Agilent TS-5040 Entry Functional Test Rack for System- and Self-Integrators

Data Sheet

Figure 1. TS-5040 entry functional system

Key features and benefits

- The perfect base for your automotive test applications
- Plug and play system for building functional test systems
- Easily expandable to fit many application needs
- Just-enough testing capabilities
- High uptime and MTBF guarantees low cost of ownership
- CE compliant and EMC prequalified
- Cost efficient quantity pack

Agilent Technologies

Agilent TS-5040 entry system

Automotive electronics manufacturers face time-to-market pressures that few can imagine. In answer to the challenge, Agilent Technologies had created the Agilent TS-5000 family of automotive functional test systems to accelerate test development and deployment in automotive applications. Current users report that functional tests get up-and-running as much as 50 percent faster with the TS-5000 family compared to other functional test systems. It's the fastest way to get quality, tested automotive modules on the road.

The Agilent TS-5040 entry bundle adds to the full portfolio of complete systems an integrator ready functional test system platform. It's targeted for automotive applications like safety, small body electronics, infotainment products and many others that require standard hard and software. The TS-5040 platform offers an open architecture that enables you to integrate any instrument or component to enhance your application.

Designed for the highest uptime in the marketplace the Agilent TS-5040 entry system provides a strong basis for your add-on applications. Due to the basic nature of the system, full integration with leading software tools is easy.

Figure 2. TS-5040 entry functional system (side view)

System components

The TS-5040 entry system consists of a small footprint rack with a standard height of 0.75 m. Optional higher racks, accommodating more equipments, are available. As measurement and switching base, the Agilent 34980A switch measurement unit includes a high accuracy 6.5 digit DMM and offers the ability to configure your system for many applications. See Table 1 for an overview of the optional modules.

The industrial controller in the entry system is also used in the full portfolio of automotive functional test systems and provides high performance with high reliability.

Standard software includes Microsoft® XP and Agilent TestExec SL. Agilent TestExec SL software is a mature test executive. Its integrated programming language (Microsoft Visual Basic for applications) and ease of integration of .NET, VEE, CVI and many others programming environments supports rapid and flexible system development and debugging.

The primary instrument control interface is LXI, however the system can easily be upgraded to also cover GPIB and other interfaces.

Figure 3. 34980A mainframe and modules

The Agilent TestExec SL software reduces development time

The TestExec SL software comes pre-installed on the IPC and ready to use for the software development job. It provides a complete test development and test execution environment which also allow you to organize and order tests, reconfigure the test stand, profile the execution speed and debug tests. The software also provides an efficient and effective structure for developing the test plans and sequencing for functional test.

Several key features in the TestExec SL that help you reduce software development time:

1. Accelerate test development
   - Action wizard that supports multi language action code writing
   - Topology editor/switch manager with streamlined switching topology configurations

2. Streamline test execution
   - Simple hierarchical structure
   - Advanced executive tools which include advanced sequencing and test flow controls, as well as debugging tools

3. Increase productivity
   - Throughput multiplier that enables multiple-UUT test for higher throughput
   - Test profiler which helps to evaluate and analyze post-testing performance

4. Integrated test efforts
   - Open architecture using Microsoft COM standard for easy sharing
   - Data logging and reporting with customizable format for database systems

Low cost ownership

Unplanned downtime poses a challenge to business continuity that is almost beyond calculation.

Agilent test and measurement products are designed to offer you the highest reliability in the market. By utilizing standard, off-the-shelf instruments and components, the high reliability in the TS-5040 remains guaranteed. This approach not only offers you one of the highest MTBFs in the market but also guarantees a quick replacement of the faulty components in case of any problems. And as you might expect from Agilent, this is anywhere in the world.

34980A module options

The 34980A mainframe holds up to eight plug-in modules. You can easily mix and match them to create a custom system to meet your applications needs. See Table 1.

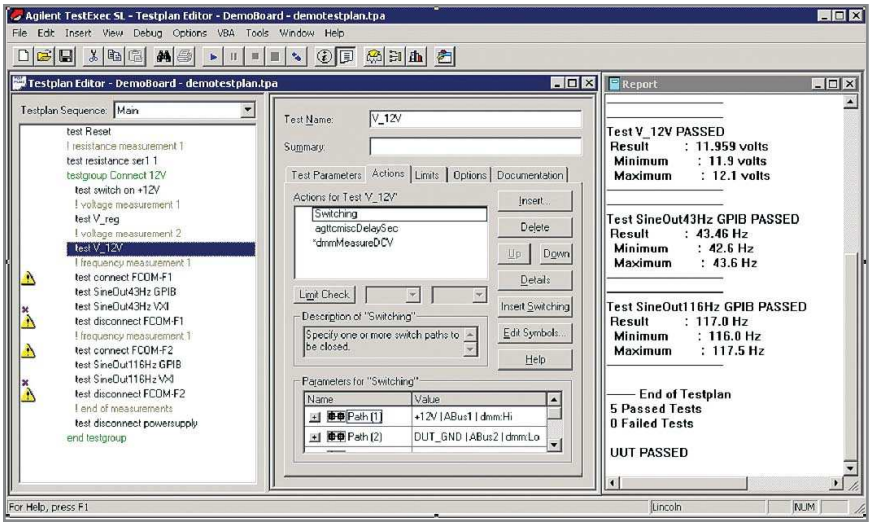

Figure 4. TestExec SL development interface

34980A module options

Table 1. 34980A module option chart

Module	Description	Max volts	Max current	BW (MHz)	Scan ch/sec	Thermal offset	Comments
Multiplexer modules							
34921A	40-channel armature multiplexer with low thermal offset	± 300 V	1 A	45 MHz	100	< 3 µV	Temperature reference Four current channels Config as 2- or 4-wire
34922A	70-channel armature multiplexer	± 300 V	1 A	25 MHz	100	< 3 µV	Config as 2- or 4-wire
34923A	40/80-channel reed multiplexer	± 150 V	0.5 A	45 MHz	500	< 50 µV	Config as 1-, 2- or 4-wire
34924A	70-channel reed multiplexer	± 150 V	0.5 A	25 MHz	500	< 50 µV	Config as 2- or 4-wire
34925A	40/80-channel optically isolated FET multiplexer	± 80 V	0.02 A	1 MHz	1000	< 3 µV	Config as 1-, 2- or 4-wire
Matrix modules							
34931A	Dual 4x8 armature matrix	± 300 V	1 A	30 MHz	100	< 3 µV	Backplane expandable
34932A	Dual 4x16 armature matrix	± 300 V	1 A	30 MHz	100	< 3 µV	Backplane expandable
34933A	Dual/quad 4x8 reed matrix	± 150 V	0.5 A	30 MHz	500	< 50 µV	Backplane expandable Config as 1- or 2-wire
General purpose modules							
34937A	28-channel Form C and 4-channel Form A	300 V 250 VAC	1 A 5 A	10 MHz	N/A	< 3 µV	
34938A	20-channel 5-amp Form A	250 VAC	5 A	1 MHz	N/A	< 3 µV	

RF and microwave modules

Module	Description	Insertion loss	Isolation	Freq range	VSWR	Input impedence	Comments
34941A	Quad 1x4 50 Ω 3 GHz RF multiplexer	0.6 dB	> 58 dB	3 GHz	< 1.25	50 Ω	at 1 GHz
34942A	Quad 1x4 75 Ω 1.5 GHz RF multiplexer	0.6 dB	> 60 dB	1.5 GHz	< 1.35	75 Ω	at 1 GHz
34945A/ 34945EXT	Microwave switch/attenuator driver	Can drive up to 64 external switch coils: 32 SPDT switches, 8 multiport switches, 8 attenuators, or your own combination. Expand with additional 34945EXTs.					
34946A	Dual 1x2 SPDT terminated microwave switch	< 0.42 dB < 0.69 dB	> 85 dB > 67 dB	4 GHz or 20 GHz	< 1.15 < 1.30	50 Ω	at 4 GHz at 20 GHz
34947A	Triple 1x2 SPDT unterminated microwave switch	< 0.42 dB < 0.69 dB	> 85 dB > 67 dB	4 GHz or 20 GHz	< 1.15 < 1.30	50 Ω	at 4 GHz at 20 GHz

System control modules		Description
34950A	64-bit digital I/O with memory and counter	Eight 8-bit digital I/O channels with programmable polarity, thresholds up to 5 V, with handshaking protocols and pattern memory. Two 10 MHz frequency counter and programmable clock output to 20 MHz.
34951A	4-channel isolated D/A converter with waveform memory	Output DC voltage up to ± 16 V or DC current up to ± 20 mA. Output waveforms with a 200 kHz update rate and 16 bits of reaolution. Use on-board memory to create point-to-point waveforms with more than 500,000 points.
34952A	Multifunction module with 32-bit DIO, 2-ch D/A and totalizer	Four 8-bit digital I/O channels, two ± 12-V analog outputs, and a 100 kHz gated totalizer.
34959A	Breadboard module	Create your own custom designs with access to the +12 V and +5 V supplies, 16 GPIO ports and 28 relay drive lines.

Instrument options

Additional instrument options

33220A function/arbitrary waveform generator
The 33220A uses direct digital synthesis techniques to create stable, low distortion output signals that ensure accurate results. It offers 11 standard waveforms plus pulse and arbitrary waveforms. Custom waveforms can be created using the 14-bit, 50 MSa/s, 64 Kpoint arbitrary waveform function. The variable-edge pulse function, along with the PWM, provides excellent flexibility for automotive test applications.

53131A universal frequency counter
The two-channel 53131A offers 10 digits per second of frequency or period resolution and bandwidth of 225 MHz. Time interval resolution is specifi ed at 500 ps. An optional third channel provides frequency.

N67xxA low-profile modular power supply system
A family of small and flexible modular power supply made of a low-profile, 1U high mainframe that accepts up to four modules with each module providing up to 300 W of power. Fast command processing makes it ideal for product test environments. See Table 2.

Table 2. N6700 module option chart

Modules	Model number	Description
N6730 50 W DC power modules	N6731B	5 V, 10 A, 50 W DC power module
	N6732B	8 V, 6.25 A, 50 W DC power module
	N6733B	20 V, 2.5 A, 50 W DC power module
	N6734B	35 V, 1.5 A, 50 W DC power module
	N6735B	60 V, 0.8 A, 50 W DC power module
	N6736B	100 V, 0.5 A, 50 W DC power module
N6740 100 W DC power modules	N6741B	5 V, 20 A, 100 W DC power module
	N6742B	8 V, 12.5 A, 100 W DC power module
	N6743B	20 V, 5 A, 100 W DC power module
	N6744B	35 V, 3 A, 100 W DC power module
	N6745B	60 V, 1.6 A, 100 W DC power module
	N6746B	100 V, 1 A, 100 W DC power module
N6750 high-performance, autoranging DC power modules	N6751A	50 V, 5 A, 50 W high-performance autoranging DC power module
	N6752A	50 V, 10 A, 100 W high-performance autoranging DC power module
	N6753A	20 V, 50 A, 300 W high-performance autoranging DC power module (occupies 2 module slots in the mainframe)
	N6754A	60 V, 20 A, 300 W high-performance autoranging DC power module (occupies 2 module slots in the mainframe)
N6760 precision DC power modules	N6761A	50 V, 1.5 A, 50 W precision DC power module
	N6762A	50 V, 3 A, 100 W precision DC power module
N6770 300 W DC power modules	N6773A	20 V, 15 A, 300 W DC power module
	N6774A	35 V, 8.5 A, 300 W DC power module
	N6775A	60 V, 5 A, 300 W DC power module
	N6776A	100 V, 3 A, 300 W DC power module

TS-5040 specifications

Figure 5. Example of a fully equipped functional system

Table 3. TS-5040 functional testing specifications

Examples of the TS-5040 functional testing capabilities	
Automotive body/ comfort/safety electronics	Standard TS-5040 configuration with 34980A mainframe and modules meeting UUT test requirements. Potentially with additional switch load unit and cards.
Infotainment/RF/ telematics	Standard TS-5040 configuration. Potential upgrade to 2 m rack with additional RF instruments.
Flash programming application	Standard TS-5040 configuration. TxSL Throughput multiplier used to flash multiple UUTs.
Vision testing application	Standard TS-5040 configuration. Upgrade with specific vision test hardware and software.

Key specifications	
Rack size	0.6m x 0.75m x 0.95m
Power	230V AC, single phase, 50/60 Hz, 15A max
Conformity	Complies with EN 55011:1998 + A1:1999 CISPR 11:1997 (mod.) + A1:1999, Group 1, Class A conducting emissions

Target automotive test segments
Comfort and body, safety, Infotainment

Target automotive products
ABS, airbag, body controllers, climate control, dashboards, navigation systems

Options and upgrade paths	
Rack height	Standard: 0.75 m, optional: 2.0 m
Agilent switch load unit	Switch load unit and TS-5000 family of multi-channel loadcards (loadcards data sheet ordering number 5989-5822EN)
System upgrade	A full list of pre-qualified equipments for our functional test racks is available at **www.agilent.com/find/automotive**
Custom upgrade	Due to the open architecture the TS-5040 can be easily upgraded with additional instruments and custom components. More information on the TS-5040 automotive functional test system is available at **www.agilent.com/find/ts5040**

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LXI

www.lxistandard.org
LXI is the LAN-based successor to GPIB, providing faster, more efficient connectivity. Agilent is a founding member of the LXI consortium.

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