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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Please send your comments to:

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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:

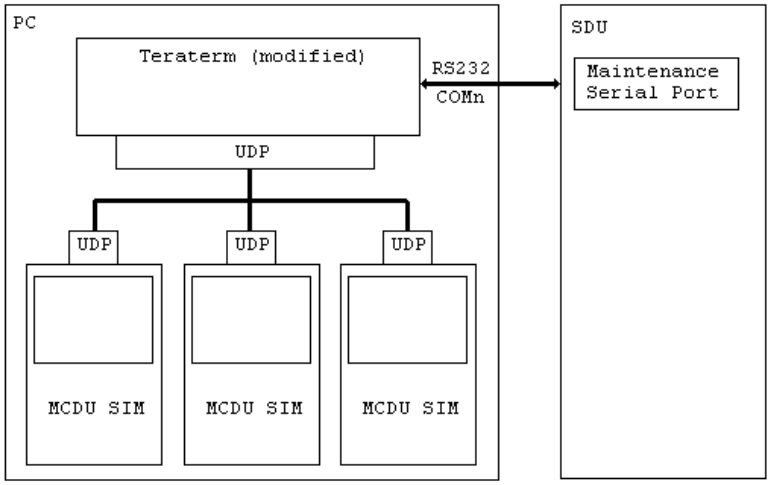

Figure 2 - McduSim UDP/Serial Connection

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:

mcdu: launches McduSim with the same settings then the last instance of itself.

mcdu (cfg): launches McduSim displaying the configuration dialog (like command line option -c).

mcdu (log): launches McduSim 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:

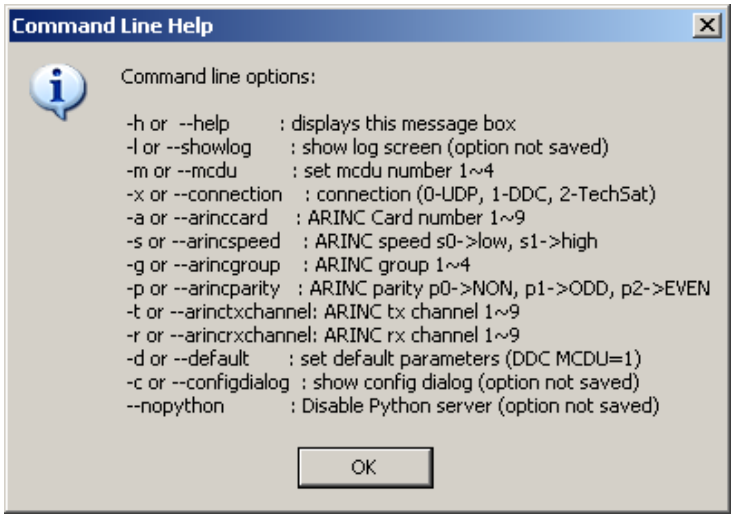

Figure 4 - Command Line

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:

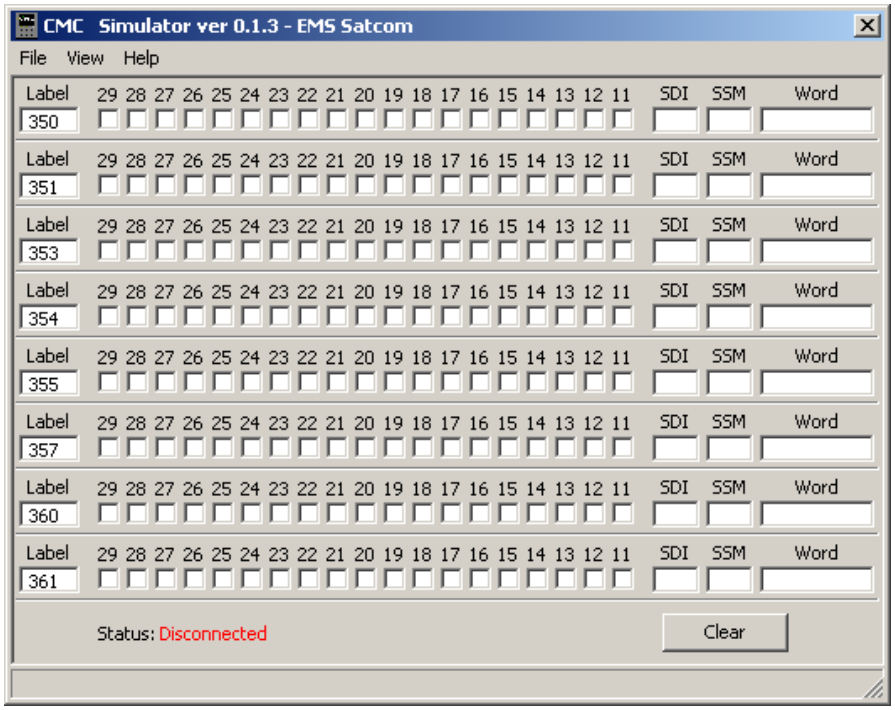

Figure 5 - CMC Simulator

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:

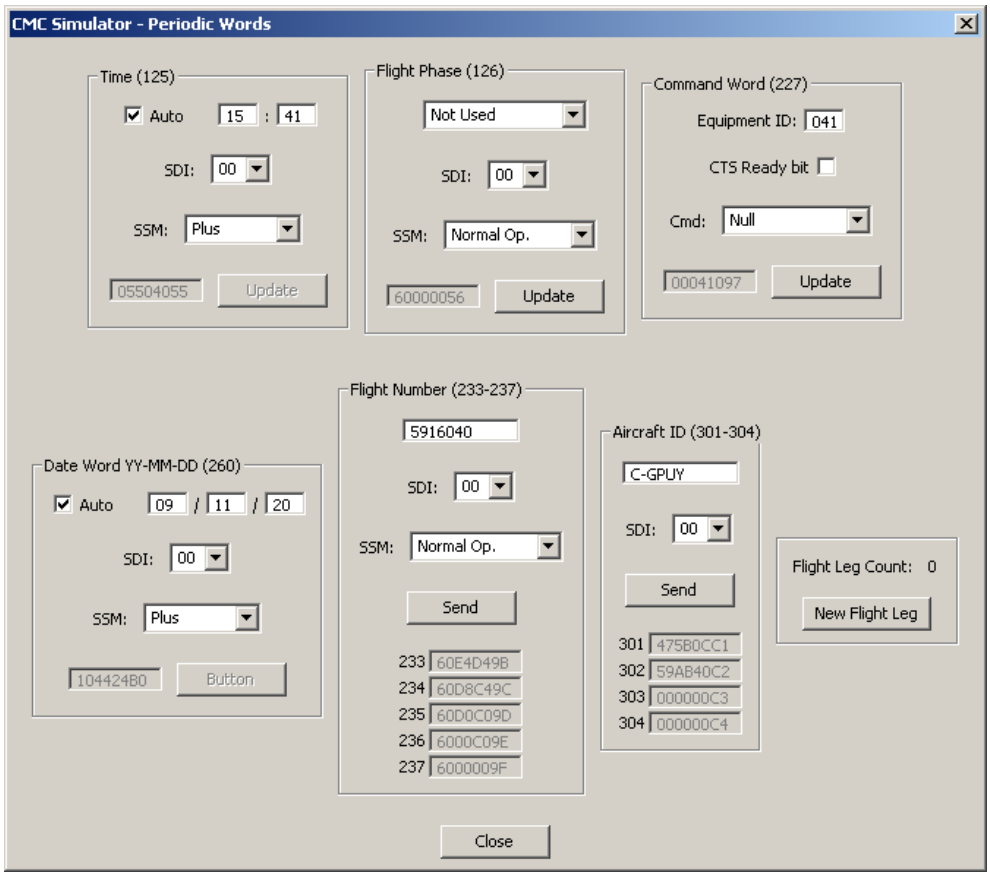

Figure 6 - Periodic Words Window

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 -