



AVDU-3070-xx-OPS
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Operators Manual



AVDU-3070-xx-OPS

12.1" XGA Multi-function LCD Display

General Description

This manual applies to the 307mm (12.1") Colour TFT-LCD Display AVDU-3070-xx and its variants. The display supports the XGA (1027(H) x 768(V)) screen format and 16.7M colours (RGB 8/6-bits data) at high response speeds optimised for high-speed motion video typical in airborne surveillance applications.

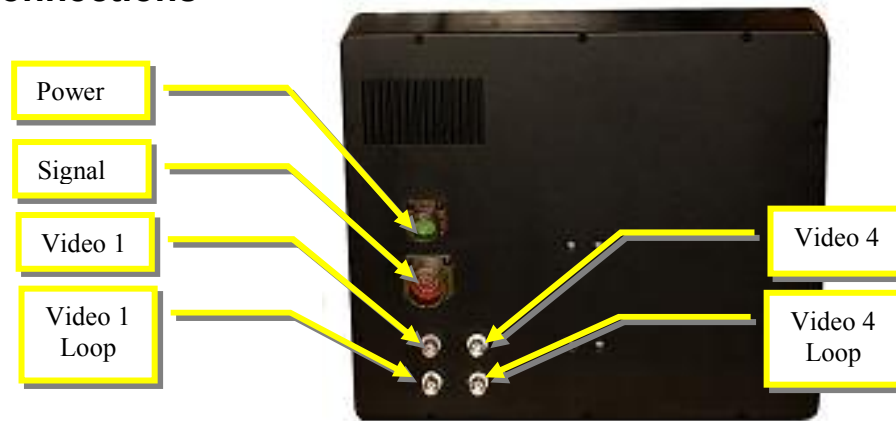
This manual relates to an upgrade to the base operation man machine interface version. Upgrades to the man machine interface are indicated in a firmware upgrade identification plate at the rear of the unit and on the On screen Display (OSD)

This manual relates to the following man machine interface versions:

Control system	Version 1.2 (Enhanced configuration)
On Screen display	Version 1.3 (Version displayed in the OSD)

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Equipment connections



Operator controls

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



1. The Power switch and Brightness controls operate independently of the other controls.

Power – This control is a latching control and when pushed in will turn the display on. By default the display powers up in MAP mode.

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

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

Map – selects the Graphics input

Video – Selects the Video 1 input on the rear panel BNC

PIP – Displays the MAP/Graphics with an overlaid video Picture in Picture (PIP) window

3. The Menu select key invokes the On Screen Menu Display (OSD) and selects the menu. To select the menu press and hold the Menu Key for more than three seconds. To exit the menu, press and hold the key for more than three seconds.

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

MODE	MAP	VIDEO	PIP	MENU/OSD
Down (-)	Button illumination Down	Freeze then Zoom out	PIP Window Down	DOWN
UP (+)	Button illumination UP	Freeze then Zoom in	PIP Window Up	UP
CONT LEFT (-)	MAP Contrast -	Video Contrast -	PIP window Left	LEFT
CONT RIGHT (+)	MAP Contrast +	Video Contrast +	PIP window Right	RIGHT

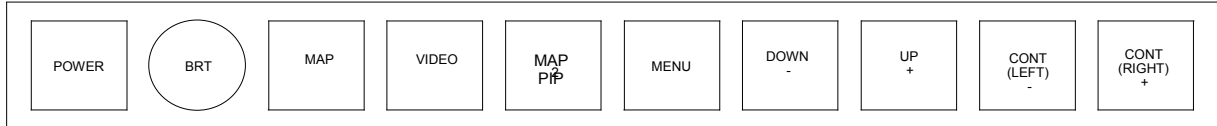


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Display Operation

The following refers to a set of push buttons that are fitted to the front of the unit. In addition to power on/off and a rotary controls for backlight brightness the control button interface provides for video source selection and an On Screen Display (OSD) of certain functions that are controlled by momentary type buttons.



Controls	
On/Off – turns controller display on and off	On/Off button
Brightness – controls display backlight brightness	Rotary VR
a. Graphic source selection	MAP
b. Video Source Selection	Video
c. Graphics with an overlaid video window	PIP
d. Menu – turns OSD menu On or Off (Hold for three seconds)	Menu
a. Dims the button illumination b. .Freezes the image then zooms out c.Moves the PIP window DOWN d.Select down – moves the selector to the next function (down)	DOWN (-)
a.Brightens the button illumination b.Freezes the image then zooms in c. Moves the PIP window UP d.Select up – moves the selector to the previous function (up)	UP (+)
a. Adjusts the Graphics/Map Contrast lower b. Adjusts the Video Contrast lower c. Moves the PIP window DOWN d.(-) Select Left – decrease setting	CONT (LEFT)
a. Adjusts the Graphics/Map Contrast higher b. Adjusts the Video Contrast Higher c. Moves the PIP window RIGHT d.(+) Select Right – increase the setting/confirm the select	CONT (RIGHT)



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Video Source Selection.

MAP

The Map button will select the external graphics video input (usually a PC or Map generator). The self adjust on its first power up to auto select the correct image parameters. (Screen size, position, graphics mode etc.) This usually takes 10 to 30 seconds) Once setup on a particular source it will remember the settings and switching will be much quicker.

Pressing MAP while in VIDEO mode will select the MAP/Graphics source

Pressing MAP when in PIP mode will remove the PIP overlay.

Pressing Contrast + or – will adjust the contrast of the MAP image

Pressing UP or DOWN will set the illumination level of the buttons

Video

Pressing Video while in MAP or PIP mode will select the appropriate video source full screen


Pressing Contrast + or – will adjust the contrast of the VIDEO image

Pressing UP or DOWN will freeze the video image and then zoom the image in or out

To Return to the “Live” image zoom back out and press the Video button.

PIP

When in MAP or VIDEO mode pressing the PIP button will overlay a video Picture In Picture (PIP) over the graphics input.

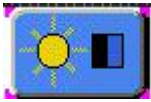
The position of the PIP may be set using the UP/DOWN/LEFT/RIGHT keys. Holding the key will allow rapid setting of the display PIP window. The size of the PIP is remembered when the unit is switched off together with the position of the window both can be set in the OSD. The size of the PIP is set in the OSD Picture in Picture menu 

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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

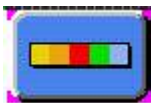
Brightness Increase/decrease panel brightness level, total: 100 steps **(50)**

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



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 warmest 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
 change bandwidth to match the source **(DVD)**

Video Type: DVD / VCR



Frequency and Phase : (DISPLAYED IN PC MODE ONLY)

Frequency Adjust the image horizontal size

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

Picture Type : Motion/Still/Normal ISelect 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: (DISPLAYED IN PC MODE ONLY)

resolution and frequency



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



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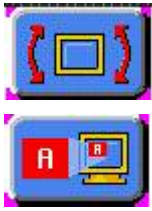


Image left/right Rotation :

: Use +/- SEL RIGHT/LEFT to move the image horizontally
Rotates the image from landscape (DISPLAYED IN VIDEO MODE ONLY) format to portrait format.

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

PIP Source : Auto / Comp / Svid/YCbCr

Auto – automatic detection of Composite, S-video and Component
Comp – manual select composite video only
SVid – manual select S-video only
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

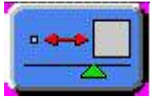
adjust the image sharpness of the PIP window

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.

Normal

Letterbox

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.

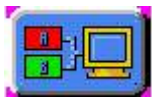
Nonlinear Scaling Modes :

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)
- 4.



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 (Disabled 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	

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)

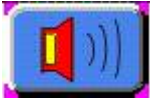
Load Factory Defaults : Recall factory default settings.

* By pressing the hot key, the source is in sequence of Analogue RGB/Composite Video/S-Video/Component Video.



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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 V1.30 OSD firmware)

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.



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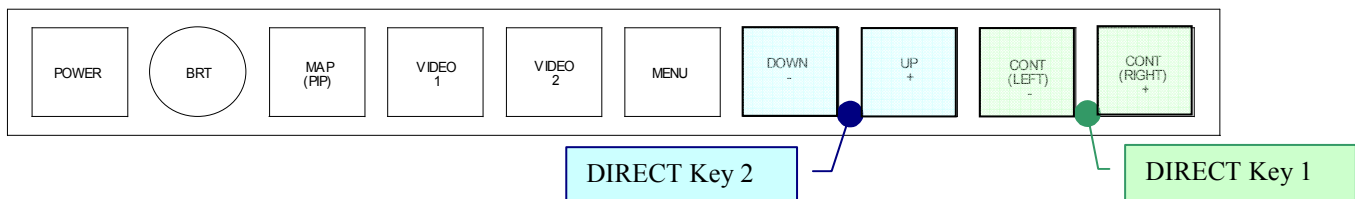
A note on Brightness


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.

Contrast.

The contrast is normally adjusted using the “Contrast” key in Map or 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.

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 and the buttons are engraved appropriately (CONT- and CONT +. 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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TROUBLESHOOTING

General

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 (Turning the Power switch on the front panel to OFF) 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).

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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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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