We Have The Solution To Your System Needs

Fully Integrated Test Systems For Any Application from DC to 50 GHz

Whether you choose one of our standard test systems – or have AR build a system to your specs – you'll be amazed at how easy, accurate, efficient, and affordable testing can be. Everything you need is right at your fingertips. It all works together perfectly, because everything has been carefully selected and assembled by AR engineers, using the most dependable and most innovative equipment on the market today.

Why An AR System Is The Smart Choice

- No company has more experience and expertise in EMC test equipment than AR
- Reduced Test Time – get products to market faster
- Increased Accuracy / Lower Risk
- Performance Guarantee – AR manufactures the majority of the critical system components allowing us to match and guarantee them to meet your requirements
- Everything is fully tested before being shipped
- Single source for support & service
- More Compact & Portable – numerous systems can be on one platform
- Free Automated Test Software

AR can deliver a solution that integrates all your testing needs: radiated and conducted immunity, radiated and conducted emissions, electrostatic discharge, lightning simulation…whatever you need.

We have the expertise and experience to supply fully automated systems needed to test various standards including IEC 61000, MIL-STD 461 and 464, DO-160, wireless, automotive, HIRF and HERO.

For information about Specifying RF/Microwave Power Amplifiers for EMC Testing, see Application Note #77.

AR can supply the systems needed to test to various standards including IEC, MIL-STD-461 and 464, DO-160, wireless, automotive, and HIRF. We can even build your ultimate turn-key system to include an anechoic chamber.

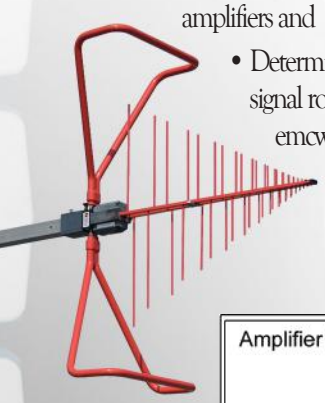
By fully understanding your specifications and requirements in the development of a system, we are able to propose a system that will meet all of your requirements. During the system development process, we will:

- Match equipment with appropriate components and guarantee performance
- Evaluate all packaging options including proper rack sizing, cooling options (air conditioning, blowers or liquid), AC power distribution, control and shielding
- Select the appropriate cabling, coax or waveguide, to match the amplifiers and accessories within the system
- Determine the best method of automation including signal routing (RF switching) and the integration of emcware EMC test software

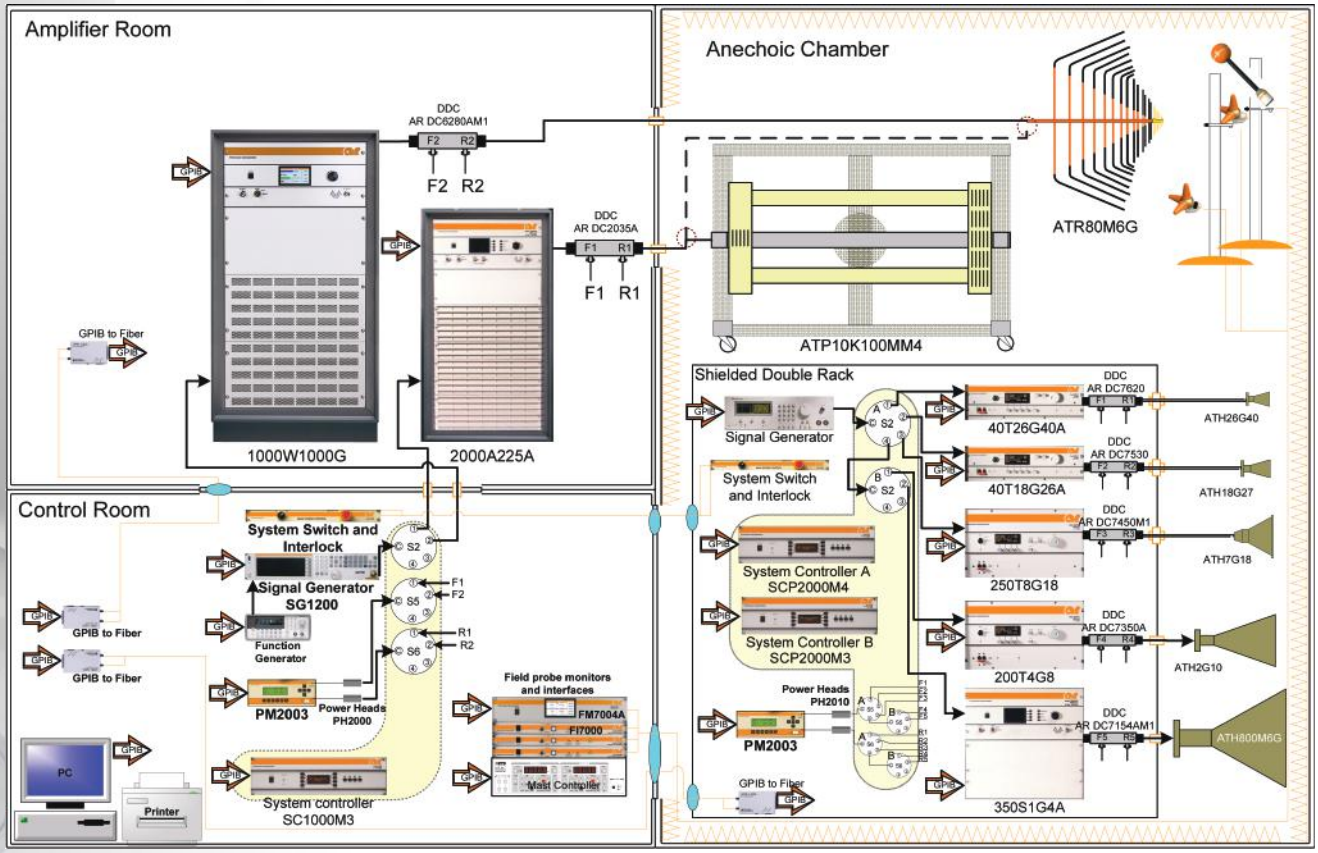
After your system has been designed and developed, we provide on-site installation and training when necessary. Our team of experienced system integrators will go step-by-step and explain how your system operates and provide support through your testing procedures.

We have several standard systems that can be modified to your requirements. If you have existing equipment, we can integrate them into a system or leave space for future expansion to higher frequencies and power levels..

With our AS systems, we do have the capabilities to provide turn-key and fully automated systems. We also offer SP (special package) systems which are racked equipment that has been designed to work together but is not fully integrated. AR has the experience and ability to take the integration as far as you are willing to go; from a simple racking of equipment (SP) to a fully integrated state of the art facility including installation with guaranteed performance or anything in between.



Schematic of a 200V/m System
10 kHz - 40 GHz



For Speed, Accuracy And Efficiency, You Can't Beat AR Systems

SP1053 1-18 GHz, MIL-STD-461, 200V/m, Radiated Immunity System on an electric scissor lift with a 1-6m adjustable antenna height.

We Have Many "Turn-Key Systems" To Take You As Far As You Want To Go.

AR Systems Make Testing Easy and Virtually Foolproof.

We have complete test systems that perform entire tests up to 50 GHz with just the press of a few buttons. Everything you need – amplifiers, antennas, couplers, signal generators, system controllers and more, along with the software to control it – all in one comprehensive test system.

Choose an AR Radiated Immunity Test System... or Let Us Customize to Your Specs

Video: AR Applications Engineer Discusses AR Turnkey Systems

Watch this new video on AR's Turnkey Systems and how we can meet your specific requirements.

AR RF/Microwave Instrumentation is proud to offer a wide range of turnkey system solutions for testing various standards including IEC, MIL-STD-461, MIL-STD-464, DO-160, Automotive and HIRF. AR currently offers standard and custom system solutions, tailored to fit your exact requirements. In this video, Applications Engineer Flynn Lawrence discusses an example of AR's turnkey system design and development.

http://bit.ly/ARSystemsDemo

Or scan this page with the Layar app to watch on your mobile device.

AS06007
AR MultiStar™ RF test system reduces radiated immunity test time by generating up to 10 frequencies simultaneously.

AR can deliver a solution that integrates all your testing needs: radiated immunity, conducted immunity, conducted emissions, radiated emissions, electrostatic discharge, electromagnetic simulation… whatever you need.

We have the expertise and experience to supply turn-key and fully automated systems needed to test various standards including IEC 61000, MIL-STD 461 and 464, DO-160, wireless, automotive, HIRF and HERO.

AS04210M2 800 MHz-4.2 GHz, IEC 61000-4-3
Photo Courtesy Kidde Safety

AS18069
Racked Equipment
80 MHz-18 GHz

Equipment list:

- Model 100S1G6M3, Amplifier, 0.7-6 GHz, 100 Watts CW
- Model 20S6G18A, Amplifier, 6.0-18.0 GHz, 20 Watts CW
- Model DC6180A, Dual Directional Coupler, 80-1000 MHz, 600W
- Model DC7205A, Dual Directional Coupler, 0.7-6 GHz, 250W
- Model DC7435A, Dual Directional Coupler, 4 GHz-18 MHz, 200 W
- Model SC1000M3, System Controller, DC-18 GHz
- Model PM2003, Power Meter, 3 Channel
- Model PH2004A, Power Head, 100kHz-18 GHz
- Model PH2000A, Power Head, 10kHz-8 GHz
- 35U Control rack, to house rack-mounted equipment, internal AC power distribution, emergency power off (EPO) switch, and all internal interconnect cables
- All internal interconnect cables between system components included
- Model emcware®, Radiated Susceptibility, Conducted Immunity, and Emissions Test Software included

Visit www.arworld.us for full specification details.

Size (H x W x D)	172.8 x 56.03 x 82.3 cm (68.01 x 22.06 x 32.4 in)
Weight	159.1 kg (350 lb)
Power Input	240VAC, 1-phase, 30 Amps

AR Systems (Partial List)

AR has designed and built turnkey test systems to perform Radiated and Conducted tests up to 50 GHz. The table below summarizes list of AR's latest systems designed to meet various test standards, including CISPR 32, IEC 61000-4-X, MIL-STD-461/464, DO-160-G, medical, automotive, telecom and HIRF.

Choose an AR test system that meets your requirements or let us customize to your specifications. To learn more about AR system configurations, please call one of our applications engineers at 800-933-8181.

AR System	Frequency Range	Test Standard(s)	Test Requirement(s)	Application(s)
AS00001	30 Hz to 100 kHz	MIL-STD-461G	RS101, Radiated Susceptibility- Magnetic Field	Military
AS00408	10 kHz to 400 MHz	MIL-STD-461G	CS114, Conducted Susceptibility- Curve #5-109dBuA	Military
AS01034	10 kHz to 1 GHz	ISO 11452-2/4	Radiated Immunity - 100 V/m @1m Conducted Immunity - 200mA	Automotive
AS02002	1 MHz to 2 GHz	ISO 11452-4	Conducted Immunity - 300mA	Automotive
AS03103	1.2 GHz to 3.1 GHz	FORD - FMC1278 GM - GMW3097	Radar Pulse - 600V/m @1m	Automotive
AS04236	200 MHz to 4.2 GHz	ISO 11452-2 FORD - FM1278 GM - GMW3097	Radiated Immunity - 150 V/m @1m Radar Pulse - 300V/m @1m	Automotive
AS06068	10 kHz to 6 GHz	ISO 11452-2/4 FORD - FM1278 GM - GMW3098	Radiated Immunity - 200 V/m @1m Conducted Immunity - 200mA Radar Pulse - 300V/m @1m	Automotive
AS06067	20 MHz to 6 GHz	ISO 11452-2/4 IEC 61000-4-3	Radiated Immunity - 200 V/m @1m - 30V/m plus 80%AM @3m	Automotive Commercial
AS06085	80 MHz to 6 GHz	IEC 61000-4-3	Radiated Immunity - 10V/m plus 80%AM @3m	Commercial
AS06071	80 MHz to 6 GHz	IEC 61000-4-3 IEC 60601-1-2 AIM 7351731	Radiated Immunity - 30V/m @3m -54V/m@1m Magnetic Field Immunity - 65A/m	Commercial Medical RFID
AS08014	80 MHz to 6 GHz	DO-160G, Section 20	Cat-R, Radiated Immunity - 150V/m @1m	Aerospace
AS08012	10 Hz to 8 GHz	DO-160G, Section 18, 20 & 21	Cat-T, Radiated Immunity - 10V/m @1m Cat-T, Conducted Immunity - 7.5mA Radiated and Conducted Emissions	Aerospace
AS10005	10 kHz to 10 GHz	EC 61000-4-3, GR-1089 CORE section 3 ETSI 300 386 IEEE 1613 Deutsche Telecom 1TR9 British Telecom GS7	Radiated Immunity - 20V/m with 80%AM @2.5m	Telecom
AS18091	1 GHz to 18 GHz	DO-160G, Section 20 ISO 11452-2 MIL-STD-461	Radiated Immunity - 200V/m @1m	Military Aerospace Automotive
AS18079	100 MHz to 18 GHz	RTCA/DO-160G, Section 20.6	Reverberation Chamber method Cat-G, Radiated Immunity -300V/m (CW) and 3000 V/m PM	Aerospace
AS40032 - RS, -RE	10 kHz to 40 GHz	MIL-STD-461G	RS103-Radiated Immunity – 200V/m@1m RE102-Radiated Emissions.	Military
AS40034	10 kHz to 40 GHz	MIL-STD-461G	RS103, Radiated Immunity - 200V/m @1m	Military

Learn More About AR Turnkey Systems, Webinar Available On Demand!

Critical Steps in Designing EMC Test Systems

In this presentation AR discusses the most critical aspects of designing an EMC test system to meet your specific needs and requirements. Focus will be on selecting and sizing the appropriate equipment and learning the appropriate questions to ask in order to achieve these goals.
AR has the experience to develop full-turnkey solutions for a multitude of requirements – not only RI and CI, but RE and CE as well.

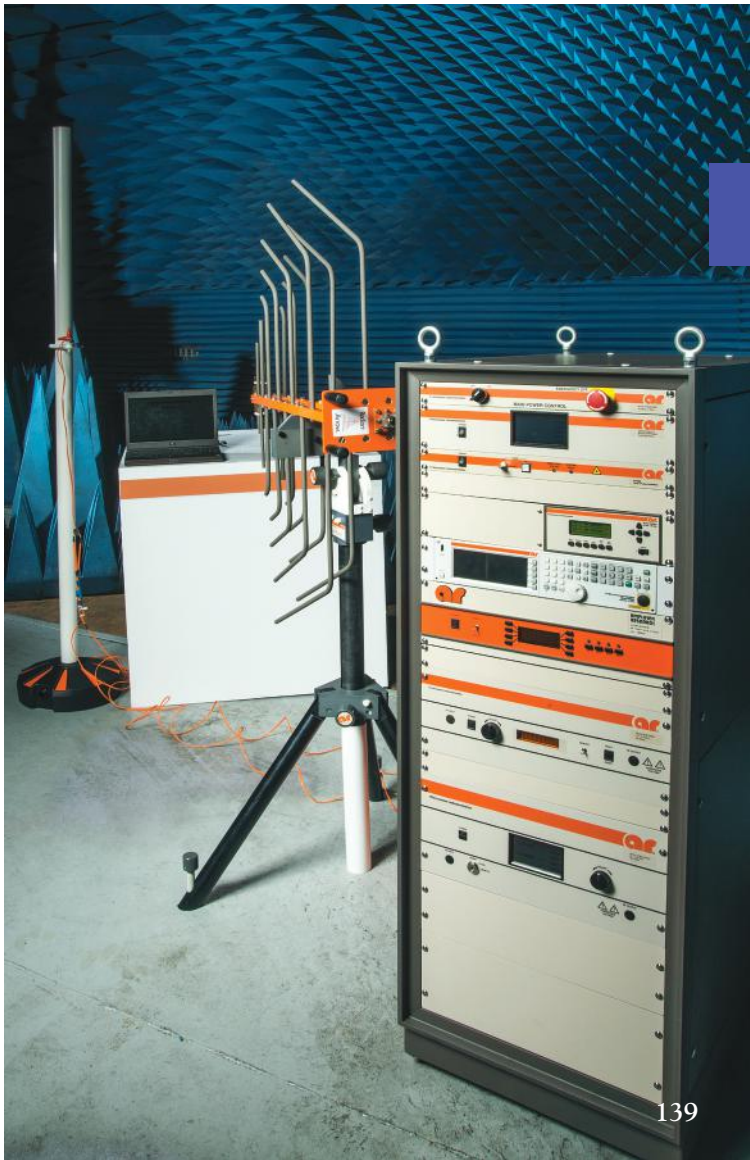
What Will You Learn from this Webinar?

- EMC Test System Basics
- Common EMC Test Standards
- Defining Test System Requirements
- Sizing Components
- Sourcing Components and Systems
- Future Considerations / Expansion
- Basic Radiated Immunity Test System Example
- AR System Examples

Learn How to Define Your System Requirements

Watch the Webinar

Visit www.arworld.us/design or scan this page with the Layar app to watch on your mobile device.



AR...The Force Behind The Field

AR's High Intensity Radiated Fields (HIRF) Equipment Designed To Meet Tomorrow's Needs

Inherent danger associated with High Intensity Radiated Fields (HIRF) is becoming increasingly evident with the growing complexity of military and aircraft systems. Sources of HIRF include high power radars, weapons, and naturally occurring environmental conditions. Unprotected equipment can fail with potentially devastating results. So to prevent possible catastrophes, you must qualify them for harsh HIRF environments by testing the equipment with AR amplifiers and power-matched antennas.

AR's ability to provide test systems with the highest power wide band amplifiers and power matched antennas to produce these HIRF and other high field environments has become AR's claim to fame.

With the recent acquisition of Sunol Sciences, now SunAR RF Motion, AR can offer a broad range of complementary positioning equipment and reverberation tuners for EMC and HIRF testing; all from one company.

Whether you're generating HIRF per MIL-STD-464 testing, DO-160, or recreating RF/microwave environments for intelligence/counterintelligence/jamming measures, and infrastructure susceptibility testing, AR has the range of solutions to make you feel at ease. And don't forget AR's limitless service and support network is second to none.

Available HIRF System Components

RF Power Amplifiers For CW Tests

Model 16000A225, RF Amplifier, 10 kHz-225 MHz, 16000 Watts
Model 50000A100, RF Amplifier, 30 MHz-100 MHz, 50000 Watts
Model 10000W1000A, RF Amplifier, 80 MHz-1000 MHz, 10000 Watts
Model 3000S1G2z5, RF Amplifier, 1-2.5 GHz, 3000 Watts
Model 1500T2G8B, RF Amplifier, 2.5-7.5 GHz, 1500 Watts
Model 1500T8G18, RF Amplifier, 7.5-18 GHz, 1500W
Model 200T18G26z5A, RF Amplifier, 18-26.5 GHz, 200W
Model 200T26z5G40A, RF Amplifier, 26.5-40 GHz, 200W

RF Power Amplifiers for Pulse Tests

Model 10000W1000A, RF Amplifier, 80 MHz-1000 MHz, 10000 Watts
Model 8000SP0z8G2z5, RF Amplifier, 0.8-2.5 GHz, 8000 Watts
Model 6900TP2G4, RF Amplifier, 2-4 GHz, 6900 Watts
Model 7400TP4G8, RF Amplifier, 4-8 GHz, 7400 Watts
Model 8300TP8G12, RF Amplifier, 8-12 GHz, 8300 Watts
Model 5700TP12G18, RF Amplifier, 12-18 GHz, 5700 Watts

Antennas CW Tests

Stripline Antenna, 10 kHz – 30 MHz
Model ATP10K100M, Broadband Transmission Line, 10 kHz-100 MHz, 3000W
Model ATR26M1G, Log Periodic Antenna, 26-1000 MHz, 20000W
Model ATH800M5GA, High Gain Horn Antenna, 800 MHz-5 GHz, 1500W
Model ATH2G8A-1, Horn Antenna, 2.5-7.5 GHz, 12000W
Model ATH7G18, High Gain Horn Antenna, 7.5-18 GHz, 2800W
High Gain Horn Antenna, 8-12 GHz, 10000W
High Gain Horn Antenna, 18-26.5 GHz, 300W
High Gain Horn Antenna, 26.5-40 GHz, 200W

Antennas for Pulse Tests

Stripline Antenna, 10 kHz – 30 MHz
Model ATP10K100M, Broadband Transmission Line, 10 kHz-100 MHz, 3000W
Model ATR26M1G, Log Periodic Antenna, 26-1000 MHz, 20000W
Horn Antenna, Quad Array, 400-1000 MHz, 13000W
Horn Antenna, Quad Array, 1-1.6 GHz, 2kW CW, 13kW Peak
Horn Antenna, Quad Array, 1.5-2.6 GHz, 1.4kW CW, 13kW Peak
High Gain Horn Antenna, 2.6-4 GHz, 700W CW, 10kW Peak
High Gain Horn Antenna, 4-6 GHz, 150W CW, 5kW Peak
High Gain Horn Antenna, 6-8 GHz, 150W CW, 5kW Peak
High Gain Horn Antenna, 8-12 GHz, 10kW CW
High Gain Horn Antenna, 12-18 GHz, 2.2kW CW, 80kW Peak

Other Equipment

Field Probes
Power Meters
System Interlock
RF Switches
Directional Couplers
Signal Generators
System Software
Positioning Equipment
Shielded Racks
Equipment Lifts

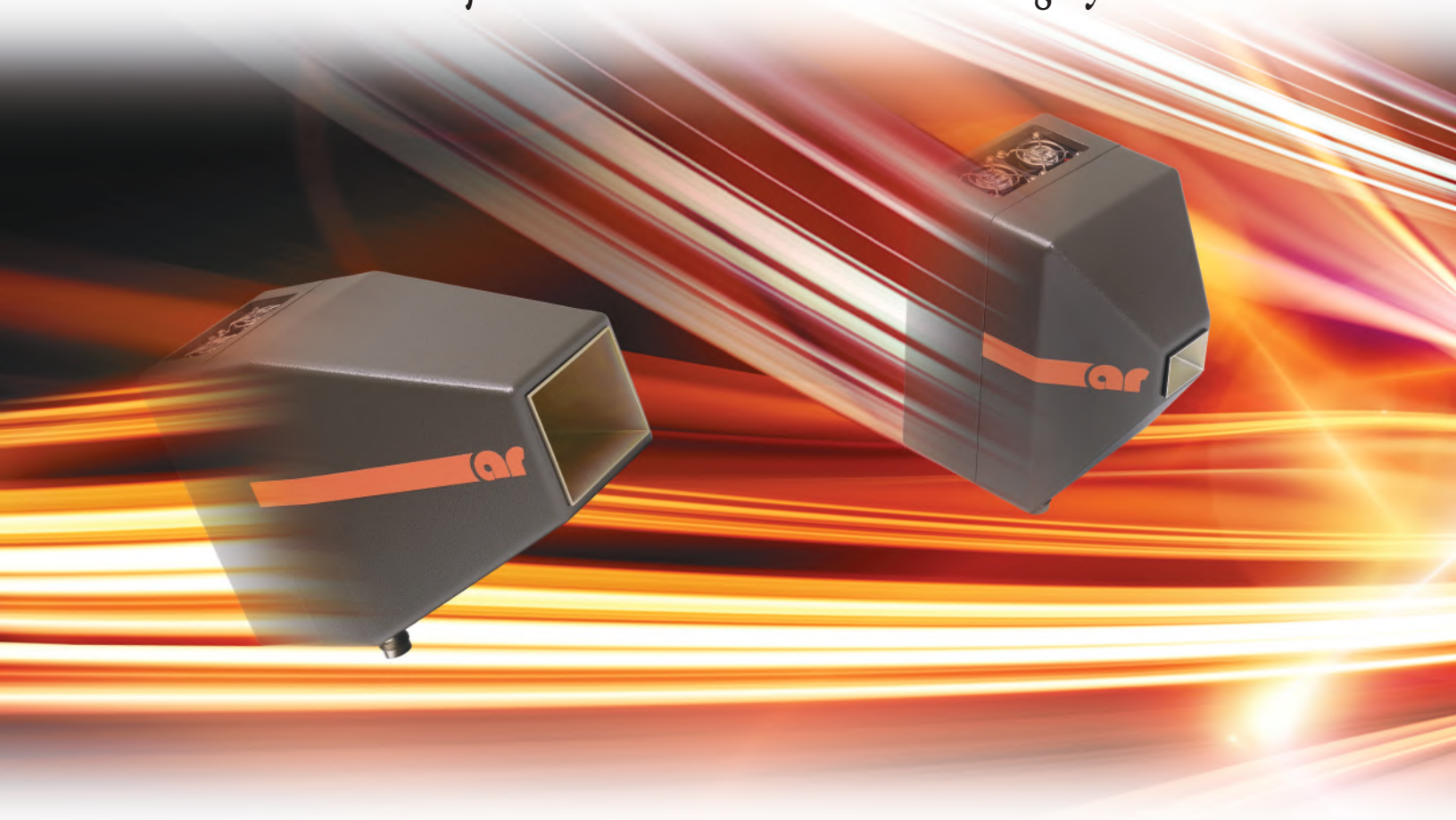
Customized system designed to address EUT height test requirement.

Shielded radiated system allows operation inside chamber during radiated immunity testing.

MIL-STD-464
Radiated Immunity
Test System

Another Breakthrough

New State of the Art Solid State Field Generating Systems



18 To 40 GHz Solid State Field Generation

Revolutionary Products! Solid State Amplifier and Antenna Combinations Generate Up to 50 V/m

AR RF/Microwave Instrumentation has just introduced a line of state-of–the-art solid state field generating systems for numerous markets and applications. These products offer a very attractive alternative to using Traveling Wave Tube Amplifiers (TWTAs) driving separate antennas to generate field strength up to 50 V/m. Performance characteristics of this magnitude (both in frequency and output power) were previously dominated by low MTBF, short warranty TWTAs; but these new solid state designs offer better performance, increased reliability, and a 3-year warranty with the best support in the industry.

"AA" Systems

Model	*Description*
AA1000	Rack mounted Power Supply, control circuitry, and fault monitoring
AA18G26-20	18 to 26.56 GHz, producing a field strength of 20V/m at 1 meter
AA18G26-50	18 to 26.56 GHz, producing a field strength of 50V/m at 1 meter
AA26G40-20	26.5-40 GHz, producing a field strength of 20V/m at 1 meter
AA26G40-50	26.5-40 GHz, producing a field strength of 50V/m at 1 meter

Field Strengths Up To 50 V/m

The amplifier and horn antenna combination form one completely housed unit which may be tripod mounted. These new "AA" series systems produce field strengths up to 50V/m in two band-specific models over the 18 to 40 GHz frequency range when driven with a suitable signal generator. A separate rack mounted unit (AA1000) contains the power supply and control circuitry (RF & DC cables included) for interfacing with these products. Please note that the rack mounted assembly can be used for any of the AA series designs. AR can supply the AA model(s) and AA1000, in addition to a signal generator for a complete turnkey system. Standard products cover 18 - 26.5 GHz and 26.5 - 40 GHz frequency ranges.

Applications include EMC Radiated Susceptibility for MIL-STD-461 Testing, Radar Systems, Communications, and TWT Replacements.

AA1000

Power Supply & Control

Primary Power (Universal; selected automatically): 100-240 VAC, 50/60Hz

Connectors (Rack Unit):

RF Input:	2.92 mm (K-type) female
RF Output:	2.92 mm (K-type) female
DC Output:	Twinax

Remote Interfaces:

IEEE-488:	24-pin female
RS-232:	9-pin sub D (female)
Fiber optic:	ST Conn Tx and Rx RS-232
USB 2.0:	Type B
Ethernet:	RJ-45
Safety Interlock:	15-pin subminiature D

Cooling: Forced air (self contained fans)

Weight:

Rack Unit:	4.5kg (10lb)

Size (W x H x D):

Rack Unit:	48.3cm x 8.9cm x 53.3cm 19in x 3.5in x 21in

Environmental:

Operating Temperature:	5°C / +40°C Operating
Altitude:	up to 2000M
Shock and vibration:	Normal Truck Transport

Regulatory Compliance:

EMC	EN 61326-1
Safety	UL 61010-1 CAN/CSA C22.2 #61010-1 CENELEC EN 61010-1
RoHS	Directive 2011/65/EU
WEEE	Directive 2012/19/EU

Export Classification: EAR99

AA18G26-20

18 - 26.5 GHz, 20 V/m

Rated Field Strength: Minimum 20 V/m at 1 meter antenna distance

Maximum Amplifier Input: +10 dBm max

Frequency Response: 18–26.5 GHz instantaneous

3dB Beamwidth:

AA18G26-20:	E Plane: 17.5 degrees H Plane: 17.8 degrees

3dB Spot Size @ 1m:

AA18G26-20:	0.31m x 0.31m

Modulation Capability:
Will faithfully reproduce AM, FM, or Pulse modulation appearing on input signal.

Spurious: Minus 65 dBc typical

Primary Power (Supplied by AA1000): 8 VDC @ 6 Amps max, +24VDC @ 1 Amp max

Connectors:

RF Input:	2.92 mm (K-type) female
DC Input:	Twinax

Cooling: Forced air (self contained fans)

Weight:

AA18G26-20:	2.5kg (5.5lb)

Size (W x H x D):

AA18G26-20:	12.1cm x 18.4cm x 17.8cm 4.75in x 7.25in x 7in

Environmental:

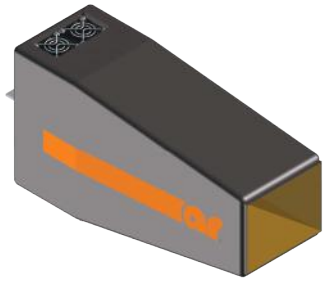
Operating Temperature:	5°C/+40°C
Operating Altitude:	up to 2000M
Shock and vibration:	Normal Truck Transport

Regulatory Compliance:

EMC	EN 61326-1
Safety	UL 61010-1 CAN/CSA C22.2 #61010-1 CENELEC EN 61010-1
RoHS	Directive 2011/65/EU
WEEE	Directive 2012/19/EU

Export Classification: EAR99

AA18G26-50



18 - 26.5 GHz, 50 V/m

Rated Field Strength: Minimum 50 V/m at 1 meter antenna distance

Maximum Amplifier Input: +10 dBm max

Frequency Response: 18–26.5 GHz instantaneous

3dB Beamwidth:

AA18G26-50:	E Plane: 8.1 degrees H Plane: 9.5 degrees

3dB Spot Size @ 1m:

AA18G26-50:	0.14m x 0.17m

Modulation Capability:
Will faithfully reproduce AM, FM, or Pulse modulation appearing on input signal.

Spurious: Minus 65 dBc typical

Primary Power (Supplied by AA1000): 8 VDC @ 6 Amps max, +24VDC @ 1 Amp max

Connectors:

RF Input:	2.92 mm (K-type) female
DC Input:	Twinax

Cooling: Forced air (self contained fans)

Weight:

AA18G26-50:	2.7kg (6lb)

Size (W x H x D):

AA18G26-50:	12.1cm x 18.4cm x 35.6cm 4.75in x 7.25in x 14in

Environmental:

Operating Temperature:	5°C/+40°C
Operating Altitude:	up to 2000M
Shock and vibration:	Normal Truck Transport

Regulatory Compliance:

EMC	EN 61326-1
Safety	UL 61010-1 CAN/CSA C22.2 #61010-1 CENELEC EN 61010-1
RoHS	Directive 2011/65/EU
WEEE	Directive 2012/19/EU

Export Classification: EAR99

AA26G40-20

26.5 - 40 GHz, 20 V/m

Rated Field Strength:
Minimum 20 V/m at 1 meter antenna distance
Maximum Amplifier Input: +10 dBm max
Frequency Response: 26.5–40 GHz instantaneous
3dB Beamwidth:
AA26G40-20: E Plane: 16.7 degrees
H Plane: 18.3 degrees
3dB Spot Size @ 1m:
AA26G40-20: 0.29m x 0.32m
Modulation Capability:
Will faithfully reproduce AM, FM, or Pulse modulation appearing on input signal.
Spurious: Minus 65 dBc typical
Primary Power (Supplied by AA1000):
8 VDC @ 6 Amps max, +24VDC @ 1 Amp max
Connectors:
RF Input: 2.92 mm (K-type) female
DC Input: Twinax
Cooling: Forced air (self contained fans)
Weight:
AA26G40-20: 2.5kg (5.5lb)
Size (W x H x D):
AA26G40-20: 12.1cm x 18.4cm x 15.2cm
4.75in x 7.25in x 6in
Environmental:
Operating Temperature: 5°C/+40°C
Operating Altitude: up to 2000M
Shock and vibration: Normal Truck Transport
Regulatory Compliance:
EMC: EN 61326-1
Safety: UL 61010-1
CAN/CSA C22.2 #61010-1
CENELEC EN 61010-1
RoHS: Directive 2011/65/EU
WEEE: Directive 2012/19/EU
Export Classification: 3A001

AA26G40-50

26.5 - 40 GHz, 50 V/m

Rated Field Strength:
Minimum 50 V/m at 1 meter antenna distance
Maximum Amplifier Input: +10 dBm max
Frequency Response: 26.5–40 GHz instantaneous
3dB Beamwidth:
AA26G40-50: E Plane: 8.3 degrees
H Plane: 9.7 degrees
3dB Spot Size @ 1m:
AA26G40-50: 0.15m x 0.17m
Modulation Capability:
Will faithfully reproduce AM, FM, or Pulse modulation appearing on input signal.
Spurious: Minus 65 dBc typical
Primary Power (Supplied by AA1000):
8 VDC @ 6 Amps max, +24VDC @ 1 Amp max
Connectors:
RF Input: 2.92 mm (K-type) female
DC Input: Twinax
Cooling: Forced air (self contained fans)
Weight:
AA26G40-50: 2.7kg (6lb)
Size (W x H x D):
AA26G40-50: 12.1cm x 18.4cm x 25.4cm
4.75in x 7.25in x 10in
Environmental:
Operating Temperature: 5°C/+40°C
Operating Altitude: up to 2000M
Shock and vibration: Normal Truck Transport
Regulatory Compliance:
EMC: EN 61326-1
Safety: UL 61010-1
CAN/CSA C22.2 #61010-1
CENELEC EN 61010-1
RoHS: Directive 2011/65/EU
WEEE: Directive 2012/19/EU
Export Classification: 3A001

We're In The Business Of Making Your Life Easier

AS00202
4 kHz – 200 MHz System

AS03010
10 kHz – 3 GHz System

RF Conducted Immunity Testing to IEC, Military & Automotive Standards

If you are tired of mixing and matching various components, try AR's complete line of RF Conducted Immunity Test Systems. We now make one fully configured and standalone CI System from 4 kHz to 400 MHz with output powers designed to meet the latest commercial, custom and military standards. In addition, ARI provides configurable systems to meeting your specific requirements of increased power and frequency range. Each CI System has the built-in flexibility to conduct standard and customized tests using our supplied user-friendly software that can generate reports directly into Microsoft® Word or Excel.

Our job is to make your job easier.

CI00402

100 Watts, 10 kHz–400 MHz

Complete Testing Solutions to the following standards: MIL-STD461D & E CS114, DO160D & E, EN/IEC 61000-4-6, IEC 60601- 1-2, EN 50130-4, EN 61000-6-1/2, EN 55024, ISO 11452-4, GMW 3097, ES-XW7T-1A278-AC, DC-11224, BMW GS95002, and other automotive standards.

Internal Test Specifications*

MIL-STD-461D, CS114, MIL-STD-461E, CS114, DO160D Section 20 BCI testing, DO160E, Section 20 BCI testing IEC/EN 60601-1-2, IEC 610004-6 procedure and levels IEC/EN 501304, IEC/EN 61326, IEC/EN 61000-6-1 IEC/EN 61000-6-2, CISPR 24/EN 55024, ISO 11452-4, GMW 3097, ES-XW7T-1A278-AC, DC-11224, BMW GS95002, and other automotive standards.

Signal Generator Specifications

Frequency Range/Resolution	9 kHz to 1.5 GHz / 0.01 Hz
Power Range/Resolution	-110 to +13 dBm / 0.01 dB
Modulation	AM, FM, Phase, Int. Pulse, Ext Pulse

Spectrum Analyzer Specifications

Frequency Range/Resolution	9 kHz to 1.5 GHz / 1 Hz
RF Power Range Resolution	-110 dBm to +13 dBm steps
Preamplifier Gain	20 dB (nom)
Sweep Time Span	> 100 Hz, 10 msec. to 1500 sec.

RF Solid State Amplifier Specifications

Frequency Range	10 kHz to 400 MHz
Power Rating	100 watts min.
	At 1 dB compression the power is 75 watts min.
Harmonic Distortion	-20 dBc at 75 Watts
Mismatch Tolerance	
	100% of rated power without fold back. Will operate without damage or oscillation with any magnitude of source and load impedance.
Gain	50 dB min.

Connections

RF Out	Type N Male (front)
Monitor Port In	Type N Male (front)
Signal Generator Out	Type N Male (rear)
RF Amp In/Out	Type N Male (rear)
Communication	USB (rear)
Directional Coupler Fwd Out	Type SMA (rear)
Directional Coupler Fwd In	Type SMA (rear)
Directional Coupler Rev Out	Type SMA (rear)
Directional Coupler Rev In	Type SMA (rear)

General

Power	115/230 VAC, 50/60 Hz, single phase 16 A
Breaker	2 pole, 20 A
Cooling	Active cooling, air ventilation
Environmental Conditions	10°C - 40°C (50°F - 104°F)
Dimensions	50.3 x 42.2 x 52.1 cm (19.8 x 16.6 x 21.7 in)
Weight	22.7 kg (50 lb)

PC Requirements

Computer	Minimum Intel Pentium 4/AMD Athion 64 or faster processor
Operating System	Windows, 7, 8 or 10
RAM	2 GB Minimum
Free Hard Drive Space	2 GB
Screen Resolution	1024 x 768
Ports	2 available USB ports
Software Requirements	Microsoft Word/Excel 2007 or newer

Options

1. Data acquisition card
2. Laptop PC with software preinstalled
3. Amplifier removed; requires use of external amplifier.

Model Configurations

CI00402M1	Includes Option 1
CI00402M2	Includes Option 2
CI00402M3	Includes Option 3

AS00202

100 Watts, 4 kHz–200 MHz

Complete Testing Solutions, from 4 kHz to 200 MHz, to the following standards: MIL-STD-461F & G CS114, DO160D & E, EN/IEC 61000-4-6, IEC 60601- 1-2, EN 50130-4, EN 61000-6-1/2, EN 55024, ISO 11452-4, GMW 3097, ES-XW7T-1A278-AC, DC-11224, BMW GS95002, and other automotive standards.

Internal Test Specifications*

MIL-STD-461F & G, CS114, DO160D Section 20 BCI testing, DO160E, Section 20 BCI testing IEC/EN 60601-1-2, IEC 61000-4-6 procedure and levels IEC/EN 50130-4, IEC/EN 61326, IEC/EN 61000-6-1 IEC/EN 61000-6-2, CISPR 24/EN 55024, ISO 11452-4, GMW 3097, ES-XW7T-1A278-AC, DC-11224, BMW GS95002, and other automotive standards.

Signal Generator Specifications

Frequency Range	9 kHz to 1 GHz
Amplitude Resolution	0.01 dB
Modulation	AM, PM, Pulse Modulation
Power Range	+16 dBm

Oscilloscope Specifications

Channel	4
Bandwidth	200 MHz
Waveform Generation	Function/Arbitrary

RF Solid State Amplifier Specifications

Two amplifiers are used in this system; 350AH1M3 and 100A400. Each is a self-contained, air cooled, broadband Class A solid state amplifier.

Connections

RF Out	Type N Male (front)
Monitor Port In	Type N Male (front)
Communication	GPIB (rear)
Directional Coupler Fwd Out	Type SMA (rear)
Directional Coupler Fwd In	Type SMA (rear)
Directional Coupler Rev Out	Type SMA (rear)
Directional Coupler Rev In	Type SMA (rear)

General

Power	240 VAC, 30 A
Cooling	Active air cooling, air ventilation
Environmental Conditions	10°C to 40°C (50°F - 104°F)
Dimensions (H x W x D)	150.52 x 56.03 x 82.3 cm (59.26 x 22.06 x 32.4 in)
Weight	95.5 kg (210 lb)

PC Requirements

Computer	Minimum Intel Pentium 4/AMD Athlon 64 or better processor
Operating system	Windows, 7, 8 or 10
RAM	2 GB Minimum
Free Hard Drive Space	2 GB
Screen resolution	1024 x 768
Ports	2 available USB ports
Software Requirements	Microsoft Word/Excel 2007 or newer

AS03010

100 Watts, 10 kHz–3 GHz

The AS03010 AR System has been specifically designed to perform Automotive Conducted Immunity testing over the frequency range of 10 kHz–3 GHz at test levels of up to 200 mA.

Internal Test Specifications*

MIL-STD-461F & G, CS114, DO160D Section 20 BCI testing, DO160E, Section 20 BCI testing IEC/EN 60601-1-2, IEC 61000-4-6 procedure and levels IEC/EN 50130-4, IEC/EN 61326, IEC/EN 61000-6-1 IEC/EN 61000-6-2, CISPR 24/EN 55024, ISO 11452-4, GMW 3097, ES-XW7T-1A278-AC, DC-11224, BMW GS95002, and other automotive standards.

Signal Generator Specifications

Frequency Range	9 kHz to 3 GHz
Amplitude Resolution	0.01 dB
Modulation	AM, PM, Pulse Modulation
Power Range	-144 to +26 dBm

Spectrum Analyzer

Frequency Range	9 kHz to 3 GHz
Frequency Resolution	1 Hz
Detectors	Positive & negative peak, sample, normal, RMS
Amplitude Accuracy	± 0.5 dB, typical

Power Meter & Head

Channels	3
Number of Power Heads	2
Type	Diode
Frequency	10 kHz – 8 GHz
Range	-60 dBm to +20 dBm

RF Solid State Amplifier Specifications

Two amplifiers are used in this system; 25U1000, and 20S1G4. Each is a self-contained, air cooled, broadband Class A solid state amplifier.

Connections

RF Out	Type N Male (front)
Monitor Port In	Type N Male (front)
Communication	GPIB (rear)

General

Power	240 VAC, 30 A
Cooling	Active air cooling, air ventilation
Environmental Conditions	10°C to 40°C (50°F - 104°F)
Dimensions (H x W x D)	150.52 x 56.1 x 82.3 cm (59.3 x 22.1 x 32.4 in)
Weight	131.8 kg (290 lb)

PC Requirements

Computer	Minimum Intel Pentium 4/AMD Athlon 64 or better processor
Operating System	Windows, 7, 8 or 10
RAM	2 GB Minimum
Free Hard Drive Space	2 GB
Screen Resolution	1024 x 768
Ports	2 available USB ports
Software Requirements	Microsoft Word/Excel 2007 or newer

* Specifications can be met using AR-specified external accessories (injection probes, monitor probes, calibration fixtures, CDN's, attenuators, etc.). Options are available on all systems. See specification sheet for detailed information. Note that Option 1 is required to satisfy these test specifications.

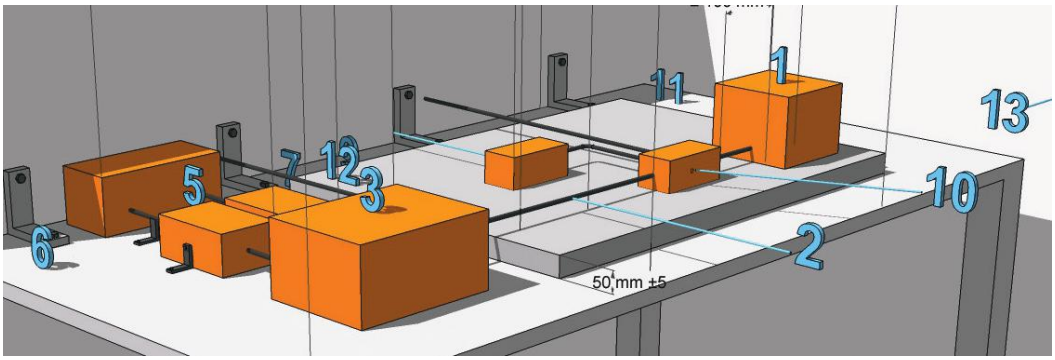
ISO 11452-4 Automotive Conducted Immunity Test Considerations

New Low Cost, CI00402

Conducted Immunity Systems contain all components necessary to perform conducted immunity testing to the most widely used standards, with the AR CI00402 specifically designed to perform test in accordance with most auto manufacturers. In addition, AR offers amplifiers and test equipment necessary to perform 11452-4 Component Test Methods for electrical disturbance from narrowband radiated electromagnetic energy - harness excitation methods (1 MHz - 3 GHz).

Tubular Wave Coupler Test Set-Up

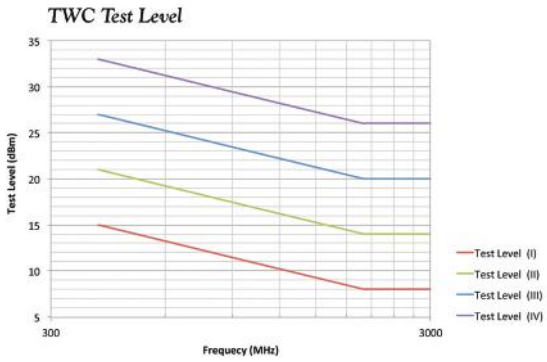
1. DUT (connected to ground if specified in the test plan)
2. wiring harness or harnesses
3. load simulator (placement and ground connection according to section 7.5 of ISO 11452-4)
4. stimulation and monitoring system*
5. power supply
6. Artificial Network (AN)
7. optical fibers
8. high-frequency equipment*
9. 50 Ω load*
10. tubular wave coupler
11. ground plane (connected to the shielded room)



12. low relative permittivity support ($\varepsilon_r \leq 1,4$)
13. shielded room

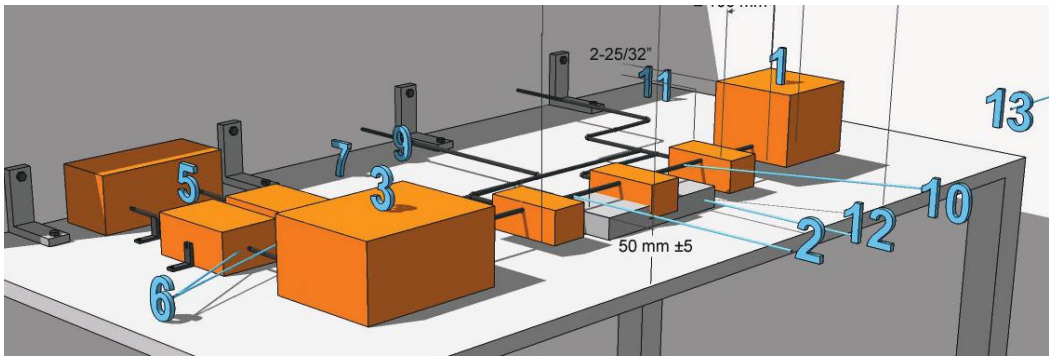
*Required equipment not shown in diagram

Examples of test severity levels for TWC are shown on the right. Specific values may differ depending on the manufacturer's requirements.



BCI Test Set-Up

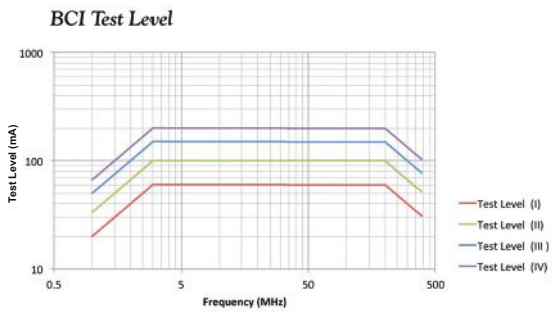
1. DUT (connected to ground if specified in the test plan)
2. wiring harness or harnesses
3. load simulator (placement and ground connection according to section 7.5 of ISO 11452-4)
4. stimulation and monitoring system*
5. power supply
6. Artificial Network (AN)
7. optical fibers
8. high-frequency equipment*
9. optional current measurement probe*
10. injection probe (represented at 3 positions)
11. ground plane (connected to the shielded room)



12. low relative permittivity support ($\varepsilon_r \leq 1,4$)
13. shielded room

*Required equipment not shown in diagram

Examples of test severity levels for BCI are shown on the right. Specific values may differ depending on the manufacturer's requirements.



3 GHz RF Conducted Immunity Test System

AS030710

Test Levels up to 500 mA
Testing from 10 kHz to 3 GHz for:

- IEC
- MIL-STD
- DO-160
- ISO
- Automotive Manufacturer's Standards

Testing up to 3 GHz?
The components below are the new standard.

Main Components Of A BCI & TWC System*

AR 150A400M3, RF Amplifier, 100kHz-400MHz, 150 Watts CW

AR 30W1000CM3, RF Amplifier, 1-1000MHz, 30 Watts CW

AR 20S1G4M3, RF Amplifier, 700MHz-4.2GHz, 20 Watts CW

Signal Generator, 9kHz-3GHz

AR PM2003, 3 Channel Power Meter

Spectrum Analyzer, 9kHz-3GHz

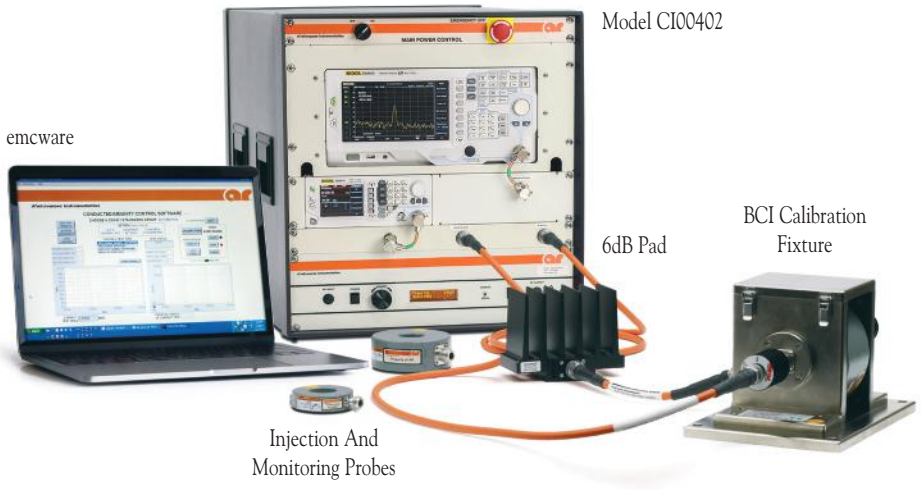
Network Analyzer, 100kHz-3GHz

AR SC1000M1, System Controller

AR Control PC with EMCWare software

* Miscellaneous components such as directional couplers, clamps, attenuators, etc are also necessary for this set up.

Testing up to 400 MHz



Model CF30000
Tubular Wave Coupler

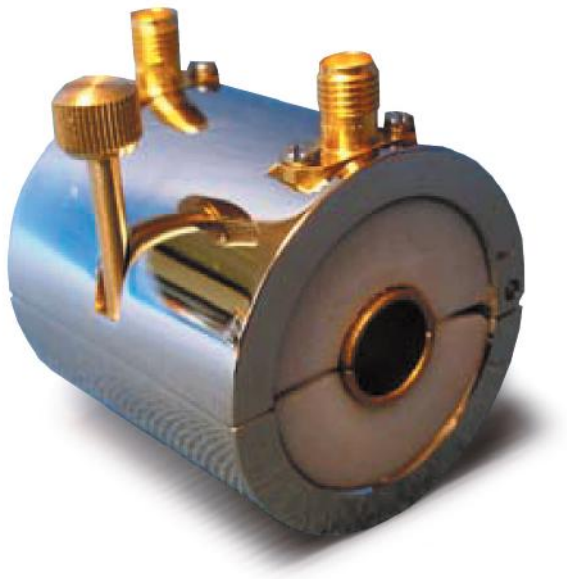
Model BI30000 Series Tubular Wave Couplers

Freq. (MHz)	BCI Probe	Required Calibration Accessories	
		Calibration Fixture	Termination
1 - 400	BI00401	CF00400	TL50050
400 -3000	BI30000	CF30000	TL50050

Conducted Immunity and Emissions Tubular Wave Couplers

Our series of compact, versatile, affordable Tubular Wave Couplers is suitable for immunity testing and emissions measurement of power leads or other connection lines. The BI30000 Series features a bandwidth from 400 MHz to 3 GHz for immunity testing and 150 kHz to 3 GHz for emissions testing.

Immunity testing, using the BI30000 Series, is similar to a BCI probe as used in ISO 11451-2, ISO 11452-4, or IEC 61000-4-6, and emission measurements can be taken as a current probe according to EN 55025 (CISPR 25). With the proposed standards coming up in the automotive industry, the BI30000 Series will provide a low cost alternative to perform conductive testing up to 3 GHz.

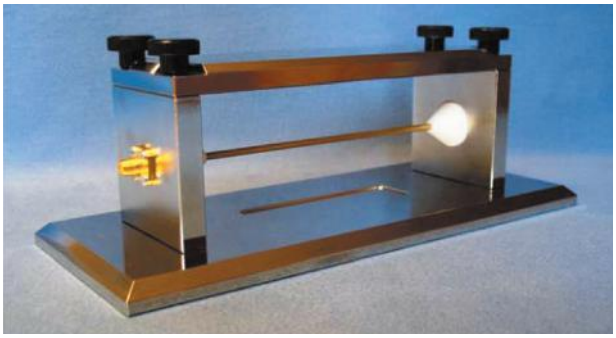


	BI30410	BI30413	BI30416	BI30520	BI30526
ISL Value <10 dB	0.50–2.80 GHz	0.60–2.80 GHz	0.80–2.50 GHz	0.60–1.40 GHz	
ISL Value < 20 dB	0.15–3.00 GHz	0.15–3.00 GHz	0.20–3.00 GHz	0.15–2.50 GHz	0.20–2.50 GHz
Size (LxW)	40 x 40 mm (1.575 x 1.575 in.)	40 x 40 mm (1.575 x 1.575 in.)	40 x 40 mm (1.575 x 1.575 in.)	50 x 50 mm (1.97 x 1.97 in.)	50 x 50mm (1.97 x 1.97 in.)
Internal Diameter	10 mm (0.394 in.)	13 mm (0.512 in.)	16 mm (0.630 in.)	20 mm (0.787 in.)	26 mm (1.02 in.)

M1 versions of the above models are available with 17025-compliant calibration.

Tubular Wave Coupler Calibration Kit

AR offers the CF30000 calibration fixture. This fixture is designed to work with the BI30000 Series Tubular Wave Couplers for the purpose of level setting prior to conducted immunity testing.



	Model CF30000
Frequency Range	150 MHz–3 GHz
Calibration Power (max. watts)	4 CW
Input Impedance	50Ω
Connectors	SMA(F)
Max. Diameter of TWC	50 mm (1.97 in.)
Length of coupling line	120 mm (4.72 in.)
Weight	1.1 kg 2.42 lb
Size (approx.) L x W x H	230 x 95 x 90 mm (9.05 x 3.74 x 3.54 in.)

RF Conducted Probes and Clamps

The following accessories are for use with our RF Conducted Immunity CI System Model CI00402.

Coupling/Decoupling Networks

AR offers a full line of coupling/decoupling networks to couple mode signals onto power supply lines. Designed to meet IEC 61000-4-6 specification requirements. All models are available in 16, 25, 32, 50, 100, 200 or 300 amps and available in 1 to 5 conductor cables.

CD10000 Series – 1 conductor
CD20000 Series – 2 conductors
CD30000 Series – 3 conductors (L-N-PE)
CD40000 Series – 4 conductors (3 phase with neutral)
CD50000 Series – 5 conductors (3 phase with neutral and PE)

Also available are coupling/decoupling networks (CDN's) for:

- Non-balanced lines – available for 2, 3, 4 or 8 lines
- Screened cables – available for 2, 3, 4, 9, 15 or 25 cables
- Unscreened balanced pair – available in 1, 2 or 4 pair

Matching calibration adapters for our CD and CDN's and 1 or 50 watt, 50 ohm termination resistors are available.

Bulk Current Injection Probes

AR offers several models of bulk current injection probes for coupling disturbances onto unshielded cables in their specified frequency range.

- BI00250: 10 kHz – 250 MHz, 40mm ID, used for testing IEC 61000-4-6 RF Conducted Immunity
- BI00251: 10 kHz – 250 MHz, 66mm ID, used for testing IEC 61000-4-6 RF Conducted Immunity
- BI00400: 10 kHz – 400 MHz, 40mm ID, used for testing MIL-STD 461, CS114 and DO160 RF Conducted Immunity
- BI00401: 1 – 400 MHz, 40mm ID, used for testing to ISO 11452-4 and SAE J1113-4 Automotive RF Conducted Immunity
- BI01000: 100 kHz – 1000 MHz, 40mm ID, used for testing Automotive RF Conducted Immunity

Current Monitor Probes

AR offers a line of clamp-on monitoring probes that are used to measure RF currents flowing through the conductor onto which the probe is placed. The following models are available:

- BP00100: 100Hz – 100MHz
- BP00100A: 10 Hz – 100MHz
- BP00400: 10 kHz – 400 MHz
- BP00251A: 10 kHz – 400 MHz
- BP00250: 1kHz – 250MHz
- BP01000: 100 kHz – 1000 MHz

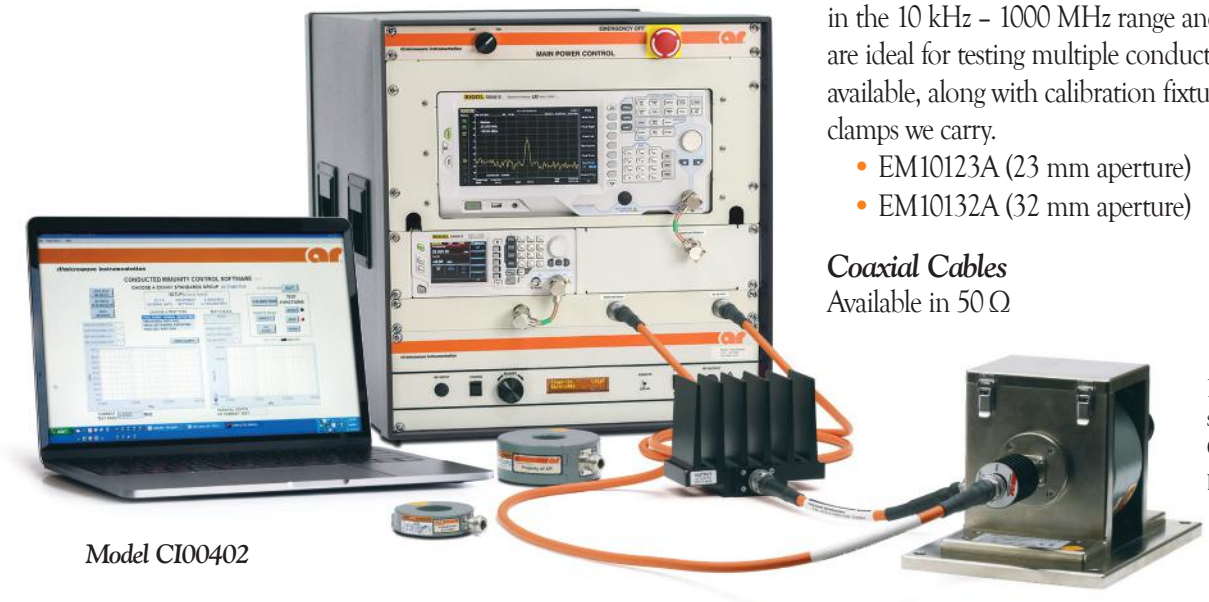
Electromagnetic Clamps

AR's highly efficient electromagnetic clamps are for testing to IEC 61000-4-6 RF Conducted Immunity specifications. They operate in the 10 kHz – 1000 MHz range and due to their aperture size, are ideal for testing multiple conductors at once. 2 models are available, along with calibration fixtures for all current injection clamps we carry.

- EM10123A (23 mm aperture)
- EM10132A (32 mm aperture)

Coaxial Cables

Available in 50 Ω



Model CI00402

For more information about selecting accessories for our Conducted Immunity Systems, please see Application Note #46.