

INSTRUCTION FOR USE

Masterwatch Ultra Pressure Monitor

**Masterwatch Ultra
Medical Gas Alarm**

System OK

02

AIR

Training

Alarm
list

Setting

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Thank you for choosing Masterwatch Ultra from QMT-Tech ab

Your new Masterwatch Ultra is an advanced medical device with high-quality components and features for safe operation and high performance.

Read the information for use before installation, commissioning and use so that you are well informed about how it is installed, commissioned and used safely.

Information on use is supplemented with instructions on installation, operation and maintenance for a long and trouble-free use.

We wish you a long, safe and trouble-free use.

This manual describes the Masterwatch Ultra's functions for safe installation, commissioning and use.

The information for use should be read and understood by all intended users.

The following symbols are used in the user manual:



Warning



Note, important information



Read the information for use

Digital copy can be downloaded from qmt3.com

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Intended use:

Masterwatch Ultra is used to monitor the pressure of medical gases in a hospital ward/department. The system is designed to detect deviations in gas pressure and alarm at abnormal levels, enabling rapid intervention and ensuring patient safety.

The alarm is primarily intended for use by healthcare staff in daily work, but it is also an important tool for technical operations staff for troubleshooting and maintenance. The interface is designed to be easy to understand and accessible, regardless of the user's technical background.

Intended users:

Installation – Installer, pipe fitter, electrician, etc.

Daily use – Healthcare staff and hospital maintenance/operations technicians

Maintenance – Technician from QMT-tech or another technician authorised for the task by QMT-tech AB.

Target group:

Not limited, since medical gases are used in all areas of the hospital.

Indications:

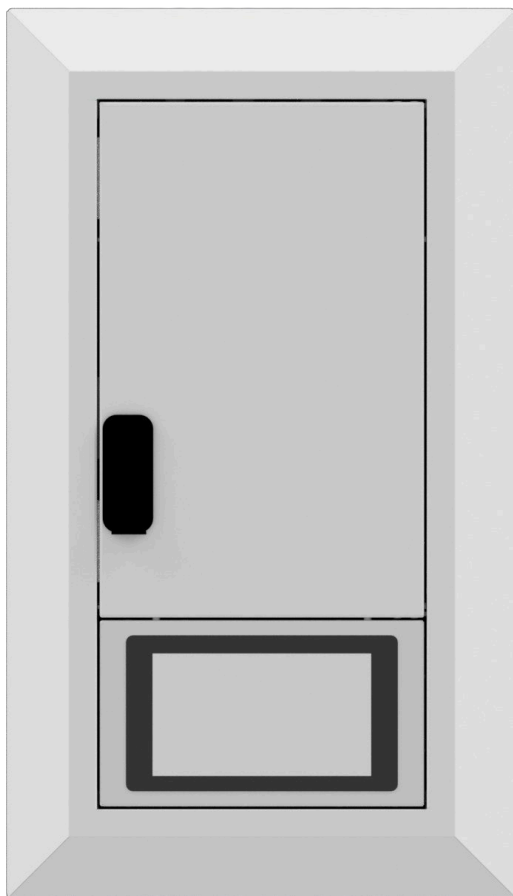
Non-specific since medical gases are used in all areas of the hospital for many different conditions.

Contra indications:

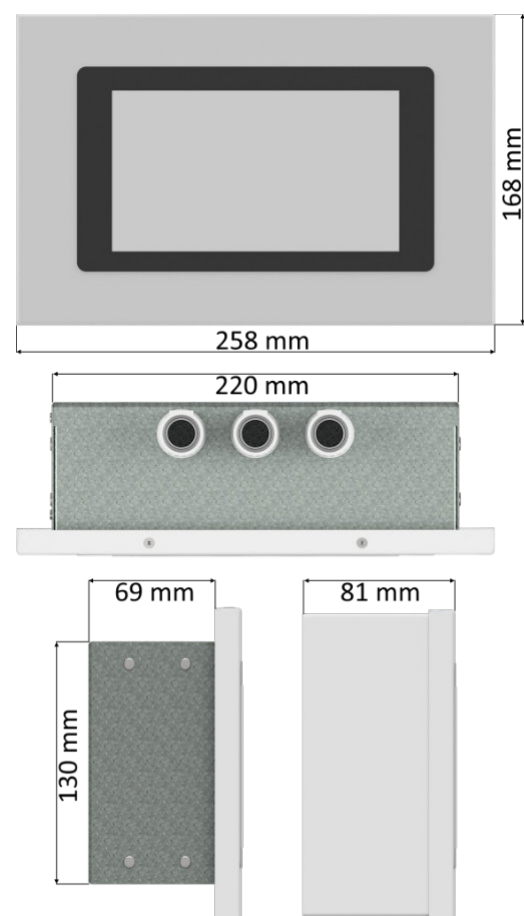
Non-specific since medical gases are used in all areas of the hospital for many different conditions.

Masterwatch Ultra pressure monitor is delivered in two versions. It can either be integrated directly in the pressure monitor, or installed separately as a wall-mounted alarm unit – either recessed or surface-mounted.

Alarm integrated in the pressure monitor



Wall-mounted alarm
recessed or surface-mounted



If the alarm is delivered integrated in the pressure monitor:

On the top side of the pressure monitor there is a 32 mm conduit coupling that continues into a channel in the device and ends in the alarm box. Through this conduit, the wiring that will be connected to the alarm unit is routed.

To access the terminal strip in the alarm, loosen the two screws on the alarm front. Then fold the front forward to access the terminal strip.

The wiring from the unit's pressure sensor and limit switches is already factory-connected and function-tested.

If the alarm is installed standalone on a wall:

On the top side of the alarm enclosure there are knockout holes for three 20 mm conduit couplings. All wiring is routed into the enclosure through these.

To access the terminal strips in the alarm, loosen the four screws on the alarm front – two at the top and two at the bottom. The front can then be removed.

Since the alarm is delivered separately from the unit it will monitor, the wiring from the unit's pressure transmitters and limit switches must be connected manually to the lower terminal strip.

A wiring diagram for this is supplied as a separate document.

**Note:**

Behind the alarm, only a reasonable amount of wiring should be placed to connect the unit. Excess wiring must not be pushed in behind the unit, but should instead be routed elsewhere in a suitable manner.

Forcing too much wiring behind the alarm so that it presses against the display may cause the display to be pushed out or come loose from its mounting.

**Note:**

During installation, the commissioning lockout is active – meaning that sound, relay outputs and external alarm outputs are temporarily set to the non-alarm state, regardless of pressure status. This allows the alarm to be powered without sounding/triggering alarms in the ward before the gas supply is connected.

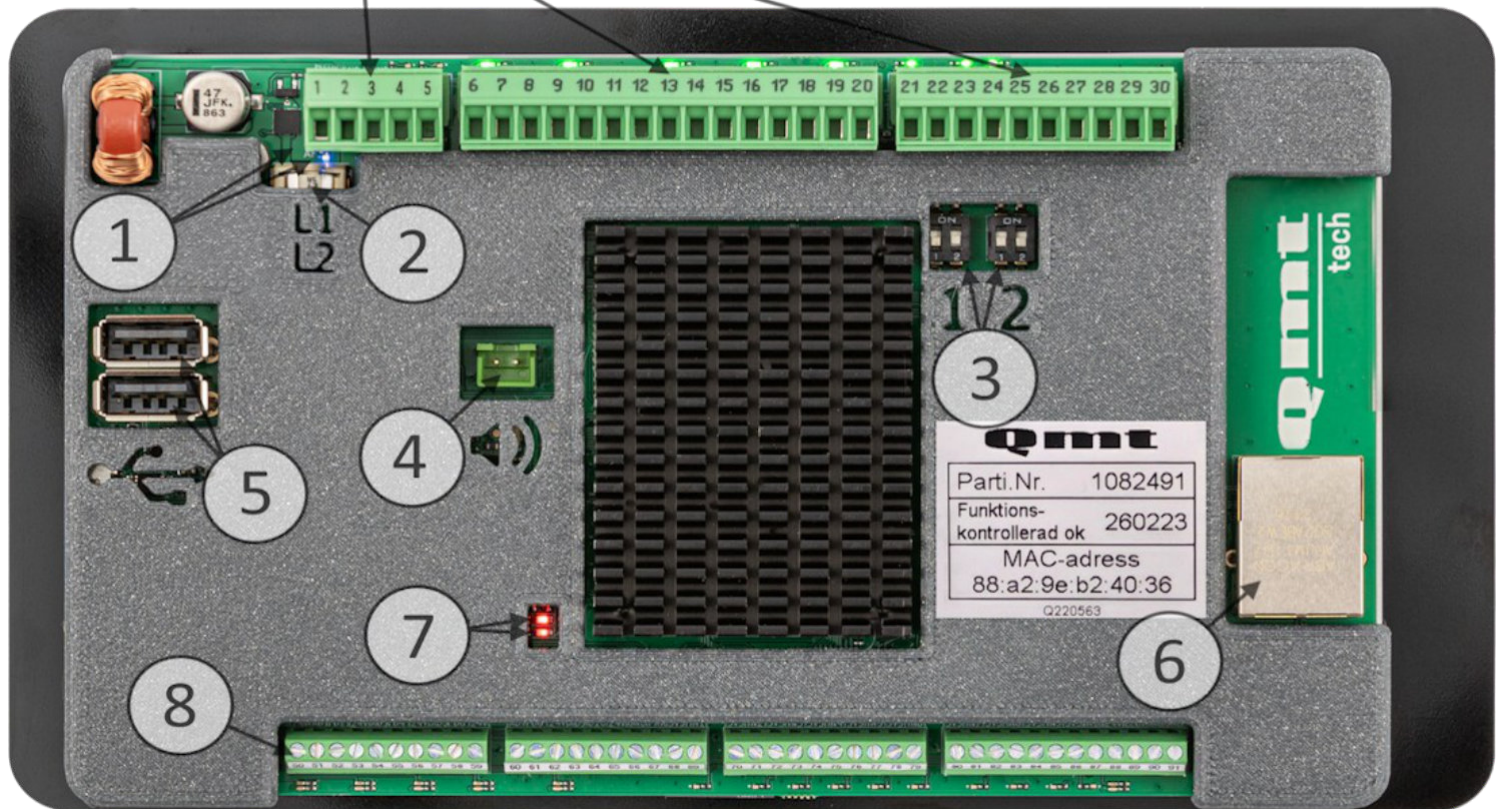
When the gas system is pressurised and the alarm is ready to be put into operation, the lockout must be deactivated.

See page 18 under *Commissioning*

Ferrules are recommended when connecting.

Conductor cross-section: 0.25 mm² – 1.5 mm²

Stripping length: 7 mm



1. Status LEDs – indicate the alarm's power supply. (More information on page 10 under *Power supply*)
2. Fuse – protects the PCB against overload.
(More information on page 10 under *Power supply*)
3. RS-485 termination. (More information on page 10 under *RS-485 termination*)
4. Connector for the alarm loudspeaker.
5. USB port – for updating the alarm and retrieving log files.
6. RJ45 connector – Modbus TCP/IP communication. (More information on page 12)
7. Heartbeat LED – lights and pulses when the system is active
8. Terminal strip – for pressure transmitters and limit switches. Normally already connected. If the alarm is delivered as a standalone unit the wiring diagram are supplied in a separate document.

1. Power supply

To ensure correct function, connect a stabilised 24 VDC power supply as follows:

Terminal	Function	Specification
1	+24 VDC	IMPORTANT! 24 VDC ±10% (Max ripple ≤ 200 mV), (More information on page 10 under <i>Power supply</i>)
2	0 VDC	
3	Protective earth	

NOTE! Verify the voltage before connection to avoid damage to the unit.

2. UPS

Signals from UPS, if QMT's UPS is used.

Terminal	Function
4	UPS battery operation
5	UPS battery alarm

3. Relay outputs

Relay outputs are used to send alarm signals to nurse call systems, DUC, or other systems.

(More information on page 11 under *Relay outputs*)

Terminal			Function	Max load
6 (NC)	7 (NO)	8 (COM)	Relay 1	4A, 250VAC
9 (NC)	10 (NO)	11 (COM)	Relay 2	4A, 250VAC
12 (NC)	13 (NO)	14 (COM)	Relay 3	4A, 250VAC
15 (NC)	16 (NO)	17 (COM)	Relay 4	4A, 250VAC
18 (NC)	19 (NO)	20 (COM)	Relay 5	4A, 250VAC

4. External alarm outputs

Connections for external control, such as remote alarm basic, remote lamp and remote buzzer.

(More information on page 11 under *External alarm outputs*)

Terminal		Function	Max load
21 (24VDC+)	22 (0V)	Remote alarm basic	1,5A
23 (24VDC+)	25 (0V)	Remote lamp	1,5A
24 (24VDC+)	25 (0V)	Remote buzzer	1,5A

5. Modbus communication

5.1 Modbus RTU (RS-485) to DUC

Communication to a supervisory system via Modbus RTU. (More information on page 12)

Terminal	Function
26	DUC Modbus A
27	DUC Modbus B

5.2 Modbus RTU (RS-485) QMT

Communication with QMT accessories via Modbus RTU. (More information on page 11)

Terminal	Function
28	QMT Modbus A
29	QMT Modbus B
30	GND Modbus DUC/QMT

5.3 Modbus TCP/IP

Connect the network cable to the RJ45 connector by the QMT logo.

(More information on page 12)

Power supply



Masterwatch Ultra must be supplied with **24 VDC $\pm 10\%$ (max ripple $\leq 200\text{mV}$)**.

Only stabilized power supplies may be used.

Using non-stabilized power supply can cause voltage variations and ripple that may damage the unit or negatively affect operation.

During normal operation, current consumption is approximately 350 mA.

Recommended minimum power supply capacity is 1 A (24 W), which provides sufficient margin for safe operation and future options such as remote alarm outputs or other accessories.

Note: If remote alarm outputs or other accessories are powered from the alarm unit, their current consumption must be included when sizing the power supply and fuse.

The unit has two status LEDs:

- L1 lights when the unit has supply voltage.
- L2 is located after the internal fuse.

If L1 is on but L2 is off, the PCB fuse (2) has blown. Replace with: Littelfuse SMD fuse, 5 A.



Important: The internal fuse is only a protective device for the device itself.

An external fuse must always be installed upstream, dimensioned for the system total current consumption.

RS-485 termination

Masterwatch Ultra is equipped with two DIP switches for RS-485 termination. They are located under the terminals and are marked with numbers **1** (blue frame) and **2** (red frame) in the enclosure.

- Switch 1 (blue): Termination for Modbus RS-485 for other systems (e.g., DUC).
- Switch 2 (red): Termination for Modbus RS-485 to QMT accessories.

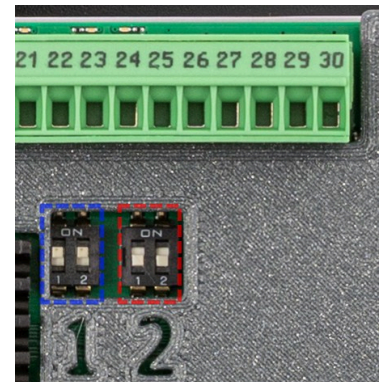
Each switch has two positions:

- ON on both 1 and 2 = termination enabled (120 ohm).
- OFF position on both = Termination disabled

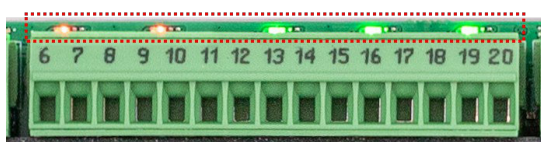
Note:

For correct RS-485 communication, only one device at each end of the Modbus bus should be terminated.

Therefore, enable termination on Masterwatch Ultra only if it is located at the end of the Modbus line.



Relay outputs



Each relay has an LED indicating relay status:

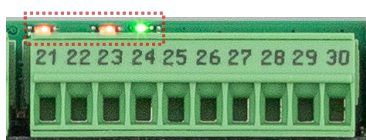
Green – Relay is in normal state.

Red – Alarm condition is met and the relay is in alarm state.

Off (no red/green) No power to the alarm; the relay is in alarm state.

Information about relay configuration is found on page 22 under *Relay functions*.

Remote alarm outputs



Each output has an LED indicating output status:

Green – Output is in normal state. No 24 VDC is supplied.

Red – Alarm condition is met; output is in alarm state. 24 VDC is supplied.

Off (no red/green) No power to the alarm; no 24 VDC is supplied.

Each output has a safety function: If an alarm is active and the output supplies 24 VDC, but the current exceeds 1.5 A, the output is automatically shut off.

Note: The LED may still be red even if no 24 VDC is supplied.

To reset the safety function:

1. Reset/acknowledge so the output returns to green.
2. Troubleshoot the wiring and connections. The safety function is most often triggered by a short circuit downstream of the alarm.

Information about output configuration is found on page 23 under *External alarm outputs*.

Modbus RTU (RS-485) QMT

Accessories with Modbus RTU are connected to the Masterwatch Ultra QMT Modbus RTU port according to the table below. The terminal designations in the table apply to the connections on the respective accessory.

Make sure that Modbus A and B are connected correctly; otherwise, communication will not work. A Modbus RTU loop must always be connected in **series (daisy-chain)** and must never be connected in parallel or as a star connection.

The 24 VDC supply voltage for the accessories may be taken from Masterwatch Ultra, provided that the total current consumption does not exceed the rating of the power supply.

Only the QMT accessories listed in the table below may be connected, and only one of each type.

QMT-accessory	+24 VDC	0 VDC	Modbus A	Modbus B
Flowlog O2	Red wire	Black wire	Green wire	Brown wire
Flowlog N2O	Red wire	Black wire	Green wire	Brown wire
Flowlog AIR	Red wire	Black wire	Green wire	Brown wire
Flowlog AIR800	Red wire	Black wire	Green wire	Brown wire
Flowlog CO2	Red wire	Black wire	Green wire	Brown wire

Alarm bits	Information	Alarm class	R/W	Input coil
	O2 low pressure	A	R	100010
	O2 high pressure	A	R	100011
	O2 primary valve not open	B	R	100012
	O2 reserv valve not closed	B	R	100013
	O2 valve position error	B	R	100014
	O2 communication error with flowlog	B	R	100015
	N2O low pressure	A	R	100020
	N2O high pressure	A	R	100021
	N2O primary valve not open	B	R	100022
	N2O reserv valve not closed	B	R	100023
	N2O valve position error	B	R	100024
	N2O communication error with flowlog	B	R	100025
	AIR low pressure	A	R	100030
	AIR high pressure	A	R	100031
	AIR primary valve not open	B	R	100032
	AIR reserv valve not closed	B	R	100033
	AIR valve position error	B	R	100034
	Andningsluft communication error with flowlog	B	R	100035
	AIR800 low pressure	A	R	100040
	AIR800 high pressure	A	R	100041
	AIR800 primary valve not open	B	R	100042
	AIR800 reserv valve not closed	B	R	100043
	AIR800 valve position error	B	R	100044
	AIR800 communication error with flowlog	B	R	100045
	CO2 low pressure	A	R	100050
	CO2 high pressure	A	R	100051
	CO2 primary valve not open	B	R	100052
	CO2 reserv valve not closed	B	R	100053
	CO2 valve position error	B	R	100054
	CO2 communication error with flowlog	B	R	100055
	N2 low pressure	A	R	100060
	N2 high pressure	A	R	100061
	N2 primary valve not open	B	R	100062
	N2 reserv valve not closed	B	R	100063
	N2 valve position error	B	R	100064
	N2 communication error with flowlog	B	R	100065
	AR low pressure	A	R	100070
	Ar high pressure	A	R	100071
	Ar primary valve not open	B	R	100072
	Ar reserv valve not closed	B	R	100073
	Ar valve position error	B	R	100074
	Ar communication error with flowlog	B	R	100075
	VAC alarm	A	R	100081
	VAC primary valve not open	B	R	100082
	VAC reserv valve not closed	B	R	100083
	VAC valve position error	B	R	100084
	UPS battery operation	B	R	100090
	UPS battery alarm	B	R	100091
	Internal error	A	R	100092

Alarm bit is high when alarm is active

To read **O2 low pressure** use function **Discrete Inputs** tag **00010**

To read **N2O pressure** use function **Input Registers** tag **00020**

	Information	Scaling	R/W	Type	Input Registers
Value	O2 pressure	xx.x bar	R	uint16	300010
	O2 current flow	xxxx.x l/min	R	uint32	300012
	O2 accumulated flow	xxxxxxxx m ³	R	uint32	300014
	O2 accumulated flow decimals	.xxx m ³	R	uint16	300016
	N2O pressure	xx.x bar	R	uint16	300020
	N2O current flow	xxxx.x l/min	R	uint32	300022
	N2O accumulated flow	xxxxxxxx m ³	R	uint32	300024
	N2O accumulated flow decimals	.xxx m ³	R	uint16	300026
	AIR pressure	xx.x bar	R	uint16	300030
	AIR current flow	xxxx.x l/min	R	uint32	300032
	AIR accumulated flow	xxxxxxxx m ³	R	uint32	300034
	AIR accumulated flow decimals	.xxx m ³	R	uint16	300036
	AIR800 pressure	xx.x bar	R	uint16	300040
	AIR800 current flow	xxxx.x l/min	R	uint32	300042
	AIR800 accumulated flow	xxxxxxxx m ³	R	uint32	300044
	AIR800 accumulated flow decimals	.xxx m ³	R	uint16	300046
	CO2 pressure	xx.x bar	R	uint16	300050
	CO2 current flow	xxxx.x l/min	R	uint32	300052
	CO2 accumulated flow	xxxxxxxx m ³	R	uint32	300054
	CO2 accumulated flow decimals	.xxx m ³	R	uint16	300056
	N2 pressure	xx.x bar	R	uint16	300060
	N2 current flow	xxxx.x l/min	R	uint32	300062
	N2 accumulated flow	xxxxxxxx m ³	R	uint32	300064
	N2 accumulated flow decimals	.xxx m ³	R	uint16	300066
	Ar pressure	xx.x bar	R	uint16	300070
	Ar current flow	xxxx.x l/min	R	uint32	300072
	Ar accumulated flow	xxxxxxxx m ³	R	uint32	300074
	Ar accumulated flow decimals	.xxx m ³	R	uint16	300076
	VAC	.xx bar	R	int16	300080

To read the entire accumulated flow both 300054, which is cubic meters, and 300056, which are decimals, are used. If the accumulated flow is 3452.245 m³. Then the value of tag 300054 is 3452 and of tag 300056 is 245

Alarm limits	O2 low pressure	xx.x bar	R	uint16	300110
	O2 high pressure	xx.x bar	R	uint16	300111
	N2O low pressure	xx.x bar	R	uint16	300120
	N2O high pressure	xx.x bar	R	uint16	300121
	AIR low pressure	xx.x bar	R	uint16	300130
	AIR high pressure	xx.x bar	R	uint16	300131
	AIR800 low pressure	xx.x bar	R	uint16	300140
	AIR800 high pressure	xx.x bar	R	uint16	300141
	CO2 low pressure	xx.x bar	R	uint16	300150
	CO2 high pressure	xx.x bar	R	uint16	300151
	N2 low pressure	xx.x bar	R	uint16	300160
	N2 high pressure	xx.x bar	R	uint16	300161
	Ar low pressure	xx.x bar	R	uint16	300170
	Ar high pressure	xx.x bar	R	uint16	300171
	VAC wrong pressure	.xx bar	R	int16	300181

Recommended polling interval: 0.5 - 1 second.

Information on how to set communication parameters for Modbus RTU and TCP/IP, as well as which tags are used in the alarm, can be found on pages 24 and 25.

Start screen

The start screen is the view normally shown during normal operation of Masterwatch Ultra. It provides a quick overview of system status and is always available. If there is no activity within 5 minutes and no alarms are active, the system automatically returns to this view.

System status

The current system status is clearly displayed in the center in a colored box.

During normal operation, the text "System OK" is shown in green.

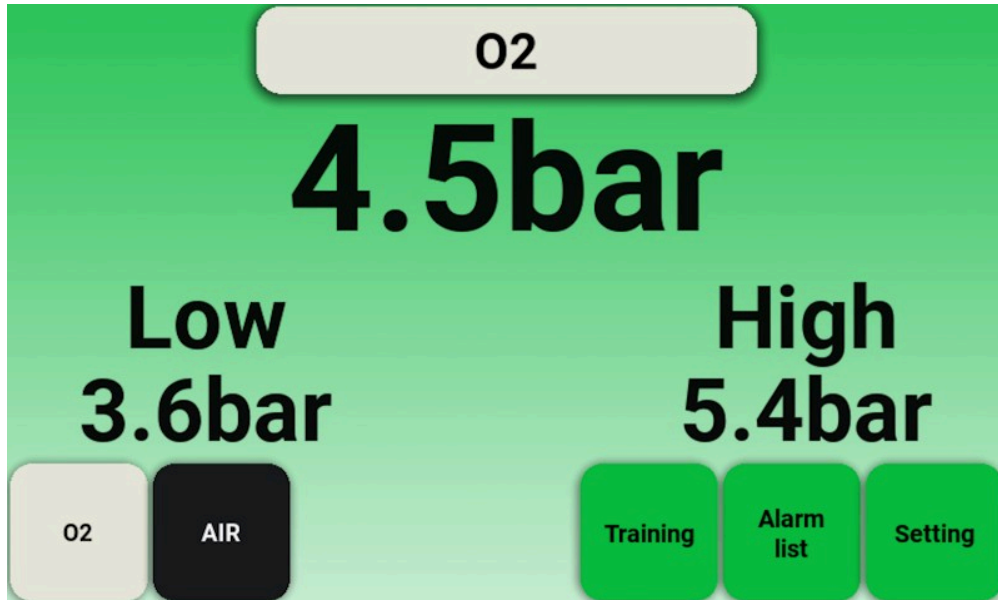
If an alarm occurs, both text and color change automatically to indicate the deviation.

Navigation buttons

- **The gas buttons** on the left show each gas monitored by the system. Press a gas to open detailed information.
- **Training** opens a simulated environment where staff can practice handling a gas loss. The button is only shown when training is available and no alarms are active.
- **Alarm list** shows all current and previous alarms.
- **Settings** provides access to system settings such as relay functions, communication and alarm limits. Access requires a code.

If you are in Gas overview or the Alarm list, you can quickly return to the start screen by swiping down on the display.

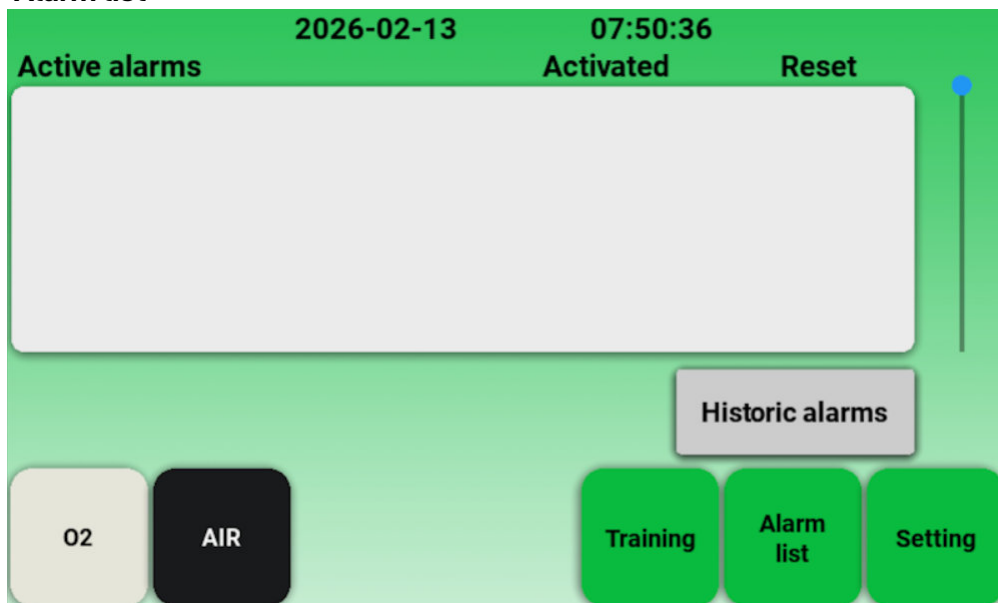
Gas overview



This view shows the current status for the selected gas.

At the top the gas name is shown, followed by a large central value displaying current pressure in real time. On each side of the current pressure, the alarm limits for that gas are displayed.

Alarm list



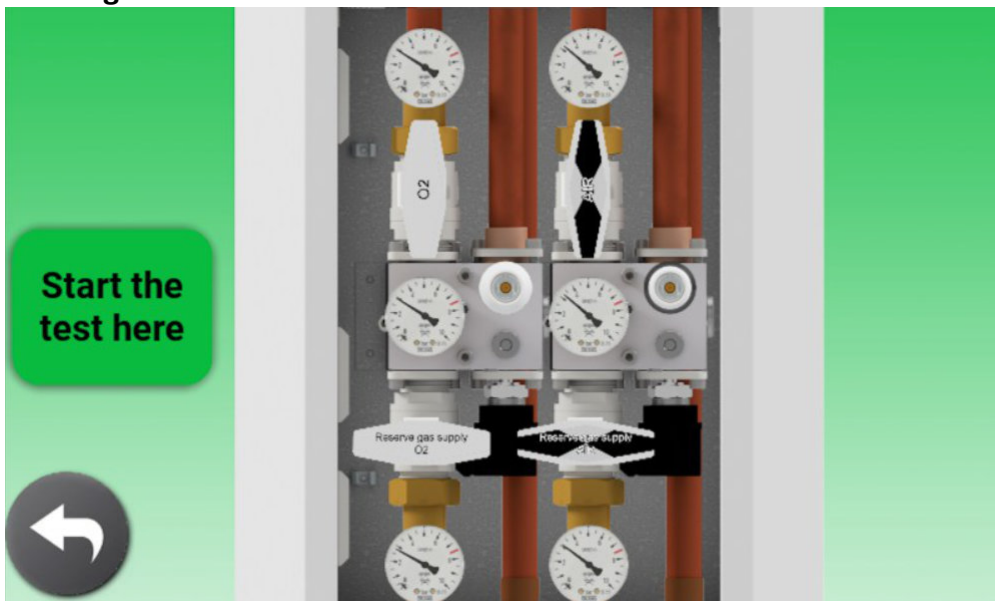
The alarm list provides an overview of all active alarms.

It makes it easy to see which alarms are active, when they occurred, and when they were restored provided the alarm has not been acknowledged.

Each entry shows alarm text, date/time of activation, and date/time of restoration (if restored). Restored and acknowledged alarms are automatically removed from the current alarm list.

Press Historical alarms to view earlier alarms, including restored ones. Deleting the historical alarm list requires the settings login code.

Training



Training mode is a simulated test environment where the user can practice alarm handling without affecting the real gas supply. The purpose is to increase confidence in using the system and improve understanding of how to act during a real alarm.

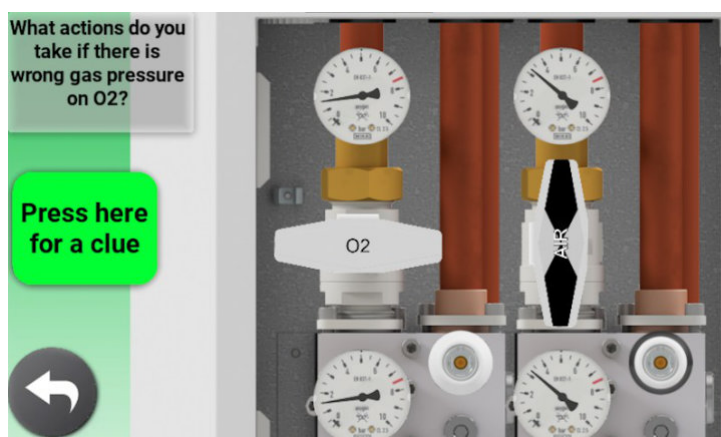
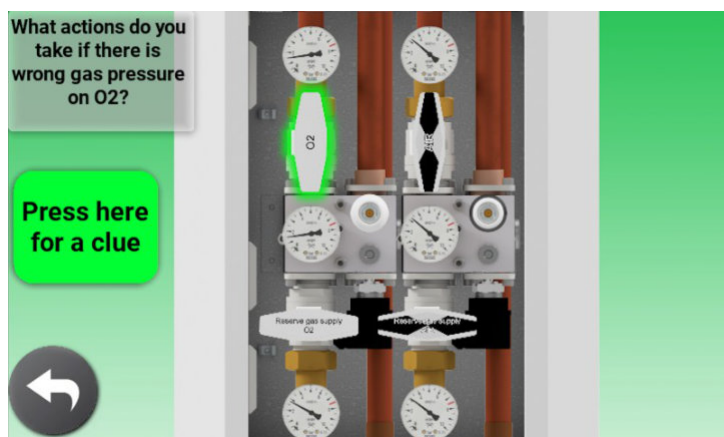
When training starts, an information box is shown with important safety information. It clearly states that this is a test environment and that no physical valves must be operated only the on-screen instructions are to be followed.

Start by pressing "Start the test here".

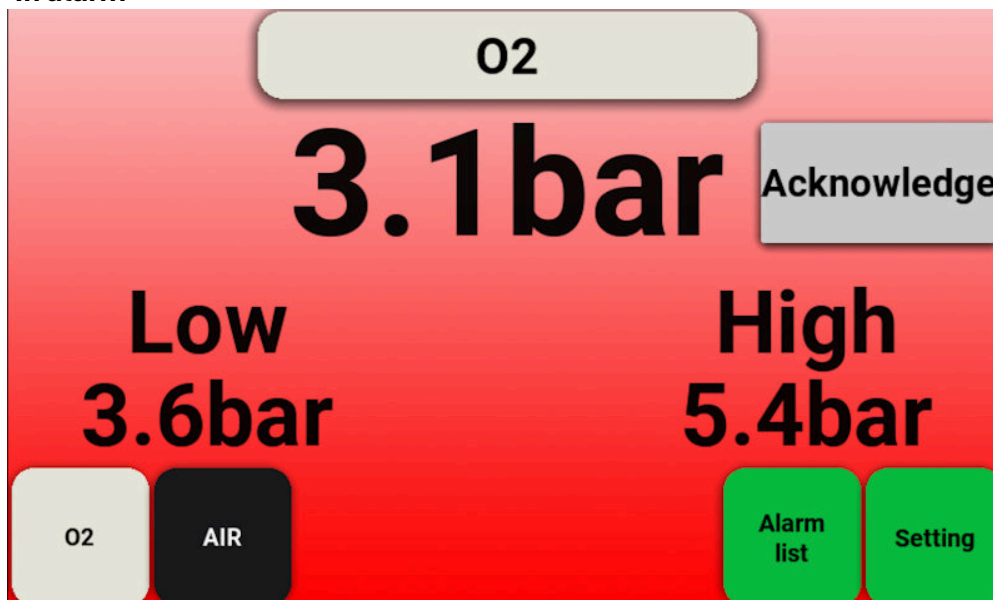
The system then simulates a gas alarm by randomly selecting a monitored gas and displaying an incorrect pressure. The user is guided to act based on the situation.

If needed, press "Press here for a clue" to get guidance. A green flashing marker then indicates the next step where to press on the screen. Use the arrow button at the lower left to exit or go back.

Note: For training to be available, the pressure monitor must be equipped with limit switches on all valves. The alarm needs this feedback to determine whether the correct action has been taken in the event of a real alarm.



In alarm



When an alarm is activated, the appearance of the screens and gas buttons changes to draw attention. For a B-alarm (less critical), the background turns yellow. For an A-alarm (critical), the background turns red even if a B-alarm is active at the same time.

- The gas button for the alarming gas pulses in yellow or red depending on alarm class.
- If multiple gases alarm simultaneously, the system automatically cycles between those gas views until the alarm is acknowledged.
- In gas view, the pressure value and the alarm text Low or High pulse if pressure is incorrect.
- If other alarms are present, their texts are also displayed and pulse.

If an alarm is restored before it is acknowledged, the background returns to green but the buzzer continues. In that case, the Alarm list is automatically shown so the user can immediately see which alarms have occurred but not been acknowledged.

Acknowledgement and guidance

When the user presses "Acknowledge" the buzzer is silenced.

If the gas pressure is still incorrect and all valves on the gas are equipped with limit switches and are in normal operating position, the alarm asks if the user wants to receive instructions on how to connect the reserve gas.

If confirmed, the user is guided step-by-step in an animated environment (training guide mode). The alarm monitors valve status in real time and waits for each step to be performed before showing the next.

Upon confirmation, the user is sent to the animated environment, where the Training function is activated in guide mode. A voice and animation guide the user step by step through the connection of reserve gas – adapted to how the pressure monitor is built. The alarm detects the status of the valves in real time and waits for the action to be carried out before displaying the next step.

When all steps are completed, reserve gas is connected and the pressure has returned to normal, a pop-up box may be displayed – if the customer has chosen to activate this function. The pop-up box contains information on how to report the alarm state, as well as contact information, for example to an emergency number or technician responsible for medical gases – the contact information has been entered by the customer in the alarm.

Commissioning



On delivery, a commissioning lockout is active.

This allows the unit to be powered before the gas supply is connected, without unwanted alarms during installation.

When commissioning lockout is active, the following remain in non-alarm state regardless of pressure:

- Buzzer (sound)
- Relay outputs
- External alarm outputs

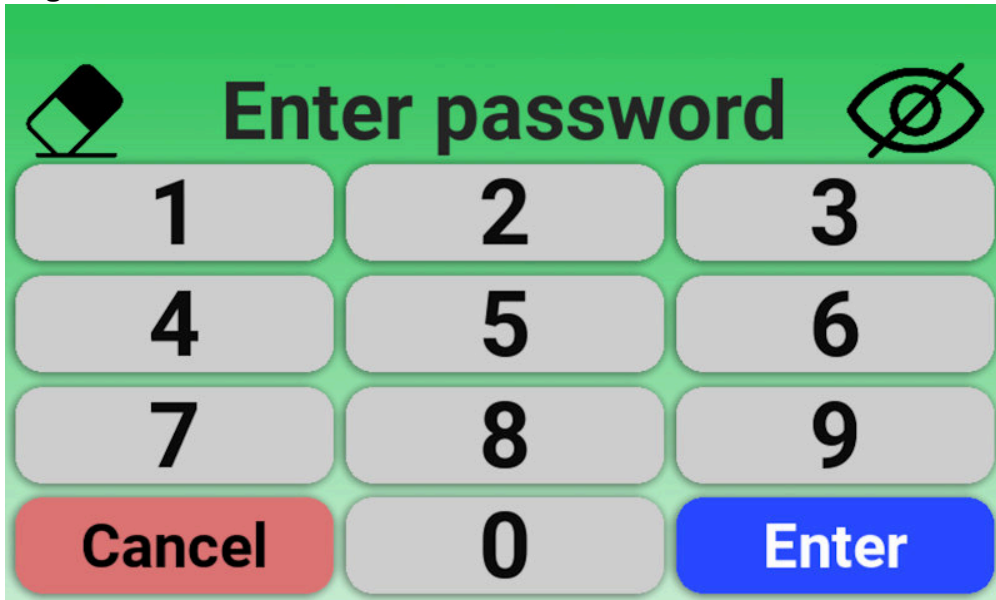
On the start screen, a clear red message is shown: "Press here, to activate the alarm"

When pressed, the user must log in with the same code used for the Settings menu.

After login, a dedicated view is shown where commissioning lockout can be removed.

Only deactivate when the gas system is connected, pressurized, and ready for normal operation.

Login screen



Before access to system settings is granted, a login screen is shown.
Enter the code to gain authorization.

The screen includes:

- Delete symbol (top left), clears entered code.
- Eye symbol (top right), shows/hides the entered code (default hidden as "X")

If no code is entered within 60 seconds, the system returns to the start screen.

On delivery, the standard code is active from previous materwatch series. The code can be changed to a user-defined code up to 8 digits. To change the code, contact a QMT technician who will provide a temporary one-time code to change the code.

Traceability and security

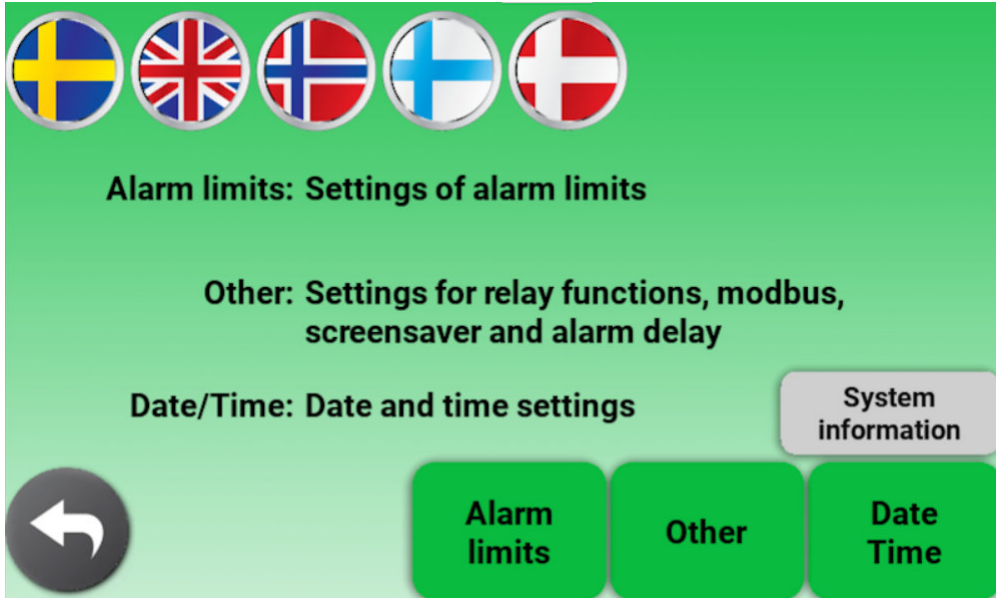
After successful login, the user gets access to Settings.
All changes are automatically logged and cannot be deleted.

Path: Other > System configuration > Logged system changes
The log shows:

- Logged-in user type (customer or QMT)
- What was changed
- Date and time for each change

If the user is inactive in Settings for more than 10 minutes, the user is automatically logged out and returned to the start screen.

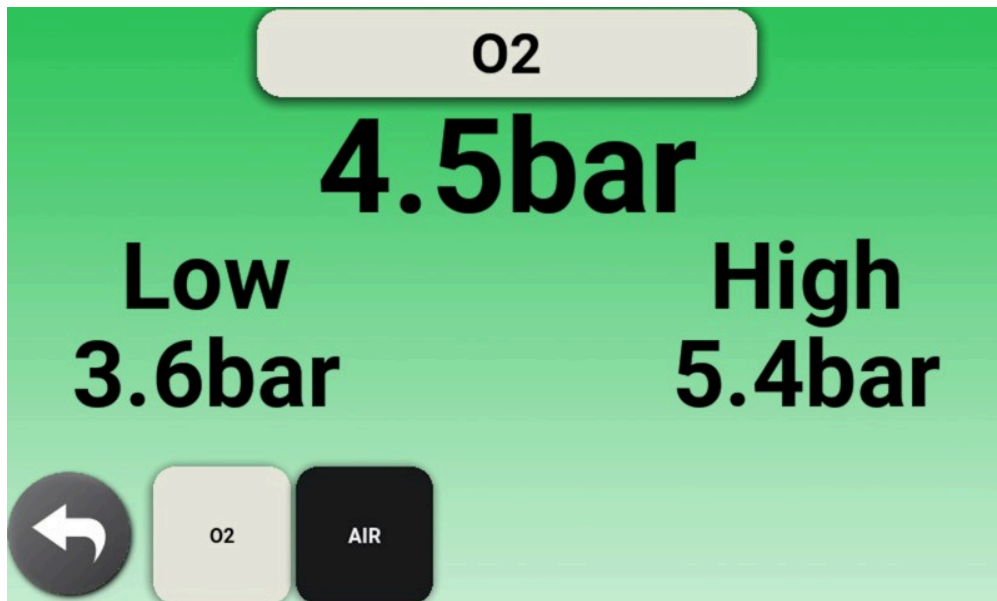
Settings



After login, the main Settings menu is shown.

At the top you can select the desired language for the user interface.

Alarm limits



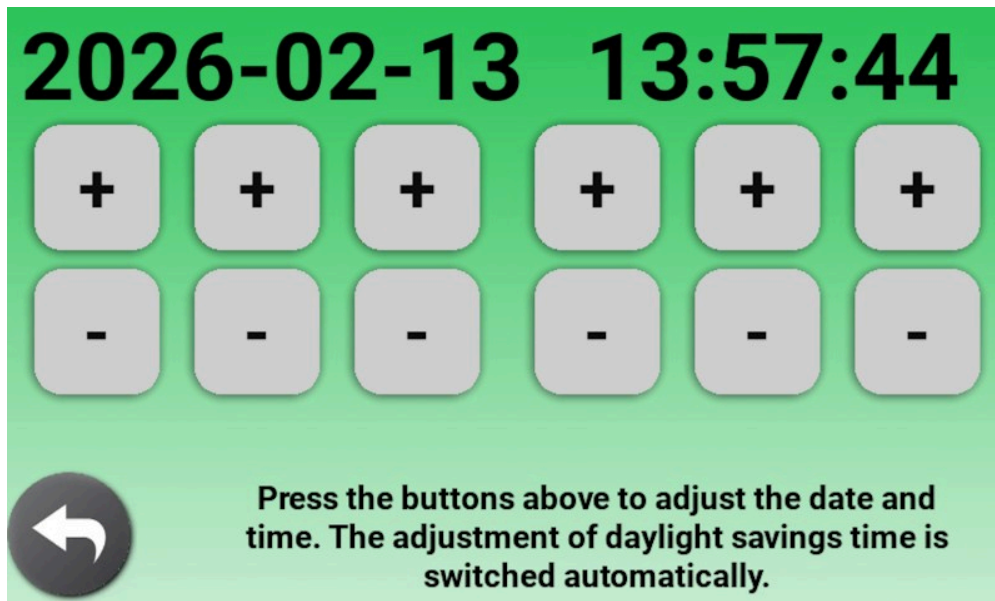
Here you can adjust high and low alarm limits for each monitored gas. How to:

1. Select the gas by pressing the gas button at the bottom of the screen.
2. The selected gas pressure and alarm limits are displayed.
3. Press "Low" or "High" to edit.
4. Enter the new limit value using the on-screen keypad.

! Note:

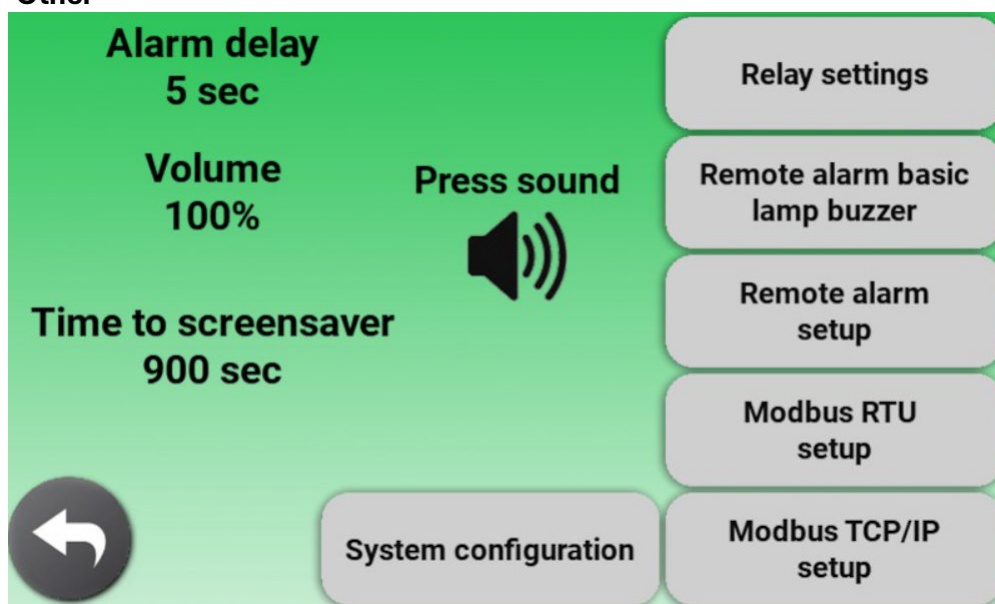
Changes do not take effect immediately. All changes are applied only when leaving Settings and returning to the start screen. While you are in Settings, monitoring is temporarily paused.

Date and time



Adjustment of date and time.

Other



The "Other" menu contains settings related to volume, communication and relay functions.

Note:

System configuration is intended for technically skilled personnel.

It contains advanced settings affecting monitoring fundamentals, and functions such as logs, software update, and sensor calibration.

If unsure - contact QMT before making changes.

Relay functions

Press the buttons to set what activates the relay outputs. New settings are activated when you return to the home screen.

Relay 1
NC terminal 5 and 8
NO terminal 7 and 8

Relay 2
NC terminal 9 and 11
NO terminal 10 and 11

Relay 3
NC terminal 12 and 14
NO terminal 13 and 14

Relay 4
NC terminal 15 and 17
NO terminal 16 and 17

Relay 5
NC terminal 18 and 20
NO terminal 19 and 20

Time that active relays are reset at new alarms.
2 sec

A-alarm

A-alarm

A-alarm

A-alarm

A-alarm

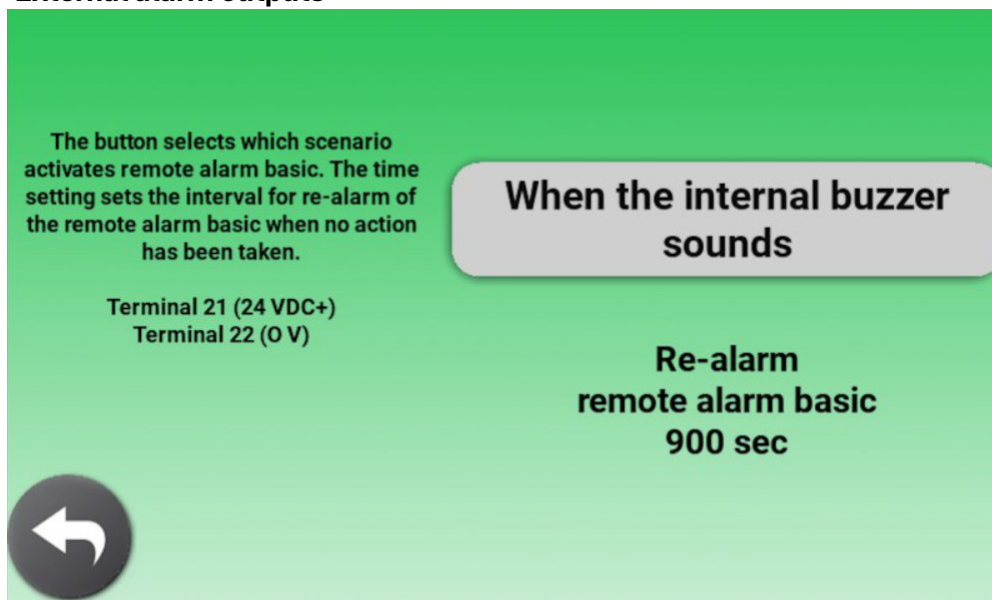


Here you define what activates each relay output. There are five relays, each programmable. How it works:

- Select a relay (e.g., Relay 1).
- Choose the desired function from the list. Only the functions and gases that are activated in the system can be selected.
- Changes apply only when leaving Settings and returning to the start screen.

Function	Description
In the event of a power failure	The relay remains in the non-alarmed state . It only goes to the alarmed state when the alarm is de-energized. Used to indicate a power failure.
Common alarm	The relay is activated if any alarm is active in the alarm panel.
A-alarm	The relay is activated if any A-alarm is active in the alarm panel. A-alarms are critical alarms, e.g. in case of incorrect pressure.
B-alarm	The relay is activated if any B-alarm is active in the alarm panel. B-alarms are non-critical alarms, e.g. in case of reserve gas supply.
(Gas type) common	The relay is activated if any alarm is active for the selected gas type.
(Gas type) wrong gas pressure	The relay is activated if incorrect pressure is detected for the selected gas type.
(Gas type) valve alarm	The relay is activated if the valve alarm is active for the selected gas type.
Wrong gas pressure for gas with reserve gas valve	The relay is activated if the wrong gas pressure is detected on a gas with a fixed backup gas supply. This function ensures that the low pressure alarm does not activate the relay if a fixed backup gas is missing. For example: If the gas supply drops on a gas supply that does not have a backup gas, this low pressure alarm should not activate the relay.
Buzzer	The relay is active as long as the internal buzzer in the alarm sounds.
Common valve alarm	The relay is activated if any gas has an active valve alarm.
Common alarm once	The relay is activated if any alarm is active in the alarm panel. It returns to the non-alarmed state when the alarm is acknowledged, but the alarm remains. This means that the relay is only activated once per alarm event.
A-alarm once	The relay is activated if any A-alarm is active in the alarm panel. It returns to the non-alarmed state when the alarm is acknowledged, but the alarm remains. This means that the relay is only activated once per alarm event.
B-alarm once	The relay is activated if any B-alarm is active in the alarm panel. It returns to the non-alarmed state when the alarm is acknowledged, but the alarm remains. This means that the relay is only activated once per alarm event.

External alarm outputs



Here you define which scenario activates each external output (remote alarm basic, lamp, buzzer). How it works:

- Select the output to configure.
- Choose the desired function from the list.
- Only functions and gases enabled in the system are shown.
- Additional options such as re-alarm time are described on the screen.

Function	Description
(Output) disabled	The output remains inactive regardless of which alarms are activated.
When the internal buzzer sounds	The output outputs 24V DC as long as the internal buzzer in the alarm sounds.
When an alarm is active in the panel	The output outputs 24V DC as long as any alarm is active in the alarm panel.
A-alarm	The output outputs 24V DC as long as an A-alarm is active in the alarm panel. A-alarms are critical alarms, e.g. in case of incorrect pressure.
B-alarm	The output outputs 24V DC as long as a B-alarm is active in the alarm panel. B-alarms are non-critical alarms, e.g. during backup gas supply.
At wrong gas pressure	The output outputs 24V DC as long as any gas pressure is incorrect.
At closed primary gas valve	The output outputs 24V DC as long as any primary valve is closed.
At open reserve gas valve	The output outputs 24V DC as long as any reserve gas valve is open.
At valve position alarm	The output outputs 24V DC as long as a valve position alarm is active.

Remote alarm

Mode 1
Multiple remote alarms

Mode 2
Several alarms to same remote alarm

Address
16

Mode 2 is selected. The alarmpanel is passive, a remote alarm manages the communication. This remote alarm collects data from several different alarmpanels.

IMPORTANT! All connected alarmpanels and the remote alarm must have mode 2 selected. Also set the alarmpanels to have different addresses, so the remote alarm can communicate correctly with the alarmpanels. Set to any address between 16 to 100. This setting is done here to the left.

NOTE! press below to enter the name of the alarmpanel. This this name with the alarm texts will appear in the remote alarms alarm list.

Current name sent to remote alarm is:
TRÖ1104
Click here to change the name.

If one or more Masterwatch Ultra remote alarm panels will be used, configure communication here.

Follow the on-screen instructions carefully to ensure correct addressing and mode.

For wiring and detailed configuration, see the documentation provided with the Masterwatch Ultra remote alarm panel.

Modbus RTU

Press the RTU setting you want to change. Change take effect when you exit this window

Modbus registers

Baud rate
9600

Parity
None

Data bits
8

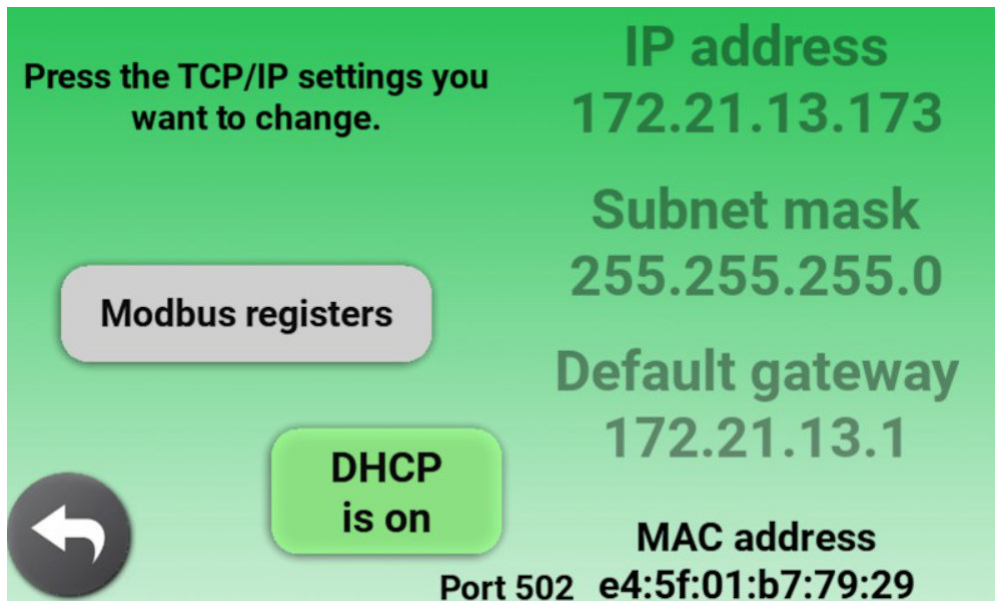
Stop bits
1

Address
15

Configure Modbus RTU communication towards a DUC or other supervisory monitoring.

Press "Modbus list" to view all current Modbus tags. Only tags active in the current configuration are shown.

Modbus TCP/IP

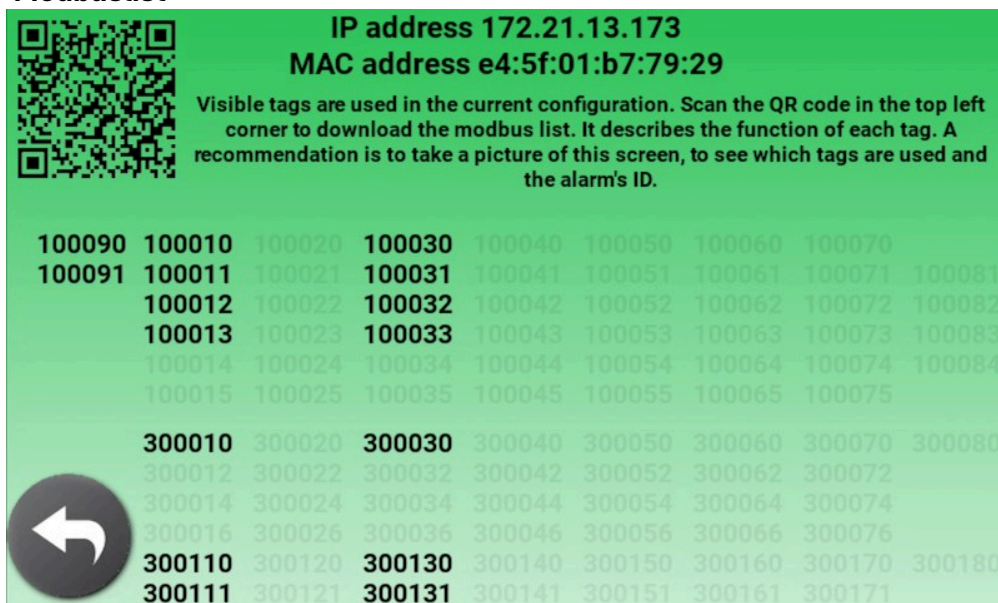


Configure Modbus TCP/IP communication for connection to a DUC or other Ethernet-based monitoring.

Network parameters are set here. The MAC address is shown in this menu and on a label on the back of the alarm.

Press "Modbus registers" to view all current Modbus tags.
Only tags active in the current configuration are shown.

Modbuslist



This view shows which Modbus tags are active in the alarm system's current configuration. As well as which Modbus address or IP address the alarm uses.

Only tags that are actually used are shown – which makes it easy to determine which registers need to be read.

In the upper left corner there is a QR code that can be scanned with a mobile phone. The QR code leads to a downloadable Modbus list that is adapted to the current configuration and with a detailed description of each tag. (Modbus list on pages 12 and 13)

Below is a guide to troubleshooting common questions and problems related to operating the Masterwatch Ultra.

The alarm does not start

- Verify that the power supply is connected correctly.
- See page 10 Power supply.

Alarms are active on startup

- Check that gas pressure is correct.
- Check that alarm limits are correctly set (page 20).

If system pressure is normal but the displayed value is incorrect, it may be due to:

- Faulty pressure transmitter
- Sensor needs calibration

If deviation is less than 1 bar, calibration may solve it. Contact QMT for guidance.

Relay signal does not work as expected

- Check that the receiving equipment works correctly.
- Check wiring of the relay outputs (page 9 and page 11).
- Verify that the correct relay function is selected (page 22).

External alarm output does not work

- Check wiring of the output (page 11).

Masterwatch Ultra is designed to be maintenance-free during normal operation, except for the touch display.

Display – cleaning and care:

- Clean with a soft, lint-free cloth.
- Do not use cleaners containing alcohol, ammonia or solvents.
- If very dirty, wipe lightly with water or mild soap solution.

This product is a medical gas monitoring alarm system.

To ensure safe and correct operation, the following points must be observed:



General warnings

- Masterwatch Ultra should be supplied with **24 VDC $\pm 10\%$ (max ripple $\leq 200\text{mV}$).**
Only stabilized power supplies may be used.
- Installation must be performed by personnel with knowledge of Masterwatch Ultra and medical gas systems.
- Reconfiguration/service may only be performed by authorized personnel.
- Incorrect installation may result in the alarm not functioning.

During commissioning/configuration

- Keep commissioning lockout active during installation until the gas system is complete and pressurized.
- Do not leave the system in lockout after commissioning.
- Settings take effect only after leaving Settings.

Logging/traceability

- Changes are logged with date/time and user type.
- Logs cannot be deleted and provide full traceability over the system life cycle.

Manufacturer:	QMT-tech AB Amerikavägen 6 39354 Kalmar
Basic UDI-DI:	734020616MS
UDI-DI:	734026100061
Product name:	Masterwatch Ultra
Article number:	QMT8ULTRAXX
Power consumption:	8,4 Watt
Supply voltage:	24 VDC $\pm 10\%$ (max ripple $\leq 200\text{mV}$)
Display:	7-inch touchscreen, 800×480 pixels (RGB), active area 154,08×85,92 mm (B×H)
Relay outputs:	5 st potential-free changeover contacts (NO/NC), Max 4A, 250VAC
External alarm outputs:	3 st 24 VDC-outputs, max 1,5 A per output
Communication:	2 st Modbus RTU (RS-485), 1 st Modbus TCP/IP (Ethernet)
Storage:	-20 till 70 °C dry indoor
Operating:	-20 till 70 °C dry indoor
Technical lifetime:	10 years (provided maintenance is performed according to this manual)



Article number

If Masterwatch Ultra is delivered integrated in a pressure monitor, the alarm is included and has no separate article number.

If ordered as a standalone unit:

- QMT8ULTRA11 – Flush wall mounting
- QMT8ULTRA12 – Surface wall mounting

Accessories

Masterwatch Ultra is supplied as a complete product for monitoring the gas system. However, there are a number of accessories that can be used to power the unit, monitor or to forward alarms to other locations in the facility. Below is a list of available accessories with name, part number, power consumption (if applicable) and a short description:

- Power supply UNO-PS (QMT7TU6PS)
60W, 24vdc transformer. Used to power Masterwatch Ultra if no 24vdc is available at the facility. QMT7TU6PSK transformer in plastic housing 130x180x125mm.
- Power supply UNO-UPS (QMT7TU6800)
If the facility lacks priority power, this unit can power the alarm in the event of a power outage. Battery capacity: 0.8 Ah.
- Flowmeter (QMTXXXXXXXX) - up to 100 mA
Contact QMT for correct part number based on application.
Measures both current and accumulated gas flow.
The flow meter is mounted on the downstream gas line after the pressure monitor.
Communication is via Modbus RTU through the alarm's QMT port.
- Remote alarm basic (QMT704206U) - about 50 mA
Remote alarm basic that is supplied with 24 VDC from Masterwatch Ultra in case of alarm.
When activated, an LED lights up and a buzzer sounds.
The buzzer can be silenced locally with the acknowledgement button on the box.
- Indicator panel(QMT704209) - up to 150 mA
An external box with lamp and buzzer that is powered by 24 VDC from the Masterwatch Ultra in the event of an alarm. Suitable for installations where the Masterwatch Ultra is placed in, for example, a gas niche cabinet and is not clearly visible or audible.
- Masterwatch Ultra remote alarm, flush-mounted wall mounting (QMT8ULTRA01) - up to 350 mA. A Masterwatch Ultra alarm that does not monitor any one device, but instead retrieves alarm data from one or more Masterwatch Ultra units at devices. These alarms are presented in the panel's alarm list. Suitable for placement e.g. at an expedition or other manned location.
- Masterwatch Ultra remote alarm, surface-mounted wall mounting (QMT8ULTRA02)
Same function as QMT8ULTRA01, but intended for surface mounting.

Manufacturer: QMT-tech AB
Amerikavägen 6
39354 Kalmar

Basic UDI-DI: 734020616MS

UDI-DI: 734026100061

Product name: Masterwatch Ultra

Article number: QMT8ULTRAXX

EMDN code: Z120309

Complies with:

EN ISO 7396-1	2016
EN 60601-1	2006
IEC 60601-1-8	2006 + A1:2012
EN 61000-3-2	2014
EN 61000-3-3	2013
EN 61000-6-2	2005
EN 61000-6-4	2007 + A1:2011



Masterwatch Ultra is an electronic product and must not be disposed of with household waste.

At end of life, handle as electrical and electronic waste according to local regulations.
Deliver the unit to an approved recycling facility or equivalent receiver.

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