The on-wall controller serves to measure temperature and relative humidity in the room. It is equipped with a button for fan mode selection within the room mode selection, a knob for regulation of the correction value of the setpoint temperature and 6 LED indicators. Communication by the protocol MODBUS RTU.

Revision history

Version	Date	Changes
100	20. 11. 2017	New document.
101	25. 04. 2019	Updated program and document name.

Basic Parameters

Controller type	AMR-OP35ARH
Communication	RS485
Protocol	MODBUS RTU Slave

Files

Program	ta_op35arh_fw01m_xxx.dso
Version	1.01
Operation Manual	amr-op3xarh_g_en_xxx.pdf
Download	amitomation.com

User operation

Measured room temperature and humidity

Room temperature and humidity measurement period is pre-set to 30 s (the user can change it in the application project *.dso in properties of the object `Timer1`).

Room mode

The user changes the room mode by pressing and releasing the controller button. The settings offer modes Comfort or Time Plan.

Fan mode

The user sets the fan mode within the selected room mode by pressing and releasing the button. The cycle of changing the mode of the room and fan by the button (controller plugged into power supply) is as follows:

Time plan
- AUTO
- OFF
- I
- II
- III

Comfort
- AUTO
- OFF
- I
- II
- III

Time plan
- AUTO
- …

Correction of setpoint room temperature

The user changes the correction value of desired temperature using the knob on the controller, in the range -100 to 100. The corresponding extent of the correction in °C is determined by the superior system.

LED

The corresponding lit LEDs indicate the selected room mode and fan mode. The Comfort mode is indicated by LED being on at the sun symbol. The LED is off in the Time Plan mode. The fan mode is indicated by one of the LEDs located in vertical order next to the printed description of fan modes. The lit LEDs move in order from the top down. If the lowest LED is on and the user presses and releases the button, the room mode changes (the LED indicator at the sun symbol lights up or turns off), and the upper LED indicating the fan mode lights up.

The user adjusts the LED brightness in the superior system. After the application is installed in the controller, the brightness intensity is set to maximum. If some of the LEDs is on and a communication failure with the superior system has been indicated (see below programmer operation), the LED starts flashing in the interval of 1 s and brightness intensity at 60 %.

Programmer operation

The sample application supports the following functions in the communication network MODBUS RTU:

- function 3 – output register reading,
- function 16 – output register setting.

System Registers Disposition

Name	Address	Type	Description
Module ID	0	R	HW identification (150 = AMR-OP3xARH).
FW	1	R	Firmware version. The value is taken from the project *.dso in the form: (version major × 256 + verseion minor).
Time	2 3	R/W	System time. The number of seconds passed since 1.1.1980, 0:00:00. The value is saved in the format BigEndian.
Guard Time	4	R/W	The number [ms] for MODBUS communication failure assessment. Zero value causes permanent disconnection and Error status. Saved in memory EEPROM.
Baud Rate	5	R/W	Communication speed. Saved in memory EEPROM.
Parity	6	R/W	Parity. Saved in memory EEPROM.
Address	7	R/W	Address. Saved in memory EEPROM.
System Status	8	R/W	System status register, uses the system, not accessible through application.

Disposition of User Registers

Name	Address	Type	Description
Status set	100	W	Bits description: **Bit** / **Description** 0 – No meaning. 1 – Setting bit 1 of the Status register. … – … 7 – Setting bit 7 of the Status register. 8 to 15 – No meaning. *)
Status reset	101	W	Bits description: **Bit** / **Description** 0 – Resetting bit 0 of the Status register. … – … 7 – Resetting bit 7 of the Status register. 8 to 15 – No meaning. *)
Status	102 to 103	R	Bits description: **Bit** / **Description** 0 – Value change from the controller. This bit is set when the value of some of the registers is changed by the on-wall controller. This bit value has no affect on the controller function.

<table>
<tr><th>Name</th><th>Address</th><th>Type</th><th>Description</th></tr>
<tr><td>Status</td><td>102 to 103</td><td>R</td><td>
<table>
<tr><th>Bit</th><th>Description</th></tr>
<tr><td>1 and 2</td><td>Room mode:
<table>
<tr><th>Bit 2</th><th>Bit 1</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>Time plan</td></tr>
<tr><td>0</td><td>1</td><td>Energy saving</td></tr>
<tr><td>1</td><td>0</td><td>Comfort</td></tr>
</table></td></tr>
<tr><td>3</td><td>See the text below the chart.</td></tr>
<tr><td>4 to 6</td><td>Fan mode:
<table>
<tr><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>Off</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>Level 1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>Level 2</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>Level 3</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>Auto</td></tr>
</table></td></tr>
<tr><td>7</td><td>See the text below the chart.</td></tr>
<tr><td>8 to 32</td><td>No meaning.</td></tr>
</table>
</td></tr>
<tr><td>Correction (Float)</td><td>104 to 105</td><td>R/W</td><td>Correction [%]. Range: -100 to 100 with floating decimal point.</td></tr>
<tr><td>Temperature setpoint (Float)</td><td>106 to 107</td><td>R/W</td><td>Temperature setpoint [°C] with floating decimal point.</td></tr>
<tr><td>Measured temperature (Float)</td><td>108 to 109</td><td>R</td><td>Measured temperature [°C] with floating decimal point.</td></tr>
<tr><td>Measured humidity (Float)</td><td>110 to 111</td><td>R</td><td>Measured relative humidity [%] with a floating decimal point.</td></tr>
<tr><td>LED brightness (Float)</td><td>112 to 113</td><td>R/W</td><td>LED brightness [%]. Range 0 to 100
0 = minimum brightness (LED is not off), 100 = maximum brightness.</td></tr>
</table>

*) *When the True value is written simultaneously to bits of the "Status reset" and "Status set" registers providing both resetting and setting the same bit, the resulting value is True (the predominant Set).*

Note

The given on-wall controller actively works with registers with addresses 100 to 105, and 108 to 113. Other registers are not actively processed by the controller. Reading/writing from/to these registers is feasible, the controller ignores their value and the value does not affect the controller functions.

Bits 0 to 7 of the "Status" register are set to value 1 after the on-wall controller restart (power supply on/off). The controller has no valid room mode value (Time Plan / Energy Saving / Comfort). The correct value can be written only from a superior control system. The same status occurs after the "Guard Time" period elapses in the event of a communication failure.

Regular reading of the "Status" register is recommended as well as checks on its value status.

If reset or communication failure is indicated (bits 0 to 7 of the "Status" register are set to "1"), it is necessary to renew the room mode status by writing correctly set registers "Status reset" and "Status set", or refresh the "Guard Time" value too that always returns to the pre-set value 30,000 ms after a reset.

HW configuration

Application settings

- address 1
- speed 38,400 bps
- parity even
- stopbit 1

Parameter setting

- programme AMRConfig
  DetStudio