

# LibertyGT™ SDSI Family

COTS Family of Software Defined Synthetic Instruments for Realtime RF, Microwave & Wireless Measurement & Test



## Preliminary Product Overview

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### RADX LibertyGT SDSI Overview

RADX® LibertyGT™ Family of Software Defined Synthetic Instruments (SDSI) combine RADX COTS, Advanced, Realtime Measurement Science Software and Firmware with modular, pre-configured PXIe and LabVIEW® Test and Development Reference Systems (TDRS) from National Instruments® (NI) and tailored, TPS and binary-compatible Deployment Platforms from RADX, NI and system integrators using NI PXIe products. This combination uniquely preserves the independence between COTS hardware and software, which enables the LibertyGT Family to provide a cost-effective, open-architecture, multifunction family of PXIe-based solutions that are optimized for high-performance, high-throughput, realtime measurement and test of RF, Microwave and Wireless Communications systems that is uniquely programmable, upgradeable, flexible, modular, scalable and capable of supporting long life cycles.

Developed in close collaboration with NI and featuring patented and patent-pending realtime Synthetic Instrumentation technology exclusively licensed to RADX by BAE Systems®, the LibertyGT family is ideal for Automated Test Equipment (ATE) system integrators and volume end-users who need to develop ATE application(s) and Test Procedure Sets (TPS), qualify the systems and then deploy widely across multiple users and installations—while maintaining strict repeatability and reproducibility and minimizing operating costs.



**LibertyGT 1200B COTS Benchtop SDSI**  
For Development & Deployment Applications

### LibertyGT SDSI Key Features and Benefits

- **Repeatable and Reproducible Performance and Precision with High Throughput**
  - NI PXIe Stimulus and Measurement Technology provides industry leading modular RF system performance
  - RADX Realtime Measurement Science provides industry leading performance and throughput via optimal use of NI PXIe RF, FPGA & Compute Resources
  - RADX RF Interface Units (RFIUs) provide Convenient, Repeatable RF Interfaces for Units Under Test (UUT) Interfacing and Consistent, Repeatable and Reproducible Calibration/Alignment
- **Independent, COTS Hardware & Software**
  - NI PXIe RF Stimulus and Measurement Modules
  - NI LabVIEW Software Framework
  - RADX Realtime Measurement Science Software and Firmware Modules
  - RADX Approved NI Test and Development Reference Systems (TDRS) with Single Part Numbers
  - RADX RFIUs
  - RADX LibertyGT 1200B COTS Benchtop SDSI Deployment Systems
  - Customer and/or System Integrator Tailored Deployment Systems based on NI PXIe Modules
- **Unique Test & Development Reference Platform (TDRP)... an Approach Ideal for Volume Apps**
  - Wide range of RADX Meas. Sci. SW & FW modules and integrated TDRPs enables rapid TPS and ATE application development & qualification
  - NI PXIe Modularity enables tailoring of HW for deployed systems while preserving compatibility and traceability to TDRPs
  - RADX LibertyGT 1200B and System Integrator or Customer Integrated Deployment Platforms provide cost-effective deployable systems
- **Programmable, Open Architecture & 3<sup>rd</sup> Party Friendly**
  - LibertyGT provides optimized support for TPS development and scripting via key standards including IVI, LabVIEW and XML
  - LibertyGT provides optimized support for 3<sup>rd</sup> party Meas. Sci. using popular programming environments including LabVIEW, C, C++, C# and Java
- **SDSI = Cost Effective**
  - SDSI Architecture eliminates the need for multiple, discrete “box instruments” by leveraging high performance COTS hardware components with flexible, multifunction RADX SDSI software
- **Modularity for Long Life Cycle Applications and Tech Insertion**
  - Modular PXIe Architecture and RADX SDSI Software supports field repairs and Tech Insertion at the Module Level for reduced Ops Costs, ongoing P3I and reduced lifetime buys for EOL items
  - Minimum Guarantee of supply for NI hardware for volume deployment

For more info...

Visit [www.radxtech.com](http://www.radxtech.com) or [www.radxtech.com/libertygt.html](http://www.radxtech.com/libertygt.html)

Email RADX Sales at [info@radxtech.com](mailto:info@radxtech.com)

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### LibertyGT COTS Test & Development Reference Platforms (TDRP)

Designed to provide a comprehensive, upgradeable development system that may be used for TPS and ATE application development, Performance Verification Testing (PVT), ongoing tech support and tailoring and qualification of deployment configurations, LibertyGT SDSI Test & Development Reference Platforms (TDRPs) consist of the following items, each purchased directly from their respective source:

- **Pre-Configured, Integrated NI COTS PXIe Test & Development Reference Systems (TDRS)**-- Equipped with LabVIEW (purchased directly from NI via a single part number)
- **RADX COTS Realtime Measurement Science Software and Firmware Modules and Bundles** (purchased directly from RADX)
- **RADX COTS RF Interface Units (RFIU) and Cable Sets** that provide repeatable and reproducible interfaces for UUTs, Calibration/Alignment and Performance Verification Testing (purchased directly from RADX)



RADX® Technologies and NI LibertyGT™ SDSI COTS Test & Development Reference Platform (RFIU Not Shown)

### LibertyGT SDSI: Develop → Qualify/Tailor → Deploy

Once customers have used a LibertyGT Test & Development Reference Platform to develop their ATE application and/or TPS, they may then qualify and tailor a LibertyGT Compatible Deployable Platform that is a derivative of the TDRP. Deployment derivatives save procurement and operating costs because only those functions required for the target application need be included. And because LibertyGT is modular in both design and implementation, LibertyGT hardware and software, along with the Performance Verification Test, TPS and GUI readily adapt to the deployable configuration. For acceptance of the Deployment Platform, customers simply need to be run the PVTs and/or application specific tests to confirm traceability-to and consistency-with the TDRP. Since LibertyGT is designed from the ground up as an open-architecture, third-party friendly system, it readily accommodates third-party developed Measurement Science modules as well, so customers can incorporate specific capabilities as they see fit.

### LibertyGT PXIe Test & Development Reference Systems (TDRS) from NI

Subject to strict configuration and version management (for assured performance), LibertyGT Test & Development Reference Systems (TDRS) are turnkey, integrated PXIe systems ordered directly from NI via a single part number. When combined with RADX Measurement Science Software and Firmware and an appropriate RFIU, a TDRS becomes a TDRP. For single channel measurement and stimulus applications with transmit and/or receive frequencies up to 6 GHz, RADX and NI have defined the LibertyGT 1000R TDRS. For apps above 6 GHz, RADX and NI are currently defining the LibertyGT 2000R TDRS, which will address dual channel applications up to 26.5 GHz. The LibertyGT 1000R TDRS includes the following items (all of which will be tech refreshed over time), integrated and tested by NI prior to shipment:

- |  |  |  |  |
|--|--|--|--|
| • NI PXIe-1085 18-Slot Chassis & Accessories                         | • NI PXIe-5644R Vector Signal Transceiver (VST)                        | • NI Factory System Integration & Test with 1 Year NI RTF Warranty   | • Key Options <ul style="list-style-type: none"><li>– RADX Adv. Meas. Sci. SW &amp; FW Bundle</li><li>– RADX Mil-Std-1553B Test Module</li><li>– NI PXIe-5442 Arbitrary Waveform Generator</li><li>– RADX RFIU MDK</li></ul> |
| • NI PXIe-8135 Controller MS Win7-64 OS, 8+ GB DDR3 & 500GB+ RMV HDD | • NI PXI-7962R FlexRIO with NI 5782 250 MSPS FPGA Adapter Module (FAM) | • Requires Purchase of: <ul style="list-style-type: none"><li>– RADX Base Meas. Sci. SW &amp; FW Bundle</li><li>– RADX RFIU Model 1000</li></ul> |  |
| • NI PXI-4065 DMM  | • NI PXI-5160 2-Ch, 2.5 GSPS, 10-bit Digitizer                         |  |  |

For more info, please visit [www.radxtech.com](http://www.radxtech.com) or contact RADX Sales at [info@radxtech.com](mailto:info@radxtech.com) or at +1 (619) 677-1849 x 1

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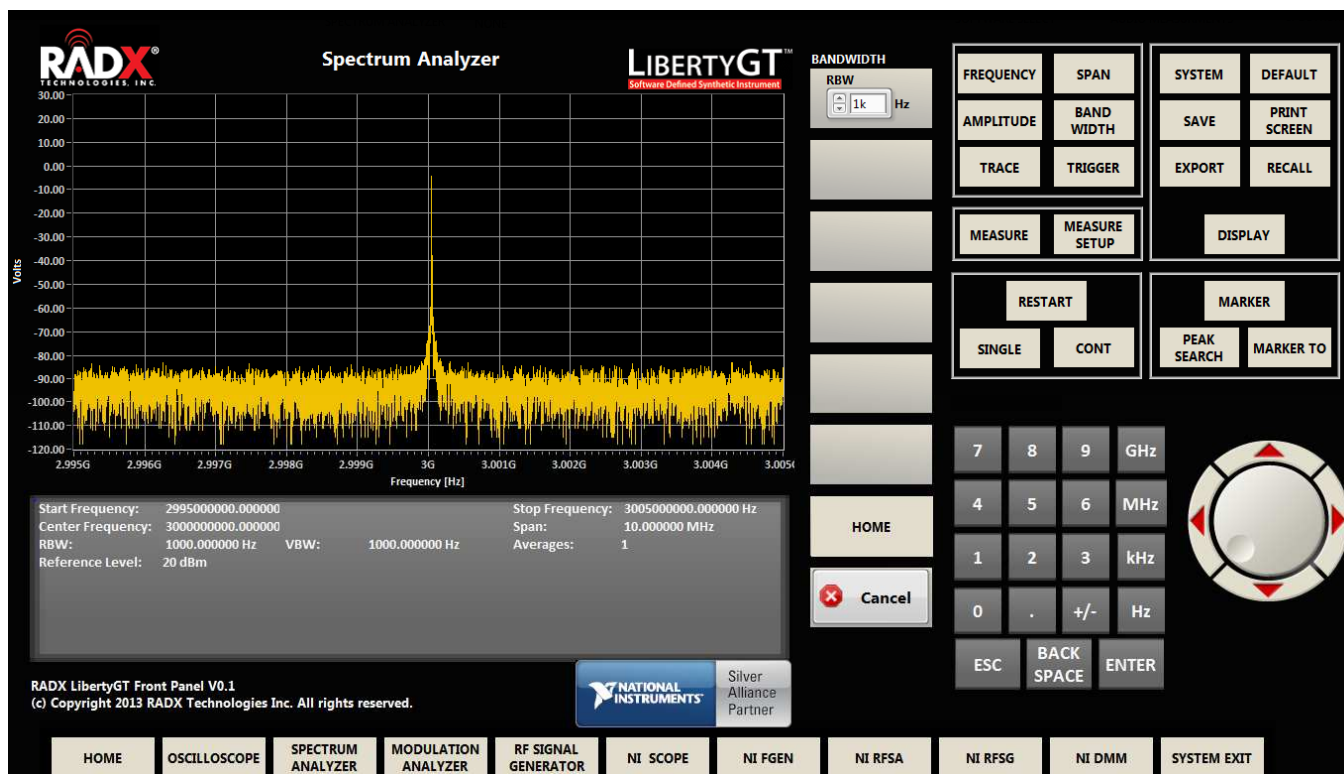
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## LibertyGT Measurement Science Software and Firmware Base

Purchasable directly from RADX, LibertyGT Measurement Science Software and Firmware consists of a **Measurement Science SW & FW Base Bundle** and **Optional Measurement Science Modules (and Bundles)** that provide specific measurement functions—each of which is optimized and configured for NI LibertyGT Reference Systems. **The LibertyGT Measurement Science Software and Firmware Base Bundle V1.0** includes the following components:

- LibertyGT Operating Environment for MS Win7 64-bit with LabVIEW and LabVIEW FPGA Runtime Software and RADX SDSI GUI
- LibertyGT Standard Calibration & Alignment Module
- LibertyGT Realtime Spectrum Analyzer Measurement Module
- LibertyGT Realtime Dual Channel DSO Module
- LibertyGT Realtime Remote Interface Module
- LibertyGT User Test Procedure Set (TPS) Scripting API Foundation and Screen Template
- LibertyGT GUI and RFUI Interface (per Module)
- LibertyGT Commercial Performance Verification Test (PVT) (per Module)
- LibertyGT USB Software Media, Binary Software License, License Key and User Documentation
- 1 Year Maintenance and Bug Fixes



## RADX LibertyGT SDSI Realtime Spectrum Analyzer

Part of the RADX LibertyGT Measurement Science Software and Firmware Base Bundle

For more info, please visit [www.radxtech.com](http://www.radxtech.com) or contact RADX Sales at [info@radxtech.com](mailto:info@radxtech.com) or at +1 (619) 677-1849 x 1

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### LibertyGT Adv. Measurement Science SW and FW Bundle (AMSB)

Additional Measurement Science Software and Firmware modules RADX intends to offer as options include Signal Analysis, Modulation Analysis, Signal Generation and Stimulus, Advanced Calibration/Alignment, 3<sup>rd</sup> Party Measurement Science Programming API, Virtual Instrument and Integrated RF and Comms System unit testing. Other modules will be announced as they become available. Each RADX LibertyGT Measurement Science Module comes complete with GUI Screen(s), RFIU Interfaces, Commercial PVT and TPS API Add-Ons. In addition, RADX may also develop customer specific modules under NRE contract as part of its value-added services offerings. For the LibertyGT 1000R TDRP and for the LibertyGT 1200B COTS Benchtop SDSI, RADX offers the LibertyGT **Advanced Measurement Science Software and Firmware Bundle (AMSB)**. The AMSB provides a wide range of optional modules, bundled together to provide developers with very attractive cost savings. **The RADX LibertyGT AMSB V1.0 includes the following:**

- LibertyGT Stimulus Control Module
- LibertyGT Realtime RF Receiver Chain Module (Demodulation Modules Sold Separately)
- LibertyGT Realtime Vector Signal Generator Module (Modulations Optional)
- LibertyGT 2-Ch Digitizer Module
- LibertyGT RF Power Meter
- LibertyGT Realtime Internal Waveform Modulation Module (AM, FM, PM Pulse Included; Other Internal Digital Modulations Optional)
- LibertyGT Realtime External Waveform Modulation Module
- LibertyGT Realtime Internal Demodulation Module (AM, FM, PM Pulse Included; Other Demodulations Optional)
- LibertyGT Realtime External Waveform Demodulation Module with Analog External Demodulation Port
- LibertyGT Realtime User Digital I/O Module
- LibertyGT Realtime Bit Error Rate Tester Module
- LibertyGT User Test Procedure Set (TPS) Scripting API and GUI Screen Template (per Module)
- LibertyGT GUI and RFIU Interface (per Module)
- LibertyGT Commercial Performance Verification Test (PVT) (per Module)
- LibertyGT USB Software Media, Binary Software License Addendum, License Key and User Documentation
- 1 Year Maintenance and Bug Fixes

### RADX LibertyGT RF Interface Unit (RFIU)

In order to reduce customer time to market, as well as to provide a repeatable and verifiable RF interface for Calibration/Alignment and UUT measurement and testing, LibertyGT TDRPs and RADX LibertyGT Deployment Platforms (e.g., LibertyGT 1200B COTS Benchtop SDSI) include a RADX RF Interface Unit (RFIU). The RFIU provides a high-quality bulkhead interconnect to UUTs as well as the interconnect between the RFIU and NI PXIe Modules. The RFIU also supports the interface control and “switchology” for the various functions provided by the LibertyGT SDSI GUI. Each RADX Measurement Science SW & FW Module includes support for the RFIU and an associated GUI screen, so that when a module is selected, its personality is reflected both in the GUI and in the RFIU control. The RFIU is an essential and required ingredient for all PVTs, since RF interface performance and quality can dramatically affect measurement results, repeatability and reproducibility. Lastly, because LibertyGT TDRPs are intended to assist integrators and volume end users, RADX offers an optional Manufacturer’s Development Kit (MDK) that includes all the information required (BOM, AVL, MPI, TPI, EMI/EMC data) and a limited license agreement that enables LibertyGT customers to design, manufacture and deploy RFIU derivatives that are compatible with and equivalent to RADX RFIUs.

### About RADX Technologies, Inc.

RADX Technologies, Inc., is a DSP-focused technology start-up that provides a wide range of cost-effective, high-performance, COTS products, technologies, software, solutions and services to end-users, OEMs and system integrators at multiple levels of integration. As both a National Instruments Silver Alliance Partner with RF and Wireless Specialty Alliance Partner designation and a Xilinx Alliance Partner, RADX has a solid team of seasoned experts with decades of experience developing advanced FPGA, multi-core, and GPU-based DSP COTS solutions for consumer, commercial, aerospace, and defense applications in Software Defined Synthetic Instrumentation (SDSI), Software Defined Radio (SDR), Cognitive Radio (CR) and other high-performance comms-related applications. For more info on RADX Technologies, please visit [www.radxtech.com](http://www.radxtech.com) or email [info@radxtech.com](mailto:info@radxtech.com).

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