domat

MEMBER OF CEZ ESCO

UX0…

Communicative room units with sunblind control

Summary

The UX… room unit range is a family of universal communicative human-machine interface for control of HVAC units and plants, IRC controllers, and blinds. The units communicate over Modbus RTU / RS485 and they can be used as open system components with majority of building control system and controllers.

Application

- ▪ **rooms with heating / air conditioning and sunblinds.**
- ▪ **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 (left / right button), sunblind correction (up / down button) and required operation status (central button or in the 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 multifunction button set has three basic functions:
- instant edit (left / right button) – settings of one predefined analogue value, usually room temperature correction
- sunblind up / down (up / down button) – control of two digital outputs with sunblind control functionality (slat angle, up / down, move to end positions)
- quick edit (short push of the central button) – change of predefined state, e.g. Presence (Comfort / Standby / Off), Air condition (Auto / Heating / Cooling / Fan only / Off) etc.
- long push of the central button – jump to menu where values are listed by left / right buttons, short push selects the value to be edited, and the value is changed by left / right buttons 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 Modbus address and functionality is defined over the RS485 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 the USB/485 converter **M080**, RS232/RS485 converter **R012**, or any suitable RS485 converter.

Technical data

Power supply	24 V AC +/- 10%
Consumption	1.5 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
Inputs	1x for dry contacts, 24 V AC, 5 mA
Outputs	3x solid state relay, zero switching, AC load, 24 V AC, maximum switched current 0,4 A
	Use ME200 relay module for power switching of the sunblind motors.
Communication	RS485 - Modbus RTU, slave, selectable speed 1200 ... 115200 bps, N,8,1
	The interface is optically separated.
Display	LCD 60 × 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

DIP switches
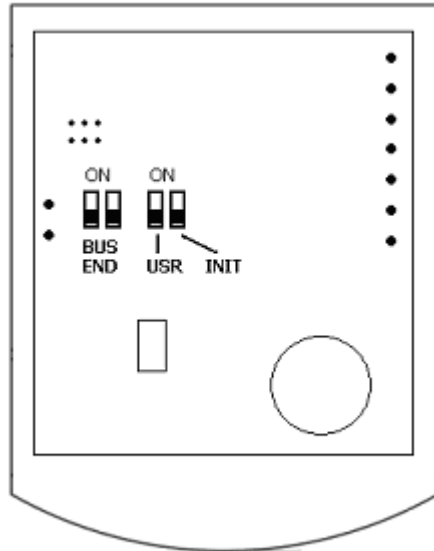
Back of the PCB

BUS END: if ON, the bus is terminated (if last device on the line)

USR: not used, reserved for future applications

INIT: sets the controller into default state and sets bus address to 1, baud rate to 9600. To init, proceed as follows:
- connect the device over RS485 to a PC with domat.exe config tool
- set INIT to ON
- apply power (use only the connector without bottom)
- find the controller in the tool (Scan)
- set INIT to OFF
- in the ModComTool tool, open the controller window
- click the Init button in the tool
- remove and apply power.

Terminals
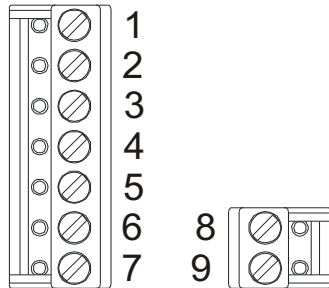
UX0...: 1 binary input, 3 binary SSR outputs

1: DI1   input 1
2: DO1   output 1, 24 V AC against G0
3: DO2   output 2, 24 V AC against G0 – sunblind up
4: DO3   output 3, 24 V AC against G0 – sunblind down
5: G0   power, outputs, input – common point
6: G0   power, outputs, input – common point
7: G   power

8: K-   communication RS485 -
9: K+   communication RS485 +
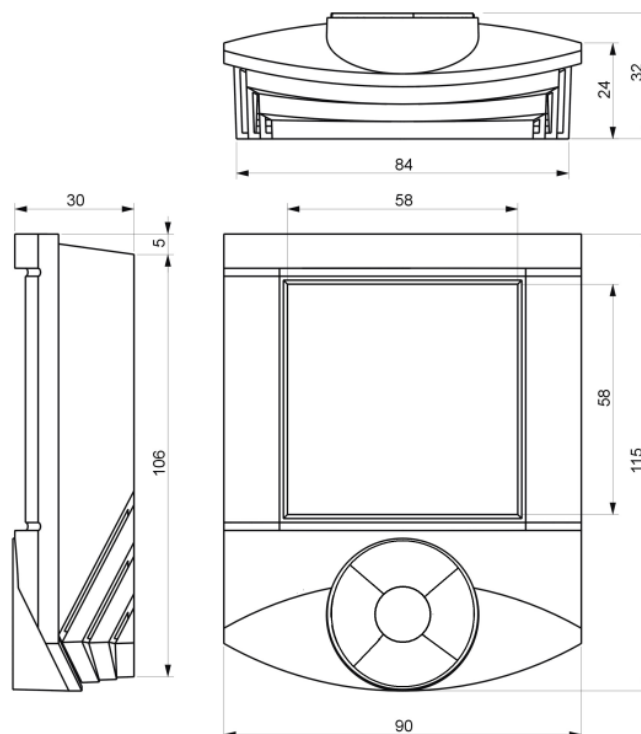
Type table	Type	LCD	5 buttons	DI	DO	t	rH	RTC
	UX011	✓	✓	1	3	✓		
	UX015	✓	✓	1	3	✓		✓
	UX041	✓	✓	1	3	✓	✓	
	UX045	✓	✓	1	3	✓	✓	✓

RTC... real time clock

Process control algorithms (evaluation of the temperature sensor and digital input DI1, activating of the DO1 output by increased / decreased temperature, humidity etc.) and central sunblind override must be implemented in the master controller.

Dimensions

All dimensions in *mm*.

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 50 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.
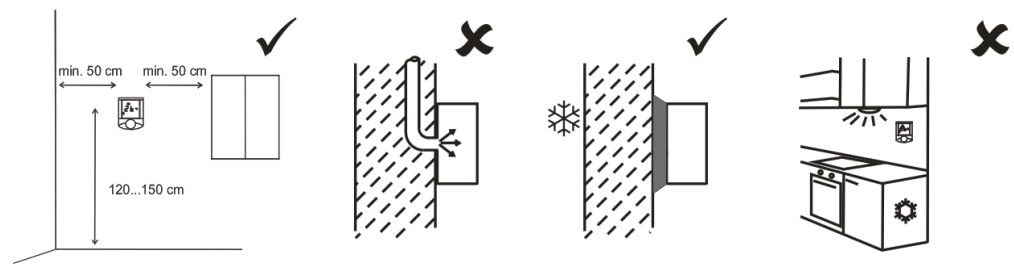
Opening the cover

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 millimeters
- 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.

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.*

The integrated temperature sensor range is -20 to +70 °C. Read and entered values are available at the RS485 bus where a controller or SCADA reads 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. It is possible to control the sunblind operation as central building function, such as „fully closed" at night time, „fully open" at strong wind, etc. Those commands must be programmed in the BMS and communicated over the RS485 bus to the room unit. A control algorithm must be implemented in the master; for independent communicative control use the UC..., FC... controllers.

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	09/2016 — Changed the format and reference to the configuration software. 03/2017 — Added picture and description of the installation. Add link on the datasheet with other colours. 05/2018 – Change technical data. 10/2023 – Change of the logo