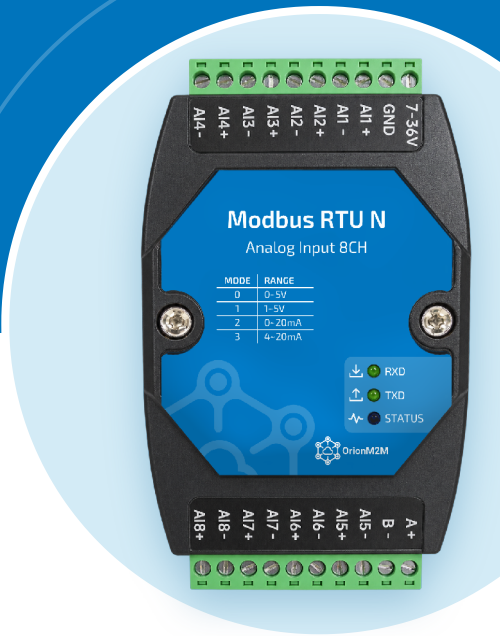
OrionM2M

INDUSTRIAL I/O MODULES

Modbus RTU N

8 DI + 8 DO · 8 AI · 8 AO · RS-485 Modbus RTU · DC 7...36 V



01 FEATURES

- 8 DI + 8 DO, 8 AI or 8 AO in the same housing
- RS-485 Modbus RTU: address 1...255, up to 256,000 bit/s
- DC 7...36 V supply, isolated power and RS-485
- Resettable fuse, TVS, reverse-polarity protection
- AI: 12-bit, current or voltage selectable per channel
- DO up to 500 mA: DI linkage and pulse (flash) modes

APPLICATIONS

- Status and alarm signals in BMS
- Valves, dampers, VFD setpoints
- 4–20 mA and 0–10 V sensors
- I/O expansion over RS-485

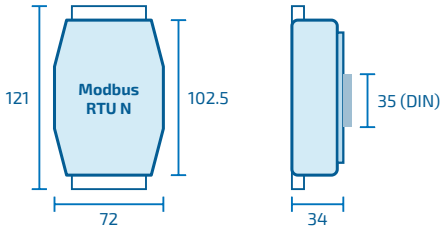
02 GENERAL

Power supply	**DC 7...36** V
RS-485 and power isolation	**galvanic**
Channel isolation DI/DO · AI/AO	**optical · magnetic**
Fuse	**resettable**
Protection	**TVS · reverse polarity**
Indicators	**RXD · TXD · STATUS**
Channel LEDs on DI/DO	**16** LEDs
Mounting	**35 mm DIN rail** side by side

03 COMMUNICATION

Interface · protocol	**RS-485 · Modbus RTU** slave
Baud rate	**4800...256,000** bit/s
Factory settings	**9600, 8N1** · address 1
Parity	**none · even · odd**
Address · broadcast	**1...255 · 0**
Function codes, DI/DO	**01 02 03 05 06 0F 10** hex
Function codes, AI · AO	**03 04 06 10 · 03 06 10** hex
Line termination	**120** Ω, external

04 DIMENSIONS AND MOUNTING



- All versions use the same housing: 72 × 121 × 34 mm including terminals; 102.5 mm high without terminals.
- Snaps onto a 35 mm DIN rail; modules mount side by side with no gap.
- Power on the top terminal block, RS-485 on the bottom one; signal terminals on both.
- Address and baud rate are set by a Modbus command; there are no switches on the housing.

05 VERSIONS

Parameter	8 DI + 8 DO	8 AI · 5 V	8 AI · 10 V	8 AO · current	8 AO · 10 V
SKU	**RTU-N-8DIO**	**RTU-N-8AI**	**RTU-N-8AI-10**	**RTU-N-8AO-I**	**RTU-N-8AO-U**
Signal	DI 5...36 V · DO 5...36 V	0–5 / 1–5 V, 0–20 / 4–20 mA	0–10 / 2–10 V, 0–20 / 4–20 mA	0–20 mA	0–10 V
Input / output type	DI: dry contact, NPN, PNP DO: open drain (sinking)	differential or single-ended	differential or single-ended	current	voltage
Output load	DO ≤ 500 mA per channel	—	—	20 mA into 500 Ω at supply ≥ 14 V	≤ 100 mA per channel
Resolution · accuracy	—	12-bit · ≤ 3 %	12-bit · ≤ 3 %	12-bit (1 µA) · ±0.03 mA	12-bit (1 mV) · ±0.01 V
Default range	—	0–20 mA	0–10 V	—	—
Update rate · current shunt	—	25 Hz · 249 Ω	25 Hz · 499 Ω	—	—

Modbus RTU N

ORDERING, WIRING, MODBUS REGISTERS

06 ORDER INFO

SKU	DESCRIPTION
RTU-N-8DIO	Digital I/O module: 8 DI 5…36 V (dry contact, NPN, PNP), 8 open-drain DO up to 500 mA
RTU-N-8AI	Analog input module: 8 AI, 0–5 / 1–5 V and 0–20 / 4–20 mA, 12-bit
RTU-N-8AI-10	As above, 10 V version: 0–10 / 2–10 V and 0–20 / 4–20 mA
RTU-N-8AO-I	Analog output module: 8 AO, current 0–20 mA, 12-bit
RTU-N-8AO-U	As above, voltage version: 8 AO, 0–10 V

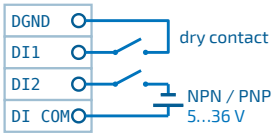
AI: current or voltage is selected per channel by a jumper inside the housing and the range register; factory setting is current for RTU-N-8AI (jumpers fitted) and voltage for RTU-N-8AI-10 (jumpers removed); the 5 V or 10 V voltage scale is set by the module version. AO: current or voltage is set by the module version.
Scope of delivery: module, product passport, packaging. **Warranty:** 12 months from commissioning, but no more than 18 months from the date of manufacture.

07 TERMINALS

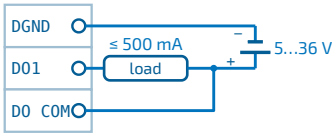
DI/DO RTU-N-8DIO	top	7~36V	GND	NC	DGND	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	DI COM
	bottom	485 A+	485 B–	EARTH	DGND	DO1	DO2	DO3	DO4	DO5	DO6	DO7	DO8	DO COM
AI RTU-N-8AI · RTU-N-8AI-10	top	7~36V	GND	AI1+	AI1–	AI2+	AI2–	AI3+	AI3–	AI4+	AI4–			
	bottom	A+	B–	AI5–	AI5+	AI6–	AI6+	AI7–	AI7+	AI8–	AI8+			
AO RTU-N-8AO-I · RTU-N-8AO-U	top	7~36V	GND	AO1	AGND	AO2	AGND	AO3	AGND	AO4	AGND			
	bottom	A+	B–	AGND	AO5	AGND	AO6	AGND	AO7	AGND	AO8			

power · RS-485 · signals

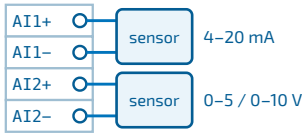
08 WIRING



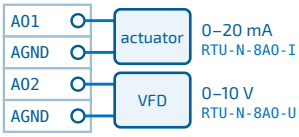
Digital inputs (DI)



Digital outputs (DO)



Analog inputs (AI)



Analog outputs (AO)

- DI: dry contact between DIx and DGND, DI COM left unconnected; NPN — DI COM to supply "+", PNP — to "–".
- DO: load between DOx and supply "+"; DO COM to supply "+", supply "–" to DGND.
- AI: sensors with separate power supplies need a common ground; for a single-ended connection, AIx– goes to ground.
- AO: load between AOx and AGND; RTU-N-8AO-U channel current up to 100 mA.

09 MODBUS REGISTERS

DI/DO

ADDRESS	CONTENT	FC
0000–0007	DO1…DO8 (coils): FF00 = on, 0000 = off, 5500 = toggle	01 05 0F
00FF	all DO at once: FF00 / 0000 / 5500	05
0200–0207	DO: on for N × 100 ms (flash on)	05
0400–0407	DO: off pulse, N × 100 ms (flash off)	05
0000–0007	DI1…DI8 (discrete inputs)	02
1000–1007	DO1…DO8 mode: 0 — normal (commands) 1 — linkage: follows DI, no commands 2 — toggle on each DI pulse 3 — edge trigger: toggle on DI change	03 06 10

AI

ADDRESS	CONTENT	FC
0000–0007	AI1…AI8 (input registers): mV, µA or ADC code	04
1000–1007	channel range: 0 — 0–5 V (8AI-10: 0–10 V) 1 — 1–5 V (8AI-10: 2–10 V) 2 — 0–20 mA 3 — 4–20 mA 4 — raw ADC code 0–4096	03 06 10

ALL MODULES — SETTINGS

ADDRESS	CONTENT	FC
2000	baud rate (low byte), parity (high byte)	03 06
4000	device address 1…255	03 06
8000	firmware version (read-only)	03

AO

ADDRESS	CONTENT	FC
0000–0007	AO1…AO8: µA (8AO-I) or mV (8AO-U)	03 06 10

- Addresses, values and function codes (FC) in hex; N — value written, up to 7FFF.

10 COMMISSIONING

Power	DC 7…36 V to the 7~36V and GND terminals; RTU-N-8AO-I needs at least 14 V to drive 20 mA into a 500 Ω load.
RS-485	A+ to line A, B– to line B, 120 Ω terminators at both line ends, shield to EARTH (RTU-N-8DIO only). Factory settings: 9600 bit/s, 8N1, address 1.
Address, baud rate	Register 4000 — address, register 2000 — baud rate and parity; write with function 06. A command to address 0 is a broadcast.
Channels	AI: current or voltage by a jumper inside the housing, range via registers 1000–1007; DO: mode via registers 1000–1007.