Tutorial to replace a black and white screen by a color screen FMC of FLY ENGRAVITY



G'déon

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Precautions of use and limits of responsibility

This tutorial explains how to replace a black & white screen by a color screen on the Fly Engravity FMC only. The author cannot under any circumstances be held responsible for any damage caused to your material by following this tutorial.

By disassembling the Fly Engravity FMC case, you lose the manufacturer's warranty. Consequently, it is imperative to be able to follow and carry out all the operations described.

Take the time to read the different chapters and understand each step of realization.

Good reading and realization.

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Necessary materials:



It takes competencies of basic DIY and competencies of electronic weld, patience and no precipitation.

A clean work plan.

A set of pliers for electronic.

A medium flat screwdriver, a small Phillips screwdriver, a small flat screwdriver (called jeweler screwdriver)..

A soldering iron / unsoldering pump (optional), solder wire and heat shrink tubing.

A stripping pliers, electric cable 1 mm mono or multi strands (to choose) black and red color of a length of 20 cm.

The rectangular screen support (we will see later its manufacture): width 12 cm, length 14 cm and a thickness of 2 mm to make in CTP or other.

A cutter, a big brush clean and silky (this is the model that I used for my realization with the kind permission of Brice from Aircockpit forum who found this little gem:

https://www.aliexpress.com/snapshot/201519235.html (note: obsolete link)

A VAT tax of about €16 to pay the carrier upon receipt of the parcel. Ordered on Alibaba in China on Friday and, received on Tuesday afternoon.

A VGA to USB adapter if you no longer have VGA output available on your PC or a standard VGA screen cable. I found mine on Conrad but it's up to you to see if you find cheaper ...

http://www.conrad.fr/ce/fr/product/871540/Carte-graphique-Manhattan-USB-externe-vers-VGA

You have gathered all the material and read, read the tutorial again and you are sure to be able to execute the operations. We can start.

I remind you that this tutorial shows how to replace a black & white screen with a color screen. To do this, we will drop off and remove the original screen. Therefore, it will take a VGA output to connect the FMC to a video output. Set parameters for the screen to have a screen identical to the old screen but in color with to the PROSIM software and only PROSIM. For other software (Project Magenta, F4S or other) see how to set parameters of the color screen.

I use a lot of photos to follow each step 'step by step'. It's better than a long speech.

1. DISASSEMBLE THE FMC

- ➢ Unscrew the 4 bis/DUZ : see the red arrows
- Remove the backlight button. To do this, carefully remove the black cap with a cutter and unscrew the screw inside the knob. Then, drop the button.





2. OPEN THE FMC WITH PRECAUTION:

Attention : you must you discharge from any static electricity before touching the motherboard to avoid damaging it.

It is necessary to mark the wires of the potentiometer of the backlighting and also to mark them on the motherboard with an indelible pen. Do the same on the cables with a piece scotch tape. Depending on the FMC, the cables can be different colors or all black.

> Unsolder the wires using the unsolder pump to work comfortably (this is not an obligation: at your convenience).













Note: In the picture, I start by unsoldering on the opposite side and then I finish on the cable side (be careful: do not take into account the position of the card because the cables were already unsoldered, it was just for the photo).

Take the opportunity to dust and clean the interior of the FMC with the brush.

3. REMOVAL OF THE ORIGINAL SCREEN:

Unscrew the 4 nuts and the 2 spacers, remove the washers. Then carefully remove the tablecloth and remove the screen.





4. INTEGRATION OF THE NEW SCREEN:

> PCB preparation:



- Take out the screen and its PCB. We will modify the PCB by removing the RCA cable (yellow) to leave only the power cable (less space and this is useless).
- ➢ Mark each connector with a pen.



Connectors modification:

- > Remove the white plug without pulling the cables (use a flat screwdriver).
- > With a cutter, remove the holding sheath taking care not to cut the cable.
- Separate the black and red cable and cut it 1.5 cm from the white connector. Then, bare and tin-plate the wire. This wire will then be soldered to the power cable.
- With a jeweler's screwdriver, remove the yellow and black cable from the white terminal block and remove the cable.



5. POWER SUPPLY:

- > Prepare 2 black and red cables 15 to 20 cm long. Strip and tin-plate the wires at each end.
- Attention: Go to the motherboard of the FMC and carefully unplug the FMC. Next, locate the black terminal block and use a voltmeter to find the + and polarities.





- Solder to the terminal block (insulation with sheath) the cable according to the polarities.
- Now, solder and insulate the white terminal block from the PCB to the power cable.





At this point we can do a test to check if the screen is working properly.

Attention : before switching on, be sure of the polarities you have noted before otherwise everything will 'grill'.



Cool...

As long as the display is on, take advantage for detect the functions of buttons on the second PCB and mark them.



6. SCREEN SUPPORT

For practical reasons to return to the original screen, I prefer to make a screen support rather than use as I have already seen an aluminum set square attached to the bottom of the FMC case. In case of problems, just remove the support and put the old screen back in less than 3 minutes.

manufacture of the screen support:

I used an old motherboard out of order that I got rid of all its components. Then, I sanded and applied a vinyl to isolate the possible conductions (a layer of paint can also do the trick).

The advantage and that it is the same thickness as the original card and I have no problem to place the support at the right height on the FMC !!! A 2mm PTC panel could also do the trick.

Here is a reminder the dimensions: you have to drill the holes by taking the dimensions in between the holes of the original card:



And here's the result:



New support

old support

7. FIXING OF THE SCREEN:

Attention : always think about you discharging static electricity before touching a motherboard.



- Mount the support and the screen 'at blank' on the FMC. Position the screen by holding it by hand. To mark points of reference and drop off. Check for proper alignment and then simply glue with a glue gun by placing 5 dots of glue on the back of the screen, carefully avoiding glue on the flat cable (You can also use double-sided tape).
- > No need to overload in glue because there are no constraints and in case of disassembly, it's easier.
- ▶ Reassemble the support and pass the flat cable below.
- \blacktriangleright Fix the support using the nuts and the washers.



> Weld the potentiometer cables on the motherboard before reassembling the assembly.



8. FIXING OF THE CARD:

- Simply fix the PCB to the back of the card with glue or double-sided, then reconnect the flat cable carefully (attention with the lugs of connector).
- Attach the cables using a plastic collar ('Rilsan' type) and if necessary fix the collar with a dot of glue as shown on the photo below and to go out the cables down of the motherboard.



9. REASSEMBLY OF THE COMPONENTS:

> Nothing complicated. Put the components back into the case, taking care to pull the cables out from below.



- > Check that the cables do not interfere with the passage of the power connector and USB connector.
- > Check that in the manipulation the switch that determines the CPT or FO mode has not moved.

We will now test ...

10. CONNECTIONS AND SETTING:

Connect the FMC to your PC with a VGA cable or a VGA / USB converter depending on your configuration.
Note: If a VGA / USB converter is used instell the driver in first.

Note: If a VGA / USB converter is used, install the driver in first.

> Connect the power supply, the USB cable. You must have a blue screen at first.



Restart Windows if necessary so that your device is recognized as an additional screen. Make the resolution settings as your screen may not have the optimum settings..

11. PROSIM PARAMETERS:

- Start PROSIM (put it in full screen).
- Right-click / Config / Driver and if necessary enable the COM port of your CDU (by going to Device Management / COM Port).
- > Restart PROSIM if necessary and right-click "Hardware connect " should be green.
- ▶ Right-click Config and set as shown below.



The screen must be black without borders; drag it to the FMC screen and resize it to fit the FMC screen. Note: If it is not possible to resize it, check Show 'Border' to have the resize feature.

It's good but nothing is aligned and the characters are too big and rude ... Do not panic.

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- > To remedy the problem, let's go back to the control panel with a right-click.
- In the center, click on 'Small Fonts' and select the font 'Microsoft Sans Serif, 11.25 pts' and do the same for 'Large Fonts'.

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Small font Large font	Microsoft Sans Seni, 11.25pt

> And here is the work:



12. THANKS :

Thanks to Brice named 'HUGUES971' from the Aircockpit forum (<u>www.aircockpit.com</u>) for allowing me to use his extraordinary work to make this tutorial.

Do not hesitate to visit this wonderful site and ask your questions or just to make live this forum of passionate.

good achievements and good flights. At your service.

G'déon