



EduControl Software

User Manual

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1. General Information about the EduControl Software

This User Manual contains information about the purpose of the EduControl software, its components, key technical characteristics, the purpose of its main elements, and instructions for preparation and operation of the Software.

2. Purpose of the Software

The EduControl software is designed for programming and controlling educational equipment, including its systems and subsystems. It is intended for use by students of educational institutions to program and control spacecraft models, as well as educational training kits used in the study of the subject area “Space Systems”.

3. Description of the Software Functionality

The Software is intended for programming and controlling educational equipment, its systems, and subsystems that are used by students of educational institutions to program and operate spacecraft models, as well as educational training kits within the subject area “Space Systems”.

4. Minimum System Requirements

The minimum system requirements are listed in Table 1.

Table 1 – Minimum System Requirements.

Parameter		Value
WINDOWS	Operating System	Windows 7 or later
	System Architecture	x64
LINUX	Operating System	Ubuntu 22.04 or later
	System Architecture	x64

5. Interface Overview

5.1. Start Page



Figure 1. Start Page

At the bottom of the main page, there is a Projects Area containing the following buttons:

- **“Create Project” button** — when clicked, a new project is created, and the user is automatically redirected to the project page;
- **Saved Project Buttons** (e.g., Case 1, Case 2, test) — these contain all previously created and saved projects and allow the user to open them.

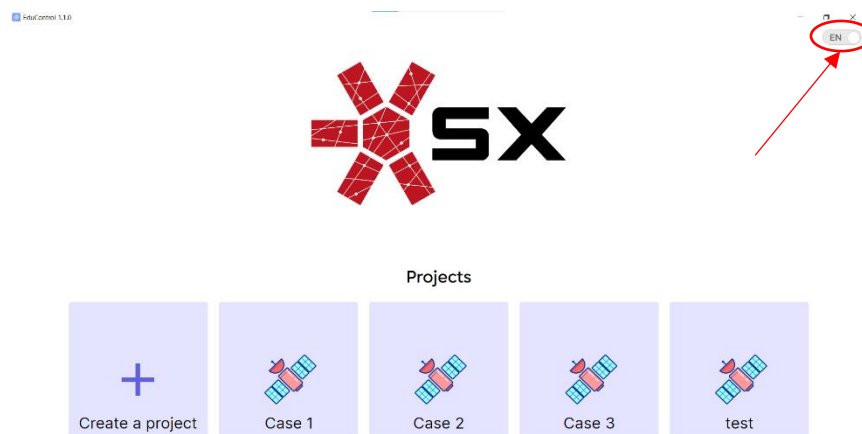


Figure 2. Start Page

At the top of the screen, there is a Language Selection Area:

- **“RU” / “EN” Toggle Switch** — allows switching between the two available languages: Russian and English. When the switch is set to “RU”, the entire application interface is displayed in Russian. When it is set to “EN”, the interface is displayed in English.

5.2. Project Page

1. By clicking the “Create Project” button, you will be taken to the new project page (Figure 3).

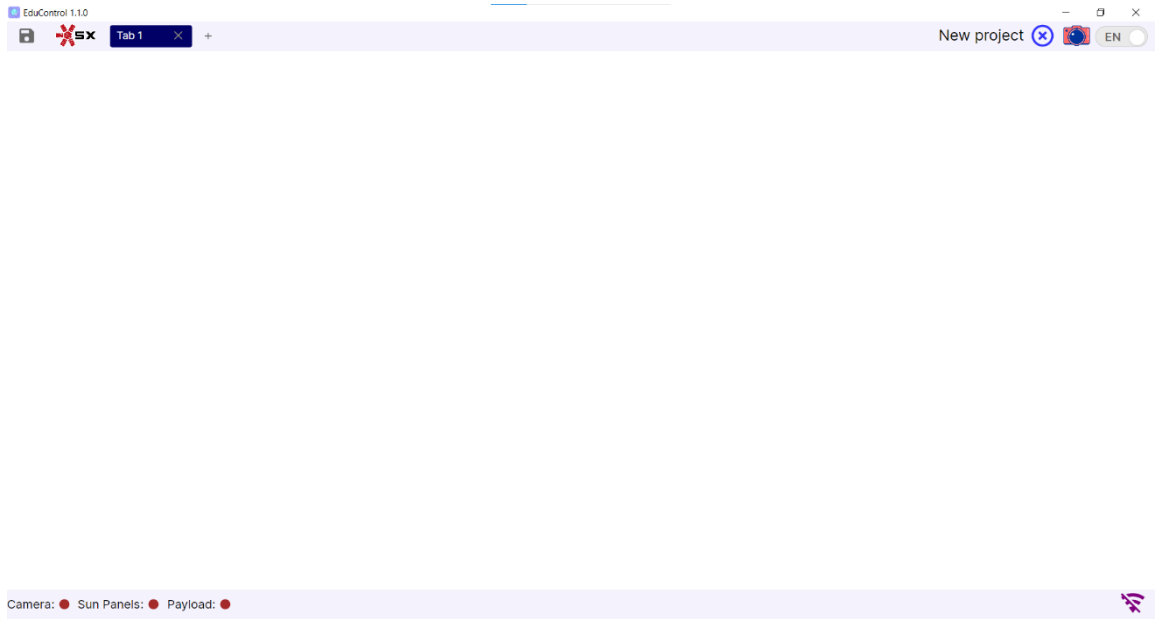


Figure 3. Project Page

The central element of the project page is a white workspace. This is where algorithms are created.

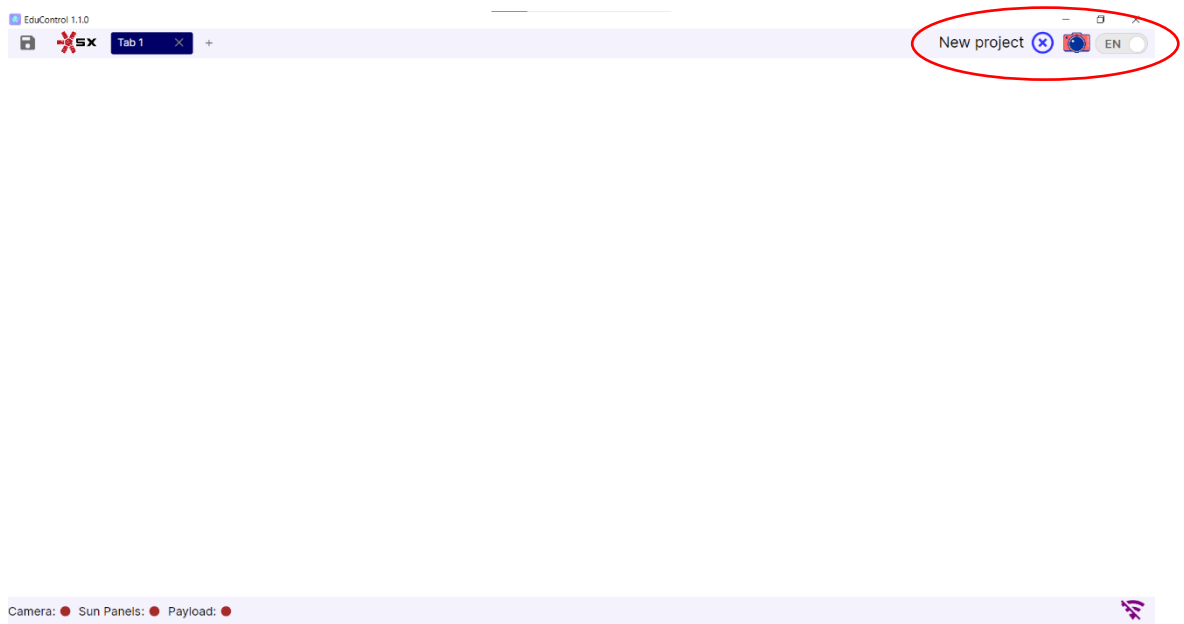


Figure 4. Project Page

- **“New Project”** - the name of your project. It can be changed when saving the project;
- **“X” Button** - clears the workspace when clicked;
- **“Camera” Button** - opens or closes the photo panel;
- **“RU” Button** - switches between Russian and English (Russian is currently selected).

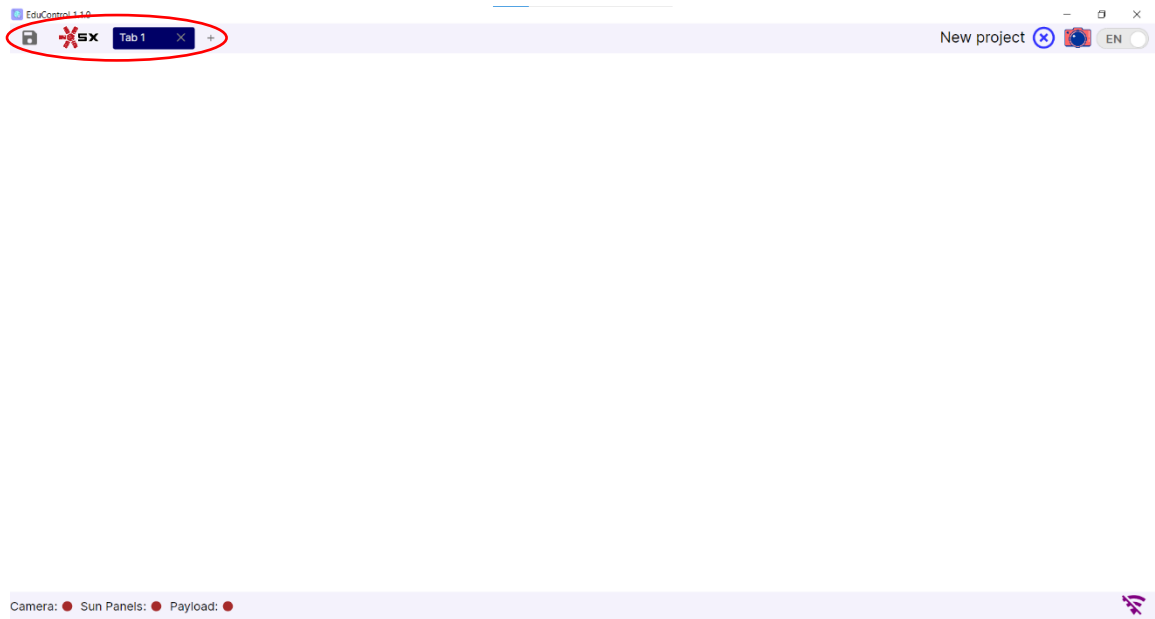


Figure 5. Project Page

- “Save” Button  – located in the upper-left corner of the page. It is used to return to the start page and save the current project;
- “SX” Button – shows or hides the command block panel;
- Tabs and the “+” Button – the currently active tab containing a user-created algorithm is highlighted in blue. Clicking the “+” button allows additional tabs to be created (up to five in total), enabling the creation of separate algorithms within the same project.

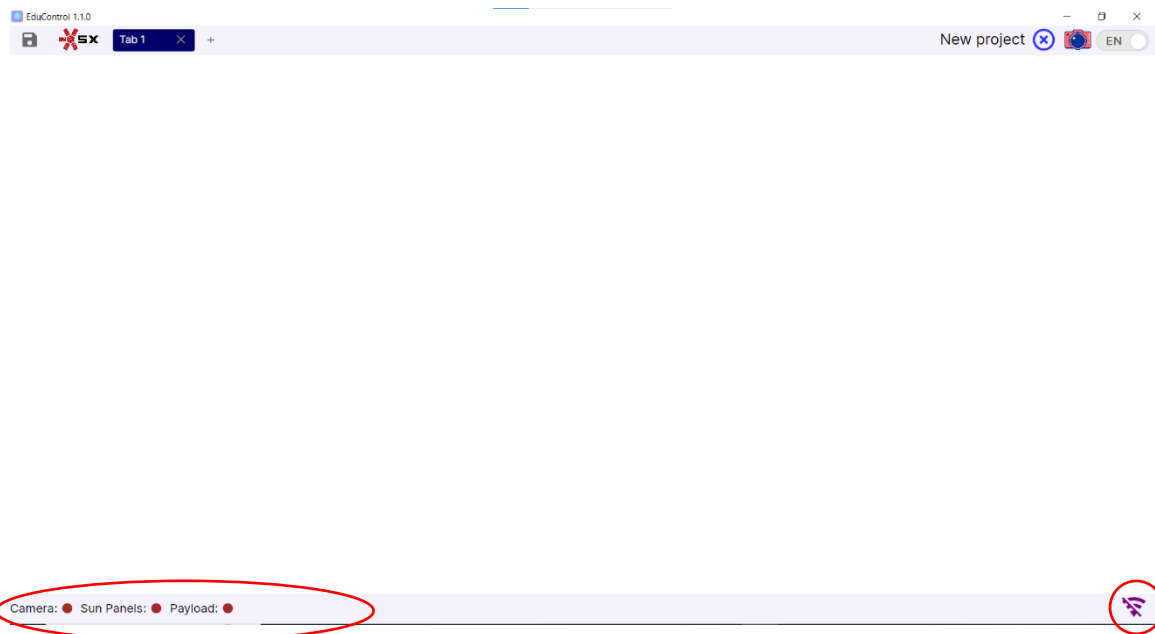


Figure 6. Project Page

- **Module Connection Indicators:** Camera, Solar Panels, and Payload;
- **Wi-Fi Connection Indicator** – located in the lower-right corner. This indicator also

functions as a button for opening the network name configuration window.

6. User Workflow

- 1) Download the software installation file;
- 2) Extract the downloaded archive to a directory (folder) selected by the user;
- 3) Turn on the JuniX Satellite Constructor;
- 4) Wait until the “JUNIX” Wi-Fi network appears in the list of available wireless networks (default password: 12345678). Connect the computer to the “JUNIX” Wi-Fi network;
- 5) Launch the EduControl software;
- 6) Create a new project or open an existing saved project;
- 7) Verify that the Wi-Fi module is operating correctly by checking the Wi-Fi connection indicator. If the Wi-Fi connection indicator is crossed out, the connection has been lost;

Note 1: If the connection is lost, repeat steps 3–6 after first turning off the constructor kit.

Note 2: When working with multiple constructor kits simultaneously, the instructor may change the network name. To do this, double-click the connection indicator with the right mouse button. In the window that appears, enter the teacher password (provided in the JuniX constructor passport included with the kit) and click “OK”. Enter a new network name. It is recommended to use the constructor number as the network name, for example: JuniX_3.

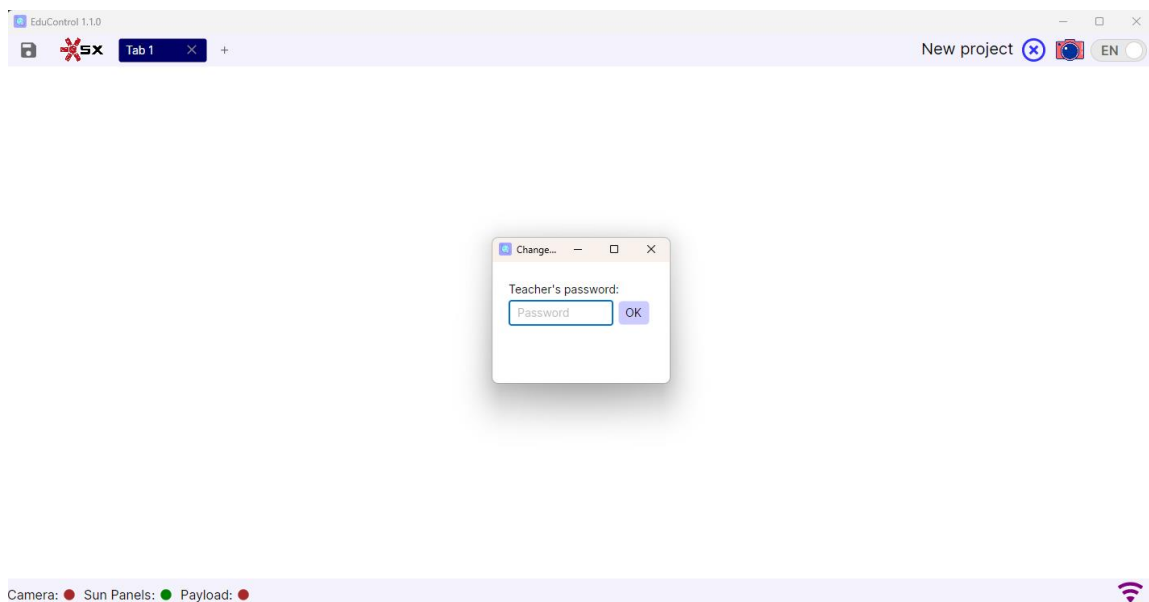


Figure 7. Changing the Access Point Name

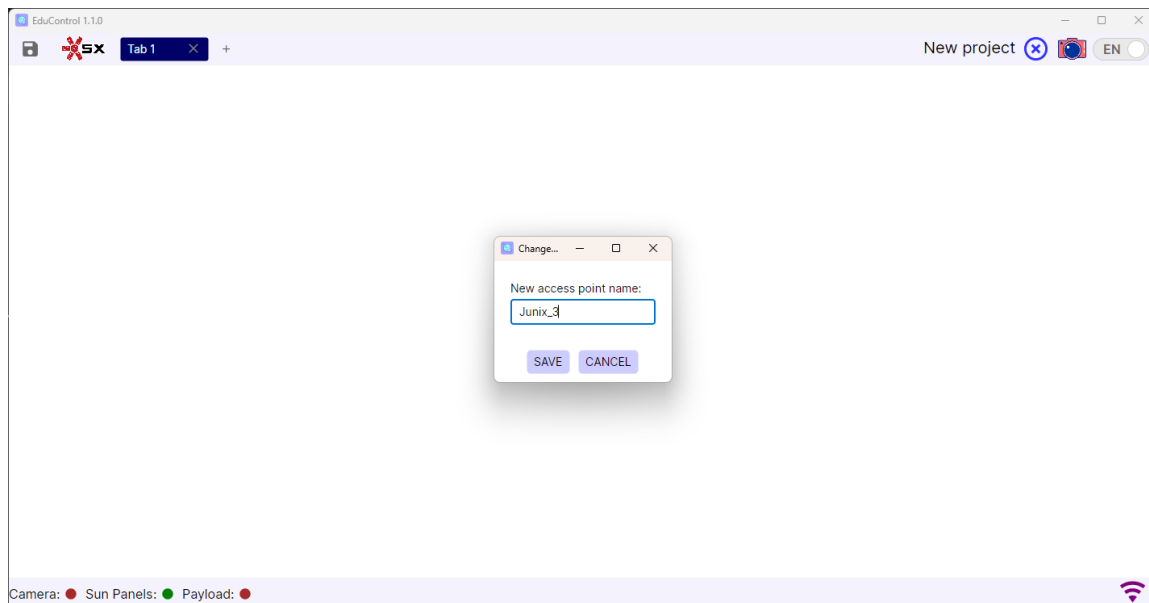


Figure 8. Changing the Access Point Name

- 8) Verify that the camera, solar panels, and payload module are connected by checking the indicators displayed at the bottom of the screen;
- 9) Start creating an algorithm.

To create a control algorithm for the constructor kit, open the command block panel by clicking the “SX” button.

The software includes several tabs containing command blocks with different functions:

- System tab;
- Solar Panels tab;
- Camera Menu tab.

To build an algorithm, select the desired block from the functional block menu, click and hold it with the left mouse button, and drag it to the desired location in the workspace.

To connect blocks into a single algorithm:

- Move the mouse cursor over a block;
- Click the connection output point (blue point) with the left mouse button. When selected, the blue point changes to red;
- Click the connection input point of the next block. A dashed connection line will follow the cursor during this process.

To start the algorithm, click the “Start” button. To stop the algorithm, click the “Stop” button.

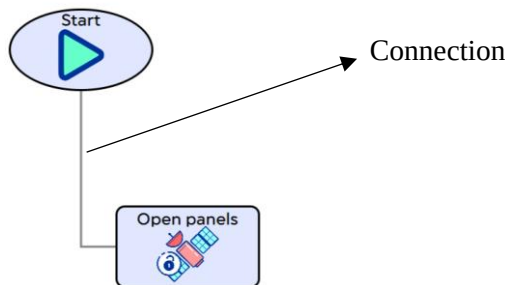
To save a project, click the Save button , select “Yes” when prompted with “Save project?”. In the dialog box that opens, enter a project name.

The use of offensive or obscene language in project names is prohibited!

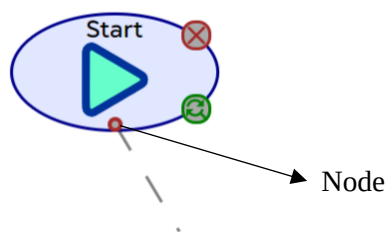
7. Creating Algorithms (Programs)

7.1 Basic Concepts

Connection Line – a line that connects algorithm blocks to one another.



Node – the point where a connection line begins or ends.



Algorithm Block – a functional element of an algorithm. A set of blocks forms a program that is uploaded to the satellite prototype. A detailed description of each block is provided below.



Program – a complete set of algorithm blocks whose execution performs an operation on the satellite prototype according to the created algorithm (for example, deploying the solar panels).

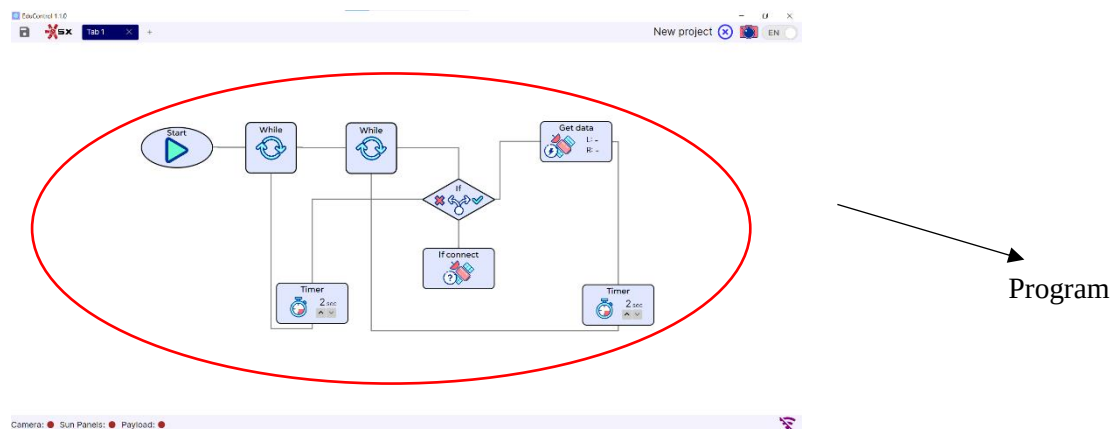


Figure 9. Program

7.2 Types of Blocks for Creating Algorithms (Programs)

Clicking the **“SX” button** opens the area containing blocks used for creating programs. The blocks are divided into three categories: System, Solar Panels, Camera.

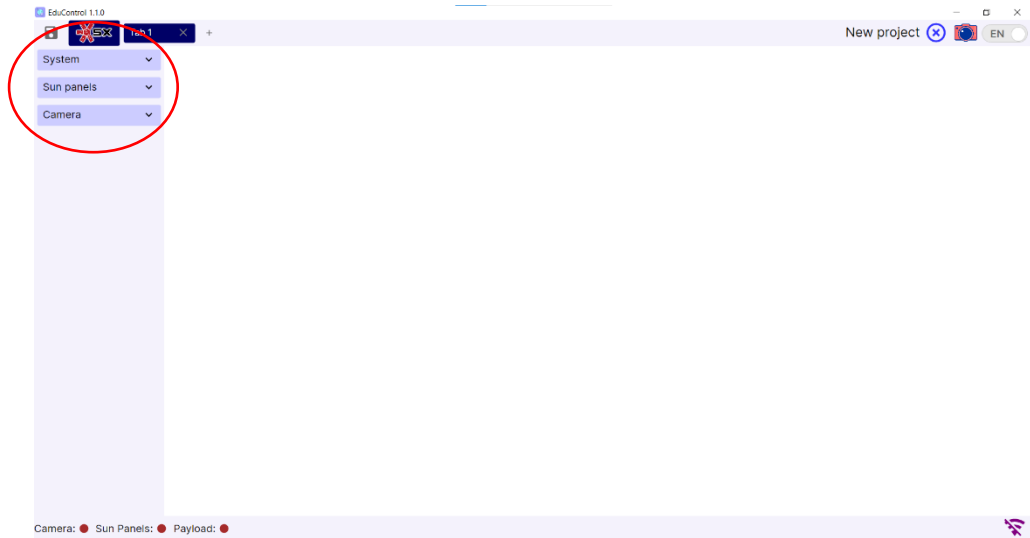


Figure 10. Block Categories

Expanding any of these categories displays all blocks available for program creation. Each block used for creating programs is described in detail below.

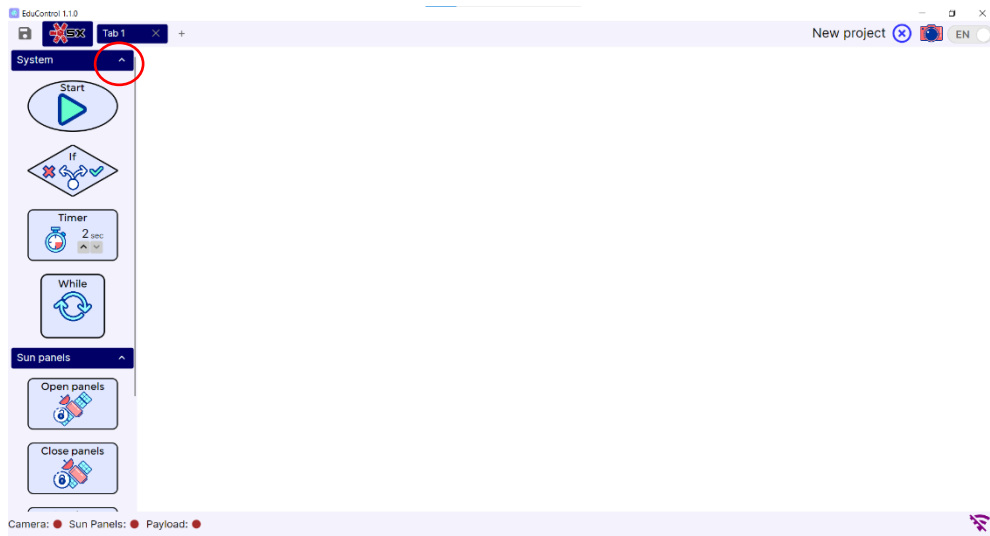


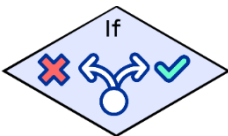
Figure 11. Block Categories

7.3. Blocks for Creating Programs



Start Block

The block from which program execution begins. Clicking the triangle button starts the execution of the program.



Conditional Block

A block that evaluates a specified condition. Further program execution depends on whether the condition is satisfied or not.



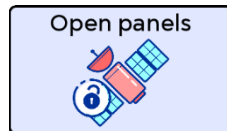
Timer Block

A block that allows a delay to be set. The delay time is adjusted using the arrows inside the block. The maximum delay is 20 seconds.



Loop (While) Block

Allows repeated execution of a specific section of code until the loop exit condition is met.



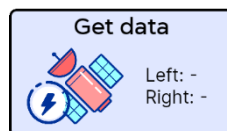
Solar Panel Deployment Block

Deploys the solar panels if the solar panel module is connected.



Solar Panel Retraction (Closure) Block

Retracts the solar panels if the solar panel module is connected and the panels are currently deployed.



Solar Panel Data Block

Displays the voltage of each solar panel. The measured value is shown directly inside the block.



Solar Panel Connection Check Block

Checks whether the solar panel module is connected.

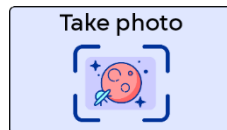


Photo Capture Block

Allows a photograph to be taken using the satellite prototype's camera. Captured images are displayed in the photo gallery panel.



Camera Connection Check Block

Checks whether the camera module is connected.

7.4. Working with Program Blocks

To work with a program block, first place it onto the workspace. To do this, move the cursor over the desired block, press and hold the left mouse button (LMB), and drag the block onto the workspace. Release the LMB at the desired location.

A program block can be moved around the workspace. To do this, click on the block with the LMB and drag it to a new position.

It is also possible to select multiple program blocks at once. To do this, click and hold the LMB in an empty area of the workspace and draw a selection rectangle large enough to encompass all required blocks.

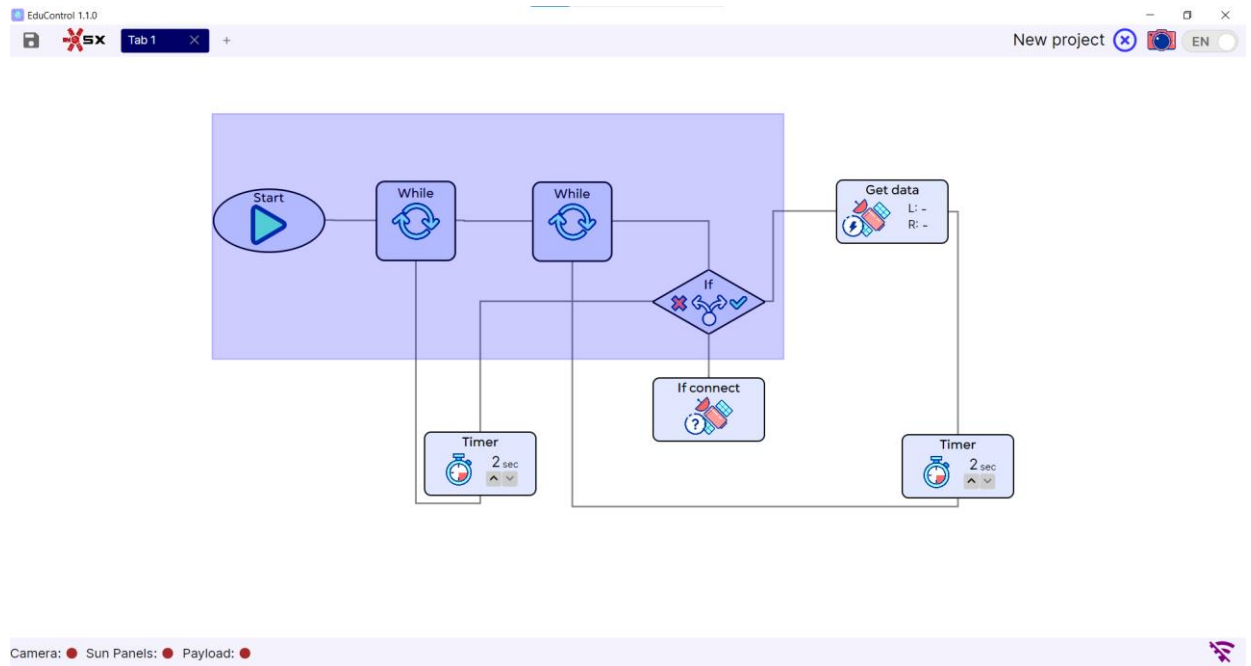
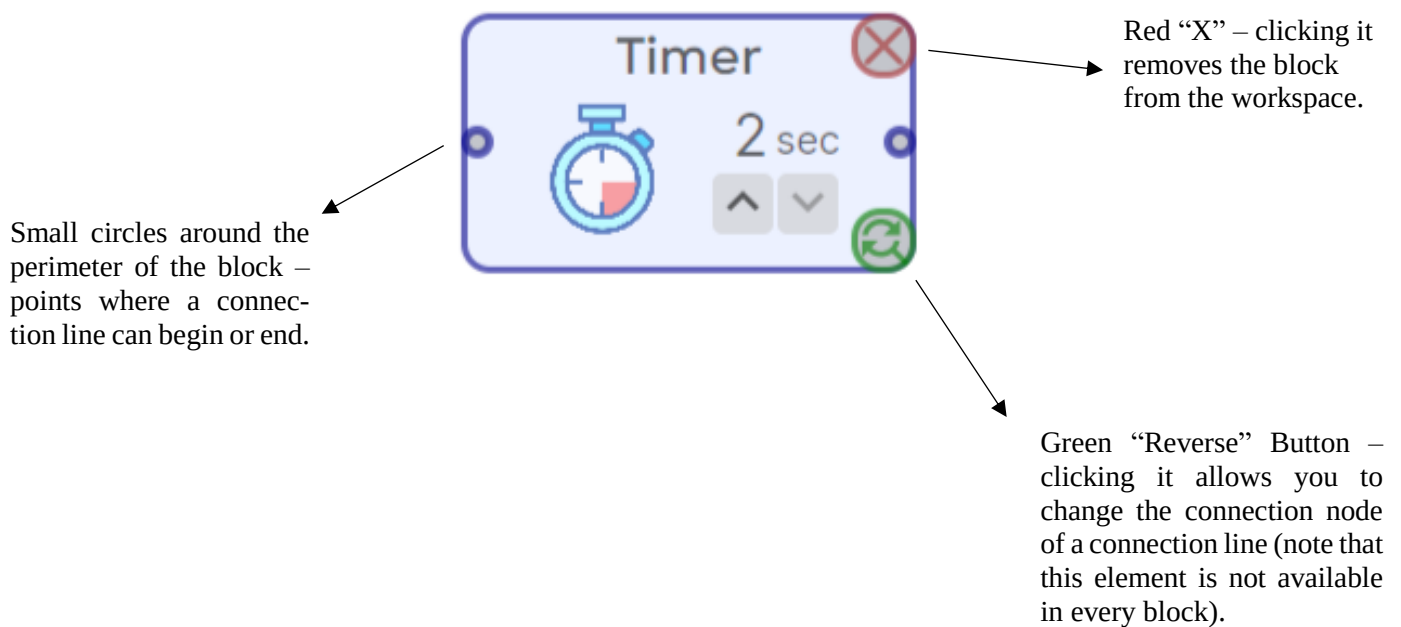


Figure 12. Selecting Multiple Blocks

When you move the cursor over a block, **the following elements become visible within the block:**



7.5. Creating a Program

To create a program, drag all required blocks onto the workspace and then connect them using connection lines.

7.6. Starting and Stopping Program Execution

To start a created program, click the Start button on the Start Block.

The Stop Button (red square) appears to on the Start Block when an algorithm is running and is used to stop execution of the current algorithm.

7.7. Viewing Captured images

To view the captured images, click the camera button located in the upper-right corner of the project page. The photo gallery window opens. The gallery displays all the images stored in the satellite prototype's memory at the moment.

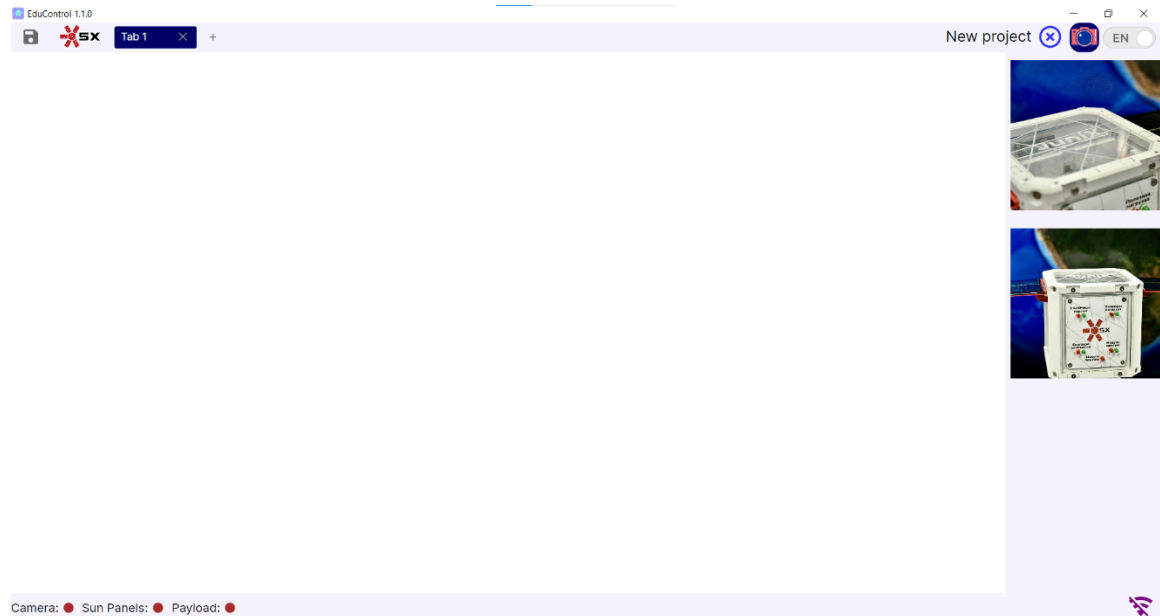


Figure 13. Satellite Kit Photo Gallery

To select an image, left-click on the desired image. The selected image will be highlighted with a blue border. The selected images become available for further actions, such as saving or deleting.



Figure 14. Image Management Menu

In the upper-right corner, there are two red buttons:

- The Delete button  permanently removes the selected image from the satellite prototype's memory;
- The Save button  allows the user to copy the selected image from the satellite prototype to a chosen location on the computer.

EduControl supports batch deletion of images. To delete multiple images, select two or more images from the gallery and click the Delete button. When multiple images are selected, the Save function is unavailable and only deletion operations can be performed. This feature is useful for quickly clearing storage space after experiments or training exercises.



Figure 15. Clearing the Photo Gallery