

MCP737USB

THIS MANUAL IS SUITABLE FOR THE MCP737USB version



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 your MCP737USB choice; through this hardware you will meet a realism never experienced before in your flight with Flight Simulator. This manual gives you the information to connect and use the MCP737USB panel with Microsoft Flight simulator and with Project Magenta (www.projectmagenta.com).

Note: This manual contains the latest information at the time of drafting. Due to the continuous evolving of the product some features could be been modified. Eventual later informations can be found at CPflight website www.cpflight.com

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.

The MCP737USB reproduce the Boeing 737 Mode Control Panel (more simply known as autopilot). The long history of Boeing 737 with its numerous versions, have incorporated many revisions to the automatic flight system, so there are many versions of MCP on the real 737. The MCP737USB reproduce one of the mostly diffuse versions. Slight differences and reduced dimensions with respect to the original panel (about 85% scaled) has been chosen to reduce cost and thus the sale price, have resulted in MCP737USB dedicated for all simmers that are keen on flight.

Even though this hardware is developed on basis of B737 models, it can also be used with the other default aircraft of MS Flight Simulator. The functioning of the B737 MCP has some differences with respect to the standard FS MCP panel. This manual assumes the user is familiar with the procedures and acronyms used by FS; to better understand how the MCP737 functions operates in a different way than FS standard.

IMPORTANT NOTE: the MCP737USB supports Project Magenta, default FS aircraft and third part add-on aircraft using FSUIPC data format and offset. Freeware and commercial add-on aircraft using their own software modules or gauges may use different data format and offset and it is not possible to assure of the compatibility. If you mean to use the MCP specifically with an add-on aircraft see:

<http://www.cpflight.com/sito/support/swcomptab.asp>

The MCP737USB form the center of an expandable system, through the expansion sockets it is possible to connect external modules like EFIS selector, radios etc. The compatibility and the supported functions of the extension modules are bound to the used software (default FS aircraft, Project magenta, PMDG etc.).

The drivers to use the MCP737USB with the default FS aircraft and FSUIPC based add-on (FS-COM) are downloadable at the CPflight website. Drivers for PMDG series are distributed by Flightsimlabs, for more informations visit <http://www.flightsimlabs.com/>. Note that the CPflight FS_COM and Flightsimlabs drivers are independent task and cannot run together; do not run FS_COM when you use the MCP737USB with PMDG series or Project Magenta.

Due to the continuous evolution in the compatibility and in the third parts software and drivers it is impossible to give timely informations in this manual, for up to date informations about the compatibility see:

<http://www.cpflight.com/sito/support/swcomptab.asp> .

HARDWARE INSTALLATION

MCP737USB is made for people that make their own "Home-Cockpits"; for this reason MCP737 is provided with wide expansion capability and is designed for panel assembly.

MCP737USB is as well made for the more occasional "desktop" pilot using the panel on a desk; an aluminum desktop stand is optionally available for this purpose.

The MCP may be fixed through the holes arranged on front plate (see the dimensions quoted at the end of this manual). If you place the MCP in a glare shield structure maintain the accessibility to the back of the MCP to allows working to the connections and eventual future firmware upgrades (see following).

CONNECTIONS

Sockets for MCP737 connection are on the back of the panel. To use MCP you only have to connect the power supply and USB computer interface (cables provided). Beyond to these two connectors the MCP737 have some further sockets to allows system expandability (see following).

WARNING! MCP737USB accepts a supply voltage of 6Vdc. Only provided stabilized plug-in power supply adapter must be used; do not attempt to plug in a different adapter as you may irreparably damage the MCP. The provided adapter is suitable for 100 to 240 Vac 50/60Hz main supply.

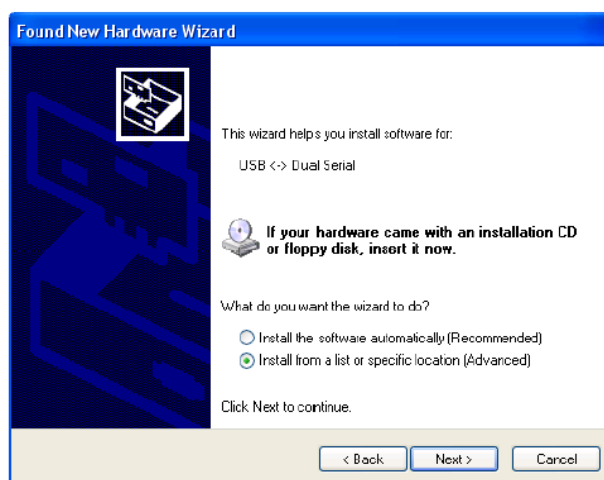
DRIVER INSTALLATION

When you connect the MCP for the first time you will ask for the USB driver installation. The drivers are available for download at CPflight website. To install the drivers follows these steps:

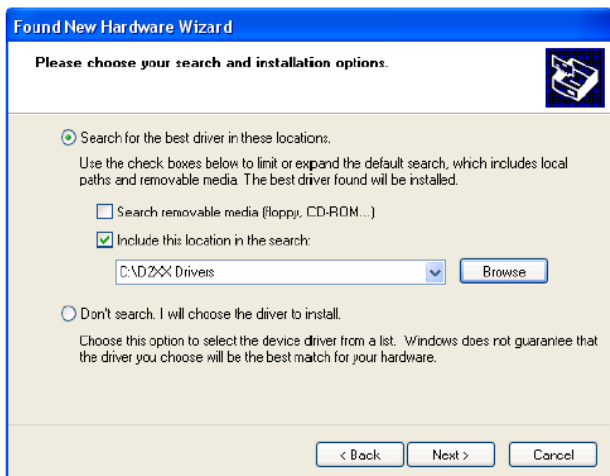
- Download the file “usbdriver.zip” at <http://www.cpflight.com/sito/downloads/downloads.asp>
- Files are in a compressed archive .zip; unzip the files in a temporarily folder...
- Connect the USB cable to the MCP737 USB connector and the other side to a free USB port of your computer...
- Connect the DC power adapter to the MCP737 and plug the adapter to a main supply socket. The computer has to be switched on when you connect the MCP for the first time...
- The driver installation procedure will start automatically; follows the instruction on the screen (note that the figure of the following example may be different depending by your operating system)...



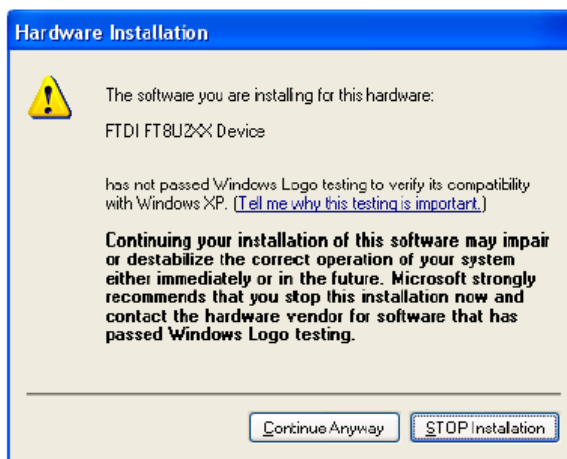
When you will ask to connect to Menu Update to search for software select “No, not this time” and click next to continue...



Select “Install from a list or specific location” and click next to continue...



Browse the temporarily folder where you have unzipped the files and click next to continue...



You will be informed that the driver has not been subordinate to Menu Logo testing click “Continue Anyway”... The drivers will be installed in the system; click “Finish” when prompted.

Important notes: Depending by the system you may be required to repeat the driver installation two times. During the USB drivers installation the system assign a number to the communication port. Check your configuration in the Windows Control panel -> System Property -> Device Manager Tab. On the (COM & LPT) port you will see “CPflight serial adapter (COM n)” where “n” is the assigned communication port number, you will use this number in the First set up (se following).

SOFTWARE INSTALLATION

Beyond the USB drivers there are some software applications to install for MCP737USB use. The applications are included in a compressed archive cpflighttoolsxxx (where xxx represent the revision number). To install the software, download latest version at:

<http://www.cpflight.com/sito/downloads/downloads.asp> , unzip the files in a temporary folder and run "setup.exe" then follow the instructions on the screen. Start PC as administrator to install software on Windows 2000/XP/Vista.

The procedure will install the following exe applications:

- **FS_COM:** it is the communication driver to manage the data exchange with FS. Run this application when using the MCP737USB with the default FS aircraft or FSUIPC based add-on. Do not run FS_COM when using the MCP737USB with Project Magenta or add-on provided with their own drivers (PMDG). See latest informations on website compatibility page at: <http://www.cpflight.com/sito/support/swcomptab.asp>
- **MCP_CONF:** allow the configuration of some preferences and the assignment of the optional MCPEX1 board inputs and outputs. Note that the MCPEX1 board compatibility is related to the used software, see latest informations on website compatibility page at: <http://www.cpflight.com/sito/support/swcomptab.asp>
- **TestCPflightHardware:** allow to directly checking the hardware (without run FS or other applications). This utility is useful in case of troubles as it allows testing the hardware functionality without take care of any software or system configuration problems. This utility is also supported by a guided help at: <http://www.cpflight.com/sito/help/mainsupport.asp>

The data exchange between FS_COM and FS occur through the popular FSUIPC, if you do not have FSUIPC in your system download it at <http://www.schiratti.com/dowson.html> . For FS 2004 download FSUIPC 3.xx, unzip the files into FS9 module folder. For FSX download FSUIPC 4.xx unzip the files in a temporarily folder and double click on "Install FSUIPC4.exe". Note that the CPflight driver doesn't need to register your copy of FSUIPC, however we suggest to get the fully registration of your FSUIPC copy to exploit all the auxiliary features allowed by FSUIPC. More information about FSUIPC at <http://www.schiratti.com/dowson.html>

FIRST SET UP

The configuration software “MCP-CONF” allows to set some preferences and to assign functions to the input and output connected through the MCPEX1 expansion board.

Note: the MCPEX1 expansion board is not a part of the MCP737, the board is optional and allows to expand your simulator with additional switches etc. to be assigned to FS functions.

Note that the MCPEX1 board compatibility is related to the used software; see latest informations on website compatibility page at:

<http://www.cpfliight.com/sito/support/swcomptab.asp>

More information about the configuration software are on the MCPEX1 expansion board Operations Manual.

At a first launch the configuration software will create some empty configuration files (Preferences.txt, DigitalIN.txt, DigitalOUT.txt, AnalogIN.txt and AnalogOUT.txt).

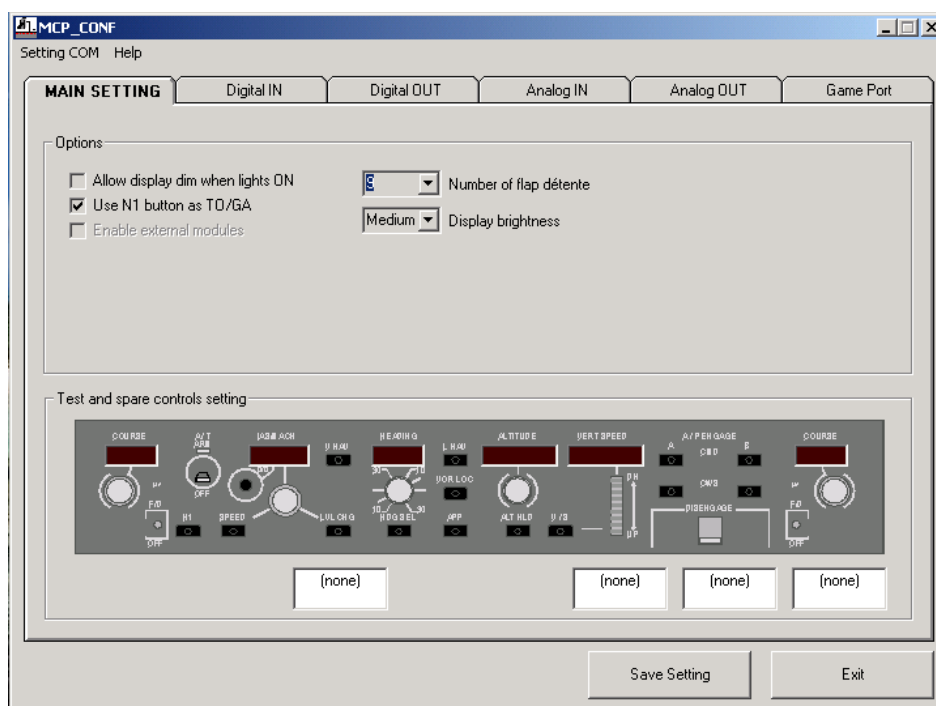


Figure 1: configuration software MCP_CONF. Note: Due to the continuous evolution of the product, the above example may be different from what you will see on your screen.

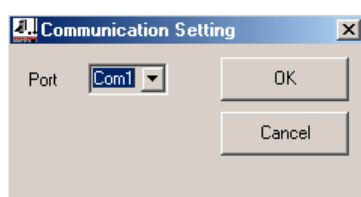


Figure 2

At a first launch you will be asked for the selection of a communication port. Select here the communication port assigned by the system during the USB drivers installation. If you use the MCP737 with Project Magenta, you have to enable communication in Project Magenta “mcp.ini” file. In the Project Magenta MCP folder open “mcp.ini” with a text editor and set CpfliightComm= n in the [Serial Connection] section where “n” is the communication port assigned by the system during the USB drivers installation.

MCP START-UP

The MCP737 will start automatically running FS_COM.exe (when used with standard FS aircraft), connecting the flysimlab driver (when used with PMDG), or running Project Magenta MCP software. The MCP737 will show on the displays the serial number and the installed Firmware revision, and then synchronize data with FS.

Important note: when used with Project Magenta or add-on provided with their own drivers you have not to run FS_COM.exe.

Note: If you do not use MCP737 for a long time it is preferable disconnect the power supply.

FUNCTIONING

It is important to know that the hardware have not its own intelligence on board, it establish an interface with the connected software; logics, operating modes and aircraft behavior are managed by the software itself. When used with Project Magenta, PMDG or other third-part software, the supported functions are those supported by the software itself.

The FS-COM driver is developed to use the MCP737USB with the FS default aircraft. The driver is developed on Boeing 737 model, so the functions could slightly differ from the default FS autopilot operating. Operating modes are affected by the settings of the MCP, by the previously engaged mode and by the existing flight situation. In some cases a pushbutton may be disabled depending by the actual conditions; in some other case a mode will be engaged automatically etc. When a Mode is selected on the MCP, a green light illuminate on the button; this indicates that mode is active or "Armed", pushing the button again will deactivate this mode. In some cases, a mode selection will deselect a previously engaged or armed mode. If the LED remains off when you push a button this means that this mode is not selectable in the actual condition. If you use MCP737 with the standard FS panel on screen, it is very important that you refer only to MCP hardware panel only as, depending by the situation, there can exists differences between panels indications.

When you load a saved flight, the MCP synchronize data with FS, this allow you to recall values saved in a previous flight. The toggle switches position (A/T ARM, FD and disengage bar) are hardware master, so they will be synchronized on FS independently by the condition saved with the flight.

LNAV and VNAV: As the default FS aircraft have not LNAV and VNAV capability, these modes are operating only with Project Magenta and with the add-on that supports these functions (see also <http://www.cpfight.com/sito/support/swcomptab.asp>). With the default FS aircraft (FS-COM driver) the LNAV function engage the GPS mode.

AUTOLAND: the "APP" mode is the only mode witch allows both CMD A + CMD B autopilot engagement for an instrumental landing. To engage both CMD A + CMD B together, both NAV1 that NAV2 radio have to be tuned to the same ILS frequency and the APP mode must be armed. Engaging both A/P is then possible if the aircraft is at a radio altitude greater than 800ft RA; below this altitude it is not possible to engage the second autopilot.

CWS A and B: these modes are operating only with the add-on that supports these functions (see also <http://www.cpfight.com/sito/support/swcomptab.asp>).

EXPANSIONS

MCP737 comes provided with wide expansion capability, this allows to connect and interface CPflight plug&play expansion modules (like EFIS selectors and radio panels) Furthermore through the MIP737 expansion boards you can connect your own LED's switches, rotary switches, pushbuttons, to allows additional Main Instrument Panel functions to works on your simulator. For further information about modules and expansion board see related manuals at download page.

The expansions are subdivided on three sockets: (Figure 3):

- C: DIN 5 pole socket (CPEXP)
- D: 40 pole I/O connector
- E: External TO/GA



Figure 3: Expansion socket

5 POLE DIN CONNECTOR (C)

The DIN 5pole socket allows the connection of CPflight plug&play add-on modules. You may add modules at anytime; the MCP forms the center for data exchange between modules and flight simulator. The MCP explores the line at start-up and detects the connected units. The module connection has daisy-chain structure: connect the first module to MCP and this to the following (Figure 4). Connection cables are provided with the modules.

Note: The compatibility and the supported functions of the extension modules/boards are bound to the used software (default FS aircraft, Project magenta, PMDG etc.). Further information can be found on website compatibility page. Disconnect power supply by the MCP before connecting any module.

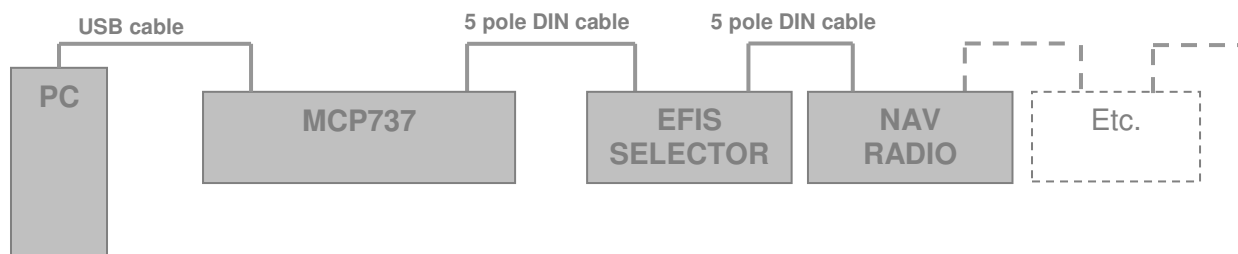


Figure 4: plug&play add-on modules

40 POLE I/O CONNECTOR (D)

Through the 40 pole connector is possible to connect the MCPEX1 connection board that allows you to wire external devices through terminal blocks. For further information see "MCPEX1 expansion board operations manual" at:

<http://www.cpflight.com/sito/downloads/downloads.asp>

Note: the MCPEX1 board compatibility is related to the used software, see latest informations at: <http://www.cpflight.com/sito/support/swcomptab.asp>

WARNING! The use of Input/Output without suitable knowledge could lead to damage of the MCP737, if you don't fully know what and how to connect, don't do it; warranty does not cover damages due to incorrect wiring of any external device.

EXTERNAL TO/GA (E)

Close to USB socket, there is a small 2-pole connector ready for an external TO/GA pushbutton. You can connect here a standard pushbutton if you need an external TO/GA button.

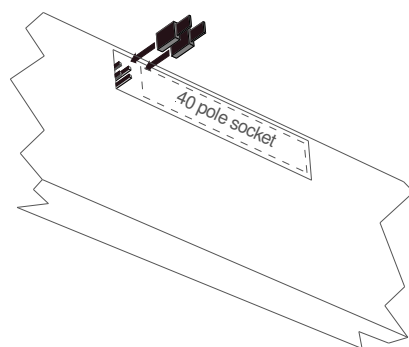
FIRMWARE UPDATE

The MCP hardware is based on a microprocessor, on this device run a special program called "firmware". The firmware manages all the hardware functions besides the communication with the computer.

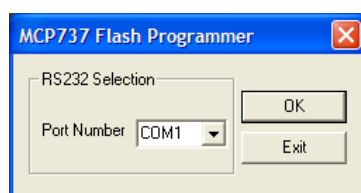
The firmware is stored in a "flash" memory, this allows the program to be updated at any time in case of improvements or functions addition. The firmware is available at CPflight website on download page; the revision number is progressive, so a higher number correspond to a latest version. Before to proceed with the upgrade, check the installed firmware revision. You can see the installed version on the display at the MCP startup.

In some circumstances a firmware upgrade may require an updating of the drivers and/or Project Magenta software, if you encounter any malfunction after a firmware update, check software version and update the software if required. To update the firmware follows these steps:

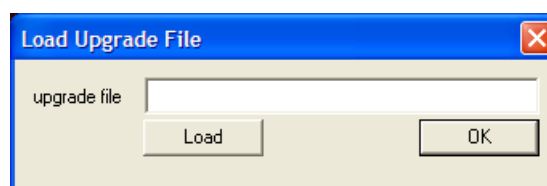
- Download the firmware at: <http://www.cpflight.com/sito/downloads/downloads.asp> ; pay attention to the relation between the firmware and the device as on the download page you may find firmware for different devices or MCP versions. The firmware for the MCP737USB is named "mcpfwxxx.zip" (where xxx act for the revision number)...
- Files are in a compressed archive .zip; unzip the files in a temporarily folder...
- Disconnect supply from the MCP; disconnect external modules and expansion board if any...
- Insert the two jumpers (provided) on the pins located on the back of the MCP (close to the 40 pole socket) as indicated in the below figure...



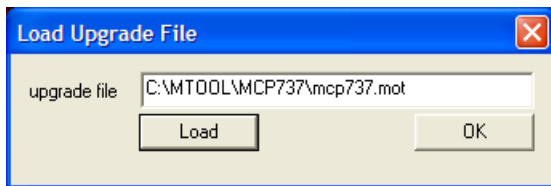
- Connect power supply to the MCP. A small flash on the backlight indicate that the MCP has started in firmware program mode...
- Close any application on the computer, browse the temporary folder that contain the downloaded firmware and run UPGRADE.EXE program. The following dialog will prompt...



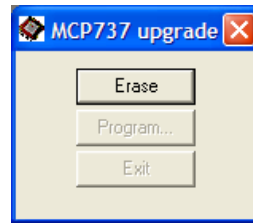
Select the port number assigned during the driver installation (see "driver installation" section) and click on OK...



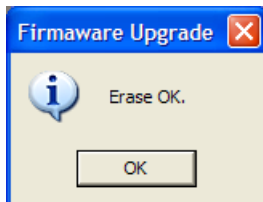
...click on "Load" button and browse the MCP737xxx.mot file (where xxx represent the release number) in the folder where you have extracted the firmware files; select it and proceed...



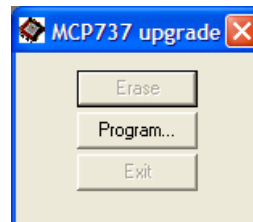
...the file name will be shown into "upgrade file" field click OK to proceed...



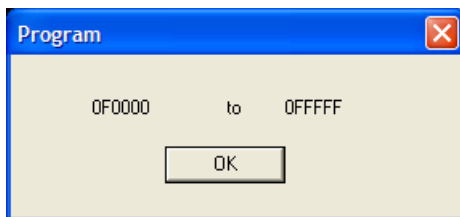
...click on the Erase button to clear the memory for programming...



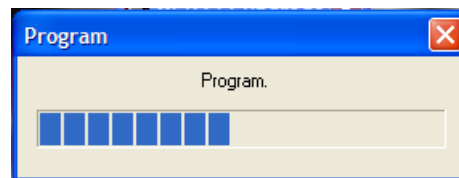
...at the end of erase phase the above dialog will prompt; click OK to proceed...



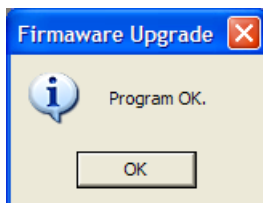
...now click on Program... button...



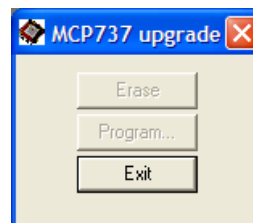
...the program show the info about the memory area to be programmed, click OK...



...the memory programming will take some time, during the programming the MCP backlight will flash...



...at the end of program procedure the above dialog will prompt, click OK to continue...

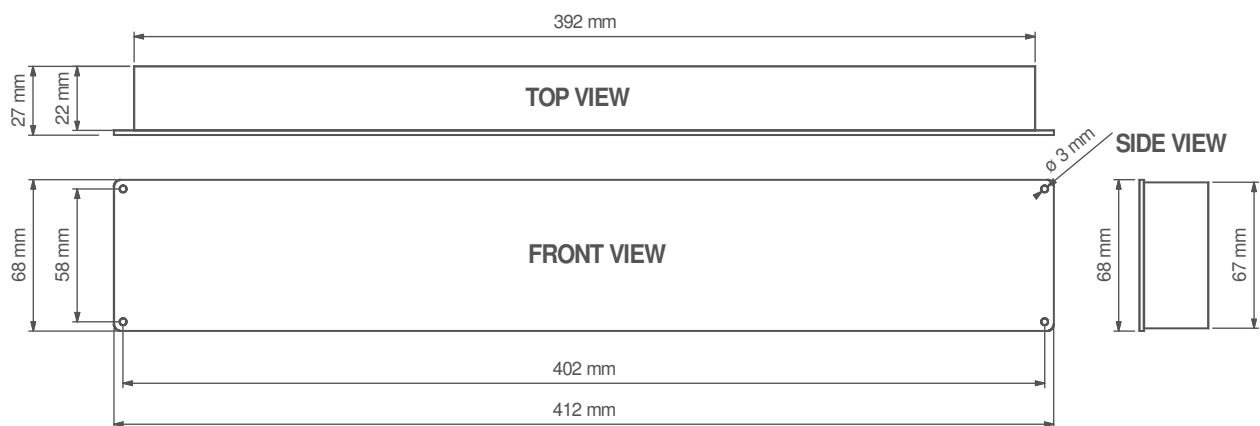


...now click to Exit button and wait until the dialog will close before proceed...

- Firmware has upgraded; disconnect supply from the MCP...
- Remove the two jumpers from the pin...
- Reconnect external modules and expansion board if any...
- Reconnect power supply to the MCP, the displays will show the new installed Firmware revision.

OVERVIEW

- Painted and laser engraved front panel with aluminum back cover.
- Backlighting panel.
- 6 digital encoders to set: Altitude, Vertical Speed, Heading, Speed, Left Course, and Right Course.
- Toggle switches for Left Flight Director, Right Flight Director and Auto Throttle.
- Flat lever switch for disengage
- Pushbuttons with integrated lights for mode selection plus C/O round button
- 7 segment yellow LED displays for selected value of: Altitude, Vertical Speed, Heading, Speed, Left Course, and Right Course.
- Display brightness regulation
- LED indication for: Left Flight Director, Right Flight Director and Auto Throttle
- 16 bit Flash microcontroller.
- USB Interface.
- DIN 5 pole connector for daisy-chain plug&play modules interface.
- Expansion socket with 64 digital inputs, 10 digital outputs, 6 analog inputs and 2 analog outputs (MCPEX1 expansion board required).
- Supply: 6Vdc 1A (supply adapter provided)



LINKS/REFERENCES

Web site: <http://www.cpflight.com>
 Support: <http://www.cpflight.com/sito/help/mainsupport.asp>
 Email: info@cpflight.com