

INSTRUCTION FOR USE

Masterwatch Ultra Regulatorunit

**Masterwatch Ultra
Medical Gas Alarm**

System OK

Over-
view

Alarm
list

Setting

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:

The Masterwatch Ultra is used to monitor the status of a medical regulator unit.

The system is designed to detect abnormal operating conditions, such as pressure deviations or abnormal conditions, and raise an alarm so that timely action can be taken.

The panel is typically installed in technical rooms next to the regulator unit.

The interface is designed to be clear and easy to use.

The system is an important tool for gas managers and operating engineers, both in daily operation and during troubleshooting or maintenance.

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.

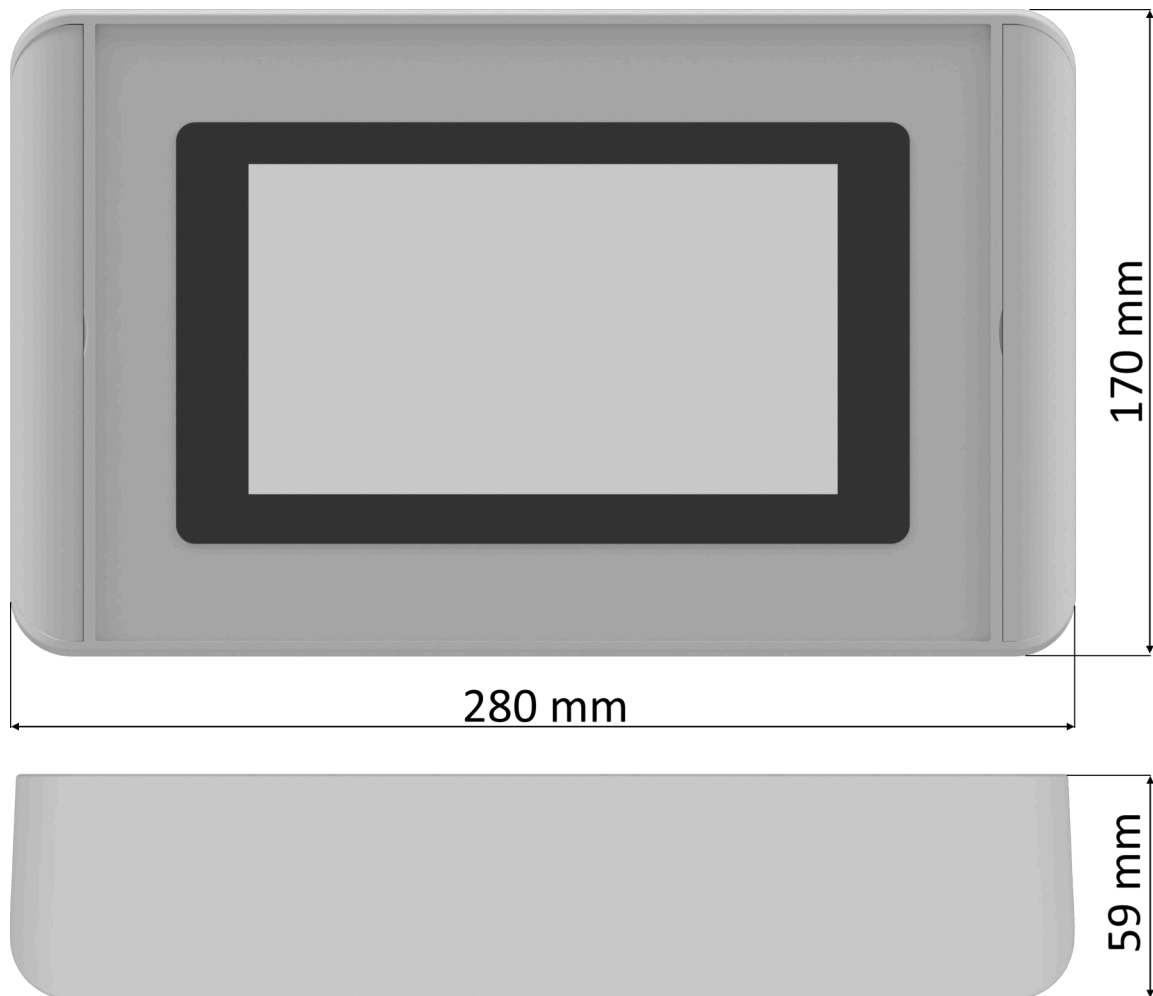
Indications:

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.

The Masterwatch Ultra regulatorunit is supplied as a wall-mounted unit.
Which is placed next to the regulatorunit.



Each Masterwatch Ultra is intended to monitor a regulator unit, a separate alarm panel is required for each unit to be monitored.

It is recommended that the enclosure be mounted on the wall in direct connection to the regulator unit, for example to the side, to simplify wiring and facilitate operation and service.

The alarm is delivered mounted in a Rolec starCASE SC 172 enclosure with protection class IP66. The enclosure is delivered without pre-drilled holes, as the holes must be adapted to the cabling and the cable glands used in the specific installation.

It is recommended that cabling be introduced via the underside of the enclosure.

Install suitable cable glands for:

- Cables from the regulator unit pressure transmitters and switches
- Power supply
- Any outgoing alarm signals

To access the terminal strip in the alarm system:

1. Fold away the covers on both sides of the front.
2. Under each cover are two screws - four in total.
3. Loosen all four screws and then remove the front to gain access to the back of the alarm and terminal board.



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.

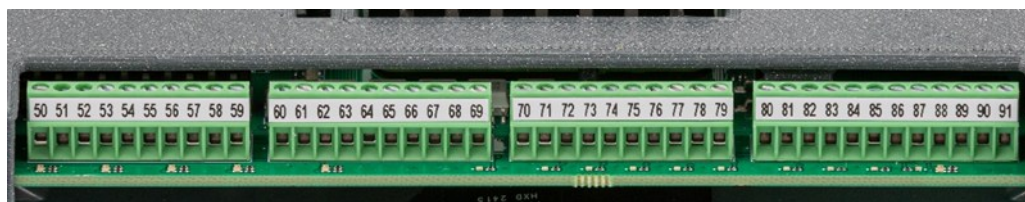
Forcing too much wiring behind the alarm so that it presses against the display may cause the display to be pushed out or come loose from its mounting.



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.



Cable specifications

Cable area
0,14 - 0,5 mm²

Recommended sleeve length
6mm



Regulator unit equipped with pressure transmitter

Ter- minal	Designation	Signal source	Conductor marking
50			
51			
52			
53	Inlet 24 VDC	Pressure transmitter inlet (optional)	White
54	Inlet 4-20 mA		Brown
55			
56	AIR 24 VDC	Pressure transmitter AIR	White
57	AIR 4-20 mA		Brown
58			
59	AIR800 24 VDC	Pressure transmitter AIR800	White
60	AIR800 4-20 mA		Brown
61			
62			
63			
64			
65			
66			
67			
68	Valve 1 3,3 VDC	Valve limit switch AIR top left (NC) (optional)	White
69	Valve 1 signal		Brown
70	Valve 2 3,3 VDC	Valve limit switch AIR top right (NC) (optional)	White
71	Valve 2 signal		Brown
72	Valve 3 3,3 VDC	Valve limit switch AIR bottom left (NC) (optional)	White
73	Valve 3 signal		Brown
74	Valve 4 3,3 VDC	Valve limit switch AIR bottom right (NC) (optional)	White
75	Valve 4 signal		Brown
76	Outlet switch 3,3VDC	Limit switch AIR valve (NC) (optional)	White
77	Outlet switch signal		Brown
78			
79			
80	Outlet switch 3,3VDC	Limit switch AIR800 valve (NC) (optional)	White
81	Outlet switch signal		Brown
82			
83			
84	Valve 5 3,3 VDC	Valve limit switch AIR800 left (NC) (optional)	White
85	Valve 5 signal		Brown
86	Valve 6 3,3 VDC	Valve limit switch AIR800 right (NC) (optional)	White
87	Valve 6 signal		Brown
88			
89			
90			
91			



Cable specifications

Cable area
0,14 - 0,5 mm²

Recommended sleeve length
6mm



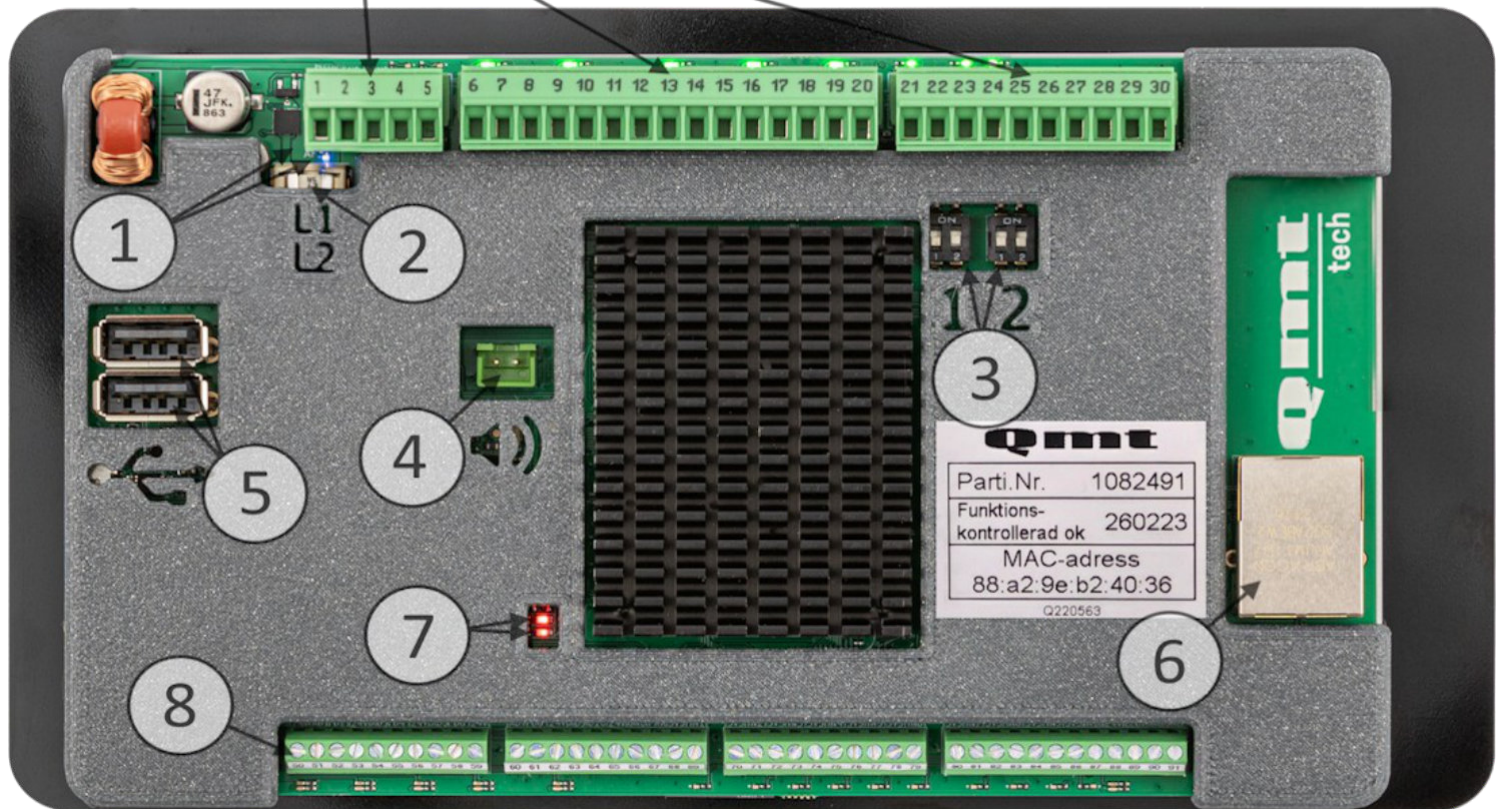
Regulatorunit equipped with signal gauge

Ter- minal	Designation	Signal source	Conductor marking
50			
51			
52			
53	Inlet 24 VDC		4
54	Inlet digital low pressure	Signal gauge inlet (optional)	1
55	Inlet digital high pressure		2
56	AIR 24 VDC		
57	AIR digital low pressre	Signal gauge AIR	4
58	AIR digital high pressure		1
59	AIR800 24 VDC		2
60	AIR800 digital low pressre	Signal gauge AIR800	4
61	AIR800 digital high pressure		1
62			2
63			
64			
65			
66			
67			
68	Valve 1 3,3 VDC	Valve limit switch AIR top left (NC) (optional)	White
69	Valve 1 signal		Brown
70	Valve 2 3,3 VDC	Valve limit switch AIR top right (NC) (optional)	White
71	Valve 2 signal		Brown
72	Valve 3 3,3 VDC	Valve limit switch AIR bottom left (NC) (optional)	White
73	Valve 3 signal		Brown
74	Valve 4 3,3 VDC	Valve limit switch AIR bottom right (NC) (optional)	White
75	Valve 4 signal		Brown
76	Outlet switch 3,3VDC	Limit switch AIR valve (NC) (optional)	White
77	Outlet switch signal		Brown
78			
79			
80	Outlet switch 3,3VDC	Limit switch AIR800 valve (NC) (optional)	White
81	Outlet switch signal		Brown
82			
83			
84	Valve 5 3,3 VDC	Valve limit switch AIR800 left (NC) (optional)	White
85	Valve 5 signal		Brown
86	Valve 6 3,3 VDC	Valve limit switch AIR800 right (NC) (optional)	White
87	Valve 6 signal		Brown
88			
89			
90			
91			

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 12 under *Power supply*)

2. Fuse – protects the PCB against overload.

(More information on page 12 under *Power supply*)

3. RS-485 termination. (More information on page 12 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 14)

7. Heartbeat LED – lights and pulses when the system is active

8. Terminal strip – for pressure transmitters and limit switches. The alarm is delivered separately from the regulator unit to be monitored, connection instructions are on page 8 – 9

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 12 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 13 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 13 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 14)

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 13)

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 14)

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.

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.

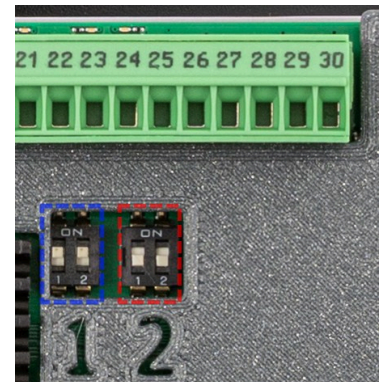
Each switch has two positions:

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

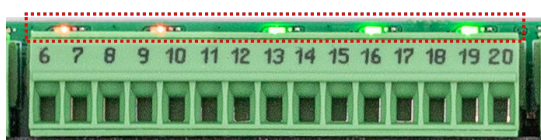
Note:

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:

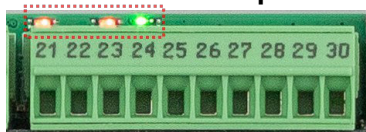
Green – Relay is in normal state.

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 24 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 25 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 inlet	Red wire	Black wire	Green wire	Brown wire
Flowlog outlet AIR	Red wire	Black wire	Green wire	Brown wire
Flowlog outlet AIR800	Red wire	Black wire	Green wire	Brown wire
Gasdetector oxygen	Terminal 1	Terminal 2	Terminal 5	Terminal 6
Gasdetector carbon dioxide	Terminal 1	Terminal 2	Terminal 5	Terminal 6
Room temperature sensor	Terminal +V	Terminal GND	Terminal A	Terminal B

Alarm bits	Information	Alarm class	R/W	Input coil
	Inlet pressure low	A	R	100020
	Inlet pressure high	A	R	100021
	Inlet communication error with flowlog	B	R	100025
	AIR pressure low	A	R	100030
	AIR pressure high	A	R	100031
	AIR valve not open	A	R	100032
	AIR valve position error	A	R	100034
	AIR communication error with flowlog	B	R	100035
	AIR800 pressure low	A	R	100040
	AIR800 pressure high	A	R	100041
	AIR800 valve not open	A	R	100042
	AIR800 valve position error	A	R	100044
	AIR800 communication error with flowlog	B	R	100045
	Indication valve 1 open top left AIR		R	100050
	Indication valve 2 open top right AIR		R	100051
	Indication valve 3 open lower left AIR		R	100052
	Indication valve 4 open lower right AIR		R	100053
	Indication valve 5 open left AIR800		R	100054
	Indication valve 6 open right AIR800		R	100055
	Gas detector oxygen low level	A	R	100060
	Gas detector oxygen high level	A	R	100061
	Gas detector oxygen needs to be calibrated	B	R	100064
	Gas detector oxygen communication error	B	R	100065
	Gas detector carbon dioxide high level	A	R	100071
	Gas detector carbon dioxide needs to be calibrated	B	R	100074
	Gas detector carbon dioxide communication error	B	R	100075
	Room temperature sensor low temperature	B	R	100080
	Room temperature sensor high temperature	B	R	100081
	Room temperature sensor communication error	B	R	100085
	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

	Information	Scaling	R/W	Typ	Input Registers
Value	Inlet pressure	xx.x bar	R	uint 16	300020
	Inlet current flow	xxxx.x l/min	R	uint 32	300022
	Inlet accumulated flow	xxxxxxxx m ³	R	uint 32	300024
	Inlet accumulated flow decimals	.xxx m ³	R	uint 16	300026
	AIR pressure	xx.x bar	R	uint 16	300030
	AIR current flow	xxxx.x l/min	R	uint 32	300032
	AIR accumulated flow	xxxxxxxx m ³	R	uint 32	300034
	AIR accumulated flow decimals	.xxx m ³	R	uint 16	300036
	AIR800 pressure	xx.x bar	R	uint 16	300040
	AIR800 current flow	xxxx.x l/min	R	uint 32	300042
	AIR800 accumulated flow	xxxxxxxx m ³	R	uint 32	300044
	AIR800 accumulated flow decimals	.xxx m ³	R	uint 16	300046
	Gas detector oxygen	xx.x%	R	uint 16	300060
	Gas detector carbon dioxide	x.xx%	R	uint 16	300070
	Room temperature sensor	xx.x °C	R	int 16	300080

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

	Inlet pressure low	xx.x bar	R	uint 16	300120
	Inlet pressure high	xx.x bar	R	uint 16	300121
	AIR pressure low	xx.x bar	R	uint 16	300130
	AIR pressure high	xx.x bar	R	uint 16	300131
	AIR800 pressure low	xx.x bar	R	uint 16	300140
	AIR800 pressure high	xx.x bar	R	uint 16	300141
	Gas detector oxygen low	xx.x%	R	uint 16	300160
	Gas detector oxygen high	xx.x%	R	uint 16	300161
	Gas detector carbon dioxide high	x.xx %	R	uint 16	300171
	Room temperature sensor low	xx.x °C	R	uint 16	300180
	Room temperature sensor high	xx.x °C	R	uint 16	300181

Recommended polling interval: 0.5 - 1 second.

To read **AIR800 pressure high** use function **Discrete Inputs** tag **00041**

To read **AIR pressure** use function **Input Registers** tag **00030**

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 26 and 27.

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.

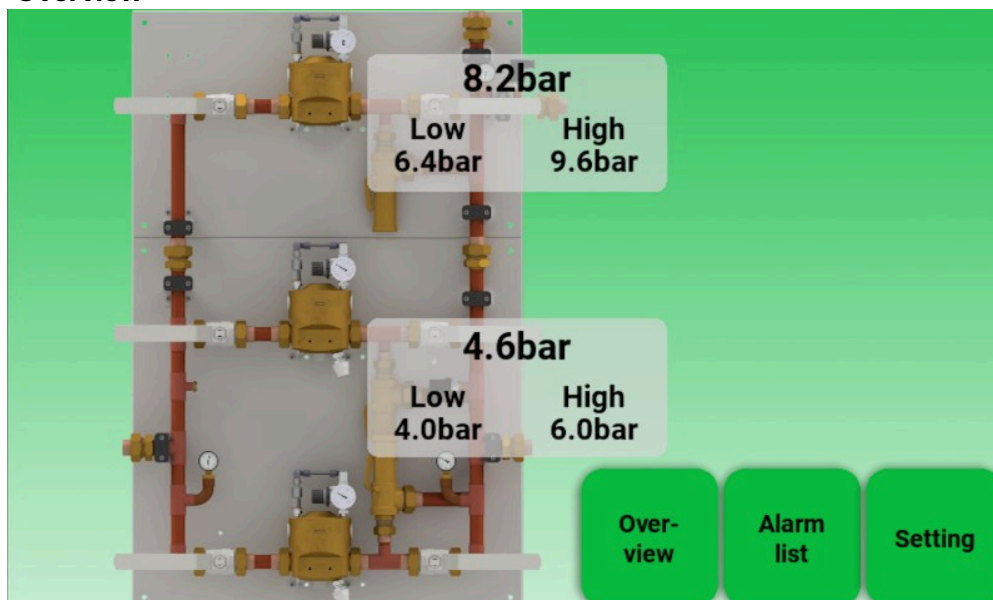
If an alarm occurs, both text and color change automatically to indicate the deviation.

Navigation buttons

- **Overview** shows the regulatorunit that is monitored by the system.
By pressing an Overview, a window opens with an animated view of the regulatorunit, where the pressure status and any alarms from the regulatorunit are displayed.
- **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 Overview or the Alarm list, you can quickly return to the start screen by swiping down on the display.

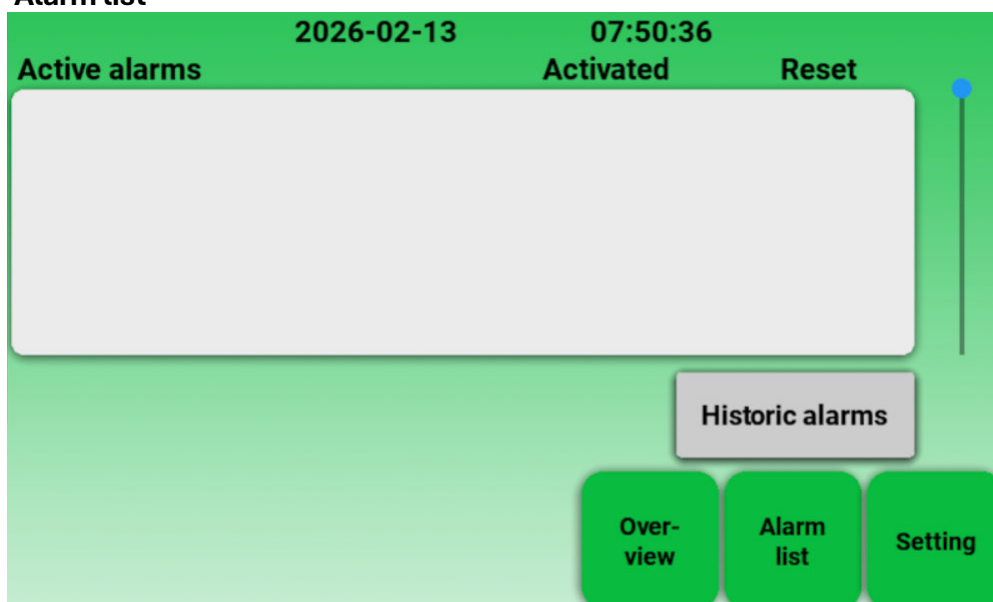
Overview



This view shows the current status of the regulator unit. All gas pressures and other information such as temperature or gas detector value etc. are displayed here – provided that these accessories are connected and monitored by the alarm system. In the event of an alarm, alarm texts are displayed together with the current measurement value directly in the view. If the valves on the regulator unit are monitored with limit switches, the current position of the valves is also shown in the animation.

(If the pressure is not monitored with an analog pressure transmitter but instead with a signal gauge, the alarm cannot read any analog pressure value. Instead, only the message "OK" is displayed on the screen when the pressure is within acceptable limits.)

Alarm list



The alarm list provides an overview of all active alarms.

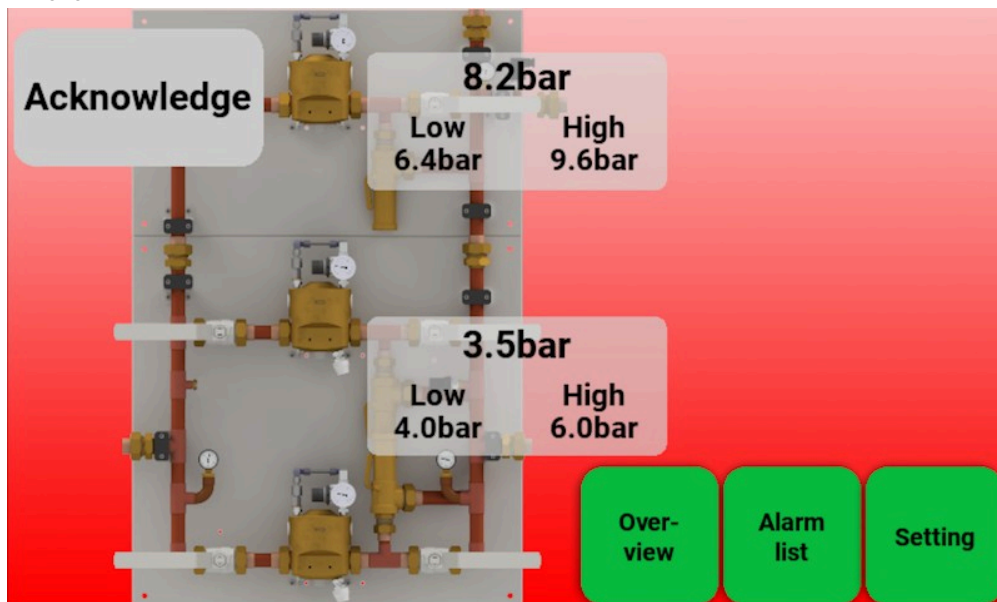
It makes it easy to see which alarms are active, when they occurred, and when they were restored provided the alarm has not been acknowledged.

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.

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In alarm



When an alarm is activated in Masterwatch Ultra, the screen appearance changes to immediately attract the user's attention.

In the case of a B-alarm (less critical), the background color changes to yellow.

In the case of an A-alarm (critical), the background always changes to red, even if a B-alarm is active at the same time.

- In the event of an alarm, the system will display the overview view, where the user gets a clear graphic image of the status of the regulator unit. This remains until the alarm is acknowledged.
- In the view, the pressure value and the alarm text ("Low" or "High") pulsate if there is an incorrect gas pressure.
(If a signal gauge is used, only "Low" or "High" are displayed because no pressure data is available.)
- If there are other types of alarms, these alarm texts will also be displayed and pulsate.

If an alarm is reset before it is acknowledged, the background returns to green, but the alarm sound continues. In this case, the Alarm List is automatically displayed, so the user immediately sees which alarms have been active but not acknowledged.

Acknowledgement

When the user presses "Acknowledge", the alarm sound is silenced.



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.

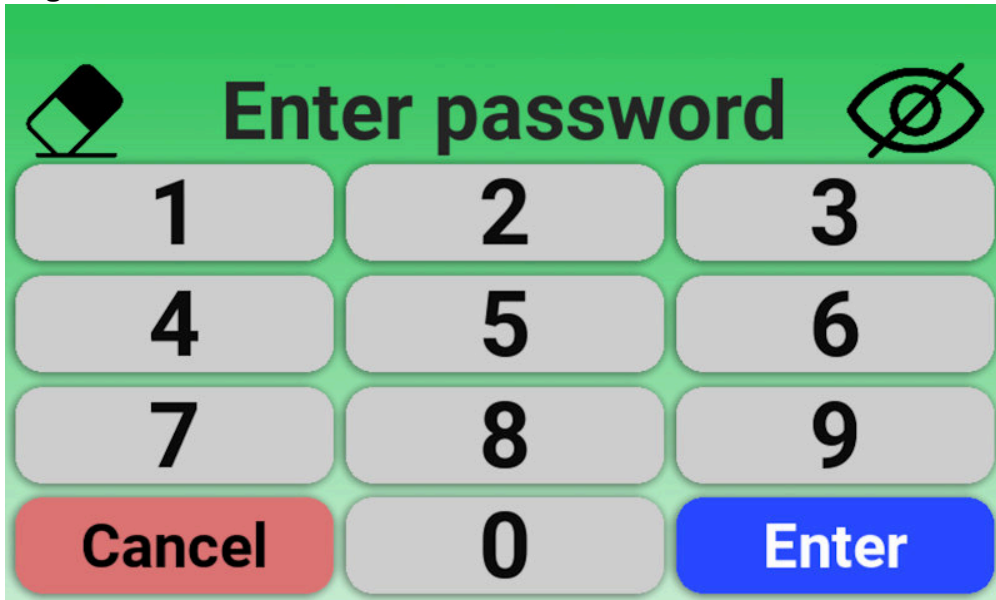
When commissioning lockout is active, the following remain in non-alarm state regardless of pressure:

- 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

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

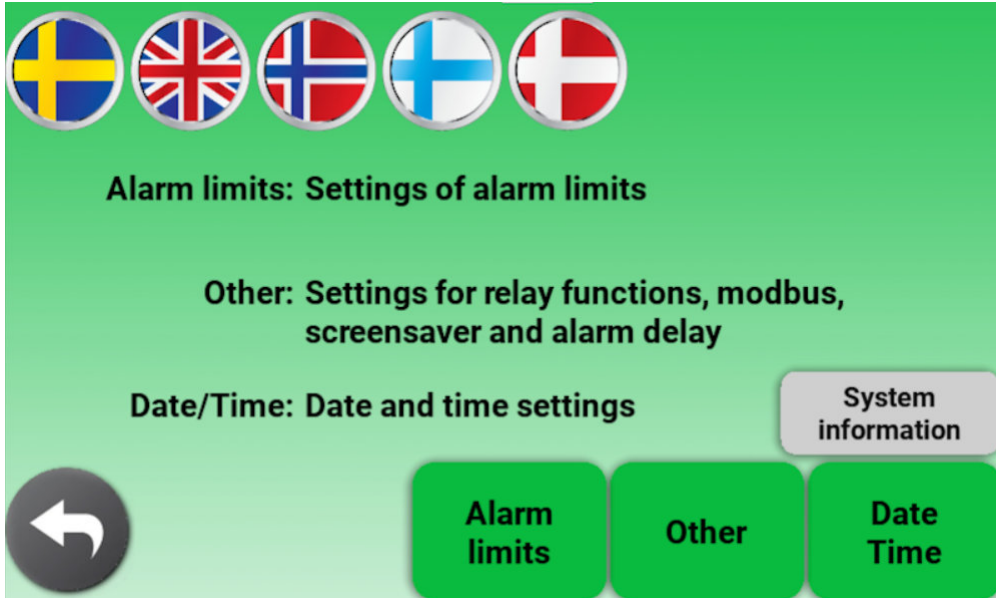
After successful login, the user gets access to Settings.
All changes are automatically logged and cannot be deleted.

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.

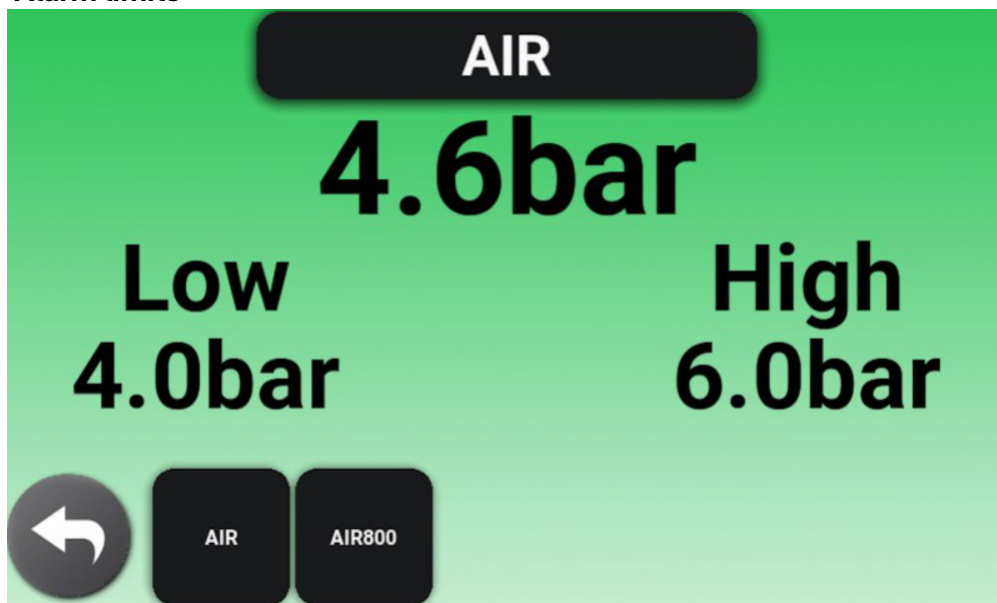
Settings



After login, the main Settings menu is shown.

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

Alarm limits



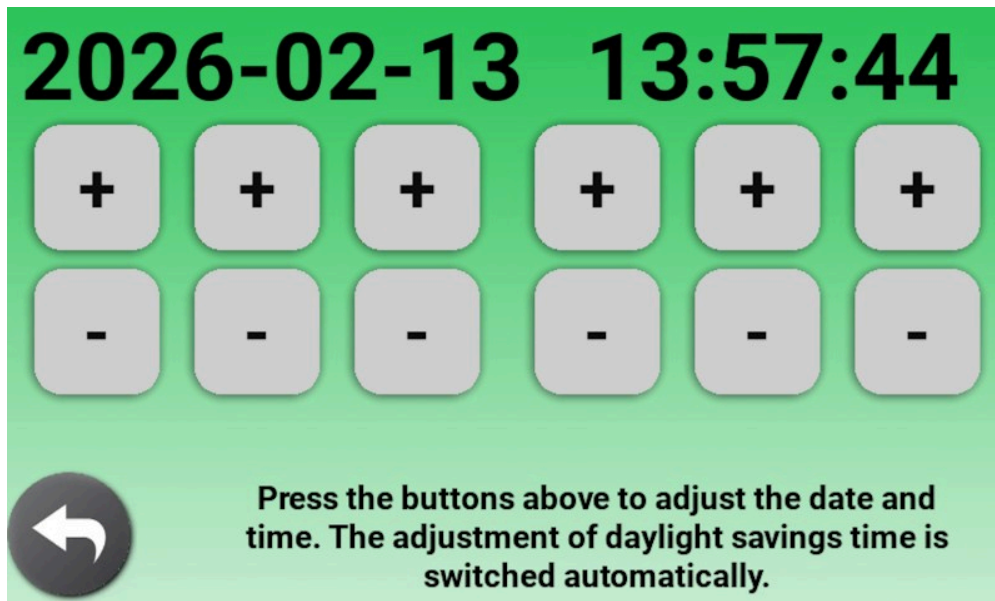
In this menu you can adjust alarm limits for functions and accessories monitored by the system. Here's how:

1. Select the parameter you want to adjust by clicking the buttons at the bottom of the screen.
2. The current measurement value and alarm limits are displayed.
3. Click on the alarm limits on the left and right to edit the respective limit.
4. Enter the new limit value using the numeric keypad that appears.

! Note:

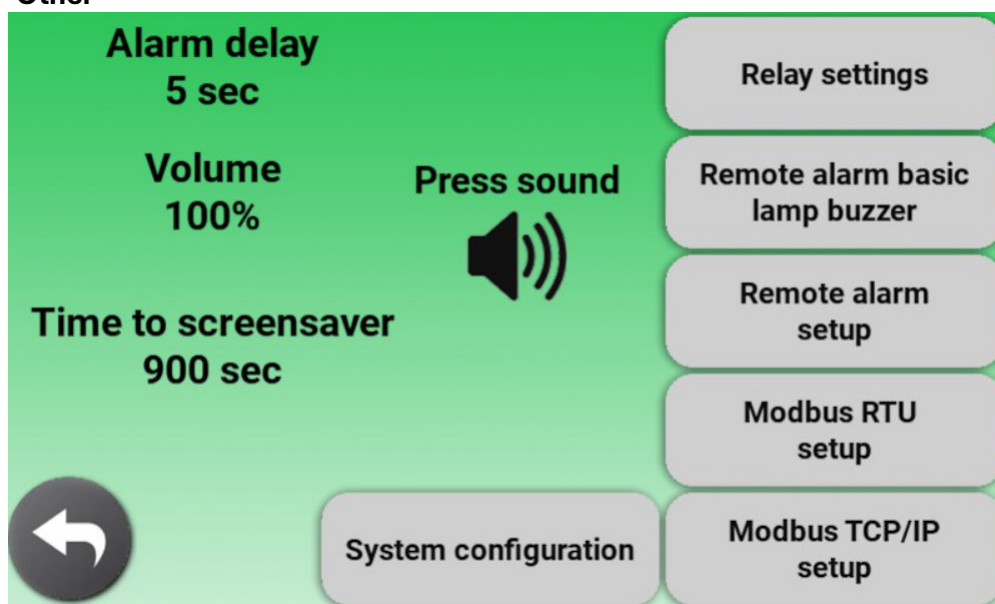
Changes do not take effect immediately. All changes are applied only when leaving Settings and returning to the start screen. While you are in Settings, monitoring is temporarily paused.

Date and time



Adjustment of date and time.

Other

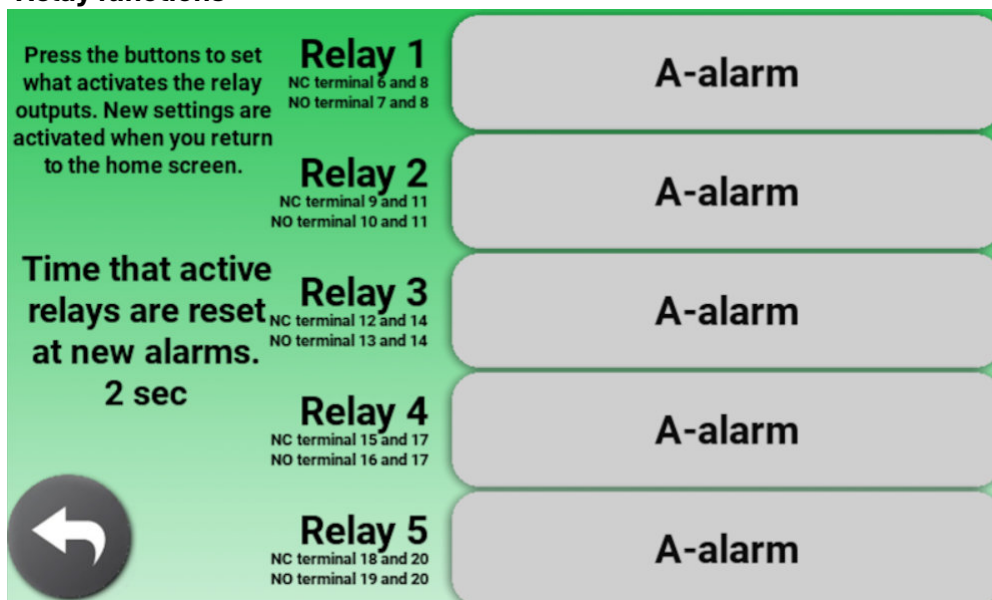


The "Other" menu contains settings related to volume, communication and relay functions.

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

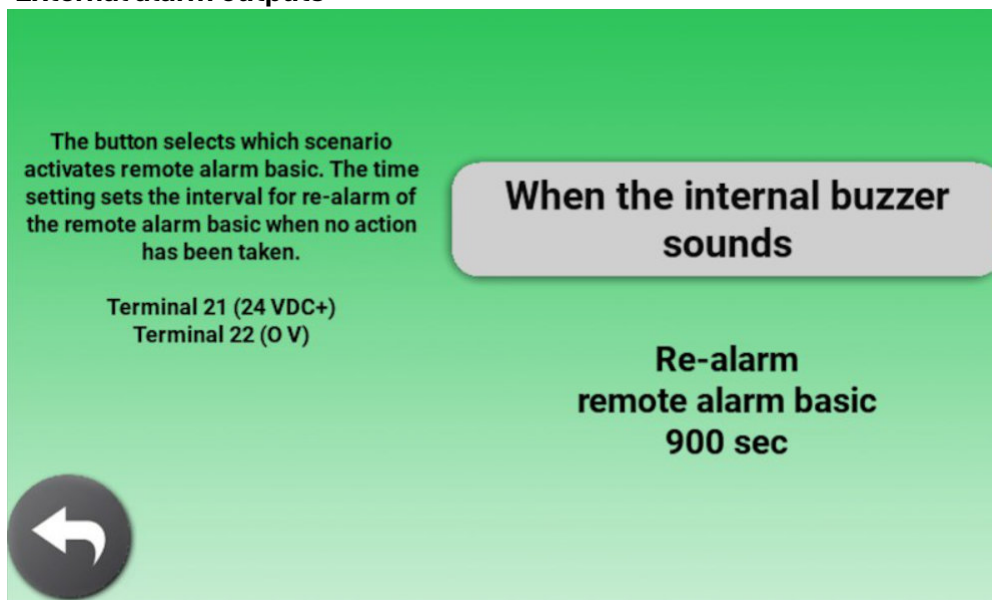


Here you define what activates each relay output. There are five relays, each programmable. How it works:

- 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 outlet 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 UPS alarm.
(Pressure) wrong gas pressure	The relay is activated if incorrect pressure is detected for the selected pressure.
Valve alarm	The relay is activated if a valve alarm is active.
Gas detector oxygen concentration alarm	The relay is activated if the measured oxygen concentration is outside the allowed range.
Gas detector carbon dioxide concentration alarm	The relay is activated if the measured carbon dioxide concentration is outside the permitted range.
Gas detector oxygen or carbon dioxide wrong concentration	The relay is activated if the measured concentration of either oxygen or carbon dioxide is outside the permitted range.
Room temperature sensor alarm	The relay is activated if the measured temperature in the room is outside the allowed range.
Buzzer	The relay is active as long as the internal buzzer in the alarm sounds.

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 outlet 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 empty cylinder.
In case of incorrect gas pressure	The output outputs 24V DC as long as any gas pressure alarms.
In case of valve position error	The output outputs 24V DC as long as the valves on the stabilizer are in an incorrect position. If the position of the valves causes the gas supply to be stopped.
When any gas pressure is wrong in the unit	The output outputs 24V DC as long as any gas pressure in the unit is faulty.
Outlet valve closed	The output outputs 24V DC as long as the outlet valve is closed.
In case of wrong concentration on gas detector(s)	The output outputs 24V DC as long as any gas detector's measured concentration is outside the allowed range.

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

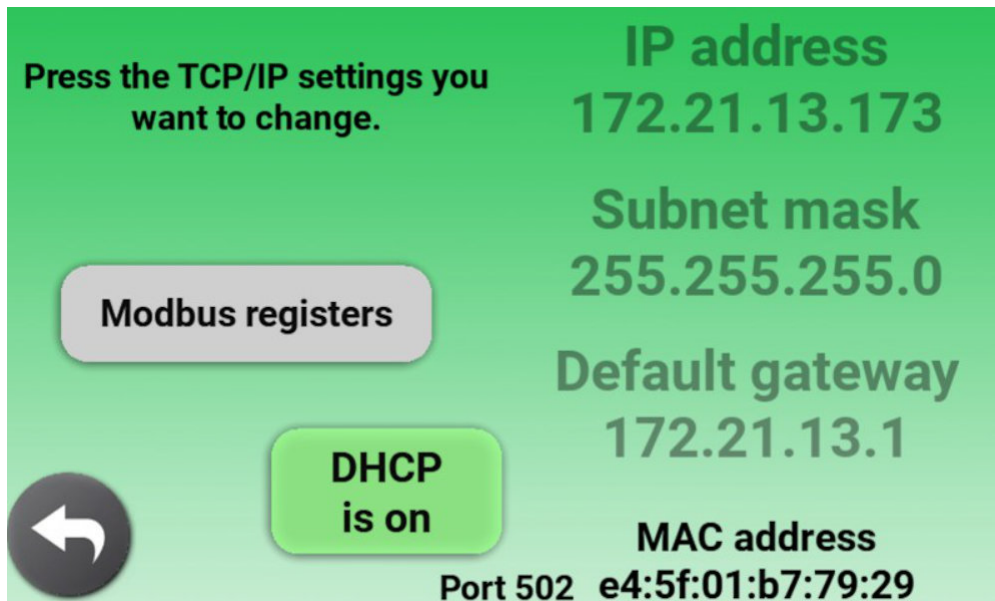
Stop bits
1

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

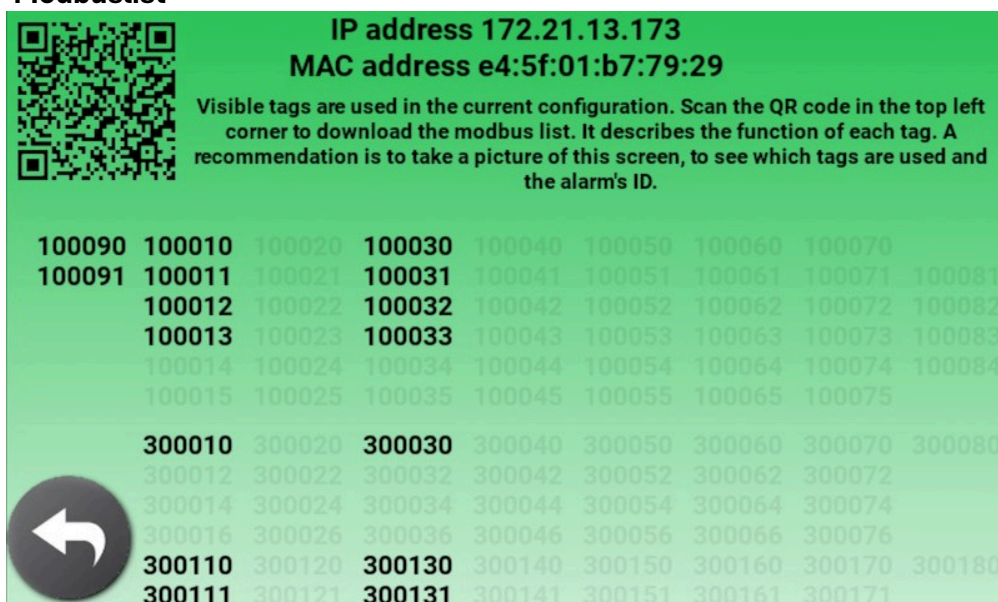


Configure Modbus TCP/IP communication for connection to a DUC or other Ethernet-based monitoring.

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 list" 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 14 and 15)

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 12 Power supply.

Alarms are active on startup

- Check that gas pressure is correct.
- Check that alarm limits are correctly set (page 22).

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 11 and page 13).
- Verify that the correct relay function is selected (page 24).

External alarm output does not work

- Check wiring of the output (page 13).

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:	QMT8ULTRA43
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)



Artikelnummer

- QMT8ULTRA43 – Masterwatch Ultra regulatorunit

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.
- Oxygen gas detector (QMT7221383) - approx. 70 mA
Measures the oxygen concentration in the room.
Communication takes place via Modbus RTU through the alarm's QMT port.
Masterwatch Ultra generates alarms in case of deviating concentrations.
- Carbon dioxide gas detector (QMT7221382) - approx. 70 mA
Measures the CO₂ concentration in the room.
Communication takes place via Modbus RTU through the alarm's QMT port.
Alarm is generated when the concentration is too high.
- Temperature sensor (QMT7GTMUMP1) - approx. 20 mA
Measures the current room temperature.
Communication takes place via Modbus RTU through the alarm's QMT port.
Alarm is given when the temperature is outside the permitted limits.
- Flowmeter (QMTXXXXXXXX) - up to 100 mA
Contact QMT for correct part number based on application.
Measures both current and accumulated gas flow.
The flowmeter is mounted on the outgoing gas line after the switch-over station.
Communication is via Modbus RTU through the alarm's QMT port.

- Limit switch DN 28 - 35 (QMT7251349)
Limit switch for mounting on shut-off valve after the stabilizer. Alarm is generated in Masterwatch Ultra if the valve is not fully open.
- Limit switch DN 42 - 54 (QMT7251350)
Same function as above, but intended for DN 42 - 54 valves.

Regulator unit in sizes DN 28 - 54 can be equipped with limit switches on the device's valves. When these are connected to Masterwatch Ultra, the valve position is shown in the alarm animation and the valve positions can be read via Modbus. If the combined position of the valves completely stops the gas supply, a valve position alarm is generated.

- 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.
The remote alarm basic is not IP65 rated and is therefore not intended for installation in a gas control panel.
- 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.
The remote alarm basic is not IP65 rated and is therefore not intended for installation in a gas control panel.
- 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: QMT8ULTRA43

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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