

MR6300D Relax & View Video Systems



OPERATORS & INSTALLATION MANUAL



MR Conditional up to and including 3 Tesla



Thank you for purchasing the MR6300D Relax & View Video system.

This product is manufactured as MR Conditional, for use up to a maximum of 3 Tesla and is tested to the highest standards.

All products are labelled inline with the International Standard F2503 "Standard Practice for Marking Medical Devices and Other Items for Safety in the Magnetic Resonance Environment".

To ensure that you obtain maximum benefit from the MR6300D Relax & View Video system, please take a few minutes to read the enclosed information regarding Operation, Service and Maintenance.

After reading this manual, store it in a safe place for future reference.

If you have any problems in the meantime or would like any advice about this or any other MR products from the Wardray Premise range, please contact us at the following address:-

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Safety Definitions for MRI as Defined by International Standard F2503

MR SAFE:



An item that poses no known hazards resulting from exposure to any MR environment. MR SAFE items are composed of materials that are electrically non-conductive, non-metallic, and non-magnetic.

MR CONDITIONAL:



An item with demonstrated safety in the MR environment within defined conditions. At a minimum, address the conditions of the static magnetic field, the switched gradient magnetic field and the radiofrequency fields. Additional conditions, including specific configurations of the item, may be required.

Supplementary marking – additional information that, in association with marking as "MR CONDITIONAL," states via additional language the conditions in which an item can be used safely within the MR environment.

MR UNSAFE:



An item which poses unacceptable risks to the patient, medical staff or other persons within the MR environment.

Warranty

Wardray Premise Ltd warranty this product to be free of defective materials and faulty workmanship for a period of 12 months.



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General Information

The system is designed to operate with a video signal received from a DVD Player, or from a Laptop / PC with HDMI output.

A DVD player is supplied as standard with the system. Please see the players own manual for its operating instructions. An Apple iPad can also be connected via an Apple HDMI converter (not supplied)

The signal from the DVD is fed to an optical converter and audio out unit, the optical signal is then fed to the screen and the audio to the scanners audio system.

The video screen is a Thin Film Transistor (TFT) panel. The screen is a 24" widescreen, with a resolution of 1920 x 1080 and is housed in a fully shielded RF enclosure.

The screen is usually mounted on the back wall behind the scanner and is then viewed with either the mirror on the head coil or via the mirror mount assembly supplied with the unit.

The ability to reverse and/or invert the image means that the picture can always be viewed correctly, regardless of patient orientation in the scanner, or whether a single or double mirror assembly is in use.

Audio to the patient will be either through the scanners inbuilt audio system or alternatively through the Wardray Premise MR200 PureSound Audio Relaxation System.

Other than the controls for the screen described on the next page and those described in the DVD players manual, there are no other user controls, and there are no user serviceable parts in the system.

The additional controls mentioned in Appendix 1 are intended for use during installation if needed.

It is recommended that the screen is switched off at the end of the working day

Power Requirements:

A total of four 220 / 240 Volt 50Hz socket outlets are required:-

- Two in the Technical Room (for the Power Supply for Screen)
- Two in the Control Room (one for the DVD Player and one for the Optical Converter Unit)

The two sockets in the Technical Room can be reduced to one if a 'Y' type mains splitter cable is used.

It is also recommended that the Technical Room power socket is accessible from ground level to allow staff to completely turn off of the video panel and power associated power supplies at the end of the working day.

Total Current Draw is approximately 3 amps for all four outlets.



Operating Instructions

MR6300D Panel Guide

The Panel has 8 operator keys on right hand side of the screen enclosure as follows.



Above the operator keys is a red/green LED. It will light up RED indicating the panel is powered up and the display backlight is off. When a signal from either the DVD player, Apple iPad or laptop / PC is being received it will turn to GREEN and the backlight will be on allowing a picture to be displayed.

Operator keys 1,2,6 and 7 all offer the same function in picture orientation.

They allow the displayed image to be 'flipped'.

Use any of these keys (1,2,6 or 7) to match the image on the screen with the patients orientation and to compensate for the patient viewing the screen through a mirror.

Successive pressing of a picture orientation button will cause the image displayed to cycle through each available orientation

To use a laptop/PC instead of the DVD player, the HDMI cable that is plugged into the DVD player will need to be taken out and plugged into a Apple iPad converter or laptop/PC.



Operating Instructions

Standby Mode

Automatic

In normal use the video display will go into standby mode after the video source, i.e. DVD player, has stopped sending an image. In the case of the normally supplied Sony DVD player it will switch itself off after a period of inactivity causing the display to go to standby mode. Restarting the video player will wake the video display.

Manual

The MENU button (operator key 3), when pressed & held will put the display into standby mode. This function is often used to blank the display when playing music to the patient but not wanting to distract the patient with the video music menus of the video source. A subsequent short press of operator key 3 will awake the display.

Please note when starting the system there can be a 30-40 second delay whilst the two ends of the fibre optic system synchronise and then the HDMI handshakes occur between the played and display, so please allow for this slight pause.

MENU Button—Further uses

The MENU button is also used (via a short press) for a multitude of configuration options. In normal use these settings do not need to be changed. A full menu explanation can be found in Appendix 1 of this manual (page 17 - 20).

Optional Video Stand MR6003.

Please Note: The stand has not been designed to be fully mobile.

The screen unit contains a certain amount of ferrous magnetic content that could potentially cause the screen / stand unit to become hazardous if moved too close to the magnet.

The stand with the screen affixed to it, will be marked as MR CONDITIONAL with an additional label stating "Must be kept at least 1m from Magnet Bore"

On installation the floor at the rear of the scanner should have had suitable markings placed on it, to ensure that the stand is at least 1m from the magnet bore,. This 1m space also ensures that the table top does not clash with the stand when fully extended to the rear (as well as to assist with centring the screen).

IMPORTANT NOTE

If the video screen unit is not permanently fixed via the wall mounting panel it must be kept at a minimum of 1 metre from the magnet bore



In Technical Room:

Check that both 12V and 32V power supplies are working, check all connections thoroughly by pushing together, as it has been found that although the green lights are on there can be problems when signal sent to screen.

In Scan Room:

Is red light on side of video screen panel on when power present but no signal present? This should turn green when signal present.

If red LED is on remove power from screen (remove XLR plug on top of screen or remove LEMO plug to power filter) and then plug back in.

The video screen panel should show Wardray Premise logo followed by "Scanning for Inputs".

If it does not show scanning for inputs follow Menu Chart – see separate document.

In Control Room:

Check 12V power supply to Fibre Optic Sender Box is plugged in and Green LED is on. Check that DVD player is running and that the HDMI cable to Fibre Optic Sender Box is plugged in.

Check that Fibre Optic (FO) cables are connected.

Please note:

If there is signal present from DVD player a GREEN light will show on side of video screen panel. If there is no signal the light will be a RED.

If RED light shows the problem could be either that the DVD player is faulty or there is a break in the fibre optic cables.



Equipment supplied:

- 24" LED Widescreen (TFT) Video Screen Panel & mounting plate
- 40m. Dual fibre optic lead, ST connectors
- 10 m 4 core shielded DC supply lead with XLR-LEMO connectors
- Pen panel filter box with LEMO & XLR connectors
- 12V Power Supply.
- 32V Power Supply.
- Y Power DC combiner cable 2 XLR into 1 XLR
- Fibre Optic Sender Box
- 12V power supply for above
- 3m Phono to Phono lead (for GE)
- 3m Phono to 3.5mm Jack Plug (for Siemens)
- Viewing mirror MR6001
- Tie wraps & adhesive bases
- DVD Player (UK Only)
- For Siemens installations an audio Amplifier kit
- For Philips Installations Ground Loop Isolator

Additional for fMRI Units:

• 1 Set of MediGlasses MR6004—B

Ferrous Tools supplied – Non Wardray installations

- 10mm drill for hole punch
- 19mm hole punch
- Hex key for punch

Local supply:

- 20mm surface trunking Self Adhesive—If required
- Mains extension lead (Optional for Computer room if power socket not adjacent to pen panel)

Tools required for Installation:

- Laser Level on Tripod
- Spirit Level.
- Drill.
- Hand Tools.



Safety Notes:

Video screen panel handling:

Important Note: The video screen panel contains an mu-metal shield which, by definition is a magnetic.

material.

Also the fibre optic receiver within the panel has magnetic shielding. The video screen panel must not be allowed to come closer than 1 metre to the magnet when being carried into the magnet room and should be held with two hands placing your body between the panel and the magnet.

Two persons are required to complete the installation.

Mounting the pen panel filter box:

The pen panel filter box is installed in the Technical Room.

The pen panel filter box has a 60mm x 30mm footprint and requires a single 19mm diameter mounting hole.

Identify a suitable location on the pen panel, (Important Note: check both sides of panel for any obstructions), and from the Technical Room side drill a 10mm pilot hole for the punch.

Make arrangements to catch any swarf from the other (magnet) side.

Insert one half of the hole punch from the Technical Room side and get a helper to attach the other half of the hole punch from the magnet side. Using the supplied 8mm AF Allen key tighten the punch to make the hole.

Mount the pen panel filter box using the Lemo connector barrel from the Technical Room side and get a helper to fix the single nut on the magnet side. Make the fixing secure by tightening the Lemo nut with a 20mm spanner.

Installing the video screen panel:

The Video Screen Panel is installed in the scanner room.

Important Note: The Video Screen Panel should ideally be at least 75cm from the back of the magnet bore.

The panel mounting plate is supplied fitted to the video screen panel and is secured with a single M5 screw on the bottom edge. (3.0mm Allen key required)

Outside the magnet room, remove the screw and the mounting plate from the video screen panel.

It is assumed the rear wall of the magnet room is parallel to the rear face of the magnet. If this is not the case then a suitable bracket can be supplied to make sure that the display and the rear face of the magnet are parallel to each other.

The display panel needs to be centred on the vertical axis of the magnet bore.

Use a laser level set up as far back from the front face of the magnet bore as possible, project a vertical line through the magnet bore onto the rear wall of the magnet room.



Mark this line on the wall using a pencil. Normally the panel is mounted slightly above the horizontal centre line, so that a patient in the bore can view all of the panel through a head coil mounted mirror.

The easiest way to achieve this is with the help of another person lying in the magnet bore and observing the rear wall via a reversed mirror set up on a head coil. Adjust the height of the mounting panel until all of the video screen panel can be seen by the person through the mirror on the head coil

Position the mounting panel, aligning its centre line with the centre line previously marked on the wall.

Mark off the top edge of the mounting panel using a spirit level. Using plasterboard fixings, screws & washers, drill the rear wall using the mounting panel as a template. Depending on the quality of the fixing 4 to 6 fixings will be required.

IMPORTANT NOTE: The use of non ferrous fixings is assumed.

The panel itself is located onto the fixing plate and held with a single M5 stainless screw in the centre of the base. (3.0mm allen key required)

The fibre and DC power cable are normally run either in surface trunking vertically from the connector area in the centre top of the video screen panel in to the suspended ceiling void, or behind the wall to the ceiling void.

Run the fibre optic cabling:

A double fibre optic cable is supplied. Connect Red to Red and Black to Black. Usually the cable is run from the video screen panel, up the wall in the trunking, through the ceiling void and down into the pen panel area.

It will depend on the scanner manufacturer as to how the cabling is run through the pen panel.

If there is a wave guide from the control room into the magnet room above the false ceiling, then this can be used instead of routing it through the pen panel.

Run the fibre optic cable through to the control room to where the DVD player is to be located. Arrange for unwanted fibre optic cable to be left in the ceiling void.

Install the fibre optic video sender box and power supply:

The Fibre Optic Sender Box is installed in the Control Room.

The plain grey plastic box is the Fibre Optic Sender Box (see photo A, pg 21).

Connect the twin fibre cable to the fibre optic sender box after removing the dust caps. It has a bayonet connector and a locating spigot. Treat this with care.

IMPORTANT NOTE: The fibre optic cable is not a wire and should not be kinked or bent round a radius tighter than 5cm.

Connect the 12V power supply and finally the HDMI lead to the DVD player or to a laptop / PC .

The fibre optic sender box also extracts the audio from the HDMI signal. This is made available via two phono sockets on the front panel.

For GE installations a stereo phono to phono cable is normally used to connect the HDMI audio to a spare auxiliary audio input on the scanner equipment



For Siemens installationa an audio amp kit & cables can be supplied. This kit includes a headphone amplifier + power supply and a 'Y' combiner cable to join the operator's microphone output with the audio from HDMI sender box.

The output from the 'Y' cable is inserted into the original operator's microphone socket. The amplifier serves two purposes, first to balance the audio levels from the two audio sources and second to isolate any DC level that might be present on the operator's microphone from back feeding into the HDMI audio system.

Running the 12/32 volt DC power cables:

The 10m long shielded power cable is supplied with an XLR connector and a Lemo connector. The female XLR is for the video screen panel end.

The object is to keep the DC power cable run as short as possible in the magnet room, whilst keeping it as far from the magnet and magnet cabling as possible.

The reason being the DC power cable can act as a radiating antenna for signals emanating from the video screen panel. These can appear as unwanted artefacts on the scanner display.

IMPORTANT NOTE: The Wardray engineer's installation cable set contains identical cables of 5m, 7.5m and 12.5m in length. Always use the shortest possible cable.

Typically this means a routing up the wall from the video screen panel into the ceiling void, around the edge of the wall at ceiling height and then dropping down into the pen panel area. Secure the cable to the pen panel using adhesive tie wrap mounting plates & tie wraps. Big loops of DC power cable near the magnet <u>must</u> be avoided as they can potentially radiate RF signals which can be seen as interference lines on the scanner images.

Starting at the display panel area, draw the cable with the Lemo connector up into the ceiling void, across to the drop point for the pen panel via the edge of the room. Drop the cable down to the pen panel, and plug the Lemo connector into the filter unit.

On the other side of the pen panel, locate a suitable power socket for the power supply.

Try to ensure the power cable does not run parallel to the magnet cables.

If the in room power cable is too long the excess must be looped backwards and forwards and Tie rapped.

Important Note: Under no circumstances must it be coiled as this will aid inductive coupling.

Install the power supply:

Plug both the 12v power supply (4 pin XLR) and also the 32V (3 pin XLR) into the Y Connector and then plug this into the pen panel filter unit using the 5 pin XLR connector. Position the whole assembly in the most convenient position.

Test the DC cable before connecting to video:

Power up the DC cable power supply and verify at the video display end that pins 1 & 5 are circa 32V DC with respect to each other, and pins 2 & 4 are 12V DC in respect to each other. Please note that pin 3 is not used.



Test the DC cable before connecting to video:

Note the system has a floating 0 volts supply. The XLR metal body is connected to the cable braid. This should read a short circuit to the pen panel using an ohmmeter. If the volts are OK and there is a circuit between the XLR body and the pen panel, connect the

XLR and fibre optic cables to the video display and offer up to the wall mounting plate.

Connecting the DVD Player:

The DVD player is installed in the control room.

Connect HDMI lead from grey box to HDMI socket on DVD player.

On Philips systems the audio output may need to be fed through a Ground Loop Isolator before being connected to the Philips audio system, this is to overcome mains hum.

Testing the system:

With the video unit and the video sender switched on, playing a DVD should result in an image being displayed on the video screen panel. Check also that the audio can be heard correctly through the headphones and speaker system if applicable.

Installations using Optional Video Stand MR6003:

If the video screen panel is mounted on the optional Video Stand MR6003 then consideration will need to be made as to whether to mount the upright section in the middle or rear of the base unit. The appropriate holes in the stand back plate will need to be used to ensure the correct height of mounting of the video screen panel.

Consideration will need to be given to the way that the power and fibre optic cables are run. The pole supplied with the stand can be used to tie-wrap the cables to.

Important Note: Check that the face of the video screen panel is no closer than 1 metre from the face of the magnet and that the stand has both the "MR Conditional" and "Must be kept at least 1m from Magnet Bore" labels attached.

It is suggested that the floor at the rear of the magnet is suitably marked as to where the feet of the stand should be to ensure that the screen is at least 1m from rear of magnet and also centred. You will also need to check that the scanner table top when fully extended at rear of scanner does not clash with stand.

With GE this is obvious as the bed runs to the extent of the section at the rear of the scanner. Siemens scanners have 2 types of beds, some only go out a short distance whereas some have a telescoping action and protrude a lot further.

Please note the video screen panel, if attached firmly to the wall will work at a lesser distance. It is the magnetic components as highlighted at the beginning of this section that necessitate this warning.

If you should experience any problems please do not hesitate to contact Wardray Premise using the contact details on page 2.









The top button **Brightness Up** (1) is a programmable hot key. In this application it is configured to change the orientation of the image displayed to the patient.

Press once to show the current setting and then again to cycle through the four image orientation options:

- Normal
- Left to right
- Top to bottom
- Both left to right and top to bottom.

The next button down **Brightness Down** (2) is configured to the same function as **Brightness Up** (1) and works in the same way as noted above

PREMISE

Appendix 1 MR6300D — Configuration Options

The third button down **Menu** (3) activates the menu system for selecting the required video input (only HDMI is used in this implementation) and changing other screen parameters.

IMPORTANT NOTE: There should be no need to adjust these settings.

Please note when in menu mode (i.e. the video screen panel will be showing a menu) the hotkey assignments are disabled so the buttons can serve as navigation controls around the menus.

The menu button also serves as a standby button, when pressed for 5+ seconds the unit will go into standby.

This standby mode can be helpful when wishing to use sound only from say a DVD player when the video element is not required.

Pressing the menu button again takes the system out of standby.

Navigation around the display menus is via the next four buttons

Select UP (4) and Select Down (5) to go up and down the menu

Adjust Up (6) and **Adjust Down** (7) will vary the value or setting of the highlighted item. The bottom button (8) is not used.

Leaving the buttons alone will invoke a timeout procedure, normally 30 seconds, where the screen will return to normal operation. When in MENU mode the menu button can act in a number of ways depending on where you are in the menu system – most typically it can work as a back button to go 'back up' the menu tree. It is recommended that once a parameter has been changed as needed, say a re-assignment of the hot keys, that the user let the system return to normal operation by not making any key presses for 30 secs.

Typically displayed along bottom of MENU mode screen when playing a video:

| Version: E1.09.DE.01 | Source: HDMI1 | Res: 1920x1080 | Hor: 26.9kHz | Ver: 24Hz |
|----------------------|---------------|----------------|--------------|-----------|
|----------------------|---------------|----------------|--------------|-----------|

Menu Items:

PICTURE Menu :Picture SettingColor TemperatureAspect/SizeBrightness100Input SourceHDMI1

With top menu displayed as above Press top button (1.**Brightness UP**) to reach the Utilities menu

UTILITIES Menu:

Menu Language: English Setup OSD Reset to factory default Software Update (USB) HotKey Brightness Setup



Appendix 1 MR6300D — Configuration Options

The **utilities menu** is navigated up/down via buttons 4 and 5 (**Select Up/Select Down**) Button 6 **Adjust Up** selects the item... then the relevant options are displayed. Repeated presses of Button 6 will change the value of the selected item. Saving is automatic – just leave the keypad alone for the OSD timeout period and the screen will return to normal operation.

Examples:

To verify 'Auto Source Seek':

Press top button **Brightness Up** (1) to select Utilities menu Move cursor to '**Setup**' and press button 6 to see current setting:

| Auto Power on | On | |
|-------------------|--------|--------------------------------|
| Auto Source seek | On | Must be on for scanning inputs |
| Image Orientation | Normal | |
| Gamma | 2.2 | |
| Fail Over | Off | |
| | | |

To do a Factory Reset:

Press top button **Brightness Up** (1) to select Utilities menu Move cursor (**Select Down** (5)) to 'Reset to factory'...and hold button 6 for 2+ secs, the reboot will exit menu system. HotKey selections will remain intact

To change OSD screen timeout:

Scroll to '**OSD**' and press button 6 to see current timeout & transparency settings Successive presses of button 6 will cycle around the available options.

The hot keys – buttons 1 & 2 (& 6&7 which are wired in parallel) are configurable with one of the functions below:-

Note - They only operate as soft keys outside the menu system – i.e. during normal operation

Scrolling to the '**HotKey'** from the utilities menu allows each key to be assigned one of 10 values:

Off Volume Black Level Contrast Input Source Aspect/Size Saturation Image Orientation Brightness

PREMISE

Appendix 1 MR6300D — Configuration Options

To setup hotkey assignments example (for image flip as originally supplied)

Press Menu (3) until top menu titled 'PICTURE' is displayed



Press top button Brightness Up (1) to select Utilities menu



Press Select Down (5) several times to move the highlight bar to 'HotKey'

Press Adjust Up (6) to select hotkey

The current **HotKey** assignments will be displayed...





Press **Adjust Up** (6) several times to cycle through the options (see list of ten possible HotKey assignments above) for HotKey 1 till 'Image Orientation' is reached.

Press Select Down (5) to move to HotKey assignment 2

Press **Adjust Up** (6) several times to cycle through the options for HotKey 2 again till 'Image Orientation' is displayed

For the image flip functions both keys should look like the picture above.

Now leave the system for 30 secs whilst the HotKey assignments are stored and the screen times out.



A) Fibre Optic Sender Box



Power Lead to electrical filter (pen panel)



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EC DECLARATION OF CONFORMITY

Wardray Premise Ltd Hampton Court Estate Summer Road Thames Ditton Surrey KT7 0SP

MR6300 Relax and View Video System MR6300fMRI Relax and View Video System with Functional Imaging Capability

I, the undersigned, certify that the product described above, and documentation detailed in the Technical File, is in conformity with the applicable provisions of:

FCC CFR 47: Part 15B: 2100 FCC ANSI 63:4: 2003 EN 60601-1-2: 2007 EN 55011: 2009 +A1: 2010 EN 6100-3-2: 2006 EN 6100-3-3: 2008 EN 6100-4-2: 2009 EN 6100-4-3: 2006 + A2: 2010 EN 6100-4-4: 2004 + A1: 2010 EN 6100-4-5: 2006 EN 6100-4-6: 2009 EN 6100-4-8: 2010 EN 6100-4-1: 2004

Ian J Benton Technical Applications Manager

Registered in England No. 347881 Registered Office as above. Directors: R-B Wardley JF Wardley JJ Wardley A Leach Date: 1st June 2012



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WARRANTY REGISTRATION FORM

To receive full warranty cover on your equipment, please complete and return this form at your earliest convenience

Reply e-mail: <u>sales@wardray-premise.com</u> Reply Fax: +44 (0)20 8398 8032

| Name: | |
|-------------------|--|
| Job Title: | |
| Company: | |
| Address: | |
| | |
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| Telephone: | |
| | |
| Fax: | |
| Email: | |
| Product Code/ | |
| Description: | |
| Product Serial/ | |
| Reference No: | |
| Please enter date | |
| Product received: | |

If your department currently has any other Wardray Premise Ltd. equipment, which is not already covered under a service contract, please contact Servicing-Admin@wardray-premise.com to discuss an all-inclusive package.

If you would like any further information or would like to be contacted regarding any of our products, please add your enquiry to the box below.