FCU320PRO

This manual is intended for Flight Simulator use only and may not be used in any real world aviation application. The authors are not responsible for any errors or omissions.

FOREWORD

Thank you for purchasing CPflight FCU320PRO hardware. To optimize the performance of this unit, please read through this manual carefully. This manual contains the latest information at the time of drafting, eventual later information can be found at CPflight website www.cpflight.com
The CPflight FCU320PRO can be used with Prosim A320, Project Magenta, Jeehell A320 (using P3D or FS2020 simulator). Also FBW A320 is supported under FS2020 using the dedicated CPflight driver fs_com. Even if the FCU320PRO supports the mainly used FS add-on software, it is not possible to assure the full compatibility with all third part add-on. New compatibility will be add time by time when possible to obtain cooperation with addon developer to share their data with a direct driver or sharing with us a SDK. Anyway new compatibility, if any, will be announced on the web site in the news page.
The CPflight modules are produced to meet requirements from the hobby market; the use of our products in professional or commercial environments is not permitted without approval of the CPflight management; please contact us at info@cpflight.com if you need to exploit our products in professional or commercial environments.
FCU320PRO is a full scale replica of the Airbus 320/340 Flight Control Unit, look and functionality are reproduced with high details. FCU320PRO is equipped with high quality level components; custom made LCD display and 1 million rotation cycles Grayhill® Push/pull optical encoder give an high fidelity performances and a never seen realism.
Note: it is important to know that the hardware has not its own intelligence on board, it establishes an interface with the software: logics, operating modes and aircraft behavior are managed by the connected software, the use of this hardware presuppose to be familiar with the connected software.

HARDWARE INSTALLATION

WARNING! The panels back cover is made with stainless still metal sheet, pay particular attention to the cutting edges while you are handling it.

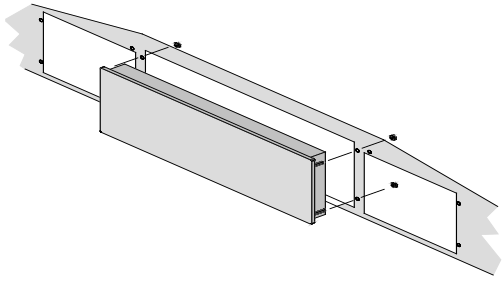


Figure 1: FCU fixing

CONNECTIONS

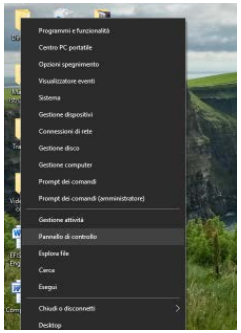
The FCU320PRO is provided with a universal supply adapter that accepts a voltage of 100 to 240Vac (50/60Hz). Supply adapter and ethernet cable are provided you don't need further hardware to operate. Sockets for connections are on the back of panel (Figure 2).

WARNING! Do not attempt to connect anything different from as described in this section; warranty does not cover damages due to incorrect wiring of any external device. The FCU320PRO is provided with 12Vdc 2A power supply adapter which through the FCU also allows you to power eventual EFIS and other Cpflight panels. Only provided stabilized plug-in power supply adapter must be used; do not attempt to plug in a different adapter because

you can damage the FCU. The provided adapter is suitable for 100 to 240 Vac 50/60Hz main supply.
Note: If you do not use FCU302PRO for a long time it is recommended to disconnect the power supply.

Figure 2: Connectors (back view)

A - Power supply socket
B - Ethernet
C - 4 poles socket for external module connection
D - Display brightness potentiometer connection (see "CONFIGURATION")
E - Glareshield integral lighting brightness potentiometer connection (see "CONFIGURATION")



ETHERNET CONNECTION

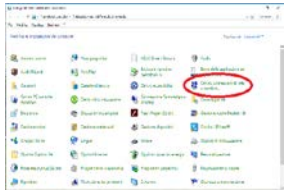
INSTALLATION

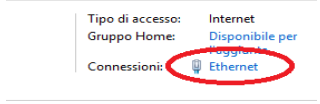
As default the FCU has the IP address 192.168.1.40. If your PC is already connected to a "home" LAN trough a router probably will be not necessary to set anything. Anyway it would be better to check some Ethernet parameters:

Case 1: connection to the LAN through a router

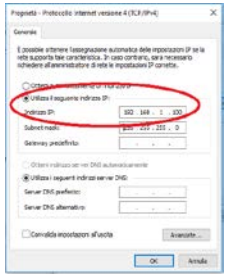
1. Click the right button of the mouse on the Windows symbol. Please select "Control panel".

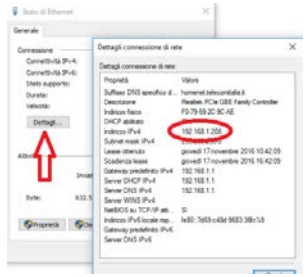
2/3. Click on "Network and Internet" then click on " Ethernet"





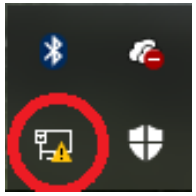
4. in Ethernet status window click on "Details" button and the system will open the ethernet connection details with the IPv4 address. In our example our IPv4 is 192.168.1.208; in order to have your FCU communicating with your PC is necessary to assign an IP number to your FCU..
As default the FCU has the IP address 192.168.1.40. So is not necessary to assign any new IP number. If the two IP addresses would be identical it will be necessary to modify the FCU IP address. How to do it will be explained in the CONFIGURATION section





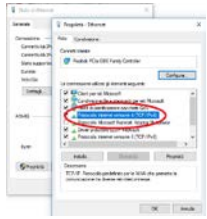
Case 2: direct connection to the PC

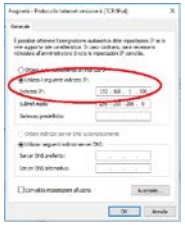
If your PC is not connected to any LAN and your FCU is connected directly to the ethernet socket of your PC, please follow these steps:



1. the PC will show a warning on the symbol of the WLAN connection (red circle).

2. Click with the right button of the mouse on the Windows button and select LAN connections and the next screen will appear. Click on Ethernet.
3. Click on "Properties" on the ethernet status window. Please flag on "Internet version 4 protocol (TCP/IPv4) .
4. Click on "Properties" and please select manually the address 192.168.1.100 flagging "use following IP address". Selecting subnet mask field the value 255.255.255.0 will be automatically inserted. Click on OK to save the changes.

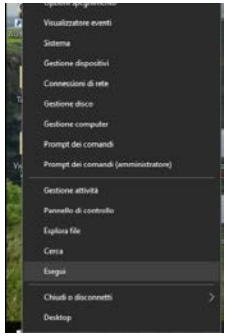


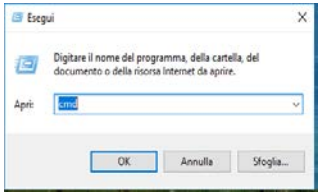


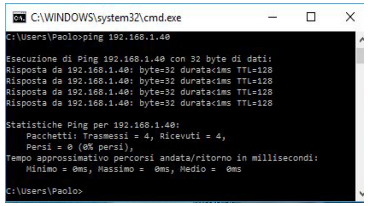
ETHERNET CONNECTION VERIFY

1. To verify for the first time the ethernet connection please click the right button of the mouse on the Windows symbol and select "execute".

2. Write in the Execute window "cmd" and select ok.







3. On the prompt command please write ping and IP address of your FCU. In the example the FCU IP address is 192.168.1.40. If all is ok the number of the transmitted and received packages will match. Differently it means that there is an ethernet connection failure. In this case please contact support@cpflight.com.

COMMUNICATION SOFTWARE INSTALLATION

CPflight communication software allows to use the FCU320PRO with FBW A32nx for FS2020. Do not run the CPflight communication software using the FCU320PRO with third part software (Prosim A320, Project Magenta, Jeehel ….).

To install the comunication software:

- Download inst_FS2020_xxx.zip where xxx = revision number at www.cpflight.com

- The file is in a compressed (zip) archive. Extract in a temporary folder and run the exe file to install software (start PC as administrator to install software on Windows).

- CPflight communication software requires the popular FSUIPC library. If you do not have FSUIPC in your system download at www.fsuipc.com .

FIRST SET UP AND START-UP

To start the hardware with default FS2020 select "Connect" in the FS Add-on menu -> CPflight -> FS-COM.

Project Magenta:To enable communication with Project Magenta you have to set tcpip parameter. So open fcu.ini file with a text editor and set the same FCU ip addres at this command line CPFlightIP=xxx.xxx.xxx.xxx (default sample address CPFlightIP=192.168.1.40) and also the port like CPflightPort=4500. Save the "FCU.ini" file.

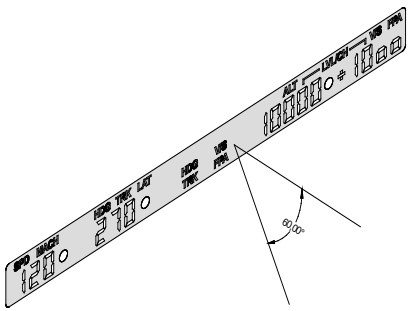
PROSIM A320: to enable the communication pelase setthe FCU ip address into Prosim config window. For more information please refer to this document:

https://www.cpflight.com/docs/prodotti/136/FCU320PRO_Ethernet_QuickStart.pdf

Run Project Magenta FCU or Prosim A320 FCU to start-up the FCU. The FCU320PRO will show for about 2 seconds on the displays the installed Firmware revision and the device serial number and then synchronize data. Is mandatory to always provide this data when you contact CPflight support.

The FCU turns off command come from the computer when you close the software. If you shut-down the computer without exit the program, or a computer block occur, the FCU may stay on or may fail the subsequent turn on. If you find any problem with the FCU start or turn off, it is advisable to reset the unit. To do this, disconnect power from the FCU, wait few seconds and reconnect.

Important notes! The FCU can extinguish the displays to simulate a "cold and dark" situation depending by the battery, avionics or other aircraft systems status. Be sure to have the right conditions in the cockpit to have the display turned on.



Note: The bias angle is the angle from the perpendicular from which an LCD display is best viewed. The bias angle is often stated with reference to a clock face. The better display viewing angle is from the perpendicular to 60° bottom (see Figure 3). The horizontal viewing angle is 140°. These are the better viewing condition for the expected placement in the cockpit.

CONFIGURATION

FCU320PRO firmware provides an internal program mode to configure some preferences in the hardware functionality.
With the FCU in stand-by (software not running) push and hold the SPEED knob for more than 1 second; this enter the hardware in configuration mode. This is the only way to access to the configuration mode; no PC software program is required to configure the FCU320PRO hardware.
In configuration mode only some knobs are operating; the SPD, HDG, ALT and V/S display area show the parameters and option as following:

SPD and HDG display	ALT (and V/S display if required)
Parameter to be settled/displayed	Setting

SPEED KNOB (push and hold for more than 1 second): enter the configuration mode
SPEED KNOB **pull**: scroll to the next parameter
ALT KNOB **rotate**: parameter change
V/S KNOB **rotate**: parameter change (if required)
V/S KNOB **pull**: save and exitt

Settings are saved in a non-volatile memory when you exit the configuration menu and the FCU go back in stand-by. Following a description of the menu available in Configuration Mode:

CONFIGURATION MENU	SPD display	HDG display	ALT display	V/S display
IP address setting	iP iP	Hi Lo	xxx xxx	xxx xxx
BACKLIGHT CONTROL: allows to select how to manage the backlight control. Setting this function to "SiN" (default) the backlight is related to the status of FS NAV lights, so the backlight will light-up according to the NAV lights condition in FS. Setting this function to "Pot" the backlight is controlled through the related auxiliary input (see "DISPLAY & INTEGRAL LIGHTING BRIGHTNESS" section). *Note: this setting does not modify the backlight brightness, it selects the way to control this parameter.*	bL	Ctr	Pot SiN	
DISPLAY BRIGHTNESS CONTROL: set the FCU display brightness. The parameter can be directly settled to 10 fixed level or, setting it to "Pot", can be controlled through the related auxiliary input (see "DISPLAY & INTEGRAL LIGHTING BRIGHTNESS" section).	dSP	brt	xxx	
MAC Address	MAC	Adr	xxx	
SERIAL NUMBER: This menu displays the device serial number. It is a read only location and is not modifiable.	SEr	nUM	xxxx	xxx

EXPANSIONS

FCU320PRO comes provided with expansion capability through the 4 pole socket, this allows to connect and interface CPflight plug&play expansion modules like EFIS's MIP and pedestal panels.

DISPLAY & INTEGRAL LIGHTING BRIGHTNESS

WARNING! Do not attempt to connect anything different from as described in this section; warranty does not cover damages due to incorrect wiring of any external device

On the back of the panel there are two terminal blocks (see "CONNECTIONS" section fig 2.). These terminal blocks allows to regulate the panels backlight and the FCU display brightness through potentiometer. To allow the potentiometer to works the related parameter must be set in the configuration menu (see "CONFIGURATION" section. The panels backlight control is extended to the whole glareshield modules, so it involves the EFIS's and SIDE panels (if any). Each input accepts standard potentiometer from 1KΩ to 10KΩ of total value.

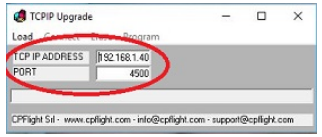
FIRMWARE UPDATE

The FCU hardware is based on a flash memory microprocessor, on this device has been developed one special program (bootloader) that allows to upgrade the firmware. When you install the CPflight driver in the folder will be also installed a program (TCPIP_upgrade.exe) that has to be used for the upgrade. Upgrade the microprocessor is a very easy operation and can be done through your ethernet connection.

Is necessary to upgrade the firmware time by time, to update new functions that are constantly developed to improve functionality and compatibility with new products.
New firmware release is available at CPflight website at FCU320PRO page, section technical and documents. Download this zip file and extract the files into a temporary folder. Please pay attention to the extension of the file: it must be an hex extension.
The revision number is progressive, so a higher number correspond to a latest version. Before to proceed with the upgrade check the installed firmware revision number. You can see the installed version at the FCU startup.

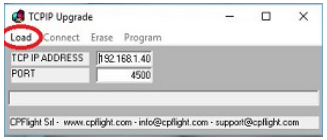
HOW TO UPGRADE

Contact CPflight support to know if there is a new firmware available. Note that firmware is free for a period of 12 months after hardware purchase, expired this period is available at cost.
Push and hold the V/S knob until the FCU will start in demo mode showing the current firmware version, then release the V/S knob.
Push and hold the ALTITUDE knob and, without release the ALTITUDE knob push and hold V/S knob until the display numbers disappear.



Then please run the program TCPIP_upgrade.exe and verify that the TCPIP parameters (TCPIP address and port) are the same used normally to communicate with your PC. If not please modify it into the TCP upgrade window program.

At this point click on "Load" menu into TCPIP_upgrade.exe menu bar and select the file that you have downloaded and extracted into a temporary folder.

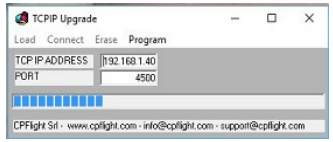


It is important to be sure to select an hex estension file. The file will be shown as FCU320PRO_xxx.hex where xxx will indicate the firmware release. Now, in the program menu bar, clock on "Connect".

If all is ok, in this menu will activate the "Erase" title. Click on "erase" to delete the old firmware and prepare the microcontroller for a new script. The erase operation will take few seconds.

At the end of this process, in the program menu bar, will activate the option "Program".

Please click on "Program", this will start a progress bar that indicates the program progression. This operation will take about two minutes to terminate.



At the end it will appear a window that indicates the end of the programmation. Close the upgrade program and disconnect the power supply from the FCU. Connect another time the power supply to verify that in the IAS display window of your FCU will appear the new release number.