

AI Education Set

User Manual

V1.0 2022.04



Quick Keyword Search

Use the Find function to search a keyword. If you are using Adobe Acrobat Reader to read this document, press Ctrl+F on Windows or Command+F on Mac to start a search.

Navigating to a Topic

View a complete list of the topics in the table of contents. Click on a topic to navigate to that section.

Printing the Document

This document can be printed in high resolution.

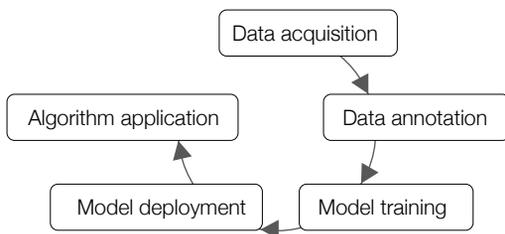
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Product Overview

The AI Education Set (hereinafter referred to as the “AI Module”) is designed for AI teaching and applications in elementary and middle schools, and built in with AI computing chips that provide universal neural network processing power and with high-performance camera module. In conjunction with the AI Training Platform of DJI™ Education Hub, users can train network models for object detection and deploy them for offline operation in this education kit, outputting the detection results in real time and achieving on-device machine vision and its applications. The AI Education Set can be used with specific robotic platforms to perform a variety of AI applications such as basic autonomous driving, gesture recognition and tracking, as well as automatic handling robots.

Through five simple steps, anyone can start an AI project from scratch:



Log in to the DJI Education Hub to access more AI-related courses.

Now, let's embark on a deep learning journey.

AI Training Platform

Log in to the DJI Education Hub at <https://edu.dji.com/> for the latest version of the DJI Education Hub client. The AI training platform is a sub-platform of the DJI Education Hub, where users can complete four steps: data acquisition and upload, data annotation, model training, and model deployment.

Obtaining Access to AI Module Software Resources

The number of annotation tasks, datasets, algorithm training tasks and models that users can create in the AI training platform is directly related to the version of the DJI Education Hub purchased by the user. Refer to the table below for details.

Version	Trial (for viewing demos only)	Advanced	Professional	Professional - Value- added AI Service Combo
Number of annotation tasks that can be created	/	3	5	15
Number of datasets that can be released	/	3	8	25
Number of datasets that can be selected per training	/	3	5	8

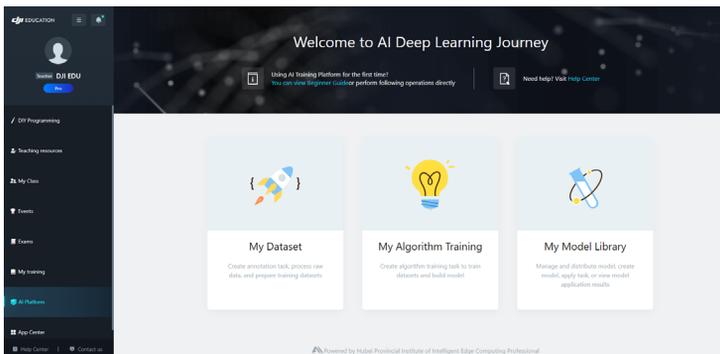
Number of algorithm trainings that can be created	/	3	5	15
Number of algorithm training tasks that can be initiated simultaneously	/	1	2	3
Number of models that can be released	/	3	8	25
Number of algorithm applications that can be created	/	3	5	15
Average completion time for algorithm training	/	Long	Long	Optimized and Faster

DJI offers a “Professional - Value-added AI Service Combo” to users with further demands on the AI training platform. Built upon the original Advanced and Professional editions, this enhanced edition allows users to significantly expand the number of tasks that can be created and initiate more algorithm training tasks at the same time, with a shorter average time for completing algorithm training. This boosts the storage capacity of the platform while greatly improving its efficiency. Visitors and trial users can view demos of the AI training platform, but are not allowed to create tasks.

Details on how to access each edition of the Education Hub can be found on the “Platform Edition Details” page of the Help Center. You can access to the Help Center by clicking “[Help Center](#)” in the lower left corner of the client page of the DJI Education Hub. The Advanced and Professional editions provide one month’s free access for each account. Details for requesting free access can be found on the “Instructions for Requesting Platform License Trial” page of the Help Center.

Introduction to the AI Training Platform

The AI Training Platform consists of three parts: “My Dataset”, “My Algorithm Training”, and “My Model Library”. In addition, users can click View Guidelines and Help Center for guidance and assistance.



My Datasets: The user completes data acquisition and annotation here to form datasets for the algorithm training.

My Algorithm Training: Model training is completed here. Using a built-in neural network training template, the user enters the dataset created in the first two steps. The training then produces a model of the objects contained in the identifiable dataset. After the training is completed, the model can be evaluated. The model can then be published if it passes the evaluation or retrained if it fails.

My Model Library: Here the user deploys the model. The user can manage the published model, distribute it to the AI module for offline operation, or upload an .mp4 format video for model application, and view the identification results of the model online.

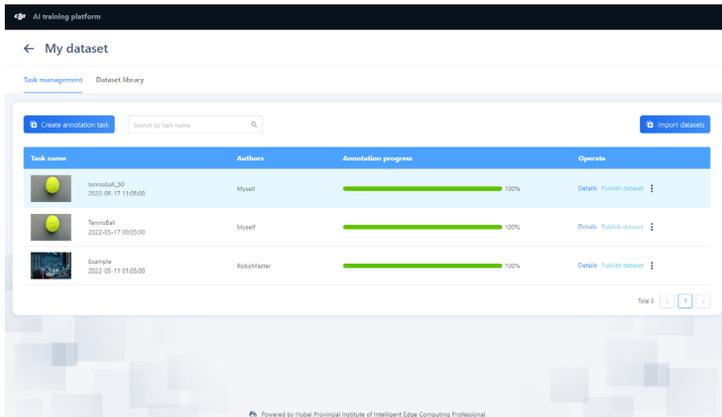
View Guidelines: To familiarize users with the steps of using the AI training platform and the role of each module.

Help Center: To familiarize users with the complete process of using the AI training platform, and provide help documents on how the AI module can be used in conjunction with the ROBOMASTER™ EP (“RMEP”), RoboMaster TT (“RMTT”) and third-party open source hardware after the AI model is distributed.

My Datasets

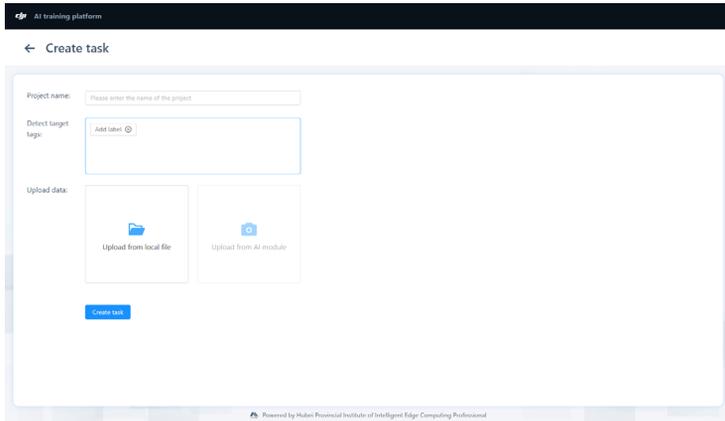
In My Datasets, users can create annotation tasks, acquire and upload data, annotate datasets, publish datasets, and ultimately form datasets that can be used for algorithm training and store them in the dataset library.

The user can view Annotation Task Demos, which are based on data from the RoboMaster Challenge.



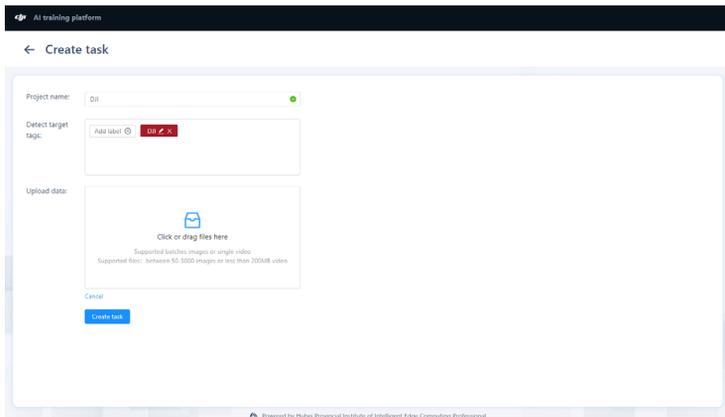
Create Annotation Task

Click the “Create Annotation Task” button to begin collecting and uploading your own data.



First, enter the task name and detect object labels. A label refers to the name of an intended object. Only English names are supported. For example, to detect “apple,” “banana,” and “orange,” enter three labels as follows: “Apple”, “Banana” and “Orange”.

The AI training platform supports data uploads via local file import or AI module upload. Local file import allows imports of batch images (50-3,000 files) and individual videos (video size < 200 MB). Users need only to drag the data to the indicated area and click on the area, or select the files via the file browser. Once the files are selected, click Create Task and wait for the data to be uploaded to the server, and the annotation task is then created.

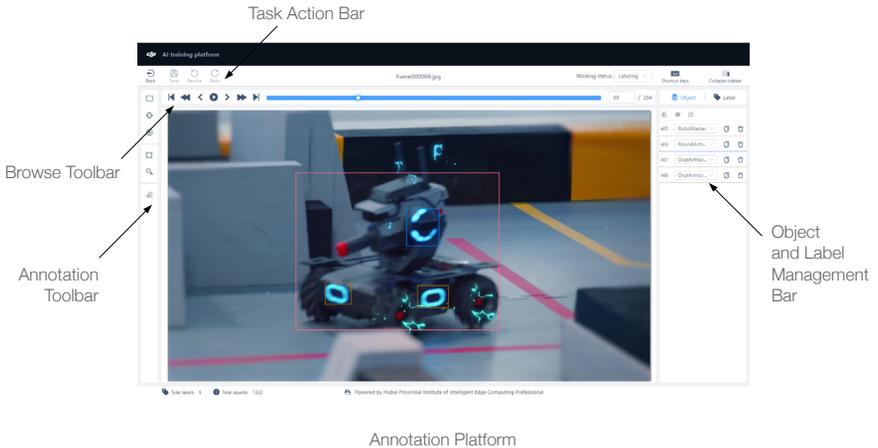


Local file import

Click AI Module Upload to enter the direct shoot and upload mode on the AI module. Refer to the “Image Capture Mode” section for information on uploading data using the AI module.

Enter Annotation Platform

After creating an annotation task, click View Details and Enter Annotation Platform to mark the raw data at the Annotation Platform.



Annotation Platform

The Annotation Platform includes four main parts:

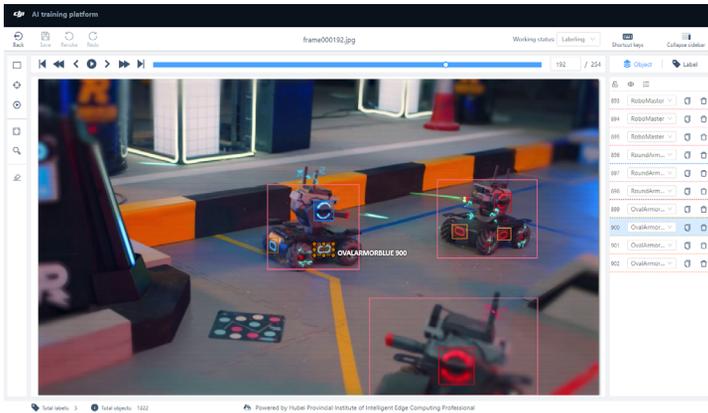
The Annotation Toolbar contains all the tools required for annotation, such as Draw, Track, and Interpolate, with the latter two as semi-automatic annotation tools;

The Browse Toolbar allows you to browse a dataset, with functions such as Play, Forward, and Back;

On the Object and Label Management Bar, users can set a label corresponding to the annotated objects, and manage the objects that have been annotated in this frame;

The Task Action Bar allows you to undo, restore, or save an annotation task.

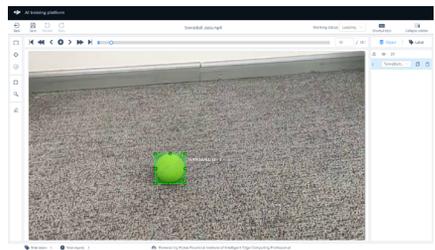
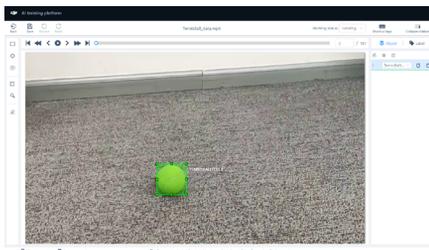
After entering the Annotation Platform, click the “Start Drawing ” (shortcut key [a]) button in an unannotated image. As in the image above, we wish to annotate the gimbal armor deck of RMEP. So move the cursor to the upper left corner of the gimbal armor, click and then move it to the lower right corner, then click again to form a complete annotation box that contains the gimbal armor deck. Meanwhile, we need to confirm that the label corresponding to this annotation box is the gimbal armor (Round Armor Red). Select the correct label in the Label Management Bar on the right to complete the annotation of an object.

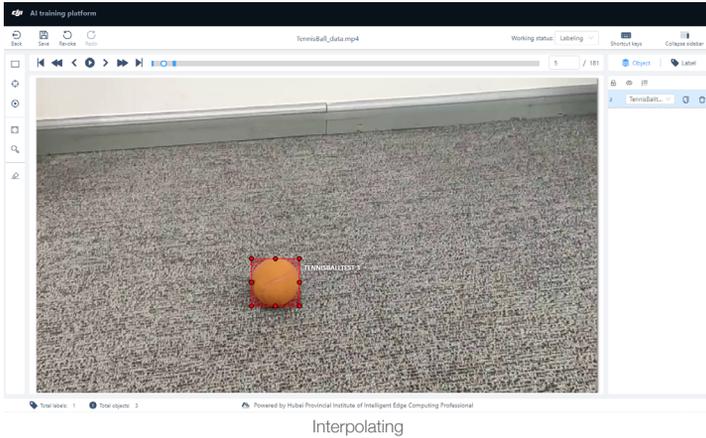


Setting a label after drawing an annotation box

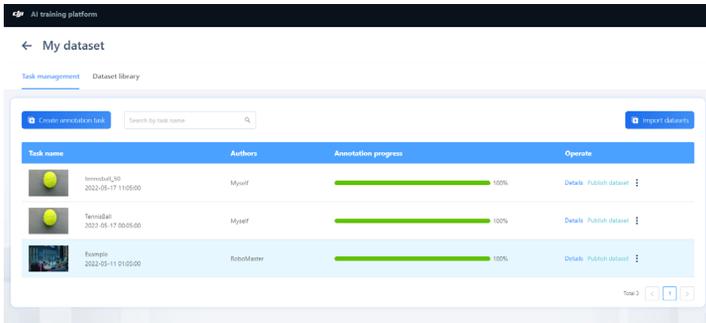
If the data uploaded by the user is a continuous video or multi-frame picture, after all the objects of the first frame have been annotated, you can click the “Track” button (shortcut key [w]) in the Annotation Toolbar, which will project the annotation box of this frame to the object of the next frame using the tracking algorithm, thus completing a semi-automatic annotation. This greatly improves annotation efficiency.

Users can use the “Interpolate” function to annotate multiple consecutive frames at once. As shown in the image, click the “Interpolate” button to select the first frame, and then skip to the 10th frame (the number of frames skipped can be determined based on the actual annotation results). Click the “Draw” button, and the eight frames in the middle will be automatically interpolated based on the annotations of frames 1 and 10. You can go back to view and adjust the automatic annotation results. After completing the interpolation, click the “End Interpolation” button to save the automatic interpolation results and their adjustments. If there are multiple labels to be interpolated, each label must be interpolated separately.



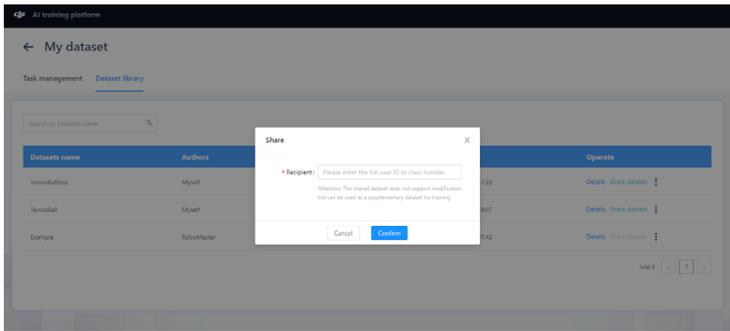
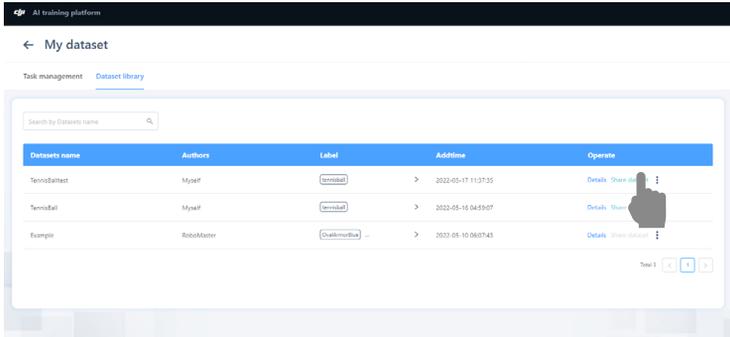


During an annotation process, we recommend that you manually click and save the changes immediately to prevent any unexpected loss of the annotations. After saving, click the back button to return to the “My Datasets” page to see the progress of the annotation task. If the dataset is not fully annotated, only the annotated portion will be used during model training.



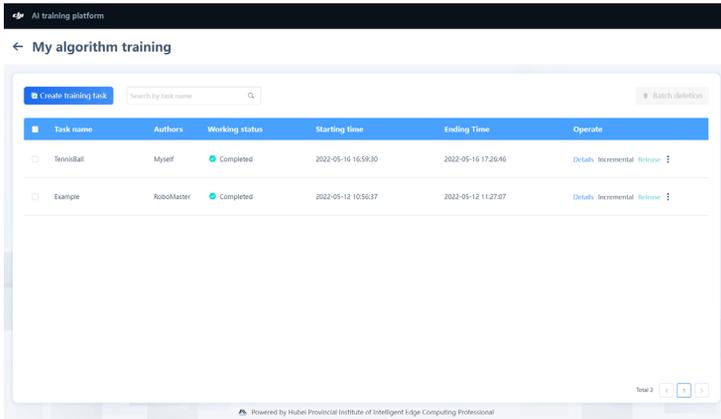
Releasing and sharing datasets

Click the “Release Dataset” button to publish a dataset into the Dataset Library (it will take longer if the dataset is larger or several people are releasing datasets simultaneously). Datasets in the Dataset Library can be used directly for algorithm training or shared with individuals using private accounts or with everyone in a class using the class account.



My Algorithm Training

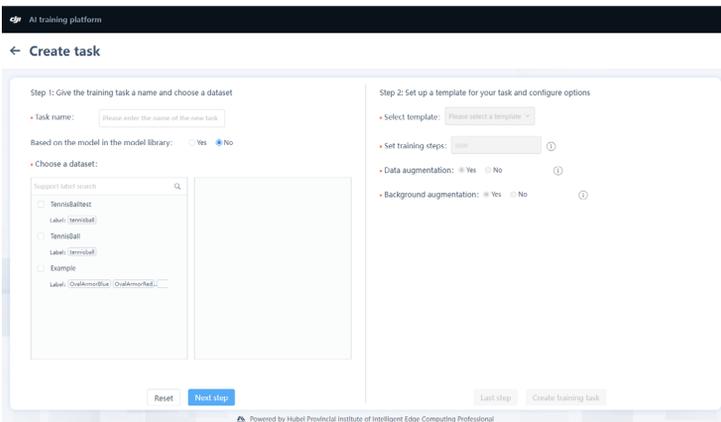
In My Algorithm Training, users can train AI models with deep-learning algorithms using data from the Dataset Library, and evaluate the models.



The “My Algorithm Training” page shows algorithm training demos that are based on data from the RoboMaster Challenge.

Creating an algorithm training task

Click the “Create Training Task” button to create a new algorithm training task.



Creating a new algorithm training task

Enter the name of the training task, select the annotated dataset needed for the training task (the datasets in the Dataset Library will be shown in a list), and click Next to select the default training template and the appropriate number of training steps.

AI training platform

← **Create task**

Step 1: Give the training task a name and choose a dataset

- Task name:
- Based on the model in the model library: Yes No
- Choose a dataset:

Support label search

TennisBall
Label: TennisBall

TennisBall
Label: TennisBall

Example
Label: Chalkboard/Outboard/...

Step 2: Set up a template for your task and configure options

- Select template:
- Set training steps:
- Data augmentation: Yes No
- Background augmentation: Yes No

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Select whether to perform data and background enhancement. Data enhancement increases the amount of relevant data in the dataset to improve overall performance. Background enhancement boosts the neural network's ability to identify relevant data. Once setup is complete, click Create Training Task to create the algorithm training task. The training task created will appear in the task list as shown below. The waiting time will be calculated after backend evaluation is completed. If no other prior tasks are queued, the task will enter the "Training" status to commence training.

AI training platform

← **My algorithm training**

Task name	Authors	Working status	Starting time	Ending Time	Operate
<input type="checkbox"/> TennisBalltest	Myself	⏸ Waiting	-	-	Details Incremental Release
<input checked="" type="checkbox"/> TennisBall	Myself	✔ Completed	2022-05-16 16:59:30	2022-05-16 17:20:46	Details Incremental Release
<input type="checkbox"/> Example	RobotMaster	✔ Completed	2022-05-12 10:54:37	2022-05-12 11:27:07	Details Incremental Release

Total

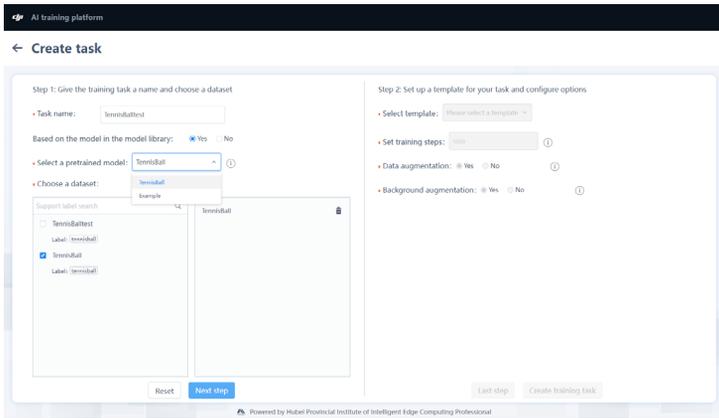
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Creating an incremental training task

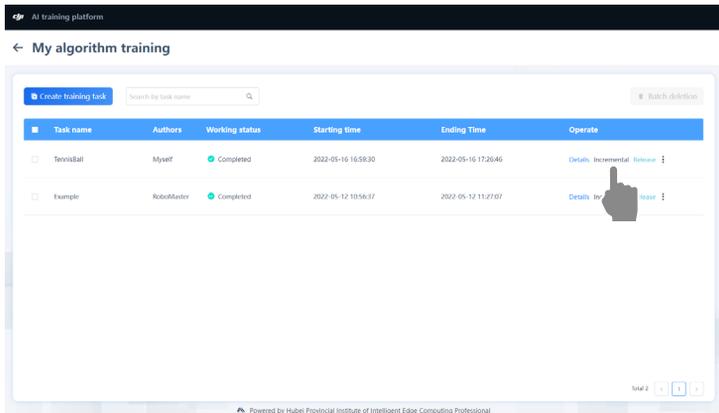
An incremental training task is the process of adding datasets for retraining based on pre-trained models generated from previous training tasks. Since pre-trained models contain previous training results, the training process can be significantly shortened, where fewer training steps suffice to achieve better results.

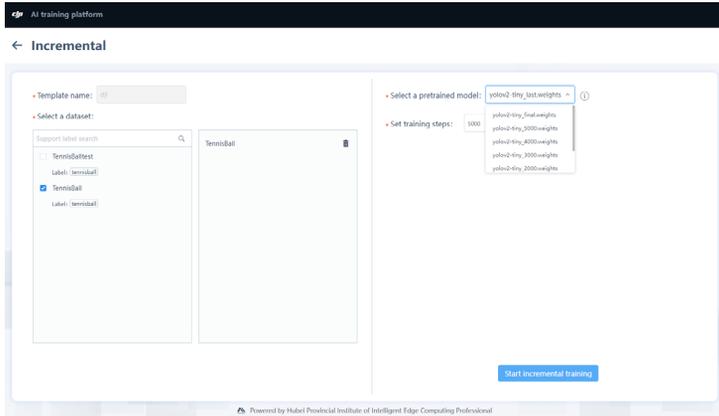
An incremental training task can be created in two ways:

1. When creating a new training task, select Yes for the option “Are you sure to create an incremental training task based on existing models in the Model Library?”, and select from the drop-down list a model shared by you or another user.



2. On the My Algorithm Training page, click Incremental Training based on the tasks you have created and completed, to add datasets for continued training.





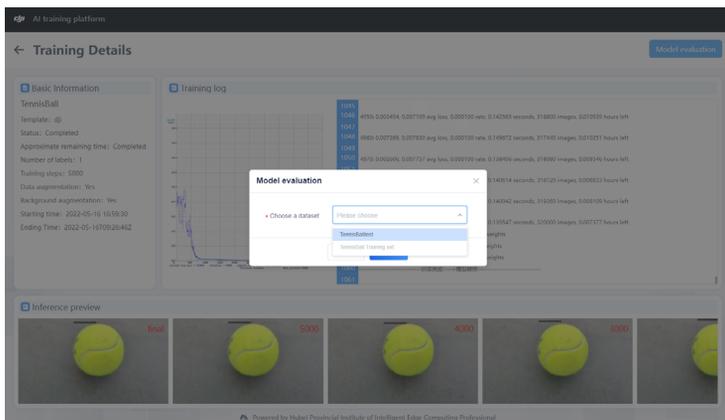
Normally, you can use default pre-trained models to continue training. Alternatively, you can select pre-trained models generated by other numbers of training steps from the drop-down list above.



- The labels of incremental training datasets must match those of the original models.

Evaluating a model

Click View Details to view the details of the completed training task, and click the Evaluate Model button to perform a quantitative evaluation of the quality of the trained model.

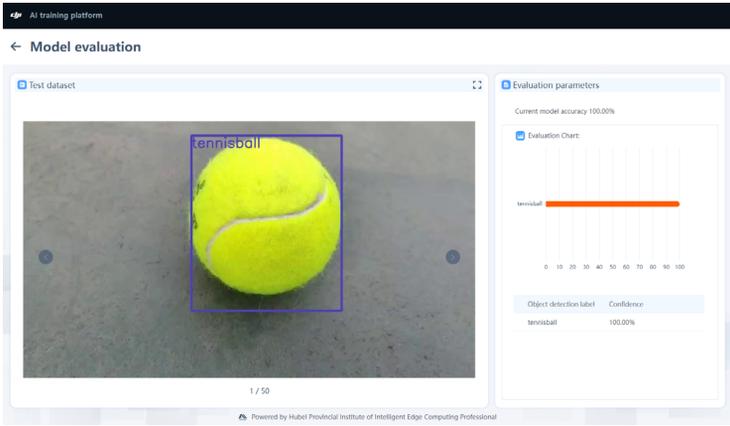


“Evaluate Model” page

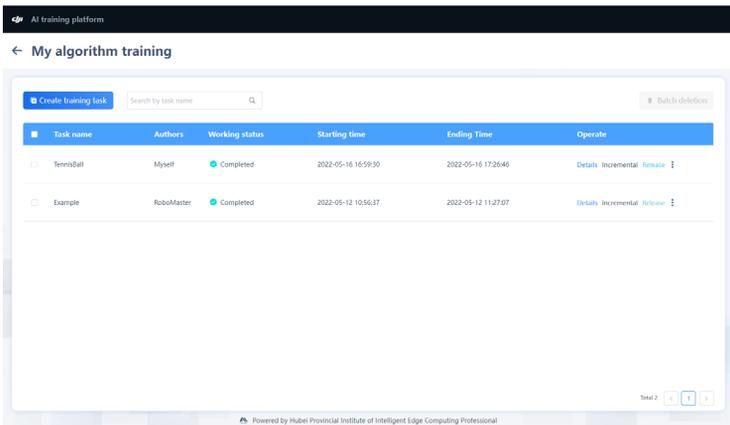
The dataset used for model training is called a “training set”, which cannot be selected as a dataset for model evaluation, because models are the results of training based on training sets. Evaluating a model using training sets cannot objectively reflect the quality of the model. Users are required to upload additional data not used for training and label them as “test sets.”

- ⚠ • Training sets and test sets share the same labels.

After a model evaluation is completed, the system will generate model evaluation results. The column on the right includes data such as the overall accuracy of the model (the figure below is an illustration only and does not represent the final effect generated by the platform) and the accuracy of each label, for evaluating the identification results of the model.



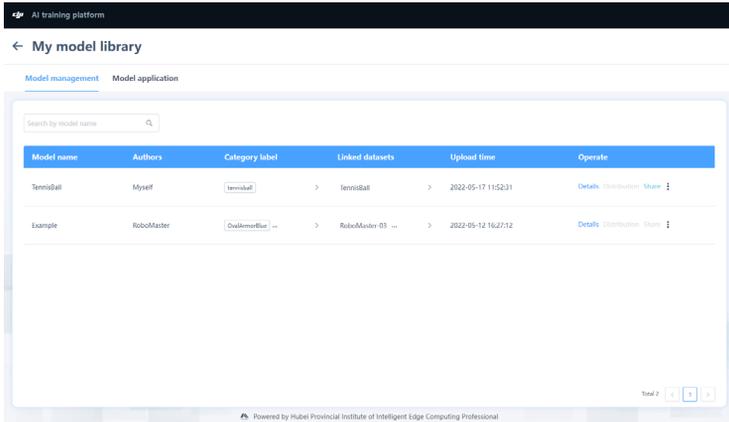
On the My Algorithm Training page, click Release Model to release trained and qualified models to My Model Library.



My Model Library

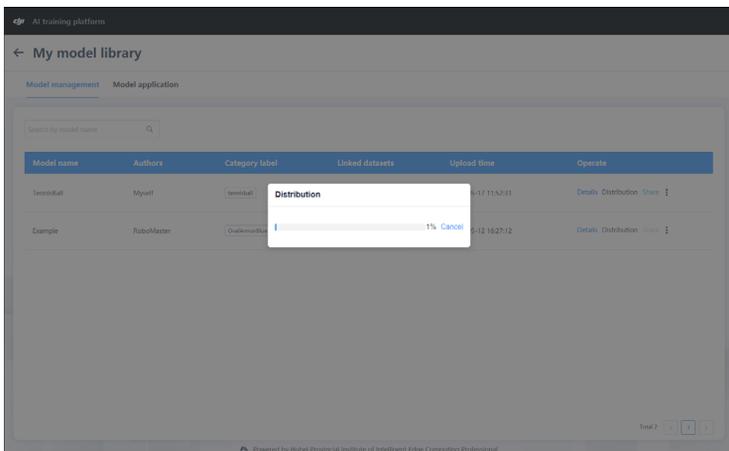
In My Model Library, users can store their trained models and distribute them to the AI module. Meanwhile, they can also implement model applications, upload another .mp4 file, perform online inference, and view identification effects.

Sample models and model applications can be viewed on the “My Model Library” page. The identification objects of the sample models are RMEP and its armor, which can be used for applications such as automatic shooting.



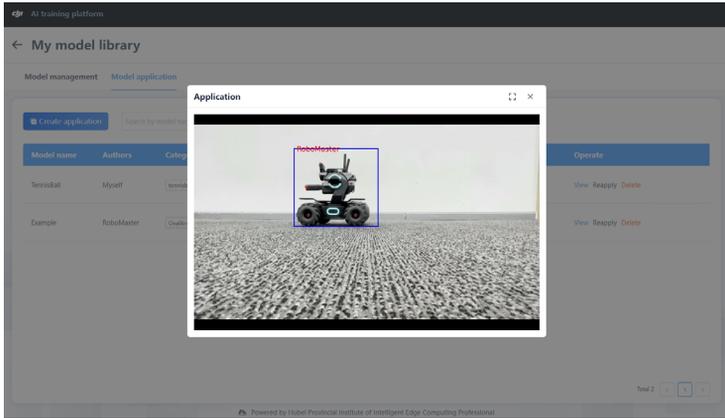
Distributing a model

When the AI module is connected directly to the computer via a USB cable, the “Distribute Model” button in the model management list will be clickable. If there is no response, try installing the “USB to serial chip driver” from the download page Click Distribute Model, and the selected model will be distributed to the AI module. After the distribution is completed, the AI module will be able to identify the corresponding object object.

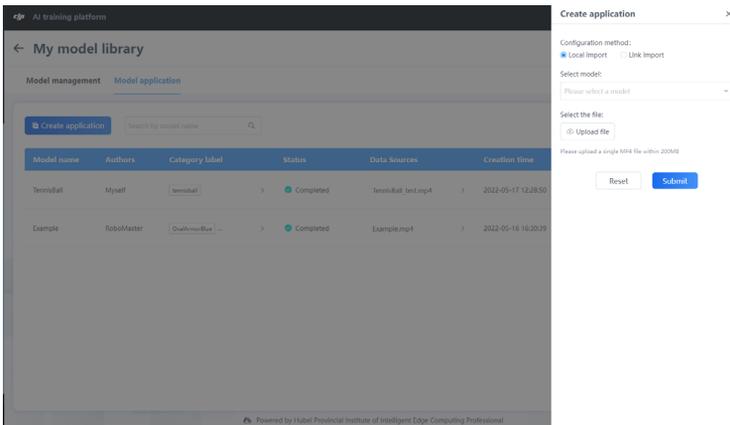


Model application

You can view the sample model applications by entering the model application interface. Click View Applications to see the identification effects of the sample models towards a video of RMEP.



Users can click the “Create Application” button, upload a video in .mp4 format, select a corresponding model to apply and view the inference effects, or view the inference effects of the webcam directly through a link import (this method only works for specific scenarios).



AI Module

After training is completed on the AI training platform and the model is deployed into the AI module, the AI module can run the neural network algorithm offline and output the object detection results in real time, so that the robot is equipped with “machine vision” and is able to use this information for completing diverse AI applications.

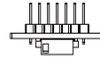
Part Names and Pin Definitions



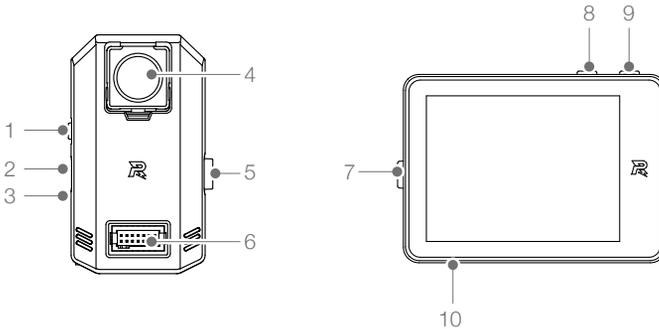
Core Module



Touch screen



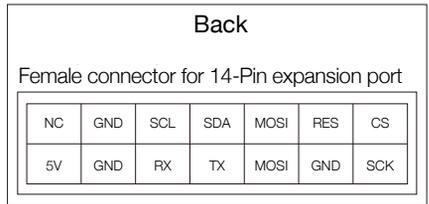
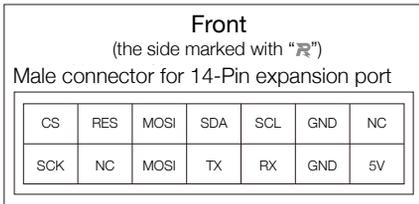
Pin Header



- | | |
|----------------------|---------------------------------|
| 1. Button | 6. 14-Pin Expansion Port |
| 2. Micro USB Port | 7. Touch Screen Port |
| 3. Status Indicator | 8. Object Detection Mode Button |
| 4. Camera | 9. Image Capture Mode Button |
| 5. Touch Screen Port | 10. microSD Card Slot |

See the AI Education Set Quick Start Guide for more details on the installation process.

The 14-Pin expansion port is defined as follows:



Pin description:

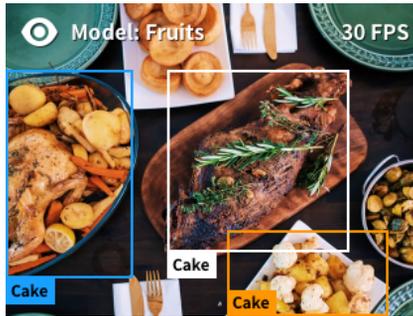
Code	Pin	Description
IO1	CS	SPI chip signal line
/	RES	Retain signals to insert detection CD here for microSD card
IO2	MOSI	SPI data line
IO3	SDA	IIC data line without pull-up resistors
IO4	SCL	IIC clock line without pull-up resistors
/	GND	Power ground
/	NC	No electrical connections
IO5	SCK	SPI clock signal line
/	NC/GND	No electrical connections on male connector, and GND on female connector
IO6	MISO	SPI data line
IO7	TX	UART sends TX
IO8	RX	UART receives RX
/	GND	Power ground
/	5 V	5V power supply

Each screen-printed mark on the pin header corresponds to the above table.

Object Detection Mode

Upon powering up, the object detection mode will appear by default. Alternatively, click the “Object detection mode” button to  enter object detection mode.

In object detection mode, the core module acquires images, runs an AI neural network algorithm, and displays the acquired images and identification results on the touch screen module in real time. For example,



if “Fruits” is the name of the user-defined neural network model; “Cake” is the name of the object label contained in the user’s model; and “30 FPS” is the frame rate at which the object was successfully detected, i.e., the object was successfully detected in 30 frames of images per second.

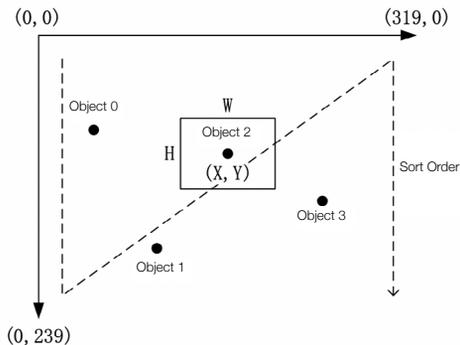
Meanwhile, the core module outputs the identification results through the serial port and micro USB port of the 14-pin expansion port. The frame format of the identification results is:

Object 0 ID	Object 0 Center coordinate X	Object 0 Center coordinate Y	Object 0 W	Object 0 H	Object 0 Confidence	Object 1 ID	Object 1 Center coordinate X	...
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Where:

- Objects 0 to N ($N < 20$) are arranged from left to right and from top to bottom according to the center coordinates.

Assuming there are four objects in the screen, the center coordinates will be distributed as follows:



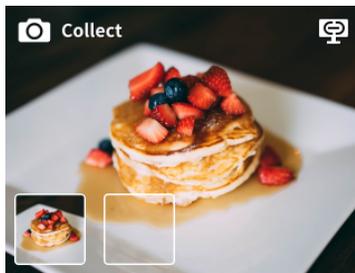
The outputted identification results will start with the information of object 0 first, followed by the information of objects 1, 2 and 3.

2. The upper left corner of the screen is the coordinate origin. The range of coordinate X and coordinate Y is (0-319) and (0-239) respectively, in pixels.
3. W and H represent the width and height of the object identification box respectively, in pixels.
4. The object inferred from the confidence representation is the true probability, with a range of (0-100).

 • This is the format output by the core module. For the output formats when the AI Education Set is used with the Rogram editor of the DJI Education Hub in conjunction with RMEP products, refer to the AI Education Set Programming Manual.

Image Capture Mode

Click the “Image Capture Mode” button to  enter image capture mode.



The image capture mode uses the AI module to acquire images of intended object and uploads them to the AI training platform to form datasets. In addition to the image capture mode, users can also take images using their own photographic devices such as mobile phones and USB cameras, or acquire images of detection objects directly from the network.

In image capture mode, images can be captured and uploaded in two ways: directly linking and uploading to the AI training platform, or saving to and then uploading from a microSD card.

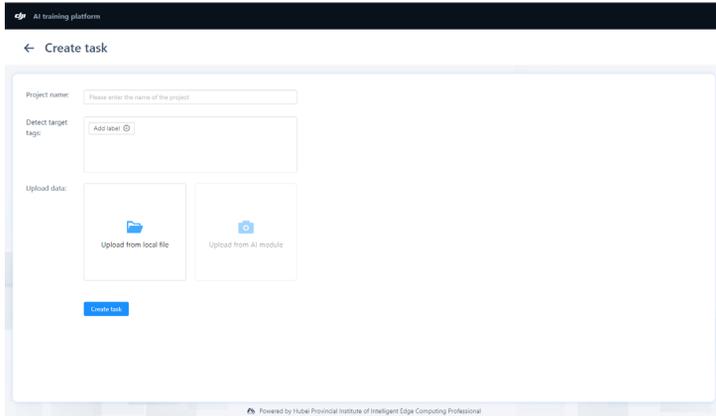
 • In image capture mode, not all frames displayed on the touch screen will be uploaded or saved. Instead, they will be “extracted”, i.e., extracting one out of every 10 frames. This is because the camera captures images faster than the movement of most objects, and any two adjacent frames only differ slightly from one another. Similar images are not meaningful for the purposes of deep learning. Please use your own photographic devices if you intend to shoot high-speed moving objects.

Directly linking and uploading to the AI training platform

If no microSD card is inserted, you may link to the AI training platform and then upload the images directly, otherwise the image capture mode will be unavailable.

To link to the AI training platform for capturing images, follow the steps below:

1. Log in to the DJI Education Hub, and ensure your account has access.
2. Open the AI training platform, click My Datasets and then Create Annotation Task to enter this page.



3. Use the micro USB cable to connect the AI module and the computer, wait for the “AI Module Upload” module to become available, and click AI Module Upload. If there is no response, try installing the “USB to serial chip driver” from the download page
4. “” will be displayed in the upper right corner of the AI module screen, indicating that you are successfully connected to the “AI Module Upload” module on the AI training platform. Click the “Image Capture Mode” button on the touch screen module to begin capturing images. After starting the capturing process, the screen will display the prompt “Capturing ...” followed by the number of images that have been captured and uploaded.



5. Click the “Image Capture Mode” button again to stop the capturing process.

Saving to and uploading from a microSD card

If it is not convenient to link to the AI training platform during a shoot, you may insert a microSD card and save the captured images to and then upload them from the card.



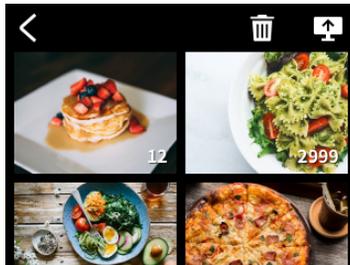
- When using a microSD card, the 14-pin expansion ports of both the core module and the touch screen module must be properly connected to one another. The hot-swapping of microSD cards is not supported.

Once a microSD card is inserted and successfully mounted, a thumbnail of the images in the card will appear in the lower left corner of the screen:



If a microSD card is not successfully mounted, follow the prompted instructions to format or replace the microSD card. Be sure to back up the data on a microSD card before formatting.

Click the "Image Capture Mode" button to begin capturing images, and click the button again to stop the capturing process. When the capturing process is complete, click the thumbnail at the bottom left of the screen to start the dataset preview:



Click "🗑️" to delete one or more selected datasets. Note that deleted datasets are not recoverable.

Click "📁" to upload one or more selected datasets. Note that the AI training platform must be connected in the manner shown in the "Directly linking and uploading to the AI training platform" section.

Click the thumbnail of a dataset to preview the dataset:



Click “” to delete the current dataset; note that deleted datasets cannot be recovered. Click “” to upload this dataset to the AI training platform, which must also be linked to first.

List of compatible microSD cards (including but not limited to)

Brand	Specs
SanDisk	16GB C10 A1
SanDisk	32GB U1 C10 A1
SanDisk	64GB U1 C10 A1
SanDisk	128GB U1 C10 A1
SanDisk	32GB U3 C10 A1 V30
SanDisk	64GB U3 C10 A2 V30
Kingston	32GB U1 A1 V10
Kingston	64GB U1 A1 V10
Kingston	128GB U1 A1 V10
Netac	16GB U1 A1 V10
Netac	32GB U1 A1 V10
Netac	64GB U3 A1 V30
Netac	128GB U3 A1 V30
Samsung	64GB U1 A1 V10
Samsung	128G U3 A2 V30

Settings

Swipe down from the top of any screen to bring up Settings.

The following items can be set or viewed in Settings:

1. Buzzer switch: For turning the buzzer on or off.

When it is on, the buzzer will respond as follows:

Buzzer Responses	Status
Single beep	Response to the user's keystroke or touch action
Single beep	Connected to the DJI Education Hub
Beep--beep--beep ...	Model is damaged and not connected to the touch screen

2. Help Center: Scan the QR code to link to the DJI Education Hub Help Center.
3. Language: For setting the AI module interaction language.
4. Firmware: Shows the current AI module firmware version number.

Status Indicator

Blinking Pattern	Description
Alternating red, green and yellow flashes	Startup loading
Slow double red flashes	Uploading data / distributing models / updating firmware
Solid blue	Object Detection Mode
Solid green	Image Capture Mode
Slow red flashes	Capturing ...
Solid red	Firmware or model is corrupted

Firmware Update

Use a micro USB cable to connect the AI module to the DJI Education Hub, and update the firmware on the device management page.

Communications and Protocols

The core module communicates with external protocol commands through the serial port of the micro USB port (USB to serial port) or 14-pin expansion port, and follows the RoboMaster Open Protocol. For the relevant protocol formats, refer to the RoboMaster Open Protocol for AI Education Set on the download page. For commands with a request, the response will be outputted from the port through which the request was inputted; for push commands, the output port depends on the situation. See the RoboMaster Open Protocol for AI Education Set on the download page for details.

The parameters for both ports (serial) are set as follows:

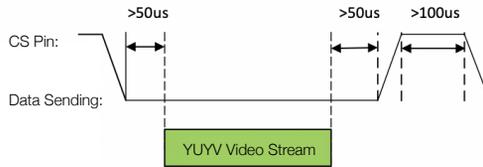
	Baud rate	Data bit	Stop bit	Parity bit
Micro USB port (USB to serial port)	1500000	8	1	0
14-pin serial expansion port	1500000 by default when powering on If the "Maintain high-speed serial port" command is not received within 3 seconds, it will be switched automatically to 115,200.	8	1	0

When using common functions, users do not need to pay attention to the underlying protocol and can use the officially packaged libraries or tools directly. For example, when using the AI Education Set with RMEP, users can program blocks directly with the Rogram editor of the DJI Education Hub or use the RoboMaster App Python API (graphical programming is not available for the RoboMaster app) and Python SDK. For RMIT, the Python SDK can also be used. When

using third-party controllers, users may download C language libraries and demos to facilitate the parsing of commands and data. See the “Program Applications” section for details.

In addition, the core module outputs video streams through the SPI in the 14-pin expansion module, and acts as the host.

The relevant timing and video stream output formats are as follows:



Specifications

Product Name	AI Education Set
Model	AIES01
Operating Temperature	0° to 45° C
Core Module	
CPU	Dual core 64-bit RISC-V CPU with a clock speed of 400 MHz, each with an independent single-precision FPU
NPU	Neural network accelerator which supports the acceleration of convolution, pooling, and other operators, with a computing power of 0.8 Tops
SRAM	8 MB 64-bit
Flash	16 MB NOR Flash
Task Category	Supporting machine vision-object detection tasks
Toolchain	One-stop visual AI training platform for supporting zero-threshold training of own models
Neural network model	YOLOv2 custom enhanced version
Model input	320×240 RGB, 16-bit
Model computing time	<9 ms
Sensor	1/4-inch, color, global exposure, 60 fps
Output image	Resolution 320×240, 16-bit color depth
Lens	FOV 40°, fixed focus 8 mm
Lens holder	Manually adjustable pitch axis
Weight	9 g
Dimensions	54×32×11 mm
Power supply	5V power supplied via micro USB or 14-pin expansion port; supports hot swapping, and short circuit, overcurrent and over-temperature protection.
Power Consumption	Approx. 1.25 W

Output port	Serial port (inference results), SPI (video streams)
Auxiliary functions	Button x 1, RGB LED x 1
Touch screen	
Screen size	6.1 cm (2.4 in)
Displayed image	Resolution 320×240, 16-bit color depth
Display port	8-bit MCU parallel port
Weight	42 g
Dimensions	67×49×15 mm
Power supply	5 V, hot swapping supported
Power Consumption	Approx. 250 mW
Auxiliary functions	Button x 2, SD card slot x 1 (must be used with core module)

Program Applications

The core module outputs the object detection results in real time. Users can use this information to program and control the corresponding robot platform to complete AI applications, i.e., the final step of an AI project - “model application”.

Using with RMEP

When used with RMEP, the AI Education Set must be paired with the RoboMaster Expansion Module. For the installation process, please refer to the RoboMaster Expansion Module Quick Start Guide.



- Please connect the RMEP to the RoboMaster app and update its firmware to the latest version before using the AI module and the Expansion Module.
-

Programming with the Rogram Editor on the DJI Education Hub

Go to the “My Programs” page of the DJI Education Hub and enter the Rogram Editor page to create a new program.

On the right side of the page, click the EP icon and connect to the EP by following the guidelines. You can choose to connect in the “Direct mode” or “Router mode”.

In the Rogram Editor, the programming blocks associated with the AI module will be shown under the “AI Module” category. For how to use each block, refer to the AI Education Set Programming Manual.

Using with RMTT

The installation process can be found in the AI Education Set Quick Start Guide.

Log on to the RoboMaster SDK developer page at <https://robomaster-dev.readthedocs.io>, update your Python SDK to the latest version and download the latest sample code. Go to the RoboMaster SDK API for more information and view the ports in `Robomaster.ai_module`.

Using with Third-Party Controllers

The installation process can be found in the AI Education Set Quick Start Guide.

1. Use a 5V power supply and any two GND wires to power the AI module.



- The current must not be less than 250 mA when connected only to the core module, and 350 mA when connected to the touch screen.
-

2. Connect the TX and RX signal lines to the third-party controller to obtain identification results or run other basic commands.



- The serial port level of the core module is 3.3 V.
-

3. Download the “Third-party Controller Communication Development Guide and Routines for the AI Education Set”, and follow the instructions to port the code into your own project.

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