



EMS MCDU Simulator

User Guide

This manual includes coverage of the following equipment:

Unit	Model	OEM Part No	EMS Part No	Software Version
			1252-SW-3801	100

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Revision 1.0

November 26, 2009
Document number

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Document title

Document No. Document number

Revision: number

Printed in Canada

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RECORD OF REVISIONS			
REVISION	SECTIONS REVISED	RELEASE DATE	COMMENTS
0.1			

LIST OF EFFECTIVE PAGES		
Pages changed, added, or deleted by the current revision		
PAGE NO	DATE OF ISSUE	COMMENTS

APPLICABLE SERVICE BULLETINS	
SERVICE BULLETIN NUMBER	SUBJECT
NA	NA

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INTRODUCTION

The EMS MCDU Simulator is a Graphic User Interface application which simulates a “Multi-purpose Control and Display Unit” as specified by the “ARINC characteristic 739A-1” ARINC document. Along this document EMS MCDU Simulator will be referenced as McduSim.

1.1 Overview

McduSim’s GUI shows a realistic MCDU panel where the user can interact with the SDU using the McduSim panel’s keyboard:



Figure 1 - EMS MCDU Simulator

1.2 Audience

This document is intended for SDU testers, test tool developers and product software developers. McduSim is currently an internal tool and must never be distributed or operated by any third party.

2 SUPPORTED CONNECTION OPTIONS

McduSim connects to EMS SDU's in two possible ways: through a ARINC 429 Interface or through the SDU's Maintenance Port.

2.1 ARINC 429 Connection

McduSim interfaces with third party ARINC 429 PCI cards or USB devices. The current McduSim version supports products from Data Device Corporation and TechSat.

2.2 Maintenance Port Connection

Support for McduSim was added for some EMS products. McduSim does not connect directly to EMS SDU's. Instead, McduSim interfaces with mTerm, a modified VT-100 Terminal program, which acts as a bridge between SDU and McduSim:

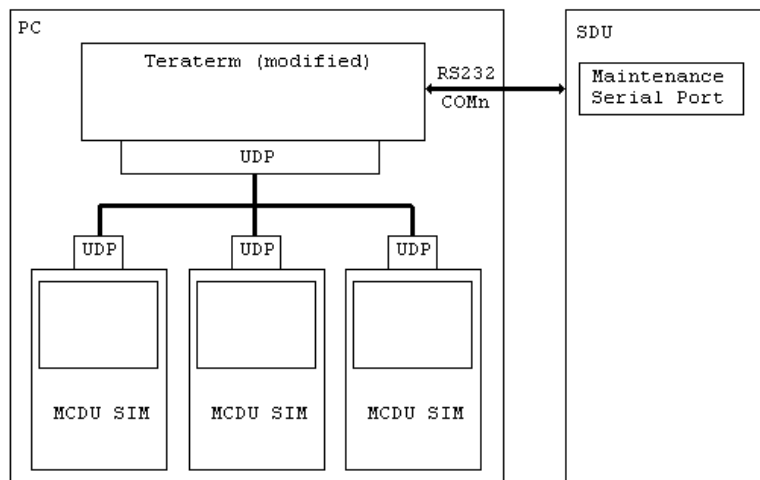


Figure 2 - McduSim UDP/Serial Connection

3 INSTALLATION

Mcdusim has a Windows compatible MSI installer file which simplifies the installation process to a simple “double click”.

3.1 *Firewall*

Mcdusim uses the following network ports depending which connection method is in use:

- **ARINC 429:** no ports used.
- **Maintenance Port:** UDP ports: 6000, 5001, 5002, 5003 and 5004.
- **Python Support enabled:** TCP ports 8000, 8001, 8002 and 8003.

Therefore, firewall should be set to allow local traffic for the above ports.

3.2 *ARINC connection support*

Proper device drivers are required to be installed before using Mcdusim for ARINC connection.

Mcdusim is integrated with the following DDC Libraries:

DD-42976S0: PCI Card Toolbox Version 1.4.3

DD-42992S0: ARINC 429 Multi-IO SDK Version 2.0.11

Refer to the proper Data Device Corporation's documentation for further installation details about their products.

Mcdusim is integrated with the following TechSat Libraries:

usb32nh.dll (version 3.64)

4 LAUNCHING EMS MCDU SIMULATOR

After the installation is completed the following shortcuts will appear in the Windows desktop “Start” menu:

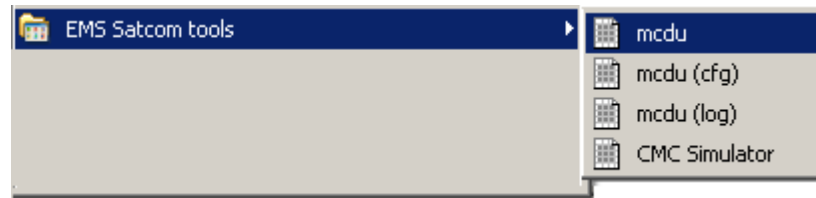


Figure 3 - Shortcuts

4.1 Shortcuts:

mcd�: launches McdûSim with the same settings then the last instance of itself.

mcd� (cfg): launches McdûSim displaying the configuration dialog (like command line option -c).

mcd� (log): launches McdûSim displaying the log console (like command line option -l).

CMC Simulator: launches CMC Simulator.

4.2 Command line options

Mcdusim can be launched from a console window. The “Help->Command Line Help” menu option displays the following dialog:

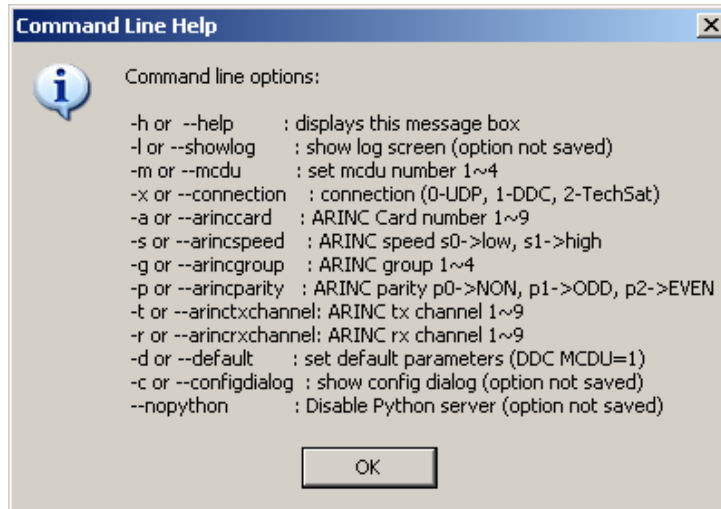


Figure 4 - Command Line

Command line options flagged as “option not saved” will not make effect when the Mcdusim starts again. All other options are “sticky” (saved). Options are saved every time an instance of Mcdusim is closed.

5 CMC SIMULATOR

MCDU Simulator Installer also provides a CMC Simulator. Its mains screen provides a monitoring for ARINC Labels as following:

Label	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	SDI	SSM	Word
350																						
351																						
353																						
354																						
355																						
357																						
360																						
361																						

Status: Disconnected Clear

Figure 5 - CMC Simulator

Labels from 350~361 are defaults. Different labels can be provided by a file named "labels.txt". Each label should be in a single line in octal, for example:

350
351
...

A Periodic Words Dialog can be visible by selecting View->Show Periodic Word:

CMC Simulator - Periodic Words

Time (125)

☒ Auto 15 : 41

SDI: 00

SSM: Plus

05504055 Update

Flight Phase (126)

Not Used

SDI: 00

SSM: Normal Op.

60000056 Update

Command Word (227)

Equipment ID: 041

CTS Ready bit ☐

Cmd: Null

00041097 Update

Date Word YY-MM-DD (260)

☒ Auto 09 / 11 / 20

SDI: 00

SSM: Plus

10442480 Button

Flight Number (233-237)

5916040

SDI: 00

SSM: Normal Op.

Send

233 60E4D49B

234 60D8C49C

235 60D0C09D

236 6000C09E

237 6000009F

Aircraft ID (301-304)

C-GPUY

SDI: 00

Send

301 47580CC1

302 59AB40C2

303 000000C3

304 000000C4

Flight Leg Count: 0

New Flight Leg

Close

Figure 6 - Periodic Words Window

6 PYTHON SUPPORT

The installer places an EMS python module called “emstools.py” that allows python scripts to interact with Mcdusim to simulate user actions. Key-strokes and screen text reading are the most used functions. A help file called PythonHelp.txt is also placed by the installer. The standard location for both files is under:

“C:\Program Files\EMS Satcom\MCDUSIM\Python” directory.

- x - x - x -