High-definition headrest monitor with programmable touch screen controller

Installation manual

This headrest monitor provides a plug and play installation rear seat entertainment without hurting the original motorized up-down adjusting mechanism. The dedicated hooks can be adjusted in horizontal 2 directions, so it can be installed in almost every car without replacing any original headrest part. The touch screen on top of the panel makes this screen easy to be installed together with any DVD players or TV tuners or VGA computers. This is an upgrade version from Fosp's patented well-sold previous version of universal headrest by adding the touch function, horizontal front/rear hook adjustment, and enhanced video processor of PAL/NTSC.

Features:

➤ Comfortable-feeling from the installers is guaranteed because of separate digital input box and the memory buffering and digital delivery. Usually these following troubles to ordinary RSE monitors will not be available to this monitor:

1. One video source [e.g. a DVD changer] needs to be sent to2 headrest monitors, installers maybe use Y splitter which will cause the impedance mismatch,(one video output=75 ohm while 2 moniotr inputs =37.5ohm), then video looks like washed and not so vivid, or maybe installers use one extra buffer box for video amplitude recovery but extra noise can possibly be generated.

2. Video source[e.g. a DVD changer] is usually located inside the rear trunk while the headrest monitor maybe 2~3 meters away from it, the transmission generate rolling noise on screen, because the distance is long and the car chassis is actually not a solid electric ground, especially when the engine is ON.

These 2 problems hurt the lifetime of the monitor, and make visible noises on screen, which is hard to remove but installers need to fight with it.   This simple RSE monitor removes such troubles by itself. it uses a separate input box which takes in all standard video, convert it into digital stable timing with a big frame memory, and transmit it into headrest monitor by a 4-meter long LVDS way.[LVDS=low voltage differential signal],which has no noise in long distance delivery, low EMI, and no compatibility problem.

➤ High-definition LCD panel with horizontally 2-directional adjustable hooks [left/right and front/Rear directions] makes this headrest compatible with almost every car, the installers do not need to throw away the original headrest, also the original motorization structure of headrest is not hurt .

➤ 64Mega bit dynamic memory inside for buffering the input video guarantees stable and exactly-fit video in whatever the video input standard. This headrest monitor supports CVBS input, RGB input or computer VGA input of NTSC/PAL/SECAM, RGB navigation and computer RGB-VGA [800X600 @60Hz].

➤ One input box with 3 side keys and many input source, the installer can adjust the video display property like brightess,contrast, saturation, also video horizontal and vertical location can be adjusted, which is ideal for sometimes not-standard DVD source videos. Their video will always nicely fit the screen.

- ➢ Programmable touch screen controller makes this monitor can be connected with almost every kind of DVD or TV tuner or VGA game device, the user can operate it easily with the specifically designed big icons and do not need to search for the remote controller. It removes any extra keypad or remote sensor and helps to make the car very neat and clean after installation. Already 10 DVD brands, 8 Digital TV brands and several RGB computer's code programmed inside. The installer can use the "Prog." Option to program it for a new DVD type easily.
- ➢ This monitor can also display original DVD or navigation information with Fosp's matrix interface inserted. it converts car's original video stream onto the headrest monitor, also it can insert extra video onto the original front monitor. [Mercedes video➔]
- ➢ Low total system cost with good performance, good compatibility, easy installation, and unnecessary service.
- ➢ This monitor is Car temperature working range[-40-85 degrees], with eMark certified.

installation Instructions

1. DIP switch setting:

DIP	=ON [DIP=Down side.]	=OFF
1	RGB input enabled	RGB disabled.
2,	AV1 for DVD enabled	AV1 disabled
3	AV2 for Tuner or extra video enabled	AV2disabled
4	The RGB input is NTSC standard which is almost all navigation unit use. That is: 400X240,480X240 resolution	The RGB input is VGA input which is computer use today That is: 800X600 resolution
5	go to CAM video when Green wire= 12V]	
6	Touch screen IR learn for re-installed navigation or DVD or tuner.	Set to OFF for normal use.
7	IR output has 38K carrier frequency	IR output without carrier wave
8	No function	Set to OFF for normal use.

The 6Pin POWER connector for the input box:

YELLOW=BATT: 12V battery power, power supply of the whole system,
                          it can also be connected to ACC.

RED=ACC： when this wire goes to 12V, the interface works.

BLACK：Ground for chassis。

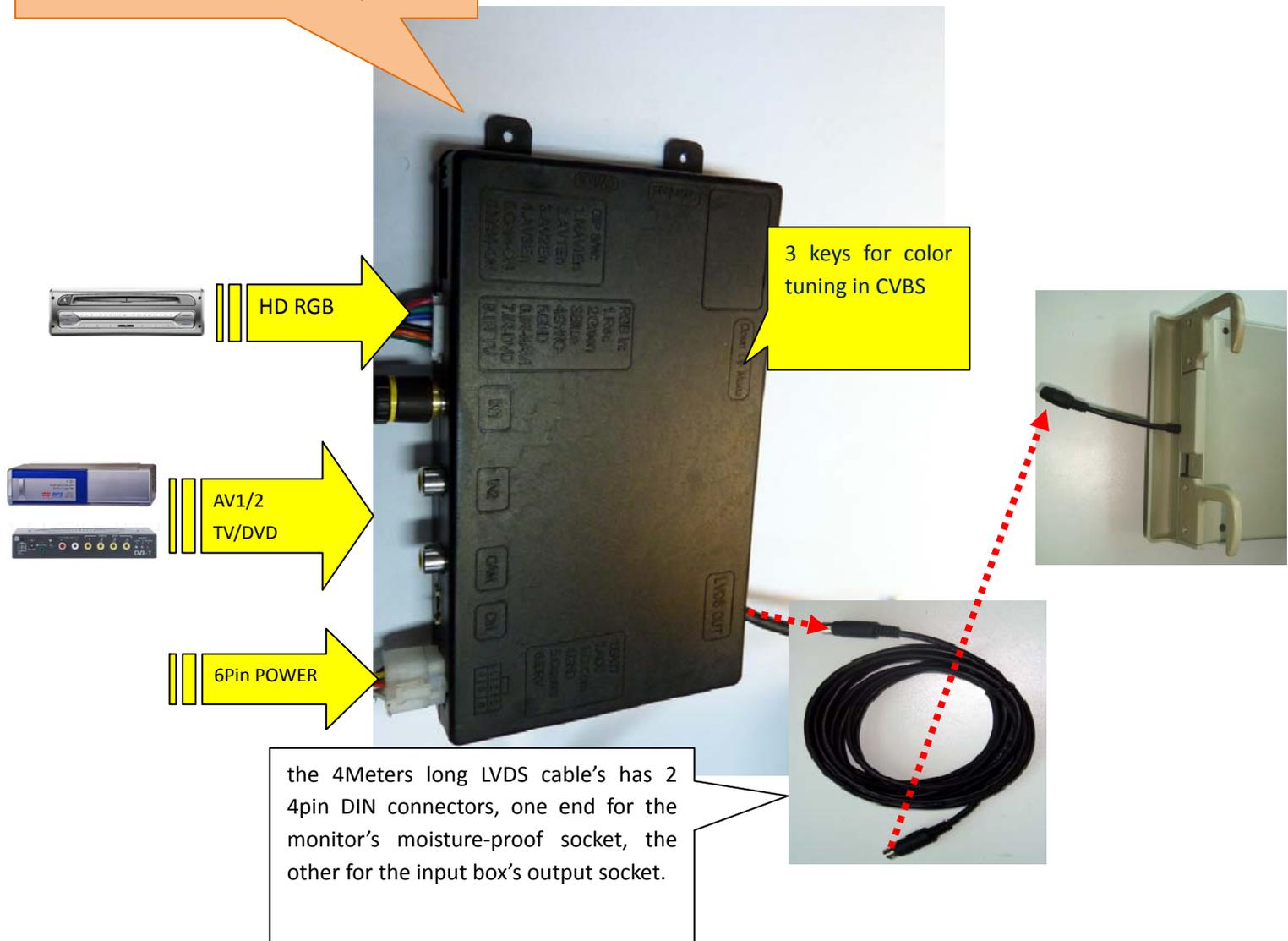GREEN：reverse wire[=12V], the input will show CAM video when this wire goes to 12V if DIP5=ON.

white：   switch signal, the input goes from RGB➔AV1—AV2➔RGB   when =12V.[max 25V].

GRAY：   specific control signal from the CAN box, do not connect to anything.

- ● In most situations: the installer just needs to connect 3 wires: BATT and ACC to ignition voltage, and GND to Chassis of the video source at the same point, then this unit works.
- ● This input box should be located to the video source as CLOSE as Possible. With GND connected to the same point of Chassis.

2. System connection:

This input box should be located to the video source as CLOSE as Possible.
The digital video cables are long enough to make the monitors installed anywhere in

HD RGB

3 keys for color tuning in CVBS

AV1/2
TV/DVD

6Pin POWER

the 4Meters long LVDS cable's has 2 4pin DIN connectors, one end for the monitor's moisture-proof socket, the other for the input box's output socket.

3. Operations:
A. turn on/off the monitor
- ◆ The monitor comes to standby state, when the BATT/ACC both go to 12V. the user needs to turn it on manually.
- ◆ power on :The user may touch any area of the screen, the monitor will power on and come to normal work state, the input box will read the installer's DIP switch settings, and choose the first enabled input,and video will be displayed. The Icons will also be shown if the current input channel IR output is not set to be "NONE" in OSD[on-screen-displayed characters].
- ◆ power off :No matter whatever situation, the user may press the left-top corner['power' icon on the picture]

for >1 second to power off the monitor. A short press less than 1 second will make the touch screen send a 'power' command to the related video source device.

◆ switch the input No matter whatever situation, the user may press the left-button corner, ['SRC' icon on the picture] to switch the input.[the input will only traverse among the DIP-switch enabled ones]

B. 3 key buttons

The input box has 3 side keys, the installer may use it to tune the picture display, and touch function for the connected DVD or other devices. The 3 keys are : menu, +, -.
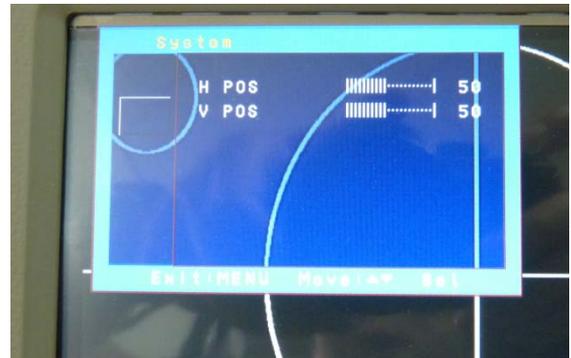
◆ When menu-key pressed 1st time: the left OSD options will be shown,
   when pressed 2nd time: the right OSD options will be shown,
   when pressed 3rd time,   the osd window will disappear.

◆ The user may use the +/- key to go to the edit mode of each item, and use menu-key again to go down to the next item.

◆ The DVD, TUNER,NAVI items mean the IR output of   RGB,AV1,AV2 input respectively, there are already many types of DVD, TV tuner and NAVI brands programmed inside.
   The installer may also set it to be "PROG" if the video source brand is not listed inside. Then he may pull the DIP6 DIP down to program the IR code.
   The installer may also set it to be "NONE" if he does not want the icon pop out when people control it.   In this case, the user may also touch the left-top corner['power' icon] to tuner off the monitor, and he may also use the left-button corner, ['SRC' icon] to switch the input.

◆ The H POS, V POS items mean the image location on monitor, different video players like DVDs may send out video with different amplitude, different image location although it is PAL or NTSC. These 2 options will give the installer the convenience of adjusting image perfectly centered in a couple of seconds.

C. IR learn operations

The input box has separate memory space to remember the IR code of every input[RGB input,AV1(DVD),AV2(Tuner or iPod)].

   1) When the current input channel's IR output is set to "PROG",   the input box goes into IR learn mode when the DIP6 is pulled down to 'ON' state.
   2) Then one icon will be blinking,saying that one IR key press is needed, the installer need to point the remote controller toward the whole on RGB input.
   3) When one code is learned, another icon will be blinking, saying that another IR code is needed. The installer then repeating step 2), until all codes are programmed. Then the icons disappear automatically and the installer may start normal operation.

◆ the touch screen will not acknowledge touch screen operations when it is in programming mode, except the 'SRC' key, which will terminate the learning progress.

◆ When the DIP6 is pulled down to 'ON' >6 times repeatedly, the monitor goes into touch screen calibration mode, a cross will be shown on screen, and the installer need to use something like a pencil to hit the cross, the cross will be changed to another location is one point is recorded.

This multi-point calibration is already done inside the manufacturer's factory in a very precise way, to remove piece to piece resistance difference between panels in mass production.

! Installers are NOT suggested to calibrate the touch panel unless it is very necessary.

D. IR code out for video source devices

The input box can output the IR code in a 4-byte protocol which most of AV devices use today, the output can be 2 ways:

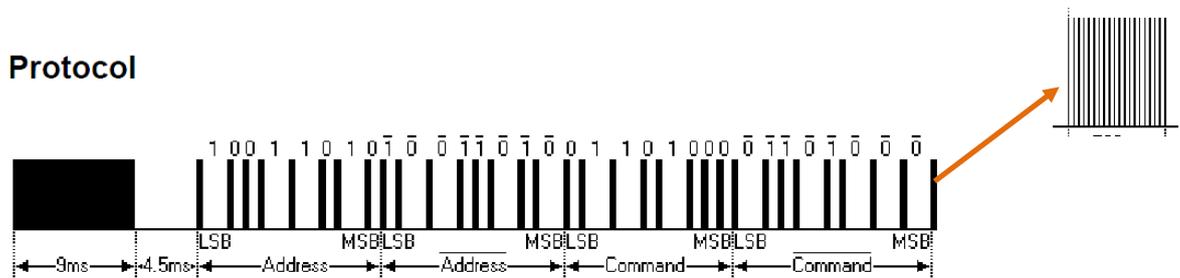(1) wire connect way without carrier frequency,

When the installer use the this IR signal [without carrier frequency], he needs to connect the IR output wire to the ir-sensor's signal wire.[all ir-sensors have 3 wires inside, +5V,GND, and signal]

(2) wireless way with carrier frequency.

The installer can point IR transmitter diode to the video source's IR sensor so both touch and remote controller can be used , and the installer do not need to cut any wire.

The difference is: the wireless-way says the signal '1' with 38K frequency pulses while the wire-way says by voltage. See picture below. The input box has 2 IR output pins: IR-RGB(the 6th pin of RGB input), and IR_DVD(the 7th pin of RGB input).The IR_RGB and IR_DVD send the IR code out no matter the monitor is showing video in RGB,AV1,and AV2. The video source may receive all these IR codes, but they will choose to acknowledge because the data bytes values are different.[the 4 data bytes say the device by the first 2 code bytes, and 3rd byte says the key button value, the last one is the verification code.]
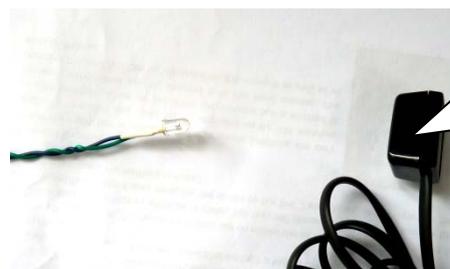
Protocol

The IR_RGB is always in wire-connect way without carrier, while the IR-DVD pin can be wire-connect[When Dip7 is high in OFF state],or in a wireless way [When Dip7 is low in ON state].
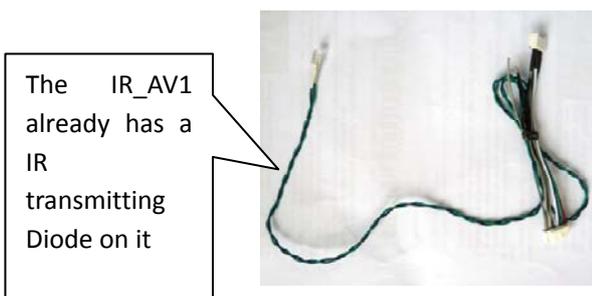
The IR_AV1 already has a IR transmitting Diode on it

The installer can point the diode to the sensor without contact (wireless), so the video device can be controlled

E. Enhanced functions
- ✓ When the input box is replaced by fosp's matrix interface, the car's original information and video can be displayed on the RSE monitors also, for example, when we use a Mercedes matrix box[suitable for W204/W212/W221] is inserted in between, extra video can be inserted onto the front monitor, also original CD/NAVI/DVD can be displayed on RSE monitor as well as an extra DVD video.
- ✓ This monitor set can also be connected to iPod, so the rear seat people can watch and control ipod video by just touching the touch screen. In this case, the Tuner item in OSD should be set to be 'iPod'. And fosp's video iPod cable should be connected.

4. Parameters:

No.	name	parameter
1	Optional colors	Black, grey, leather color with soft coating
2	Monitor cable length	4 Meters
3		
4	RGB video amplitude	0.7Vpp with 75 ohm impedance
5	sync amplitude in RGB-navi port when DIP4=ON	3~5Vpp with 5K ohm impedance Sync should be NTSC composite with negative polarity.
6	RGB resolution when DIP4=ON	NTSC-RGB navigation, that is. 320X240,400X240,480X240 [vertically some computer only output 234 line,it is also compatible]
7	sync amplitude in RGB-navi port when DIP4=OFF	3~5Vpp with 5K ohm impedance Sync should be H,V seperate with negative polarity.
8	RGB resolution when DIP4=OFF	VGA-RGB device, suggested 800X600@60Hz
9	Normal work Power consumption	6W [0.5A @12V] 0.5A on battery wire ACC wire <2mA.
10	Av1,Av2, cam video	0.7Vpp with 75 ohm impedance
11	Av1,Av2, cam standard	NTSC/PAL/SECAM automatic switch
12	Standby current	< 10mA
13	Reverse trigger threshold	>5V trigger
14	Ctrl port Pin1,2 and Pin7: Relay pull voltage for optional relay expansion	5V volts. Max : 2A.
15	Work temperature	-40 ~ +85C
16	Work voltage	9V ~ 25V