

# Smartphone Interface user's manual\_v20120701

--Product type: FC—phone--HDMI

-----All Smart Phone displays “Mirrored” to Car screen.



Smart Phone[Apple iphone, ipad , android system like Samsung, HTC, Motorola, Sony] will mirror all their displays to the car LCD by using this interface,

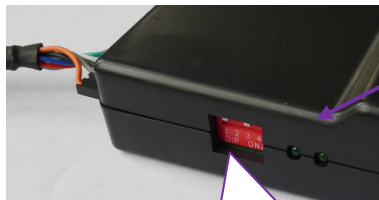
So the CAR oem screen displays:

- live traffic situation from the smartphone GSM data.
- The music and movie/TV stored inside the smartphone.
- The internet text and information, also internet radio by browsing with the smart phone.

FOSP's smart phone interface is specially tuned for smart phones, it has many phone protocols so the smart phones' audio and video signals can to mirrored to the car screen, in the way of digital High definition media format.[HDMI], It has the following features:

- By using just one cable to connect Smart phone, this interface can generate video output of CVBS,RGB, and RGB-HD. and be further connected to video-interface so the smartphone's video output can be displayed on Car Screen.
- Several protocols for smart phones are stored inside, so this interface is compatible with many smart phones types. Including Apple iPhone/iPad series, and almost all Android smart phones including Samsung, HTC, motorola, sony,etc).whatever output format the smart phone gives[including 720p,1080p], this interface generate stable single-format for the car screen.
- 2-channel stereo audio output makes the installers easily plug the output to the car AUX connector, the extra 5.1-Channel digital audio output can be plugged onto other processing circuit.
- The Internal HDMI circuit is compatible with lots of HDMI formats, smartphones, also PAL/NTSC TV formats from HDD/SD media player boxes, or 1080P from home Blue-Ray DVDs, and many computer /Notebook output formats for example 640X480, 800X600, 1280X1024. this interface can be used to connect to almost whatever HDMI resources, and convert them into one stable NTSC-CVBS or RGB video, which can be further connected to almost every car screen by Fosp's different video interfaces.
- The interface has a USB connector, which is testified to Charge a smartphone, by connecting with the phone's accessory USB cable.

## 1. Connection relationships:



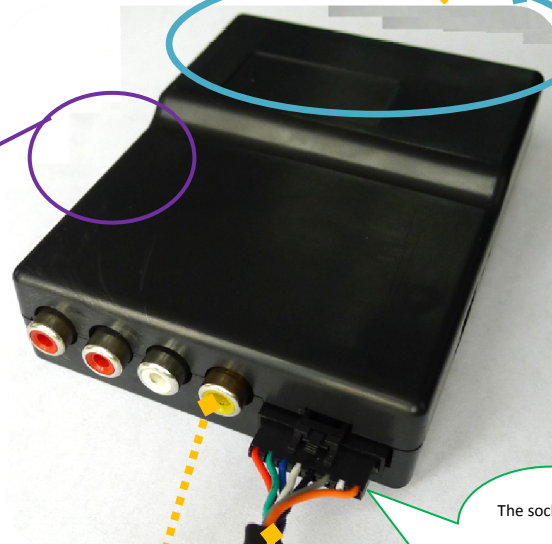
The DIP of this side :

**DIP1** : Down(ON)= output in CVBS-NTSC ,  
UP=output in RGB.

**DIP2** : Down(ON)=RGB-NTSC, Up=RGB-HD-FOSP  
These 2 RGB has resolution difference of  
4times.Suggested: RGB-HD-FOSP.

**DIP3** :Up=720p ,Down(ON)=1080P. not all smart  
phone output 1080P smoothly, so the suggested  
mode=720P.

**DIP4** : no functions.



The sockets of this side are inputs(starting from left ):

1. **Power input** : Only 3 wires needs to be connected, Yellow —to Constant power or ACC, Red—to ACC, Black—to GND.
2. **HDMI socket**: To connect to smart phone's HDMI output. For Apple,Samsung,HTC a conversion cable is needed.
3. **USB socket**: to charge the smartphone while the USB cable of smartphone charger is connected.

The sockets of this side are outputs(starting from left )



1. Digital audio output, Coaxial 5.1 Channel spdif output.
2. RCA output of audio and video, the Red white and yellow connectors are audio-L, audio-R, and CVBS respectively.
3. RGB output. Only The left 5 wires are useful when connecting to a video interface. 1=Red,2=Green,3=Blue,4=Sync,5=GND. 6=not connected. 7.Horizontal sync, 8=Vertical Sync.



This video interface will do the final  
insertion of smart phone's output.



## 2. Connection and Control:

1	<p>To connect with a video-interface</p> <p>(DIP 1, 2 controls)</p>	<p>There are 2 connection ways: Composite video (CVBS-NTSC), RGB-NTSC and RGB-HD. The last format is the suggested way. It is 4 times more clear than RGB-NTSC, which is already clearer than CVBS-NTSC.</p>  <p>The user's eyes can not tell much difference, when watching TV or movie files. However, when browsing internet or watching text, the difference is big.</p> <p>When connecting with RGB-HD format:</p> <ol style="list-style-type: none"> <li>1. The smart phone should set: DIP1, 2 both Up.</li> <li>2. The connected video interface should set to RGB-HD also. In this case, the DIP1 should be Down to enable the RGB input, and DIP4=DOWN to set RGB=HD.</li> </ol> <p>All fosp's video interface, no matter will car they target, like Audi,Benz etc, they support RGB-HD input.</p> <p>If the RGB connector is not on the video interface, [Occupied, or people use non-FOSP interface which does not support RGB-HD], CVBS-NTSC may be used between these 2 interfaces.</p> <ol style="list-style-type: none"> <li>1. the smartphone interface should set DIP1=Down.</li> <li>2. the video interface should set AV2 and AV3 On, and use a composite cable to connect both interfaces.</li> </ol> <p>When HD-RGB is used, the composite video cable should not be used since CVBS-NTSC is not used, otherwise the picture will has poor red color.</p> <p>When CVBS-NTSC is used, the RGB cable should be pulled out, otherwise the total video will be dark.</p>
2	<p>720P and 1080P output format</p> <p>(DIP3 controls)</p>	<p>Not all smart phone output 1080P smoothly, so the suggested mode=720P.</p> <p>The DIP3 should stay UP in this case.</p>
3	<p>Color Tuning.</p>	 <p>this smart phone interface has 3 keys on one side.which are Op/+/- , when OP is held down, the +/- will increase/Decrease the brightness of picture. when OP is released, the +/- will increase/Decrease the contrast of picture.</p> <p>When tuning the display effect, the installer needs to display a bright picture, and check the car screen's display to set the text and icons to be the most clear and most detailed.</p>
4	<p>Audio output.</p>	<p>There is audio data inside the HDMI cable's data stream.</p> <p>This HDMI converter generates 2 types of audio output, 2-channel stereo audio and 5.1-channel SPDIF digital audio. They both are always there when a multimedia file is played.</p>



### 3. The Usage difference between Operation systems

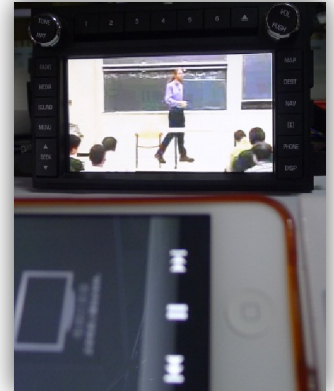
#### (1) the Apple iOS operations systems,

for example iPhone4, iPhone4S,iPad.

Apple devices need a 30P-to-HDMI conversion cable to provide a HDMI socket, then a HDMI cable can be used to connect the iPhone and this interface.



When iPhone is plugged, all displays will be mirrored to car screen.



When Application are executed, for example iPod video, games like Angry birds, camera pictures, and web browsers, the car screen's display will be rotated as the iPhone rotated, and it will come to full screen.

The users can use iTunes software, to transfer the audio, video files from computer to iPhone devices, then it will be played on a car screen by using this interface.

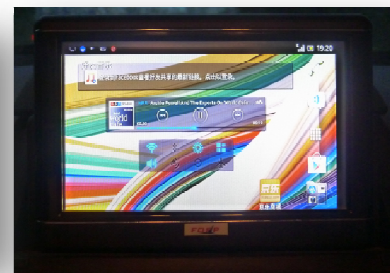
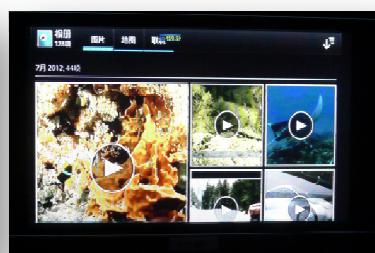


#### (2) The Android Operation systems, for example, SONY, MOTOROLA,Samsung, HTC smart phones



Android is used by many smart phone makers, the HDMI output from android has very convenient operation and nice visual effect. Different makers however may change somewhat on the HDMI output icons but basically the same as HDMI is just mirroring the output.

when HDMI cable is inserted, the SONY smart phone will pop out a dedicated screen as the picture shows, then the user can select icon to play audio, video files, or return to main menu and run various applications.





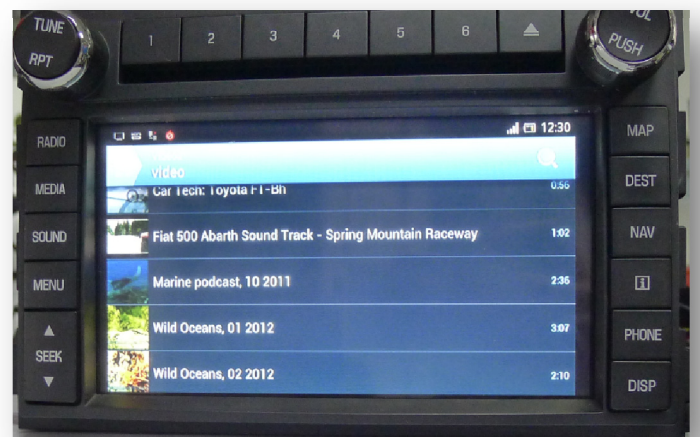
when HDMI cable is inserted, the Motorola smart phone will show exactly the same picture on the smart phone, then the user can select a icon to play audio, video files or run applications..



**To transfer files onto Android phones:** it is very convenient, the user just connect the USB cable of the phone to computer, and operate just like a USB disk, he can copy the MP3 files, movie files, pdf files onto the smart phone's internal storage. When the transfer is finished, and the android system will check internal storage, sort and make a nice list of all the stored files, then the user can browse easily and enjoy freely.

**To play the multimedia files:** the android system is very powerful on this, it can play almost all audio, video formats with nice effect, and it has very good human-machine interface allowing people to choose and play.

**Android phones can also share multimedia files downloaded and processed by apple iTunes software** easily: PodCast, iTunes U MP3 or video files can be shared by Android. The method is: the iTunes downloaded files are usually stored in one directory inside computer, the user copy the whole directory to phone's internal storage, then the Android system will automatically sort and list them into the play list. Usually the iTunes download the files and store them at : C:\Users\...\Music\iTunes\iTunes Media\Podcasts,(if the user do not find the directory, then just search \*.MP3 inside HDD. He can track back and find the storage directory), just copy the total directory to smart phone, and Android system will do the remaining by sorting and listing nicely for him→.



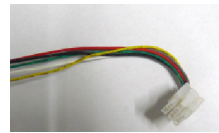
(3) **The windows operation system**, like HDMI from computer or laptop notebooks.

Many users want to install a computer on their cars, and display the content onto the car screen. This HDMI input can also receive the input from computers as well. Some attention should be paid is: the computer's output should be set to 800X600 or 640X480 resolution to get the best reading on text since most cars LCD physical resolution is 800X480.

#### 4. Accessories

This product has already these accessories:

- One power input cable,
- One RGB output cable to video interface,
- And One small-HDMI to Big-HDMI connection cable.



- ✚ For Apple devices like iPad, iPhone, the user needs to purchase a 30p-HDMI apple cable, it generate HDMI socket which can be connected to this interface →



- ✚ For Samsung, HTC smart phones, they do not have a HDMI socket on shell, so the installer needs to get a MHL cable, which generate HDMI+USB socket from their USB socket, the generated USB connector can also be used to charge the phone.



- ✚ For China domestic customers, FOSP provides a specific sim card as cooperated with some main signal carriers. it can be installed on iPhone or other smart phones and gives the user low-cost especially on long-time internet browsing, listening to internet Radio or TV watching for long time, which need big data rate as well.



#### 5. Parameters

	Name	Parameter
1	CVBS output	0.7Vpp with 75 $\Omega$ impedance
2	RGB sync amplitude	3~5Vpp with 5K impedance, negative sync
3	RGB Resolution	NTSC-RGB: Horizontally 400, Vertically 240. RGB-HD: Horizontally 800, Vertically 480
4	Stereo output	2.0Vpp,
5	Coaxial audio output	3.3Vpp, SPDIF
6	Power consumption	2.0W [0.2A @12V]
7	Standby current	< 10mA
9	Supply voltage	7~20V for normal working
10	ESD protection	2000 V,
11	Working temperature	-40 ~ +85C