

CHALK RIVER GRAPHICS

CrgSim Documentation

Interface VIA
FSUIPC

Chalk River Graphics
4/5/2016

Table of Contents

| | |
|--------------------------------------|----|
| Heartbeat..... | 3 |
| Bit Order..... | 3 |
| EFIS SW1 and SW2..... | 3 |
| Nav Display Range..... | 4 |
| Nav Display Centered..... | 4 |
| Nav Display Mode..... | 5 |
| Nav Display Show Items..... | 5 |
| Barometric Units..... | 6 |
| Altitude Units..... | 6 |
| VNAV and LNAV..... | 6 |
| FSUIPC CrgSim Interface Offsets..... | 7 |
| Examples..... | 10 |
| Set Nav Display Range..... | 10 |
| Set LNAV and VNAV..... | 11 |
| Read LNAV and VNAV..... | 11 |

Introduction

A small area of the FSUIPC offset space has been reserved for CrgSim. The offset space is from 0x7800 to 0x781f. This document defines the use of that interface.

The offsets may be used from a variety of other applications. For example if you have Open Cockpits hardware and use SIOC and LUA you can use the interface to change CrgSim displays. Since CrgSim works with most of the default FSX aircraft your OC MCP and EFIS can also use the same default FSX aircraft.

Configuration File Entries

Additional entries to the Communications Manager configuration file are used to control which variables are used. This allows you to pick and choose which variables are sent over the interface.

| Config Line | Purpose |
|------------------|---|
| offset mode | Nav Display mode |
| offset show | Select Nav Display items (NAV, Airports, Ground Stations) |
| offset range | Nav Display range |
| offset lvnav | LNAV and VNAV |
| offset barounits | Barometric units (HPA or In of Hg |
| offset altunits | altitude units (feet or meters) |
| offset voradf | EFIS Sw1 and SW2 (VOR/OFF/ADF) |

Heartbeat

The byte at 0x7800 is incremented at the rate of about once per second. This byte can be used to determine if CrgSim is actively monitoring the interface.

Bit Order

This bit order used in this document is:

Bit Order = 7 6 5 4 3 2 1 0

EFIS SW1 and SW2

Two bits are used to encode the position of each switch:

| Dec | Bin | Position |
|-----|-----|----------|
| 0 | 00 | VOR |
| 1 | 01 | OFF |
| 2 | 10 | ADF |

Nav Display Range

Three bits are used to encode the Nav Display Range

| Dec | Bin | Range |
|-----|-----|--------|
| 0 | 000 | 5 NM |
| 1 | 001 | 10 NM |
| 2 | 010 | 20 NM |
| 3 | 011 | 40 NM |
| 4 | 100 | 80 NM |
| 5 | 101 | 160 NM |
| 6 | 110 | 320 NM |
| 7 | 111 | 640 NM |

Nav Display Centered

One bit is used to encode the centered mode of the Nav Display:

| Dec | Bin | Meaning |
|-----|-----|----------------------|
| 0 | 0 | Expanded or ARC mode |
| 1 | 1 | Centered Mode |

Nav Display Mode

Two bits are used to encode the Nav Display Mode:

| Dec | Bin | Mode |
|-----|-----|----------|
| 0 | 00 | Approach |
| 1 | 01 | VOR |
| 2 | 10 | Map |
| 3 | 11 | Plan |

Nav Display Show Items

3 bits are used to encode the items that will show on the Nav Display:

| Dec | Bin | Item |
|-----|-----|----------------|
| 1 | 001 | Show Waypoints |
| 2 | 010 | Show Airports |
| 4 | 100 | Show Nav Aids |

Any, none, or all of the bits may be turned ON at the same time. For example to show Airports AND NavAids on the Nav Display use the following bit combination:

| Dec | Bin |
|-----|-----|
| 6 | 110 |

Barometric Units

1 bit is used to select barometric units:

| | |
|---|----------|
| 0 | HPA |
| 1 | In of Hg |

Altitude Units

1 bit is used to select units of altitude:

| | |
|---|-------|
| 0 | Foot |
| 1 | Meter |

VNAV and LNAV

1 bit is used to encode each variable.

| | |
|---|-------------------------|
| 0 | Button is not depressed |
| 1 | Button is depressed |

FSUIPC CrgSim Interface Offsets

Offsets from 7800 to 781f have been reserved in the FSUIPC offset space for CrgSim.

The use of each bytes in this 32 byte space is defined below:

0x7800 Heartbeat 1 Byte

0x7801 Captain's EFIS Settings Group 1

| Bit(s) | Function |
|--------|----------------------|
| 0 | Nav Display Centered |
| 1 - 2 | Nav Display Mode |
| 3 - 5 | Nav Display Range |
| 6 | Barometric Units |
| 7 | Altitude Units |

0x7802 First Officer's EFIS Settings Group 1

| Bit(s) | Function |
|--------|----------------------|
| 0 | Nav Display Centered |
| 1 - 2 | Nav Display Mode |
| 3 - 5 | Nav Display Range |
| 6 | Barometric Units |
| 7 | Altitude Units |

0x7803 Captain's EFIS Settings Group 2

| Bit(s) | Function |
|--------|------------|
| 0 - 1 | EFIS SW1 |
| 2 - 3 | EFIS SW2 |
| 4 - 6 | Show Items |
| 7 | Reserved |

0x7804 First Officer's Settings Group 2

| Bit(s) | Function |
|--------|------------|
| 0 - 1 | EFIS SW1 |
| 2 - 3 | EFIS SW2 |
| 4 - 6 | Show Items |
| 7 | Reserved |

0x7805 CrgSim Status Bits (From CrgSim)

| Bit(s) | Function |
|--------|-------------|
| 0 | VNAV Status |
| 1 | LNAV Status |
| 2-7 | Reserved |

0x781F MCP Status Bits (To CrgSim)

| Bit(s) | Function |
|--------|---------------------------|
| 0 | VNAV Button (pressed = 1) |
| 1 | LNAV Button (pressed = 1) |
| 2-7 | Reserved |

Examples

Set Nav Display Range

Set Captain's ND range to 160 NM and First Officer's range to 640 NM:

In Hex:

0x7804 = 0x75

In Binary

0x7804 = 01110101

Set Captain's ND mode to centered VOR and First Officers display to expanded (ARC) map mode:

In Hex:

0x7801 = 0x03 Indicate Capt centered VOR mode

0x7802 = 0x04 Indicate FO expanded Map mode

In Binary

0x7801 = 00000011

0x7802 = 00000100

Set LNAV and VNAV

LNAV and VNAV are simple to handle. As long as the button is being pushed the variable should be set to 1. When the button is not being pushed the variable should be set to 0.

The LNAV and VNAV lights are similarly simple. If the bit is on then illuminate the light. If the bit is 0 then do not illuminate the light.

Read LNAV and VNAV

An ON LNAV bit in the CrgSim status byte indicates that LNAV is active within CrgSIM. VNAV is indicated ON/Off in the same way.