

# **RASS-R Data Handling Module**

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Abstract           The RASS-R Data Handling Module User manual describes the Data Handling module and the software components of which it is built.           These manual supplements the RASS-R Toolbox manual, and assumes that you are familiar with that material. You should also be familiar with the operation of your computer, your computer's operating system and the Intersoft Electronics specific hardware for Radar Data I/O.			
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#### **DOCUMENT APPROVAL**

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#### DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITIO N	DATE	REASON FOR CHANGE	SECTIONS PAGES AFFECTED
1.0	06/01/05	New document	All
1.1	16/02/05	Revised, change from draft to final version	All
1.2	06/04/06	New Modules added	All
1.3	30/10/07	Manual updated to DHM version 2.4.0 New modules added Chapters about File Merger and Advanced File Merger added	All
1.4	30/04/08	Manual updated to DHM version 2.7.0 Chapter 4 split into 4. DHM Configuration Manager and 5. Session Editor Features added in the DHM Configuration Manager Software components added: ADCCPConvert/DataManipulation/D6Manipulation/CD- 2ccConvert Filter in software components is only active for ASTERIX CAT001/048 and will be described in next manual update.	All
1.5	01/09/08	Manual updated to DHM version 2.8.0; Printscreens / status windows updated; New functionalities in the DHM Conf. Mgr, as described in section "4.2.7 View functions" and "4.2.8 Advanced functions"; New functionalities in the DHM Session Editor, as described in section "5.2.7 Advanced session modes" and "5.2.8 Sanity check"; Chapter 6: software components: Introduction completed; Some of the software modules have a tab "Script", this feature is still under development and not described yet; Filter in AsterixCat001/048 described (section 6.9); AsterixCat017 described (section 6.16); AsterixCat018 described (section 6.17); AsterixCat018 described (section 6.20); D6Filter (section 6.36); D6Recorder, explanation added (section 6.38); RDIFConvert (section 6.61) was already available in DHM v2.7.0; Recorder, explanation added (section 6.64); UDR (section 6.83), DTE/DCE disabled (only for active LAP-B output);	All



7	16/04/09	Manual updated to DHM version 2.9.0;	All
		Glossary added	
		Chapter 1,2 and 3 renewed;	
		Section 4.2.2, DHM version number is reported	
		Chapter 6, introduction improved	
		Chapter 6, 7 and 8, printscreens updated	
		Section 6.31 renamed to AsterixPacketizer	
		Section 6.9 AsterixCat001_002Convert added,	
		Section 6.18 AsterixCat019Convert added,	
		Section6.19 AsterixCat020Convert added,	
		Section 6.24 AsterixCat034 048Convert added,	
		Section 6.47 module name changed to EDRRecorder and type	
		explained,	
		Section 6.57, module name changed to pcapInput	
		Section 6.76, support of the UVR892	
		Chapter 7 File merger updated	
		References added	
8	09/11/09	Manual updated to DHM version 2.9.1:	P59 - P190
		Section 6.2 ADS-B Decoder added	
	00/10/10	Section 6.59 and 6.60 Replay increased to 12 channels	
9	02/12/10	Manual updated to DHM version 2.10.0:	P21 - P196
		TCP/IP port numbers – note added in Table 2-1;	
		Time Keeper described at start of chapter 6 ;	
		6.2 ADS-B Decoder has updated explanation;	
		Replay modules have speed parameter better explained (paragraph 6.39 and 6.48);	
		versions mentioned for various convert modules;	
		ASTERIXCatSplitter: updated with better explanation (paragraph	
		Section 6.6 Alenia RHP Decoder added;	
		Reference [4] and [5] added at the end of this manual; TMD module (section 6.76), offset explained;	
		Section 9.5 USB device troubleshooting added	
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10	10 511 12	ARUP convert module added; Extended CAT48 and SP added to	197
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		Logo updated;	121
		Figure 3 toolbox updated;	
		Paragraph 6.2 updated along with figure Figure 62;	
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		142	
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			P26-27, P30-31,
			P33-34, P36,
			P39-40, P42-48,
			P50, P52, P54,
			P56, P58-60,
			P65, P73, P75,
			P117-118, P121-
			122, P134, P149, P160-162, P171,
			P177, P179,
			P188, P191-193,
			P196
14	19-MAR-13	Paragraph 6.76 TMD module for UVR892 added.	P182-172
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16	05-Sept-17	Added ASTERIX CAT9 convert module	P80
17	19-Oct-17	Review for release 3.8.1 Cat009 and Cat023 module changes Update logo and lay out toolbox	P25, P83-85, P98-99
18	20-Apr-18	Adding Mode 4 feature in ASTERIX CAT48 and CAT34-48 modules	104, 108
19	10-Oct-18	Adding mapping info of the ASTERIX CAT34 type info	106
20	13-May-19	Adding the RAW recorder module	163



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#### CONVENTIONS USED IN THIS MANUAL

The following conventions are used in this manual:

and the

Note: This icon to the left of bold italicized text denotes a note, which alerts you to important information.



*Caution: This icon to the left of bold italicized text denotes a caution, which alerts you to the possibility of data loss or a system crash.* 



*Warning: This icon to the left of bold italicized text denotes a warning, which alerts you to the possibility of damage to you or your equipment.* 



#### GLOSSARY

ACC	Air traffic Control Centre
ACP	Azimuth Change Pulse
ADS-B	Automatic Dependent Surveillance, Broadcast
ARP	Azimuth Reference Pulse
Asterix	All Purpose Structured Eurocontrol Radar Information Exchange
	· · · · · · · · · · · · · · · · · · ·
Asterix Data Block	Unit of information seen by the application as a discrete entity by its
	contents. A Data block contains one or more Record(s) containing data of the same category.
Asterix Record	A collection of transmitted Data Fields of the same category
ASTC	Air Traffic Control
Baud	Unit of signal frequency in signals per second. Not synonymous with
Dauu	bits per second since signals can represent more than one bit. Baud
Buffer	equals bits per second only when the signal represents a single bit.
	Temporary storage for acquired or generated data.A byte stream is an abstraction used in computer science to describe a
Byte-stream	particular kind of communication channel between two entities.
	It is a channel (often bidirectional, but also unidirectional) down
	which one entity can send a sequence of bytes to the entity on the
	other end. In almost all instances, the channel has the property that it is
	reliable; i.e. the exact same bytes emerge, in the exact same order, at
	the other end.
CAT001	Monoradar Data Target Reports, from a Radar Surveillance System to
CATUUI	an SDPS
	(plots and tracks from PSRs, SSRs, MSSRs, excluding Mode S and
	ground surveillance)
CAT002	Monoradar Service Messages
CA1002	(status, North marker, sector crossing messages)
САТ034	Monoradar Service Messages, next version of CAT002
CAT048	Monorader Data Target Reports, next version of CAT001
COTS	Commercial Off The Shelf
D6	Intersoft Electronics internal Radar data format, plot or track based.
Data bits	In data communications, the number of bits used to send each
Data Dits	character, not including any added timing or error checking bits
DCE	Data Communications Equipment. The local and/or remote modem. A
DCL	DCE is usually connected to a DTE.
DHM	Data Handling Module
DTE	Data Terminal Equipment. The computer or terminal, either local
DIL	(yours), or the remote (the one you're communicating with). A DTE is
	usually connected to a DCE.
EDR	Intersoft Electronics internal data format for record based data. Also
	stands for Extended Data Recorder, a device for generating and
	capturing serial data.
EDR V2	Second version of the EDR format.
Ethernet	A network specification developed by DEC, Intel, and Xerox which
	provides anywhere from 10 megabits to 1000 megabits per second
	transmission speeds.
Event	Event, signals occurrences between event source and receiving
_,	software module, Events include North, Time, ACP/ARP
FDDI	Fiber distributed data interface



FIFO	A first-in-first-out memory buffer. In a FIFO, the first data stored is		
	the first data sent to the acceptor.		
Flow control	A method of controlling when information is sent		
GPS	Global Positioning System		
HDLC	Abbreviation for High Level Data Link control. A Link-Level protocol		
	used to facilitate reliable point-to-point transmission of a data packet.		
	Note: A subset of HDLC, known as 'LAP-B,' is the Layer-two		
	protocol for CCITT Recommendation X.25.		
Hex	Hexadecimal. 16 based numbering system ranging from 0 to F		
ICD	Interface Control Document		
IE	Intersoft Electronics		
I/O	Input/Output		
IP	Internet Protocol		
LAN	Local Area Network		
LAPB	Link Access Protocol for Channel B. (ISDN, Data Link). The		
	balanced-mode, enhanced version of HDLC. Used in X.25 packet-		
	switching networks.		
LCN	The LCN is an index number which identifies a circuit between		
	endpoints on an X.25 network.		
MB	Megabytes of memory.		
Memory buffer	See buffer.		
MIB	Management Information Base		
Monopulse	Radar-receiving processing technique used to provide a precise		
	bearing measurement		
MSSR	Monopulse Secondary Surveillance Radar		
NM	Nautical Mile, unit of distance		
Path	A path can be described as a file's address on your file system,		
	describing where the file lives: An absolute path gives the complete		
	path, starting at the root directory, or the very top of the filesystem; A		
	relative path looks for a file from the directory you are currently in		
Deem	down.		
Pcap POEMS	Package capture, raw network packages format.		
POENIS PSR	Pre-Operational European Mode-S		
PSK PVC	Primary Surveillance Radar Permanent Virtual Circuit		
Radar	Radio Detection And Ranging		
RAID	Radio Detection And Ranging           Redundant Array of Independent Disks. Overall term for computer		
KAID	data storage schemes that can divide and replicate data among		
	multiple hard disk drives to improve data reliability and/or increase		
	input/output performance		
RASS-R	Radar Analysis Support Systems – Real-time measurements		
RASS-S	Radar Analysis Support Systems – Site measurements		
RCS	Radar Cross Section		
RDP	Radar Data Processing (system)		
Record	A collection of data forming a complete message.		
RS323, RS422	The Electronics Industry Association (EIA) has produced standards		
,	for RS232 and RS422 that deal with data communications.		
RF	Radio Frequency		
RMCDE	Radar Message Convert and Distribution Equipment		
RTQC	Real Time Quality Control		



RX	Receiver		
SAC	System Area Code		
SIC	System Identification Code		
SLS	Side Lobe Suppression, a technique to avoid eliciting transponder replies in response to interrogations transmitted via antenna sidelobes		
SNMP	Simple Network Management Protocol. Internet Suite Protocol used in network management systems to monitor network-attached devices.		
SSR	Secondary Surveillance Radar		
Stop bits	Used to indicate the end of each character as it is transmitted		
SVC	Switched Virtual Circuits		
ТСР	Transmission Control Protocol		
Timeout	A timeout occurs when a device has waited too long for another		
	device to send or receive a transmission.		
TMD	Technical Maintenance Display		
Transponder	Airborne unit of the SSR system, detects an interrogator's		
	transmission and responds with a coded reply stating either the		
	aircraft's identity or its flight level		
TTL	Time To Live. An internet header field which indicates the upper		
	bound on how long this internet datagram may exist.		
ТХ	Transmitter		
UAP	User Application Profile, used in Asterix data for assigning Data Items		
	to Data Fields.		
UDP	User Datagram Protocol. A connectionless, unreliable Internet		
	protocol.		
UTC	Coordinated Universal Time		
X.25	<ul><li>X.25 is the CCITT's recommendation for the interface between a DTE and DCE over a Public Switched Telephone Network (PSTN).</li><li>Generally, X.25 covers layers 1 to 3 of the ISO communication model, but the term is used here to refer specifically to packet layer 3. X.25 is carried within the Information Field of LAPB frames.</li></ul>		





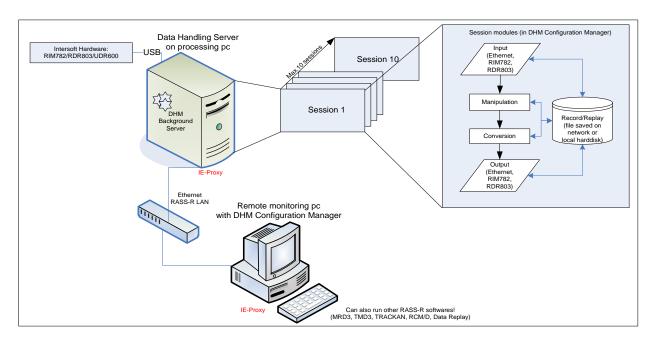
# 1 Introduction

The RASS-R Data Handling Module (DHM) is a radar data input/output system.

On the one hand it can run as RMCDE, large scaled in an ACC or smaller setup on the radar site. On the other hand, it can be the backbone for other RASS-R programs by preprocessing data for displaying in the MRD3 and TMD3 and analysis in the TRACKAN or Radar Comparator Mono/Dual. It can also be used in combination with the Data Replay tool to reinject timestamp corrected data.

The DHM consists of 2 main parts: the **DHM Background Server** and the **DHM Configuration Manager**. The DHM "background" Server is a process that runs as a service in the background of the computer, while the DHM Configuration Manager is a HMI to connect to the DHM Server. Due to its unique design, both components offer complete scalability:

- The DHM Background Server and DHM Configuration Manager can both run on the same computer or separately on two computers (As in the figure below). In the latter case, the computer with the DHM Background Server on is often referred to as 'processing pc' while the DHM Configuration Manager runs on the 'monitoring pc'.
- Dependent on the required processor load, (RAID) disk space, network interface cards etc.; the DHM can run on a dedicated server, desktop or laptop.
- One or multiple DHM Servers can be combined in a network with one or multiple DHM Configuration Managers allowing remote connection and editing.
- When a licensed IE-PROXY (SNMP-agent) is running on the processing and monitoring pc's, SNMP-messages supporting Intersoft Electronics private MIB can be exchanged with any 3rd party SNMP-manager. (refer to the user manual from the IE-PROXY)
- The DHM Server allows running multiple sessions simultaneously. A session is defined as a DHM process executed on radar data.



*Figure 1: Block diagram of the DHM (processing and monitoring pc)* 



## 1.1 Benefits and possibilities of the system

- Input (recording) and output (replay) of radar data through various computer interfaces (for example Ethernet, serial port, FDDI)
- Input (recording) and output (replay) of radar data through various Intersoft Electronics hardware devices (UDR600, RIM782, RDR803, PRE790)
- Real-time filtering of data on all available data fields (for example filter on S-addresses, filter on presence of MB data)
- Scalability and reuse; new data handling modules can be plugged in (possibly into live system) as they are developed or updated and they will seamlessly integrate with existing modules.
- The same input data may be processed in different ways and be presented at different outputs.
- Different inputs may be merged to the same output.
- Data manipulation modules can take input from external source and do error correction on the life data stream.
- Protocol conversion is possible from and to any data format.
- Duplicate sessions may be configured for redundancy.
- Live testing and modification of sessions on a running system without disturbing running mission critical sessions.
- Client specific demands are easily integrated.
- Time module which can connect to a variety of sources can use this time stamp to correct or modify the data streams.
- Status reporting when used with licensed IE-Proxy SNMP agent.



# 2 General overview

As already explained in the introduction in the first chapter, the DHM consists of the DHM Background Server and the DHM Configuration Manager. Both applications can be run on the same computer (see figure below) or on different computers. (See Figure 1) In the next paragraphs, a general overview of both parts is given.

Then, in chapter 3 you can read the details about the DHM Background Server and in chapter 4 about the DHM Configuration Manager with in chapter 5 it's Session Editor.

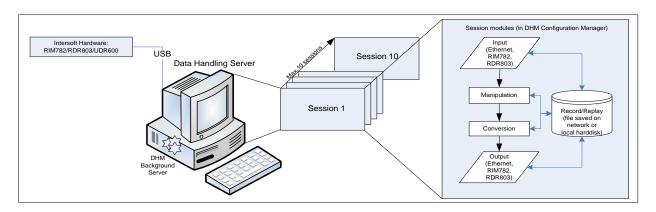


Figure 2: Block diagram of the DHM (single pc)

## 2.1 Network operation

The DHM uses several TCP/IP ports for different purposes. It is important that these ports are free for use on the target system. The table below shows an overview of the ports used by the DHM.

Table	2-1:	DHM	TCP/IP	ports
-------	------	-----	--------	-------

Port number	Used by	Usage
5555	DHM Discovery	Discover DHM Background servers running on the connected networks
5570	DHM Background Server	Inter-application communication with DHM Configuration Module
5572	DHM Background Server	Webinterface; inter-application communication with TMD3
5870	DHM Configuration Manager	Inter-application communication with DHM Background Server



Should any of these ports be occupied by another essential program, the port numbers could be changed. Please contact support if this is required.

## 2.2 DHM Background Server

The DHM Background Server is configured to run as a Windows XP service. The module doesn't have a user interface of its own. Therefore, configuration is done with the DHM Configuration Manager.

The server module can be installed onto multiple systems. This is useful for:

- dedicated tasks
- redundancy for failsafe operation
- distributed processing

The server module can be configured to start previously stored configurations at start-up of the computer before user logon.



## 2.3 DHM Configuration Manager

All configuration of the DHM Background Server is done with the DHM Configuration Module. This connection can be done either remotely (as in Figure 1) or locally as in (Figure 2). The DHM Configuration Manager allows you to create, edit, run and monitor sessions on the DHM Background Server.

Sessions are built up of software components, these components can be categorized in 3 types:

**Input modules**, collect data from external sources, external here means external to the Data Handling Module which in itself is a software service. External sources include Ethernet, files (for recording) and hardware (for example RIM782/RDR803/UDR600 as in Figure 2).

**Processing modules**, modify, manipulate or process the data presented at the input of these modules. Modifying include stripping/adding transport layers, converting protocols and error correction.

**Output modules**, provide the handled data to the outside world, outside means outside of the Data Handling Module which is viewed as a software service. External destinations include Ethernet, files (for replay), hardware (for example RDR803 or UDR600 as in Figure 2) and special inter application data exchange protocols. (for example to send preprocessed data from the DHM to the MRD3)

Software components communicate with each other via an internal buffering system, a module's output is connected to the next module's input via a FIFO buffer. All components are described in chapter 6.





## 2.4 DHM as the backbone of the RASS-R toolbox

The DHM Configuration Manager can be opened in the RASS-R toolbox.

The RASS-R toolbox is installed on your pc and has a shortcut on the desktop. It can also be accessed using the Windows Start-menu. The toolbox is displayed below. The current version of the RASS-R toolbox is displayed in the right upper corner. The DHM Configuration Manager is

part of this RASS-R toolbox and can be opened using the appropriate icon

RASS-R						X
2 2	Current Configuration:	CAMPAIGN	RASS-R		3.8.1	0
						A LEWISCH AL
Data Handling	<b>100</b>	Display &	Monitoring	Radar Comparator Dual	Analysis	
		Multi Radar Display				
				Radar Comparator Mon		
				Data Replay		
				Coverage Map Calculatio	on	
					INTERSOFT	

Figure 3: RASS-R Toolbox

The menu bar contains the following items:

Table 2-2: RASS-R Menu bar:

Button	Usage		
Help window	When this button is clicked, the Help window will appear and show help information whenever you point over a button.		
Campaign change	Click this to make an appropriate campaign structure (see further)		
<b>_</b>	Under development		
Site file	Under development		
Print graphs	Under development		
Print tables	Under development		
O Exit	Quit the application		

When you click the button, it will ask you where you want to create your RASS-R campaign folder. Select the correct path. Upon completion, you should have the following directory structure created as in the figure below.



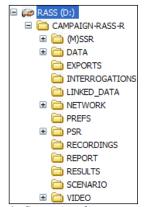


Figure 4: Campaign directory structure

and the

When you make a campaign folder with the RASS-R toolbox, it is preferred to make it on a separate drive than the drive where your operation system is on. For example, as in the figure above, a structure named "CAMPAIGN-RASS-R" is created on the D-drive.



# 3 DHM Background Server

# You might need to be logged on as an administrator or a member of the Administrators group in order to perform some tasks.

The DHM Background Server is configured to automatically run at start-up of your computer, you may alter this default setting and start the service manually when needed.

The DHM Background Server can be started using the Windows XP services management console.

To open Services, click **Start**, point to **Settings**, and then click **Control Panel**. Double-click **Administrative Tools**, and then double-click **Services**. It can also be opened by typing "services.msc" in the Run command line. For information about using Services, click **Help** on the **Action** menu in Services.

The following window appears (this window might look different on your system depending on your installation):

Services							
<u>File Action View</u>	Help						
← → 💽 🗳 🔮	) 🖪 😫 🕨 🗉 🗉 🖦						
Services (Local)	🍓 Services (Local)	_					
	DHM Background Server	Name 🛆	Description	Status	Startup Type	Log On As	•
	_	COM+ System Appli	Manages t		Manual	Local System	
	Stop the service Pause the service	🖏 Computer Browser	Maintains a	Started	Automatic	Local System	
	Restart the service	Cryptographic Servi	Provides th	Started	Automatic	Local System	
		DataSvr2		Started	Automatic	Local System	
		DCOM Server Proce	Provides la	Started	Automatic	Local System	
		Dell 3007WFP		Started	Automatic	Local System	
		🖏 DHCP Client	Manages n	Started	Automatic	Local System	
		🙀 DHM Background Se		Started	Automatic	Local System	
		🏶 Distributed Link Tra	Maintains li	Started	Automatic	Local System	
		🏶 Distributed Transac	Coordinate		Manual	Network S	
		🖏 DNS Client	Resolves a	Started	Automatic	Network S	
		EloSystemService	Elo TouchS	Started	Automatic	Local System	
		68 D	All	Charles of	A	- I I C	
	Extended Standard						

Figure 5: Services Management Console

Locate the entry "DHM Background Server" and press the "Start Service ( $\blacktriangleright$ )" button to start the service and press the "Stop Service ( $\blacksquare$ )" button to stop the service.

After the service is running it will be visible as a separate executable named

YARDIOS\_SRV.exe (See Figure 26). Sessions can now be configured using the DHM Configuration Manager. Starting and stopping of the service can also be done by the Windows Start menu:

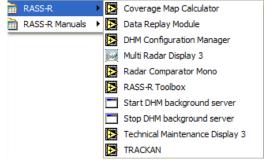


Figure 6: Start and stop the DHM Background Server





# 4 DHM Configuration Manager

When you open the DHM Configuration Manager as explained above, the following user interface will appear:

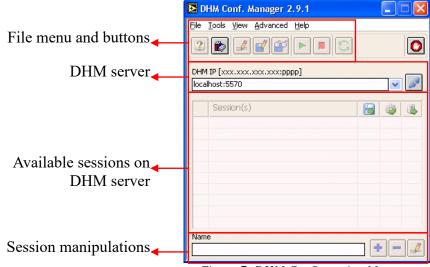


Figure 7: DHM Configuration Manager

In this user interface, first different menu items and menu buttons are seen. Then there is the field to select the DHM server where you want to connect to. Thirdly you see the sessions that are running on the selected DHM server. Finally there is space to create, add, delete and edit sessions. All functionalities are described in detail in the next paragraphs.



## 4.1 User interface

#### 4.1.1 File menu

An overview of all available menu items is given in the table below.

Menu	Usage		
File			
└→ Open Ctrl+O	Opens the Session select dialog.		
└→ Save <b>Ctrl+S</b>	Saves the current session.		
└→ Save a copy as	Makes and saves a copy from the current session.		
└→ Save all Ctrl+A	Saves all loaded sessions.		
└→ Delete from disk <b>Ctrl+D</b>	Deletes a session from disk.		
└→ Start Session	Starts the selected session		
└→ Start All	Starts all loaded sessions		
└→ Stop Session	Stops the selected session		
└→ Stop All	Stops all running sessions		
└→ Exit <b>Ctrl+Q</b>	Exit DHM Configuration Manager		
Tools			
└→ File Merger Ctrl+M	Opens the File Merger tool (described at the end of this manual)		
└→ Advanced File Merger	Opens the Advanced File Merger tool (described at the end of this manual)		
View			
└→ Module list Ctrl+L	Opens the Module list		
└→ IP	Opens different network related functions		
└→ Configuration	Opens the IP configuration dialog		
└→ Statistics	Opens the IP statistics dialog		
└→ Addresses	Opens the IP addresses dialog		
Advanced			
└→ Rescan Modules Ctrl+R	Open the Rescan Modules dialog		
→ Manage USB Devices Ctrl+U	Manage the Intersoft hardware devices connected by USB		
└→ DHM Discovery	Discover all DHM servers on the network		
└→ Clear DHM IP History	Clear the IP addresses from all DHM servers stored		
Help			
└→ Log On	Log on to a DHM server		
$\hookrightarrow$ Log Off	Log off from a DHM server		
└→ Password <b>Ctrl+P</b>	Set password of the DHM Server		
└→ Help	Open DHM User Manual		
└→ About	Display version information		

Table 4-3: File men	u
---------------------	---

and the

Menu items and buttons that can only be used in accordance with a DHM Background Server, only become active when the DHM Configuration Manager is connected to a DHM Background Server. Otherwise they are inactive.



## 4.1.2 Buttons

An overview of all available buttons is given in the table below.

Button	Usage
🛍 Manual	Load User Manual
Save	Save the current session
Session load	Open the session select list to load a session
Start	Start a session
Stop	Stop a session
S Rescan	Rescan all modules
Connect	Connect to a DHM server
O Exit	Quit the application
+ Add	Add a session
Remove	Remove a session
📕 Edit	Edit a session by opening the Session Editor (see Session editor 5)

Table 4-4: Different buttons



## 4.2 Configuration

### 4.2.1 Password protection

A DHM Configuration Manager can be password protected to prevent that unauthorized personnel changes something to (critical) sessions. If you protect the DHM Configuration Manager, you automatically also protect the DHM Background Server of the local machine (it is not possible to remotely protect the DHM Background Server). The first time that you start up the DHM Configuration Manager, the following dialog automatically appears:

DHM Co	nf. Manager:Initialize 🛛 🛛 🔀
(į)	This DHM Conf. Manager is not password protected! Please enable password protection if required.
	ОК

Figure 8: Password protection

By pressing OK, you will be guided to the following dialog:

Passwo	ord 🛛 🕹
Enable	password protection
Password	
Confirm	
(Max. 10 ch	ars, not case sensitive)
Cancel	ОК

Figure 9: Enable password protection

When you decide to enable password protection, select the checkbox and fill in a password.

	Passwo	ord 🛛 🔍
	🗹 Enable	password protection
	Password	****
	Confirm	*****
	(Max. 10 ch	ars, not case sensitive)
	X Cancel	🚫 ок
7i 9	gure 10:	Choose passwor

When you confirm by pressing Enter, the next dialog appears:



Figure 11: Protection successful



When you open a DHM Configuration Manager with password protection, it will look as follows: a password dialog will prompt and the DHM Configuration Manager is inactive until the correct password is typed.

	DHM Conf. Manager 2.9.0 Ele Tools View Advanced Help (2) (1) (2) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	
	DHM IP [xxx.xxx.xxx.xxx:ppp] localhost:5570	<b>v</b>
	Session(s)	
🔁 Log On		
Password		
Cancel OK	Name	+ - 4

Figure 12: DHM Configuration Manager password protected

When you entered the wrong password, the following dialog appears, with the message in the DHM Configuration Manager indicating that there is a password protection.

DHM Conf. Manager: Log On Research Conf. Manager: Log On Research Conf. Please try again.	Name This DHM Conf. Manager is password	<b>+ -</b> <i>‡</i>
Figure	e 13: Wrong password	

You can also use the log on/off menu item under "Help".

If you want to disable or enable password protection later on, you can do this using the menu item "Password". Unselect the checkbox to disable it. Of course, you need to be logged on first before you can disable the protection.

Passwo	ord 🛛 🔛
Enable	password protection
Password	****
Confirm	ale ale ale ale ale
(Max. 10 ch	ars, not case sensitive)
Cancel	ОК

Figure 14: Disable password protection



## 4.2.2 Connecting to a DHM Background Server

Once you are logged on a DHM Configuration Manager, you can connect to a DHM Background Server. This can be done upon selection of the right DHM Background Server in the "DHM IP" field. In the figure below, the DHM Configuration Manager is not connected yet to a DHM Background server. As long as the Connect button is not pressed the Session field is greyed out.

🛃 DI	HM Conf. Manager 2.9.0			
Eile	<u>T</u> ools <u>V</u> iew <u>A</u> dvanced <u>H</u> elp			
				0
DHM	IP [xxx.xxx.xxx.xxx:pppp]			
local	host:5570		*	<i>1</i>
	Session(s)			
0	(0) RIM782OUTPUT			_
1	(1) DATASET RMDCE OPS			
X	(2) DATASET ADSB RAW			
Name	2	_		
			-    -	4

Figure 15: Connect to a DHM Background Server

When you open the dropdown list by clicking on the "DHM IP" field the DHM Configuration Manager sends a "DHM PING" data packet on the configured networks (see 4.2.8.3 DHM Discover). All active (=running) DHM servers will send a response and the following list (or similar) will be populated:

DHM Conf. Manager 2.9.0	
<u>File T</u> ools <u>V</u> iew <u>A</u> dvanced <u>H</u> elp	
2 🗞 🚅 🚰 🕨 🗉 😂	0
192.168.0.113:5570	·
192.168.0.53:5570	
192.168.0.89:5570	
192.168.0.82:5570	S 1
192.168.0.118:5570	
192.168.0.62:5570	
√ localhost:5570	
192.168.0.111:5570	
192.168.0.77:5570	
:5570	
192.168.0.177:5570	
RMCDE:5570	
192.168.0.78:5570	
192.168.0.57:5570	
192.168.0.114:5670	
192.168.0.75:5570	
192.168.0.114:5570	
127.0.0.1:5570	
192.168.0.61:5570	
192.168.0.34:5570	
192.168.0.101:5570 192.168.0.59:5570	
192.168.0.100:5570	
192.168.0.90:5570	_≠
192.168.0.66:5570	

Figure 16: DHM server list

It gives an overview of all active and recent used DHM Background Servers running on the network (respectively above and below the horizontal line). You can use this list to select the appropriate DHM Background Server instead of manually filling in the IP address. To complete selection, now press the connect button  $\boxed{}$ .



From DHM v2.8.0 onward, the DHM Configuration Manager tries to make connection with the DHM Background Server by using Inter Application Communication or IAC. Therefore, it communicates with the I.E.-Proxy software. This software is a separate tool running as a background process. (Refer to the user manual from the IE-PROXY). When for any reason communication cannot be established over IAC, it falls back on RPC or Remote Procedure Call and the following dialog will prompt:



Figure 17: RPC instead of IAC

If you select a remote DHM Background Server that is password protected, you will be asked for password authentication. Only when the correct password is given the DHM Configuration Manager will connect.

🗖 DHM	Conf. Manager:DHM Background server conn 🔀
(į)	The requested DHM Background server is password protected. Please proceed with the password authentification procedure.
	OK Eigura 18: Authentification notification

Figure 18: Authentification notification

172.16	i.100	.102	5	×
Password				
X Cancel			ОК	

Figure 19: Password request

Once you are connected to a DHM Background Server, the session window will display all running sessions on the DHM Background Server and the connect button 🗾 will be in the pressed status.

🛃 DI	HM Conf. Manager 2.9.0			×	
<u>File Tools View A</u> dvanced <u>H</u> elp					
	i / / / / / / / /			0	
DHM	IP [xxx.xxx.xxx.xxx:pppp]				
local	host:5570		<b>v</b>	ø.	
	Session(s)		1		
0	(0) RIM782OUTPUT				
1	(1) DATASET RMDCE OPS				
X	(2) DATASET ADSB RAW				
Name	lame				
	-	7 🖪		4	



Another way of connecting to a DHM Background Server, is by typing its IP address in the "DHM IP" field: enter the IP address of the computer on which the background server is running followed by the port number of the DHM background server (default 5570) separated by a colon ":". If the background server is located on the same machine as the configuration module you may enter "localhost" instead of the machine's IP address. Though, it is easier to use the dropdown list which suggests the available DHM Background servers for you.

From DHM 2.9.0, the DHM Background Server also reports its version number to the DHM Configuration Manager. If the version number is unknown, you will see a small triangle left in the DHM IP field.

DHM Conf. Manager 2.9.0	
<u>File Tools View A</u> dvanced <u>H</u> elp	
2 🖒 📕 🗹 🖬 🗖 🖸	0
DHM IP [xxx.xxx.xxx.xxx:pppp]	
172, 16, 100, 36:5570	🔺 🔽 🚿

Figure 21: DHM Background Server version unknown

#### Three situations might occur:

• When you try to connect to a DHM Background Server that is not running at the moment (so it may appear in the list below the horizontal line when it was active in the past, see Figure 16), you will get the following error dialog:

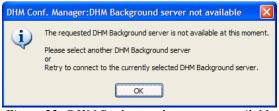


Figure 22: DHM Background server not available

It suggests retrying to make a connection or to select another DHM Background server.

• When you try to connect to another DHM server, you first have to disconnect from the actual connected DHM Background server. This can be done by pressing the 🖉 again. When you do not do this, the following warning will appear:



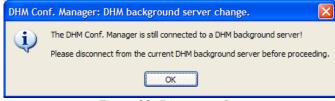


Figure 23: Disconnect first

• When you are connected to a DHM Background server and suddenly the connection is lost between the DHM Configuration Manager and the DHM Background Server. (for example the DHM Background Server crashed, the pc is shutdown or the network connection is lost), you will get the following warning:



Figure 24: DHM Background server not available anymore

#### Multiple connections to the same DHM Background Server

It is also possible to connect with multiple DHM Configuration Managers to the same DHM Background server. It is even possible to open the session editor, but only 1 DHM Configuration Manager can edit a session at the same time. (See chapter 5 about Sessions)



# 4.2.3 Creating a session

A session is a separate configuration entity in the DHM. Multiple sessions may be configured and can run simultaneously. This approach gives flexibility in administrating the tasks of the DHM. Sessions can be stored and loaded and run independently of each other. Enter a session name in the "Name" text box and press the "Add Session **†**" button.

and the

Session names must be unique; you cannot use the same name for multiple sessions running on the same server. A maximum of 10 sessions can be loaded at the same time.

When the session is added its name appears in the "Sessions" list.

DHM Conf. Manager 2.9.0	×
ile <u>T</u> ools <u>V</u> iew <u>A</u> dvanced <u>H</u> elp	
	)
DHM IP [xxx.xxx.xxx.xxx:pppp]	
172.16.100.61:5570 💌 🎑	1
	_
Session(s)	
(0) RIM782OUTPUT	
✓ (1) DATASET RMDCE OPS	
X (2) DATASET ADSB RAW	
Name	
+	Ž
Figure 25: Sessions	

A session can have 4 modes:

Table 4-5: Different session modes

Mode	Meaning
Ioading	A session is loading. When multiple sessions are selected to load at the same
= loading	time, loading will be done one by one.
✓ running	The session is running after having pressed the run button
× stopped	The session is not running running after having pressed the stop button
Serror	There is an error in the session (for example the session contains a software
Co error	module referring to a RIM782 but the hardware is not available anymore)

In "Chapter 5 Session editor", you will see how to configure and monitor sessions by means of the "Session Editor". This last window can be opened pressing the Edit button is or just by double clicking on the session name.



Once a session is created, the DHM Background Server builds a separate executable for this session. This executable is only visible in Windows Task Manager. The different numbers, assigned to the executables, correspond to the numbers between () before the session names. In the figure below, you see the following executables:

- YARDIOS\_SESSION\_ENGINE\_0.exe: this corresponds to session (0) in the DHM Configuration Manager, which is named "RIM782OUTPUT"
- YARDIOS\_SESSION\_ENGINE\_1.exe: this corresponds to session (1) in the DHM Configuration Manager, which is named "DATASET RMCDE OPS"
- YARDIOS\_SESSION\_ENGINE\_2.exe: this corresponds to session (2) in the DHM Configuration Manager, which is named "DATASET ADSB RAW Digital"
- Further on you see the YARDIOS\_SRV.exe (DHM Background Server) and the YARDIOS\_SMGR.exe (DHM Configuration Manager)

📕 Windows Task Manager		
<u>File Options View H</u> elp		
Applications Processes Perfor	rmance Networking	
Image Name	User Name	c 🔨
ZCfgSvc.exe YARDIOS_SRV.exe	Bert SYSTEM	00 01
YARDIOS_SMGR.exe YARDIOS_SESSION_ENGINE YARDIOS_SESSION_ENGINE		00
YARDIOS_SESSION_ENGINE wmiprvse.exe		01 00
wmiprvse.exe WLLoginProxy.exe	SYSTEM Bert	00
WLKEEPER.exe wisptis.exe WINWORD.EXE	SYSTEM Bert Bert	00
winlogon.exe VPTray.exe	SYSTEM Bert	00
usnsvc.exe tcsd_win32.exe	SYSTEM	00
taskmgr.exe	Bert	
Show processes from all us	ers End Pr	ocess
Processes: 79 CPU Usage: 89	% Commit Charge: 1101	M / 3938M

Figure 26: Sessions in task manager

When you are connected to a DHM Background Server on a remote pc, you have to open the task manager on that remote pc and not on the local pc where your DHM Configuration Manager is running on.

An advantage of sessions running as separate executables is the possibility to set them in auto load-start and persistent mode. (See paragraph 5.2.7) Using Windows Task Manager, it is also possible to set the processor affinity of a particular session. This can be done by right clicking on that session. For more information about this, refer to Windows help functions.

YARDIOS_SESSIO	N_ENGINE_2.exe	SYSTEM	00
YARDIOS_SESSIO	N_ENGINE_1.exe	SYSTEM	00
YARDIOS_SESSIC		SYSTEM	00
wmiprvse.exe	End Process	WORK SERVICE	00
wmiprvse.exe	End Process Tree	TEM	00
WLLoginProxy.ex	Debua	t	00
WLKEEPER.exe	bebug	TEM	00
wisptis.exe	Set Priority	• E	01
WINWORD.EXE	Set Affinity	t	13
winlogon.exe	Set Animity	TEM	00

Figure 27: Set affinity of a session





#### 4.2.4 Removing a session

Select the session which you wish to remove from the "Sessions" list and press the "Remove Session " button. A session can only be removed when it is not running. If a session is still running, the following warning appears:

DHM C	onf. Manager: Destroy Session
(į)	The session can not be destroyed because it is still running. Please stop the session before destroying it.
	OK

Figure 28: Destroy session

#### 4.2.5 Saving a Session

To save a session first select its name from the "Sessions" list and then press the "Save Session" button or select "Save" from the "File" menu.

If you wish to save all the sessions in the "Sessions" list at once select "Save All" from the file menu.

If you wish to save a copy from a session with a different name, select "Save a Copy as" from the file menu.

Session configurations are stored as a \*.ini-file on the computer where the DHM Background Server is running on. You can find them in the following path:

"C:\INTERSOFT\DHM\YARDIOS\_SRV\UserPrefs".

æ

*The UserPrefs-folder with ini-files remains on disk when doing an un-installation of the DHM software, so that after a new installation you still have your sessions available.* 



# 4.2.6 Loading a Session

To load a previously stored session press the "Load Session" button 🖆 or select "Open" from the "File" menu. The following dialog appears:

🚯 RDR803 INPUTcopy ini	^
REPLAYCOMPILE.ini	
RFM_ON_RIM782.ini	
RIM782OUTPUT.ini	
STATUS OUTPUT.ini	
(B) test.ini	
THALES_IP.ini	
🚯 TMD 3 Digital.ini	
🚯 TMD 3 Ethernet.ini	Ī
🚯 TMD 3 Video.ini	~

Figure 29: Session select

Select one or multiple sessions (by holding the Ctrl-key pressed) name(s) and press "OK" or double-click the session name.

The Session Select window also has the possibility to have a preview of the session configuration. This can be enabled by selecting the Preview check box. A window at the right will appear, with possibilities to zoom in/out.

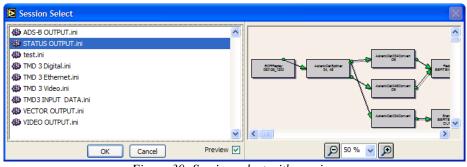


Figure 30: Session select with preview



# 4.2.7 View functions

#### 4.2.7.1 Module list

The "Module List" can be opened via the Menu bar: click View,  $\rightarrow$  Module list or press Ctrl+L. The module list shows all available DHM modules for a particular DHM Background Server (see IP address in the title bar). The different modules are explained in chapter 6. The module list is convenient to check which Intersoft Electronics hardware devices are connected to the computer or to see which DHM modules are installed. (It is recommended to do a Rescan Modules first when new hardware devices are connected after startup of the DHM Background server. (See paragraph 4.2.7.2)

In the figure below, you see that a RIM782 is connected to a DHM Background Server running on a pc with IP address 192.168.0.118:5570.

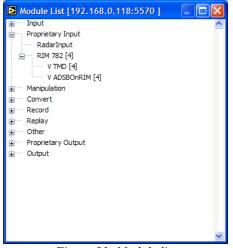


Figure 31: Module list

*The Module List is only available when you are connected to a DHM Background Server.* 



#### 4.2.7.2 IP network related functions

When multiple DHM Background Servers are working together in a network, with different DHM Configuration Managers on computers with multiple network interfaces and IP addresses, it might be convenient to use these tools to check your IP configuration and statistics.

# **Take care:** The IP configuration corresponds to the pc with the DHM Background Server where you are connected to.

Suppose that you are working on a workstation with a connection to a server; you can use the DHM Configuration Manager to make a connection to the DHM Background Server and then view the different network cards that are active on that server.

When you click in the Menu bar, View  $\rightarrow$  IP  $\rightarrow$  IP Configuration, you will see the following result:

P Configuration [172.16.100.51:5570 ]	
Ethernet adapter Local Area Connection Q5:	^
Connection-specific DNS Suffix .: Description : Intel(R) Gigabit VT Quad Port Server Adapter #4 Physical Address : 00-1B-21-19-B2-91 Dhcp Enabled	
Ethernet adapter Local Area Connection Q6:	
Connection-specific DNS Suffix . : inventive-engineering.com Description : Intel(R) Gigabit VT Quad Port Server Adapter #3 Physical Address : 00-1B-21-19-B2-90	
Dhcp Enabled.        : Yes         Autoconfiguration Enabled        : Yes         IP Address        : 172.16.100.51         Subnet Mask        : 255.255.0.0         Default Gateway        : 172.16.1.9         DHCP Server        : 172.16.1.7         DNS Servers        : 172.16.1.2	III
Primary WINS Server : 172.16.1.7 Lease Obtained : 25 August 2008 09:27:56 Lease Expires : 02 September 2008 09:27:56	*

Figure 32: IP Configuration

The result is the same as after an "ipconfig/all" command in the DOS-prompt. You can see that this computer has multiple Ethernet ports (probably a server), one with address 10.20.100.1, subnet 255.255.255.0 and another with 172.16.100.51, subnet 255.255.0.0



When you click in the Menu bar, View  $\rightarrow$  IP  $\rightarrow$  Statistics, you will see the following result:

IP Statistics [172.16.1	00.60:5570 ]		
IPv4 Statistics			<u>^</u>
Packets Received		= 909773	
Received Header Erro	rs	= 0	
Received Address Err	ors	= 12907	
Datagrams Forwarded		= 0	
Unknown Protocols Re	ceived	= 0	
Received Packets Dis	carded	= 12	
Received Packets Del:	ivered	= 909648	
Output Requests		= 876951	
Routing Discards		= 0	
Discarded Output Pac	kets	= 0	
Output Packet No Rou	te	= 0	
Reassembly Required		= 25	
Reassembly Successful	1	= 12	
Reassembly Failures		= 1	
Datagrams Successful	ly Fragmented	= 0	
Datagrams Failing Fr	agmentation	= 0	
Fragments Created	-	= 0	
ICP Statistics for IPv	4		
Active Opens		= 3230	
Passive Opens		= 44	
Failed Connection At	tempts	= 437	
Reset Connections		= 48	
Current Connections		= 23	
Segments Received		= 872234	
Segments Sent		= 855655	
Segments Retransmitt	ed	= 8223	
UDP Statistics for IPv	4		
Datagrams Received	= 29385		
No Ports	= 15363		
Receive Errors	= 29		
Datagrams Sent	= 12975		
			~

Figure 33: IP Statistics

The result is similar as after a "netstat -s" command in the DOS-prompt.



When you click in the Menu bar, View  $\rightarrow$  IP  $\rightarrow$  Addresses, you will see the following result:

P Addresses [172.16.100.51:5570 ]	
Session: PP1_RDR_5_INPUT	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11001 Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11002	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11003	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11004	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11005	
Module: RadarOutput Local : 10.20.100.1	
Remote: 225.1.1.130:11006	
Module: RadarOutput	
Local : 172.16.100.51	
Remote: 172.16.100.33:40008 Session: PP1_RDR_6_INPUT	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11007	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11008	
Module: RadarOutput	
Local : 10.20.100.1 Remote: 225.1.1.130:11009	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11010	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11011	
Module: RadarOutput	
Local : 10.20.100.1	
Remote: 225.1.1.130:11012	
	×

Figure 34: IP Addresses result

This window shows all IP addresses that are used in the sessions (PP1\_RDR\_5\_INPUT and PP1\_RDR\_6\_INPUT) loaded on this DHM Background server. Remark again that 2 physically different Ethernet ports are used in session PP1\_RDR\_5\_INPUT: RadarOutput (dotted line): outputs data to a MRD3 on Ethernet port 10.20.100.1 RadarOutput (dashed line): outputs data to a MRD3 on Ethernet port 172.16.100.51

This explains the meaning of Local and Remote IP Address, which comes back several times in chapter 6.

All IP functionalities require that IAC is supported by running the Intersoft Proxy Agent. They are only available when you are connected to a DHM Background Server. (Because the information comes from the DHM Background Server computer of course.)



#### **Advanced functions** 4.2.8

#### 4.2.8.1 <u>Rescan modules</u>

The "Rescan Modules" can be opened via the Menu bar: click Advanced, → Rescan Modules, by pressing Ctrl+R or by clicking the rescan button

The DHM Background Server checks all connected hardware to the computer at start up phase. Since the DHM Background Server is registered as a Windows service, this check is done when Windows is started. When new hardware (e.g. a RIM782. RDR803 or UDR600) is connected to the pc after the DHM Background Server has started, it is necessary to "rescan the modules". Rescanning makes that the connected hardware becomes available as software component in the session editor.

ReScan Modules	×
Re-Scanning [192.168.0.118:5570] 28%	]
	)
Figure 35: Rescan dialog	

igure 35: Rescan dialog

en) The Rescan Modules is only available when you are connected to a DHM Background server and when the session editor is closed.

Suppose you have the session editor open (See chapter 5), you will get the following error dialog:



Figure 36: Close session editor before rescan of modules



#### 4.2.8.2 Manage USB Devices

*This function is still under development. This chapter will be updated in the next release.* 

The "Manage USB Devices" can be opened via the Menu bar: click Advanced,  $\rightarrow$  Manage USB Devices or by pressing Ctrl+U. (Black dots means that these devices are connected to the pc)

Manage USB Devices [172.16.100.60:5570]			×
USB Architecture	DHM Modules	USB History	
Intel(R) 82801G (1CH7 Family) USB Universal Host Controller - 2 RootHub Generic USB Hub Gener	Input     RadarInput     RadarInput     Rots R03 [0]     UDR2 [100]     UDR2 [100]     Gonvert     Replay     Other     Replay     Other     RadarOutput     RadarOutput     RadarOutput     UDR2 [100]     VectorOutput     VideoOutput     VideoOutput     Output		
	✓		~
IMPORTANT NOTICE: Changing the USB constellation can have serious conse	quences for existing sessions. Please proce	ed with care. There is NO UNDO ava	ailable.
Figure 37: Ma	nage USB Devices		

For the computer where the DHM Background Server is running on:

- in the left pane you see the architecture of all USB devices.
- in the middle, you can see which USB devices are connected to your DHM Background Server. (if any)
- In the USB History, you see the link between the USB device serial number (between square brackets [xxx]) and the logical numbers. Important to know is that hardware in a DHM session is identified with its logical number.

#### Let's explain with an example:

You have created a DHM session with the UDR[100]. According to the USB Devices window, this corresponds to logical number 8. This corresponds to the value in the ini-file from the session:

In the following path: C:\INTERSOFT\DHM\YARDIOS\_SRV\UserPrefs, you find the session file, for example UDRINPUT.ini, that contains the following line (Notepad): Configuration.UDR Params.LogicalNbr=8

Now you want that UDR[83] corresponds to this UDRINPUT-session, without changing the session. Then follow the next steps:

First of all you stop the UDRINPUT-session. Then you right click on the UDR you want to change, choose Exchange "8.UDR[100]" with for example 11.UDR[83]



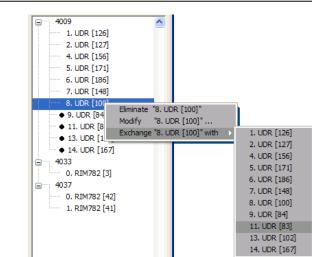


Figure 38: Exchange an USB device

By pressing F5, the USB Discover window will refresh.

and the

The Manage USB Devices function requires that IAC is supported by running the Intersoft Proxy Agent. The Manage USB Devices is only available when you are connected to a DHM Background server.



#### 4.2.8.3 DHM Discover

The "DHM Discover" can be opened via the Menu bar: click Advanced,  $\rightarrow$  DHM Discover. The following window appears:

DHM Discover SetUp Port 5555	t Port V Default Addresse	s
Address [xxx.xxx.xxx.xxx]	Subnet Mask [xxx.xxx.xxx.xxx]	~
10.20.100.1	255.255.255.0	
172.16.100.51	255.255.255.0	
200.0.4.150	255.255.255.0	
		×
X Cancel	Discover 🐼 OK	

Figure 39: DHM Discover (first)

It automatically scans all active Ethernet ports on your computer where the DHM Configuration Manager is running on. In the figure above, there are 3 Ethernet ports with the given IP addresses. (So this example is from a server)

If you want to scan for DHM Background servers on another port or another subnet, disable "Default Port" and "Default Address" and type the correct port number or subnet. If you do not want that the DHM Conf. Manager looks on the 200.0.4.150 network, you simply delete this address and press OK.

Port 5555 🔽 De	fault Port Default Addresses	;
Address [xxx.xxx.xxx.xx	cx] Subnet Mask [xxx.xxx.xxx.xxx]	^
10.20.100.1	255.255.255.0	
172.16.100.51	255.255.0.0	
200.0.4.150	255.255.255.0	
		~

Figure 40: DHM Discover

*Even if the subnet mask is correctly configured in your network settings, this DHM Discover Setup sets 255.255.0 for the subnet and you have to change it manually if necessary. (For example 255.255.0.0 for IP 172.16.100.51)* 

When making a mistake, you will see the following dialog:



Or in case of any trouble, you will see:

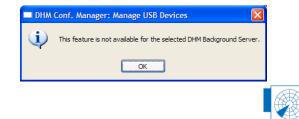




Figure 41: DHM Discover result

As you can see in the figure above, from DHM 2.9.0 onward also the version number is sent in a data packet. (See also Figure 21: DHM Background Server version unknown)

The IP addresses from the discovered DHM Background servers will now be saved until you choose Advanced, → Clear DHM IP Discover.

They also appear in the dropdown list as in Figure 16: DHM server list. (Though this dropdown list also shows DHM Background Servers that were active in the past but where you did not receive a DHM response from.)



**The DHM Discover function corresponds to the DHM Configuration Manager** computer. Therefore, this function can be used when you are not connected to a DHM Background Server; this in contrast with for example the IP functions.



When you changed the IP settings of the computer where the DHM Configuration Manager is running on, you need to restart the computer. Only after restart, the DHM Configuration Manager will recognize the new IP settings and can correctly discover other DHM servers.



# 5 <u>Session editor</u>

To edit, configure and check session, you need to take a look in their configuration. This can be done using the "session editor".

ile Edit Operate Tools Advance	u <u>m</u>	ыþ			_				_															
2 🗈 🗾 🛃 🕨 🔳				\$	Э	10	0 %	v		€														
Modules		Co	nfig	jura	tio	n																		
	^																							
Proprietary Input																								
<ul> <li>Manipulation</li> </ul>																								
Convert											1						1							
Replay																								
Other																								
Proprietary Output																								
Output											1						1							
			1			1					1			1	1		1			1			1	
			1	÷.	1	1	1					1	1	1	1	1	1	1	1		1	1		
											1													
			÷.	÷	÷.	÷								÷	j.	÷.	j.							
			÷.														į.							
		_																						

Figure 42: Session configuration editor in edit mode

The session editor operates in two modes:

- Run mode: start, stop and monitor sessions. (Module list not visible)
- Edit mode: add, remove and configure the software components in a session. (Module list visible)

Switch between the two modes by clicking  $\checkmark$  or by using the menu.

#### **Multiple connections:**

it is also possible to connect with multiple DHM Configuration Managers to the same DHM Background server. It is even possible to open the session editor, but only 1 DHM Configuration Manager can edit a session at the same time. When a session is for example in edit mode in another DHM Configuration Manager, it is locked and you will see the following warning:



The next paragraphs explain how to work in the "session editor".



## 5.1 User interface

#### 5.1.1 File menu

An overview of all available menu items is given in the table below.

Menu	Usage
File	
$\hookrightarrow$ Close (Ctrl+W)	Close a session
$\hookrightarrow$ Save (Ctrl+S)	Save a session
→ Save a copy as	Save a copy of a session with a different name
Edit	
$\hookrightarrow$ Cut (Ctrl+X)	Cut a module (Delete)
$\hookrightarrow$ Copy (Ctrl+C)	Copy a module
$\rightarrow$ Paste (Ctrl+V)	Paste a module
Operate	
└→ Start all	Start all modules in the current session
└→ Stop all	Stop all modules in the current session
$\hookrightarrow$ Change to run mode/edit mode (Ctrl+M) mode	Change to other mode
Tools	Under development
Advanced	
└→ Autoload	Set a session in Autoload mode
└→ Autorun	Set a session in Autorun mode
└→ Persistent	Set a session in Persistent mode
└→ Expert	
→ Sanity check	Open the session sanity check
Help	
└→ About	Display version information

Table 5-6: File menu

# 5.1.2 Buttons

An overview of all available buttons is given in the table below.

Button	Usage
🔊 Manual	Load User Manual
<b>E</b> dit	Change to edit mode
Save	Save the current session
▶ Start	Start a session
Stop	Stop a session
Zoom out	Zoom out the editing pane
100 % ど Scale	Zoom in/out by selecting a scale factor
Zoom in	Zoom in the editing pane

Table 5-7: Different buttons



# 5.2 Configuration

## 5.2.1 Adding and removing a software component

Software components are the building blocks of the DHM, they have specific functions like input (capture data), output (storage on disk, broadcast on LAN ...), and manipulation (convert data, strip transport layer ...). By connecting different software components together you can build a DHM session to provide simple or complex functionality.

In edit mode there is a "Modules" selection list on the left side of the window from where you may select software components to build a session. Select a component from the list and doubleclick it to add it to the configuration window. If you wish to remove a component from the configuration select it in the configuration window and press the "Delete" key on your keyboard. You may move the components around in the configuration window simply by dragging them with the mouse.

A typical configuration consists of several components: input, processing and output, as in the example below.

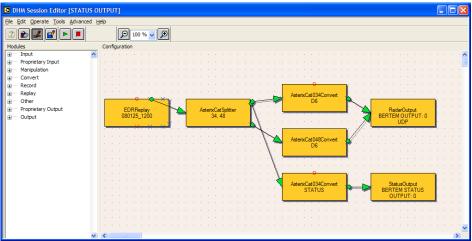


Figure 44: Session example

*Caution: The modules in the list correspond to the Module List window as described in paragraph "4.2.7.1".* 

*Caution: Never delete more than 20 modules at once as this will cause a session crash and unsaved modifications will be lost.* 



# 5.2.2 Connecting software components

The components are wired together by arrows drawn from one component's output to another component's input.

A sample session under construction is shown here:

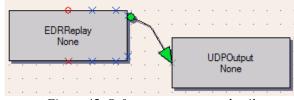


Figure 45: Software components detail

Notice the different connection "anchors" on the software components, outputs are depicted with a blue X, inputs are depicted with a grey X, event connections are depicted with a red O (North/Sector Message) or red X (ACP/ARP/PPS).

You can draw arrows between outputs and inputs by moving the cursor over the blue X until it changes into a "hand" icon, click and hold the left mouse button while dragging the cursor towards the grey X to which you wish to connect the output.

*If no arrow can be drawn, this means that the input from the arrow has a wrong data format for the output you wish to connect to.* 

αß

 $\Box$  Take into account the following rules: an output must be connected to an input, and X to an X, an O to an O.

When correctly positioned over the grey X, release the mouse button. If you wish to remove a connection select the arrow in the configuration window and press the "Delete" key on your keyboard.



## 5.2.3 Configuring a software component

Double-click the component in the module to open the component specific configuration window. A detailed description of each software component is provided in chapter 6.

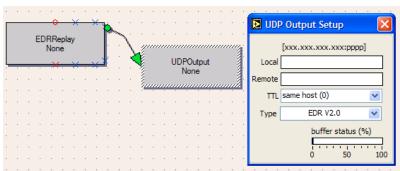


Figure 46: Configuring a software component

#### 5.2.4 Rearranging objects

You may rearrange objects such as software components and arrows when the session configuration window is set in edit mode.

#### 5.2.4.1 Moving/Modifying software components

Software Components are depicted by rectangles; you can edit the rectangles by first selecting them. Select the object by moving the cursor to the centre of the object and then clicking the (left) mouse button. Selected components are marked by a hash frame. You can now drag the object around the diagram. When multiple modules are selected, they can be moved simultaneously only with the mouse and not with the keyboard.

#### 5.2.4.2 Moving/Modifying connecting arrows

Arrows can be selected by moving the cursor to the arrow and then clicking the (left) mouse button. A selected arrow has white selection points which you may drag around to adjust the position of the arrow. By right click on the arrow you also have the possibility to add/remove a segment, choose an arrow style or open a Probe (See 5.2.6).

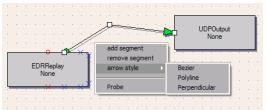


Figure 47: Moving and modifying connecting arrows

#### 5.2.4.3 Copy/Paste/Cut software components

After selecting one or multiple software components, you can easily perform the following functions: Copy (CTRL+C), Paste (CTRL+V) and Cut (CTRL+X).

Copy and Paste is not possible with a hardware module because a unique hardware device is addressed.





#### 5.2.5 Running

Running a configured session is done by pressing the "Start D" button or by selecting "Start All" from the "Operate" menu. Running software components are colored green in the session configuration window. When colored yellow, this means that the software component is in idle state. It is waiting for a next module to connect to its output; then it turns green.

In the example below, the RadarOutput module is yellow, as well as the AsterixCat001Convert. As soon as the MRD3 connects as a client to this RadarOutput module (see also 6.60) it becomes green. Consequently, the preceding module AsterixCat001Convert will also turn green. Other software modules as for example the UDPOutput or any recorder, always request data and

therefore will not be green immediately.

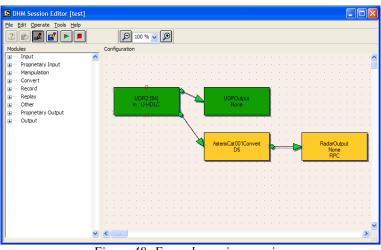


Figure 48: Example session running

Stopping a configured session is done by pressing the "Stop "button or by selecting "Stop All" from the "Operate" menu. Stopped software components are colored grey in the session configuration window.

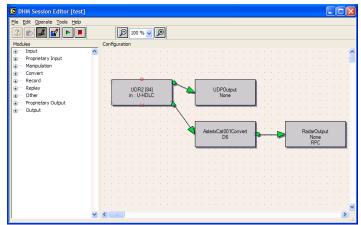


Figure 49: Example session stopped



If the session configuration editor is in "Edit" mode you may start/stop **individual** software components by right-clicking on the component and subsequently selecting "Start" or "Stop" from the pop-up menu. Referring to Figure 48 above, you can forcefully start the AsterixCat001Convert and RadarOuput module by clicking Start on them individually. (and without the MRD3 actually being connected.)

Pressing "Status" will open a status window from the selected module.

By clicking "Delete" you have the following options:

- Delete the module
- Delete the input connections
- Delete the output connections
- Delete all connections (i.e. input and output)

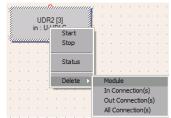


Figure 50: Right click on module

Example of a status window that shows useful information about a software component. If no status window is implemented, a warning will appear.

🖻 STATUS 🛛 🔀
ACP: 0
ACPR: 0
ARP: 0
PPS: 0 Time: 07:44:20.220
lime: 0/1441201220
Ch A Tx: 0
Rx Good: 0, Rx Bad: 0
Ch B Tx: 0
Rx Good: 0, Rx Bad: 0

Figure 51: Example of status window (UDR)

The different status windows are explained in chapter 6 Software components.

When after loading a session, a software module becomes red, this indicates an error. You cannot run the session correctly upon resolving the problem. An error will also be visible in the sanity check. (See 5.2.8)

An error can for example occur in the following situation: you load a session where you previously configured a hardware module in (for example a UDR600). But now this UDR600 is not connected to the computer anymore. Then, the DHM Background Server cannot communicate with this hardware module and will result in an error.



Figure 52: Module not available



#### 5.2.6 Inspecting a running session

You may inspect the output of software components by right-clicking on an arrow (see Figure 47) leading from the output to a next module's input and selecting "Probe" from the pop-up menu. A floating window appears:

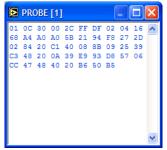


Figure 53: Output data probe

Depending on the content of the output, different kinds of probes are available: D6 probe, text probe, an event probe or just a normal probe. The matching probe will be launched automatically by the software. The data in the probe is presented in an appropriate manner according to the type of probe. It is possible to open multiple probes. They will be enumerated starting from [0].

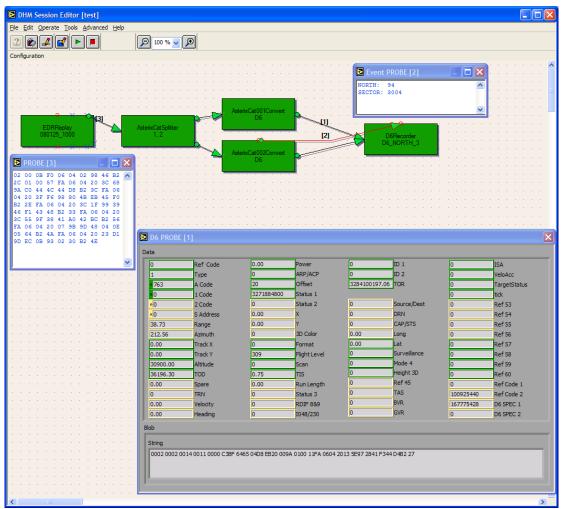


Figure 54: Multiple probes opened



# 5.2.7 Advanced session modes

In the Advanced menu, you have the possibility to enable 3 modes for a session:

<u>A</u> dvanced <u>H</u> elp	<b>)</b>
✓ Auto Load ✓ Auto Run ✓ Persistent	الله onfig
Expert 🕨	- × -

They have the following meaning:

- Auto Load 🗟: If active, the session is automatically loaded when the DHM Background server starts.
- Auto Run 😺: If active, the session starts automatically on the condition that the session is also loaded. (Which can be done manually or via the auto load mode)
- Persistent 🖳: When the sessions disappeared after a crash, it reloads again and starts automatically.

Finally, you will see the 3 symbols appear in the DHM Session Editor:



The different modes will also be visible in the DHM Conf. Manager window:

🛃 DI	HM Conf. Manager 2.8.0			
<u>F</u> ile	<u>T</u> ools <u>V</u> iew <u>A</u> dvanced <u>H</u> elp			
	e 🖉 💕 🕨 🗉 😋			0
DHM	IP [xxx.xxx.xxx.xxx:pppp]			
172.	16.100.60:5570		~	<u>ø</u>
	Session(s)		1	
0	(0) RIM782OUTPUT			_
X	(1) test *			
X	(2) TMD 3 Digital			
1	(4) STATUS OUTPUT *	×	×	×
Name	a			
	- INPUT			1

Figure 55: Different session modes

Auto Run and Persistent can only be enabled once a session has been saved at least once as these parameters are set in the session's ini-file while the Auto Load setting is a parameter in windows registry.



# 5.2.8 Sanity check

By clicking "Sanity Check" in the Advanced menu → Expert, the following window opens:

Sanity Check	
01.Module: StatusOutput [EDD00012]	
-> Anchorpattern: lin0out	
-> Parents:	
1. 0D0000F5:02:00	
-> DataSources:	
1. 0D0000F5:02:00	
-> Inputs : # Output 2 AsterixCat034Convert [D0000F5]> input 0	
-> Output 2 Asterikeat034CBNVert [D0000073]> Input 0	
02.Module: EDRReplay [F3700040]	
-> Anchorpattern: 0in7out+event	
-> Parents: None	
-> DataSources: None	
-> Inputs : None	
-> Outputs:	
<pre># output 1&gt; Input 2 AsterixCatSplitter [71000CC]</pre>	
03.Module: AsterixCat034Convert [F970006A]	
-> Anchorpattern: linlout+event	
-> Parents:	
1. 071000CC:00:00 -> DataSources:	
-> DataSources: 1. 071000CC:00:00	
-> Inputs :	
<pre># Output 0 AsterixCatSplitter [71000CC]&gt; input 0</pre>	
-> Outputs:	
<pre># output 2&gt; Input 0 RadarOutput [13700124]</pre>	
04.Module: AsterixCat048Convert [70009D]	
-> Anchorpattern: linlout	
-> Parents:	
1. 071000CC:01:01	
-> DataSources:	
1. 071000CC:01:01	
-> Inputs : # Output 1 AsterixCatSplitter [71000CC]> input 1	
-> Output : AsterixCatSpiitter [/1000000]> input i	
<pre># outputs: # output 0&gt; Input 0 RadarOutput [13700124]</pre>	
05.Module: AsterixCatSplitter [71000CC]	
-> Anchorpattern: lin6out	
-> Parents:	
1. F3700040:01:02	
-> DataSources:	
1. F3700040:01:02	
-> Inputs :	
<pre># Output 1 EDRReplay [F3700040]&gt; input 2</pre>	
-> Outputs:	
<pre># output 0&gt; Input 0 AsterixCat034Convert [F970006A] # output 1&gt; Input 1 AsterixCat048Convert [70009D]</pre>	
<pre># output 1&gt; Input 1 AsterixCat048Convert [70009D] # output 0&gt; Input 0 AsterixCat034Convert [D0000F5]</pre>	
06.Module: AsterixCat034Convert [D0000F5]	
-> Anchorpattern: linlout+event	
	1

It is a text version of the graphical representation of a session and can be used for advanced debugging purposes only.



# 6 Software components

This chapter provides a detailed overview of all the available software components in alphabetical order.

#### Warning: First read this section before reading the different software modules.

Software component blocks that correspond to hardware, will only appear in the module list when the hardware is connected to the pc running the DHM Background Server. Remember that by pressing the rescan button (refer to 4.2.8.1 Rescan modules), you can display hardware that was connected to the pc **after the start of the DHM server**. (Refer to 3 DHM Background Server).

Intersoft Electronics' hardware will be listed in the Proprietary Input and Output field. In the left figure below, no hardware is connected. In the right figure, a RDR803, RIM782 and UDR600 are connected to the pc running the DHM server. Some of these devices can work both as input or output, depending on the configuration in the DHM session. Through further developments of RASS-R hardware, new modules will become available at new software releases, for example the UVR892.

Modu	les	
÷	Input	^
<b>b</b> m	Proprietary Input	
	RadarInput	
<b></b>	Manipulation	
<b>±</b>	Convert	
÷	Record	
±	Replay	
<b></b>	Other	
<b></b>	Proprietary Output	
÷	Output	



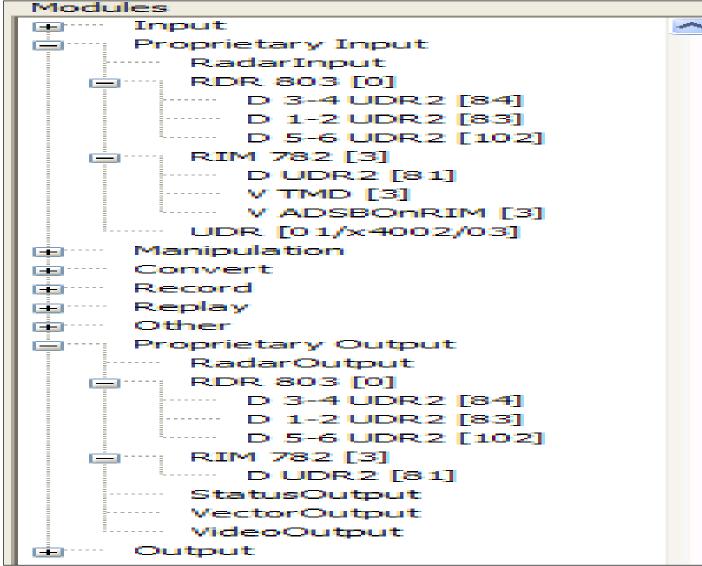


Figure 57: No hardware to input connected versus hardware connected

#### Before you start reading the software components:

In this chapter, the software components are in alphabetical order. However, in the module list in the DHM Session Editor, they are grouped together according to their function. The different categories are listed in the figures above. (for example: input, manipulation etc.) **Intersoft internal data formats:** 

The DHM converts data always to an internal data format. The following Intersoft proprietary formats are available:

- D6: RASS-R file data format (\*.D6), to be used in TMD3, MRD3, TRACKAN and RCM/D
- S4: RASS-S file data format (\*.S4), but also to be used in RCM/D
- Text: to see the input data in a text format (\*.txt), for example to be viewed with Notepad
- Replay: format to be used in combination with the Data Replay tool
- IRD: Interrogation Reply data format (Currently only implemented in the ADS-B module and to be viewed in RASS-S with the Interrogation Reply viewer) [Reference 2]
- EDR V2: standard data format as being input or output by an UDR600, RDR803 or RIM782 (serial channels) [Reference 2]
- Vector: data format to describe vectorized data (for example weather data to MRD3)
- Status: data format to describe status messages data (for example status messages to



#### MRD3)

- Video: data format to describe video data, for example input from the RIM782 and sent to the MRD3.

#### How to choose between a D6-recording and an EDR-recording?

An EDR recording is recommended when you want to make long time recordings on disk of your data (For example 30 days). Advantage is that the raw data with all information is recorded. No RASS-R software program can directly input EDR data, except the (Advanced) File Merger in the DHM (See chapter 7). A D6 recording is recommended when you want for example input the D6 chunks of data into the TRACKAN software. D6-files are bigger than EDR-files, so not recommended for long time storage. It also does not contain the raw data as received through for example the UDR600, because the data already went to D6 convert modules. From an EDR-file, you can always make a D6-file and a S4-file. From a D6-file, you can only make an EDR-file with the D6toCAT034/048 module.

#### Local versus Remote IP address:

Every time that an input or output over Ethernet network must be configured, you have the local and remote IP address to fill in. Local IP must only be filled in when the pc has multiple Ethernet ports. In this way, you tell the DHM through which physical Ethernet port it has to input or output data.

In the case that there is only one Ethernet port on the computer, you never have to fill in the local IP address. A practical example can be seen in "Figure 34: IP Addresses result".

#### **IP addresses:**

Whenever you have to type an IP address, it must be in the following form:

[xxx.xxx.xxx]:[ppppp].

A check will be performed on the validity of IP address and maximum port number, with the following dialog if wrong:



Figure 58: Invalid IP

#### **Default network protocol:**

By default and when applicable, all modules will have UDP as default transport protocol. **Modules to MRD3:** 

The following modules can be used to connect to a MRD3: RadarOutput, VectorOutput, StatusOutput and VideoOutput. Because more MRD3's can be connected to these output types, you will see the number of connected MRD3's in these modules.

#### **Data for TMD3:**

You cannot send D6 data to the TMD3. The TMD3 has an own engine that converts ASTERIXCat001/002/008/034/048 and RDIF to D6. So these actions do not need to be done by a DHM session. To send data to a TMD3, choose an UDPOutput module set to output type "EDR V2.0 incl. header".

#### **Sensor coordinates:**

Data protocols that only contain position in Lon/Lat (for example ASTERIXCat021), have a tab to fill in sensor coordinates. This makes it possible to calculate the X/Y or Ra/Az position in the D6 data, in order to process it in the TRACKAN software.



Drag and drop folder paths for recording and replay modules:

All recording and replay software modules require a **path to a folder**. Path selection cannot be made by a standard Windows dialog. You should drag and drop the path from Windows explorer to the Destination Path in the software module setup. Upon release of the mouse, a shaded border appears as in the figure below.



Figure 59: Drag and drop

Dragging and dropping between a processing pc (where the DHM Background Server runs on) and a monitoring pc (where the DHM Configuration Manager runs on) is not possible. In this case, you have to copy and paste the path.

Alternatively for recording modules, you can also type a path. If the path does not exist yet, a folder will be created.



#### Time Stamping:

The DHM always uses the PC time to timestamp each received data package with a **time of recording** (TOR). In order to accurate measure the processing delay of the radar; the TOR field has to be set in the EDR or D6 format as soon as possible. Therefore, this is done by an **input** module (for example: UDPInput, TCPInput, UDR600) instead of a recording module (for example EDRRecorder, D6Recorder, S4Recorder).

When setting recording parameters in a recording module, it can be selected to use the TOR from the data or the current system time to time stamp the file header and folder name. (See for example Figure 145)

The **time of detection** (TOD), present in the EDR, D6 or S4 file, is received from the radar data content or, in case of ADS-B data extracted by the RIM782 in combination with a GPS450, the RIM782 sets the TOD.

The **UDR module** can further be used to **synchronise the PC clock with UTC time** by selecting the checkbox "**use as timekeeper**". (See for example Figure 258) Proprietary hardware such as RIM782, UDR600, RDR803, enables the UDR module. The UDR will check each second whether the PC clock has to be synchronized with the GPS time or not. On the condition that the GPS450 sends a valid time message to the UDR (the time message is valid once the GPS450 receives enough satellite signals and had sufficient time to get synchronized.); and the difference with the PC clock is more than 100ms, the PC clock is corrected.

When no GPS450 or **other time source** (e.g. **NTP time server**) is available, the PC time can also be synchronized with the time present in the North Messages of ASTERIX CAT002 or 034 data, by using their respective convert modules. It is required to pass also the **ARP pulse** to the input of the convert module, using the event output of the UDR input module, in order to calculate the difference in receive time of the ARP and the TOD of the North message. A time synchronization routine will correct the PC time when the time difference is more than 100ms. (See also the tutorial at the end of the TMD3 usermanual, IE-UM-00030-xxx TMD3.pdf)

# and the

Whether a time server, GPS450 or North Message + ARP is used to synchronise PC time, the date is not corrected and will have to be set manually.





## 6.1 ADCCP Convert

	<u>*</u> *
ADCCPConvert None	×
	$\sim \times$

Figure 60: ADCCP Convert software component symbol

- **Purpose:** Convert ADCCP digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts clean ADCCP data.
- **Output:** Five output channels. ADCCP data in D6, text, vector or EDR format. Outputs are numbered clockwise starting with the top leftmost blue X.

**Configuration**: Double click the ADCCPConvert software component symbol in the session configuration diagram. Following dialogs are shown:

ADCCP Setup	ADCCP Setup
Output Selection Version Filter	Output Selection Version Filter
Output Type Message Type D6 All W	Standard ADCCP
buffer status (%)	buffer status (%)

Figure 61: ADCCPConvert configuration interfaces

 Output selection:
 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt, vector or EDR. Choose the appropriate message type for every enabled channel to filter on: Status/Target/Weather/Strobe/Map or All messages

 $\Box$  Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

- Version: Select the correct version of ADCCP: Standard or LRR
- Filter: disabled, reserved for future development

Buffer status: shows the component's input FIFO buffer fill status.





#### 6.2 ADS-B Decoder

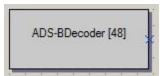


Figure 62: ADS-B Decoder software component symbol

**Purpose**: to input ADS-B data.

Inputs: None, direct interface to RIM782 and UVR892 hardware.

In combination with a RIM the ADS-B Decoder module will only appear when the USB Video output is connected to the pc running the DHM server.

**Outputs**: One single output that must be connected to the ADS-B-module.

**Configuration**: Double click the ADS-BDecoder software component symbol in the session configuration diagram. Following dialog is shown:

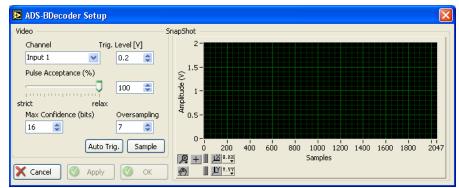


Figure 63: ADS-BDecoder configuration interface

Channel:	1 and 2 in combination with the UVR892. 1 to 6 corresponds to the video channels on the RIM782. Ch1 to 4 for Input 1 to 4, I for Input 5 and Q for Input 6.
Trigger Level:	the trigger level must be set just above the peaks of the noise floor. Use the horizontal zoom button to zoom in on the noise floor.
Pulse Acceptance:	(min.0, max. 100). These are % values resulting in a value use internally to determine if pulses are accepted as belonging to the same reply.
Max. Confidence:	(bits): (min. 0, max. 16) number of bits that may be corrected during the error correction phase by use of the CRC. Using a larger number of bits will result in more processor load. Selecting 0 will remove all corrupted packets.
Oversampling:	(min.1, max. 7) select the number of possible replies when a valid preamble is detected.
Auto Trigger:	automatically calculates a trigger level, based on the peaks measured in the snapshot.
Snapshot window:	every time the Sample-button is pressed, the snapshot-window is updated.



# Status: Right click the ADS-BDecoder software component symbol in the session configuration diagram and select status. Following dialog is shown:

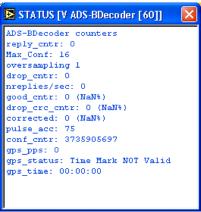


Figure 64: ADS-BonRIM status

<b>Reply counter</b> :	incremental counter showing the number of replies	
Max_Conf:	as set by the max confidence parameter	
Oversampling:	as set by the oversampling parameter	
Drop counter:	number of replies dropped by the RIM, if this increments at a fast pace adjust trigger level.	
Nreplies/sec:	number of replies per second, average number of replies during the last 10 seconds.	
Good_cntr:	number of replies that didn't need error correction	
Drop_crc_cntr:	rejected replies due to CRC error	
Corrected:	replies with corrected CRC error	
Pluse_acc:	<b>internal value determined by the 1-100% pulse acceptance</b> parameter	
Conf_cntr:	snapshot of the current reply's confidence bits	
Gps_pps:	pulse per second from GPS signal	
Gps_status:	status of the GPS, locked means valid timestamping	
Gps_time:	GPS time	

and

The status windows can be used to get the configuration parameters set for best performance. The configurable parameters, together with site setup and conditions, have an influence on Coverage, Probability of detection, Plot Quality, RIM782 Processing Load, ... The optimal parameters setting will depend on what is desired to be detected. Figure 63 shows a configuration as described in heading 2.2 of [IE-UM-00054-002 ADS-B 1090ES Extractor] tuned for maximum number of tracked detections (see Figure 68) during peak traffic over Belgium.



# 6.3 ADS-B on RIM

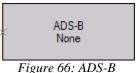
	ADS-BOnRIM [2]	¢
F	igure 65: ADS-BOnRI	M

and

The ADS-B on RIM module has been replaced by the ADS-B Decoder module and is no longer available for new sessions. For compatibility reasons, earlier sessions might still load with this module. It is recommended replacing the ADS-B on RIM module in these sessions.

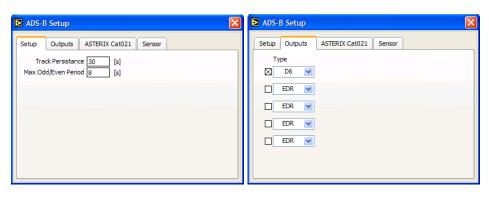


#### 6.4 <u>ADS-B</u>



- **Purpose:** Converts ADS-B digital messages to other formats as described by the output and configuration sections below.
- Inputs: ADS-B input from the ADS-BDecoder module
- **Output:** Multiple outputs. The output format can be configured in the ADS-B configuration screen. Currently EDR, IRD and D6 are supported.

**Configuration**: Double click the ADS-B software component symbol in the session configuration diagram. Following dialog is shown:



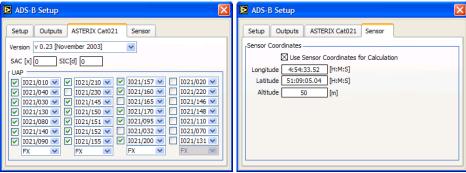


Figure 67: ADS-B Configuration interface

Setup:	Track persistence: Period that the ADS-B track is maintained without update.
	Max Odd/Even period: Max period between odd and even message
	for ADS-B track to start.
Outputs:	three formats are supported: EDR (use this to output to an
-	AsterixCat21Convert or to make an EDR-recording), IRD (RASS-
	S compatible format) and D6 (display, analysis).
AsterixCat021:	Here you can completely define the UAP for the ASTERIX cat021
	content according to the EUROCONTROL standards for the ADS-
	B messages. Version 0.23 and 0.26 is implemented.
Sensor:	You can fill in the longitude, latitude and altitude of the sensor
	where the ADS-B data originates from. Use the tick box to use

these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

Status: Right click the ADS-B software component symbol in the session configuration diagram. Following dialog is shown:

STATUS [ADS-B]	
DF17 Mess/sec:0 DF18 Mess/sec:0	
tracked D0-260: 0 D0-260A: T-Syncro: Position: Velocity: ID: 0 Other: 0	0 0 0
FOM/PA = 0:000 1:000 2:000 3:000 4:000	6:000 7:000 8:000

Figure 68: ADS-B Status window

ADS-B messages/sec: Number of valid ADS-B messages received per second

DO-260:	Number of DO-260 type transponders currently tracked	
DO-260A:	Number of DO-260A type transponders currently tracked	
T-Syncro:	Time-synchronization value (in case of FOM 8-9)	
<b>Position</b> :	Number of transponders transmitting position information that are currently tracked	
Velocity:	Number of transponders transmitting velocity information that are currently tracked	
ID:	Number of transponders transmitting ID information that are currently tracked	
Other:	Number of transponders transmitting other than the above mentioned information that are currently tracked	
FOM/PA	Number of ADS-B targets according to their Figure of Merit.	



## 6.5 <u>AircatConvert</u>



- **Purpose**: Convert Aircat digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts clean Aircat data.
- Output: Five output channels. Aircat data in D6, text, EDR or Replay format. Outputs are numbered clockwise starting with the top leftmost blue X. Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration**: Double click the AircatConvert software component symbol in the session configuration diagram. Following dialog is shown:

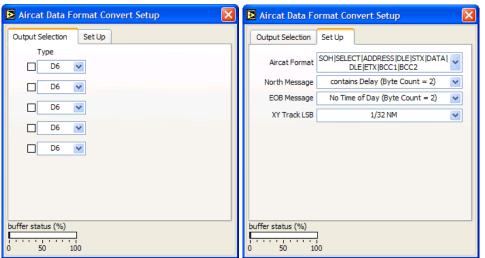


Figure 70: AIRCATConvert configuration interface

**Output selection**: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt or EDR.

ends -

 $\square$  Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Set Up:Aircat Format: Select the correct formatNorth Message: select the north message contentEOB Message: select the EOB messageXY Track LSB: select the XY track LSB

Buffer status: shows the component's input FIFO buffer fill status.



# 6.6 AleniaRHPConvert

Figure 71: AleniaRHP Convert software component symbol

- **Purpose:** Convert Alenia RHP digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean Alenia RHP data without the presence of transport protocol framing data.



 $\square$  Alenia RHP uses U-HDLC with one header byte. The U-HDLC module by default strips 2 bytes (header and format,) so reconfigure it to only strip the header byte (see 6.80).

- Outputs:Up to 5 outputs, each output has an associated output format, which can be<br/>configured using the AleniaRHPConvert configuration screen.<br/>Supported output formats are: D6, text, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AleniaRHPConvert software component symbol in the session configuration diagram. Following dialog is shown:

🖻 Alenia RHP Setup	🖪 Alenia RHP Setup
Output Selection     Version     Sensor       Type     D6     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Db     Image: Constraint of the sensor     Image: Constraint of the sensor       Do     Image: Consens <th>Output Selection     Version     Sensor       Sensor Coordinates     Use Sensor Coordinates for Calculation       Longitude     4:54:47.58     [H:M:S]       Latitude     51:08:58.92     [H:M:S]       Altitude     50     [m]</th>	Output Selection     Version     Sensor       Sensor Coordinates     Use Sensor Coordinates for Calculation       Longitude     4:54:47.58     [H:M:S]       Latitude     51:08:58.92     [H:M:S]       Altitude     50     [m]
0 50 100	0 50 100

Figure 72: AleniaRHPConvert Configuration interface

**Output selection**: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt, EDR or Replay.



# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

- Sensor: You can fill in the longitude, latitude and altitude of the sensor where the RADAR data originates. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).
- Version: Version 04 [13/01/91] is implemented.
- **Buffer status**: shows the component's input FIFO buffer fill status.



### 6.7 ARUP Convert



Figure 73: ARUP Convert software component symbol

- **Purpose:** Convert ARUP digital plot and sector message format to other formats as described by the output and configuration sections below. Jamming and Clutter map data will be discarded.
- Inputs: Single input accepts data in raw EDR V2 format. The data presented at the input must be clean ARUP data without the presence of transport protocol framing.
- Outputs: Up to 5 outputs, each output has an associated output format, which can be configured in the Output Selection tab of the configuration screen. Supported output formats are: D6, text, EDR and replay. Outputs are numbered clockwise starting with the top right blue X.
- **Configuration**: Double click the ARUP Convert software component symbol in the session configuration diagram. Following dialog is shown:

🖻 ARUP Data Format Convert Setup
Output Selection
Туре
⊠ D6 💌
🛛 txt 💌
EDR 💌
🛛 replay 💌
D6 💌
buffer status (%)
0 50 100

Figure 74: ARUP Convert Configuration interface

**Output selection**: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt, EDR or Replay.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

**Buffer status**: shows the component's input FIFO buffer fill status.

#### 6.8 ASR9Convert





- **Purpose:** Convert digital messages ASR-9 (Airport Surveillance Radar 9) 13-bit CD format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASR9 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the ASR9Convert configuration screen. Supported output formats are: D6 and text.



 $\Box$  Outputs are numbered clockwise starting with the top leftmost blue X.

**Configuration:** Double click the ASR9Convert component symbol in the session configuration diagram. Following dialog is shown:

🔁 ASR9 Convert Setup
Output Selection
Туре
D6 💌
buffer status (%)
0 50 100

Figure 76: ASR9Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

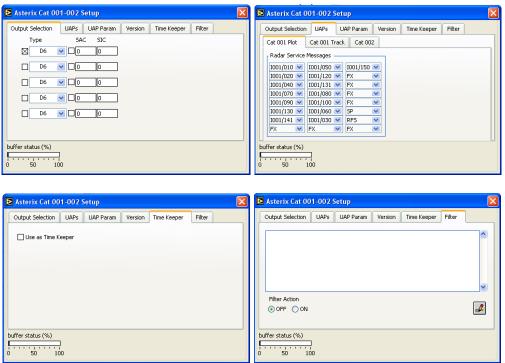


#### 6.9 AsterixCat001 002Convert

AsterixCat001-002Cor None	nvert

Figure 77: AsterixCat001-002Convert software component symbol

- **Purpose:** Convert ASTERIX Cat001 (Monoradar data target reports) and Asterix Cat002 (Monoradar service messages) digital messages format to other formats as described by the output and configuration sections below. This component replaces the components described in heading 6.10 and 6.11 and have been added to be compatible with future RASS-M. Main difference is that output remains synchronous with the sequence of the input packets, which is not the case with an ASTERIX splitter and the separate ASTERIX Cat001 and ASTERIX Cat002 converters. Use the separate converters only in case status output is required.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX Cat001 and/or ASTERIX Cat002 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat001-002Convert configuration screen. Supported output formats are: D6, text, EDR and replay. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat001-002Convert software component symbol in the session configuration diagram. Following dialog is shown:



*Figure 78: AsterixCat001-002Convert Configuration interface* 

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.







Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding CAT001 or CAT002 Data Fields.

Click on the "UAP Param" tab to fill in the CAT001 scaling.

Click on the "Version" tab to select the correct version of each ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the "Time Keeper" tab and tick the checkbox if you want to use the ASTERIX CAT002 data stream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.

Filter: use the filter to filter on every data item according to the ASTERIX UAP. Choose the appropriate Filter Action: OFF or On.

By clicking the filter field or the pencil button  $\swarrow$ , the editor window will open:

Filter Editor		$\mathbf{X}$
( FSPEC ==	1001/010 Data Source De	escriptor)
		~
FSPEC 010 SAC	== !=	And
010 SIC 020 TYP	>	
020 SIM	<	Or
020 SSR/PSR 020 ANT 020 SPI	<= [] ![]	OExcept
Value I001/010 Data Source Descriptor		
Clear One Cl	ear All Cancel	ОК

Figure 79: AsterixCat001 Filter Editor

The filter editor is self-explanatory: select a type to filter on, a proper condition and a logical relation between types. [..] Means "contains" while ![..] means "does not contain". When filtering on FSPEC, all the FSPEC items will appear in a dropdown list (Value field). Finally, after pressing OK, you will see the result appearing in the filter pane.

This filter engine is the same as used in the MRD3 as S-filter. Therefore you need to install the DHM on a computer when you want to make use of the S-filter in the MRD3.

#### 6.10 AsterixCat001Convert





Figure 80: AsterixCat001Convert software component symbol

- **Purpose:** Convert ASTERIX CAT001 (Monoradar data target reports) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2.0 format. This means that the data presented must be clean ASTERIX CAT001 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat001Convert configuration screen.<br/>Supported output formats are: D6, txt, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat001Convert software component symbol in the session configuration diagram. Following dialog is shown:

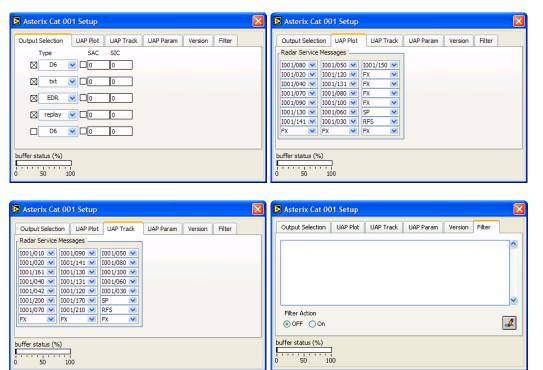


Figure 81: AsterixCat001Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.



Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP Plot" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "UAP Track" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Track Data.

Click on the "UAP Param" tab to fill in the scaling.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Filter: use the filter to filter on every data item according to the ASTERIX UAP. Choose the appropriate Filter Action: OFF or On.\_\_\_\_

When clicking the filter field or the pencil button 4, the following window will open:

Filter Editor		X
( FSPEC	== 1001/010 Data Source De	escriptor)
		<b>~</b>
FSPEC 010 SAC	· == !=	() And
010 SIC 020 TYP	> >=	Oor
020 SIM 020 SSR/PSR	< <=	
020 ANT 020 SPI	[] ![]	OExcept
Value I001/010 Data Source Descriptor		×
Clear One	Clear All Cance	ОК

Figure 82: AsterixCat001 Filter Editor

The filter editor is self-explanatory: select a type to filter on, a proper condition and a logical relation between types. [..] Means "contains" while ![..] means "does not contain". When filtering on FSPEC, all the FSPEC items will appear in a dropdown list (Value field). Finally, after pressing OK, you will see the result appearing in the filter pane.

This filter engine is the same as used in the MRD3 as S-filter. Therefore you need to install the DHM on a computer when you want to make use of the S-filter in the MRD3.

You can better use the AsterixCat001\_002Convert module that preserves the correct message sequencing.



#### 6.11 AsterixCat002Convert

AsterixCat002Convert None	
None	

Figure 83: AsterixCat002Convert software component symbol

- **Purpose:** Convert ASTERIX CAT002 (Monoradar service messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT002 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat002Convert configuration screen.<br/>Supported output formats are: D6, text, EDR, status and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.<br/>Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration**: Double click the AsterixCat002Convert software component symbol in the session configuration diagram. Following dialog is shown:

🔁 Asterix Cat 002 Setup	Asterix Cat 002 Setup	Asterix Cat 002 Setup
Asterix Cat 002 Setup         X           Output Selection         UAPs         Version         Time Keeper           Type         SAC         SIC         Image: SIC	Asterix Cat 002 Setup           Output Selection         UAPs         Version         Time Keeper           Radar Service Messages         1002/00 w         1002/00 w         1002/00 w           1002/000 w         1002/00 w         1002/00 w         1002/00 w           1002/000 w         1002/000 w         1002/00 w         1002/00 w           1002/000 w         1002/000 w         1002/000 w         1002/000 w           1002/000 w         1002/000 w         1002/000 w         1002/000 w           1002/000 w         RFS w         PX         w           buffer status (%)         0         0         0	Asterix Cat 002 Setup  Output Selection UAPs Version Time Keeper Use as Time Keeper  Duffer status (%)
0 50 100	0 50 100	0 50 100

Figure 84: AsterixCat002Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



### $\Box$ Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the "Time Keeper" tab and select the tickbox if you want to use the ASTERIX CAT002 datastream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.



You can better use the AsterixCat001\_002Convert module that preserves the correct message sequencing.



#### 6.12 AsterixCat008Convert

AsterixCat008Convert
AsterixCaluuuConvert
None

Figure 85: AsterixCat008Convert software component symbol

- **Purpose:** Convert ASTERIX CAT008 (Monoradar derived weather information) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2.0 format. This means that the data presented must be clean ASTERIX CAT008 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat008Convert configuration screen.<br/>Supported output formats are: text, EDR, replay and vector.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat008Convert software component symbol in the session configuration diagram. Following dialog is shown:

🗈 Asterix Cat 008s Setup	🔁 Asterix Cat 008s Setup	► Asterix Cat 008s Setup
Output Selection         UAP         Version         Sensor           Type         SAC         SIC         -         •         0         0           -         •         0         0         -         •         0         0           -         •         0         0         -         •         0         0           -         •         0         0         -         •         0         0           -         •         0         0         -         •         0         0	Output Selection         UAP         Version         Sensor           Monosensor Weather Information         Messages         1008/000 w         1008/000 w           1008/000 w         1008/100 w         1008/100 w         1008/100 w           1008/000 w         1008/101 w         1008/100 w         1008/100 w           1008/003 w         1008/101 w         1008/100 w         1008/100 w           1008/003 w         1008/100 w         1008/100 w         1008/100 w           1008/003 w         1008/100 w         1008/100 w         1008/100 w           1008/003 w         1008/100 w         1008/100 w         1008/100 w           1008/003 w         FPS w         PX         W	Output Selection     UAP     Version     Sensor       Sensor Coordinates     Use Sensor Coordinates for Calculation       Longitude     4:54:47.58     [H:M:S]       Latitude     51:08:58:92     [H:M:S]       Altitude     50     [m]
buffer status (%) 0 50 100	buffer status (%)	buffer status (%)

*Figure 86: AsterixCat008Convert Configuration interface* 

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

## Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the



assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the "Sensor" tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT008 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).





Figure 87: AsterixCat009Convert software component symbol

- **Purpose:** Convert ASTERIX CAT009 digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2.0 format. This means that the data presented must be clean ASTERIX CAT098 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat008Convert configuration screen. Supported output formats are: text, EDR, replay and vector. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat009Convert software component symbol in the session configuration diagram. Following dialog is shown:



Asterix Cat 009 Setup	Asterix Cat 009 Setup
Output Selection UAP Version Sensor   Type SAC SIC   0 0   0 0   0 0   0 0   0 0   0 0	Output Selection       UAP       Version       Sensor         Monosensor       Weather Information       Messages         1009/000       1009/090       I009/010         1009/010       1009/100       I009/020         FX       I009/030       FX         1009/060       FX       I009/070         FX       I009/080       FX         FX       FX       I009/080
buffer status (%)	buffer status (%)
Actorix Cat 000 Setup	Actoria Cat 000 Satur
Asterix Cat 009 Setup	Asterix Cat 009 Setup
Asterix Cat 009 Setup	Asterix Cat 009 Setup

*Figure 88: AsterixCat009Convert Configuration interface* 

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



### Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the "Sensor" tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT009 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).



#### 6.14 AsterixCat010Convert

AsterixCat010Convert None

Figure 89: AsterixCat010Convert software component symbol

- **Purpose:** Convert ASTERIX CAT010 (Monosensor Surface Movement Data) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT010 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat010Convert configuration screen.<br/>Supported output formats are: D6, text, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat010Convert software component symbol in the session configuration diagram. Following dialog is shown:

Asterix Cat 010 Setup	🗈 Asterix Cat 010 Setup	Asterix Cat 010 Setup
Output Selection       UAP       Version       Sensor         Type       SAC       SIC         D6       0       0         0       50       100	Output Selection         UAP         Version         Sensor           Monosensor Surface Movement         Messages         1010/50 ♥         1010/50 ♥           1010/010 ♥         1010/200 ♥         1010/200 ♥         1010/200 ♥           1010/100 ♥         1010/200 ♥         1010/200 ♥         1010/200 ♥           1010/140 ♥         1010/170 ♥         1010/991 ♥         1010/210 ♥           1010/040 ♥         1010/220 ♥         1010/550 ♥         SP ♥           1010/040 ♥         1010/220 ♥         1010/550 ♥         SP ♥           1010/040 ♥         1010/220 ♥         1010/550 ♥         SP ♥           1010/042 ♥         1010/210 ♥         1010/310 ♥         RE ♥           FX<	Output Selection       UAP       Version       Sensor         Sensor Coordinates       Use Sensor Coordinates for Calculation         Longitude       4:54:47.58       [H:M:S]         Latitude       51:08:58.92       [H:M:S]         Altitude       50       [m]         buffer status (%)       50       [m]

Figure 90: AsterixCat010Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.



Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the "Sensor" tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT010 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).



### 6.15 AsterixCat011Convert

Figure 91: AsterixCat011Convert software component symbol

- Purpose:Convert ASTERIX CAT011 (Advanced-SMGCS Data) digital messages format<br/>to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT011 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat011Convert configuration screen. Supported output formats are: D6, text, EDR and replay. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat011Convert software component symbol in the session configuration diagram. Following dialog is shown:

🔁 Asterix Cat 011 Setup	🗈 Asterix Cat 011 Setup	Asterix Cat 011 Setup
Output Selection         UAP         Version         Sensor           Type         SAC         SIC         ID           D6         0         0         0           Doffer status (%)         0         0           0         50         100	Output Selection         UAP         Version         Sensor           A-SMGCS Messages         1011/100 w         1011/100 w         1011/100 w         1011/100 w           1011/010 w         1011/100 w         1011/100 w         1011/100 w         Spare w           1011/101 w         1011/104 w         1011/100 w         Spare w         1011/100 w           1011/101 w         1011/104 w         1011/100 w         Spare w         1011/100 w           1011/101 w         1011/11 w         1011/101 w         Spare w         1011/100 w           1011/102 w         1011/120 w         1011/100 w         Spare w         1011/20 w           1011/202 w         1011/120 w         1011/201 w         1011/20 w         Spare w         1011/20 w           1011/202 w         1011/200 w         1011/200 w         Spare w         PX w         PX w         PX w           buffer status (%)         59         100         100         100         100         100	Output Selection     UAP     Version     Sensor       Sensor Coordinates     Use Sensor Coordinates for Calculation       Longitude     4:54:47.58     H:M15]       Latitude     51:08:58.92     [H:M15]       Attitude     50     [m]

Figure 92: AsterixCat011Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output. In a similar way, filtering on the "ID" can be done.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.



Click on the "Sensor" tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT011 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

The "buffer status" indicator shows the component's input FIFO buffer fill status.



### 6.16 AsterixCat017Convert

AsterixCat017Convert None	XXX
------------------------------	-----

Figure 93: AsterixCat017Convert software component symbol

- **Purpose:** Convert ASTERIX CAT017 (Mode-S Surveillance Co-ordination Function messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT017 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat017Convert configuration screen.<br/>Supported output formats are: D6, text, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat017Convert software component symbol in the session configuration diagram. Following dialogs are shown:

Asterix Cat 017 Setup	Asterix Cat 017 Setup	
Output Selection         UAPs         Version         Filter           Type         SAC         SIC         D6         0         0           D6         0         0         0         0         0         0           D6         0	Output Selection         UAPs         Version         Filter           Data Link Function Messages         1017/010         1017/045         1017/350         1017/350           1017/012         1017/070         spare         v         1017/050         1017/050           1017/2050         1017/200         spare         v         1017/250         1017/200         spare         v           1017/221         1017/240         spare         v         1017/240         spare         v           1017/140         V         spare         v         1017/140         Spare         v           FX         FX         FX         V         FX         v         FX         v	
buffer status (%)	buffer status (%) 0 50 100	

Figure 94: AsterixCat017Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



### $\Box$ Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.2 is implemented.



### 6.17 AsterixCat018Convert

AsterixCat018Convert None	· ·
	$\mathcal{L}$

Figure 95: AsterixCat018Convert software component symbol

- **Purpose:** Convert ASTERIX CAT018 (Mode-S Data-Link Function messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT018 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat018Convert configuration screen.<br/>Supported output formats are: D6, text, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat018Convert software component symbol in the session configuration diagram. Following dialogs are shown:

Asterix Cat 018 Setup	Asterix Cat 018 Setup
Output Selection         UAPs         Version         Filter           Type         SAC         SIC         D6         0	Output Selection         UAPs         Version         Filter           Data Link Function Messages         1018/013 w         1018/013 w         1018/013 w           1018/037 w         1018/013 w         1018/002 w         1018/015 w         1018/031 w           1018/001 w         1018/010 w         1018/010 w         1018/013 w         1018/031 w           1018/001 w         1018/023 w         1018/002 w         1018/021 w         1018/034 w           1018/001 w         1018/025 w         1018/000 w         1018/034 w         1018/035 w           1018/015 w         1018/027 w         1018/010 w         1018/021 w         1018/021 w           1018/017 w         1018/021 w         1018/013 w         1018/013 w         1018/013 w
D6 0 buffer status (%) 0 50 100	FX         FX<

Figure 96: AsterixCat018Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



### **Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.**

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.6 is implemented.



### 6.18 AsterixCat019Convert

<del>~~~~</del>	v
AsterixCat019Convert None	×

Figure 97: AsterixCat019Convert software component symbol

- **Purpose:** Convert ASTERIX CAT019 (MLT System Status Messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT019 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat019Convert configuration screen.<br/>Supported output formats are: text, EDR, status and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.<br/>Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration**: Double click the AsterixCat019Convert software component symbol in the session configuration diagram. Following dialogs are shown:

🖻 Asterix Cat 019 Setup	🖻 Asterix Cat 019 Setup	🔁 Asterix Cat 019 Setup
Output Selection     UAPs     Version       Type     SAC     SIC       Status     0     0       tx     0     0       EDR     0     0       Status     0     0       EDR     0     0       Status     0     0	Output Selection         LIAPs         Version           Multilateration System Status Messages         1019/010         1019/600           1019/010         1019/600         1019/600           1019/910         1019/600         1019/9100           1019/910         1019/600         1019/950           1019/950         Spare         1019/950           1019/950         Spare         1019/950           1019/950         RE         V           1019/950         Spare         V           1019/953         RE         V           FX         FX         V	Output Selection UAPs Version          v 1.1 [March 2007]         v         buffer status (%)
0 50 100	0 50 100	0 50 100

*Figure 98: AsterixCat019Convert Configuration interface* 

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



### Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.



Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.1 is implemented.



### 6.19 AsterixCat020Convert

AsterixCat020Convert None

Figure 99: AsterixCat020Convert software component symbol

- **Purpose:** Convert ASTERIX CAT020 (MLT Messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT020 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat020Convert configuration screen. Supported output formats are: D6, text, EDR and replay. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat020Convert software component symbol in the session configuration diagram. Following dialog is shown:

🖻 Asterix Cat 020 Setup	🔁 Asterix Cat 020 Setup	🔁 Asterix Cat 020 Setup
Output Selection         UAP         Version         Sensor           Type         SAC         SIC         0	Output Selection         UAP         Version         Sensor           Multilateration         Target Reports         T020/105 w         T020/203 w           1020/020 w         T020/020 w         T020/210 w         T020/260 w           1020/140 w         T020/100 w         T020/301 w         T020/303 w           1020/041 w         T020/100 w         T020/500 w         T020/500 w           1020/102 w         T020/202 w         T020/500 w         T020/500 w           1020/101 w         T020/202 w         T020/500 w         T020/500 w           1020/101 w         T020/500 w         T020/500 w         T020/500 w           1020/101 w         T020/202 w         FX         SP         w           FX         FX         W         FX         w	Output Selection     UAP     Version     Sensor       [Sensor Coordinates

Figure 100: AsterixCat020Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

and the

### Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.



Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.5 is implemented.

Click on the "Sensor" tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT020 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).



### 6.20 AsterixCat021Convert

Figure 101: AsterixCat021Convert software component symbol

- **Purpose:** Convert ASTERIX CAT021 (ADS-B Messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT021data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat021Convert configuration screen.<br/>Supported output formats are: D6, text, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat021Convert software component symbol in the session configuration diagram. Following dialogs are shown:

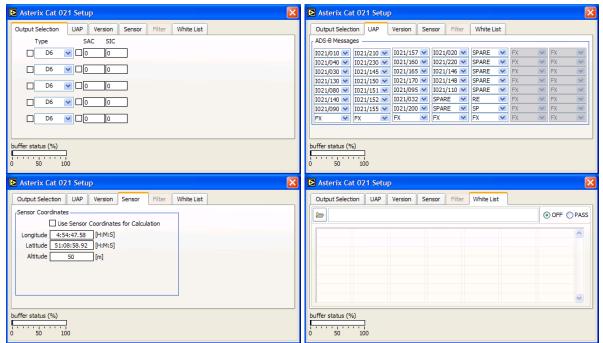


Figure 102: AsterixCat021Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

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### $\Box$ Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data



on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 0.23, 0.26 and 1.0 is implemented.

Click on the "Sensor" tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT021 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

Click on the "White List" tab to load a .TXT-file with one MODE-S addresses per line. When the "PASS" radio button is checked, only the MODE-S addresses in the white list will pass the AsterixCat021Convert.



#### 6.21 AsterixCat023Convert

AsterixCat023Convert
None

Figure 103: AsterixCat023Convert software component symbol

- **Purpose:** Convert ASTERIX CAT023 digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT023 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat023Convert configuration screen. Supported output formats are: D6, text, EDR and replay. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat021Convert software component symbol in the session configuration diagram. Following dialogs are shown:

Asterix Cat 023 Setup	Asterix Cat 023 Setup	Asterix Cat 023 Setup
Output Selection     UAP     Version       Type     SAC     SIC       •     •     •       •     •     •       •     •     •       •     •     •       •     •     •       •     •     •       •     •     •       •     •     •       •     •     •	Output Selection         UAP         Version           Radar Service Messages         1023/010 ▼         1023/010 ▼           1023/010 ▼         1023/010 ▼         1023/010 ▼           1023/010 ▼         1023/010 ▼         1023/010 ▼           1023/010 ▼         1023/010 ▼         1023/010 ▼           1023/010 ▼         1023/010 ▼         1023/010 ▼           1023/010 ▼         1023/010 ▼         1023/010 ▼           1023/010 ▼         1023/010 ▼         1023/010 ▼	Output Selection UAP Version V 0.10 [October 2002]
buffer status (%)	buffer status (%)	buffer status (%)

Figure 104: AsterixCat023Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

### and

### $\Box$ Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 0.10, 0.11, 0.13, 1.0, 1.1 and 1.2 are implemented.



### 6.22 AsterixCat030Convert

AsterixCat030Convert None

Figure 105: AsterixCat030Convert software component symbol

- **Purpose:** Convert ASTERIX CAT030 (Exchange of Air Situation Pictures) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT030 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat030Convert configuration screen.<br/>Supported output formats are: D6, text, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat030Convert software component symbol in the session configuration diagram. Following dialog is shown:

Asterix Cat 030 Setup	
Output Selection UAP Version Parameters	
Type SAC SIC User Nb.	
buffer status (%)	
o 50 100	
🔁 Asterix Cat 030 Setup	
Output Selection LIAP Version Parameters	
Output Selection UAP Version Parameters	
Air Situation Pictures Messages	
Air Situation Pictures Messages	191 ¥ 1030/050 ¥
Air Situation Pictures Messages           1030/010 v         1030/100 v           1030/015 v         1030/080 v           1030/015 v         1030/080 v           1030/015 v         1030/080 v           1030/015 v         1030/080 v           1030/015 v         1030/090 v           1030/016 v         1030/090 v	135 💌 1030/270 💌
Air Situation Pictures Messages           1030/010 v         1030/100 v         1030/080 v         1030/360 v         1030/440 v         1030/490 v         1030/1           1030/015 v         1030/180 v         1030/080 v         1030/140 v         1030/450 v         1030/202 v         1030/1           1030/030 v         1030/181 v         1030/200 v         1030/340 v         1030/450 v         1030/382 v         1030/3	135 👽 1030/270 👽 165 👽 1030/370 👽
Air Situation Pictures Messages           1030/010         1030/100         1030/080         1030/360         1030/440         1030/490         1030/1           1030/15         1030/160         1030/990         1030/140         1030/450         1030/020         1030/1           1030/030         1030/181         1030/200         1030/340         1030/435         1030/382         1030/1           1030/035         1030/060         1030/220         RE         1030/430         1030/344         1030/344	135 👽 1030/270 👽 165 👽 1030/370 👽
Air Situation Pictures Messages           1030/010         1030/100         1030/080         1030/360         1030/440         1030/490         1030/100           1030/015         1030/180         1030/090         1030/140         1030/450         1030/202         1030/150           1030/030         1030/180         1030/200         1030/340         1030/435         1030/382         1030/150           1030/030         1030/180         1030/200         1030/340         1030/430         1030/382         1030/150           1030/030         1030/150         1030/220         RE         1030/430         1030/384         1030/310           1030/040         1030/150         1030/240         1030/390         1030/460         1030/386         1030/200           1030/070         1030/130         1030/290         1030/400         1030/480         1030/110         1030/200	135 💉 1030/270 💉 165 🔍 1030/370 💙 230 📡 Spare 🔍
Air Situation Pictures Messages           1030/010 ×         1030/100 ×         1030/080 ×         1030/360 ×         1030/440 ×         1030/490 ×         1030/1           1030/015 ×         1030/100 ×         1030/090 ×         1030/140 ×         1030/450 ×         1030/202 ×         1030/1           1030/030 ×         1030/181 ×         1030/200 ×         1030/340 ×         1030/382 ×         1030/32         1030/32         1030/31         1030/382 ×         1030/31         1030/382 ×         1030/31         1030/382 ×         1030/31         1030/382 ×         1030/31         1030/382 ×         1030/31         1030/382 ×         1030/31         1030/384 ×         1030/384 ×         1030/384 ×         1030/384 ×         1030/384 ×         1030/31         1030/31         1030/21         1030/400 ×         1030/460 ×         1030/386 ×         1030/31         1030/21         1030/400 ×         1030/160 ×         1030/11	135       V       1030/270         165       V       1030/370         230       Spare       V         250       Spare       V         210       Spare       V         120       Spare       V
Air Situation Pictures Messages           1030/010         1030/100         1030/080         1030/360         1030/440         1030/490         1030/100           1030/015         1030/180         1030/090         1030/140         1030/450         1030/020         1030/150           1030/030         1030/180         1030/200         1030/340         1030/355         1030/382         1030/322           1030/030         1030/200         1030/200         1030/340         1030/430         1030/384         1030/20           1030/040         1030/150         1030/240         1030/390         1030/460         1030/386         1030/2           1030/070         1030/130         1030/290         1030/400         1030/400         1030/110         1030/2	135 ×       I030/270 ×         165 ×       I030/370 ×         230 ×       Spare ×         250 ×       Spare ×         210 ×       Spare ×
Air Situation Pictures Messages           1030/010         1030/100         1030/000         1030/360         1030/440         1030/490         1030/10           1030/015         1030/100         1030/000         1030/140         1030/450         1030/020         1030/13           1030/030         1030/180         1030/200         1030/340         1030/382         1030/32         1030/382         1030/31           1030/035         1030/200         1030/220         RE         1030/384         1030/384         1030/364         1030/364         1030/364         1030/364         1030/364         1030/364         1030/364         1030/364         1030/20         1030/400         1030/480         1030/364         1030/366         1030/20         1030/400         1030/480         1030/364         1030/20         1030/400         1030/480         1030/10         1030/20         1030/10         1030/20         1030/10         1030/20         1030/20         1030/10         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20	135       V       1030/270         165       V       1030/370         230       Spare       V         250       Spare       V         210       Spare       V         120       Spare       V
Air Situation Pictures Messages           1030/010         1030/100         1030/000         1030/360         1030/440         1030/490         1030/10           1030/015         1030/100         1030/000         1030/140         1030/450         1030/202         1030/150           1030/030         1030/180         1030/200         1030/340         1030/352         1030/382         1030/322         1030/352         1030/384         1030/360         1030/384         1030/360         1030/384         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/360         1030/460         1030/360         1030/360         1030/460         1030/100         1030/460         1030/100	135       V       1030/270         165       V       1030/370         230       Spare       V         250       Spare       V         210       Spare       V         120       Spare       V
Air Situation Pictures Messages           1030/010         1030/100         1030/000         1030/360         1030/440         1030/490         1030/10           1030/015         1030/100         1030/000         1030/140         1030/450         1030/020         1030/13           1030/030         1030/180         1030/200         1030/340         1030/382         1030/32         1030/382         1030/31           1030/035         1030/200         1030/220         RE         1030/384         1030/384         1030/364         1030/364         1030/364         1030/364         1030/364         1030/364         1030/364         1030/364         1030/20         1030/400         1030/480         1030/364         1030/366         1030/20         1030/400         1030/480         1030/364         1030/20         1030/400         1030/480         1030/10         1030/20         1030/10         1030/20         1030/10         1030/20         1030/20         1030/10         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20         1030/20	135       V       1030/270         165       V       1030/370         230       Spare       V         250       Spare       V         210       Spare       V         120       Spare       V



🔁 Asterix Cat 030 Setup		
Output Selection UAP Version Parameters		
I030/100 and I030/110 Scaling F = 0 (LSB = 1/64 NM)		
buffer status (%)		
0 50 100		

Figure 106: AsterixCat030Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output. In a similar way, filtering on the "User number" can be done.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 2.5ter and 6.2 is implemented.

Click on the "Parameters" tab to select the scaling factor for calculated track position - range.



### 6.23 AsterixCat031Convert

A + + C +0010	
AsterixCat031Convert None	

Figure 107: AsterixCat031Convert software component symbol

- **Purpose:** Convert ASTERIX CAT031 (Sensors Information messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT031data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat031Convert configuration screen.<br/>Supported output formats are: text, status, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.<br/>Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration**: Double click the AsterixCat031Convert software component symbol in the session configuration diagram. Following dialog is shown:

🔁 Asterix Cat 031 Setup	Asterix Cat 031 Setup	X
Output Selection       UAPs       Version         Type       SAC       SIC       User Nb.         Image: Sac in the state st	Output Selection         UAPs         Version           Sensor Status Messages         1031/010         1031/010         1031/010         1031/010         1031/010         1031/010         1031/020         1031/020         1031/020         1031/020         1031/020         1031/020         1031/020         1031/020         Yersion         Yersion	
buffer status (%)	buffer status (%)	

Figure 108: AsterixCat031Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

### æ

### Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output. In a similar way, filtering on the "User number" can be done.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 6.2 is implemented.



#### 6.24 AsterixCat034 048Convert

AsterixCat034-048Conver None	t

Figure 109: AsterixCat034-048Convert software component symbol

- Purpose: Convert ASTERIX CAT034 (Monoradar service messages) and CAT048 (Monoradar data target reports) digital messages format to other formats as described by the output and configuration sections below. This component replaces the components described in heading 6.25 and 6.26 and have been added to be compatible with future RASS-M. Main difference is that output remains synchronous with the sequence of the inputted packets, which is not the case with an ASTERIX splitter and the separate ASTERIX CAT034 and ASTERIX CAT048 converters. Use the separate converters only in case status output is required.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT034 and/or ASTERIX CAT048 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat034-048Convert configuration screen.<br/>Supported output formats are: D6, text, EDR and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.

**Configuration**: Double click the AsterixCat034-048Convert software component symbol in the session configuration diagram. Following dialog is shown:

Asterix Cat 034-048 Setup	Asterix Cat 034-048 Setup
Output Selection     UAPs     Version     Time Keeper     Filter       Type     SAC     SIC     Mode 4 Support Display       D6     0     0     This selection is only available in D6 output       D6     0     0     In order to view Mode 4       In order to view Mode 4     In order to view Mode 4       D6     0     0	Output Selection     UAPs     Version     Time Keeper     Filter       Cat 034     Cat 048     v1.14 [November 2000]     v       V1.26 [November 2000]     v     N1.14 [November 2000]     v       REF Version     v1.4 [June 2011]     v       SP Type     None     v
buffer status (%) 0 50 100	buffer status (%) 0 50 100
S Asterix Cat 034-048 Setup	Asterix Cat 034-048 Setup
Output Selection         UAPs         Version         Time Keeper         Filter           Use as Time Keeper	Output Selection UAPs Version Time Keeper Filter

Figure 110: AsterixCat034-048Convert Configuration interface



Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



### $\Box$ Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The Mode 4 selection flag is an extra option for displaying Mode 4 targets in the Intersoft Electronics MRD3 display software in a specific "user configurable" color. This option is only applicable on a D6 output.

# *For the MRD3 a specific configuration file is acquired and can be delivered by Intersoft Electronics.*

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding CAT034 or CAT048Data Fields.

Click on the "Version" tab to select the correct version of each ASTERIX category according to the Eurocontrol specifications. For CAT034 version 1.26 and for CAT048 version 1.14 are implemented. Extended CAT48 version 1.14 is implemented. The Special Purpose (SP) field is radar manufacturer dependent, select N/A unless you have the following interface implemented:

Type 1 : Telephonics Military M5

Click on the "Time Keeper" tab and tick the checkbox if you want to use the ASTERIX CAT034 data stream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.

The filter mechanism is the same as for the AsterixCat001-002Convert (Paragraph 6.9). An example: Aircraft ID contains "DAT".

( 240 Aircraft Identifie And(	ation	[] DAT	)	
230 AIC 230 B1A 230 B1B 240 Aircraft Identification 250 Repetition 250 BDS Register 250 BDS Register 260 ACAS			<pre>&gt;&gt;== != &gt;&gt;&gt;= &lt;&lt;== ! ! </pre>	⊘And ⊘Or ⊘Except

Figure 111: AsterixCat048 Filter Editor



#### 6.25 AsterixCat034Convert

0
AsterixCat034Convert None

Figure 112: AsterixCat034Convert software component symbol

- **Purpose:** Convert ASTERIX CAT034 (Monoradar service messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT034 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat034Convert configuration screen.<br/>Supported output formats are: D6, text, EDR, status and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.<br/>Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration**: Double click the AsterixCat034Convert software component symbol in the session configuration diagram. Following dialog is shown:

Asterix Cat 034 Setup	Asterix Cat 034 Setup	🗈 Asterix Cat 034 Setup
Output Selection UAP Version Time Keeper	Output Selection UAP Version Time Keeper	Output Selection UAP Version Time Keeper
Type     SAC     SIC       D     0     0       Utt     0     0       EDR     0     0       Status     0     0       Replay     0     0	Nobile         1034/010         1034/070           1034/010         1034/070         1034/070           1034/020         1034/100         1034/100           1034/020         1034/120         1034/120           1034/020         1034/120         1034/120           1034/020         1034/120         1034/020           1034/050         94         94           1034/060         SP         94           PX         PX         94	⊠ Use as Time Keeper
buffer status (%)	Duffer status (%)	buffer status (%)

Figure 113: AsterixCat034Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



### Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.26 is implemented.

Click on the "Time Keeper" tab and select the tickbox if you want to use the ASTERIX CAT034 datastream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.

### and the

### $\square$ You can better use the AsterixCat034\_048Convert module that preserves the correct message sequencing.

The ASTERIX CAT034 have different message types (see figure below), the types values are stored in the track number field of the D6 data output.

- 001 North Marker message
- 002 Sector crossing message
- 003 Geographical filtering message
- 004 Jamming Strobe message

Figure 114: Asterix Category 034 types



#### 6.26 AsterixCat048Convert

X	111
AsterixCat048Convert	2
	5

Figure 115: AsterixCat048Convert software component symbol

- **Purpose:** Convert ASTERIX CAT048 (Monoradar data targets report) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT048 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat048Convert configuration screen.<br/>Supported output formats are: D6, text, replay and EDR.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat048Convert software component symbol in the session configuration diagram. Following dialog is shown:

Asterix Cat 048 Setup	Asterix Cat 048 Setup
Output Selection     UAPs     Version     Filter       Type     SAC     SIC       D6     0     0       D6     0     0	Output Selection         UAPs         Version         Filter           Radar Service Messages         1048/210         1048/260         1048/260         1048/260           1048/010         1048/220         1048/200         1048/030         1048/055         1048/055           1048/020         1048/250         1048/080         1048/050         1048/050         1048/050           1048/040         1048/151         1048/050         1048/050         1048/050         1048/050           1048/040         1048/161         1048/100         1048/050         1048/060         1048/050           1048/040         1048/102         1048/10         1048/050         1048/060         1048/050           1048/130         1048/120         SP         Y         Y         Y         Y           FX         FX         FX         FX         Y         Y         Y
buffer status (%)           0           50	buffer status (%)
Asterix Cat 048 Setup	🔁 Asterix Cat 048 Setup
Output Selection UAPs Version Filter	Output Selection UAPs Version Filter
buffer status (%)	© OFF ○ ON

Figure 116: AsterixCat048Convert Configuration interface



Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.



Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The Mode 4 selection flag is an extra option for displaying Mode 4 targets in the Intersoft Electronics MRD3 display software in a specific "user configurable" color. This option is only applicable on a D6 output.

# *For the MRD3 a specific configuration file is acquired and can be delivered by Intersoft Electronics.*

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.14 is implemented.

The filter mechanism is the same as for the AsterixCat001Convert. Refer to this paragraph. An example: Aircraft ID contains "DAT".

Filter ( 240 And (	Editor ) Aircraft Identification		[] DAT)		
230 AIC 230 B1A 230 B1B 240 Aircraf 250 Repeti 250 MB Da 250 BDS R 250 BDS R 260 ACAS	ta			<ul> <li>==</li> <li>&gt;=</li> <li>&lt;&lt;</li> <li>&lt;=</li> <li>&lt;</li> <li>()</li> </ul>	<ul> <li>And</li> <li>Or</li> <li>⊙Except</li> </ul>
Value					
		Clear One	Clear All	Cance	і ок

Figure 117: AsterixCat048 Filter Editor

The "buffer status" indicator shows the component's input FIFO buffer fill status.



You can better use the AsterixCat034\_048Convert module that preserves the correct message sequencing.



### 6.27 AsterixCat062Convert

AsterixCat062Convert None

Figure 118: AsterixCat062Convert software component symbol

- **Purpose:** Convert ASTERIX CAT062 (System Track Data) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT062 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat062Convert configuration screen. Supported output formats are: D6, text, EDR and replay. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCat062Convert software component symbol in the session configuration diagram. Following dialog is shown:

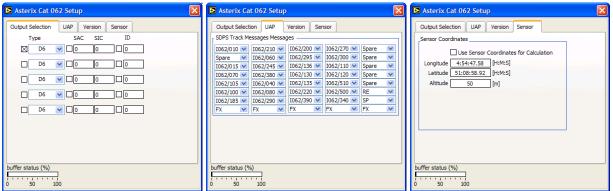


Figure 119: AsterixCat062Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output. In a similar way, filtering on the "ID" can be done.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.3 and 1.11 are implemented.

Click on the "Sensor" tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT062 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).



### 6.28 AsterixCat063Convert

•	1
AsterixCat063Convert None	

Figure 120: AsterixCat063Convert software component symbol

- **Purpose:** Convert ASTERIX CAT063 (Sensor Status Messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT063 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat063Convert configuration screen.<br/>Supported output formats are: text, EDR, status and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.<br/>Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration**: Double click the AsterixCat063Convert software component symbol in the session configuration diagram. Following dialog is shown:

Asterix Cat 063 Setup	Asterix Cat 063 Setup	×
Output Selection         UAPs         Version           Type         SAC         SIC         ID           X         txt         0         0         0           -         V         0         0         0           -         V         0         0         0           -         V         0         0         0           -         V         0         0         0           -         V         0         0         0	Output Selection         UAPs         Version           Sensor Status Messages         1063/061 w         1063/061 w           1063/015 w         1063/090 w         1063/090 w           1063/050 w         1063/090 w         1063/092 w           1063/050 w         1063/090 w         1063/090 w           1063/070 w         RE w         1063/070 w           Fx w         Fx w         Fx w	
buffer status (%)	buffer status (%)	

*Figure 121: AsterixCat063Convert Configuration interface* 

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

## Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output. In a similar way, filtering on the "ID" can be done.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.1 is implemented.



### 6.29 AsterixCat065Convert

v	1
AsterixCat065Convert None	

Figure 122: AsterixCat065Convert software component symbol

- **Purpose:** Convert ASTERIX CAT065 (SDPS Service Status Messages) digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT065 data without the presence of transport protocol framing data.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the AsterixCat065Convert configuration screen.<br/>Supported output formats are: text, EDR, status and replay.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.<br/>Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration**: Double click the AsterixCat065Convert software component symbol in the session configuration diagram. Following dialog is shown:

🔁 Asterix Cat 065 Setup	Asterix Cat 065 Setup	×
Output Selection         UAPs         Version           Type         SAC         SIC         ID           Ext         0         0         0         0           EDR         0         0         0         0         0           Status         0         0         0         0         0           Replay         0         0         0         0         0	Output Selection         UAPs         Version           SDP5 Service Status Messages         1065/010         Spare         V           10055/010         Spare         V         1065/020         Spare           10055/030         Spare         V         1065/030         Spare           10055/030         Spare         V         1065/030         Spare           10055/030         Spare         V         1065/030         Spare           10055/050         Spare         V         V         V           10055/050         SP         V         V         V           FX         FX         V         V         V	
buffer status (%)	buffer status (%)	

Figure 123: AsterixCat065Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.



The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAPs" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.2 is implemented.



	××
AsterixCatSplitter	
	<u></u> ×

Figure 124: AsterixCatSplitter software component symbol

Purpose:This component is necessary to process multiple ASTERIX messages (belonging<br/>to the same or different ASTERIX category) in a protocol frame.<br/>For example, an UDP- or TCP-frame (OSI Transport Layer) can contain multiple<br/>ASTERIX messages.<br/>Another example: an U-HDLC-frame (OSI Data Link Layer) can also contain<br/>multiple ASTERIX messages.<br/>In order to split the data in these protocol frames into individual ASTERIX<br/>messages, the ASTERIXCatSplitter is used.<br/>Remark: The module does not split an ASTERIX message into different records.<br/>This is done in the different ASTERIX protocol converts. (For more information,<br/>refer to the ASTERIX structure, reference [4])

*Even in the case when only one ASTERIX category is present in the data field, it is still recommended to use the ASTERIXCatSplitter because more than one ASTERIX message of the same category can be found in one protocol frame.* 

- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX data without the presence of transport protocol framing data.
- **Outputs**: Up to 6 outputs, each output has an associated ASTERIX Category. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration**: Double click the AsterixCatSplitter software component symbol in the session configuration diagram. Following dialog is shown:

🔁 AsterixCatSplitte 🔀
Enable selectors and enter category numbers ';' separated
⊠34
⊠48
34;48
buffer status (%) Sync.
0 50 100

Figure 125: AsterixCatSplitter Configuration interface

Click on the checkbox next to the Category specification field. Enter a category number in the Category specification field. If multiple categories are required on a channel, type the category numbers consecutive and separated with a ";". Alternatively, when you fill in "!" with a category number, you will let pass all data except that category. For example: !1 means that all categories will pass this channel except category 1.





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### Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the "Sync" checkbox to enable internal package numbering. This is useful to restore the message sequencing after further processing. Due to the multitasking nature of the DHM it is possible that not all message types are processed equally fast, i.e. target messages might take longer to process than sector messages, when converted data streams are later on merged together it is possible that the original package sequence is lost. To prevent this you may number all the packages with the "Sync" checkbox so the original message flow may be restored with the "Synchronize Ack" message re-sequencer.



## Use the "Sync" option in combination with the "Synchronize Ack" software component.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Status: Right click the AsterixCatSplitter software component symbol in the session configuration diagram. Following dialog is shown:

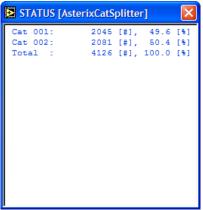


Figure 126: AsterixCatSplitter status

The status display shows how many data packets (in number and percentage) are sent in a split category.



### 6.31 <u>AsterixPacketizer</u>

AsterixPacketizer	

Figure 127: AsterixPacketizer software component symbol

**Purpose:** Packetize ASTERIX byte-stream. Builds clean ASTERIX EDR-V2 records from byte-stream information. Byte-stream sources include Comm ports and TCP/IP.



Care must be taken that the information captured via a byte-stream input starts with the first byte of an ASTERIX record. If the first byte captured is not the first byte of an ASTERIX record the DHM could lock-up in an endless loop or produce unpredictable results.

- Inputs: Single input accepts data in byte-stream format. This means that the data presented must be clean ASTERIX data without the presence of transport protocol framing data.
- **Outputs**: One output. Packetized ASTERIX data in EDR-V2 format.
- **Configuration**: Double click the AsterixPacketizer software component symbol in the session configuration diagram. Following dialog is shown:



Figure 128: Asterix Packetizer Configuration interface

No configuration is needed; the "buffer status" indicator shows the component's input FIFO buffer fill status.

Status: Right click the AsterixPacketizer software component symbol in the session configuration diagram to select status. Following dialog is shown:

STATUS [AsterixPacketizer]	×
<pre># Packets: 0 # Resets : 0 Last Reset: 00:00:00 [UTC]</pre>	

Figure 129: AsterixPacketizer status

The status display shows how many data packets where processed and how many times and when it last received a reset from the COMM port or TCP/IP module.

Resets could have caused loss of data. If number of resets is high this could indicate a malfunctioning or overloaded connection.



### 6.32 <u>Beat</u>



Figure 130: Beat software component symbol

**Purpose**: This software component generates a beat.

Inputs: No input available.

- Outputs: One output that can be connected to an event node of a software component. For example: S4 recorder, D6 recorder, IRD recorder.
- **Configuration**: Double click the Beat software component symbol in the session configuration diagram. Following dialog is shown:



Figure 131: Beat Configuration interface

Fill in the clock value in milliseconds. Everytime the module sends a beat, the LED flashes green.



<	CD-2CConvert None	×¥ ¥
		×

Figure 132: CD-2c Convert Software Module symbol

- **Purpose:** Converts CD-2C digital messages format to other formats as described by the output and configuration sections below.
- **Inputs:** Single input accepts clean CD-2C data.
- **Outputs:** Five output channels. CD-2C data in D6, text, vector or EDR format. Outputs are numbered clockwise starting with the top leftmost blue X.

**Configuration:** Double click the CD-2C software component symbol in the session configuration diagram. Following dialogs are shown:

🔁 CD-2C Setup	CD-2C Setup
Output Selection Version Filter	Output Selection Version Filter
Output Type Message Type           D6         All	Standard CD-2C
buffer status (%)	buffer status (%)

Figure 133: CD-2Convert configuration interface

**Output selection**: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt or EDR. Choose the appropriate message type for every enabled channel to filter on: Status/Target/Weather/Strobe/Map or All messages

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

- Version: Select the correct version of CD-2C: Standard or LRR
- Filter: disabled, future development

Buffer status: shows the component's input FIFO buffer fill status.





Figure 134: COMMInput software component symbol

**Purpose:** Hardware interface with standard Windows COMM ports. Typically used for asynchronous data acquisition. The Software components are enumerated within the square brackets. There will be as many COMMInput modules as there are available Windows COMM ports.



**COMMInput** modules can only be instantiated once and are mutually exclusive with COMMOutput modules.

- **Inputs:** None, direct interface with system drivers.
- **Outputs:** One output, byte-stream of characters received on the COMM port.
- **Configuration:** Double click the COMMInput software component symbol in the session configuration diagram. Following dialog is shown:

		_
9600		baud rate (9600)
8		data bits (8)
None	~	parity (0:none)
1.0	10	stop bits (10: 1 bit)
None	0	flow control (0:none)
10000		timeout (10sec)
×A		termination char (0xA = '\n' = LF
		enable termination char (T)

Figure 135: COMMInput Configuration interface

Baud rate is the rate of transmission. The default is 9600.

**Data bits** is the number of bits in the incoming data. The value of data bits is between five and eight. The default value is 8.

Parity specifies the parity used for every frame to be transmitted or received.

- 0 No parity (default)
- 1 Odd parity
- 2 Even parity
- 3 Mark parity
- 4 Space parity



Stop bits specifies the number of stop bits used to indicate the end of a frame.

- 10 1 stop bit
- 15 1.5 stop bits
- 20 2 stop bits

Flow control sets the type of control used by the transfer mechanism.

Туре	Explanation
0	None(default)- The transfer mechanism does not use flow control. Buffers on both sides of the
	connection are assumed to be large enough to hold all data transferred.
1	XON/XOFF- The transfer mechanism uses the XON and XOFF characters to perform flow
	control. The transfer mechanism controls input flow by sending XOFF when the receive buffer is
	nearly full, and it controls the output flow by suspending transmission when XOFF is received.
2	RTS/CTS- The transfer mechanism uses the RTS output signal and the CTS input signal to perform flow control. The transfer mechanism controls input flow by unasserting the RTS signal when the receive buffer is nearly full, and it controls output blow by suspending the transmission
-	when CTS signal is unasserted.
3	XON/XOFF and RTS/CTS—The transfer mechanism uses the XON and XOFF characters and the RTS output signal and CTS input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the RTS signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the CTS is unasserted.
4	DTR/DSR—The transfer mechanism uses the DTR output signal and the DSR input signal to perform flow control. The transfer mechanism controls input flow by unasserting the DTR signal when the receive buffer is nearly full, and it controls output flow by suspending the transmission when the DSR signal is unasserted
5	XON/XOFF and DTR/DSR—The transfer mechanism uses the XON and XOFF characters and the DTR output signal and DSR input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the DTR signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the DSR signal is unasserted.

Timeout sets the timeout value for the write and read operations.

**Termination char** calls for termination of the read operation. The read operation terminates when **termination char** is read from the serial device. 0xA is the hex equivalent of a linefeed character (\n). Change the **termination char** to 0xD for message strings that terminate with a carriage return (\r).

**Enable termination char** prepares the serial device to recognize **termination char**. If checked (default), the device is set to recognize the termination character. If unchecked the device does not recognize the termination character.



The COMMInput module is only available when a COM-port is installed in the computer. It is also necessary to install the VisaRuntime engine to make the COM-port visible in the DHM. (Can be found on the RASS-R installation DVD, folder "Prerequisites", "VISA", "visa410runtime.exe".



COMMOutput [3]

Figure 136: COMMOutput software component symbol

**Purpose:** Hardware interface with standard Windows COMM ports. Typically used for asynchronous data acquisition. The Software components are enumerated within the square brackets. There will be as many COMMOutput modules as there are available Windows COMM ports.



**COMMOutput modules can only be instantiated once and are mutually** *exclusive with COMMInput modules.* 

- **Inputs:** Single input accepts data in EDR V2 format.
- **Outputs:** None, direct interface with system drivers.
- **Configuration:** Double click the COMMOutput software component symbol in the session configuration diagram. Following dialog is shown:

E Comm Outpu	t Setup 🛛 🔀
9600	baud rate (9600)
8	data bits <mark>(</mark> 8)
None 💌	parity (0:none)
1.0 10	stop bits (10: 1 bit)
None 0	flow control (0:none)
10000	timeout (10sec)
buffer status (%)	 100

Figure 137: COMMOutput Configuration interface

Baud rate is the rate of transmission. The default is 9600.

**Data bits** are the number of bits in the incoming data. The value of data bits is between five and eight. The default value is 8.

Parity specifies the parity used for every frame to be transmitted or received.

- 0 No parity (default)
- 1 Odd parity
- 2 Even parity
- 3 Mark parity
- 4 Space parity



**Stop bits** specifies the number of stop bits used to indicate the end of a frame.

- 10 1 stop bit
- 15 1.5 stop bits
- 20 2 stop bits

used by the transfer

**Flow control** sets the type of control mechanism.

Mode	Explanation
0	None(default)- The transfer mechanism does not use flow control. Buffers on both sides of the connection are assumed to be large enough to hold all data transferred.
1	XON/XOFF- The transfer mechanism uses the XON and XOFF characters to perform flow control. The transfer mechanism controls input flow by sending XOFF when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received.
2	RTS/CTS- The transfer mechanism uses the RTS output signal and the CTS input signal to perform flow control. The transfer mechanism controls input flow by unasserting the RTS signal when the receive buffer is nearly full, and it controls output blow by suspending the transmission when CTS signal is unasserted.
3	XON/XOFF and RTS/CTS—The transfer mechanism uses the XON and XOFF characters and the RTS output signal and CTS input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the RTS signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the CTS is unasserted.
4	DTR/DSR—The transfer mechanism uses the DTR output signal and the DSR input signal to perform flow control. The transfer mechanism controls input flow by unasserting the DTR signal when the receive buffer is nearly full, and it controls output flow by suspending the transmission when the DSR signal is unasserted
5	XON/XOFF and DTR/DSR—The transfer mechanism uses the XON and XOFF characters and the DTR output signal and DSR input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the DTR signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the DSR signal is unasserted.

Timeout sets the timeout value for the write and read operations.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

The COMMOutput module is only available when a COM-port is installed in the computer. It is also necessary to install the VisaRuntime engine to make the COM-port visible in the DHM. (Can be found on the RASS-R installation DVD, folder "Prerequisites", "VISA", "visa410runtime.exe".





**Purpose:** Filters on D6 data messages.

**Inputs:** Single input accepts data in D6 format.

**Outputs:** Single output in D6 format.

**Configuration:** Double click the D6Filter software component symbol in the session configuration diagram. Following dialogs are shown:

D6Filter Setup	D6Filter Setup
Filter Coverage	Filter         Coverage           Image: Apply Volume         Apply DTED           Min. Elev.         2.0           Max. Elev.         45.0           Min. Range         0.0           Min. Range         256.0           Min. Apply SMGET         State
Filter Action ⊙ OFF ○ On ○ Flag	Max. Ak.         127000         [fk]           ⊙ OFF         On         Flag            Lon         [H:M:S]         Lak         [H:M:S]         Ak         0         (m)
buffer status (%)	buffer status (%) 

Figure 139: D6Filter Configuration interface

Filter:	Filter on the D6 messages by opening the filter editor (Similar as in AsterixCat001Convert). This filter engine is the same as the G- filter in the MRD3.
	The following filter actions are possible: Off: Filter is disabled On: Filter is enabled Flag: D6-messages that pass the filer are flagged (Flag can be interpreted in the MRD3 or TRACKAN).
Coverage:	You can filter on 3 coverage related items, by enabling the appropriate radio buttons:
	Volume: define the volume in Elevation/Range and Altitude DTED: load screening files (.hrscr created by the Coverage Map Calculator). Only D6-messages in coverage will pass the filter. SMGET: load SMGET screening files. Only D6-messages in coverage will pass the filter.
	The logical relation between the Volume/DTED and SMGET filter is an AND-condition.



The filter conditions are the same again: **Off/On/Flag**. **Longitude**, **Latitude** and **Altitude** need to be filled in to know the screening files centre points.

**Buffer status:** indicator shows the component's input FIFO buffer fill status.

æ

First the Filter-tab is executed, then the Coverage tab.

Status: Right click the D6Filter software component symbol in the session configuration diagram to select status. Following dialog is shown:

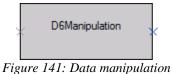
💽 S	TA	TUS [D6F	ilter	]	×
# D	6	processe passed failed	: 0		

Figure 140: D6Filter status

The status display shows the number and percentage of D6 data packets processed, passed and filtered out.



### 6.37 <u>D6Manipulation</u>



**Purpose:** Change real time data information fields in a D6 stream.

**Inputs:** Single input accepts data in D6 format.

**Outputs:** Single output in D6 format.

**Configuration:** Double click the D6Manipulation software component symbol in the session configuration diagram. Following dialogs are shown:

D6Manipulation Setu Range Azimuth Ali Range Bias  0.000 Range Gain  0 buffer status (%) 0 50 100	p X	▶ D6Manipulation Setu         Range       Azimuth         Azimuth       Alt         Azimuth       Bias         0.000       Eccentricity Correction         File Path	itude   Lon/Lat   X / Y   [deg]
D6Manipulation Setup         Range       Azimuth         Altitude       Lon/Lat       X / Y         Barometric Correction       File Path         Duffer status (%)	D6Manipulation Setu         Range       Azimuth         Altude         Calculate L         Longitude         Altude         Altude         buffer status (%)         0         50         100	itude Lon/Lat X/Y	D6Manipulation Setup       X         Range       Azimuth       Altitude       Lon/Lat       X / Y         X Coordinate Bias       0.000000       [NM]         Y Coordinate Bias       0.000000       [NM]         United Bias       0.000000       [NM]         Duffer status (%)       0       50       100

Figure 142: D6Manipulation Configuration interface

Range:	Enable Range Bias and fill in the correction in [+/-NM] with a precision of 0.001NM. Range bias is only changed for X/Y or Range/Azimuth data. (Not for Lon/Lat data) Enable Range Gain and fill in the correction in [+/-ppm].
Azimuth:	Enable Azimuth Bias and fill in the correction in [+/-deg] with a precision of 0.001deg. You can also use eccentricity correction based on a RASS-S processed eccentricity file.
Altitude:	Enable Barometric Correction, based on a barometric sounding file.

Lon/Lat:	Enable Calculate long/lat and fill in the position of the radar. It will calculate and add the long/lat based on the range/azimuth data.
X/Y:	Enter the desired bias for X and/or Y in degrees. Use the checkboxes to select if you want to apply the bias.
Buffer status:	indicator shows the component's input FIFO buffer fill status.

**Status:** Right click the D6Manipulation software component symbol in the session configuration diagram to select status. Following dialog is shown:

STATUS [D6Manipulation]	
# D6 processed:0	

Figure 143: D6Manipulation status

The status display shows the number of D6 data packets that where processed.



### 6.38 D6Recorder



Figure 144: D6Recorder software component symbol

- Purpose:Record D6 information onto disk. Recording can group D6 records together and<br/>archive recordings based on the configuration settings. D6 information is used as<br/>a RASS-R inter-application data exchange format. D6 recordings can mainly be<br/>used in the TRACKAN and Radar Comparator Mono/Dual.<br/>A D6-file is recorded in a folder with the same name as the D6-files.<br/>All D6-files (folders) are recorded in the folder as specified in the Destination<br/>Path. (There is no grouping of folders per day as in the EDRRecorder.) See also<br/>the example at the end of this section.<br/>You can change the name of the D6-file afterwards, though the name of the folder<br/>and file must be the same.
- **Inputs:** Single input accepts data in D6 format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording. Event input accepts event data (North, Sector crossing, Sector 0).
- **Outputs:** None, stores .D6 output files on disk.
- **Configuration:** Double click the D6Recorder software component symbol in the session configuration diagram. Following dialog is shown:

D6 Recorder Setup	<
General Script	
Destination path	
8	
None V Period	
None Rec. Delimiter	
All recordings 💌 Archive	
System Time 💌 Time Source	
buffer status (%)	

Figure 145: D6Recorder Configuration interface

**Destination path:** Enter a destination path; this is the **full path to the directory** in which you wish to store the recordings.

# The files are stored on the machine where the DHM background server is running.

- **Period:** Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of **period** size, select "none" for continuous recoding in one data file.
- **Rec. Delimiter:** D6 Records can be grouped together in the recording file based on the delimiter setting.



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---------

None	Each D6 record is stored as a separate entity in the recording.
ARP (Event)	D6 records are grouped together in the recording based on ARP events.
North (Event)	D6 records are grouped together in the recording based on North events.
Sect 0 (Event)	D6 records are grouped together in the recording based on Sect 0 events.
Time (Event)	D6 records are grouped together in the recording based on Time events.
North (D6)	D6 records are grouped together in the recording based on North messages in
	the D6 data stream.
Sect 0 (D6)	D6 records are grouped together in the recording based on Sect 0 messages in
	the D6 data stream.

## Make sure that an Event Source is configured when using an event as delimiter.

- Archive: When using a specific **period** the **archive** setting specifies how many recording files will be kept on disk, ranging from 1 to 5000 recordings. Old recordings will be deleted to make place for new ones. Select "All recordings" if no recordings are to be removed.
- Time Source:Build file names with the current system time or with the time of<br/>recording information. When system time is selected the current<br/>UTC time will be used, with the condition that the time zone of the<br/>computer is correctly set. See also time keeper note explained in<br/>the beginning of heading 6.
- **Buffer status:** indicator shows the component's input FIFO buffer fill status.
- Status: Right click the D6Recorder software component symbol in the session configuration diagram. Following dialog is shown:

STATUS [D6Recorder]	×
<pre># Records in file:32 # D6 in file :8214</pre>	

Figure 146: D6Recorderd status

The status display shows how many records are recorded in the D6-file and how many D6 messages are recorded. (A record can contain multiple D6 messages as defined in the Record Delimiter: when this is set to <none>, the number of "Records in file" and "D6 in file" will be the same.)



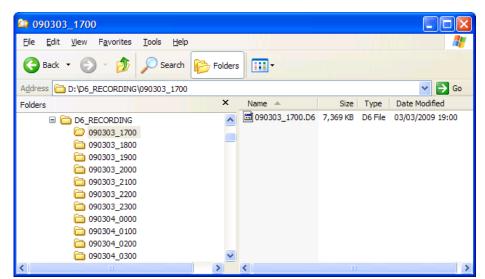


Figure 147: Example of a D6 recorder file structure



### 6.39 D6Replay



Figure 148: D6Replay Software component symbol

- **Purpose:** Replay (read) a D6 recording from disk. Previously captured data is played back with the option of increasing playback speed, replay only a subsection and replay continuous loop.
- Inputs: None, reads files from disk. Files must be in D6 format.
- Outputs: One output. Data is output in D6 format. The event output replays event data (North, Sector crossing, Sector 0).
- **Configuration:** Double click the D6Replay software component symbol in the session configuration diagram. Following dialog is shown:

<b>2</b> [	)6Replay	y Set	ир		
Sour	ce path				
<sup>1</sup> RN	DATA RA ICDE OPS 0125-110	0801			
typ	e Single	~	Speed	1.0	
Co	ntinuous		status	0	(%)
ind	ex range				
sta	rt time	curre	nt time	end time	
	:00:00.17	11:0	0:00.17	12:00:0	0.03

Figure 149: D6Replay Configuration interface

Source path: Enter a Source path; this is the full path to the directory from which you wish to retrieve the recording. When the file is correctly loaded, you will see a start and end time filled in.

# The files are stored on the machine where the DHM background server is running.

Type:

When type is set to Single, one can choose the replay speed for the recording: 1 (default) means as recorded, 2 means twice as fast, use 0.5 to playback at half the recording speed, etc. When speed is set to  $\mathbf{0}$  the D6 replay module will replay as fast as possible. When type is set to Block, a fixed block length is used for replay.

All DHM modules use buffer overflow protection. So, even when set to max. speed, the replay module will pause replay each time the input buffer of a connected module runs full. Because of this pausing, a well chosen speed can be faster than speed set to 0.

**Index range:** Select start and stop position in the recording (default all) to enable partial playback.





**Replay status (%):** Gives an indication in % of the number of D6-messages replayed.

Start time: End time:	Shows the recording timestamp from which playback will be started, adjust the <b>index range</b> start slider to select a different start time. Shows the recording timestamp at which the playback will stop, adjust the <b>index range</b> end slider to select a different end time.
Current time:	Shows the recording timestamp of the current record being played back.
Continuous loop:	When true the playback cycle is never stopped, when a recording has reached its end time the playback will start again from the start time in endless loop.

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### 6.40 D6ToCat034-048

D6ToCat034-048

Figure 150: D6ToCat034 software component symbol

**Purpose:** Converts D6 data messages to ASTERIX CAT034 and 048.

**Inputs:** Single input accepts data in D6 format.

**Outputs:** Data messages in ASTERIX CAT034 and CAT048 format. (EDR)

**Configuration:** Double click the D6ToCat034-048 software component symbol in the session configuration diagram. Following dialog is shown:

D6 to ASTERIX Cat034-048 Setup	D6 to ASTERIX Cat034-048 Setup
ASTERIX Cat034       ASTERIX Cat048       Sensor         Version       v 1.26 [November 2000]       v         UAP       v       1034/010       v         V 1034/000       v       1034/100       v         V 1034/000       v       1034/100       v         V 1034/020       v       1034/100       v         V 1034/020       v       1034/10       v         V 1034/020       v       1034/10       v         V 1034/020       v       1034/090       v         I 034/050       v       RE       v         V 1034/060       SP       V       V         FX       v       V       V	ASTERIX Cat034         ASTERIX Cat048         Sensor           Sensor Coordinates         SAC [X] 0         SIC[d] 0           SIC[d] 0         Longitude         4:54:47.58           Latitude         51:08:58.92         [H:M:S]           Latitude         50         [m]

Figure 151: D6ToCat034-048 Configuration interface

Click on the "ASTERIX CAT034" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields. Select the correct version of the ASTERIX CAT034 according to the Eurocontrol specifications. Version 1.26 is implemented.

Click on the "ASTERIX CAT048" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields. Select the correct version of the ASTERIX CAT048 according to the Eurocontrol specifications. Version 1.14 is implemented.

Click on the "Sensor" tab on top of the configuration window to edit to fill in the SAC/SIC code and the radar's position longitude, latitude and altitude that will be used in the ASTERIX CAT034 message. (On the condition that these fields are enabled in the UAP's)



### 6.41 D6toRSRP

D6ToRSRP

Figure 152: DotoRSRP software component symbol

**Purpose:** Converts D6 digital data messages to RSRP.

**Inputs:** Single input accepts data in D6 format.

**Outputs:** Data messages in RSRP format.

**Configuration:** Double click the D6ToRSRP software component symbol in the session configuration diagram. Following dialog is shown:

D6 to A	STERIX Cat034-048 Setup	
Sensor Sensor Coo Site Longitude Latitude Altitude	ordinates 0 0[deg] 0[deg]	

Figure 153: D6toRSRP Configuration Interface

Sensor Coordinates: Not used.



### 6.42 <u>D6ToS4</u>



Figure 154: D6toS4 Software component symbol

- **Purpose:** Converts D6 data messages to S4. S4 data can be used in other software tools, for example in the RASS-S Inventory tool or in the RASS-R Radar Comparator Mono/Dual.
- **Inputs:** Single input accepts data in D6 format.
- **Outputs:** Data messages in S4 format. (For example to send it to the S4-recorder)
- **Configuration:** Double click the D6ToS4 software component symbol in the session configuration diagram. Following dialog is shown:



Figure 155: D6ToS4 Configuration interface

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Status: Right click the D6ToS4software component symbol in the session configuration diagram. Following dialog is shown:

STATUS [D6ToS4]	×
# D6 to \$4:2164	

Figure 156: D6ToS4 status

The status display shows how many records are converted from D6 to S4.



-	-1	-	1	-	
01:01:15.718	Timestamp	×C00A0102	Status	246	Com/FS/ACAS
25/01/2008	1	-44.265625	X (Nm)	þ	#seg CC/CA
0	Target ID	-118.859375	Y (Nm)	0.000000	Æ time
1630	Track Nr	400.426392	Velocity	0	Overlap
7	Scan Nr	313.115845	Heading	D	Target Gen
<mark>•</mark> 0	1 Code	þ	# PSR Refl.	D	TP nr
<mark>∘</mark> 0	2 Code	D	# SSR Refl.	×0	Coverage
<mark>°</mark> 5767	A Code	<mark>×</mark> 40066A	S-Address	0	Reflector
27325	Altitude	×D	MB1	0	Set
19124	TO <b>[</b> s/256]	×0	MB2	d <mark>0</mark>	Index
126.835937	Range	×O	MB3	×0	Datalink Counte
0.000000	Æ Range	×0	MB4	×1040020	Status2
200.423584	Azimuth	×0	MB5	×42435331	TargetIDh
0.000000	Æ Azimuth	×0	MB6	×3834382E	TargetIDl
×O	S/D	×0	MB7	×0	- Datalink type
-70.00	Power	0	#seg CD/AIC	в	

Figure 157: S4 probe



### 6.43 Data manipulation

DataManipulation	
None	

Figure 158: D6 Manipulation software component symbol

**Purpose:** Manipulates an EDR V2.0 data stream in real time.

**Inputs:** Single input accepts data in EDR V2.0 format.

**Outputs:** Single output in EDR V2.0 format.

**Configuration:** Double click the DataManipulation software component symbol in the session configuration diagram. Following dialogs are shown:

	Data Manipula			Data Manipulat	
1	None	*	1	✓ None Bit Inverse	
2	None	~	2	Bytewise Bit R	everse
3	None	~	3	Wordwise Bit R	leverse
4	None	~	4	Byte Swap	
4	None	~	7	None	v
5	None	~	5	None	*
buff	er status (%)		buff	er status (%)	

Figure 159: Data Manipulation configuration interface

This module allows manipulating the data in the following ways:

Bit Inverse:	all bits are inverted. (0 becomes 1 and vice versa)
Bytewise Bit Reverse:	all bits in one byte change position (bit 0 becomes bit 7, bit
Wordwise Bit Reverse: Byte Swap:	1 becomes bit 6 etc.) all bits in one word change position two bytes in one word are swapped (byte 0 becomes byte 1 and vice versa)

These actions can be executed 5 times, taken into account that first Data Manipulation 1 is executed, then Data Manipulation 2 etc.

For example:

1	Bit Inverse	~	
2	Bytewise Bit Reverse	۷	
3	Wordwise Bit Reverse	۷	
4	None	*	
5	None	~	

Figure 160: Example Data Manipulation

The "buffer status" indicator shows the component's input FIFO buffer fill status





Figure 161: DataTrimmer software component symbol

**Purpose:** Strip a number of header and footer bytes so that only valid information frames remain.

**Inputs:** Single input accepts data in EDR V2.0.

**Outputs:** One output. Data in EDR V2.0 format stripped as defined in the setup.

**Configuration:** Double click the DataTrimmer software component symbol in the session configuration diagram. Following dialog is shown:

🔁 Data Trim	mer Setup				
Unwrap	0 Bytes	0 Offset from Begin			
Trim Header	0 Bytes	0 Offset from Begin			
Trim Footer	0 Bytes	0 Offset from End			
buffer status (%)					
0 50 100					

*Figure 162: DataTrimmer Configuration interface* 

Check the respective checkboxes to strip a header and/or footer. Give in the number of bytes to strip and the offset in bytes from begin or from end.

By enabling the Unwrap functionality, you have the possibility to read out the length of a data packet and to make separate data packets based on this information.

For example: suppose that a UDP packet contains different ASTERIX CAT001 packets one after each other. Knowing that in ASTERIX, there is a 2 byte length description with a 1 byte offset from the beginning, the Data Trimmer can read this length and cut the different ASTERIX CAT001 messages inside this UDP packet. In this way the "long" UDP packet can be unwrapped in different ASTERIX CAT001 messages.

The "buffer status" indicator shows the component's input FIFO buffer fill status



### 6.45 EADSConvert



Figure 163: EADSConvert software component symbol

- **Purpose:** Convert EADS PEX/ST digital messages format to other formats as described by the output and configuration sections below.
- **Inputs:** Single input accepts data in raw EDR V2 format. This means that the data presented must be clean EADS PEX/ST data without the presence of transport protocol framing data.
- **Outputs:** Up to 5 outputs, each output has an associated output format which can be configured using the EADSConvert configuration screen. As output, D6 format and text format are supported. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration:** Double click the EADSConvert software component symbol in the session configuration diagram. Following dialog is shown:

EADS Convert Setup	E
Output Selection	
Туре	
D6 💌	
D6 🗸	
D6 💌	
D6 💌	
🗖 D6 💌	
buffer status (%)	

Figure 164: EADSConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

<sup>d</sup> Output

### $\Box$ Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The "buffer status" indicator shows the component's input FIFO buffer fill status.



#### 6.46 EADS



Figure 165: EADS software component symbol

**Purpose:** Packetize EADS PEX/ST bytestream. Builds clean EADS PEX/ST EDR-V2 records from bytestream information. Bytestream sources include Comm ports and TCP/IP.



Care must be taken that the information captured via a bytestream input starts with the first byte of an EADS PEX/ST record. If the first byte captured is not the first byte of an EADS Pex/ST record the DHM could lock-up in an endless loop or produce unpredictable results.

- **Inputs:** Single input accepts data in byte-stream format. This means that the data presented must be clean EADS PEX/ST data without the presence of transport protocol framing data.
- **Outputs:** One output. Packetized EADS PEX/ST data in EDR-V2 format.
- **Configuration:** Double click the EADS software component symbol in the session configuration diagram. Following dialog is shown:

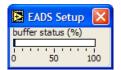


Figure 166: EADS Configuration interface

No configuration is needed, the "buffer status" indicator shows the component's input FIFO buffer fill status.



### 6.47 EDRRecorder



Figure 167: EDRRecorder software component symbol

- Purpose:Record EDR information onto disk. Recording can group EDR records together<br/>and archive recordings based on the configuration settings.<br/>An .EDR-file is recorded in a folder with the same name as the .EDR-file.<br/>All .EDR-files (folders) are recorded in the folder as specified in the Destination<br/>Path, grouped together per day (24hours). See also the example at the end of this<br/>section.<br/>An .EDR-file must always be accompanied by its index-file .idx. [Reference 2]<br/>You can change the name of the .EDR- and .idx-file, though they must be the<br/>same as the folder name.
- Inputs:6 Sources can be accepted as input. This means that more than one source may be<br/>configured; the data is then combined into a single recording.<br/>Event input accepts ACP/ARP/PPS. (On line 0)
- Outputs: None, stores output files on disk.
- **Configuration:** Double click the Recorder software component symbol in the session configuration diagram. Following dialog is shown:

EDRRecorder Setup	
General Script	
Destination path	
8	
None Veriod	
All recordings 💌 Archive	
RASS-S Format 💌 Format 🚅	
buffer status (%) 0 25 50 75 100	

Figure 168: Recorder Configuration interface

Destination path:	Enter a destination path; this is the <b>full path to the directory</b> in which you wish to store the recordings.  The files are stored on the machine where the DHM background server is running.
Period:	Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of <b>period</b> size, select "none" for continuous recoding in one data file.
Archive:	When using a specific <b>period</b> the <b>archive</b> setting specifies how long recording files will be kept on disk, ranging from 1 day to 10 years. Old recordings will be deleted to make place for new ones. Select "All recordings" if no recordings are to be removed.
Format:	Choose RASS-S compatible format for the recording.

ELECTRONIC

**Buffer status**: indicator shows the component's input FIFO buffer fill status.

The following setup is only necessary when the recording will be analyzed further in RASS-S.

When you click the pencil *button*, the following dialog will open:

🛃 R	ASS-S Recording Setup	$\times$
RAS	S-S Recording Setup	
Rec	cording Type 🛛 RAW 🛛 💌	
1.	None 💌	]
2.	ASTERIX 💌	]
з.	ASTERIX 💌	]
4.	ASTERIX 💌	]
5.	ASTERIX 💌	]
6.	ASTERIX 💌	]
X	Cancel 🚫 OK	

Figure 169: Recording setup

**Recording Type:** For the recording, select the appropriate recording type: Raw (default) the data is bitwise recorded, without respect of protocol framings EDR/UDR when the data is input from the EDR or UDR when the data is input from a data stream over TCP or UDP TCP/UDP Type of data: Select the type of data for every input line. Following data types are implemented: Asterix (default) **RDIF** DDE EADS SIP-PEX EADS PEX-ST **RSRP** LINK-1 **RIS CLF RIS RSRP RIS RAT31DL** Radar RAT31DL



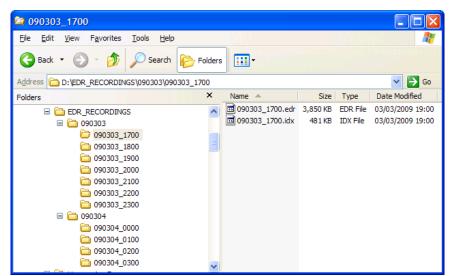


Figure 170: Example of an EDR recorder file structure

Status: Right click the EDRRecorder software component symbol in the session configuration diagram. Following dialog is shown:

STATUS [EDRRecorder]	×
Line 1: 36 [#], 8.85 [%] Line 2: 39 [#], 9.58 [%] Line 3: 37 [#], 9.09 [%]	
Line 3: 37 [#], 9:39 [*] Line 4: 38 [#], 9:34 [*] Line 5: 134 [#], 32.92 [*]	
Line 6: 123 [#], 30.22 [%]	

Figure 171: EDRRecorder status

The status display shows how many data packets (in number and percentage of the total over all channels) are recorded on each of the 6 channels.



### 6.48 EDRReplay



Figure 172: EDRReplay software component symbol

- **Purpose:** Replay (read) an EDR recording from disk. Previously captured data is played back as it was recorded with the option of increasing playback speed, replay only a subsection and replay in continuous loop.
- Inputs: None, reads files from disk. Files must be in EDR V2.0 or EDR V1.0 format.
- Outputs: Six outputs, to mimic the EDR hardware device. One output per recorded line. Data is output in EDR V2.0 format. The event output (O) replays event data (North, Sector crossing, Sector 0). The event output (X) replays ACP/ARP/PPS.
- **Configuration:** Double click the EDRReplay software component symbol in the session configuration diagram. Following dialog is shown:

EDRReplay Setup	×
General Script	
Source path	
D:\DATA RASS-R\TEST\EDR\1hour\090304\ 090304_0700	
type Single 💌 Speed 1.0	
Continuous Status 0.4344 (% time) index range	
start time current time end time	
14:55:03.29 14:55:18.93 15:55:03.07 2008/01/25 2008/01/25 2008/01/25	

Figure 173: EDRReplay Configuration interface

**Source path**: Enter a Source path; this is the **full path to the directory** from which you wish to retrieve the recording. When the file is correctly loaded, you will see a start and end time filled in.

*The files are stored on the machine where the DHM background server is running.* 

Type:

When type is set to Single, one can choose the replay speed for the recording: 1 (default) means as recorded, 2 means twice as fast, use 0.5 to playback at half the recording speed, etc. When speed is set to  $\mathbf{0}$  the EDR replay module will replay as fast as possible. When type is set to Block, a fixed block length is used for replay.

All DHM modules use buffer overflow protection. So, even when set to max. speed, the replay module will pause replay each time the input buffer of a connected module runs full. Because of this pausing, a well chosen speed can be faster than speed set to 0.

**Index range:** Select start and stop position in the recording (default all) to enable partial playback.



**Replay status (%):** Gives an indication in % of the number of messages replayed.

**Start time:** Shows the recording timestamp from which playback will be started, adjust the **index range** start slider to select a different start time. It is also possible to set the different times by using the "set Time and Date" dialog:

þ	Set	Time	and D	ate			Þ
[	09:59:	59.953			\$		
[	Januar	'y			~	2008	\$
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		
			Set 1	Time to	Now		
			ОК	) Ca	ancel		ielp

Figure 174: EDRReplay time adjustment

End time:	Shows the recording timestamp at which the playback will stop, adjust the <b>index range</b> end slider to select a different end time.
Current time:	Shows the recording timestamp of the current record being played back.
Continuous loop:	When true the playback cycle is never stopped, when a recording has reached its end time the playback will start again from the start time in endless loop.

Status: Right click the EDRReplay software component symbol in the session configuration diagram. Following dialog is shown:

STATUS [EDRReplay]	
Line 1: 2348 [#], 14.92 [%] Line 2: 988 [#], 6.28 [%] Line 3: 2426 [#], 15.42 [%] Line 4: 1056 [#], 6.71 [%] Line 5: 4464 [#], 28.37 [%] Line 6: 4451 [#], 28.29 [%]	

Figure 175: EDRReplay status

The status display shows how many data packets (in number and percentage) are replayed on each of the 6 channels.





Figure 176: EDR software component symbol

**Purpose:** Interface with hardware EDR679 device. The software components are enumerated within the square brackets; there will be as many EDR modules as there are EDR679 devices connected to the system.



**Each EDR module can only be instantiated once.** 

- Inputs: None, direct interface EDR679 device hardware.
- Outputs: Six outputs, one per hardware line. Data is output in EDR V2.0 format. Event output (0) generates event data (North, Sector crossing, Sector 0). Event output (X) generates event data (ACP/ARP/PPS).
- **Configuration:** Double click the EDR software component symbol in the session configuration diagram. Following dialog is shown:

ie Config Mode	Туре	App.	Rx Clk	Tx Clk	Baud
Passive	RS232 🗸	DTE 💌	Ext. 🛩	Ext. 🛩	0
Passive	🖌 RS232 🗸	DTE 💌	Ext. 🛩	Ext. 🗸	0
Passive	🖌 RS422 🗸	DTE 💌	Ext. 🛩	Ext. 🗸	0
Passive	🖌 RS422 🗸	DCE 💌	Ext. 🛩	Ext. 🗸	0
Active	🖌 RS232 🗸	DTE 💌	Ext. 🗸	Ext. 💌	9600
None 🔹	🖌 RS232 🗸	DTE 😽	Ext. 🛩	Ext. 🗸	0
ecial					
12 bit (4	096) 😽 🗸	CP Input	- i		- Refre

Figure 177: EDR Configuration interface

The "Line Config" section allows parameters to be set for each corresponding hardware channel. Lines are numbered from top to bottom starting with line 1.

Mode is the operational mode of the line being configured

None	Line is not configured.
Passive	Used to monitor/view data, clock is provided externally.
Active	For point-to-point connection with active support for transport protocols. Clock is either provided internally or externally, if provided internally also specify the baud rate.
Y-Passive	Used to monitor/view data from 2 lines, typically transmit and receive pair, clock is provided externally.

Type is the hardware type of connection, either RS232 or RS422.

App. is the appearance of the connection, either DTE or DCE.

Rx Clk. Receive Clock source, either externally (Ext.) or internally (Int.).





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- Tx Clk. Transmit Clock source, either externally (Ext.) or internally (Int.).

**Baud.** The rate of transmission.

In the "Event Config" section you can specify the number of ACPs per rotation.

Status: Right click the EDRReplay software component symbol in the session configuration diagram. Following dialog is shown:



Figure 178: EDR status

ARP:Number of received ARP messagesACP:Number of received ACP messagesEVT:Number of received EventsREC:Number of received recordsTime:Time detected



#### 6.50 Ethernet



Figure 179: Ethernet software component symbol

- **Purpose:** Strip Ethernet transmission protocol headers, may also be configured to strip UDP, TCP and IP transmission protocol headers.
- **Inputs:** Single input accepts data in EDR V2.0 format.
- **Outputs:** One output. Data in EDR-V2 format stripped from the configured transportation protocols.
- **Configuration:** Double click the Ethernet software component symbol in the session configuration diagram. Following dialog is shown:

🛃 Eti	hernet	🗙
strip he	aders	
0		T
buffer	status (°	%)  100

Figure 180: Ethernet Configuration interface

Select the transmission protocol which you wish to strip from the "strip headers" dropdown box.

Ethernet	Ethernet headers (14 bytes)
Eth.+ip	Ethernet and IP headers (34 bytes)
Eth.+ip+udp	Ethernet and IP and UDP headers (42 bytes)
Eth.+ip+tcp	Ethernet and IP and TCP headers (62 bytes)

The "buffer status" indicator shows the component's input FIFO buffer fill status.

You can better use the TransportLayerTrimmer module that gives more flexibility.



### 6.51 EV760Convert

EV760Convert None	

Figure 181: EV760Convert Software component symbol

- **Purpose:** Converts EV760 digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean EV760 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the EV760Convert configuration screen. As output, D6 format, text format and EDR V2.0 format are supported. Outputs are numbered clockwise starting with the top leftmost blue X. Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration:** Double click the EV760Convert software component symbol in the session configuration diagram. Following dialog is shown:

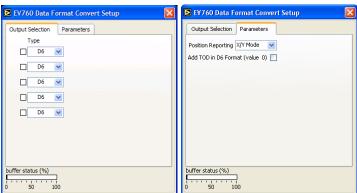


Figure 182: EV760Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

In the parameters tab, you can choose between X/Y mode and Range/Azimuth mode for the target position indication.

When "Add TOD in D6 format (value 0)" is selected the Time Of Day field in the D6 formatted data will be 0. Set this only when the RADAR does not output TOD in the EV760 data stream.



### 6.52 FAANetworkConvert

FAANetworkConvert None

Figure 183: FAANetworkConvert software component symbol

- **Purpose:** Convert digital messages FAA Network format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean FAANetwork data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the FAANetworkConvert configuration screen. Supported output formats are: D6 and text. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration:** Double click the FAANetworkConvert component symbol in the session configuration diagram. Following dialog is shown:

🔁 FAA Network Data Format Convert Setup
Output Selection
Туре
⊠ D6 💌
txt 💌
D6 V
D6 💌
D6 💌
buffer status (%)
0 50 100

Figure 184: FAANetworkConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

## and the

**Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.** 



×	IOSS-Framing	,	<

Figure 185: IOSS-Framing software component symbol

- **Purpose:** To make the data compatible with the Eurocontrol SASS-C tool. The software component adds the correct header and footer, called the IOSS-framing. [Reference 2]
- Inputs: Single input accepts data in raw EDR V2 format.
- **Outputs:** Single output accepts data in raw EDR V2 format.
- **Configuration:** Double click the IOSS-Framing software component symbol in the session configuration diagram. Following dialog is shown:

🔁 IOSS Fram 🔀
format
Final 💙
timestamp
Relative 🔽
buffer status (%)
0 50 100
0 30 100

Figure 186: IOSS-Framing Configuration interface

Format: choose between Mayer and Final.

Timestamp: choose between relative and absolute.



•	_
IRDRecorder None	

Figure 187: IRDRecorder software component symbol

- **Purpose:** Record IRD information onto disk. Recording can group IRD records together and archive recordings based on the configuration settings. IRD information is used as a RASS-S Mode-S analysis format.
- **Inputs:** Single input accepts data in IRD format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording. Event input accepts event data.
- **Outputs:** None, stores output files on disk.
- **Configuration:** Double click the IRDRecorder software component symbol in the session configuration diagram. Following dialog is shown:

🔁 IRD Re	corder S	etuj	)	X
General	Script			
Destinatio	n path			
8				
N	one	¥	Period	
N	one	×	Rec. Delimiter	
All rec	ordings	¥	Archive	
Syste	m Time	۷	Time Source	
buffer sta	itus (%)	1		

Figure 188: IRDRecorder Configuration interface

Destination path:	Enter a destination path; this is the <b>full path to the directory</b> in which you wish to store the recordings.  The files are stored on the machine where the DHM background server is running.
Period:	Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of <b>period</b> size, select "none" for continuous recoding in one data file.
Rec. Delimiter:	IRD Records can be grouped together in the recording file based on the delimiter setting.



None		Each IRD record is stored as a separate entity in the recording.				
	ARP	IRD records are grouped together in the recording based on ARP events.				
North		IRD records are grouped together in the recording based on North events.				
	Sect 0	IRD records are grouped together in the recording based on Sector zero events.				
	Time	IRD records are grouped together in the recording based on Time events.				
Archive:		When using a specific <b>period</b> the <b>archive</b> setting specifies how long recordings will be kept on disk, ranging from 1 day to 10 years. Old recordings will be deleted to make place for new ones. Select "All recordings" if no recordings are to be removed.				
r U C		uild file names with the current <b>system time</b> or with the <b>time of</b> <b>cording</b> information. When system time is selected the current TC time will be used, with the condition that the time zone of the omputer is correctly set. See also time keeper note explained in e beginning of heading 6.				
Buffer stat	us:	indicator shows the component's input FIFO buffer fill status.				



### 6.55<u>LAPB</u>



Figure 189: LAPB software component symbol

- **Purpose:** Configure LAPB protocol parameters and strip transmission protocol frames and headers so that only valid information frames remain.
- Inputs: Single input accepts data in EDR V2.0 format containing LAPB packages.
- **Outputs:** One output. Data in EDR-V2 format stripped from the LAPB transportation protocol.
- **Configuration:** Double click the LAPB software component symbol in the session configuration diagram. Following dialog is shown:

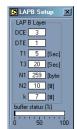


Figure 190: LAPB Configuration interface

Configuration of the following parameters is only necessary when the software component is connected to an "Active" connection on a hardware device.

**DCE** address

**DTE** address

**T1** The retransmission timer (T1) determines how long a sent frame can remain unacknowledged.

T3 Specifies the time in milliseconds to wait before considering the link to be disconnected.

N1 The maximum number of bits in an I-frame.

N2 Maximum number of attempts to complete the successful transmission of a frame.

k Maximum number of outstanding I-frames (window).



### 6.56 Link1Convert



Figure 191: Link1Convert software component symbol

- **Purpose:** Convert Link1 digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean Link1 data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the Link1Convert configuration screen. Data format can be D6 or text.

Outputs are numbered clockwise starting with the top leftmost blue X.

**Configuration:** Double click the Link1Convert software component symbol in the session configuration diagram. Following dialog is shown:

Link1 Convert	: Setup
Output Selection	
Туре	
D6	<b>~</b>
D6	<b>v</b>
buffer status (%)	
0 50 10	UU

Figure 192: Link1Convert Configuration interfac

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.



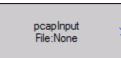


Figure 193: pcapInput software component symbol

**Purpose:** Direct network access for package capturing. Capture raw packets, both the ones destined to the machine where it's running and the ones exchanged by other hosts (on shared media), filter the packets according to user-specified rules before dispatching them to the application.



This tool can only be used if WinPcap is installed which can be downloaded from <u>http://winpcap.polito.it/</u> or installed from the RASS-R installation DVD.

- Inputs: None, direct interface with network adapters or saved capture file (for example a \*.pcap file saved with the Ethernet sniffer Wireshark, http://www.wireshark.org/)
- **Outputs:** One output. Data in EDR-V2 format.
- **Configuration:** Double click the pcapInput software component symbol in the session configuration diagram. Depending on the source selection one of the following dialogs is shown:

🗈 pcapInput Setup	🗈 pcapInput Setup
data source	data source
file v source Continuous Loop	network 🗸 source
Source path	network adapter
D:\DATA RASS-R\A-SMGCS\CAT11 rec.pcap	Network adapter 'Broadcom NetXtreme Gigabit
	Ethernet Driver (Microsoft's Packet Scheduler) '
filter	filter
A 1	
link type	
	L

Figure 194: pcapInput Configuration interface

Source:	You can output all received data on the network card (network source) or output the data originating from a file (file source). Depending on the source selection the dialog shows other option	
Source path:	is the <b>full path to the *.pcap file</b> from which you wish to retrieve the data. (See also figure above.)	
Network adapter:	Select the network adapter on which you wish to capture data.	
Filter:	Enter a filter which you wish to apply to the data. See <u>http://www.tcpdump.org</u> for a full explanation of the filter	





language. Wireshark **capture** filters use the same language.

<ul> <li>4. Amateur</li> <li>5. Proteon I</li> <li>6. Chaos</li> <li>7. IEEE 802</li> <li>8. ARCNE<sup>7</sup></li> <li>9. Serial Lin</li> </ul>	ental Ethernet (3Mb) Radio AX.25 ProNET Token Ring 2 Networks T, with BSD-style header
11. FDDI	

#### **Common filter examples:**

Capture all traffic to and from the Ethernet address 08:00:08:15:ca:fe. Ether host 08:00:08:15:ca:fe

Capture all traffic to and from the ip address 192.168.0.10 Host 192.168.0.10

Capture all traffic to and from the TCP port 80 (http) of all machines Tcp port 80

Capture all traffic to and from the ip address 192.168.0.10 except http Host 192.168.0.10 and not tcp port 80



### 6.58 pcapOutput

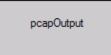


Figure 195: pcapOutput software component symbol

**Purpose:** This module can send a digital data stream to an Ethernet adapter installed on the pc. It gives the possibility to create a header and footer.

Inputs: All type of data.

- **Outputs:** Can be HEX format, Ethernet or FDDI, being output by the network adapter.
- **Configuration:** Double click the pcapOutput software component symbol in the session configuration diagram. Depending on the type selection one of the following dialogs is shown:

🔀 pcap Output	Setup 🔀		pcap Output Setup	×	🔁 pcap Output Setup
network adapter			network adapter		network adapter
Ethernet Driver (N	Broadcom NetXtreme Gigabit licrosoft's Packet Scheduler) '		Network adapter 'Broadcom NetXtreme Gigabit Ethernet Driver (Microsoft's Packet Scheduler) ' on local host	~	Network adapter 'Broadcom NetXtreme Gigabit Ethernet Driver (Microsoft's Packet Scheduler) ' on local host
Туре		Ш	Туре		Туре
HEX	×	Ш	Ethernet	~	FDDI 💌
Prepend Header		Ш			Frame Control
		Ш			
		Ш	Source MAC		Source MAC
	<b>•</b>	Ш			
Append Footer		Ш	Destination MAC		Destination MAC
		Ш			
		Ш			шс
	•	Ш			
buffer	status (%)	)	buffer status (%)	 100	buffer status (%)

Figure 196: pcapOutput Configuration interface

When hexadecimal is selected as type, you can prepend a header or append a footer, composed in hexadecimal characters.

When Ethernet is selected as type, you can fill in a source and destination MAC address.

When FDDI is selected as type, you can fill in a source and destination MAC address, as well as the frame control field and the LLC.



### 6.59 <u>RadarInput</u>



Figure 197: RadarInput software component symbol

- **Purpose:** A named radar output that is published (made available to other applications) by another DHM server, can be input again by connecting to the remote DHM server.
- Inputs: None. Application needs to connect to a DHM server with an active RadarOutput.
- **Outputs:** Single output in D6 format.
- **Configuration:** Double click the RadarInput software component symbol in the session configuration diagram. Following dialog is shown:

Radar Input Setup	×
DHM IP [xxx.xxx.xxx.xxx:pppp] [Localhost:5570	
Radar Data Source	
RAT31	₽

Figure 198: RadarInput Configuration interface

Click and the following dialog is shown:

Radar data source dialog	X
Data Source Selection	
DHM IP [xxx.xxx.xxx.xxx:pppp]	
Localhost:5570	
Radar data sources	
0.1701	^
RAT31	
X Cancel	🕑 ок

Figure 199: Data source selection

Fill in the IP address and port (default this is 5570) from the DHM server you want to connect to. Press in the radar data sources box and the available data output sources will be shown.

Radaroutputs that are running on that DHM server will be listed here. Select and press OK to configure them as RadarInput.





Figure 200: RadarOutput software component symbol

- **Purpose:** Publish (make available to other applications) a named radar output, this allows other applications to connect to a D6 data stream. (e.g. the MRD3)
- Inputs: Single input accepts data in D6 format.
- **Outputs:** None: applications need to subscribe to the D6 radar data stream to receive data. When one or more applications are subscribed, behind the name a client counter will show their number.
- **Configuration**: Double click the RadarOutput software component symbol in the session configuration diagram. Depending on the type selection one of the following dialogs is shown:

🛃 Radar	Output Setup	ľ	🛃 Radar	Output Setup 🛛 🔀
Name			Name	
Туре	UDP 🔽 Timeout 0		Туре	TCP V Timeout 0
	[xxx.xxx.xxx.xxx:pppp]			[xxx.xxx.xxx.pppp]
Local			Local	
Remote				
πι	same host (0) 🛛 👻			
buffer (%)	0 50 100		buffer (%)	
	0 50 100			5 50 100

Figure 201: RadarOutput Configuration interface

- RadarName:The name of the published data, applications that connect to the<br/>DHM get a list of RadarOutputs and can select a certain output<br/>based on the RadarName.
- **Type UDP:** When more than one network adapter is installed on the computer running the connected DHM server, fill in the **local** network adapter's ip address and the port number from which you wish to initiate UDP/IP communication.

In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted.

TTL: Time-To-Live

- Type RPC:RPC is no longer supported.
- Type TCP:In case that TCP is selected as type, fill in the IP address and port<br/>number to which the data is sent.
- **Overrun Timeout:** If the subscribing application doesn't collect the data at regular interval, the output buffers will fill up. When full no further processing can take place and the module halts execution. After specified timeout the output buffer's data will however be overwritten and execution may continue.





### 6.61 RAT31DLConvert

Figure 202: RAT31DLConvert Software component symbol

- **Purpose:** Converts RAT31DL digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in RAT31DL format.
- **Outputs:** Up to 5 outputs, each output has an associated output format which can be configured using the RAT31DL configuration screen. As output, D6 format, text format and EDR V2.0 format are supported. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration:** Double click the RA31DL software component symbol in the session configuration diagram. Following dialog is shown:

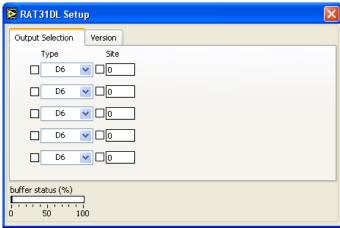


Figure 203: RAT31DLConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality

Click on the checkbox next to the **Site** field to filter on a site number. Fill in the site number in the appropriate field.

In the Version tab select "Standard" version. "SR/SSR Plot Message Code = 41" is implemented on only one unique radar.



### 6.62 RAWRecorder

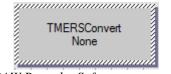


Figure 204: RAW Recorder Software component symbol

Purpose:Record RAW sensor information onto disk. Recording can archive recordings<br/>based on the configuration settings. RAW information can be loaded into any<br/>COTS text reader (e.g. notepad).<br/>A text file is recorded in a folder with the same name as the .RAWCSV-files.<br/>RAWCSV file format is a ASCII/Text format that separate every RAW sensor<br/>message with a ";" symbol.<br/>All files (folders) are recorded in the folder as specified in the Destination Path.<br/>(There is no grouping of folders per day as in the EDRRecorder.)

- **Inputs:** Single input accepts data in EDR format from single source.
- **Outputs:** None, stores output files on disk.

**Configuration:** Double click the RAWRecorder software component symbol in the session configuration diagram. Following dialog is shown:

0	0	0	
RAWRecorder Setu	р		×
Destination path			
8			
None [	<ul> <li>Period</li> </ul>		
All recordings [	<ul> <li>Archiv</li> </ul>	/e	
buffer status (%) 0 25 50 75	100		

Figure 205: RAWRecorder Configuration interface

Destination path:	Enter a destination path; this is the full path to the directory in which you wish to store the recordings (.RAWCSV-files).
Period:	Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of <b>period</b> size, select "none" for continuous recoding in one data file.
Archive:	When using a specific <b>period</b> the <b>archive</b> setting specifies how long recording files will be kept on disk, ranging from 1 day to 10 years. Old recordings will be deleted to make place for new ones. Select "All recordings" if no recordings are to be removed.
Buffer status:	indicator shows the component's input FIFO buffer fill status.



### 6.63<u>RDIFConvert</u>



Figure 206: RDIFConvert Software component

- **Purpose:** Convert digital messages RDIF interface format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean RDIF data without the presence of transport protocol framing data.
- Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the RDIFConvert configuration screen. D6, txt, Replay and EDR V2.0 are supported. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration:** Double click the RDIFConvert software component symbol in the session configuration diagram. Following dialog is shown:

RDIF Setup	Σ
Output Selection	
Туре	
🗖 D6 💌	
D6 💌	
D6 💌	
🗆 D6 💌	
🗖 D6 💌	
buffer status (%)	
0 50 100	
0 30 100	

Figure 207: RDIFConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

# and h

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.



### 6.64 <u>ReplayRecorder</u>



Figure 208: ReplayRecorder software component symbol

- **Purpose:** When an EDR recording needs to be replayed using the RASS-R Data Replay tool, the ReplayRecorder will mark the different timestamp positions in the file. During playback of the data formatted as "Replay", the timestamps can more easily be replaced with current time stamps.
- **Inputs:** 12 sources can be accepted as input. This means that more than one source may be configured; the data is then combined into a single recording. Input data must have the correct data format 'replay'.
- **Outputs:** None, stores output file on disk. (.rpl-file)
- **Configuration:** Double click the ReplayRecorder software component symbol in the session configuration diagram. Following dialog is shown:

	ReplayRecorder Setup 🔀
De	stination path
8	
bu L	ffer status (%)

Figure 209: ReplaySetup Configuration interface

Choose the correct destination path where to save the .rpl-file.

**Buffer status**: indicator shows the component's input FIFO buffer fill status, depending on the selected input line.

This module needs to be used to process EDR data into a replay-file (.rpl). This type of file can only be used in combination with the Data Replay tool. (Refer to the manual from the Data Replay tool)





Figure 210: Replay software component symbol

- **Purpose:** When a replay is started using the RASS-R Data Replay tool, the tool will connect to a DHM session that is running a Replay software component. The replay module can synchronous replay up to 12 sources.
- Inputs: None. The RASS-R Data Replay Tool makes connection to this software component.
- **Outputs:** 12 outputs, for replay with or without original timestamp. Data is output in EDR V2.0 format.
- **Configuration:** Double click the Replay software component symbol in the session configuration diagram. Following dialog is shown:

Replay Setup	×
Name	
Keep original time star	mp

Figure 211: Replay configuration interface

Give in the name for the Replay session. This name will be visible in the RASS-R Data Replay tool dialogs. Use the tickbox to replay with original time stamps instead of actual timestamps.

Status: Right click the Replay software component symbol in the session configuration diagram. Following dialog is shown:

STATUS	; 🛛 🛛
Name: BH	
Source: RECORDING	D:\CAMPAIGN-S6\ACT GLOBAL\ S\REPLAY
Start:	10:00:00.265
End:	11:00:00.140
Current:	10:01:48.046
Progress	:: 3 %

Figure 212: Replay status

This module can only be used in combination with the Data Replay tool. (Refer to the manual from the Data Replay tool)



### 6.66 <u>RSRPConvert</u>



Figure 213: RSRP Software component

- **Purpose:** Converts RSRP digital messages format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in RSRP format.
- Outputs:Up to 5 outputs, each output has an associated output format which can be<br/>configured using the RSRP configuration screen.Supported output formats are:D6 format, text format, EDR V2.0 and Vector.<br/>Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration:** Double click the RSRPConvert software component symbol in the session configuration diagram. Following dialog is shown:

RSRP Convert Setup	X
Output Selection	
Type Site	
buffer status (%)	
Ó 50 100	

Figure 214: RSRPConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

## and the

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality

Click on the checkbox next to the **Site** field to filter on a site number. Fill in the site number in the appropriate field.



### 6.67 **RSRPPacketizer**

RSRPPacketizer

Figure 215: RSRPPacketizer software component

**Purpose:** Serial input of RSRP digital data messages.

**Inputs:** Input must be a COMMInput.

**Outputs:** The RSRP output must be followed by a RSRPConvert software component.

**Configuration:** Double click the RSRPPacketizer software component symbol in the session configuration diagram. Following dialog is shown:

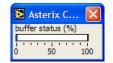


Figure 216: RSRPPacketizer Configuration interface

No configuration is needed; the "buffer status" indicator shows the component's input FIFO buffer fill status.

Status: Right click the RSRPPacketizer software component symbol in the session configuration diagram and select status. Following dialog is shown:

🔄 STATUS [RSRPPacketizer]	1
<pre># Packets: 0 # Resets : 0 Last Reset: 00:00:00 [UTC]</pre>	

Figure 217: S4Recorder status

The status display shows how many packets where processed and how many times and when it last received a reset.



**L** Resets could have caused loss of data. If number of resets is high this could indicate a malfunctioning or overloaded connection.



### 6.68<u>RVR</u>

RVR [09/05/052]

Figure 218: RVR Software component

**Purpose:** Interface with hardware RVR device (e.g. RVR680 or RVR481) on the condition that it is connected to a **MDI561/2**. The software components are enumerated within the square brackets; there will be as many RVR modules as there are RVR devices connected to the system.



**Each RVR module can only be instantiated once.** 

Inputs: None, direct interface RVR device hardware.

**Outputs:** Video stream must be connected to a VideoOutput software component.

**Configuration:** Double click the RVR software component symbol in the session configuration diagram. Following dialog is shown:

Video ———		Digital
🏵 Analogue 🥤 🤇	Quantised	Encoder 1 Timing Source
Channel	Trig. Level [V]	
CH 1 Input 1	0.25 🛨	Trigger 1 Trigger
CH 2 None	💌 0.25 🚊	14 bit (16384)
CH 3 None	0.25 🛨	
CH 4 None	• 0.25	300 🕂 Range [Nm]

Figure 219: RVR Configuration interface

Video Source:	In case <b>analogue video</b> is selected, the user can only select one input channel out of 8 possible inputs. In case <b>quantised video</b> is selected, up to four inputs can be combined into one video bit. Notice that the four inputs for the quantised mode do not have to correspond with the hardware inputs on the MDI65x (Maintenance Display Interface).
Trigger level:	The trigger level determines the threshold value below which no video is sampled (in Volts).
Timing Source:	This control selects between encoder input 1 or 2 or composite video input 7 or 8.
Trigger:	This control selects the source of the trigger pulses. This control selects the trigger (zero range) between trigger input 1 (on MDI front panel), trigger input 2, composite video on video input 7 or composite video input 8.
ACP input: Range:	Select the correct ACP value (12, 14 or 16 bit) Limits the range in Nm for the input video.



#### 6.69 <u>S4Recorder</u>



Figure 220: S4Recorder software component

- Purpose:Record S4 information onto disk. Recording can group S4 records together and<br/>archive recordings based on the configuration settings. S4 information is used as a<br/>RASS-S inter-application data exchange format. (For example RASS-S Inventory<br/>Tool, but also in the RASS-R Radar Comparator Mono/Dual)<br/>A S4-file is recorded in a folder with the same name as the S4-files.<br/>All S4-files (folders) are recorded in the folder as specified in the Destination<br/>Path. (There is no grouping of folders per day as in the EDRRecorder.)<br/>See also the example at the end of this section.<br/>You can change the name of the S4-file afterwards, though the name of the folder<br/>and file must be the same.
- **Inputs:** Single input accepts data in S4 format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording. Event input accepts event data (North, Sector crossing, Sector 0).
- **Outputs:** None, stores .S4RD output files on disk.
- **Configuration:** Double click the S4Recorder software component symbol in the session configuration diagram. Following dialog is shown:

S4 Recorder Setup 🛛 🛛 🗙		
General Script		
Destination path		
8		
None Veriod		
None 💌 Rec. Delimiter		
All recordings 💌 Archive		
System Time 💌 Time Source		
Continuous Scan Numbers		
buffer status (%) 		

Figure 221: S4Recorder Configuration interface

Destination path:	Enter a destination path; this is the <b>full path to the directory</b> in which you wish to store the recordings.  The files are stored on the machine where the DHM background server is running.
Period:	Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of <b>period</b> size, select "none" for continuous recoding in one data file.
Rec. Delimiter:	S4 Records can be grouped together in the recording file based on the delimiter setting.

None	Each S4 record is stored as a separate entity in the recording.
ARP (Event)	S4 records are grouped together in the recording based on ARP events.
North (Event)	S4 records are grouped together in the recording based on North events.
Sect 0 (Event)	S4 records are grouped together in the recording based on Sector 0 events.
Time (Event)	S4 records are grouped together in the recording based on Time events.
North (S4)	S4 records are grouped together in the recording based on S4 North events.
Sector 0 (S4)	S4 records are grouped together in the recording based on S4 Sector 0 events.

# Make sure that an Event Source is configured when using an event as delimiter.

Archive: When using a specific **period** the **archive** setting specifies how many recording files will be kept on disk, ranging from 1 to 5000 recordings. Old recordings will be deleted to make place for new ones. Select "All recordings" if no recordings are to be removed.

**Time Source**: When using a specific **period** the **Time Source** setting specifies the time reference that is used to build the file name. When system time is selected, the UTC time will be used with the condition that the time zone of the computer is correctly set. See also time keeper note explained in the beginning of heading 6.

**Continuous Scan Numbers**: When selected the scan numbering will continue over multiple files; if not selected each file will start with scan 1.

Buffer status: indicator shows the component's input FIFO buffer fill status.

Status: Right click the S4Recorder software component symbol in the session configuration diagram. Following dialog is shown:



Figure 222: S4Recorder status

The status display shows how many records are recorded in the S4-file and how many S4 messages are recorded. (A record can contain multiple S4 messages as defined in the Record Delimiter: when this is set to <none>, the number of "Records in file" and "S4 in file" will be the same.)



Figure 223: Example of a S4 recorder file structure



### 6.70 <u>StatusOutput</u>



Figure 224: StatusOutput software component symbol

- **Purpose:** Publish (make available to other applications) a named status output, this allows other applications to connect to a status data stream. (e.g. MRD3)
- **Inputs:** Single input accepts data in status format.
- **Outputs:** None. Publishes status data. Applications need to subscribe to the data to receive a status datastream. When one or more applications are subscribed, "none" will show their number as client counter.
- **Configuration:** Double click the StatusOutput software component symbol in the session configuration diagram. Following dialog is shown:

🔁 Status	Output Setup 🛛 🛛	🛃 Status	Output Setup 🛛 🛛
Name	Status	Name	Status
Туре	UDP 🔽 Timeout 0	Туре	TCP 🔽 Timeout 0
	[xxx.xxx.xxx.xxx:pppp]		[xxx.xxx.xxx.xxx:pppp]
Local	172.16.100.102:12353	Local	172.16.100.102:12353
Remote	172.16.100.93:12354		
TTL	same site (32) 🛛 🗸		
buffer (%)		buffer (%)	<b>[</b> ]
1	0 50 100		0 50 100

Figure 225: Status Output Configuration interface

- Radar Name:The name of the published data, applications that connect to the<br/>DHM get a list of RadarOutputs and can select a certain output<br/>based on the Radar Name.
- Type UDP:Fill in the local network adapter's ip address and the port number<br/>from which you wish to initiate UDP/IP communication.

This is only necessary when multiple network adapters are installed on the computer running the DHM server.

In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted.

TTL: Time-To-Live.

- **Type RPC:** Disabled, RPC is no longer supported.
- **Type TCP:** Fill in the IP address and port number to which the data is sent.

**Overrun Timeout:** If the subscribing application doesn't collect the data at regular interval the output buffer eventually will become full causing the module to halt further execution. When a timeout is specified the output buffer's data will be overwritten after the specified timeout and execution may continue.







Figure 226: Synchronize software component

- **Purpose:** Merge data streams and synchronize packages in their original sequence. Due to the multitasking nature of the DHM it is possible that not all message types are processed equally fast, i.e. target messages might take longer to process than sector messages, when converted data streams are later on merged together it is possible that the original package sequence is lost.
- **Inputs:** Multiple inputs that need merging and synchronizing. The inputs data are given sequence number information in order to be synchronized in the SynchronizeAck module. (AsterixCatSplitter has a synchronize option which numbers packages). Input format is EDR v2.0.
- **Outputs:** Single output which has the merged data stream including sequence number information in the original data format. (EDR v2.0) Output must be sent to a SynchronizeAck software module.
- **Configuration:** Double click the Synchronize software component symbol in the session configuration diagram. Following dialog is shown:

🖪 Synchronize Setup 🔀	
Timeout -1	
buffer status (%)	
0 50 100	

Figure 227: Synchronize Configuration interface

Timeout: Fill in the milliseconds the module is allowed to wait for the next package in sequence. "-1" will let the module wait until the next sequence arrived. So no

time out will be generated.



### 6.72 SynchronizeAck

Synchronize	Ack

Figure 228: SynchronizeAck software component symbol

- **Purpose:** Merge data streams and synchronize packages in their original sequence. Due to the multitasking nature of the DHM it is possible that not all message types are processed equally fast, i.e. target messages might take longer to process than sector messages, when converted data streams are later on merged together it is possible that the original package sequence is lost.
- **Inputs:** Multiple inputs that need merging and synchronizing. The inputs need to have sequence number information in order to be synchronized. (AsterixCatSplitter has a synchronize option which numbers packages). Input must be in EDR v2.0 format.



Care must be taken that all separate data streams which carry package numbers must be presented into the same SynchronizeAck module.

- **Outputs:** Single output which has the merged synchronize data stream in the original data format. (EDR v2.0)
- **Configuration:** Double click the SynchronizeAck software component symbol in the session configuration diagram. Following dialog is shown:

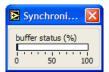


Figure 229: SynchronizeAck Configuration interface

No configuration is needed, the "buffer status" indicator shows the component's input FIFO buffer fill status.



### 6.73 TCPInput

TCPInput

Figure 230: TCPInput software component symbol

**Purpose:** Direct network access for TCP input.

**Inputs:** None, direct interface with network adapters.

**Outputs:** One output. Data in bytestream format.

The output needs to be connected to a Packetizer module.

**Configuration:** Double click the TCPInput software component symbol in the session configuration diagram. Following dialog is shown:

[xxx.xxx.xxx.xxx:pppp] Local	🖪 тсі	P Input Setup	×
Local		[xxx.xxx.xxx.xxx:pppp]	
	Local		
Remote	Remote		

Figure 231: TCPInput Configuration interface

Local: The network adapter's ip address and the port number from which you wish to initiate TCP/IP communication. (Only in case when multiple Ethernet adapters are installed on the pc running the DHM server)
 Remote: The IP address and port number on which the data server is running.



### 6.74 TCPOutput

TCPOutput

Figure 232: TCPOutput software component symbol

**Purpose:** Direct network access for TCP output, either in server or client mode.

**Inputs:** One input, accepts data in EDR V2 format.

**Outputs:** None, direct interface with network adapters.

**Configuration:** Double click the TCPOutput software component symbol in the session configuration diagram. Following dialog is shown:

E TCP Output Setup	×
Server: specify port number only Client: specify IP & port number	
IP:port	
[xxx.xxx.xxx.xxx:pppp]	
connections	_
	^
	<u>~</u>
Close Connection	
buffer status (%)	
0 50 100	

Figure 233: TCPOutput Configuration interface

IP:port: The IP address and port on which you wish to start the listening process. When only the port number is provided the module acts as a server and will service any client that connects to it. If both IP number and port number are supplied the module acts as a client and initiates a connection to the remote address and port number.
 Connections: If running as server, it shows the list of connected clients, you may disconnect clients by selecting them from the list and then pressing the "Close Connection" button.



## 6.75 <u>TextRecorder</u>



Figure 234: Text Recorder software component symbol

- Purpose:Record Text information onto disk. Recording can archive recordings based on<br/>the configuration settings. Text information can be loaded into any COTS text<br/>reader (e.g. notepad).<br/>A text file is recorded in a folder with the same name as the .TXT-files.<br/>All text files (folders) are recorded in the folder as specified in the Destination<br/>Path. (There is no grouping of folders per day as in the EDRRecorder.)<br/>See also the example at the end of this section.
- **Inputs:** Single input accepts data in Text format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording.
- **Outputs:** None, stores output files on disk.
- **Configuration:** Double click the TextRecorder software component symbol in the session configuration diagram. Following dialog is shown:

Text Recorder Se	tup 🛛 🔀
General Script	
Destination path	
8	
None	Period
None	Rec. Delimiter
All recordings	Archive
System Time	Time Source
buffer status (%)	
0 50 100	

Figure 235: TextRecorder Configuration interface

- Destination path: Enter a destination path; this is the full path to the directory in which you wish to store the recordings (.TXT-files).
   The files are stored on the machine where the DHM background server is running.
   Period: Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of period size, select "none" for continuous recoding in one data file.
   Rec. Delimiter: Not used. Each record is stored as a separate entity in the recording.
   Archive: When using a specific period the archive setting specifies how
- Archive:When using a specific period the archive setting specifies how<br/>long recording files will be kept on disk, ranging from 1 day to 10<br/>years. Old recordings will be deleted to make place for new ones.<br/>Select "All recordings" if no recordings are to be removed.



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**Time Source**: When using a specific **period** the **Time Source** setting specifies the time reference that is used to build the file name. When system time is selected, the UTC time will be used with the condition that the time zone of the computer is correctly set. See also time keeper note explained in the beginning of heading 6.

Buffer status: indicator shows the component's input FIFO buffer fill status.

When you open the probe, the following text probe dialog will open:

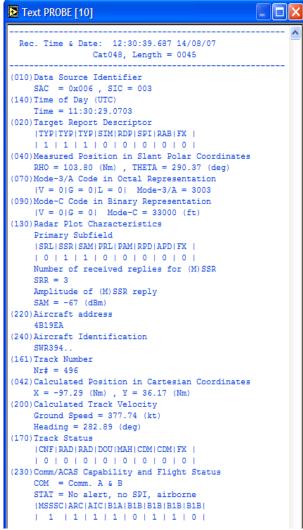


Figure 236: Text probe



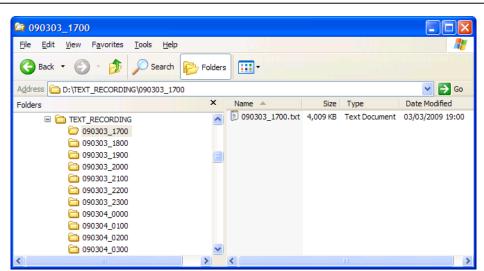


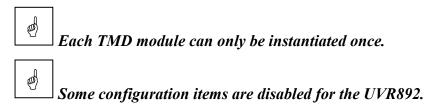
Figure 237: Example of a Text recorder file structure





Figure 238: TMD Software component

**Purpose:** Interface with hardware RIM782 or UVR892. The software components are enumerated within the square brackets; there will be as many TMD modules as there are devices connected to the system. Connect this module with a VideoOutput in order to send video to the TMD3 or MRD3.



- Inputs: None, direct interface to RIM782 device hardware.
- Outputs: Video stream must be connected to a VideoOutput. (See further) Event output generates event data (North, Sector crossing, Sector 0).
- **Configuration:** Double click the TMD software component symbol in the session configuration diagram. Following dialog is shown:

🖪 ТА	ND Setup					
Video					Digital	
• A	nalogue 🔵 Quanti	sed			Encoder 1	V Timing Source
	Channel	Tri	g. Level	[V]		
CH 1	None	¥	0.25	\$	Trigger 1	✓ Trigger
CH 2	None	¥	0	*	14 bit (16384)	ACP Input
CH 3	None	¥	0	\$	110/0 (2000 1)	ACF Input
CH 4	None	<b>v</b>	0	\$	0 😂 Range [Nm]	
Offset	0	gain	1	\$		
				×	Cancel 🕜 Apply	🛛 ок
				_		
$F_{i}$	auro 230. T	MD	Cont	Gou	ration interface	DIM782
	-	MD	Conf	igu	ration interface	– RIM782
	gure 239: Th D Setup	MD	Conf	figu	ration interface ·	- RIM782 🔀
	-	MD	Conf	figu	ration interface	- RIM782
Video	D Setup nalogue OQuanti	sed		-		- RIM782
Video	D Setup nalogue Quanti Channel	sed Triç	g. Level	[V]	Digital Encoder 1	Timing Source
Video O AI	D Setup nalogue Quanti Channel Input 1	sed Triç	g. Level 0.1	-	Digital	
Video Video All CH 1 CH 2	D Setup nalogue Quanti Channel Input 1 None	sed Triç	g. Level	[V]	Digital Encoder 1	Timing Source
Video Video All CH 1 CH 2	D Setup nalogue Quanti Channel Input 1	sed Trig	g. Level 0.1	[V]	Digital Encoder 1 Trigger 1	Timing Source
Video Video O Al CH 1 CH 2 CH 3	D Setup nalogue Quanti Channel Input 1 None	sed Trig	g. Level 0.1	[V]	Digital Encoder 1 Trigger 1	Timing Source
Video Video O Al CH 1 CH 2 CH 3	D Setup nalogue Quanti Channel Input 1 None None None	sed Trig	g. Level 0.1 0	[V]	Digital Encoder 1 Trigger 1 12 bit (4096)	Timing Source
Video Video CH 1 CH 2 CH 3 CH 4	D Setup nalogue Quanti Channel Input 1 None None None	sed Trig	g. Level 0.1 0	[V]	Digital Encoder 1 Trigger 1 12 bit (4096)	Timing Source

Figure 240: TMD Configuration interface - UVR892

Video Source:

In case **analogue video** is selected, the user can only select one



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	input channel out of 6 possible inputs. Disabled for UVR892, channel is fixed to input 1. In case <b>quantised video</b> is selected, up to four inputs can be combined into one video bit. Not applicable for UVR892.
Trigger level:	The trigger level determines the threshold value below which no video is sampled (in volts).
Offset and Gain:	These parameters are applied to the video voltage level before sampling, and thus before trigger level, using following formula: $Video = 2^{gain} * (Input Video - Offset)$
Timing Source:	The <b>gain</b> can be set to 0, 1, 2 or 3 so that the resulting gain factor will be respectively 1, 2, 4 or 8. This control selects between encoder input 1 or 2 or composite video input 7 or 8.
	Disabled for UVR892.
Trigger:	This control selects the source of the trigger pulses. This control selects the trigger (zero range) between trigger input 1, trigger input 2, composite video on video input 7 or composite video on video input 8. Disabled for UVR892.
ACP input:	Select the correct ACP value (12, 14 or 16 bit)
Range:	Limits the range in Nm for the input video.

**Status:** When you right click on the software component and select status, the following status window will open:

UVR for TMD	counters	
ptr: 603904		
ACP: 9901		
ARP: 11		
ACPR: 16383		
IPR: 12066		

Figure 241: TMD Status window

Ptr:	Pointer to memory write position
ACP:	ACPs received since last reference
ARP:	number of received ARPs
ACPR:	ACP rate
IPR:	Interrogations per revolution (trigger)



# 6.77 TPS77Convert

TPS77Convert

Figure 242: TPS77Convert software component symbol

- **Purpose:** Convert digital messages TPS77 interface 13-bit CD format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean TPS77 data without the presence of transport protocol framing data.
- **Outputs:** Up to 5 outputs, each output has an associated output format which can be configured using the TPS77Convert configuration screen. D6 and txt are supported. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration:** Double click the TPS77Convert software component symbol in the session configuration diagram. Following dialog is shown:

TPS77 Convert Setup	
Output Selection	
Туре	
D6 💌	
D6 V	
D6 💟	
D6 🗸	
D6 💌	
uffer status (%)	

Figure 243: TPS77Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

# Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The "buffer status" indicator shows the component's input FIFO buffer fill status.



# 6.78 TransportLayerTrimmer



Figure 244: TransportLayerTrimmer software component symbol

- **Purpose:** Strip transport layer protocol frames and headers so that only valid information frames remain.
- **Inputs:** Single input accepts data in EDR V2.0.
- **Outputs:** One output. Data in EDR-V2 format stripped from the selected transport layer protocols protocol.
- **Configuration:** Double click the TransportLayerTrimmer software component symbol in the session configuration diagram. Following dialog is shown:



Figure 245: TransportLayerTrimmer Configuration interface

Check the respective checkboxes to strip the corresponding transport layer protocol.

The "buffer status" indicator shows the component's input FIFO buffer fill status





Figure 246: TVT2Convert Software component

- **Purpose:** Convert digital messages TVT2 interface format to other formats as described by the output and configuration sections below.
- Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean TVT2 data without the presence of transport protocol framing data.
- **Outputs:** Up to 5 outputs, each output has an associated output format which can be configured using the TVT2Convert configuration screen. D6, txt and EDR V2.0 are supported. Outputs are numbered clockwise starting with the top leftmost blue X.
- **Configuration:** Double click the TVT2Convert software component symbol in the session configuration diagram. Following dialog is shown:

TVT2 Setup
Output Selection
Туре
D6 💌
D6 V
D6 💌
D6 🗸
D6 V
puffer status (%)
50 100

Figure 247: TVT2Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The "buffer status" indicator shows the component's input FIFO buffer fill status.



# 6.80 <u>U-HDLC</u>

U-HDLC

Figure 248: U-HDLC software component symbol

- **Purpose:** Strip U-HDLC transmission protocol frames (headers and CRC) so that only valid information frames remain.
- **Inputs:** Single input accepts data in EDR V2.0 format containing U-HDLC packages.
- **Outputs:** One output. Data in EDR-V2 format stripped from the U-HDLC transportation protocol.
- **Configuration:** Double click the U-HDLC software component symbol in the session configuration diagram. Following dialog is shown:

🔁 U-HDLC Se 🔀
<ul><li>☑ 3 Address</li><li>☑ 3 Format</li></ul>
buffer status (%)

Figure 249: U-HDLC Configuration interface

Check/Uncheck the checkbox to exclude the U-HDLC protocol frames. When checked, define the value of the address byte and the format byte. (refer to the U-HDLC protocol description)

The "buffer status" indicator shows the component's input FIFO buffer fill status



# 6.81 UDPInput

UDPInput

Figure 250: UDPInput software component symbol

**Purpose:** Direct network access for UDP input.

**Inputs:** None, direct interface with network adapters.

**Outputs:** One output. Data in EDR V2 format.

**Configuration**: Double click the UDPInput software component symbol in the session configuration diagram. Following dialog is shown:

陸 UDP Input Setup			
	[xxx.xxx.xx	x.xxx:pppp]	
Local			
Remote			
Туре	EDR	V2.0	~
Input Buffer Size 8192			

Figure 251: TCPInput Configuration interface

Local:	The network adapter's ip address and the port number from which you wish to initiate UDP/IP communication. (Only in case when multiple Ethernet adapters are installed on the pc running the DHM server)
Remote:	The IP address and port number on which the data server is running. Or the multi- or broad cast address and port number on which the data is casted.
Туре:	Specify the type of data that is input: EDR V2.0, EDRV2.0 Incl. Header, D6 or S4.

*When you select the type, make sure no input module is connected yet to the UDPInput module. Otherwise the following dialog appears:* 

UDPInp	ut: Connection Type  🛛
♪	Make sure that the UDPInput DataType is compatible with the current set-up.
	ОК

Figure 252: UDPInput not compatible

Input buffer size: Fill in the FIFO input buffer size of the network adapter.



The UDPInput module will only be started (turned green) when data is



#### received on the configured IP address and port number.

**Status:** When you right click on the software component and select status, the following status window will open:



Figure 253: UDPInput status

The number of received packets is shown.



# 6.82 UDPOutput

UDPOutput

Figure 254: UDPOutput software component symbol

- **Purpose:** Direct network access for UDP output.
- **Inputs:** Single input accepts data in EDR V2.0 format.
- **Outputs:** None, direct interface with network adapters.

**Configuration:** Double click the UDPOutput software component symbol in the session configuration diagram. Following dialog is shown:

🛃 UDF	9 Output Setup 🛛 🔀
	[xxx.xxx.xxx.xxx:pppp]
Local	
Remote	
ΠL	same host (0) 🛛 👻
Туре	EDR V2.0 💌
	buffer status (%)

Figure 255: UDPOutput Configuration interface

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*When you select the type, make sure no input module is connected yet to the UDPOutput module. Otherwise the following dialog appears:* 

UDPOutput: Connection 🔀		
♪	Selected Type not compatible with current set-up	
	ОК	

Figure 256: UDPOutput not compatible

The "buffer status" indicator shows the component's input FIFO buffer fill status.



An UDPOutput module in EDRv2.0 Incl. Header format can be used to send



data to the TMD3. Remark: the TMD3 will only see this UDPOutput when there is data available.



# 6.83 <u>UDR</u>

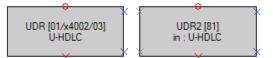


Figure 257: UDR software component symbol (left: old UDR600, right: new UDR600<sup>1</sup>, RIM782, PRE790 or RDR803)

**Purpose:** Interface with hardware UDR device. This UDR will be listed when an UDR600, RIM782, PRE790 and/or RDR803 is/are connected to the pc running the DHM server.

The software components are enumerated within the square brackets; there will be as many UDR modules as there are UDR devices connected to the system.



Each UDR module can only be instantiated once.

Inputs: None, direct interface UDR device hardware.

Outputs: Two outputs, one per hardware line. Data is output in EDR V2.0 format. Event output (0) generates event data (North, Sector crossing, Sector 0). Event output (X) generates event data (ACP/ARP/PPS).

**Configuration:** Double click the UDR software component symbol in the session configuration diagram. Following dialog is shown:

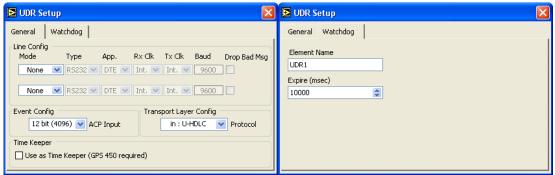


Figure 258: UDR Configuration interface

The "Line Config" section allows parameters to be set for each corresponding hardware channel. Lines are numbered from top to bottom starting with line 1.

**Mode** is the operational mode of the line being configured:

None:	Line is not configured.
Passive:	Used to monitor/view data, clock is provided externally.
Active:	For point-to-point connection with active support for transport protocols. Clock is either provided internally or externally, if provided internally also specify the baud rate.
Y-Passive:	Used to monitor/view data from 2 lines, typically transmit and receive pair, clock is provided externally.

<sup>&</sup>lt;sup>1</sup> An old UDR600 will be named in the windows device manager as UDR HDLC while a new UDR600 is called UDR.



Type is the hardware type of connection, either RS232 or RS422.

**App.** DTE/DCE disabled. (Only necessary for Active LAP-B which is not supported by the UDR600 and RDR803)

Rx Clk. Receive Clock source, either externally (Ext.) or internally (Int.).

Tx Clk. Transmit Clock source, either externally (Ext.) or internally (Int.).

**Baud.** The rate of transmission. (Only applicable when the Clock is internally generated and 9600bd default.)

Drop Bad Msg. If enabled, all messages with faulty CRC will be skipped.

In the "Event Config" section you can specify the number of ACPs per rotation.

In the "Transport Layer" section you can specify the transport protocol to be used by the UDR. The following protocols are possible:

UDR600\*, RDR803 Input: Bit Input: Aricat500 Input: CD-13 Input: U-HDLC Input: Link-1 Input: EV760 Input: TVT2 Output: U-HDLC Output: Bit Output: TVT-2 Output: Aircat500

\* A UDR600 is also part of the RIM782

Tick the checkbox of the "**Time Keeper**" if you want to use the GPS450 connected to the UDR600 as time keeper for the computer. (See also chapter 6). When the UDR600 is set to output data, it cannot be used as Time Keeper.

Watchdog TAB: see Watchdog User Manual.

When you right click on the software component, the following status window will open. In case the CRC of the data is faulty, the "bad" counter increments.

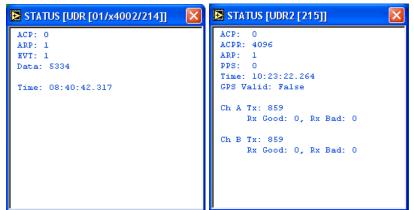


Figure 259: Status window (left: old UDR600, right: new UDR600, RIM782, PRE790 or RDR803)



# 6.84 VectorOutput



Figure 260: VectorOutput software component symbol

- **Purpose:** Publish (make available to other applications) a named vector output, this allows other applications to connect to a vector data stream. (e.g. MRD3)
- Inputs: Single input accepts data in vector format.
- **Outputs:** None. Publishes vector data. Applications need to subscribe to the data to receive a vector datastream. When one or more applications are subscribed, "none" will show their number as client counter.

**Configuration:** Double click the VectorOutput software component symbol in the session configuration diagram. Following dialog is shown:

🔁 Vector	Output Setup 🛛 🛛 🔀	陸 Vector Output Setup 🛛 🛛 🔀
Name	Vector Data	Name Vector Data
Туре	UDP 🛛 V Timeout 5000	Type TCP 💽 Timeout 5000
	[xxx.xxx.xxx.xxx:pppp]	[xxx.xxx.xxx.xxx:pppp]
Local	10.20.100.60:0	Local 10.20.100.60:0
Remote	10.20.100.102:12350	
TTL	same subnet (1) 🛛 👻	
buffer (%)		buffer (%)
1	50 100	0 50 100

Figure 261: VectorOutput Configuration interface

RadarName:The name of the published data, applications that connect to the<br/>DHM get a list of VectorOutputs and can select a certain output<br/>based on the RadarName.

**Type UDP:**Fill in the local network adapter's ip address and the port number<br/>from which you wish to initiate UDP/IP communication.

This is only necessary when multiple network adapters are installed on the computer running the DHM server.

In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted.

TTL: Time-To-Live: number of routers each packet can pass.

- Type RPC: Disabled.
- **Type TCP:** Fill in the IP address and port number to which the data is sent.
- **Overrun Timeout:** If the subscribing application doesn't collect the data at regular interval the output buffers eventually will become full. When this occurs no further processing can take place and the module halts execution. When a timeout is specified the output buffer's data will be overwritten after the specified timeout and execution may continue.





# 6.85<u>VideoOutput</u>



Figure 262: VideoOutput software component

- **Purpose:** Publish (make available to other applications) a named video output, this allows other applications to connect to the video stream. (e.g. TMD3 or MRD3)
- **Inputs:** Single input accepts data from a UVR.
- **Outputs:** None. Applications need to subscribe to the video stream to receive the video data. When one or more applications are subscribed, "none" will show their number as client counter. Video data can be received by the TMD3 or the MRD3.
- **Configuration:** Double click the VideoOutput software component symbol in the session configuration diagram. Following dialog is shown:

🛃 Video	Output Setup	🔀 Video	Output Setup	X
Name		Name		
Туре	UDP 🔽 Timeout 0	Туре	TCP 🛛 Timeout 0	
	[xxx.xxx.xxx.pppp]		[xxx.xxx.xxx.xxx:pppp]	
Local		Local		
Remote				
πι	same host (0) 💉			
Data Mode	Pulse 💌	Data Mode	Raw	*
Resolution	1024 x 1024 💌	Resolution	1024 x 1024	*
ACPR	12 bit (4096) 💌	ACPR	12 bit (4096)	*
buffer (%)	0 50 100	buffer (%)	0 50	100

Figure 263: VideoOutput Configuration interface

Name: The name of the published data, applications that connect to the DHM get a list of video streams and can select a certain output based on the Name. **Type UDP:** Fill in the local network adapter's IP address and the port number from which you wish to initiate UDP/IP communication. æ This is only necessary when multiple network adapters are installed on the computer running the DHM server. In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted. TTL: Time-To-Live. Disabled. Type RPC:



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Туре ТСР:	In case that TCP is selected as type, fill in the IP address and port number to which the data is sent.
Overrun Timeout:	If the subscribing application doesn't collect the data at regular interval the output buffers eventually will become full. When this occurs no further processing can take place and the module halts execution. When a timeout is specified the output buffer's data will be overwritten after the specified timeout and execution may continue.
Data Mode:	Pulse mode (to be sent to MRD3 or TMD3), raw mode (to be sent to MRD3 only), raw compressed mode (to be sent to MRD3 only)
Resolution:	Choose for the appropriate resolution: 1024x1024, 2048x2048 or 4096x4096.
APCR:	Select the correct Azimuth Change Pulse Rate. (12 bit, 14 bit or 16 bit).

The "buffer status" indicator shows the component's input FIFO buffer fill status.





Figure 264: X25 software component symbol

- **Purpose:** Configure X25 protocol parameters and strip transmission protocol frames and headers so that only valid information frames remain. For a detailed description see ITU recommendations on X.25 [1].
- **Inputs:** Single input accepts data in EDR V2.0 format containing X25 packages.
- **Outputs:** One output. Data in EDR-V2 format stripped from the X25 transportation protocol.
- **Configuration:** Double click the X25 software component symbol in the session configuration diagram. Following dialog is shown:

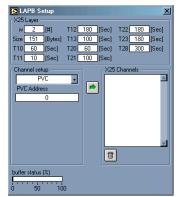


Figure 265: X25 Configuration interface

Configuration of the parameters is only necessary when the software component is connected to an "Active" connection on a hardware device.

w:	
Size:	Maximum frame size
T10:	Sets the DCE restart request retransmission timer.
T11:	Sets the DCE Call request retransmission timer.
T12:	Sets the DCE reset request retransmission timer.
T13:	Sets the DCE clear request retransmission timer.
T20:	Sets the DTE restart request retransmission timer.
T21:	Sets the DTE Call request retransmission timer.
T22:	Sets the DTE reset request retransmission timer.
T23:	Sets the DTE clear request retransmission timer.
T28:	Registration timer.

**Channel setup:** Make a selection between "PVC", "SVC in" and "SVC out", depending on the selection more parameters are available for configuration.





Figure 266: X25 Channel setup

**PVC Address.** The PVC address

SVC Calling Address.:	SVC calling address.		
SVC Called Address:	SVC outgoing call address.		
Start LCN end LCN:	LCN range between which is rotated.		
Call User Data:	User definable data.		
X25 Channels:	A list of configured X25 channels. To add a channel first configure it in the channel setup and then press the "Add channel ()" button. To remove a channel select it from the list and then press the "delete channel ()" button.		

The "buffer status" indicator shows the component's input FIFO buffer fill status.



# 7 File merger

The file merger is a tool to merge different recorder EDR, D6 or S4 files into one file. Suppose that you record EDR-files with a DHM connected to a RDR803, RIM782 or UDR600. You record files from 15 minutes long, but at a certain moment you want to do a replay of a file from 1 hour. Then, the 15 minutes files can be merged to a new file of 1 hour length. This tool collates all data together into one file, in the sequence as the files were selected.



#### Note that the module does not perform any check on timing or protocol.

In the tools menu, click File Merger to open.



Figure 267: Open File Merger

When opening the File Merger, the following window will appear:

File Merger V1.1.0			$\times$
2 🔊 🕨 🕨 🗕			0
Source			
		EDR recording	~
		Folders	Y
Destination			
Available Files	Selected File	es	
			^
			<b>~</b>
Progress		Idle	

Figure 268: File Merger



#### The table below explains the buttons and fields in the user interface:

Table	7-8:	File	merger	buttons
-------	------	------	--------	---------

Button	Usage			
Start	When there are files selected to be merged, you can start merging here. (otherwise the button will not be active)			
Stop	Stop merging			
Add	Click the add button to select a file from the available files to be merged.			
Remove	Unselect a file from the list to be merged.			
Exit	Quit the application			
Source path	Here you can select the source path of the (original recording) files			
EDR recording	Select the type of files that will be merged (EDR, D6 or S4)			
Folders	If D6 or S4 is selected you have to choose "folders" if the source has subfolders OR "files" if the source folder has no subfolders.			
Destination path	Here you can select the destination path of the (collated) file. For EDR this will be a folder and the merged file will get the same name as the name of the source folder. For D6 and S4 a filename can be chosen.			
Available Files	When the source path is correctly filled in, the available files will be listed here.			
Selected Files	You can make a selection of the files to be merged using the add button.			

### 7.1 How to merge 2 files?

Since the usage of this tool is quite self explanatory, the tool will be explained in a kind of tutorial.

Suppose that different EDR-recordings are present in the following directory:

'D:\FileMerger\Files\EDR' and that the goal is to merge these files into one file, placed in another directory called 'D:\FileMerger\Merged\EDR'. The print screen below shows the different file in Windows Explorer.

and

Make sure there are only edr-files in the folder and no D6 or S4 file formats.

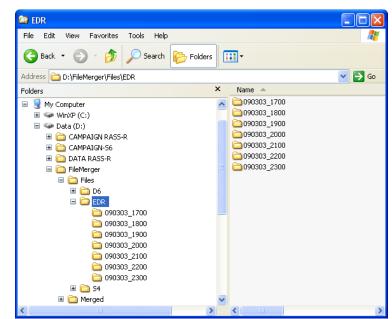


Figure 269: Files directory structure



When the File Merger is open, select the correct Source and Destination paths. After a selection of 4 files out of 7 available files, the window will be like this:

File Merger V1.1.0	X
	0
Source	
D:\FileMerger\Files\EDR EDR recording	~
Files	•
D:\FileMerger\Merged\EDR	
Available Files Selected Files	5
090303_1700 090303_1800 090303_1900 090303_2100 090303_2200 090303_2200 090303_2200 090303_2300	
	<b>~</b>
Progress Idle	
Figure 270: Merging 4 files	J

When you press the start button [L], the merging process will start as can be seen in the Progress bar.



Now, the result can be seen in the path given in Destination Path field. An example in Windows Explorer can be seen in the next picture.

😂 EDR		
File Edit View Favorites Tools Help		A.
🌀 Back 🔹 🕥 🕤 🏂 🔎 Search 陵	Folders .	
Address 🛅 D:\FileMerger\Merged\EDR		💌 🄁 Go
Folders	× Name 🔺	
🞯 Desktop	EDR.edr	
🗉 📋 My Documents	EDR.idx	
🖃 🧕 My Computer		
🗉 🧼 WinXP (C:)		
🖃 🥪 Data (D:)		
🗷 🚞 CAMPAIGN RASS-R		
🗉 🧰 CAMPAIGN-56		
🗉 🧰 DATA RASS-R		
🖃 🧰 FileMerger		
🗉 🧰 Files		
🖃 🧰 Merged		
🗁 EDR	~	
<	> <	>
Figure 2	271: Merged file	

As you can see, the new merged file will get the same name as the folder where it is created in. If you want to check the merged file, you can make an EDRReplay session in the DHM and verify the data time stamps in the file. The file length is 4 hours now, instead of 4 separate files of one hour.

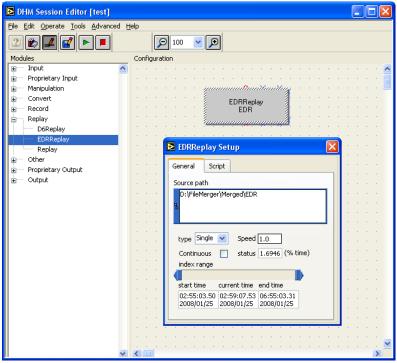


Figure 272: Verify file length





# 8 Advanced File Merger

This tool has the same function as the normal File Merger except that it only merges EDR files. The main difference is that the different files to be merged are not selected by clicking, but that a time window is defined. For every file in the selected folder tree where the time mentioned as folder name falls in the time window that is selected, the file in that folder will be merged into the new file (see 6.47 for details about EDR recording folders).

In the tools menu, click Advanced File Merger to open.

💽 D	HM Conf. Manager 2.9.	0	
<u>F</u> ile	Tools View Advanced Hel	p	
	File <u>M</u> erger Ctrl+M Advanced File Merger	] 🗖 🖸	0
DHM	Preferences		
loca	lhost: 5570		v 🖉

Figure 273: Open Advanced File Merger

When opening the File Merger, the following window will appear:

Advanced File Me	erger V1.0.	.0	X
2 🗈 🕨			0
Start 00:00:00 DD/MM/YYYY		End 00:00:00 DD/MM/YYYY	
Destination Path			
Sources			
<b>a</b>			
Progress		Id	le

Figure 274: Advanced file merger



æ

The table below explains the buttons and fields in the user interface:

Button	Usage
Start	When there are files selected to be merged, you can start merging here. (otherwise the button will not be active)
Stop	Stop merging
Start time	Evokes a 'set time and date window'. Use this to select a lower time limit.
Stop time	Evokes a 'set time and date window'. Use this to select an upper time limit.
Exit	Quit the application
	Here you can select the destination path of the files. In the user interface, there are 7
Destination path	destination paths foreseen. However, this number can be increased using the 10
Destination path	window. You can enable or disable a source path by the tick button.

Table 8-9: Advanced file merger buttons

# 8.1 <u>How to merge different files?</u>

Since the usage of this tool is quite self explanatory, the tool will be explained in a kind of tutorial.

Suppose that different EDR-recordings are present in the following directory: "F\RADAR DATA\". This file contains radar data from the 13/08/07 and from 14/08/07. The goal is to merge some of these files into one file, placed in another directory called 'E:\FileMerger\'. The print screen below shows the different files in Windows Explorer.

Make sure there are only edr-files in the folder and no D6 or other file formats.

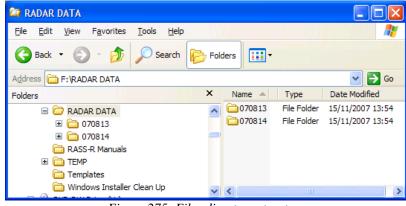


Figure 275: Files directory structure

For example, the goal is to merge the files recorded on 13/08/07 started at 11:15:00 and ended on 14/08/07 at 13:30:00. Set this time using the 'Set time and date window' and by using the

increase/decrease buttons.



E	Set	Time	and [	)ate				×	E	Set	Time	and D	ate			
	11:15	:00.000	)		\$					13:30:	00.000			-		
	Augus	t			~	2007	*	]		August	:			~	2007	\$
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	1		Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3	4						1	2	3	4
	5	6	7	8	9	10	11			5	6	7	8	9	10	11
	12	13	14	15	16	17	18			12	13	14	15	16	17	18
	19	20	21	22	23	24	25			19	20	21	22	23	24	25
	26	27	28	29	30	31				26	27	28	29	30	31	
	_															
	Set Time to Now						Set Time to Now									
OK Cancel Help OK C					ancel		ielp									

Figure 276: Set time and date window

When the File Merger is open, select the correct destination paths. Different source paths can be selected by checking the tick box before the source field. If files must be merged in more than 7 source paths, increase the number of source paths by clicking **1**.

Make sure that the source path corresponds to the path that groups the directories of the day. (F:\ RADAR DATA and not F:\RADAR DATA\0708013 or \070814)

Advanced File Merger V1	.0.0
	0
Start	End
E:\FileMerger	
Sources	
	<b>E</b>
Progress	Idle

Figure 277: Merging 4 files

When you press the start button, the merging process will start as can be seen in the Progress bar.



Similar as in the FileMerger, the merged file can be found in the destination path folder and will have the same name as the folder itself (RADAR DATA.edr and RADAR DATA.idx). If you want to check the file length of the new collated file, use an EDRReplay software component to verify.







# 9 Troubleshooting

# 9.1 DHM Configuration Module is not responding

The configuration module or the session editor is not responding. This can happen due to bugs in the configuration monitor which have not yet been resolved. In the event that this happens, use the windows task manager to manually end the YARDIOS\_SMGR.exe task. Since the session status and configuration parameters are all kept on the DHM background server you should be able to continue with the configuration when you re-launch the DHM Configuration Module.

# 9.2 <u>Session start / stop response is very slow</u>

When starting or stopping a session it takes a long time before the status colour switches from grey to green of vice versa (i.e. longer than 2-3 sec). This means that for some reason one of the modules in the session is blocked. Close any session configuration windows that are still open, save the sessions and restart the DHM background server with the windows services management console as described in Chapter 0.

# 9.3 <u>A session does not respond/cannot be stopped by the DHM.</u>

Open Windows Task Manager to kill the session. Sessions are listed as "YARDIOS\_SESSION\_ENGINE\_#.exe, with the appropriate session number at position #.

📕 Windows Task Manager						
<u>File O</u> ptions <u>V</u> iew <u>H</u> elp						
Applications Processes Performance	Networking					
Image Name	User Name	CPU 🔼				
ZCfgSvc.exe	Bert	00				
YARDIOS_SRV.exe	SYSTEM	03				
YARDIOS_SMGR.exe	Bert	08				
YARDIOS_SESSION_ENGINE_0.exe		10				
wmiprvse.exe	SYSTEM	00				
wmiprvse.exe	NETWORK SERVICE	00				
WLKEEPER.exe	SYSTEM	00				
WINWORD.EXE	Bert	00				
winlogon.exe SYSTEM 00						
VPTray.exe Bert 00						
Tracker Server.exe SYSTEM 01						
tcsd_win32.exe SYSTEM 00						
taskmgr.exe Bert 00						
	System Idle Process SYSTEM 76					
System SynTPEnh.exe	SYSTEM Bert	00				
sychost.exe	SYSTEM	00				
sychost.exe		00				
<		>				
Show processes from all users	End	Process				
Processes: 68 CPU Usage: 25%	Commit Charge: 10	16M / 3938M				

Figure 278: Task manager



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# 9.4 IAC not supported when connecting to a DHM server

When you get the error: "IAC not supported...", the first thing to check is the IP settings in the Advanced – DHM Discovery menu. If all IP addresses and Masks are accurate the reason could be that the I.E. Proxy is not installed or the service was started after the DHM service, especially when this was done manually. Solution is to stop both services using windows computer management and restart I.E.-Proxy before you restart the DHM service. A third reason could be when multiple network cards are installed and one is not connected. The "media sense" setting in the registry is disabled when DHM software is installed. Other software installed afterwards could however have enabled it again.

## 9.5 Proprietary hardware is not discovered by the DHM

When new proprietary hardware (RIM782, RDR803, UDR600) is connected, Windows will auto-detect the device instance and install the proper driver. Should you have purchased new proprietary hardware or, because of maintenance, the hardware was upgraded to a higher version, the driver might not be automatically detected. Installation of the most recent DHM software will be required to solve this issue. Proper installation of the hardware can be checked using Windows "Device Manager". Please contact Intersoft Electronics Customer Support Department to receive the most recent DHM software version.

After the hardware is connected and installed by Windows, rescan the DHM for new connected devices, see heading 4.2.8.1. Even when Windows properly installed the driver, especially when the hardware was already installed earlier and has been reconnected, the device might not be recognized in the DHM. This can be checked with the "Manage USB devices" as explained in heading 4.2.8.2 or by looking for the Proprietary Input/Output module in the module list, see heading 4.2.7.1. When the newly added device is not marked with a black dot in the device list or the desired module id not available in the module list, the device is not discovered. A malfunctioning or too long USB cable, or a dirty or aged USB port, can cause poor connection with the device, causing this error. Try swapping the USB cable and/or connecting the device to a second USB port. Make sure to press the rescan button again. Alternatively you could uninstall and reinstall the device driver manually using Windows "Device Manager".

Should the device still not be recognized and it is the first time you use the hardware, then an error might be occurred during first registration of the device. Upon first registration, the device is added to Windows registry. When an error caused wrong registration, neither re-installation of the hardware, nor the DHM software will solve the issue. The **registration of the device will have to be removed manually** from Windows registry. This can be done by opening Windows registry: type "regedit" in Windows Run-dialog, Then browse to:

"HKEY\_LOCAL\_MACHINE\SOFTWARE\Intersoft Electronics\USB\_DEVICES" and delete the entire USB\_DEVICES folder. Note that when deleting this folder, all existing DHM session that call for hardware will no longer function (reason and solution see heading 4.2.8.2).



If all above fails, please contact Intersoft Electronics Customer Support Department as the hardware might need replacement/maintenance.



# 9.6 Error codes

This section lists the error codes returned by the RASS-R Data Handling Background Server and the Configuration Module, including the error number, description, occurred when and possible reason.

Table 9-10: DHM Error codes

Code Description Occurred when Possible reason 14 Error 14 occurred at (Module not Double-clicking a Cannot add resource. Module is already in use and can be instantiated only once. There is available) software component in YARDIOS SESSION CONFIG the DHM configuration already a software component for the same ModuleListBocDblClicked Event module hardware device on the diagram or in use in Callback.vi in another session. YARDIOS SESSION CONFIG ModuleListBocDblClicked Event Callback.vi.ProxyCaller 56 Error 56 occurred at Open Allication Pressing the "Connect The network operation exceeded the user-Reference in YARDIOS SMGR (D)" button in DHM specified or System time limit. DHM background SetSRV.vi->YARDIOS\_SMGR.vi configuration module. server is not running or TCP/IP:Port combination provided in YARDIOS\_SRV field is incorrect or unreachable. 60 Error 60 occurred at TCP Create At startup of the DHM The specified network address is currently in use. Listener in Internecine Avoider.vi-> background server when Make sure that no other application is using port TCP Listen.vi-> TCP Server Engine manually launched as 5572 and restart the DHM background server. normal application not as 1.vi service. 63 Error 63 occurred at Open Pressing the "Connect The network connection was refused by the Application Reference in (D)" button in DHM server. DHM background server could not YARDIOS SMGR SetSRV.viacquire TCP port 5570 at startup. Make sure that configuration module. >YARDIOS SMGR.vi no other application is currently occupying TCP port 5570 and restart the DHM background server. 97 Error 97 occurred at unknown Opening the Labview NULL refnum was passed as input. configuration editor by system error in Problem with ActiveX component loading, restart YARDIOS SESSION CONFIG pressing the "Edit the DHM configuration manager, keep the Session(𝒶)" button. SetConfigurationFlowchart.vi background server running. >YARDIOS SESSION CONFIG.vi 1004 Pressing the "Connect Error 1004 occurred at Open VI The VI is not in memory. Another LabVIEW Reference in YARDIOS\_SMGR (D)" button in DHM application is occupying the DHM background SetSRV.vi->YARDIOS SMGR.vi server TCP port 5570. Quit the application configuration module. occupying TCP port 5570 and restart the DHM background server.



#### **REFERENCED DOCUMENTS**

Reference	Document
[1]	ITU Recommendations for X.25 10/96; http://www.itu.int/
[2]	POEMS ICD in RASS-S. This is installed with RASS-S. You can find more
	information about .EDR, .IDX, .IOSS, .IRD
	IE-DD-00273-002 ICD S4.pdf
[3]	For all ASTERIX categories, refer to the EUROCONTROL website:
	http://www.eurocontrol.int/asterix/public/subsite_homepage/homepage.html
[4]	ASTERIX Structure, SUR.ET1.ST05.2000-STD-01-01
	http://www.eurocontrol.int/asterix/gallery/content/public/documents/pt1ed130.pdf
[5]	D6 ICD, IE-DD-00272-001 ICD D6.pdf

