finder
SWITCH TO THE FUTURE

# Programmable Logic Relays

- Panels for electrical distribution
- Packaging machines
- Control and management of water
- Control panels for pumps
- Air Conditioner
- Building automation
- Forced-air ventilators


8A
SERIES

**Programmable Logic Relays (PLRs) with 8 input and 4 output relays**

**Type 8A.04-8300**
- Lite version with USB (type C port), ETH

**Type 8A.04-8310**
- Plus version with USB (type C port), ETH and Modbus RS485

**Type 8A.04-8320**
- Advanced version with USB (type C port), ETH, Modbus RS485, Wi-Fi and BLE

- 8 digital or analog (0…10V) input
- 4 relay output 10 A
- USB (type C port) port for programming, data logging and powering during configuration
- RJ45 port
- Connectivity (*according to type):
  - USB
  - 1 Gbit Ethernet TCP/IP or Modbus TCP/IP
  - Modbus RS485*
  - Wi-Fi + BLE*
- LED status indicator for each output
- Programmable USER button
- Programming language via IDE as an option IEC-61131-3 (LD - SFC - FBD - ST - IL)
- 70 mm wide
- 35 mm rail (EN 60715) mount

8A.04
Screw terminal

For outline drawing see page 7

NEW **8A.04-8300**

- Lite version
- USB Port
- RJ45 Port for ETH and Modbus TCP/IP

NEW **8A.04-8310**

- Plus version
- USB Port
- RJ45 Port for ETH and Modbus TCP/IP
- Modbus RS485 Port

NEW **8A.04-8320**

- Advanced version
- USB Port
- RJ45 Port for ETH and Modbus TCP/IP
- Modbus RS485 Port
- Wi-Fi/BLE internal module

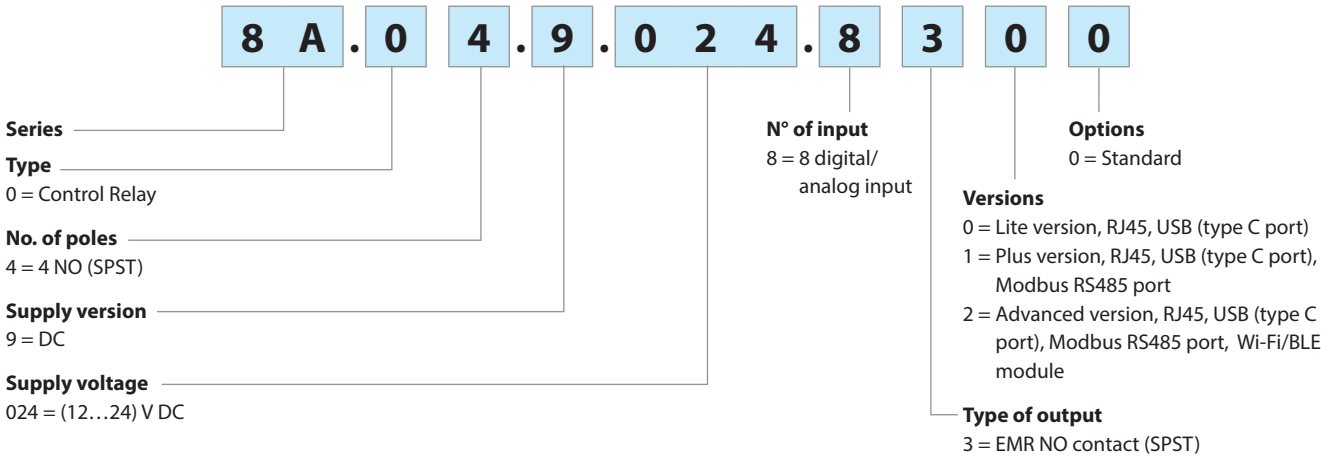
**OPTA**

Partnership with ARDUINO PRO

| | | |
|---|---|---|
| **Output specification** | | |
| Contact configuration | | 4 NO (SPST) |
| Rated current/Maximum peak current | A | 10/15 |
| Rated voltage/ Maximum switching voltage | V AC | 250/400 |
| Rated load AC1 | VA | 2500 |
| Rated load AC15 (230 V AC) | VA | 500 |
| Breaking capacity DC1: 24/110/220 V | A | 10/0.3/0.12 |
| Minimum switching load | mW(V/mA) | 300 (5/5) |
| Output operate/release time | ms | 6/4 |
| Standard contact material | | AgNi |
| **Supply specification** | | |
| Nominal voltage ($U_N$) | V DC | 12…24 |
| Rated power | W | 0.6…2.2 (according to type) |
| Operating range | V DC | 10.2…27.6 |
| **Input circuit** | | |
| Number of input | | 8 |
| Type | | Digital/Analog (configurable) |
| Analog input type | V | 0…10 |
| Analog input resolution | | 16 to 12 bit user configurable |
| Input frequency | kHz | 4.5 |
| Input voltage | signal 0/signal 1 | <4 V DC / > 5.9 V DC (Max 24 V DC) |
| Maximum input voltage | V DC | 24 |
| Input compatibility | | PNP/NPN/Sink |
| Reverse polarity protection | | YES |
| **Technical data** | | |
| Programm language | | Arduino IDE, IEC-61131-3 (LD - SFC - FBD - ST - IL) via Arduino PLC-IDE |
| Minimum input signal | ms | 0.2 |
| Electrical life at rated load in AC1 | cycles | $100 \cdot 10^3$ |
| Ambient temperature range | °C | –20…+55 |
| Protection category | | IP 20 |
| **Approvals** (according to type) | | |

## Ordering information

Example: 8A series, Lite PLR version, 4 NO (SPST) - 10 A, 8 digital/analog input, 12…24 V DC.

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## Technical data

| | | | | |
|---|---|---|---|---|
| **Insulation** | | | | |
| | between input and output circuit | V AC | 4000 | |
| | between open contacts | V AC | 1000 | |
| Insulation (1.2/50 µs) between input and output | | kV | 6 | |
| **EMC specifications** | | | | |
| **Type of test** | | | **Reference standard** | |
| Electrostatic discharge | contact discharge | | EN 61000-4-2 | 4 kV |
| | air discharge | | EN 61000-4-2 | 8 kV |
| Radio-frequency electromagnetic field (80 ÷ 1000 MHz) | | | EN 61000-4-3 | 10 V/m |
| Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals | | | EN 61000-4-4 | 4 kV |
| Surges (1.2/50 µs) on Supply terminals | common mode | | EN 61000-4-5 | 4 kV |
| | differential mode | | EN 61000-4-5 | 4 kV |
| on input terminals | common mode | | EN 61000-4-5 | 4 kV |
| | differential mode | | EN 61000-4-5 | 4 kV |
| Radio-frequency common mode (0.15 ÷ 80 MHz) on Supply terminals | | | EN 61000-4-6 | 10 V |
| Radiated and conducted emission | | | EN 55022 | class B |
| **Other data** | | | | |
| Power lost to the environment | without contact current | W | 1.4 | |
| | with rated current | W | 3.2 | |
| PLC to PLC communication and<br>PLC to network communication (Ethernet) | | | **Ethernet:**<br>– For Modbus TCP communication<br>– As standard TCP/IP<br>– RJ45 connector CAT5 cable, 2X LAN status led indicators<br>**RS485:**<br>– For Modbus RTU communication<br>– For custom serial communication | |
| Wireless connectivity | | | Wi-Fi and Bluetooth® Low Energy | |
| Maximum program memory | | | 1 MB internal | |
| External memory module | | | USB-C pendrive | |
| Data Logging | | | USB-C Stick + internal flash memory | |
| Flash memory | | | 2MB int + 16MB Flash QSPI | |
| RESET button | | | YES | |
| USER button | | | Push button configurable for user purposes | |
| MCU | | | STMicroelectronics STM32H747XI Dual ARM® Cortex® M7/M4 IC:<br>1x ARM® Cortex® -M7 core up to 480 MHz<br>1x ARM® Cortex® -M4 core up to 240 MHz | |
| Secure element | | | ATECC608B | |
| Programming interface | | | USB-C + OTA via Web Editor (Cloud) + Ethernet | |
| RTC power reserve | | | 10 days at 25 °C | |
| RTC accuracy | | | 10 min/year @25 °C 37.5 min/year @ –10…+70 °C | |
| Cloud support | | | Arduino Cloud via Wi-Fi and Ethernet or the Cloud services | |
| Response time ON/OFF | | ms | 6/4 | |
| Bounce time NO/NC | | ms | 3/6 | |
| **Terminals** | | | **Screw terminals** | |
| Wire strip length | | mm | 9 | |
| Screw torque | | Nm | 0.5 | |
| Min. wire size | | | solid cable | stranded cable |
| | | $mm^2$ | 0.5 | 0.5 |
| | | AWG | 20 | 20 |
| Max. wire size | | | solid cable | stranded cable |
| | | $mm^2$ | 1 x 2.5 / 2 x 1.5 | 1 x 2.5 / 2 x 1 |
| | | AWG | 1 x 14 / 2 x 16 | 1 x 14 / 2 x 16 |

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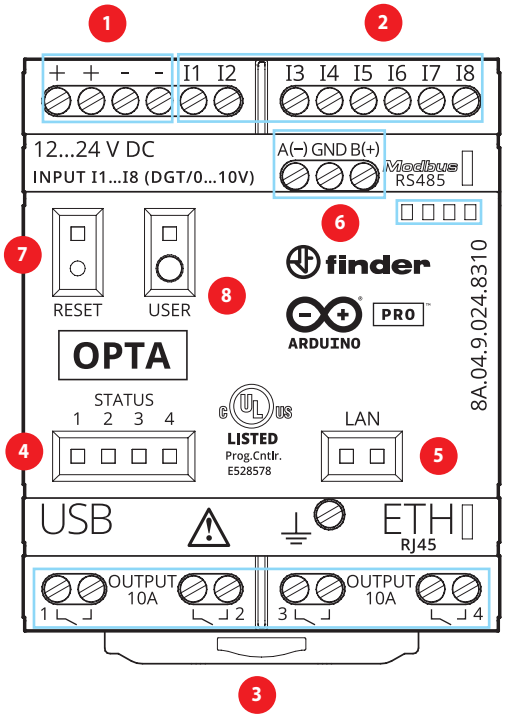
## Front view




**1** **Supply terminals**
12…24 V DC, Split terminals to facilitate wiring.

**2** **Input terminals**
I1…I8 digital/analog (0…10 V) input configurable via IDE.

**3** **Output terminals**
1…4 Output relay, 10 A 250 V AC, NO contact.

**4** **LED Status**
1…4 LED Status configurable via IDE.
For exemple for 1…4 output relay LED ON = Contact CLOSE.

**5** **LED Ethernet port status**
Status of ETH connection.

**6** **Modbus RS485 Port**
Terminals for Modbus over RS485 protocol.

**7** **HARDWARE RESET**
Button for hardware reset. BE CAREFUL. Press the 'RESET' button with the tip of a small non-metallic insulated tool.

**8** **Programmable USER button**
Button configurable via IDE by user, according to application (ex. RUN/STOP, ON/OFF, BLE pair).

## Contact specification

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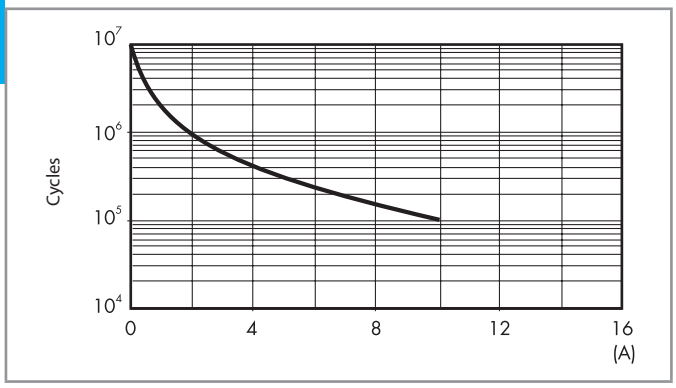
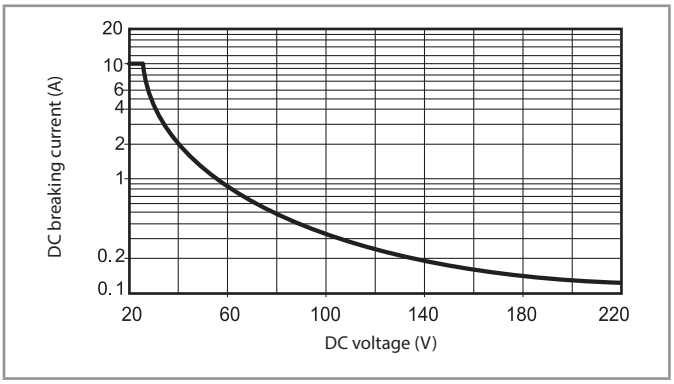
**F 8A - Electrical life (AC) v contact current**



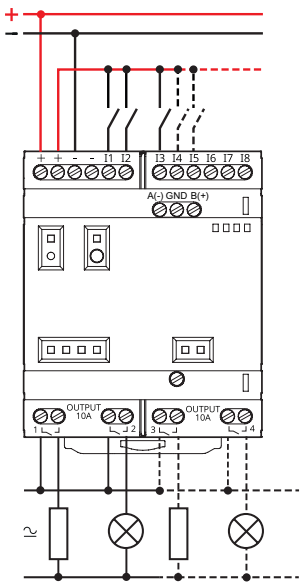

**H 8A - Maximum DC1 breaking capacity**



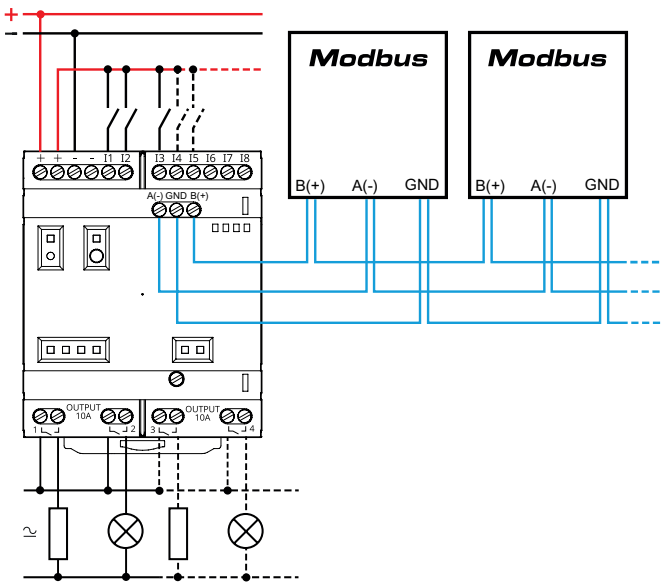

- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of ≥ 100 · $10^3$ can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load.
  Note: the release time for the load will be increased.

## Wiring diagrams

Type 8A.04-8300



Type 8A.04-8310/8320




## Getting "Started Guide"

**Getting started - IDE**
If you want to program your 8A.04 while offline you need to install the Arduino Desktop IDE.
To connect the 8A.04 to your computer, you'll need a USB-C cable. This also provides power to the board, as indicated by the LED.
https://opta.findernet.com/en/tutorial/getting-started

**Getting started - Arduino Web Editor**
All Arduino boards, including this one, work out-of-the-box on the Arduino Web Editor, by just installing a simple plugin.
The Arduino Web Editor is hosted online, therefore it will always be up-to-date with the latest features and support for all boards. Follow to start coding on the browser and upload your sketches onto your board.
https://opta.findernet.com/en/#software

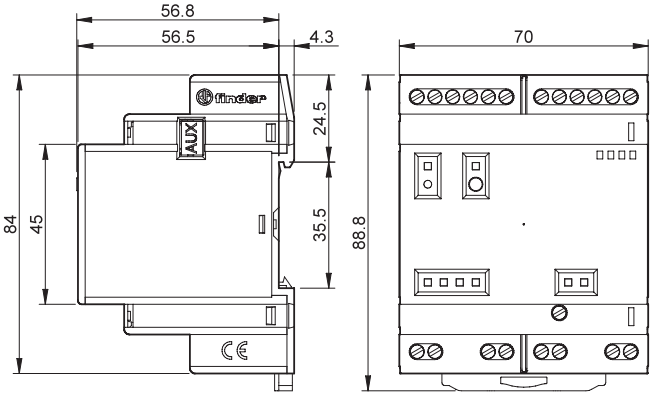
**Getting started - Arduino IoT Cloud**
All Arduino IoT enabled products are supported on Arduino IoT Cloud which allows you to Log, graph and analyze sensor data, trigger events, and automate your home or business.

**Online resources**
Now that you have gone through the basics of what you can do with the board you can explore the endless possibilities it provides by checking exciting projects on ProjectHub and the Arduino Library Reference
https://opta.findernet.com/en/

**Board Recovery**
All Arduino boards have a built-in bootloader which allows flashing the board via USB. In case a sketch locks up the processor and the board is not reachable anymore via USB it is possible to enter bootloader mode by double-tapping the reset button right after power up.

## Outline drawings

Type 8A.04-8300
Screw terminal




Type 8A.04-8310/8320
Screw terminal