AIER1000 series

Artificial Intelligence Education Solution

User's Manual

Version 1.0
(June 2021)

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Compliance

CE

The product described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

FC

This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive of for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE

This product complies with the current RoHS directives restricting the use of the following substances in concentrations not to exceed 0.1% by weight (1000 ppm) except for cadmium, limited to 0.01% by weight (100 ppm).

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

Important Safety Information

Carefully read the following safety information before using this device.

Setting up your system:

- Put the device horizontally on a stable and solid surface.
- Do not use this product near water or any heated source.
- Leave plenty of space around the device and do not block the ventilation openings. Never drop or insert any objects of any kind into the openings.
- Use this product in environments with ambient temperatures between 0˚C and 45˚C.

Care during use:

- Do not place heavy objects on the top of the device.
- Make sure to connect the correct voltage to the device. Failure to supply the correct voltage could damage the unit.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure the total ampere rating of all devices plugged into the extension cord does not cord’s ampere rating.
- Do not spill water or any other liquids on your device.
- Always unplug the power cord from the wall outlet before cleaning the device.
- Only use neutral cleaning agents to clean the device.
- Vacuum dust and particles from the vents by using a computer vacuum cleaner.

Product Disassembly

Do not try to repair, disassemble, or make modifications to the device. Doing so will void the warranty and may result in damage to the product or personal injury.

CAUTION

There is a danger of explosion if the lithium-ion battery is replaced with an incorrect battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries by observing local regulations.

Avoid Disassembly

You are not suggested to disassemble, repair or make any modification to the device. Disassembly, modification, or any attempt at repair could generate hazards and cause damage to the device, even bodily injury or property damage, and will void any warranty.

Warranty Policy

- **IBASE standard products:**

  24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

  12-month (1-year) warranty from delivery for 3rd-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adaptor, display panel and touch screen.

* PRODUCTS, HOWEVER, THAT FAIL DUE TO MISUSE, ACCIDENT, IMPROPER INSTALLATION OR UNAUTHORIZED REPAIR SHALL BE TREATED AS OUT OF WARRANTY AND CUSTOMERS SHALL BE BILLED FOR REPAIR AND SHIPPING CHARGES.

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the l
2. atest information about the product.
3. If you encounter any technical problems and require assistance from your distributor or sales representative, please prepare and send the following information:

   - Product model name
   - Product serial number
   - Detailed description of the problem
   - Error messages in text or screenshots if any
   - The arrangement of the peripherals
   - Software used (such as OS and application software)

4. If repair service is required, please download the RMA form at http://www.ibase.com.tw/english/Supports/RMAService/. Fill out the form and contact your distributor or sales representative.

Chapter 1
General Information

The information provided in this chapter includes:

1.1 Introduction
1.2 Features
1.3 Packing List
1.4 Specifications
1.5 Product View
1.6 Dimensions

1.1 Introduction

The AIER1000 series is powered by the 8th Generation LGA1151 Intel® Core™ i7-8700 Processor. The system features two 2.5” SATA SSD bays with RAID 0/1/5 function to ensure security of data and disks and comes with two 8GB DDR4 SO-DIMM memory modules for a total of 16GB capacity, internal 300W power supply and pre-installed Windows 10 & AI recognition software. It is designed for use as an inference computing system for high-performance Artificial Intelligence education applications.

The AIER102E model in the AIER1000 series uses one full-height PCIe capture card and two Full-HD SDI interface cameras to collect and analyze specific data for edge side system deployment.
The AIER100C, another AIER1000 series model, can be built as a centralized management system connecting several AIER102E for central management server.

AIER102E

AIER100C

1.2 Features

- 8th Gen Intel® Core™ i7-8700 processor
- 2x 8G DDR4 SO-DIMM on board
- Dual Intel® Gigabit LAN
- 4x USB3.0, 2x USB2.0, 1x RS232 COM port
- 1x HDMI 1.4

1.3 Packing List

AIER102E	1 x AIER102E system 1 x Power cord 1 x Wall mount kit and screws 4 x Foot pads 1 x Camera kit: (1) AIDA SDI interface Full HD cameras *2 (2) 12V power adaptor and power cables for camera *2 (3) 20M SDI cables *2
AIER100C	1 x AIER100C system 1 x Power cord 1 x Wall mount kit and screws 4 x Foot pads

1.4 Specifications

Product	AIER102E	AIER100C
System		
Mainboard	MI998AF-AI	
Operating System	Microsoft Windows 10 (64-bit)	
CPU	8th Gen Intel® Core™ i7-8700 Processor 3.20GHz, TDP ≤ 65W	
Chipset	Intel® Q370 PCH	
Memory	2x DDR4 SO-DIMM 2666/2400 MHz up to 32GB, default 2x 8GB	
Graphics	Intel® UHD Graphics P630	
Network	1x Intel® I219LM Gigabit LAN controller 1x Intel® I211AT Gigabit LAN (as 2nd LAN)	
Power Supply	Internal 300W PSU	
Storage	2x 2.5” SATA devices, Default 1x 128G SSD and 1x 500G HDD	2x 2.5” SATA devices Default 1x 128G SSD and 1x 2TB HDD
Expansion	Default 1 x SDI full-height PCIe capture card	N/A
Front Side I/O	• 2x USB 2.0 • 1x Reset button • 1 x Power/HDD LED	

Rear Side I/O	• 1x HDMI • 4x USB 3.0 • 2x RJ45 Gigabit LAN • 1x COM port RS232 • 1 x IEC 60320 (C14) AC Inlet	
Power Requirement	AC 100V~240V	
Watchdog	Watchdog Timer 256 segments, 0, 1, 2…255 sec/min	
Chassis	Aluminum and SGCC, Gray & white	Aluminum and SGCC, Blue & white
Mounting	Standard system bracket	
Dimensions (W x H x D)	406mm(W) x 345mm(D) x 93mm(H) 462.8mm(W) x 345mm(D) x 98mm(H) with desktop mounting kit	
Net Weight	8 kgs (17.64 lbs)	
Compliance	CE/FCC class A	
Temperature	• Operating: 0°C ~ 45°C (32°F ~ 113°F) • Storage: -20°C ~ 80°C (-4°F ~ 176°F)	
Relative Humidity	10 ~ 90% (non-condensing)	

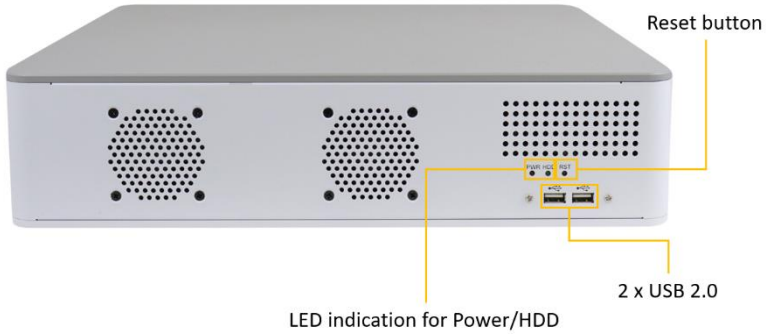
SDI Capture Card	
Video Input	4× SDI
Max. FPS	1920×1080p@60/50fps in → 1920×1080p@60/50fps out
Recording Video Resolution	3G-SDI: 1920 x 1080p @60/50fps HD-SDI: 1920 x 1080p @30/25/24fps, 1920 x 1080i @60/50fps, 1280 x 720p @60/50fps SD-SDI: 720 x 480i @60fps, 720 x 576i @50fps

3G-SDI Full HD Camera	
Image Sensor	1/3 inch Progressive CMOS
Sensor Size	5.346 x 3.003mm (16:9)
Effective Pixels	Horizontal: 1920, Vertical: 1080
Pixel Size	2.75um x 2.75um
Resolution	1080p / 1080i: 1920 x 1080, 720p & 720i: 1280 x 720
Resolution/Rate	1080 60p/ 59.94p/ 50p/ 30p/ 29.97p/ 25p, 1080 60i/ 59.94i/ 50i, 720 60p/ 59.94p/ 50p/ 30p/ 25p
Output	HD-SDI/ 3G-SDI (1 BNC), HDMI 1.3a
Dimension	49mm x 49mm x 71mm (With default 3.6mm lens)
Weight	180g/0.39Lbs (With default 3.6mm Lens)
Power	30W/12VDC

All specifications are subject to change without prior notice.

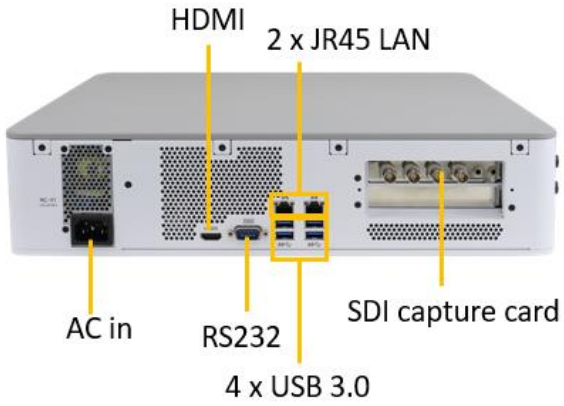
1.5 Product View

Front View

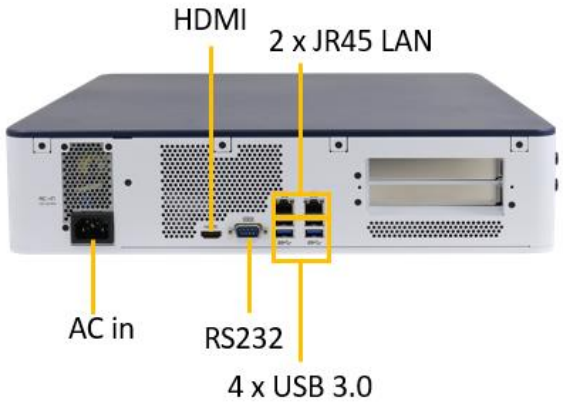


Rear View

AIER102E

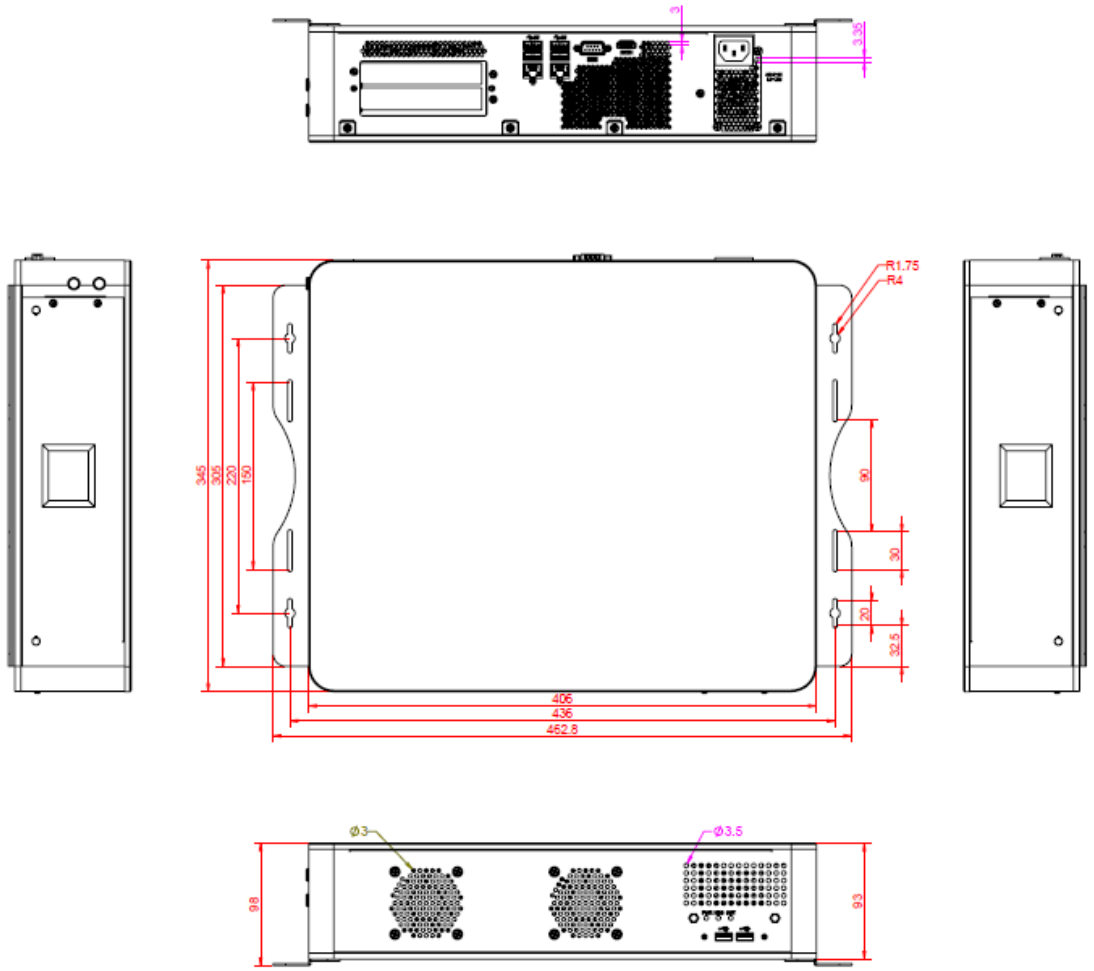


AIER100C



1.6 Dimensions

Unit: mm



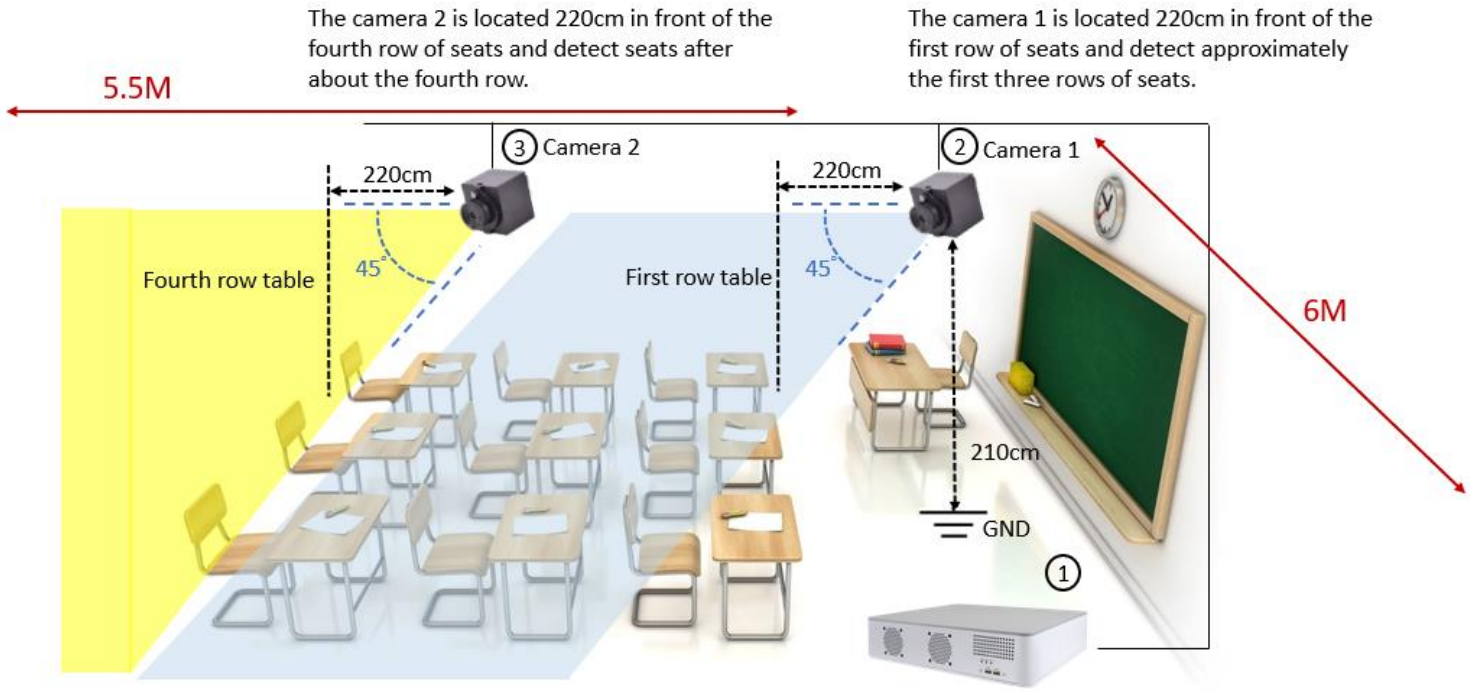
Chapter 2
Hardware Installation

This section contains general information about:

2.1 Edge Side System Installation
2.2 Central Management Server Installation
2.3 Mounting Installation

2.1 Edge Side System Installation

1. Install AIER102E in each classroom.



Hardware:

① AIER102E AI Education System
② Camera 1 → for Students
③ Camera 2 → for Students
④ Camera 3 → for Students (future feature)
⑤ Camera 4 → for Teacher (future feature)

Software:

QDEEP Education

Surroundings:

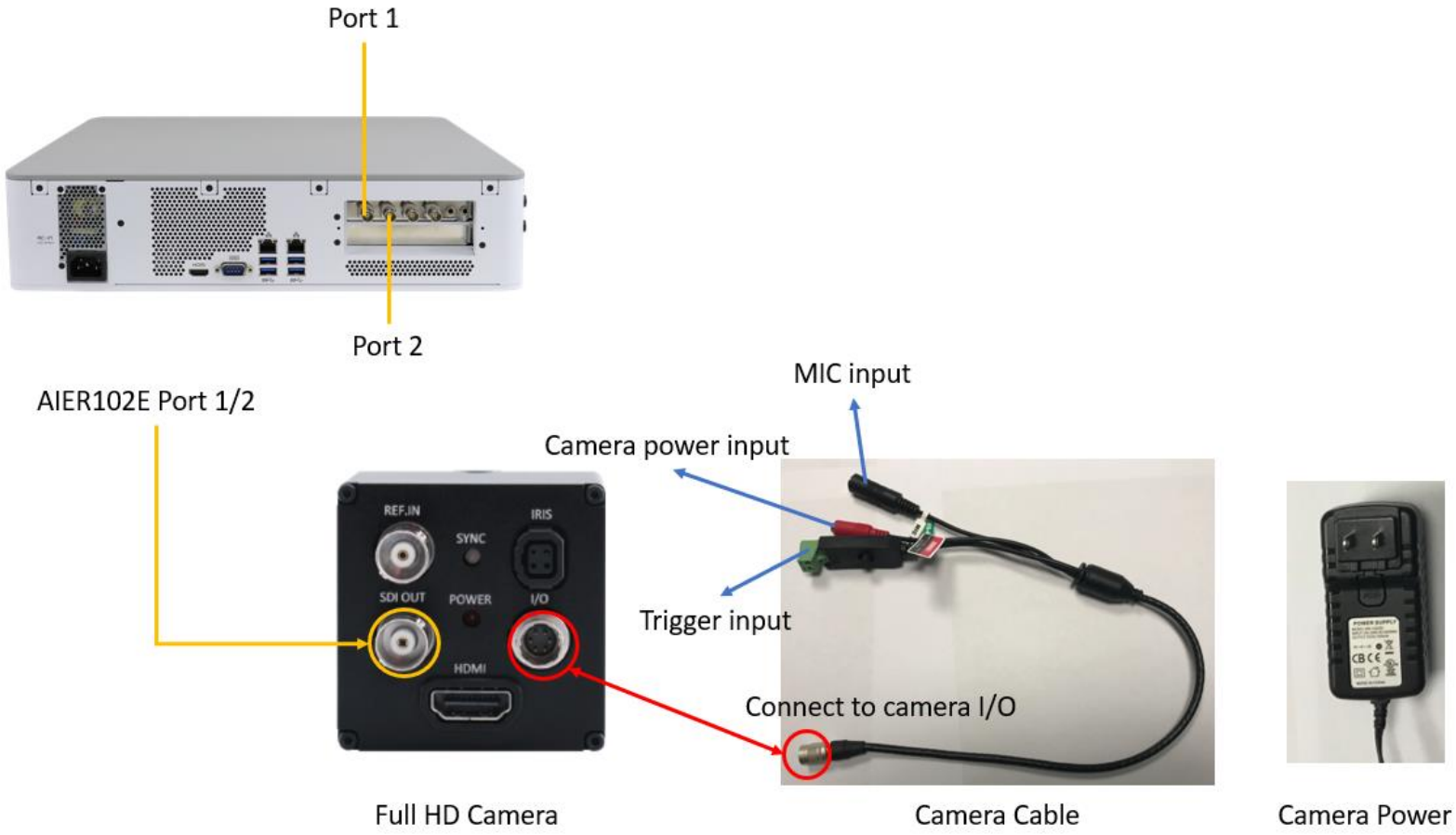
① No. of detection: Max. 35
② Detected area space: 6M x 5.5M

Camera setting:

The cameras set up at a distance of 210 cm from the ground and look down at a 45-degree angle

2. Set up two cameras with default 20M SDI cable on the left and right sides of the front of the classroom. Make sure cameras can capture all students' faces.

3. Connect the cameras to the two ports as below. Be sure to connect port 1/2 and select 2 on the CHANNEL_NUMBER page.

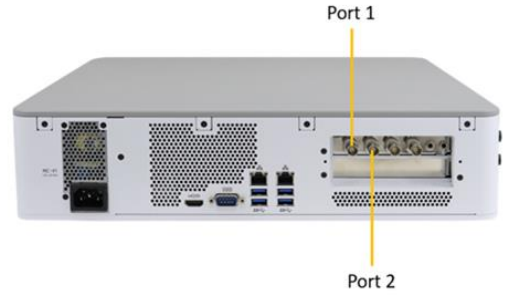


If there is only one camera connected (whether on port1 or port2), select 1 on the CHANNEL_NUMBER page.

Then you will see the corresponding image in the UI windows and another one will have a black screen.

In other words, if one camera is connected to Port 1, the image will be shown at Channel 1, and Channel 2 will have a black screen and vice versa.

Port 1 = Channel 1
Port 2 = Channel 2



*If you want to use another camera, choose one with the following specifications:

(a) Camera maximum resolution: Full HD

(b) Camera output interface: SDI

4. Use an HDMI 1.4 Type A cable to connect the AIER102E to your monitor.

5. Use a USB Type A connector for your keyboard & mouse.

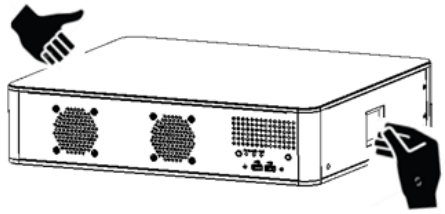
6. After the above connections have been made, plug the power cord and start the system.

2.2 Central Management Server Installation

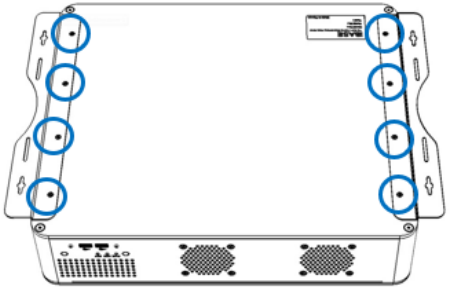
1. If there are many classrooms that need to be set up with the AIER102E system, prepare one AIER100C central management server at your office to simultaneously manage these AIER102E systems.
2. Connect all AIER102E and AIER100C to the ethernet.
3. Connect an HDMI 1.4 Type A cable to the AIER100C and monitor.
4. Connect the keyboard & mouse with a USB Type A connector.
5. Plug the power cord and start the system.

2.3 Mounting Installation

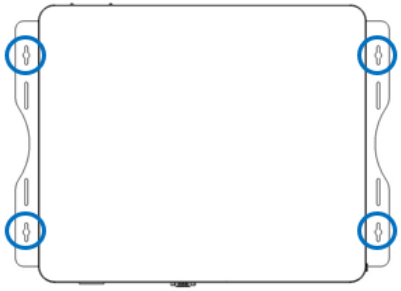
Before mounting the system, ensure that you have enough space for the power cord and signal cable routing. Use the following methods for mounting your system:



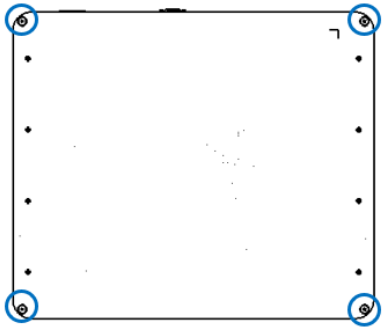
1. Use the embedded handle for ease of grip and handling of the system.



2. Turn your system upside down. Attach the wall-mount kit to the system and secure with the supplied 8 screws.



3. Prepare at least 4 screws (M3) to install the device on the wall as shown.



If you want to let the system stand as a desktop platform, turn your system upside down and attach the foot pads in the four corners as shown in the picture.

Chapter 3
Software Setting

This section contains general information about:

3.1 Edge Side System UI Introduction

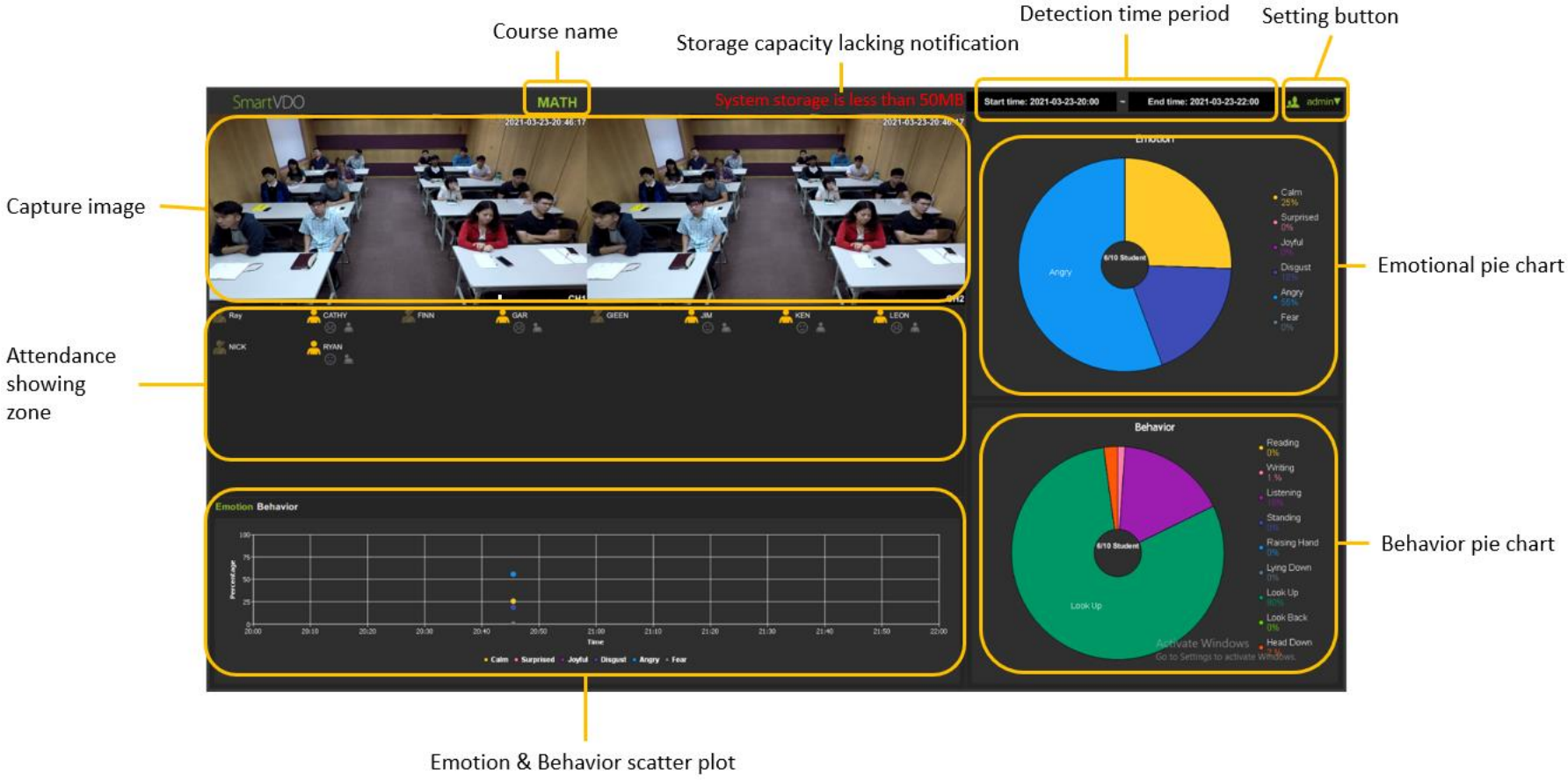
- 3.1.1 User Interface Overview
- 3.1.2 Account Login
- 3.1.3 Student Data Registration
- 3.1.4 Schedule Setting
- 3.1.5 Live Detection
- 3.1.6 System Information
- 3.1.7 Report Export
- 3.1.8 Video recording
- 3.1.9 Activity Controls

3.2 Central Management Server UI Introduction

- 3.2.1 User Interface Overview
- 3.2.2 Account Login
- 3.2.3 Connect to Edge side system
- 3.2.4 Raw Data Export

3.1 Edge Side System UI Introduction

3.1.1 User Interface Overview

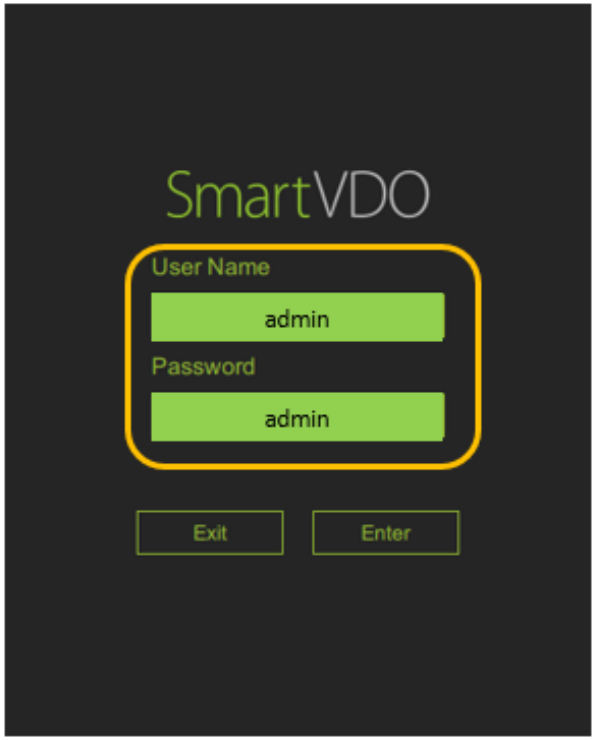


Six emotion categories in student's facial recognition

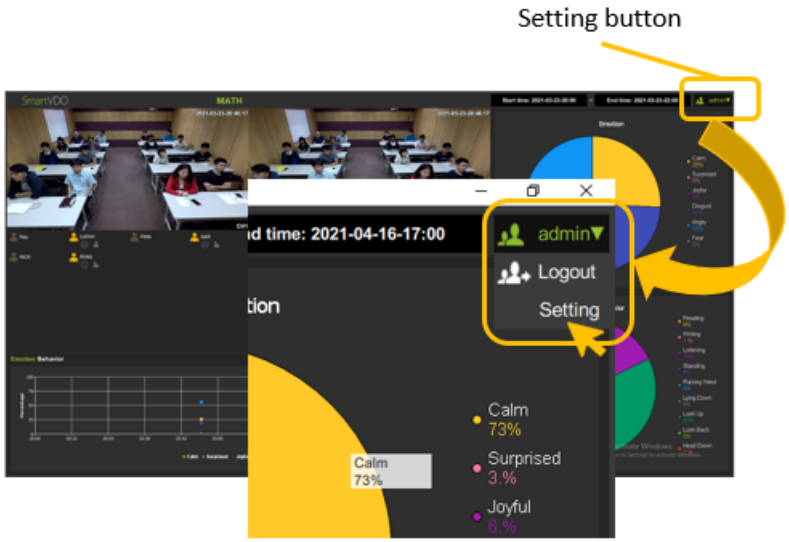
Nine behavior detections of students in the classroom

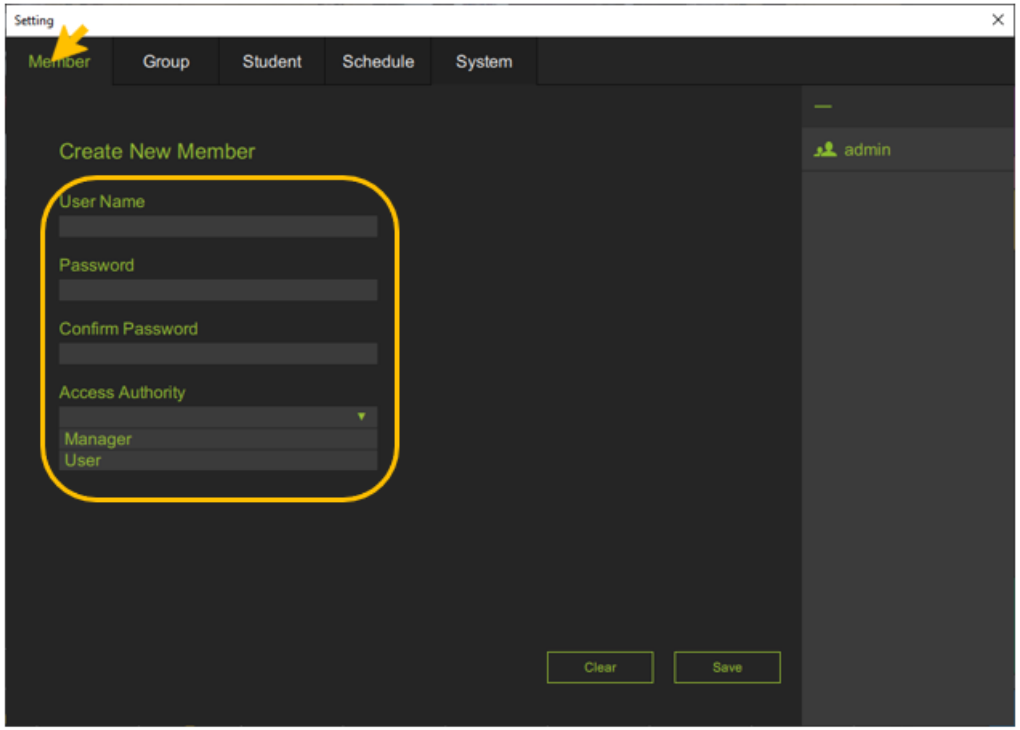
3.1.2 Account Login

Please key in the default user name and password: admin



To create a new user, click the “Setting” and then “Member” at the top left of the Setting page.

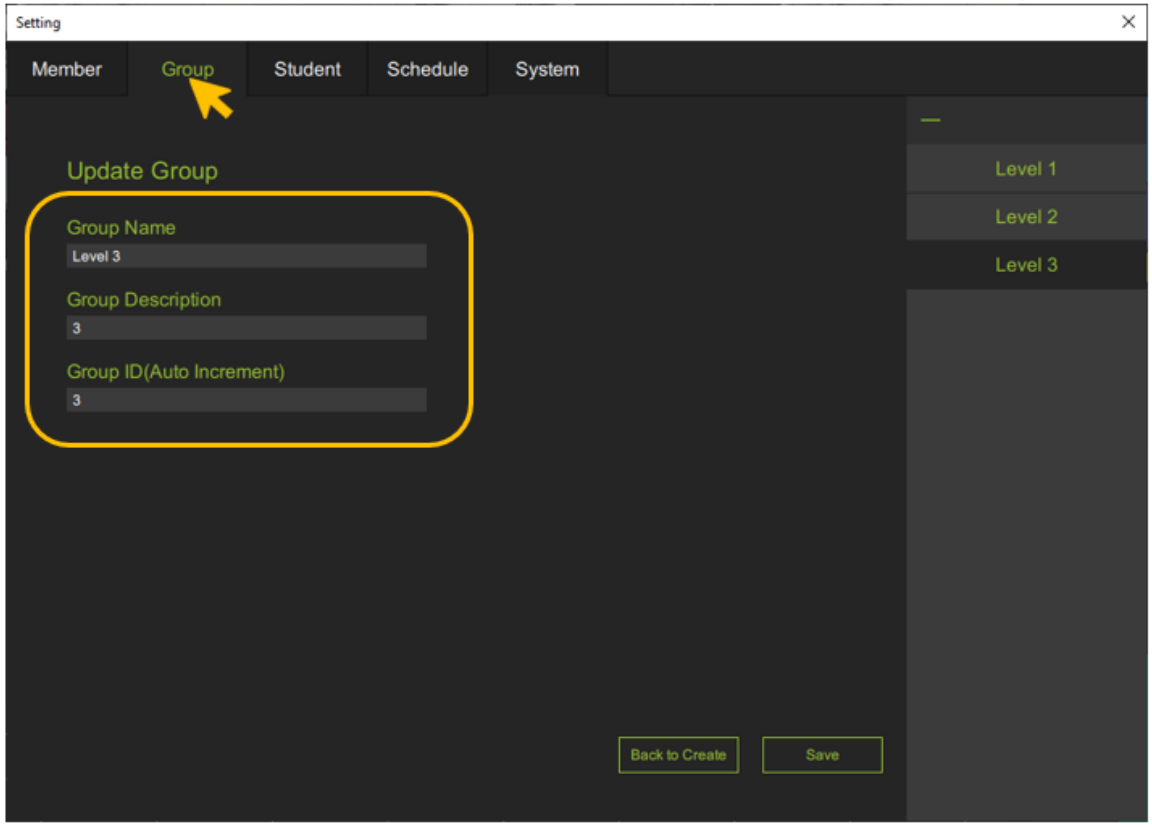




3.1.3 Student Data Registration

Prepare the pictures of the students to register information in advance before using this UI.

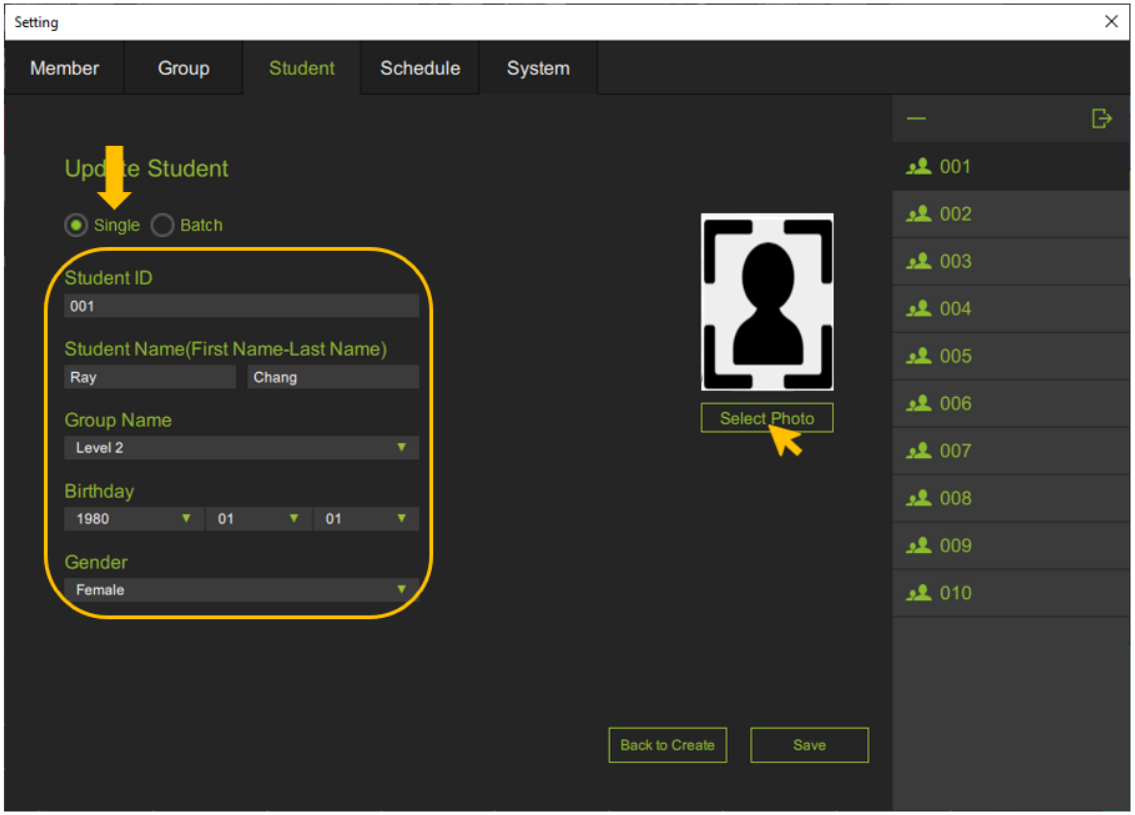
- Set up the Group information. "Group" means the group of students.



The methods of student registration.

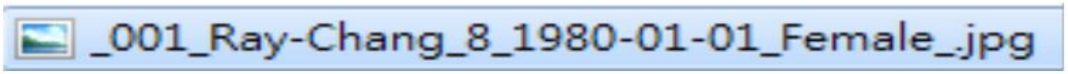
(1) Single Registration

- Fill in the fields as shown in the picture.
- Click Select photo to attach the picture file.

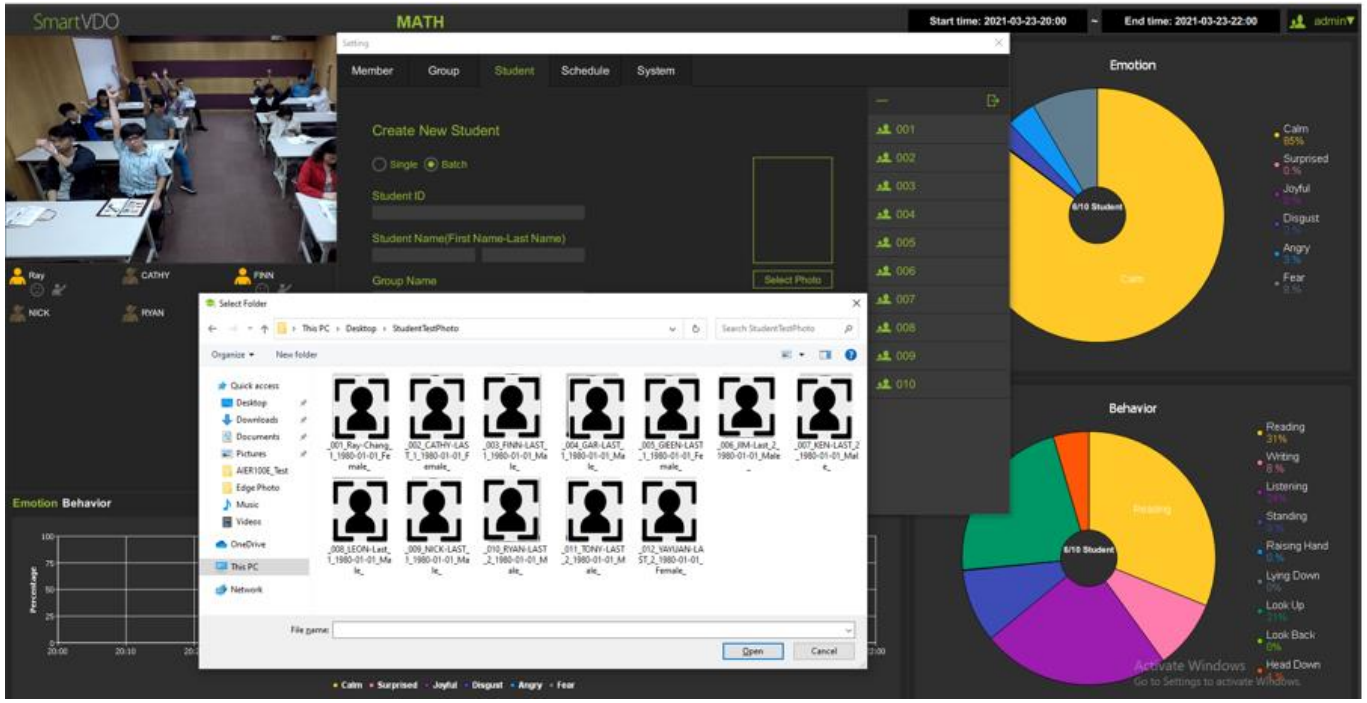


(2) Batch Registration

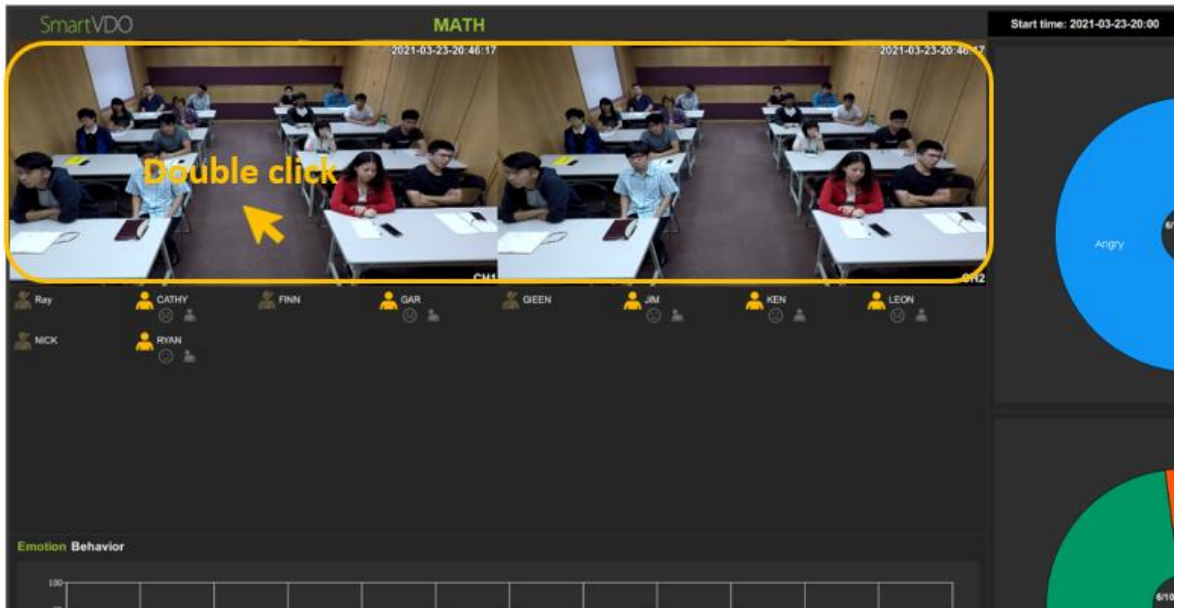
- Setting up the filename of the pictures.
  The file name format: _Student ID_Student First Name-Last Name_Group ID_Birthday_Gender_



- Select photo to attach all files



- **If you do not have the student picture ready, you can use the camera function to take a photo of the classroom. Double click the area to capture and take a picture. The picture will be automatically saved on the desktop of the computer.**

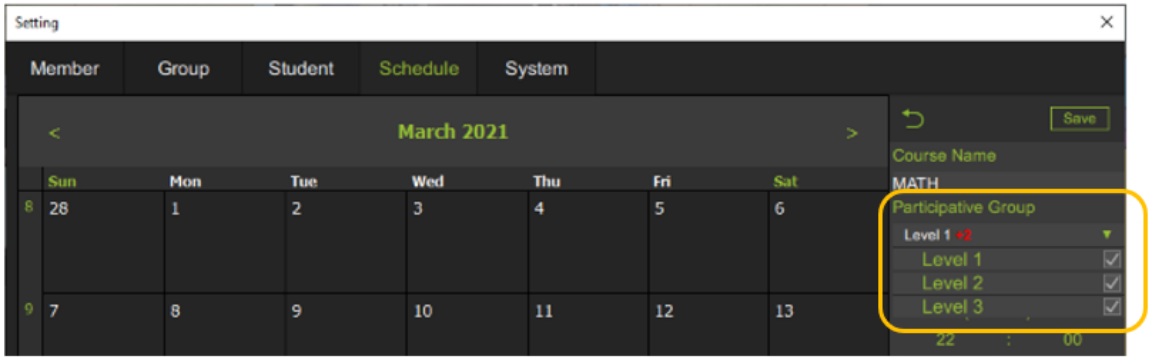


3.1.4 Schedule Setting

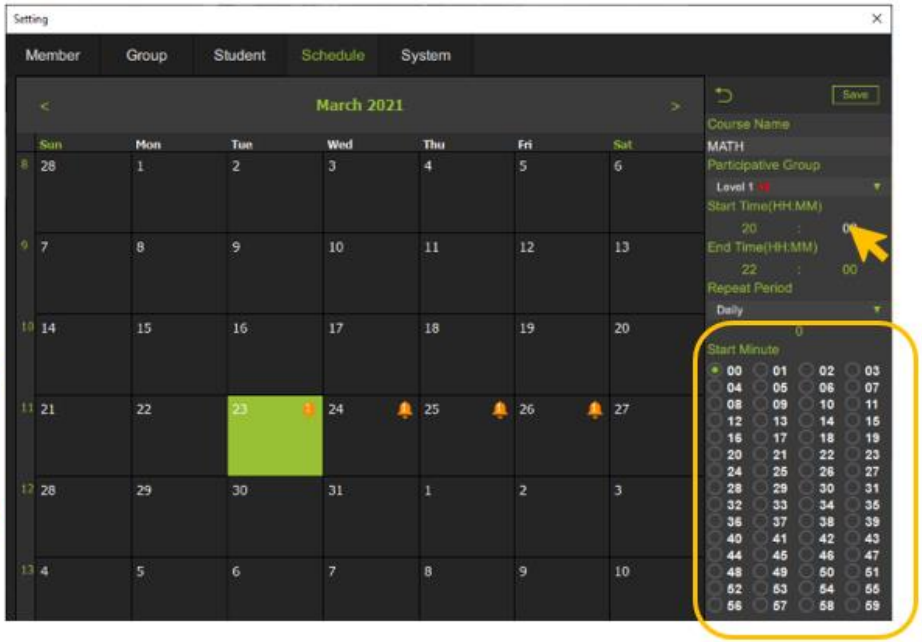
(1) Click “Schedule” at the top of the screen and open the setting page.
(2) Create “Course Name”

Course name cannot be repeated

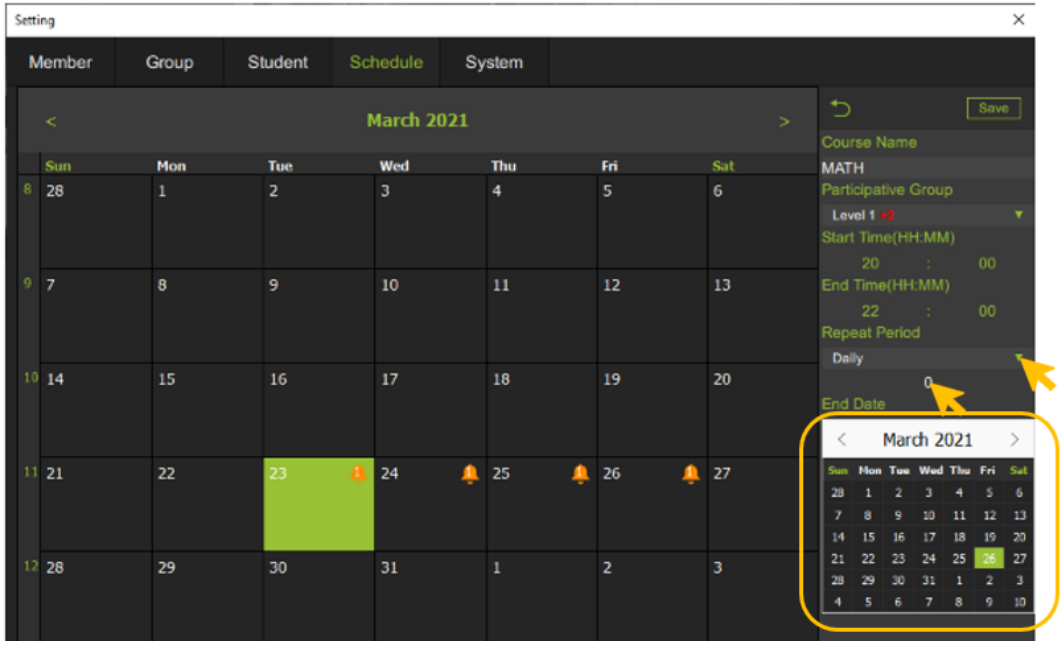
(3) Chose the “Participative Group”



(4) Set up the course start time and end time.



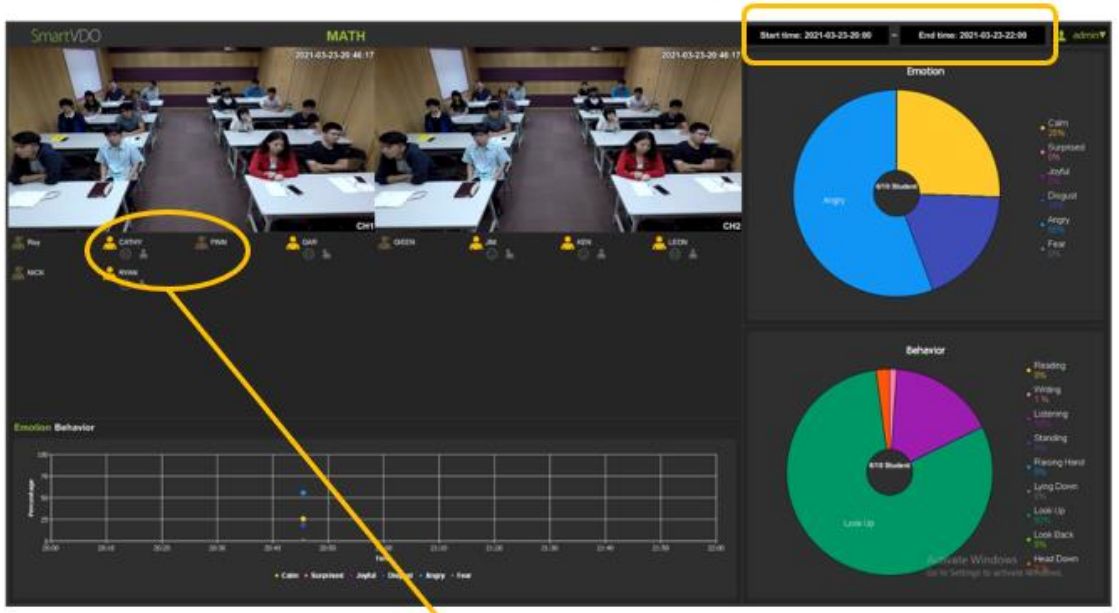
(5) There are two repeat periods: Daily or Weekly.



Please choose the end date of this repeat period.

3.1.5 Live Detection

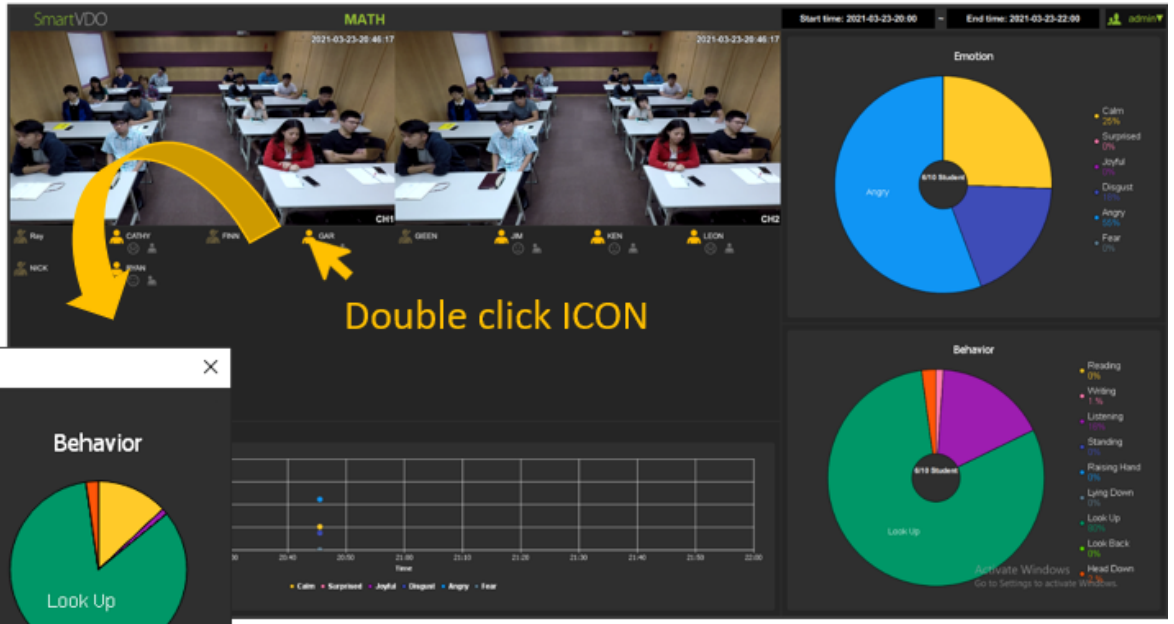
When the system starts to detect, the time period is WHITE.
Otherwise, the time period is RED.

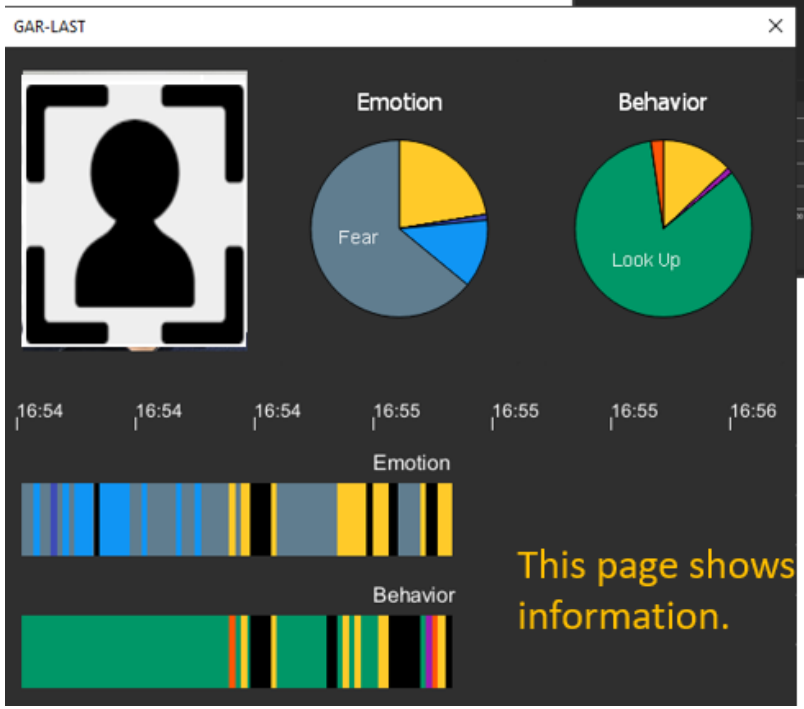


The ICON indicator lights up to indicate that the student is "present"

The ICON indicator lights up to indicate that the student is "absent"

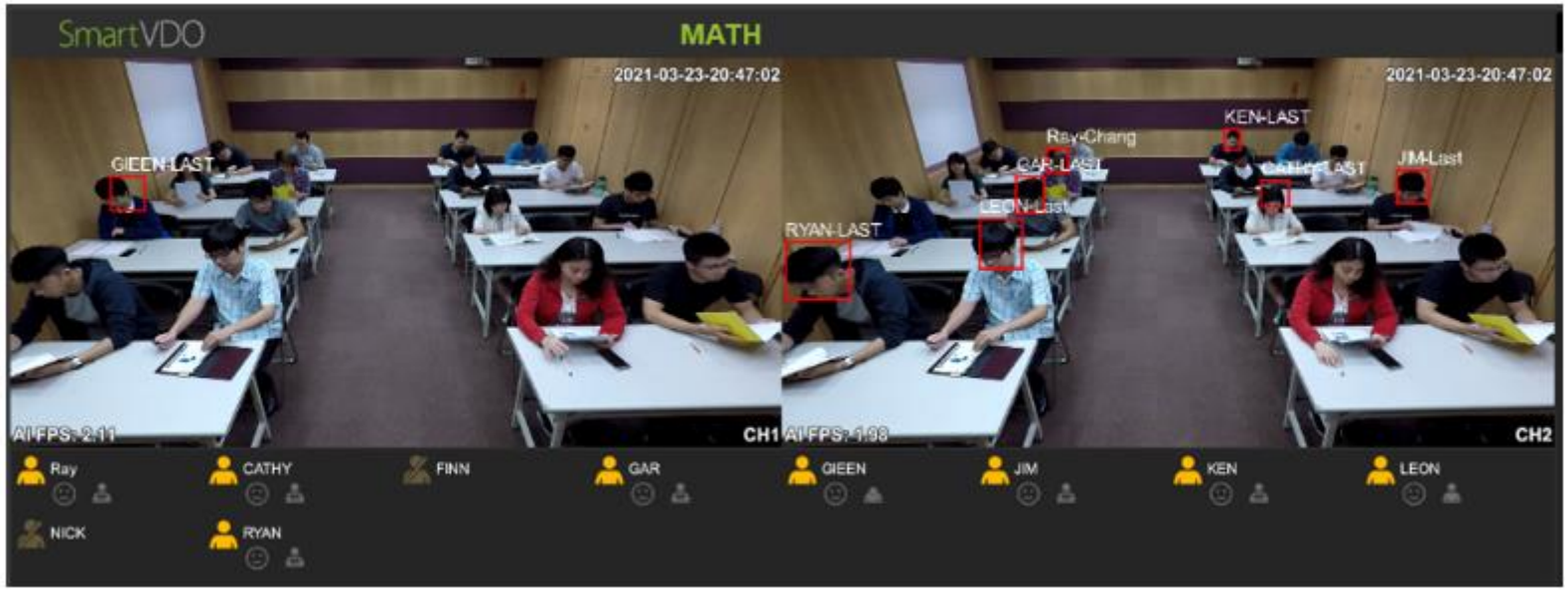
iBASE





This page shows the personal detection information.

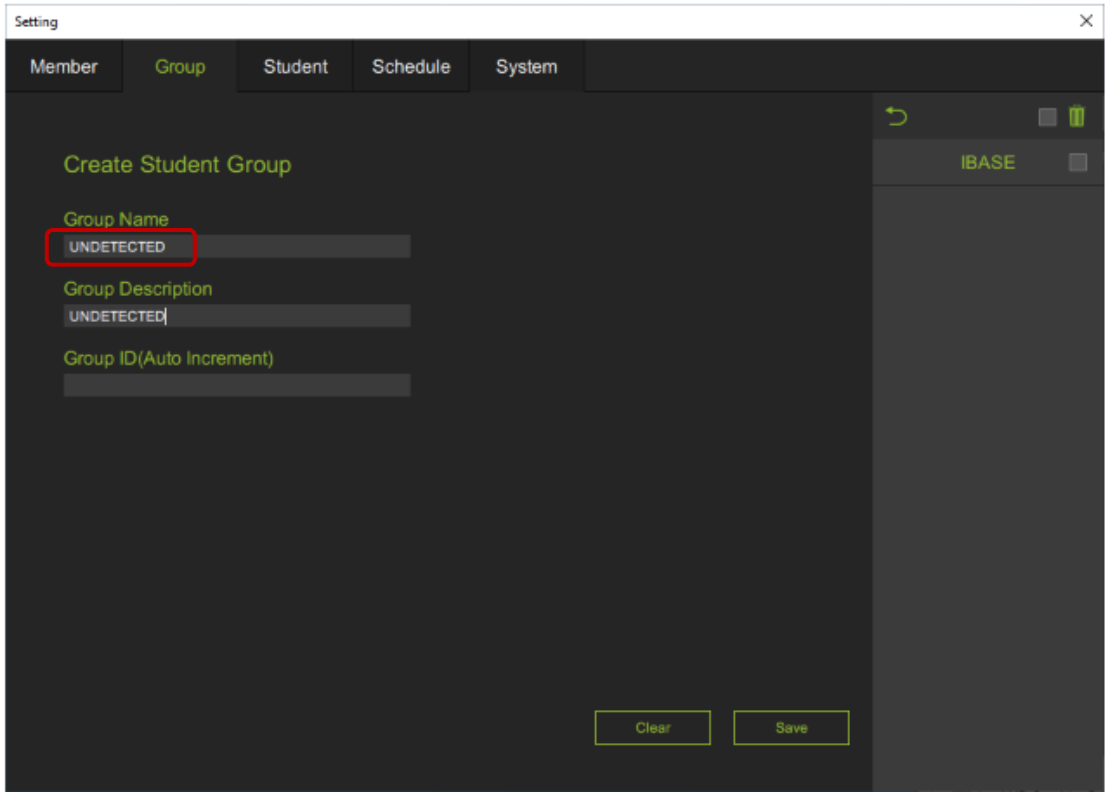
Press the F3 button on the keyboard and the system place the detected student in red frames.



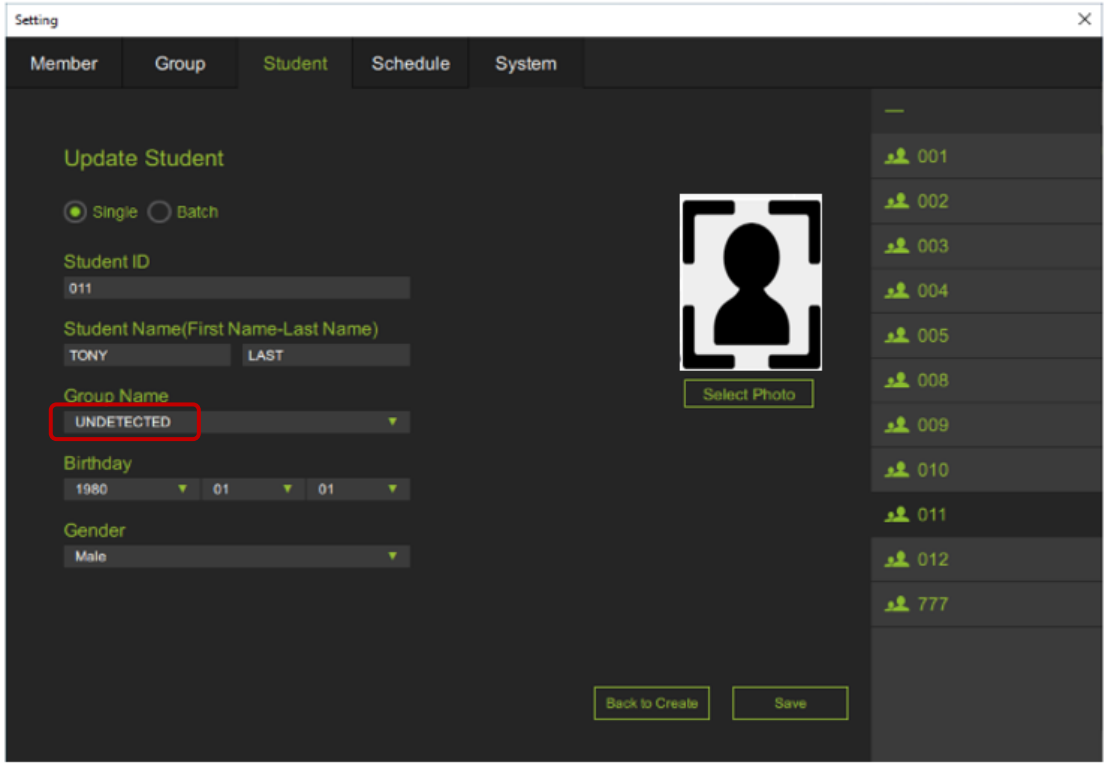
➢ Undetected mode

1. If a person does not want to be detected, do this setting.

2. Create a new group with the name “UNDETECTED”, for example.



3. Move the students who do not want to be detected into the “UNDETECTED” group.



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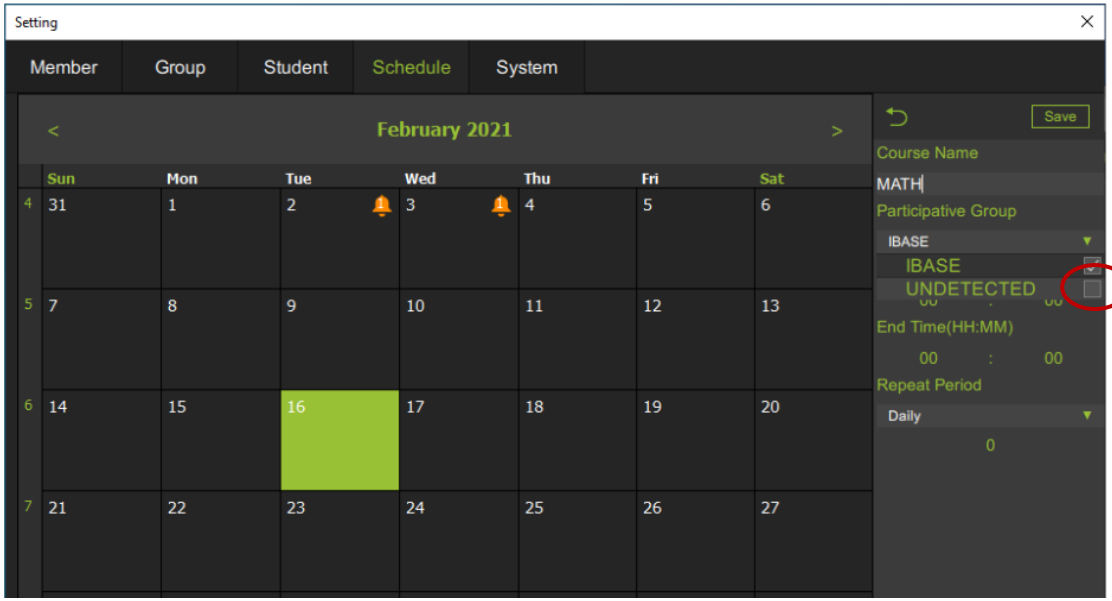
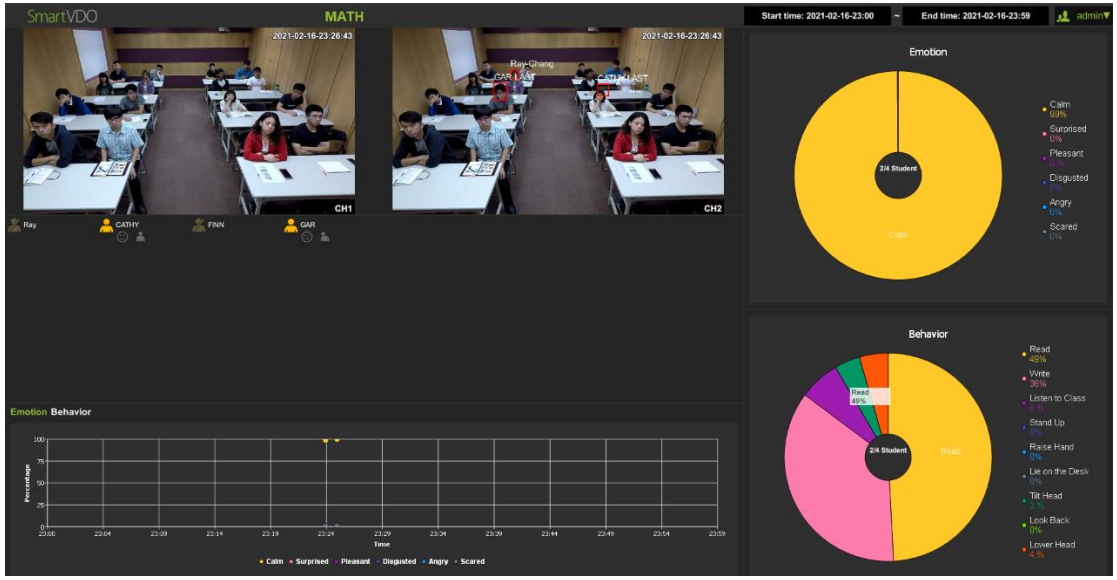
4. In the course schedule calendar, do not select the “UNDETECTED” group in the student list.



5. During smart course detection, “UNDETECTED” students will not be included in the output AI data even if they are present in the classroom.



3.1.6 System Information

(1) Channel Number: The number of cameras connection

(2) Video Source: Default is “Capture Card”

(3) Class Name: The name of the classroom

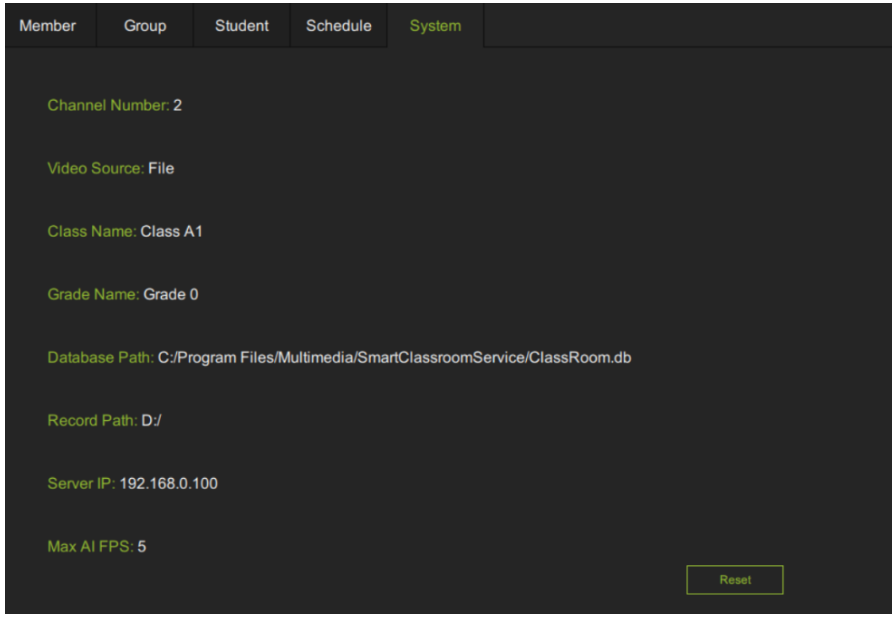
(4) Grade Name: The group of classrooms

(5) Database Path: Specify the path where the database is stored

(6) Record Path: Specify the path where the record is stored

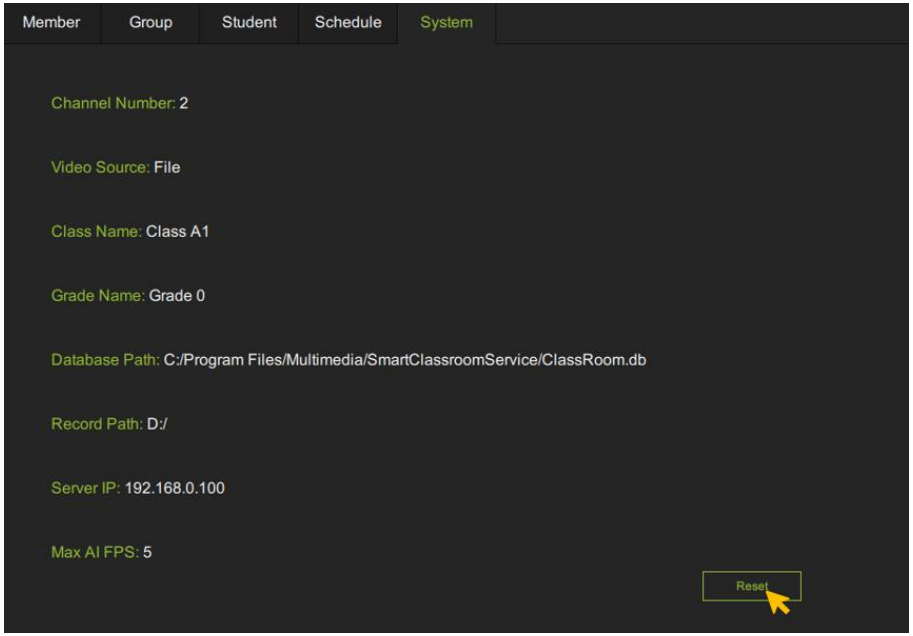
(7) Server IP: Used to connect to Server-side system

(8) Max AI FPS: Maximum Frames Per Second

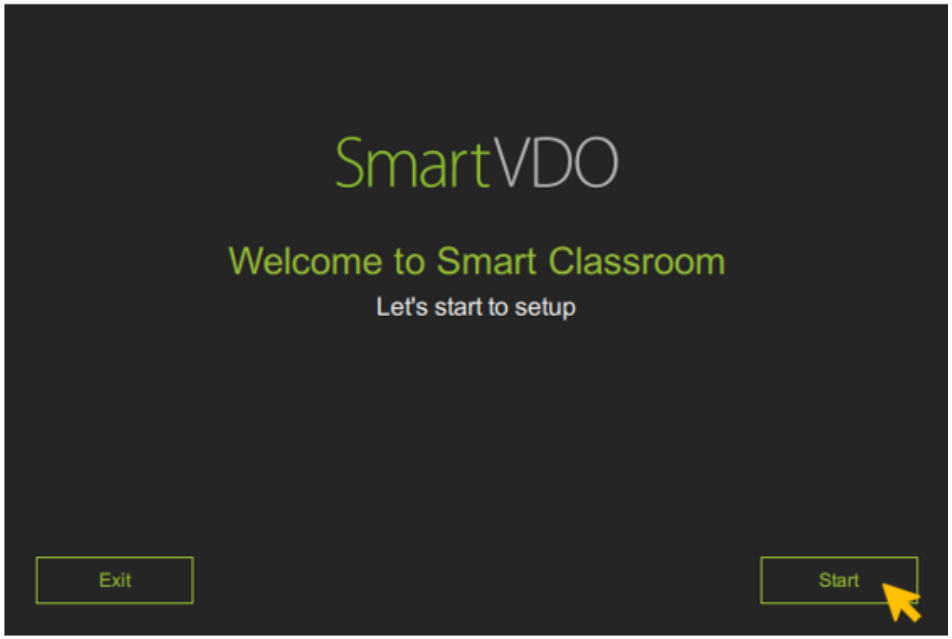


Click the "Reset" button to rearrange the value of each item. Follow the steps as below.

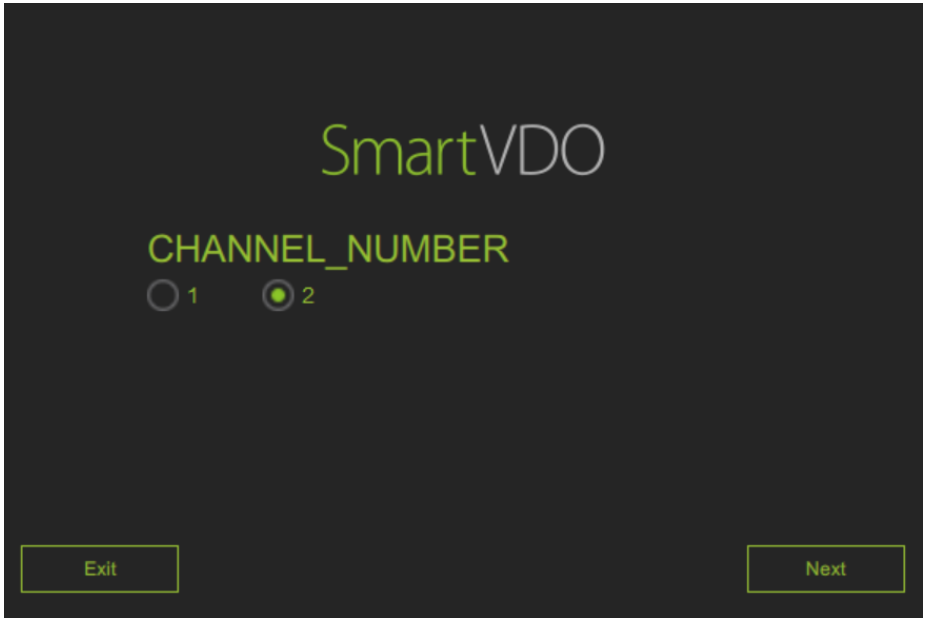
(1) Click the “Reset” button at the lower right.



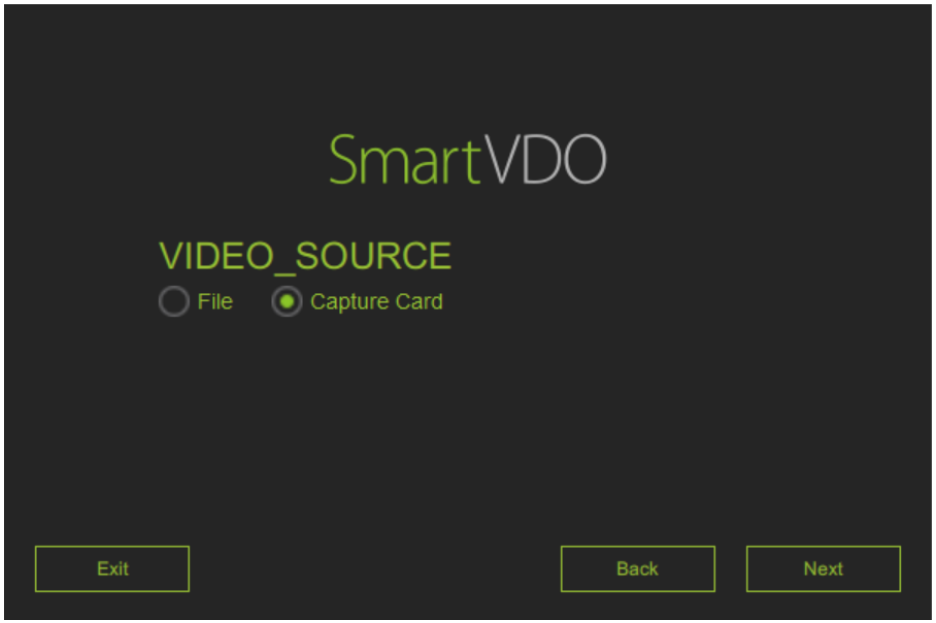
(2) Click “Start”.



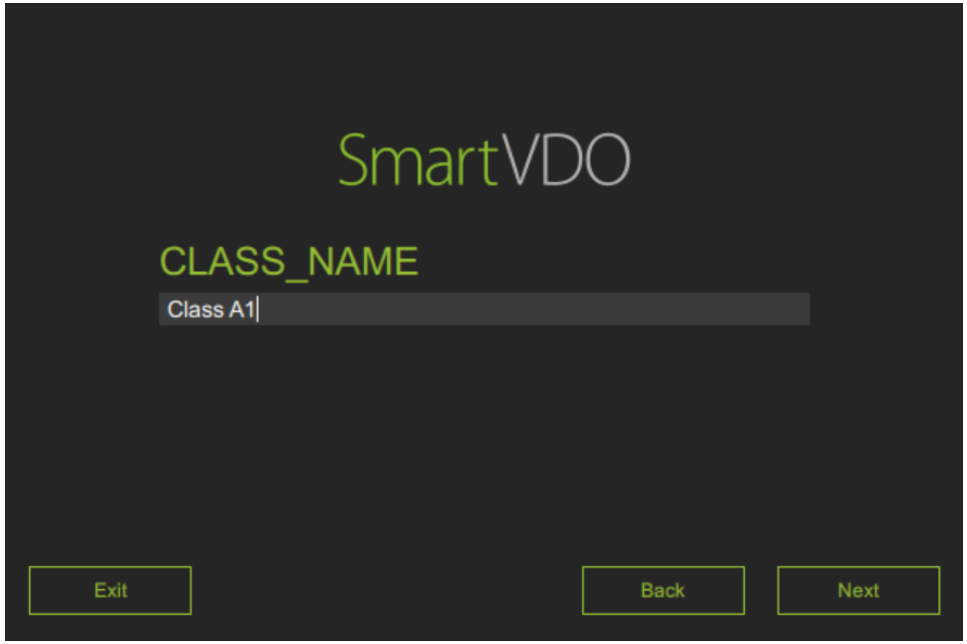
(3) Choose the number of camera connections and click “Next”.



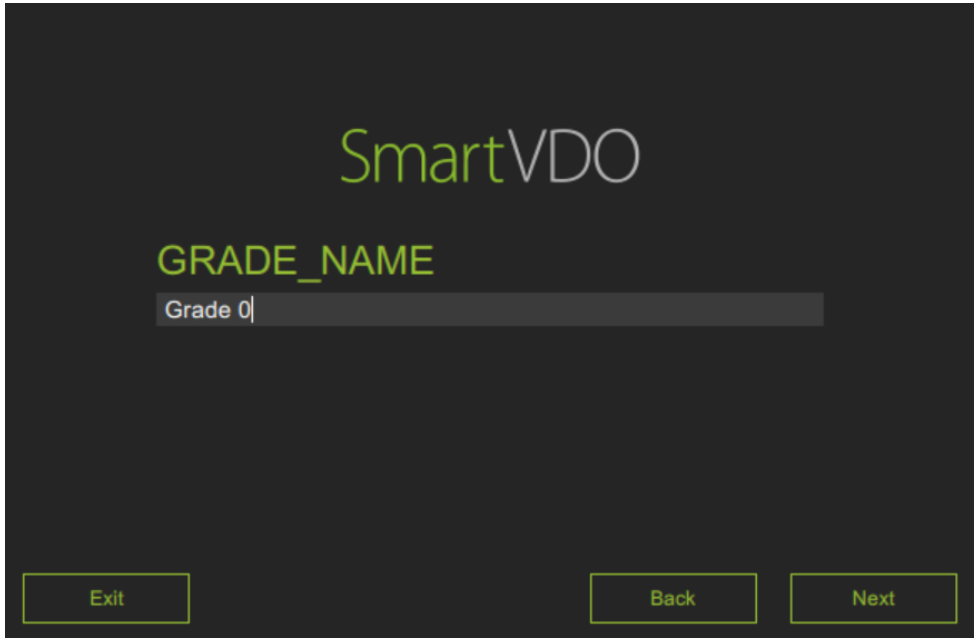
(4) The video source default is Capture Card.
“File” is used only for testing purpose.



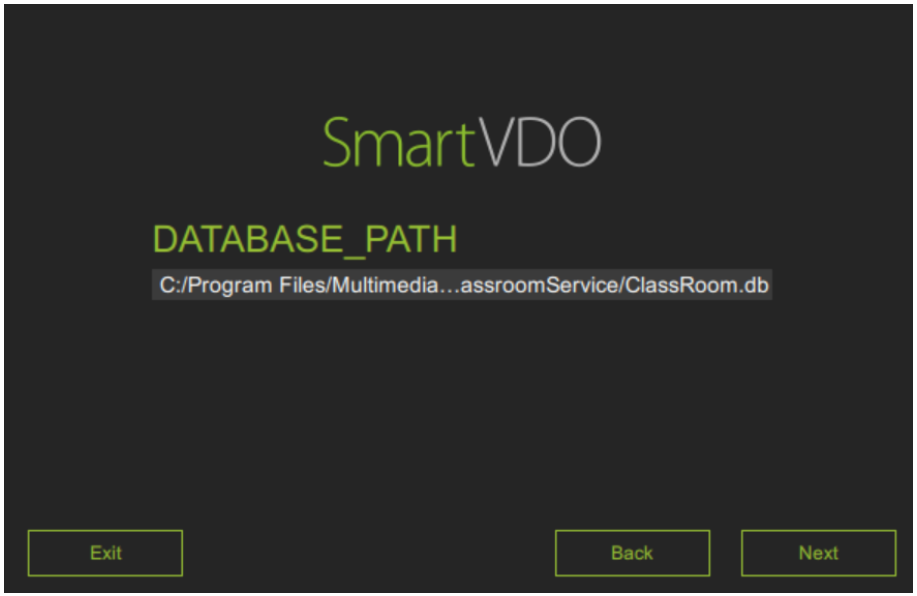
(5) Rename the classroom name.

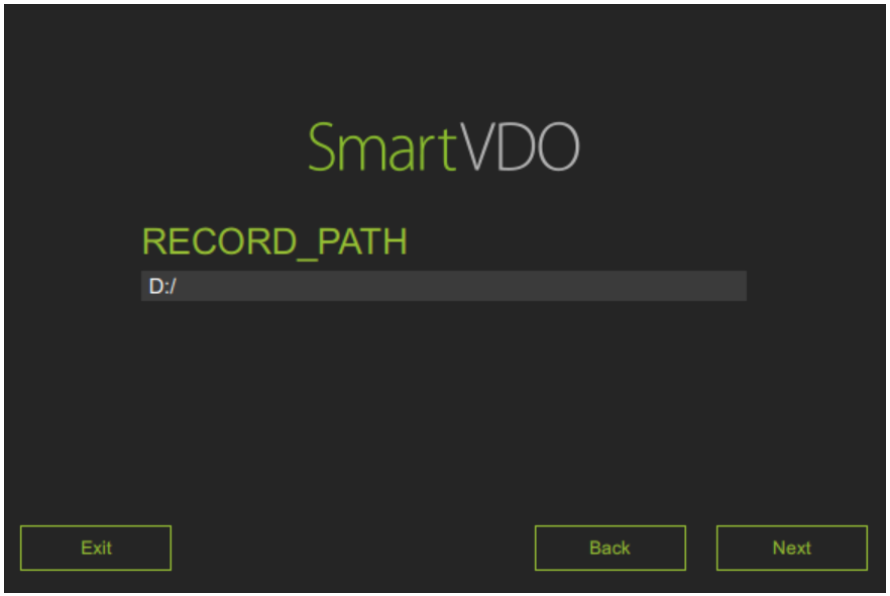


(6) Re-define the Grade of the classroom.

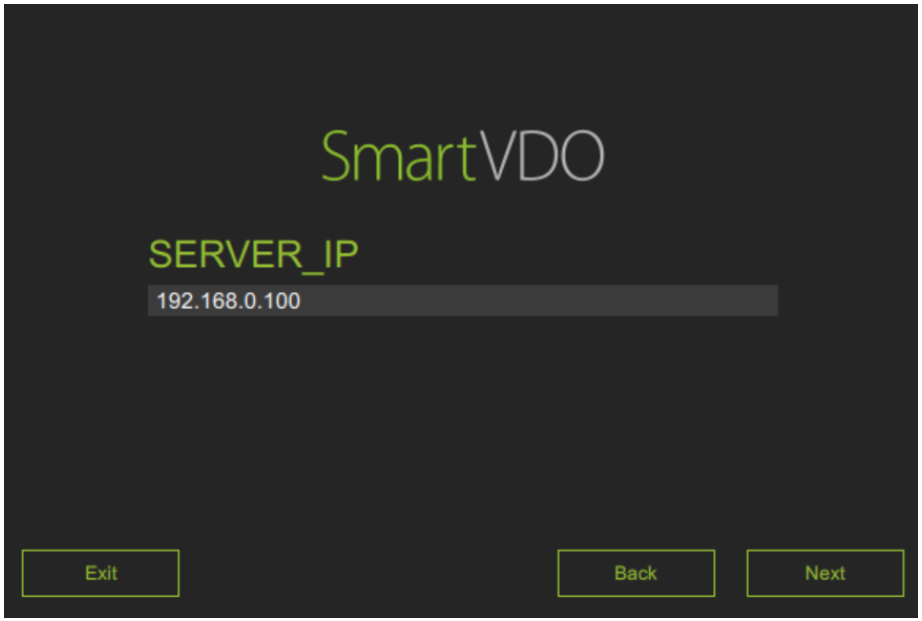


(7) Reset the database and record file paths.

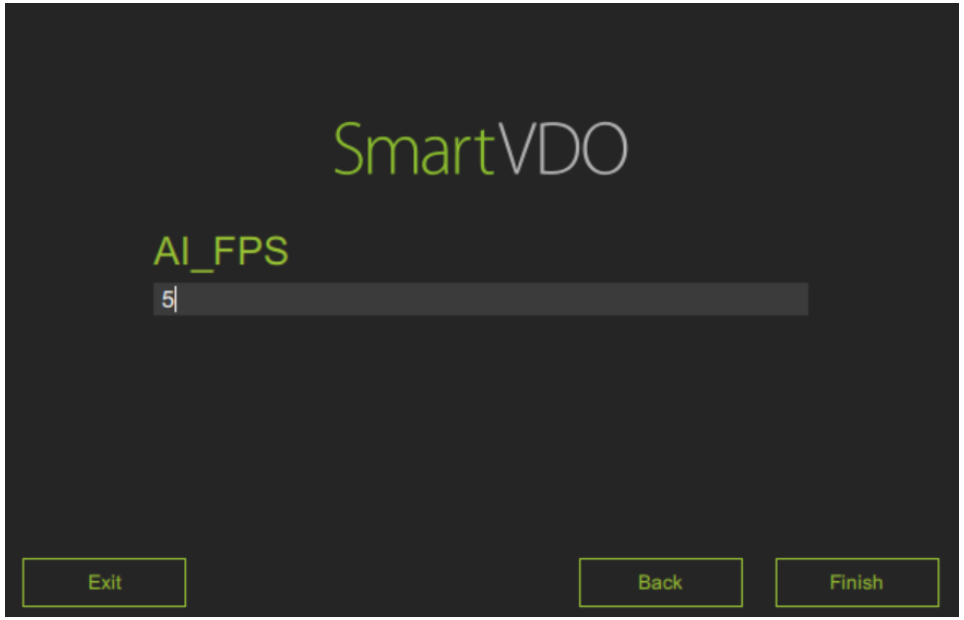




(8) Set up the IP of server-side system.
(When the edge side needs to connect to the server side)

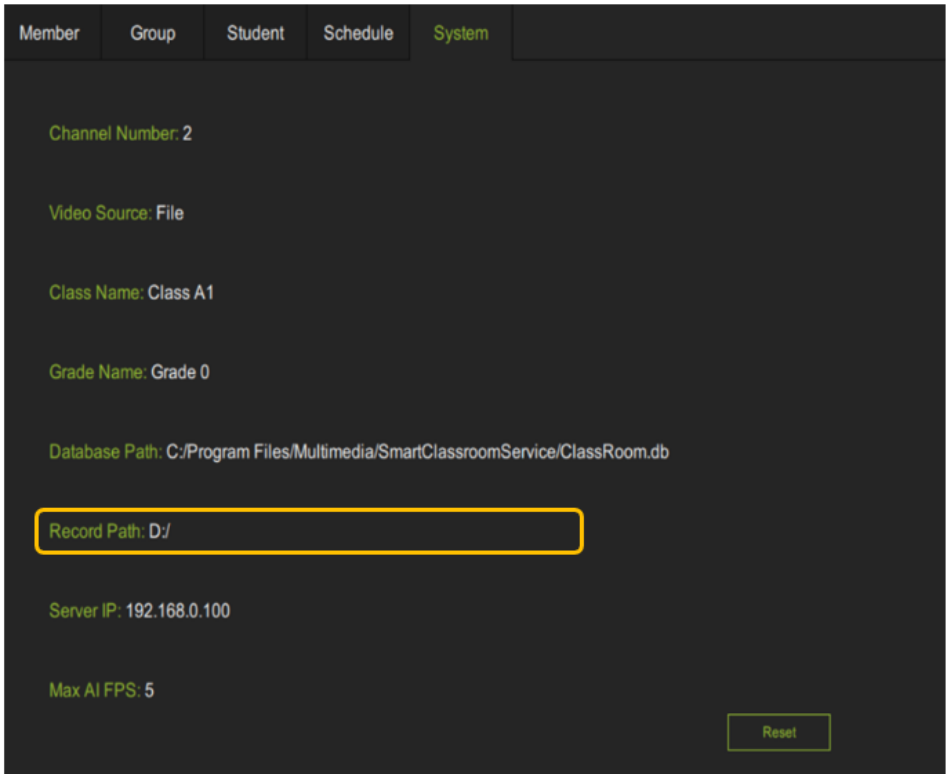


(9) Set up the frames per second.
Maximum Frames per Second is 5.



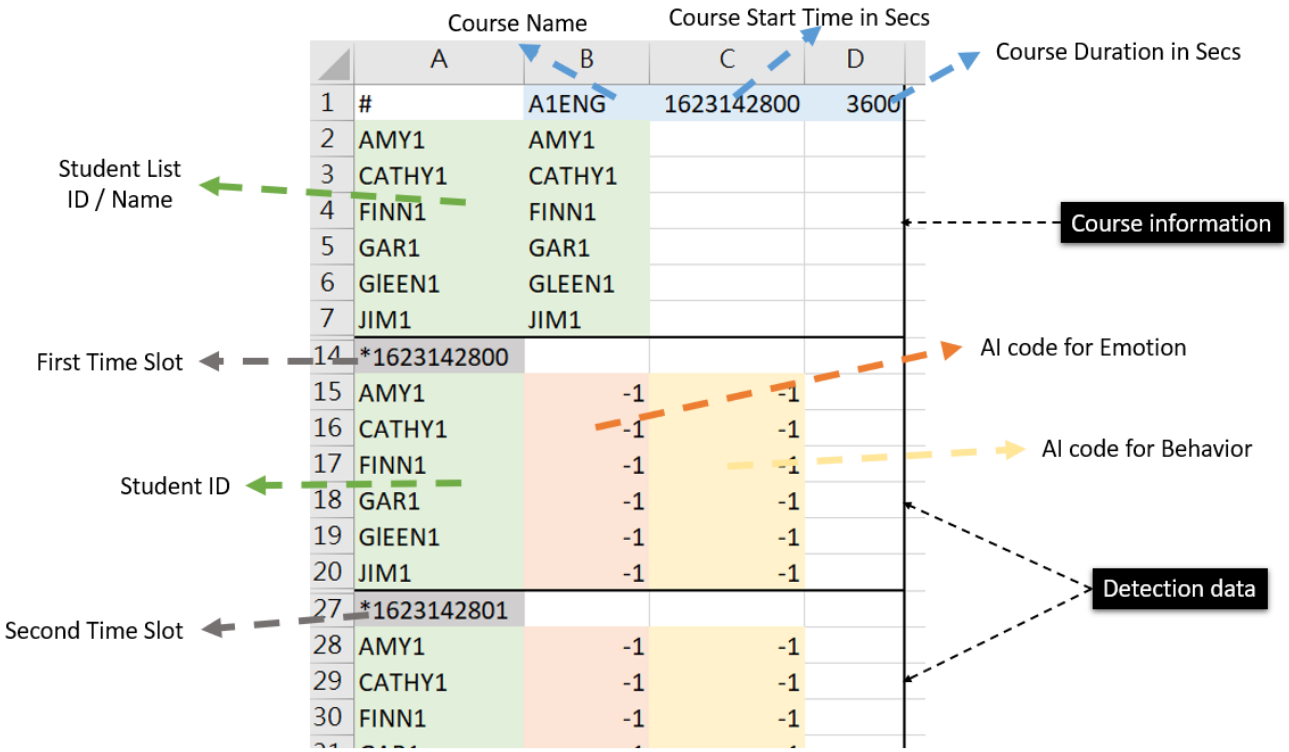
3.1.7 Report Export

According to the Record Path in the System page, you can find the detection data via CSV file.



The file is named by the course name.

Introduction to the CSV file format



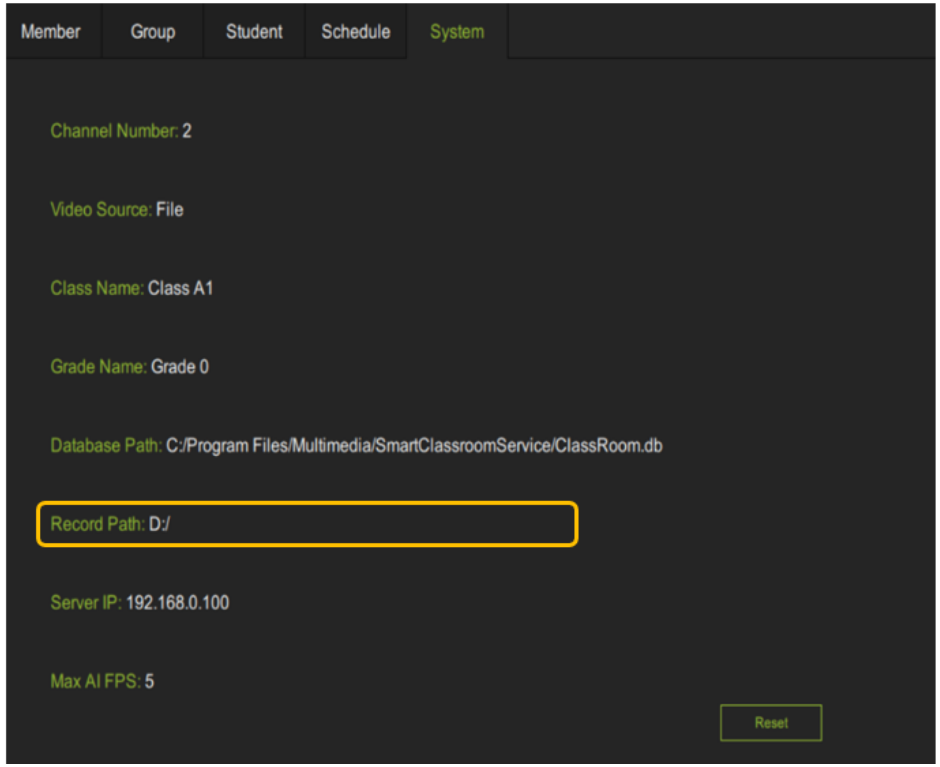
	A	B	C	D
1	#	A1ENG	1623142800	3600
2	AMY1	AMY1		
3	CATHY1	CATHY1		
4	FINN1	FINN1		
5	GAR1	GAR1		
6	GlEEN1	GLEEN1		
7	JIM1	JIM1		
14	*1623142800			
15	AMY1	-1	-1	
16	CATHY1	-1	-1	
17	FINN1	-1	-1	
18	GAR1	-1	-1	
19	GlEEN1	-1	-1	
20	JIM1	-1	-1	
27	*1623142801			
28	AMY1	-1	-1	
29	CATHY1	-1	-1	
30	FINN1	-1	-1	

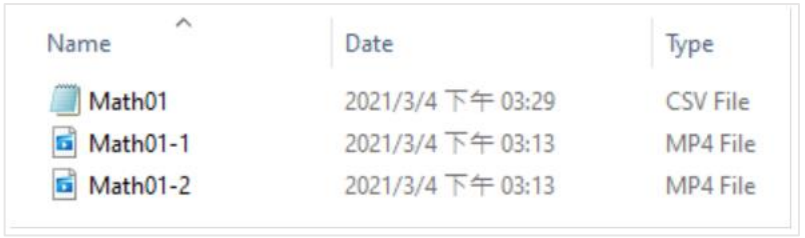
AI code comparison table

AI code	Emotion	Behavior
-1	No Detected	No Detected
0	Calm	Reading
1	Surprised	Writing
2	Joyful	Listening
3	Disgust	Standing
4	Angry	Raising Hand
5	Fear	Lying Down
6		Look Up
7		Look Back
8		Head Down

3.1.8 Video recording

All MP4 video files are saved in the specified path.

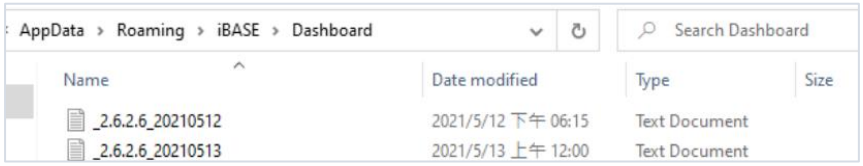




3.1.9 Activity Controls

How to find your activity controls?

- Open the AppData file.
- Choose the date file you want. You'll find activity logs in the file.




```
[2021-05-31 13:24:40]Info: Viewer Logout "::ffff:127.0.0.1:50320
[2021-05-31 13:24:52]Info: Stop Server
[2021-05-31 13:25:27]Info: Start Server
[2021-05-31 13:25:29]Info: Viewer Login "admin" "::ffff:127.0.0.
[2021-05-31 13:31:11]Info: Add Group "A11" "A11"
[2021-05-31 13:31:11]Info: Add Group "A11" "A11" failed!
[2021-05-31 13:31:18]Info: Add Group "A12" "A12"
[2021-05-31 13:31:18]Info: Add Group "A12" "A12" failed!
[2021-05-31 13:31:25]Info: Add Group "A13" "A13"
[2021-05-31 13:31:25]Info: Add Group "A13" "A13" failed!
[2021-05-31 13:31:48]Info: Add Group "A21" "A21"
[2021-05-31 13:31:48]Info: Add Group "A21" "A21" failed!
[2021-05-31 13:31:56]Info: Add Group "A22" "A22"
[2021-05-31 13:31:56]Info: Add Group "A22" "A22" failed!
[2021-05-31 13:32:02]Info: Add Group "A23" "A23"
[2021-05-31 13:32:02]Info: Add Group "A23" "A23" failed!
[2021-05-31 13:32:18]Info: Add(Update) Student "AMY1" "AMY"
[2021-05-31 13:32:19]Info: Add(Update) Student "CATHY1" "CATHY"
[2021-05-31 13:32:19]Info: Add(Update) Student "GAR1" "GAR"
[2021-05-31 13:32:20]Info: Add(Update) Student "GlEEN1" "GLEEN"
```

3.2 Central Management Server UI Introduction

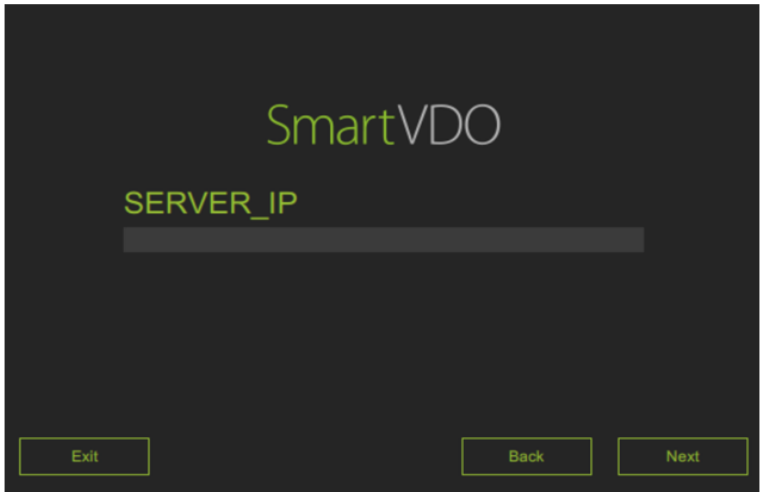
3.2.1 User Interface Overview

3.2.2 Account Login

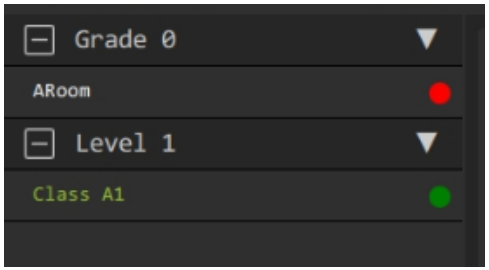
Please key in the default value for the user name and password: admin

3.2.3 Connect to Edge side system

Please fill in the Server IP address on this page of each edge side system.



When the connection between edge side and server side is successful, a green light will be displayed.
When the connection fails, a red light will be displayed.

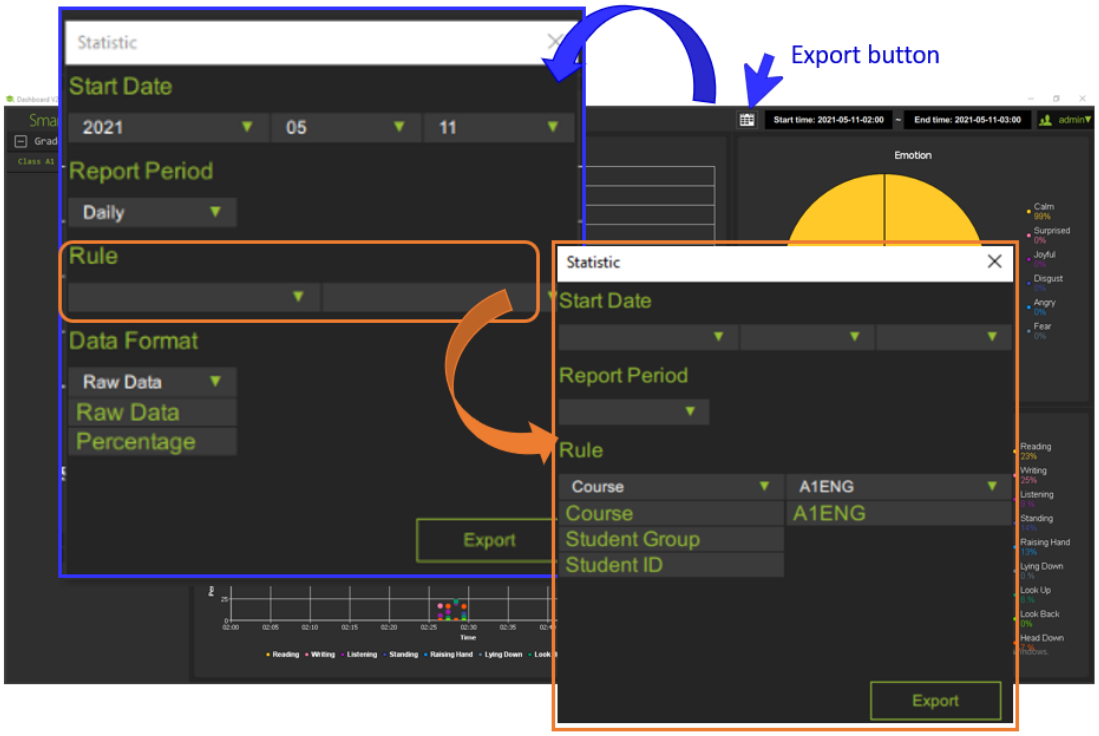


3.2.4 Raw Data Export

- Click the export button.

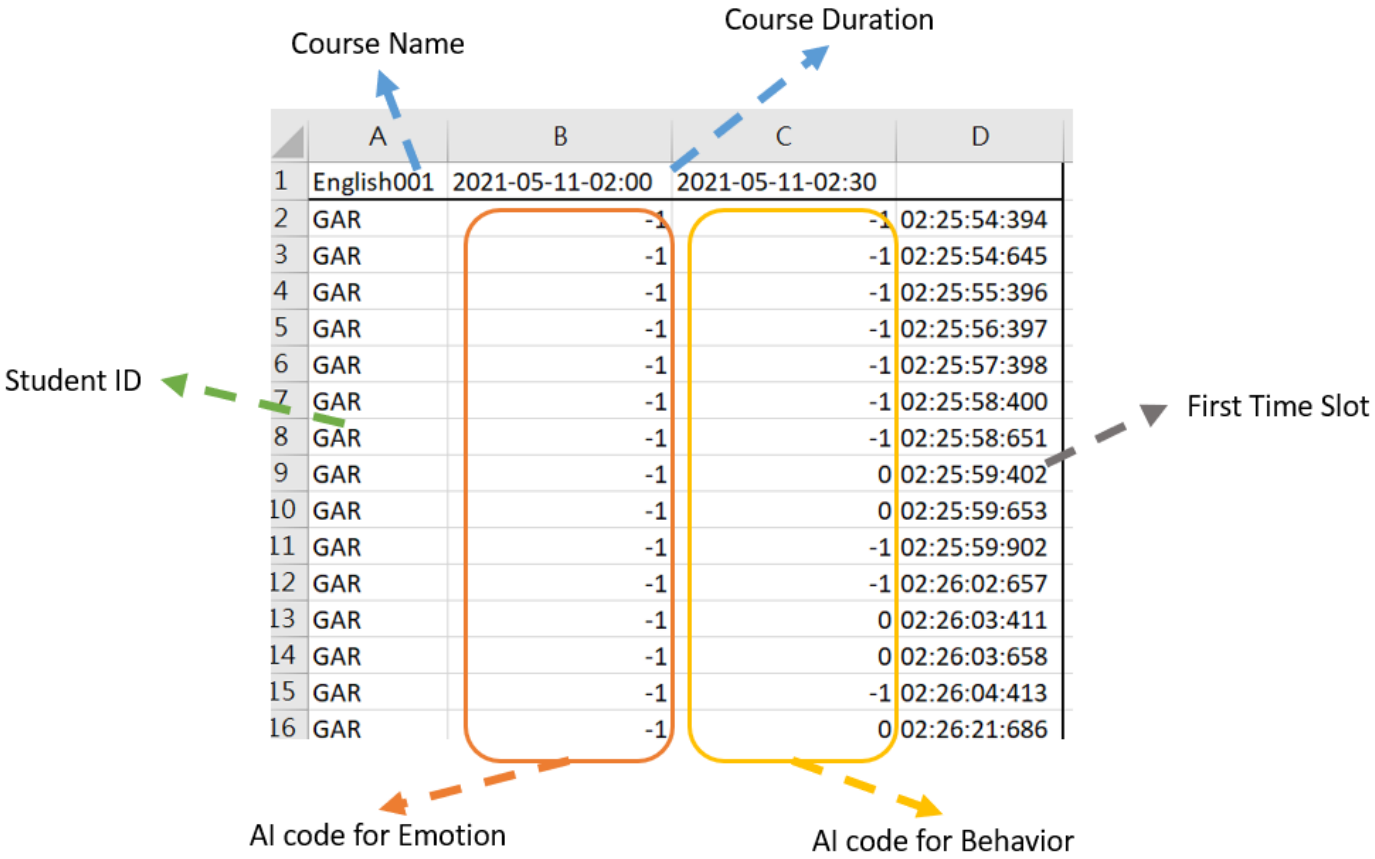
- There are four conditions to filter.
  (1) Start Date
  (2) Report Period
  (3) Rule (Course, Student Group, Student ID)
  (4) Data Format

- Click “Export” and the CSV file will be saved in the C drive of the computer.



iBASE

Introduction to the CSV file format



	A	B	C	D
1	English001	2021-05-11-02:00	2021-05-11-02:30	
2	GAR	-1	-1	02:25:54:394
3	GAR	-1	-1	02:25:54:645
4	GAR	-1	-1	02:25:55:396
5	GAR	-1	-1	02:25:56:397
6	GAR	-1	-1	02:25:57:398
7	GAR	-1	-1	02:25:58:400
8	GAR	-1	-1	02:25:58:651
9	GAR	-1	0	02:25:59:402
10	GAR	-1	0	02:25:59:653
11	GAR	-1	-1	02:25:59:902
12	GAR	-1	-1	02:26:02:657
13	GAR	-1	0	02:26:03:411
14	GAR	-1	0	02:26:03:658
15	GAR	-1	-1	02:26:04:413
16	GAR	-1	0	02:26:21:686

AI code comparison table

AI code	Emotion	Behavior
-1	No Detected	No Detected
0	Calm	Reading
1	Surprised	Writing
2	Joyful	Listening
3	Disgust	Standing
4	Angry	Raising Hand
5	Fear	Lying Down
6		Look Up
7		Look Back
8		Head Down