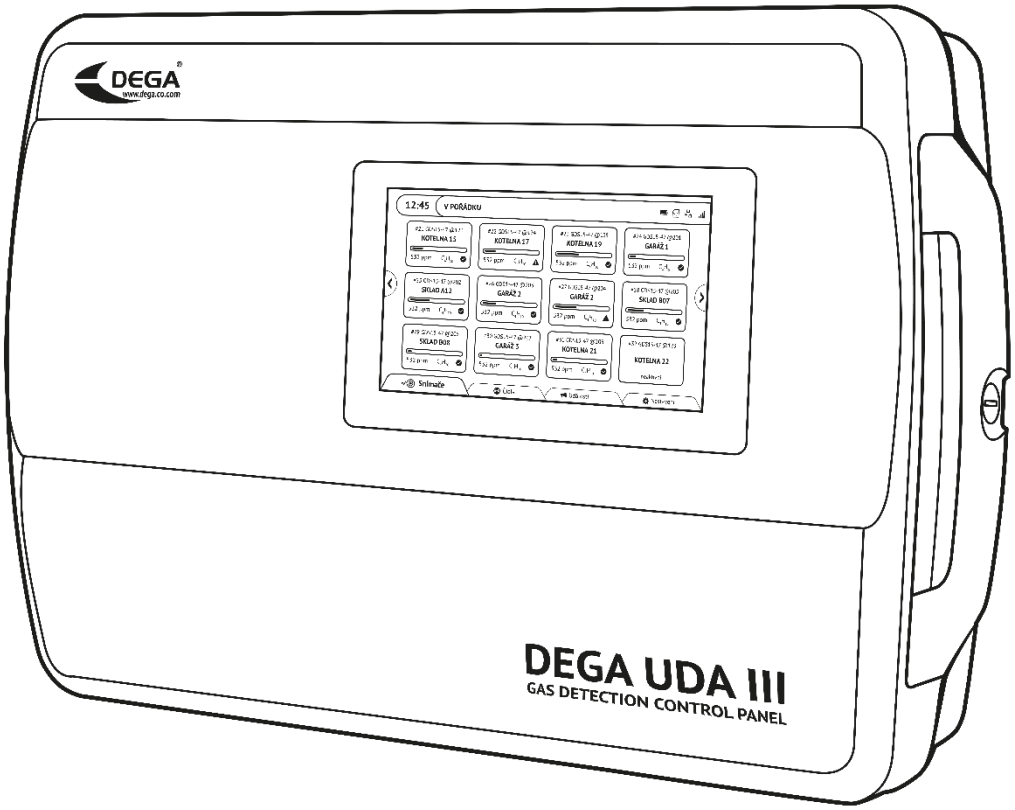
User manual

Gas detection control panel

DEGA UDA III



Company DEGA CZ s.r.o. reserves the right to change the specifications of the hardware and software described in this manual at any time without notice.

Company DEGA CZ s.r.o. shall not be liable for damages resulting from the use of the device.

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1 For your safety

Beware of static electricity

Electronic components are sensitive to static electricity. Do not touch them directly - the risk of damage!

The device is intended for installation by a trained person

The product is intended for installation by a certified technician only. The manufacturer is not liable for damages caused by incorrect or unprofessional handling.

In the event of a fault, disconnect the device from the power supply immediately

If you notice an unusual odor or smoke coming from the product, disconnect it from the power supply, backup battery, and all additional devices. Further operation may result in personal injury or property damage. After disconnection, have the device inspected by an authorized service center or the manufacturer.

Do not disassemble the product and avoid contact of water with internal components

Contact with internal product components may result in electric shock. In the event of a fault, have the product repaired exclusively by a certified service center. Contact of internal components with water can cause a short circuit in the device and consequently its damage, property damage or personal injury.

Use suitable cable types

To ensure compliance with product specifications, use only the recommended cables described in this manual to connect the product to other equipment or power.

Dispose of the product in an environmentally friendly manner

Dispose of the product in accordance with the applicable environmental protection legislation or send it to the manufacturer for disposal

2 Technical details

2.1 Control panel

Power voltage:	230 V AC / max 150 W 24 V DC / 6.3 A nominal, functional range 20-28 V
Transmitter connection cable:	
via HART (4-20 mA) (only with DEGA UDA III AI8 card)	shielded cable 3 x 1 mm (max. 1200 m) or 3 x 1.5 mm (max. 2400 m)
via RS485:	shielded cable 4 x 0.8 mm (max. 1200 m) shielded cable 4 x 1.5 mm (max. 1200 m)
Sensor connection cable:	
DEGA Tc II temperature sensor:	shielded cable 3 x 0.25 mm (max. 100 m)
Flood sensor DEGA Zc II:	shielded cable 4 x 0.25 mm (max. 100 m)
Cable for signaling and button connection	2 x 1 mm
Output:	20x switching relay 250 V/10 A 2x output for sound and optical signaling (max. 24V/5A) LTE modem - sending SMS messages - transfer of measured data to the cloud Ethernet - sending emails (in development) - transfer of measured data to DegaVisioIII RS485_HOST - MODBUS for control system RS485_HOST - DEGA protocol USB - for configuration of the control panel via PC
RS485 communication speed:	9.6 kB
Functional safety EN61508:	SIL 1
Dimensions without bushings:	460x320x120 mm (WxHxD)
Dimensions of box:	462x321x122 mm (WxHxD)
Weight:	4.5 kg
Internal memory capacity:	300 days at a recording interval of 30 s
Memory storage interval:	30 s (adjustable range 30-255 s)
Maximum number of transmitters:	200
Digital lines:	8
Topology of connected transmitters:	Bus (BUS) - 8 independent buses Circular (LOOP) - 4 independent circuits
Maximum number of transmitters on the bus:	32
Maximum cross-section of wires to the terminal board:	2.5 mm^2
Other inputs:	DEGA Tc II (critical temperature sensor) DEGA TL II (acoustic signaling release button) 2x digital input for general use
Logic levels of digital input:	0-1V - log 0 2-28V - log 1

Boxing material:	ABS + 20% glass, V-0
Wiring security:	lockable box
Ambient temperature:	-20 to +75 °C
Relative humidity:	20-90% RH
Degree of protection by cover:	IP 54
Working environment:	BE1 - non-explosive environment
Maximum size of modules on DIN rail:	290 x 100 x 90 (HxWxD)

2.2 Extension modules

2.2.1 DEGA UDA RE16

Expansion card with 16 relays.

Consumption:	260 mA
Output:	16x switching relay 250 V/10 A
Maximum conductor cross section:	2.5 mm^2
Dimensions:	145 mm x 90 mm x 33 mm (WxHxD)
Ambient temperature:	-20 to +75 °C
Relative humidity:	20-90% RH
Degree of protection by cover:	IP 20
Working environment:	BE1 - non-explosive environment
Connecting cable:	RJ45 - UTP cat5e
Maximum bus length:	10 m
Maximum number of cards:	20
Address range:	201-220

2.2.2 DEGA UDA III AI8

Expansion card with 8 analog 4-20 mA inputs with HART support.

Consumption:	40 mA
Input:	8x 4-20 mA with HART support
Maximum transmitter distance:	1200 m
Recommended cabling:	shielded cable 3 x 0.8 mm^2 or 3 x 1 mm2
Maximum conductor cross section:	2.5 mm^2
Dimensions:	145 mm x 90 mm x 33 mm (WxHxD)
Ambient temperature:	-20 to +75 °C
Relative humidity:	20-90% RH
Degree of protection by cover:	IP 20
Working environment:	BE1 - non-explosive environment
Connecting cable:	RJ45 - UTP cat5e
Maximum bus length:	10 m
Maximum number of cards:	25
Address range:	201-253

3 Product description

The gas detection control panel is suitable for applications that place increased demands on the complexity of the system. Up to 100/200 transmitters of toxic and explosive gases can be connected to the control panel using 8 independent digital buses (BUS). If higher system reliability is required, these buses can be combined and connected in a ring topology (LOOP).
The control panel has 20 output programmable relays. Each of these relays can be freely selected to 4 levels of detection, PEL and fault from each transmitter.
The control panel has an integrated DIN rail inside the box with the possibility of adding other components such as relays, auxiliary sources, etc.
If analog transmitters are required, they can be connected via a 4-20mA analog input card with HART support and a card with output relays.
The control panel has an optional LTE modem with connection to the DegaCloud service for remote management and visualization via the internet.
The graphic display allows clear visualization of the detection status, viewing the alarm history, and also the complete settings of the control panel without the need to use a PC.

3.1.1 DEGA UDA III 100/200

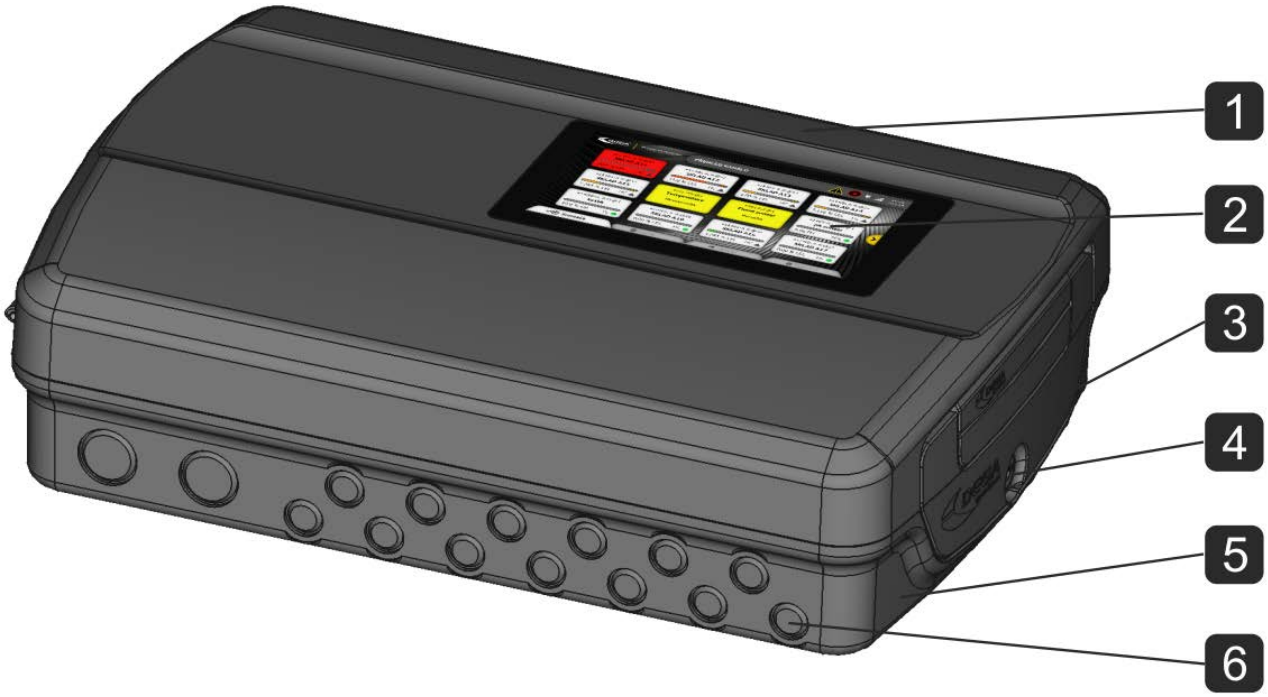


Figure 1 Exterior view

1	Cover
2	LCD TFT display
3	Slits for bushings
4	Sound alarm output
5	Relay terminal block RE6-RE10
6	RS485 for the superior system

3.1.2 DEGA UDA III 100/200, PCB (I/O card)

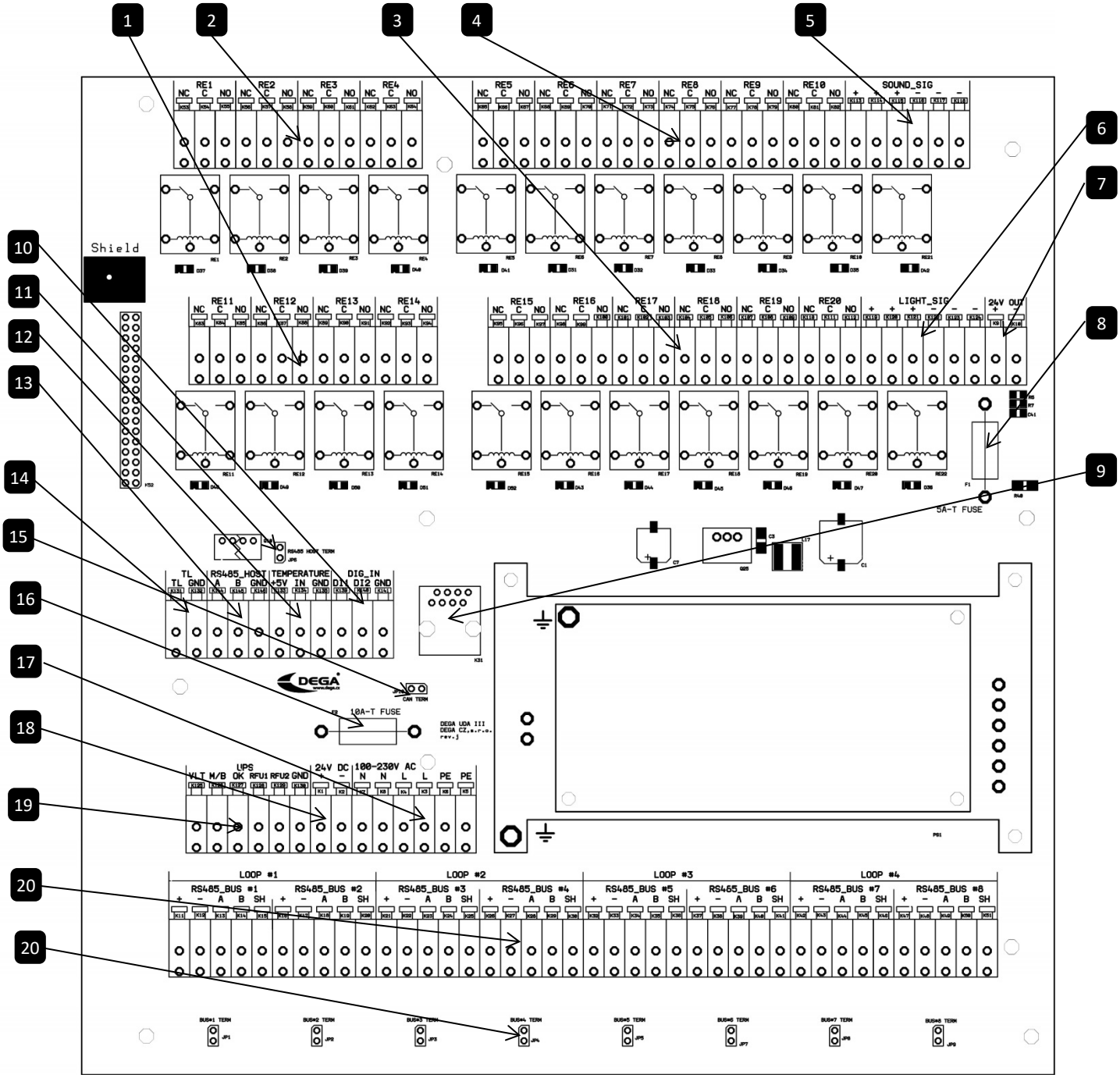


Figure 2 I/O card

1	Relays 11-13	2	Relays 1-4	3	Relay 15-20
4	Relay 5-10	5	Output for sound signaling	6	Output for light signaling
7	Output 24V DC 5A max	8	Fuse 5A-T output for sound and acoustic signaling	9	Bus connector for DEGA UDA III RE16 expansion cards a DEGA UDA III AI8
10	Auxiliary digital input	11	Bus termination resistor for DEGA UDA III RE15 expansion cards a DEGA UDA III I16	12	DEGA Tc II temperature sensor input
13	RS485 for control system (PLC, BMS, PC)	14	Sound lock button input	15	RS485 termination resistor for control system (PLC, BMS, PC)
16	Fuse 6.3A-T 24V power input	17	Power supply 100-230V AC	18	Power supply 24V DC 6.3A max
19	UPS terminal blocks	20	8x BUS RS485 for connecting transmitters	21	8x terminating resistor BUS RS485 for connecting transmitters

3.1.3 Processor card

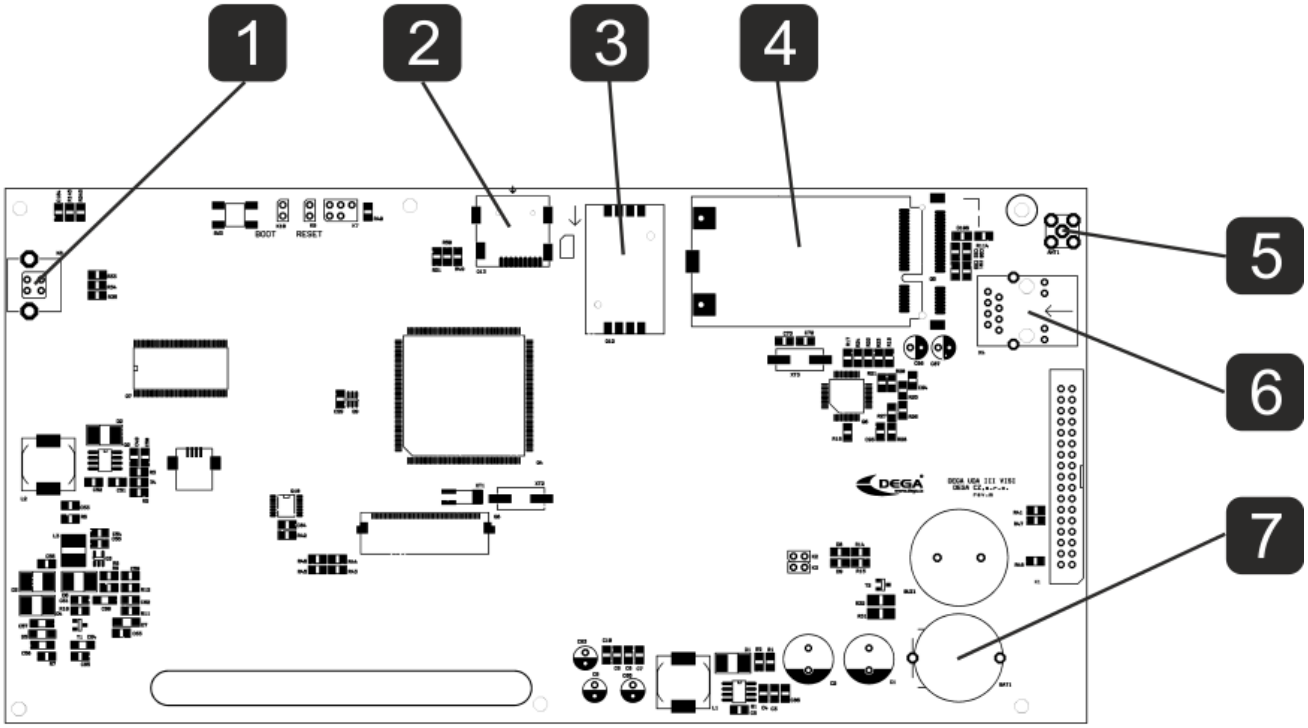


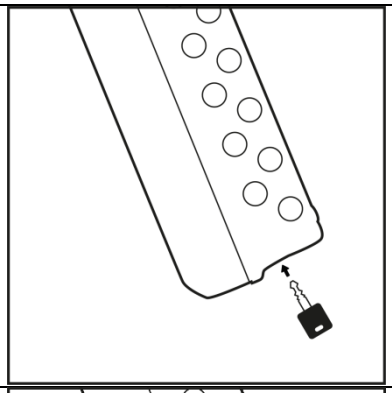
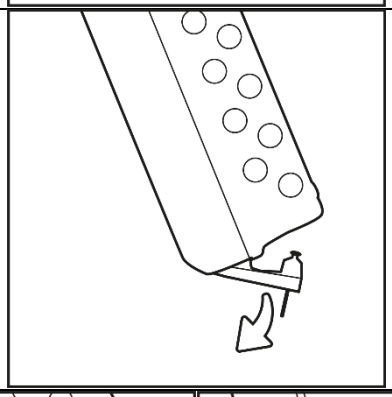
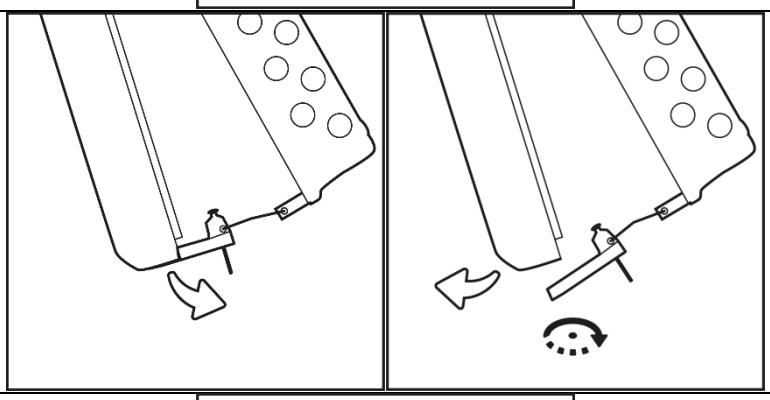
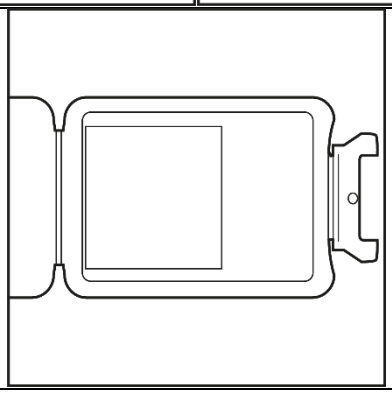
Figure 3 Processor card

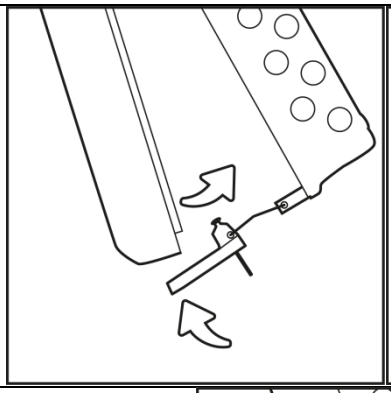
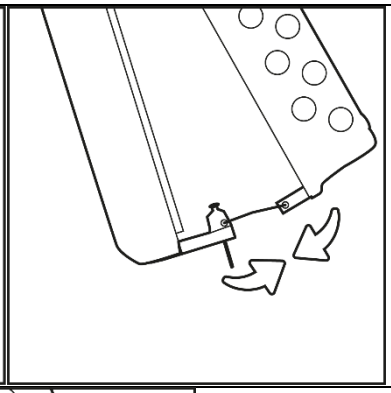
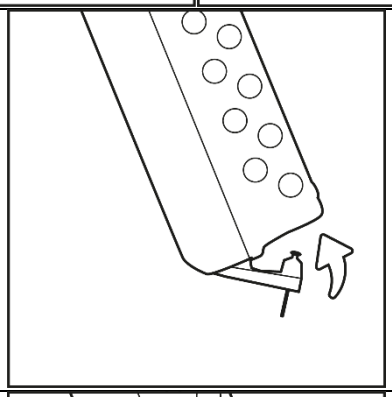
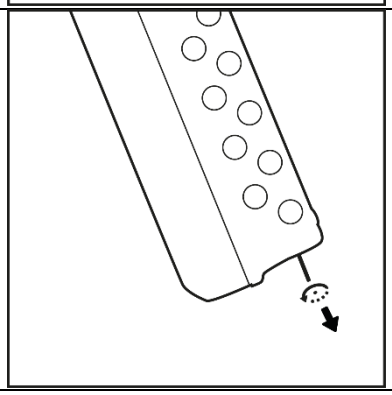
1	USB connector
2	uSD card
3	SIM card
4	LTE modem
5	SMA antenna LTE modem
6	RJ45 - ethernet
7	Battery 2032

4 Construction

Prior to mounting, read the valid installation standards ČSN EN 60079-29-2 (Selection, installation, use and maintenance of flammable gas and oxygen detectors) and ČSN EN 45544-4 (Instructions for selection, installation, use and maintenance of toxic substance detectors).
In explosive areas, the electrical installation must be carried out in accordance with the ČSN EN 60079-14 standard (electrical installation in hazardous areas).

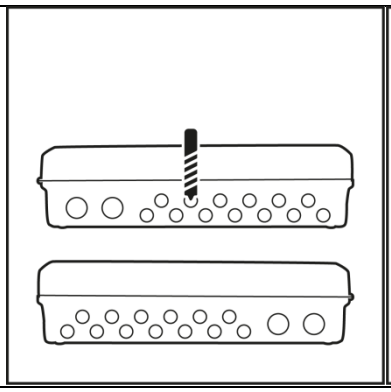
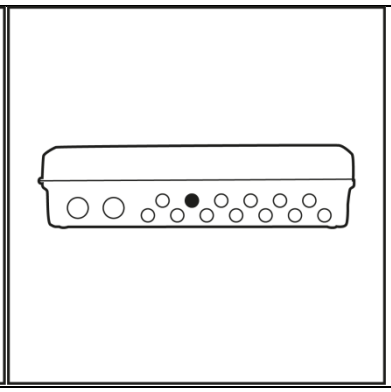
4.1 Control panel assembly

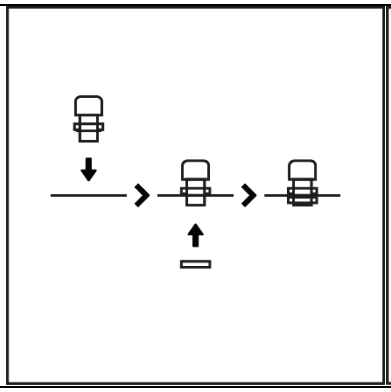
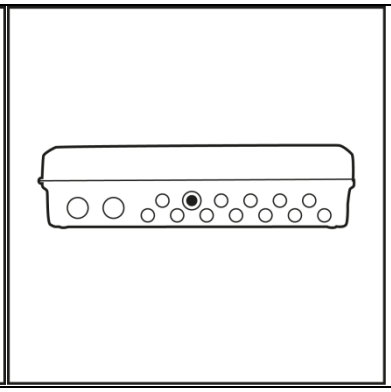
	Insert the key and turn it
	Pull the handle and the box opens slightly
	Disconnect the handle from the lid and open the lid fully
	View of the control panel

 	Put the handle on the lid
	Press the handle to close the lid
	Secure with a key

4.2 Drilling holes for bushings

There are 28 holes for the PG11 bushing and 4 holes for the PG21 bushing in the control panel box. Take extra care when drilling holes to avoid damaging the internal electronics.

 	Drill the required number of holes with a drill with the required diameter according to the bushings used. When drilling, pay attention to damage to the electronics.

			Install bushings

Note: The bushings must be carefully tightened after cable installation. This is the only way to ensure IP protection according to these instructions.

4.3 Selection of supply voltage and maximum current load

4.3.1 Supply voltage 100-230V AC

The maximum current load of the control panel is 6300 mA (maximum source load). This current is used to power the connected transmitters and the optical and sound signals, which are connected to the "LIGHT_SIG" and "SOUND_SIG" terminals. The maximum load of these terminals is 5 A. The outputs are protected by a 5A-T tubular fuse.

Example: we have connected 20 transmitters with a consumption of 60 mA, for powering optical and sound signaling we have 5100 mA (I = 6300-20x60)

4.3.2 Supply voltage 24V DC

Consumption of control panel electronics is 300 mA. The maximum current at the "+24V DC" terminals is 6300 mA, which are protected by a 6.3A-T tubular fuse. The maximum load of the control panel is calculated as in the previous case

Information on the consumption of individual transmitters and components of optical and sound signaling is provided in the relevant manuals.

Warning: Never connect 24V and 230V power supply at the same time.

4.4 Uninterruptible power supply UPS

In this case, the control panel is powered by 24V from a backup source. Connect the control signals from the backup source according to Figure 4 Connection of backup power supply and control panel. Dimension the wires according to the current consumption of the control panel. See 7.3.2 Supply voltage 24V DC.

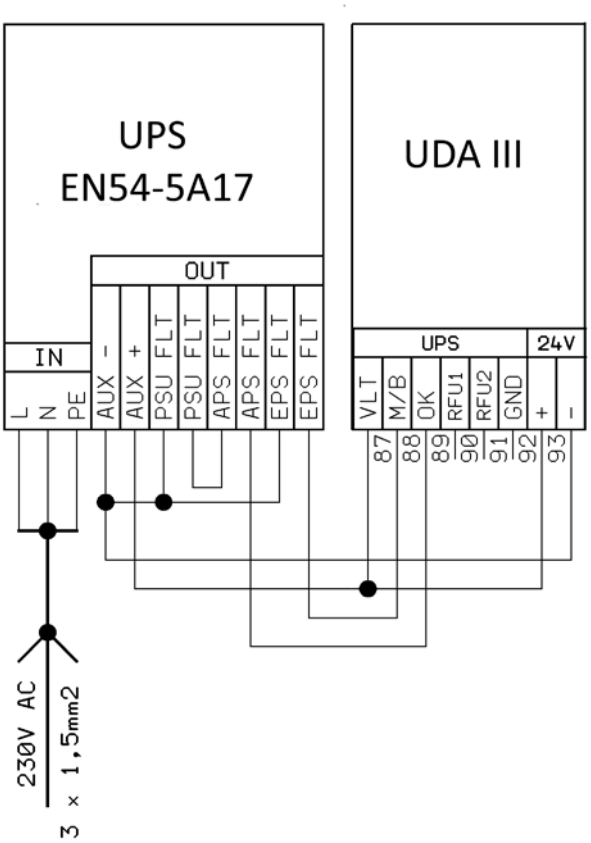


Figure 4 Connection of backup power supply and control panel

4.5 Connection of transmitters via RS485 bus

The transmitters can be connected to the control panel via a digital RS485 bus. The control panel has 8 independent RS485 lines. All transmitters can be connected to one line, but it is recommended to balance the transmitters on multiple lines due to power loss on the wires.
It is possible to use two ways of connection:

1) Bus topology (BUS) - transmitters are connected to the bus, which is connected to one line on the control panel. Up to 8 independent buses can be created. The control panel can be connected anywhere on the bus. If the cable is interrupted, communication with all transmitters located behind this interruption will be lost.

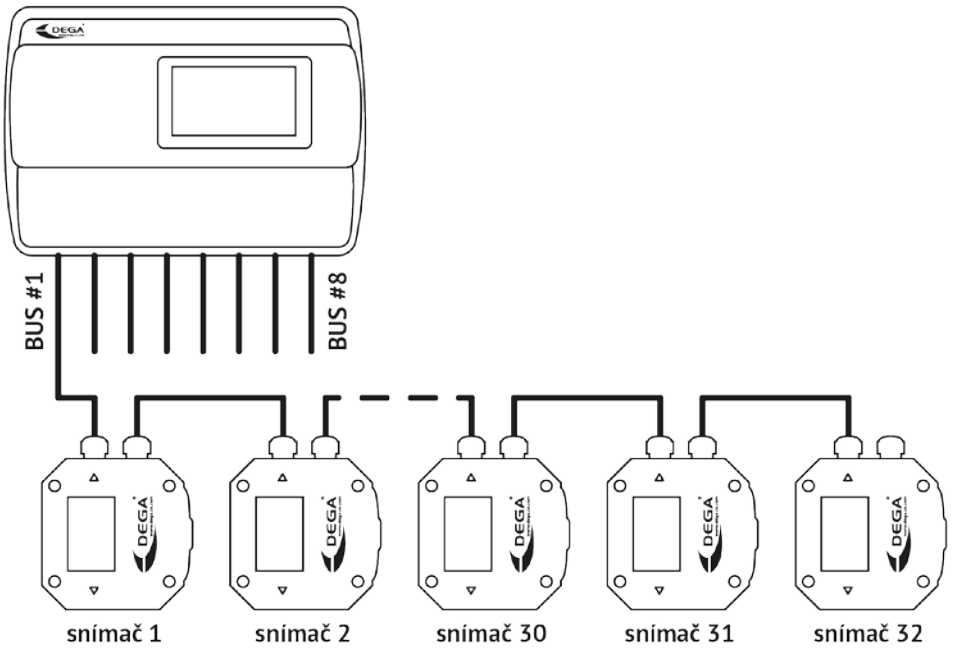


Figure 5 Bus topology

2) Circular topology (LOOP) - the beginning of the bus is on the control panel (BUS0 or BUS2) and the connected transmitters follow. The bus termination is again on the control panel in BUS1 or BUS2). Therefore, 2 independent circuits (BUS0-BUS1 and BUS2-BUS3) are used. The advantage of this solution is that in the event of a cable break in one place, there will be no loss of communication with any transmitter.

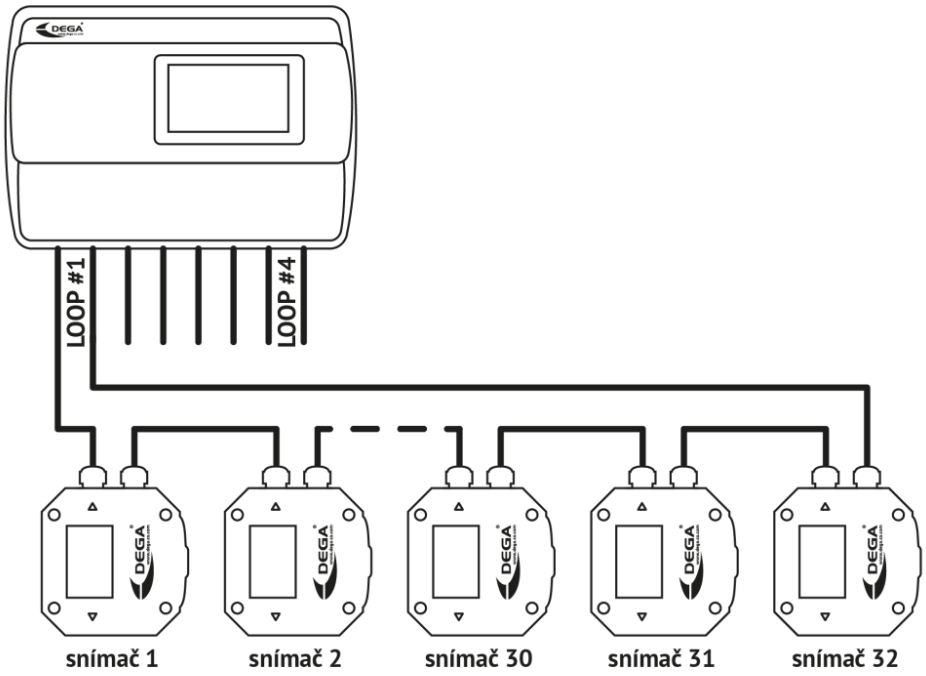


Figure 6 Circular topology

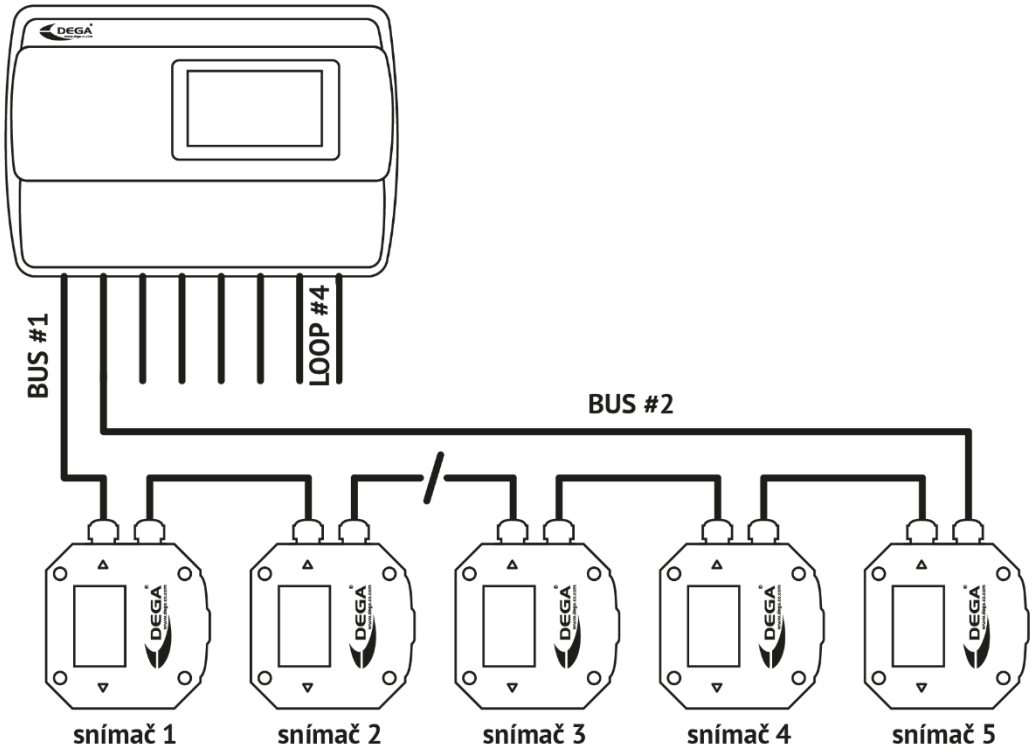


Figure 7 Cable break between transmitter 2 and 3. Communication has broken down into 2 independent BUSes. No communication was lost.

4.5.1 Cabling installation for RS485

The cabling must be suitably dimensioned to prevent excessive voltage drops on the bus. It is recommended that for 32 transmitters on the bus/ring, the maximum distance between the control panel and the last transmitter is 500 m. For 16 transmitters, this length is then doubled.
In the Czech Republic, the control panel is approved for use only with Prakab PraFlaGuard 2x2x0.8 cables. In other countries, any cables of a similar type can be used.

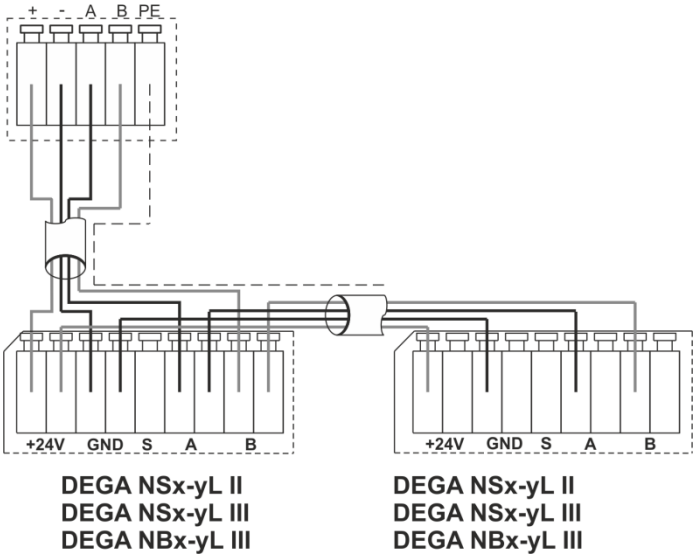
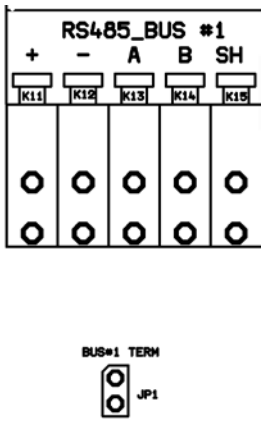


Figure 8 Connection of RS485 terminals

4.5.2 Termination resistor



According to the RS485 specification, the last device on the bus must be terminated with a 120R terminating resistor. If the control panel is the last element of the bus, install a jumper on both pins. There is a separate termination resistor for each bus, which is located below the terminal block of the respective bus.

Figure 9 Termination resistor

4.6 Connection of transmitters using 4-20 mA

If it is required to connect transmitters to the control panel using 4-20 mA, it is necessary to use DEGA UDA AI8 expansion modules. Up to 8 transmitters can be connected to each module. The maximum number of modules is 25 pcs.

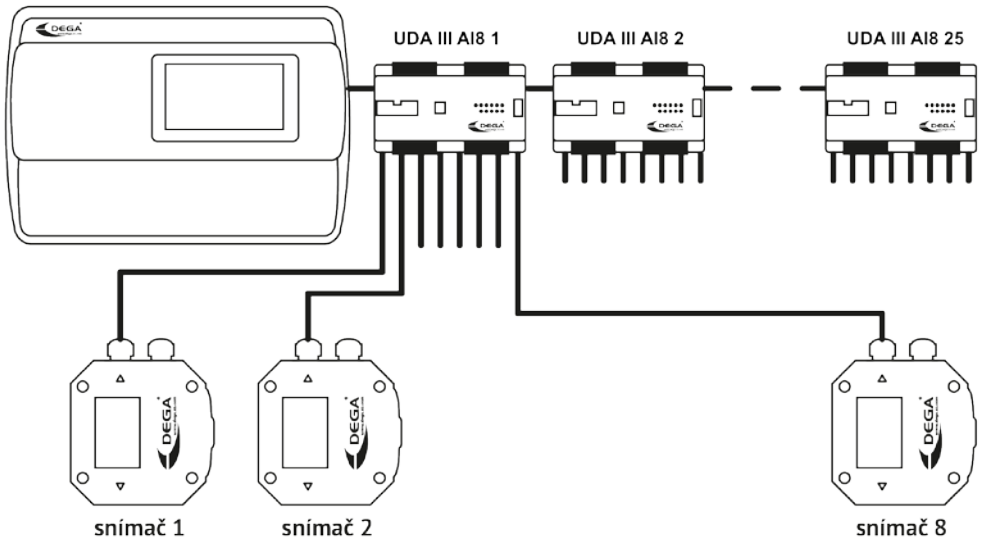


Figure 10 Connection of transmitters using 4-20 mA

4.7 Connection of optical and sound signaling

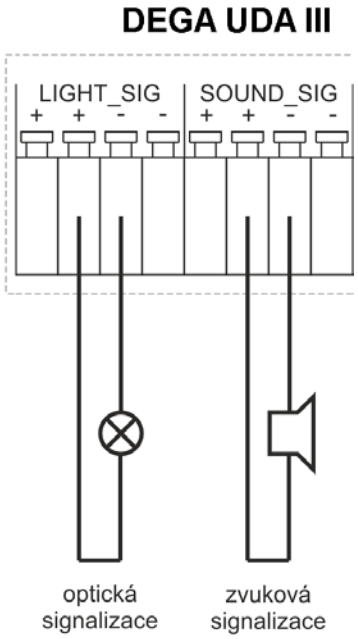


Figure 11 Signaling connection

Note: The outputs are protected by a 5A-T tubular fuse.

4.8 Output relay

Each relay can be configured to activate the following arbitrary number and combination of events:
4 levels of gas leak alarm, PEL, STEL, transmitter failure, and control panel signal states.
After activation, the relay can have the following output functions configured: idle on, idle on, cycling on/off, automatic deactivation of outputs after a certain time, or after pressing a button.

The specific configuration of the relay can be found in the configuration protocol supplied with the control panel.

4.9 RS485 Host connection

This interface is used to transfer process data using the MODBUS protocol. It must be enabled in the settings menu. See chapter 9.11.1. The interface is galvanically separated from the rest of the control panel and should be connected to the superior system in 3 wires using data signals A and B and a common GND wire.
If the control panel is the last element on the bus, it should be terminated with a termination resistor - shorted jumper JP6.

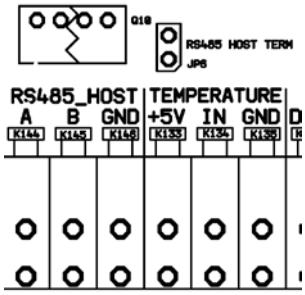


Figure 12 Termination resistor RS485_HOST

4.10 Connection of temperature sensor and sound stop button

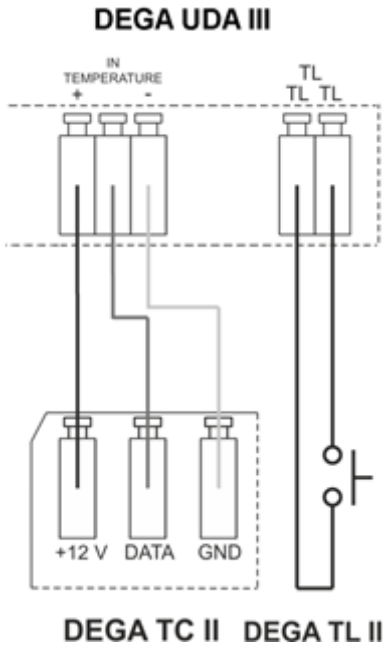


Figure 13 Connecting accessories

4.11 Digital inputs

The control panel is equipped with a pair of digital inputs for general use, such as a flood sensor, smoke detection transmitter, etc.

The logical levels are as follows:

0-1V	1-2V	2-28V
Log 0	undefined	Log 1

Table 1 Voltage levels of digital inputs

4.11.1 Input connection

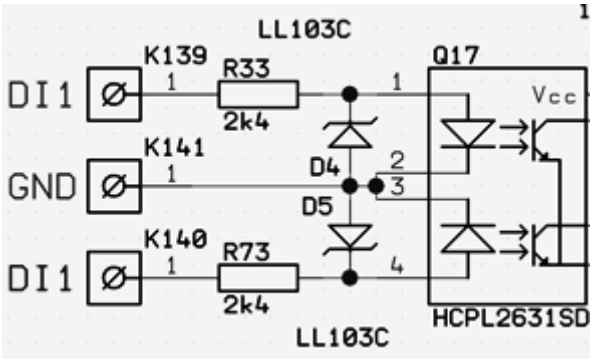


Figure 14 Connection of digital inputs

4.12 Installation DIN rail

Any components with a maximum power loss of 50 W can be mounted on the DIN rail.

4.13 LTE modem

The LTE modem is connected to the marked terminal board, or it is already installed from the factory.
Connect the GSM antenna to the SMA connector and take it out of the box as shown.

4.14 Ethernet

Connect the Ethernet cable to the processor card and secure it with hooks as shown.

4.15 Sample cabling connection

In this chapter, we will show a sample connection of the control panel

1) 2 transmitters are connected in redundant mode - circle topology on LOOP #1 loop - RS485_BUS #1 and RS485_BUS #2 lines. In the event of a wiring failure at any point in this loop, communication with any transmitter will not be lost
2) 3 transmitters are connected in bus mode on the RS485_BUS #3 line. If the cable is interrupted, the transmitters will stop working after this interruption
3) 1 shut-down button connected to TL terminals
4) The control panel is powered by 24V from the backup UPS and is connected to the control signals of the control panel
5) The sound signal is connected to the sound_sig output
6) Optical signaling (non-ATEX) is connected to the light_sig input
7) Optical signaling DEGA MR-EX II (ATEX - ia safety) is connected via a zener barrier to relay 20 and powered from 24V OUT output
8) RE1 controls the actuator - at rest, the contacts are open. They close at a defined event (alarm, fault, etc.)
9) RE2 controls the actuator - at rest, the contacts are closed. They open at a defined event (alarm, fault, etc.)
10) Data transfer to the visualization is ensured by RS485_HOST

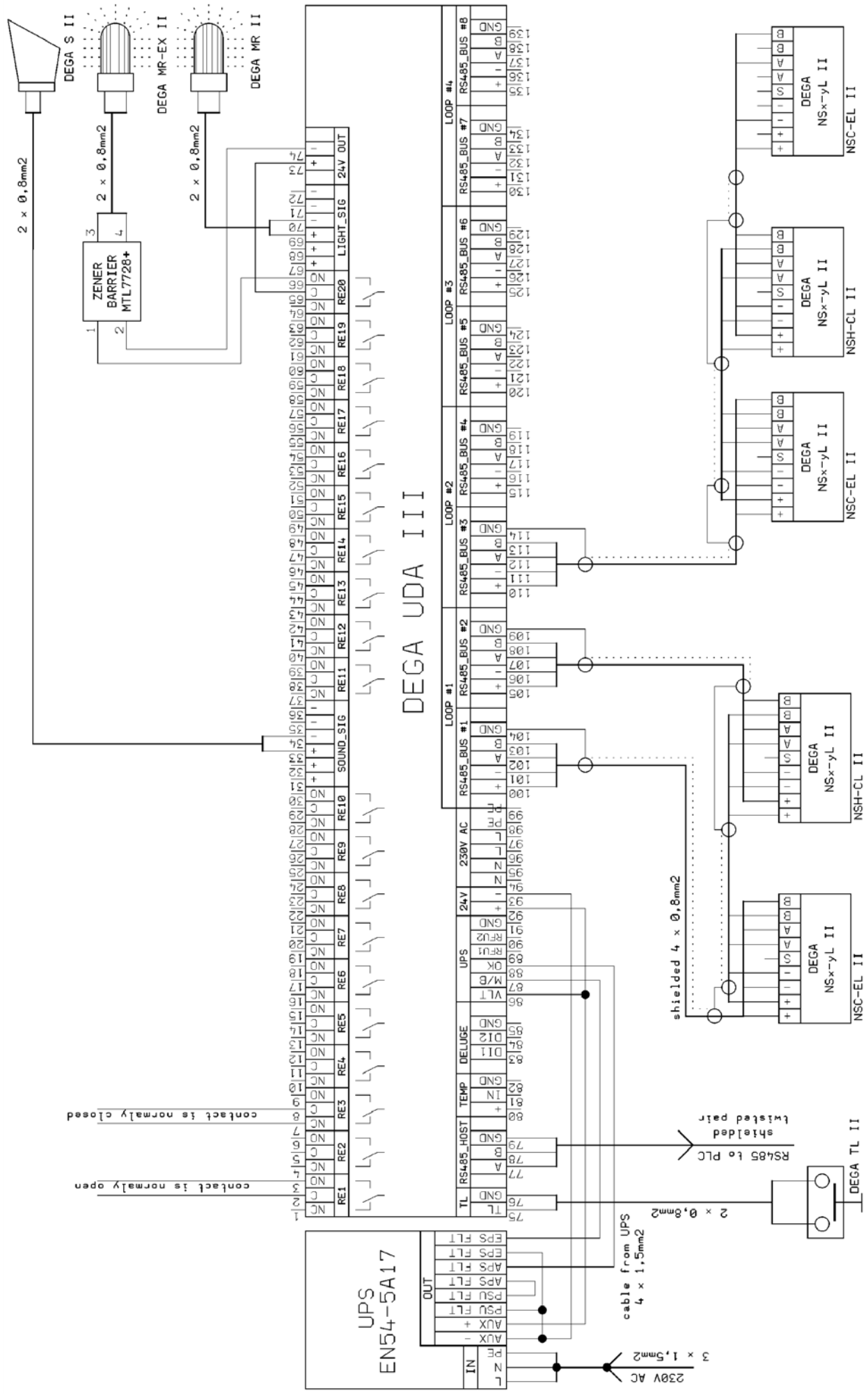


Figure 15 Sample connection of the control panel

5 Expansion cards

5.1 Connectable peripherals

It is possible to connect expansion peripherals to the control panel to increase the possibilities of the control panel. They include:

DEGA UDA III AI8 - expansion board for 8 transmitters with 4-20 mA current loop with HART support
DEGA UDA III RE16 - expansion board with 16 relays.

These peripherals can be connected to the internal DIN rail in the control panel box in a maximum number of 2 pieces, or they can be installed in an external box. The length of the cabling should not exceed 10 m.

Connection to the control panel using a non-crossed UTP cable cat5e to the CAN connector.
The end elements of the network must be terminated with a termination jumper.

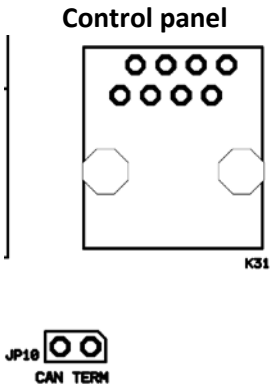


Figure 16 CAN termination jumper - expansion cards on the control panel are located near the CAN connector

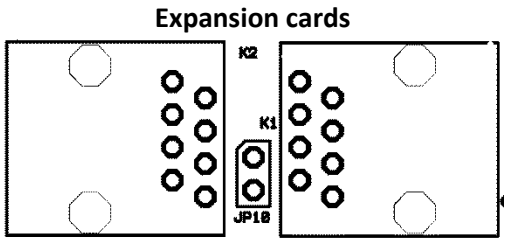


Figure 17 CAN termination jumper on the expansion cards is located between the CAN connectors

5.1.1 DEGA UDA III RE16

Expansion card with 16 additional relays. Each relay can be configured to activate the following combination of events from up to a maximum of 32 transmitters:
4 levels of gas leak alarm, PEL, STEL, transmitter failure, and control panel signal states.
After activation, the relay can have the following output functions configured: idle on, idle on, cycling on/off, automatic deactivation of outputs after a certain time, or after pressing a button.

The maximum number of cards that are simultaneously connected to the control panel is 20 pcs and they can be operated in the address range 201-220. Each card (UDA III RE16 and UDA III AI8) on the CAN bus must have a unique address set.

address	1	2	3	4	5	6
201	ON	OFF	OFF	ON	OFF	OFF
202	OFF	ON	OFF	ON	OFF	OFF
203	ON	ON	OFF	ON	OFF	OFF
204	OFF	OFF	ON	ON	OFF	OFF
205	ON	OFF	ON	ON	OFF	OFF
206	OFF	ON	ON	ON	OFF	OFF
207	ON	ON	ON	ON	OFF	OFF
208	OFF	OFF	OFF	OFF	ON	OFF
209	ON	OFF	OFF	OFF	ON	OFF
210	OFF	ON	OFF	OFF	ON	OFF

address	1	2	3	4	5	6
211	ON	ON	OFF	OFF	ON	OFF
212	OFF	OFF	ON	OFF	ON	OFF
213	ON	OFF	ON	OFF	ON	OFF
214	OFF	ON	ON	OFF	ON	OFF
215	ON	ON	ON	OFF	ON	OFF
216	OFF	OFF	OFF	ON	ON	OFF
217	ON	OFF	OFF	ON	ON	OFF
218	OFF	ON	OFF	ON	ON	OFF
219	ON	ON	OFF	ON	ON	OFF
220	OFF	OFF	ON	ON	ON	OFF

Table 2 Address range DEGA UDA III RE16

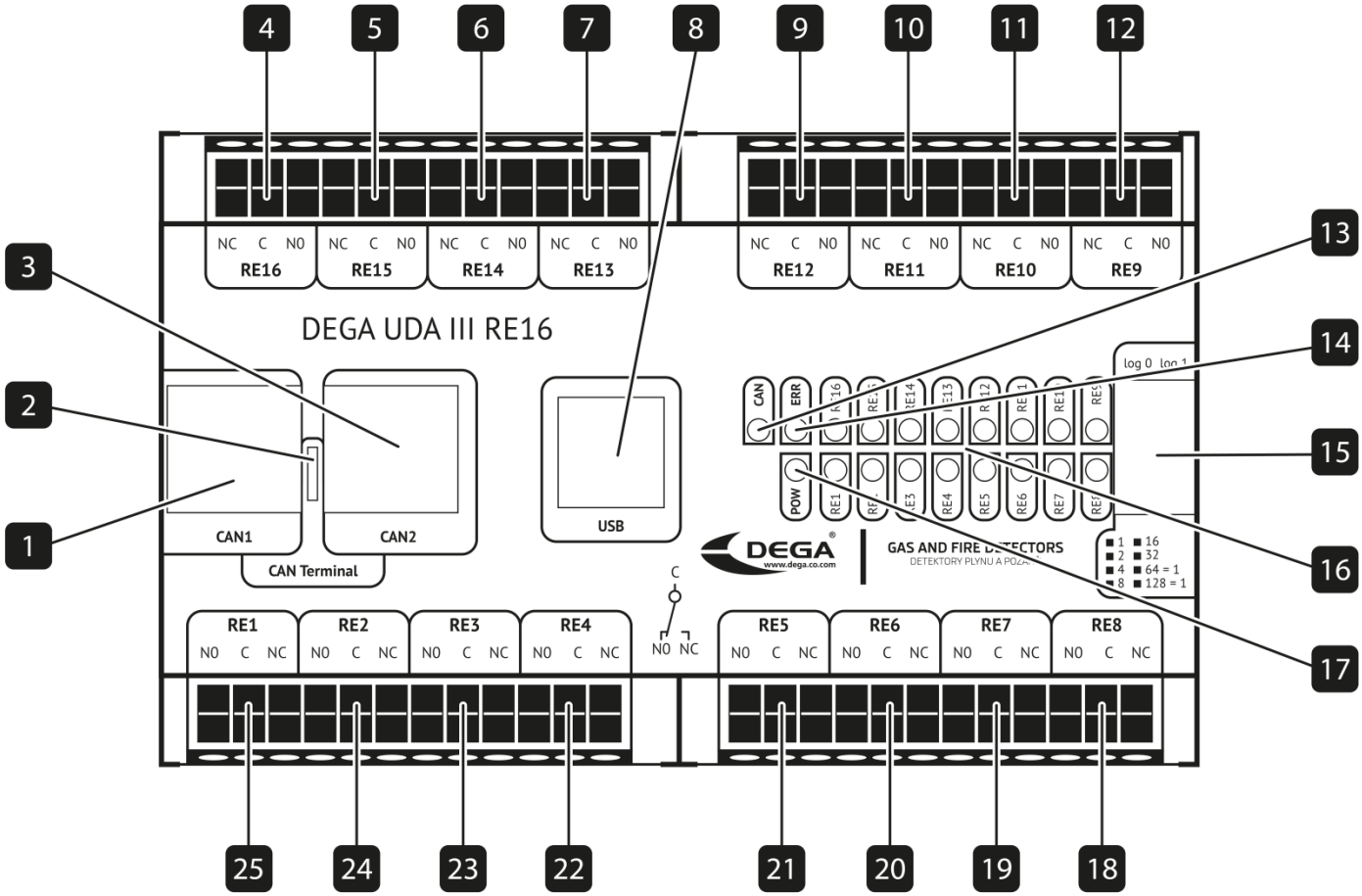


Figure 18 Description of DEGA UDA III RE16

1	RJ45 - CAN connector	2	CAN bus termination jumper. The last device on the bus must have the jumper connected.	3	RJ45 - CAN connector
4	Relay 16	5	Relay 15	6	Relay 14
7	Relay 13	8	USB connector for service purposes	9	Relay 12
10	Relay 11	11	Relay 10	12	Relay 9
13	LED indicating CAN bus functionality	14	Equipment failure	15	Address DIP switch
16	Indication of full relays	17	LED power	18	Relay 8
19	Relay 7	20	Relay 6	21	Relay 5
22	Relay 4	23	Relay 3	24	Relay 2
25	Relay 1				

LED POWER	LED ERROR	ICE	Description
Off	Off		Defective device
On	Off		Functional
Flashing	Off		Initialization
Flashing	Flashing		Device error
Flashing fast	-		Active bootloader
Flashing fast at each other			Bootloader (CRC flash error)

Table 3 Significance of LED indicators DEGA UDA III RE16

5.1.2 DEGA UDA III AI8

Expansion card with 8x 4-20 mA analog inputs with HART protocol support.

The maximum number of cards that are simultaneously connected to the control panel is 8 pcs and it is possible to operate them in the address range 201-253. Each card must have a unique address set.

Address range

address	1	2	3	4	5	6
201	ON	OFF	OFF	ON	OFF	OFF
202	OFF	ON	OFF	ON	OFF	OFF
203	ON	ON	OFF	ON	OFF	OFF
204	OFF	OFF	ON	ON	OFF	OFF
205	ON	OFF	ON	ON	OFF	OFF
206	OFF	ON	ON	ON	OFF	OFF
207	ON	ON	ON	ON	OFF	OFF
208	OFF	OFF	OFF	OFF	ON	OFF
209	ON	OFF	OFF	OFF	ON	OFF
210	OFF	ON	OFF	OFF	ON	OFF
211	ON	ON	OFF	OFF	ON	OFF
212	OFF	OFF	ON	OFF	ON	OFF
213	ON	OFF	ON	OFF	ON	OFF
214	OFF	ON	ON	OFF	ON	OFF
215	ON	ON	ON	OFF	ON	OFF
216	OFF	OFF	OFF	ON	ON	OFF
217	ON	OFF	OFF	ON	ON	OFF
218	OFF	ON	OFF	ON	ON	OFF

address	1	2	3	4	5	6
219	ON	ON	OFF	ON	ON	OFF
220	OFF	OFF	ON	ON	ON	OFF
221	ON	OFF	ON	ON	ON	OFF
222	OFF	ON	ON	ON	ON	OFF
223	ON	ON	ON	ON	ON	OFF
224	OFF	OFF	OFF	OFF	OFF	ON
225	ON	OFF	OFF	OFF	OFF	ON
226	OFF	ON	OFF	OFF	OFF	ON
227	ON	ON	OFF	OFF	OFF	ON
228	OFF	OFF	ON	OFF	OFF	ON
229	ON	OFF	ON	OFF	OFF	ON
230	OFF	ON	ON	OFF	OFF	ON
231	ON	ON	ON	OFF	OFF	ON
232	OFF	OFF	OFF	ON	OFF	ON
233	ON	OFF	OFF	ON	OFF	ON
234	OFF	ON	OFF	ON	OFF	ON
235	ON	ON	OFF	ON	OFF	ON
236	OFF	OFF	ON	ON	OFF	ON

address	1	2	3	4	5	6
237	ON	OFF	ON	ON	OFF	ON
238	OFF	ON	ON	ON	OFF	ON
239	ON	ON	ON	ON	OFF	ON
240	OFF	OFF	OFF	OFF	ON	ON
241	ON	OFF	OFF	OFF	ON	ON
242	OFF	ON	OFF	OFF	ON	ON
243	ON	ON	OFF	OFF	ON	ON
244	OFF	OFF	ON	OFF	ON	ON
245	ON	OFF	ON	OFF	ON	ON
246	OFF	ON	ON	OFF	ON	ON
247	ON	ON	ON	OFF	ON	ON
248	OFF	OFF	OFF	ON	ON	ON
249	ON	OFF	OFF	ON	ON	ON
250	OFF	ON	OFF	ON	ON	ON
251	ON	ON	OFF	ON	ON	ON
252	OFF	OFF	ON	ON	ON	ON
253	ON	OFF	ON	ON	ON	ON

Table 4 Address range DEGA UDA III AI8

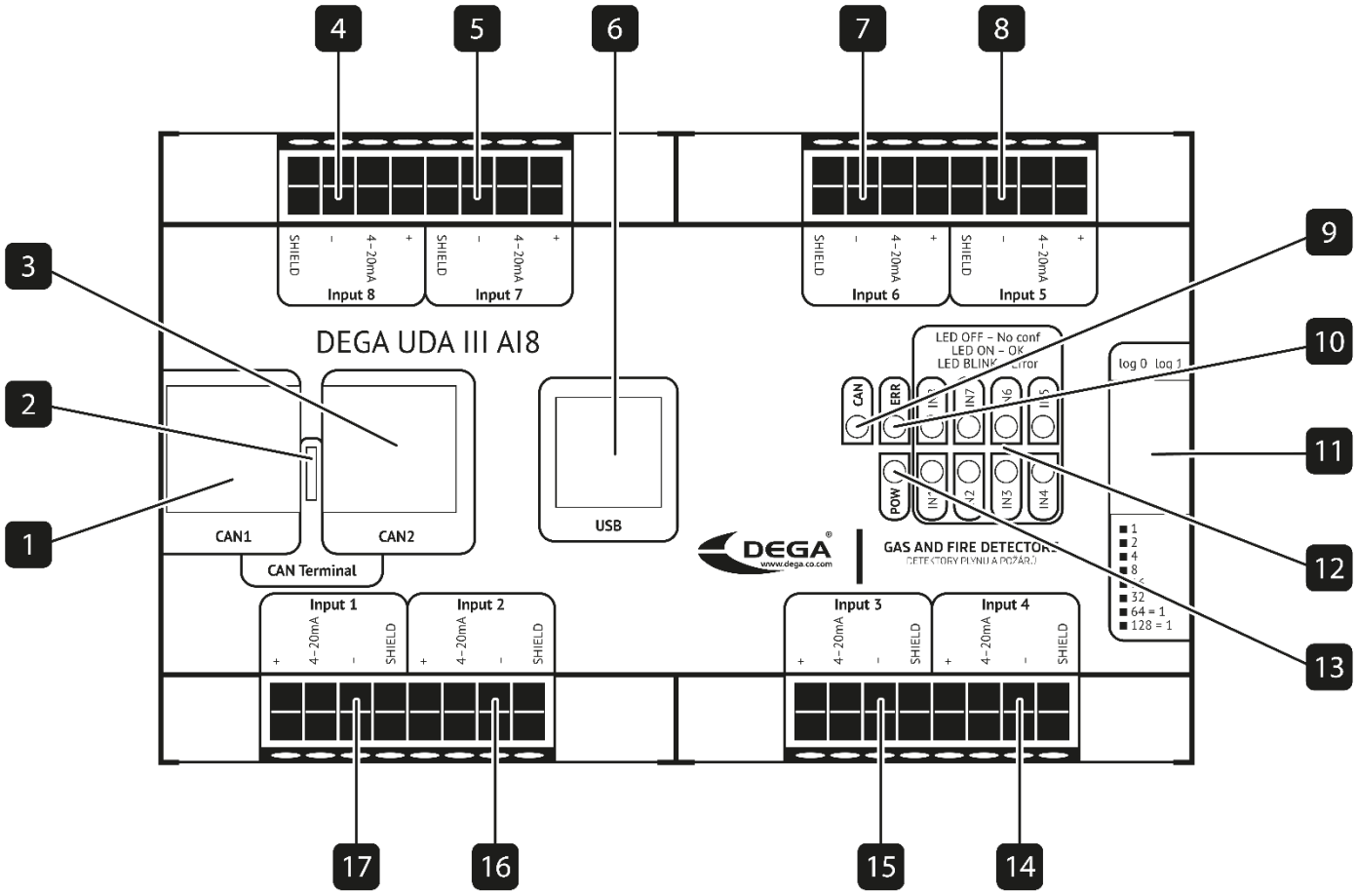


Figure 19 Description of DEGA UDA III AI8

1	RJ45 - CAN connector	2	CAN bus termination jumper. The last device on the bus must have the jumper connected.	3	RJ45 - CAN connector
4	Analog input 8	5	Analog input 7	6	USB connector for service purposes
7	Analog input 6	8	Analog input 5	9	LED indicating CAN bus functionality
10	Equipment failure	11	Address DIP switch	12	LED power
13	LED power	14	Analog input 4	15	Analog input 3
16	Analog input 2	17	Analog input 1		

LED POWER	LED ERROR	Description
Off	Off	Defective device
On	Off	Functional
Flashing	Off	Initialization
Flashing	Flashing	Device error
Flashing fast	-	Active bootloader
Flashing fast at each other		Bootloader (CRC flash error)

Table 5 Significance of DEGA UDA III AI8 indicator LEDs

Transmitter connection - see the manual for the respective transmitter.

The connected analog transmitters receive a virtual address in the range 1-200. Which the control panel then works with. See chapter 9.11.11

6 Graphical user interface

The control panel is equipped with a TFT touch screen. In the basic state, the concentrations and states of the individual configured channels are displayed. You can switch between channels using the navigation buttons. The user interface is designed for easy control and setup of the control panel using the touch screen.

6.1 First run

Figure 20 First run

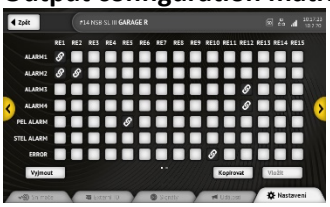
The control panel prompts the user to select the interface language the first time it is started. The selection is made by pressing the appropriate button. The interface language can be changed at any time later in the control panel settings.

6.2 Menu structure

Transmitters tab

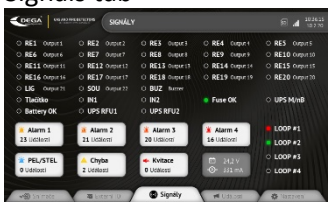
Channel details

Output configuration matrices



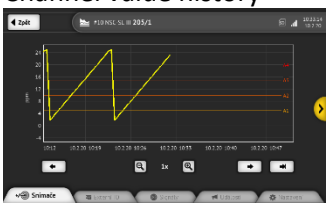
External IC tab

Signals tab



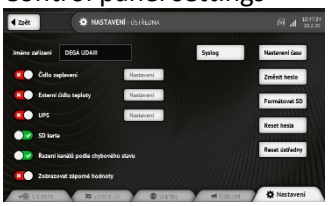
Events tab

Channel value history



Settings tab

Control panel settings



Transmitter settings

Transmitter settings

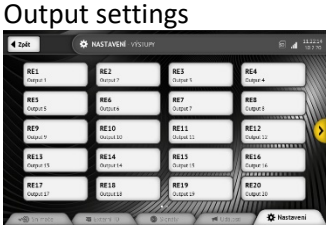
Output configuration matrices

Expansion tab settings

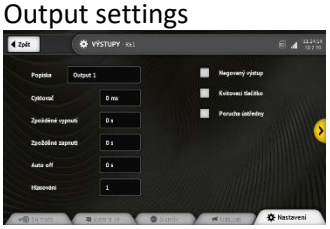
AI8 settings

RE16 settings

Output settings

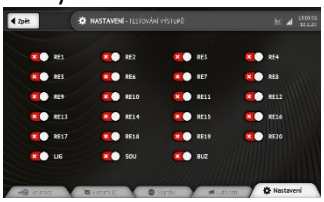


Output settings



Communication interface

Relay test



Fictitious configuration test

Transmitter blocking

Service mode

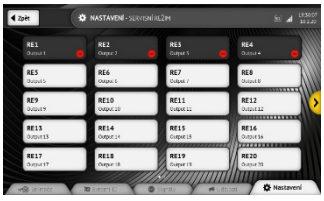


Figure 21 Menu structure

6.2.1 Transmitters tab

Status and measured value of individual channels
Channel details
O Channel value history
O Channel alarm history
O Output settings for channel events (read only)

6.2.2 External IC tab

Status of external IO cards
O DEGA UDA III RE16
O DEGA UDA III AI8
O Uninterruptible power supply UPS
O Temperature sensor
Details of individual cards
O Channel value history
O Channel alarm history
O Output settings for channel events (read only)

6.2.3 Signals tab

Status of inputs and outputs of the control panel.
Event counters - alarms and errors.
Sound alarm Acknowledgment button.

6.2.4 Events tab

History of control panel events

6.2.5 Settings tab

User login.
Control panel configuration
- Control panel settings
- Device name
- External temperature sensor
- UPS
- SD card
- Channel sorting after an error condition
- Display negative values
- Syslog
- Time setting
- Change Password
- Format SD
- Password reset
- Control panel reset

Transmitter settings
- Add a transmitter
- Editing alarms
- Editing outputs

Expansion cards
- Add a device
- Editing UDA III RE16
- Editing UDA III AI8

Output settings
Communication interface
Relay test
Fictitious concentration test
Transmitter blocking
Service mode
Czech
English
Log out

6.3 Control panel screen structure

The control panel screen consists of several parts - a status bar for indicating status information, navigation buttons to move in the selected screen, and a tab bar for switching function screens.

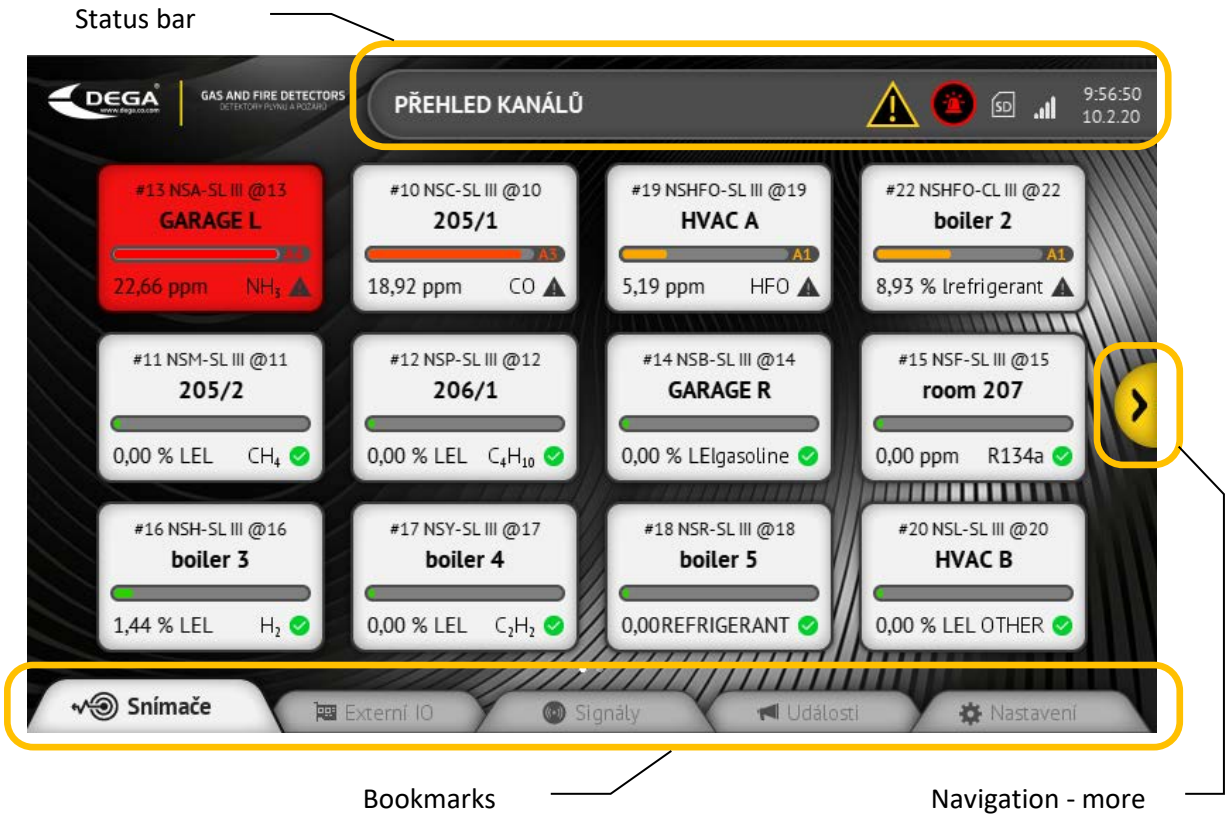


Figure 22 Control panel screen structure

6.3.1 Status bar

Icon	Description
	Control panel service mode. One of the outputs is blocked for equipment/system service needs. An overview of blocked outputs can be found in Settings / Service mode.
	Device error. Details of errors in the Events tab. The icon remains active even after the error ends. To deactivate the icon, it is necessary to confirm the error by pressing the error button in the Signals tab.
	Alarm1. The icon remains active even after the alarm ends. To deactivate the icon, it is necessary to acknowledge the alarm by pressing the alarm button in the Signals tab.
	Alarm2. The icon remains active even after the alarm ends. To deactivate the icon, it is necessary to acknowledge the alarm by pressing the alarm button in the Signals tab.
	Alarm3. The icon remains active even after the alarm ends. To deactivate the icon, it is necessary to acknowledge the alarm by pressing the alarm button in the Signals tab.
	Alarm4. The icon remains active even after the alarm ends. To deactivate the icon, it is necessary to acknowledge the alarm by pressing the alarm button in the Signals tab.
	PEL/STEL alarm. The icon remains active even after the alarm ends. To deactivate the icon, it is necessary to acknowledge the alarm by pressing the alarm button in the Signals tab.
	Acknowledgment. The icon indicates an active output with an acknowledgment function. Pressing the Acknowledgment button in the signal menu or the external Acknowledgment button deactivates the outputs

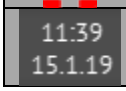
	with the acknowledgment function enabled. Deactivating the output using the Acknowledgment button or ending the alarm that caused the output to be activated will also deactivate the icon.
	Logged in user + role name (service / user)
	UPS - mains supply indication
	UPS - battery powered indication
	UPS - battery error
	GSM modem - signal strength indication. The number of bars indicates the signal strength; 5 commas is full signal, 1 comma is insufficient signal.
	GSM modem - fault
	Ethernet link status - link up
	Ethernet link status - link down
	Diagnostics - Power supply fuse fault
	SD card - the control panel uses an SD card to store the history of values / events
	SD card - fault. Error writing data to SD card
	Advanced IO card functional
	Advanced IO card error
	Control panel time and date

Table 6 List of status bar icons

6.4 Control options of the control panel

The touch screen is used exclusively to control the control panel. The alphanumeric keypad dialog on the 'QWERTY' screen is used to enter text values, and the numeric keypad is used to enter numeric values. The dialog is closed either by pressing the Save button or by the Close button. When you press Save to apply the new value, the Close button cancels the changes.

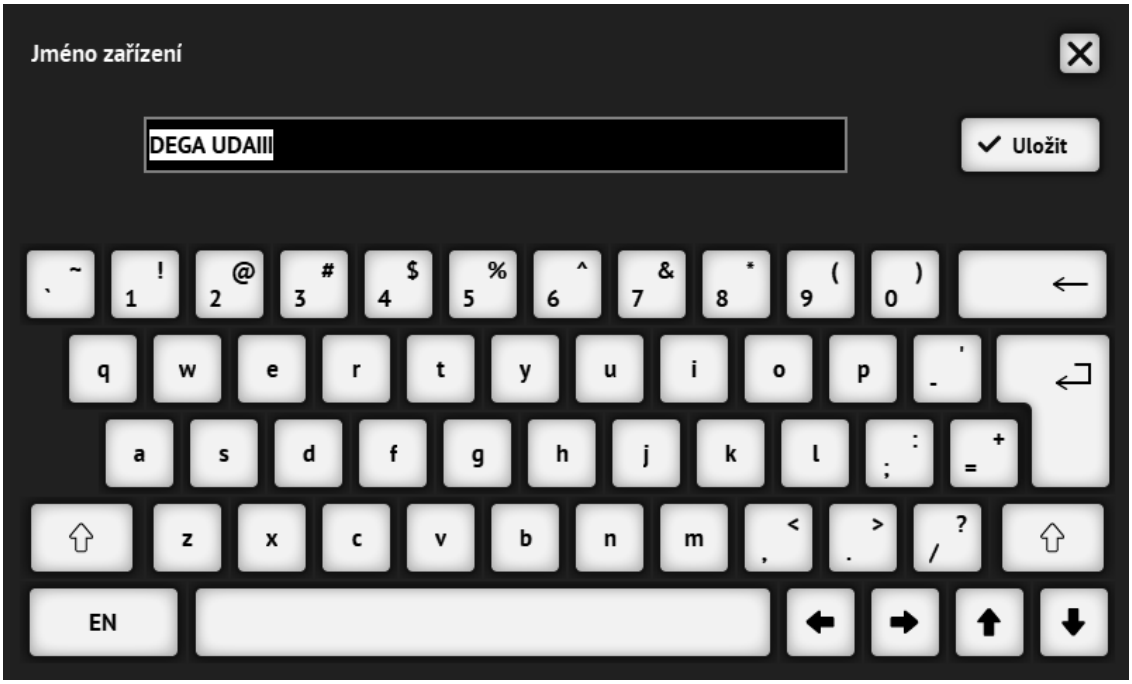


Figure 23 Input - keyboard

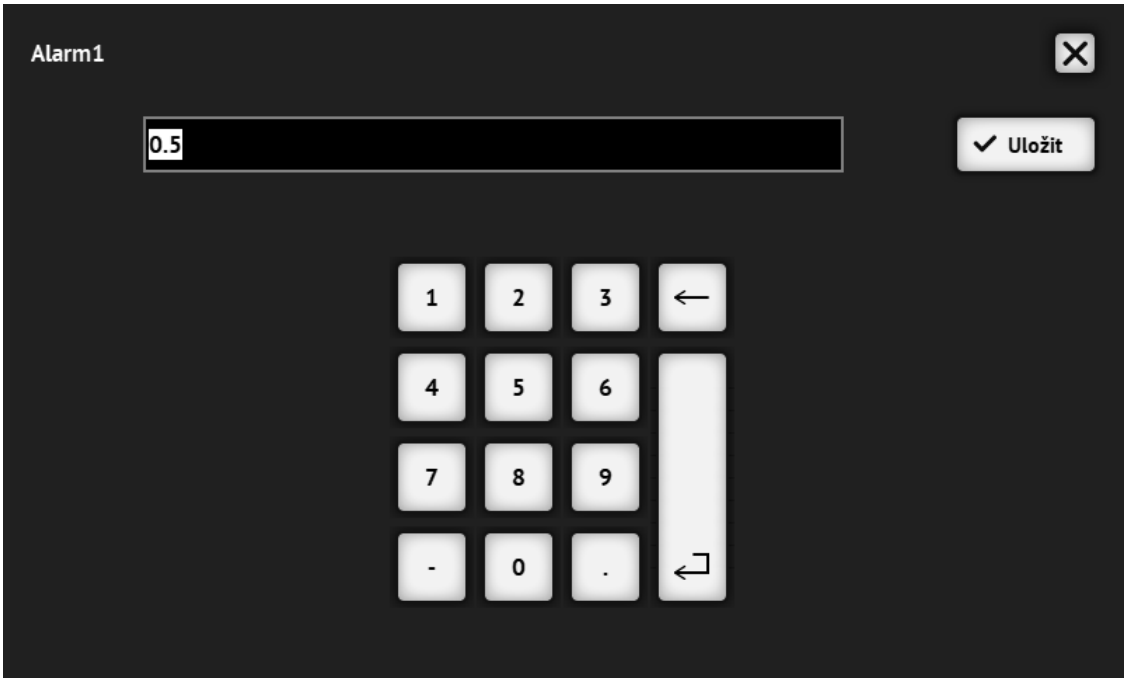


Figure 24 Input - numeric keypad

6.5 Control panel architecture

6.5.1 Control panel channel

The control panel channel represents one transmitter connection to the control panel. The control panel channel contains the transmitter settings and processes the measured data by the transmitter. The output of the channel is status information and signals, which are further processed by the control panel. Each channel can generate up to 7 digital signals, which are fed to the digital outputs via a user-configurable matrix. The user has the option to set the output activation to any signal from the channel using the output configuration matrix. Each channel has its own output configuration matrix.

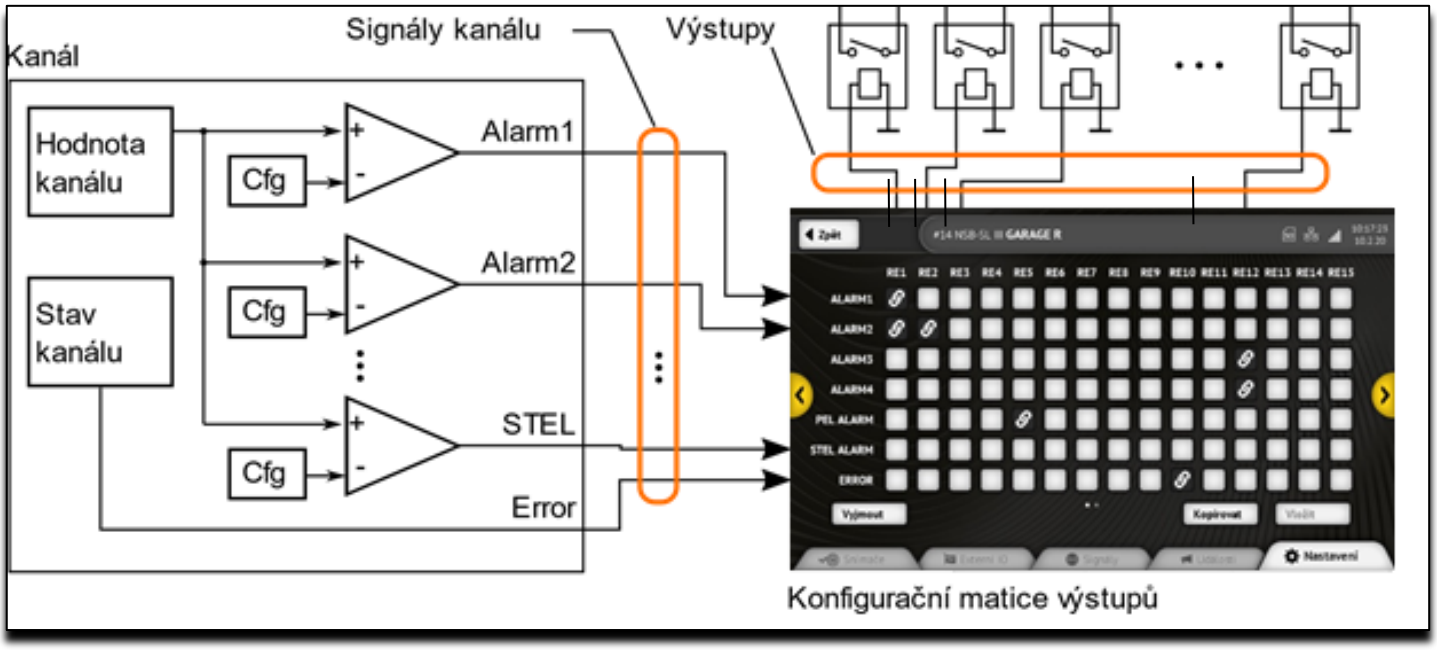


Figure 25 Channel signals

Channel signals are evaluated based on the measured value (ALARM type) and the channel status (ERROR type). The signal states are then used to activate the outputs according to the output matrix settings. Each signal can activate any combination of outputs, and similarly one output can be activated by any number of signals.

6.5.2 Digital outputs

The following figure describes how to control and function the digital outputs. The output of requests for switching the output from individual channels is introduced into the voting block. If the number of requests is higher than the set voting limit for the output, the request continues to the cascade of delayed-on and delayed-off blocks. This is followed by an RS flip-flop, which is used for the alarm inhibition function on the output - the current alarm can be deactivated, but each subsequent alarm activates the output again. Another function is a cycler, which allows the output to generate pulses instead of permanent switching. The last function at the level of the IO pin is the function of output negation - rotation of the output logic, when at rest the output is closed and in case of an alarm it opens.

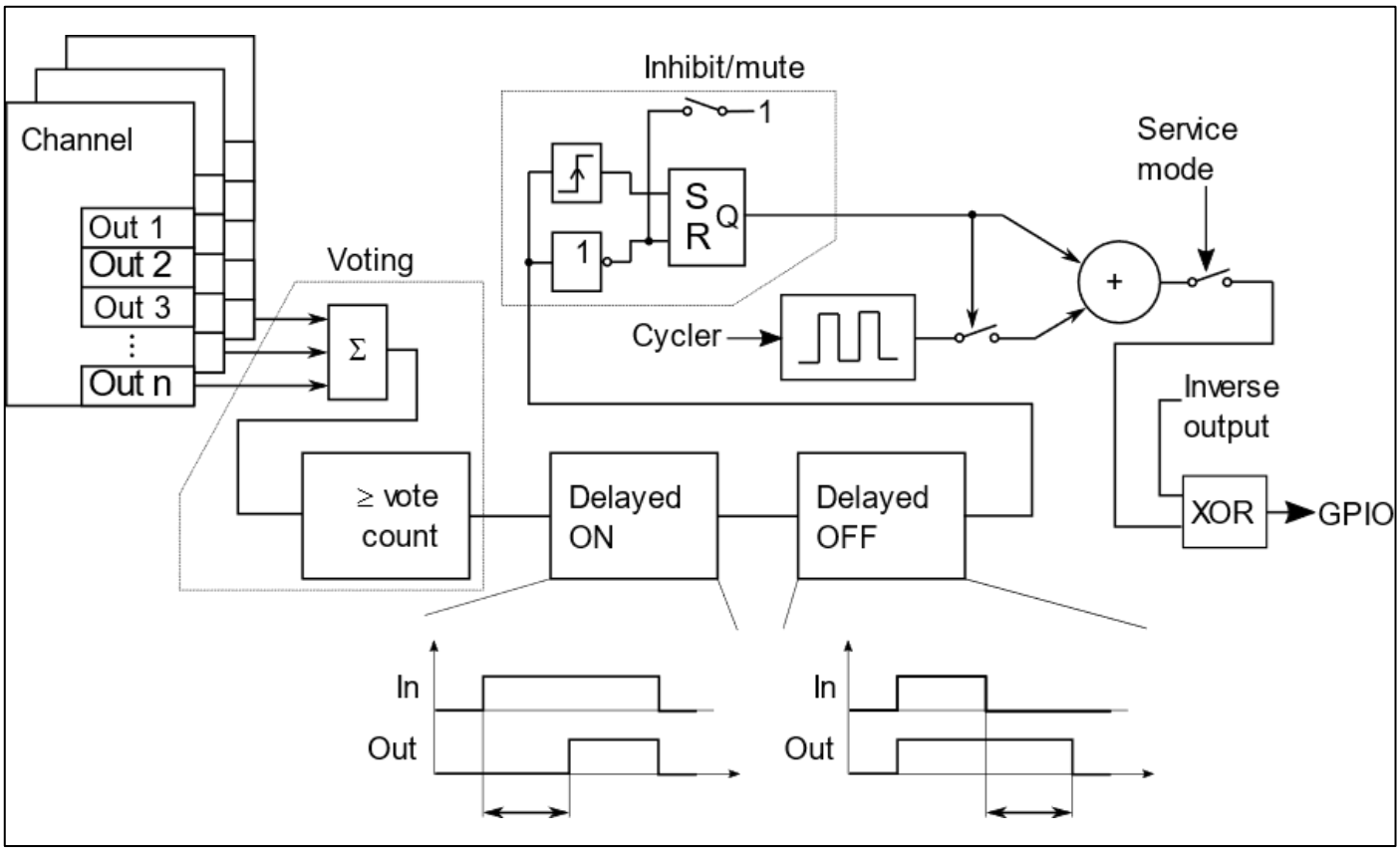


Figure 26 Block diagram of the output connection

Parameter	Parameter	Description
Inhibit	acknowledgment function	Used for outputs controlling acoustic signaling. In the event of an alarm, the output can be deactivated using the Acknowledgment button. The output will remain deactivated for the duration of the alarm. To reactivate the output, the alarm must end and the next alarm will reactivate the output.
Inverse output	negated output	The function inverts the output logic at the GPIO level. At rest, the relay is closed and the activated output means the relay is open.
Cycler	cycler	In the activated state, the output is excited at the corresponding frequency in a 1:1 rotation.
Delayed ON	delayed start	The output will not be activated until the specified time interval, i.e. the alarm must last at least the delay time to activate the output, the end of the alarm always resets the delay timer.
Delayed OFF	delayed shutdown	After the alarm ends, the output remains activated for the specified time. The delayed switch-off function is only listed after the delayed switch-on function.
Voting	vote	The voting function evaluates the arithmetic sum of the requests to close the output from all channels, and if the result is higher than the specified value, the output is activated, i.e. the voting function can be used to set the activation of the output only after several transmitters (channels) have detected an alarm. The default value is 1, each individual channel causes the output to be activated. If the voting value is set to 2, at least two channels must require the output to be activated in order for it to close.

Table 7 Output function

6.5.3 Service mode

The control panel service mode is used to block the output relays. It is used for the needs of service performed 'on the fly' when manipulation with the transmitter and the like could lead to the shutdown of the monitored technology. The user selects the outputs to be blocked in the service mode menu. Subsequently, the mode is indicated by the key icon in the status bar. In the service mode, the control panel performs all evaluation and measurement, only the output is not activated by itself. The service mode ends after all outputs are unlocked or automatically after a defined time has elapsed.

6.5.4 Transmitter blocking

In the event of a transmitter failure, the 'transmitter lock' function can be used to remove a channel from the list of active channels. The control panel with a blocked transmitter does not communicate and deactivates all signals (ALARMS) of the channel. The function is used to put into operation the technology that would otherwise be blocked by the control panel in the event of a faulty transmitter. Blocking the transmitter does not change the configuration of the control panel, the function is only temporary until the next reset of the control panel. Blocked channels are displayed in gray on the main screen.

6.6 Transmitters tab

The basic screen of the control panel where the status and values of individual channels are displayed. Each channel is represented by a graphic element with a description (location) of the transmitter and the measured value. 12 transmitters are displayed on one page, you can switch between the pages using the navigation buttons. A channel is an active element that, when pressed, brings up the channel details screen.

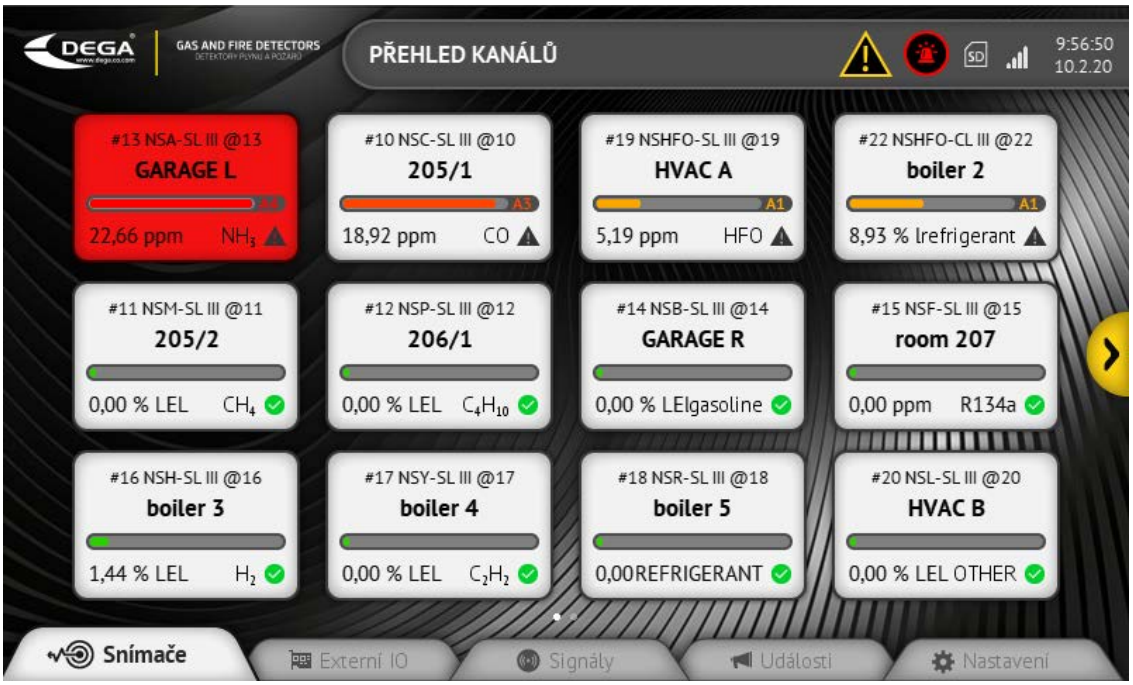


Figure 27 Transmitter tab

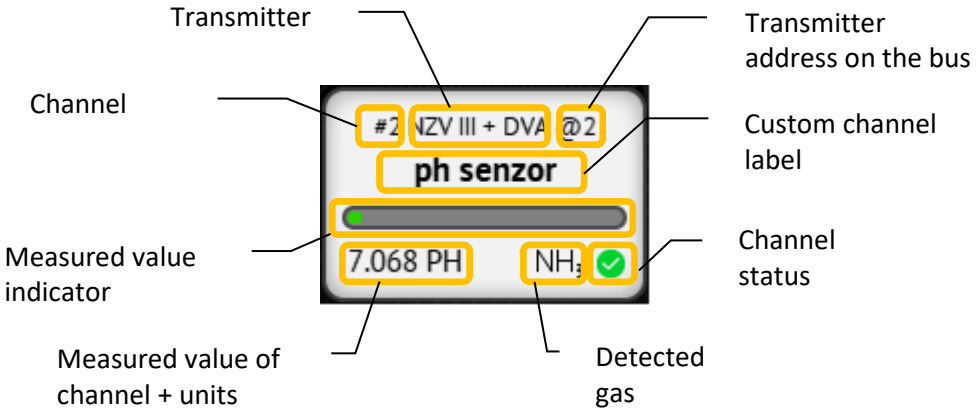


Figure 28 Control panel channel

Item	Description
Channel number	Channel number [1-250]
Transmitter type	Type designation of the connected transmitter
Transmitter address	Transmitter address on the bus.
User label	User-defined label is used to identify/mark the position of the transmitter in the installation. The label can be changed in the channel details screen.
Channel value	Measured channel value including units
Detected gas	Identification of the detected substance, usually gas
Channel value indicator	Measured value indicator in relation to alarm level 4. Value 0 corresponds to the idle concentration of the channel, value 100% (full range) corresponds to the value for alarm 4.
Channel status	Details are described in the following chapter.

Table 8 Control panel channel

6.6.1 Channel status

The status of the channel is indicated by the color background of the channel graphics and the graphic appearance of the channel element. The following table describes the individual states and how they are indicated. This is an overview information, details can be obtained by clicking on the channel and displaying the channel details screen.

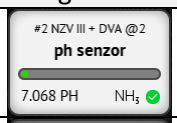
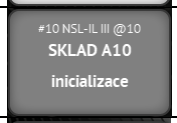
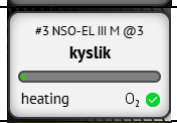
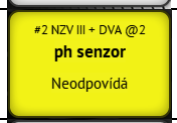
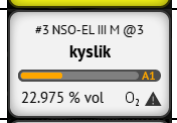
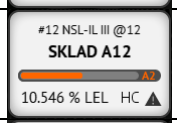
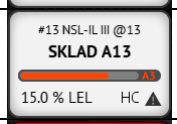
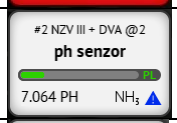
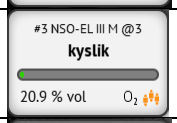
State	Graphic Design	Indication	Description
Ok		White background and green check	Functional channel.
Initialization		Gray background and inscription 'initialization'	Initialization of communication with the transmitter. The control panel tries to establish communication and configure the transmitter. In case of failure, the channel status changes to Fault.
Glow		Inscription 'heating' instead of value	The transmitter sensor glows when the power is turned on. The transmitter waits for the values from the transmitter to stabilize. After stabilization, it switches itself to the measurement mode.
Disorder		Yellow background	Channel error. The basic error status is displayed in the channel description. The detailed information about the error can be obtained in the channel details screen and in the control panel log.
Alarm 1		Value indicator	Alarm 1 is indicated by the color of the value indicator and the A1 mark.
Alarm 2		Value indicator	Alarm 2 is indicated by the color of the value indicator and the A2 mark.
Alarm 3		Value indicator	Alarm 3 is indicated by the color of the value indicator and the A3 mark.
Alarm 4		Value indicator and red background	Alarm 4 is displayed by the color of the value indicator, the A4 mark and the change of the color background of the channel to red.
PEL/STEL alarm		Condition - blue triangle	The PEL/STEL channel alarm is indicated by a flashing blue triangle in the lower right corner. The detailed information about active alarms can be obtained in the channel details screen.
Calibration		Condition - calibration mark	Passed transmitter calibration.
Inactive		Gray background and inscription 'inactive'	Blocked channel. For service and maintenance purposes, the channels can be blocked in the control panel settings. Attention, resetting the control panel will unblock all channels.

Table 9 Possible channel states

6.6.2 Channel sorting

By default, the channels on the screen are sorted by status. Each state is assigned a priority, channels are displayed from the highest priority. As a result, the home screen first displays channels that are not working and require the user's attention. If several events occur at the same time (e.g. Alarm 4 and PEL alarm), the status with the highest priority will be used and displayed.
The following table shows the channel order:

Priority	State	Description
The highest	Alarm 4	
↓	Alarm 3	
	Alarm 2	
	Alarm 1	
	STEL alarm	
	PEL alarm	
	Disorder	
	Calibration	
	Ok	Function channels and channels in heating / initialization state.
The lowest	Inactive	Inactive channels have the lowest priority and are listed after functional ones.

Table 10 Channel sort order

Tip: channel switching can be switched off in the control panel settings menu.

6.6.3 Channel details screen

Clicking on a channel element in the transmitter screen opens the channel details screen. The screen displays detailed information about the status and configuration of the channel. The user can also edit the channel label here.

Figure 29 Channel detail

Dialog item	Description
Description	Control panel description. Touch to call up the value editing dialog
History	Displays the history dialog for this channel's values
Alarms	Display channel events (preset filters in the Events dialog for a specific channel)
Outputs	In 'read' mode, the dialog opens the response matrix of the outputs to the channel signals

Table 11 Control panel settings dialog

List of status information:

Item name	Description
Type	Transmitter / device type name
Interface	The name of the interface to which the transmitter is connected
Serial number	Transmitter serial number
Gas type	Detection of detected gas (chemical symbol)
Address	Transmitter address on the bus
FW version	Transmitter firmware version
Value	Current measured value
Last calibration	Date of last transmitter calibration
The following calibration	Transmitter calibration validity date. When the calibration expires, a CAL alarm is activated on the transmitter (calibration)
Active alarms	The list of active transmitter alarms. The individual alarms in the report are separated by a comma. Example 'A1, CAL' indicates active ALARM1 and calibration alarm. Only the alarm with the highest priority is displayed on the main channel element, all active alarms are listed here.
Error condition	Text description of the transmitter error status
Sensor temperature	The temperature read from a transmitter sensor
CPU temperature	The temperature measured on the transmitter processor (internal temperature of the device)
Hours	Time in hours measured since the last calibration
Alarm1	The set value for alarm1 in the transmitter. The units of value are the same as the units of the measured quantity.
Alarm2	The set value for alarm2 in the transmitter. The units of value are the same as the units of the measured quantity.
Alarm3	The set value for alarm3 in the transmitter. The units of value are the same as the units of the measured quantity.
Alarm4	The set value for alarm4 in the transmitter. The units of value are the same as the units of the measured quantity.
Offset	The set value for alarm offset in the transmitter. Used for oxygen and PH probe. The units of value are the same as the units of the measured quantity. When using offset, the alarm is evaluated according to: Abs (value - offset) > ALARMx I.e. when using the offset parameter, an alarm will occur both if the value of the measured quantity is too high and if it is too low -> the size of the difference between the measured value and the entered offset is evaluated.
Dead zone	The set value for the transmitter dead band. Defines the value of the measured quantity below which the zero value will be displayed. The units of value are the same as the units of the measured quantity.

Table 12 Channel status information

6.6.4 Channel value history screen

The dialog is used for graphical display of the history of channel values. The X axis of the graph represents the sampling time of the value and the Y axis the value of the channel. The range of the Y axis is given by the channel 'offset' parameter (lower limit, usually 0) and the ALARM4 value (upper limit). If channel data is not available for a certain time (a sensor failure or the control panel was out of order), the graph is not plotted at that location.

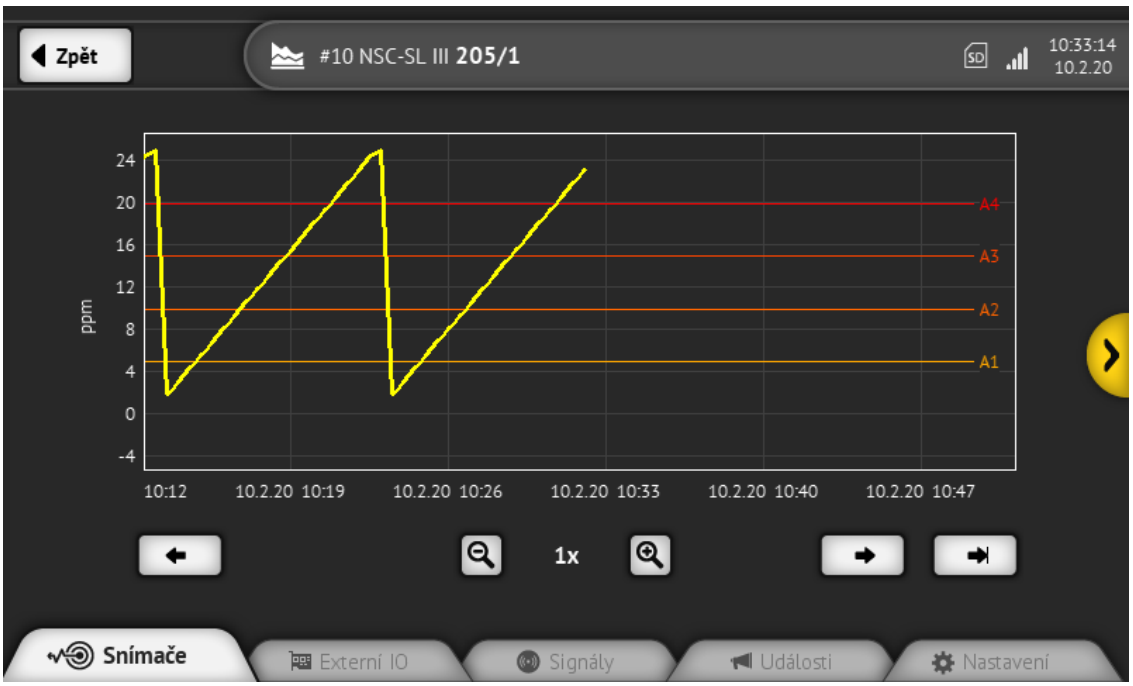


Figure 30 Channel value history screen

Dialog item	Description
	Move the graph to the past
	Move the graph towards the present
	Reset the timeline to the current time
	Timeline scaling - zoom
	Timeline scaling - reduction

Table 13 Channel value history dialog

Tip: you can use the 'swipe' gesture to the right or left in the graph area to move the graph.

6.8 External IC tab

The External IO screen displays the status of external devices, such as the UDA III RE16 and UDA III AI8 I/O expansion cards, the status of the UPS, and the status of the temperature sensor.
Individual devices are interpreted in the same way as transmitters on the Transmitters tab.
The individual UDA III RE16 and UDA III AI8 devices must have a unique address set and cannot be in an address conflict with the transmitters.

Figure 31 Expansion tabs tab

6.8.1 Relay card UDA III RE16

Relay card main screen with user selectable label, card information, and the current relay status.
Alarms - log of events triggered by the card
Outputs - view the configuration matrix of outputs

Figure 32 Relay card

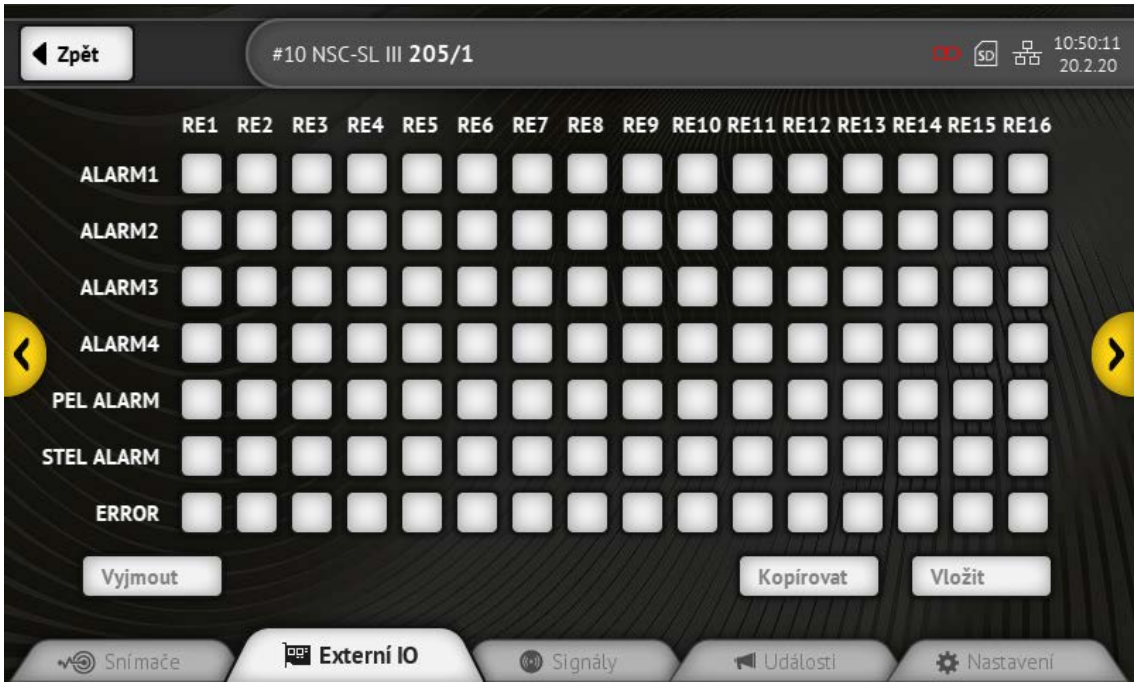


Figure 33 Configuration matrix

6.8.2 DEGA AI8 analog input card

Analog card main screen, with user selectable label, card information and current relay status.
Alarms - log of events triggered by the card

Figure 34 Analog input card

6.8.3 UPS

main screen

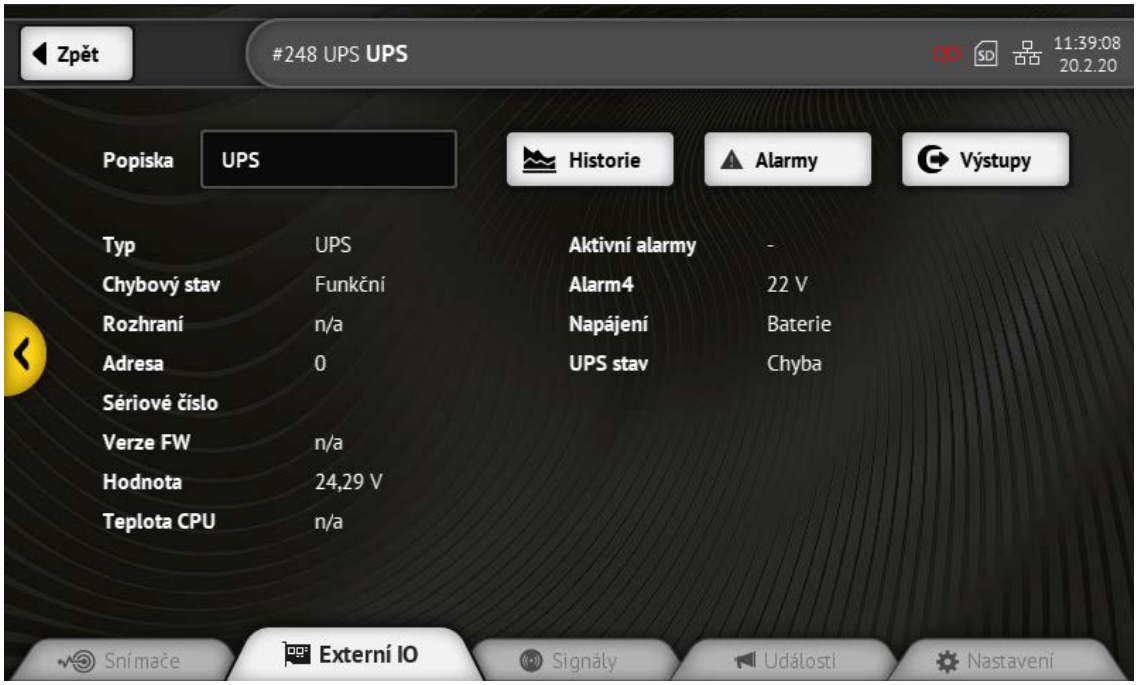


Figure 35 UPS

6.9 Signals tab

The status of the control panel's IO signals is displayed on the signals screen. The IO status of the user signals informs which relays are closed and which inputs are active. The value of analog signals such as event error counters and UPS battery voltage is also displayed.

Figure 36 'Signals' tab

6.9.1 Digital signals

Digital signals are represented by a status icon, a signal name and a label. In the case of digital outputs, the label can be defined in the settings menu.
Overview of signal states:

- - Inactive digital signal (log 0)
- - Active digital signal (log 1)

6.9.2 Analog signals

Analog signals are displayed using a button element that contains the name of the signal and its value. In the case of event counter type signals, this is an active element, by pressing which it is possible to clear the counter.

Figure 37 Analog signal element

Signal name	Description
Alarm 1	Alarm1 event counter. The non-zero value of the counter is also indicated by the flashing Alarm1 icon in the status bar. The counter can be cleared by pressing the Signal button.
Alarm 2	Alarm2 event counter. The non-zero value of the counter is also indicated by the flashing Alarm2 icon in the status bar. The counter can be cleared by pressing the Signal button.
Alarm 3	Alarm3 event counter. The non-zero value of the counter is also indicated by the flashing Alarm3 icon in the status bar. The counter can be cleared by pressing the Signal button.
Alarm 4	Alarm4 event counter. The non-zero value of the counter is also indicated by the flashing Alarm4 icon in the status bar. The counter can be cleared by pressing the Signal button.
PEL/STEL alarm	PEL and STEL event counter (sum of both). A non-zero value of the counter is also indicated by a flashing PEL/STEL icon in the status bar. The counter can be cleared by pressing the Signal button.

Error	Error event counter. A non-zero value of the counter is also indicated by a flashing Error icon in the status bar. The counter can be cleared by pressing the Signal button.
Acknowledgment	Acknowledgment button. The icon also functions as an Acknowledgment button of the control panel and deactivates outputs with the acknowledgment function enabled. Acknowledgment event counter - the acknowledgment output has been activated. The counter can be cleared by pressing the Signal button.
Power supply	Status of the control panel supply voltage source. Displays the voltage at the 'UPS VLT' input and the current drawn from the power supply. The 'UPS VLT' input is intended for monitoring the UPS battery voltage and it is possible to generate an ALARM when the voltage drops below the set limit. See UPS configuration.

Table 14 Analog signals

6.10 Events tab

In the Events tab, the control panel displays the history of events. Each record is divided into several columns. The first column contains a button to display the channel values at the time the event occurred and the second channel number. If the event is not channel-bound, both columns are blank. The third column contains the date and time of the event, the fourth icon corresponding to the type of event. The icons are described in the table below. The last column is a description of the event in the current control panel language.
In the right part of the dialog there is a panel containing buttons for moving in the event history and setting filters of displayed events. Selected event types can be filtered and by setting the channel number only events from a certain channel (0 - deactivated channel filter). The set filter is applied by pressing the 'Filter' button.
The 'Date' button is used to set the date and time of the first displayed event.

Figure 38 'Events' tab

Dialog item	Description
Newer button	Previous page - newer events
Older button	Next page - older events
Checkbox A1 - INFO	Filters - event type. Show only selected event types
Channel	Filter only records with the given channel number / 0 - all events
Filter	Apply filters and search only for records that match the filter settings
Date	Quickly scroll through the history to a specified date

Table 15 Events dialog

Icon	Type	Description
	A1	ALARM1 channel event
	A2	ALARM2 channel event
	A3	ALARM3 channel event
	A4	ALARM4 channel event
	PEL	PEL channel event
	STEL	STEL channel event
	ERR	Error event
	INFO	Information type event

Table 16 Event types

6.11 Settings tab

The control panel settings are password protected. To enter the menu, the user must first log in. Three user roles are defined, the user is selected by entering the appropriate password. Therefore, different users must have different passwords.

Figure 39 User login dialog

Role	Password	Description
User	0000	The role with the lowest authority. It does not allow you to change the control panel settings, just browse and view the current control panel settings.
Service	1111	The user has access to the control panel configuration.

Table 17 a list of users

Figure 40 'Settings' tab

Tip: Closing the dialog saves and applies the new control panel settings.
Tip: In case of inactivity, the dialog closes and the user logs off after the automatic logout time has elapsed.

6.11.1 Control panel settings

The dialog is used to set general parameters and functions of the control panel.

Figure 41 Control panel settings

Dialog item	Description	User	Service
Device name	Control panel description	×	✓
External temperature sensor	External control panel temperature sensor - enable / set	×	✓
UPS	UPS power supply - enable / set	×	✓
SD card	Enables the use of an SD card to store the history of values. If the function is disabled, the history is stored in the internal RAM (only a few hours / reset clears the history). When using an SD card, the history is stored approximately 1 year back.	×	✓
Sort channels by error condition	Channel sorting method (by status / by channel number) on the main screen.	×	✓
Negative temperature display	Displaying a negative channel value. Some transmitters send a negative concentration value (e.g. in case of incorrect zero calibration), the control panel ignores the negative value and displays only 0. The setting can also enable the display of negative values sent by the transmitter.	×	✓
Syslog	Viewing the system log	✓	✓
Time setting	Control panel time setting	✓	✓
Change Password	Dialog for changing the password of the logged in user	✓	✓
Format SD	Reformats the SD card with the FAT32 file system - clears the history of values / events	×	✓
Password reset	Reset all users' passwords to default values	×	×
Control panel reset	Performs a device reset	✓	✓

Table 18 Control panel settings

6.11.2 Temperature sensor

The dialog is used to configure the external control panel temperature sensor. The value of the sensor channel is the measured temperature [°C]. Furthermore, the control panel diagnoses the functionality of the sensor and activates the signal of the ERROR channel in the event of a sensor failure.

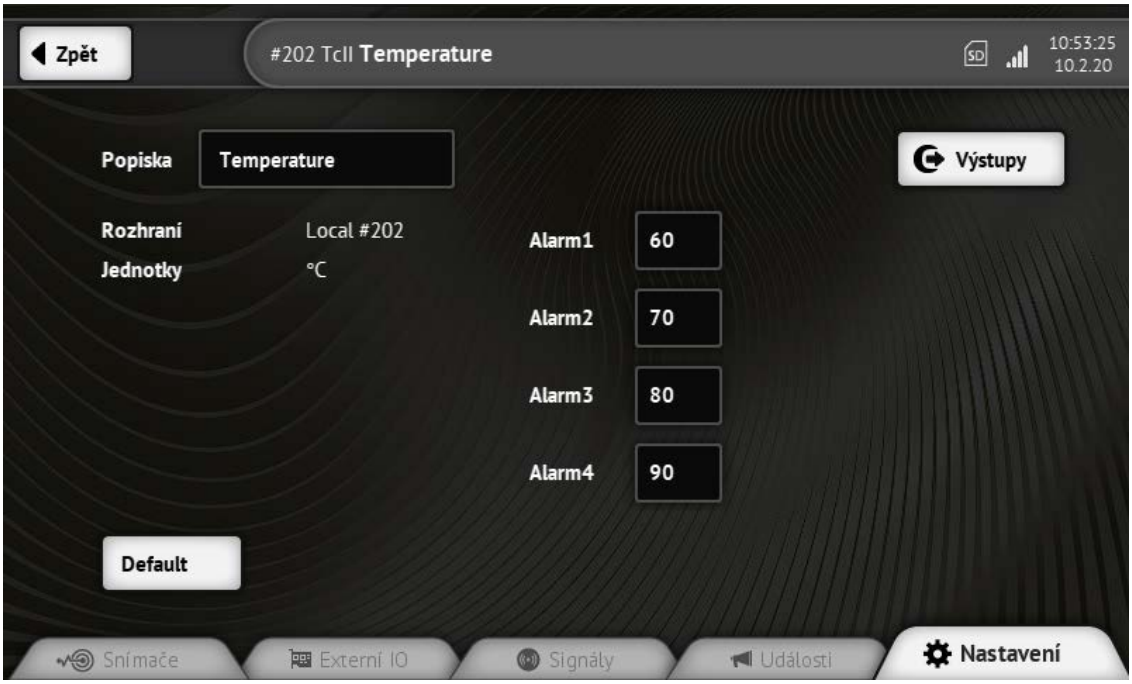


Figure 42 Temperature sensor

Dialog item	Description	User	Service
Description	Used for user channel description (channel name)	✖	✓
Alarm1	Alarm value 1	✖	✓
Alarm2	Alarm value 2	✖	✓
Alarm3	Alarm value 3	✖	✓
Alarm4	Alarm value 4	✖	✓
Show channel	Enables channel display on the 'Transmitters' tab	✖	✓
Outputs	Opens the output response matrix dialog to channel signals	✓	✓

Table 19 Temperature sensor dialog

The channel signals for the output response matrix are as follows:

Signal name	Description
Alarm1	Channel value equal to or higher than the set value 'Alarm1'
Alarm2	Channel value equal to or higher than the set value 'Alarm2'
Alarm3	Channel value equal to or higher than the set value 'Alarm3'
Alarm4	Channel value equal to or higher than the set value 'Alarm4'
PEL alarm	Does not support
STEL alarm	Does not support
Error	Transmitter failure. The signal is active in the event of a communication error with the transmitter

Table 20 'Temperature sensor' channel signals

6.11.3 UPS

The dialog is used to configure the UPS. The sensor channel value is the measured UPS battery voltage [V]. Furthermore, the control panel evaluates the UPS status signals and can be responded to by activating a channel alarm.

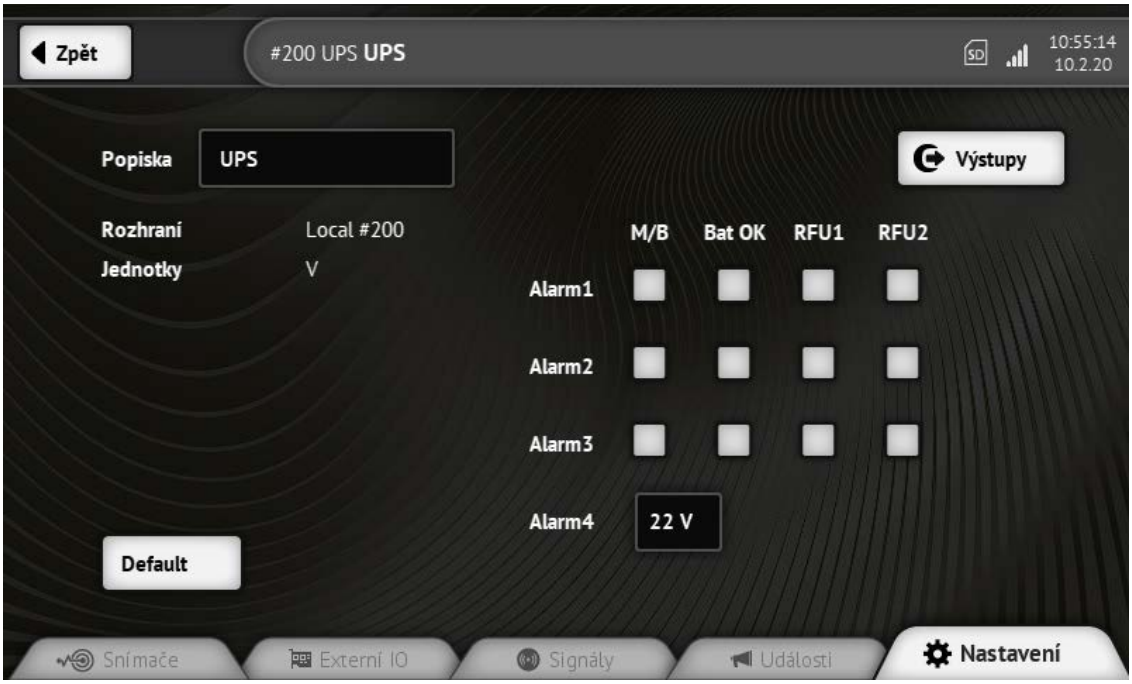


Figure 43 UPS

Dialog item	Description	User	Service
Description	Used for user channel description (channel name)	✖	✓
Alarm1	Selection of UPS signals for alarm 1 activation	✖	✓
Alarm2	Selection of UPS signals for alarm 2 activation	✖	✓
Alarm3	Selection of UPS signals for alarm 3 activation	✖	✓
Alarm4	Alarm 4 value	✖	✓
Show channel	Enables channel display on the 'Transmitters' tab	✖	✓
Outputs	Opens the output response matrix dialog to channel signals	✓	✓

Table 21 Dialog UPS

The channel signals for the output response matrix are as follows:

Signal name	Description
Alarm1	Activation of any of the selected UPS signals will trigger the appropriate alarm
Alarm2	Activation of any of the selected UPS signals will trigger the appropriate alarm
Alarm3	Activation of any of the selected UPS signals will trigger the appropriate alarm
Alarm4	A UPS voltage value lower than the set value triggers the Alarm4 signal
PEL alarm	Does not support
STEL alarm	Does not support
Error	Does not support

Table 22 'UPS' channel signals

Tip: The UPS signals are active in log 0 state. The idle, inactive state corresponds to logic level 1.

6.11.4 System log dialog

Display of the control panel system log. The system log contains detailed information about the events and the status of the control panel. It can be used to diagnose and detect control panel errors/problems or the entire installation.

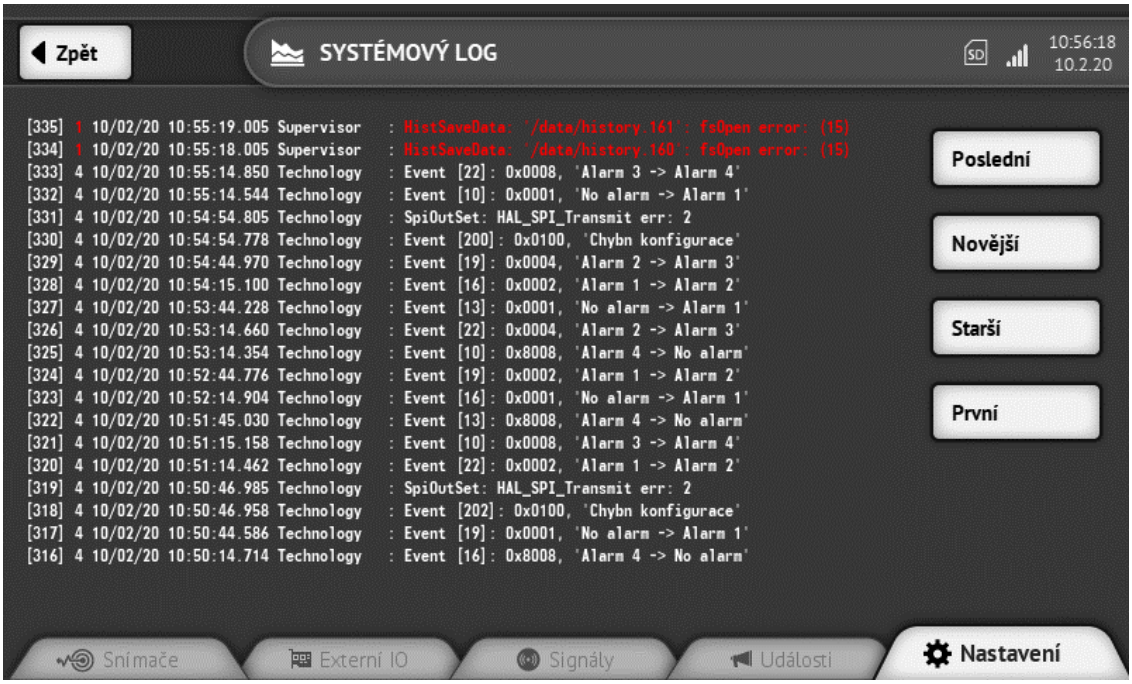


Figure 44 System log

6.11.5 Time setting

The dialog is used to manually set the control panel time. The time format is 24h. The control panel does not support time zones or automatic change of summer/winter time.

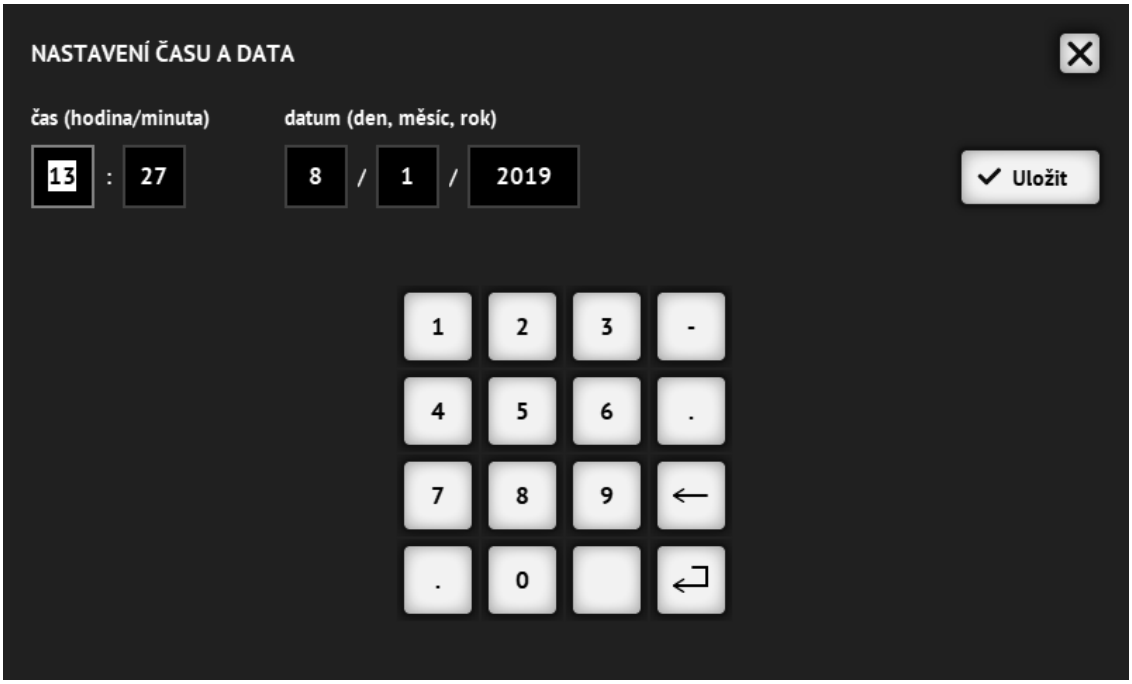


Figure 45 Time setting

Tip: By connecting DegaConfig to the control panel and saving the configuration, the control panel time will be set to the current PC time.

6.11.6 Changing the password

The dialog allows you to change the password of the currently logged-in user. For a successful change, you need to enter the old password and then the new password with confirmation. Successful password change leads to closing the dialog. In case of unsuccess, the user is informed by a messagebox with a description of the error (invalid old password / new confirmation error). The password is a combination of any 4 digits.

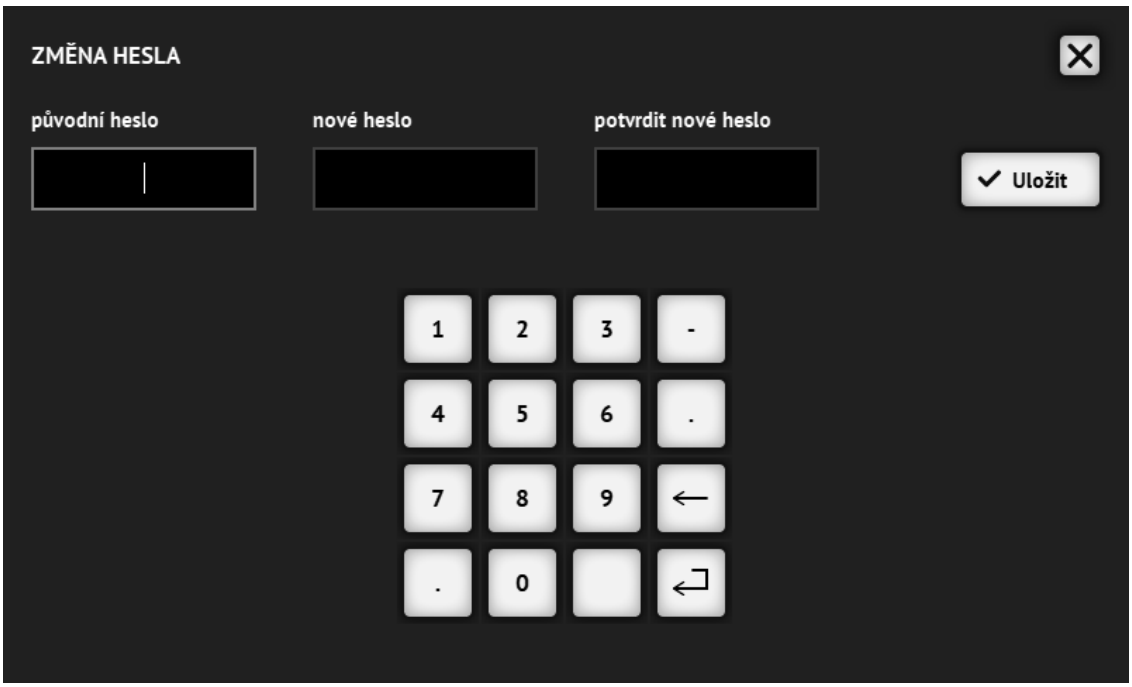


Figure 46 Changing the password

6.11.7 Format SD

This formats the SD card with the FAT32 file system. All data on the SD card will be deleted. The function can be used to 'clear' the control panel history.

Figure 47 Format SD card

6.11.8 Control panel reset

Invokes the control panel reset.

Figure 48 Control panel reset

6.11.9 Transmitter settings

The dialog is used to set the transmitters connected to the control panel. The first part of the dialog is a screen with a list of configured transmitters.

Figure 49 Settings - selection of transmitters

Selecting a transmitter displays the settings dialog for that transmitter. The user has the option to change the transmitter settings by touching the appropriate editbox.
The configuration parameters are stored in the control panel's memory independently of the internal configuration of the transmitter. Each time the control panel initiates communication with the transmitter, it reads its configuration and checks whether it matches the configuration stored in the control panel. In case of differences, reconfigure the transmitter. Therefore, for example, if a transmitter is replaced with another one due to a fault, the control panel will ensure the correct configuration of the new transmitter.

Figure 50 Transmitter channel setting

Dialog item	Description
Description	Channel description. Touch to call up the value editing dialog
Address	Transmitter address on the bus
Alarm1	The set value for ALARM1 in the transmitter. The units of value are the same as the units of the measured quantity.
Alarm2	The set value for ALARM2 in the transmitter. The units of value are the same as the units of the measured quantity.
Alarm3	The set value for ALARM3 in the transmitter. The units of value are the same as the units of the measured quantity.
Alarm4	The set value for ALARM4 in the transmitter. The units of value are the same as the units of the measured quantity.
PEL time	PEL (permissible exposure limit) calculation time in minutes. Typically 480 minutes (8h).
PEL limit	PEL concentration limit for alarm announcement.
STEL time	STEL (short-term exposure limit) calculation time in minutes.
STEL limit	STEL concentration limit for alarm announcement.
Glow	Transmitter glow time. The time it takes for the transmitter to stabilize the measured value after a power failure. No alarm will be triggered during glow.
Offset	The set value for alarm offset in the transmitter. Used for oxygen and PH probe. The units of value are the same as the units of the measured quantity. When using offset, the alarm is evaluated according to: Abs (value - offset) > ALARMx I.e. when using the offset parameter, an alarm will occur both if the value of the measured quantity is too high and if it is too low -> the size of the difference between the measured value and the entered offset is evaluated.
Dead zone	The set value for the transmitter dead band. Defines the value of the measured quantity below which the zero value will be displayed. The units of value are the same as the units of the measured quantity.
Zero calibration	Calibration gas concentration value for parameter 'zero'
Span calibration	Calibration gas concentration value for the 'span' parameter
Default button	Sets the default channel configuration values for the given transmitter type
Load button	Retrieves the configuration from the connected transmitter at the given address
Delete button	Deletes the configured channel
Outputs button	Opens the channel output matrix configuration dialog

Table 23 Transmitter channel settings dialog

List of status information:

Item name	Description
Interface	The name of the interface to which the transmitter is connected
Serial number	Transmitter serial number
Gas type	Detection of detected gas (chemical symbol)
Units	Units of quantity measured by the channel transmitter
Last calibration	Date of last transmitter calibration
The following calibration	Transmitter calibration validity date. When the calibration expires, a CAL alarm is activated on the transmitter (calibration)

Table 24 Channel status information

Tip: Closing the dialog saves the configuration and uploads the new values to the connected transmitter.

6.11.11 Expansion cards

Settings of individual expansion cards UDA III RE16 and UDA III AI8

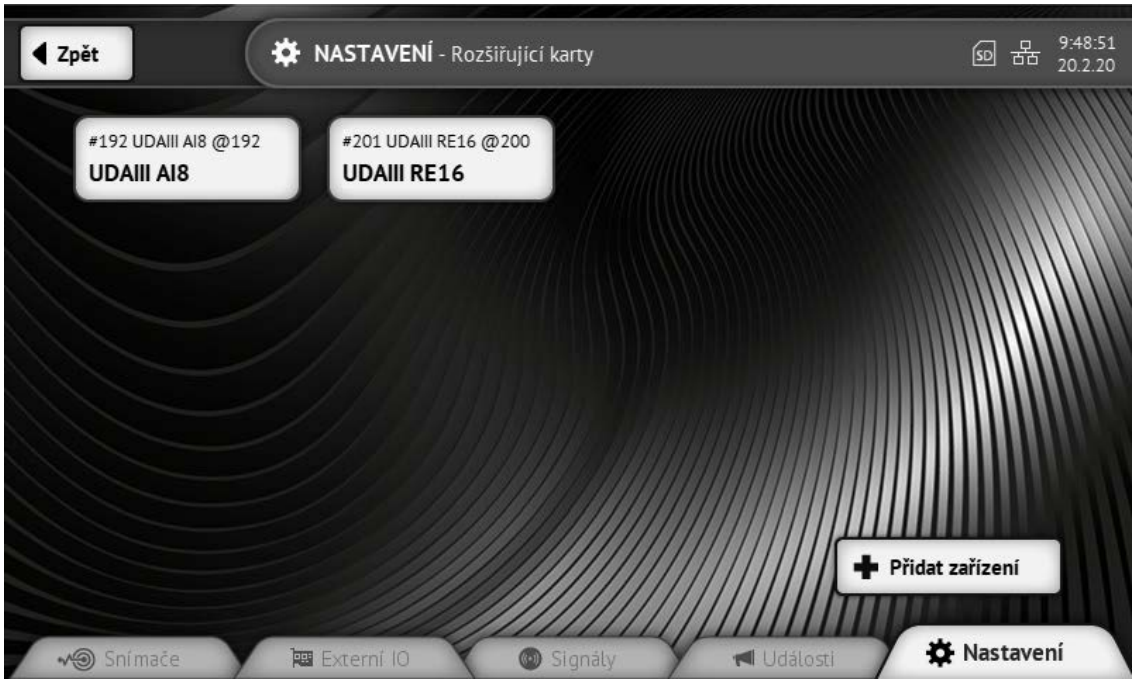


Figure 51 Expansion cards

UDA III RE16

- Label - user label
- Outputs and RE1-RE16 - Setting of individual output relays. Same logic as for the control panel relay. See chapter 9.11.12
- Relay test - manual relay test. Same logic as the control panel relay. See chapter 11/9/18
- Default - clears the output configuration matrix from all transmitters
- Load - loads the output configuration matrix from the card
- Delete - deletes the card from the control panel configuration

Outputs from a maximum of 32 transmitters can be set for each relay card

UDA III AI8

- Label - user label
- Channel -> address - virtual RS485 address of the connected analog transmitter
- HART - activation of the HART protocol on the given input
- Default - clears the output configuration matrix from all transmitters
- Load - loads the output configuration matrix from the card
- Delete - deletes the card from the control panel configuration

6.11.12 Output settings

The dialog is used to set the parameters of the control panel's digital outputs. The first part of the dialog is the screen with the list of outputs and selecting the output will display the dialog of parameters of a specific output.

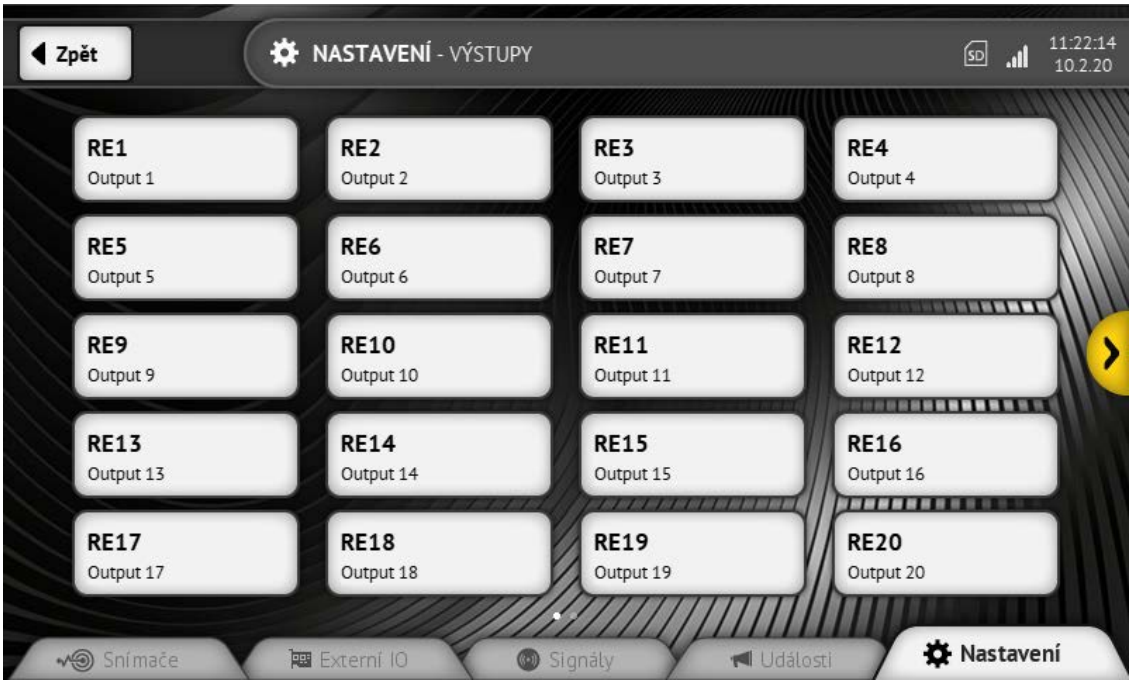


Figure 49-2 Settings - outputs

Figure 52 Output parameters

Dialog item	Description	User	Service
Description	Output label	×	✓
Cycler	The active output switches on/off with the specified period, 1:1 shift.	×	✓
Delayed shutdown	After activation, the output will not switch on until the specified delay.	×	✓

Delayed start	After deactivation, the output will not be switched off until the specified delay.	×	✓
Vote	Necessary number of channels requiring activation in order to close the output.	×	✓
Negated output	The negated output is closed in the idle state and opens when activated.	×	✓
Acknowledgment button	Enables the output deactivation function when the Acknowledgment button is pressed.	×	✓
Control panel failure	Activates the output in case of control panel failure	×	✓

Table 25 Output settings dialog

6.11.13 Communication interface

The dialog allows setting of individual communication interfaces of the control panel.

Figure 53 Communication interface

Dialog item	Description	User	Service
RS485_HOST	Universal RS485 interface (DEGA protocol, Modbus protocol)	×	✓
RS485_BUS	Interface for connecting DEGA transmitters	×	✓
USB DEGA slave	Enables the DEGA (DegaConfig) protocol on the USB interface. Otherwise, USB is used as a service terminal.	×	✓
LTE modem	SMS settings for alarms	×	✓
Ethernet	Ethernet interface and protocol settings	×	✓
Expansion cards	Setting up additional control panel IO cards	×	✓

Table 26 Output settings dialog

6.11.14 RS485_HOST settings

RS485_HOST is a universal RS485 interface that can be used to connect the control panel to a DEGA Visio system or service using DegaConfig (DEGA slave protocol). Or the Modbus protocol can be used to connect to a remote PLC.

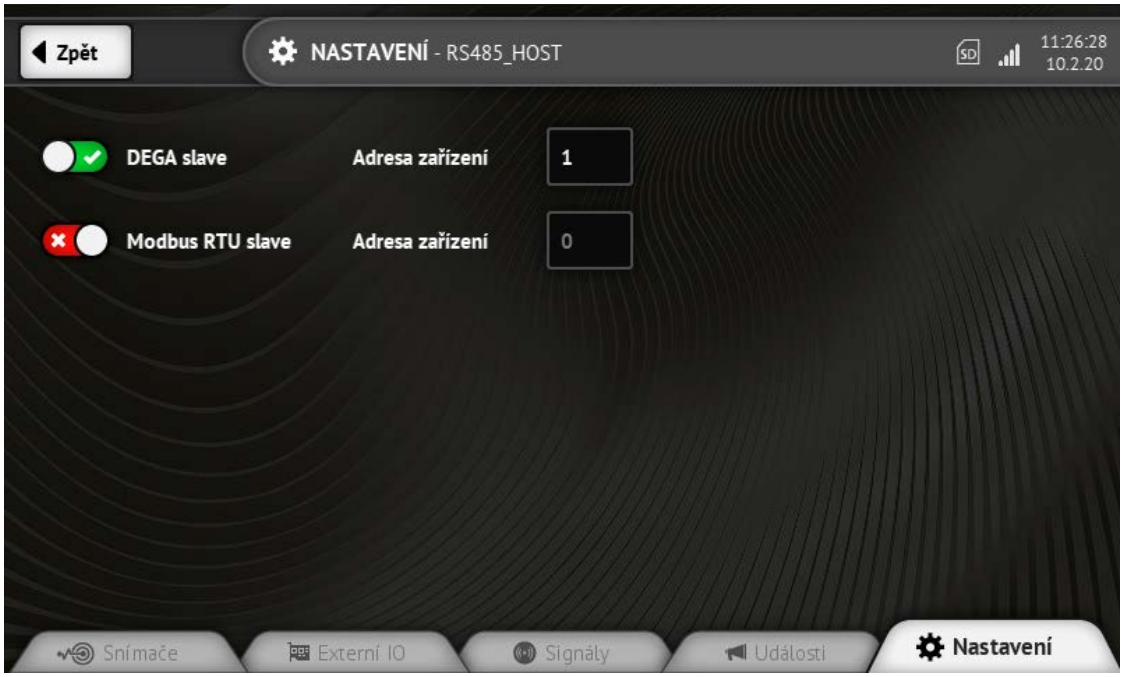


Figure 54 RS485_HOST settings

Dialog item	Description	User	Service
DEGA slave	Activate the DEGA slave protocol on the RS485_HOST interface	✖	✓
Modbus RTU slave	Activate the Modbus protocol on the RS485_HOST interface	✖	✓

Table 27 RS485_HOST settings dialog

6.11.15 RS485_BUS settings

RS485 interface for connecting DEGA transmitters to the control panel. The control panel contains a total of 4 interfaces marked RS485_BUS #0 to RS485_BUS #3. Depending on the settings, it is possible to use the individual interface as separate 4 segments or to connect two interfaces as one redundant segment. For redundancy mode, BUS #0 and BUS #1 or BUS #2 and BUS #3 are connected to each other - the RS485 line starts on one interface and ends on the other. Thanks to this, the control panel checks the correct function of the line and, in the event of a fault, detects an error without interrupting communication with the transmitters.

Figure 55 RS485_BUS settings

Dialog item	Description	User	Service
Transmitter initialization timeout	After the start, the control panel waits for the transmitters to start up and initialize. After this time, the control panel marks the transmitters that failed to initialize as faulty.	×	✓
RS485_BUS #0 & RS485_BUS #1 redundancy mode	Activation of redundancy mode between BUS #0 and BUS #1	×	✓
RS485_BUS #2 & RS485_BUS #3 redundancy mode	Activation of redundancy mode between BUS #2 and BUS #3	×	✓

Table 28 Output settings dialog

Tip: The transmitter initialization timeout value should take into account the number of transmitters connected to the control panel - the value in seconds should be higher than the number of configured transmitters.

6.11.16 LTE modem settings

The LTE modem is used to send SMS messages in the event of an alarm or transmitter failure to the specified telephone numbers. The SMS contains similar information as can be found in the record in the 'Events' tab. The control panel allows you to set a limit on the number of sent SMS to prevent overload of recipients in case of many events on a large network of transmitters.

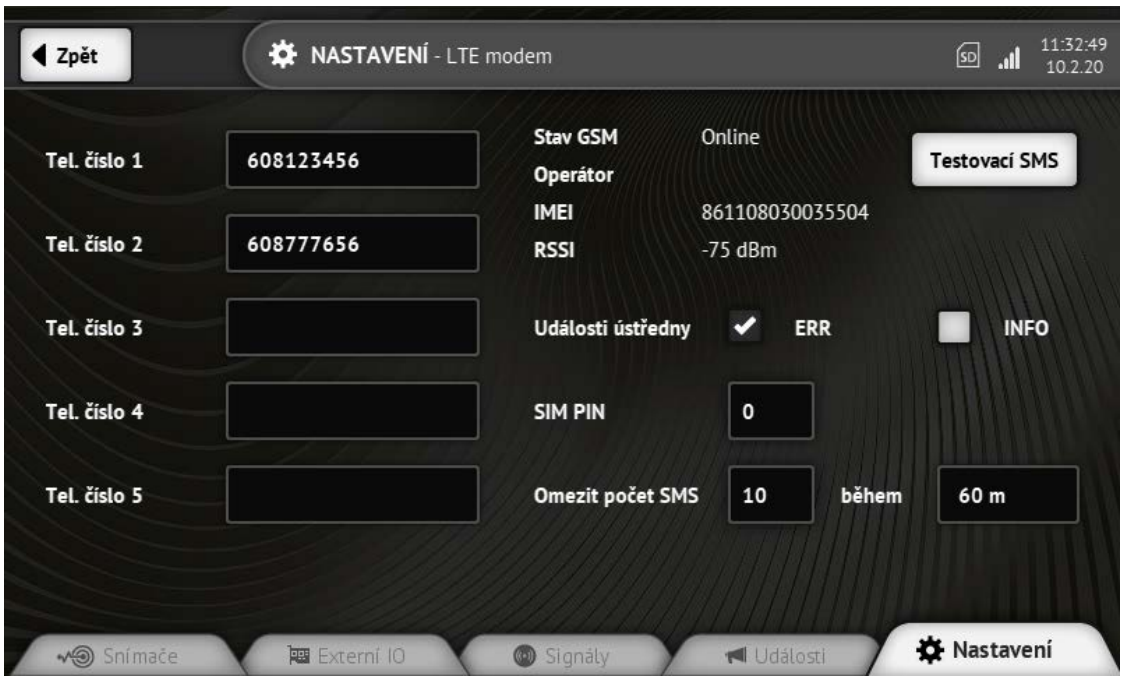


Figure 56 LTE modem settings

Dialog item	Description	User	Service
Tel. number X	Phone number for sending SMS. The control panel supports a maximum of 5 numbers to which it sends SMS messages. The same SMS will be sent to all numbers.	×	✓
Test SMS button	Sends a test SMS to all entered numbers	×	✓
ERR control panel event	Send SMS in case of ERR control panel event (error).	×	✓
INFO control panel event	Send SMS in case of INFO control panel event (notification).	×	✓
SIM PIN	Used if the SIM card requires a PIN	×	✓
Limit the number of SMS	Limits the maximum number of SMS that the control panel sends to individual telephone numbers in a given time interval. A value of 0 deactivates the function and sending SMS will not be restricted.	×	✓

Table 29 Output settings dialog

SMS message structure

TIME	NAME OF CONTROL PANEL	;	EVENT 1	;	…	EVENT n	;
SMS sending time	Control panel location	Separator	Event description	Separator		Event description	Separator

Table 30 SMS message structure

The SMS message sent by the control panel contains a header identifying the control panel that sent the SMS and the time of the event. This is followed by one or more events separated by a semicolon.

Event description:

CHxx	:	CHANNEL NAME	:	DESCRIPTION

The channel on which the event occurred	Separator	Transmitter location	Separator	Event description

Table 31 SMS - description of events

Example of an SMS message:

3/12/19 10:21 AM DEGA UDAIII; CH4: STORAGE A4: No alarm -> Alarm 1; CH4: STORAGE A4: Alarm 1 -> Alarm 2;

6.11.17 Ethernet settings

The ethernet interface can be used for remote monitoring with the DEGA VISIO visualization tool, to alert the user in the event of an alarm using classic email messages or to connect the control panel to a remote PLC using the Modbus protocol.

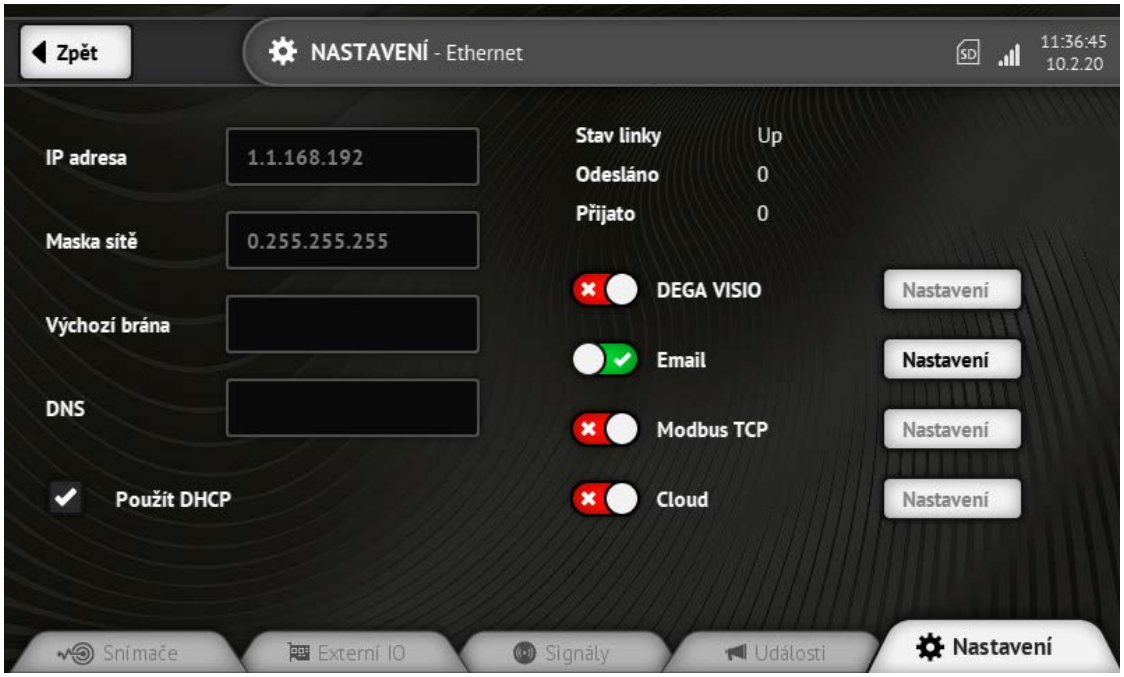


Figure 57 Ethernet settings

Dialog item	Description	User	Service
IP address	Static configuration settings - IP address	×	✓
Netmask	Static configuration settings - network mask	×	✓
Default gateway	Static configuration settings - default gateway	×	✓
DNS	Static configuration settings - DNS server	×	✓
Use DHCP	Enables dynamic configuration of the IP protocol using DHCP	×	✓
DEGA VISIO	Client enable / settings for DEGA VISIO server (visualization SW)	×	✓
E-mail	Enable / configure mail client for sending notifications	×	✓
Modbus RTU	Enable / set Modbus TCP protocol	×	✓
Cloud	Enable / configure the client to send process data to the data store	×	✓

Table 32 Ethernet settings

Tip: The ethernet interface is set to 100 mbit/s, full duplex. The autonegotiation function is not used.

6.11.18 Relay test

Using the dialog, you can manually activate/deactivate the control panel outputs and test the connected technology. Opening the dialog sets all outputs to the inactive state and pressing the corresponding output changes its state.

Figure 58 Relay test

Tip: Closing the dialog restores normal relay operation

6.11.19 Fictitious concentration test

The fictitious concentration test is used to test the control panel settings and verify the correct response to alarms from transmitters. When setting a fictitious concentration, the control panel behaves as if the given transmitter was measured by the transmitter itself. The response to the alarm corresponds to the channel configuration, the alarm is stored in the logs, etc. The forced concentration remains applied even after leaving the dialog, the user can check the status of the control panel in the other screens.

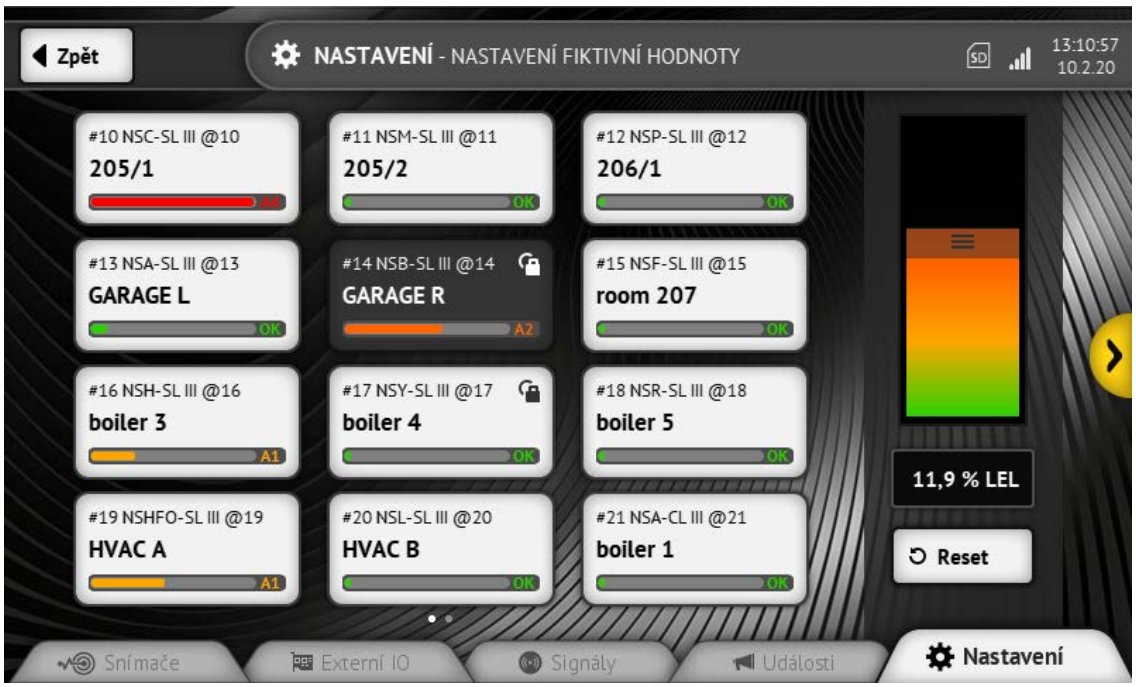


Figure 59 Fictitious concentration test

Dialog item	Description
Channel icon	Touching the icon selects a channel in the list for which a fictitious concentration can be 'forced'. Channels with a forced concentration contain a lock icon.
Fictitious concentration - slider	Slider for quick adjustment of the fictitious concentration of the marked channel.
Fictitious concentration - editbox	Editbox allows you to enter the exact value of the fictitious concentration of the selected channel.
Reset button	Restores normal channel operation.

Table 33 Dialogue test of fictitious concentration

Tip: After the set time has elapsed, the normal function of the channel will be restored automatically.

6.11.20 Transmitter blocking

In the event of a transmitter failure, the 'transmitter lock' function can be used to remove a channel from the list of active channels. The control panel with a blocked transmitter does not communicate and deactivates all signals (ALARMS) of the channel. Pressing a channel button locks the corresponding channel. Press again to unlock the channel. Blocked channels are indicated by a dark color and a red mark.

Figure 60 Transmitter blocking

Tip: blocked channels are automatically unblocked after the control panel is reset.

6.11.21 Service mode

The control panel service mode is used to block the output relays. It is used for the needs of service performed 'on the fly' when manipulation with the transmitter and the like could lead to the shutdown of the monitored technology. Pressing the output button blocks the corresponding output. Press again to unlock the output. Blocked outputs are indicated by a dark color and a red mark.

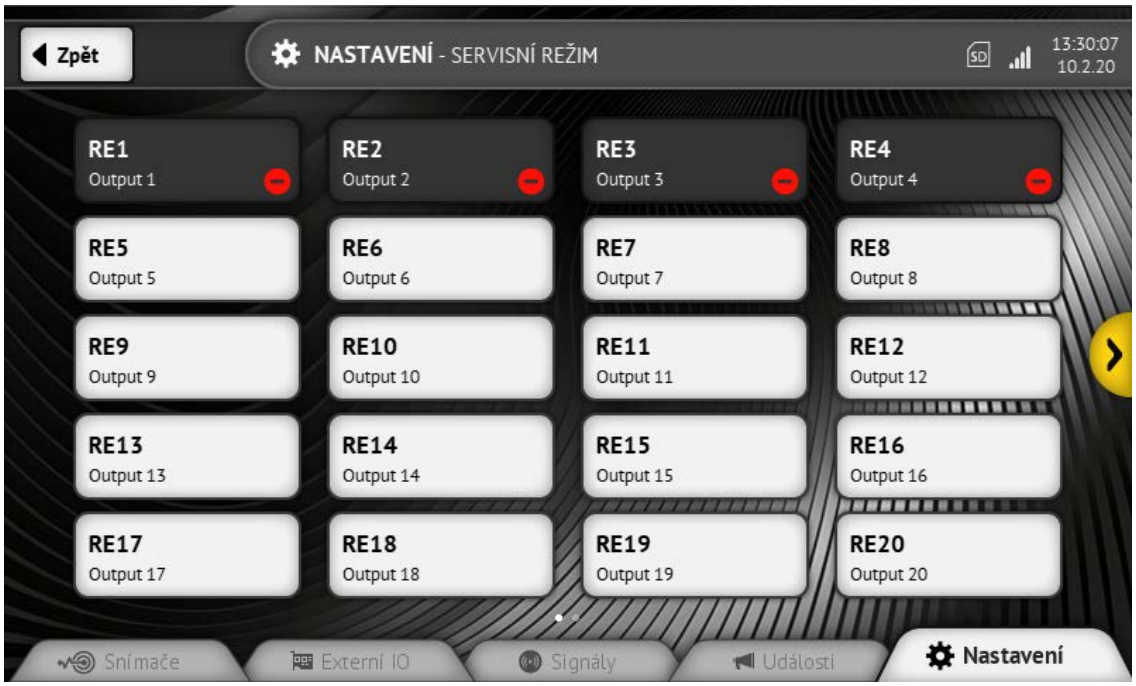


Figure 61 Service mode

Tip: the default time for automatically leaving the service mode is 4 hours.

6.12 FAQ

6.12.1 How to add a new transmitter

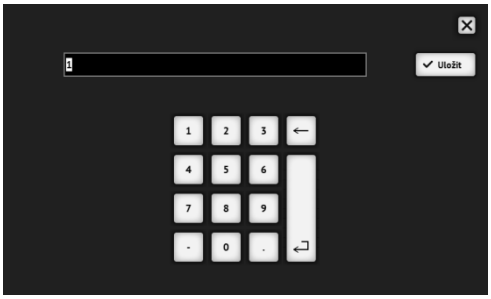
1	Settings → Transmitter settings → 'Add transmitter' button	
2	Enter the channel number for which the transmitter is added. It is recommended to use the channel number corresponding to the transmitter address (channel = address).	
3	Enter an address (if it does not match the channel number)	
4	Press the Load button - The parameters are read from the connected transmitter	
5	Optionally set channel: - enter a caption - change transmitter settings - set the output matrix Press the Back button	

Table 34 How to add a new transmitter

6.12.2 Acknowledgment of the alarm

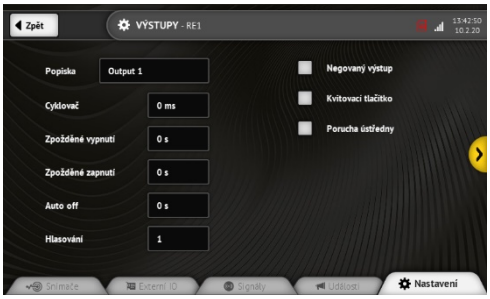
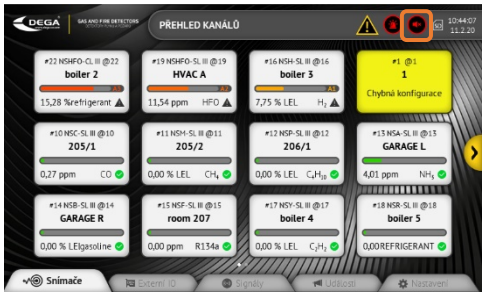
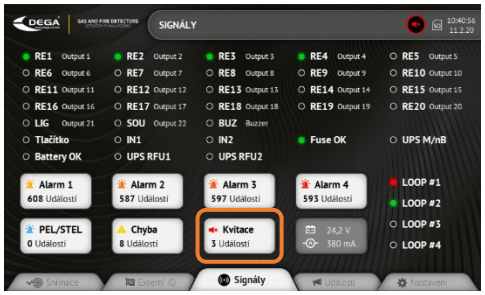
1	Settings → Output settings → select output	
2	Check the 'Acknowledge button' option	
3	If the corresponding output is activated, the acknowledgment icon appears in the status bar	
4	The alarm can be acknowledged by pressing an external button or by pressing the Acknowledgment button in the 'Signals' tab	

Table 35 Acknowledgment of the alarm

6.12.3 How to block a faulty transmitter

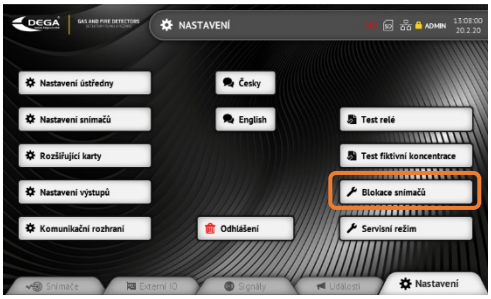
1	Settings → Transmitter blocking	
2	Click to select the channels you want to block.	
3	The marked channels are now inactive and the control panel ignores them.	

Table 36 How to block a faulty transmitter

6.12.4 How to name transmitters

1	Settings → Transmitter settings	
2	Let's go to the transmitter you want to name	
3	Change the user label	

Table 37 How to name a transmitter

7 Operation / Maintenance

In case of dirt, the surface can be cleaned with a slightly damp cloth as required. The connected transmitters must be serviced at regular intervals, in two ways:

Perform "calibration" and functional check once every 6 months - setting the sensitivity of the transmitter using a calibration gas, checking the functionality of the system. The exact interval depends on the cleanliness of the environment, the required accuracy, and the presence of interfering gases in the environment.

a) **1x in 12 months** perform "**calibration**" - setting the sensitivity of the transmitter using the calibration gas, checking the functionality of the system. The exact interval depends on the cleanliness of the environment, the required accuracy, and the presence of interfering gases in the environment. In addition, **a "functional check" must be performed once every 3 months** - check the function of the entire detection system with a test gas that does not exceed the range of the transmitter.

Substances for testing fire alarms must not be used for "functional inspection"!

Perform the calibration only in **certified services with a valid certificate of competence** or at **the manufacturer**.
For the Czech Republic, it is only DEGA CZ s.r.o.

7.1 Battery replacement

The battery life is 5-10 years and is used to back up the control panel's internal clock. See chapter 6.1.2 item 7 for battery location. A CR2032-size lithium battery is used

7.2 Fuses

See chapter 6.1.2 items 1 and 20. Tubular fuses 5x20 mm are used

1	Optical / acoustic signaling fuse T 5A
20	Power fuse T 6.3A

8 Side dishes

8.1 Modbus communication

Modbus RTU specification

Node type	Slave
Baud rate	9600
Data bits	8
Stop bits	1
Parity	none
Address	Can be set in DegaConfig
Protocol	RTU
Supported function code	3 - read holding register
Broadcast	No

Table 38 Modbus RTU specification

Modbus address	Modbus register	Type	Name	Description
0	40001	STR12	SN	Device serial number, string
…	…			
5	40006			
6	40007	STR8	Product	Product name, string (UDAIII)
…	…			
9	40010			
10	40011	WORD	TO	Digital outputs - status
11	40012	WORD	DI	Digital inputs - status
12	40013	INT16	Temperature	Equipment temperature [* 10 C]
1099	41100	INT32	Channel 1, 10 registers	Measured concentration [* 1000]
1101	41102	WORD		Alarms [bit flags]
1102	41103	INT16		Channel error code (0 - functional) - see the error code appendix in the transmitter manuals
1103	41104	INT32		TWA concentration [* 1000]
1105	41106	INT16		Sensor temperature [* 10 C]
1106	41107	WORD		Reserve
1107	41108	WORD		Reserve
1108	41109	WORD		Reserve
1109	41110		Channel 2	10 registers, same structure as channel 1
…	…		…	
1349	41350	INT16	Channel 250	10 registers, same structure as channel 1

Table 39 Mapping Modbus registers to device data

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
-	Calibration expired	PEL2	PEL1	Alarm4	Alarm3	Alarm2	Alarm1

Table 40 Alarm bitflags

General warranty conditions

If the installation, operation, and maintenance instructions are followed, the manufacturer grants a 24-month warranty from the date of receipt of the product. If the purchased product is to be commissioned by an entity other than the seller, the warranty period will start from the date of commissioning of the product, provided the buyer ordered commissioning within three weeks of receipt. The customer expressly acknowledges that during the warranty period exceeding the warranty period stipulated by the Commercial Code (statutory warranty period) it is not possible to request a replacement of the product or to withdraw from the purchase contract.

1. When claiming a product, it is necessary to submit proof of purchase of the item containing the following information: name and surname, name and business name of the seller, its identification number; in the case of a legal entity – name, identification number, and registered office; in the case of a natural person – first name, surname, place of residence, and warranty card if the buyer has received it from the seller. Failure to fulfill the obligations relating to the issue of the guarantee certificate shall not affect the validity of the guarantee.
2. The product (only complete equipment is accepted for warranty repair) during the warranty period can be claimed only from the seller where it was purchased, then the seller is obliged to hand over this product to an authorized service or manufacturer.
3. The prerequisite for recognition of rights under warranty is the installation of the product by an authorized person with a valid certificate from the manufacturer.
4. Complaints about a product defect, which can be remedied reasonably quickly without consequences, will be resolved by removing the defect (repair) or replacing a part of the product since in such a case it contradicts the nature of the thing to change the whole product (§ 616, paragraph 4 of the Commercial Code.
5. The buyer who enforces the right to warranty repair is not entitled to the issue of parts that have been replaced.
6. The warranty can be extended for a period of up to 48 months and extended beyond the scope of the warranty by concluding an individual warranty contract. More information can be obtained at a specific business meeting.

This warranty does not apply to:

- a transmitter that **has not been commissioned by a certified technician** with a valid manufacturer's certificate or by the manufacturer
- a transmitter on which **calibration and functional checks have not been regularly performed** by a certified service center with a valid certificate or by the manufacturer
- damage caused by fire, water, static electricity, overvoltage in the utility or public grid, accident, improper use of the product, wear and tear and mechanical damage,
- soiling the device transmitters and cleaning them
- damage caused by **improper installation, adjustment, modification** or use in an improper manner incompatible with the operating instructions, technical standards or safety regulations in force in the Czech Republic
- damage to the product during transport caused by improper manipulation or handling of the product in violation of the operating instructions
- DEGA products that **have been used with other than original DEGA products, including consumables or accessories**
- **calibration of transmitters**, i.e. setting detection limits
- **wear or destruction of the transmitter sensors, including the need for replacement**
- quickly wearable parts and consumables (e.g. transmitter removal key, gasket, etc.) that are damaged by normal wear and tear during operation and to wear of the product and its parts due to normal use.

The complete wording of the General Terms and Conditions and the Complaints Procedure can be found at www.dega.cz

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 User Manual ver.: 8/4/2020 1:59:00 PM