



Analysis
Software

Testing for the Future – Today!

PBA.pro™ – A Good Choice!



Test, Simulation, Analysis Solutions

The ► PBA.pro is the AIM core software platform for Avionics Test and Analysis application with AIM's family of high performance avionics test and simulation interface modules plus a wide range of 3rd party hardware. PBA.pro is modular, scalable and customizable by the user to cover a wide range of applications in an extremely efficient manner.

The PBA.pro software runs on Windows and Linux platforms and integrates the essential features for today's and tomorrow's Avionics test, development, simulation, monitoring and analysis applications. Various customization capabilities via Scripts, user defined Panels and dedicated GUIs support the PBA.pro for use as a simple Databus Protocol Analyzer up to System Test and Integration tool for handling multiple data buses via single software solution.

Core Functionality

- Modular, scalable and integrated Software platform
- Support for Windows and Linux
- Fully automatable and customizable via Scripts, Remote Control and User Dialogs
- Manage single or multiple AIM Avionics Interfaces and 3rd party hardware resources within a single Framework
- Software Platform for:
 - Low and high level Protocol/Network analyzers
 - Recording/Monitoring/Data Logging Systems
 - Special-To-Type Test Equipment (STTE)
 - Test benches and integration rigs
 - 'Hardware in the Loop' simulation rigs
 - In-Service and maintenance toolsets
- Flexible licensing options (Full, Light, Runtime)
- PBA.pro Server/Client support for data distribution to multiple workstations
- Complete Add-On Script Packages to support:
 - AS4111 and AS4112 Test Plans
 - EFABus RT Production Test Plan
 - ARINC664P7 End System/Switch compliance tests
 - Useful PBA.pro utility scripts, panels, etc. are available via AIM Download Area

Resource
Components

Database
Manager
Components

Test and
Script
Manager

Core Functionality
Framework & Designer
Component

Remote
Control

Utility
Resource
Components

3rd Party
Resource
Components

Customer
Components

PBA.pro™

Resource Components



Functions

Index	TimeTag	DiffTime	Alias	Info	FrameSize	SequenceNumber	Error	MACDst	VL	MACSrc	IPSrc	IPDest	UDPSrcPort
378	228d:11...	1.234		VL: 0 • IP: 10.1.33.1 → 224.224.0.0 • Port: 0 → 0	364	63	no	03:00:0...	0	02:00:0...	10.1...	224.2...	
379	228d:11...	0.060		VL: 2 • IP: 10.1.33.1 → 224.224.0.2 • Port: 2 → 5	200	63	no	03:00:0...	2	02:00:0...	10.1...	224.2...	
380	228d:11...	15.940		Error: CRC • VL: 5 • IP: 10.1.33.33 → 224.224.0.5 • Port: 55 → 123	500	63	CRC	03:00:0...	5	02:00:0...	10.1...	224.2...	
381	228d:11...	16.000		VL: 444 • IP: 10.1.33.2 → 224.224.1.188 • Port: 666 → 777	1000	63	no	03:00:0...	444	02:00:0...	10.1...	224.2...	6
382	228d:11...	0.125		VL: 3333 • IP: 10.1.33.12 → 224.224.13.5 • Port: 9123 → 63000	1200	63	no	03:00:0...	3333	02:00:0...	10.1...	224.2...	91
383	228d:11...	15.875		VL: 55555 • IP: 10.1.33.1 → 224.224.217.3 • Port: 6300 → 2345	1518	63	no	03:00:0...	55555	02:00:0...	10.1...	224.2...	63
384	228d:11...	1.234		VL: 0 • IP: 10.1.33.1 → 224.224.0.0 • Port: 0 → 0	364	64	no	03:00:0...	0	02:00:0...	10.1...	224.2...	
385	228d:11...	0.060		VL: 2 • IP: 10.1.33.1 → 224.224.0.2 • Port: 2 → 5	200	64	no	03:00:0...	2	02:00:0...	10.1...	224.2...	
386	228d:11...	15.940		Error: CRC • VL: 5 • IP: 10.1.33.33 → 224.224.0.5 • Port: 55 → 123	500	64	CRC	03:00:0...	5	02:00:0...	10.1...	224.2...	
387	228d:11...	16.000		VL: 444 • IP: 10.1.33.2 → 224.224.1.188 • Port: 666 → 777	1000	64	no	03:00:0...	444	02:00:0...	10.1...	224.2...	6
388	228d:11...	0.125		VL: 3333 • IP: 10.1.33.12 → 224.224.13.5 • Port: 9123 → 63000	1200	64	no	03:00:0...	3333	02:00:0...	10.1...	224.2...	91

Message Information

Filter

Properties and Objects

Value

Comment

Verification

no

how was the received frame checked/verified, maybe useful to rat...

Error

no

error type of this frame, each bit!=0 indicates a specific error in the...

Proto

IPv4 and...

[MACDst, VL, MACSrc, MACProto]

IP

[IPVersion, IPHeaderLength, IPTypeOfService, IPTotalLength, IPFr...

UDP

[UDPSrcPort, UDPDstPort, UDPLength, UDPChecksum]

Parameters

GlobalParameters

Height

68

GPS-X

45

Message View Index 384 - Parameter: GPS-X

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

0 03 00 00 00 00 00 02 00 00 01 21 20 08 00 45 00

16 00 2D 00 00 40 00 01 11 6D DE 0A 01 21 01 E0 30

32 00 00 00 00 00 00 19 00 00 41 42 43 44 45 46

48 47 48 49 4A 4B 4C 4D 4E 4F 50 51 00 00 00 00

64 FF D8 FF E0 00 10 4A 46 49 46 00 01 01 01 00 64

80 00 64 00 00 FF DB 00 43 00 05 03 04 04 03 05

96 04 04 04 05 05 06 07 0C 08 07 07 07 07 0F 0B

112 0B 09 0C 11 0F 12 12 11 0F 11 11 13 16 1C 17 13

128 14 1A 15 11 11 18 21 18 1A 1D 1D 1F 1F 13 17

144 22 24 22 1E 24 1C 1E 1F 1E FF DB 00 43 01 05 05

160 05 07 06 07 0E 08 08 0E 1E 14 11 14 1E 1E 1E

176 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E

192 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E

208 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E 1E

Time: 000d:00h:00m:06s Messages: 791

Bus Monitor Session

Everything Starts Here

The ► **PBA.pro Resource Manager** provides easy access to view and control all resources available within the PBA.pro system. AIM interfaces include for example MIL-STD-1553A/B, STANAG3910/EFEX, ARINC429, AFDX®/ARINC664P7, Standard Ethernet, ARINC825 (CANbus) or Fibre Channel.

Further 3rd party and utility resources like various types of digital or analog hardware, serial COM ports, 10G Ethernet, TCP/IP or UDP network sockets (and many more) to meet extensive system demands by one application, are supported as well.

All resources are accessible from the PBA.pro framework by a single Resource Tree. Visualization and control of each resource is provided by standard and dedicated displays. These can be customized, configured and automated easily using the powerful ► **PBA.pro Designer** or scripting components. In addition to real interfaces, AIM hardware can be simulated as virtual boards (so called NTG – No Target).

The PBA.pro NTG simulates the hardware to enable the user to setup and configure a system or even analyze hardware specific information like recordings without the need of the real physical hardware interface.

Features

- Support for all AIM interface types, current and future
- Simulation of virtual AIM hardware via so called NTG (No Target) licenses
- Intuitive resource handling by a hierarchical, logical tree structure
- Manage, control and display resources in real time
- Add new resources as required
- Integrate and facilitate AIM, 3rd party and utility resources
- Intercommunication between different resources

MIL-Board1 - System Overview	
Irig Time	
Time: 228d:11h:10m:50s:388ms Status: Internal	
External	
RT12	RT14
12	14
RT18	RT22
18	22
RT23	RT24
23	24
RT25	RT26
25	26
RT27	RT30
27	30
Internal	
RT00	RT01
0	1
RT02	RT03
2	3
RT04	RT05
4	5
RT06	RT07
6	7
RT08	RT09
8	9
RT10	RT11
10	11
RT13	RT15
13	15
RT16	RT17
16	17
RT19	RT20
19	20
RT21	RT28
21	28
RT29	RT31
29	31
Recording information	
File name:	-
File size:	1.0 GB
Progress:	62%
Bytes written:	0
Replay information	
File name:	-
File size:	0B
Progress:	0%
Replayed:	0B

System Overview

- MIL-STD-1553/1760
- ARINC429
- ARINC664/AFDX®
- ARINC825/CANbus
- 10/100/1000 Ethernet
- Fibre Channel
- STANAG3910/EFEX

PBA.pro™ Designer Component



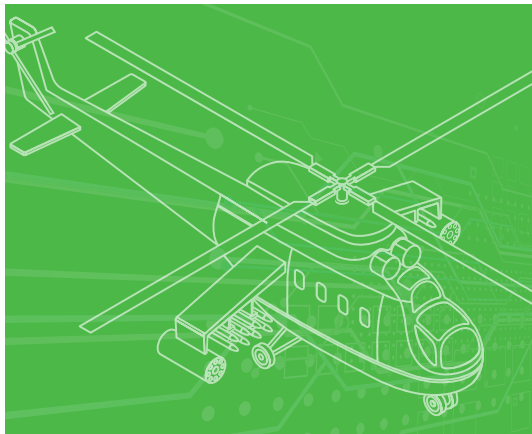
Be Creative

Included within the PBA.pro framework, the Designer component is offering the core functionalities for building applications with the PBA.pro. The Designer is an easy to use drag and drop tool to design and build your own, user-defined dialogs for visualization and control of any PBA.pro information or data source. This gives the ability to easily tailor the PBA.pro display and control features to meet individual and unique needs for any user application.

The ► **PBA.pro Designer** offers an extensive and very powerful set of widgets that can be added interactively or completely automated. Dialogs can also be created, modified, arranged and controlled by PBA.pro scripts to create user defined/ customized dialogs and displays.

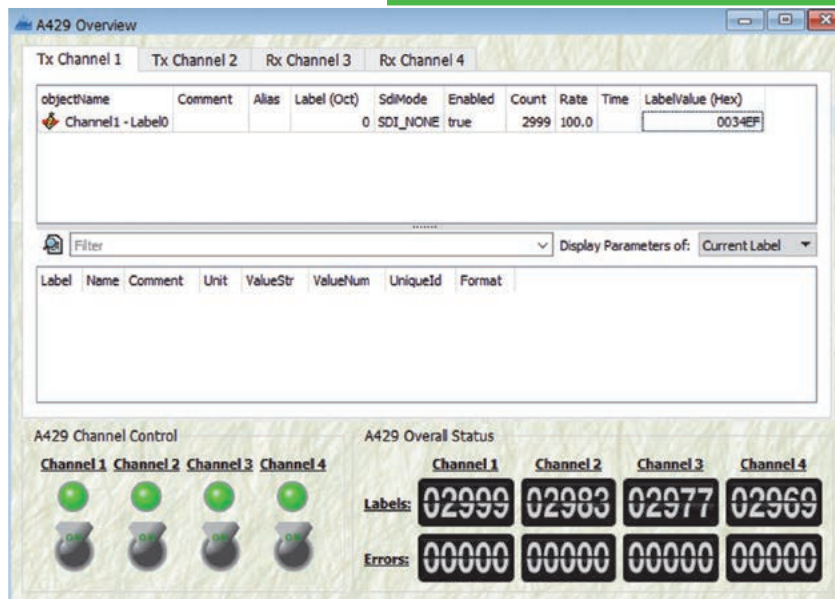
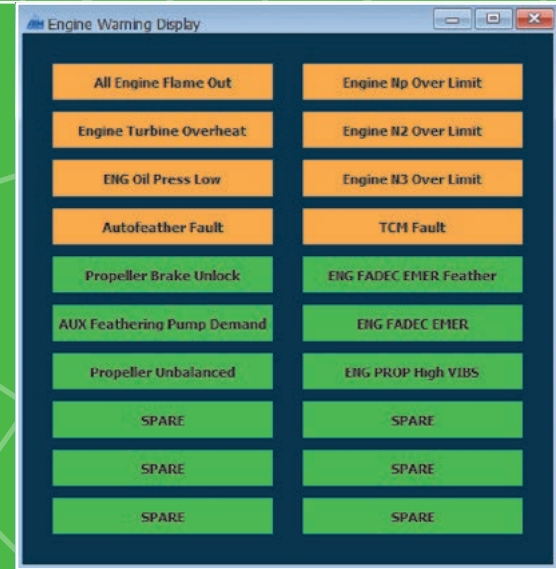
Features

- Easily build dialogs for visualization, display and control using Drag and Drop
- Extensive, expanding and dynamic widget library
- Simple to use GUI to build custom dialogs
 - Display/control of any PBA.pro object information/value
 - Embed existing PBA.pro dialogs (e.g. any view provided by a resource component)
 - Use layouts to auto resize and arrange widgets
 - Automated dialog creation for parameters with context menu or Drag and Drop
- Flexible connection definitions between PBA.pro objects and/or widgets
- No coding required
- Fully scriptable
- Standalone or frameless execution of dialogs outside the PBA.pro main window



Functions

Examples of Control and Visualization Displays created with the Designer Component



PBA.pro™ Database Manager



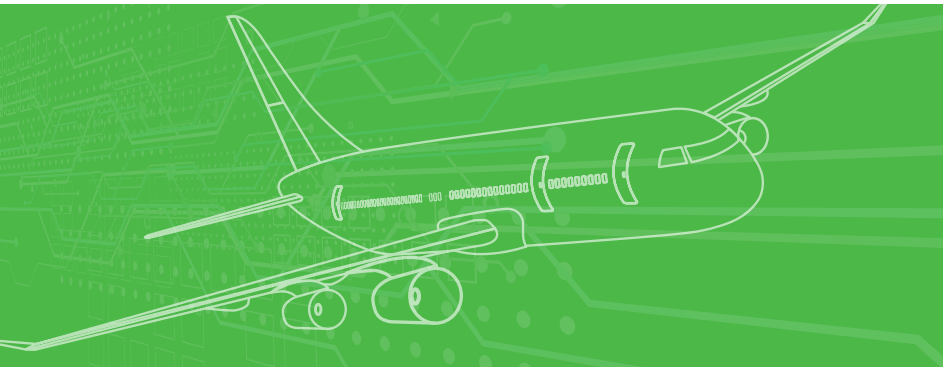
Import Your ICD

Use the powerful and flexible PBA.pro Database Manager to define conversion rules for visualization and modification of buffer or message raw data, acquired by various PBA.pro resources, into Engineering Units as so called Parameters.

For quick visualization and modification of any information like parameter values or status information a powerful Assign Window is included. Any Parameter information can be added to the Assign Window by Drag and Drop and – if added once – graphically visualized and controlled by a designer dialog and time plots. Parameters in the Assign Window can be individually animated with PBA.pro generated functions, supported by a comprehensive formula editor or by script. For post recording analysis the Database Manager offers an off-line parameter replay functionality to perform a virtual play back of previously recorded data of a resource. The parameter values are updated by the replay and e.g. their data profile can be visualized by a time history plot.

Features

- Defines Engineering Unit Conversions of the Raw Data
- Fully scriptable
- Expandable for future data sources
- Quick and easy Drag and Drop information display (Assign Window)
- Higher level protocol support via conditions and parameter structures
- Available to convert online (buffers/messages) and offline data (recording files)
- Fully controllable offline parameter replay
- Graphical parameter representation of a whole recording file in a time plot
- Import of any custom databases via scripts
- Storage in XML format
- Built-in import of AIM legacy databases in PDI format



Functions

Assign

Name	Comment	Parameter Info	Instance	Value	Unit
ModeCodes					
This group tests the Mode Codes on BC and RT Side					
BC					
TVW		MIL1.BC.RT1.Tx.SA0.Transmit Vector Word	MIL-Board1.BC.TVW	1100	
SYNC		MIL1.BC.RT1.Rx.SA0.Synchronize	MIL-Board1.BC.SYNC	0125	
RT					
TVW		MIL1.RT.RT1.Tx.SA0.Transmit Vector Word	MIL-Board1	1100	
SYNC		MIL1.RT.RT1.Rx.SA0.Synchronize	MIL-Board1	0125	
MuxTrack					
This Group tests The Second Level Mux The description how it looks, is in the first folder					
BC_LS_MUX					
LS_RT_MIL_MTV		MIL1.RT.RT2.Tx.SA1.WP_4	MIL-Board1	0507	
LS_RT_MIL_TR1		MIL1.RT.RT2.Tx.SA1.WP_2	MIL-Board1	0507	
LS_RT_MIL_TR2		MIL1.RT.RT2.Tx.SA1.WP_3	MIL-Board1	0507	
BC_LS_TX_TRACK		MIL1.BC.RT2.Tx.SA1.WP_2	MIL-Board1.BC.BC_LS_...	7	
The Following Parameter must end with 0,1,2,3,4,5,6					
BC_LS_TX_MUX_0		MIL1.BC.RT2.Tx.SA1.BC_LS_TX_TRACK...	MIL-Board1	0500	
BC_LS_TX_MUX_1		MIL1.BC.RT2.Tx.SA1.BC_LS_TX_TRACK...	MIL-Board1	0501	
BC_LS_TX_MUX_2		MIL1.BC.RT2.Tx.SA1.BC_LS_TX_TRACK...	MIL-Board1	0502	
BC_LS_TX_MUX_3		MIL1.BC.RT2.Tx.SA1.BC_LS_TX_TRACK...	MIL-Board1	0503	
BC_LS_TX_MUX_4		MIL1.BC.RT2.Tx.SA1.BC_LS_TX_TRACK...	MIL-Board1	0504	
BC_LS_TX_MUX_5		MIL1.BC.RT2.Tx.SA1.BC_LS_TX_TRACK...	MIL-Board1	0505	
BC_LS_TX_MUX_6		MIL1.BC.RT2.Tx.SA1.BC_LS_TX_TRACK...	MIL-Board1	0506	

Assign Display

SA1

- Parameter1
 - MessageState1
 - EquipmentId
 - EquipmentType
 - GE-Equipment
 - TRANCHE-ID
 - AES
 - FLT-Left
 - FLT-Right
 - TRANCHE3
 - DEVELOPMENT
 - GROUND-Equipment
 - PHASE1-Equipment
 - MessageState2

Offline Replay

Files

Control

Replay Control

Time

228d:10h:59m:39s 228d:11h:01m:36.311s 228d:11h:11m:30s

Offline Display

Assign

Name	Value	Unit
ALL		
Placeholder_Assign_Entry	0	
BC		
VGG_1	21	m/s²
VGG_2	22	m/s²
GCU	42	rpm
RT_MWS		
LPU_STATE	0000 0000	rel
LPU_LEVEL	-17	dB
LPU_LOAD	0011	%
RT_XCG		
Group		

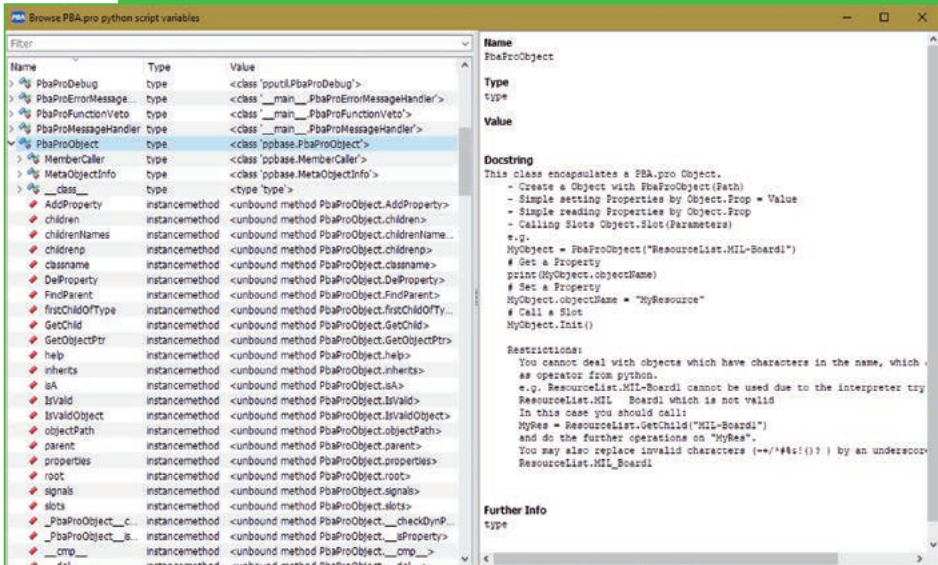
PBA.pro™ Test and Script Manager

```

885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
function literal( ) {
    return o + " ";
};
function join( pre, arr, post ) {
    var s = jsDump.separator;
    base = jsDump.indent;
    inner = jsDump.indent;
    if ( arr.join )
        arr = arr.join( ' ' + s + " ");
    if ( !arr )
        return pre + post;
    return [ pre, inner + arr, base + post ].join( s );
};
function array( arr ) {
    var i = arr.length, ret = Array(0);
    this.up();
    while ( i-- )
        ret[i] = this.parse( arr[i] );
    this.down();
    return join( '[', ret, ']' );
};
var reName = /^function (.*?) {

```

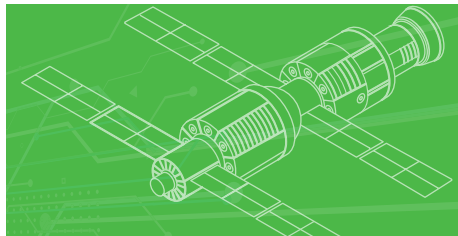
Functions



Automate Your Tasks

The ► **PBA.pro Test and Script Manager** offers access to any PBA.pro object as well as to the PBA.pro framework. The Test and Script Manager component combines a Script Manager and a Test Manager component including an interface for PBA.pro Remote Control over TCP/IP.

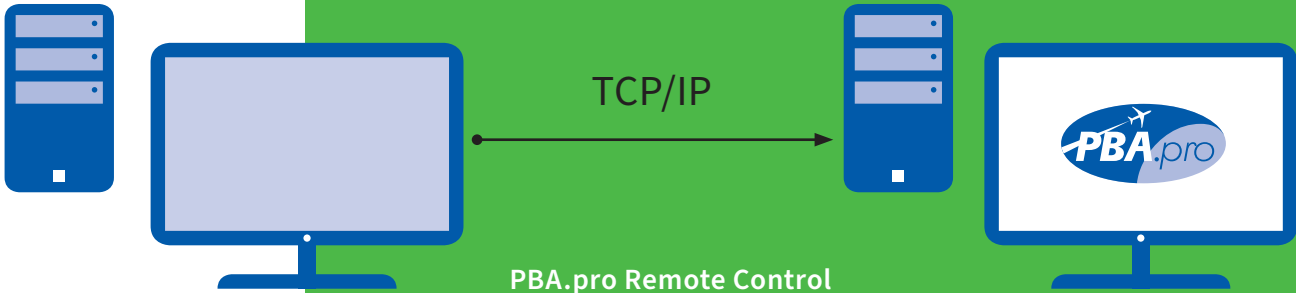
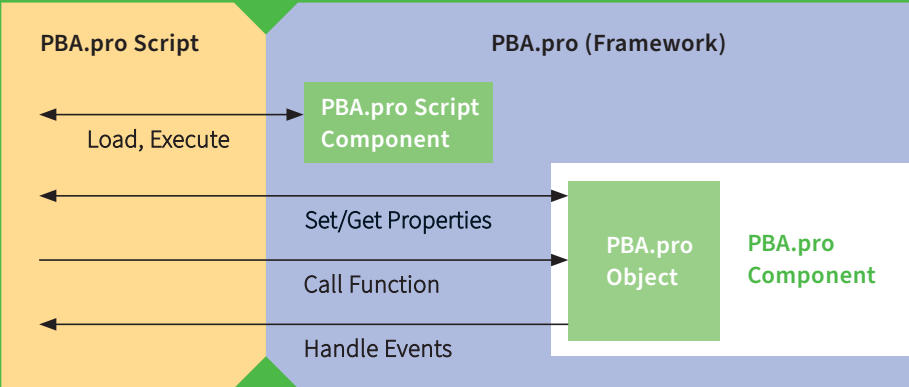
The Script Manager provides a simple interface to setup and run individual test scripts whilst the Test Manager executes automated or semi-automated test procedures including handling of configuration data and the execution/evaluation of tests by documenting test results with fully user customizable test reports in ASCII, XML or PDF format.



Scripts can do everything the user would do interactively:

- Python support
- Setup and control PBA.pro Resource Components
- Import and creation of engineering unit databases to PBA.pro Database Manager
- Access and customization of PBA.pro framework
- User interaction (message boxes, input dialogs)
- Interactive message modification
- Evaluation and export of recorded data into user definable formats
- Execution of test cases and simulations building user dedicated dialogs via the PBA.pro Designer
- ► **Optional script packages** are available off-the-shelf to support:
 - MIL-STD-1553 Protocol and Waveform Validation (AS4112 RT Production Test Plan)
 - MIL-STD-1553 Protocol Validation (AS4111 RT Validation Test Plan)
 - Protocol Testing of EFA TRD-J-017-E-0002-EFA RT Production Test Plans
 - ARINC664P7 End System Compliance Test
 - ARINC664P7 Switch Compliance Test

PBA.pro Scripting



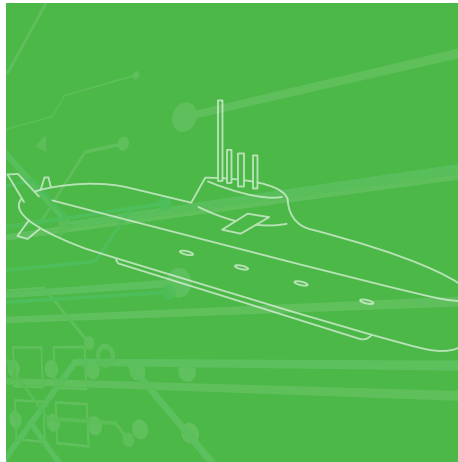
PBA.pro™ 3rd Party and Utility Components



Integrate and Extend Your Toolbox

An unique feature of the PBA.pro is the open PBA.pro concept which allows an efficient and smooth integration of ► 3rd party and utility interfaces via corresponding components.

This extends the PBA.pro for use with additional hardware and functionality to cover your unique system needs. Starting for various 3rd party (COTS) hardware like digital and analog I/O devices a wide and steadily growing range of 3rd party hardware and utility components can be added to the PBA.pro to meet your specific needs. Utility components like data exchange with the MS Flight Simulator are provided. All PBA.pro 3rd party and utility components are available inside the PBA.pro framework for visualization, scripting and control as well as for intercommunication with other hardware components.



Extract of currently supported
PBA.pro 3rd party and utility components:

- 10G Ethernet Monitoring
- Ethernet UDP/TCP Sockets
- Serial RS232, RS422, Serial COM Ports
- Digital I/O
- Analog I/O
- User Administration Utility Component
- Microsoft Flight Simulator

Further PBA.pro 3rd party or utility components can be offered on request.
Please contact AIM for details.

Functions

RS232-Device

232 RS232-Device1

COMPort1

COMPort2

COMPort3

COMPort4

BM

Status

Sessions

Current

EventMarker

FilterLibrary

COMPort4

COMPort4

Property	Value
objectName	COMPort4
Comment	
Enabled	true
ExpertMode	false
PortSpeed	BPS_115200
StopBits	ST_BITS_1
DataBits	D_BITS_8
Parity	PAR_NO
FlowControl	NO_FLOW_CTRL
Selftest	not executed
COMControl	CTRL_NOCTRL
DisplayBuffersAsStrings	false
SendBuffer	49 73 0a
ReceiveBuffer	49 73 0d 0a 2d 73 68 3a 20 49 73 3a 20 6e 6f 74 20 66 6f 75 6e 64 0d 0a 23 ...

Oscilloscope Control Center

Connection Settings

Host IP: 192.168.0.0.254

Port: 5025

Commands

Predefined Commands: Selftest

Custom Commands: Send

General Oscilloscope Control

Offset

Scale

Delay

Range

Set Value

Set Value

Set Value

Set Value

0 Volt

0.1 Volt

0 msec

500 usec

Auto-Scale

Received Messages

clear

Function Generator Control Center

HM8131-2-Control Center

Enable Function Generator

Enable Output Line

Predefined Commands: Loud Beep, BPL

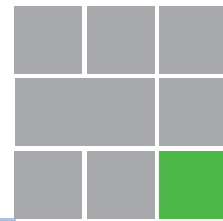
Custom Commands: Send

Frequency: 305 Hz

Received Messages:

Clear

PBA.pro™ Customer Components



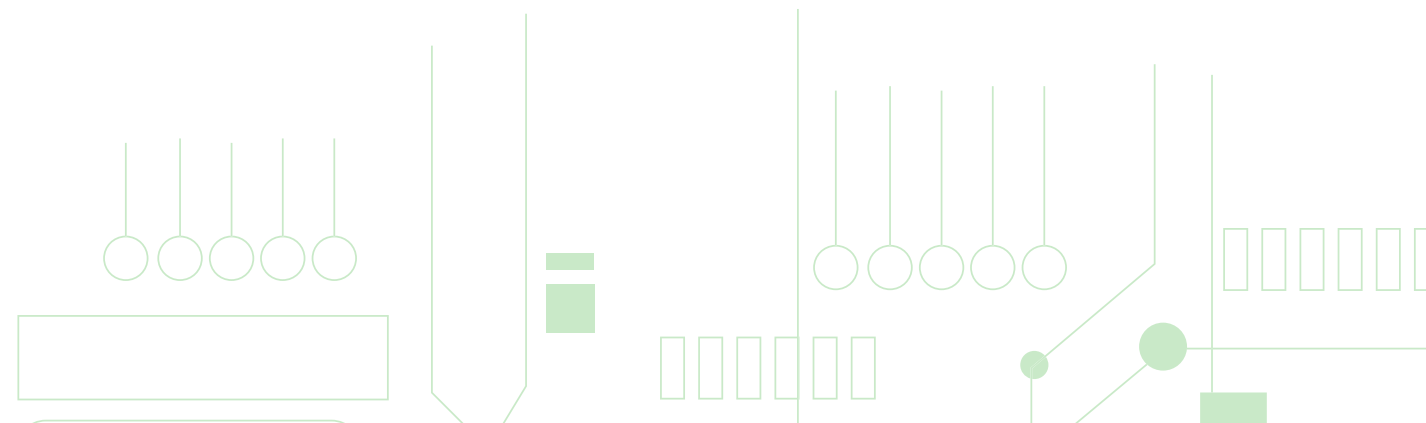
Get Plugged in

The open PBA.pro concept supports an efficient integration of customer written PBA.pro components representing a certain customer or application specific functionality.

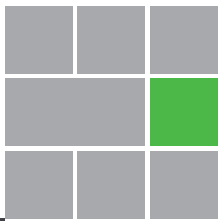
This can be either purely software related or for the support of customer specific or further 3rd party hardware interfaces. Those components can easily benefit from lots of existing PBA.pro core features like the default GUIs for interactive use or scripting interfaces for automated use of the customer component via the ► **PBA.pro Test and Script Manager**.

As a part of the ► **PBA.pro Training packages**, a dedicated workshop for PBA.pro Component programming can be booked (C/C++ programming knowledge required).

Add Hardware
Add Software
Custom Widgets
Complete Integration



PBA.pro™ Remote Control



Take control

The PBA.pro Remote Control offers the control of the PBA.pro via a TCP/IP socket connection and an open communication protocol. This can be performed by any TCP/IP capable system, independent from the Controller's operating system.

The communication protocol for the PBA.pro Remote Control is derived from the PBA.pro's scripting concept, therefore the Remote Control capability is an integral part of the ► **PBA.pro Test and Script Manager** component.

Via the Remote Control, a PBA.pro setup can be done either by setup and control every component and its objects from scratch, or by simply commanding PBA.pro to load existing projects, databases etc. An explicit enabling of the Remote Control on the PBA.pro system which is to be controlled, addresses the locking against unauthorized use. With these features, PBA.pro based systems can be easily integrated into bigger test system infrastructures.

PBA.pro™ Applications



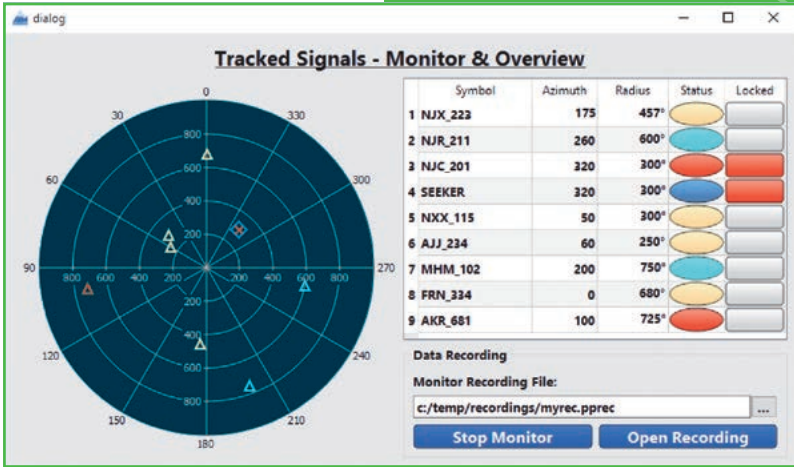
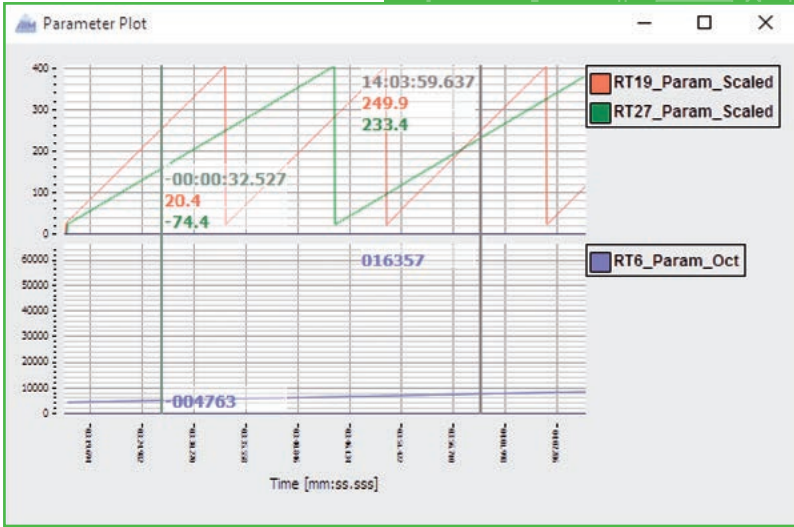
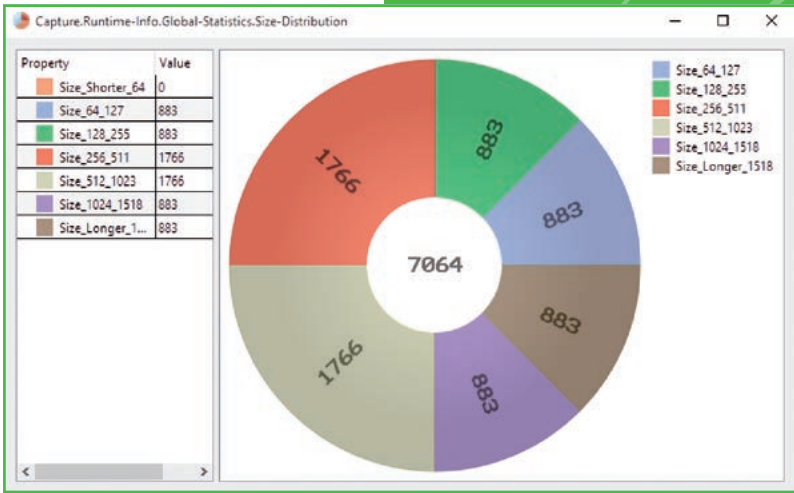
More than just a Tool

With the component approach and flexible customization capabilities via the Designer and Test and Script Manager, more closed and dedicated PBA.pro Applications can be implemented based on the PBA.pro framework and its components.

Customer application specific Scripts, Panels and Dialogs e.g. support user skill level specific GUIs in a wide variety from a simple GO/NOGO Tester, Parameter Viewer to more complex Data Acquisition and System Integration PBA.pro Applications based on the powerful PBA.pro. The ► **User Administration Utility Component** and a flexible license model with a Runtime license type, address typical needs for closed and dedicated PBA.pro Applications without losing the interactive PBA.pro tool capabilities, if required.

MIL-STD-1553 RT Validation
Custom ATP
AFDX® Test Plans
Flight Test Units

Functions



Engine Control Display



Parameter Plot

Tracking Display

PBA.pro™ Light



Lighten Your Testing

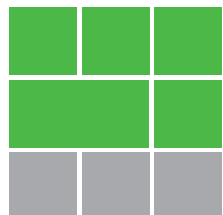
As the name implies the ► **PBA.pro Light** is the reduced function option for the PBA.pro. The 'cut back' version has been deployed to realize simple or reduced application and system needs.

Pre-configured displays are offered to visualize and control the essential information and data of interest providing only a subset of the full PBA.pro functionality using Run-time Mode. The PBA.pro Light is the simple to use, quick and easy one-click solution covering many typical user cases with the underlying core features of the PBA.pro. Upgrade to the full PBA.pro functionality is possible at any time.

The main features of the PBA.pro Light include:

- One-click solution solves typical use cases like:
 - Basic Resource resp. Interface Board setup
 - Basic Resource resp. Interface Board control
 - Data Monitoring and Recording
 - Data Visualization
- No in depth PBA.pro knowledge needed for fast and effective solutions
- Performance remains the same – reduced function set only
- Look and feel of the displays just like the PBA.pro full version for an easy upgrade to the full version
- Can be further customized
- Upgrade to full version available
- Offered for:
 - MIL-STD-1553
 - AFDX®/ARINC664P7
 - ARINC429

PBA.pro- FD-Client



Share Your View

The ► **PBA.pro-FD-Client** option allows the use of 1 or more PBA.pro Clients on the same network (LAN).

A Standard PBA.pro is acting as a Master and can serve the data bus information to 1 or more PBA.pro Clients, which can have their individual database and setups for monitoring and visualization of data bus traffic and associated parameters. This allows sharing of acquired data bus information between multiple users, which can configure their PBA.pro Client targeted to their individual needs. Further automation capabilities of the ► **PBA.pro Test and Script Manager** are also available on the PBA.pro Clients for a maximum of flexibility and efficiency on your testing task.

Training and Services



Get Your Certificate

AIM offers a range of training courses for PBA.pro users at all levels. Comprehensive training courses are conducted by expert trainers and can be adapted to individual needs and requirements. Furthermore, special tool customization and development services can also be offered.

PBA.pro Training Courses:

- Basic PBA.pro Tool Introduction – (1 Day)
- In depth PBA.pro workshop focussing on the customer's specific interests – (2 Days)

Certificate



Full Service Website

The ► www.aim-online.com website provides our customers with the very latest product information, technical support, databus tutorials and a rich and powerful download resource maximizing the investment and use of AIM products with an exceptional online experience.

We serve our customers online features including support for mobile platforms, a product filter and finder plus access to downloads for product related documentation and software directly from the product page.

The website also supports a quick and efficient routing of all ► **your online requests** to your AIM sales representative and the AIM technical support team at the head office.



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