

Manual

for Operation



PFS 200N Series

Voltage Dips and Drop interruptions

➤ PFS 200N30, N50, N100, N150, N200

Testing of electronic modules in 12V/24V or 42V supply systems.

Short-term interruptions, micro dips and voltage drop out are causing malfunctions in electronic modules. These phenomena are simulated by the PFS 200N power fail generator.

The PFS 200 can be used as an individual instrument or can be used in combination with all other generators of the series 200.

- Daimler Chrysler PF9326
- Ford ES-XW7T
- PSA B217110
- Renault 36.00.808
- Fiat 9.90110



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1. Model overview

1.1. PFS 200 models

The different models of the Series PFS 200N will be named in this manual as PFS 200.

Standard devices

Model	Name till 2008	Voltage	Current range PF1 Input	Inrush
PFS 200N30	PFS 200 B1	80 V	I = 30A	(70A 500ms)
PFS 200N50	PFS 200 B2	80 V	I = 50A	(100A 500ms)
PFS 200N100	PFS 200 B3	80 V	I = 100A	(150A 500ms)
PFS 200N150	PFS 200 B4	80 V	I = 150A	
PFS 200N200	PFS 200 B5	80 V	I = 200A	

Input current range of PF2 is the same as PF1



PFS 200N30 N50, N100



PFS 200N150 and N200

2. Operating Functions

2.1. Front view



- | | | | |
|---|-------------------------|----|------------------------------------|
| 1 | Display | 6 | EXIT |
| 2 | Function keys "F1..F7" | 7 | ESC |
| 3 | "TEST ON" | 8 | BNC CRO Trigger |
| 4 | Knob (Inc/Dec) | 9 | LED Channel mode |
| 5 | Cursor keys "←" and "→" | 10 | Test supply output EUT 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 procedure is initiated with the preselected parameters. The yellow key is illuminated in TEST ON mode.

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 moves back one page in the menu.

8 BNC CRO Trigger

At the BNC plug CRO TRIGGER a signal is available to trigger an oscilloscope. (5V \square neg slope at event)

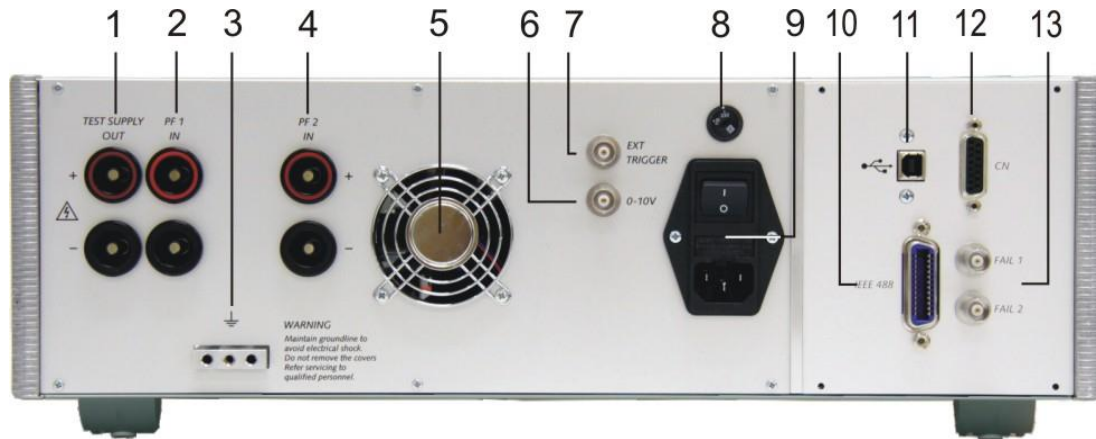
9 LED channel mode

The actual channel under control is indicated by LED.

10 EUT test supply

The EUT is powered via the safety laboratory plugs at the front panel of the simulator. The nominal battery supply depend on the PFS200 model.

2.2. Rear view



- | | | | | | |
|---|-----------------------------|---|-----------------------|----|--------------------------|
| 1 | Test supply OUTPUT | 5 | Ventilation | 9 | Power on switch |
| 2 | Test supply PF1 | 6 | Control voltage 0-10V | 10 | Parallel interface |
| 3 | Reference ground connection | 7 | Ext. Trigger | 11 | Serial interface |
| 4 | Test supply PF2 | 8 | Mains selector | 12 | CN interface not used |
| | | | | 13 | Fail detection Fail1 / 2 |

1 Test supply output

Additionally to the output at the front panel of the simulator the test supply output is also available at the rear part. This output is mostly used for rack-mounted equipment.

2 Test supply PF1

The power supply for the EUT is connected to the banana connectors + / -. The power supply is connected to channel PF1. See par. 4 and 5 for connecting diagrams and detailed information.

3 Reference ground connection

4 Test supply PF2

The power supply for the EUT is connected to the banana connectors + / -. The power supply is connected to channel PF2. See par. 4 and 5 for connecting diagrams and detailed information.

5 Ventilation

After long-term duration tests with maximum load current the generator should keep on running for some minutes, to cool down the system.

6 Control voltage 0-10V

The voltage is used to control external power sources. The source normally is connected to the channel PF2. The voltage level can be selected via the operating panel of the PFS.

7 BNC EXT. TRIGGER

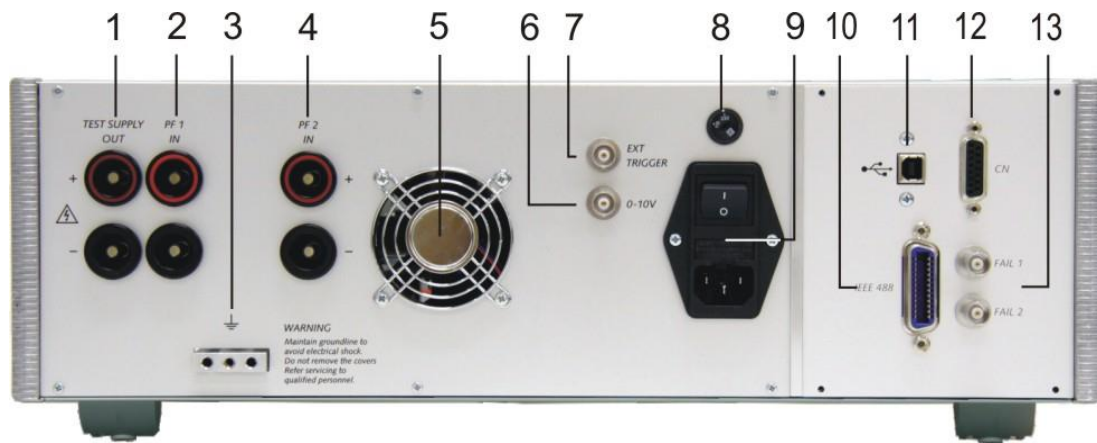
One single event can be released. Trigger level +5 to +15V positive going.

8 Mains selector

Selection 115V / 230V.

9 Power on switch

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



- | | | |
|-------------------------------|-------------------------|-----------------------------|
| 1 Test supply OUTPUT | 5 Ventilation | 9 Power on switch |
| 2 Test supply PF1 | 6 Control voltage 0-10V | 10 Parallel interface |
| 3 Reference ground connection | 7 Ext. Trigger | 11 Serial interface |
| 4 Test supply PF2 | 8 Mains selector | 12 CN interface not used |
| | | 13 Fail detection Fail1 / 2 |

10 Parallel interface

GPIB / IEEE-488 interface.

11 USB interface

USB interface "USB B" connector. For datatransfer a USB interface is available. The internal RS 232 interface is converted to USB standard. Therefore the user must set the same Baudrate in the device and control software. Using the USB interface the user can have emc problems during burst tests Our experiences says, that usually the computer USB port is disturbed by interference's. Therefore a high quality USB cable (USB 2.0 standard) must be used.

12 CN interface

Device internal interface not used

13 Fail detection FAIL 1 (TEST STOP)

The BNC input FAIL 1 can be used for failure detection at the EUT. If the input is set to ground (chassis) the PFS-generator will be stopped and the actual test routine is finished. It is not possible to continue this test routine. A complete restart of the routine is necessary.

A message of FAIL 1 is indicated in the LCD display as well as in the ISM software.

Fail detection FAIL 2 (TEST PAUSE)

The BNC input FAIL 2 can be used for failure detection at the EUT. If the input is set to ground (chassis) the actual test routine is paused as long as the low level signal is available at the FAIL 2 input.

Without the low level signal the test procedure continues automatically.

A message of FAIL 2 is indicated in the LCD display as well as in the ISM software.



Rearside PFS200N150 or PFS200N200

3. Operation

3.1. Description of the menus

The simulator is operated by an easy menu control system. Seven function keys are available to select parameters and functions. All functions are indicated on the display.



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

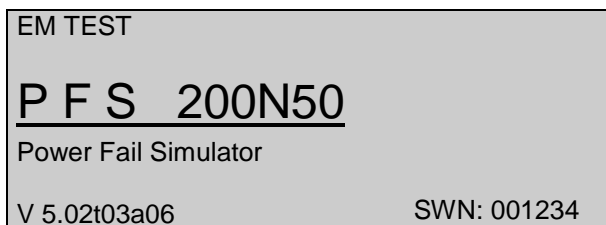
←→ : The digit to be changed can be selected with the cursor (←→).

- 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.

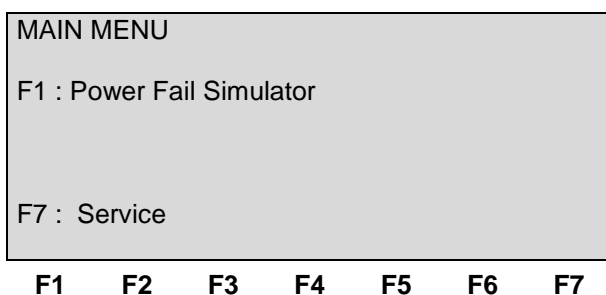
EXIT : The firmware will reset to the main screen.



Start-up display example PFS 200N50

The serial number and the version number SWN are used for tractability reasons. These numbers are listed in the test reports and calibration certificates. These numbers also are listed within the test reports generated by the ISM ISO software

3.2. Main Menu



F1 Power Fail Simulator

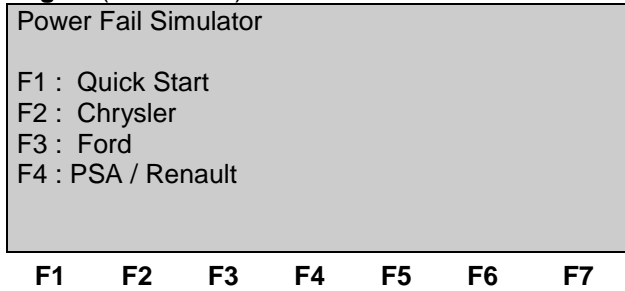
Selection of the various **Dips** and **Drop Out** functions, including **Quick Start** and **Standard Test Routines**.

F7 Service

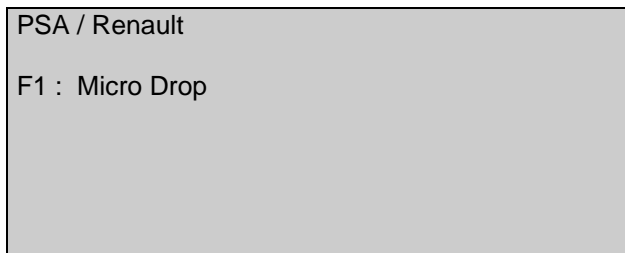
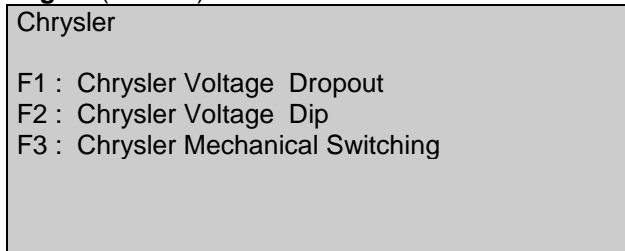
Set-up, self-test, addresses of EM Test can be selected and displayed.

3.3. Power Fail Simulator

Page 2 (Power Fail)



Page 3 (menus)



F1 Quick Start

Easy and fast operation of the equipment. All parameters can be changed while the test is running.

F2 Chrysler PF 9326 standard

Preprogrammed test routines for Voltage Dips and Voltage Drop Out

F3 Ford ES-XW7T standard

Preprogrammed test routines for Power Drop Out and Power Dip.

F4 PSA standard

Preprogrammed test routines for Microcoupures

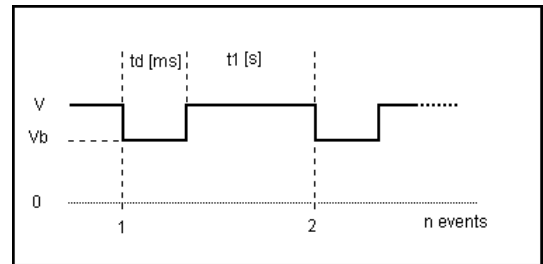
3.4. Quick Start

In Quick Start mode the operator can change all test parameters while the test is running. It is possible to simulate **Voltage Dips** as well as **Voltage Drop Out** test.

The latest simulator setting is automatically saved and will be recalled with the next selection of Quick Start.

Page 4 (Show parameters)

Quick Start	
td = 10.00 ms	t1 = 0.50s
CH = +	Vb = 9.5V
tri = Auto	n = endl.
START CHANGE	
F1	F2 F3 F4 F5 F6 F7



Press **CHANGE** and the test parameters parameter can be changed.

Select the desired parameter with the related function key and change the value by turning the front panel knob. The cursor allows the user to define the digit to be changed (fast or slow change).

Press **START** and the test routines begins immediately to work with the displayed test parameters.

After "START" the voltage dips starts with the preselected repetition rate and the counter will be incremented.

STOP	Counter	All function keys except F2 (manual trigger) can Stop the test routine.
F1	F2 F3 F4 F5 F6 F7	1

The operator now can navigate with the **Cursor** from parameter to parameter. The blinking parameter can be changed by turning the front panel knob.

Press **ESC** will bring the user back to the previous menu level.

Parameters		Range
td	Duration of a single event (0.001ms, 0.01ms – 9999.00ms)	0.001, 0.1ms - 9999.99ms
t1	Repetition rate (time between two events)	0.1ms - 99.00s
CH	Channel select (drop or ΔV (voltage dip); see clause 4 and 5)	- drop / ΔV
Vb	Variable test voltage (required battery supply or dip voltage)	0.0V - 30.0V (60.0V)
n	Number of events	Auto / Manual
tri	Trigger mode (Auto, Manual)	1A - 30A (Imax)

Voltage drops:

Dependent on the preselected test parameters the power supply for the DUT is switched off for a specified time. The rise and fall time shall be less than $1.5\mu s$. The duration t_d is adjustable in the range of μs to s.

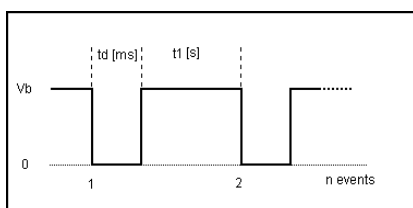
The nominal battery supply has to be connected to the PF1 channel input at the rear panel of the PFS 200N. No voltage shall be supplied to the PF2 channel input.

Voltage dips

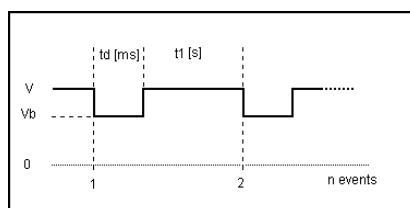
Dependent on the preselected test parameters the power supply for the EUT is reduced for a certain time to a certain dip voltage (reduced supply voltage).

The **Nominal Battery Supply** has to be connected to the PF1 channel input at the rear panel of the PFS 200N. This can be an electronic dc source or a simple battery.

The **Dip Voltage Supply** for the DUT is connected at the rear panel of the simulator to the PF2 connectors. This external dc source can be controlled by a 0-10V analog control voltage which is available at the rear panel of the PFS 200N. The RDS 200 voltage source is recommended for this application. The voltage setting then is controlled automatically by the PFS 200N.



voltage drops



voltage dips ΔV

for more information about these both modes (Dip / Drop) see section operation modes

3.5. Chrysler Test Routines

Page 4 (menus)

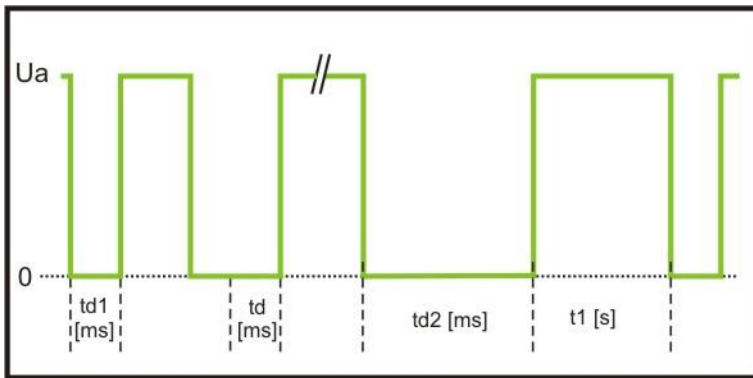
Chrysler

F1 : Chrysler Voltage Dropout
 F2 : Chrysler Voltage Dip
 F3 : Chrysler Mechanical Switching

F1 F2 F3 F4 F5 F6 F7

3.5.1. Chrysler Voltage Drop Out

(PF-9326 ; Laboratory procedure LP-138_C_38)



Parameters:

- td1 : 10us, 0.1ms, 1.0ms, 10ms, 0.1s
- td2 : 0.1ms, 1.0ms, 10ms, 0.1s, 1.5s
- dt : 10us, 0.1ms, 1.0ms, 10ms, 0.1s
- t1 : < 3s
- Td : 10µs to 1.5s
- Vb : +13.5V dc to 0(+0.5, -0)V
- n : 5 events with same duration

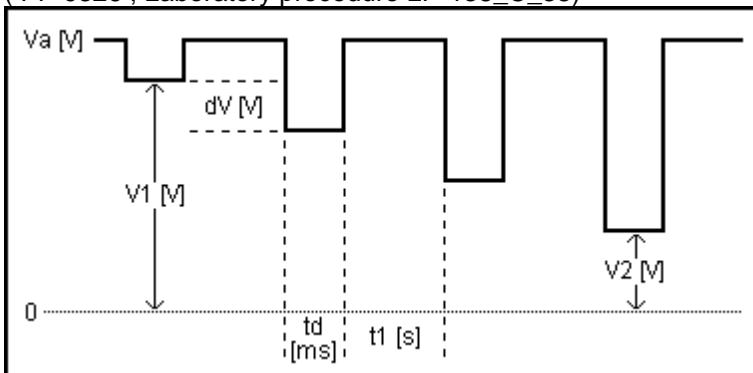
Fall time : 1± 0.5µs at 1kΩ load
 Rise time : 1± 0.5µs at 1kΩ load

Verification:

Load : 2 Ohm Fall time : < 1µs Rise time : <5µs

3.5.2. Chrysler Voltage Dips

(PF-9326 ; Laboratory procedure LP-138_C_38)



Parameters:

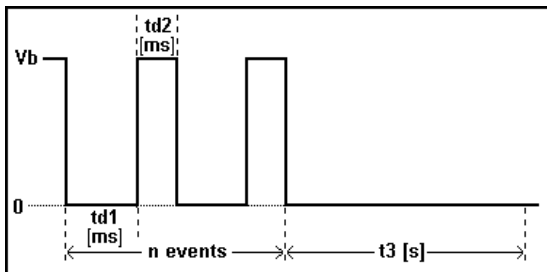
- td 0.01ms **0.1ms,** 1.0ms
- 10ms** **500ms** or other spec
- t1 : < 3s
- V1 : 5.5V
- V2 : 1.5V
- ΔV : 0.5V
- n : 5 events with same duration
- Vb : +13.5V

Fall time : 1± 0.5µs at 1kΩ load
 Rise time : 1± 0.5µs at 1kΩ load

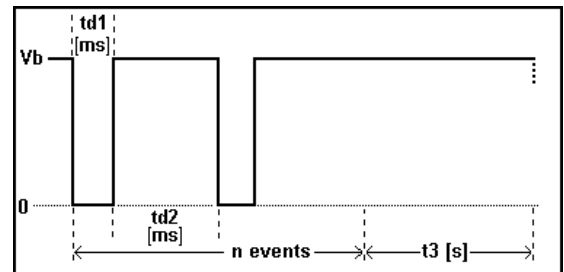
3.5.3. Chrysler Mechanical Switching

(PF-9326 ; Lab. Procedure LP-138_C_38)

This test applies to logic inputs to the DUT that are mechanically switched, usually to ground. The DUT shall be monitored during normal operation while being subjected to switching transients, to simulate switch bounce, on all of its mechanically switches logic inputs, line by line, ranging from 10 μ s to 100ms to determine the DUT effect threshold. Multiple transients (pulse train) of 10% duty cycle or less may also be used. Test duration as required to test DUT functions



Mechanical Switching Low



Mechanical Switching High

If $t_{ms} > r_{ms}$: Mechanical Switching Low

If $t_{ms} \leq r_{ms}$: Mechanical Switching High

Parameters:

td1 : .01ms, 0.1ms, 1.0ms, 10ms, 100ms

td2 : 0% duty cycle

Vb : 3.5V

t3 :

tri : Auto or Manual

n : number of events(td1+td2)

Caution:

If td1 in [0.01...0.99ms] then $td2 \geq 1.00ms$

If td2 in [0.01...0.99ms] then $td1 \geq 1.00ms$

3.6. Ford test routines as per ES-XW7T



The setting of Ford parameters on device is only possible if in menue **F7 Service / F3 Setup / F6 Set voltage** the parameter **F2 max. DC source voltage**

is connected to a source with **at least 13.5V voltage**.

SETUP	
F1 :	nominal DC voltage
F2 :	max. DC source voltage
Vn	V
2.0	60.0

RDS 200 = 16.0V
VDS 200B = 60.0V
VDS 200 = 30.0V

3.6.1. Power Dropout (CI 260)

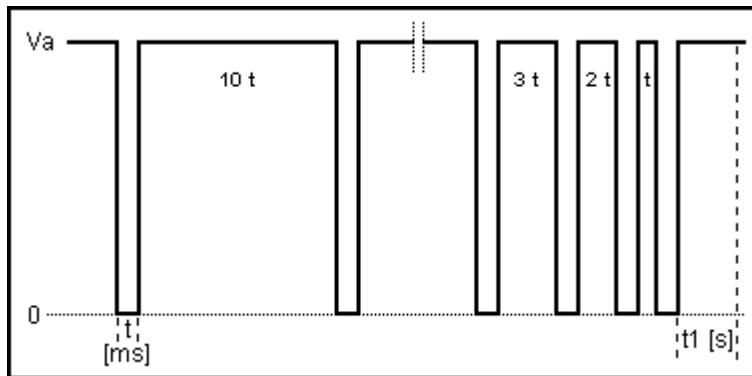
This test represents intermittent power interruptions and switch bounce.

Page 4 (menus)

Ford							
F1 : Ford Dropout High							
F2 : Ford Dropout Low							
F3 : Ford Dropout Single							
F4 : Ford Dip							

F1 F2 F3 F4 F5 F6 F7

3.6.2. Ford Voltage Drop High CI 260-A

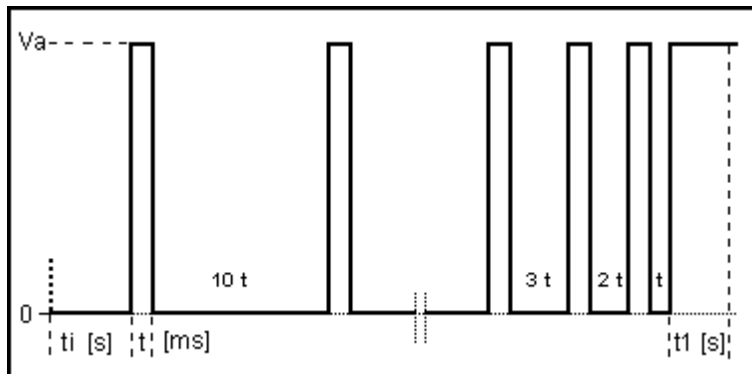


Parameters:

- t : 100µs , 200µs , 400µs , 700µs , 1ms, 3ms , 7ms, 10ms, 12ms, 18ms, 20ms, 50ms
- t1 : 0.1s to 99.0s
- tri Auto / Manual
- n :

Rise and fall-times are approximately 10µs

3.6.3. Voltage Drop Low CI 260-B

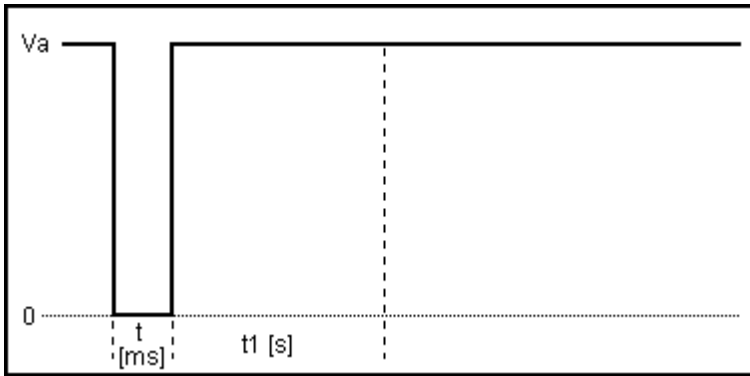


Parameters:

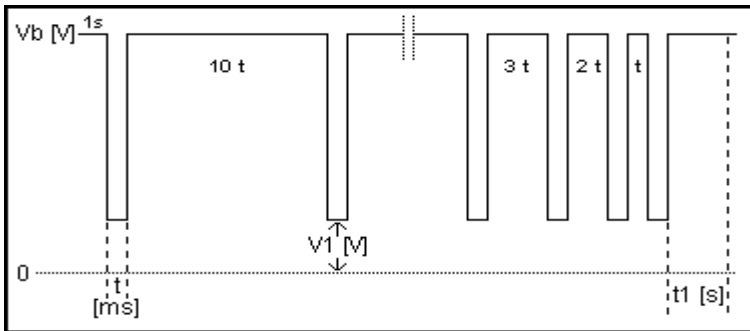
- ti : 0.1s to 99.0s
- t : 100µs , 200µs , 400µs , 700µs , 1ms, 3ms, 7ms, 10ms, 12ms, 18ms, 20ms, 50ms
- t1 : 0.10s to 99.00s
- tri : Auto / Manual
- n :

Rise and fall-times are approximately 10µs

3.6.4. Ford Power Dropout Single CI 260-B

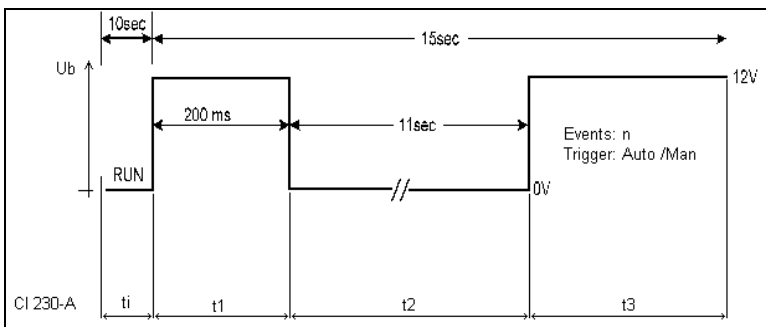


3.6.5. Ford Voltage Power Dip CI 260-B



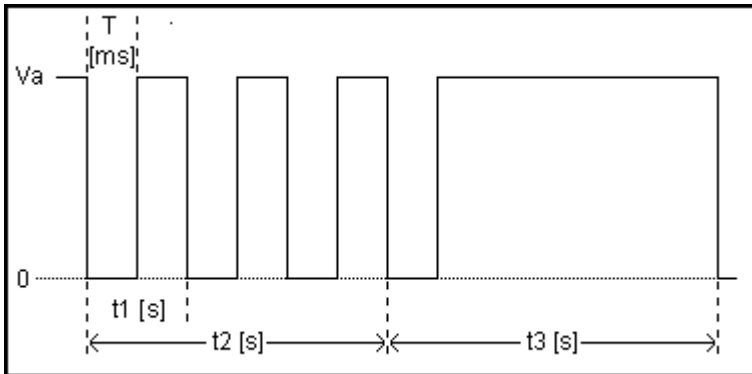
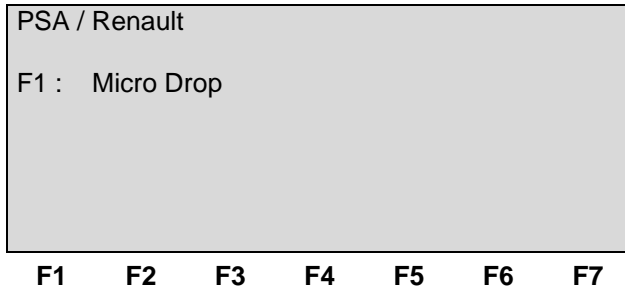
3.6.6. Ford CI 230-A

only in remote mode available



This routine is programmed to control the 0-10V output to drive external power supply units, e.g. the VDS 200 at ist control input at the rear part of the instrument.

3.7. PSA / Renault Test Routines



PSA B217110 specifies two procedures for testing the “Microcoupures”:

- **Test procedure:**

The “Microcoupures” are generated in “**Open Circuit Mode**”, that means the serial switch of the PFS 200N is opened and the DUT is disconnected from the battery supply. The DUT discharges internally. No load is connected for fast discharge.

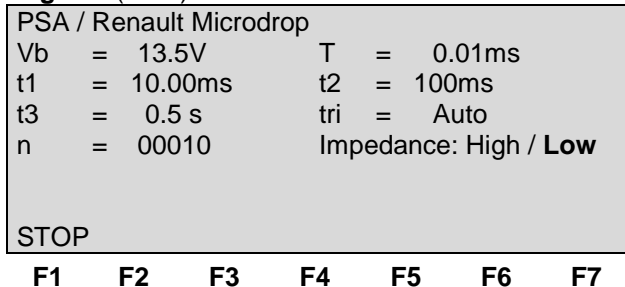
Therefore the operator has to select “**Impedance: High**” for testing.

- **Verification procedure**

The generator must be verified under loaded conditions. The load resistor is integrated in the PFS 200N.

Therefore the operator has to select “**Impedance: Low**” for verification. In case that the High mode is selected it is not possible to verify the fast rise and fall times which are specified to be $<1\mu\text{s}$.

Page 4 (Start)



↔ : Select with the cursor for change **High** or **Low** mode

All other parameters are fix according to the PSA standard.

3.8. Service

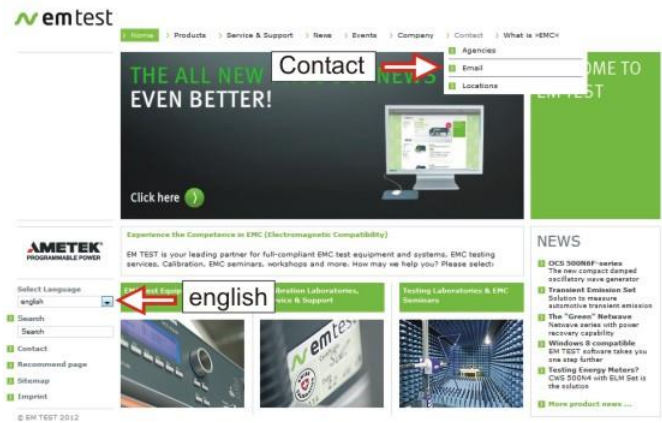
All service functions are indicated on the display.



F1 Addresses

The addresses of the EM TEST (Switzerland) GmbH and the EM TEST GmbH in Germany are shown. The addresses of all EM TEST sales agencies are listed on the web site of EM Test under :

www.emtest.com



F2 Selftest

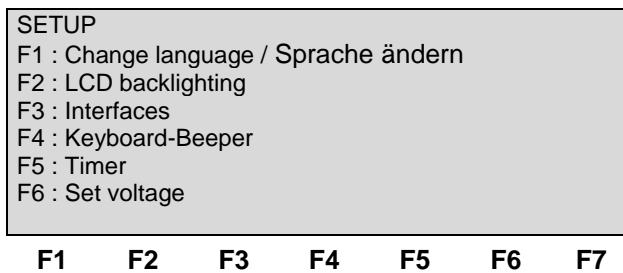
A simple selftest for checking the key's.

F3 Change standard levels

Future product family or dedicated product standards may use other test levels or test parameters. This procedure allows the user to change the standard values to his actual requirements.

3.9. Setup

This menu helps the user to define the configuration of the PFS 200.



F1 Change language

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

F2 LCD backlighting

With 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 Serial Interface 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 operating time of the test equipment.

F6 Set voltage

For control of an external power supply source an analogue control voltage can be programmed (0-10V dc). The operator can specify the following parameters:

F1: **Max output voltage** of the variac. The analogue reference value for this is 10V.

F2: **Rated output voltage** for the device under test. This voltage shall be specified by the operator and depends on the type of equipment under test. The variac normally is automatically set to this output voltage.

4. Test set-up



When setting up the test national and international regulations regarding human safety have to be guaranteed.

It is recommended to connect the simulator to the ground reference plane of the test set-up.

The generators of the series 200, UCS, LD, PFS and VDS can be linked together to a fully automotive test set-up.

The set-up communicates via the IEEE/GPIB bus and is controlled by ISM ISO software.

For setting up the system see the following figures:

Each generator can be operated individual as a single equipment.

4.1. Test setup with software iso.control software

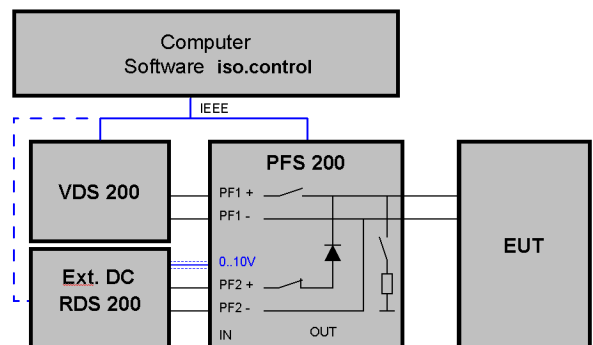


Attention

Operating with iso.control connect the VDS 200N to the PF1 input of PFS 200N

Within a software controlled test setup the system must be wired as shown in the above figure.

- The VDS 200N must be connected to input PF1. This unit works as the central battery supply unit and is also used for battery supply simulation.
- The external DC source, EM TEST recommends the RDS 200 dc source, is controlled by the analog output voltage which is available at the rear panel of the PFS 200N. The output of the voltage source must be connected to PF2 input of the PFS 200N.

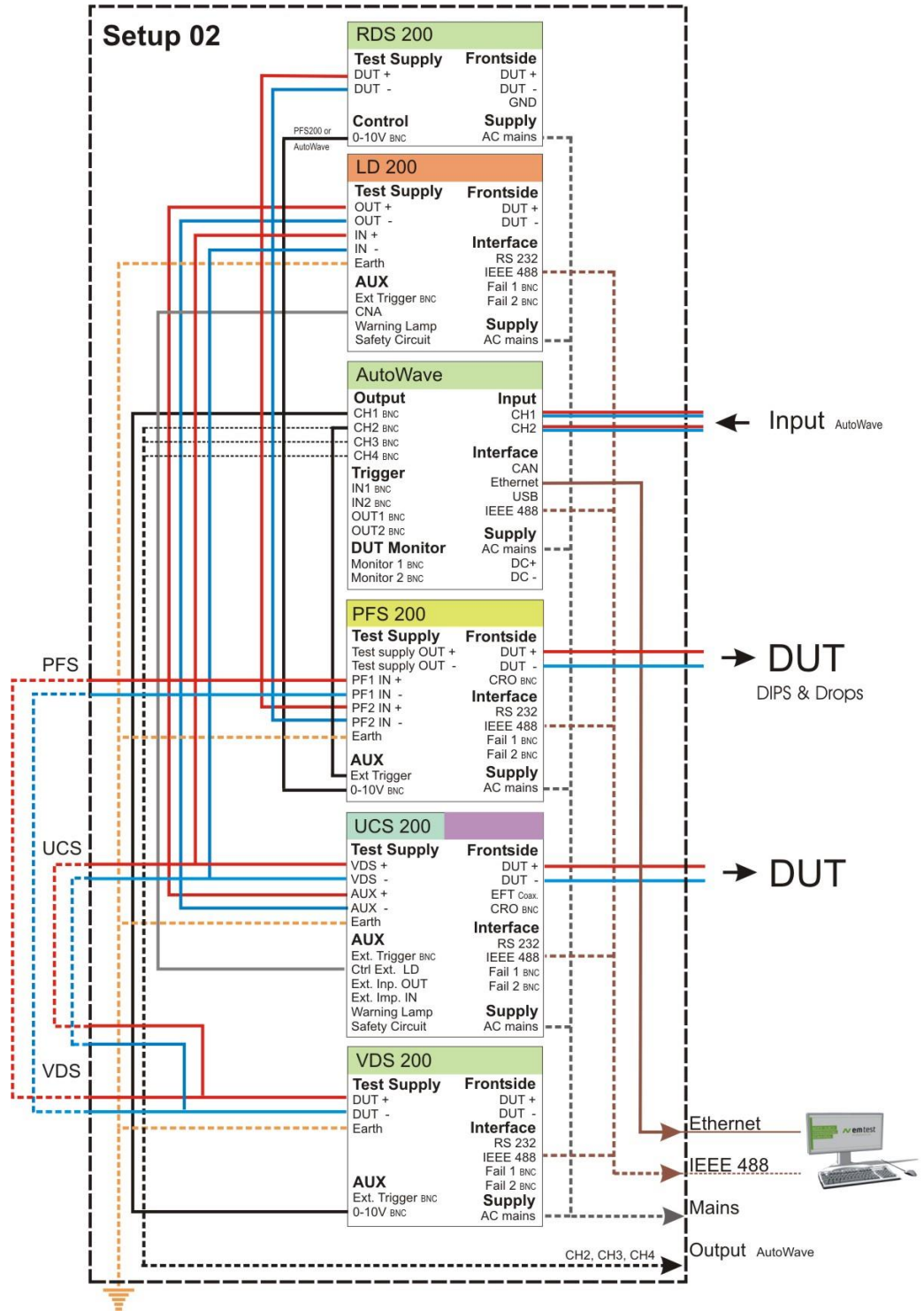


Within this set-up all settings for dips and dropouts tests are performed automatically.

4.2. Examples Test setup

Setup example with:

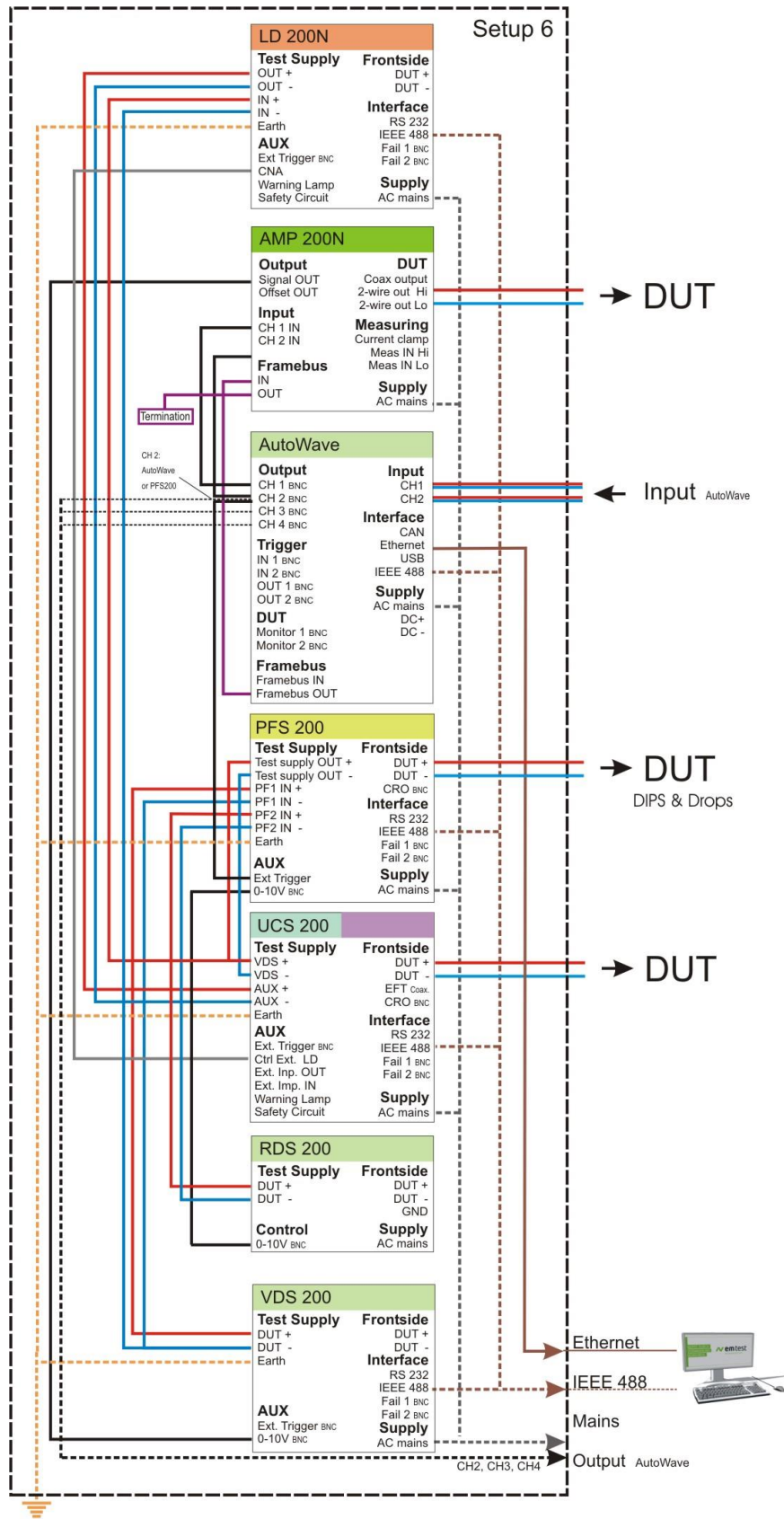
- AutoWave
- UCS 200N
- VDS 200N
- LD200N
- PFS 200N
- RDS 200N



Note : Do never connect The PFS200 output 0-10V in parallel with any Autowave output. In this case the controlled DC source will deliver a wrong output signal. It is not allowed to connect two voltage sources in parallel.

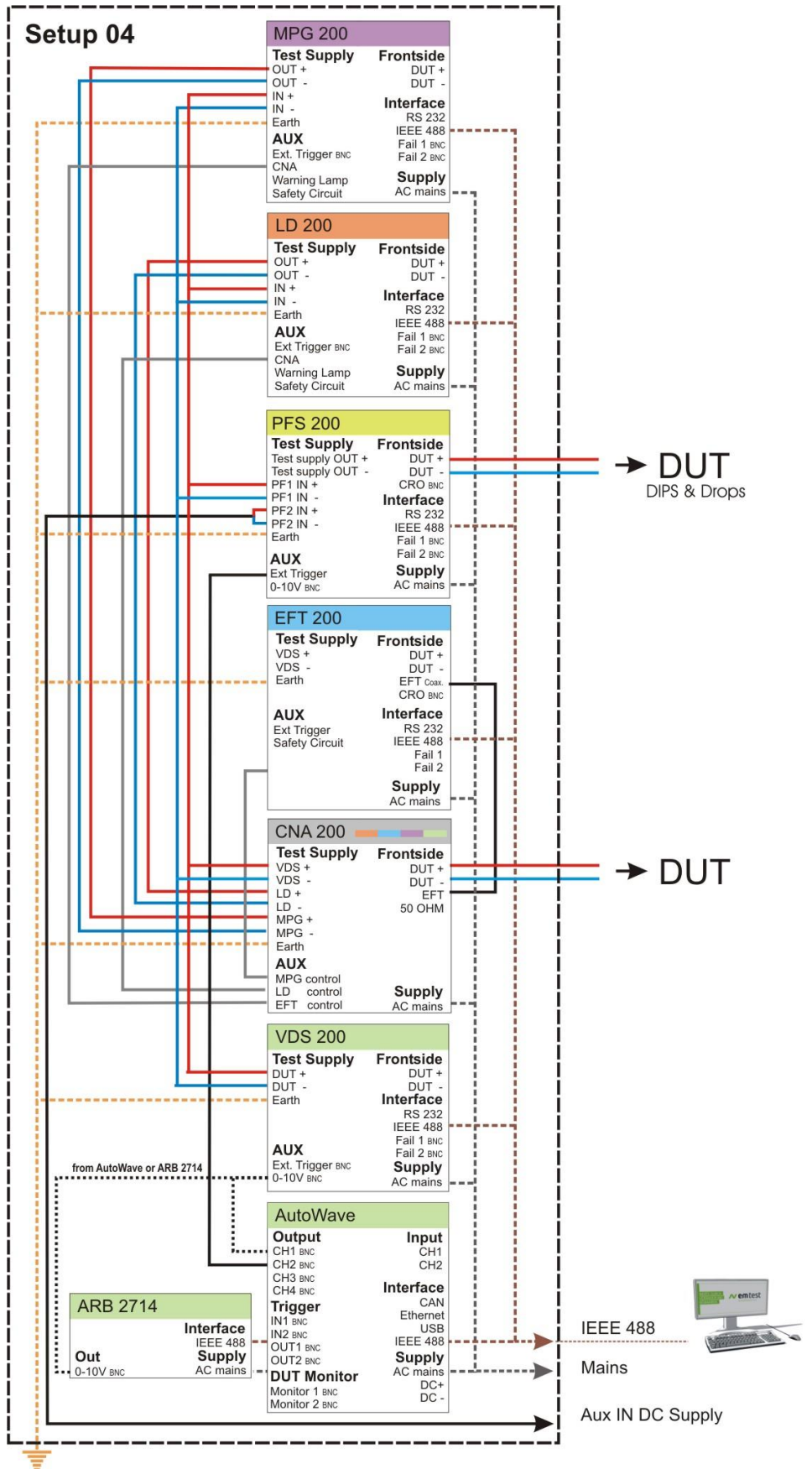
Setup example with:

- AutoWave
- UCS 200N
- VDS 200NB
- LD200N
- PFS 200N
- AMP 200N
- RDS 200



Note : Do never connect The PFS200 output 0-10V in parallel with any Autowave output. In this case the controlled DC source will deliver a wrong output signal. It is not allowed to connect two voltage sources in parallel.

Setup example with:
 ARB 2714 or AutoWave
 MPG 200
 VDS 200B
 LD 200
 PFS 200
 EFT 200
 CNA 200

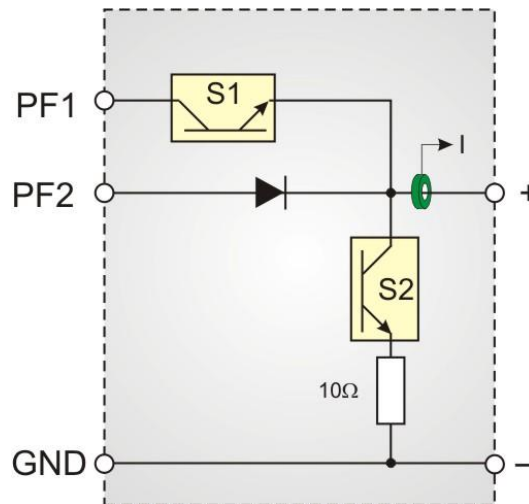


Note : Do never connect The PFS200 output 0-10V in parallel with any Autowave output. In this case the controlled DC source will deliver a wrong output signal. It is not allowed to connect two voltage sources in parallel.

4.3. Operation modes

LED

Two LED's mounted on the front panel show if a channels is active or not. The LED of an active channel is lighted. During DIP mode the LED display switches from one channel to the other.



General diagram

Drop: The voltage supply at channel PF1 will be interrupted for the preselected time t_d . The voltage at PF2 is set to 0V. At the same time switch S2 close and connect the internal 10Ω load to the DUT. This is indicated by the PF2 LED.

For the drop out test the supply voltage must be connected to PF1 input at the rear side.

ΔV : Channels PF1 and PF2 are supplied with different voltages; e.g. channel PF1 with nominal voltage, channel PF2 with a reduced dip voltage.

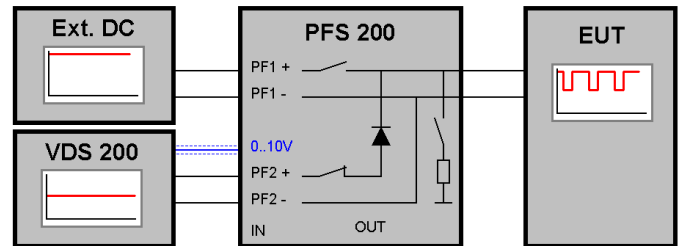
Channel PF1 is switched off for the preselected time t_d . During this time the DUT is powered by the reduced voltage of channel PF2. The "Dip voltage" is delivered through the diode..

4.3.1. Voltage dips

Dependent on the preselected test parameters at the front panel of the simulator the power supply for the EUT is reduced for a certain time to a certain dip voltage.

The nominal supply for the DUT is connected at the rear side of the simulator to channel PF1 and the reduced dip voltage shall be connected to PF2. The generator in voltage dip mode will switch over from channel PF1 to PF2 within the timing specified in the test parameters. External DC sources are required.

V_b is the rated DUT power supply voltage
 V is the reduced voltage for the dip testing

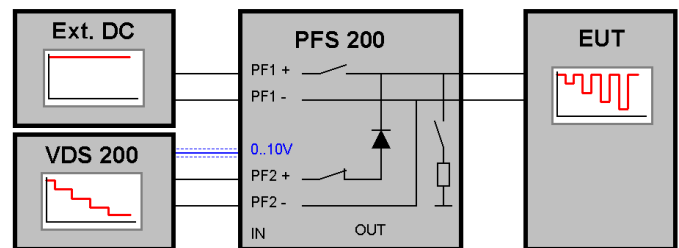


Within this test routine the VDS can be used as external power source. The **0-10V output** of the PFS (rear panel) can be used to control the voltage setting of the VDS. For this purpose connect the PFS output and the VDS input with a BNC cable and hook up PFS and VDS as follows:

Switch the VDS in the menu functions to **VDS Extern.**

The VDS now can be controlled via the front panel/display of the PFS 200N.

In combination with the VDS of course the voltage setting V_1 to V_2 by ΔV is set automatically via the control voltage 0-10V of the PFS.



Within this mode also very easily complete automated test routines can be pre-programmed e.g. the CHRYSLER PF 9326 specification for voltage dips.

Remark : If the units are operated via windows software ISMISO the VDS must be connected to PF1, and the external DC source to PF2. The external DC source is controlled by the analogue output of PFS. With this setup all settings are automatically performed.

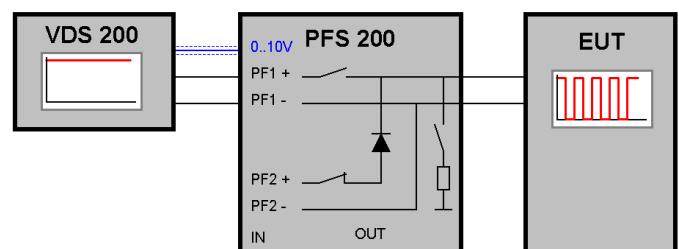
4.3.2. Voltage drop out

The test set-up for the voltage drop procedure is identical to the voltage dip test. The generator in **Voltage Drop Out** mode will switch off the power supply voltage of the DUT.

The nominal supply for the DUT is connected at the rear side of the simulator to channel (PF1).

In case that the VDS is used as supply source the supply voltage is controlled via the 0-10V control voltage of the PFS 200N. The setting is controlled via front panel operation at the PFS.

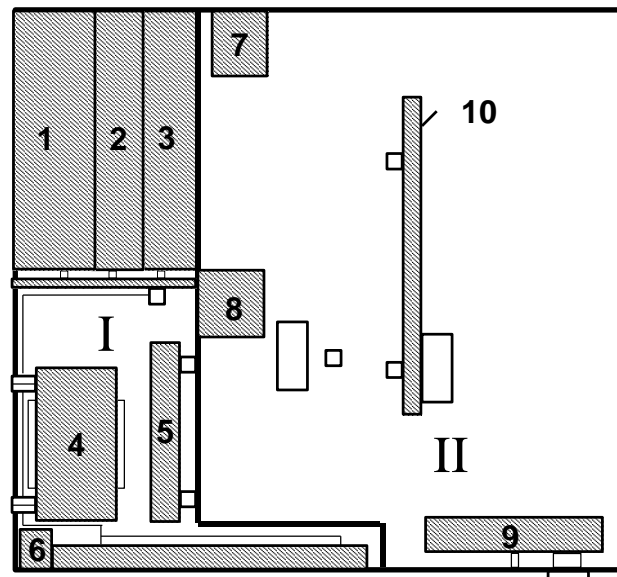
The **rise time t_r** and **fall time t_f** must be $\leq 1\mu s$ under no load condition.



5. Test Equipment

5.1. Construction

The Power fail generator type PFS 200 is divided into two main parts. The control unit is shielded and decoupled against the other unit.



I	Control unit	II	Power switches
1	Power supply	7	Power supply
2	Interface board	8	Current sensor
3	Processor board	9	Front-panel board
4	Transformer	10	Switch PF1 and PF2 diode
5	Filter board		
6	Keyboard / LCD display		

5.2. Control unit

The control unit is built up by 3 boards, the power supply, the micro-controller board and the interface board.

Power supply unit

The power supply unit supplies voltages of +/- 15V, + 5V, + 24V for all other modules of the simulator. The unit is fused on the back of the device in the power supply socket.

Micro-controller unit

This unit controls the entire functions of the power supply simulator and simultaneously organizes the data transfer via the USB or parallel IEEE interface.

The desired test parameters are preselected via the function keys or the knob (incr./decr).

I / O Controller

All control parameters entered via the keyboard or the interfaces are interpreted by the I/O controller. In addition this print contains the control of the power electronics as well as the optical separation between control circuits and power electronic.

LED

Two LED's mounted on the front panel show if a channel is active or not. The LED of an active channel is lighted. During mode ΔV the LED display switches from one channel to the other.

Trigger mode

In order to accelerate the test procedure the events may be generated repetitively. In the operating mode „AUTO“ events are released at a preselected interval time.

5.3. Power switch

Input channels

The input channels PF1 and PF2 are located at the rear part of the equipment. Attention has to be given to the following:

1. The plus pole of the dc supply voltage shall be connected to the red + socket and the minus pole to the black – socket.
2. This applies for both channels.
3. The minus input of both channels are connected internally and directly lead to the output.
4. The power switches can bear no more than a voltage of 80 Vdc. They are protected by a diode.

Power switches

The power switches are electronically protected against overload and short-circuit. The nominal current of the switches is 32A and 200A depending on the model.

Special protection requirements of the EUT must be separately assured by the user.

Inrush currents

Inrush currents of $\geq 100A$ are acceptable. To avoid higher inrush currents of the EUT an electronic control limiting the inrush current is incorporated in the device.

Over-voltage generated by connecting or disconnecting additional loads will be limited internally by protection diodes.

6. Technical Data

6.1. Power switches PFS200N

PFS200N30

Channel PF1/PF2

	DC voltage	max. 80 V
	DC current	max. 32 A
Switching time (on/off)	Open circuit	< 1 μ s
Inrush current		70 A 500 ms
electronically overload protection		Settable up to 32 A
protected against short circuit		

PFS200N50

Channel PF1/PF2

Channel PF1

Channel PF2

	DC voltage	max. 80 V
	DC current	max. 50 A
	DC current	max. 50 A
Switching time (on/off)	Open circuit	<1 μ s
Inrush current		100 A 500 ms
electronically overload protection		Settable up to 50 A
protected against short circuit		

PFS200N100

Channel PF1/PF2

Channel PF1

Channel PF2

	DC voltage	max. 80 V
	DC current	max. 100 A
	DC current	max. 100 A
Switching time (on/off)	Open circuit	< 1 μ s
Inrush current		150 A 500 ms
electronically overload protection		Settable up to 100 A
protected against short circuit		

PFS200N150

Channel PF1/PF2

Channel PF1

Channel PF2

	DC voltage	max. 80 V
	DC current	max. 150 A
	DC current	max. 150 A
Switching time (on/off)	Open circuit	<1 μ s
electronically overload protection		Settable up to 150 A
protected against short circuit		

PFS200N200

Channel PF1/PF2

Channel PF1

Channel PF2

	DC voltage	max. 80 V
	DC current	max. 200 A
	DC current	max. 200 A
Switching time (on/off)	Open circuit	<1 μ s
electronically overload protection		Settable up to 200 A
protected against short circuit		

6.2. Trigger

Automatic	automatic release of the events		
- Repetition rate	0.1 s – 999 s		
	0.10 s –	1.00 s	step 0.01 s
	1.00 s –	10.00 s	step 0.1 s
	10.00 s –	999.00 s	step 1.0 s
- Drop out duration t_d	1.0 μ s - 9999ms		
- Dip duration	0.001ms –	1.00 ms	step 0.001 ms
	1.00ms –	10.00 ms	step 0.01 ms
	10.0ms –	9999 ms	step 0.1 ms
Manual	single event trigger		
External	trigger by external signal		

6.3. Measurement

BNC connector CRO I	internal current sensor for nominal current, inrush current 10mV / A max. 700A
BNC connector CRO TRIGGER	trigger for oscilloscope positive ramp to +15V delay approx. 30ms

6.4. Test routines

Quick Start	All parameters adjustable while test is running
Standard test Routines	1. Chrysler PF 9326 2. Ford 3. PSA / Renault
Service	Addresses Selftest Set-up

6.5. Interfaces

Serial Interface USB	Setting Baudrate (RS232: 9'600 , 19'200 Baud)
Parallel Interface IEEE	Addresses 1 – 30
Analogue output	0 – 10V DC to control external voltage sources

6.6. General

Device	PFS 200N30,N50,N100	PFS 200N150, N200
Dimensions	19" / 3 HU	19" / 6 HU
Weight	N30 / N50: 10.8 kg N100: 14kg	approx. 30 kg
Power supply	115/230V +10/-15% 50/60Hz (optional 115 V) Max. 60 VA	
Fuses	2 * 1 A T	

6.7. Environmental conditions

Temperature	10 °C to 35 °C
Humidity	30 % to 70 %; non condensing
Atmospheric pressure	86 kPa (860 mbar) to 106 kPa (1 060 mbar)

=> Not relevant data for the standards can be changed by the manufacturer <=

7. Maintenance

7.1. General

The generator is absolutely maintenance-free by using a solid state semiconductor switch to generate the fast transients.

7.2. Calibration and Verification

7.2.1. 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

7.2.2. 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.

7.2.3. 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.

7.2.4. 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 refer to the waveshape and values of the original calibration certificate.

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



Before starting the calibration or verification
remove the DUT Mains Supply
from the generator and from the coupling network

8. Delivery Groups

8.1. Basic equipment

- Simulator PFS 200N
- Power supply cable
- 1 set of safety laboratory cables
- Manual on USB memory stick

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

8.2. Accessories and options

- User software " iso.control "
 - Test, analysis and documentation with windows (see separate documentation)
 - License version for testing according the most automotive standards
 - Report generator with export function to word-processing software



USB Interface

- **K-USB USB interface cable**
High quality USB 2.0 interface cable for data transfer to the computer.
Length: 3m connector type USB A – USB B
- **FER-USB**
Ferrite for suppress burst pulses on the USB cable.
Application: 8 turns for the best result. max. 10cm above ground.



9. Appendix

9.1. Declaration of CE-Conformity

Manufacturer : **EM TEST (Switzerland) GmbH**
 Address: Sternenhofstr. 15
 CH 4153 Reinach
 Switzerland

declare, that under is 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: Power Fail Simulator Series PFS 200N
 Model Number(s) PFS200N30, PFS 200N50, PFS 200N100, PFS 200N150,PFS 200N200

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 : 2013 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.

European representative
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 Lünenerstr. 211
 D 59174 Kamen
 Tel: +49 (0) 2307 / 26070-0
 Fax: +49 (0)2307 / 17050



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 EM TEST (Switzerland) GmbH
 Sternenhofstr. 15
 CH 4153 Reinach
 Tel: +41 61-7179191
 Fax: +41 61-7179199



By A. Gerstner
 General manager
 Kamen, Germany
 Date 20. December 2016

A. Burger
 Business Manager Conducted EMC
 Reinach BL, Switzerland
 25. February 2016

9.2. PFS 200N Blockdiagram

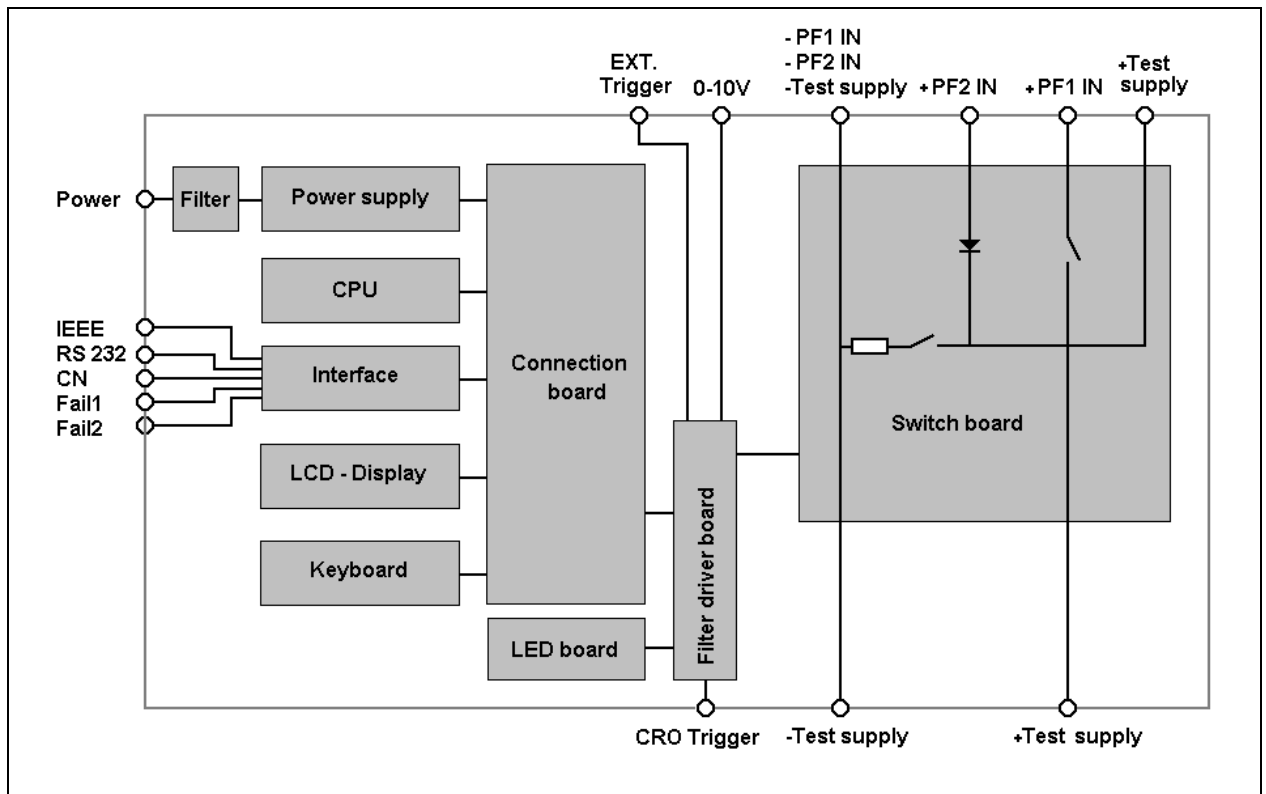
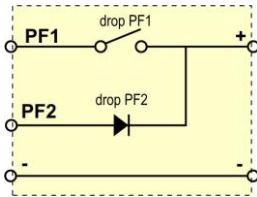


Figure 9.1 Blockdiagram PFS 200N

9.3. Voltage drop of PF1 and PF2 input



The internal voltage drop depends on the built in element and the actual current. Figures 9.3 to 9.6 shows the internal voltage drop in relation to the current.

PF1 : MOS field effect transistor
 PF2 : DSEI Diode

Fig. 9.2 : PFS 200

Voltage correction

Using a PFS 200 for control an external source, the analogue output 0-10V compensates the internal voltage drop. The PFS 200 increases the dc-control voltage for the source:

- Voltage drop at PF 1 input : $V_{set} + 0.2V$
- Voltage dip at PF2 input : $V_{set} + 0.9V$

Generator

Voltage drop on PF1

Voltage drop on PF2

PFS 200N50

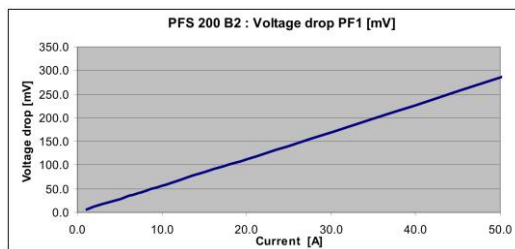


Fig. 9.3:

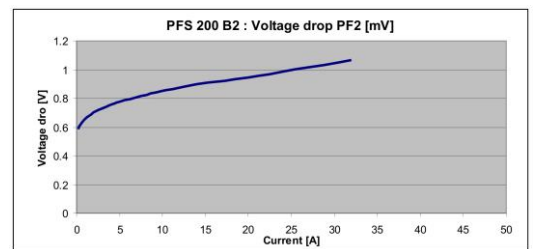


Fig. 9.4:

PFS 200N100

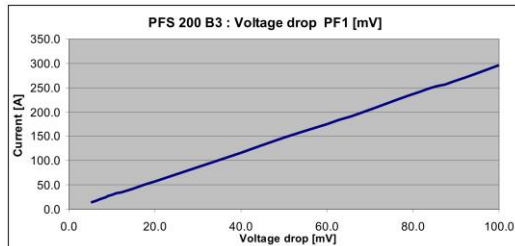


Fig. 9.5:

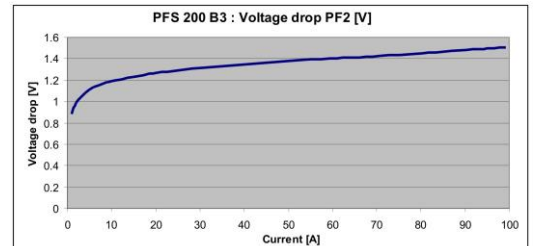


Fig. 9.6:

9.4. PFS 200N Menu overview

Page 0	Page 1	Page 2	Page 3	Page 4	Page 5
EM TEST PFS 200N V5.02 SWN: 000115	Main menu F1 Power Fail Simulator F7 Service	Power Fail Simulator F1 Quick Start F2 Chrysler F3 Ford F4 PSA / Renault	Quick Start F1 Start / Stop F2 Change F3 Continue	Start run the test procedure Stop stops the test procedure Change Select the parameters Continue the test procedure	
			Chrysler F1 Chrysler Voltage Dropout F2 Chrysler Voltage Dip F3 Chrysler Mechanical Switching	Chrysler test routines F1-F3 F1 Start / Stop F2 Change F3 Continue	Start run the test procedure Stop stops the test procedure Change Select the parameters Continue the test procedure
			Ford F1 Ford Dropout High F2 Ford Dropout Low F3 Ford Dropout Single F4 Ford Power Dip	Ford test routines F1-F4 F1 Start / Stop F2 Change F3 Continue	Start run the test procedure Stop stops the test procedure Change Select the parameters Continue the test procedure
			PSA / Renault F1 Micro Drop	PSA / Renault test routine F1 Start / Stop F2 Change F3 Continue	Start run the test procedure Stop stops the test procedure Change Select the parameters Continue the test procedure
		Service F1 Addresses F2 Self test F3 Set-up	Addresses Addresses of EM TEST and their representatives are displayed.		
			Selftest F1 Press the displayed Key	Selftest F1 Continue F2 Again F3 Break	
			Set-up F1 Change language / Sprache ändern F2 LCD backlighting F3 Interfaces F4 Keyboard beeper F5 Power ON counter F6 Set voltage	Change language German/English LCD backlighting ON/OFF or AUTO Interfaces Select parameters Keyboard-Beeper (ON/OFF) Power ON counter Voltage Unom, Umax. dc source	