

Manual

For Operation



CN 200N1

Low frequency coupling network for supply simulation

The CN 200N1 is a standalone coupler unifying two audio transformers, individually configurable for various test requirements, requiring the application of the test signal to the lines under test via an audio transformer.

- Ford EMC-CS-2009
- Ford FMC1278
- SAE J1113-2



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Information in earlier versions. Specifications subject to change

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1. Standards covered by CN 200N1

The CN 200N1 is special designed for testing the following standards.

Automotive

Ford EMC CS 2009 CI250
SAE J1113-2

Immunity to Ground Voltage Offset
Voltage Ripple Test, Closed loop / Substitution

Other

GLoyd GL VI-7-2

Voltage Ripple test

1.1. General

The CN 200N1 is a standalone coupler unifying two audio transformers, individually configurable for various test requirements, requiring the application of the test signal to the lines under test via an audio transformer.

CN 200

The CN 200N1 replaced the CN200N. The different is the layout at the frontside where the output plugs must be changed depends the application.

Handling

The CN 200 has only one bridge for setting.



2. Operating Functions

2.1. Front view

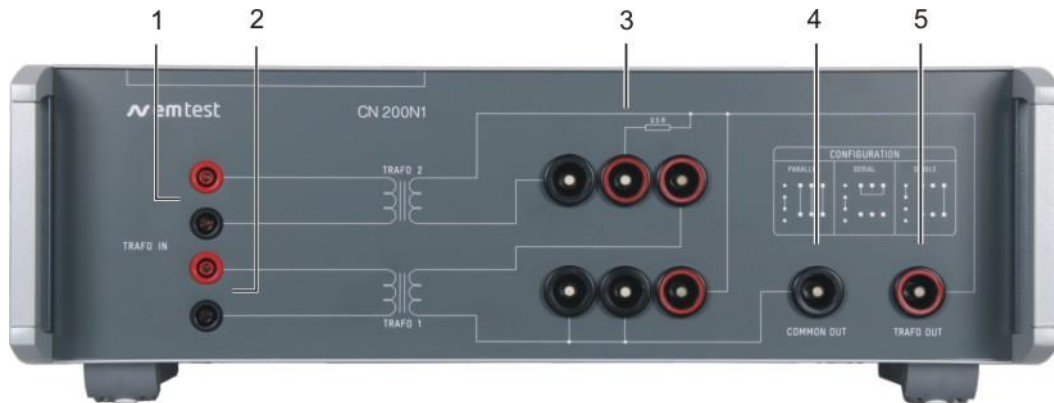


Figure 2.1

1. Input Transformer 1
2. Input Transformer 2
3. Bridge field

4. Common Output
5. Transformer Output

2.2. Rear view

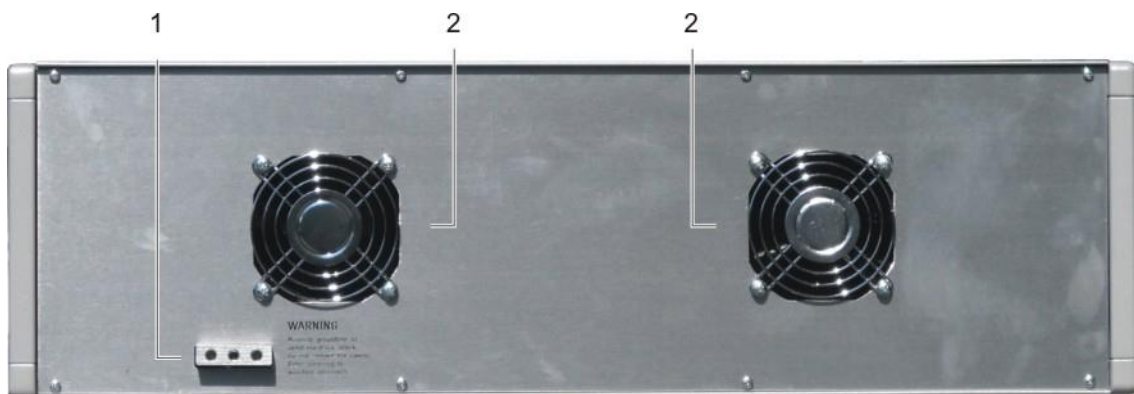


Figure 2.1

- 1 Reference Earth connection
- 2 Cooling grids (passive cooling)

1 Reference earth connection

The generator has to be connected to the reference earth plane of the test set up.

2 Cooling grids

The CN 200N1 has a passive cooling.

3. Test Equipment CN 200N1

3.1. Block diagram

The CN 200N1 is an easy-to-use coupling device consisting of two audio transformers and a 0.5Ω /250watt load resistor configurable as required by Ford EMC-CS-2009.1, Fig. 18-6 for AC ground voltage offset testing. The two transformers need to be connected in series on their primary side. Their secondary side is paralleled and loaded by the 0.5Ω non-inductive resistor load.

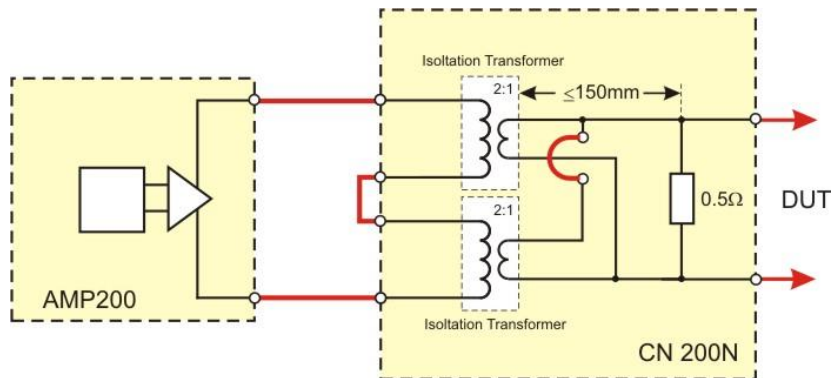


Figure 3.1: Application for Ford EMC-CS 2009

Application using one isolating transformer and no load resistor shows the setup in figure 3.2

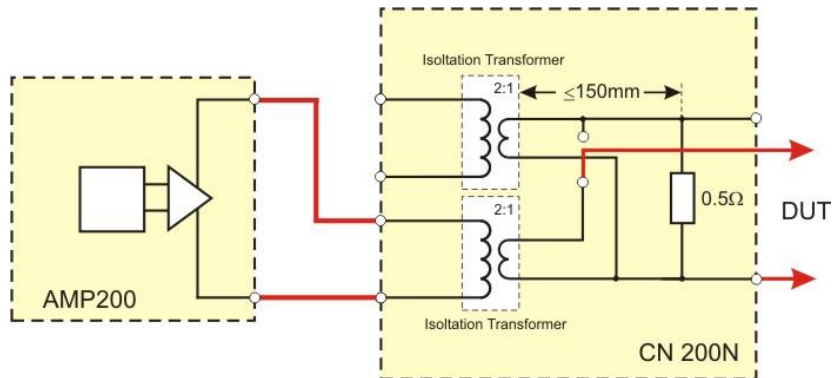


Figure 3.2: Application with one isolating transformer

4. Technical data

4.1. Audio isolating transformer characteristics

Frequency range	10Hz – 200kHz
Audio power	200W
Secondary saturation	Ma. 50A AC or DC
Output current	Max. 5A rms
Turns ratio	2:1 step down
Dielectrical isolation	600 V dc primary to secondaries and each winding to end bells
Secondary inductance	Approx. 1.0 mH (unloaded)

4.2. Transformer configuration

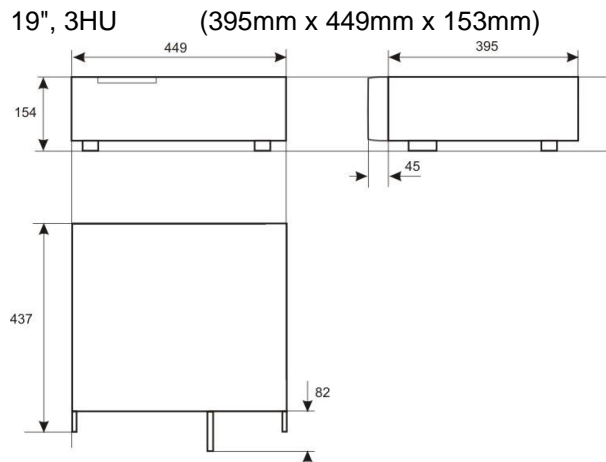
Primary configuration	Single, series or parallel connection
Secondary configuration	Single or parallel (with 0.5 Ω , 250 W load)

4.3. Connectors

Primary connectors	4mm safety lab socket
Secondary connectors	High current safety receptable with 6mm pin with integrated 4mm socket

4.4. General

Dimension



Weight	24.3kg
Supply voltage	No , passive
Cooling	passive cooling
Temperature	10°C - 40°C
Humidity	20 to 85% relative humidity (RH) non condensing)

5. Maintenance

5.1. General

The CN 200N1 is absolutely maintenance-free.

5.2. Calibration and Verification

5.2.1. Factory calibration

Every EM TEST generator is entirely checked and calibrated as per international standard regulations before delivery. A calibration certificate is issued and delivered along with a list of the equipment used for the calibration proving the traceability of the measuring equipment. All auxiliary equipment and accessories are checked to our internal manufacturer guidelines.

The calibration certificate and the certificate of compliance (if available) show the date of calibration.

The EM Test equipment are calibrated in the factory and marked with a calibration mark. The used measuring instruments are traceable to the Swiss Federal Office of Metrology.

The calibration date is marked. The validity of the calibration is to the responsibility of the user's quality system. Neither the certificate of calibration nor the corresponding label mark any due date for re-calibration.



Example: Calibration mark

5.2.2. Guideline to determine the calibration period of EM Test instrumentation

Our International Service Departments and our QA Manager are frequently asked about the calibration interval of EM TEST equipment.

EM TEST doesn't know each customer's Quality Assurance Policy nor do we know how often the equipment is used and what kind of tests is performed during the life cycle of test equipment. Only the customer knows all the details and therefore the customer needs to specify the calibration interval for his test equipment.

In reply to all these questions we like to approach this issue as follows:

EM TEST make use of a solid state semiconductor switch technique to generate high voltage transients. A precious advantage of this technique is the absolute lack of periodical maintenance effort. In consequence thereof a useful calibration period has to be defined based on two criteria:

- The first one is the customer's Quality Assurance Policy. Any existent internal regulation has to be applied at highest priority. In the absence of such internal regulation the utilization rate of the test equipment has to be taken into consideration.

- Based on the experience and observation collected over the years **EM TEST recommends a calibration interval of 1 year** for frequently used equipment. A 2-years calibration interval is considered sufficient for rarely used test generators in order to assure proper performance and compliance to the standard specifications.

5.2.2.1. Calibration of Accessories made by passive components only

Passive components do not change their technical specification during storage. Consequently the measured values and the plots stay valid throughout the storage time. The date of shipment shall be considered as the date of calibration.

5.2.2.2. Periodically In-house verification

Please refer to the corresponding standard before carrying out a calibration or verification. The standard describes the procedure, the tolerances and the necessary auxiliary means. Suitable calibration adapters are needed. To compare the verification results, EM Test suggests referring to the wave shape and values of the original calibration certificate.

All calibrations and verifications are always done without mains supply voltage connected to the coupling network input.

6. Delivery Groups

6.1. Basic equipment

Identical accessory parts are delivered only once if several devices are ordered. The delivered packing list is in each case valid for the delivery.

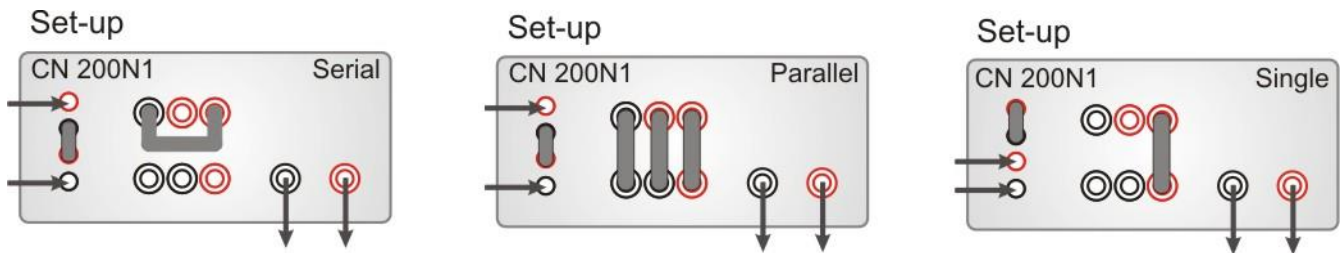
- Coupling Network type CN 200N1
- 3 Bridge Adapter for using the transformer in parallel
- 6 pieces for extend the bridges
- 1 Short circuit adapter for Transformer
- 2 cables 2m (1xred; 1x black)



7. Application

7.1. Bridge application

Depends on the application the figure 7.1 shows the bridge switching at the CN200N1 front side.



7.2. Immunity to Ground Voltage Offset: CI 250

Components shall be immune from AC ground offset voltages. Requirements include both continuous and transient disturbances.

Default test setup Continuous Disturbances

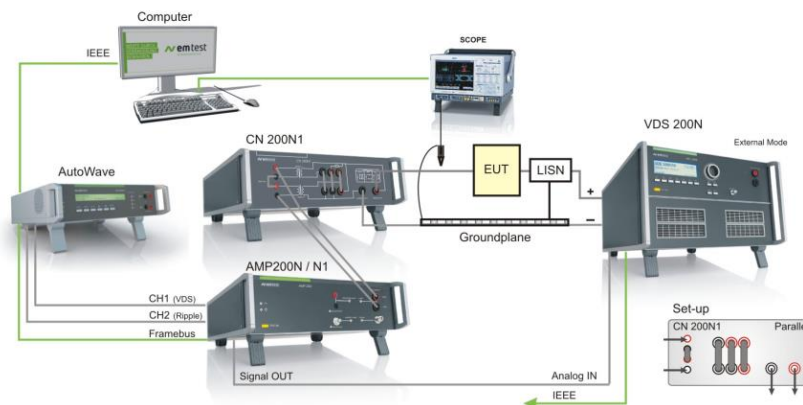


Figure 7.1 : Setup for CI 250 Continuous disturbances

Default test setup Transient Disturbances

Transient disturbances consist of a damped sinusoidal pulse with a resonant frequency of 100 kHz illustrated in Figure 8.16. The pulse is applied using the delay sequence illustrated in Figure 8.17. The Standard defines four sequences with delay times listed in table 8.1.

Delay times for the four sequences are listed in Table 18-2.

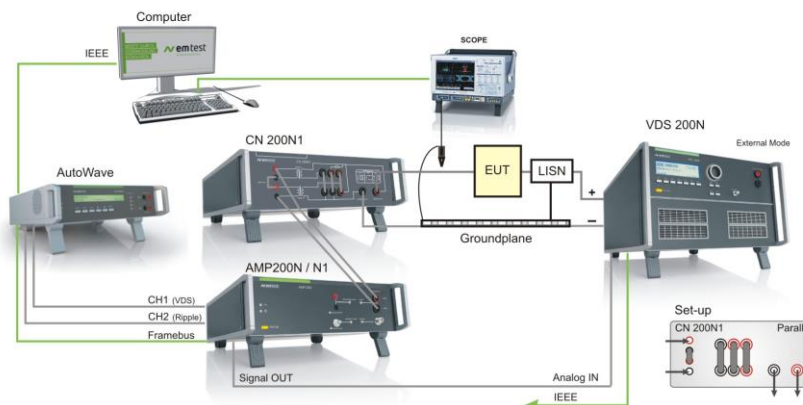


Figure 7.2 : Setup for CI 250 Transient disturbances

7.3. Immunity to SAE J1113-2

Default test setup continuous interference

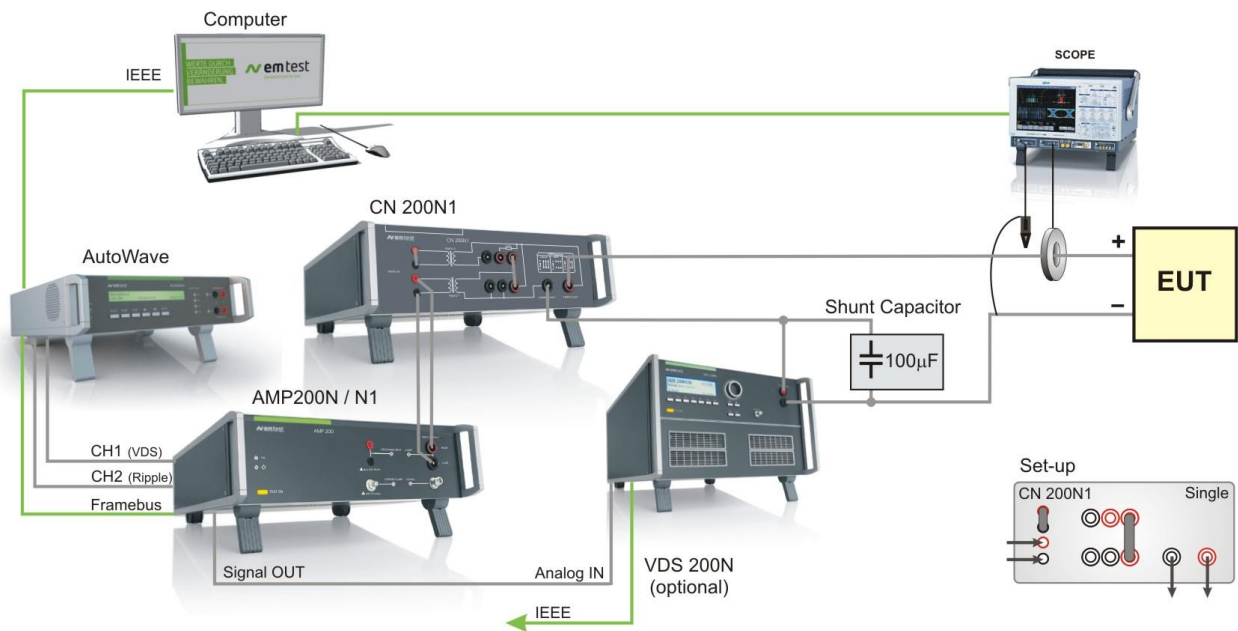


Figure 7.3 : Setup for SAE J1113-2

7.4. Immunity to GLoyd GL 2003 VI-Teil 7 Kapitel 2

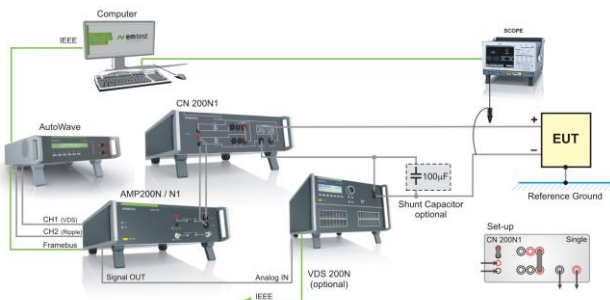


Figure 7.4. Setup for DC power supply

For more information refer to the AMP200Nx manual.

8. Appendix

8.1. Declaration of CE-Conformity

Manufacturer : **EM Test Switzerland GmbH**
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 Switzerland

Declares, that under its sole responsibility, the product's listed below, including all their options, are conformity with the applicable CE directives listed below using the relevant section of the following EC standards and other normative documents.

Product's name: Low frequency coupling network for supply simulation
 Model Number(s) CN 200N1

Low Voltage Directive 2014/35/EU

Standard to which conformity is declared:

EN 61010-1 : 2011 Safety requirements for electrical equipment for measurement, control, and laboratory use.

EMC Directive 2014/30/EU

Standard(s) to which conformity is declared:

EN 61326-1 : 2012 Electrical equipment for measurement, control and laboratory use Class A
 EN 61000-3-2 : 2014 Limits for harmonic current emissions
 EN 61000-3-3 : 2013 Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.

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