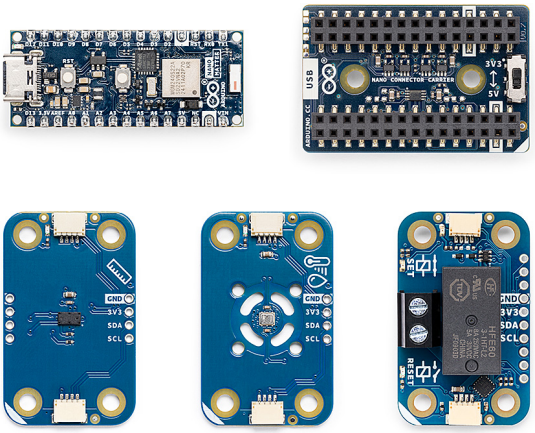
User Manual
SKU: AKX00081



Description

Build smarter and prototype faster with the Arduino Matter Discovery Bundle, an all-in-one solution for creating interoperable Internet of Things (IoT) devices using Matter, the industry-backed smart home connectivity standard supported by Apple®, Google, Amazon, Home Assistant, and other major platforms. At the core of this bundle is the Arduino Nano Matter board with pre-mounted headers, powered by Silicon Labs' MGM240S module for Matter-over-Thread connectivity. Combined with the Arduino Nano Connector Carrier featuring Qwiic and Grove interfaces and three Arduino Modulino® modules, this bundle enables rapid prototyping of smart home devices in minutes.

Target Areas

Smart home automation, IoT prototyping, home automation education, Matter device development, legacy appliance retrofitting, interoperability testing

CONTENTS

1 Application Examples

The Arduino Matter Discovery Bundle is designed for rapid prototyping of Matter-compatible smart home devices. With built-in Thread connectivity and seamless integration with major smart home ecosystems, this bundle enables developers to create interoperable IoT solutions quickly.

Discover how the Matter Discovery Bundle can accelerate your smart home projects through the following application examples:

- **Smart home device development**: Create Matter-compatible devices that work across multiple ecosystems:
  - **Smart temperature monitoring**: Use the Arduino Modulino® Thermo to build a Matter-compatible temperature and humidity sensor that integrates with Apple® HomeKit, Google Home™, and Amazon Alexa. Monitor environmental conditions in real-time and trigger automations based on temperature thresholds.
  - **Presence-aware automation**: Leverage the Arduino Modulino® Distance with its Time-of-Flight sensor to create occupancy detection systems. Build smart room sensors that detect presence and communicate with Matter controllers to automate lighting, HVAC, and security systems.
  - **Smart relay control**: Use the Arduino Modulino® Latch Relay to retrofit traditional appliances with smart capabilities. Control lights, fans, coffee makers, and other devices through Matter-compatible voice assistants and automation platforms.
- **Education and training**: Teach modern IoT connectivity standards:
  - **STEM curriculum integration**: With its 7-module course, the bundle provides structured learning materials for understanding Matter protocol fundamentals, Thread networking and embedded programming for smart devices.
  - **Hands-on IoT labs**: Perfect for technical universities and bootcamps to deliver practical experience with industry-relevant Matter certification processes and device interoperability testing.
  - **Professional development**: Enable corporate training programs for embedded engineers and IoT developers looking to expand their expertise in Matter technology and smart home connectivity.
- **Legacy device retrofitting**: Modernize existing appliances:
  - **Smart appliance conversion**: Transform conventional electrical devices into Matter-compatible smart nodes; add voice control and automation capabilities to legacy equipment without redesigning the original appliance.
  - **Home automation integration**: Connect analog systems to Home Assistant, Apple® HomeKit, or other Matter platforms. Schedule and automate legacy devices through modern smart home interfaces.

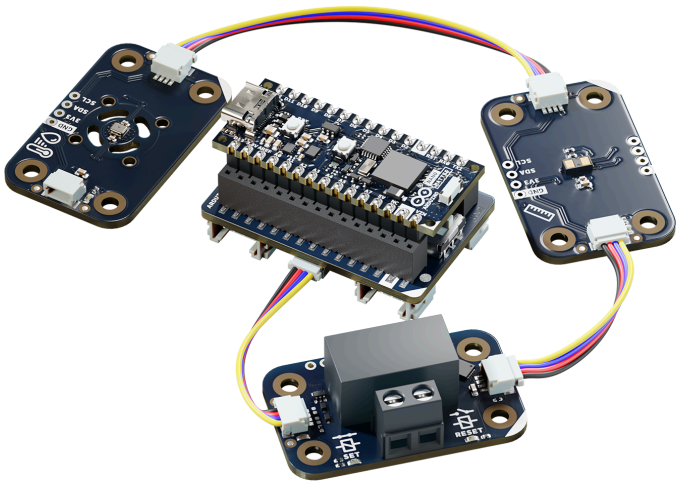
- **Interoperability testing**: Validate device compatibility across ecosystems:
  - **Cross-platform validation**: Test device behavior across Apple® HomeKit, Google Home™, Amazon Alexa, and Home Assistant to ensure consistent performance and compliance with Matter protocols.
  - **Certification preparation**: Use the bundle as a test bench for validating Matter protocol compliance before pursuing official CSA certification for commercial products.

2 Features

2.1 Bundle Contents

The Arduino Matter Discovery Bundle includes all the hardware components necessary to prototype Matter-over-Thread smart home devices in no time. Below is the list of included items and their main features and specifications:

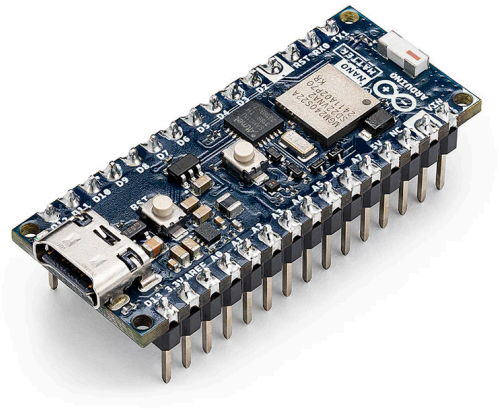
- Arduino Nano Matter with headers (SKU: ABX00137) (x1)
- Arduino Nano Connector Carrier (SKU: ASX00061) (x1)
- Arduino Modulino® Latch Relay (SKU: ABX00138) (x1)
- Arduino Modulino® Distance (SKU: ABX00102) (x1)
- Arduino Modulino® Thermo (SKU: ABX00103) (x1)
- Qwiic cables (x4)
- USB-C® cable (x1)



The Arduino Matter Discovery Bundle components.

2.1.1 Arduino Nano Matter with Headers (SKU: ABX00137)

The Arduino Nano Matter is a compact microcontroller board powered by the Silicon Labs MGM240SD22VNA module, which features a 32-bit Arm® Cortex®-M33 processor with a DSP instruction set and a floating-point unit. This board combines Arduino's user-friendly approach with Silicon Labs' powerful Matter-over-Thread connectivity, making the popular IoT standard accessible to makers and professionals alike.



The Arduino Nano Matter board

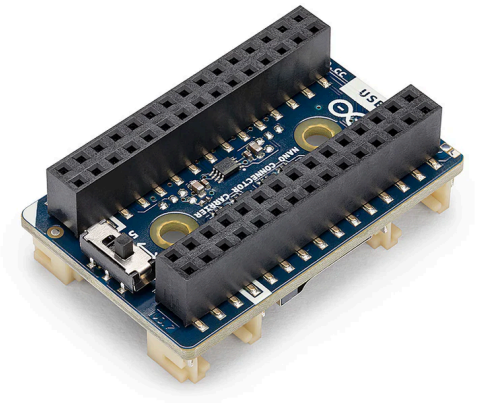
Below is a summary of the most important technical specifications of the Arduino Nano Matter board:

Feature	Specification
Module	Silicon Labs MGM240SD22VNA
Processor	32-bit Arm® Cortex®-M33 with DSP instruction and FPU
USB Connector	USB-C®
Memory	1536 kB Flash, 256 kB RAM
Wireless Connectivity	802.15.4 Thread®, Bluetooth® Low Energy 5.3, Bluetooth® Mesh
Antenna	On-board 2.4 GHz antenna
Interfaces	I²C, SPI, UART, PWM, ADC, DAC, Digital I/Os
User Interface	User push-button, RGB LED
Security	Secure Vault® High
I/O Voltage	+ 3.3 VDC
Input Voltage	+ 5 VDC (nominal)
Board Dimensions	18 mm x 45 mm

For detailed information about the Arduino Nano Matter board, please refer to its corresponding documentation available on Arduino Docs: Arduino Nano Matter Official Documentation [1]

2.1.2 Arduino Nano Connector Carrier (SKU: ASX00061)

The Arduino Nano Connector Carrier is a versatile expansion board that simplifies prototyping with Arduino Nano-form-factor boards. It provides multiple connectivity options, including Grove and Qwiic connectors for plug-and-play integration with sensors and actuators. The carrier also features a MicroSD card slot for data logging applications and a voltage selection switch for compatibility with both +3.3 VDC and +5 VDC devices.



The Arduino Nano Connector Carrier board

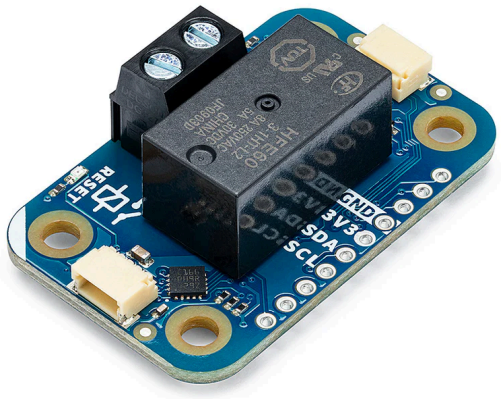
Below is a summary of the most important technical specifications of the Arduino Nano Connector Carrier:

Feature	Specification
Connectors	Grove analog/digital I/O (x2), Grove I²C, Grove UART, Qwiic I²C
Storage	MicroSD card slot
Headers	Double female board header for Arduino Nano family boards
I/O Voltage	Switchable between +3.3 VDC and +5 VDC
Dimensions	28 mm x 43 mm

For detailed information about the Arduino Nano Connector Carrier, please refer to its corresponding documentation available on Arduino Docs: Arduino Nano Connector Carrier Official Documentation [2]

2.1.3 Arduino Modulino® Latch Relay (SKU: ABX00138)

The Arduino Modulino® Latch Relay is a compact actuator module designed for controlling external devices at higher voltages. It features a latching relay that maintains its state without continuous power, making it ideal for energy-efficient smart home applications. The module connects via the Qwiic interface for simple integration with with the Nano Connector Carrier and can be daisy-chained with other Arduino Modulino® nodes.



The Arduino Modulino® Latch Relay module

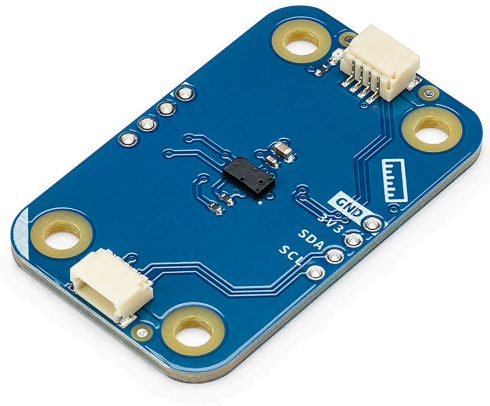
Below is a summary of the most important technical specifications of the Arduino Modulino® Latch Relay module:

Feature	Specification
Relay Type	Latching relay
Switching Capacity	+30 VDC @ 5A
Interface	I²C (via Qwiic connector)
Power Indicator	Green LED
Connectors	Qwiic connectors (x2, daisy-chain capable)
Dimensions	41 mm x 25.36 mm

For detailed information about the Arduino Modulino® Latch Relay module, please refer to its corresponding documentation available on Arduino Docs: Arduino Modulino® Latch Relay Official Documentation [3]

2.1.4 Arduino Modulino® Distance (SKU: ABX00102)

The Arduino Modulino® Distance module is a compact sensor module featuring a Time-of-Flight (ToF) proximity sensor for accurate distance measurements. It is ideal for presence detection, object proximity sensing, and occupancy monitoring applications. The module connects via the Qwiic interface for simple integration with with the Nano Connector Carrier and can be daisy-chained with other Arduino Modulino® nodes.



The Arduino Modulino® Distance module

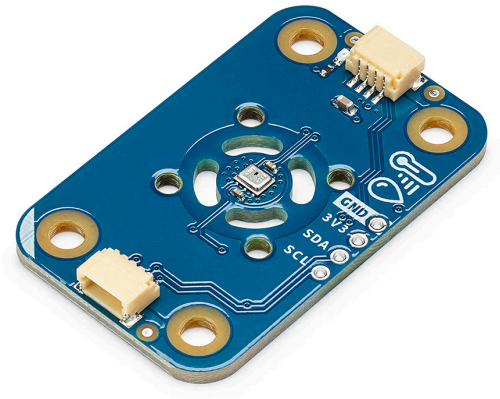
Below is a summary of the most important technical specifications of the Arduino Modulino® Distance module:

Feature	Specification
Sensor Type	Time-of-Flight (ToF) proximity sensor
Measurement Range	0 to 1200 mm
Interface	I²C (via Qwiic connector)
Power Indicator	Green LED
Connectors	Qwiic connectors (x2, daisy-chain capable)
Dimensions	41 mm x 25.36 mm

For detailed information about the Arduino Modulino® Distance module, please refer to its corresponding documentation available on Arduino Docs: Arduino Modulino® Distance Official Documentation [4]

2.1.5 Arduino Modulino® Thermo (SKU: ABX00103)

The Arduino Modulino® Thermo is a compact environmental-sensing module with temperature and humidity sensors. It is designed for climate monitoring, HVAC control, and environmental data collection applications. The module connects via the Qwiic interface for simple integration with with the Nano Connector Carrier and can be daisy-chained with other Arduino Modulino® nodes.



The Arduino Modulino® Thermo module

Below is a summary of the most important technical specifications of the Arduino Modulino® Thermo:

Feature	Specification
Sensors	Temperature sensor, humidity sensor
Interface	I²C (via Qwiic connector)
Power Indicator	Green LED
Connectors	Qwiic connectors (x2, daisy-chain capable)
Dimensions	41 mm x 25.36 mm

For detailed information about the Arduino Modulino® Thermo module, please refer to its corresponding documentation available on Arduino Docs: Arduino Modulino® Thermo Official Documentation [5]

2.2 Bundle Included Accessories

- Qwiic cable (x4)
- USB-A to USB-C® cable (x1)

2.3 Bundle Related Products

- Arduino Modulino® Movement (SKU: ABX00101)
- Arduino Modulino® Knob (SKU: ABX00107)
- Arduino Modulino® Buzzer (SKU: ABX00108)
- Arduino Modulino® Pixels (SKU: ABX00109)
- Arduino Modulino® Buttons (SKU: ABX00110)
- Arduino Modulino® Light (SKU: ABX00111)
- Arduino Modulino® Joystick (SKU: ABX00135)
- Arduino Modulino® Vibro (SKU: ABX00130)

3 Ratings

3.1 Recommended Operating Conditions

The table below provides a comprehensive guideline for the optimal use of the Arduino Matter Discovery Bundle, outlining typical operating conditions and design limits. The operating conditions of the Arduino Matter Discovery Bundle are largely determined by its components' specifications.

Parameter	Symbol	Min	Typ	Max	Unit
USB Input Voltage[1]	V_{USB}	4.8	5.0	5.5	VDC
VIN Pad Input Voltage[2]	V_{IN}	6.0	7.0	21	VDC
Operating Temperature[3]	T_O	-40	25	85	°C

[1] Input voltage via USB-C® connector on the Arduino Nano Matter board.

[2] Input voltage via `VIN` pad on the Arduino Nano Matter board, accessible through the Arduino Nano Connector Carrier.

[3] The operating temperature represents the range for the entire bundle and not just an individual component.

Important Note: The recommended methods for powering the bundle are through the USB-C® connector on the Arduino Nano Matter or via the `VIN` pad accessible through the Arduino Nano Connector Carrier. When using the `VIN` pad, ensure the input voltage is within the +6 to +21 VDC range. **Do not apply power through both methods simultaneously**.

4 Bundle Power Supply

The Arduino Matter Discovery Bundle can be powered through the following recommended methods:

- **USB-C® connector on the Arduino Nano Matter**: Provides a +5 VDC input through the onboard USB-C® port. This is the recommended method for powering the entire bundle during development and prototyping.
- **VIN pad via Arduino Nano Connector Carrier**: The `VIN` pad on the Arduino Nano Matter is accessible through the Arduino Nano Connector Carrier's female headers, allowing external power supply connection. This pad accepts an unregulated +6 to +21 VDC input (typical +7 VDC) that is internally regulated. This method is suitable for standalone deployments or when higher current capacity is required.

Power Tip: When using the Arduino Modulino® Latch Relay module to control external devices, ensure that the external power supply for the controlled device is properly isolated from the bundle's power supply to prevent any damage.

Safety Note: Always disconnect power before making hardware changes to the bundle.

5 Device Operation

5.1 Getting Started - IDE

To program your Arduino Matter Discovery Bundle offline, install the Arduino Desktop IDE **[6]**. Connect the Arduino Nano Matter to your computer using the included USB-C® cable. Ensure you have installed the Silicon Labs board package through the Arduino IDE Board Manager to access Matter-specific libraries and examples.

5.2 Getting Started - Arduino Cloud Editor

All components of the Arduino Matter Discovery Bundle work with the Arduino Cloud Editor **[7]** by installing a simple plugin. The Arduino Cloud Editor is hosted online, ensuring it is always up-to-date with the latest features and support for all boards and devices. Follow **[8]** to start coding in the browser and upload your sketches onto the Arduino Nano Matter board.

5.3 Getting Started - Arduino Cloud

The Arduino Matter Discovery Bundle is supported on Arduino Cloud, enabling you to log sensor data, trigger events and automate processes for smart home applications via the Arduino Nano Matter board. Take a look at the official documentation **[8]** to learn more about how to integrate the kit into your IoT projects.

5.4 Matter Discovery Course

The Arduino Matter Discovery Bundle includes access to the Matter Discovery Course, a 7-module course **[10]** designed to help you master Matter technology. The course's modules are the following:

- **Module 1**: Introduction to Matter (Theory)
- **Module 2**: Setting Up the Arduino Nano Matter Board (Practice)
- **Module 3**: Matter Network Deployment (Theory)
- **Module 4**: Hands-On with the Arduino Nano Matter Board (Practice)
- **Module 5**: Advanced Features of Matter (Practice)
- **Module 6**: Evaluating Matter for Your Product (Theory)
- **Module 7**: Next Steps and Real-World Implementation (Theory)

Upon course completion, you can earn an **Arduino Certified Engineer** credential for Matter development.

5.5 Sample Sketches

Sample sketches for the Arduino Matter Discovery Bundle can be found in the "Examples" menu in the Arduino IDE under the Matter library. These examples include basic Matter device implementations, sensor integration and relay control applications demonstrating smart home connectivity.

5.6 Online Resources

Explore the endless possibilities of the Arduino Matter Discovery Bundle by checking projects on Arduino Project Hub **[11]**, the Arduino Library Reference **[12]** and the Matter Discovery course **[10]**. Additional resources from Silicon Labs, including the Matter Developer Journey documentation**[13]**, provide in-depth technical information for advanced implementations.

6 Mechanical Information

The Arduino Matter Discovery Bundle offers mechanical flexibility, supporting multiple configurations based on the combination of components used. This section provides the main dimensions of the individual components for reference.

6.1 Component Dimensions

The table below summarizes the dimensions of each component included in the kit:

Component	Width	Length	Unit
Arduino Nano Matter	18	45	mm
Arduino Nano Connector Carrier	28	43	mm
Arduino Modulino® Latch Relay	25.36	41	mm
Arduino Modulino® Distance	25.36	41	mm
Arduino Modulino® Thermo	25.36	41	mm
Qwiic cables (x4)	-	50	mm

7 Product Compliance

The Arduino Matter Discovery Bundle consists of multiple individual Arduino products, each of which complies with specific regulations and certifications. For detailed product compliance information, please refer to the corresponding datasheets of each component included in the kit:

- Arduino Nano Matter Documentation **[1]**
- Arduino Nano Connector Carrier Documentation **[2]**
- Arduino Modulino® Latch Relay Documentation **[3]**
- Arduino Modulino® Distance Documentation **[4]**
- Arduino Modulino® Thermo Documentation **[5]**

8 FCC Caution

The components of the Arduino Matter Discovery Bundle are subject to individual FCC regulations. Please refer to the FCC documentation linked in each Arduino component's datasheet for specific compliance details:

- Arduino Nano Matter Documentation **[1]**

9 ISED Caution

The components of the Arduino Matter Discovery Bundle are subject to individual Canada ISED regulations. Please refer to the ISED documentation linked in each Arduino component's datasheet for specific compliance details:

- Arduino Nano Matter Documentation **[1]**

10 Company Information

Company name	Arduino S.r.l.
Company address	Via Andrea Appiani, 25 - 20900 Monza (Italy)

11 Reference Documentation

No.	Reference	Link
1	Arduino Nano Matter Documentation	https://docs.arduino.cc/hardware/nano-matter/
2	Arduino Nano Connector Carrier Documentation	https://docs.arduino.cc/hardware/nano-connector-carrier/
3	Arduino Modulino® Latch Relay Documentation	https://docs.arduino.cc/hardware/modulino-latch/
4	Arduino Modulino® Distance Documentation	https://docs.arduino.cc/hardware/modulino-distance/
5	Arduino Modulino® Thermo Documentation	https://docs.arduino.cc/hardware/modulino-thermo/
6	Arduino IDE (Desktop)	https://www.arduino.cc/en/software
7	Arduino Cloud Editor	https://create.arduino.cc/editor
8	Arduino Cloud - Getting Started	https://docs.arduino.cc/arduino-cloud/guides/overview/
9	Arduino Matter Discovery Bundle Documentation	https://docs.arduino.cc/hardware/matter-discovery-bundle/
10	Matter Discovery Course	https://academy.arduino.cc/
11	Arduino Project Hub	https://create.arduino.cc/projecthub
12	Arduino Library Reference	https://docs.arduino.cc/language-reference/
13	Silicon Labs Matter Developer Journey	https://www.silabs.com/support/training/matter-developer-journey

12 Document Revision History

Date	Revision	Changes
31/12/2025	1	First release