

# PSXseecon

## Manual

Version **3.46**

Sep 14, 2026

Nico Kaan



**Copyright © 2014–2026, Nico W. Kaan, The Netherlands. All rights reserved.**  
No part of this publication may be reproduced or published by print, photocopy,  
Copyright © 2014-2025, Nico Kaan, The Netherlands, All Rights reserved.

|          |                                                                                 |           |
|----------|---------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>Introduction .....</b>                                                       | <b>4</b>  |
| 1.1      | Technical information .....                                                     | 4         |
| 1.2      | System requirements .....                                                       | 4         |
| <b>2</b> | <b>Installing and configuring PSXseecon .....</b>                               | <b>5</b>  |
| 2.1      | Installing PSXseecon .....                                                      | 5         |
| 2.1.1    | Downloading and installation.....                                               | 5         |
| 2.1.2    | Upgrading PSXseecon to a new version .....                                      | 5         |
| 2.1.3    | Uninstalling PSXseecon .....                                                    | 5         |
| 2.2      | Configuring PSXseecon.....                                                      | 5         |
| 2.2.1    | Position of PSXseecon on your screen .....                                      | 5         |
| 2.2.2    | Connection parameters .....                                                     | 6         |
| 2.2.3    | Key definitions for a CDU [Optional].....                                       | 6         |
| 2.2.4    | CDU screen parameters [Optional].....                                           | 6         |
| 2.2.5    | Position of PSXseecon as a CDU window on your screen [Optional] .....           | 6         |
| 2.2.6    | Infinite rotary selector direction [Optional] .....                             | 6         |
| 2.2.7    | Blacklisting or whitelisting PSXseecon variables [Optional] Experts Only! ..... | 7         |
| 2.2.8    | Version Check [Optional] .....                                                  | 7         |
| 2.2.9    | Monitoring messages [Optional] .....                                            | 7         |
| 2.2.10   | Engine Start Switches dominant or not [optional] .....                          | 8         |
| 2.2.11   | PushToTalk Switches dominant or not [optional].....                             | 8         |
| 2.2.12   | ACP Left implemented by single encoder and push button [optional].....          | 8         |
| 2.2.13   | ACP Centre implemented by single encoder and push button [optional] .....       | 9         |
| 2.2.14   | ACP Left implemented by single encoder and push button [optional].....          | 9         |
| 2.2.15   | Autobrakes Selector dominant or not [optional].....                             | 9         |
| 2.2.16   | Parking Brake Lever dominant or not [optional].....                             | 9         |
| 2.2.17   | GearLockOverride dominant or not [optional] .....                               | 9         |
| 2.2.18   | FireEng1 dominant or not [optional].....                                        | 9         |
| 2.2.19   | FireEng2 dominant or not [optional].....                                        | 9         |
| 2.2.20   | FireEng3 dominant or not [optional].....                                        | 9         |
| 2.2.21   | FireEng4 dominant or not [optional].....                                        | 9         |
| 2.2.22   | FireApu dominant or not [optional] .....                                        | 9         |
| 2.2.23   | Qi204 as integer instead of BCD4 .....                                          | 10        |
| <b>3</b> | <b>Predefined SIOC variables for PSX .....</b>                                  | <b>11</b> |
| 3.1      | Introduction.....                                                               | 11        |
| 3.1.1    | Documentation method used.....                                                  | 11        |
| 3.1.2    | Mapping of the Q Variable to a SIOC variable number .....                       | 13        |
| 3.1.3    | Qh vars with information elements .....                                         | 13        |
| 3.1.4    | Display windows.....                                                            | 13        |
| 3.2      | CDU keyboard .....                                                              | 14        |
| 3.3      | Infinite Rotary Selectors .....                                                 | 15        |
| 3.4      | Rotary switches .....                                                           | 15        |
| 3.5      | OnOfOn Toggle switches.....                                                     | 15        |
| 3.6      | Power sources for indicators lights and panel lights.....                       | 16        |
| 3.7      | Rudder and Aileron Trim commands.....                                           | 16        |
| 3.8      | Hardware (solenoid) synchronization.....                                        | 16        |
| 3.9      | AutoThrottle.....                                                               | 16        |
| 3.10     | Temperature potentiometers.....                                                 | 17        |
| 3.11     | TCAS Rotary Switches .....                                                      | 17        |
| 3.12     | Towing control variable .....                                                   | 17        |
| 3.13     | Variables for dedicated hardware.....                                           | 18        |
| 3.13.1   | Altitude, Heading and TAS .....                                                 | 18        |
| 3.14     | PSXseecon added control variables .....                                         | 18        |
| 3.14.1   | CDU Screen Selector.....                                                        | 18        |
| 3.15     | Configuration variables.....                                                    | 18        |
| 3.16     | MalFunction variables.....                                                      | 19        |
| 3.17     | Doors Control variables .....                                                   | 19        |
| 3.18     | Call From Cabin variable.....                                                   | 20        |
| 3.19     | CDU screen.....                                                                 | 21        |
| 3.19.1   | NG FMC .....                                                                    | 24        |
| 3.20     | Flight Controls.....                                                            | 24        |
| 3.21     | ToeBrakes .....                                                                 | 25        |

|          |                                                             |           |
|----------|-------------------------------------------------------------|-----------|
| 3.22     | Rotary switches with a variable number of terminals .....   | 25        |
| 3.23     | CallPanelDisp .....                                         | 25        |
| <b>4</b> | <b>Running PSXseecon .....</b>                              | <b>27</b> |
| 4.1      | Starting sequence.....                                      | 27        |
| 4.2      | Starting PSXseecon and hardware switch synchronization..... | 27        |
| 4.3      | Update frequency .....                                      | 28        |
| 4.4      | Log file.....                                               | 28        |
| 4.5      | Error messages .....                                        | 28        |

# 1 Introduction

**PSXseecon** connects the [Aerowinx Precision Simulator version 10 \(PSX\)](#) (**PSX**) with the **SIOC** software by [Opencockpits](#). It acts as a bridge between these two systems, “speaking” the Aerowinx Network Protocol over TCP/IP to PSX and the IOCP protocol over TCP/IP to the SIOC Server.

Although both systems offer a TCP/IP-based interface, they use different protocols and both operate as servers. **PSXseecon** functions as a client to PSX and as a client to SIOC, performing protocol translation between the two.

There are **2,523 predefined SIOC Variables**, covering approximately **99%** of the functionality exposed by the PSX interface. These variables provide access to almost all states and controls within PSX. You can monitor state changes in the 747-400 and control buttons, switches, levers, throttles, dials — everything you need to build a realistic cockpit.

For convenient SIOC programming, **PSXseecon** includes additional features such as:

- LED variables with built-in support for bulb failure, power failure, and MD&T tests.
- Rotary switch terminal variables.
- On-Off-On switch terminal variables.
- Direct support for rotary encoders.
- Direct support for the Opencockpits USB key card (e.g., for CDU operation).

To assist with debugging, **PSXseecon** provides tools to monitor the messages exchanged between PSX and PSXseecon, and between SIOC and PSXseecon. Example SIOC scripts for PSX can be found in the **PSXcockpit** folder.

Note that **PSXseecon** automatically detects the predefined SIOC variables for PSX in your SIOC scripts!

The first version of **PSXseecon** was released on **September 3, 2007**.

## 1.1 Technical information

PSXseecon is a 64-bit Windows application, written in C++, for Windows 7 or later.

## 1.2 System requirements

You need a 64-bit Windows version.

To run it, you need Microsoft Visual C++ Redistributable for Visual Studio 2022, version 17, architecture x64. The standalone installer for x64 (VC\_redist.x64.exe) can be [downloaded here](#).

## 2 Installing and configuring of PSXseecon

### 2.1 Installing PSXseecon

#### 2.1.1 Downloading and installation

Download the PSXseecon\_vx.y.zip [from my website](#). Unzip. You may install PSXseecon at any Windows PC (Vista or higher) in your local network.

Installation is easy, there is no install procedure, no registry entries, no program groups. Just unzip the archive wherever you want. To prevent UAC problems, installation outside C:\Program Files is recommended.

PSXseecon.exe is the application.

Documentation is provided in the manual, release notes, and SIOC variable definitions (explained in this Manual in Chapter 2.2.5). Aerowinx MCDU Large and Small fonts are provided in case you want to use PSXseecon as a CDU screen (section 3.19).

The PSXcockpit folder contains SIOC scripts for building a PSX cockpit.

|                                                                                    |                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>An important file included in the archive is the <i>EULA.pdf</i>. This End-User License Agreement is a legally binding contract between you and the Author. By downloading and installing the PSXseecon package, you agree to be bound by the terms of this EULA.</p> |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Note:** You may install and run the software multiple times on the same PC. Each PSXseecon instance should have its own PSXseecon.cfg file containing parameters that point to different SIOC instances (either on the same PC or on other PCs). Each SIOC instance must handle a **disjoint set of SIOC PSX control variables** (information variables may overlap).

#### 2.1.2 Upgrading PSXseecon to a new version

Just install the new version by unzipping and overwriting files. The new version will continue to run with your settings in PSXseecon.cfg (if in use).

#### 2.1.3 Uninstalling PSXseecon

Removing PSXseecon from your PC can be done just by deleting the files. There are no registry entries.

### 2.2 Configuring PSXseecon

Configuration information has to be put in a plain text file named **PSXseecon.cfg** in the **same** folder as PSXseecon. Note that this file is not in the software package, it will be created the first time PSXseecon runs (if not already there).

Make sure you are using the correct parameter names. This can be checked in the log file Log.txt (see section 4.4).

#### 2.2.1 Position of PSXseecon on your screen

PSXseecon will remember the last position of PSXseecon on your screen by writing (and reading) the following parameters to your PSXseecon.cfg.

**MAIN\_WINDOW\_X=number**  
**MAIN\_WINDOW\_Y=number**

If PSXseecon.cfg does not exist, it will create one. The values of these parameters can be changed manually, but it is easier just to place the main window where you want it.

### 2.2.2 Connection parameters

Always run PSX as **main server** first (*in the network tab*)!

What you must do depends on the computers where PSX, SIOC and PSXseecon run.

#### Scenario A: all on one computer

In this scenario no configuration work is needed. PSXseecon will find PSX and SIOC and it will find the SIOC script(-s) that you are running automatically.

#### Scenario B: SIOC on a different computer than PSXseecon

In this scenario you have to give PSXseecon information about where to find SIOC and where to find the script(-s) that you are running. The following parameters have to be defined in PSXseecon.cfg (with your data of course):

```
IOCP_HOSTADDRESS=192.168.1.70  
IOCP_port=8092  
CONFIG_FILE=\\ADAM\SIOC\cockpit744.lst
```

The IOCP\_HOSTADDRESS parameter is the IP-address of the PC running SIOC.

The IOCP\_port is the port used by the SIOC Server. You can find that information in the <IOCP> SERVER section of the main window of the SIOC.exe program.

The CONFIG\_FILE parameter specifies the very same file as is specified in sioc.ini. Depending on how you use SIOC it can be either a .ssi file or a .lst file. Note that you must specify a full path name (unlike sioc.ini). In this example ADAM is the logical name of the PC running SIOC and cockpit744.lst defines all the SIOC scripts for a 744 cockpit.

#### Scenario C: PSXseecon on a different computer than PSX

In this scenario you have to give PSXseecon the IP-address of the PSX Server.

```
PSX_HOSTADDRESS=192.168.1.71
```

### 2.2.3 Key definitions for a CDU [Optional]

See section 3.2

### 2.2.4 CDU screen parameters [Optional]

See section 3.19

### 2.2.5 Position of PSXseecon as CDU Window on your screen [Optional]

PSXseecon will remember the last position of PSXseecon as CDU window (see section 3.19) on your screen by writing (and reading) the following parameters to your PSXseecon.cfg.

```
MAIN_CDU_WINDOW_X=number  
    (may also be negative)  
MAIN_CDU_WINDOW_Y=number
```

If PSXseecon.cfg does not exist, it will create one. The values of these parameters can be changed manually, but it is easier just to place the main window where you want it.

### 2.2.6 Infinite rotary selector direction [Optional]

See section 3.3

### 2.2.7 Blacklisting or whitelisting PSXseecon variables [Optional] Experts Only!

PSXseecon by default detects all PSXseecon variables in the .ssi file pointed to by the CONFIG\_FILE parameter (section 2.2.2) and connects these variables to PSX.

However, you may exclude one or more PSXseecon variables from being connected. The concepts of blacklisting and whitelisting are introduced for that purpose.

With the parameter BLACKLIST you can **exclude** one or more variables and with the parameter WHITELIST you can specify which variables you want to be connected **only**.

**BLACKLIST**=var1  
**WHITELIST**=var1, var2, var3

*[specify one or more variable numbers, separated by commas.]*

A situation for which these concepts are particularly useful is this:

Suppose you have two Opencockpits hardware CDU's (V3) connected to the same PC, one for CDU Left and one for CDU Right. You combine the two SIOC scripts from my PSXcockpit archive (cduv31.txt and cduv32.txt) by putting these filenames in a .lst file and let one SIOC instance run the file.

You want two PSXseecon instances, one to expand to the left CDU screen (with parameter CDU\_L=1) and the other to the right CDU screen (with parameter CDU\_R=1).

However, the Left instance should not respond to changes in the right CDU SIOC script and vice versa. This can be specified in PSXseecon.cfg of the Left CDU instance as follows:

**WHITELIST**=1401, 2086

and in the PSXseecon.cfg of the Right CDU instance you should specify:

**WHITELIST**=1403, 2088

### 2.2.8 Version Check [Optional]

**VERSION\_CHECK**=1

At each start-up PSXseecon will check if there is a new version available. If so, the normally green version message in the main window will turn yellow, and the new version number will be shown in parentheses.

This is just a reminder; you have to download and install the new version yourself (see section 2.1.2). If you do not want this check, give this parameter the value 0.

### 2.2.9 Monitoring messages [Optional]

Sometimes it can be helpful to see the messages that pass between PSX and PSXseecon and/or the ones that pass between PSXseecon and SIOC.

With the following parameters you can activate or deactivate the logging of messages in the log file.

To log the Qh, Qi and Qs messages sent by PSX to PSXseecon, write (*\_IN\_ from PSXseecon's perspective*):

**MONITOR\_PSX\_IN\_Qh**=1  
**MONITOR\_PSX\_IN\_Qi**=1  
**MONITOR\_PSX\_IN\_Qs** =1

*Note: The following Qs messages are never logged, while they can be up to 50.000 characters long and they are not really needed for cockpit builders: Qs375, Qs376, Qs377, Qs407, Qs408, Qs409, Qs410, Qs411 and Qs412.*

To log the non-Q messages sent by PSX to PSXseecon, write:

**MONITOR\_PSX\_IN\_NONQ=1**

To log all the messages sent by PSXseecon to PSX, write (*\_OUT\_ from PSXseecon's perspective*):

**MONITOR\_PSX\_OUT=1**

To log the messages sent by SIOC to PSXseecon, write:

**MONITOR\_SIOC\_IN=1**

To log the messages sent by PSXseecon to SIOC, write:

**MONITOR\_SIOC\_OUT=1**

To de-activate monitoring specify a 0 as value or remove the parameter.

The default value of all these parameters is 0.

If you want to focus on a specific set of variables, you may specify variable lists. To specify the Qh, Qi and Qs variables you want to monitor between PSX and PSXseecon (so both ways), write:

**Qh\_VarList**=num1, num2      *Example: Qh\_Varlist=426, 313*  
*[specify one or more variable numbers, separated by commas.]*

**Qi\_VarList**=num1, num2

**Qs\_VarList**=num1, num2

If a list is empty, all variables will be monitored.

In the log file, messages received by PSXseecon are preceded by a "<" (less than) character. Messages sent by PSXseecon are preceded by a ">" (greater than) character.

The SIOC messages start with "Arn". For a description of the SIOC messages see the [IOCP Protocol specification version 1.1](#).

### 2.2.10 Engine Start Switches dominant or not [optional]

You can switch **off** the dominance of the Engine Starter Switches (Qh267 .. Qh270), see section 3.8, by defining:

**ENG\_STARTERS\_DOMINANT=0**

### 2.2.11 PushToTalk Switches dominant or not [optional]

You can switch **off** the dominance of the PTT switches (Qh82 and Qh93), by defining:

**PTT\_SWITCHES\_DOMINANT=0**

### 2.2.12 ACP Left implemented by single encoder and push button [optional]

You can switch **off** the **default** use of a dual encoder by:

**DUAL\_ENCODER\_RCPL=0**

And use SIOC vars 3819 and 3435.

### 2.2.13 ACP Centre implemented by single encoder and push button [optional]

You can switch **off** the **default** use of a dual encoder by:

**DUAL\_ENCODER\_RCPC=0**

And use SIOC vars 3820 and 3436

### 2.2.14 ACP Left implemented by single encoder and push button [optional]

You can switch **off** the **default** use of a dual encoder by:

**DUAL\_ENCODER\_RCPR=0**

And use SIOC vars 3821 and 3437

### 2.2.15 Autobrakes Selector dominant or not [optional]

You can switch **off** the dominance of the Autobrakes (Qh34), by defining:

**AUTOBRAKES\_DOMINANT=0**

### 2.2.16 Parking Brake Lever dominant or not [optional]

You can switch **off** the dominance of the Parking Brake Lever (Qh397), by defining:

**PARKBRKLEV\_DOMINANT=0**

### 2.2.17 GearLockOverride dominant or not [optional]

You can switch **off** the dominance of the GearLockOverride (Qh169), by defining:

**GEARLOCK\_OVERRIDE\_DOMINANT=0**

### 2.2.18 FireEng1 dominant or not [optional]

You can switch **off** the dominance of the FireEng1 (Qh275), by defining:

**FIRE\_ENG1\_DOMINANT=0**

### 2.2.19 FireEng2 dominant or not [optional]

You can switch **off** the dominance of the FireEng2 (Qh276), by defining:

**FIRE\_ENG2\_DOMINANT=0**

### 2.2.20 FireEng3 dominant or not [optional]

You can switch **off** the dominance of the FireEng3 (Qh277), by defining:

**FIRE\_ENG3\_DOMINANT=0**

### 2.2.21 FireEng4 dominant or not [optional]

You can switch **off** the dominance of the FireEng4 (Qh278), by defining:

**FIRE\_ENG4\_DOMINANT=0**

### 2.2.22 FireApu dominant or not [optional]

You can switch **off** the dominance of the FireApu (Qh279), by defining:

**FIRE\_APU\_DOMINANT=0**

### 2.2.23 *Qi204 as integer instead of BCD4*

If set to **1** the value of Qi204 (=SIOC 2204) will be given as **integer** instead of BCD4 + b16 (ident), as indicated in the SIOC var list.

**SQUAWK\_AS\_INT=1**

## 3 Predefined SIOC variables for PSX

The pre-defined SIOC variables reflecting the PSX interface are defined in a separate machine produced and machine-readable document called [SIOC variables by Qcode.txt](#).

The PSX interface is documented by Hardy in [network documentation.txt](#) and [variables.txt](#), that are available in the [744 Forum](#), sub forum networkers, and in the developers folder at the 744 DVD.

SIOC variables are always **32** bit. After an introduction in section 3.1, specific variables are described.

### 3.1 Introduction

#### 3.1.1 Documentation method used

Each line in the documents 'SIOC variables\_by\_Qcode.txt' or 'SIOC\_variables\_by\_Name.txt' specifies a SIOC variable.

A line contains five pieces of information, separated by commas. They are:

#### **Name**

The name of the variable. For most variables this name is equal to the name that is in use in the variables.txt document of PSX.

#### **Qcode**

The related Qcode.

#### **SIOC**

The number of the corresponding predefined SIOC variable (between 1000 and 5499).

#### **Control Type** (*control variables only*)

Possible control values:

| Type    | Meaning                                                                                                                                                                                                                                    |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [x..y]  | Range of values, x=lower bound, y = upper bound.<br>The brackets mean that values sent to this variable less than the lower bound will be set to the lower bound and values greater than the higher bound will be set to the higher bound. |
| P270    | Potentiometer 270 degrees, range 0 ... 4713<br>As [x..y] above, but to cope with jitter, with suppression of delta values less than 47.                                                                                                    |
| [x.%.y] | As [x..y], but to cope with jitter, with suppression of delta values less than 1% of the range.                                                                                                                                            |
| x..y    | example: -1 ... 68<br>Values sent to this variable that are out of this range will be ignored.                                                                                                                                             |
| A       | Alternate Switch, values 0 or 1                                                                                                                                                                                                            |
| M       | Momentary Switch, values 0 or 1, at each 0->1 or 1>0 change (in SIOC) the function is activated                                                                                                                                            |
| H       | Momentary Switch (see above), that can be held. <i>Used for instance for some ACP and RCP buttons.</i>                                                                                                                                     |
| R       | Rotary Switch terminal, values 0 or 1.<br>Put a 1 in this variable if the terminal is selected and a 0 if not. <i>Note: a Rotary Switch can have two or more terminals</i>                                                                 |
| O       | On/Off/On Switch terminal, values 0 or 1<br>At most one terminal can be selected, indicated by value 1.<br><i>Note: an On/Off/On Switch always has two terminals.</i>                                                                      |
| E       | Rotary Encoder                                                                                                                                                                                                                             |
| K       | Opencockpits USB-Keys card                                                                                                                                                                                                                 |

**Information Value** (*information variables only*)

The format of the information value, which can be:

- *Qcode value*  
for the definition of the value consult PSX's variables.txt document.  
PSXseecon transfers these bits integrally.
- Qh value (Virtual Switch position)  
See section 3.8
- a *value range*  
such as 0..1001
- *b n*  
meaning bit n

|                                                                                   |                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>The way a bit (n) is indicated here is different from PSX in its network documentation document. It's n in <b>2 to the power of n</b>. This bit number can be used directly in SIOC's TESTBIT statements.</p> |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- *b 14 15 16*  
14 to 16 are bit numbers for LEDs in MCP Momentary Action Switches and in Indicator Lights that are not integrated. 14=left bulb, 15=right bulb and 16 is left or right bulb.

If the bit is 1 the LED will be lit; MD&T test, bulb failure and whether there is power in the power source for the bulb is incorporated.

bits 0 to 13 are as defined in network documentation.txt.

- *b 14 15 16 17 18 19 20 21*  
14 to 21 are bit numbers for LEDs in Big Alternate or Big Momentary Action Switches. 14=upper/left bulb, 15=upper/right bulb, 16=upper/left or upper/right bulb, 17=lower/left bulb, 18=lower/right bulb and 19=lower/left or lower/right bulb.

If the bit is 1 the LED will be lit; MD&T test, bulb failure and whether there is power in the power source for the bulb is incorporated.

For Big Alternate Action Switches bit 20 indicates that switch is pushed and there is (panel) power source for this switch; use this bit if the upper/left part of the switch is not an indicator light.

For Big Alternate Action Switches bit 21 indicates that switch is pushed and there is (panel) power source for this switch; use this bit if the lower/right part of the switch is not an indicator light.

bits 0 to 13 are as defined in network documentation.txt.

- *b x() y(z) ...*  
where x, y, and z are bit numbers for LEDs, with a clue in parentheses about what they represent. Consult PSX's network documentation document for more information.
- BCDn  
n hexadecimal digits, range 0x0 ... 0xB, whereby A='blank', B='minus sign'  
These variables are meant for Display windows (see section 3.1.4).

### 3.1.2 Mapping of the Q Variable to a SIOC variable number

The pre-defined SIOC variables for PSX are defined in the range **1000 ... 5499**.

There are three Q categories: Qi (mostly information variables, some can be set too), Qh (control variables), Qs (mix of information and control)):

- The **Qh** category start at **1000**, e.g., Qh169 = 1169;
- The **Qi** category start at **2000**, e.g., Qi21 = 2021;  
The **Qi** category variables that can be set start at **5000**, e.g., Qi12 = 5012;
- The **Qs** category is not mapped one-to-one to a SIOC range because in SIOC strings are not supported. PSXseecon splits these strings up into several SIOC variables starting from **3000**.

### 3.1.3 Qh vars with information elements

PSX's Qh variables for big alternate action switches, momentary action switches, MCP momentary action switches, Fuel Cutoff switches, Engine Start Switches, Green squib pushbuttons and Fire Switches have both a control part and an information part.

To hide you from that level of detail, PSXseecon splits these Qh variables up into two SIOC variables, one for the control and one for information. PSXseecon takes care of "splitting up/combining and re-sending" when communicating with PSX.

Take for instance Qh201:

```
BusTie1      , Qh201, 1201, A
BusTie1      , Qh201, 3201, , b 14 15 16 17 18 19 20 21
```

1201 is the control variable, it can be used in SIOC by linking an On/Off switch to it.  
3201 is the information variable, it contains not only the bits from Qh201, but also eight extra bits.

*Note: as a rule of thumb: the information variable always has the same number as the control variable +2000*

If you are using two LEDs for each function in the switch (so 4 in total) you should take bits 14,15 and 17,18 for indicators and bit 20 and 21 for non-indicator functions. If you are using one LED, you should take bits 16 and 19 for indicators and 20 and 21 for non-indicators.

**NOTE: You cannot implement the information variable only, that will not work. Implement both, or at least the control variable.**

### 3.1.4 Display windows

Values for 7-segment digits are packed in **BCD** (Binary Coded Decimal). Each digit takes four bits (a 'nibble') and the values are 0 to 9. On top of that there are the following special values defined by PSXseecon:

- Decimal 10 (= hexadecimal 'A') representing **blank**
- Decimal 11 (= hexadecimal 'B') representing the **minus sign**

With these definitions PSXseecon can provide support for blanks and minus signs.

The following combinations may occur:

| BCD Format | Meaning                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------|
| BCDx       | x digits with leading zeroes                                                                                  |
| BCDxb      | x digits with leading blanks (but at least one nonblank)                                                      |
| BCD3b1     | 3 digits with at most one leading blank                                                                       |
| BCDxbn     | x digits, or x-1 digits and a with a minus sign, and possibly also leading blanks (and at least one nonblank) |

In the definition of a Variable, you may find these codes.

The SIOC script for your cockpit can now be very simple, just map each digit directly to a hardware digit. In the PSXcockpit archive (on my website) you will find the file 1\_Digit.txt with all kinds of SIOC subroutines to assist you in doing that.

### 3.2 CDU keyboard

For the CDU keyboard there are two implementation options. Take for instance Qh401:

```
KeybCduL      , Qh401, 1401, K      ,
KeybCduL      , Qh401, 3401, -1..68 ,
```

SIOC variable 1401 can be linked directly to an Opencockpits USB-Keys card. PSXseecon will convert the integer key card codes to the codes expected by PSX in Qh401.

This variable works **out of the box** for USB-Keys cards supplied with the Opencockpits 767/747 CDU (assembled or as a kit)!

For USB-Keys cards with other key arrangements, built by yourself, you must define the integer code for each key in **PSXseecon.cfg**, like this (in PSXseecon.cfg one parameter per line of course):

|                       |                      |                        |
|-----------------------|----------------------|------------------------|
| <b>LSK_L1=56</b>      | <b>KEY_MENU=63</b>   | <b>LET_T=17</b>        |
| <b>LSK_L2=64</b>      | <b>KEY_NAVRAD=62</b> | <b>LET_U=13</b>        |
| <b>LSK_L3=72</b>      | <b>KEY_PREV=55</b>   | <b>LET_V=12</b>        |
| <b>LSK_L4=80</b>      | <b>KEY_NEXT=54</b>   | <b>LET_W=11</b>        |
| <b>LSK_L5=88</b>      | <b>LET_A=61</b>      | <b>LET_X=10</b>        |
| <b>LSK_L6=87</b>      | <b>LET_B=60</b>      | <b>LET_Y=9</b>         |
| <b>LSK_R1=86</b>      | <b>LET_C=59</b>      | <b>LET_Z=5</b>         |
| <b>LSK_R2=85</b>      | <b>LET_D=58</b>      | <b>KEY_SP=4</b>        |
| <b>LSK_R3=84</b>      | <b>LET_E=57</b>      | <b>KEY_DEL=3</b>       |
| <b>LSK_R4=83</b>      | <b>LET_F=53</b>      | <b>KEY_SLASH=2</b>     |
| <b>LSK_R5=82</b>      | <b>LET_G=52</b>      | <b>KEY_CLR=1</b>       |
| <b>LSK_R6=74</b>      | <b>LET_H=51</b>      | <b>DIG_1=32</b>        |
| <b>KEY_INITREF=79</b> | <b>LET_I=50</b>      | <b>DIG_2=31</b>        |
| <b>KEY_RTE=78</b>     | <b>LET_J=49</b>      | <b>DIG_3=30</b>        |
| <b>KEY_DEPARR=77</b>  | <b>LET_K=29</b>      | <b>DIG_4=24</b>        |
| <b>KEY_ATC=76</b>     | <b>LET_L=28</b>      | <b>DIG_5=23</b>        |
| <b>KEY_VNAV=75</b>    | <b>LET_M=27</b>      | <b>DIG_6=22</b>        |
| <b>KEY_FIX=71</b>     | <b>LET_N=26</b>      | <b>DIG_7=16</b>        |
| <b>KEY_LEGS=70</b>    | <b>LET_O=25</b>      | <b>DIG_8=15</b>        |
| <b>KEY_HOLD=69</b>    | <b>LET_P=21</b>      | <b>DIG_9=14</b>        |
| <b>KEY_FMCCOMM=68</b> | <b>LET_Q=20</b>      | <b>KEY_DOT=8</b>       |
| <b>KEY_PROG=67</b>    | <b>LET_R=19</b>      | <b>DIG_0=7</b>         |
| <b>KEY_EXEC=66</b>    | <b>LET_S=18</b>      | <b>KEY_PLUSMINUS=6</b> |

The integer codes for your key card can easily be found with the siocmonitor program. In the cockpit744 folder you will find a file with all these parameters to be filled in.

And do not forget (!) to add a line

**OCCDU=0**

to switch off the OCCDU default.

Note that keeping key CLR or key ATC pushed does not work. Therefore, CLR has been implemented just as any other key: a push will clear one character (if any). To simulate ATC Hold you must push the ATC key once and to push it a second time in order to clear the hold.

SIOC variable 3401 behaves as defined in the network documentation document.

### 3.3 Infinite Rotary Selectors

The infinite rotary variables can be linked directly to a Rotary Encoder (with just one line of SIOC code). Take for instance Qh78:

```
McpTurnHdg      , Qh78 , 1078, E ,
```

In SIOC it would read:

```
Var 1078 Static name TurnHdg Link IOCARD_ENCODER Aceleration 4
Device 2 Input 6 Type 2
```

If turning right does not increment but decrements the value, you can change that by changing the wires, or –easier- by adding a parameter to PSXseecon.cfg.

For each encoder there is a parameter named Invert+“variable name”. Setting it to 1 will make the direction turn. E.g. to change the direction of the small freq knob of RCP L, write:

**InvertSmallFreqKnobL=1**

The default value is 0.

The possible parameters are (see also the PSXseecon.log file):

|                               |                               |                               |
|-------------------------------|-------------------------------|-------------------------------|
| <b>InvertDeltaStbyIasBug1</b> | <b>InvertDeltaStbyIasBug2</b> | <b>InvertDeltaStbyIasBug3</b> |
| <b>InvertAbsStbyIasBug1</b>   | <b>InvertAbsStbyIasBug2</b>   | <b>InvertAbsStbyIasBug3</b>   |
| <b>InvertEcpMinsCp</b>        | <b>InvertMcpTurnSpd</b>       | <b>InvertTurnStbyBaro</b>     |
| <b>InvertEcpBaroCp</b>        | <b>InvertMcpTurnHdg</b>       |                               |
| <b>InvertEcpMinsFo</b>        | <b>InvertMcpTurnVs</b>        |                               |
| <b>InvertEcpBaroFo</b>        | <b>InvertMcpTurnAlt</b>       |                               |
| <b>InvertHfSenseL</b>         | <b>InvertHfSenseC</b>         | <b>InvertHfSenseR</b>         |
| <b>InvertBigFreqKnobL</b>     | <b>InvertBigFreqKnobC</b>     | <b>InvertBigFreqKnobR</b>     |
| <b>InvertSmallFreqKnobL</b>   | <b>InvertSmallFreqKnobC</b>   | <b>InvertSmallFreqKnobR</b>   |

### 3.4 Rotary switches

For all Rotary Switches PSXseecon defines a variable for each rotary switch terminal, take for instance Qh421:

```
SeatbeltsOff      , Qh421, 3783, R ,
SeatbeltsAuto     , Qh421, 3784, R ,
SeatbeltsOn       , Qh421, 3785, R ,
```

In SIOC you can link an IOCARD\_SW Type I to each variable. PSXseecon will convert this to the right value (0, 1 or 2) for Qh421.

### 3.5 OnOfOn Toggle switches

For all OnOffOn toggle switches PSXseecon defines a variable for each toggle switch terminal, take for instance Qh183:

```
LtIndTestOnL      , Qh183, 3751, O ,
LtIndTestOnR      , Qh183, 3752, O ,
```

In SIOC you can link an IOCARD\_SW Type I to each variable. PSXseecon will convert this to the right value (-1, 0 or 1) for Qh183. The variable with suffix “L” is coded -1, the variable with suffix “R” is coded +1. The middle position is coded 0.

### 3.6 Power sources for indicators lights and panel lights

Qs323 MdtVoltages is converted by PSXseecon to 16 different SIOC variables starting from 4920.

Qs324 LtVoltages is converted by PSXseecon to 22 different SIOC variables starting from 4936.

### 3.7 Rudder and Aileron Trim commands

The network commands for Rudder (Qh416) and Aileron Trim (Qh418) have been added integrally. This is how to use the values for these Qh variables:

Qh416:

- 2: fast left.
- 1 slow left.
- 0: neutral
- 1: slow right
- 2: fast right.

Qh418:

- 0: both switches center.
- 1: upper switch left.
- 2: lower switch left. (so, you need 3 to trim to the left).
- 4: upper switch right.
- 8: lower switch right (so you need 12 to trim to the right).

Note they must be sent in DELTA mode (see Hardy's network documentation.txt)

### 3.8 Hardware (solenoid) synchronization

In general, your hardware switches will be dominant over the virtual switches in PSX; PSXseecon will take care of that.

However, there are a few switches for which that is not always the case. For instance the GearLockOverride Switch, the Engine Start Switches, the PTT switches, the FireEngineOverride Switches, the FireApuOverride Switch, the ParkBrkLever and the Autobrakes Selector.

The virtual Autobrakes Selector, for instance, will automatically return (to either OFF or DISARM) and the Engine Start Switches will jump back in PSX if N2 reaches a certain value.

To be able to let your hardware switches (via solenoids) synchronise with the virtual switches PSXseecon provides information variables (4700 to 4009) for that purpose, indicating the position of these virtual switches.

In the SIOC variable definitions this is indicated by:

Qh value (Virtual Switch position)

If you define ENG\_STARTERS\_DOMINANT=0 (see 2.2.10) the Engine Start Switch variables for Qh267 ... Qh270 are no longer dominant over the start switches in PSX, which makes it easier to use a solenoid to reset your hardware switch based on the information coming from the variables in the 4700 range.

Similar definitions exist, see 2.2.11 and 2.2.15 ... 2.2.22.

### 3.9 AutoThrottle

PSXseecon derives from Qs434 the SIOC variable **3434 ATActive** with values:

- 1 = AT is moving the virtual Throttle Levers, and
- 0 = AT is not moving the virtual Levers (BLANK or HOLD).

If ATActive = 1, PSXseecon will, upon receipt of a virtual Lever update from PSX, not send the hardware Throttle Lever variables to PSX (so the hardware is no longer dominant!). But if ATActive changes from 1 to 0, PSXseecon will immediately write the hardware Throttle Lever variables to PSX (once).

If ATActive = 1 SIOC variable **4739 TlaMotor** is +1 if at least one of the four Levers is moving upwards, -1 if at least one of the four Levers is moving downwards and 0 otherwise. If ATActive = 0, TlaMotor will be 0.

The four variables, **Tla1Virtual**, **Tla2Virtual**, **Tla3Virtual** and **Tla4Virtual**, give the value of the virtual Throttle Levers. They are only written if ATActive = 1 and can be used to set the hardware Throttle Levers according to the virtual ones.

### 3.10 Temperature potentiometers

Qh302="TempPassenger"; Mode=ECON; Min=-4000; Max=4000;  
Qh303="TempFlightDeck"; Mode=ECON; Min=-4000; Max=4000.

The pot range is -2400 to +2400.

When the knob moves outside this range, the knob jumps to 6 o'clock.

The C toggle position is -2800.

The W toggle position is +2800.

The 6 o'clock toggle position is 3141.

The values are radians \* 1000, i.e.,  $3141 = \pi * 1000 = 180^\circ$

### 3.11 TCAS Rotary Switches

Qs117 is a complex "string" variable because it controls the four rotary switches of the TCAS. It is translated by PSXseecon to 11 Rotary terminals in SIOC:

```
Qs117, TcasPanSelAb      , 3015, R      ,
Qs117, TcasPanSelBe      , 3017, R      ,
Qs117, TcasPanSelL       , 3013, R      ,
Qs117, TcasPanSelNo      , 3016, R      ,
Qs117, TcasPanSelOff     , 3011, R      ,
Qs117, TcasPanSelOn      , 3012, R      ,
Qs117, TcasPanSelR       , 3014, R      ,
Qs117, TcasPanSelRATA    , 3021, R      ,
Qs117, TcasPanSelStby    , 3018, R      ,
Qs117, TcasPanSelTA      , 3020, R      ,
Qs117, TcasPanSelXpdr    , 3019, R      ,
```

Be aware that you must implement them all, otherwise any missing rotary switches will be forced to the 0 position, and you can no longer control these with the mouse.

### 3.12 Towing control variable

To be able to operate the Towing controls via hardware instead of with mouse in the instructor panel, a SIOC **control** variable 5191 is provided with the interface of Qi191, next to the already available SIOC **information** variable 2191 for Qi191.

Both variables always consist of 6 digits. E.g., 180359

Digit 1:

1 = "Push back" selected

2 = "Push forward" selected

Digits 2 and 3:

20 = "Stop" selected

80 = "Auto" selected

99 = "Start" selected

Internal process (if "Start" selected):

98 = Phase: "Steering pin inserted; release brakes please."

97 = Phase: "Pushing back." (Not called when pushing forward.)

Internal process (if "Auto" selected):

79 = Phase: "Steering pin inserted; release brakes please."

78 = Phase: "Pushing back." (Not called when pushing forward.)

Internal process (general):

15 = Phase: "Set parking brake, please."

10 = Phase: "Towing system removed, and steering pin removed."

Digits 4, 5, 6:

Target heading (true north reference).

An example SIOC script, named **0\_Towing.txt**, is available in my file [PSXcockpit.zip](#)

### 3.13 Variables for dedicated hardware

Note that these variables are not needed in a full 747-400 cockpit with LCDs and instrument windows.

*Removed in version 2.0.0, except:*

#### 3.13.1 Altitude, Heading and TAS

From Qs121 PSXseecon derives three SIOC variables:

```
Qs121, Altitude      , 4886,      , BCD5b (if positive), 0xAA + BCD3bn (if negative)
Qs121, TrueHeading  , 4887,      , BCD3
Qs121, TAS          , 4888,      , integer value (note: not * 1000)
```

### 3.14 PSXseecon added control variables

The control variables in this section are introduced by PSXseecon (they are not in Hardy's list).

#### 3.14.1 CDU Screen Selector

```
Qh998, CduScreenSelector , 1998, [0 ..2]
```

With this control variable you can dynamically switch the information at your CDU screen (see section 3.19) to CDU\_L (value 0), CDU\_C (value 1) or CDU\_R (value 2).

An example SIOC script for fully sharing a MCDU, so also keyboard and LEDs, can be found in my **PSXcockpit** archive at my website; the file is called **5\_Cdu1\_2\_and3Shared.txt**. There is also a file 5\_Cdu1and2Shared.txt if you want to share Left and Centre.

### 3.15 Configuration variables

The 32 Qi Cfgxyz variables (Qi0 ... Qi31) are available in the SIOC range 5000 ... 5031. These variables determine the configuration of the 747-400. They are useful for guaranteeing that each flight you load adapts to your hardware.

See for example the SIOC script I'm using:

```
Var 0 Value 0
{
    // always set CF6 engines because I'm using TopCat + PFPX
    &CfgEngModCtrl = 0

    // My MCP has just two mach digits
```

```

    &CfgMachSCtrl = 1
}

Var 5001 Static name CfgEngModCtrl
Var 5013 Static name CfgMachSCtrl

```

### 3.16 MalFunction variables

The Malfunction variables Qs137 up to Qs320 are available as SIOC control variables 5237 up to 5420 with a 3-bit interface.

Take for instance Qs213 MfFlameout1:

**Qs213, MfFlameOut1** , 5313, bits 0 & 1: Severity, b 2: Set/Clear MF,

The first two bits (0 & 1) can be used to set severity:

- If both bits are 0 the severity value from the Severe checkbox in the instructor panel is taken.
- If bit 0 is set and bit 1 is not set, a non-severe malfunction is set.
- If bit 0 is not set and bit 1 is set, a severe malfunction is set.

Bit 2 determines whether the resulting Qs message is triggering or clearing the Malfunction.

So the possible assignments in SIOC are:

```

Var 5313 Static name MfFlameout1

&MfFlameout1 = 6 // trigger a severe malfunction
&MfFlameout1 = 5 // trigger a non-severe malfunction
&MfFlameout1 = 4 // trigger a malfunction with the severity
                  // defined in the instructor panel
&MfFlameout1 = 0 // repair the malfunction, and leave the
                  // severity as is
&MfFlameout1 = 1 // repair the malfunction, and set the
                  // severity to non-severe
&MfFlameout1 = 2 // repair the malfunction, and set the
                  // severity to severe

```

Note that the last two assignments are possible with this interface but not really needed. Severity is more relevant when triggering a malfunction.

For convenience PSXseecon will always automatically generate a **Qi130 MfEvent** message after each Malfunction message so PSX will act immediately, making your SIOC code as simple as possible.

For examples of the use of Malfunction variables see my file **0\_MalFunction.txt** in cockpit744.zip (at the PSXseecon web page).

### 3.17 Doors Control variables

With the following Qi control variable, we can control opening and closing of doors.

**Qi179, DoorComBitsCtrl** , 5179, Qcode value,

| bit | Command     |
|-----|-------------|
| 0   | COM_CLOSE   |
| 1   | COM_OPEN    |
| 2   | COM_PARK    |
| 3   | COM_BOARD_L |
| 4   | COM_BOARD_R |
| 5   | COM_OFF     |

The COM commands set the Doors checkboxes on the instructor, see also Aerowinx Manual page 40.

(!) The COM\_OFF command sets all three radio buttons to zero. You must do that before you can make use of the following two control variables, otherwise the PSX doors randomizer function will interfere with what you want to do...

With the following two Qi control variables we can open/close several doors and/or set the escape slide mode from Auto to Manual.

Qi180, DoorOpenBitsCtrl , 5180, Qcode value,  
Qi181, DoorManBitsCtrl , 5181, Qcode value,

| bit | Command       | C | P | F |
|-----|---------------|---|---|---|
| 0   | DR_NOSE_CARGO |   |   | x |
| 1   | DR_FWD_OVHD   |   |   | x |
| 2   | DR_MAIN_ELEC  | x | x | x |
| 3   | DR_ENTRY_1L   | x | x | x |
| 4   | DR_UPPER_L    | x | x |   |
| 5   | DR_ENTRY_2L   | x | x |   |
| 6   | DR_ENTRY_3L   | x | x |   |
| 7   | DR_ENTRY_4L   | x | x |   |
| 8   | DR_SIDE_CARGO | x |   | x |
| 9   | DR_ENTRY_5L   |   | x | x |
| 10  | DR_ENTRY_1R   | x | x |   |
| 11  | DR_FWD_CARGO  | x | x | x |
| 12  | DR_UPPER_R    | x | x | x |
| 13  | DR_ENTRY_2R   | x | x |   |
| 14  | DR_CTR_ELEC   | x | x | x |
| 15  | DR_ENTRY_3R   | x | x |   |
| 16  | DR_ENTRY_4R   | x | x |   |
| 17  | DR_AFT_CARGO  | x | x | x |
| 18  | DR_BULK_CARGO | x | x | x |
| 19  | DR_ENTRY_5R   |   | x |   |

C : Combi  
P : Pax  
F : Freighter

Note that these three control variables are leading (have priority) over settings in the instructor panel.

### 3.18 Call From Cabin variable

With the CallFrCabinCtrl variable we can simulate calls from the cabin:

Qi102, CallFrCabinCtrl , 5102, Qcode value,

Possible values are:

| Val | Call                          |
|-----|-------------------------------|
| 01  | DIRECTORY                     |
| 02  | VIDEO IN USE                  |
| 03  | PA IN USE                     |
| 04  | CABIN READY (with Call light) |
| 05  | PILOT ALERT                   |
| 06  | PRIORITY                      |
| 07  | PARTY LINE                    |
| 11  | DOOR 1 LEFT                   |
| 12  | DOOR 2 LEFT                   |
| 13  | DOOR 3 LEFT                   |
| 14  | DOOR 4 LEFT                   |
| 15  | DOOR 5 LEFT                   |

|    |                                   |
|----|-----------------------------------|
| 16 | U/D LEFT DOOR                     |
| 21 | DOOR 1 RIGHT                      |
| 22 | DOOR 2 RIGHT                      |
| 23 | DOOR 3 RIGHT                      |
| 24 | DOOR 4 RIGHT                      |
| 25 | DOOR 5 RIGHT                      |
| 26 | U/D RGHT DOOR                     |
| 31 | PILOT                             |
| 32 | PRIORITY STA                      |
| 33 | PRIORTY PILOT                     |
| 34 | PURSER                            |
| 36 | U/D STAIR                         |
| 41 | PA FIRST CL                       |
| 42 | PA BUSINESS                       |
| 43 | PA ECONOMY CL                     |
| 44 | PA CREW REST                      |
| 46 | PA ALL AREAS                      |
| 47 | PA PRIORITY                       |
| 51 | DOOR 2 GALLEY                     |
| 52 | M/D GALLEY                        |
| 53 | DOOR 4 GALLEY                     |
| 55 | ALL CALL                          |
| 56 | U/D GALLEY                        |
| 61 | DR5 CREW REST (Pax only)          |
| 66 | CR REST PILOT                     |
| 67 | CABIN READY (inhibits Call light) |
| 71 | GND CREW CALL                     |
| 72 | CARGO CALL (Combi only)           |
| 73 | U/D CREW REST                     |
| 74 | M/D CREW REST                     |
| 77 | PILOT ALERT                       |

One useful use could be sending value 67 indicating CABIN READY

### 3.19 CDU screen

#### **Acknowledgement**

*I owe particular thanks to Martin Erdelen, Jeroen Hoppenbrouwers and Hardy Heinlin for the creation of the Aerowinx MCDU Large and Small true type fonts. Thank you!*

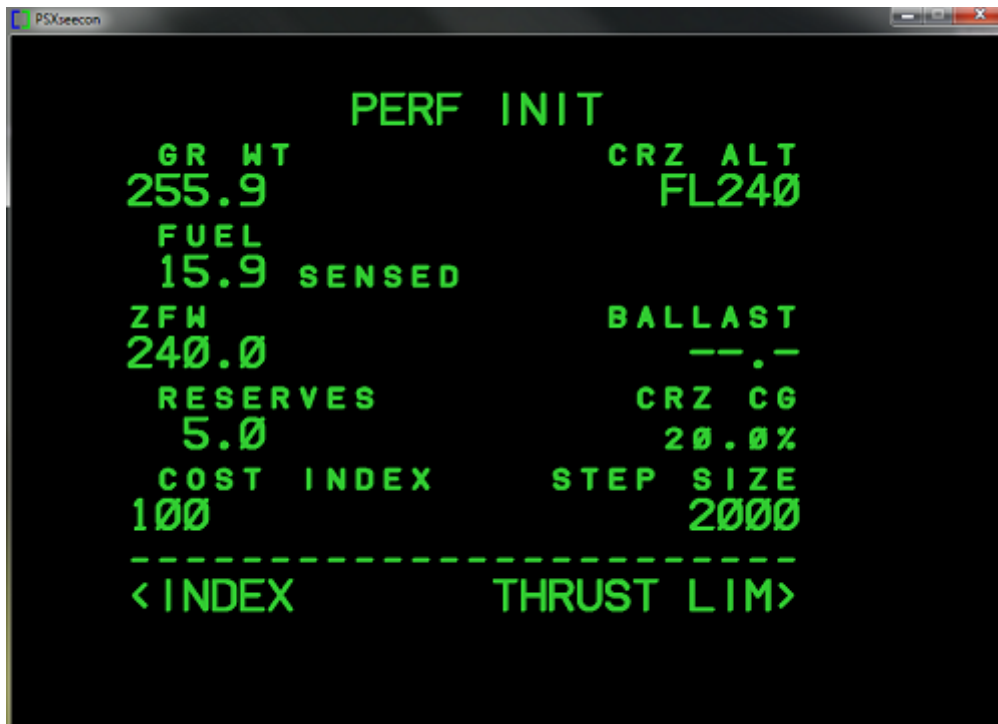
The main window of PSXseecon can be changed dynamically into a CDU screen window.

To do this add **one** of these lines to PSXseecon.cfg:

```
CDU_L=1
CDU_C=1
CDU_R=1
(Possible values 0 ... 1)
```

Install the **Aerowinx MCDU Large** and **Small fonts** which are available in the PSXseecon package. Help about how to install fonts can be found [here](#).

The screen change happens as soon as SIOC and PSX are connected. The main PSXseecon window will then look like this (example):



The size of this **PSXseecon window** is defined by the following parameters in PSXseecon.cfg (the values shown are the **default** values).

**PSXSEECON\_AS\_CDU\_WIDTH**=900  
 (Possible values 600 ... 1200)  
**PSXSEECON\_AS\_CDU\_HEIGHT**=650  
 (Possible values 400 ... 900)

In that space you can (re-)size and (re-)position the CDU window so it will fit perfectly over your CDU monitor with black space all around, by defining the following parameters:

**CDU\_WIDTH**=620  
 (Possible values 200 ... 1200)  
**CDU\_HEIGHT**=510  
 (Possible values 200 ... 1000)

The CDU\_WIDTH defines the width of the CDU window; CDU\_HEIGHT defines the height of the CDU window.

With the CDU\_X\_OFFSET you shift the CDU window to the right in the PSXseecon window. With the CDU\_Y\_OFFSET you shift the CDU window down:

**CDU\_X\_OFFSET**=100  
 (Possible values 0 ... 400)  
**CDU\_Y\_OFFSET**=50  
 (Possible values 0 ... 400)

There are 14 lines of text in a CDU window. Text and data can be written with large and small font characters/symbols. The size of these fonts (for both large and small) is defined by the CDU\_FONTSIZE parameter:

**CDU\_FONTSIZE**=44  
 (Possible values 12 ... 76)

With this rather special parameter you can shift the small font characters/symbols a little bit up, so they appear in the same positions as on the CDU screen of PSX:

**CDU\_SMALL\_FONT\_Y\_OFFSET=7**  
*(Possible values 0 ... 15)*

If CDU\_BOLD is 1 PSXseecon will emulate bold text by re-printing the char/symbol a little bit to the right and by reprinting the char/symbol a little bit up:

**CDU\_BOLD=1**  
*(Possible values 0 ... 1)*

The color (green) can be changed as well, by defining the RGB values:

**CDU\_COLOR\_R=50**  
**CDU\_COLOR\_G=205**  
**CDU\_COLOR\_B=50**  
*(Possible values 0 ... 255)*

PSXseecon will remember its window position used as CDU screen; it writes the X and Y position to your PSXseecon.cfg:

**MAIN\_CDU\_WINDOW\_X**  
**MAIN\_CDU\_WINDOW\_Y**

These values can be adjusted manually. When you start again it will automatically move on top of your CDU monitor to its last position.

With the following parameter you can get rid of the title bar and borders of the PSXseecon main window:

**CDU\_BORDER=1**  
*(Possible values 0 ... 1)*

If CDU\_BORDER = 0 you will see this kind of window:



A drawback is that you now no longer can drag the window to its position on top of the CDU Monitor.

To go around this "problem" you can start with BORDER=1 and drag the window to the CDU monitor first, before switching to BORDER=0. You will notice that the window has

gone up and/or left a bit so you slightly change that by manually changing the `MAIN_CDU_WINDOW_X` and `MAIN_CDU_WINDOW_Y` parameters in `PSXseecon.cfg`.

If everything is set, you are ready; next time you start PSXseecon it will jump to the right position on your CDU monitor from the start.

Note that with a special control variable ***CduScreenSelector*** it is possible to display CDU-L as well, CDU-C as CDU-R on one physical MCDU. Read more about it in section 3.14.1

**NOTE:**

You may run three PSXseecon instances as CDU screen, each for a different CDU. These PSXseecon instances can use one (shared) SIOC script run by one SIOC instance (each PSXseecon using a different part of that same script, see section 2.2.7) or each PSXseecon uses a separate script on a separate SIOC instance, or a combination of both approaches.

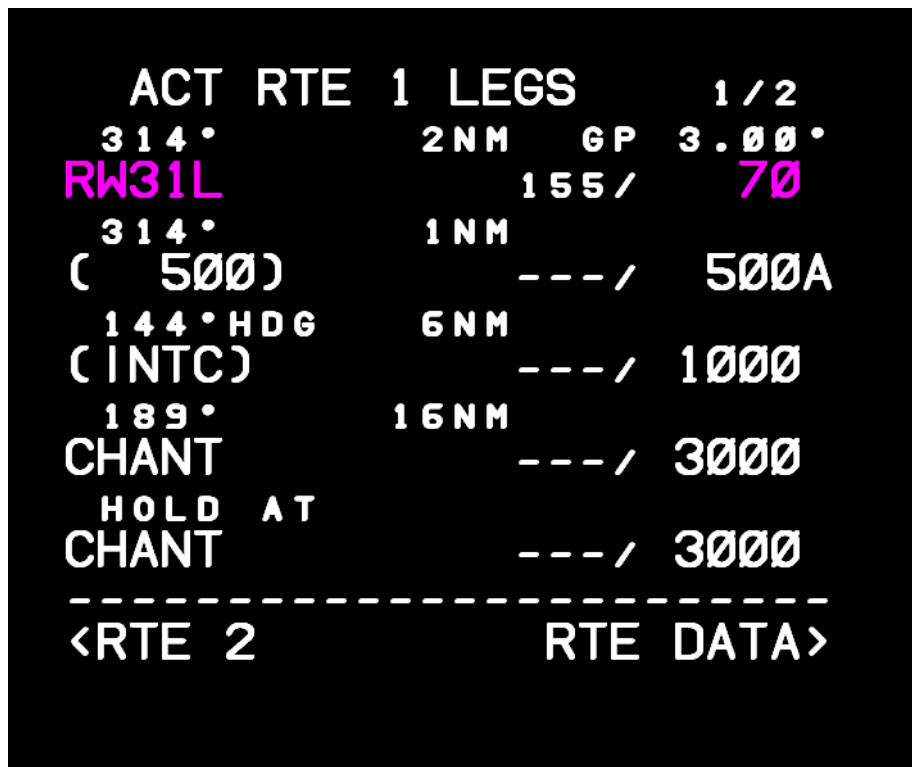
A networked PC running PSXseecon as CDU screen + SIOC is also possible alongside a PSXseecon + SIOC version at a PC running your cockpit hardware scripts.

### 3.19.1 NG FMC

Add this line to `psxseecon.cfg` (next to one out of `LCD_L=1`, `LCD_C=1` or `LCD_R=1`):

**LCD\_CDU=1**

That's all, enjoy the colors!



### 3.20 Flight Controls

Qs120, AileronsVirtual , 4743, , Qcode value  
 Qs120, ElevatorVirtual , 4744, , Qcode value  
 Qs120, RudderVirtual , 4745, , Qcode value

Virtual variables 4743, 4744 and 4745 (derived from Qs120) can be used to read the values for Ailerons, Elevator and Rudder in PSX (*so called panel values or virtual values contrary to your hardware real values*).

```
Qs120, AileronControlW      , 3709, [-999.%.999]
Qs120, ElevatorStick       , 3708, [-999.%.999]
Qs120, RudderPedals       , 3710, [-999.%.999]
```

With the variables 3709, 3708 and 3710 you can feed var Qs120 with information about the state of your hardware Aileron, Elevator and Rudder. They are used to write that info into PSX. It is not obligatory to use all three. If, for instance, the rudder is controlled via a USB device you may leave 3710 out.

### 3.21 ToeBrakes

```
Qs357, ToeBrakeLeftVirtual , 4746,      , Qcode value
Qs357, ToeBrakeRightVirtual, 4747,      , Qcode value
```

Virtual variables 4746 and 4747 (derived from Qs357) can be used to read the values for the ToeBrakes in PSX.

```
Qs357, ToeBrakeLeft      , 3711, [0.%.1000]
Qs357, ToeBrakeRight    , 3712, [0.%.1000]
```

With the variables 3711 and 3712 you can feed var Qs357 with information about the state of your hardware ToeBrakes. They are used to write that info into PSX. It is not obligatory to use both.

### 3.22 Rotary switches with a variable number of terminals

The source selector switches **SrceIrsCp** (Qh119), **SrceIrsFo** (Qh124), **SrceAdcCp** (Qh120) and **SrceAdcFo** (Qh125) have a different number of terminals depending on what you have chosen in Instructor/Model/Equipment for "IRS with auto source select" and/or "Air Data System". Another example is the **HydDem1** (Qh184) selector.

The terminals of these switches cannot have fixed suffixes (such as L, C, R), they have a digit as suffix instead, numbered **clockwise** 0,1,2,3.

For instance, if you are using a hardware switch with 3 terminals, you should use the SIOC terminal variables ending with 0, 1, and 2.

### 3.23 CallPanelDisp

```
Qs457, CallPanelDisp      , 4887,
```

SIOC var 4887 is **-1 if display is blanked**, other values are the index in the following messages table:

```
"", // 00
"DIRECTORY"s, // 01
"VIDEO IN USE"s, // 02
"PA IN USE"s, // 03
"CABIN READY"s, // 04
"PILOT ALERT"s, // 05
"PRIORITY"s, // 06
"PARTY LINE"s, // 07
""s, // 08
""s, // 09
""s, // 10
"DOOR 1 LEFT"s, // 11
"DOOR 2 LEFT"s, // 12
"DOOR 3 LEFT"s, // 13
"DOOR 4 LEFT"s, // 14
```

```

"DOOR 5 LEFT"s,      // 15
"U/D LEFT DOOR"s,    // 16
""s,                 // 17
""s,                 // 18
""s,                 // 19
""s,                 // 20
"DOOR 1 RIGHT"s,     // 21
"DOOR 2 RIGHT"s,     // 22
"DOOR 3 RIGHT"s,     // 23
"DOOR 4 RIGHT"s,     // 24
"DOOR 5 RIGHT"s,     // 25
"U/D RGHT DOOR"s,    // 26 LH only
""s,                 // 27
""s,                 // 28
""s,                 // 29
""s,                 // 30
"PILOT"s,            // 31 LH only
"PRIORITY STA"s,     // 32 LH only
"PRIORTY PILOT"s,    // 33
"PURSER"s,           // 34 QF, LH
""s,                 // 35
"U/D STAIR"s,        // 36 UAL only
""s,                 // 37
""s,                 // 38
""s,                 // 39
""s,                 // 40
"PA FIRST CL"s,      // 41
"PA BUSINESS"s,      // 42
"PA ECONOMY CL"s,    // 43
"PA CREW REST"s,     // 44
""s,                 // 45
"PA ALL AREAS"s,     // 46
"PA PRIORITY"s,      // 47
""s,                 // 48
""s,                 // 49
""s,                 // 50
"DOOR 2 GALLEY"s,    // 51 QF, UAL
"M/D GALLEY"s,       // 52
"DOOR 4 GALLEY"s,    // 53 QF, UAL
""s,                 // 54 attendants only
"ALL CALL"s,         // 55 QF, UAL
"U/D GALLEY"s,       // 56
""s,                 // 57
""s,                 // 58
""s,                 // 59
""s,                 // 60
"DR5 CREW REST"s,    // 61 Pax only
"MCR CREW REST"s,    // 62 Combi only
""s,                 // 63
""s,                 // 64
""s,                 // 65
"CR REST PILOT"s,    // 66 UAL only
"CABIN READY"s,      // 67 LH only
""s,                 // 68
""s,                 // 69
""s,                 // 70
"GND CREW CALL"s,    // 71
"CARGO CALL"s,       // 72 Combi only
"U/D CREW REST"s,    // 73 LH only
"M/D CREW REST"s,    // 74 LH only
""s,                 // 75
""s,                 // 76
"PILOT ALERT"s,      // 77 LH only

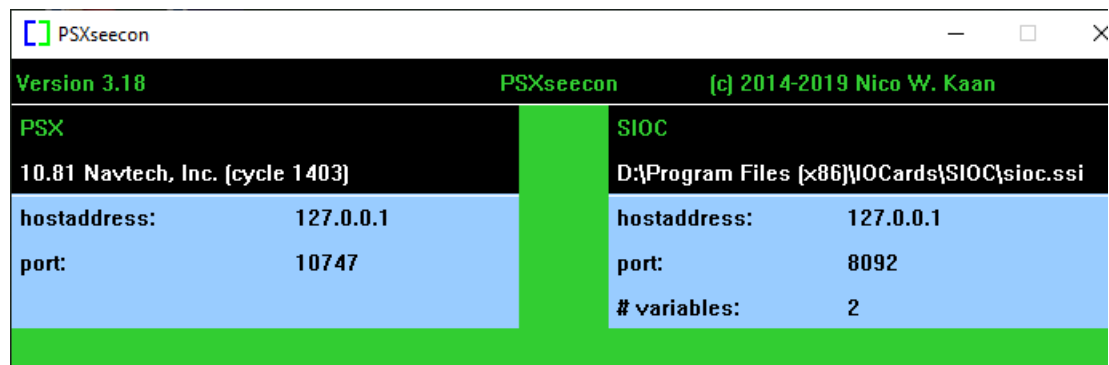
```

## 4 Running PSXseecon

### 4.1 Starting sequence

Start PSX, SIOC and PSXseecon.exe. In principle the order does not matter. PSXseecon will continuously try to connect to the IOCP Server of SIOC and to PSX.

If PSX and SIOC are connected, the window will look like this:



The window shows status information only, there are no menus with commands, other than the standard window controls from Microsoft (top right).

The header gives version, title, and author information.

The left half gives information about PSX, and the right half gives information about the IOCP Server in SIOC.

In the black area (in white) the version of PSX and the SIOC CONFIG\_FILE that is in use are given.

The PSX part shows host address and port of PSX.

The SIOC part shows host address and the port of the IOCP Server found. The number of PSXseecon variables found in your CONFIG\_FILE is also shown.

Note that IP address 127.0.0.1 means that the server is at the same PC as the one running PSXseecon.

If both servers are connected PSXseecon will start exchanging information (its actual job!). It will automatically stop without further notice and exit if the link to SIOC breaks down, for instance because SIOC has exited, or if the link to PSX breaks down. You can manually stop PSXseecon via the standard Windows close button in the PSXseecon window.

PSXseecon will remember the position of its main window on your monitor (it writes the X and Y position to your PSXseecon.cfg). When you start again it will pop up at the same place.

If PSXseecon is to be used as a CDU screen, the main window will expand and change to a CDU window (see section 3.19).

### 4.2 Starting PSXseecon and hardware switch synchronization

Hardware switches are dominant over virtual switches. When you start PSXseecon while PSX is in flight, it might be that your hardware switches are not in the same position as the virtual ones. An illustrative example is the Landing Gear. You do not like it to be lowered when you are in cruise flight ... Or that the Autopilot switches off, or the Fuel Switches ...

The same problem occurs while PSXseecon is already running, but you load a new situ in PSX (without stopping PSXseecon).

To synchronize your switches with the virtual ones in those situations it is better to start PSX and SIOC first (and not PSXseecon). Load the desired flight in PSX, then start PSXseecon.

For fine-tuning you could also Freeze PSX after loading (with the M key), then start PSXseecon, fine tune, and finally start PSX by unfreezing with the M key.

### 4.3 Update frequency

PSXseecon buffers messages coming from and going to SIOC and PSX. Twenty times a second it flushes these buffers, and it checks if messages must be sent to SIOC and/or PSX. So, in the terminology of Hardy, it runs at **20Hz**. However, changes in values of Information variables are checked at 5Hz, which is sufficient for flight-decks.

### 4.4 Log file

During each run a log file named **log.txt** will be written in the **same** folder as PSXseecon.exe. The previous log will be saved under the name log0.txt.

The log contains version information, configuration parameters, the PSXseecon variables used, error messages, and warning messages. It is certainly worthwhile to have a look at it every now and then.

### 4.5 Error messages

Error messages are always severe. They are shown at the bottom of the main window in yellow with a red background.

After reading the message, you must stop PSXseecon.exe manually, using the standard Windows close button (top-right).

The error messages that may appear have been described in the following Tables.

SIOC related error messages:

| #  | Error Message (and help)                                                                                                                                                                                            |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>No variables found</b><br>PSXseecon variables are numbered from 1000 to 4999 and must have attribute <b>Static</b> .                                                                                             |
| 2  | <b>Var &lt;var&gt; in your &lt;CONFIG FILE&gt; is not a PSXseecon variable</b><br>Update your SIOC source first.                                                                                                    |
| 11 | <b>sioc.ini and PSXseecon.cfg not found</b><br>If SIOC was not installed at your FS computer, add a PSXseecon.cfg file.<br>If SIOC was installed at your pc, reinstall it in a folder C:\SIOC or preferably D:\SIOC |
| 12 | <b>IOCP_HOSTADDRESS information is missing in &lt;file&gt;</b><br>Add that information to <file>                                                                                                                    |
| 13 | <b>IOCP_port information is missing in &lt;file&gt;</b><br>Add that information to <file>                                                                                                                           |
| 14 | <b>CONFIG FILE information is missing in &lt;file&gt;</b><br>Add that information to <file>                                                                                                                         |
| 15 | <b>CONFIG FILE has no .ssi or .lst extension</b><br>Is the CONFIG FILE parameter in your sioc.ini or PSXseecon.cfg correct?                                                                                         |

|    |                                                                                                                                                        |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 | <b>CONFIG FILE not found</b><br>Is the CONFIG FILE parameter in your sioc.ini or PSXseecon.cfg correct?                                                |
| 17 | <b>Connect to TCP/IP failure, &lt;host address&gt;, &lt;port&gt;</b><br>A firewall might block the connection request to SIOC. Allow PSXseecon access. |
| 18 | <b>Connection attempt to SIOC timed out</b><br>Is the IOCP_HOSTADDRESS the same as the HOSTADDRESS in the SIOC main window?                            |
| 19 | <b>SIOC not detected</b><br>Is SIOC running?                                                                                                           |

PSX related error messages:

| #  | <b>Error Message</b> <i>(and help)</i>                                                                                                                |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 21 | <b>Connect to TCP/IP failure, &lt;host address&gt;, &lt;port&gt;</b><br>A firewall might block the connection request to PSX. Allow PSXseecon access. |

Generic error message:

| #   | <b>Error Message</b> <i>(and help)</i>                                                                                            |
|-----|-----------------------------------------------------------------------------------------------------------------------------------|
| 100 | <b>System Error</b><br>Please report this with your PSXseecon.cfg and PSXseecon.log files to the author or in the Aerowinx forum. |