

EMS serial tracer

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1 Somac EMS Serial Tracer

The 'Somac EMS Serial Tracer' is available in 2 variants and serves automatic logging of serial data flows to a storage medium.
(EMS = Expert Maintenance System)

The device is used to recording binary traces of cyclic communication between SPC and ABS interface vport during a brake filling process. Communication diagnostics between vport and vehicle ABS is additionally recorded.

The Tracer is available in two variants:

- Variant 1: M0368463.01 - Somac EMS Serial Tracer SD/ETH
- Variant 2: M0368465.01 - Somac EMS Serial Tracer USB

1.1 Description of the unit



Fig. 1: Tracer in Variant 1

- 1 Serial 9-pin DSUB port
- 2 RJ45 network connection (Variant 1)
- 3 On-off switch
- 4 Battery compartment
- 5 Power pack, storage medium connecting side
- 6 Operational LED



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The mechanically rugged housing protects the electronics. The internal recording software logs the data flows. For this purpose, the unit's own trace cable (pin 2- RxD and pin 5 – GND) is connected to the 9-pin DSUB of the RS232 device interface.

An analysis software can be optionally provided for data analysis.

The following accessories are optionally available:

- M0368466.01
Charger with 2 charging slots for 9 V/350- 500 mAh li-ion batteries
- M0368467.01
rechargeable 9 V/500 mAh li-ion battery pack for battery supply
- M0368468.01
For Variant 1: 8 GB SD-HC card
- M0368469.01
For Variant 2: 8 GB USB stick



Fig. 2: Charger for li-ion batteries



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Alternatively, the Tracer can be operated via battery supply using a mains adapter to enable autonomous, battery-supplied operation. The left housing cover can be unlatched to change the battery. Using a screwdriver, the cover is levered out from the underside in the central recess of the cover plate. The battery compartment is located beneath which can also be flipped open using a smaller screwdriver.

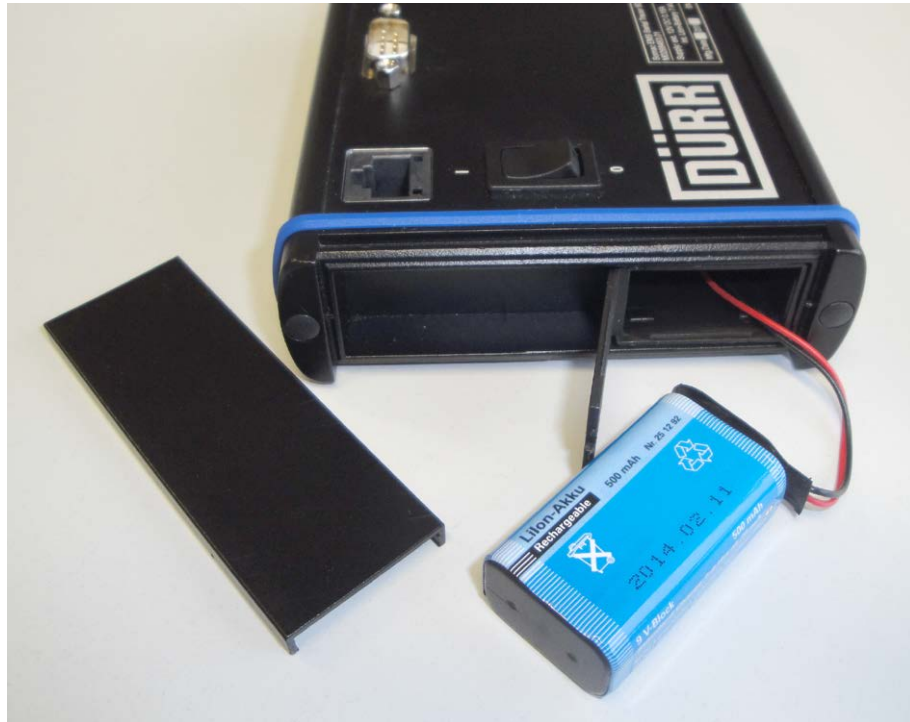


Fig. 3: Battery connection

The port for an external 12 V mains adapter and the memory slot are located on the right side (SD card or USB stick depending on device variant). Next to them, two further LEDs indicate the device status, and a small black pushbutton is responsible for storage medium ejection. A repeated push on the button enables the storage medium again after preceding ejection.



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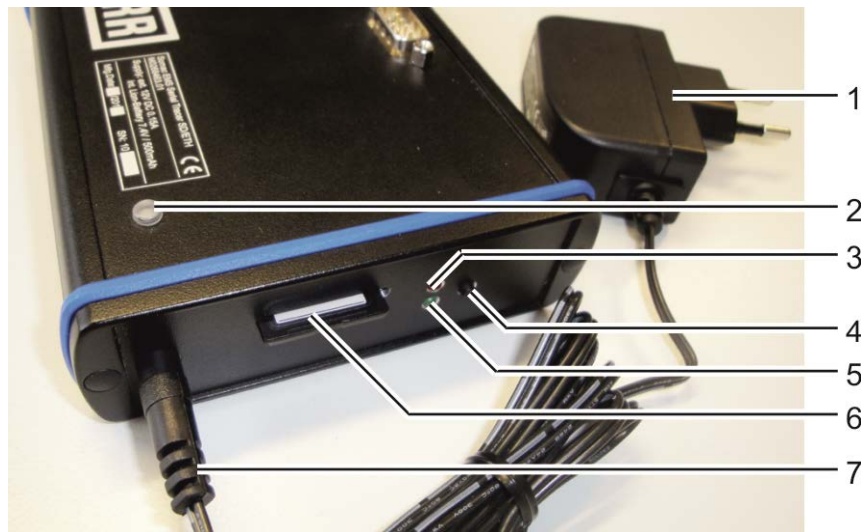


Fig. 4: External supply, memory slot, status LEDs and pushbutton

- 1 12 V power supply
- 2 Operational LED
- 3 Red LED
- 4 Pushbutton for storage medium ejection
- 5 Green LED
- 6 Storage medium (SD card)
- 7 12 V plug

The device can also be fastened on a top-hat rail in the switching cabinet using a clamp.

Variant 1 allows remote access to the storage medium via FTP access or a WEB parameterisation via connected Ethernet cable to the RJ45 jack.



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1.2 Battery operation - Mains operation functionality

In battery operation, the Tracer switches off with discharged battery via the built-in exhaustive discharge protection and the operational LED goes out.

If connected, an external 12 V power supply takes priority over battery operation, i.e. an internally connected battery will not be used.

Operational LED	On	Device switched on and battery voltage or external voltage > 6.4 V
	Off	Device switched off or battery discharged or external voltage < 6.4 V
Red LED	On	Storage medium active
	Flashing	Logging of serial data (LED off)
	Off	Storage medium disabled via pushbutton (eject) or device switched off (operational LED Off)
Green LED	On	Internal recording software ready
	Off	No internal recording software enabled or device switched off (operational LED Off)



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2 Recording software

2.1 General information

The internal recording software needs to be activated once prior to using the device.

A process script (for vport traces: vportV14.txt) and a general autorun.txt start file in the Archive folder comes with the storage medium for that purpose.

The start file, together with the process script from the Archive folder, has to be copied into the storage medium ROOT (root directory) for initial use.

The start file is automatically read in and the commands contained therein executed on switching on the device.

- Setting of the system time to generate the file name (if required)
- Enabling the default settings (if required), e.g.
IP address: 192.168.0.75,
FTP Server
user=admin and password=1234
(Notice: Next, the Tracer IP and FTP server has to be parametrised again via the WEB surface and set to 'Enabled'. Afterwards the tracer has to be switched on again.)
- General settings incl. 'auto operation' mode.
- Setting the data interface (RS232)
- Loading the process script
- Deleting the start file



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The screenshot shows the AVISARO 2.0 web interface in Internet Explorer. The left sidebar contains a navigation menu with the following categories and links:

- Networking
 - GSM/PPP
 - WLAN
 - Ethernet
 - IP
- Data Interface
 - RS232/RS485
 - SPI
 - IIC
 - CAN
 - TCP Socket
- Module Settings
 - Webserver
 - FTP Server
 - Scripting
 - Clock
 - Firmware
 - General
- Information
 - Statistics

The main content area is titled "FTP Server" and contains the following configuration fields:

- Port: 21
- Data Port: 4457
- Timeout: 20
- User: admin
- Password: 1234
- Enabled: ☒

At the bottom of the configuration area are "Submit" and "Cancel" buttons.

Fig. 5: Parameterisation (FTP server) in Variant 1

The screenshot shows the AVISARO 2.0 web interface in Internet Explorer, displaying the "IP" configuration page. The left sidebar is identical to the one in Figure 5. The main content area is titled "IP" and contains configuration fields for both WLAN and Ethernet interfaces.

WLAN Configuration:

- Local: 192.168.0.74
- Subnet: 255.255.255.0
- Gateway: 192.168.0.1
- DNS: 192.168.0.1
- Use DHCP: Auto Configuration

Ethernet Configuration:

- Local: 192.168.0.101
- Subnet: 255.255.255.0
- Gateway: 192.168.0.1
- DNS: 192.168.0.1
- Use DHCP: Disabled
- UDP Beacons: Disabled
- TCP Keep Alives: 10

At the bottom of the configuration area are "Submit" and "Cancel" buttons.

Fig. 6: Parameterisation (IP) in Variant 1



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2.2 System time

The Tracer will 'forget' its date/time settings if not being used for a certain period of time (see Technical Data). When switching on the device, the date and timeframe will be copied on executing the time<date time> command.

NOTE In Tracer Variant 1, the date/time setting can also conveniently be set via the WEB interface.

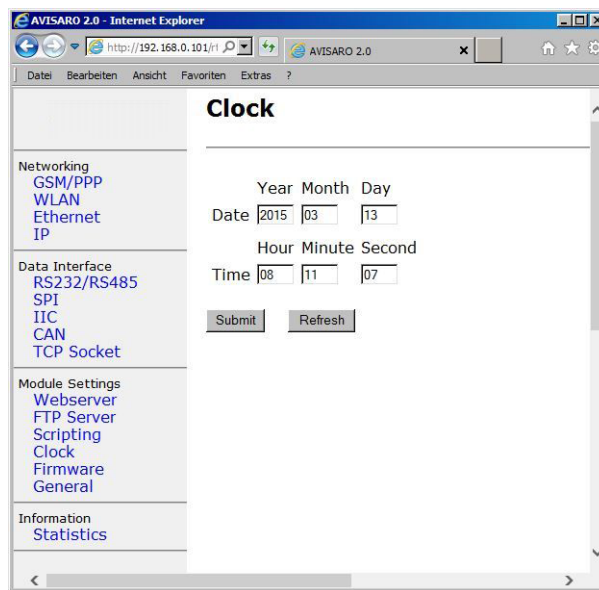


Fig. 7: WEB parameterisation (date/time) in Variant 1

NOTE In Variant 2, the current date and time should be entered into the Archive directory and copied into the ROOT shortly before start of use.



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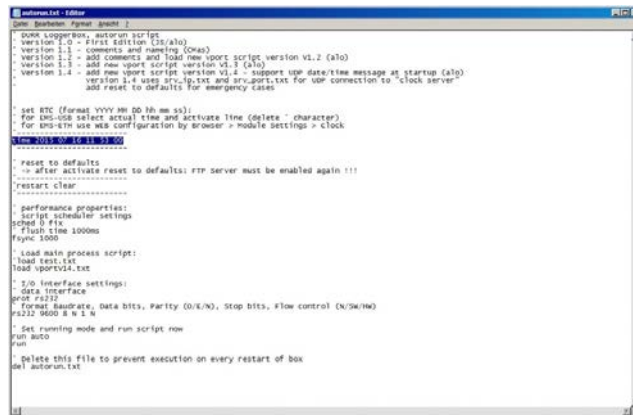


Fig. 8: Start script for setting (date/time) in Variant 2

2.3 General settings

Details on save interval (flush) and operation mode are stated here.

The flush interval is fixed to 1 second so that the red LED flashes every second with adapted vport and enabled SPC communication.

Cyclic continuous operation is specified as operation mode.

2.4 Data interface

The RS232 interface incl. corresponding communication parameters is used. Setting '9600, 8, N, 1, N' is required for vport traces.

2.5 Process script (e.g. vport)

The process script for vport is loaded and executed. This ensures the following sequence:

The process script will start after switching on and 'booting' the Tracer and subsequent execution of the start file. It will first create a new trace file into which the serial data stream is being logged. The current trace file is closed and a new trace file created once no serial data are being received for more than 10 seconds. 10 seconds is a typical value in order to safely detect a new vehicle, whether or not an ABS



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vport de-adaptation was caused by a disconnected OBD plug or whether the external supply has been switched off.

Correct date/time setting (see 2.1) is precondition for naming the created trace files and, hence, for later temporal assignment to vehicle fillings.

The following description of the trace files was chosen since the file naming convention is confined to the '8.3 DOS format':

DDhhmmss.trc, e.g. 28100756.trc means that the trace file was generated on the 28th day of the current month at 10:07:56.

In addition, the script controls LEDs control and creation of an intermediate file Temp.txt containing the name of the current trace file with the filename of the initial creation time.

2.6 Deleting the start file

The start file is finally deleted so that no invalid (legacy) date/time settings are being copied on next starting-up.

All other settings in the start file are stored in the Tracer in a fail-safe manner so that the start file is no longer needed for log mode and after temporary device switch-off (e.g. battery replacement).

NOTE

Point 2.1 for renewed date/time adjustment (e.g. changed time zone, summer/winter time changeover or device has not been used over an extended period of time) has to be manually executed once again in order to updating the setting of the internal real-time-clock (RTC).



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3 Analysis software

The Tracer comes standard with an analysis programme for individual trace files. This synchronises the filling process and ABS control to analyse this in a readable text file.

Using the status signals under PlcCtrl and VportCtrl, for example, the ProcessOk and EcuProcessOk evaluation (line highlighted in blue) is shown on changing from CycleActiv to CycleEnd.

This indicates correct brake filling with ABS control.

[illegible]

CycleEnd,ProcessOK EcuProcessOK

Fig. 8: Evaluation of a logged trace file

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NOTE

The date information of the path statement is retrieved from the trace file change date. Therefore, correct RTC setting is so important (see Point 2.2).

Following information can be gained from the content of the trace files:

- Production number (8-digit VIN – SPC programme as precondition)
- Filling process type number – SPC programme as precondition
- Date and time
- Process evaluation (OK, NOK-SPC, NOK-ABS, fault)
- Filling process SPC process error – SPC programme as precondition
- ABS controller process error
- ABS type and diagnostic protocol
- ABS part number optional
- vport firmware version
- Individual process times of the individual SPC process steps during brake filling (air pressure leak test, vacuum 1-4, filling 1+2, filling pressure leak test, suction, pressure compensation, awaiting ABS completion and awaiting stop) and total process time without handling

As an alternative to the evaluation program, a WEB-based evaluation software can be used for an individual trace file.

The basis of the WEB-based evaluation by means of a browser frontend is a server with a SQL database in which the data automatically accessed by the tracer is saved and displayed using an individual display along with reports on self-defined filters.

This enables rapid display of error frequency and consequently a targeted rectification of the causes.



4 Technical data

External DC input	8..16 V / 0.15 A
Buffered real-time clock with date	Service life 1 month Charge time 48 h
9-Pin D-SUB pin assignment	1, 4, 6, 9 not connected 2 RxD 3 TxD optional 5 GND 7 RTS optional 8 CTS optional
Li-ion battery 7.4 V/500 mAh	approx. 2 h operation time (Variant 1) approx. 5 h operation time (Variant 2) approx. 8 h charge time with 70 mA
Ambient temperature	0 to 45 °C, natural convection
Interfaces	RS232 Ethernet 10 Mbit (Variant 1)
Protection category	IP20
Dimensions LxWxH	138 x 109 x 35 mm
Housing	Aluminium, matt black powder-coated



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