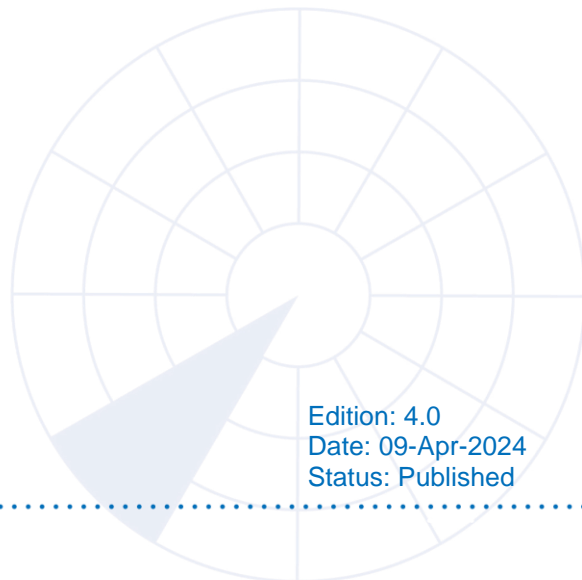


RASS Toolbox



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Edition	Date	Reason for Change
1.0	19 Nov 2009	First Edition
2.0	06 Mar 2024	Completely reworked for RASS8
3.0	06 Mar 2024	Updated license installation path
4.0	21 Mar 2024	Updated content for RASS8.0



2. GLOSSARY OF TERMS

The following glossary with acronyms, abbreviations and definitions can be used for correct understanding of the RASS set of software tools.

2.1. General

A-code, C-code	A combination of data bits contained in signals transmitted by an SSR Transponder in reply to an SSR Interrogator.
ACP	Azimuth Count (or change) Pulses (ACPs): The output pulses of the incremental azimuth measuring device fitted to the radar antenna turning platform (turning gear). The encoding device may give its output in serial or parallel form, but typically provides 4096 pulses (12 bit encoding), 16384 pulses (14 bit encoding) or 65 536 pulses (16 bit encoding) in serial form per 360° of azimuth rotation.
ADS-B	Automatic Dependent Surveillance, Broadcast
Annex 10	Aeronautical Telecommunication, <i>Annex 10 to the Convention on International Civil Aviation</i> , the principle international document defining SSR
ARTAS	ARTAS ATC Radar Tracker and Server
ASR	Airport Surveillance Radar
ASTERIX	All purpose STructured Eurocontrol Radar Information eXchange
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATM	Air Traffic Management
Azimuth	The angle between North (normally true North) and a radar target, measured from the sensor site.
Back Lobe	A lobe of radiated energy to the rear of an antenna (180° in azimuth with respect to the main lobe).
baud	Unit of signal frequency in signals per second. Not synonymous with bits per second since signals can represent more than one bit. Baud equals bits per second only when the signal represents a single bit.
Beam Width	The angle subtended (either in azimuth or elevation) at the halfpower points (3 dB below maximum) of the main beam of an antenna.
Bit	Binary Digit
bps	bits per second
C-code	Code: A combination of data bits contained in signals transmitted by an SSR Transponder in reply to an SSR Interrogator.
CAA	Civil Aviation Authority
CAV or CMV	Coverage Assessment or Measurement Volume (CMV): The coverage measurement volume is defined as the three dimensional volume of Airspace within which the performance and availability requirements will be analysed during a particular measurement campaign.
Clutter	A general term used for interfering reflections of radio energy in PSR. There can be a number of different types of clutter: <ul style="list-style-type: none"> • ground clutter (generally non-moving); • weather clutter (rain, snow, etc.); • sea clutter; • angel clutter
Co-located	An expression used for antennas which are at the same physical location, but may be on-mounted, back-to-back mounted, etc., and may use a common turning gear.
Cone of Silence	A gap in coverage above a radar due to the limitations of the antenna performance at high elevation angles.
COTS	Commercial Off The Shelf
CPU	Computer Processing Unit
CWP	Controller Working Position
dB	DeciBels
DCE	Data Communications Equipment. The local and/or remote modem. A DCE is usually connected to a DTE.
Deg	Degrees



DOS	Disk Operating System
DTE	Data Terminal Equipment. The computer or terminal, either local (yours), or the remote (the one you're communicating with). A DTE is usually connected to a DCE.
Ethernet	A network specification developed by DEC, Intel, and Xerox which provides anywhere from 10 megabits to 1000 megabits per second transmission speeds.
EUROCONTROL	European Organisation for the Safety of Air Navigation
False Plot	A radar plot report (PSR, SSR or combined plot) which does not correspond to the actual position of a real aircraft (target), within certain limits.
FDDI	Fiber distributed data interface
FL	Flight Level, unit of altitude (expressed in 100's of feet), the vertical distance above mean sea level when referenced to standard pressure setting of 1 013.25 hectopascals.
FOM	Figure of merit: a measure of the accuracy of an aircraft's reported position, usually when talking about ADS-B reports
FTP	File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one host to another host over a TCP-based network, such as the Internet.
FRUIT	False Replies Unsynchronized In Time, unwanted SSR replies received by an interrogator which have been triggered by other interrogators
Garbling	A term applied to the overlapping in range and/or azimuth of two or more SSR replies so that the pulse positions of one reply fall close to or overlap the pulse positions of another reply, thereby making the decoding of reply data prone to error.
GB	Gigabyte (equivalent to 1 073 741 824 bytes)
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.
Hz	Hertz
ICAO	International Civil Aviation Organization
ICD	Interface Control Document
IE	Intersoft Electronics
IP	Internet Protocol
km	Kilometres
kt	Knots
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.
m	Meters
m	Minutes
Mb	Megabyte (equivalent to 1 048 576 bytes)
MHz	MegaHertz (equivalent to 1 million hertz)
Mode	The coding of SSR Interrogation transmissions according to ICAO Annex 10 recommendations. Modes of interrogation are determined by the relative spacing of a sequence of transmitted pulses. Mode A and Mode C interrogators use the following spacings between the P1-P3 pulse pair: <ul style="list-style-type: none"> • Mode 3/A : 8 ± 0.2 microseconds; • Mode C : 21 ± 0.2 microseconds.
Mode-S address	Unique ICAO 24-bit address assigned to an aircraft having a Mode-S transponder
ms	Milliseconds
MSSR	Monopulse Secondary Surveillance Radar
Multipath	Interference and distortion effects due to the presence of more than one path between transmitter and receiver
NM	Nautical Mile, a measure used in navigation. The unit is equal to 1852 m.
North Message	Special message(s) generated by a plot extractor to indicate the passage of the antenna boresight bearing through North.
OC	Object Correlator
OEM	Original Equipment Manufacturer



PCAP	Package capture, raw network packages format.
Pd	Probability of Detection
Plot	A target report resulting from digital integration of the received echoes (PSR) or replies (SSR) inside the antenna beamwidth. The PSR report contains range and bearing information whereas the SSR report contains in addition Mode 3/A identity code and the Mode C decoded altimeter height value.
Plot extractor	A signal processing equipment, which applies digital integration techniques to detect and resolve, depending upon design, either PSR reflected returns or SSR transponder replies to provide a single message output for each aircraft in the OCV. Both PSR and SSR plot extractors provide range and bearing of the aircraft in the plot output messages whereas SSR plot extractors also include Mode 3/A identity code and the Mode C decoded altimeter height value.
PPI	Plan Position Indicator
PRF	Pulse Repetition Frequency
PSU	Power Supply Unit
PSR	Primary Surveillance Radar
Radar	RAdio Detection And Ranging
RASS	RAdar Analysis Support Systems
RDP	RAdar Data Processing (system)
Remote Desktop Connection	Remote Desktop Connection (RDC, also called Remote Desktop, formerly known as Microsoft Terminal Services Client, or mstsc) is the client application for Remote Desktop Services. It allows a user to remotely log in to a networked computer running the terminal services server. RDC presents the desktop interface (or application GUI) of the remote system, as if it were accessed locally.[
Reflections	A signal processing device for the combination of PSR and SSR data ascertained as having originated from the same target (aircraft). Targets failing to meet pre-defined combination criteria will be output as "PSR only" or "SSR only" plots in place of "combined plots".
RF	Radio Frequency
Ring-Around	The continuous reception of aircraft replies to interrogations by the sidelobes of the ground antenna. This normally occurs only at short ranges and high elevation angles, usually due to the nonexistence of a sidelobe suppression mechanism or the improper functioning of this mechanism at either the interrogator or the transponder side.
RMS	Root Mean Square
RS232/422	The Electronics Industry Association (EIA) has produced standards for RS232 and RS422 that deal with data communications.
RTQC	Real Time Quality Control
s	Seconds
SAC	System Area Code
Screening	When the shape of the terrain or certain objects prevent the detection of targets in certain parts of the airspace, one speaks about screening of the parts of the airspace concerned.
Second-Time Around Targets (STAT)	Target returns from ranges beyond that associated with a basic PRF interval.
SIC	System Identification Code
Sidelobe suppression (SLS)	A mechanism in an SSR transponder actuated by the transmission (radiation) of a Control Pulse (P2 or P5) of amplitude greater than the antenna sidelobe signals in space, which will enable the transponder to prevent itself from replying to the sidelobe interrogation signals.
Sidelobes (Antenna)	Lobes of the radiation pattern of an antenna, which are not part of the main or principal beam. Radar systems can have sufficient sensitivity via sidelobes for successful detection of aircraft (particularly for SSR, but also for PSR). Special precautions are necessary to protect against these false plots.
SLB	Side Lobe Blanking
SNMP	Simple Network Management Protocol. Internet Suite Protocol used in network management systems to monitor network-attached devices.



SNR	Signal-to-Noise ratio
Split Plot(s)	A generation of two plots by a radar extraction system for the same target for one passage of the antenna main-beam through the target.
Spurious Plot	Unwanted radar plot not corresponding directly with an aircraft position (generally applied for SSR).
SSR	Secondary Surveillance Radar
Target report	A digital message which depending on the filtering function applied can be either polished / filtered plot or track.
TCP	Transmission Control Protocol
TOD	Time of Day
TOR	Time of Recording
Track	A target report resulting from the correlation, by a special algorithm (tracking) of a succession of radar reported positions for one aircraft. The report normally contains smoothed position and speed vector information.
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
UAP	User Application Profile, used in Asterix data for assigning Data Items to Data Fields.
UDP	User Datagram Protocol
UTC	Coordinated Universal Time
Wireshark	Wireshark is a free and open-source packet analyzer. It is used for network troubleshooting, analysis, software and communications protocol development, and education.
X.25	X.25 is the CCITT's recommendation for the interface between a DTE and DCE over a Public Switched Telephone Network (PSTN). 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.
µs	Microseconds



2.2. Specific RASS terminology

Bitstream	In data communications, the number of bits used to send each character, not including any added timing or error checking bits
Buffer	Temporary storage for acquired or generated data.
Bytestream	A byte stream is an abstraction used in computer science to describe a 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.
CMC	Coverage Map Calculator
D6	Intersoft Electronics radar data description language where the raw sensor data is decomposed in D6 fields to be input and output by RASS-S and RASS-R tools.
Data Replay	Data replay tool
DHM	Data Handler Module which consists of a DHM Background Server and DHM Configuration Manager
EDR	Intersoft Electronics radar data description language containing raw sensor data
Event	Event, signals occurrences between event source and receiving software module, Events include North, Time, ACP/ARP
MRD3	Multi Radar Display 3
RCD	Radar Comparator Dual
RCM	Radar Comparator Mono
RDCR992	Radar Data Convertor and Recorder
RES	Radar Environment Simulator
RFA	Radar Field Analyser
RFT	RF Testset
RGI	Radar Gyroscope and Inclinator
RTG	Radar Target Generator
RTI	Radar Timing Interface
S4	Intersoft Electronics radar data description language where the raw sensor data is decomposed in S4 fields to be input and output by RASS-S and RASS-R tools.
TMD3	Technical Maintenance Display 3
UDR600	USB Data Recorder
UPM	USB Power Meter



3. GENERAL INFORMATION

The information contained in this document is related to the RASS solutions by Intersoft Electronics.

3.1. Referenced Documents

If not otherwise mentioned, the last released version is valid.

Table 1 Referenced Documents






Ref	Document Title and Number
/1/	EUROCONTROL Document for Radar Sensor Performance Analysis (Document Reference SUR.ET1.ST03.1000-STD-01-01, Edition 0.1, dated June 1997).
/2/	EUROCONTROL Document for European Mode S Station Functional Specification (Document Reference ET2.ST03.3114-SPC-01-00, Edition 3.11, dated May 2005).
/3/	EUROCONTROL Document RADAR SURVEILLANCE IN EN-ROUTE AIRSPACE AND MAJOR TERMINAL AREAS SUR (Document Reference ET1.ST01.1000-STD-01-01, Edition 1.0, dated March 1997)
/4/	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 4 Category 048 Monoradar Target Reports (Document Reference SUR.ET1.ST05.2000-STD-04-01, Edition: 1.14, November 2000)
/5/	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 2b Category 34 Mono Radar Service Messages (Document Reference SUR.ET1.ST05.2000-STD-02b-01, Edition: 1.26, November 2000)
/6/	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 2a Category 001 Monoradar Target Reports (Document Reference EUROCONTROL-SPEC-0149-2a, Edition: 1.3, April 2021)
/7/	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 2b Category 002 Monoradar Service Messages (Document Reference EUROCONTROL-SPEC-0149-2b, Edition: 1.1, April 20210)
/8/	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 12 Category 021 ADS-B reports, Edition: 2.6 December 2021)
/9/	ICAO Annex 10 (Recommendations) (up to the latest Amendment), hereafter called "ICAO Annex 10".

Within this document references to other documents are identified by a Slash '/' immediately before and after the reference identifier (e.g. /1/). The reference identifier is contained in the first column of the tables above. A trace to another document is enclosed by square brackets '[']' Part of the trace is the document reference provided between the opening bracket '[' and a tilde '~'. The trace origin within the referenced document is provided between the tilde '~' and the closing bracket ']'. Trace example [/1/~5.1]. This formatting is chosen to foster automatic extraction of the traces for purposes of trace analysis.



4. CONVENTIONS USED

4.1. Notes, Warning and Cautions:

 Info macro example This text is rendered inside the info macro.	 Note macro example  This text is rendered inside the note macro.
 Tip macro example This text is rendered inside the tip macro.	 Warning macro example This text is rendered inside the warning macro.

4.2. Code blobs

Code blobs are are indicated by preformatted text.



5. INTRODUCTION

This manual describes the RASS toolbox, which user interface sections and functionalities are available.

5.1. What is RASS

RASS® or Radar Analysis Support System, is a solution suite of several measurement and analysis products. These products are manufacturer and Air Traffic sensor type independent. Providing a full top-down analysis approach of all the elements in the system chain, verifying the performance of each element separately and as complete system in the operational or factory environment of the radar. Every component in this top down can be analysed, tested and verified in both factory and operational environments. It is the perfect solution to assist in development, verification, maintenance and services.



Figure 1 What is RASS

5.2. RASS Philosophy

The RASS mission is providing a full and broadly usable product portfolio that keeps focusing on the complete Top-Down Approach (from antenna to data link including data analysis). This core principle is centrally placed for the product portfolio, to have have impact on every step of the sensor life cycle (from regulation over development to commission and daily driving the system). Currently, the target markets will be the civil and military ATC market. This covers radars, sensors and by extension NAVAIDS.

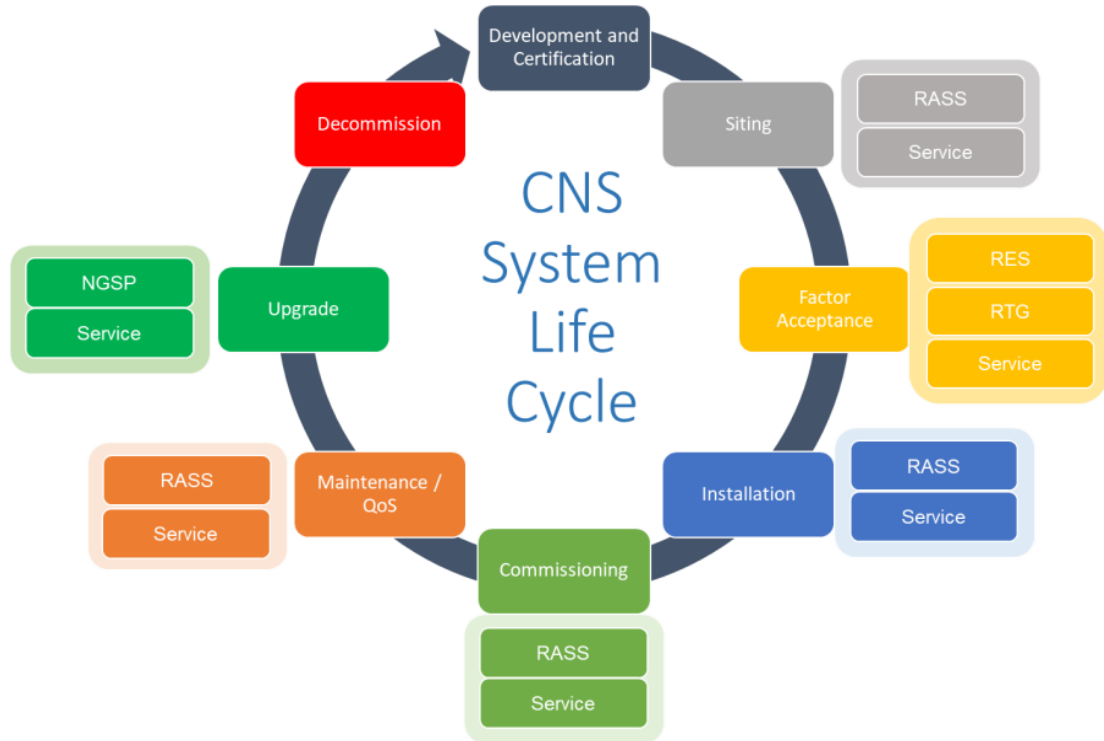


Figure 2 RASS impact on the sensor Live cycle

5.3. Top-Down Analysis

The RASS philosophy: "**From top to bottom. From antenna to center. From pilot to control.**" means that Intersoft Electronics always works the way down from the antenna chain in order to check the entire system. From the RF signals present at the antenna down to sensor data output, all these signals can be measured and analysed in a very short period of time. Each element of the total radar chain can be characterized by specific parameters. A summary:

1. Antenna System:
 - Horizontal and vertical radiation and reception diagrams
 - Gain
 - Tilt alignment
 - Polarisation
 - Reflections
 - RF properties
2. Transmission (focused on RF):
 - Cabling
 - Waveguides
 - Rotary joint
 - Couplers losses
 - Phase matching
 - Directionality
 - VSWR
 - Coupling
3. Mechanical:
 - Encoder
 - Turning gear
 - ACP and ARP errors
 - Stability and wind load
4. Interrogator Transmitter:
 - Power
 - Pulse shape
 - Pulse width
 - Pulse spacing
 - Power droop
 - PRF, stagger and mode
5. Interrogator Receiver:
 - Sensitivity
 - Bandwidth
 - Channel alignment
 - Saturation
 - STC
 - Monopulse accuracy



6. Processor:

- Accuracy
- Degarbling
- Load
- Delay
- Resolution
- Code validation
- False plot generation
- Probability of detection

7. Transponder:

- Classification
- Monitoring
- Fault finding

8. Environment:

- Other interrogators
- FRUIT
- Load
- ACAS
- ADS-B/TIS-B
- Jamming

9. Data Center:

- Radar accuracy
- Multi radar tracker behavior
- Multi radar alignment
- Data transmission

The RASS portfolio setup used to perform such a top-down analysis is indicated in the image below, use case radar.



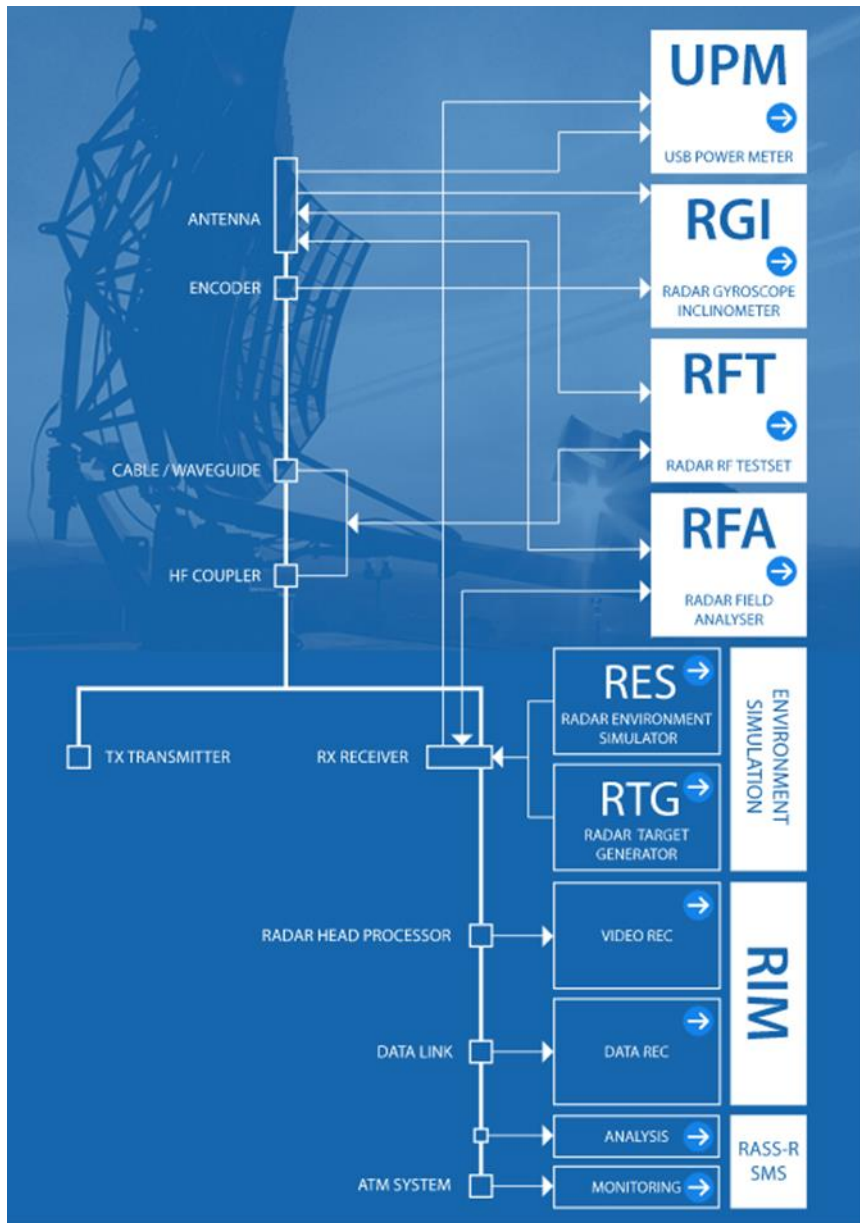


Figure 3 RASS Top-Down Approach

6. USER INTERFACE DESCRIPTION

The RASS Toolbox emphasises the same top-down conceptual idea and consists of a number of functional menus accessible through buttons. Each of these button controls a set of tools and corresponds to a specific element in the sensor chain, starting with the antenna down to and including the data collection equipment delivering the plot and track data to the control center. A special set of tools qualify the plot and track data output and allow a detailed analysis of these data towards resolution and probability of detection parameters.

Principal Features:

- Multiple use of programmable hardware using software virtual instruments.
- Graphical user interface.
- Synoptical windows with push button operation.
- Online help functions on setup and use of the equipment.
- Logging and retrieval of all measurements.

The RASS Toolbox has to following sub sections:

- Title bar
- Menu bar
- Top bar
- Side bar
- Main Window

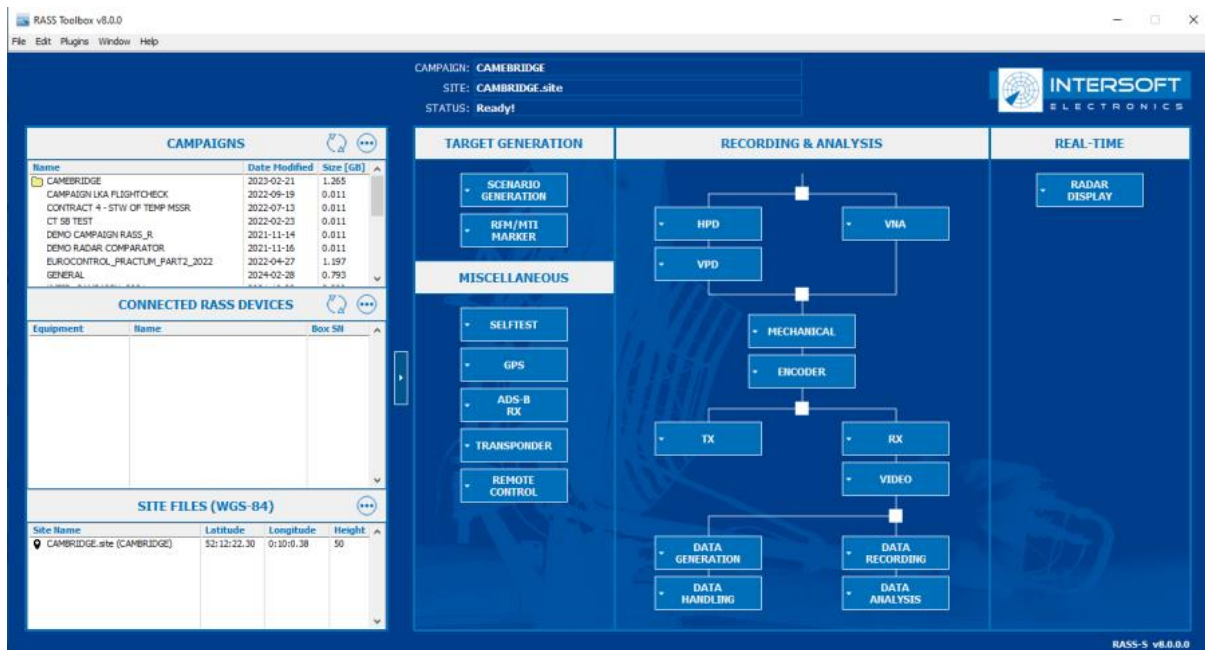


Figure 4 RASS Toolbox

6.1. First launch

6.1.1. Application Settings File

Upon launch of the RASS Toolbox application, the software tries to load the application settings file "RASS-S Application Settings.ini", located in directory "%appdata%\Intersoft Electronics\" where "%appdata%" points to the current user application data system folder under Windows. This is typically the directory "C:\Users\CurrentUser\AppData\Local\" in standard Windows environments. If this file cannot be found, the user will be presented with the following warning dialog:

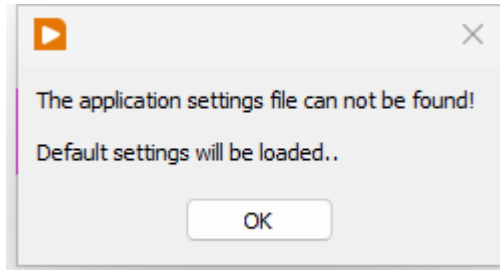


Figure 5 Application Settings File Missing

The RASS Toolbox application will use default settings if the file could not be found. It also becomes clear that for each user under Windows, the settings could be different.

6.1.2. EULA Acceptance

When the RASS Toolbox application is started for the first time, the user has to agree with the EULA (End User License Agreement) in order to continue. If user cannot accept the EULA, the application will close automatically and is asked again to accept the EULA when the Toolbox application is started the next time. Once agreed, the application will continue and the user is not asked to accept the EULA the next time the RASS Toolbox application is started.

The following window is presented containing the EULA content:

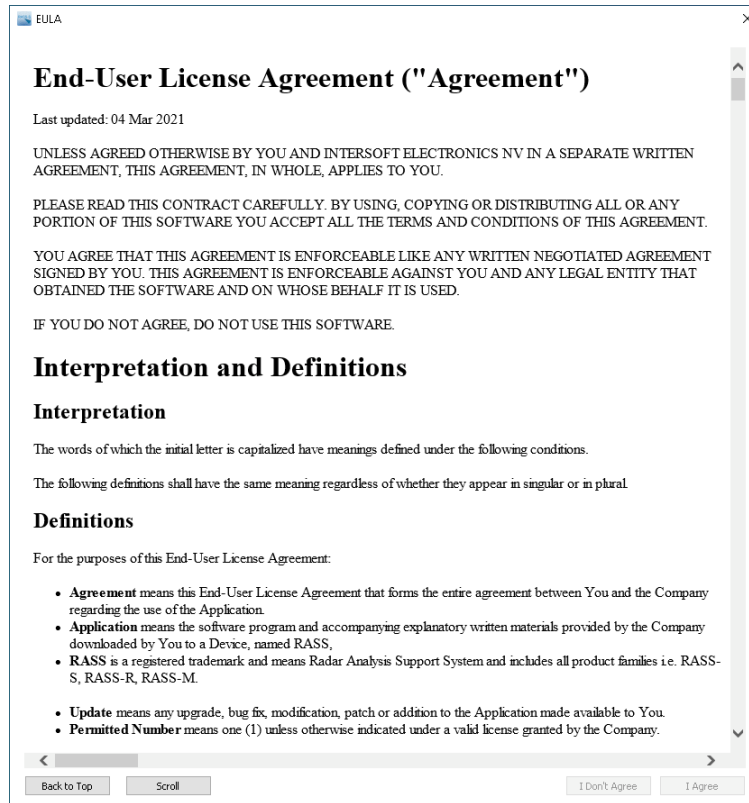


Figure 6 EULA browser

The user has to scroll through the complete EULA document and can either decide whether or not to agree with the EULA statement. In case of not accepting the installation will be aborted.

6.1.3. User interface Items

6.1.3.1. Title Bar

6.1.3.2. Software Version and Licensing

The title bar contains the RASS Toolbox application name, version and indicates whether the RASS Toolbox application is licensed or not. The following textual indication can be present depending on installed licenses:

- UNLICENSED: The RASS Toolbox application didn't find any installed licenses
- LICENSE EXPIRED: The current installed license has been expired and needs an update
- Empty indication: This means that a valid license is installed

License files can be found or need to be copied into the directory "(C)(D):\INTERSOFT\Licenses\".

6.1.4. Menu bar

6.1.4.1. File Menu

- Open: Opens a specific selected file which must be a virtual instrument (*.VI file extension) that is able to open through the LabVIEW runtime environment. This feature is typically used for advanced debugging purposes and is not relevant for normal operation.
- Exit: Closes the RASS Toolbox application. When several tools are still open, the user is presented with a dialog indicating the number of tools still open. This is done for clean shutdown purposes. It is not guaranteed that a RASS application can still work in normal conditions when the RASS Toolbox application is closed.

6.1.4.2. Edit Menu

- Settings: Opens the preferences or settings window

6.1.4.3. Plugins Menu

The plugin section houses some custom and specific applications that are not located under a specific top down philosophy topic. The sections are:

- File Handling
- Interrogators
- Legacy

The user can open the applications by selecting the desired plugin from the available list. The available plugin items can be different between RASS release versions.

6.1.4.4. Window Menu

The window menu can be used to switch between open application windows or toolbox window.



6.1.4.5. Help Menu

- Show Context Help: This option will open a floating tooltip window, which provides additional explanations on the control or indicator field from the GUI of RASS applications (including the toolbox) in case the mouse pointer is hovering over these fields.
- Show Error Details: Open an additional GUI window where errors are collected and can be reviewed in detail.
- Online Manual: This menu item can be enabled or disabled (by a checkbox) and when enabled, the user is presented with a manual (PDF) which belongs to a specific RASS application selectable from one of the RASS Toolbox menu buttons from the top-down view.
- Connection Diagram: This menu item can be enabled or disabled (by a checkbox) and when enabled, the user is presented with a connection diagram (PDF) which belongs to a specific RASS application selectable from one of the RASS Toolbox menu buttons from the top-down view.
- About RASS Toolbox: Issues the About dialog window indicating the version and contact details of Intersoft Electronics NV. Also the EULA can be launched from this window in read-only mode only.



6.1.5. Settings Window

In the Toolbox Settings window, overall RASS settings can be made. This information is shared between many RASS applications where these settings are of importance.

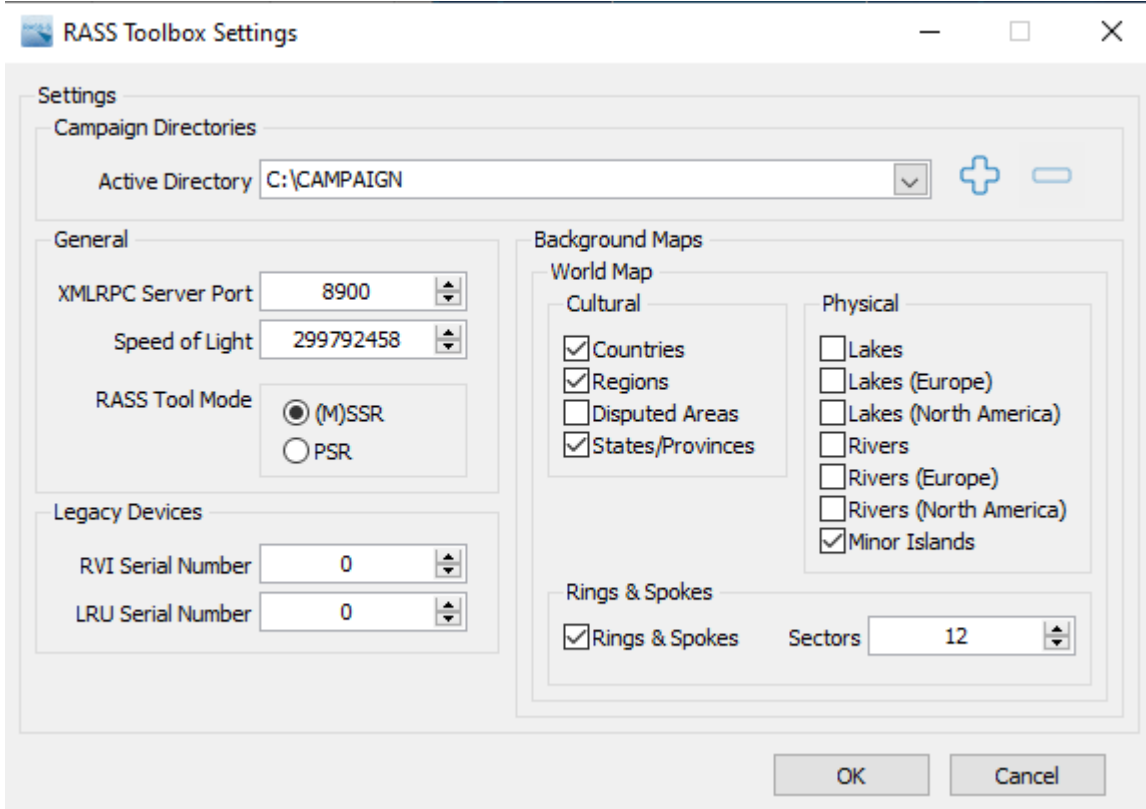


Figure 7 RASS Toolbox Setting Window

All individual sections are described below.

6.1.5.1. Campaign Directories

<p>Active Directory <input type="text" value="D:\CAMPAIGN"/></p>	<p>Active Directory selector. It is allowed to have more than 1 campaign directory containing several individual campaigns on disk. An active campaign directory can be added or deleted from the current defined list. This active directory list is also part of the application settings file and these directories will be scanned in order to list all possible campaigns from the selected active directory. See also section "Campaigns" as part of Side Bar.</p>
<p></p>	<p>Add a new active directory which contains many campaigns created with the RASS toolbox. This new active directory will be part of the application settings file.</p>
<p></p>	<p>Delete an active campaign directory from the current defined active directories (as stored in the application settings file).</p>



6.1.5.2. General

XMLRPC Server Port <input type="text" value="8900"/>	The default port number for remote control of several RASS applications. This number identifies the port of the (listening) XML-RPC server so an XML-RPC client can connect to this port using plain TCP.
Speed of Light <input type="text" value="299792458"/>	Sets the speed of light in m/s
RASS Tool Mode <input checked="" type="radio"/> (M)SSR <input type="radio"/> PSR	With the radio button, the user can select in which mode to operate the RASS Toolbox. Depending on the selection, a majority of the RASS applications will be launched with either (M)SSR or PSR preferences. For example the Uplink measurement application will start with 1030MHz as Frequency setting in (M)SSR mode

Currently an older XML-RPC implementation server instance uses the configured XMLRPC Server Port parameter (e.g. 8900) while the latest implementation of XML-RPC uses an incremental port (e.g. 8901) since RASS-S v7.2.8 or greater. When a user want to use XML-RPC in their own written client applications, it is advised to use the latest XML-RPC implementation (thus using the incremented port e.g. 8901).

6.1.5.3. Legacy Devices

Devices which can't be listed in the side bar are listed in here,

RVI Serial Number <input type="text" value="0"/>	RVI serial number is sometimes needed for (deprecated) tools. Normally this field is not used!
LRU Serial Number <input type="text" value="0"/>	LRU serial number is sometimes needed for (deprecated) tools. Normally this field is not used!

In future releases this section could be removed.

6.1.5.4. Background Maps

In the background maps section, the user can enable and disable which kind of map information will be displayed as a background layer is specific RASS applications (e.g. Inventory).

The user has the option to select different cultural options like countries, region, disputed areas, states and provinces. while in the physical sub section, the user has even more detailed information that can be displayed.

Typically, the more layers are selected, it might take some time to calculate the background map within each RASS application depending on the amount of data to display (e.g. maximum range).

From the rings and spokes section, the user can enable the rings and spokes option and select the number of sectors to be displayed. Also here, depending on the RASS application parameters, the range rings could be displayed at different ranges.



6.1.6. Top Bar



Figure 8 Toolbox Top Info Bar

The top bar at the top of the toolbox lists the following items:

- Active campaign folder, changes can be made in the side bar
- Active site, changes can be made in the side bar
- Status of the RASS Toolbox application

6.1.7. Side Bar

The side bar has 3 sub sections:

- Campaigns
- Connected RASS Devices
- Site Files



6.1.7.1. Campaigns

The campaigns section lists all the campaign directories that are located in the active campaign directory. Please note that the active campaign directory can be changed using the settings window.




CAMPAIGNS		
Name	Date Modified	Size [GB]
DEMO CAMPAIGN RASS_R	2021-11-14	0.011
 DEMO RADAR COMPARATOR	2021-11-16	0.011
GENERAL	2024-02-28	0.793
NEW FOLDER	2024-02-28	0.011
TEST	2022-05-04	0.203
TMP	2021-06-22	4.228

Figure 10 Toolbox side bar - campaign

Together with the campaign name, the modification date and campaign size is being reported at 5 minute intervals.

The current active campaign will be indicated by the folder icon in front of the campaign name. The user can change the active campaign by double-clicking on a specific campaign name. The top bar will be updated with the newly activated campaign folder. The user is allowed to select different campaigns other than the current active campaign in order to apply specific actions.

The following buttons are available from the campaigns list:

	Refreshes the campaigns in the current defined active directory. The active directory of campaigns on disk can be changed in the settings window.
	This button contains a set of unique functions to maintain campaigns. Creation of new (empty) campaigns, deletion and renaming of a selected campaign. The current active campaign cannot be deleted or renamed when selected!

6.1.7.2. Connected RASS Devices



In the devices section, all connected RASS equipment is listed by name and serial number. If the calibration information could not be found, else device is listed in red.

CONNECTED RASS DEVICES		
Equipment	Name	Box SN
<ul style="list-style-type: none"> Video <ul style="list-style-type: none"> UVR <ul style="list-style-type: none"> UVR 892 	USB Video Recorder	070/003/056

Figure 11 Toolbox side bar - devices

A device serial number can be shown in red to indicate that the calibration files are not found. There is no indication whether a specific device calibration file falls outside calibration periods or is declared 'old'. As long as the calibration file is present, it can operate using an appropriate RASS application.

The following buttons are available from the device list:

	Rescans for RASS devices connected to the PC.
	This button contains a unique set of functions to extract additional information from connected devices like showing calibration file details and investigating hardware details. Typically, only a single device of a specific device family (e.g. RFA) can be active when multiple devices of the same family are detected. If a device is part of a device family that allows for multiple active devices at the same time (e.g. UVR, UDR, RIM, RTI, RTG10xx), more than 1 device of such a family can be active.

6.1.7.3. Site Files

The site files section lists all available site files in the activated campaign structure. In case of multiple possible site files, the active site file is indicated by a pin icon. Together with the site file name, the configured WGS-84 location and height (meters above mean sea level) are indicated.

Accordingly, the top bar will be updated with the newly activated site file. If no site files are present, there is simply no active site file.



SITE FILES (WGS-84) ⋮			
Site Name	Latitude	Longitude	Height ^
 Radar1.site (Radar1)	50:52:16.78	4:37:01.43	125
Radar3.site (Radar3)	50:53:21.92	4:30:03.59	80

Figure 12 Toolbox side bar - site files

The following buttons are available from the site files list:

	This button contains a set of unique functions to handle site files within the current active campaign like creating new or edit existing site files, delete and rename specific selected site files. The current active site file can not be deleted or renamed!
---	---

6.1.8. Main Window section

The main window section represents the same top-down conceptual idea and consists of a number of functional menus accessible through buttons and menus. The main section is divided in 4 areas and are describe in the following paragraphs:

- Target Generation
- Recording and Analysis
- Real-Time
- Miscellaneous

Every section has one or multiple buttons related to specific functionalities of sensor components. Such a functionality can be accessed by clicking the button and a drop-down menu will be active that combines a logical grouping of similar functions (e.g. measurements) independent from the supported RASS hardware. One of the revealed menu items (functions) can be clicked in order to launch the correct application belonging to this functionality. However, if multiple RASS devices are detected by the toolbox while more then one RASS device can perform the same measurement function, the user will get the following pop-up menu to select which device the user wants to use for this specific function.

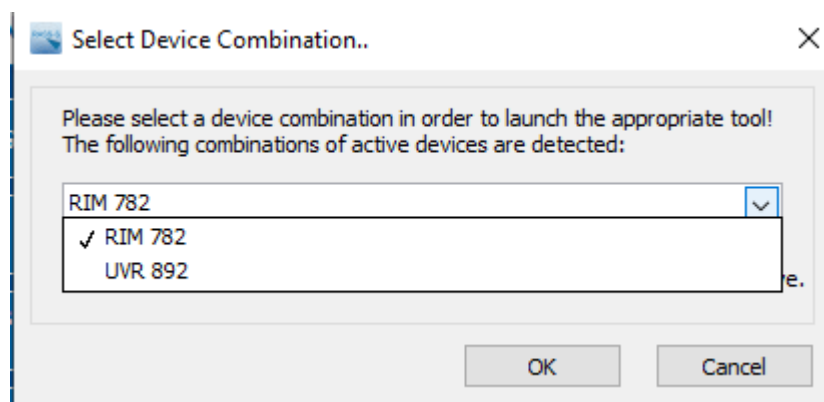


Figure 13 Toolbox Select Device Combination

From this menu the user can determine which device type (or a combination of detected devices) will be used for the measurement and the appropriate application will be opened.

If multiple devices of the same device family are active and no other device (other than the multiples of the same family) is active and detected for a specific function, the pop-up window for device selection will not be displayed and the correct application will be loaded automatically. Inside the application itself, the user will need to select the correct device as detected by the application itself. Typically, such applications will also detect and list these devices in a device selector available on the GUI.

6.1.8.1. Target Generation

The target generation area holds all functions and thus also RASS applications that are related to RES, RTG and RFA products. These applications are ranging from antenna editor over scenario generator up to the CAM applications.

Those applications are divided in 2 groups

- Scenario Generation
- RFM/MTI Marker



6.1.8.2. Recording and Analysis

Recording and analysis section holds all standard ground measurement applications to measure every component in the top-down approach.

- Antenna : HPD/VPD
- VNA
- Mechanical
- Encoder
- Transmitter (TX)
- Receiver (RX)
- Video
- Data Generation
- Data Handling
- Data Recording
- Data Analysis

6.1.8.3. Real-Time

The real time section holds all the RASS radar display solutions (e.g. MRD and TMD).

6.1.8.4. Miscellaneous

The miscellaneous section holds all specific tools to perform miscellaneous actions or procedures:

- Self Test : The self test applications for Radar Environment Simulator (RES) and Radar Field Analyser (RFA)
- GPS
- ADS-B
- Transponder
- Remote Control



7. TOOLBOX USAGE

The Toolbox forms the main user interface for the RASS program from which all RASS applications are started. We will further refer to it as the Toolbox. It is the only entry which has to be started from the Windows Explorer. It is very valuable to make a shortcut and put it on your desktop (normally this is already done automatically during the installation of RASS8).

7.1. Loading the toolbox and an application

The toolbox is a user-friendly platform for loading and running all of the RASS applications. It is the point of start and return for all tools.

When the toolbox is opened, the user will be able to select a number of applications according to the measurements to perform. The measurement program should always be loaded from the RASS toolbox. Load an application by clicking the button in the Main Window section covering the specific function and selecting the program from the pop-up menu. The selected tool will then be loaded and ready for usage.

8. TROUBLESHOOTING

Helping guide for most common error or user mistakes, including explanation of error messages.

8.1. Error Dialogs

The following paragraphs indicate specific error dialogs when operating the RASS Toolbox application. The description of each dialog is presented in these paragraphs below.

8.1.1. INTERSOFT.db3 not found

When installing the RASS Toolbox and according applications, automatically the INTERSOFT.db3 file is installed in the default INTERSOFT directory on the C or D root of the PC. If for some reason, this file has been removed, the following dialog can be presented to the user:

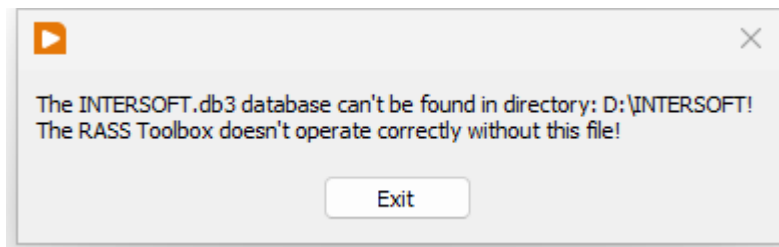


Figure 14 INTERSOFT.db3 not found

The RASS Toolbox application will exit since this file is mandatory for correct operation.

8.1.2. CALIBRATION folder not found

When installing the RASS Toolbox and according applications, automatically the CALIBRATION files will be installed in the default directory on the C or D root of the PC, typically "\INTERSOFT\CALIBRATION". If for some reason, this folder has been removed, the following dialog can be presented to the user:



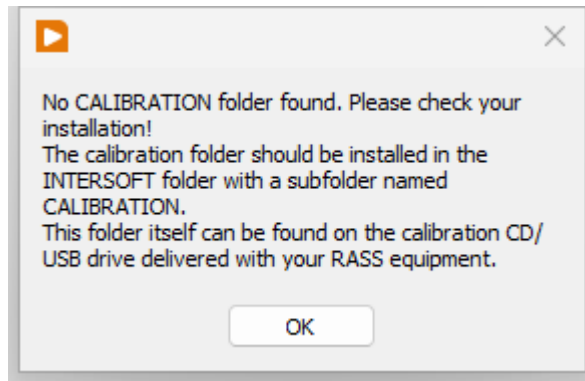


Figure 15 CALIBRATION directory not found

The RASS Toolbox application will continue to operate, although it is not guaranteed that every RASS application can be run correctly.

8.1.3. Current Campaign not found

The last campaign directory used is stored to the application settings file. If for some reason this folder cannot be found when launching the RASS Toolbox application, the following dialog is presented to the user:

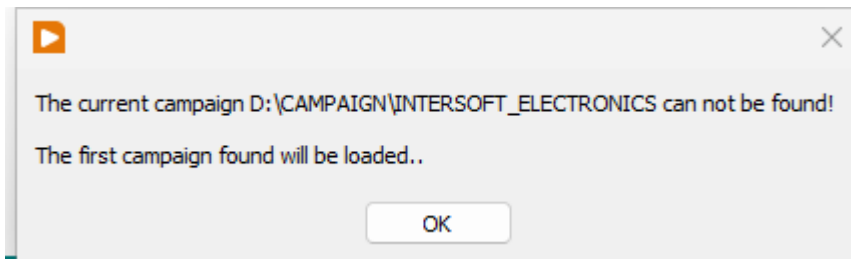


Figure 16 Current campaign not found

If the current campaign could not be found, the first available campaign will be loaded from the defined active campaign directory.

8.1.4. Renaming Campaign failed

Any campaign can be renamed but specific dialogs can occur when the campaign is renamed to an already existing campaign or an invalid name has been chosen.

When the campaign is renamed to an existing campaign name, the following dialog is presented:

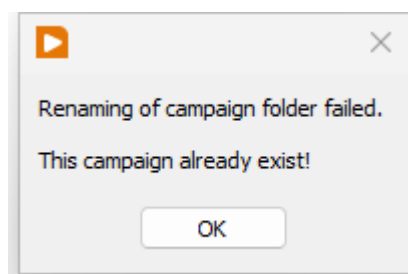


Figure 17 Already Existing Campaign

When the campaign is renamed to an empty name, the following dialog is presented:



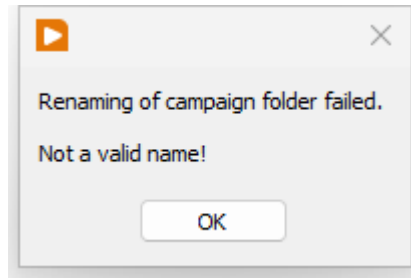


Figure 18 Invalid Campaign Name

8.1.5. Renaming Site file failed

Any site file from the current selected campaign can be renamed but specific dialogs can occur when the file is renamed to an already existing site file or an invalid name has been chosen.

When the site file is renamed to an existing file name, the following dialog is presented:

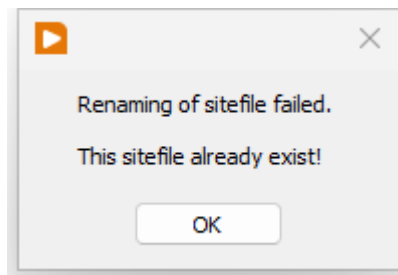


Figure 19 Already Existing Site File

When the site file is renamed to an empty name, the following dialog is presented:

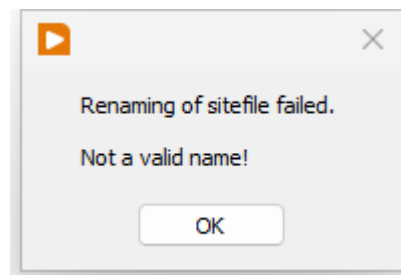


Figure 20 Invalid Site File Name

8.1.6. Unavailable application(s)

If a specific application function is selected from one of the top-down buttons of the main GUI window within the RASS Toolbox application and no application(s) is (are) found for this selected RASS function, the following dialog is presented:

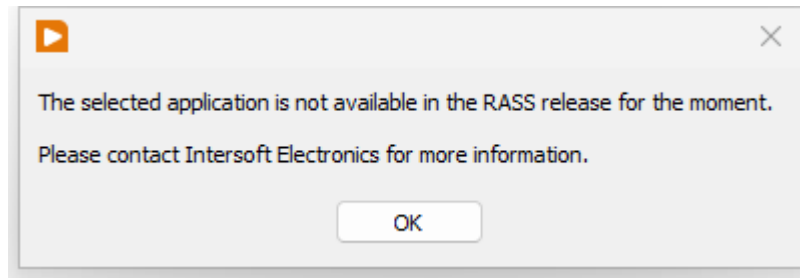


Figure 21 Unavailable Application

This is typically the case when specific applications serving a specific RASS function are not installed as part of the current RASS release.

8.1.7. Devices not detected

When specific RASS devices are needed for a specific selected function from the RASS Toolbox application and these devices are not detected by the toolbox, the following dialog can be presented which informs the user that these are needed for correct launching of the required RASS application:

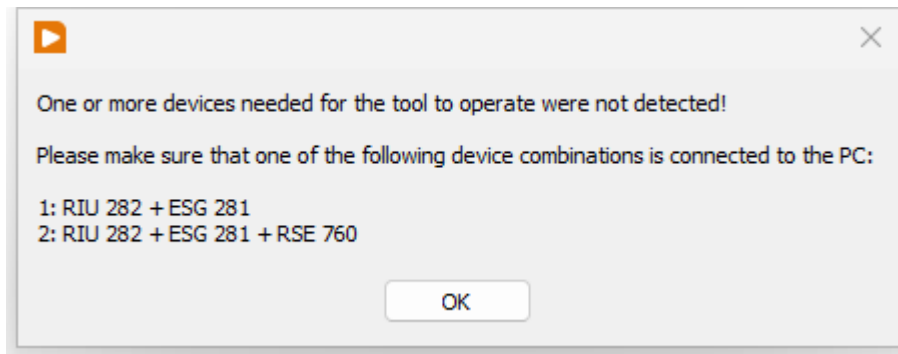


Figure 22 Devices not detected

It is possible that multiple combinations could be needed for a specific RASS application in order to run it.

8.1.8. Plugin is not able to start

When the user selects a plugin from the RASS Toolbox application "Plugins" menu from the menu bar and this plugin is not able to start due to coding issues, the following dialog is presented:

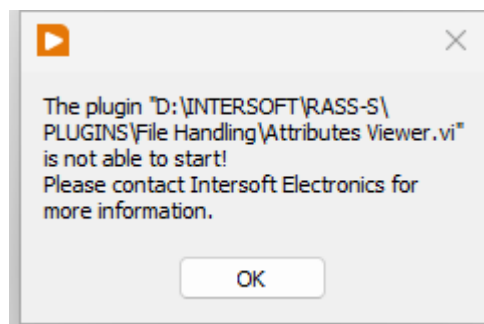


Figure 23 Plugin not able to start

8.1.9. Could not activate device

When the user tries to activate a device whereas multiple devices of a specific device family are detected by the toolbox and at least one of them is already active, the user can be presented with a dialog warning to indicate that another device (of this family) is currently 'locked' or used in a running RASS application:

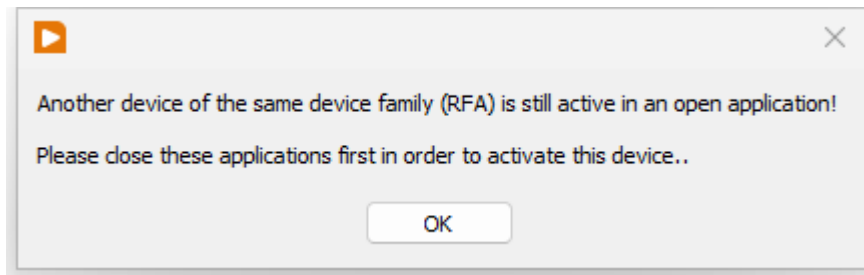


Figure 24 Could not activate device

8.1.10. Devices in use when exiting toolbox

When the RASS Toolbox application is closed by the user, it can happen that one or more RASS applications using specific RASS devices are still running and can not be closed automatically. The user is then informed by the following dialog:

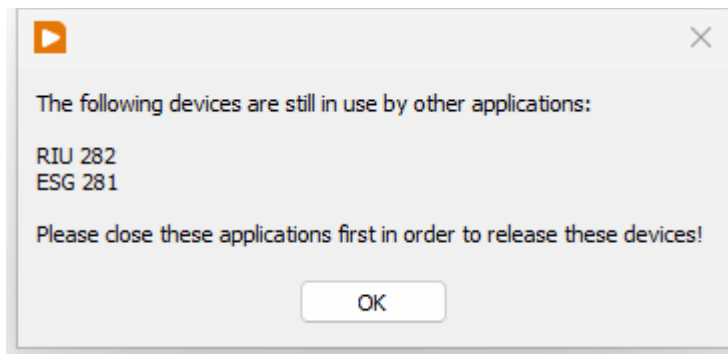


Figure 25 Devices still running