Guardian

Verifying Operational Readiness for Field Deployed, Mission Critical Aerospace & Defense Electronic Systems

Guardian is a portable, rugged automated testing platform that quickly and accurately verifies the operational readiness of complex electronics systems in aircraft, ships, and vehicles.

With its software-defined, reconfigurable architecture, Guardian supports a wide range of applications including electronic combat, communication, navigation, avionics, and control systems. The flexible configuration addresses rapidly evolving test requirements and allows for cost-effective long-term sustainment.

Addressing Field Test Requirements

A successful field test operation requires test equipment that meets many unique operational test requirements, supports program expansion, and adapts to future requirement changes.

Guardian offers an ideal solution for a multitude of operational test requirements. Its highly reconfigurable architecture along with its ability to support any standard PXIe instrument as well as reconfigurable instruments provide endless test application possibilities. Its reconfigurable I/O panel accommodates a wide range of UUT interfaces, standard or custom. In addition, its open software environment provides flexible test development options.

The use of industry standards and Teradyne software-defined, reconfigurable instrumentation allows for easy addition and expansion of test capabilities. Guardian's common software environment minimizes training effort and provides seamless transitions from test development to operation and maintenance.

Unlike many single-purpose field testers, which are difficult to modify or upgrade, Guardian can easily adapt to meet new test requirements as they evolve.

Guardian is a turn-key solution for field test requirements in a single, secure package. Its ruggedized enclosure meets the requirements for single person lift and can operate in the harshest environments.

Features & Advantages

- Software-defined, Reconfigurable Architecture
- Based on Industry Standard PXIe Instrumentation
- Secure Win10 SHB Operating System

Supporting Long-term Sustainment

Effective long-term deployment of test equipment largely depends on its reliability, supportability, and upgradability, all impacting sustainment costs.

Guardian is built on Teradyne's High-Speed Subsystem (HSSub) whose reliability and supportability have long been proven by multiple major defense programs.

Guardian provides hassle-free maintenance and upgrades. Users can easily remove and replace components and UUT interfaces, HSSub software-defined, reconfigurable instrumentation allows for cost-effective future upgrades via HSSub Apps software.

Guardian is fully supported by Teradyne's decades of experience and extensive service capabilities, assuring more than 10 years of product support and services that enable customers to maintain uptime and reduce sustainment costs throughout the ATE life cycle.

Guardian Software

Guardian utilizes Teradyne's TestStudio, an open architecture, web-based test executive software to manage TPS development, documentation, debug, and execution. TestStudio leverages common Application Development Environments (ADEs) and interface standards and supports the use of major ADEs including C#, C++, LabWindows, LabView, and CVI.

To meet the demand for changing test requirements and UUT updates, Guardian's software can be managed at the platform level, test development level, and instrument level. Guardian's software is partitioned such that there is a general Guardian segment that works in tandem with a configuration specific layer developed for each individual solution.

Guardian can be easily reconfigured for new test requirements or UUTs. TPS's can be changed conveniently by swapping the solid-state drive that stores them.

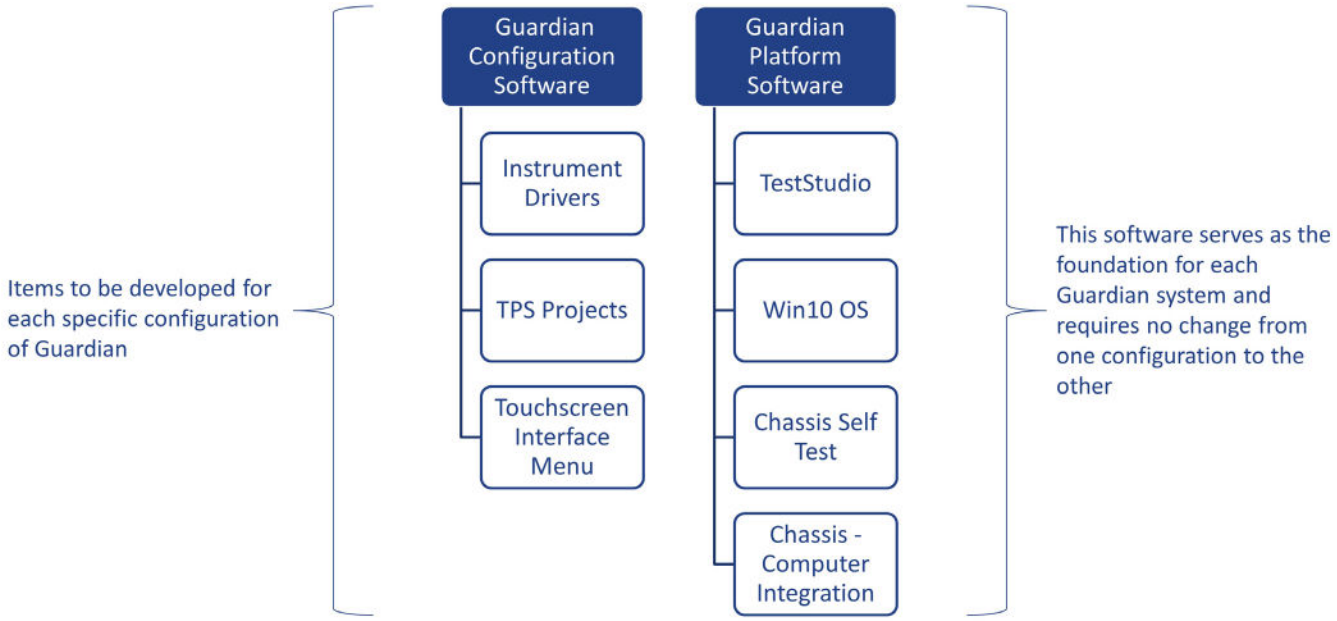
Guardian provides three levels of user privileges to address cyber security concerns.

1. Developers can write and edit Test programs.

2. Operators can execute the test programs in the field

3. Administrators can load or swap test programs in the field via solid state drive

These three modes can be accessed conveniently by those with the necessary credentials.



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Guardian Mechanics

Guardian hardware combines flexibility and ruggedness in one single package. Guardian has two main components: The mechanical core and the ruggedized enclosure.

Guardian's mechanical core holds all main circuit boards, an IO panel, and a 4-slot PXIe chassis. The core is removable, allowing users to easily swap instruments without having to disconnect cabling connections.

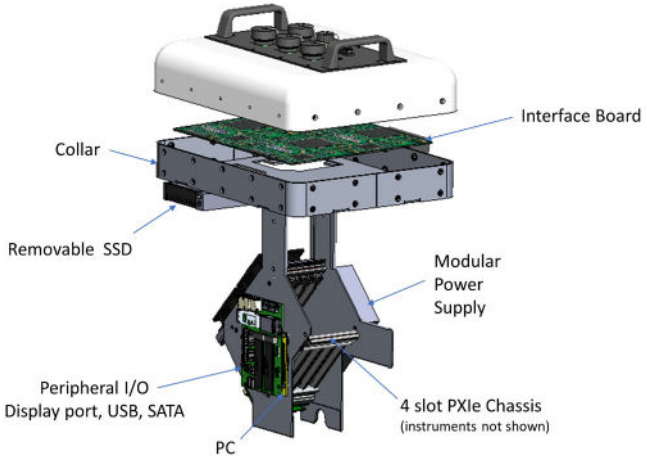

Figure 1: Guardian Mechanical Core

Guardian's enclosure is ruggedized and designed to comply with MIL-PRF-28800F class II and MIL-STD-810G. Designing to these standards allows Guardian to operate in the harshest environments.

The enclosure equipped with a 10.7-inch touch screen interface that runs on Win10 OS and is compatible with TestStudio. The OS has been fully tested against the Secure Host Baseline.

The membrane switch located on the front panel controls system power and screen brightness, while the recessed handles allow for easy handling during operation.

The I/O interface the configuration specific connector panel that allows the UUT cables to connect with Guardian's PXIe instruments.

In the event of a change to testing requirements or the UUT and its cables, simply swapping the I/O interface will allow the UUT cables to connect to Guardian.

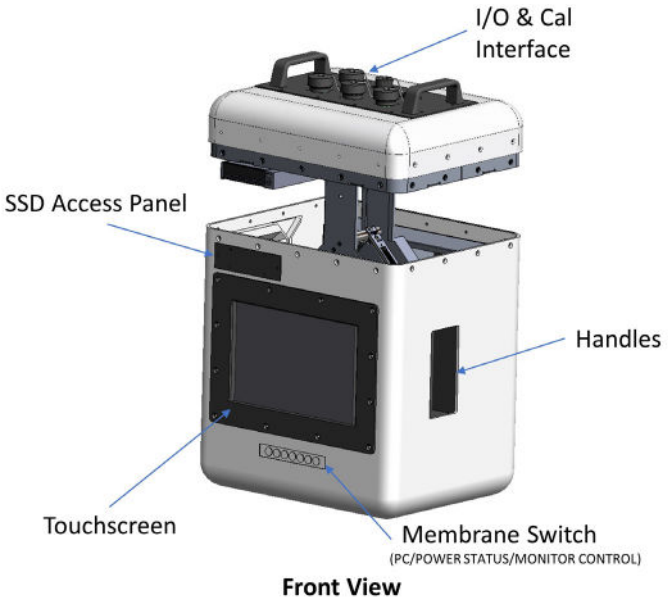

Figure 2: Guardian Enclosure & Core Mechanism

To maintain a safe operating temperature for the components and instruments, a heat exchanger is mounted on the rear enclosure to provide air circulation for cooling.

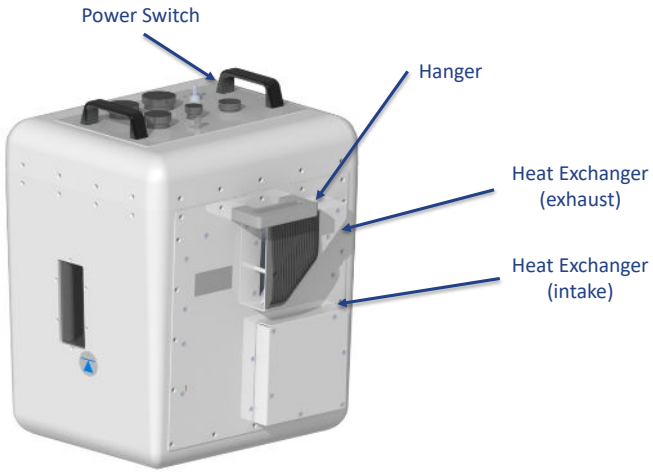

Figure 3: Guardian's Heat Exchanger & Hook Mechanism

In full compliance with MIL-STD-1472G, Guardian meets the weight limit requirement of 37.5lb for a single person lift.

User Modes	
Operator	Users in operator can run TPS's, write log files, perform system maintenance
Developer	Developer mode gives users access to create, debug, and modify TPS's
Administrator	Administrator mode is used for software installation

Notes:

1. Account privileges limited to those essential for that account's purpose.

2. TPS development occurs in TestStudio

Instrumentation	
Configurable Instrumentation	Teradyne/AIT HSSub PXIe Instrument Family, Industry Standard PXIe Instruments
Built-in Test Instrument Functionality	Digital Voltmeter, Discrete I/O, Third Party PXIe Instrumentation

Computer	
Operating System	Win 10 OS
Instrument Housing	Embedded 4 slot PXIe Chassis
Computer	Single Board PC
Storage	500GB, 16GB DDR4 RAM Solid State Drive

Mechanical	
Transport	Ruggedized Travel Case: Pelican iM3075 (standard), closed cell foam insert
Additional Accessories	Mounting Hardware, Self-Test/Cal Fixture, extra SSD
System Dimensions (LxWxH)	14"x20"x12"
System Weight	37.5 lbs
System Enclosure	High Strength Polyethylene Blend, White
Environmental Specifications	MIL-PRF-28800F, MIL-STD-810G, MIL-STD-1472G
EMI shielding	Compliant with MIL-STD-461E
Operating Temp	-25 to 55 degrees Celsius
Non-operating Temp	-40 to 71 degrees Celsius
Power	115V AC, 400Hz

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