

OPERATING INSTRUCTIONS



EB 9510-2 EN

Translation of original instructions



Media 7 Differential Pressure Meter Configuration with TROVIS-VIEW 4

Firmware version V1.02.07

Edition October 2018

Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices.

- For the safe and proper use of these instructions, read them carefully and keep them for later reference.
- If you have any questions about these instructions, contact SAMSON's After-sales Service Department (aftersaleservice@samson.de).



The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at www.samson.de > **Service & Support** > **Downloads** > **Documentation**.

Definition of signal words

DANGER

Hazardous situations which, if not avoided, will result in death or serious injury

WARNING

Hazardous situations which, if not avoided, could result in death or serious injury

NOTICE

Property damage message or malfunction

Note

Additional information

Tip

Recommended action

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1 TROVIS-VIEW 4 Software

These instructions describe the operation and setting the Media 7 Differential Pressure Meter at the TROVIS-VIEW 4 user interface.

- Refer to Mounting and Operating Instructions ► **EB 9510** for a description of the **Media 7 Differential Pressure Meter**.
- Refer to the Operating Instructions ► **EB 6661** on how to use the TROVIS-VIEW 4 software.

The TROVIS-VIEW 4 software allows users to configure and parameterize smart SAMSON devices over a common user interface. It consists of the user interface, communication server and the device-specific module. The menu language can be changed (also while the software is running). Working in TROVIS-VIEW is similar to working in Windows Explorer.

In addition to configuration and operation, the TROVIS-VIEW 4 software includes other features, such as documentation of the Media 7 device, for example editing plant texts, saving and printing configuration data.

The TROVIS-VIEW 4 software allows operation in offline mode (device not connected to a computer) or in online mode (device connected to a computer). This enables data to be changed in the device immediately, or they can be saved on the computer first and later downloaded to the device on site.

1.1 General

TROVIS-VIEW 4 and the Media 7 device are supplied with default data for differential pressure measurement, in cases where no specifications have been made by the customer.

Newly created data can be saved to a file, which can be opened at anytime. A stored TROVIS-VIEW file (*.tro) contains the configuration data and parameters of one single device and can be transferred to the Media 7 device after it has been connected to the computer.

To download configuration data from the software to the SAMSON memory pen or to upload data from the memory pen, a SAMSON modular adapter must be inserted into the serial interface of the computer to connect the memory pen.

When the Media 7 device is not connected, the default settings are shown in TROVIS-VIEW 4. A TROVIS-VIEW 4 file (*.tro) can be loaded and edited by selecting Open in the File menu.

i Note

Media 6 data are not compatible with Media 7.
Any data already saved in the medium database are automatically adopted.

1.2 Communication with Media 7

Proper start-up is necessary for communication between TROVIS-VIEW 4 and the Media 7 device. Refer to the Mounting and Operating Instructions ► **EB 9510**.

1.2.1 Establishing communication

1. Connect the SSP interface of the Media 7 device to the USB interface adapter (order no. 1400-9740).
2. Connect the USB interface adapter using a USB cable to the USB port of the computer.
3. Start TROVIS-VIEW 4.

1.3 Operation of TROVIS-VIEW 4

The basic operation, navigation and editing of parameters in TROVIS-VIEW 4 is described in the Operating Instructions ► **EB 6661**.

1.4 Terms and abbreviations

Filling level	Current tank content in %
$h_{perm.}$	Permissible filling height up to the overflow or gauge pipe
MCN	Maximum tank content in % or maximum flow rate in selected unit
SCN	Tank content up to overflow/gauge pipe
UCW	Tank content up to the operating filling limit
$V_{perm.}$	Permissible volume
PFL	Liquid density of the medium in kg/m^3
PGN	Standard gas density in kg/m^3
PGB	Gas density in tank in kg/m^3
PGL	Gas density in the low-pressure pipe in kg/m^3
Δp_{100}	Differential pressure at 100 % filling level in mbar
Δp_0	Differential pressure at 0 % filling level in mbar
WE	Default setting

2 Operating mode

The Media 7 device has two operating modes:

- **Differential pressure:** in the most simple case, two absolute pressures p_1 and p_2 are compared. This way, for example the filters can be monitored by measuring the upstream and downstream pressures at the filter. The reading on the display is linear to the differential pressure.
- **Filling level:** the tank content (function of the hydrostatic pressure, tank geometry and liquid density of the stored gas) is displayed proportional to the content and the operating pressure as a measured value in the selected unit.

i Note

*The availability of parameters and their editing options vary depending on the operating mode selected (see section 2.1 and section 2.2). The operating mode is changed in **Start-up > Operating mode**.*

2.1 Folder structure in differential pressure mode

Media 7 Differential Pressure Meter	
Start-up	See section 3.1.
Device settings	See section 3.2.
General	See section 3.2.1.
Differential pressure mode	See section 3.2.2.
Option modules	See section 3.2.3.
Slot 1	See section 3.2.3.1.
Slot 2	See section 3.2.3.1.
Slot 3	See section 3.2.3.1.
Slot 4	See section 3.2.3.1.
Identification	See section 3.2.4.
Process data	See section 3.3.
Diagnostics	See section 3.4.
Status messages	See section 3.4.1.
Error messages	See section 3.4.2.
E1	See section 3.4.2.1.
E2	See section 3.4.2.2.
E3	See section 3.4.2.3.
Reset functions	See section 3.4.3.
Diagnostic data	See section 3.4.4.
Temperature	See section 3.4.5.
Differential pressure events	See section 3.4.6.
Pressure sensor events	See section 3.4.7.

2.2 Folder structure in filling level mode

Media 7 Differential Pressure Meter	
Start-up	See section 4.1.
Device settings	See section 4.2.
General	See section 4.2.1.
Filling level mode	See section 4.2.2.
Tank	See section 4.2.2.1.
Characteristic	See section 4.2.2.1.1.
Process medium	See section 4.2.2.2.
Medium database	See section 4.2.2.2.
Medium 1	See section 4.2.2.3.1.
Medium 2	See section 4.2.2.3.1.
Medium 3	See section 4.2.2.3.1.
Medium 4	See section 4.2.2.3.1.
Medium 5	See section 4.2.2.3.1.
Medium 6	See section 4.2.2.3.1.
Medium 7	See section 4.2.2.3.1.
Medium 8	See section 4.2.2.3.1.
Option modules	See section 3.2.3.
Slot 1	See section 3.2.3.1.
Slot 2	See section 3.2.3.1.
Slot 3	See section 3.2.3.1.
Slot 4	See section 3.2.3.1.
Identification	See section 4.2.4.
Process data	See section 4.3.
Diagnostics	See section 3.4.
Status messages	See section 3.4.1.
Error messages	See section 3.4.2.
E1	See section 3.4.2.1.
E2	See section 3.4.2.2.
E3	See section 3.4.2.3.
Reset functions	See section 3.4.3.
Diagnostic data	See section 3.4.4.
Temperature	See section 3.4.5.
Filling level events	See section 3.4.6.
Pressure sensor events	See section 3.4.7.

3 Settings in differential pressure mode

3.1 Start-up

- Start-up

Parameters	Settings	Description
Language	<ul style="list-style-type: none"> ▪ German/English (default)/French/Italian/Spanish 	Selectable menu and display language
Operating mode	<ul style="list-style-type: none"> ▪ Differential pressure (default) ▪ Filling level 	<p>Differential pressure measurement with linear characteristic</p> <p>The device issues an mA signal (4 to 20 mA) which is proportional to the tank content.</p>
<p>→ If the filling level mode is selected, section 4 on page 24 applies from this point onwards.</p>		
Password protection	<ul style="list-style-type: none"> ▪ Not active ▪ Active 	To protect the device against unauthorized access, the password protection can be activated.
Password	<ul style="list-style-type: none"> ▪ 0 to 9999 (default: 1234) 	After the password protection has been activated, a one to four-digit code (0 to 9999) can be entered
Write protection (data transmission module)	<ul style="list-style-type: none"> ▪ Active (default) ▪ Not active 	To protect the device against unauthorized access during remote data transmission, the password protection can be activated.
Start-up wizard (in differential pressure mode only)	<ul style="list-style-type: none"> ▪ OFF (default) ▪ ON 	<p>Without the support of the start-up wizard; enter all relevant data manually</p> <p>With the support of the start-up wizard; key data are entered automatically (default settings). The start-up wizard starts automatically when the device is restarted.</p>
Power line frequency	<ul style="list-style-type: none"> ▪ 50 Hz (default) ▪ 60 Hz 	The local power line frequency must be entered to be able to properly filter out any disturbances which are transmitted over ground wires or external power supply units.

3.2 Device settings

3.2.1 General

• General

Parameters	Settings	Description
Identifier	<ul style="list-style-type: none"> ▪ Enter characters as required (default: MEDIA7) 	Enter a freely selectable code for the device (max. 15 characters)

• Reading

Parameters	Settings	Description
Differential pressure	<ul style="list-style-type: none"> ▪ Yes (default) ▪ No 	Read the differential pressure; the unit can be changed (see section 3.2.2, 'Unit' parameter).
Pressure sensor	<ul style="list-style-type: none"> ▪ Yes (default) ▪ No 	Read the tank pressure measured by the pressure sensor
Unit	<ul style="list-style-type: none"> ▪ bar (default) ▪ kPa ▪ psi 	Selectable unit of the pressure sensor
LCD backlight	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate or deactivate LCD backlight
LCD	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	The LCD of the Media 7 device can be switched off after the entered deactivation time (only when the OFF setting is selected).
LCD deactivation time	<ul style="list-style-type: none"> ▪ 1 to 10 min (default: 10 min) 	Enter the time after which the LCD of the Media 7 device is to be automatically switched off.

Settings in differential pressure mode

LCD heating control	<ul style="list-style-type: none">▪ ON (default)▪ OFF	The 'ON' setting causes the display to be heated when the outdoor temperature is low. Upper switching temperature (deactivate): -12.5 °C Lower switching temperature (activate): -17.5 °C
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3.2.2 Differential pressure mode

• Differential pressure specifications

Parameters	Settings	Description
Min. differential pressure [Δp_0]	<ul style="list-style-type: none">▪ The setting range depends on the measuring range and the entered unit (see Unit parameter).	Set the minimum differential pressure.
Max. differential pressure [Δp_{100}]	<ul style="list-style-type: none">▪ The setting range depends on the measuring range and the entered unit (see Unit parameter).	Set the maximum differential pressure.
Permissible filling limit [SCN]	<ul style="list-style-type: none">▪ 70.00 to 100.00 % (default: 100.00 %)	Set the permissible filling limit in %.
Unit	<ul style="list-style-type: none">▪ mbar (default)▪ bar▪ kPa▪ psi▪ cmH₂O▪ mH₂O▪ inH₂O	Set the unit for minimum and maximum differential pressure

• General medium data

Parameters	Settings	Description
Medium identifier	<ul style="list-style-type: none">▪ Enter characters as required	Enter a name (max. 11 characters) to identify the medium

• Medium pressure specifications

Parameters	Settings	Description
Additional pressure	<ul style="list-style-type: none">▪ No (default)▪ Yes	The tank pressure is shown on the display of the Media 7 device.

3.2.3 Option modules

The available parameters of inserted options modules are listed in the folder of the corresponding slot depending on the optional additional function. TROVIS-VIEW automatically detects the option module and lists its parameters.

3.2.3.1 Slot 1 to slot 4

AO: Analog output option module:

• Slot X

Parameters	Settings	Description
Option module identification	– Read only –	Detection of optional additional function: AO: Analog output
Option module status	– Read only –	Read the current status of the option module (No module inserted/Module not permissible in this setup/Module unknown/Module active)
Name	<ul style="list-style-type: none"> ▪ Enter characters as required (default: OPTION) 	Enter a name (max. 15 characters) to identify the medium.
Fault alarm output	<ul style="list-style-type: none"> ▪ High ▪ Low (default) 	Determines the signal for the fault alarm output: 'High' stands for >21 mA, 'Low' for <3.6 mA.
Error message in case of 'Failure' condensed state (E1)	<ul style="list-style-type: none"> ▪ No ▪ Yes 	Determines whether an error message is issued in case of condensed state (E1) (see page 20).
Error message in case of 'Out of specification' condensed state (E2)	<ul style="list-style-type: none"> ▪ No ▪ Yes 	Determines whether an error message is issued in case of condensed state (E2) (see page 20).
Error message in case of 'Maintenance required' condensed state (E3)	<ul style="list-style-type: none"> ▪ No ▪ Yes 	Determines whether an error message is issued in case of condensed state (E3) (see page 20).
Assignment of analog output	<ul style="list-style-type: none"> ▪ Differential pressure/filling level (depending on operating mode) ▪ Tank pressure (pressure sensor), only when pressure sensor exists 	Assignment of a measured value for the analog output

Settings in differential pressure mode

Parameters	Settings	Description
Pressure at 20 mA	▪ 0 to 60 bar (based on 20 mA)	The adaptation to the tank can be made when a pressure sensor is used.
Signal of analog output	– Read only –	Read the applied signal in %
Start test	Directly executable function	Two-wire test signal issued.
Test mode	▪ Not active ▪ Active	Test mode is <i>Active</i> while the test is in progress (test duration: 30 s).
Test signal of analog output	▪ -10.00 to +110.00 %	Test signal in % based on the 4 to 20 mA signal range.

AI: Analog input option module:

• Slot X

Parameters	Settings	Description
Option module identification	– Read only –	Detection of optional additional function: AI: Analog input
Option module status	– Read only –	Read the current status of the option module <ul style="list-style-type: none"> ▪ No module inserted ▪ Module not permissible in this setup ▪ Module unknown ▪ Module active
Name	▪ Enter characters as required (default: OPTION)	Enter a name (max. 15 characters) to identify the medium.
Signal source	▪ Unknown (default) ▪ Filling level ▪ Pressure ▪ Temperature	Enter the signal source on which the 4 to 20 mA signal is based
Medium identifier	▪ Enter characters as required (default: MEDIUM)	Enter a name (max. 11 characters) to identify the medium.
Measured value	– Read only –	Read the current measured value in the selected unit
Unit	▪ %/kg/Nm ³ /L/ft ³ /lbs/mbar/bar/kPa/psi/cmH ₂ O/mH ₂ O/in-H ₂ O/°C/°F/K	Unit in which the measured value is to be indicated.

Parameters	Settings	Description
Lower measuring range value	<ul style="list-style-type: none"> ▪ Enter value as required (depending on the selected unit) 	Determine the lower limit of the measuring range at 4 mA
Upper measuring range value	<ul style="list-style-type: none"> ▪ Enter value as required (depending on the selected unit) 	Determine the upper limit of the measuring range at 20 mA
Event: Broken cable	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activates or deactivates the event for a detected cable breakage at the input of the AI option module. The event is activated when the signal falls below the switching threshold of 0.2 mA.
Event: Residual current	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activates or deactivates the event for a detected residual current violation at the input of the AI option module. The event is activated when the signal falls below the switching threshold of 3.6 mA or exceeds 21.0 mA.
Limit 1	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 1
Mode	<ul style="list-style-type: none"> ▪ Max. contact ▪ Min. contact 	An upper limit can be determined with 'Max. contact' and a lower limit with 'Min. contact' for limit 1.
Limit	<ul style="list-style-type: none"> ▪ 0 to 100 % 	Setting limit 1
Limit 2	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 2
Mode	<ul style="list-style-type: none"> ▪ Max. contact ▪ Min. contact 	An upper limit can be determined with 'Max. contact' and a lower limit with 'Min. contact' for limit 2.
Limit	<ul style="list-style-type: none"> ▪ 0 to 100 % 	Setting limit 2
Limit 3	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 3
Mode	<ul style="list-style-type: none"> ▪ Max. contact ▪ Min. contact 	An upper limit can be determined with 'Max. contact' and a lower limit with 'Min. contact' for limit 3.
Limit	<ul style="list-style-type: none"> ▪ 0 to 100 % 	Setting limit 3
4 to 20 mA measured value	<ul style="list-style-type: none"> – Read only – 	Read the current (in mA) at the option module

Settings in differential pressure mode

Parameters	Settings	Description
Start test	Directly executable function	Two-wire test signal issued.
Test mode	<ul style="list-style-type: none"> ▪ Not active ▪ Active 	Test mode is <i>Active</i> while the test is in progress (test duration: 30 s).
Test signal of analog output	<ul style="list-style-type: none"> ▪ -10.00 to +110.00 % 	Test signal in % based on the 4 to 20 mA signal range.

AIA: Analog input active option module:

• Slot X

Parameters	Settings	Description
Option module identification	- Read only -	Detection of optional additional function: AIA: Analog input active
Option module status	- Read only -	Read the current status of the option module <ul style="list-style-type: none"> ▪ No module inserted ▪ Module not permissible in this setup ▪ Module unknown ▪ Module active
Name	<ul style="list-style-type: none"> ▪ Enter characters as required (default: OPTION) 	Enter a name (max. 15 characters) to identify the medium.
Signal source	<ul style="list-style-type: none"> ▪ Unknown (default) ▪ Filling level ▪ Pressure ▪ Temperature 	Enter the signal source on which the 4 to 20 mA signal is based
Medium identifier	<ul style="list-style-type: none"> ▪ Enter characters as required (default: MEDIUM) 	Enter a name (max. 11 characters) to identify the medium.
Measured value	- Read only -	Read the current measured value in the selected unit
Unit	<ul style="list-style-type: none"> ▪ %/kg/Nm³/L/ft³/lbs/mbar/bar/kPa/psi/cmH₂O/mH₂O/in-H₂O/°C/°F/K 	Unit in which the measured value is to be indicated.
Lower measuring range value	<ul style="list-style-type: none"> ▪ Enter value as required (depending on the selected unit) 	Determine the lower limit of the measuring range at 4 mA

Parameters	Settings	Description
Upper measuring range value	<ul style="list-style-type: none"> ▪ Enter value as required (depending on the selected unit) 	Determine the upper limit of the measuring range at 20 mA
Event: Broken cable	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activates or deactivates the event for a detected cable breakage at the input of the AI option module. The event is activated when the signal falls below the switching threshold of 0.2 mA.
Event: Residual current	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activates or deactivates the event for a detected residual current violation at the input of the AI option module. The event is activated when the signal falls below the switching threshold of 3.6 mA or exceeds 21.0 mA.
Limit 1	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 1
Mode	<ul style="list-style-type: none"> ▪ Max. contact ▪ Min. contact 	An upper limit can be determined with 'Max. contact' and a lower limit with 'Min. contact' for limit 1.
Limit	<ul style="list-style-type: none"> ▪ 0 to 100 % 	Setting limit 1
Limit 2	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 2
Mode	<ul style="list-style-type: none"> ▪ Max. contact ▪ Min. contact 	An upper limit can be determined with 'Max. contact' and a lower limit with 'Min. contact' for limit 2.
Limit	<ul style="list-style-type: none"> ▪ 0 to 100 % 	Setting limit 2
Limit 3	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 3
Mode	<ul style="list-style-type: none"> ▪ Max. contact ▪ Min. contact 	An upper limit can be determined with 'Max. contact' and a lower limit with 'Min. contact' for limit 3.
Limit	<ul style="list-style-type: none"> ▪ 0 to 100 % 	Setting limit 3
4 to 20 mA measured value	<ul style="list-style-type: none"> – Read only – 	Read the current (in mA) at the option module
Start test	Directly executable function	Two-wire test signal issued.
Test mode	<ul style="list-style-type: none"> ▪ Not active ▪ Active 	Test mode is <i>Active</i> while the test is in progress (test duration: 30 s).

Settings in differential pressure mode

Parameters	Settings	Description
Test signal of analog output	▪ -10.00 to +110.00 %	Test signal in % based on the 4 to 20 mA signal range.

3.2.4 Identification

• Identification

Parameters	Reading/description
Firmware version	▪ Read the current firmware version of the Media 7 device
Serial number of Media 7	▪ Read serial number of the Media 7 device
Serial number of option 1	▪ Read the serial number of the option module in slot 1
Serial number of option 2	▪ Read the serial number of the option module in slot 2
Serial number of option 3	▪ Read the serial number of the option module in slot 3
Serial number of option 4	▪ Read the serial number of the option module in slot 4
Voltage supply	▪ Unknown ▪ Two-wire ▪ 24 V DC ▪ Explosion-protected, two-wire device
HW version/supply voltage	▪ Read the hardware version of the voltage supply
Explosion protection certification	▪ No ▪ Yes
Oxygen approval	▪ No ▪ Yes

3.3 Process data

• Process data

Parameters	Reading/description
Identifier	▪ Read the entered identifier
Tank identifier	▪ Read the tank identifier
Medium identifier	▪ Read the entered medium identifier
Filling level active	▪ Read the current filling level in %
Differential pressure active	▪ Read the current differential pressure in %

Filling level	▪ Read the current filling level in the selected unit
Pressure sensor	▪ Read the tank pressure measured by the pressure sensor
Differential pressure [Δp]	▪ Read the current differential pressure in the selected unit (differential pressure mode)
Differential pressure [Δp]	▪ Read the current differential pressure in the selected unit (filling level mode)
Zero shift	▪ Read the zero shift in mbar
Span offset	▪ Read the span offset in mbar
MCN (total volume)	▪ Read the maximum tank content in the selected unit
SCN (volume up to gauge pipe)	▪ Read the tank content up to overflow/gauge pipe in the selected unit
UCW (operating filling limit)	▪ Read the tank content up to the operating filling limit in the selected unit
Differential pressure [Δp_0]	▪ Read the minimum differential pressure (differential pressure mode)
Differential pressure [Δp_{100}]	▪ Read the maximum differential pressure (differential pressure mode)
Differential pressure [Δp_0]	▪ Read the minimum differential pressure (filling level mode)
Differential pressure [Δp_{100}]	▪ Read the maximum differential pressure (filling level mode)
Temperature inside device	▪ Read the current temperature in °C
Heating	▪ Reading ON/OFF
Measuring range	▪ Read the measuring range (0 to 4000 mbar)
4-20 mA measured value	▪ Read the measured value in mA (two-wire version only)
Battery voltage	▪ Read the battery voltage in V





3.4 Diagnostics





The diagnostics area lists status messages (see section 3.4.1) and error messages (see section 3.4.2) of the Media 7 device. Additionally, various functions, such as restart or setting limits, exist.

3.4.1 Status messages

Status messages provide an overview on the current states of individual functions or components of the Media 7 device. A corresponding status icon is assigned to failures and error messages. The meaning of the icons and their order of priority are listed in Table 1.

Table 1: *Status icons and their meanings*

Status icon	Priority	Meaning
	1	Failure
	2	Out of specification
	3	Maintenance required
	4	No message





Status messages	Possible status			
				
Media condensed state	•	•	•	•
Condensed state (E1)				
101: AMR magnet lost	•			•
102: AMR sensor not recognized	•			•
103: Memory error (calibration)	•			•
104: Memory error (data)	•			•
105: No factory calibration	•			•
106: Pressure sensor error	•			•
107: Internal data processing error	•			•
Condensed state (E2)				
201: AMR signal outside range		•		•
202: Measuring span error		•		•
203: Characteristic error		•		•
204: AMR temperature sensor		•		•
205: Temperature inside device below min. limit		•		•
206: Temperature inside device above max. limit		•		•
207: Large differential pressure drop found		•		•
Condensed state (E3)				
301: Power supply unit not recognized			•	•
302: Option not recognized			•	•
303: Option module combination invalid			•	•

3.4.2 Error messages




Error messages provide an overview on present errors and malfunctions in the Media 7 device. Similar to the status messages, a status icon is assigned to each error message (see Table 1). Additionally, each message is counted and date-stamped for statistical data processing. Reset error messages by selecting 'Delete alarm'.

All device errors (class E1 to E3) are logged in an error history, which can be read in TROVIS-VIEW. The signal of the Media 7 device is switched to ≤ 3.6 mA when class E1 and E2 errors occur.

3.4.2.1 E1





Error messages	Possible status			
				
Condensed state (E1)	•	•	•	•
101: AMR magnet lost	•			•
102: AMR sensor not recognized	•			•
103: Memory error (calibration)	•			•
104: Memory error (data)	•			•
105: No factory calibration	•			•
106: Pressure sensor error	•			•
107: Internal data processing error	•			•

3.4.2.2 E2

Error messages	Possible status			
				
Condensed state (E2)	•	•	•	•
201: AMR signal outside range		•		•
202: Measuring span error		•		•
203: Characteristic error		•		•
204: AMR temperature sensor		•		•
205: Temperature inside device below min. limit		•		•
206: Temperature inside device above max. limit		•		•
207: Large differential pressure drop		•		•

Settings in differential pressure mode

3.4.2.3 E3

Error messages	Possible status			
				
Condensed state (E3)	•	•	•	•
301: Power supply unit not recognized			•	•
302: Option not recognized			•	•
303: Option module combination invalid			•	•

3.4.3 Reset functions

Parameters	Settings	Description
Restart	Directly executable function	The device restarts.
Default settings	Directly executable function	All parameters in the device are reset to their default settings.

3.4.4 Diagnostic data

Parameters	Settings	Description
Operation duration	– Read only –	Read the entire operating time of the device (dd:hh:mm:ss)

3.4.5 Temperature

Parameters	Settings	Description
Temperature inside device	– Read only –	Read the current device temperature in °C
Max. temperature inside device	▪ 10 to 80 °C (default: 80 °C)	Set an upper temperature limit within the specified range: if the current device temperature is above the adjusted limit, an error message is generated and displayed. The status changes to 'Out of specification'.

Min. temperature inside device	<ul style="list-style-type: none"> ▪ -40 to +10 °C (default: -40 °C) 	Set a lower temperature limit within the specified range: if the current device temperature is below the adjusted limit, an error message is generated and displayed. The status changes to 'Out of specification'.
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3.4.6 Differential pressure events

Parameters	Settings	Description
Filling limit alarm [SCN]	<ul style="list-style-type: none"> ▪ ON ▪ OFF (default) 	Activate/deactivate the permissible filling level
Pre-alarm	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate the pre-alarm when the filling level falls below the limit.
Limit	<ul style="list-style-type: none"> ▪ 0.0 to 100.0 % (default: 30 %) 	Set limit in %
Main alarm	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate the main alarm when the filling level falls below the limit.
Limit	<ul style="list-style-type: none"> ▪ 0.0 to 100.0 % (default: 15 %) 	Set limit in %

3.4.7 Pressure sensor events

Parameters	Settings	Description
Limit 1	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 1
Mode	<ul style="list-style-type: none"> ▪ Max. contact (default) ▪ Min. contact 	An upper pressure limit can be determined with 'Max. contact' and a lower pressure limit with 'Min. contact'.
Limit	<ul style="list-style-type: none"> ▪ 0 to 60 bar (default: 40 bar) 	Set limit 1 in bar
Limit 2	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	Activate/deactivate limit 2
Mode	<ul style="list-style-type: none"> ▪ Max. contact (default) ▪ Min. contact 	An upper pressure limit can be determined with 'Max. contact' and a lower pressure limit with 'Min. contact'.

Settings in filling level mode

Limit	<ul style="list-style-type: none">0 to 60 bar (default: 25 bar)	Set limit 2 in bar
Limit 3	<ul style="list-style-type: none">ON (default)OFF	Activate/deactivate limit 3
Mode	<ul style="list-style-type: none">Max. contactMin. contact (default)	An upper pressure limit can be determined with 'Max. contact' and a lower pressure limit with 'Min. contact'.
Limit	<ul style="list-style-type: none">0 to 60 bar (default: 5 bar)	Set limit 3 in bar

4 Settings in filling level mode

4.1 Start-up

• Start-up

Parameters	Settings	Description
Language	<ul style="list-style-type: none">German/English (default)/French/Italian/Spanish	Selectable menu and display language
Operating mode	<ul style="list-style-type: none">Differential pressure (default)Filling level	Differential pressure measurement with linear characteristic The device issues an mA signal (4 to 20 mA) which is proportional to the tank content.
Password protection	<ul style="list-style-type: none">Not activeActive	To protect the device against unauthorized access, the password protection can be activated.
Password	<ul style="list-style-type: none">0 to 9999 (default: 1234)	After the password protection has been activated, a one to four-digit code (0 to 9999) can be entered
Write protection (data transmission module)	<ul style="list-style-type: none">Active (default)Not active	To protect the device against unauthorized access during remote data transmission, the password protection can be activated.
Power line frequency	<ul style="list-style-type: none">50 Hz (default)60 Hz	The local power line frequency must be entered to be able to properly filter out any disturbances which are transmitted over ground wires or external power supply units.

4.2 Device settings

4.2.1 General

• General

Parameters	Settings	Description
Identifier	<ul style="list-style-type: none"> ▪ Enter characters as required (default: MEDIA7) 	Enter a freely selectable code for the device (max. 15 characters)

• Reading

Parameters	Settings	Description
Filling level	<ul style="list-style-type: none"> ▪ Yes (default) ▪ No 	Read the filling level; the unit can be changed (see section 4.2.2.2, 'Unit' parameter).
Pressure sensor	<ul style="list-style-type: none"> ▪ Yes (default) ▪ No 	Read the tank pressure measured by the pressure sensor
Unit	<ul style="list-style-type: none"> ▪ bar (default) ▪ kPa ▪ psi 	Selectable unit for pressure measured by the pressure sensor
MCN/SCN	<ul style="list-style-type: none"> ▪ No (default) ▪ Yes 	MCN (maximum tank content in %) or SCN (tank content up to overflow/gauge pipe) reading on the display
Hazard warning for filling limit	<ul style="list-style-type: none"> ▪ SCN (volume up to gauge pipe) ▪ UCW (operating filling limit) 	Select filling limit to be indicated on the display when this limit is reached.
LCD	<ul style="list-style-type: none"> ▪ ON (default) ▪ OFF 	The LCD of the Media 7 device can be switched off after the entered deactivation time (only when the OFF setting is selected).
LCD deactivation time	<ul style="list-style-type: none"> ▪ 1 to 10 min (default: 10 min) 	Enter the time after which the LCD of the Media 7 device is to be automatically switched off.

Settings in filling level mode

LCD heating control	<ul style="list-style-type: none">▪ ON (default)▪ OFF	The 'ON' setting causes the display to be heated when the outdoor temperature is low. Upper switching temperature (deactivate): -12.5 °C Lower switching temperature (activate): -17.5 °C
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4.2.2 Filling level mode

4.2.2.1 Tank

• Tank database

Parameters	Settings	Description
Load data	Directly executable function	Load saved Media 7 data
Save data	Directly executable function	Save current tank data

• General tank data

Parameters	Settings	Description
Tank identifier	<ul style="list-style-type: none">▪ Enter characters as required (default: SAMSON)	Enter a name (max. 15 characters) to identify the tank
Tank type	<ul style="list-style-type: none">▪ Cylinder, upright (default)▪ Cylinder, horizontal▪ Ball	Select the tank shape
Shape of tank head	<ul style="list-style-type: none">▪ Flat head▪ Torispherical head▪ Semi-ellipsoidal head (default)▪ Enter r and R▪ Enter R (r = 0)	Select shape of tank head (ball tank shape cannot be selected)

• Tank truck

Parameters	Settings	Description
Tank truck	<ul style="list-style-type: none">▪ No (default)▪ Yes	Select 'Yes' if the tank is located on a vehicle.

Permissible total weight	▪ 15000 to 60000 kg (default: 40000 kg)	Enter the permissible total weight of tank truck
Own weight	▪ 2500 to 40000 kg (default: 15000 kg)	Enter the own weight of tank truck
Max. payload	▪ 0 to 60000 kg (default: 25000 kg)	Enter the payload of tank truck

• Inside tank dimensions

i Note

The parameters marked with an asterisk *) in the following table are either directly entered or calculated based on other entered parameters in the table.

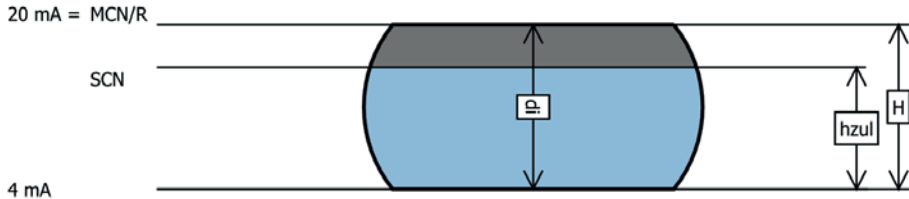
Parameters	Settings	Description
Existing data	▪ Length/height and volume (default) ▪ Diameter and length/height ▪ Diameter and volume	Select known data to determine the tank's inside dimensions.
Diameter *)	▪ Enter or display in m	Enter the tank inside diameter in m or the calculated value based on the other entered parameters.
Length/height of tank*	▪ Enter or display in m	Enter the tank length or height in m or the calculated value based on the other entered parameters.
Static column	▪ Reading in m	Calculated value based on the entered tank inside dimensions
Total volume [MCN]*	▪ Enter or display in m ³	Enter the total volume (MCN) in m ³ or the calculated value based on the other entered parameters.
Radius R	▪ 1,000 to 50,000 m	Enter the radius R in m
Nose radius r	▪ 0 to 2,000 m	Enter the nose radius r in m

Settings in filling level mode



Tip

In the bottom section of the main window of TROVIS-VIEW, a diagram of the tank is shown based of the entered parameters. See the example below:



• Tank measuring line

Parameters	Settings	Description
Length/height of measuring line	<ul style="list-style-type: none"> 0 to 5,000 m 	Enter the length or height of the measuring line

• Reference volume (MCN, SCN)

Parameters	Settings	Description
Volume at 20 mA	<ul style="list-style-type: none"> MCN (total volume) SCN (volume up to gauge pipe) 	Select at which volume (MCN or SCN) the 20 mA signal is to be issued.
Permissible filling limit [SCN]	<ul style="list-style-type: none"> Enter or display in % 	Enter the permissible filling level (SCN) in % or calculated value based on other entered parameters
Permissible height [SCN]	<ul style="list-style-type: none"> Enter or display in m 	Enter the permissible height (SCN) in m or calculated value based on other entered parameters
Permissible volume [SCN]	<ul style="list-style-type: none"> Enter or display in m³ 	Enter the permissible volume (SCN) in m ³ or calculated value based on other entered parameters

4.2.2.1.1 Characteristic

The software calculates a specific characteristic based on the tank data and the tank geometry. The tank is subdivided into 16 supporting points (Supporting point 1 to Supporting point 16). A height value (H1 to H16) in m and a volume value (V1 to V16) in m³ are assigned to each supporting point.

Parameters	Reading/description
Supporting point 1, height (H1) Supporting point 1, volume (V1)	<ul style="list-style-type: none"> Read the assigned height in m Read the assigned volume in m³
... to ...	
Supporting point 16, height (H16) Supporting point 16, volume (V16)	<ul style="list-style-type: none"> Read the assigned height in m Read the assigned volume in m³

4.2.2.2 Process medium

Eight different process medium (Medium 1 to Medium 8) are available for the Media 7 device in TROVIS-VIEW. The following process media are set by default:

Process medium	Medium identifier	Element/compound
Medium 1	AR	Argon
Medium 2	O2	Oxygen
Medium 3	N2	Nitrogen
Medium 4	CO2	Carbon dioxide
Medium 5	CH4	Methane
Medium 6	C2H4	Ethylene
Medium 7	LNG	Liquefied natural gas
Medium 8	User	Wildcard for any process medium

Settings in filling level mode

• Process medium

Parameters	Settings	Description
Process medium	<ul style="list-style-type: none">▪ AR▪ O2▪ N2▪ CO2▪ CH4▪ C2H4▪ LNG▪ User	Select the process medium
Unit	<ul style="list-style-type: none">▪ %▪ kg▪ Nm³▪ L▪ ft³▪ lbs	Selectable unit for the process medium

i Note

The parameters of all process media can be edited (see section 4.2.2.3.1).

4.2.2.3 Medium database

4.2.2.3.1 Medium 1 to Medium 8

• Medium database

Parameters	Settings	Description
Load data	Directly executable function	Load saved medium data
Save data	Directly executable function	Save current medium data

• General medium data

Parameters	Settings	Description
Medium identifier	<ul style="list-style-type: none">▪ Enter characters as required	Enter a name (max. 11 characters) to identify the medium
Shrink factor	<ul style="list-style-type: none">▪ 0.95 to 1.00	Enter tank's shrink factor (depends on the tank material, operating temperature and the process medium).

- Filling limits

Parameters	Settings	Description
Operating filling limit [UCW]	▪ 0 to 100.00 %	Enter operating filling limit in %
Load filling level [UCW]	▪ Reading in %	Read the load filling level in %

- Medium pressure specifications

Parameters	Settings	Description
Additional pressure	<ul style="list-style-type: none"> ▪ No (default) ▪ Yes 	A 'Yes' setting allows an operating pressure to be added to the medium (for information only). The corresponding unit can be entered in Unit of 'Operating pressure'.
Operating pressure	<ul style="list-style-type: none"> ▪ 0 to 50000 mbar ▪ 0 to 50.000 bar ▪ 0 to 5000.0 kPa ▪ 0 to 725.19 psi ▪ 0 to 509858 mmH₂O ▪ 0 to 50985.8 cmH₂O ▪ 0 to 509.858 mH₂O ▪ 0 to 20073.15 inH₂O 	Set the operating pressure: the setting range depends on the entered unit.
Unit of 'Operating pressure'	<ul style="list-style-type: none"> ▪ mbar ▪ bar (default) ▪ kPa ▪ psi ▪ cmH₂O ▪ mH₂O ▪ inH₂O 	Selectable units for the operating pressure

- Densities

Parameters	Settings	Description
Liquid density [PFL]	▪ Value in kg/m ³	Density value in kg/m ³ in liquid state
Standard gas density [PGN]	▪ Value in kg/m ³	Standard gas density in kg/m ³
Gas density in tank [PGB]	▪ Value in kg/m ³	Needs only be entered when the gas column correction is active (Density calculations).

Settings in filling level mode

Gas density in low-pressure pipe [PGL]	▪ Value in kg/m ³	Needs only be entered when the gas column correction is active (Density calculations).
Mixture density	▪ Value in kg/m ³	Mixture density refers to the density when filling the tank. The value is automatically calculated from the entered liquid density (PFL). The operating filling limit (UCW) is derived from this.

• Calculated values

Parameters	Settings	Description
Max. tank content	▪ Reading, e.g. in Nm ³	Calculated value based on the entered parameters
Tank content up to overflow/gauge pipe	▪ Reading, e.g. in Nm ³	Calculated value based on the entered parameters
Tank content up to the operating filling limit	▪ Reading, e.g. in Nm ³	Calculated value based on the entered parameters
Min. differential pressure (Δp_0)	▪ Reading in mbar	Calculated value based on the entered parameters
Max. differential pressure (Δp_{100})	▪ Reading in mbar	Calculated value based on the entered parameters
Filling level table	Directly executable function	A table is shown based on the determined characteristic (see section 4.2.2.1.1). The following values are assigned to the 16 coordinates: <ul style="list-style-type: none"> ▪ Height in m ▪ Volume in m³ ▪ Filling volume in m³ ▪ Δp_{100} in mbar ▪ Output signal in mA

4.2.3 Option modules

→ See section 3.2.3 on page 13.

4.2.4 Identification

• Identification

Parameters	Reading/description
Firmware version	▪ Read the current firmware version of the Media 7 device
Serial number of Media 7	▪ Read the serial number of the Media 7 device
Serial number of option 1	▪ Read the serial number of the option module in slot 1
Serial number of option 2	▪ Read the serial number of the option module in slot 2
Serial number of option 3	▪ Read the serial number of the option module in slot 3
Serial number of option 4	▪ Read the serial number of the option module in slot 4
Voltage supply	▪ Unknown ▪ Two-wire ▪ 24 V DC ▪ Explosion-protected, two-wire device
HW version/supply voltage	▪ Read the hardware version of the voltage supply
Explosion protection certification	▪ No ▪ Yes
Oxygen approval	▪ No ▪ Yes

4.3 Process data

• Process data

Parameters	Reading/description
Identifier	▪ Read the entered identifier
Tank identifier	▪ Read the tank identifier
Medium identifier	▪ Read the entered medium identifier
Filling level active	▪ Read the current filling level in %
Filling level	▪ Read the current filling level in the selected unit

Settings in filling level mode

Pressure sensor	▪ Read the tank pressure measured by the pressure sensor
Differential pressure [Δp]	▪ Read the current differential pressure in the selected unit
Zero shift	▪ Read the zero shift in mbar
Span offset	▪ Read the span offset in mbar
MCN (total volume)	▪ Read the maximum tank content in the selected unit
SCN (volume up to gauge pipe)	▪ Read the tank content up to overflow/gauge pipe in the selected unit
UCW (operating filling limit)	▪ Read the tank content up to the operating filling limit in the selected unit
Differential pressure [$\Delta p0$]	▪ Read the minimum differential pressure (filling level mode)
Differential pressure [$\Delta p100$]	▪ Read the maximum differential pressure (filling level mode)
Temperature inside device	▪ Read the current temperature in °C
Heating	▪ Reading ON/OFF
Measuring range	▪ Read the measuring range (0 to 4000 mbar)
4-20 mA measured value	▪ Read measured value in mA (two-wire version only)
Battery voltage	▪ Read the battery voltage in V

4.4 Diagnostics

→ See section 3.4 on page 19.

5 Recommended settings



Tip



We recommend taking the following procedure into account during the parameterization and configuration of the Media 7 device:

- In differential pressure mode according to section 5.1
 - In filling level mode according to section 5.2
-


Note

Proper start-up is necessary for parameterization and configuration of the Media 7 device in TROVIS-VIEW. Refer to the Mounting and Operating Instructions ► EB 9510. Furthermore, the Media 7 device must be connected to the computer (see section 1.2).

5.1 Device configuration in differential pressure mode

1. Click  (read data) button.
→ The device version is detected and the parameters and setting options are adapted accordingly in TROVIS-VIEW.
2. Perform the settings in the 'Start-up' folder.
3. Perform the settings in the 'General' folder.
4. Perform the settings of the relevant parameters in the 'Differential pressure mode' folder:
 - Δp_0 : set '0' when a raised zero is not required.
 - Δp_0 : the entered value must not be the same as Δp_{100} (max. 85 % of the permissible span).
 - Δp_{100} : set the value within the permissible span reading (recommended: 20 to 110 %).
5. Perform the settings in the 'Diagnosis' folder.
6. After all settings have been made, click  (write data) button.

5.2 Device configuration in filling level mode

1. Click  (read data) button.
→ The device version is detected and the parameters and setting options are adapted accordingly in TROVIS-VIEW.
2. Perform the settings in the 'Start-up' folder.
3. Perform the settings in the 'General' folder.
4. Perform the settings of the relevant parameters in the 'Filling level mode' folder:

Tank:


- Enter the following parameter: Inside tank dimensions and/or total volume, permissible filling limit [SCN].

Read the tank manufacturer's manual.

- Determine the reference volume [MCN/SCN]

Medium database:

- Enter the liquid density and standard gas density of the process medium (see gas specification sheet).

5. Perform the settings in the 'Diagnosis' folder.
6. After all settings have been made, click  (write data) button.

EB 9510-2 EN



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