

W-EasySat Monitoring System

Application Note

WAVECOM[®]
NACHRICHTENTECHNIK

Introduction

'EasySatSystem' controls the satellite-modes running on a system of up to eight (8) W-PCI or W-PCI cards in a way that only one card monitors the same satellite communications session, identified by a specific satellite-mode (INMARSAT-B, INMARSAT-M, and INMARSAT-mini-M), a service (data, fax, ISDN, etc.), and mobile earth station identification number (termed MES Id in the following) at the same time. The monitoring system configuration is specified in a text file using a very simple syntax. For logging purposes, statisti-

cal data concerning the monitored sessions can be collected.

'EasySatSystem' has 3 kinds of user interfaces:

- ◆ the operational status display of the coordinated cards, i.e., the EasySatSystem' graphical user interface (GUI);
- ◆ the configuration interface, i.e., the text file EasySATSystem.ini, stored in some predefined directory;
- ◆ the MS-DOS command line with parameters.

Software Installation

During the installation of the product 'EasySatSystem' by means of the provided setup program, the directory into which the software shall be installed is specified. Hereafter, this directory is denoted as <easysatsystem_dir>

The following files can be found in <easysatsystem_dir>

- ◆ EasySatSystem.exe (the main and only executable)
- ◆ XMLRCICPP.dll (a required DLL)
- ◆ EasySATSystemUserManual.pdf (this document)
- ◆ FileHandler.exe (a program solely needed during the installation of 'EasySatSystem')
- ◆ WAVECOM_Decoder.chm, the Helpfile

Administrator privileges are required to modify the contents of the directory <easysatsystem_dir>.

The Config file is stored in the directory (referred to as <easysatsystem_config_dir>):
C:\Documents and Settings\All Users\Documents\WAVECOM\EasySat System\Config

This directory contains the files

- ◆ EasySatSystem.ini
- ◆ Template-EasySatSystem.ini

By default, after start of EasySATSystem.exe, the program looks in this <easysatsystem_config_dir> directory for the required configuration file EasySATSystem.ini. However, a different directory can be specified by setting the environment variable EASYSATSYS_CONFIG_DIR accordingly.

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The collected data will be stored in the directory (referred to as <easysatsystem_data_dir>)

- ◆ C:\Documents and Settings\All Users\Documents\WAVECOM\EasySatSystem\Data.

By default, the <easysatsystem_data_dir> directory will be used to store statistical data files (if logging has been enabled; see below). Again, a different directory can be specified by setting the environment variable EASYSATSYSTEM_DATA_DIR accordingly. User privileges are sufficient to modify (i.e., also delete) the subdirectories \Config and \Data as well as their respective contents.

In order to have 'EasySatSystem' working properly, the 'XML Remote Control Interface' port has to be opened on each personal computer (PC) hosting W-PCIe or W-PCI cards to be coordinated. This is done as follows

- ◆ Open 'Control Panel'
- ◆ Open 'Windows Firewall'
- ◆ If the 'On' button is set, then clear the 'Don't allow exceptions' checkbox
- ◆ Select the 'Exceptions' tab
- ◆ Click on 'Add Port...' and give a name and set the port number to the default value of 33234, or to the value you have specified in the tab 'Networking Information' of the W-PCIe or W-PCI Wavecom-ServerControl GUI

For test purposes, it might also be necessary to open the port for the GUI of W-CODE (default value of 33233)

Furthermore, on each PC hosting W-PCIe or W-PCI cards to be coordinated, the respective Wavecom-Service must be running and allow remote connections. In order to allow remote connections to a WavecomService, check the box 'Allow Remote Connections' in the tab 'Networking Information' of the respective W-CODE WavecomServerControl GUI.

Software Setup

'EasySatSystem' can run on any PC under the Microsoft Windows 7, XP or Server2008 operating system. If cards on more than one PC must be coordinated, then the PCs must be connected via a network.

'EasySatSystem' must be told somehow which PCs with which W-PCIe or W-PCI cards it must coordinate. This is done with the configuration file EasySATSystem.ini, which, by default, needs to be located in the directory <easysatsystem_config_dir>.

An alternative location can be specified by means of the environment variable EASYSATSYSTEM_CONFIG_DIR.

In the EasySATSystem.ini file, one can also specify the sessions to exclusively be watched by listing the respective MES Ids; if no MES Id is specified, then all sessions will be watched.

It is also possible to specify the duration (in seconds) of the automatic level setting (ALS) performed at mode start-up. Only the first valid val-

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ue specified will be used, if several are given in EasySATSystem.ini.

If desired, 'EasySatSystem' collects statistical data concerning the monitored sessions. In such a case, when exiting 'EasySatSystem', a respective text file is stored in the directory <easysatsystem_data_dir> or in the directory specified by the environment variable EASYSATSYSTEM_DATA_DIR if it is set. The name

of such a file is 'Stat<dateAndTime>.txt', where <dateAndTime> denotes the date and time (including seconds) of the log-file creation, which occurs at the end of a monitoring session with 'EasySatSystem'. Be aware that such a file may become quite large. To enable statistical logging, a sampling interval (in seconds) greater than 0 has to be specified in EasySATSystem.ini. Only the first valid value specified will be used, if several are given in EasySATSystem.ini.

The name of the configuration file must be 'EasySATSystem.ini' (case-insensitive). Below, the syntax of the configuration file is specified, for which the following rules apply

- ◆ Whitespace (blanks, tabs) can be expanded to any length
- ◆ EOL means end-of-line
- ◆ * means repetition 0 or more times
- ◆ Single superscript (e.g., xyz¹⁰) means repetition exactly the given number of times
- ◆ Range superscript (e.g., xyz¹⁻⁹) means repetition with minimum and maximum bounds
- ◆ Bold words must appear exactly as shown
- ◆ | means alternative
- ◆ Terms in <...> are expanded

The starting point for the syntax is <config>

```
<config> ::= <section>+
<section> ::= <cardSection> | <mesWatchSection>
           | <alsPeriodSection> | <logPeriodSection>
<cardSection> ::= <cardSectLine>EOL
                <addrLine>EOL<snLine>EOL<modeLine>EOL
<cardSectLine> ::= [card_<n>]
<n>             running number starting at 1
<addrLine>     ::= address = <nameOrIPAddress>;
<nameOrIPAddress> ::= char1-32
<snLine>       ::= serialNo = <serialNo>;
<serialNo>     ::= numchar1-3
<modeLine>     ::= <mode>;
<mode>         ::= sat-b | sat-m | sat-mini-m
<mesWatchSection> ::= <watchSectLine>EOL<watchLine>EOL
<watchSectLine> ::= [watch]
<watchLine>     ::= mesid = <mesIdNo> ;
<mesIdNo>       ::= numchar1-5
<alsPeriodSection> ::= <alsPeriodSectLine>EOL<periodLine>EOL
<alsPeriodSectLine> ::= [als]
<logPeriodSection> ::= <logPeriodSectLine>EOL<periodLine>EOL
<logPeriodSectLine> ::= [log]
<periodLine>    ::= period = <seconds> ;
<seconds>       ::= numchar
```

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- ◆ The string <nameOrIPAddress> can be the PC name, or the dotted IP address of the PC. The local PC of 'EasySatSystem' can also be denoted by 127.0.0.1.
- ◆ A maximum of 10 card-sections can be specified. Each card can run on its own PC, so there can be a maximum of 10 PCs. One PC can have a maximum of 8 cards.
- ◆ The number of MES Id watch-sections is not limited.

Following are two examples of valid configuration files. Example 1 shows the configuration file for a system with 4 cards configured for INMARSAT-B, 1 for INMARSAT-M and 5 for INMARSAT-mini-M, residing on 2 different PCs (Niklaus2 and Test-w61pc). All MES Ids shall be considered, no ALS shall be performed, and no statistical data shall be collected. In Example 2, the system to be monitored consists of 3 different PCs and 4

cards: the local one (127.0.0.1) with one card and two remote hosts, 123.45.67.89 with one card and ComputerA with two cards. On all cards INMARSAT-B transmissions with specific MES Ids shall be monitored. Furthermore, ALS shall be performed for a period of 5 minutes (300 seconds), and statistical data shall be collected every 30 seconds.

```
Example 1:
[card_1]
address = Niklaus2;
serialno= 0508002720;
mode    = sat-b;
[card_2]
address = Niklaus2;
serialno= 0508001120;
mode    = sat-b;
[card_3]
address = Test-w61pc;
serialno= 0508007220;
mode    = sat-b;
[card_4]
address = Test-w61pc;
serialno= 0508004620;
mode    = sat-b;
[card_5]
address = Test-w61pc;
serialno= 0508005620;
mode    = sat-m;
[card_6]
address = Test-w61pc;
serialno= 0508008320;
mode    = sat-mini-m;
[card_7]
address = Test-w61pc;
serialno= 0508002120;
mode    = sat-mini-m;
[card_8]
address = Test-w61pc;
serialno= 0508010020;
mode    = sat-mini-m;
[card_9]
address = Test-w61pc;
serialno= 0508003620;
mode    = sat-mini-m;
[card_10]
address = Test-w61pc;
serialno= 0508003920;
mode    = sat-mini-m;
```

```
Example 2:
[card_1]
address = 127.0.0.1;
serialno= 0508002720;
mode    = sat-b;
[card_2]
address = ComputerA;
serialno= 0508001120;
mode    = sat-b;
[card_3]
address = 123.45.67.89;
serialno= 0508007220;
mode    = sat-b;
[card_4]
address = ComputerA;
serialno= 0508004620;
mode    = sat-b;
[watch]
mesid   = 12345;
[watch]
mesid   = 54321;
[watch]
mesid   = 67890;
[watch]
mesid   = 98765;
[als]
period  = 300;
[log]
period  = 30;
```

The rules must be followed strictly. If there is an error in the EasySATSystem.ini file, the corresponding card will not be included in the coordination process.

System Operation

'EasySatSystem' must be started by the user. The command to start 'EasySatSystem' has the following format

```
<easysatsystem_dir>/EasySatSystem [/L:<n1>] [/A:<n2>]
```

The optional argument /L indicates that statistics data should be collected. The number <n1> must be in the range 4..120. This number specifies the sampling interval for the statistics data in seconds; (approximately) every n1 seconds a snapshot of the busy status of each card is taken and written at program termination to the statistics file Stat<dateAndTime>.txt in <easysatsystem_data_dir> or in the directory specified by the environment variable EASYSATSYSTEM_DATA_DIR if it is set. If this argument is not present, or n1 is not in the range

4..120, no statistics data will be collected. A sampling interval specified in the configuration file EasySATSystem.ini has precedence over the value passed as argument on the command line. Absence of both parameters indicates that no statistical data has to be collected.

The optional argument /A specifies the duration (in seconds) of the ALS that will be performed on each card. An ALS period specified in the configuration file EasySATSystem.ini has precedence over the value passed as argument on the com-

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mand line. Absence of both parameters indicates that no ALS has to be done.

After starting 'EasySatSystem', a new window appears on the display, showing one line of status information for each correctly configured W-PCI

or W-PCI cards, as well as the specified ALS period, sampling interval, and MES Id watch-list. The maximum number of cards is fixed to maxN=10, since the window has space for exactly this number. If less than maxN cards are configured, the remaining lines contain empty fields.

Column heading	Meaning
Number	This is the global number of the card within the scope of the coordinated cards; range: 1..maxN
SAT Mode	The SAT mode configured on this card
Computer Name or IP Address	Address of the computer of this card; can be the (dotted) IP address or the computer name; maximum length 30 characters
Serial #	Serial number of this card
Op Status	Operational status of the card, this can be <ul style="list-style-type: none">◆ 'Not Connected': the PC of this card is not under control of 'EasySatSystem'◆ 'Host Connected' (transient): the PC has answered to 'EasySatSystem' and announced all its cards◆ 'Card Ready' (transient): the card has answered◆ 'Mode Running': the mode was set on the card◆ 'Busy Session': the card is monitoring a SAT session
MESId	If Op Status is 'Busy Session', this is the forward MES Id of the terminal being in the monitoring session, otherwise this field is empty
Service	If Op Status is 'Busy Session', this is the service being monitored, otherwise this field is empty

The term 'transient' means that this state may last only a very short time, and is therefore possibly not visible for the user.

If a configured card is not shown at all, then there must be an error in the respective card's specification in the EasySATSystem.ini file.

There is only one button available, named 'Exit'. Pressing this button will terminate the program, as will pressing the 'Close' button in the window frame.

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- ◆ At start-up, 'EasySatSystem' does not automatically synchronise with the operational status of the cards, meaning that, if a card is already in a session, this is not shown. Only at the next status change of the card, the 'Op Status' field will display the correct status.
- ◆ It can take some time until the program has properly terminated after pressing 'Exit' or 'Close'.
- ◆ The system does not check if more than one instance of 'EasySatSystem' coordinates the same card (s). So make sure to start this program with the same cards configured only once.
- ◆ It is recommended to manually control from time to time the signal level settings at the different cards under the control of 'EasySatSystem', also when ALS is enabled.

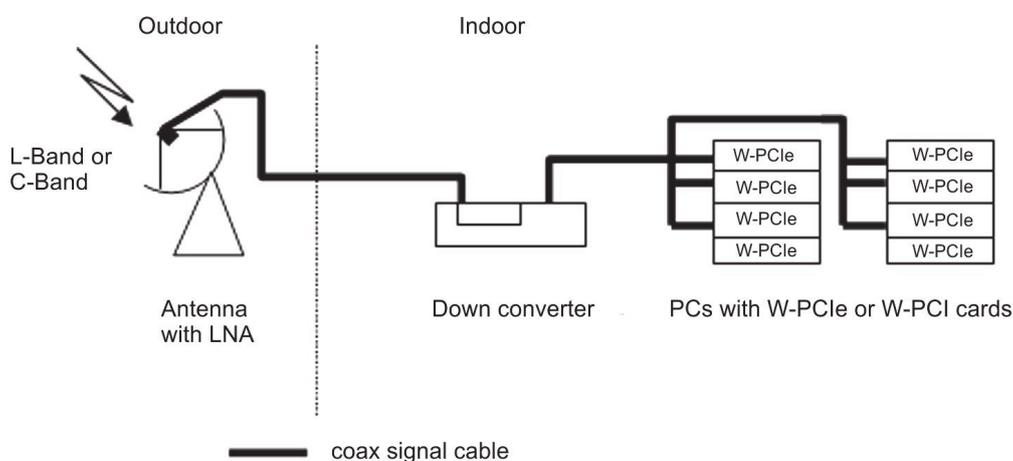
ERROR HANDLING

'EasySatSystem' tries to connect configured, but not connected cards approximately every 30 seconds. All cards not connected are shown in the 'Op Status' field accordingly.

Hardware Recommendations

This document describes how the Wavecom W-PCle or W-PCI cards can be used to implement a simple INMARSAT L-Band Monitoring system. A brief overview of the INMARSAT System is given in the help file of W-CODE.

The W-CODE Software allows the monitoring of the L-Band downlink (in the 1550 MHz range, also called forward path) of the INMARSAT System. This link contains the information from the Land Earth Station to the Mobile Earth Stations, MES.



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The monitoring system consists of three main components

- ◆ An antenna, including a low noise amplifier (LNA)
- ◆ A down converter L-Band or C-Band with IF 70 MHz
- ◆ One or more W-PCIe or W-PCI card(s)
- ◆ One or more card hosts

These components are connected via coax cable. If more than one W-PCIe is to be fed from the same source, a splitter must be used to correctly match the input impedance of the 70 MHz input.

The recommended PC requirements are

- ◆ Windows 7 32-bit/64-bit or Server 2008 with the same number of PCIe or PCI slots as the number of cards to be installed
- ◆ Intel® Core i5 or i7 2.8 GHz, 4 - 8 GB RAM and a hard disk with 500 GB to 1 TB of free space.
- ◆ Wavecom recommends up to four cards in a computer, if the cooling and power supply are appropriate.

Wavecom recommends the following products

L-Band

Dish antenna

3.7 m epoxy-glass resin dish

Feed and LNA

L-Band, Dual-Polarization-Feed with integrated LNA (1.5-1.7 GHz) from <http://www.globotech.ch>

Down converter

MP-9201 Satellite Down converters from <http://www.microphaseinc.com>

C-Band

Dish antenna

5 - 7 m epoxy-glass resin dish

Feeds and LNA

C-Band-Feed, Seavey ESA-44C C-Band Dual Circular Polarity Feed horn (INTELSAT Feed 3.7 GHz – 4.2 GHz) from www.vincor.com

C-Band LNA LNA8000N from www.norsat.com

Down converter

MP-9240 Satellite Down converters from <http://www.microphaseinc.com>

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Since more than thirty years Wavecom Elektronik AG has developed, manufactured and distributed high quality devices and software for the decoding and retrieval of information from wireless data communication in all frequency bands. The nature

of the data communication may be arbitrary, but commonly contains text, images and voice. The company is internationally established within this industry and maintains a longstanding, world-wide network of distributors and business partners.

Product Information

Products	http://www.wavecom.ch/product-summary.php
Datasheets	http://www.wavecom.ch/brochures.php
Specifications	http://www.wavecom.ch/product-specifications.php
Documentation	http://www.wavecom.ch/manuals.php
Online help	http://www.wavecom.ch/content/ext/DecoderOnlineHelp/default.htm
Software warranty	One year free releases and bug fixes, update by DVD
Hardware warranty	Two years hardware warranty
Prices	http://www.wavecom.ch/contact-us.php

System Requirements

	<i>Minimum</i>	<i>Recommended</i>
CPU	Core i5 or Core i7 2.8 GHz	Core i7-6700 3.4 GHz
Memory	4 - 8 GB RAM	16 - 32 GB RAM
OS	Windows 7	Windows 10 32-bit or 64-bit

Distributors and Regional Contacts

You will find a list of distributors and regional contacts at <http://www.wavecom.ch/distributors.php>