

AMR-UI2RDO2 controller as I/O module allows reading digital or analogue inputs and controlling relay outputs through MODBUS RTU protocol communication registers.

History of revisions

Revision	Date	Author of change	Changes
100	14. 7. 2016	Kupčák M.	New document

Basic parameters

Controller type	AMR-UI2RDO2
Communication	RS485
Protocol	MODBUS RTU (Slave)

Files

Program	ta_ui2rdo2_io01m_xxx.dso
Version	1.00
Operation manual	amr-ui2rdo2_g_en_xxx.pdf
Download	www.amitotation.com

User operation

Sample application provides remote input / output function. Controller functions are set from superior system.

Programming operation

Digital inputs

AMR-UI2RDO2 controller has 2 universal inputs that can be used as dry contacts.

Analogue inputs

AMR-UI2RDO2 controller has 2 universal inputs that Ni1000 (6180 ppm) / Ni1000 (5000 ppm) / Pt1000 sensors can be connected to. Default sensor type set in application is Ni1000 (6180 ppm). It is necessary to change IO object setting in *.dso project for different sensor type.

Safe state

In case that communication is interrupted, automatic mechanism implemented in application for output shutdowns takes effect. The time for turning outputs off into safe state is given by GuardTime value. This value can be changed in *.dso project in "Properties" panel of **ModbusSlave** object. Default set value is 10 000 ms.

The safe state corresponds to opened relay outputs.

Sample application has predefined the following communication registers and supports following functions in the MODBUS RTU communication protocol:

- ◆ function 1 – read coils,
- ◆ function 2 – read discrete inputs,
- ◆ function 3 – read multiple holding registers,
- ◆ function 4 – read input registers,
- ◆ function 5 – write single coil,
- ◆ function 6 – write single holding register,
- ◆ function 15 – write multiple coils,
- ◆ function 16 – write multiple holding registers.

The register values are saved in BigEndian format.

System holding registers layout

Name	Address	Type	Description
Module ID	0	R	Module identification. Number indicates type of unit, is given by HW type.
FW	1	R	Firmware version, taken from the project
Time	2 and 3	R/W	System time. Number of seconds since 1.1.1980, 0:00:00. Number with fixed decimal point.
Guard Time	4	R/W	Number of [ms] for evaluation of MODBUS communication interruption. A zero value causes permanent disconnection. Saved in EEPROM memory.
Baud Rate	5	R/W	Communication rate. Saved in EEPROM memory.
Parity	6	R/W	Parity. Saved in EEPROM memory.
Address	7	R/W	Address. Saved in EEPROM memory.
System Status	8	R/W	System status register, used by system; it cannot be accessed by the application.

User holding registers layout

Name	Address	Type	Description
hr_DAI	100 (bit 0 and 1)	R	Digital inputs status. Bit 0 – UI0 Bit 1 – UI1
hr_UI_Ni0	110 and 111	R	UI0 analogue input reading. Number with floating decimal point.
hr_UI_Ni1	112 and 113	R	UI1 analogue input reading. Number with floating decimal point.
hr_RDO	200 (bit 0 and 1)	W	Relay output writing. Bit 0 – RDO0 Bit 1 – RDO1

Input registers layout

Name	Address	Type	Description
ir_DAI	0 (bit 0 and 1)	R	Digital inputs status. Bit 0 – UI0 Bit 1 – UI1
ir_UI_Ni0	1	R	UI0 analogue input reading. Measured temperature = register value / 10
ir_UI_Ni1	2	R	UI1 analogue input reading. Measured temperature = register value / 10

Coils layout

Name	Address	Type	Description
c_RL0	0	W	RDO0 relay output writing.
c_RL1	1	W	RDO1 relay output writing.

Discrete inputs layout

Name	Address	Type	Description
di_DI0	0	R	UI0 digital input status.
di_DI1	1	R	UI1 digital input status.

HW configuration
Application settings

- ◆ address 1
- ◆ rate 38 400 bps
- ◆ parity even
- ◆ stopbit 1

Changing parameters

- ◆ by program AMRConfig
DetStudio