKFR response message

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5

Example:
$DSKFQ,L1*1A[CR][LF]

Response:
DSKFR or DSNAK

DSKTQ "REQUEST PROGRAM KEY TEXT TRANSMIT MESSAGE" COMMAND

Request a DSKTR response message

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5

Example:
$DSKTQ,L1*08[CR][LF]

Response:
DSKTR or DSNAK

DSKDR "KEY DOWN TRANSMIT MESSAGE RESPONSE" COMMAND

The DSKDR is a response message to a DSKDQ and contains the transmit message used when the key is pressed.

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5

Example:
$DSKDR,L1,4C31440D0C*45[CR][LF]
Top left button (L1) set to transmit "L1D\r\n" when pressed. '\r' and '\n' are escape sequences for carriage return and newline characters.

Response:
DSACK or DNAK

DSKUR "KEY UP TRANSMIT MESSAGE RESPONSE" COMMAND

The DSKUR is a response message to a DSKDQ and contains the transmit message used when the key is released (from being pressed).

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5
1	Key Up Message	Hex bytes encoded as an ASCII Hex character Sequence. Maximum data length is 40 bytes, which will represent up to 20 hex bytes a key can transmit.

Example:
$DSKUR,L1,4C31550D0C*54[CR][LF]
Top left button (L1) set to transmit "L1U\r\n" when pressed. '\r 'and '\n' are escape sequences for carriage return and newline characters.

Note:
Maximum key up transmit text is 20 bytes.

Response:
DSACK or DSNAK

DSKFR "KEY FUNCTION RESPONSE" COMMAND

The DSKFR is a response message to the DSKFQ command. The response message contains the function assigned to the key.

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5
1	Function	NONE, COMM, SRC, SWAP, VIEW1, VIEW2, VIEW3, VIEW4, SDI, DVI, HDMI, C1, C2, or C3

Example:
$DSKFR, L1, SRC*77 [CR][LF]
Top left button (L1) is set to cycle the video input

Response:
DSACK or DSNAK

DSKTR "OSD KEY TEXT RESPONSE" COMMAND

The DSKTR is the response message to a DSKTQ command. The message contains the OSD text assigned to the key.

0	BTNID	L1, L2, L3, L4, L5, R1, R2, R3, R4, R5, B1, B2, B3, B4 or B5
1	Hex ACII Text	Hex bytes encoded as an ASCII Hex character Sequence. The hex string must be less than or equal to 12 bytes representing up to 6 characters.

Example:
$DSKTR, L1, 535243*21[CR][LF]
Top left button (L1) text is "SRC"

Response:
DSACK or DSNAK

DSACK "ACKNOWLEDGE RESPONSE" COMMAND

The DSACK Acknowledge Response command is the DHDW1410's response to valid commands.

0	Placeholder	00

Example: $DSACK,00*72[CR][LF]
(Command runs.)

Response: N/A

DSNAK "NOT ACKNOWLEDGE RESPONSE" COMMAND

The DSNAK Not Acknowledge Response command is the DHDW1410's response when it receives a command it does not recognize or the received command has errors such as the checksum failed.

0	Placeholder	00

Example:$DSNAK,00*7F[CR][LF]
(Command runs.)

Response: N/A

FACTORY DEFAULT KEY DOWN AND KEY UP TRANSMIT TEXT

These Factory Default Key Down and Key Up softkeys (below) are factory-programmed to transmit the following text messages.

Down	$DSKDN,L1*07[CR][LF]
Up	$DSKUP,L1*08[CR][LF]
Down	$DSKDN,L2*04[CR][LF]
Up	$DSKUP,L2*0B[CR][LF]
Down	$DSKDN,L3*05[CR][LF]
Up	$DSKUP,L3*0A[CR][LF]
Down	$DSKDN,L4*02[CR][LF]
Up	$DSKUP,L4*0D[CR][LF]
Down	$DSKDN,L5*03[CR][LF]
Up	$DSKUP,L5*0C[CR][LF]

Down	$DSKDN,R1*19[CR][LF]
Up	$DSKUP,R1*16[CR][LF]
Down	$DSKDN,R2*1A[CR][LF]
Up	$DSKUP,R2*15[CR][LF]
Down	$DSKDN,R3*1B[CR][LF]
Up	$DSKUP,R3*14[CR][LF]
Down	$DSKDN,R4*1C[CR][LF]
Up	$DSKUP,R4*13[CR][LF]
Down	$DSKDN,R5*1D[CR][LF]
Up	$DSKUP,R6*11[CR][LF]

Down	$DSKDN,B1*09[CR][LF]
Up	$DSKUP,B1*06[CR][LF]
Down	$DSKDN,B2*0A[CR][LF]
Up	$DSKUP,B2*05[CR][LF]
Down	$DSKDN,B3*0B[CR][LF]
Up	$DSKUP,B3*04[CR][LF]
Down	$DSKDN,B4*0C[CR][LF]
Up	$DSKUP,B4*03[CR][LF]
Down	$DSKDN,B5*0D[CR][LF]
Up	$DSKUP,B5*02[CR][LF]

OPTIONAL TOUCH SCREEN

TOUCH SCREEN INSTALLATION

Touch Screen Installation instructions are available from the Digital Systems Engineering website. www.iTechLCD.com > Support > Touch Drivers; http://www.itechlcd.com/Support/Drivers.html

If hurdles are encountered during an installation, contact ITECHLCD's Service Center at 1-888-483-2418; e-mail: service@itechlcd.com; or visit http://www.itechlcd.com/Support/Drivers.html

TSHARC TOUCH CONTROLLER DRIVER/WINDOWS OPERATING SYSTEMS

The DHDW1410's touch screen function requires the download of a TSHARC Touch Controller Driver application installed on the device to which the DHDW1410 is connected. To download the latest compatible drivers, go to http://www.itechlcd.com/Support/Drivers.html.

Operating Systems compatible with TSHARC Touch Controller Driver are: Microsoft's® 7 (32 and 64-bit) and XP; with RS232 and USB options. If other MS O/S are installed, contact: service@itechlcd.com for assistance. **NOTE: TSHARC TOUCH CONTROLLER DRIVER IS NOT COMPATIBLE WITH MICROSOFT© VISTAS.**

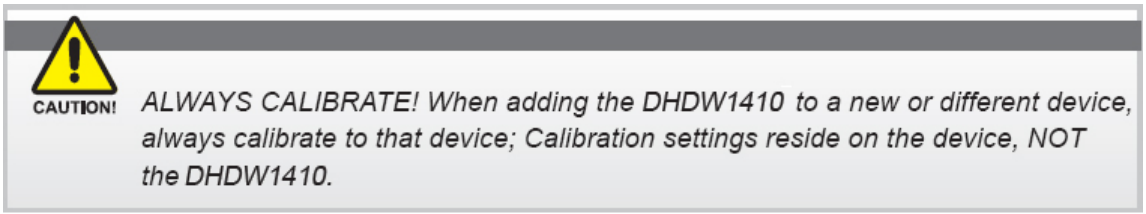
PREVIOUS VERSIONS OF TOUCH SCREEN CONTROLLER DRIVERS

Previous versions of ANY Touch Screen Controller Driver must be removed before installing the latest version of the TSHARC™ Touch Screen Controller Driver.

If a different T/S Controller Driver (not TSHARC) is on the device it must be removed before installing the TSHARC drivers. Note: A typical driver uninstall program utility of Microsoft's® does not remove all traces of a T/S Driver installation. ***Contact manufacturer of previously installed driver program to learn how to uninstall their product. These instructions may be available from the manufacturer's web site.***

NEW DHDW1410 INSTALLATION WITH EXISTING DEVICE

Whenever the DHDW1410 is installed to an existing device (equipped with the TSHARC driver), Touch Screen calibration is always required. The Touch Screen driver resides on the computer device, not the DHDW1410 display.



NEW OPERATING SYSTEM INSTALLATION

If installing a new operating system (O/S), do not install Touch Screen Controller Driver until O/S is installed and computer's video display settings have been verified. Touch Screen Controller Driver uses computer's O/S display driver settings to accurately configure T/S Controller Driver files.

APPENDIX A

MECHANICAL DRAWINGS

Mount diagrams and dimensions may assist with installation. Overview drawings can be found on the corresponding product download page. These may be found on the iTechLCD website: http://www.itechlcd.com/

OPTIONAL MOUNTS

Diagrams of Flush, panel or Rack Mounts and dimensions may assist with installation of Display. These may be found athttp://www.itechlcd.com/

APPENDIX B

IP INDUSTRY STANDARD

Electrical manufacturing organizations classify product enclosures and/ or their degree of protection; each organization publishes technical manufacturing standards.

The International Electrotechnical Commission (IEC) 60529 Standard addresses Ingress protection (IP); this describes the degree of enclosure protection provided, not the enclosure itself. The first digit of IP Code designation describes degree of protection against ingress of solids; second digit designates degree of protection against ingress of liquids. (www.iec.ch)

Digital Systems Engineering designs the HDRM sealed Display to exceed Standards of IP67, incorporating a range of environmentally-sealed connectors engineered to provide a safe and secure dust and waterproof environment in rugged conditions.

Summary of IP 67: Enclosures constructed for indoor or outdoor use; to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose-directed water and the entry of water during occasional temporary submersion at a limited depth (6” to 3 feet or 15cm to 1m); and that will be undamaged by external formation of ice on the enclosure. Sealed from dust and water.