

Product Catalog



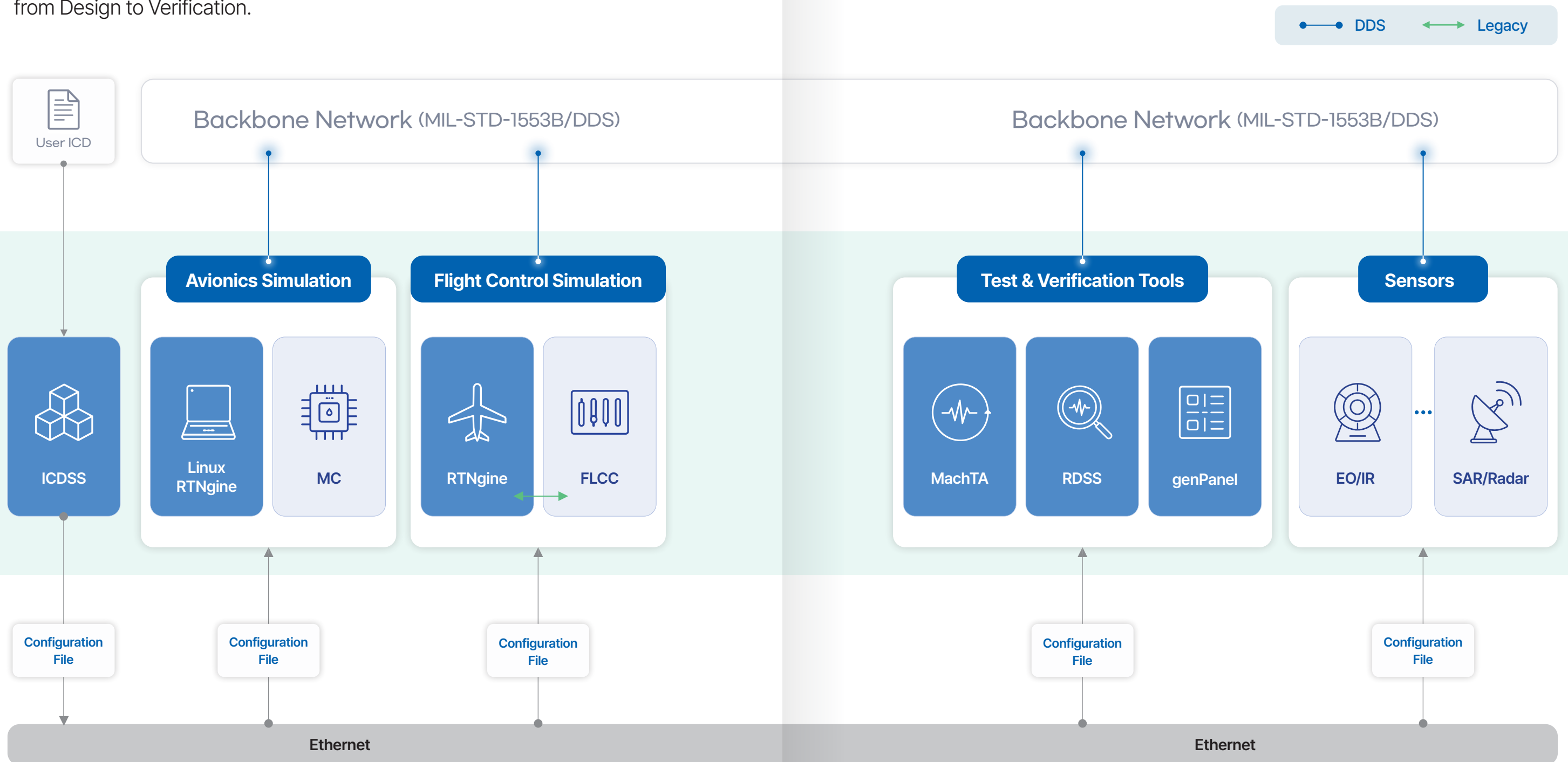


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01 Ecosystem Platform

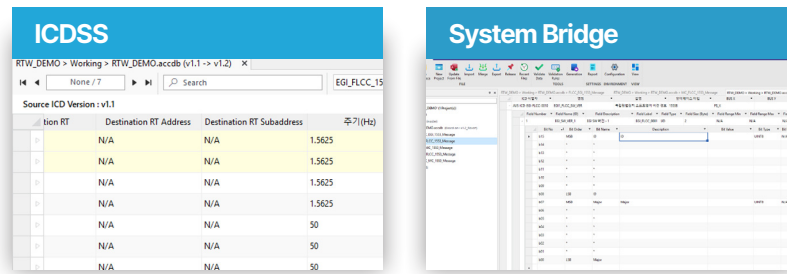
A **Seamlessly Integrated** Simulation Environment
from Design to Verification.



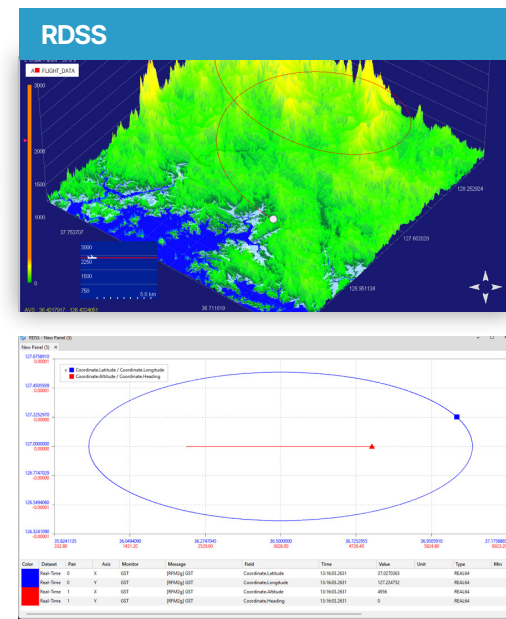
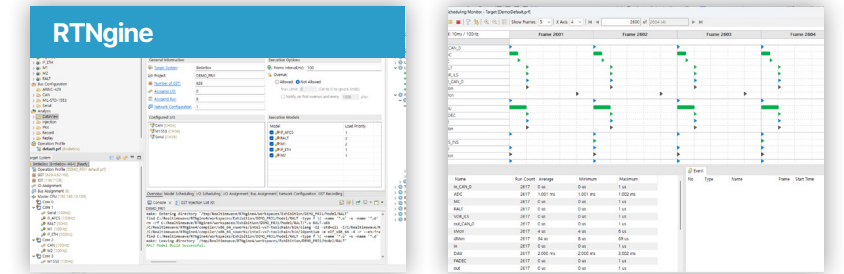
02 Software

An Integrated Platform that Ensures Data Continuity and Provides an Optimal Path to **Seamless System Integration**.

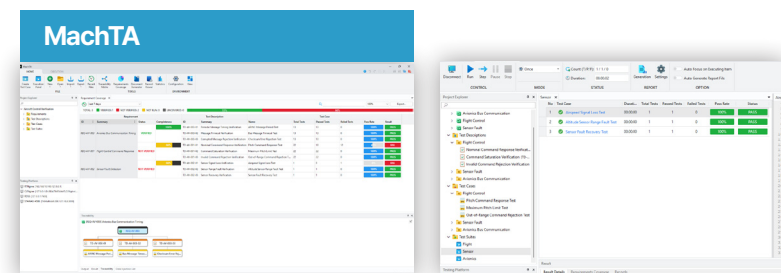
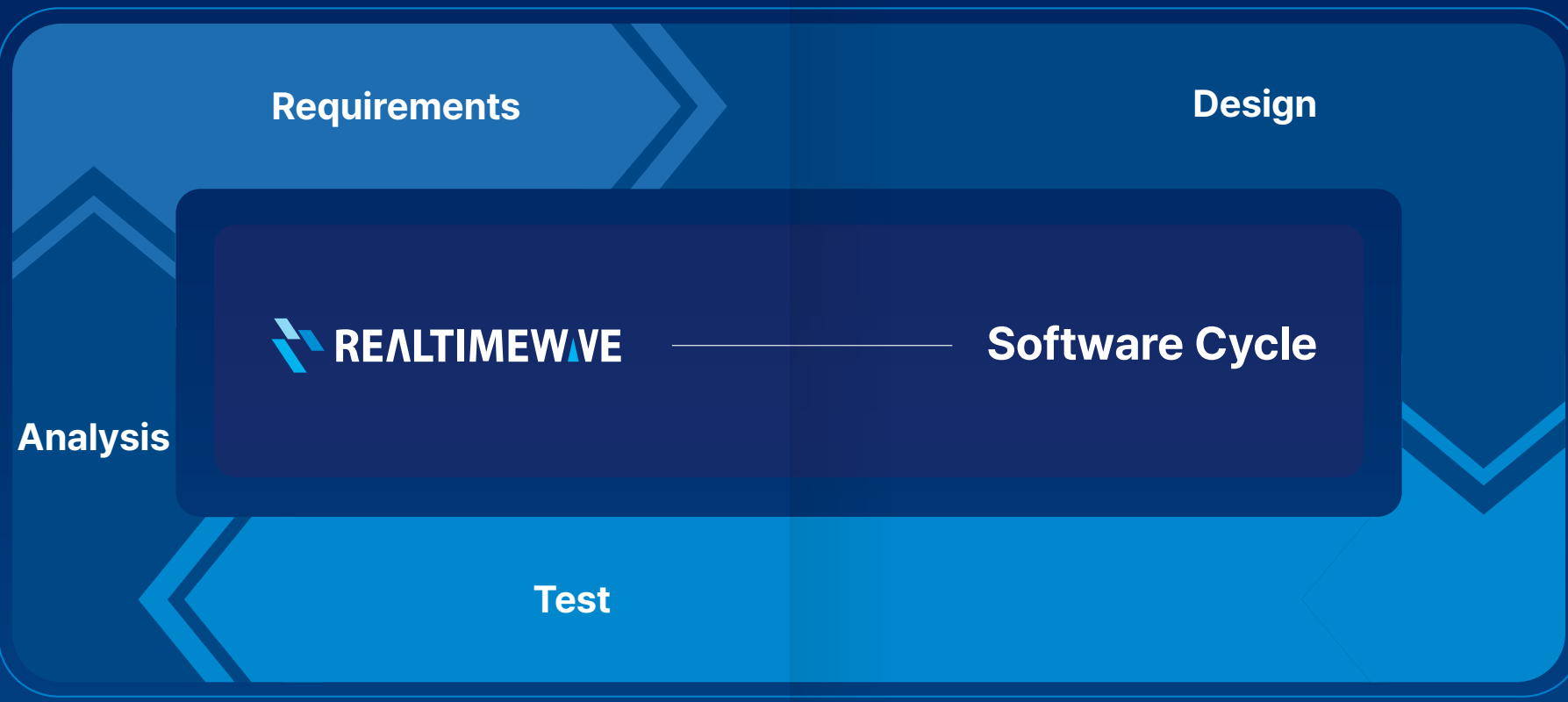
An interface design and management tool that automates the process from ICD definition to integrated system configuration.



A real-time simulation engine for SIL/HILS, supporting model execution, precision analysis, and fault injection.



A data analysis solution for real-time interface monitoring, simulation data logging, analysis, and verification.



A test automation framework covering requirements-based test generation, execution, analysis, and reporting.



A GUI tool for real-time simulation visualization, control, and monitoring through seamless interaction with RTNgin.

Real-Time Simulation Engine

RTNgin

RTNgin is a core platform for real-time testing, integrating various models and equipment. It supports I/O simulation, fault injection, real-time data acquisition and analysis, performance monitoring, and interface validation for safe and efficient development and verification.

Highlight

Real-Time Simulation and STE/HILS/SIL Integration

Platform for Ground-Based Verification of Aircraft, UAVs, Space & Satellite, and Guided Weapon Systems

Enables fast and reliable **system evaluation** from early development through integration and verification with real-time data processing, ICD-based interface integration, and automated testing and analysis.

Integrates flight dynamics, control, sensors, actuators, and I/O to provide a **high-fidelity test environment** that closely replicates real-world conditions.

User / Application

SILS

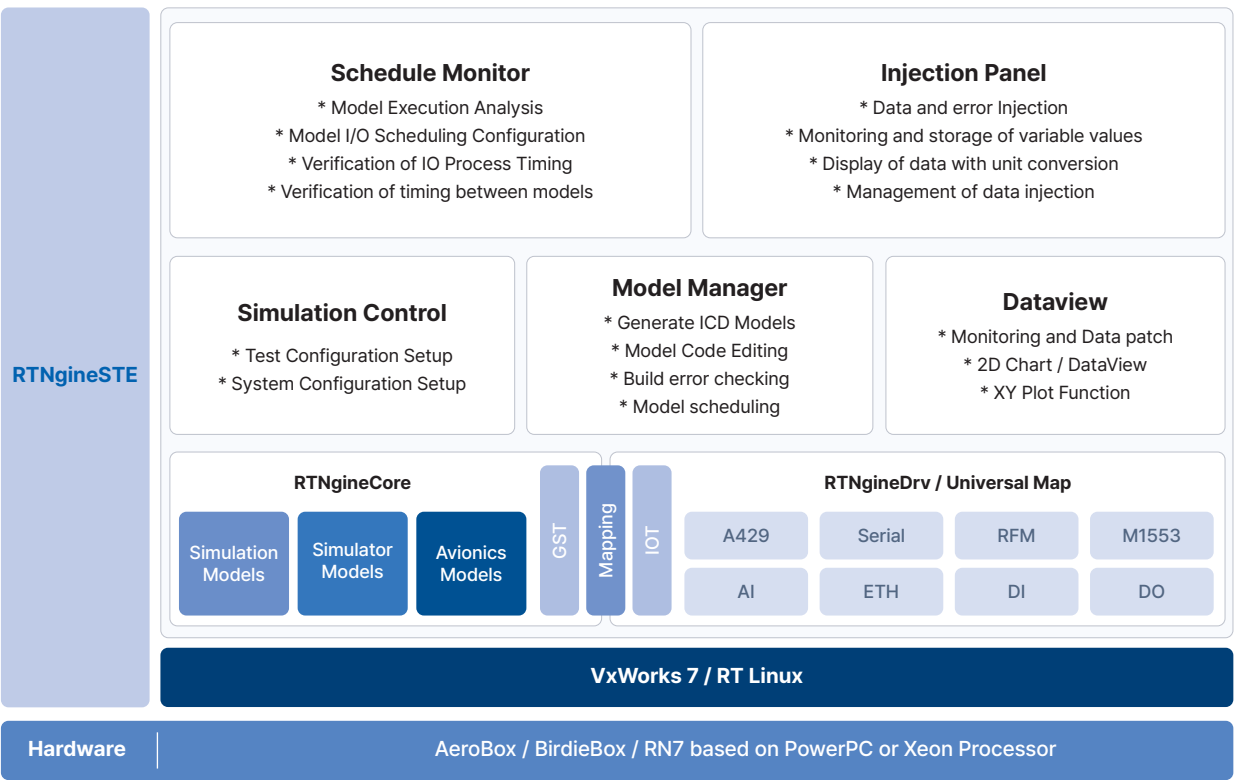
STE

HILS

SIL

Aircraft Integration Test Environment

System Architecture

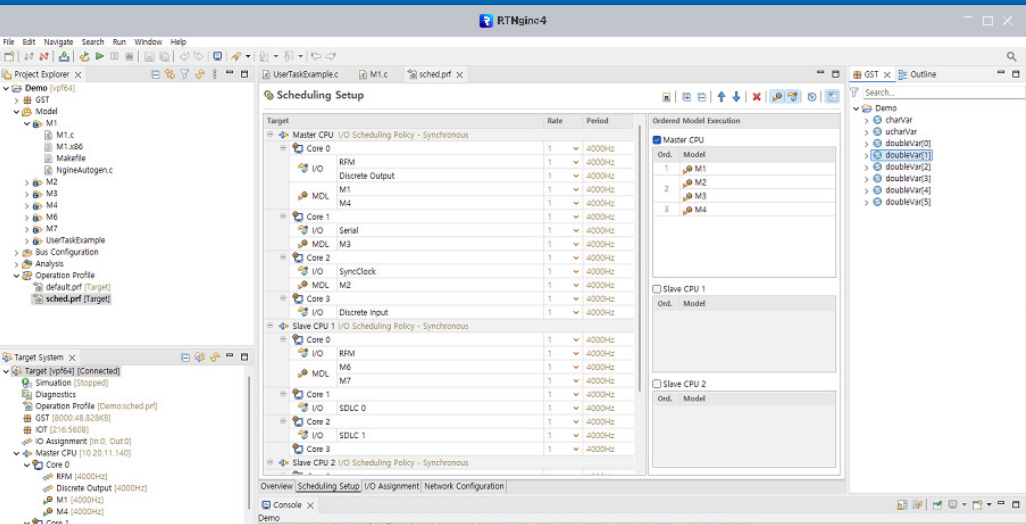


Feature

01

RTOS-Based Real-Time Execution

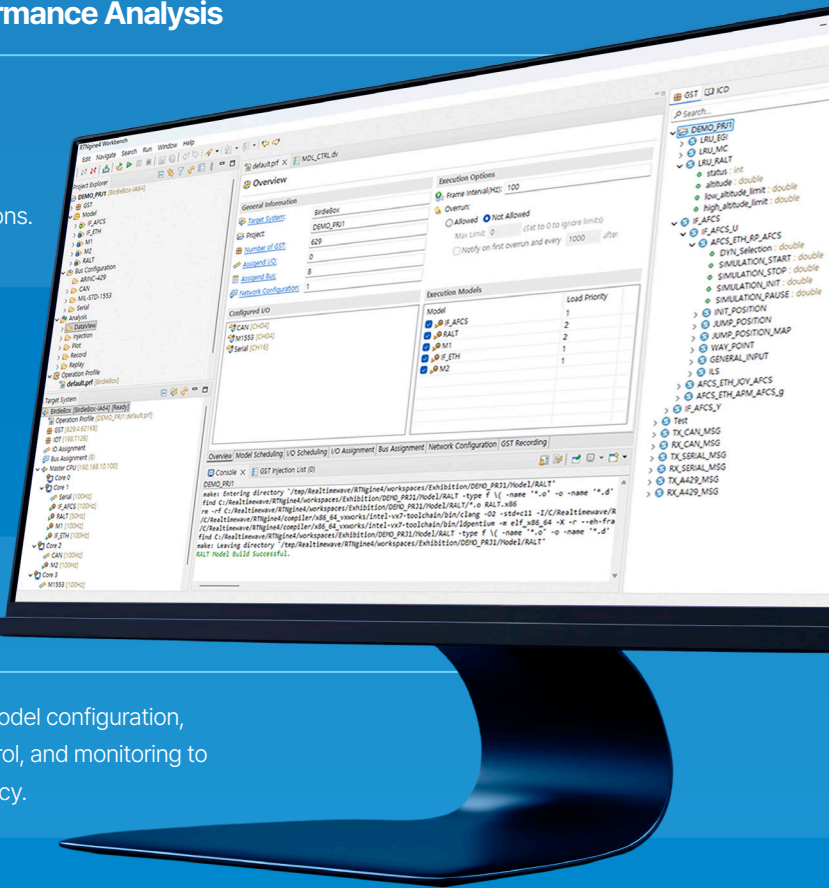
Executes models and I/O in a deterministic sequence, providing a stable and reliable real-time test environment.



02

Real-Time Scheduling & Performance Analysis

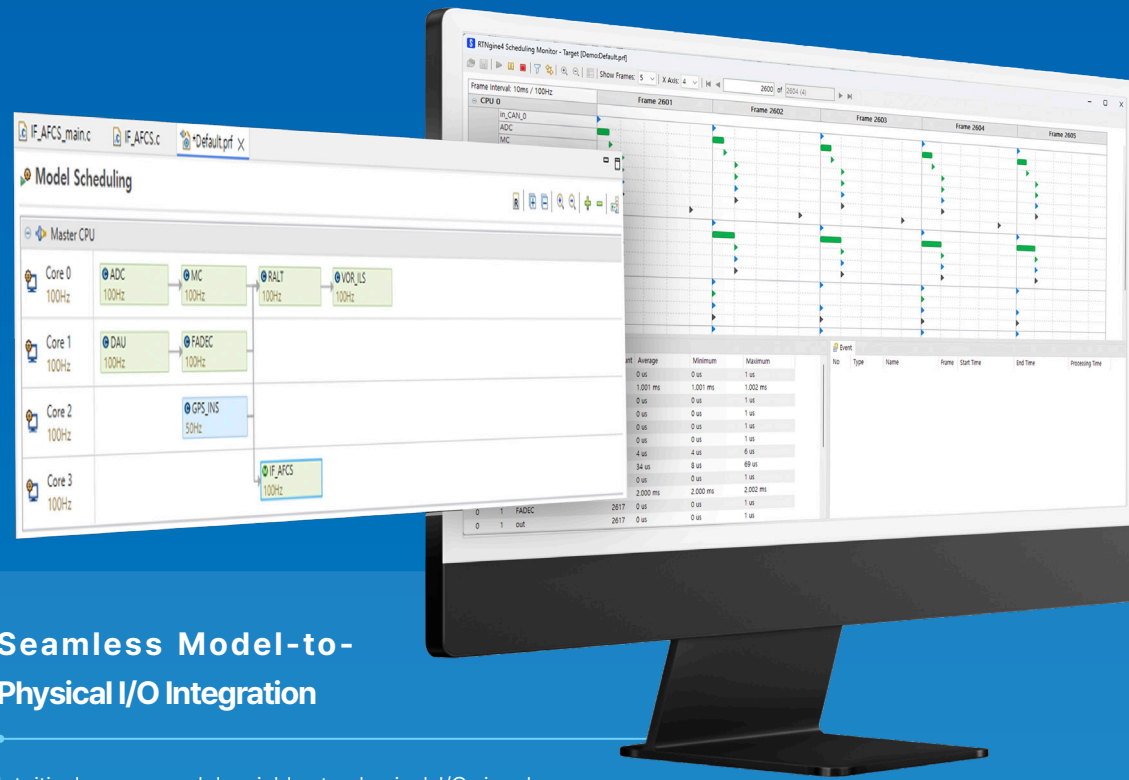
Configures execution cycles, I/O processing sequences, and synchronization policies while analyzing performance to verify optimal test conditions.



03

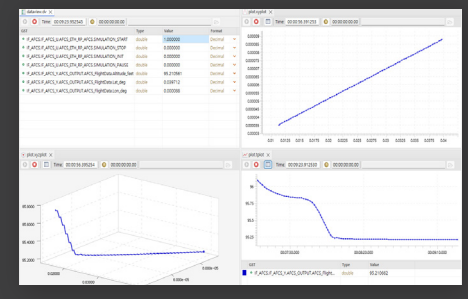
Integrated Development Environment (IDE)

Provides an integrated environment for model configuration, I/O setup, ICD integration, execution control, and monitoring to improve development and testing efficiency.



04 Seamless Model-to-Physical I/O Integration

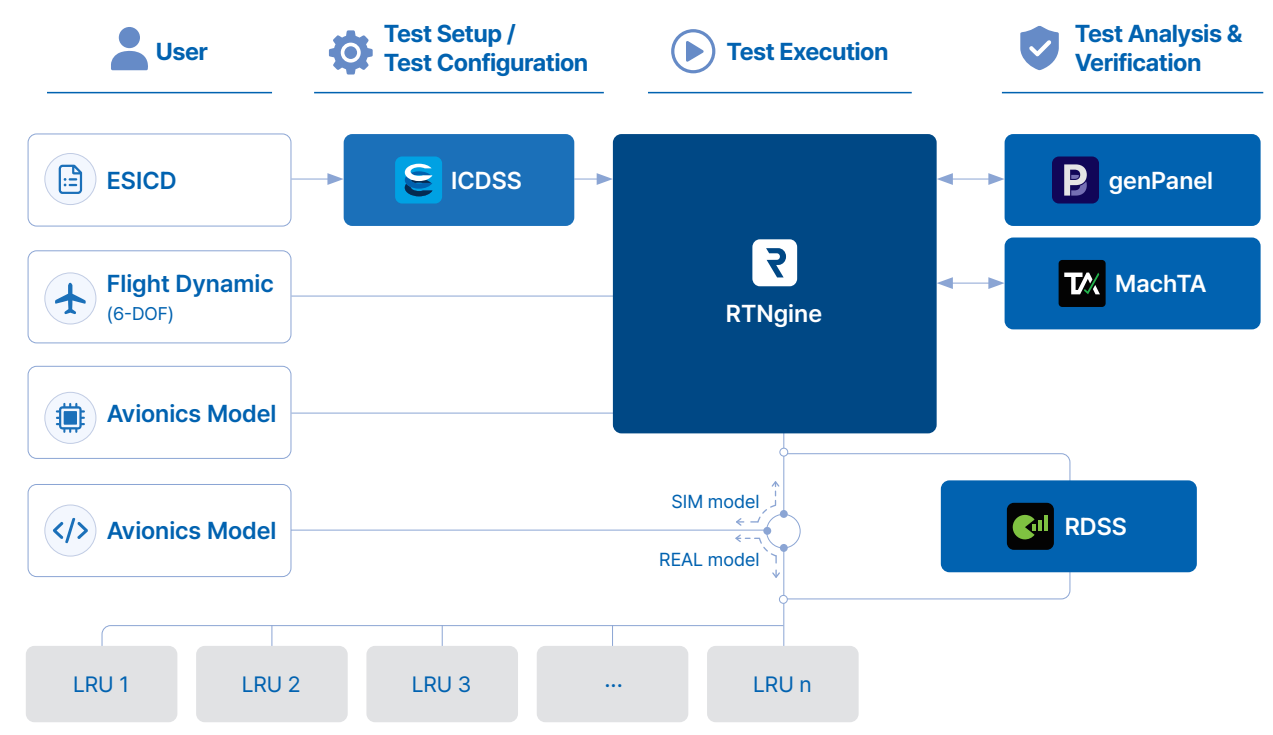
Intuitively maps model variables to physical I/O signals, enabling rapid configuration of complex SILS/HILS test environments.



05 Data Monitoring & Fault Injection

Provides real-time analysis of model and I/O data through 2D/3D charts, XY plots, and DataView, with fault simulation through data injection.

Integrated Development Process & Environment



RTNginde-Related Products

ICDSS

Supports ICD creation, import / export, error detection and validation, deployment, and version management.

MachTA

Requirements-based test automation software supporting test execution, traceability, statistical analysis, and reporting.

genPanel

GUI builder software for creating custom GUI panels such as flight instruments, control displays, and maps.

RDSS

Flight data acquisition and analysis software supporting MIL-STD-1553B, ARINC 429, ARINC 664, Ethernet, and various avionics interfaces.

Interface

MIL-STD-1553B	Serial(RS232 / 422 / 485 / SDLC)	MIL-1394	Synchro / Resolver
MIL-STD-1760	Ethernet	Fibre Channel	Timer / Counter
ARINC429	AFDX (ARINC664p7)	TTEthernet	RVDT / LVDT
Analog	ARINC818	Resistive Loader	GPS Simulator
Digital	Reflective Memory	PWM	
CAN / ARINC825	ScramNet Interface	IRIG-B	

ICDSS

ICDSS is an ICD management tool for integrated management of system interfaces used in STE/HILS/SIL environments. It enables structured definition of devices, interfaces, messages, and data structures, while comparison, validation, and version control ensure ICD consistency and integrity. Import, export, and merge capabilities streamline ICD-based test environment configuration and ensure consistent application of interface changes.

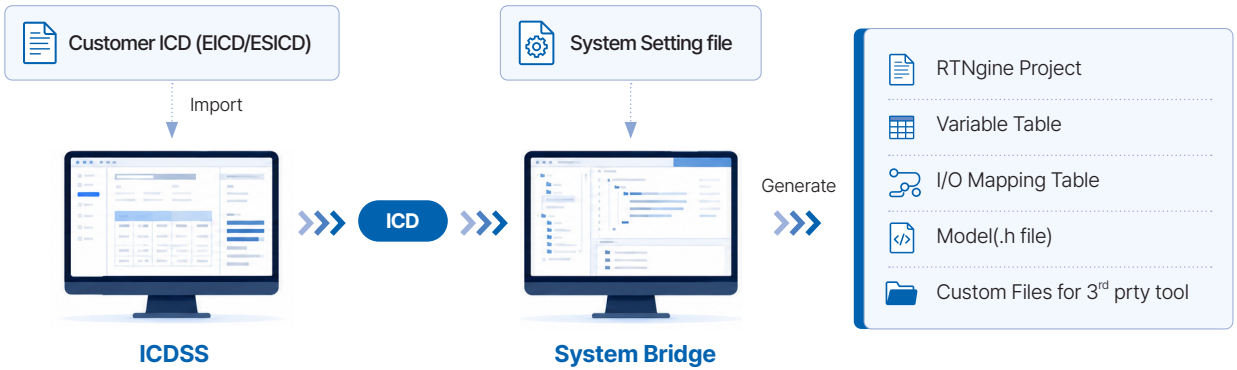
Highlight

Systematically **create and manage** devices, interfaces, messages, and data structures for ICDs

Identify **errors and inconsistencies in advance** through validation and ICD comparison

Support **ICD configuration management and test environment integration** through version control, change tracking, and file import, export, and merge

System Architecture



System Bridge

System Bridge is a test environment configuration tool that automatically generates STE/HILS/SIL projects based on ICDs. It creates configuration data for test execution and monitoring using ICDs, variables, interfaces, and I/O mappings. When ICDs change, existing project settings are retained, enabling fast and efficient test environment reconfiguration.

Highlight

- Custom variable and I/O settings
- Integration with test and analysis platforms
- Early detection of ICD errors
- Generation of I/O, monitoring, and simulation data
- Automatic generation of ICD-based test projects

Feature

- 01** Intuitive ICD Editing Environment

Provides intuitive table-based editing of devices, interfaces, messages, and data structures, with efficient add, delete, copy, and paste functions.
- 02** Interface Consistency & Validation

Validates signal, message, and data definitions to identify errors and missing items while maintaining interface integrity.
- 03** Version Control & Change Tracking

Manages ICD configurations by version, tracks added, modified, and deleted items, and supports comparison and restoration of previous versions.
- 04** ICD Import, Export, Merge & Conversion

Imports, exports, merges, and converts various ICD data formats into a consistent structure for efficient test environment configuration.



Key Deliverables

ICD Database

Version-controlled interface definitions managed in MS Access.

ICD Difference Report

Summary of changes between ICD versions.

ICD Specification Document

ICD documentation generated in MS Word / HTML format.

Exported Integration Data

Structured data exported for use with RTNgin.

MachTA

MachTA is a test automation management tool that supports the entire testing process, from requirements-based test planning and test case creation to automated execution, result analysis, and report generation. It links requirements, test specifications, and test cases to ensure traceability and requirements coverage. MachTA also integrates with testing platforms such as RTNngine, CVNngine, and RDSS to provide an efficient automated testing environment.

Highlight

Links requirements, test specifications, and test cases to **reduce test omissions** and **ensure traceability and requirements coverage**

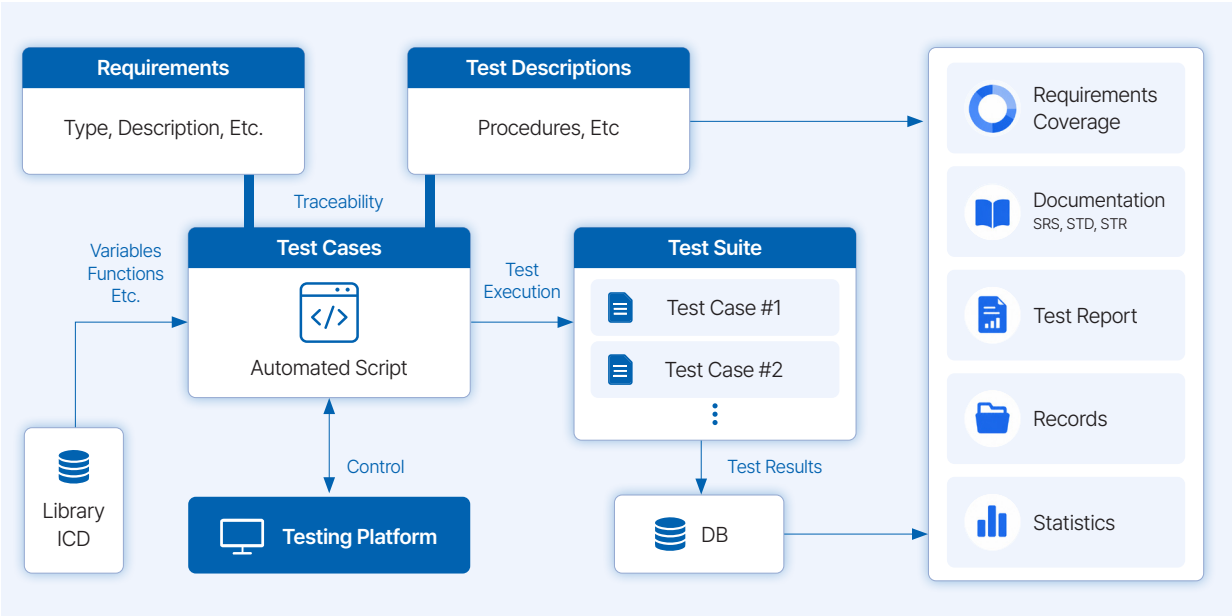
Integrates with RTNngine real-time simulation and RDSS data monitoring to **automate repetitive test procedures** and **simplify result verification**

Automates repeated test case execution, result recording and analysis, and report generation to **reduce testing time and improve efficiency**

User, Application

For engineers performing regression testing or large-scale System Integration Testing (SIT)

System Architecture



Feature

01 Requirements-Based Test Traceability Management

Links requirements, test specifications, and test cases to manage traceability and requirements coverage. Test omissions and verification status can be easily identified.

02 Script-Based Automated Test Case Creation

Creates test cases using Python scripts and library commands, including test procedures, input conditions, and pass/fail criteria. Supports RTNngine, RDSS, UDP, and ICD data for complex test procedures.

03 Test Execution with Multiple Testing Platforms

Integrates with RTNngine, CVNngine, RDSS, STANAG-4586, PI, and other platforms for system control and data verification. Supports simulation, data verification, and network communication within a single tool.

04 Test Suite-Based Batch & Repeated Execution

Organizes multiple test cases into test suites for batch execution. Automates repetitive testing with Once, Time, Count, and Infinity options and records results automatically.

05 Test Result Analysis & Automated Report Generation

Provides requirements coverage, execution history, and statistics and automatically generates test reports. Record Viewer and Statistics support result tracking and pattern analysis.

Key Deliverables

Test Execution Report

Automated report with Pass/Fail results.

Regression Test Result

Test results verifying that changes do not affect existing functionality.

Coverage Analysis

Measurement of test coverage against requirements.

RDSS

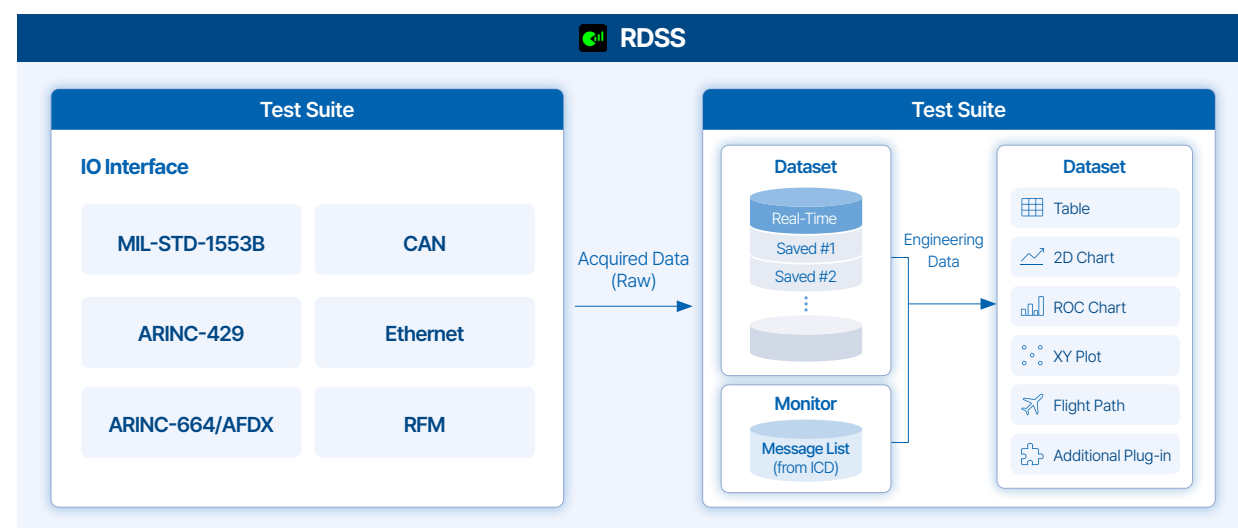
Highlight

Uses Heartbeat, Checksum, cycle, Min/Max validation, and alarms to **detect data anomalies** and **improve test result analysis**

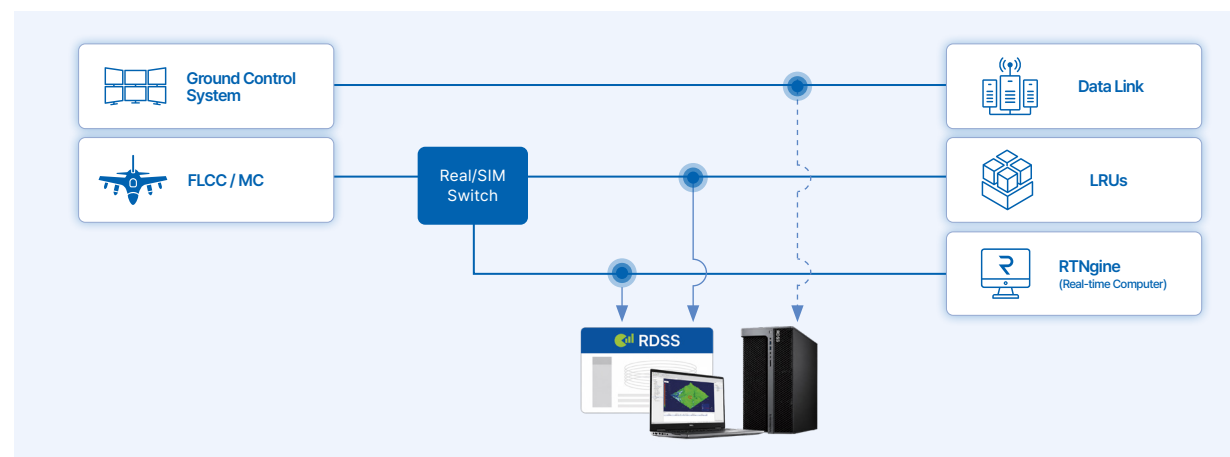
User, Application

Application	Real-time flight data monitoring, large-scale data post-analysis, remote data transmission and control
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System Architecture

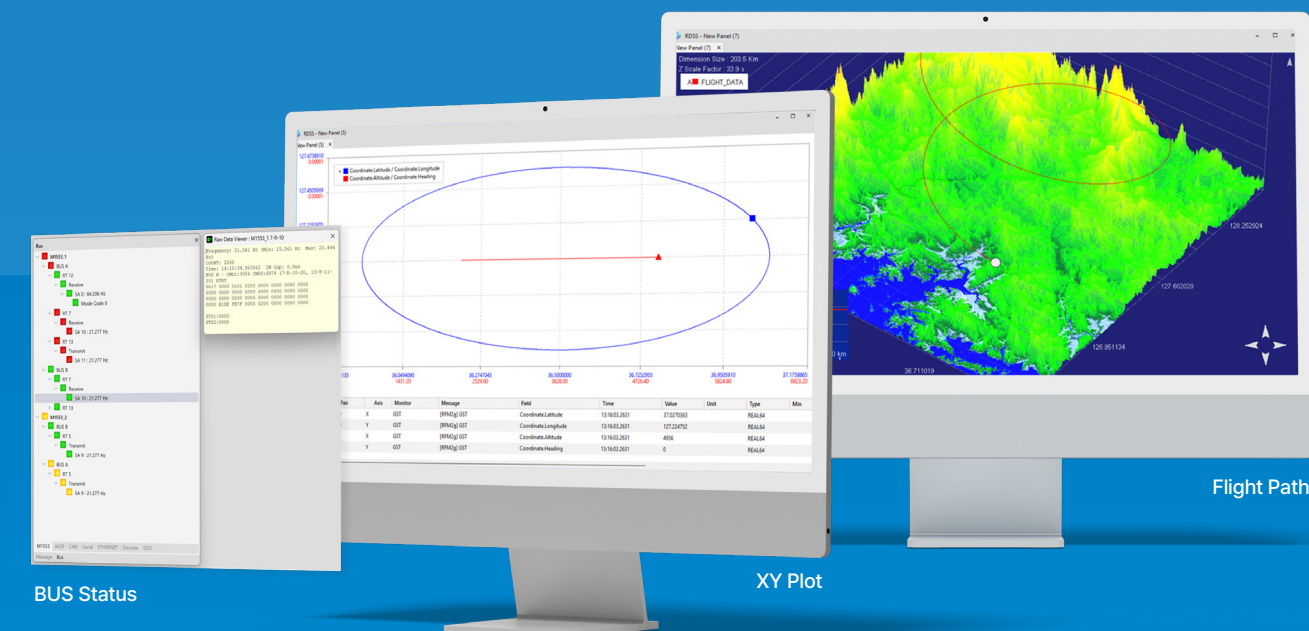


STE/HILS/SIL Data Monitoring



Feature

Tables, 2D charts, variation charts, XY plots, and flight paths provide visual analysis of changes, correlations, and trajectories in test data.



04

Data Validation & Anomaly Detection

- Supports various error validation patterns

Apply selected datasets to alarms

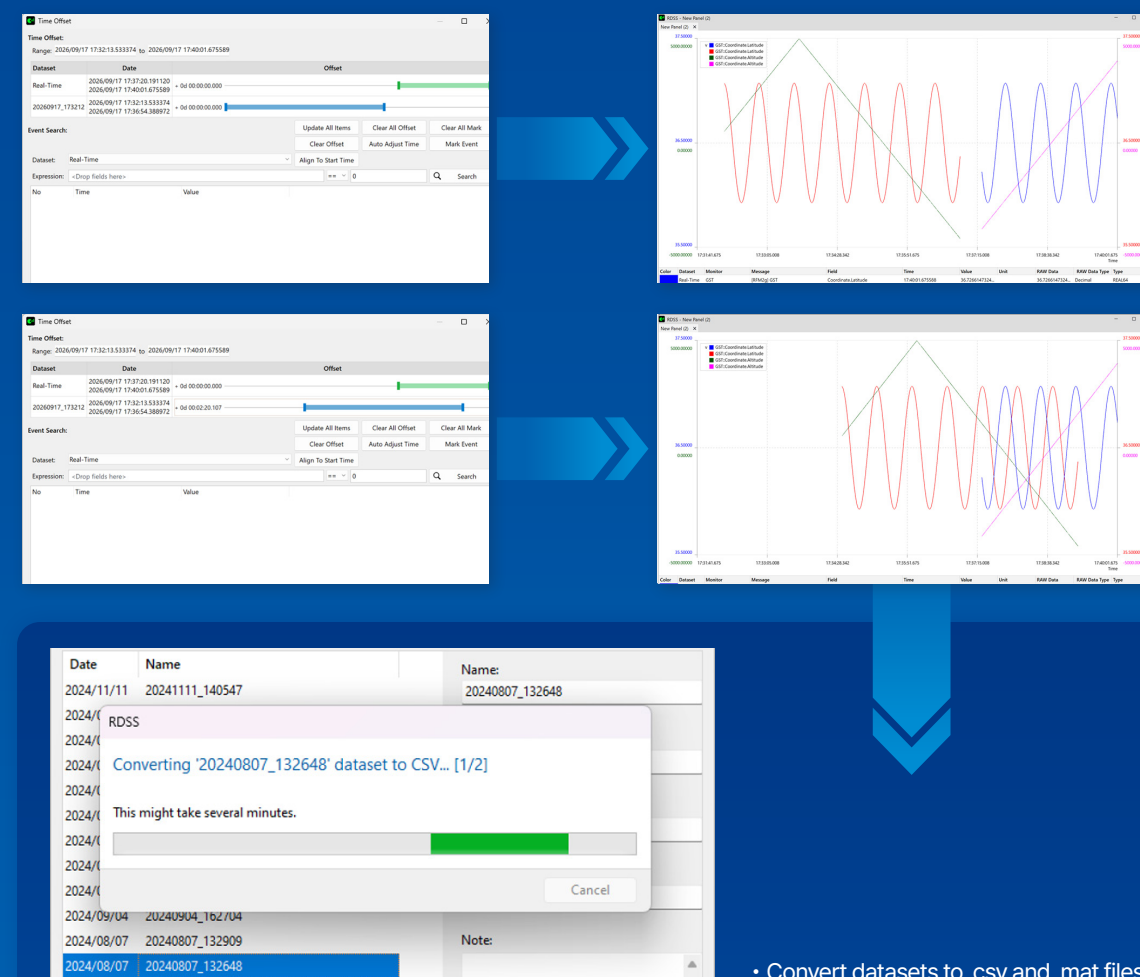
View registered alarms and
check their current status

- View the timeline of triggered alarms
- Use Find Target View to locate a specific time in the desired view

05

Stored Data Comparison & External Analysis Integration

Compares stored and real-time data and allows selected data segments to be searched and extracted for use with external analysis tools in CSV, MAT, and other formats.



- Convert datasets to .csv and .mat files

Interface

MIL-STD-1553B	Ethernet	Analog	SMN(Shared Memory Network)
ARINC-429	CAN	Serial	*Additional interface types are available
ARINC-664/AFDX	Discrete	RFM(Reflective Memory)	

*Additional interface types are available

Key Deliverables

Synchronized Integrated Log File

Analysis-ready data synchronized
on a common time axis across
multiple interfaces.

Custom Analysis Report

User-defined dashboards and statistical reports with 2D/3D charts and gauges.

External Analysis Data File

Converted data formats for
immediate use in tools such as
MATLAB and Excel.

genPanel

genPanel is a GUI authoring tool for quickly creating interactive panels connected to real-time data. Users can build responsive panels by placing components such as buttons and indicators and linking them to data. From simple settings to advanced formulas and events, genPanel provides a flexible environment for a wide range of panel applications.

Highlight

Arrange buttons, switches, LEDs, text, images, gauges, and other components to **intuitively build** panels for testing and operation.

Map interface data from STE/HILS/SIL environments to components and define data read/write, injection, and **status display** behavior.

Extend data control and panel behavior **for specific user needs** using component conditions, formulas, and Python scripts.

Key Deliverables

01
Custom Control Panel

Custom HMI dashboards connected to real-time data.

02
Aerospace & Defense Widget Library

UI components optimized for MIL-STD and specialized test environments.

03
Standalone Runtime Package

Deployable and executable panel packages requiring no additional license.

Feature

01 Drag-and-Drop GUI Panel Creation

Arrange buttons, switches, LEDs, text, images, gauges, and other components to intuitively create GUI panels for testing and operation.

02 ICD-Based Data Mapping & Control

Map STE/HILS/SIL interface data to components and configure data read/write and injection for real-time control.

03 Convenient Design Editing Tools

Use Zoom In/Out, Smart Guide, Gridline, Align, and Layer features to easily and precisely arrange complex panel layouts.

04 Flexible UI Customization

Customize component size, position, color, font, borders, backgrounds, and display conditions to freely configure panels for specific test purposes.

05 Condition, Formula & Event-Based Behavior

Use component conditions, formulas, and events to dynamically control screen behavior and status displays based on data states.



03 Hardware

AeroBox

AeroBox is a compact hardware simulation solution focused on the core capabilities of RTNgin. Its modular and flexible design provides a stable and efficient simulation environment while supporting diverse system development requirements.



BirdieBox

Hardware supporting hard real-time simulation with enhanced processing performance and expanded interface support.



From Simulation to Real System

Our scalable, integrated test environment—from AeroBox to RN7—delivers proven performance and reliability across the entire process, from simulation to real-world operation.

RN7

An integrated simulation platform optimized for aerospace and defense test environments, delivering best-in-class real-time performance.



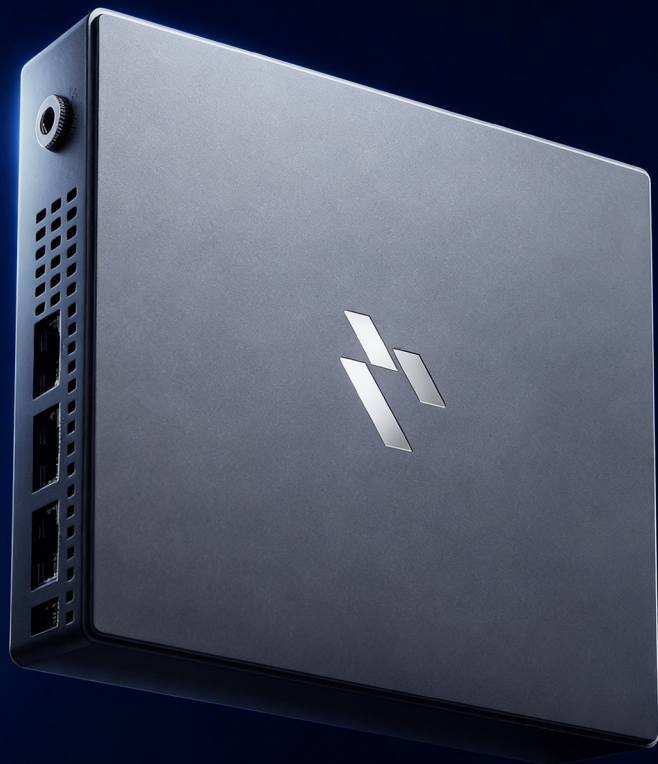
Linux Target

A flexible real-time simulation environment can be configured on Linux-based PCs and workstations, supporting complex scheduling, large-scale data processing, and integration with external software.



RTNginer's New Compact Hardware AeroBox

AeroBox is a compact hardware simulation solution focused on the core capabilities of RTNginer. Its modular and flexible design provides a stable and efficient simulation environment while supporting diverse system development requirements.



Highlight

01 • Small Size, Full RTNginer Essentials

Delivers high performance in a simple environment with essential RTNginer capabilities. Enables easy implementation of real-time simulation with all key functions included.

02 • Compact and Scalable

Its modular design allows multiple units to be easily combined and expanded. The compact, optimized design saves space and enables efficient configuration.

03 • Essential Features, Greater Efficiency

Optimized for simple system integration and testing for improved usability. Reduces cost compared with RTNginer while maintaining high efficiency.

User/Application

• Research & Educational Institutions

• Aerospace-Specific Test Environments

• Test Environments for Small Businesses

• Pre-Purchase RTNginer Performance Evaluation

Technology Focus

1. Rapid Control Prototyping

- Flight Control Computer
- Mission Computer
- Navigation Computer

2. Model-Based Simulation

- C Language Modeling
- MATLAB / Simulink Modeling

3. Autonomous

- ADAS, ECU Modeling and Simulation

4. Aerospace

- Flight Dynamic Simulation
- Flight Environment Simulation
- Avionics System Simulation
- Guidance, Navigation and Control System Simulation
- LRU Model Simulation- Real-Time Product Validation Environment Setup

Specification

Software	RTNginer4 (Hard Real-Time Support)	
Microcontroller and Memory	CPU	NXP PowerPC™ QorIQ T1022 / T1042
	Memory	512Mbyte DDR3 RAM
	Real-Time Clock	RTC with Battery
Bus Interface	PCIe PCI Express® Mini Card Electromechanical Specification Revision 1.2, Full-Mini Card	
Safety	Voltage Monitor	For all internal voltages and temperatures
	Temperature Monitor	CPU temperature sensor
	Watchdog	CPU watchdog
Interface	Ethernet	3x Gigabit Ethernet, 1000BaseT, IEEE802.3 at RJ45-connectors in front panel
	USB host	USB 2.0 High-Speed(480 Mbit/s), 1x via USB socket type-A in front panel
	Serial	1x RS-232, up to 155 kbaud, RJ45 connector, Terminal 1x via Mini USB socket onboard
	CAN	2x CAN 2.0A/B (Optional by PCIe mini slot)
General	Power Supply	24VDC/2A
	Dimensions (LxDxH)	166 × 131 × 40 mm

Hard Real-Time Solution,
Expanded Possibilities

BirdieBox

BirdieBox is a hardware simulation solution based on the core capabilities of RTNgene, offering enhanced flexibility and performance. It provides stable Hard Real-Time performance and flexible configuration through various interfaces, making it suitable for complex test environments.



Highlight

01 • Enhanced Performance & Expanded Interfaces

Designed to deliver higher performance alongside AeroBox with enhanced processing power and expanded interface support.

Real-Time Processing

- T2080, Xeon Processor

Model Processing

- Powerful multiprocessing

Scalable I/O Interfaces

- MIL-STD-1553B, ARINC429, CAN, AFDX, ADIO, etc.
- Supports various interfaces for flexible system integration

02 • Flexible Hardware for Scalability & Connectivity

Based on RTNgene's core capabilities, BirdieBox provides more interfaces and higher performance than AeroBox. With a simpler configuration than RN7 pro, it delivers stable Hard Real-Time simulation across various environments.

User/Application

• Research & Educational Institutions

• Aerospace-Specific Test Environments

• Test Environments for Small Businesses

• Pre-Purchase RTNgene Performance Evaluation

Technology Focus

1. Rapid Control Prototyping

- Flight Control Computer
- Mission Computer
- Navigation Computer

2. Model-Based Simulation

- C Language Modeling
- MATLAB / Simulink Modeling

3. Autonomous

- ADAS, ECU Modeling and Simulation

4. Aerospace

- Flight Dynamic Simulation
- Flight Environment Simulation
- Avionics System Simulation
- Guidance, Navigation and Control System Simulation
- LRU Model Simulation
- Real-Time Product Validation Environment Setup

Specification

Software	RTNgene4 (Hard Real-Time Support)	
Microcontroller	CPU	Intel Xeon Multi-Core
Interface	Ethernet	2CH 10/100/1000 BaseT copper ports
	Serial	8 ports, RS-232, RS-422, RS-423, RS-485 Asynchronous Serial Interface, Programmable Baud Rate (Up to 5.5296Mbps)
	CAN	4x CAN High speed, PCI Bus acc. To PCI Local Bus Specification 2.2, ARINC825 protocol available
	Discrete Input	20 CH, 0 to 60V DC input range Input Signal Threshold : TTL compatible. 1.5V DC with 200mv of hysteresis, Typical
	Discrete Output:	20 CH, 0 to 60V DC Voltage range Output ON current range : 0 to 1A DC, Continuous(Up to 10A total for all channels combined) : 250mA DC, continuous(All channels on) Output channel configuration: 40 open-drain DMOS MOSFETs with common source connection.
	Analog Input	8 Differential, A/D resolution: 16bits, Input range: $\pm 5V$, $\pm 10V^*$, 0-5V and 0-10*(*Requires $\pm 15V$ external supplies)
	Analog Output	8 Analog voltage outputs, D/A resolution: 16bits / Output ranges: $\pm 5V$, $\pm 10V$, 0 to 10V(Jumper-Selectable) / Data sample memory: 128 sample FIFO buffer on each channel
	M1553B	2 CH M1553B, Multi-Function
	ARINC429	8-16 CH ARINC429, Each channel can be set to Tx or Rx
General	Power Consumption	Max. 175W
	Power Supply	100-240V, 50-60Hz
	Dimensions(LxDxH)	284 × 358 × 125 mm

Real-Time Simulation Computer

RN7

RN7 is a real-time simulation computer designed for control system simulation and testing in defense and aerospace applications, including aircraft, missiles, and satellites. It serves as a simulation computer for integrated test environments such as STE, HILS, and SIL, and can also be used as a target system for RCP. RTNginde simulation and test software is provided with the system, enabling users to operate and experience various functions directly.



Highlight

- 01

Real-Time Performance with Multiple CPU Options
Supports multicore CPUs such as NXP T2080 and Intel Xeon for high-performance real-time processing.
- 02

Optimized for HILS, SIL & Test Benches
Optimized for simple system integration and testing to reduce cost and improve efficiency.
- 03

Expandable VME Slot Architecture
Expandable from 7 to 16 slots for flexible hardware configurations.
- 04

Support for Various Communication Protocols
Supports a wide range of aerospace and defense protocols for flexible I/O connectivity.
- 05

Ready for RCP Environments
Deploy control software directly to target hardware for immediate simulation.

User/Application

- Aerospace & Defense Test Environments

System Architecture



Specification

	Std	Ex	Pro
CPU	T2080 Processor, Xeon Processor		
Number of VME slots	7 Slots	7 Slots	16 Slots
Power Consumption	Max. 525W	Max. 525W	Max. 1050W
AC Input	100-240V, 50-60Hz		
Total weight (Approximatel)	17kg	19kg	21kg
Dimension (WxDxH mm)	438×648×177 (w/o bracket) 482×648×177 (w/ bracket)	438×648×222 (w/o bracket) 482×648×222 (w/ bracket)	438×648×310 (w/o bracket) 482×648×310 (w/ bracket)

Interface

MIL-STD-1553B	SDLC	Reflective Memory	Timer/Counter
MIL-STD-1760	CAN	SCRAMNet	RVDT/LVDT
ARINC429	Ethernet	Shared Memory Network	MIL-1394
ARINC664p7/AFDX	ADIO	ARINC825	Fiber Channel
TTEthernet	PWM	IRIG-B	
Serial(RS232/422/485)	ARINC818	Synchro/Resolver	

Linux Target

Open and High-Performance Linux Simulation Platform with RTNginer 4.0

The RTNginer 4.0 Linux Target Platform is an open simulation platform based on high-performance multicore processors and a Real-Time Linux operating system. It can run and integrate various simulation models and application software. RTNginer 4.0 provides efficient task scheduling and model management, enabling stable operation of complex simulations. It also supports large amounts of data and various network interfaces included DDS for mission-system and sensor integration. The platform works seamlessly with our software products, including ICDSS, RDSS, and MachTA. Together, they provide an integrated test environment for simulation execution, interface control, data monitoring, and analysis.



RTNginer 4.0

Real-Time OS	Target Simulation Platform	Key Features
Hard Realtime OS	AeroBox BirdieBox RN7	Provides deterministic execution, predictable response times, and low jitter, making it suitable for high-fidelity real-time simulations and tests that require strict timing determinism. It also supports reliable model execution and interface verification in an environment similar to actual embedded systems, while enabling flexible configuration and integration of concurrent and distributed simulation environments involving multiple aircraft.
Real-Time Linux	Linux PC/ Workstation	Supports parallel processing and large-scale data handling by leveraging high-performance multicore processors, while providing an open and user-friendly development environment. Its flexibility enables easy system expansion and integration with external software, making it suitable for mission-system and sensor integration, complex simulation configurations, and network-based distributed testing.

About us

Realtimewave Co., Ltd. provides real-time test and simulation solutions for the aerospace and defense industries. Since 2002, we have specialized in V&V solutions for SIL, HILS, and customized test benches. Our flagship platform, RTNginer™, integrates with RDSS, MachTA, and other software tools to support system integration testing, automated verification, and mission scenario-based AI validation.



Application

01
Aircraft

Avionics SIL

Flight Control HILS

Software Test Environment

Electronic Warfare Test & Verification Environment

Radar Modeling & Verification Environment

FADEC HILS

Electric RIG

02
Space

Launch Vehicle Integrated Test Environment

Attitude Control Simulation

Electrical Ground Support Equipment (EGSE)

On-Board Computer (OBC) Software Test Bench

03
Guided Weapons

Guidance & Control HILS

Guidance & Control Test Systems

Seeker HILS

Air Missiles Test Equipment

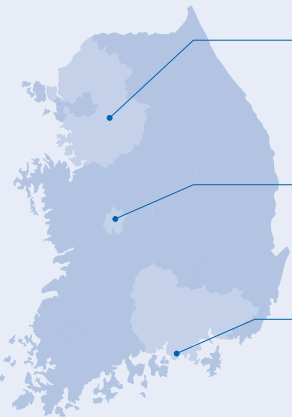
Weapon Launch Procedure Test Systems

04
Ground Vehicle

Unmanned Reconnaissance Vehicle HILS

Manned-Unmanned Teaming (MUM-T) Test Environment

Our Locations in Korea



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Key Clients

