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CWS 500N2.2

CONTINUOUS WAVE SIMULATOR FOR BCI (BULK CURRENT INJECTION) FROM 9 KHZ UP TO 1 GHZ

FOR TESTS ACCORDING TO ...

- › BMW GS 95002 (2001)
- › DaimlerChrysler DC-10614
- › DaimlerChrysler DC-11224
- › DO 160 Section 20
- › EN 61000-4-6
- › EN 61000-6-1
- › EN 61000-6-2
- › Fiat 9.90110
- › Ford EMC-CS-2009.1
- › Ford FMC1278
- › GMW 3097 (2001)
- › GMW 3097 (2004)
- › IEC 60601-1-2
- › IEC 61000-4-6
- › IEC 61326
- › IEC 61850-3
- › ISO 11452-4
- › ISO 11452-5
- › MBN 10284-2
- › MIL STD 461 D CS 114
- › MIL STD 461 E CS 114
- › ...

BULK CURRENT INJECTION (BCI) TESTING

Bulk Current Injection (BCI) is a test procedure to proof the immunity to electrical disturbances by narrowband electromagnetic energy. The test signal is injected by means of a current injection probe physically being a current transformer laid around the wiring harness. Immunity tests are performed varying the level and the frequency of the injected test signal. The BCI test methode is widely known in the automotive industry as well as in the military/aircraft industry to test single components of a complex system.
The CWS 500N2.2 is designed to be used for tests as per MIL STD 461 D/E/F/G CS 114, ISO 11452-4 and IEC/EN 61000-4-6 with CDNs and EM clamps and related standards.

HIGHLIGHTS

- **› Most compact equipment**
- **› Supports BCI testing as per various standard requirements**
- **› Basic frequency range 9 kHz up to 400 MHz**
- **› Extendable frequency range up to 1 GHz**
- **› Built-in 110 W class A amplifier up to 400 MHz**

APPLICATION AREAS

- AUTOMOTIVE
- INDUSTRY
- TELECOM
- MEDICAL
- AVIONICS
- BROADCAST
- MILITARY
- RESIDENTIAL

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TECHNICAL DETAILS

OUTPUT	
RF output	N connector at the front panel
Ouptut power	Built-in amplifier 110 W (nominal)
Gain amplifier	› 50 dB
Output impedance	50 ohm
Harmonic distortion	‹ -20 dBc at max. power
Insertion loss	Approx. 1 dB (directional coupler + RF relay)

SIGNAL GENERATOR	
Output level	-63.5 dBm to 0 dBm
Frequency range	9 kHz to 1 GHz
Output impedance	50 ohm
Direct RF output	To control an external amplifier

TEST FREQUENCIES	
Frequency range	9 kHz - 400 MHz (built-in amplifier) 9 kHz - 1,000 MHz (ext. amplifier)
Unmodulated signal	CW (continuous wave)
Amplitude modulation	Frequency: 1 Hz to 3,000 Hz, Index: 1% to 95%,
Pulse modulation	Frequency: 1 Hz to 3,000 Hz Index: 10% to 80%

DUAL DIRECTIONAL COUPLER	
Dual directional coupler	Included to measure forward power and reverse power
Frequency range	10 kHz to 1 GHz
Power	200 W max.
Insertion loss	0.6 dB max.
Mainline VSWR	1.1:1 max.

TECHNICAL DETAILS

MEASUREMENT	
PM 1000	3-channel power meter up to 1 GHz
Forward power	Internal power meter #1, -10 dBm to +52 dBm
Reverse power	Internal power meter #2, -10 dBm to +52 dBm
Injected current (Monitor)	Internal power meter #3, -45 dBm to +13 dBm

TIME PARAMETERS	
Dwell time	td = 0.3 s - 9,999 s
Pause time	tr = 0/0.3 s - 9,999 s

BULK CURRENT INJECTION AS PER ISO 11452-4	
Output level	As required in ISO 11452-4, using closed loop or substitution method, up to level 4, 200 mA

BULK CURRENT INJECTION AS PER PSA B217110, EQ IC-08	
Output level	As required in PSA B217110, EQ IC-08, using the closed loop method, up to level 3, 200 mA

BULK CURRENT INJECTION AS PER MIL 461 CS 114	
Output level	As required in MIL 461 CS 114, using the closed loop method up to curve #5, 109 dBuA

BULK CURRENT INJECTION AS PER RTCA-DO-160G, SECTION 20	
Output level	As required in RTCA-DO-160G, Section 20, using closed loop or substitution method, up to 250 mA

TEST ROUTINES FOR BULK CURRENT INJECTION	
ISO 11452-4	Operation via icd.control
MIL 461 CS114	Operation via icd.control

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TECHNICAL DETAILS

TECHNICAL DATAILS

TEST ROUTINES FOR IEC 61000-4-6	
Quick Start	Immediate start; easy-to-use and fast test routine
Service	Service, Set-up

IEC 61000-4-6	
Output level	1 V - 30 Vrms (emf) all standard test levels are guaranteed with all coupling methods

MEASUREMENTS, IEC 61000-4-6	
Cal in (BNC)	Integrated power meter to record the calibration data of a coupling device
Injected current	Measured by internal power meter
RF indicator	LED indicating the RF output status
LCD	Display of the test level and the preselected frequency value

INTERFACE	
Serial interface	USB
Parallel interface	IEEE 488, addresses 1 - 30
Fail 1	BNC input; test will be stopped (active low)
Fail 2	BNC input; test status will be saved (max. 10 events) when active low. Test continues

GENERAL DATA

GENERAL DATA	
Dimensions, weight	19"/6 HU, 31.6 kg
Supply voltage	115 V or 230 V +10/-15 %, 50/60 Hz
Input power	Max. 1430 W Inrush
Power factor	cos(phi) = 0.96 at max. output power as per IEC 555
Fuses	2x6.3 AT (115 V) or 2x6.3 AT (230 V)
Cooling	Active cooling, air ventilation
Temperature	10 °C - 40 °C
Rel. humidity	Max. 85 %, non-condensing
Atmospheric pressure	86 kPa (860 mbar) to 106 kPa (1,060 mbar)

ACCESSORIES

ACCESSORIES	
Cables	N-type coaxial cables to connect the 3dB attenuator and/or the injection probe, BNC-coaxial cable to connect the current monitoring probe, with N-to-BNC adapter
icd.control	Extensive and most versatile remote control and reporting software. The standard library helps to configure the test setup. Multiple interruption functions automated by IEEE instruments or manually. Easy-to-use as well as expandable to complex test routines based on vector definitions.

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TECHNICAL DETAILS

OPTIONS

OPTIONS	
ATT3/100	3dB attenuator, 100 W
ATT6/80	6dB attenuator, 80 W
ATT20/15	20dB attenuator for current monitor path, the set includes 2 units
ATT20/100	20dB attenuator, 100 W for small level RF signals as per MIL STD 461 an DO-160
T-50A	50 ohm, 6 W termination resistor
Calibration	Adaptors and cal jigs
CDNs	as per IEC 61000-4-6 (refer to seperate list)
Clamps	EM clamp as per IEC 61000-4-6 Current injection clamps Current monitoring clamps

OPTIONS BCI CLAMPS	
F-120-6A	Clamp-on injection probe, 10 kHz - 400 MHz, 40 mm diameter
F-120-9A	Clamp-on injection probe, 10 kHz - 230 MHz, 40 mm diameter
F-130A-1	Clamp-on injection probe, 1 MHz to 400 MHz, 40 mm diameter
F-140	Clamp-on injection probe, 1 MHz to 1000 MHz, 40 mm diameter

OPTION CURRENT MONITOR CLAMPS	
F-33-2	Clamp-on monitor probe, 1 kHz - 250 MHz, 32 mm diameter
F-55	Clamp-on monitor probe, 10 kHz - 500 MHz, 32 mm diameter
F-65	Clamp-on monitor probe, 100 kHz to 1000 MHz, 32 mm diameter

OPTIONS

CALIBRATION OPTIONS	
Connector plate size	Size as per IEC 61000-4-6 Ed.4, The CDN output connector height h defines the connector plate size for the calibration procedure, h = 30 mm => 100 mm x 100 mm h › 30 mm => 150 mm x 150 mm
R-100N	150 ohm-to-50 ohm matching impedance for CDN calibration acc. IEC 61000-4-6 Ed. 4 Connector plate: 100 mm x 100 mm
R-100N1	150 ohm-to-50 ohm matching impedance for CDN calibration acc. IEC 61000-4-6 Ed. 4 Connector plate: 150 mm x 150 mm
R-100A	150 ohm-to-50 ohm matching impedance with N-type connector for BCI-clamp calibration
Cal adapters	For all types of CDNs and clamps
CWS-CAL	Basic calibration kit including 1 x R-100N, 1 x 50 cm BNC cable, 1 x plastic case
CA EM Ed. 4	Calibration kit for EM 101 as per IEC 61000-4-6 Ed. 4 2 x R-100N1, 4 x connection rods, 1 x interconnection for rod, 1 x T50, 1 x 90 deg angle for RF input, 1 x 50 cm BNC cable 1 x plastic case
FCC-BCICF-1	Injection probe calibration fixture (jig) for F-120-6A / F-130-1A probe types
FCC-BCICF-2	Injection probe calibration fixture (jig) for F-140 probe
FCC-BCICF-4	Injection probe calibration fixture (jig) for F-120-9A probe

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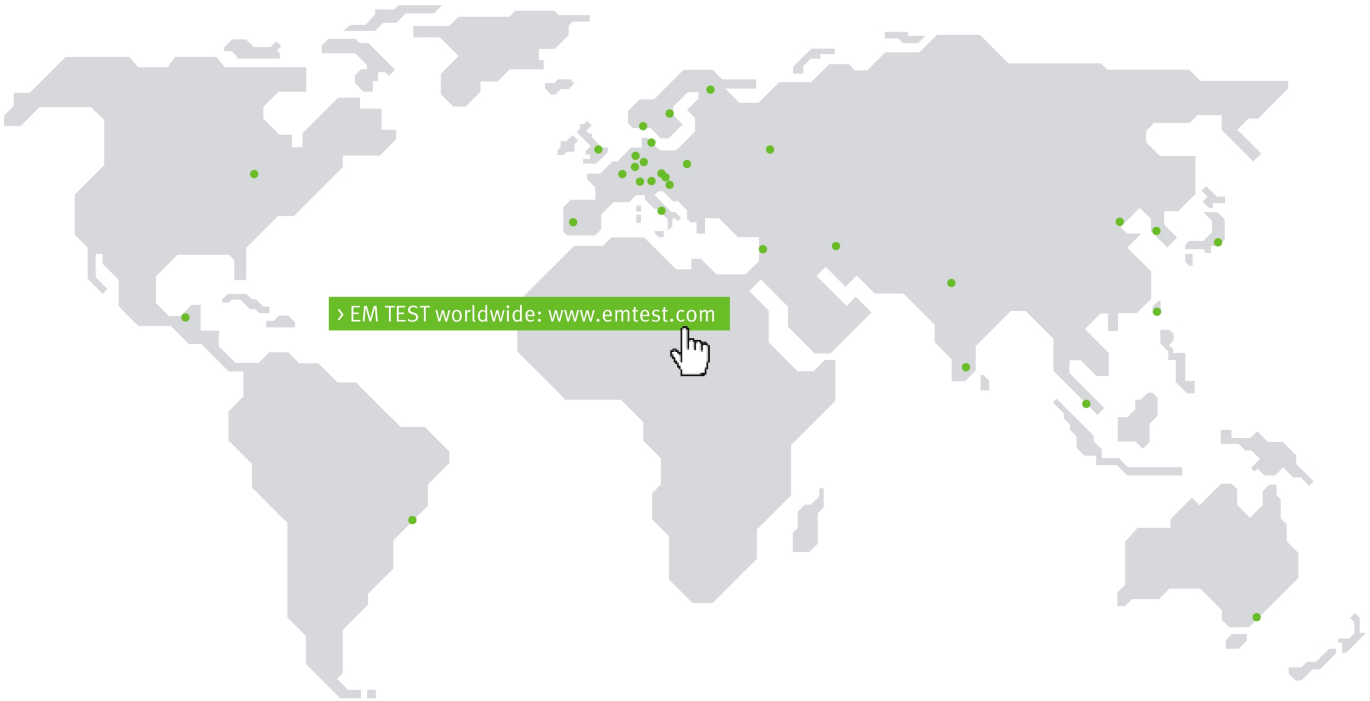
COMPETENCE WHEREVER YOU ARE



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Information about scope of delivery, visual design and technical data correspond with the state of development at time of release. Subject to change without further notice.