MIP737ICS3

Main Instrument Panel Integrate Circuit System

FOREWORD

The MIP737ICS3 (Integrate Circuit System) is a series of modules that integrates the electronic and hardware to support the functions of the Main Instrument Panel of B737NG simulator. MIP737ICS3 is plug&play and fully working with Flight Simulator X, Flight Simulator Steam Edition, Prepar 3D, Project Magenta, Prosim737, PMDG737NGX, LVLD767, Xplane737, iFly737 and the most common FS add-on software; due to the continuous evolving in the compatibility and in the third parts software and drivers it is not possible to give timely information in this manual, for up to date information about the compatibility see "Technical and documents" on CPflight product page.

The MIP737ICS3 is ready to be inserted in the MIP Casing structure (see: MIP Casing with Glareshield and Display Bezels on the website); of course this does not prevent to be used with different or self-made MIP structures. Dimensional compatibility with third parts MIP structures cannot be guaranteed.

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 information can be found at our website www.cpflight.com

NOTE!
The MIP737ICS3 is an extension of the CPflight MCP hardware, so it requires the CPflight MCP737 (EL, NG, PRO/PRO2/PRO3 versions) to operate. For more information about CPflight MCP737 see website products page. With FS default 737 the MIP737ICS3 works partially (see the list of supported functions on CPflight website).
The working functions are depending by the installed software Add-on; the hardware supports all the MIP737 functionality. If you note some mismatch about the functionality when used with a software add-on, please check the hardware with the test utility "testcpflighthardware.exe" (included in the Cpflight driver available at website "Technical and documents" page). When the hardware works with the test utility this means that the hardware is correctly working and an upgrade to the software add-on can be necessary to fix the correct functionality.
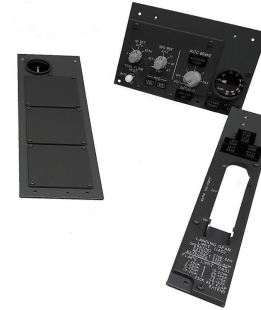
IMPORTANT NOTES FOR THE ASSEMBLING:

- The MIP737ICS3 is a plug&play system, it does not need any configuration file or script. Only connect to the CPflight daisy-chain and the MCP will automatically detect the modules and will start to communicate with the entire system. The MIP737ICS3 hardware is organized in some separate electronic boards, the boards are interconnected through 4 pole and/or flat cables where required (cables included). Each cable must be connected to the related socket as indicated in this manual, do not try to connect anything in a different way, warranty does not cover damages due to incorrect connection or misuse. The MIP frame structure must arrange proper slot for passing cables.

- The MIP737ICS3 boards contains sensitive Integrated Circuit (IC) chips. To protect them against damage from static electricity, you should follow some precautions whenever you interconnect the boards:

  - Always disconnect power supply before to work on the connections.
  - Before connecting cables, touch both of your hands to a safely grounded object or to a metal object, such as the power supply case of your PC to discharge possible electrostatic charges.

A complete MIP737ICS3 system (MIP737ICS3_FULL) is composed of:

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MIP737ICS3_MAIN: include the center module, Gear panel and Stanby instrument plate. Switches, rotary, annunciators, leds and knobs are already installed and working. The "AUTOBRAKE" rotary switch has a guarded position, the knob must be pulled out to select "MAX". N1 SET and SPD REF use dual concentric rotaries with external knob selector and internal knob regulation. Flaps gauge integrate two independent needles to show L+R, working YAW-DAMPER and BRAKE PRESS gauges are integrated in the modules. The MIP737ICS3_MAIN does not include Chrono and standby gauges. Gear lever and ISFD module are available separately. All frontplates are backlighted (warm white).	
MIP737ICS3_CP: the Captain panel include the captain DU's selectors, the AP-A/T-FMC Indicators/pushbuttons, annunciators and switches, a 3 pole terminal block for the connection of the captain tiller and the left chrono plate with Nose Wheel Steering guarded switch (clock not included). The MIP737ICS3_CP connect to the MIP737ICS3_MAIN through the provided 4 pole cable.	
MIP737ICS3_FO: the FO panel include the Backlighted Brake Pressure gauge, the First Officer DU's selectors, the AP-A/T-FMC Indicators/pushbuttons and switch, annunciators, a 3 pole terminal block for the connection of the F/O tiller and the right chrono plate (clock not included). The MIP737ICS3_FO connect to the MIP737ICS3_MAIN through the provided 4 pole cable.	
MIP737ICS3_CP_LO: lower Captain panel (left+right subpanels). All the potentiometer, single or dual are functional (where supported by the software). Beside Captain and FO backlight regulation, the lower panels also includes the potentiometers to regulate the Background and AFDS lights and PFD/ND display regulation.	
MIP737ICS3_FO_LO: the lower First Officer panel (left+right subpanels). *Note: Unlike the above others, the MIP737ICS3_FO_LO is a slave panel and connect to the MIP737ICS3_CP_LO through a flat cable*	

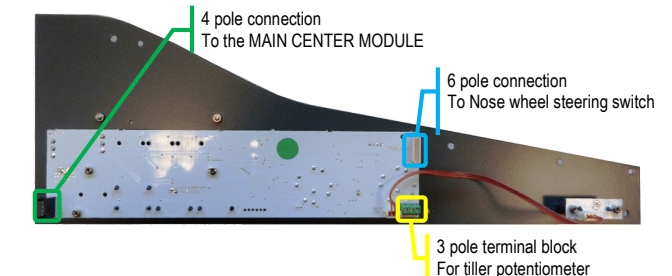Each of the above groups is also available separately

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The MIP737ICS3 follows the plug&play concept to provide easy to install system. Of course it is not possible to have a single electronic board as the hardware is disposed on different positions on the MIP, so the MIP737ICS3 is organized on different electronic boards: some are "active" boards that integrate a microprocessor and transfer data through a serial communication; some are "passive" boards (i.e Gear panel or lower First Officer panel) and only integrate the hardware and connect to the related active board through a small flat cable. The center panel module holds the main system board and it is the one to be connected to the daisy-chain and to the power supply for the whole ICS. All other modules are connected to the center panel through 4 pole and/or flat cables. Connections located on the Main center module and other active modules are shown in the figures below (modules seen from behind):
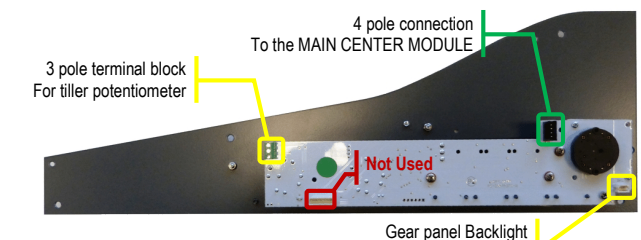
MAIN CENTER MODULE
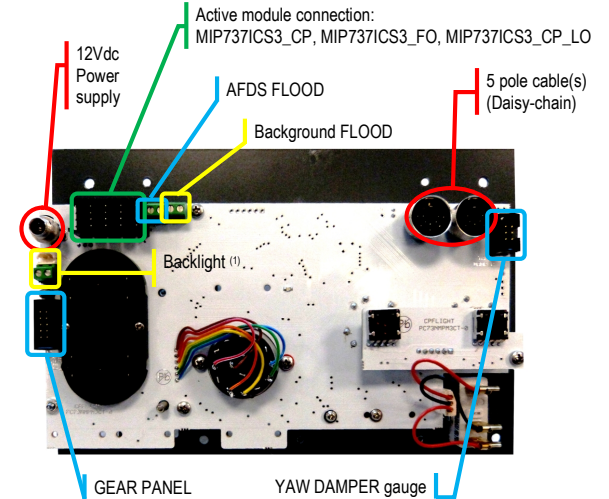
(1): The gear panel backlight is normally regulated by the F/O Main Panel brightness.
In case of single seat simulator the gear panel backlight can be connected here to link the regulation with the Captain Main Panel brightness.
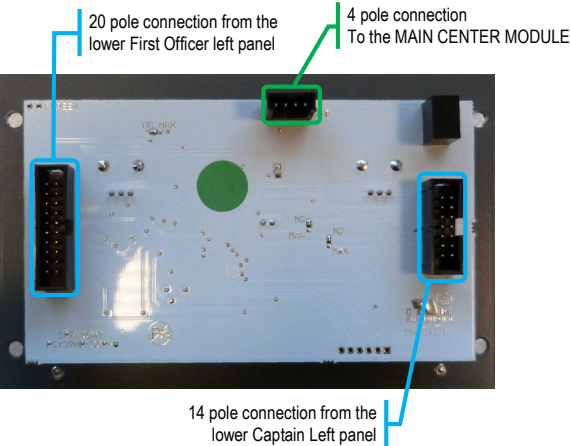
CAPTAIN MODULE

FO MODULE

LOWER CAPTAIN MODULE (Right)

20 pole connection from the lower First Officer left panel

4 pole connection To the MAIN CENTER MODULE

14 pole connection from the lower Captain Left panel

Passive boards connect to the related active boards as indicated in the figures above:

- Gear panel: 10 pole flat cable connect to the Main Center Panel
- Yaw Damper gauge: 6 pole flat cable connect to the Main Center Panel
- Nose Wheel Stering Switch: 6 pole flat cable connect to the Captain panel
- lower Captain Left panel: 14 pole flat cable connect to lower Captain Right panel
- lower First Officer Left panel: 20 pole flat cable connect to lower Captain Right panel

The lower First Officer Right panel connect to the lower First Officer Right panel through a 14 pole flat cable (not shown on the figure)

WARNING! do not try to connect anything in a different way than the above, warranty does not cover damages due to incorrect connection or misuse.

SETTING UP

To allow the MIP737ICS3 function, the MCP737 firmware revision has to be updated to the last version. If you have a previous version installed, upgrade the firmware, you may find it at website on the MCP product page, be sure to download the correct MCP version firmware (EL, NG, PRO ecc). More information about the firmware update are reported on the MCP operation manuals (download the later revision at "Technical and documents" product page).

The MIP737ICS3 is connected to the MCP (or EFIS selector(s)/SIDE737 board if any) through the 5 pole cable. The second 5 pole socket on the MIP737ICS3 allows to connect the subsequent modules like pedestal modules, each module has two 5 pole plugs, one cable is connected to the previous module and the second plug allows connecting the subsequent one (daisy-chain).

The MCP have a single 5 pole connector as it function as a Master and manage signals for all other modules. The Daisy-chain concept allows a flexible and over time upgradable system using a single USB port on your computer. Only the MCP is connected to the PC, all further modules are managed by the MCP itself thank to its 16 bit flash microcontroller. This involves a negligible load on your computer, benefit the performances and does not affect the frame-rate.

Some modules are directly powered by the 5 pole daisy-chain connector (i.e. EFIS), some other modules require a dedicate power supply. The MIP737ICS3 requires a dedicate power supply and the supply adapter is provided. Due to the power draw and distribution on the daisy-chain, when you connect pedestal modules to the MIP737ICS3, it is recommended to power the pedestal by the BRT737 module that function as power distributor for the entire pedestal.

Before to connect the ICS to the daisy-chain, disconnect power supply from the MCP. The correct connection sequence is:

- disconnect power supply from MCP and any other eventual module
- interconnect all MIP737ICS3 boards and auxiliary connections
- connect daisy-chain (DIN 5pole) to the ICS and eventual other modules
- connect power supply to the MIP737ICS3, to pedestal or any other eventual module and finally to the MCP

EXAMPLE OF DAISY-CHAIN CONNECTION
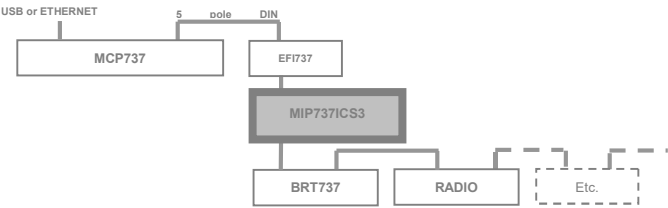
PANEL BACKLIGHT REGULATION

The panel backlight brightness can be regulated through the "MAIN PANEL BRIGHT" knobs. The Captain side knob regulate the Captain + center panels backlight. When connected to the MIP737ICS3, the CPflight MCP/EFIS backlight brightness are controlled by the Captain side knob. The F/O side "MAIN PANEL BRIGHT" knob regulate the First Officer section.
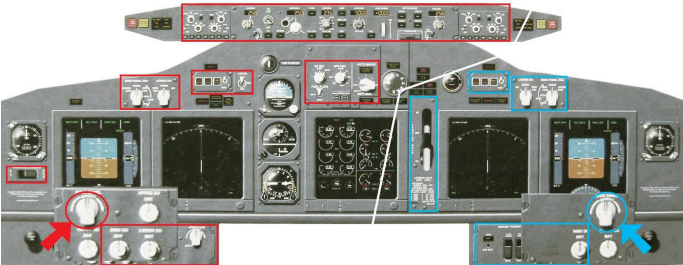

GLASS COCKPIT DU'S REGULATION

Concentric potentiometer for the PFD/ND display regulation send related position data to the connected software. This feature is functional where supported by the software add-on.
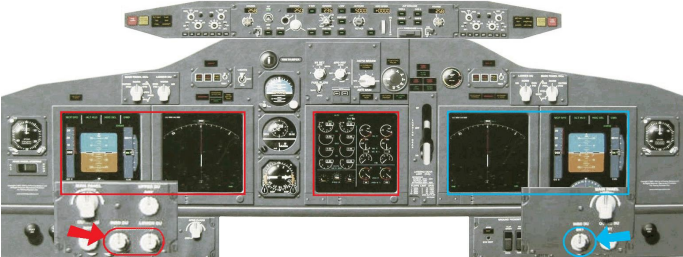
FLOOD LIGHTS

Two more regulations are available on the MIP737ICS3 lower sub-panels: one to regulate the background lights brightness and one to regulate the AFDS lights brightness. Terminal blocks for the background and AFDS lights are on the Main Center panel module. Outputs can drive 12V LED strip (max 5W on each output).
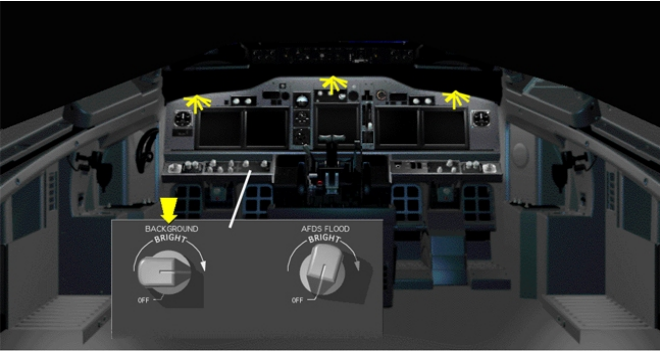
Background light regulation

AFDS light regulation

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