

QUICK-START GUIDE  
AND SAFETY INSTRUCTIONS

# Automotive Transient Immunity Test Generators 200-series

UCS 200Nx  
LD 200Nx  
VDS 200Qx  
PFS 200Nx  
MPG 200S21  
RCB 200Nx  
SNG 200Px



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## 1. Safety

### 1.1. Safety Aspects

Observe all precautions to assure your personal safety. The generators comply with Installation Category II (excess voltage section).

Pay special attention to safety and operation details!

### 1.2. Safety and warning label on the device

Take note of the following explanations of the symbols used in order to achieve the optimum benefit from this manual and to ensure safety during operation of the equipment.



This symbol warns of a potential risk of shock hazard. The symbol on an instrument shows that it can source 1000 volt or more, including the combined effect of normal and common mode voltages. Use standard safety precautions to avoid personal contact with these voltages.



This symbol indicates where a caution is required. Refer to the operating instructions located in the manual in order to protect against personal injury or damage the equipment.



**GROUND**

Indicates protective Ground Terminal

**\*CAUTION\***

The "CAUTION" symbol indicates a potential hazard. It calls attention to a procedure, practice or condition which, if not followed, could possibly cause damage to equipment. Such damage may invalidate the warranty. If a "CAUTION" is indicated, do not proceed until its conditions are fully understood and met.

**"WARNING"**

The "WARNING" symbol indicates a potential hazard. It calls attention to a procedure, practice or condition which, if not followed, could possibly cause bodily injured or death. If a "WARNING" is indicated, do not proceed until its conditions are fully understood and met.

### Power Supply

The equipment is intended to operate with a power supply not to exceed 250 volts between phase and neutral or between phase and ground. A proper ground connection through the ground connector of the power cord is essential for safe operation.

### Grounding the Generators

The generators are grounded through the power cord. To avoid electric shock, plug the power cord into a properly installed receptacle which was tested by a qualified electrician. Have the test performed before connecting equipment.

Without the protective ground connection, all parts of the generators are potential electric shock hazards. This may include components which appear to be insulated. The equipment must not be used if this protection is altered.

### Use the Proper Power Cord

Use only power cords and connector specified for your product. Use only power cords in good condition.

### Use Proper Fuses

To avoid fire hazard, use only fuses as specified in the parts listing for your product - matching type, voltage and current rating.

**Do Not Remove Covers or Panels**

To avoid personal injury, do not operate the generators without panels and covers.

**Do Not Operate in an Explosive Environment**

Never apply power to a connector which is not specified for that particular voltage/current.

**1.3. Responsibility of the operator**

These operating instructions form an essential part of the equipment and must be available to the operator at all times. The user must obey all safety instructions and warnings.



**CAUTION:** The purpose of this instrument is the generation of defined interferences signals for EMI immunity testing. Depending on the arrangement of the test rig, the configuration, the cabling and the properties of the EUT itself, a significant amount of electromagnetic radiation may result that could also affect other equipment and systems.

The equipment is designed to operate in industrial environment. For operating in other or sensitive environment, such as light industry, airport area..., the user may use a shielded room for operate.

The user himself or herself is ultimately responsible for the correct and controlled operation of the rig. In case of doubt, the tests should be carried out in a Faraday cage.

**1.4. General hazard**

Before applying power to the system, verify that your product is configured properly for your particular application.



**WARNING:** The generators and their accessories operate at high voltages.

Hazardous voltages may be present when covers are removed. Qualified personnel must use extreme caution when servicing this equipment.

Circuit boards, test points, and output voltages also may be floating above (below) chassis ground.

The design of external insulation must be such that it exceeds the maximum impulse voltages of the generator.

Only qualified personnel who deal with attendant hazards in impulse generators, are allowed to perform installation and servicing.

Ensure that the AC power line ground is connected properly to the Unit or Power Rack input connector or chassis. Similarly, other power ground lines including those to application and maintenance equipment *must* be grounded properly for both personnel and equipment safety.

Always ensure that facility AC input power is de-energized prior to connecting or disconnecting any cable.

The user must ensure that the output power lines are labeled properly as to the safety hazards and that any inadvertent contact with hazardous voltages is eliminated.

Guard against risks of electrical shock during open cover checks by not touching any portion of the electrical circuits. Even when power is off, capacitors may retain an electrical charge. Use safety glasses during open cover checks to avoid personal injury by any sudden component failure.

Neither AMETEK CTS GmbH, nor any of the subsidiary sales organizations can accept any responsibility for personnel, material or inconsequential injury, loss or damage that results from improper use of the equipment and accessories.



**CAUTION:** Personnel fitted with a heart pacemaker must neither operate the instrument nor approach the test setup while a test is being executed.

Only approved accessories, connectors, adapters, etc. are to be used to ensure safe operation.

## 1.5. Qualification of personnel

The generator must be operated only by authorized and trained specialists with detailed knowledge of the international, national or manufacturer's test standard.

## 1.6. Inspection before Use

### 1.6.1. Damage due to Shipment

The instrument was tested before shipment and was packed carefully on a transport palette. Each box is marked with a detailed list of the contents.

Before activating the equipment, check for damage which may have occurred during shipment. Check each container as well as the generator itself. In case of physical damage, contact the manufacturer before operating the unit.



Figure 1 - Rack shipment



Figure 2 - System shipment



Figure 3 - Single equipment shipment

## 1.7. Power requirements

Prior to turning the equipment on, check that the selected voltage corresponds to the supply voltage.

The position of the voltage selector must correspond with the mains. If you change the mains voltage, replace the fuses according to the recommended value on the number plate.



Figure 4 - Power Requirements

First check the 115 V / 230 V voltage selector where applicable!  
Do not connect 230 VAC into the 115 VAC units.  
The result could be a severely damaged unit.

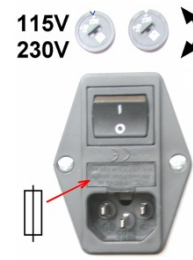


Figure 5 - Voltage Selection

If power to the equipment of Class I is supplied by an auto-transformer which is connected to a higher supply voltage, the base of the auto-transformer must be connected to the neutral of the power supply.

Equipment of Class I, which is supplied with a 3-phase power cord, must only be connected to a grounded receptacle. The protective ground connection must not be disconnected or otherwise interrupted.

Each interruption or disconnection of the protective ground connection inside or outside the equipment may cause electric shock.

Connecting different units with each other or to a personal computer for remote control may be performed only with cables recommended and/or supplied by the manufacturer.

### 1.8. 3-phase EUT power lines

The connectors for 3-phase EUT power lines on the devices is realized with CEE connectors.

Take care to connect carefully the correct plugs during installation.

Important is a direct connection between neutral and PE from the power supply. Otherwise you get problems with the floating neutral star point and inconvenience or malfunctions during the test.

The figures show the correct mapping of the plugs of the CEE connectors.

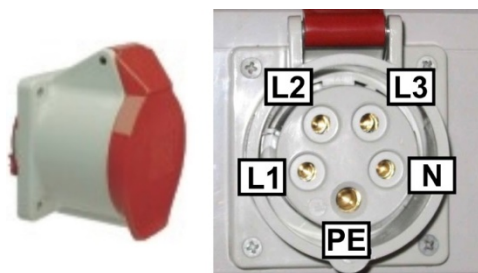


Figure 6 - Female Connector

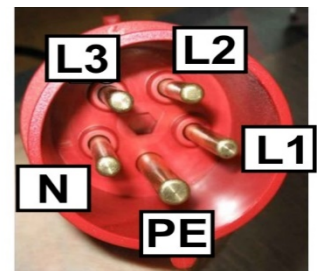


Figure 7 - Male Connector

### 1.9. Fuse for the EUT power supply

The pulse generators have no built in fuse for the EUT power supply. It is in the scope of responsibility of the user to protect the EUT external for the rated current.



**CAUTION**

**CAUTION:** The design of the external fuse must be matching the following rules:

- fuse dimension must be equal or smaller than the rated EUT current of the connected test generator
- fuse must be designed for protect the connected EUT device under test in malfunction

## 2. Safety functions

The test area must be organized so that only those involved in the test may enter it. In the case that the safety circuit is used to control the complete area, an additional interlock contact must be used to directly protect the operator from contact with the DUT.

Neither the DUT nor any cables or accessories must be touched during the test. During work on the DUT, the test procedure must be stopped and the DUT disconnected from the power mains supply.

Coupling devices have no safety functions built in, because these functions are integrated in the generators.

### 2.1. Safety circuit

The safety circuit will switch off the high voltage and the TEST ON button of the unit.

#### 2.1.1. Safety circuit for 200, series

The safety circuit is powered by 24VDC and disconnects the internal power supply of the high voltage control. For external wiring use twisted pair screened cable (current max. 2A).

The EUT power supply will not be disconnected when the safety circuit is open. To disconnect the EUT power, the user must design a special electrical circuit.

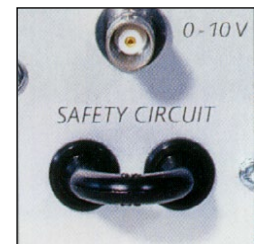


Figure 8 - Safety Circuit

Devices with no safety circuit:

ISO Generators: PFM 200, PFS 200, RCB 200, RDS 200, VDS 200, AutoWave, AMP200 (12V)

#### 2.1.2. Warning lamp 200-series

The EUT must be tested within a safety box or within a protected area. In extreme circumstances the DUT may explode or ignite. The available "Safety Circuit" and "Warning Lamp" functions can be used to provide additional protection for the operator.

Function

Active: Test ON button is released and the safety circuit is closed.

Inactive: Test ON is OFF or the safety circuit is open



Figure 9 - Warning Lamp

This voltage free contact provided can be used for switching external warning lamps or other safety devices. For filtering interference's, two 2.2nF 250V Y-type capacitors are connected in the circuit.

Max. Power: 230V AC/DC, 6A

Generators: LD 200 M, LD 200N, UCS 200M, UCS 200N

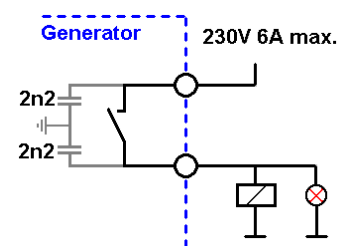


Figure 10 - Wiring Diagram Warning Lamp

#### 2.1.3. Earthing of devices

Earth Bolt, When equipped

Generators must be grounded to the reference ground plane. Generally, the generators are equipped with a metal earth bolt (8 mm x 30 mm, or 18,5 mm x 22 mm) at the rear side of the device.



### 3. Testing and Precautions

All tests produced EMC generators are immunity tests on electronic equipment or devices. These tests are potentially dangerous to the operator. It is the responsibility of the user to avoid critical failures and risks to the environment and the operator.

National and International regulations regarding human safety must be followed.

Individuals with certain health conditions (e.g. with a heart pacemakers or similar devices), should not participate in testing.

Long power supply lines to the EUT may radiate energy which may interfere with other instruments unrelated to the generator. It is the responsibility of the user to determine whether to conduct immunity tests in a given area.

Generator and coupling/decoupling voltage power supplies must be grounded and connected to reference plane.

#### 3.1. Standard Testing and Trained Operators

Operators must have read and understood the manufacturer or international standard to be applied.

This document does not replace an intimate understanding of the standard and the DUT which is required for correct, compliant testing. The equipment is to be used by trained operators only.

#### 3.2. Precautions to be taken

EMC and High Voltage test areas must always be supplied by a decoupled and well-known power supply.

The decoupling can be realized either by

- filtering
- or the use of an isolating transformer

When using isolating transformers, the fault current safety devices normally don't trip.

EMC and High Voltage test areas must always have a clear grounding strategy. All coupling/decoupling high power voltages and all LISN's must be strictly and securely connected to the ground reference plane of the test setup.

Ensure the correct current back flow to the generator. Missing connections can cause extremely high voltages and may become a health hazard. Therefore, it is absolutely necessary to use ground reference planes which are connected to a protective ground.

#### 3.3. Failures and Damage

If it is determined that a safe operation of the equipment due to failure or heavy strain is no longer possible, the supply voltage must be disconnected, and the equipment protected from unintentional use.

Unsafe operation is determined as follows:

- the equipment shows visible damage
- the equipment is not working
- the equipment has experienced severe stress during transport
- the equipment was stored in an unsuitable environment for an extended period of time.

Always exercise good judgement in determining whether a device is unsafe for operation.

#### 3.4. Coupling Networks

- The coupling network has mostly no On / Off switch and no internal fuse for the EUT power supply. This is caused the different regulation in each country. The device under test must be protected by the user in an adequate safe solution. As an option special adapters and switches can be built in, but the user must specify this special solutions.
- Generators and coupling devices must be grounded and connected to the reference ground.
- For coupling pulses to the lines, the coupling path must be settled.
- If a line has not to be coupled, it is necessary to disconnect or switch off this coupling path.
- Special safety adapter cables are part of the delivery.

### 3.5. Interference to the environment



#### CAUTION

CAUTION: The AMETEK CTS interferences generators are instruments with a functionally emission of electromagnetic interference during the test (e.g., ESD, EFT, conducted RF, etc.). Therefore, a disturbance of the environment cannot be excluded.

The user has an obligation to use a suitable test environment in order to minimize influences to the environment. This may require a suitable screening or to test in a shielded room.

Next should be considered during the test, that nearby are no disturbers such as (switching relays or drives with frequency converters etc.) that can influence through their emission the test.

### 3.6. Testing

The generator can be operated locally from the front panel or remotely from the computer.

When it is necessary to observe the EUT during the test, it can be more comfortable to operate locally. The tester is nearer to the EUT and therefore faster to switch off the test generator in EUT fail condition.

When the computer fails, the Test On button on the generator front or the Fail 1 input must be used for switching off the test.

#### 3.6.1. Safety Precautions

The test area must be secured that only authorized test personnel may enter it.

Working alone with high voltages is dangerous.

The high voltages must be switched off when nobody is present.

Neither the EUT nor cables or accessories must be touched during the test.

Make sure all high voltage connections are adequately insulated to prevent accidental contact by you or neighboring colleagues.

Keep one hand in your pocket when probing high voltage circuits or discharging capacitors. This reduces the peril to touch the high voltage with both hands.

While working on the EUT, the test procedure should be stopped and the EUT disconnected from the voltage power supply.

The EUT must be tested within a safety container or within a protected area. In extreme circumstances the EUT may ignite or explode as a result of internal damage.

### 3.7. Danger from EUT



#### WARNING

WARNING: The device being tested may become defective and ignite due to the influence of the applied test signal.

The stored energy inside the test simulator must be considered. This energy can destroy or damage the EUT even when the EUT operates under normal conditions.



#### WARNING

WARNING: Moving parts may move in an unexpected way due to the interference of the applied signal.

Never approach a test setup that uses actuators or electric motors during the test run!

Therefore, the operator shall take the following precautions:

As soon as the EUT ceases to operate as intended, the test shall be stopped immediately.

In case of internal damage, the operator may be exposed to high frequency signals of high power (up to 75 Watts and more) anywhere on the EUT.

Cables and connectors can be overloaded by high voltages or energies.

Due to internal damage of components fire and/or explosion may occur.

Unintended use of the EUT may cause hazardous situations in the vicinity of the test area.

The user is responsible for the correct EUT protection. The device under test is to be secured in such a way that no dangerous conditions arise.

Some generators, such as the PFM and PFS 200-series do not generate high voltage on their own.

Nevertheless, a DUT with heavy inductance will self-generate high voltage due to switching processes in all generators, or when switching them on or off using the 200-series.



CAUTION: Never touch the EUT or anything connected to the EUT during a test!

Never approach an EUT or anything connected to the DUT during a test!

It is absolutely necessary to observe and comply with all safety requirements.

## 4. Operating Elements 200-series

Many of the 200-series generators, such as UCS, LD, PFS, VDS, MPG, are built into a 19" housing, use a common front panel control and have a large display. Operating element as well connectors are similar, but not all connectors, in- and outputs and interfaces are available at all generators. Discription below refers to the UCS 200Nx generator.

### 4.1. Front view 19" units



1	Display	8	TRIGGER
2	Function keys "F1...F7"	9	HV pulse output 50 ohm
3	TEST ON	10	Earth connector for verification
4	Knob (Inc / Dec)	11	LED battery switch
5	Cursor keys "←" and "→"	12	LED Pulse at + output
6	EXIT	13	LED Burst 3a/3b pulses
7	ESC	14	TEST SUPPLY

#### 1 Display

All functions and parameters are displayed (8 lines with max. 40 characters).

#### 2 Function keys "F1 .. F7"

Parameters and functions, displayed in the lowest line, can be selected with the related function key.

#### 3 TEST ON

By pressing the key "TEST ON" the TEST SUPPLY output is activated and a test can be startet. indicates

#### 4 Knob (Inc / Dec)

The knob increments or decrements test parameters with a numeric value or selects from a list of parameters.

#### 5 Cursor keys

Parameters and functions can be changed on-line. The selection of these parameters is realized with the cursor moving to the left or to the right.

#### 6 EXIT

Pressing of the Exit function will cause a reset of the firmware. This is only possible if no test routine is running.

#### 7 ESC

When pressing the ESC button the user gets back one page in the menu.

#### 8 TRIGGER (selected generators only)

At the BNC CRO Trigger output, the generator trigger can be checked, e.g. the burst duration, the burst repetition rate and the spike frequency (+15 V rectangular). This output signal can also be used to trigger external measuring devices (e.g. an oscilloscope).

#### 9 HV pulse output 50 ohm (selected generators only)

External coupling devices such as the capacitive coupling clamp are connected to the coaxial 50 ohm output. Also the pulse parameters, on open circuit and 50Ω load condition (pulses 3a/3b), must be verified at this coaxial output.

**10 Earth plug for verification (select generators only)**

This earth plug can be used during pulse verification special for pulse 3a/3b verification.

**11 LED Battery Switch (select generators only)**

The red LED shows whether the battery switch is off or on. For negative pulses the battery switch is switched OFF during pulse generation.

**12 LED Pulse at +output**

The LEDs show the type of pulse (micro pulse or burst) and at which output they are carried out.

**13 LED Burst 3a/3b pulses**

Generators with multiple outputs usually have an LED to indicate which connector is active. Burst and micro-pulses could be carried out at different outputs.

**14 TEST SUPPLY**

Test Supply output to DUT.

The DUT is powered via the safety lab connectors at the front panel of the simulator. The transient test pulses are superimposed onto the battery supply voltage inside the generator.

## 4.2. Rear view 19" units



- |   |                              |    |                                    |
|---|------------------------------|----|------------------------------------|
| 1 | DUT test supply input        | 9  | Mains selector 115V / 230V         |
| 2 | Reference earth connection   | 10 | Power ON switch / fuse             |
| 3 | AUX Pulse input from ext. LD | 11 | USB interface                      |
| 4 | Control input for ext. LD    | 12 | Parallel interface GPIB / IEEE 488 |
| 5 | Ext Impedance                | 13 | Remote control connector CN        |
| 6 | External trigger             | 14 | Fail input Fail 1                  |
| 7 | Warning lamp                 | 15 | Fail input Fail 2                  |
| 8 | Safety circuit               |    |                                    |

### 1 Supply input

Most generators have one or more inputs for the DC voltage. Pulses (transients) will be superimposed on battery supply voltage or created from this (PFM/PFS)

### 2 Reference ground connection

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

### 3 Pulse input for one external generator

The UCS 200N includes a central coupling matrix. The pulse output of an external Load Dump LD200 generator can be connected to this input. The Load Dump pulses then will be available at the central DUT output at the front panel of the UCS 200N

### 4 Control input for one external generator

The UCS 200N includes a central coupling matrix. The control output of the external generator can be connected to this input. The external generator is able to control the UCS200 coupling network.

### 5 External impedance

Some generators support an external resistor, which can be added to achieve impedance additional to those the generator includes. Select the "External Rs" mode in the setup menu.

### 6 External trigger

One single event, burst, surge, voltage dip can be released. Trigger level 5-15V positive going.

### 7 Warning lamp control

Some generators support a relays contact to control warning lamps which may be installed in the test set-up (Test On).

### 8 Safety circuit

To connect an external security circuit when available.

### 9 Mains selector

Selection of 115V / 230V

### 10 Power on switch

The switch is part of the mains filter. Mains fuses are part of the filter. (230V / 1A and 115V / 2A)

**11 USB interface**

Serial USB interface port to remote control the generator by software  
This interface is only available for iso.control software tool

**12 GPIB / IEEE 488**

Parallel interface GPIB / IEEE 488 to remote control the generator by software tool

**13 Remote control connector CN**

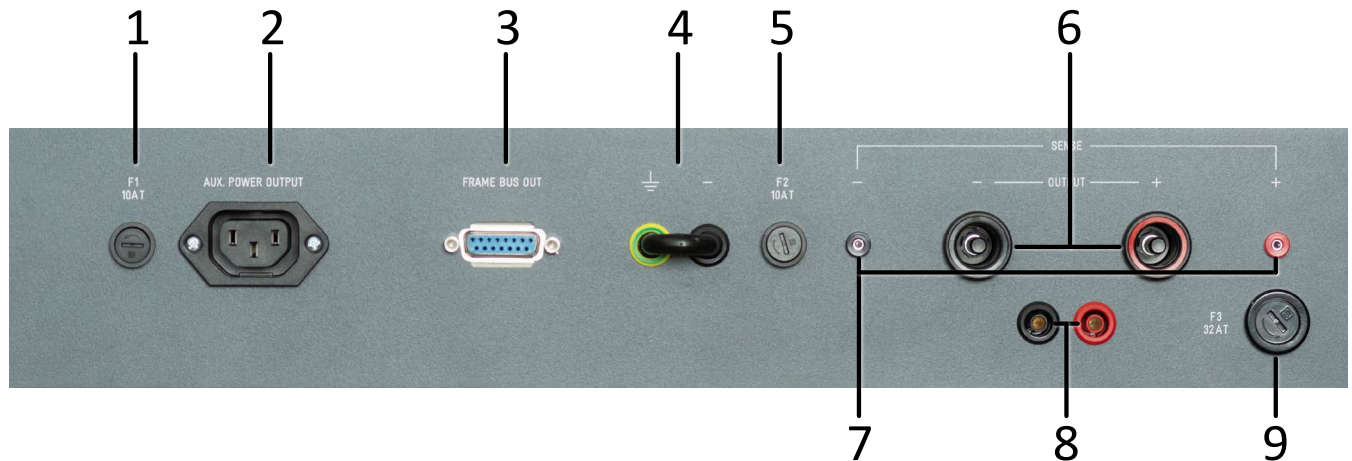
EM Test internal interface to be connected to other generators, currently not in use

**14 Fail detection FAIL 1 (TEST STOP)**

The BNC input FAIL 1 can be used for DUT monitoring. In case of a low going signal (to chassis ground) the UCS 200N will stop pulse generation and the actual running test routine is interrupted. The test routine can be restarted by pressing start again.

**15 Fail detection FAIL 2 (TEST PAUSE )**

The BNC input FAIL 2 can be used for DUT monitoring. In case of a low going signal (to chassis ground) the UCS 200N will stop pulse generation and the actual running test routine is paused as long as the low level signal is available at the FAIL 2 input. The test routine continues automatically as soon as the low level signal goes to high level. A message of FAIL 2 is indicated in the LCD display as well as in the iso.control software.

**Additional User Elements (VDS 200Q)**

- |   |  |   |                               |
|---|--|---|-------------------------------|
| 1 | Fuse for the PFM mains output              | 6 | DC output to DUT or PFM 200N  |
| 2 | Mains output to external PFM 200N          | 7 | Sense input                   |
| 3 | Frame Bus out to PFM 200N                  | 8 | Low-Current output or monitor |
| 4 | Ground connector minus out to GND          | 9 | Fuse for monitor              |
| 5 | Fuse against excess ground leakage current |   |                               |

- 1** An appropriate fuse (10A / 5x20mm) is provided for units that support external PFM units.
- 2** An appropriate mains connector is provided for units that only support external PFM units.
- 3** The PFM 200N and VDS 200Q- and VDS 200R-series have additional “FrameBus” in and out connector that must be connected and terminated with the provided cable or terminator.
- 4** Some models support an optional ground connector to minimize noise and connect the negative output to earth.
- 5** Fuse 10 A (5x20 mm) for ground to avoid excess ground leakage current is included in some models
- 6** Main dc output (high current) to connect either directly to the DUT or to a PFM 200N (UCS, PFS, LD)
- 7** Some units support a sense connector to minimize cable voltage drop when connecting directly to the DUT.
- 8** Some units support a secondary 4mm banana connection (in parallel with the high current dc output). This can be used for either low current testing or to monitor the signal on high current dc output.
- 9** Fuse (32A / 5x20mm) for the secondary output



### 4.3. RCB 200Nx

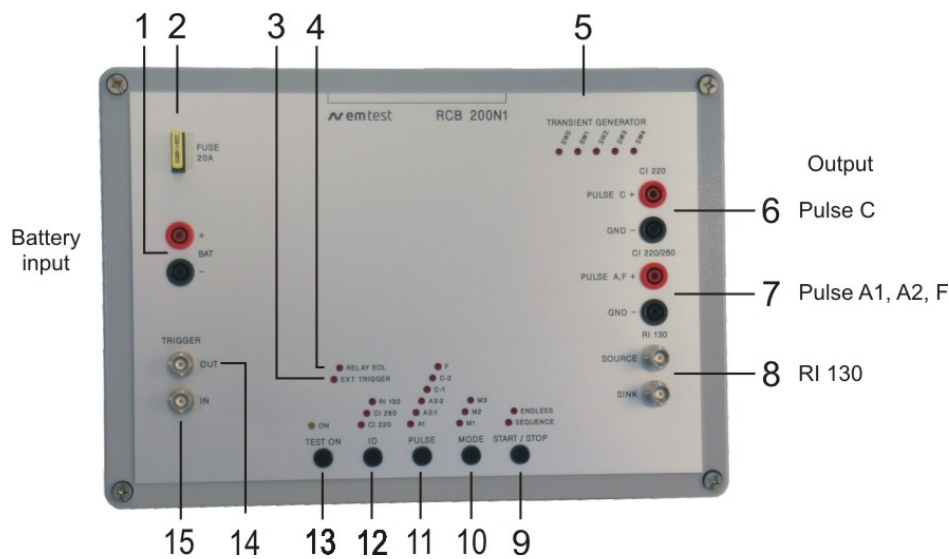


Figure 2.1

- |   |   |    |                                       |
|---|---|----|---------------------------------------|
| 1 | BAT input 13.5V ( Power supply RCB 200N1) | 9  | START / STOP ; LED endless / sequence |
| 2 | Fuse 20A                                  | 10 | MODE selection                        |
| 3 | Ext. Trigger mode                         | 11 | PULSE Transient pulse selection       |
| 4 | Indication Relays EOL (end of lifetime)   | 12 | ID Test selection                     |
| 5 | Transient Generator switching             | 13 | TEST ON                               |
| 6 | Pulse C Output CI 220, CI 260             | 14 | Internal Trigger OUT                  |
| 7 | Pulse A, F Output CI 220, CI 260          | 15 | Trigger IN                            |
| 8 | Pulse Output RI 130 (BNC)                 |    |                                       |

- 1 Battery input**  
Power supply input for RCB200N1, nominal 13.5Vdc (max 18Vdc)
- 2 Fuse**  
Fuse 20A for device protection
- 3 Ext. Trigger mode**  
Indication of external Trigger mode. The controller detect when the bridge between Trigger OUT – Trigger In is disconnected. In this Mode the user has to connect an external trigger signal for relays switching.
- 4 Relays EOL End of Lifetime indication**  
The lifetime of the Potter & Brumfield relays is limited by the erosion during BURST testing. The operating duration is limited to 100hours.  
- LED blinking: Lifetime is within 10 hour of max lifetime  
- LED on: The test will be stopped. The user must replace the relays.
- 5 Transient generator switch settings**  
The selected pulse the Ford standard recommends to set different switches. The LED indicates the internal relays setting according the Ford Standard
- 6 Pulse C output to DUT**  
Output plugs for testing pulses C-1 and C-2 as per CI 220
- 7 Pulse A, F output to DUT**  
Output plugs for testing pulses A1, A2-1, A2-2 and F as per CI 220 and CI 260
- 8 Pulse output to clamp**  
Output BNC plugs for testing as per RI 130. The BNC plugs are internal shorted when RI130 is not selected.

**9 START / STOP Button**

Button for Start and Stop the test. The LED indicates the status.

- Sequence ( Test in progress)
- Endless

**10 MODE Button**

Button for Mode selection depend the mode definition in Ford FMC1278 and EMC-CS-2009 standard

**11 PULSE Button**

Pulse selection with LED indication. Cyclic selection of test procedures A1, A2-1, A2-2, (C-1), C-2, F

**12 ID Button**

Button for test selection cyclic rotation of the tests CI220, CI 260, RI 130

**13 TEST ON Button**

Button for switch on/off the power to the DUT

**14 Trigger OUT (BNC)**

Trigger output from the internal controller unit

**15 Trigger IN (BNC)**

Trigger input (E) for relays 1 trigger. Max. trigger input voltage= 35V

#### 4.4. SNG 200Px Operating Elements



- 1 Power ON/OFF and Battery Indicator**  
The ON/OFF button sets turns the generator on and off. LEDs are provided to show when the battery gets low.
- 2 Test Enable Button "TEST ON"**  
Pressing the "TEST ON" button enables testing. The LED serves also as an optical indication when the switch switches: the DUT power will be provided when the button is lit.
- 3 Sequence Select and Indicator**  
Pressing the SELECT button to choose the pre-programmed SEQUENCE 1...4. These sequences are sent from autowave.control
- 4 START/STOP Button**  
Press to start or stop the test. The RUN indicator will light when the test is running.  
The FAIL light will light in case of an error.
- 5 Charge Voltage Set and Indicator**  
Turn this knob to set the voltage up to 100.0V. The TEST ON must be disabled to change the voltage.
- 6 Framebus Connction**  
Connects to an AutoWave to send the sequences to the SNG 200N. Device an internal terminator.
- 7 DUT Test Supply**  
DUT output HIGH (red) and LOW (black) with 4 mm (male) / 6 mm (female) connectors
- 8 Earthing Connector (Side, not shown)**  
A banana jack is provided for safety

## 5. Operation 200-series 19" units using front panel control

Most simulators are operated by an easy menu control system. Seven function keys are available to select parameters and functions. All functions are indicated on the display; max. 8 lines and 40 characters.



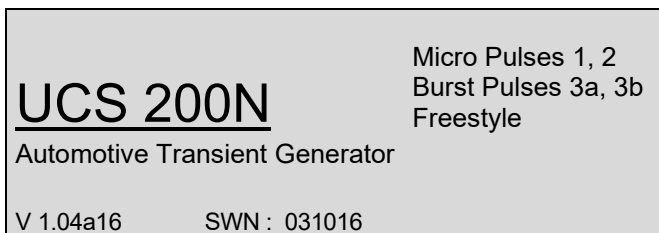
The selected parameter is blinking and can be changed by turning the knob (incr./decr.).

**↔** : The digit to be changed can be selected with the cursor (**↔**).

- Setted values are direct indicated on the screen.
- Status on the bottom lines shows the desired status after pressing the function key.

**ESC** : ESC will take you back to the previous level in the menu and set the displayed values. The latest settings are stored automatically and will be recalled when the menu is selected again.

**EXIT** : The firmware will reset to the main screen.

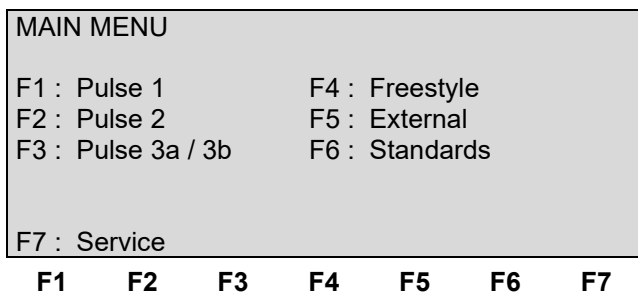


The generator type, serial number and the version number SWN are shown on the main screen. These numbers are listed in the test reports and calibration certificates.

### 5.1. Manual Operation

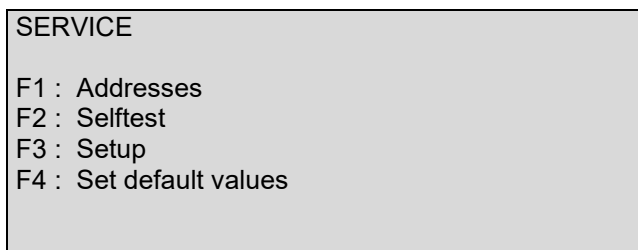
#### 5.1.1. Main Menu

The main menu is where pulses are selected, and will vary by generator. Here you can also select the Service menu.



**F1    F2    F3    F4    F5    F6    F7**

#### 5.1.2. Service



**F1    F2    F3    F4    F5    F6    F7**

#### F1 Addresses

Here you will find addresses for service and support organizations

[www.emtest.com](http://www.emtest.com)

#### F2 Selftest

Together with the user the firmware can test some parts of the equipment. The software will clearly explain the self-test procedure.

**F3 Setup**

Opens the setup menu.

**5.2. Setup**

In the setup menu, you can choose the language and other device settings.

```

SETUP
F1 : Change language / Sprache ändern
F2 : LCD backlighting
F3 : Interfaces
F4 : Keyboard-Beeper
F5 : Power-on counter
  
```

**F1**    **F2**    **F3**    **F4**    **F5**    **F6**    **F7**

**F1 Change language**

The user can chose between two languages, German and English.

**F2 LCD backlighting**

With the use of F2 the backlighting can be switched On or Off. Additionally the Auto Off function can be programmed to switch off the backlighting after a specified time the generator has not been in operation (1 - 30min).

**F3 Interfaces**

This menu will help the user to define the status of the integrated serial and parallel interfaces, e.g. the baud rate of the RS 232 or the address of the IEEE interface.

**F4 Keyboard-Beeper**

F1 is the selector for the beeper ON/OFF mode.

The beeper is always on when a test routine is finished. To indicate that a running test is finished the beeper sounds 3 times.

**F5 Power-on counter**

Pressing of F5 will show the total power-on time and testing time of the test equipment.

**5.3. Tests**

The following sections shows the common menu-items.

**5.3.1. The Test or Quick Start Menu**

When you select either a test, or Quick Start, when available, you can set, and change the various parameters or press START to start the test.

Consulte the applicatlbe manufacturer or international standard to set the applicable parameters before starting the test.

```

QUICK START
V = 100 V          pul = 2
+/- = -           Ri  = 10 Ohm
t1 = 1.0 s        t2  = 8.0ms
tri = Auto        cpl = Supply
n = 10000

START  CHANGE
  
```

**F1**    **F2**    **F3**    **F4**    **F5**    **F6**    **F7**

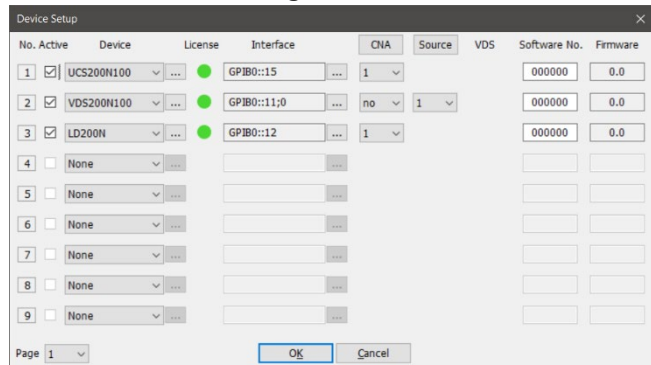
## 5.4. Software Operation

Most generators can also be operated with software.

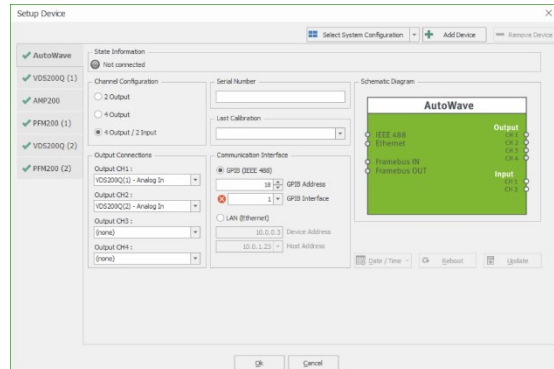
Some generators such as the AutoWave and PFM 200N can be operated only with software.

Once the software is connected and configured as shown, users can browse to the appropriate standard and run the test.

### Connection and Configuration

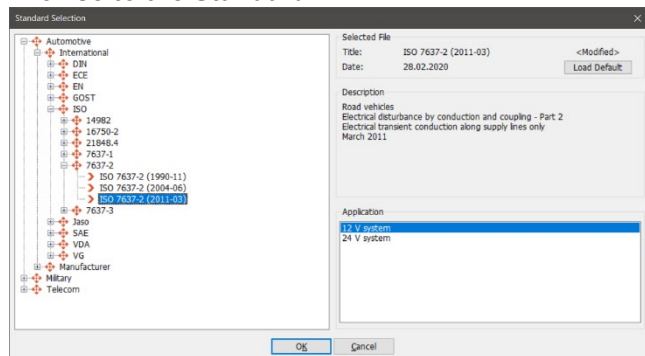


iso.control

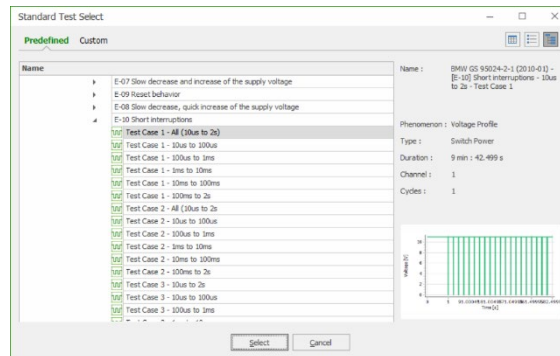


autowave.control

### Browse to the Standard

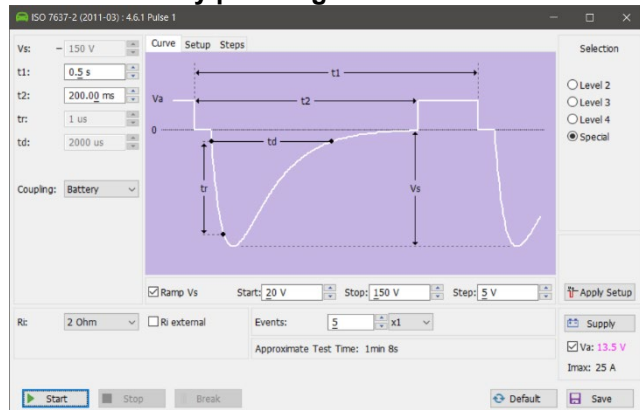


iso.control

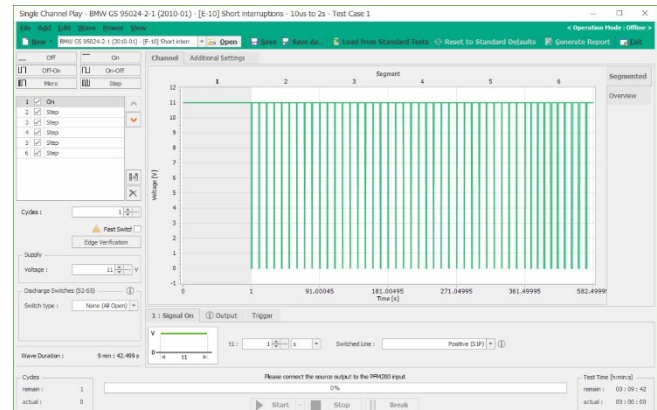


autowave.control

### Run the Test by pressing "Start"



iso.control



autowave.control

Note: The TEST ON button must be activated to start the test. The test will start immediately with no further user intervention.

## 5.5. Test Setup Examples

The test setup shall be performed in careful compliance with the standard. Common use-cases are summarized below.

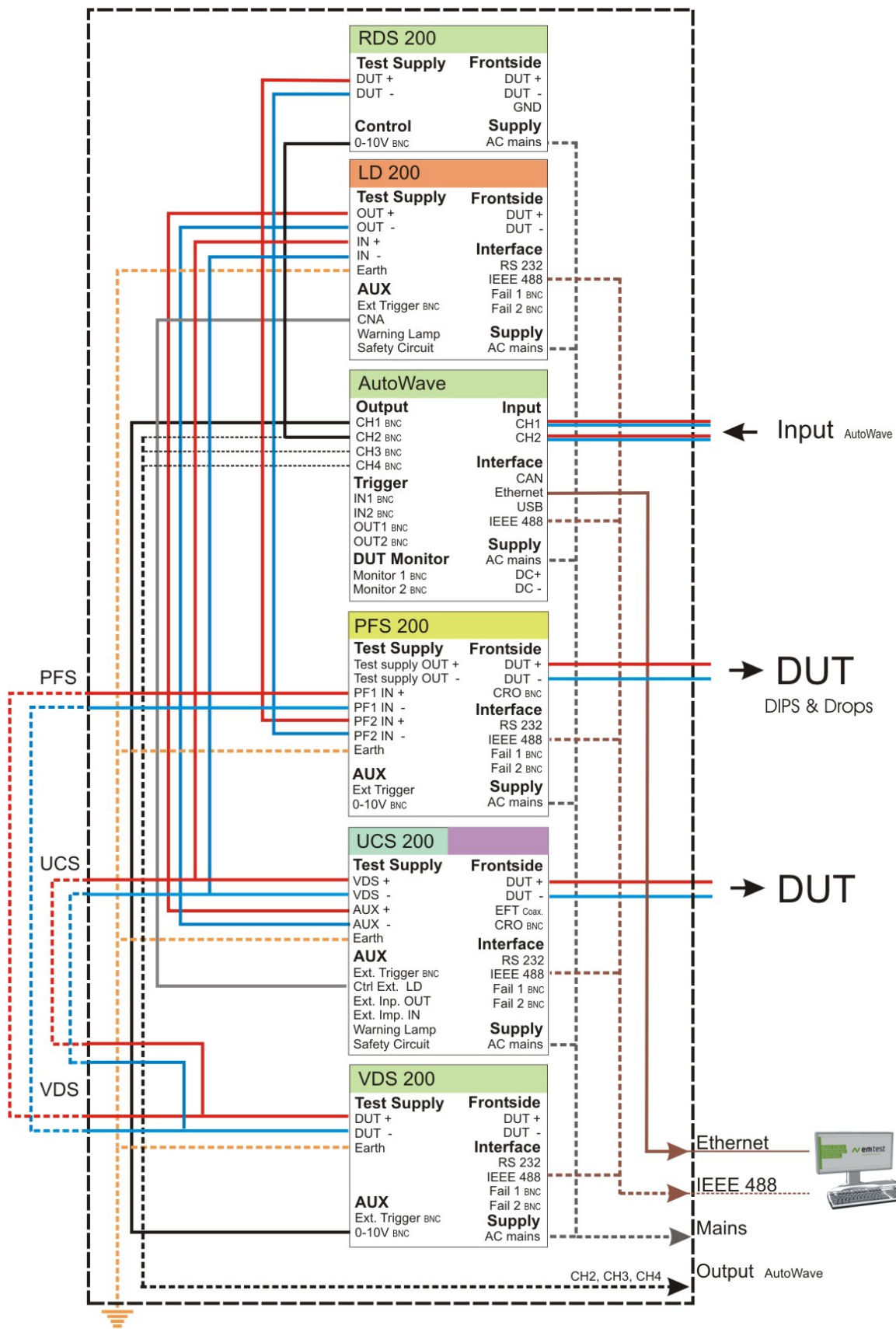


Figure 11 - Common Setup, Transients and Dropouts (PFS)



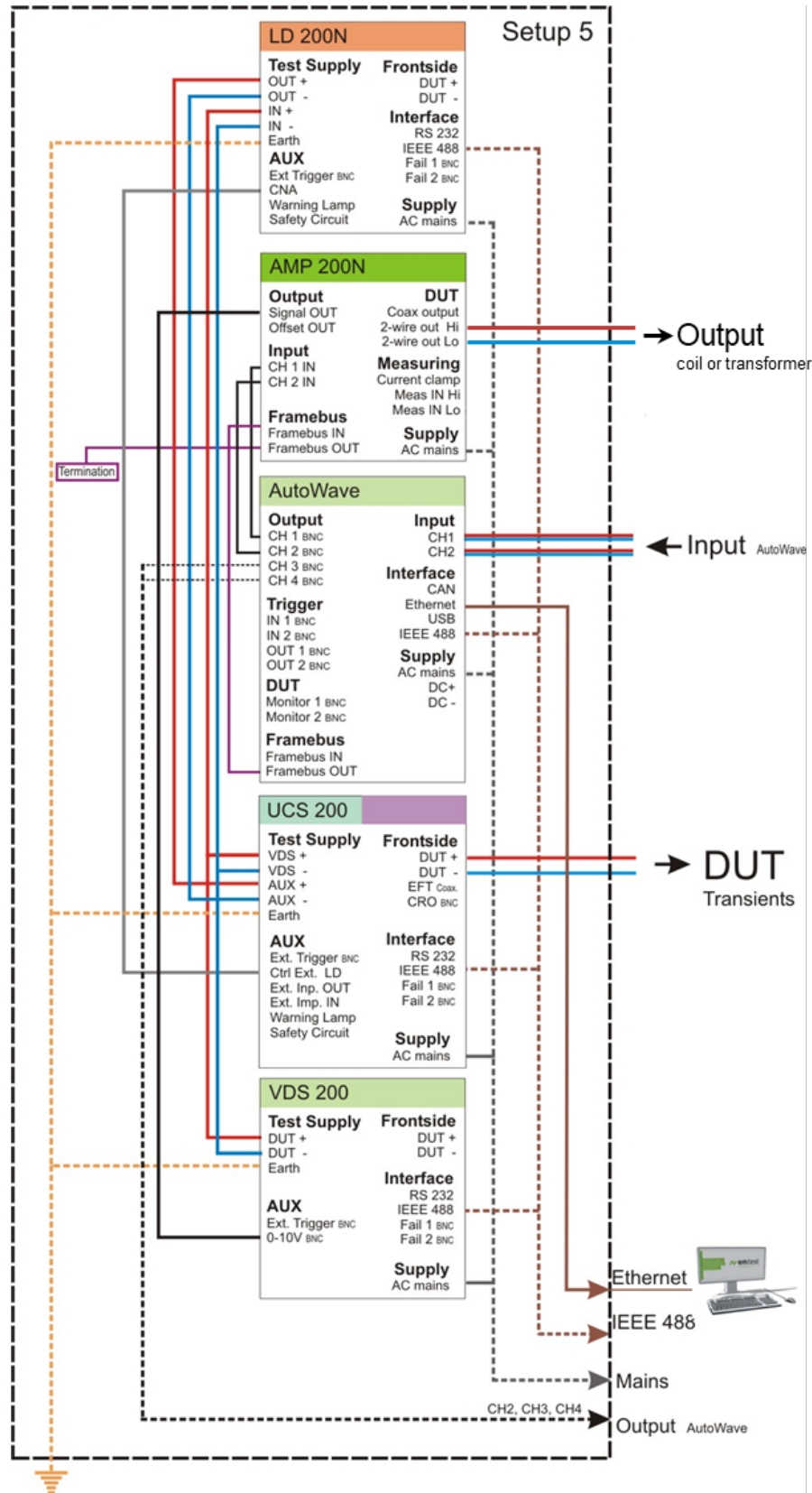


Figure 12 - Common Setup, Transients, Dropouts and AMP/PFS



**5.5.1. Tests with clamps and other couplers.**

Be aware that coupling clamps, as defined by the standard, must be connected and usually adjusted due to losses. These shall be used only in compliance with the standard.



WARNING: Coupling clamps are dangerous to touch and must not be approached during the test run!

**5.5.2. Verification Accessories**

Consult the datasheet for verification accessories. Only genuine AMETEK CTS and EM Test accessories are supported. Consult the standard for proper usage and when verification must take place.

## 6. Maintenance, Adjustments, Replacement of Parts



WARNING: No user-serviceable parts inside.

Hazardous voltage exists inside the case of the generators. Maintenance must only be performed by qualified service technicians.

The generators do not contain any parts or components requiring special maintenance.

Electrical maintenance must only be performed by experienced and specially trained technicians. Generally, standard maintenance requires only the periodic cleaning of the instrument, verification and calibration of certain parameters.

- When removing the cover or other parts of the equipment, high voltage parts may become exposed. High voltages are potentially lethal.
- For service, repair, adjustment or replacement of parts, the generator must be disconnected from all power supply sources before covers are to be removed.
- The user is not permitted to change or modify any EM TEST / TESEQ generator. Only original EM TEST / TESEQ parts and components shall be used for repair and service. AMETEK CTS is not responsible for accidents or injuries caused through the use of parts or components not sold by AMETEK CTS.
- Maintenance and service must only be performed by qualified service technicians who are trained and familiar with the dangers of servicing the generator.
- Only fuses of correct voltage and amperage as specified by the manufacturer are to be used for replacement. The repair of fuses is not permitted.

### 6.1. Disposal of devices



For the disposal of electronic devices, the country-specific regulations are to be considered. The equipment should be delivered to a specialized waste collection center.

EM TEST and Teseq devices can be returned to AMETEK CTS in Switzerland or to their agency for adequate disposal. Alternatively, the equipment can be handed over to a specialized enterprise for disposal of electronic devices.

#### Details to used material and components

- Built-in capacitors contain no polychlorinated biphenyl (PCB).
- Back-up batteries and rechargeable batteries must be disposed separately.

### 6.2. Calibration and Verification

Calibration should be performed regularly based on the user's internal policy. AMETEK CTS recommends calibration every year.

Verification must be performed, according to the applicable standard, regularly. Consult the applicable standard for details about regular verification.

For the calibration and verification of the voltage impulses the using of calibration adapters is recommended. The calibration is at all times without any mains supply on the output to calibrate. Therefore, the following warnings are to adhere strictly.