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 10

8A.04-8300	8A.04-8310	8A.04-8320
		
• Lite version • USB Port • RJ45 Port for ETH and Modbus TCP/IP	• Plus version • USB Port • RJ45 Port for ETH and Modbus TCP/IP • Modbus RS485 Port	• 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)		CE UKCA EAC cULus

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Expansion Range modules

Type 8A.58-1600
- 16 digital or analog (0…10 V) input
- 8 EMR output 6 A

Type 8A.88-1600
- 16 digital or analog (0…10 V) input
- 8 SSR output 2 A

- Power LED status indicator
- 8 LED output status indicator
- Auxiliary port
- Up to 5 expansion modules connectable
- Programming language via Arduino IDE or via Arduino PLC-IDE for IEC 61131-3 languages (LD - SFC - FBD - ST - IL)
- 70 mm wide
- 35 mm rail (EN 60715) mount

8A.58 / 8A.88
Screw terminal

NEW **8A.58-1600**

- 16 digital/analog (0…10 V) inputs
- 8 EMR 6 A outputs
- Nominal voltage 12…24 V DC

NEW **8A.88-1600**

- 16 digital/analog (0…10 V) inputs
- 8 SSR 2 A outputs
- Nominal voltage 12…24 V DC

OPTA

Partnership with

ARDUINO PRO

For outline drawing see page 10

Output specification			
Contact configuration		8 NO (SPST)	8 NO (SPST)
Rated current/Maximum peak current	A	6/10	2/50
Rated voltage/ Maximum switching voltage	V	250/400 V AC	24/— V DC
Switching voltage range	V DC	—	1.5…30
Maximum blocking voltage	V DC	—	33
Rated load AC1	VA	1500	—
Rated load AC15 (230 V AC)	VA	300	—
Rated load DC13	W	—	36
Minimum switching current	mA	—	1
Breaking capacity DC1: 24/110/220 V	A	6/0.2/0.12	—
Minimum switching load	mW (V/mA)	500 (12/10)	—
Max "OFF-state" leakage current	mA	—	0.0001
Max "OFF-state" voltage drop	V	—	0.4
Output operate/release time	ms	6/4	0.02/0.2
Standard contact material		AgNi	—
Supply specification			
Nominal voltage (U_N)	V DC	12…24	
Rated power	W	1	
Operating range	V DC	10.6…27.5	
Input circuit			
Number of input		16	
Type		Digital/analogue	
Analog input type	V	0…10	
Analog input resolution		configurable 12 bit max - 8 bit min	
Input frequency	kHz	4.5	
Input voltage	signal 0/signal 1	< 4 V / > 5.9 V DC (Max 24 V DC)	
Maximum input voltage	V DC	24	
Input compatibility		PNP/NPN	
Reverse polarity protection		YES	
Technical data			
Programm language		ARDUINO IDE or ARDUINO PLC-IDE (IEC 61131-3 languages)	
Minimum input signal	ms	0.02	
Electrical life at rated load in AC1	cycles	$60 \cdot 10^3$	$> 10^6$
Ambient temperature range	°C	–20…+55	
Protection category		IP 20	
Approvals (according to type)		CE UKCA EAC	

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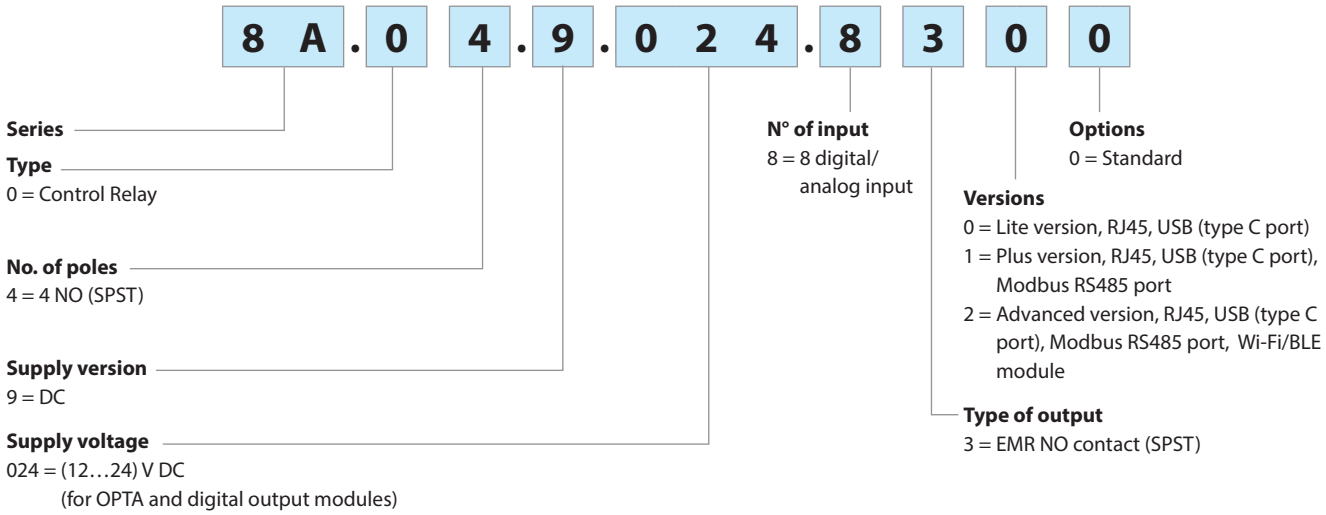
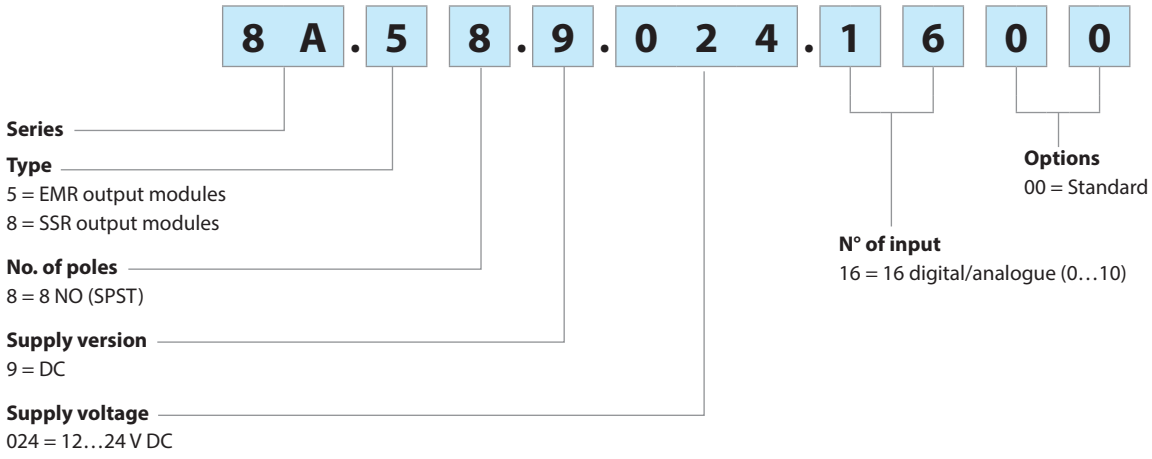
Ordering information

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



Example: 8A series, digital EMR expansion, 8 EMR output - 6 A, 16 digital/analog input, supply 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 PLC to network communication (Ethernet)			**Ethernet:** – For Modbus TCP communication – As standard TCP/IP – RJ45 connector CAT5 cable, 2X LAN status led indicators **RS485:** – For Modbus RTU communication – 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: 1x ARM® Cortex® -M7 core up to 480 MHz 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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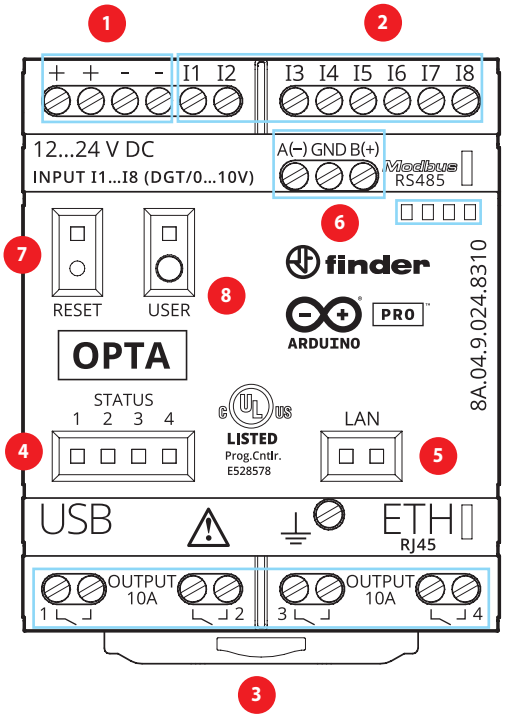
Front view - Type 8A.04.9.024.8310



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.

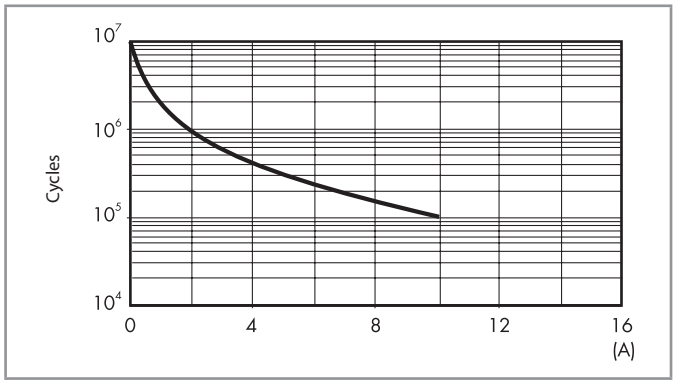
6. **Modbus RS485 Port**
   Terminals for Modbus over RS485 protocol.

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

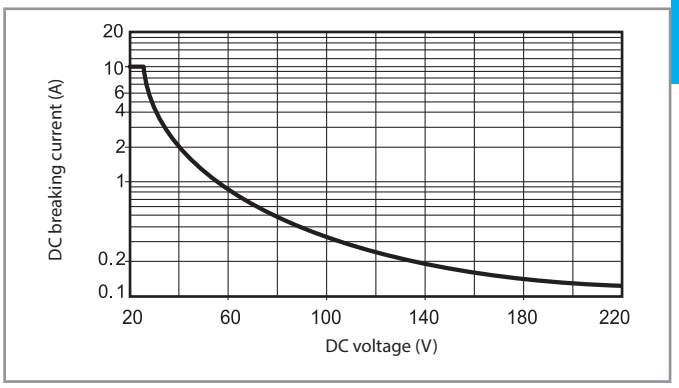
8. **Programmable USER button**
   Button configurable via IDE by user, according to application (ex. RUN/STOP, ON/OFF, BLE pair).

Contact specification

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

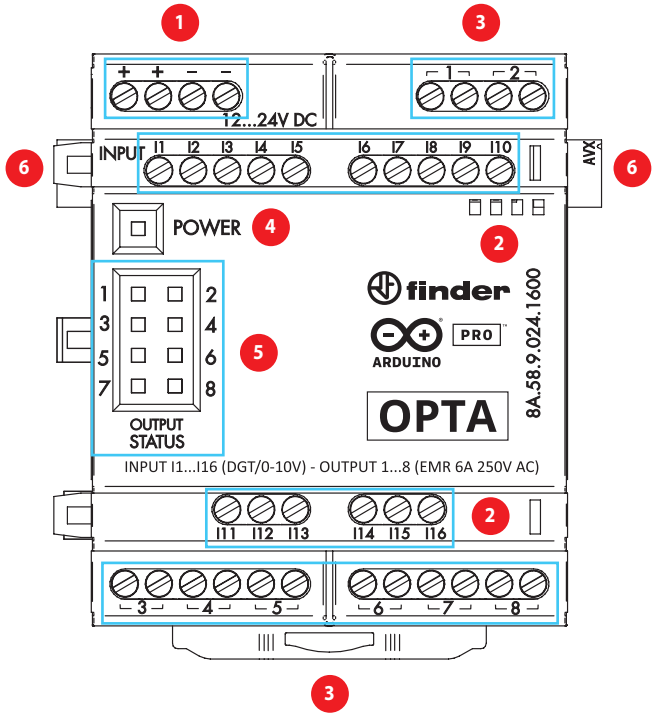


H 8A - Maximum DC1 breaking capacity



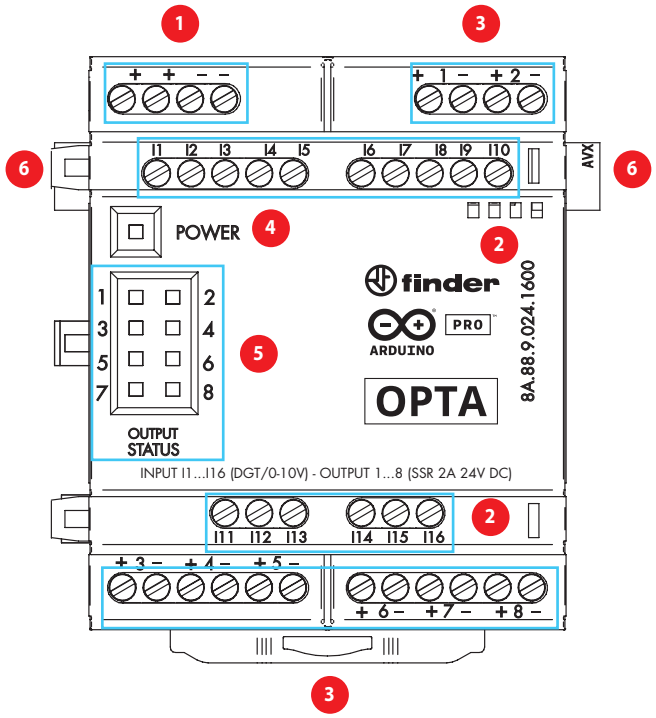
- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of ≥ $100 \cdot 10^3$ can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load.
  Note: the release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

Front view - Digital EMR - Type 8A.58.9.024.1600



1. **Supply terminals**
   12…24 V DC, Bifourcated terminals
2. **Input terminals**
   I1…I16 digital/analog (0…10 V) input configurable via IDE.
3. **EMR Output terminals**
   1…8 EMR output, 6 A - 250 V AC
4. **LED Status**
   LED RGB
5. **Output status LED**
   Green LED output status
6. **AUXILIARY PORT**

Front view - Digital SSR - Type 8A.88.9.024.1600



1. **Supply terminals**
   12…24 V DC, Bifourcated terminals
2. **Input terminals**
   I1…I16 digital/analog (0…10 V) input configurable via IDE.
3. **SSR Output terminals**
   1…8 SSR output, 2 A - 24 V DC
4. **LED Status**
   LED RGB
5. **Output status LED**
   Green LED output status
6. **AUXILIARY PORT**

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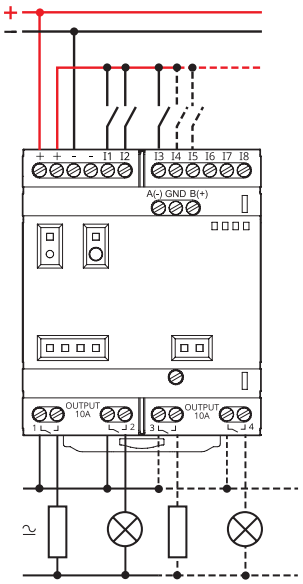
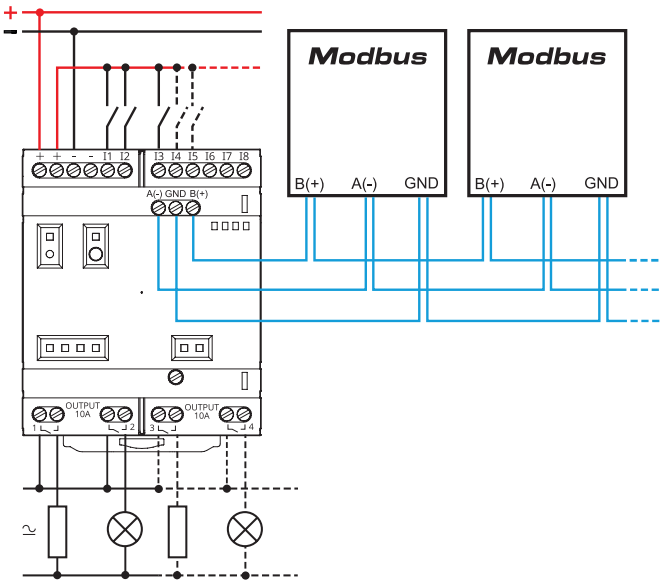
Wiring diagrams

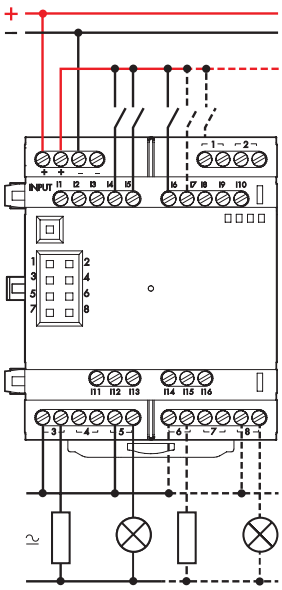
Type 8A.04-8300



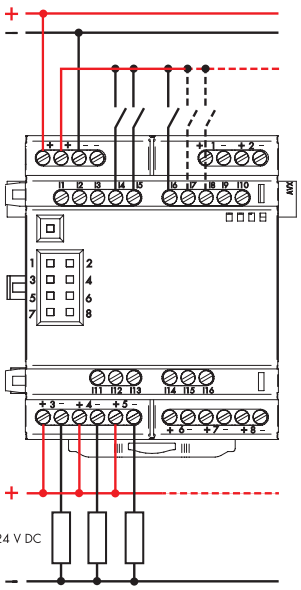
Type 8A.04-8310/8320



Type 8A.58-1600



Type 8A.88-1600



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Getting "Started Guide"

Getting started - IDE

If you want to program your 8A.04 while offline you need to install the Arduino Desktop IDE or Arduino PLC-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 Cloud Editor

All Arduino boards, including this one, work out-of-the-box on the Arduino Cloud Editor, by just installing a simple plugin.
The Arduino Cloud 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 Cloud

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

Online resources

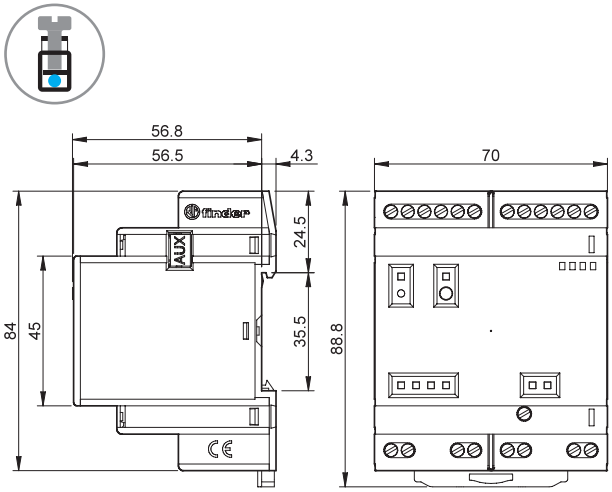
Now that you have gone through the basics of what you can do with the board you can explore the endless possibilities it provides by checking exciting projects on ProjectHub and the Arduino Library Reference
https://opta.findernet.com/en/

Board Recovery

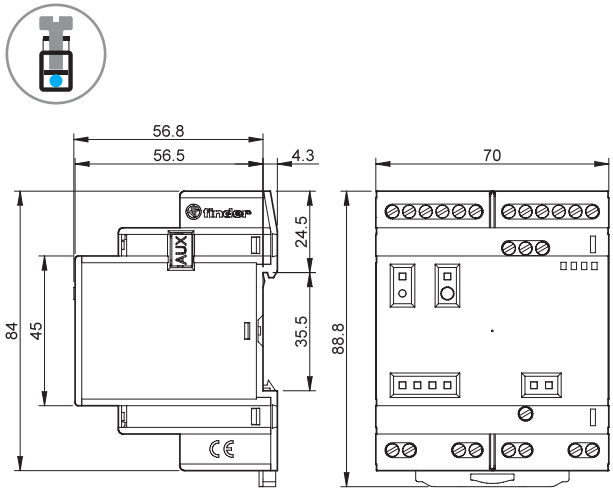
All Arduino boards have a built-in bootloader which allows flashing the board via USB. In case a sketch locks up the processor and the board is not reachable anymore via USB it is possible to enter bootloader mode by double-tapping the reset button right after power up.

Outline drawings

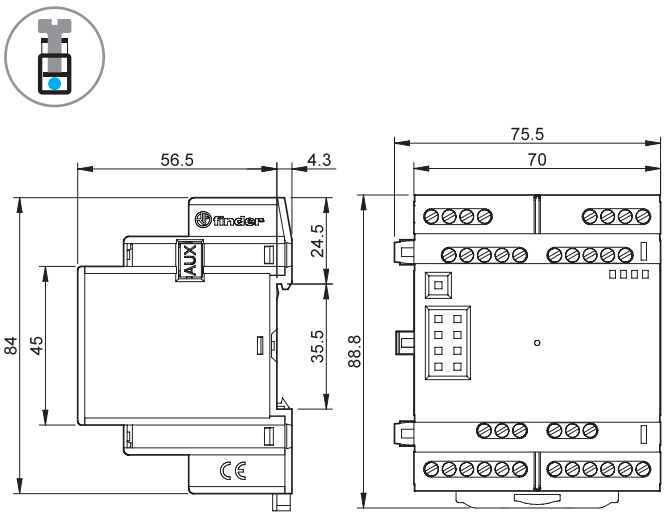
Type 8A.04-8300
Screw terminal



Type 8A.04-8310/8320
Screw terminal



Type 8A.58-1600
Screw terminal



Type 8A.88-1600
Screw terminal