EMS 100 µs-switch

SIMULATION OF MICRO CUT-OFFS AND DISCHARGE OF LOAD CURRENTS IN AUTOMOTIVE SUPPLY NETWORKS

EMS 100 µs-switch

- ✓ Extremely fast electronic switch for signal and power lines
- ✓ Very short voltage interruptions
- ✓ Fast rise and fall time
- ✓ Trigger input and output
- ✓ Signal line switch or relay
- ✓ Switch supply line or ground line independently
- ✓ Device control via webinterface and interface commands
- ✓ Test and evaluation software available

The relating standards:*
ISO 7637-2
ISO 7637-3
ISO 16750-2
ISO 21848
LV124
VDA320 (LV148)
BMW GS 95002
BMW GS 95002-2
BMW GS 95003-2
BMW GS 95024-2-2
BMW GS 95026
FCA CS.00054
Fiat 9.90111-01
Ford FMC1278
GMW 3097
GMW 3172
JLR EMC-CSv1.0A4
MAN M 3285
MBN LV 124-1
MBN 10567
Mitsubishi ES-X82114
Mitsubishi EX-X82115
Nissan 28401NDS02
PSA B21 7110
Renault 36-00-808/--M,N
SAE J 1113-11
Volvo 31822854
Volvo 31850329
VW 80000
VW 82148
VW TL 81000
Magnetic field test

***** *The EMS 100 µs-switch can be used for certain tests within these standards. Additional equipment might be required. For detailed information, please contact sales@spitzenberger.de.*

FAST ELECTRONIC SWITCH
FOR SHORT VOLTAGE INTERRUPTIONS

Schematic overview

The µs-switch type EMS is a very fast electronic switch combination for testing in accordance with various automotive test standards. Originally designed for the LV124 standard, the flexibility of the EMS 100 µs-switch extends its use to the VDA 320 (LV148) and various manufacturer specific standards. The EMS 100 µs-switch allows to switch the supply and ground lines independently. For interruption of signal lines, the EMS 100 µs-switch offers two extension slots for an optional signal switch module and relay module.

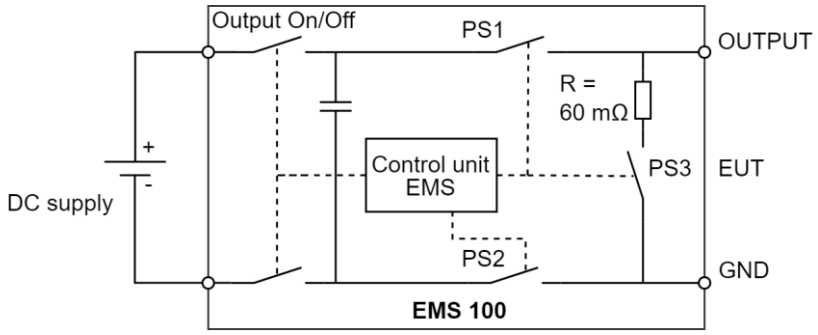

Fig. 1: EMS 100 µs-switch schematic

The ability of generating very short voltage interruptions of 10 µs duration requires a very fast rise and fall time of the electronic switches. The LV124 standard specifies the rise and fall time t_r / t_f as ≤ (0.1 * t_1) of the desired test cycle t_1 (Fig. 2).

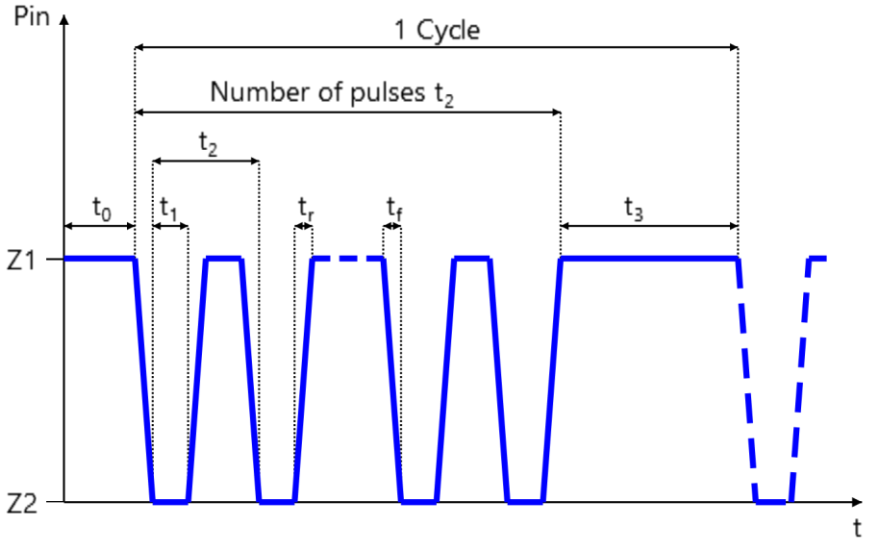

Fig. 2: LV124 E-13 pin interruption test pulse

The short-time current capability of the power switches is shown in the diagrams below.

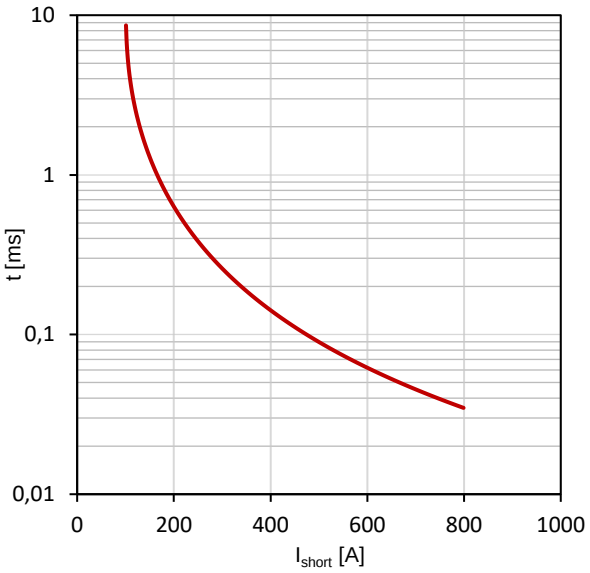

Fig. 3: Short-time current capability PS1 and PS2

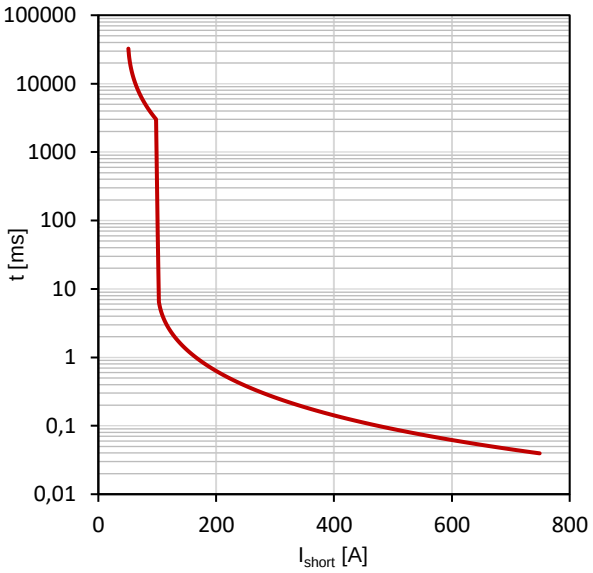

Fig. 4: Short-time current capability PS3 and R

SOFTWARE CONTROL

SPS TestManager

- ✓ Test and evaluation software for fully compliant emission and immunity tests
- ✓ Automated test run of various IEC and automotive standards

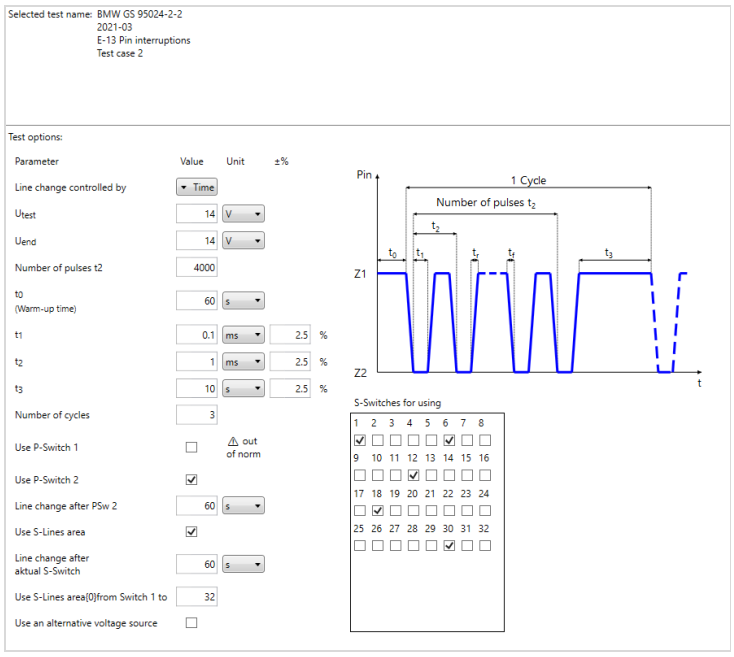

Fig. 5: SPS TestManager software

SPS SystemControl

- ✓ Simulation and control software for arbitrary waveforms, voltage and frequency variations
- ✓ Generation of user defined sequences
- ✓ Sequence preview graph

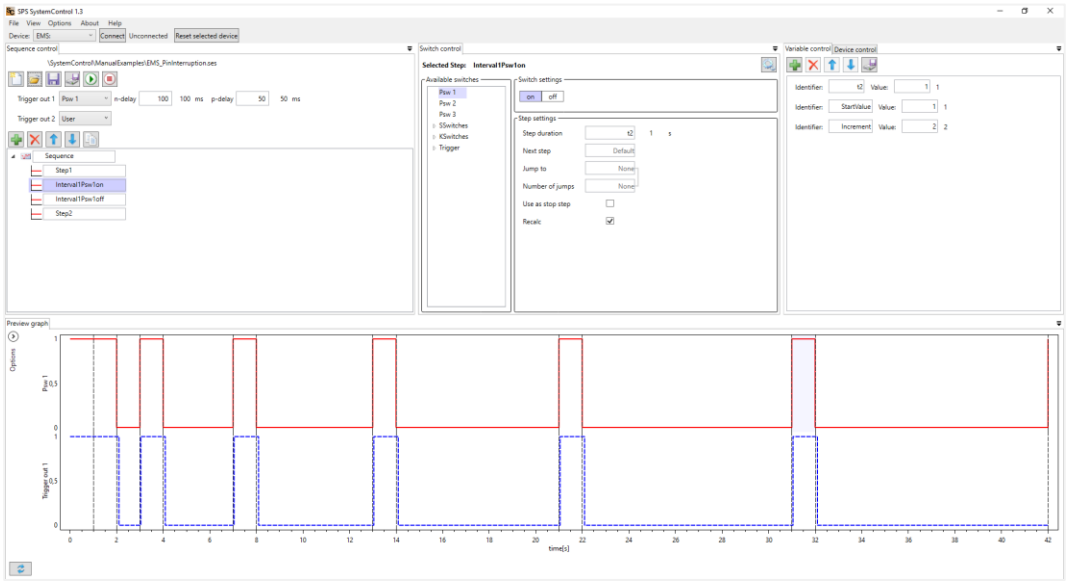

Fig. 6: SPS SystemControl software

Command interface

- ✓ Easily integrate the device into your own software applications
- ✓ Remote control commands are based on the SCPI standard

Webinterface

- ✓ Monitor and control the connected device via a web browser

TOUCHSCREEN USER INTERFACE

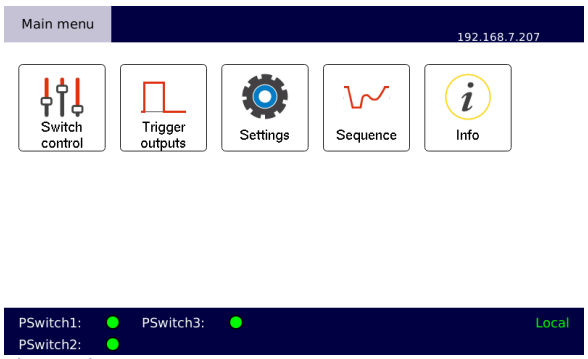

Fig. 7: Main menu

Fig. 8: P Switch control

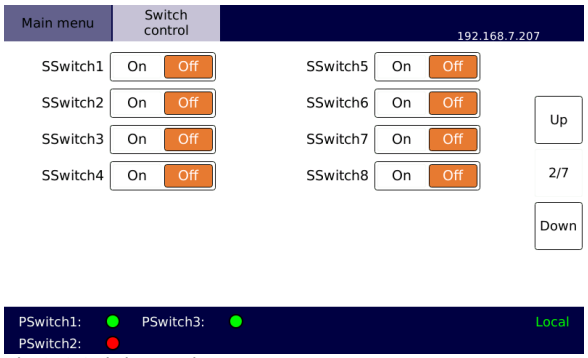

Fig. 9: S Switch control

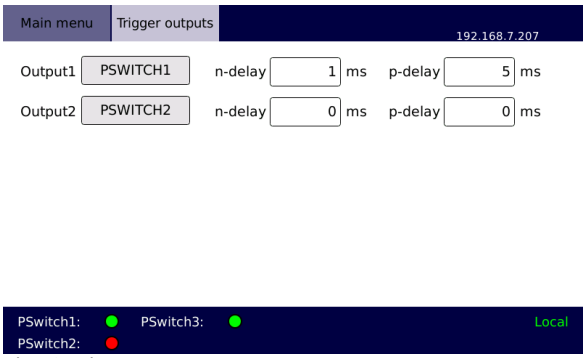

Fig. 10: Trigger outputs

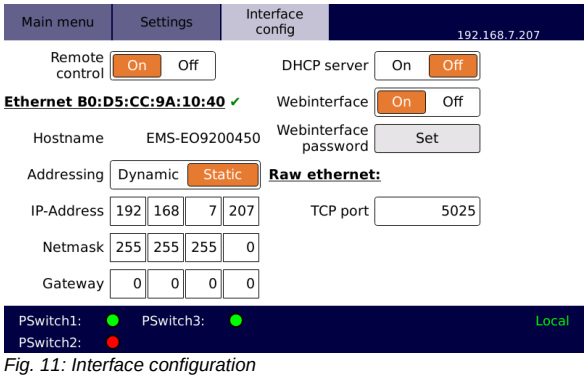

Fig. 11: Interface configuration

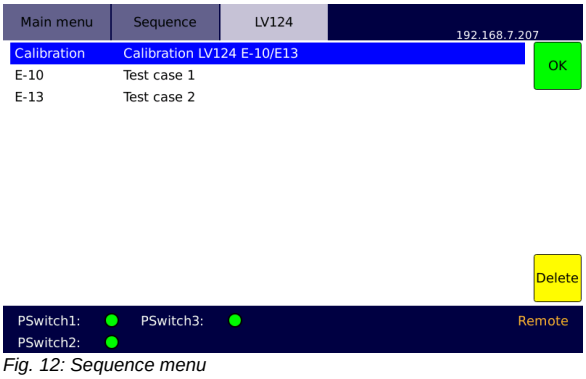

Fig. 12: Sequence menu

TECHNICAL DATA – EMS 100

		EMS 100
DC input voltage *(max.)*		70 V
Break down voltage		> 70 V
DC output current	*continuous*	100 A
	short-time	see diagrams Fig. 3 and Fig. 4
Power switch on-state resistance		approx. 10 mΩ at nominal current
Rise time t_r *(ref. load)*		< 1 µs (1 Ω / 10 Ω / 100 Ω)
Fall time t_f *(ref. load)*		< 1 µs (1 Ω / 10 Ω / 100 Ω)
Rise time t_r *(ref. load)*		< 10 µs (1 kΩ)
Fall time t_f *(ref. load)*		< 10 µs (1 kΩ)
t_{on} / t_{off} time *(min.)*		1 µs
Extension slots for SSW/Relay		2
Trigger input (*PS1 + PS2)*		+5 V … +24 V
Trigger output *(switch selectable)*		
	Trigger level	+5 V (TTL level)
	Release delay	0 … 100 ms
Protection circuits		overcurrent / short circuit / overtemperature / overvoltage
Internal control unit		
	Display	7.0" touchscreen (17.8 cm, resolution 800 x 480)
	Sequencer	integrated sequence: Calibration LV124 user defined sequences memory
	User interface	touchscreen / front panel button / incremental encoder webinterface
Interface		Ethernet 100 Mbit/s (HiSLIP SCPI) USB 2.0 Host
Insulation resistance		> 1 MΩ
Peak withstand voltage *(max. 10 s, output to earth)*		> 500 V
Cooling		temperature-controlled forced air cooling
Ambient temperature		+10 °C up to +40 °C
Storage temperature		-25 °C up to +60 °C
Relative humidity		non condensing, max. 80 % for temperature < 31 °C, decreasing linearly to 50 % at 40 °C
Ingress protection		IP20
Power supply *(±10 %, 50/60 Hz)*		230 V
Line protection, connection		2 A, Schuko
Housing		plug-in unit or desktop, light grey (RAL7035)
Switch *approx. dimensions (H x W x D)*		19", 5 U 222 x 483 x 450 mm
Weight *(approx.)*		23 kg

OPTIONS AND ACCESSORIES

Options		
OPT.01	IEEE488	Not in combination with OPT.02
OPT.02	RS232	Not in combination with OPT.01
EMS.CAL		**Calibration Kit LV124**
	Resistor types	High precision non-inductive measurement resistors
	1 kΩ	5 W / 1 %
	100 Ω	5 W / 1 %
	10 Ω	125 W / 1 %
	1 Ω	125 W / 1 %
	Measurement	BNC connector
	approx. dimensions (H x W x D)	55 x 114 x 64 mm
EMS.R2.16		**Relay module 2A/16**
	Number of relays	16 per module, contact type 2C
	Max. DC switching current (real load)	2 A
	Max. DC switching voltage (real load)	70 V
	Max. switching power (real load)	60 W
	Protection	2 A fuse
EMS.SSW.1.16		**Signal switch module 1A/16 (upgradable to 32)**
	Number of switches	16 per module
	DC input voltage	0 … +70 V
	DC output current capability	1 A
	Rise time t_r (ref. load)	< 1 µs (100 Ω / 1 kΩ)
	Fall time t_f (ref. load)	< 1 µs (100 Ω / 1 kΩ)
	Protection	1 A fuse
EMS.SSW.4.8		**Signal switch module 4A/8 (upgradable to 16)**
	Number of switches	8 per module
	DC input voltage	0 … +70 V
	DC output current capability	4 A
	Rise time t_r (ref. load)	< 1 µs (100 Ω / 1 kΩ)
	Fall time t_f (ref. load)	< 1 µs (100 Ω / 1 kΩ)
	Protection	4 A fuse