

Operators Manual

AVDU-2102-xx-03-OPS

Issue B



OPERATORS MANUAL

AVDU-2102-xx-03-OPS
8.4" High Brightness LCD Display

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1 General Description

This manual applies to the 210mm (8.4") Colour TFT-LCD Display AVDU-2102-xx-03, and its variants. The DVI option includes an additional connector on the rear.

The display is configured to support the following inputs
a single composite video input.

This manual relates to an upgrade to the base operation man machine interface version. Upgrades to the man machine interface are indicated in a firmware upgrade identification plate at the rear of the unit and on the On screen Display (OSD)

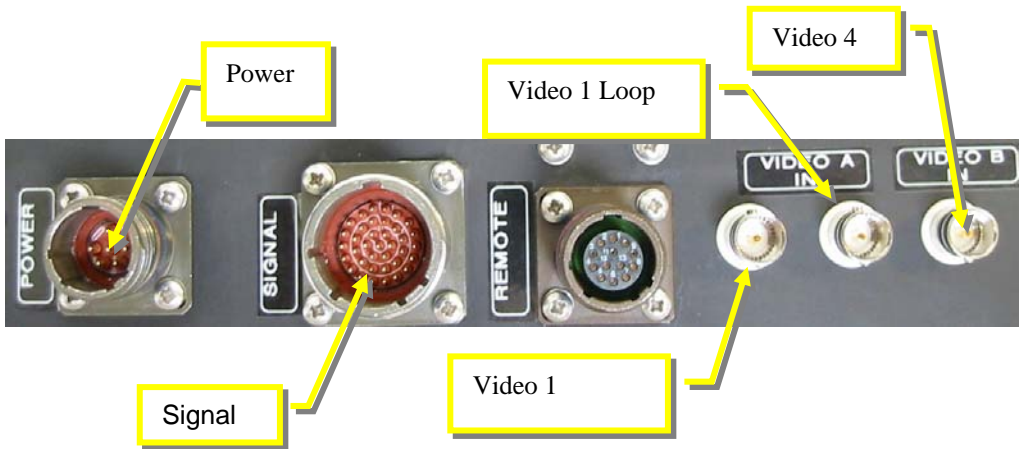
This manual relates to the following man machine interface versions:

Control system Version 1.0

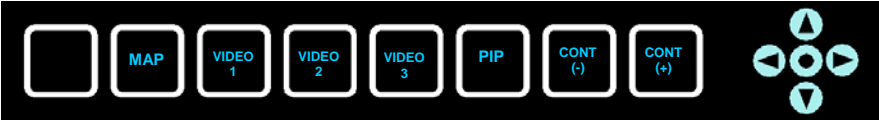
On Screen display Version 1.6.0A (Version displayed in the OSD)
Version 1.6 (DVI option only)

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2 Equipment connections



3 Control Key Functions and legend



Button Functionality

The functionality for the buttons on the Display's front panel. The ON/OFF switch is implemented by the rotary brightness control when pushed in and out provides and isolates power to the unit.

| No | Legend | | Function |
|----|------------|----------------|---|
| 1 | - | <DVI> | Selects DVI input (when DVI option fitted). |
| 2 | MAP | | Selects the Graphic (VGA input) |
| 3 | Video 1 | Video1 | Selects the video 1 input from the signal Connector or the Video A BNCs at the rear of the Display (Composite). |
| 4 | Video 2 | Video 2 (Y/C) | Selects the video 2 input from the signal Connector at the rear of the Display (Y/C) |
| 5 | Video 3 | Video 3 (RGsB) | Selects the video 3 input from the signal Connector at the rear of the Display (RGsB) |
| 6 | PIP | | Superimposes the last selected video signal over the Graphic image |
| 7 | 'CONT (-)' | | Adjusts the display contrast down. (Graphic or Video Depending o the mode) |
| 8 | 'CONT (+)' | | Adjusts the display contrast up. |

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The Menu select key invokes the On Screen Menu Display (OSD) and selects the menu when held down for more than 5 seconds. To exit the menu press and hold the key for >5 seconds

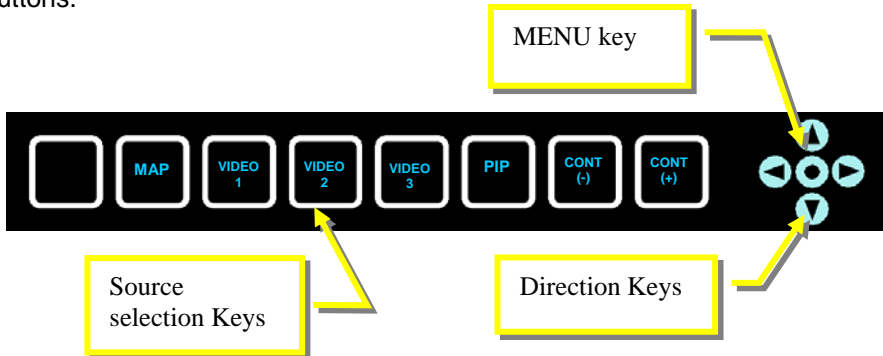
The four direction keys have four modes depending on the current display mode.

| MODE | Graphic MAP | VIDEO | PIP | MENU/OSD |
|--------------|-------------------------------------|--------------------|----------------|-----------------|
| Down | Dim the brightness of the keys | Zoom out if frozen | Move PIP Down | DOWN |
| UP | Increase the Brightness of the keys | Zoom in if frozen | Move PIP UP | UP |
| LEFT | MAP Contrast - | Video Contrast - | Move PIP Left | LEFT |
| RIGHT | MAP Contrast + | Video Contrast + | Move PIP Right | RIGHT |

The brightness of the key legends is determined by the front panel brightness and the offset determined by the up/down keys when used in MAP mode. The key backlights are not determined by the external lighting bus in this version.

4 Operator controls

The equipment configuration is controlled from a series of rotary controls and push buttons.



1. The Brightness control operates independently of the other controls.

BRT – This rotary control adjusts the illumination level of the display.

Power – This control is a latching control and will turn the display off and on. By default the display powers up in the default VGA Graphic mode.

2. The eight remaining select keys control the displayed image source and appearance.

3. The Menu select key invokes the On Screen Menu Display (OSD) and selects the menu. To select the menu press and hold the centre Menu Key for more than three seconds. To exit the menu, press and hold the centre key for more than three seconds. The menu functions are described in the next few pages.

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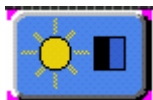
5 Key Backlights

The back illumination of the front panel buttons may be optionally controlled by the lighting bus in the aircraft. (Not implemented) The aircraft lighting bus is connected to the lighting bus contact in the “Power” connector. The signal is fed to the Display where it is processed. The brightness of the key backlights is adjusted by the main brightness knob. The keys will flash while the video image is frozen to warn the operator that a frozen image is present on the display.

6 On Screen Display (OSD) operation.


| | |
|----------------------------------|--|
| To turn on the OSD menu: | Press the MENU button and hold for three seconds |
| Move to next icon: | Press the MENU button momentarily |
| Select options within icon menu: | Use SEL UP/SEL DN buttons, the selected option is in yellow. |
| Increase/decrease setting: | Use +/- buttons (SEL RIGHT/LEFT) |
| Move selection left/right: | Use +/- buttons, the selected option is in green |
| To confirm the selection: | Use + button (SEL RIGHT) |
| To turn off the OSD Menu | Press the MENU button and hold for three seconds – this will store the user adjusted settings |


On screen Display (OSD) functions



Brightness and Contrast :

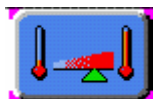
The Brightness and contrast of the video and Map are independent

Brightness  Increase/decrease panel brightness level, total: 100 steps **(50)**

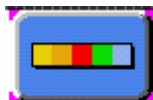
Contrast  Increase/decrease panel contrast level, total: 100 steps **(50)**

Note: No function in DVI mode

Colour Temperature : 9500K / 8000K / 6500K / 5000K




Adjust the warmth of the image displayed. The higher temperature the cooler the image looks like. The lower temperature the warmer image looks.



Video Adjustment :

(DISPLAYED IN VIDEO MODE ONLY)

Colour:  adjust video colour level

Tint:  adjust video tint level (NTSC video only)

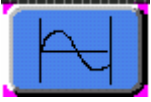
Sharpness:  adjust video image sharpness level

Picture Type: Motion/Still/Normal Select different modes for different Videos
Motion mode – Good for dynamic scenes
Still mode – Steady and sharp image. For still picture displayed.


Normal mode – “Non-flicker” image. For general use


Video Type: DVD / VCR change bandwidth to match the source **(DVD)**

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Frequency and Phase : (DISPLAYED IN PC MODE ONLY)

Frequency  Adjust the image horizontal size

Phase  Fine tune the data sampling position (adjust image quality)

Note No function of the frequency or phase in DVI mode

Picture Type : Motion/Still/Normal Select still mode to getting a stable still picture displayed inside PIP window.

Select Normal mode to getting a better display quality for RGB video input

(MOTION)



Video System : Select video system and input signals (DISPLAYED IN VIDEO MODE ONLY)

AUTO : automatic detection of NTSC and PAL system (not applicable in SECAM system)

(AUTO)

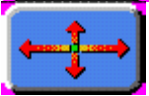
NTSC / NTSC 4.43 : manual select NTSC system

PAL / PAL M : manual select PAL system

SECAM : manual select SECAM system



Status : Display graphic information: resolution and frequency (DISPLAYED IN PC MODE ONLY)



Position : Image up/down : Use SEL UP/SEL DN to move the image vertically

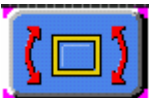


Image left/right : Use +/- SEL RIGHT/LEFT to move the image horizontally

Rotation : Rotates the image from landscape format to portrait format. (DISPLAYED IN VIDEO MODE ONLY)



Picture in Picture : (DISPLAYED IN PC MODE ONLY)

PIP Size : / 1 / 2 / 3 Select PIP window size: close, size 1, size 2 to size 24
Do not set this to zero or no PIP will be displayed in PIP mode

PIP Source : Select video source to be display in PIP window: **(Set to Auto)**

Auto – automatic detection of Composite, S-video and Component

Comp – manual select composite video only



SVid – manual select S-video only

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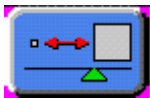
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YCbCr/RGB – manual select component video only
(YCbCr/RGB Internally selected)

Horizontal Position  adjust the position of the PIP window horizontally
Vertical Position  adjust the position of the PIP window vertically

Advanced PIP Settings :

Brightness  adjust the image brightness of the PIP window
Contrast  adjust the image contrast of the PIP window
Sharpness  adjust the image sharpness of the PIP window
Tint  adjust the tint of the image of the PIP window
Colour  adjust the colour of the image of the PIP window



Video Scaling : (DISPLAYED IN VIDEO MODE ONLY)

Use the UP and DOWN arrow keys to select the following scaling modes.

4:3 Normal

4:3 Letterbox

4:3 Letterbox with Subtitles

Nonlinear Scaling Modes : Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch

Graphic Scaling Modes (DISPLAYED IN PC MODE ONLY)

Use the up and down arrow keys to choose a scalar mode.

Use the + or - key to modify a following scalar parameters.

One to One :

Horizontal Pan 

Vertical Pan 

Fill Screen : enable full screen expansion for lower resolution Image
(Default)

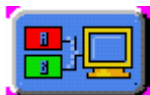
Fill to Aspect ratio : enable fill screen expansion for lower resolution image according to aspect ratio.

Nonlinear Scaling Modes Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch



Language : Select OSD menu language display

1. English **(Default)**
2. Danish
3. Chinese (Simplified)



Video source : Select the input video signal

Analogue RGB / Component Video / **Composite Video** / S-Video





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Utilities :

| | | |
|----------------|--------------------|---|
| User Setting : | User Timeout | adjust the OSD menu timeout period in a step of 5 seconds (No user adjustment possible – setting will be overridden) |
| | DPMS | Disable / Enable the DPMS function When enabled the screen will display an error message when no input is present on the selected image source. The display will go into standby after a short period if there continues to be no input. The display will “wake up” if an image source returns. |
| | Display Input | Disable /Enable the input source name on screen (Enabled by default) |
| | Auto Source Select | : Off - Disable auto source select function. Low - Auto source select enable ONLY in power up. High - Auto source select ALWAYS enable. Set to OFF by Default – screen will display an error message when no input is present) |
| | Gamma: | 1.0 (Default setting) 1.6 2.2 |
| | Video Port Select | Select “Port 1” or “Port 2” of the source Composite/SVideo/YCbCr (Do not adjust these settings) |

OSD Setting :

| | | |
|---------------------|---|---|
| OSD Horz Position : |  | move the OSD menu horizontally |
| OSD Vert Position : |  | move the OSD menu vertically |
| OSD Background : | Translucent / Opaque | |
| OSD Rotate : | Normal / Rotate | |
| Freeze Frame : | Freeze the image (use “+” button) | |
| Zoom : | Zoom level : enable the zoom in function on the image displayed. Use “+” Right button to zoom in the image. Use “-“ Left button to decrease the zoomed image. | |
| | Horizontal Pan |  |
| | Vertical Pan |  |

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Direct Access #1: Define the hot key function(Right "+" and Left"-") for one of the following adjustments : Brightness / Contrast / Volume / Freeze / Zoom / Video Source* / PIP

(Automatically set to Contrast)

Direct Access #2: Define the hot key function ("SEL UP" and "SEL DN") for one of the following adjustments : Brightness / Contrast / Volume / Freeze / Zoom / Video Source* / PIP

(Automatically set to Brightness)

Display Orientation : **Normal** / Horizontal Inverse /

Vertical Inverse / Inverse

Calibrate RGB Gain : Colour Calibration

(DISPLAYED IN PC MODE ONLY)

Load Factory Defaults : Recall factory default settings.

* By pressing the hot key, the source is in sequence of Analogue

RGB/Composite Video/S-Video/Component Video.



Volume : Not Implemented

Adjust the audio volume level (functions only if the audio add-on installed)



Exit menu

Do not exit the OSD menu using this mode. The User adjustments will not be saved and the exit mode is indeterminate. To Exit the menu Press and hold the Menu button for three seconds.

In the event that the menu is exited using this method return to the OSD by pressing and holding the Menu key for three seconds twice (the first will not display the OSD, the second will display the OSD. It will then be possible to exit the menu normally (pressing and holding the Menu key for three seconds) and the adjustments will be saved, Alternatively remove power from the unit by turning the system power switch off.

(applies to V1.6 OSD firmware)

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NOTE:

The OSD settings chosen will be stored in memory. The OSD menu can be cleared from the screen by pressing and holding the Menu Key for more than three seconds. Exiting the Menu in this way will allow the system to store the changed parameters and return to the normal operating mode. Moving the selection bar to the EXIT icon pressing the + (Right) button will exit the menu but will cause an error in the function of the keys and is not recommended.

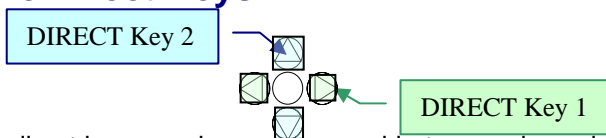
7 A note on Brightness


The front panel brightness control adjusts the illumination level coming from the display unit. It may be adjusted to match the background illumination level present in the aircraft and may be set to very low levels for night operation and high levels for day operation. Care should be taken not to leave the unit powered at high brightness levels when in a static or training mode as high power is drawn by the unit and overheating may occur. There is an independent “brightness” secondary control on the OSD for both the video and the Graphics/map input. This sets the video level of the video or graphic source. It is factory set to its midpoint (50) and it should not be normally necessary to adjust this on a day to day basis.

8 Contrast.

The contrast is normally adjusted using the “Contrast” keys in video mode. Pressing either these keys will display a contrast bar in the centre of the screen. Pressing the keys or holding them will adjust the contrast + or -. The contrast is factory set to its midpoint (50) It should not be necessary to adjust this on a day to day basis unless the contrast level from the sensor video is poor (It is usually better to adjust the sensor settings rather than the “normalised” display. (Holding the key will auto repeat for rapid value change) The contrast settings for the Map and the video are independent and are stored separately.

9 A note on the Direct Keys



The function of the four direct keys can be programmed in two modes using the OSD Utilities menu.  However these are overridden by the button controller and thus have no function. Changing the direct key programming from the factory default settings is therefore not recommended.

Direct Key 1

Direct key one is programmed in the factory to contrast. It is not possible for this to be changed by the user.)

Direct Key 2

The function of this key can be programmed in the factory to Brightness

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10 TROUBLESHOOTING

A general guide to troubleshooting the flat panel display system it is worth considering the system as separate elements, such as:

- External Equipment; PC settings, video format
- Display Panel (Menu setup, cabling, connection, panel, PC settings)
- Backlight (inverter, cabling, backlight tubes)
- Computer system (display settings, operating system)

Through step-by-step cross checking with instruction manuals and a process of elimination to isolate the problem it is usually possible to clearly identify the problem area.

Removing power from the system may clear a system lockup or return the settings to their default condition.

No image:

- If the panel backlight is not working it may still be possible to just see some image on the display.
- A lack of image is most likely to be caused by incorrect connection, lack of power, failure to provide a correctly formatted signal or incorrect graphic card settings.

Image position:

If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test using another graphics card. This situation can occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal such as a signal splitter (please note that normally a signal splitter will not have any adverse effect).

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Image appearance:

- A faulty panel can have blank lines, failed sections, flickering or flashing display
- Incorrect graphics card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, to scroll, flicker badly or possibly even no image.
- Internal jumper settings are set at the factory. Incorrect internal jumper settings on the internal controller card may cause everything from total failure to incorrect image.

Continued failure:

If unit after unit keeps failing consider and investigate whether you are short circuiting the equipment or doing something else seriously wrong.

Generally after common sense issues have been resolved we recommend step-by-step substitution of known working parts to isolate the problem.

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11 Handling Precautions

Handling of the Display should be in compliance with Real-Time Vision's handling principles.

- 1) Since front window is an optical assembly and is easily damaged, observe precautions in order not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting the input connectors.
- 3) Wipe off water or fluid droplets immediately. Long contact with water or other fluids may cause discoloration or spots.
- 4) When the front window surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 5) Since the panel is made of polycarbonate or glass, it may break or crack if dropped or bumped on hard surface.
- 6) Since CMOS LSI is used in this module, take adequate static electricity precautions and ensure correct human earth bonding when handling.
- 7) Do not open nor modify the Assembly.
- 8) Do not press the front window sheet in any direction.
- 9) At the insertion or removal of the Power and Signal Interface Connector, ensure that the sockets are free from debris and be sure not to damage the Interface pins
- 10) After installation of the Display into a mounted position, do not twist nor bend the Display even momentary. When designing a suitable mounting, it should be taken into consideration that no bending/twisting forces are applied to the Display from outside. Otherwise the TFT -LCD module or backlight may be damaged.

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