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Operating Manual STW164IP

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from Firmware: 0-00

For more information and help about this product please scan the QR-Code or choose the following link: STW164IP

Operating manual, Quick guide, Datasheet, Connection diagram, CAD Data
Firmwareupdates, FAQ, Videos about installation and settings, Certificates

- extraction systems
Control of up to 32 sliders via bus line in connection with bus modules STW168M and STW161M

CE

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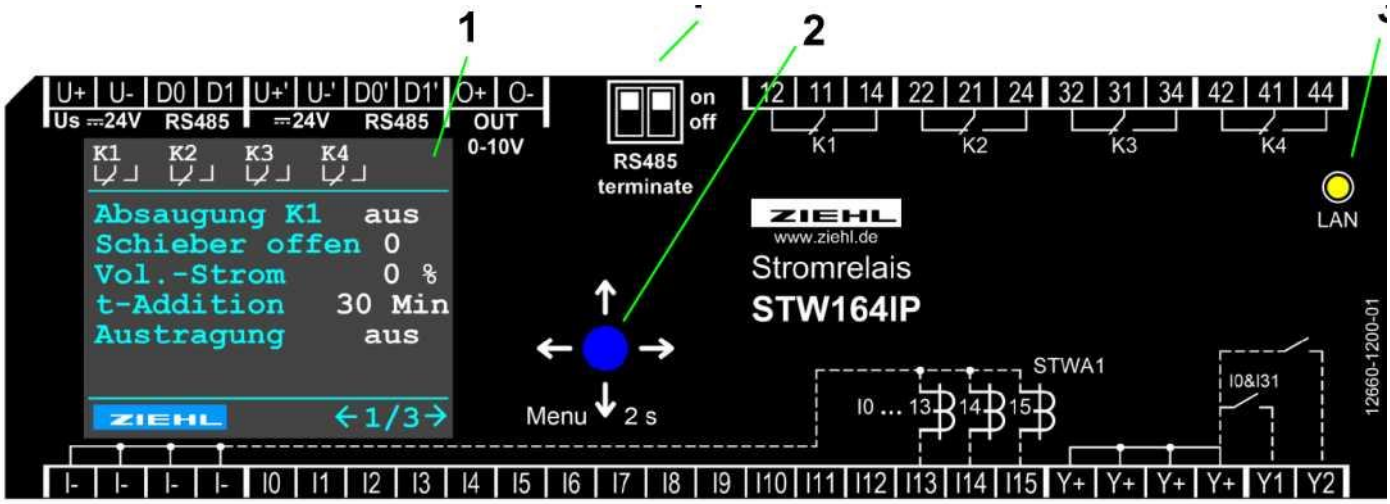
1 General Notes

Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, commissioning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties.

Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

2 Display and controls



1 Display - Colour display
2 Control element - Joystick button
3 LED - Ethernet connectivity
4 RS485 BUS terminating resistor. Both DIP switches on = terminating resistor on

3 Default Settings

The tables contain the parameters with the factory default values.
The parameters can be reset to these values via the website or on the device (factory reset).

The table can be used by the customer to document the set values of the parameters (enter values in tables).

Menu on the device: Machines	Parameters on website: Configuration^Machines

	Default value	My data (addresses of STW168M or STW161M)															
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
On/off	off																
I-limit value	3.0A																
Delay on	3s																
Overrun time	10s																
Volume flow	10%																
Line	1																
Priority	1...16																
End position Y4	off																

	Default value	My data (addresses of STW168M or STW161M)															
		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
On/off	off																
I-limit value	3.0A																
Delay on	3s																
Overrun time	10s																
Volume flow	10%																
Line	1																
Priority	17^32																
End position Y4	off																

Menu on the device on website	Parameter Parameters on website	Value	My data
Machines / Configuration→Machines	Y4 off after End position Y4 off after	2.5s	
	Last overrun Last overrun	01:00 [mm:ss] 60s	
	Input Y1 Input Y1 (I0&I31)	Switch	
	Open offset Open slider offset	0.5s	
Extraction / Configuration→Extraction - Relay K1	Delay on Delay on	00:00 [mm:ss] 0s	
	Overrun time Overrun time	01:00 [mm:ss] 60s	
	Min. Vol. Min. volume flow	1%	
	Max Vol. Max. volume flow	100%	
	Min-Vol line 1 Min. volume flow line 1	10%	
	Min-Vol line 2 Min. volume flow line 2	10%	
	Min-Vol line 3 Min. volume flow line 3	10%	
	Min-Vol line 4 Min. volume flow line 4	10%	
	Open more Open more sliders	Yes	
Cleaning / Configuration→Cleaning - Relay K2	Addition time Addition time	00:30 [hh:mm] 30min	
	Rundown time Rundown time after K1	00:50 [mm:ss] 50s	
	Vibration Vibration	Static	
	Vibration intervals Number of vibration intervals	0	
	Vibration time Interval vibration time	3s	
	Break time Interval break time	00:10 [mm:ss] 10s	
	Continuous vibration time Continuous vibration time	00:50 [mm:ss] 50s	
	Input Y2 Input Y2	Cleaning	
Discharge Configuration→Discharge	Starts with Start condition	Cleaning when cleaning is pending	
	Overrun time Overrun time	00:00 [mm:ss] 0s	

Relay Configuration→Relay	Volume flow >> Volume flow exceeded	Relay K4 Rel K4	
	Discharge Discharge	Relay K3 Rel K3	
	Error end position Error end position	off	
	Fault Fault	Relay K4 Rel K4	
Analog output Configuration→Analog output	U at 0% volume U at 0% volume	0.5V	
	10V @ volume 10V @ volume	100%	
Network Network→Network settings	DHCP	on	
	IP address		
	Subnet mask		
Settings System→Display settings	Language Display language	English	
	Qty. Interval Display Interval	0.5s	
	Brightness Brightness	50%	
	Dimming time Dimming time	00:05:00 [hh:mm:ss] 300s	
Settings System→Code Lock	Code lock Code lock	off	
	Pin code	504	

4 Application and Brief Description

Controllers STW164IP allow in conjunction with slider controls STW168M and bus modules STW161M controls extraction systems with up to 32 machines.
The STW164IP control serves as the central control unit. It records the operating state of the machines by measuring their current consumption in the supply lines (current transformer STWA1 (H)) or via potential-free contacts.
It switches on the central extraction and opens the sliders on the channels to the individual machines.
8-fold slider modules are used to control the sliders. These can be mounted next to the STW164IP or distributed in the system. The latter reduces the wiring effort.
Additional sliders can be opened to optimize the air flow. Assignment to different lines and prioritization is possible.
It is also possible to control cleaning and discharge.
The parameters are conveniently configured via the network (Ethernet). If the control is connected to the Internet, it can also be parameterized remotely.
The recording of operating hours of the machines and the switching frequency of the valves provide valuable services for preventive maintenance. In this way, components can be replaced as part of a service operation before they age and fail.

Application:
Control of extraction systems in the wood and plastic processing industry in accordance with the Technical Rules for Hazardous Substances TRGS 553. The central automatic start-up system switches on the extraction system as soon as a machine is put into operation. Shut-off valves in the extraction channels of the individual machines are controlled automatically. The device can also control filter cleaning (vibrator) and discharge, start external cleaning (compressed air) and signal when a maximum volume flow is exceeded. STW164IP optimize the function by opening sliders in the extraction channels only where machines are in operation. In addition, the analog output can be used to control a frequency converter on the extraction motor. This ensures better extraction performance, saves energy and offers a high savings potential for the implementation of measures within the framework of Directive 2012/27/EU (Energy Efficiency Directive).

5 Overview of Functions

- Individual evaluation of 16 machines on the device (STWA1, current sensor S1 or contact), a further 16 machines via bus modules
- Input for "all sliders open" with timer for automatic shutdown
- 1 relay for extraction motor
- 1 relay for filter cleaning
- 2 relays freely programmable for the functions
  - Discharge
  - Volume flow exceeded message
  - End position error message
  - Fault message
- Control of up to four 8-fold slider modules for controlling sliders via potential-free contacts
- Control of up to 32 1-fold bus modules for controlling sliders DC 24V
- Analog output 0-10V for frequency inverter control
- Plug-in connection terminals
- Supply voltage DC 24V

Functions/setting options

- Switch-on delay extraction 0...1200s
- Overrun extraction 0...1200s
- Overrun last slider 0...1200s
- Maximum volume flow of the entire extraction 5... 100%
  - The opening of further sliders can be prevented
  - Message if exceeded
- Minimum volume flow of the entire extraction, 1... 100%
  - If necessary, automatic opening of additional sliders
  - Sequence adjustable via priority of the sliders
- Up to 4 extraction lines, each with its own minimum volume flow, 1... 100%
- Logging of operating processes
- Operating hours counter for extraction system and extracted machines
- Counter for switching frequency of the sliders

Individually adjustable per channel (I0...I31)

Control of filter cleaning

The runtime of the extraction is added taking into account the volume flow. Cleaning is started after the programmed runtime has expired. Vibrating processes are only carried out when the extraction is switched off.

- Addition time: 0...1200min
- Storage of the added time even in the event of a power failure (power failure, closing time)
- Rundown time: 0...1200s
- Number of vibration intervals: 0...20
- Interval vibration time: 1...30s
- Interval break time: 1...120s
- Continuous vibration time: 0...1200s
- Optional pulse vibration 0.1...10s (rectangle)
- Optional cleaning request (while the extraction is running) for cleaning with compressed air

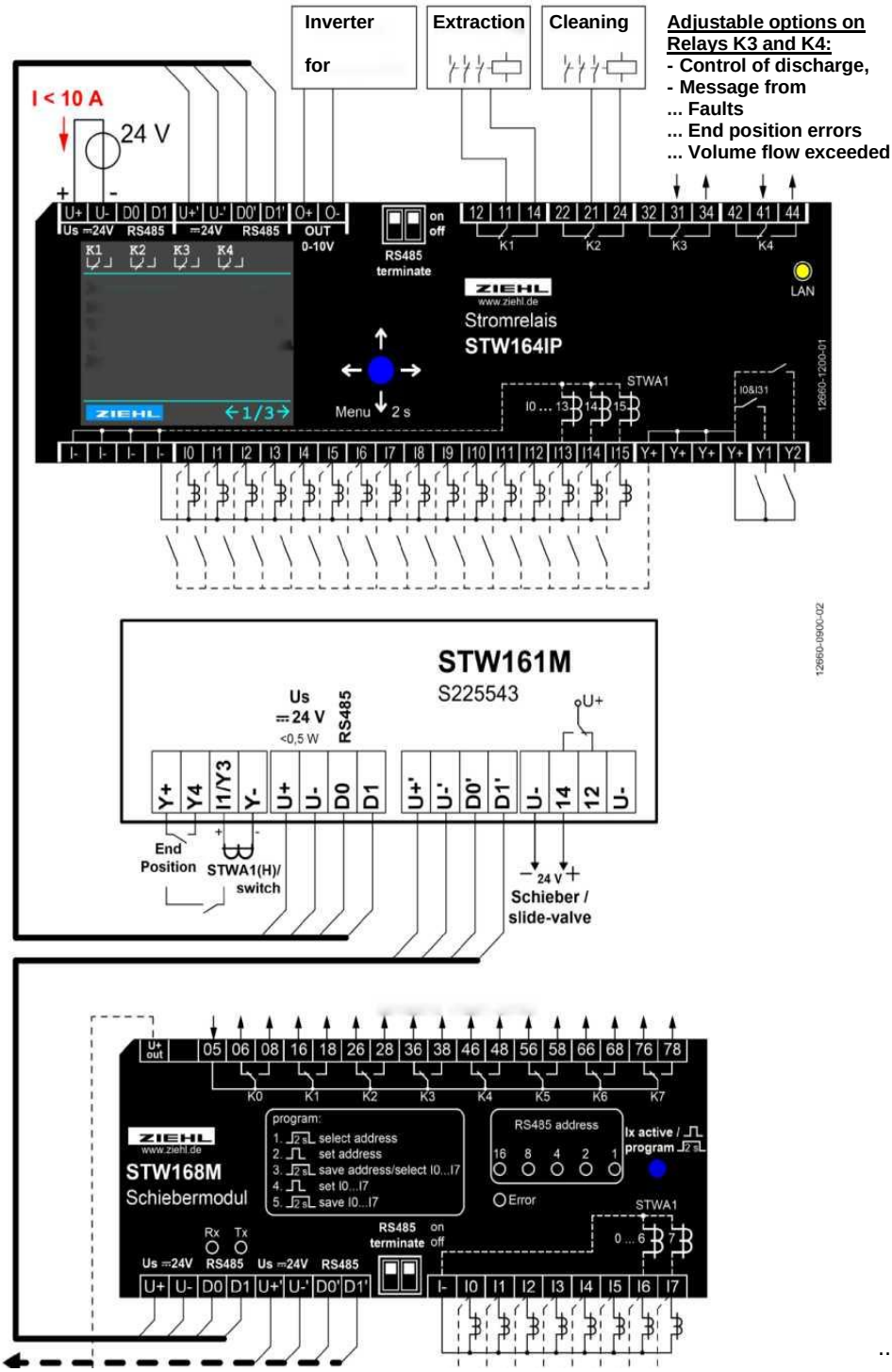
Ethernet interface:

- integrated web server, for
  - Display of measured values
  - Display of operating states
    - Display of operating hours and counter values
    - Error memory display
    - Firmware updates
- Modbus TCP (read)

Display and operation

- Color LCD display for displaying the operating conditions and for programming
- Intuitive operations via joystick
- Convenient display of operating states and programming on the computer via a web browser

6 Connection Diagram



... STW168M
... STW161M

RS485 BUS: Switch on terminating resistors at the beginning and end of the BUS line

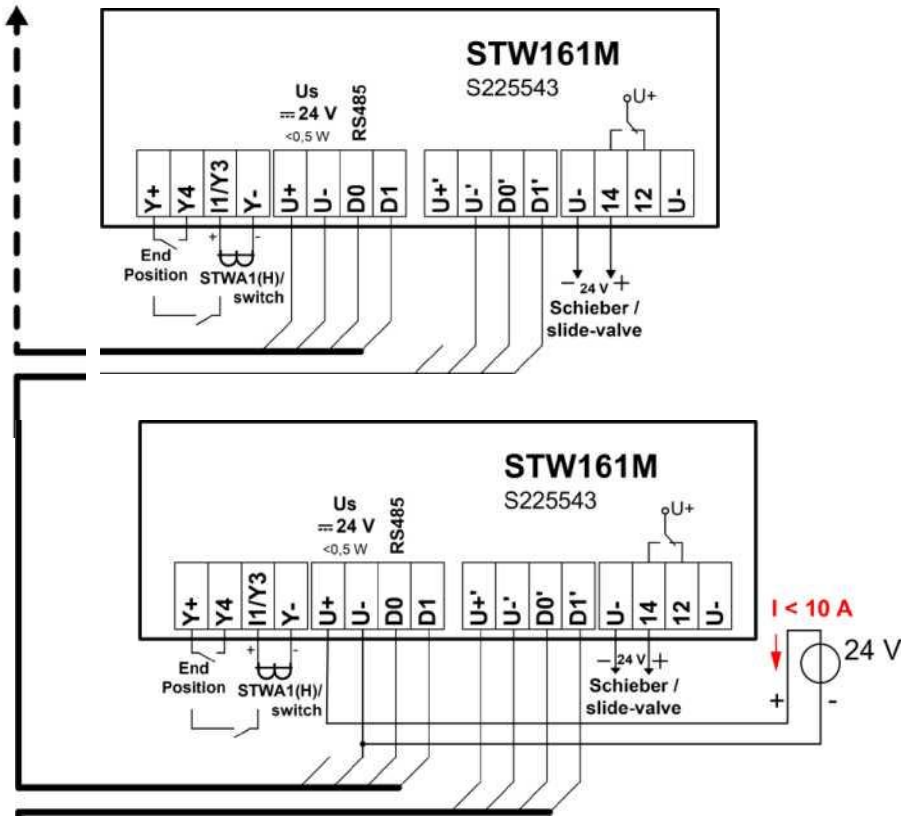
• STW164IP: • STW161M: • STW168M:	2 x DIP switch "RS485 terminate" to on, DIP switch "Terminate" to on Both DIP switches "RS485 terminate" to on

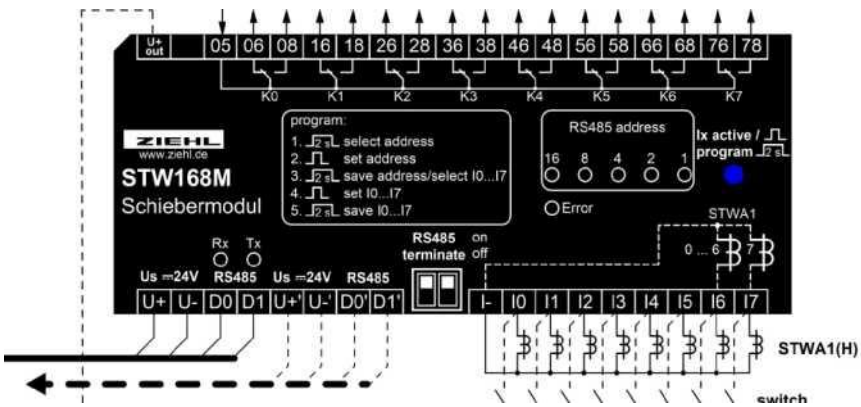
If the STW164IP is not located at the beginning or end of the BUS line, the terminating resistors must be switched on at the corresponding STW168M or STW161M (beginning and end of the BUS line).

6.1 Connection of additional power supplies

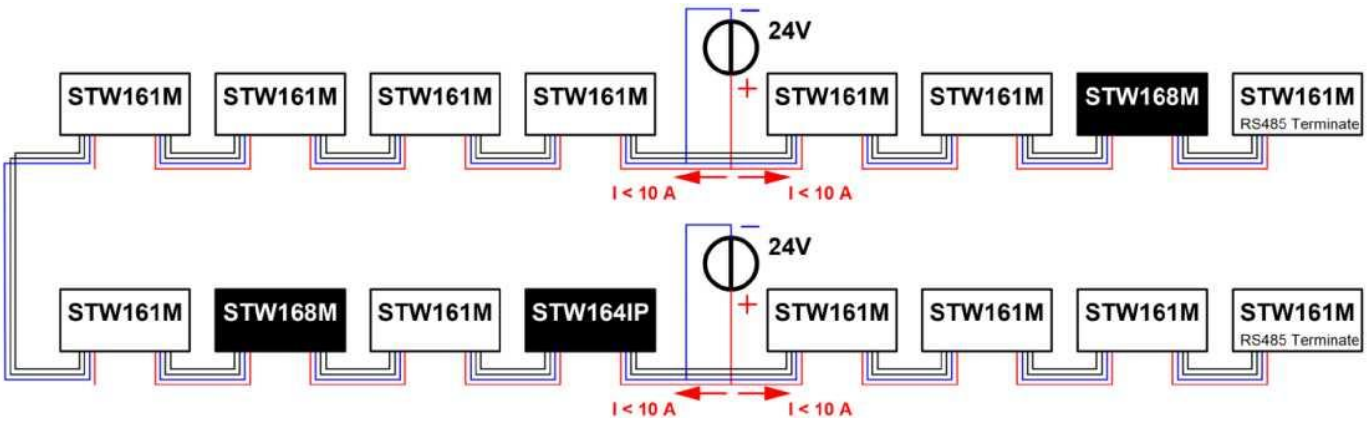
It may be necessary to connect additional power supply units in the BUS line for large systems. The following factors must be taken into account:

- Voltage drop on the BUS line at U+/U- (observe line length and cross section)
- Power consumption of the STW161M/STW168M and the sliders/flaps connected to it





Power supply units can be used at any (sensible) position in the RS485 BUS. The plus lines of these power supply units should not be connected to each other.
Example:



6.2 Ethernet

Ethernet socket for network cables

7 Detailed Description

[Menu item / parameters] on the device

7.1 Extraction on relay K1

Switching on the extraction system:

- A machine is switched on — [Machine / I limit value] exceeded
- After delay time for machine — [Machine / Delay on]
- The slider / flap of the extraction channel opens — [Extraction / Delay on]
- After delay time for extraction

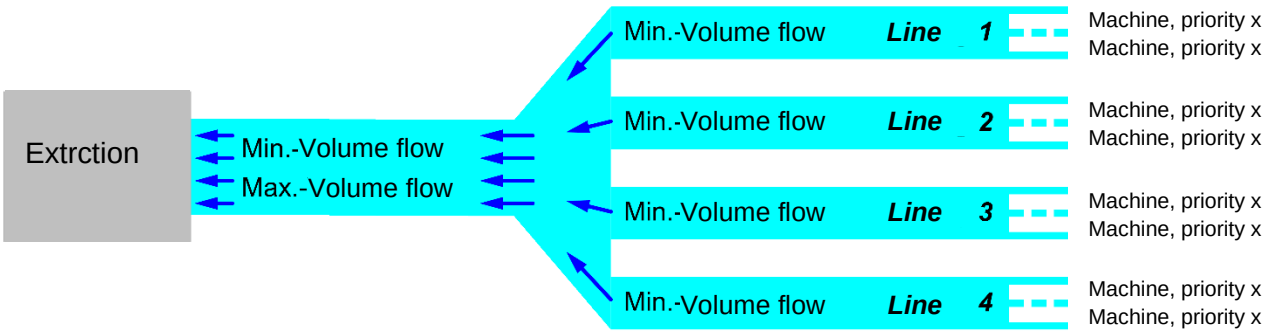
Switches on the extraction system

Switching off the extraction system:

- Last machine is switched off — [Machine / I-limit value] undershot
- After delay time for machine — [Machine / Overrun time]
- After delay time for extraction — [Extraction / Overrun time]
- Switches off the extraction system
- After delay time (machine, last overrun) — [Machine / last overrun]
- The slider / flap of the extraction channel closes

7.1.1 Volume flow

Control of the air flows (volume flows) in the extraction pipes:



In order to achieve a minimum volume flow (min. volume flow), it may be necessary to open additional sliders of unused machines. For this purpose, each machine can be assigned a unique priority in which sequence of additional sliders open (priority 1...32, 1=highest).

- Min. volumetric flow in the line (line 1...4) not reached
  > Additional sliders in the line are opened (in ascending order of the priority of the machines)
- Min. volume flow of the extraction not reached
  > Additional sliders are opened (starting with line 1, in ascending order of the priority of the machines)

Min. volume flow [Extraction / min. vol.]

The volume flow of the entire extraction system must not fall below this value. Further sliders are opened (starting with line 1, depending on the priority of the sliders). Volume flows of additionally opened sliders have no influence on the addition time for cleaning.

Max. volume flow [Extraction / max vol.]

Maximum permissible volume flow of the entire system.

The opening of further sliders can be prevented. [Extraction / open more]

If exceeded, an error message is displayed on the device and in the web browser.

This message can be parameterized to a relay. [Relay / volume flow >>]

Min. volume flow line 1...4 [Extraction / min. vol line 1...4]

Smallest volume flow in the respective extraction line. In order to achieve this, additional sliders/flaps in the line may be opened (sequence depends on the priority of the sliders).

7.2 Cleaning on relay K2

There are three different modes available for filter cleaning...

1. Vibration - Static [Cleaning / Vibration]

The relay K2 is statically on during the interval vibration time and during the continuous vibration time

2. Cleaning - Compressed air (1s) [Cleaning / Vibration]

The relay K2 switches on for 1s to start a compressed air cleaning.
This is independent of the state of the extraction (parameter "Discharge time" without function) and takes place immediately upon reaching the addition time.

3. Vibration - 0.1^10.0 s (pulse) [Cleaning / Vibration]

The relay K2 switches on/off during the interval vibration time and during the continuous vibration time in the set time interval.

7.2.1 Addition time

The filters are cleaned after the addition time [cleaning / addition time] has elapsed

Calculation of the addition time:

> Extraction runtime [min.] x volume flow [%]

For example, if the extraction system runs for 120 minutes with a volume flow of 50%,

> 120 minutes x 50% = 60 minutes

is added to the addition time.
The addition time is stored in the device with zero voltage protection.

7.2.2 Cleaning procedure

- The extraction is off
- After the rundown time (starts when extraction is off) — [Cleaning / Rundown time]
- Starts cleaning (relay K2 on)
- The following process is repeated x times (x = vibration intervals) — [Cleaning / Vibration Intervals]
  - Cleaning active (relay K2 on) — [Cleaning / Vibration time]
  - Cleaning break (relay K2 off)
- Cleaning is then active for the continuous vibration time — [Cleaning / Continuous vibration time]
- End of cleaning (relay K2 off)

If cleaning is interrupted (a machine switches on) and at least 50% of the continuous shaking time has not yet elapsed, cleaning is restarted at the next opportunity.

7.3 Discharge

Two different discharge modes are available.

7.3.1 Starts with extraction

Discharge	- Starts with extraction	[Discharge / Starts with]
Starts:	when at least one slider is open	
Ends:	- when cleaning is complete and the subsequent overrun time has elapsed, or - when the extraction has ended and the subsequent overrun time has elapsed	[Discharge / Overrun]

7.3.2 Starts with cleaning

Discharge	- Starts with cleaning	[Discharge / Starts with]
Starts:	when the addition time has elapsed (= 0)	
Ends:	- when cleaning is complete and the subsequent overrun time has elapsed	[Discharge / Overrun]

7.4 Input Y1 (I0&I31)

Function - Switch — [Machine / Input Y1]
all sliders (flaps) open when input Y1 closed

Function - 00:10.59:59 [mm:ss] — [Machine / Input Y1]
all sliders (flaps) open for the specified time (input Y1 = swipe signal/button)

- The volume flow takes into account the open sliders (total volume flow of all extraction channels)
- The function "Extraction/further opening = no" is not active (open all)
- When extraction off: Extraction starts without delay

7.5 Input Y2

Function - Start cleaning [Cleaning / Input Y2]

Y2 on (swipe signal): The addition time is set to 0, cleaning takes place at the next possible time

Function - 1,100[%] (volume flow) [Cleaning / Input Y2]

Y2 on: Cleaning is suppressed or aborted. The set volume flow is counted towards the addition time. This makes it possible to connect an additional extraction unit to the filter.

7.6 Relays K3 and K4

Various functions can be programmed on the relays K3 and K4. It is also possible to program several functions on one relay.

Function - Volume flow >> [Relay / volume flow >>]
"Volume flow exceeded" message on relay K3, K4 or off

Function - Discharge [Relay / Discharge]
Control of a "discharge" on relay K3, K4 or off

Function - End position error [Relay / End position error]
Message of end position errors of the sliders/flaps on relays K3, K4 or off

7.7 Analog output

Proportional to the volume flow, a voltage is output at the analogue output.
This can control a frequency converter on an extraction motor.

Output voltage (DC 0.10 V) at 0% volume flow [Analog output / U at 0% volume]

Volume flow at DC 10 V output voltage [Analog output / 10V at volume]

When the extraction is switched off (relay K2 off), the output voltage is always 0V.

8 Important Information

DANGER!
Hazardous voltage!
Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device.

WARNING!
The control voltage must have suitable insulation that complies with SELV (Safety Extra Low Voltage) conditions.

All connections (except relay contacts) and Ethernet have no mutual potential separation/isolation. When connecting a device to the analogue output (OUT O+, O-), it must have reinforced insulation / safe isolation from the load/mains side.

Attention!
When using current transformers STWA1 or STWA1H for current measurement, the following must be observed: Only one current-carrying conductor may be passed through the current transformer.

WARNING!
In the case of a non-loaded (open) secondary circuit of the current transformer STWA1 (H), high voltages are induced at its secondary terminals. In case of primary currents > 16A, the resulting voltage values are dangerous for persons.

"Open operation", i.e. operation of the current transformer without secondary wiring, must be avoided.

When dimensioning the power supply, the power consumption of all devices must be taken into account.

- **STW164IP**
- **of the connected STW161M/STW168M**
- **of the connected sensors with auxiliary voltage**
- **of theconnected sliders / flaps (only if supplied via the power supply)**

It must also be ensured that sufficient voltage is available at each BUS participant (STW164IP, STW168M, STW161M and, if applicable, sliders/flaps). The cable cross-section and the line length of the BUS cable must be taken into account. If necessary, additional power supply units can be inserted into the BUS lines.

9 Assembly

The device can be fastened:

- Distributor installation on 35mm mounting rail to EN 60715
- With M4 screws for wall mounting. (additional bars not included)
- Connect according to the connection diagram or rating plate.

10 Commissioning

10.1 Overview of commissioning

must	can	Overview
X		9.2 Switching on the device
	X	9.3 Device in the network
	X	9.4 Operation on the device
	X	9.5 Displays on the device
X		9.6 Parameters
	X	9.7 Code lock
	X	9.5 Simulation

10.2 Switch on the device

Switch on the supply voltage,

> The display turns on, after about 1s the device is ready for use
> The device language must be specified during initial startup. Use the joystick button to navigate to the language you want (German/English) and select.

10.3 Device on the network

If the STW164IP is connected to a network via an Ethernet, the measured value display and programming can be performed via a web browser on the computer.

Basic knowledge of network engineering is required for configuration.

10.3.1 Find device in the network

Network with DHCP server:

After connecting to the network, the device will automatically receive an IP address.

Retrieve IP address on the device:

- Switch to display page 3 (4) using the joystick on the device
  - IP address is shown on the display
- In menu mode, call up the menu item "Network"
  - Settings for the network parameters DHCP, IP address and subnet mask can be viewed and changed

Set network without DHCP server / manual IP address:

The relevant network parameters can be set and changed directly on the device:

- In menu mode, call up the menu item "Network"
- Configure the network parameters DHCP, IP address and subnet mask

Connection:

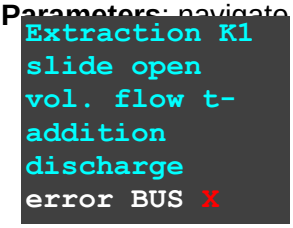
Open the web browser on the computer and enter the IP address in the address bar.

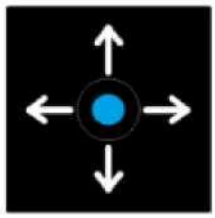
10.4 Device operation

The device is operated via the integrated joystick button. It can be operated in four directions (up, down, left and right). In conjunction with the graphical colour display, operation of the device is easy and intuitive.

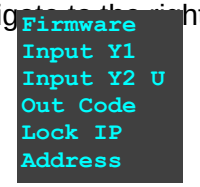
↑ Actuation upwards.
Display page: -
Menu: Scroll up
Parameter: Increase value

← Actuation to the left.
Display page: previous display page
Menu: back
Parameters: navigate to the left





→ Actuation to the right.
Display page: next display page
Menu: Call up submenu/parameter **Parameter**: navigate to the right

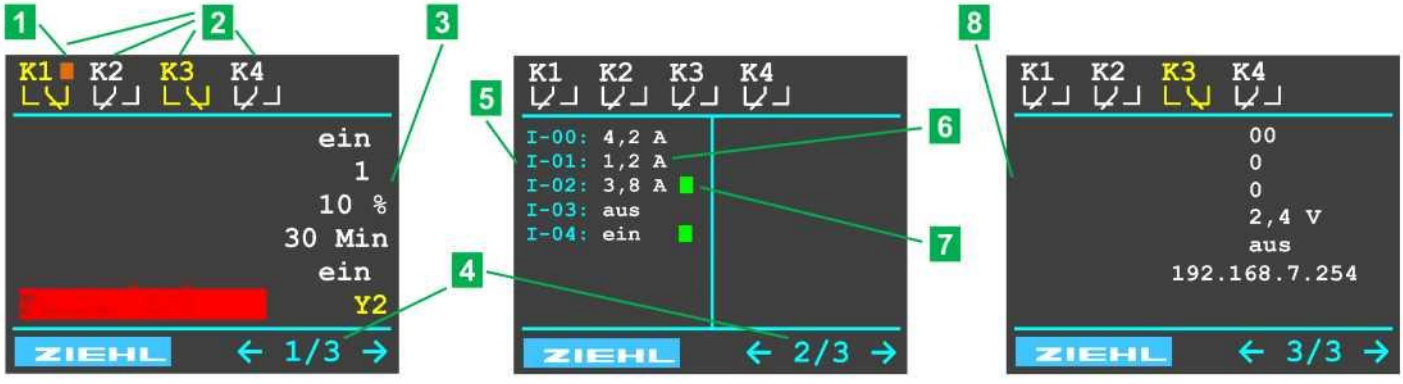


↓ Actuation downwards.
Display page: Press and hold for 2 seconds to call up the menu
Menu: Scroll down

Navigate between display pages: ← →
Call up menu: ↓ Press and hold for 2 seconds

10.5 Displays on the device

10.5.1 Display Pages



Display page 1 **Display page 2** **Display page 3**

1 Time bar, orange (K1 only): Bar increasing: Switch-on delay elapses (K1 still off)
Bar decreasing: Overrun time elapses (K1 still energized)
Bar static on: Extraction on (K1 energized)

2 Relay display K1...K4: yellow = tightened, white = dropped

3 Display of operating states,

Extraction K1: State of extraction, on/off
Slider open: Number of open sliders in the extraction channels
Vol. flow: Volume flow of the extraction system
t-addition time: Current addition time, at 0s -> filter cleaning is pending
Discharge: State of discharge, on/off
BUS error: General error display, will be displayed if necessary (here: BUS error)
Y2: Displayed when input Y2 has been enabled (closed)

4 Number of the display page, with more than 16 parameterized sliders/flaps there are 4 pages

5 Addresses of STW161M/STW168M connected to the RS485 BUS

6 Display of the current consumption of the individual machines (measured bySTWA1 (H) converters). When switches are used, machine "on/off" is displayed

- Measured value red: Error in communication with corresponding STW161M/STW168M
- Measured value highlighted in red: End position error on the slider/flap or error in the supply

7 Status of the extraction sliders/flaps on the machines

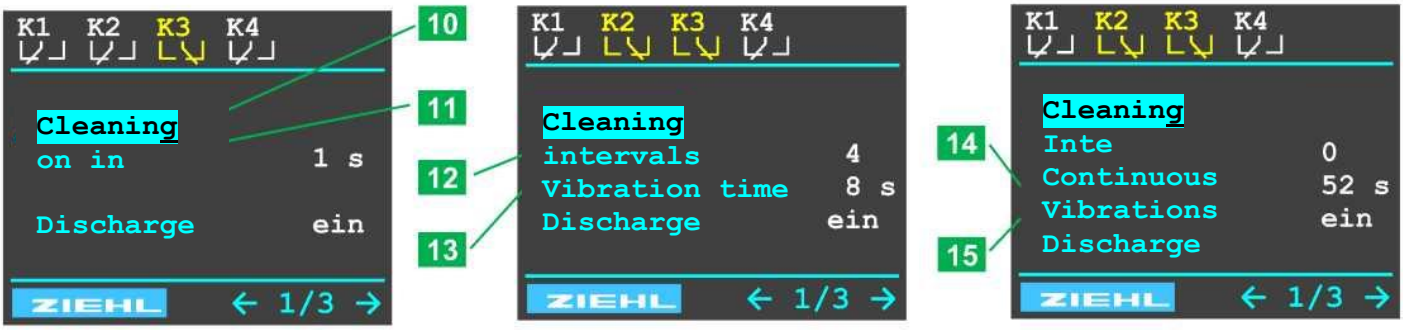
• Bar off: Slider/flap closed
• Bar green: - Slider/flap open
- Bar increasing: Switch-on delay elapses (slider still closed)
Bar decreasing: Overrun time elapses (slider still open)
• Bar white: - Slider/flap open so that minimum volume flow is reached
• Bar cyan: Bar decreasing: Time of "Last overrun" elapses (slider still open)

8 Display of various information

• Firmware: Firmware version on the device
• Input Y1: 0 = open, 1 = closed
• Input Y2: 0 = open, 1 = closed
• U Out: Voltage at output OUT (terminals O+/O-)
• Code lock: Code lock against unauthorized adjustment on the device = off / on
• IP address: IP address of the device in the Ethernet network

10.5.2 Display page, filter cleaning

During cleaning, display page 1 changes and shows the process (does not apply to compressed air cleaning).



10	Cleaning:	Filter cleaning is active
11	On in:	Cleaning process starts after this time has elapsed
12	Intervals:	Number of vibration intervals remaining time:
13	Vibration time/Break	Displays the time that is currently elapsing
14	Continuous vibration:	Continuous vibration takes place after the vibration intervals (display of remaining time)
15	Discharge:	Status of the discharge (on/off)

10.5.3 Menu pages

Main Menu

Call up the main menu:	Press ↓ for 2s
Exit main menu:	Press ← (back to the display pages)
Call up submenu:	• Press →
Navigate within the main menu:	• Down, press ↓ • Up, press ↑

Submenu

Call up submenu:	From the main menu, select the submenu and press →
Exit submenu:	Press ← (back to the main menu)
Call up parameter menu:	• Press →
Navigate within the submenu:	• Down, press ↓ • Up, press ↑

Parameter menu (value setting)

Call up parameter menu:	From the submenu, select the parameters and press →
Navigate in the parameter menu: Change value:	• Position to the left, press ←, • Position to the right, press →, • Increase value, press ↑ • Decrease value, press ↓
Exit parameter menu:	Press right → (several times) until the green tick is activated. Using the ↓ / ↑ keys, select the **X** (discard change) or the **tick** (save changes) and leave by pressing →

10.6 Parameters

The device can be parameterized via the device's web pages or directly on the device.
The function of the device is explained under "Detailed description".

10.6.1 Machines

On the device, Menu / Machines	In the web browser, Register Configuration, Machines	Parameter, description
Search.	*Not possible...*	All correctly configured STW161M/STW168M connected to the RS485 BUS are registered
On/off. On/off	Status On/off	Activate STW161M/STW168M with corresponding address (switch on/off)
I-limit (Adr. 0.31) 0.5.....9.9A / switch	I-limit (Adr. 0.31) 0.5.....9.9A / switch	If the I limit value is exceeded, the slider opens (detection, machine on). When using switches, a closed contact is interpreted as a switched on machine
Delay on (Adr. 0.....31) 0.....20s	Delay (Adr. 0.....31) 0.....20s	Delay after switching on the machine until the corresponding slider opens
Overrun time (Adr. 0.....31) 00:00.02:00 mm:ss	Overrun time (Adr. 0.....31) 0....120s	Delay after switching off the machine until the corresponding slider closes
Volume flow (Adr. 0....31) 0.....100%	Volume flow (Adr. 0....31) 0.....100%	Indication of the volume flow on the corresponding slider
Line (Adr. 0.....31) 1.....4	Line (Adr. 0.....31) 1.....4	Extraction line in which the machine is integrated. Up to four lines are supported.
Priority (Adr. 0.....31) 1.....32	Priority (Adr. 0.....31) 1.....32	Priority, in which order additional sliders open to reach the minimum volume flow (1 = highest). In each line, the priority must be unique. When setting on the device, no plausibility check is carried out, if necessary, an error message is displayed
End position Y4 (Address 0....31) off / 1.0....10.0s	End position Y4 (Address 0....31) off / 1.0....10.0s	Evaluation of a limit switch on the sliders (input Y4 to STW161M). Within the set time, the limit switch must close. Otherwise, an error message is generated. This message can be parameterized to a relay (see relay)
Y4 off after 00.1.....25.0 ss,s	Global Settings: End position Y4 off after 0.0.....25.0s	Delay in the evaluation of a limit switch on the sliders (when the slider closes again)
Last overrun 00:00.20:00 mm:ss	Global Settings: Last overrun 0.....1200s	After switching off the last machine: • Overrun time slider elapses • Subsequently, the overrun time of the extraction • Extraction switches off • Overrun time "Last overrun" elapses
Input Y1 Switch / 00:00:00... 01:00:00 hh:mm:ss	Global Settings: Input Y1 (I0&I31) Switch / 0.3600s	All sliders open and the extraction starts, Switch: Slider open static Time: Start with swipe signal, sliders remain open for the set time
Offset open 00.00.....02.50 ss,ss	Global Settings: Slider offset open 0.0.....2.5s	Time offset when multiple sliders open at the same time

10.6.2 Extraction

On the device, Menu / Extraction	In the web browser, Register Configuration, Extraction - Relay K1	Parameter, description
Delay on, 00:00.....20:00 mm:ss	Delay on, 0.....1200s	The start of the extraction is delayed by this time
Overrun time 00:00.....20:00 mm:ss	Overrun time 0.....1200s	The shutdown of the extraction is delayed by this time
Min. Vol. 1.100%	Min. volume flow 1,100%	Minimum volume flow of the entire system. To achieve this, additional valves/flaps are opened if necessary
Max Vol. 5.100%	Max. volume flow 5.100%	Maximum permissible volume flow of the entire system. If exceeded, an error message is displayed on the device/in the web browser. This message can be parameterized to a relay (see relay)
Open more yes / no	Open more sliders yes / no	Setting whether after exceeding the max. volume flow, more sliders/flaps may open
Min. vol line 1.4 1.100%	Min. volume flow line 1.4 1.100%	Minimum volume flow in the respective extraction line. In order to achieve this, additional sliders/flaps in the line may be opened

10.6.3 Cleaning

On the device, Menu / Cleaning	In the web browser, Register Configuration, Cleaning - Relay K2	Parameter, description
Addition time 00:01.....20:00 hh:mm	Addition time 1.....1200min	Time after which the filters are cleaned (time at 100% volume flow)
Rundown time 00:00.....20:00 mm:ss	Rundown time after K1 0.1200 s	Delay time after switching off the extraction until cleaning begins
Vibration Static/Compressed Air / 0.1.....10s	Vibration Static/compressed air/pulse 0.1.....10s	Cleaning type: Compressed air: Relay K2 on for 1s (starts external compressed air cleaning) Static: Relay K2 statically on during cleaning 0.1.....10.0s (pulse): Relay pulses with set duration during cleaning
Vibration intervals 0.....20	Number of vibration intervals 0.....20	Number of vibration intervals, which are composed of interval vibration time and interval break time
Vibration time 1.....30s	Interval vibration time 1.....30s	On cleaning time (K2 on, in case of pulse vibration K2 = on/off in alternation) during the vibration intervals
Break time 00:00.....02:00 mm:ss	Interval break time 1....120s	Off cleaning time (K2 off) during the vibration intervals
Continuous vibration time 00:00....20:00 mm:ss	Continuous vibration time 0.....1200s	The continuous vibration time starts after the vibration intervals. Static vibration: K2 = on Pulse vibration: K2 = on/off in alternation
Input Y2 cleaning / 1.....100%	Input Y2 cleaning / 1.....100%	Cleaning: The addition time is set to 0, cleaning takes place at the next possible time. 1....100% Cleaning is suppressed or aborted. The set volume flow is counted towards the addition time

10.6.4 Discharge

On the device, Menu / Discharge	In the web browser, Register Configuration, Discharge	Parameter, description
Not possible... (see relay)	Discharge from / Rel K4 / Rel K3	Parameterize the function of the discharge to a relay
Starts with cleaning / extraction	Start condition when cleaning is pending / when extraction on	Cleaning: - starts when the addition time has elapsed (= 0) - ends when cleaning is completed and the subsequent overrun time has elapsed Extraction: - starts when at least one slider is open - ends when cleaning is completed and the subsequent overrun time has elapsed, or when the extraction has ended and the subsequent overrun time has elapsed
Overrun time 00:00.....20:00 mm:ss	Overrun time 0...1200s	Overrun time of the discharge starts as soon as the condition for the discharge is no longer met.

10.6.5 Relays

On the device, Menu / Relay	In the Web Browser, Register Configuration, Relay	Parameter, description
Discharge from / relay K3 / relay K4	*Not possible. (see Discharge)*	Discharge function: -> if necessary, parameterize to a relay
Volume flow >> off / Relay K3 / Relay K4	Volume flow exceeded off / Rel K4 / Rel K3	Message volume flow exceeded: -> if necessary, parameterize to a relay
End position error off / Relay K3 / Relay K4	End position error off / Rel K4 / Rel K3	Message end position error (only with activated function "End position Y4"): -> if necessary, parameterize to a relay (End position of "slider open" not reached within the parameterized time)
Fault off / Relay K3 / Relay K4	Fault off / Rel K4 / Rel K3	Reporting faults/errors, - Error from RS485 BUS (device not reachable) - Error Us 24V from STW164IP - Error in internal memory - Error in parameter - Error in parameter for priority of slider - Internal device error - Error Us 24V from STW164IP - Display error -> if necessary, parameterize to a relay

10.6.6 Analog Output

On the device, Menu / Analog Output	In the web browser, Register Configuration, Analog Output	Parameter, description
U at 0% volume 0.0....10V	U at 0% volume 0.0....10V	Output voltage at 0% volume flow. When the extraction is switched off (relay K2 off), the output voltage is always 0V
10V @ volume 0...100%	10V @ volume 0...100%	Volume flow at DC 10V output voltage

10.6.7 Network

Basic knowledge of network engineering is required for network configuration.

On the device, Menu / Network	In the web browser, Register Network, Network settings	Parameter, description
Not possible.	Network Settings / Host name	Name in the network
DHCP on / off	Network settings / DHCP on / off	on: If a DHCP server is available on the network, the device can automatically obtain the network configuration. off: The network configuration must be entered manually (see below)
IP address	Network settings / IP address	If DHCP = on: no input required If DHCP = off: Enter a valid IP address
Subnet mask	Network settings / subnet mask	If DHCP = on: no input required If DHCP = off: Enter a matching subnet mask
Not possible.	Network settings / Gateway	DHCP = on: no input required DHCP = off: Enter the IP address of the gateway in the network
Not possible.	Network settings / DNS server	DHCP = on: no input required DHCP = off: Enter the IP address of the DNS server on the network
Not possible.	Time server settings and Time zone settings	Settings for date/time (for error memory). In the event of operation without a time server, the date/time will not be stored in the event of a power failure. It then restarts on 01.01.2018 / 12:00:00 (+UTC time shift)

10.6.8 Settings

On the device, Menu / Settings	In the web browser, Register system,	Parameter, description
Language German / English	Display language German / English	Language on the device
Qty. Interval 0.1,2.0s	Display interval 0.1,2.0s	Interval at which measured values are updated on the device display
Brightness 20,100%	Brightness 20,100%	Brightness of the display is reduced after dimming time without pressing a button.
Dimming time 00:00:10.....01:00:00 hh:mm:ss	Dimming time 10....3600s	
Code lock on / off + pin	Code lock on / off + pin code	Code lock to protect the device against unauthorized changes (protection against misalignment on the device). Set code lock on the device (with joystick button): Select menu item -> code lock on/off -> enter old code (factory setting 504) -> enter new code (only if code lock on)
Factory setting yes / no	Set factory reset	Reset device to factory default

10.6.9 Simulation

On the device, Menu / Simulation	In the Web Browser, Register Home / Button Simulation	Parameter, description
STW16xM (Address 0.....31) on / off	Machines (Address 0.....31) on / off	Simulated switching on/off of the machines
Not possible.	Reset addition time	A cleaning is started at the next possible time
Not possible.	Relay simulation	Switch relays K3 and K4 on/off manually

No errors are logged during a simulation on the device / via the website.

10.6.10 Info

On the device, Menu / Info	In the web browser, Register System	Parameter, description
Firmware	Firmware version	Firmware version on the device
Not possible.	Bootloader version	Bootloader version on the device
Not possible.	Hardware version	Hardware version of the device
Serial number	Serial number	Device serial number
Not possible.	Item number	Item number of the device
Not possible.	Last modified by	Documentation of who and when the last change was made to the device
Not possible.	Last modified on	

On the device, Menu / Info	In the web browser, Register Counter	Parameter, description
Operating hours	Counter STW164IP and Counter STW161M / STW168M	Operating hours of devices controlled by the STW164IP. The values can be reset via the web interface
Slide Counter	Counter STW161M / STW168M	Number of slider openings. The values can be reset via the web interface

10.7 Code lock / code reset

The device can be protected against unauthorized changes to **the device** (via joystick button) with the code lock (see Parameter -> Settings -> Code lock).
A pin code is used for this purpose (factory setting: 504).

Reset pin code/switch off code lock, on the device:

- Interrupt supply voltage
- Press (and hold) the joystick button upwards
- Switch on the supply voltage (keep pressing the joystick button)
- After approx. 4 seconds, the reset menu appears, select code lock and press the button to the right
- Code lock is switched off, pin code = 504

Via web interface:

- In the System menu: Switch off the code lock and apply with the "Save" button

10.8 Simulation

With the simulation on the device (see Parameters -> Simulation), the machines on the STW161M / STW168M can be switched on and off in a simulated manner.
The state of the sliders is displayed (state description, see display pages under Point 7).

11 Web Interface

If the device is connected to an Ethernet network, it can be conveniently configured via a computer's web browser.

11.1 Register Home

Status displays of

- Extraction
- Volume flows (total, line 1...4)
- Cleaning (addition time, cleaning process)
- Discharge
- Analog output
- Status of relays K3 and K4
- Error messages
- STW161M / STW168M - machines with....
  - Line No., Priority, Address
  - Machine name
  - Status slider
  - Status Limit
  - Delay times, overrun
  - Function end position

Individual displays are hidden as long as the corresponding functions are not active.
If a new firmware is available, a note appears and the device can be updated (update notification on the "System" page must be active).

11.1.1 Simulation

- Simulation of machines = on/off
- Reset addition time (cleaning will start at the next possible time)
- Relays K3 and K4

11.2 Register - Configuration

Setting the function parameters, for description see "Parameters"

11.3 Register - System

- Device name (appears in the header of the website)
- Version info (see "Parameters")
- Display settings for LCD display (see "Parameters")
- Code lock (see "Parameters")
- Firmware update STW164IP
  - Update notification (message when update is available)
  - Firmware status, if necessary the firmware update can be carried out via the update button ○ Manual update installation:
    - Select firmware (select downloaded firmware)
    - Manual update installation (selected firmware is uploaded and installed)
- Firmware update STW161M / STW168M:
  - Save firmware (compare firmware versions with information in the table to see if newer version is available)
  - Start update (selection of downloaded firmware, upload to STW164IP)
  - Update (the STW161M/STW168M with the selected address will receive the firmware update)
  - If necessary, carry out the update for other modules
  - End update (end process, STW64IP does a reset and restarts)
- Configuration (last changes to the device are saved with date/time and the user name, see User Management)
  - Save configuration (download system configuration, back up and transfer to other devices)
  - Load configuration (load and activate a saved configuration in the device). Activated user management is deactivated. No passwords will be transferred.
- Reset
  - Set factory reset (optionally with/without network parameters)
  - Perform restart

11.4 Register - Network

- network settings
- Modbus settings (Modbus TCP protocol on port 502)
- Time server settings and time zone settings (for current time in the device, important to be able to evaluate error memory in the device)

11.5 Register - User

- User management (providing device with read and write permissions for users on the network)
- User (activate user and create name and password)
  - User name for guest when logging in (fixed, cannot be changed): "guest", "Guest" or leave blank
- User permissions (determine which users have which rights on which pages)

Attention: Changes (including to passwords) are only applied after saving (Save button)

11.6 Register - Logging

Error memory (occurring errors are logged)

- Storage in case of occurrence of a new error
- Storage in case of disappearance of an error
- Storage of
  - Status of all max. possible STW161M/ STW168M on the BUS
  - Relay state K1.....K4
  - Status inputs Y1 and Y2
  - Voltage at analog output OUT
  - Error status

Description Error Log...
machine 1...31:
bit-0 (valence = 1): Module is switched on in configuration of STW164IP
bit-1 (valence = 2): Communication to STW161M / STW168M available
bit-2 (valence = 4): Relay on STW161M / STW168M has energized
bit-3 (valence = 8): Status of Y3 on STW161M or Ix on STW168M (limit value exceeded, or contact closed)
bit-4 (valence = 16): Status of Y4 on STW161M (contact for end position closed)
bit-5 (valence = 32): Error on supply voltage of STW161M / STW168M (Voltage too high / too low)

Relays:
bit-0: Relay K1 energized
bit-1: Relay K2 energized
bit-2: Relay K3 energized
bit-3: Relay K4 energized

in Y1+Y2:
bit-0: Input Y1 closed
bit-1: Input Y2 closed

Analog out:
Voltage at analogue output in mV

Error:
bit-0 (valence = 1): Volume flow exceeded
bit-1 (valence = 2): End position error
bit-2 (valence = 4): Error on RS485 BUS (communication to STW161M / STW168M)
bit-3 (valence = 8): Error on supply voltage of STW161M / STW168M (voltage too high / too low)
bit-4 (valence = 16): Error in internal memory
bit-5 (valence = 32): Parameter error
bit-6 (valence = 64): Error in parameter for priority (STW161M/ STW168M - priority the same several times)
bit-7 (valence = 128): internal device error
bit-8 (value = 256):Error on supply voltage of STW164IP (voltage too high / too low)
bit-9 (valence = 512): Error on display of STW164IP

No errors are logged during a simulation on the device / via the website.
A data record is always logged when the device is started (as soon as a current date/time has been obtained from the time server, but after 20 s at the latest).

11.7 Register - Counter

- STW164IP: Operating hours counter
- STW164IP: Switch-on times of relay extraction, cleaning, K3 and K4 (values can be reset)
- STW161M / STW168M (Address 00...31): Switch-on times of machines (values can be reset)
- STW161M / STW168M (Address 00....31): Number of slider openings (values can be reset)

The switch-on times are only updated after the individual functions have been switched off again.

12 Firmware Update

If a newer firmware version is available, an update can be carried out as follows...

1. Website "System" - Firmware update STW164IP - Update notification = **active**:
   > An update message appears when the device is accessed via a web browser
   > Confirm message, the current firmware will be downloaded and installed

2. Website "System" - Firmware update STW164IP - Update notification = **inactive**:
   > Press the "Update" button, the current firmware will be downloaded and installed

3. Download the firmware from www.ziehl.com and then ...
   Website “System” - Firmware update STW164IP - Manual update installation

Display / website reports:	Error on BUS
> On display page 2 (3), the measured value of no longer reachable STW161M/STW168M is red > The red LED flashes on the corresponding STW161M/STW168M (yellow LEDs Tx and Rx off)	
Cause	• RS485 bus line interrupted • A device connected to the BUS cannot be reached
Remedy	• Check bus line • Check STW168M and STW161M connected to the BUS > LEDs Rx and Tx must flash briefly all the time (display RS485 communication) > Check 24V supply (green LED "Power" must light up) > Check BUS address on STW168M and STW161M. Addresses also enabled on STW168M > Red error LED must not flash (no communication with this device)

Display / website reports:	Volume flow
Cause	The programmed maximum volume flow has been exceeded. Too many sliders/flaps are open.
Remedy	If necessary, switch off individual machines

Display / website reports:	End position error
> On display page 2 (3), the measured value of STW161M with end position error is highlighted in red > The red LED lights up on the corresponding STW161M	
Cause	The contact Y4 on a STW161M does not close or closes too late
Remedy	• Check the end position contact on the corresponding STW161M • If necessary, adjust parameters [machine/end position Y4] (extend time)

Display / website reports:	STW16xM: 24V >><<
> On display page 2 (3), the measured value of the STW161M/STW168M is highlighted in red > The red LED flashes on the corresponding STW161M/STW168M	
Cause	The supply voltage on a STW161M/STW168M is too high or too low
Remedy	Check the supply voltage on the STW161M/STW168M. If the voltage is too low, this can be remedied with an additional power supply unit in the BUS line (see connection diagram)

Display / website reports:	STW164IP: 24V
Cause	The supply voltage on the STW164IP is too high or too low
Remedy	Check supply voltage on STW164IP. If the voltage is too low, this can be remedied with an additional power supply unit in the BUS line (see connection diagram)

Display / website reports:	Int Memory Error Device Error /Display Error
Cause	Internal error in the device
Remedy	Switch the device off and on again. If the fault persists, the device must be returned to the factory for repair.

Display / website reports:	Parameter error
Cause	Incorrect parameter value (out of range)
Remedy	Check parameters, perform factory reset

Display / website reports:	P error priority
Cause	The priority of the sliders contains multiple entries
Remedy	Check priority of the sliders (parameters) -> each priority may only be assigned once

14 Technical data

Control voltage Us:	DC 24 V, SELV, PELV
Tolerance	DC 20 - 30V
Power consumption	< 3W
Permissible current Imax on BUS line	< 10A
Duty cycle	100%
Relay outputs K1, K2, K3, K4	4 x 1 changeover contact
Switching voltage	max. AC 300V; DC 300V
Inrush current normally open contact (no)	AC 15A 4s 10% ED
Minimum values voltage/current	12V 10mA
Conventional thermal current Ith	max. 5A
Switching capacity max. AC cos φ = 1	2000 VA
Switching capacity max. DC (ohmic)	0.3A 300V; 0.4A 120V; 0.8A 60V; 8A 30V cos φ = 1 -> 5 x 10^5 Switching cycles at 250V / 2A AC-15Ie= 3A Ue = 250V DC-13 Ie = 2A Ue = 24V
Electrical contact life	
Switching capacity	
Utilization category	
Rated operating current	DC-13 Ie = 0.2A Ue = 250VV
Rated operating voltage	
Test conditions for relay outputs	EN 61010-1
Rated impulse withstand voltage	4000V
Overvoltage category	III
Degree of contamination	2
Rated insulation voltage Ui	300V
Inputs I0...I31 (I0...I15 also possible directly on STW164IP)	
Current transformers	- STWA1(H) (terminals I- and I0.I15) - Potential-free contact (terminals Y+ and I0.I15) - Ziehl current sensor S1 (S1 output PNP at I0.I15, Us of S1 at Y+ and I-)
AC internal resistance	approx. 15kQ
Overload capacity with STWA1 (H)	max. 100A continuous, max. 300A for 10s
Switch-on value	adjustable 0.5...9.9 A with current
Tolerance	transformerSTWA1 (H) ±20% (current transformer STWA1(H))
Inputs Y1, Y2	potential-free contact at terminals Y1 / Y2 and Y+
Internal resistance	approx. 38kQ
Switching threshold	ON > 17V, OFF < 8V
Voltage output	DC 0.10V
Accuracy / temperature drift Load	1% of the final value (from 0.1V) / < 0.06% / K > 1 k Q
Ethernet interface	RJ45 Connection
Speed	10 / 100Mbit/s

RS485 BUS for STW161M/STW168M	
Cable	recommended: twisted, shielded (twisted pair)
Length	max. 1000m (RS485 BUS)

When selecting and dimensioning the cable, it must be ensured that sufficient voltage is available on each BUS participant (STW164IP, STW161M/STW168M with slider/flaps).

Power consumption of the BUS devices for the calculation:

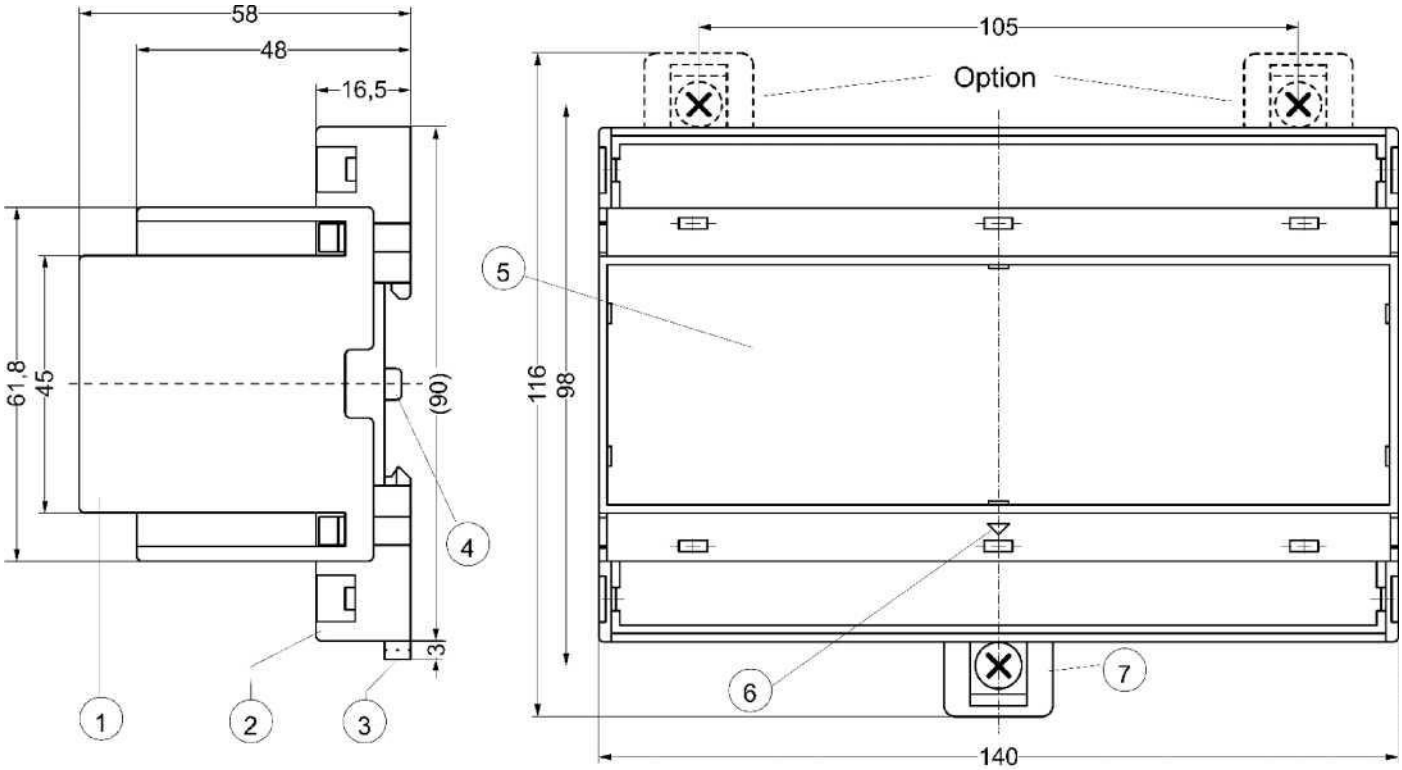
• STW164IP	approx. 3W
• Connected STW161M	approx. 0.5W each
• Connected STW168M	approx. 3.5W each
• Connected sliders / flaps	approx. ... each on the customer's side

EMC tests	EN 61326-1
Interference emission	EN 61326-1; CISPR 11 Class B
Interference immunity	EN 61326-1; industrial environment

Installation conditions		
Permissible ambient temperature	-20°C ... +55°C	
Permissible storage temperature	-20°C ...+70°C	
Installation height	- 2000 m above sea level	
Climate resistance	5-85% relative humidity, no condensation	
Permissible wiring temperature	-5°C ...+70°C	
Oscillation	IEC 60255-21-1	Class 1
Shock	IEC 60255-21-2	Class 1
Seismic stress	IEC 60255-21-3	Class 1

Housing	Type V8, Distributor installation
Installation depth Width	59mm
Dimensions (W x H x D)	8 TE
Cable connection single-wire	140 x 90 x 58mm
Fine-wire with ferrule	1 x 0.34 - 1.5mm^2 / AWG 22 - 14
Stripping length / tightening torque	1 x 0.1 - 1.0mm^2 / AWG 27 - 16
Protection type housing/clamps fastening	8mm / 0.5Nm
	IP 30 / IP20
	Snap-on fastening on 35mm mounting rail to
Weight	EN 60 715 or M4 screw fastening (additional latches not included) approx. 310g

15 Design V8



16 Disposal

Disposal should be carried out properly and in an environmentally friendly manner in accordance with legal provisions.
ZIEHL is registered with the EAR Foundation under WEEE no .: DE 49 698 543.