UI6xx

Communicative room units, Ethernet, PoE

Summary

The UI... room unit range is a family of universal communicative human-machine interface for control of HVAC units and plants, and IRC controllers. The units communicate over Modbus TCP / Ethernet and they can be used as open system components with majority of building control system and controllers. They are powered over Ethernet (PoE).

Application

- ▪ **ripening and cooling boxes, datacenters, controlled climate storage rooms, alarm messaging systems etc.**
- ▪ **systems with fancoils, convectors, floor and radiator heating, AHUs, air conditioning units.**
- ▪ **control of boilers, DHW, heating circuits, building controls in general**
- ▪ **monitoring of room temperature and humidity**
- ▪ **with a SCADA system: temperature, humidity and status recording, remote control.**

Function

The units acquire temperature and optionally relative humidity in room, temperature correction (knob) and required operation status which is set by push of the button or in menu. In the configurable menu following values can be set and displayed:

- - temperature, actual temperature correction
- - humidity (actual value only at room units containing the humidity sensor)
- - time (only display at room units with RTC)
- - basic setpoint - day
- - basic setpoint - night
- - outside temperature for heating enable
- - DHW temperature
- - heating curve type (1...4)
- - operation mode (Residential with Day, Night, Time schedule, Off, or Hotel / Office with Comfort, Standby, Party, Off)
- - fan stage (Auto, Off, St.1, St. 2, St. 3)
- - A/C mode (Auto, Heating, Cooling, Off, Fan only)

- weekly scheduler: 7 days, up to 6 events per day
- another 5 variables (air quality, fan speed etc.) – each has a profile where max. and min. values, step, number of decimals, and symbol set are defined.

It is also possible to set / reset any of the LCD symbols on the display over Modbus.

The turn / push knob has three basic functions:

- instant edit (turning the knob) – settings of one predefined analogue value, usually room temperature correction
- quick edit (short push) – change of predefined state, e.g. Presence (Comfort / Standby / Off), Air condition (Auto / Heating / Cooling / Fan only / Off) etc.
- long push – jump to menu where values are listed by turning the knob, short push selects the value to be edited, and the value is changed by turning the knob followed by short push for confirmation.

After definable inactivity time, the display goes back to its basic state with rolling display of selected values (e.g. actual temperature and humidity).

The unit functionality is defined over the Ethernet interface with service software **ModComTool** which is free for download at **http://domat-int.com/en/downloads/software**. To interface the room unit to the computer use an Ethernet cross cable or switch.
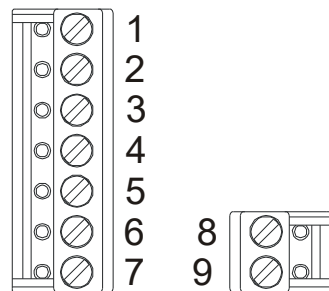
Default IP address is 192.168.1.99.

The integrated temperature sensor range is -20 to +70 °C. Read and entered values are available at the bus where a controller or SCADA can read them. The supervising system can also write values to the unit (operation mode, fan stage, etc.), which are displayed on a large LCD display. Models with digital inputs and outputs also have those data available. A control algorithm must be implemented in the master; for independent communicative control use the UC..., FC... controllers.

Technical data		
Power supply	active PoE, 20 mA at 46 V	
	passive PoE: 40...50 V, typical 48 V	
Consumption	3 W	
Temperature measuring range	-20 ÷ 70 °C, accuracy according to DIN IEC 751, Class B	
Humidity measuring range (selected types only, see table below)	10 ÷ 90 %rH (30-70% ± 3.5%, 10-90 ± 4.5%)	
Protection	IP20	
Powering of inputs (selected types only)	external power, 24 V AC or DC, 5 mA, max. switching frequency 10Hz	
Outputs (selected types only)	1x - 2x solid state relay, zero switching, AC or DC load, 24 V, maximum switched current 0,4 A	
Setpoint	according to configuration, ± 10 to ± 1 K	
Communication	Ethernet 10 Mbit/s:	
	Modbus: TCP port 502, max. 3 TCP connections	

web (http): TCP port 80

Default IP address: 192.168.1.99.

Display	LCD 60 x 60 mm, symbol set see above
Terminals	screw terminals for wires 0,14 – 1,5 mm^2
Cover	ABS, RAL9010
Weight	0,13 kg
Dimensions	see below

Terminals

As seen when removing the display part.

The wiring goes towards the center of the unit so that the cable can be brought through the aperture in the middle of the bottom part.

UI6x1 (no hardware inputs / outputs)

1:    not connected
2:    not connected
3:    not connected
4:    not connected
5:    not connected
6:    not connected point
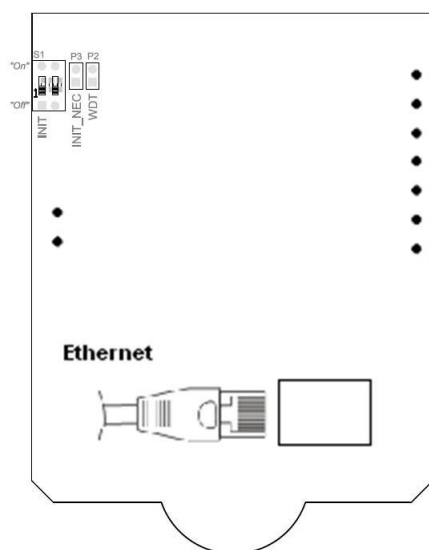7:   not connected

UI6x2 (one binary SSR output)

1:    G   power (+)
2:    NC   not connected
3:    DO1   digital output 1
4:    NC   not connected
5:    NC   not connected
6:    G0   power, output – common point
7:    G   power, output – common point

UI6x5 (2 binary inputs, 2 binary SSR outputs)

1:    G   power (+)
2:    DO2   digital output 1
3:    DO1   digital output 1
4:    DI2   input2, activated by connection to G0
5:    DI1   input1, activated by connection to G0
6:    G0   power, inputs – common point
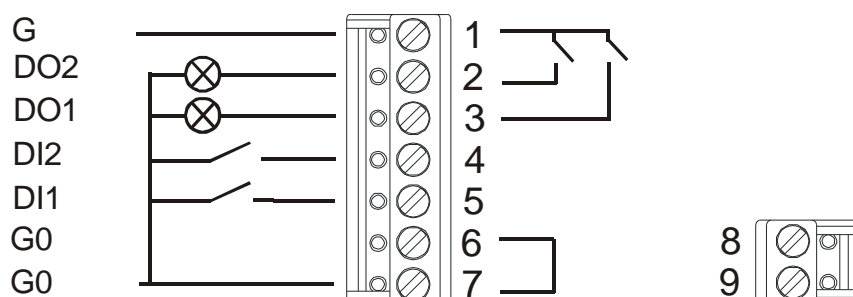
7:     G0   power, inputs – common point

DIP switches

Back of the PCB

USR: in the ON position, the web access is blocked to increase security

INIT: to set default IP values (IP address 192.168.1.99, mask 255.255.255.0, default gateway 192.168.1.1) set the INIT switch to ON and apply power. After new values have been set and saved over the web interface, set the INIT switch back to OFF, so that the new data is not overwritten by the default values at the next reboot, and switch the power off and on.
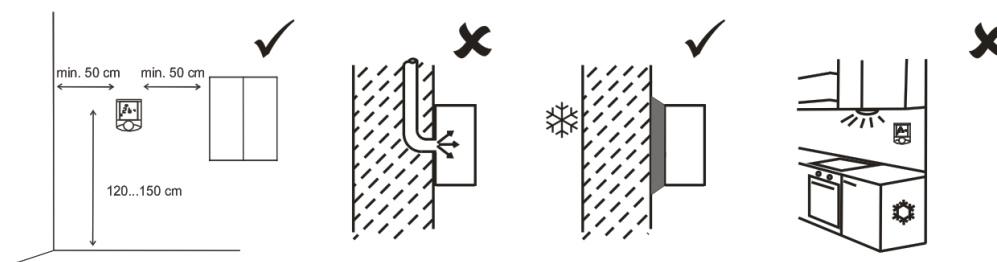
Peripherial connection

Installation

Units are intended for operating in a normal and chemically non-aggressive environment. They do not need any servicing or maintenance. Install them in a vertical position at places where they can be operated easily and measure correct values of temperature and humidity, i.e. in the height of about 150 cm, with no direct sunlight or other heat / cool source (AHU outlets, refridgerator, electrical appliances). The device consists of two parts: bottom with screw terminal block and cover containing PCB, display, and the knob. The bottom part is fixed by 2 or 4 screws to any flat surface or a flush-mounting box Ø 60 mm. At the back of the bottom there is an aperture for cabling. The bottom should be installed and cabling connected first, and the upper part inserted after the construction works have been finished to prevent damage to the unit.

Seal the conduits to avoid influencing the sensor by draught. Use insulating pad when installing the sensor on cold walls. Avoid sensor exposition to sunlight or other heat sources.

Opening the cover

When removing the display part, proceed as follows:

- press gently the side parts of the unit and pull the right of the display part by several milimeters
- pull the left of the display part
- pull the display part and remove it from the bottom.

Do not bend the display part too much, the connector pins could be damaged. The locks are only at the sides of the display part, not at the top nor bottom.

When removing the Ethernet cable, use a small flat screwdriver or similar tool to bend the Ethernet connector lock and unplug the cable at the same time.

Network settings

The IP address and other network parameters are set over a web interface. The INIT switch in the ON position sets the default IP parameters:

IP address	192.168.1.99
Network mask	255.255.255.0
Default gateway	192.168.1.1

All the parameters, input and output properties etc. are stored in the EEPROM memory.

The unit communicates with the master (SCADA, PLC) over Ethernet 10 Mbit/s using Modbus TCP and it can be used in a range of systems. The register description is available in a separate document Room units UI... – Communication description. User manual for domat.exe and detailed description of the room unit functions find in the document Room units configuration – User manual.

Communication

The Ethernet interface may be connected to following systems:

- process station IPCT.1 (8" colour touch screen, for local operation, web access, alarms over e-mail and SMS, link to RcWare Vision or another SCADA over Ethernet)
- direct to the RcWare Vision SCADA (plant graphics, trends, SMS alarms, web access...)
- any SCADA or PLC using Modbus TCP communication
- to a PC with web browser for initial settings, reading of values and outputs control.

When communicating with a PC over Ethernet cross cable, some network cards do not autodetect the physical communication speed and the units are not available. This can be fixed by setting communication speed of 10 Mbit/s in the network card driver properties in your PC. Make also sure that your PC has a fixed IP address in the

192.168.1.x range and corresponding network mask (this may not be valid for other than default settings). The IP address must be different from that of the unit.

Both the Ethernet RJ45 socket and power terminals are within the unit. The cables can thus be lead through the apertures in the bottom part of the device and are not visible from the outside. Use flush mounting box for optimum installation.

Power

Use a switch or injector with PoE supply. Otherwise the unit will not operate. It is not possible to use another power supply than PoE (in case of 10..35 V DC or 12..24 V AC external power, use UI5xx).
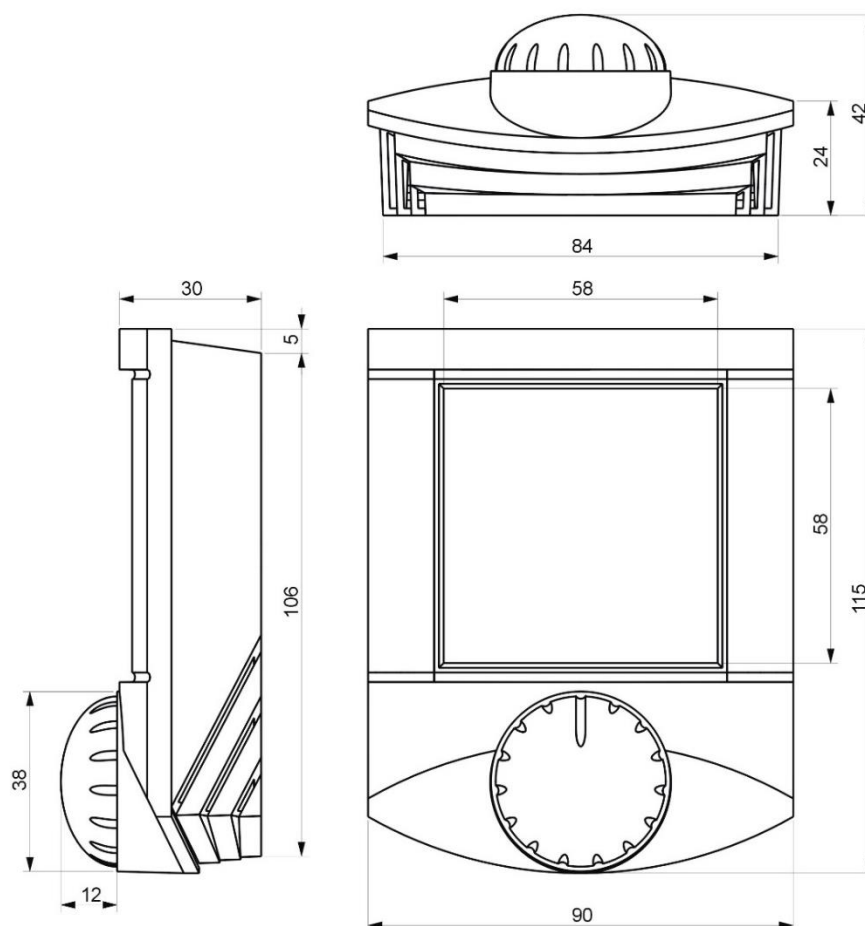
Display

Over Modbus, it is possible to set / reset the complete symbol set except for the 7 segment digits, „Error" and „Setting" texts, and symbols of °C, °F, %, and rH. Those are part of the configurable menu profiles. The register description is available in a separate document *Room units UI... – Communication description.* User manual for ModComTool and detailed description of the room unit functions find in the document *Room units configuration – User manual.*

LCD symbol set

Type table

Type	LCD	Knob	DI	DO	t	rH	RTC
UI611	✓	✓	-	-	✓		
UI612	✓	✓	-	1	✓		✓
UI620	✓	✓	2	2	✓		✓
UI641	✓	✓	-	-	✓	✓	
UI642	✓	✓	-	1	✓	✓	✓
UI645	✓	✓	2	2	✓	✓	✓
UI661	✓		-	-	✓	✓	
UI671			-	-	✓		
UI681			-	-	✓	✓	
UI685			2	2	✓	✓	✓

Dimensions

All dimensions in *mm*.

RoHS notice   The device contains a non-rechargeable battery which backups the real-time clock and part of the memory. After the device is not operable, please return it to the manufacturer or dispose of it in compliance with local regulations.

Safety note   The device is designed for monitoring and control of heating, ventilation, and air conditioning systems. It must not be used for protection of persons against health risks or death, as a safety element, or in applications where its failure could lead to physical or property damage or environmental damage. All risks related to device operation must be considered together with design, installation, and operation of the entire control system which the device is part of.

Changes in versions

04/2015 – Change of DIP switch schema.

09/2016 – Edited format and deleted Related products.

03/2017 – Added picture and description of the installation and link on the datasheet with other colors.

10/2017 – Added Safety note.

05/2018 – Change of technical data.

08/2018 – Change of type table.

10/2020 – Box Ø corrected, added max. switching frequency and terminal description, new logo.

12/2020 – Added types UI671 and UI681.

11/2021 – Added default IP address, new logo.