# Studuino
# Temperature Sensor

## Manual

This manual explains the Studuino Programming Environment and how to use it. As the Studuino Programming Environment develops, this manual may be edited or revised. You can find the full manual below.

■ Installing Studuino Software
http://artec-kk.co.jp/studuino/docs/en/Studuino_setup_software.pdf

## Index

# 1. About Your Temperature Sensor

## 1.1. Overview

Your Temperature Sensor measures temperature by converting ambient temperature into electrical voltage.

## 1.2. Specifications

| | |
|---|---|
| Sensor | MCP9700 |
| Operating Voltage | 2.3-5.5V |
| Operating Temperature | -40-+125℃ |
| Accuracy | ±4℃ (max.) (at 0-70℃) |

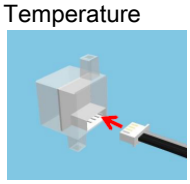
# 2. Connecting to Studuino

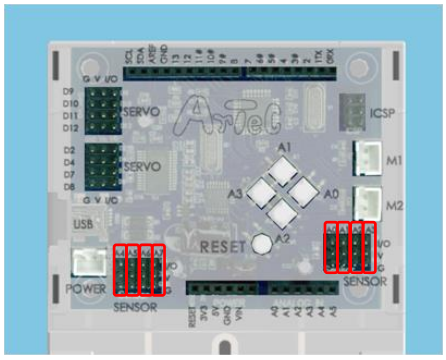
① Use the three-wire 15 cm or three-wire 30 cm connecting cable (products 153125 and 153126, sold separately).

② The white end of the cable plugs into your Temperature Sensor, while the black end connects to your Studuino.

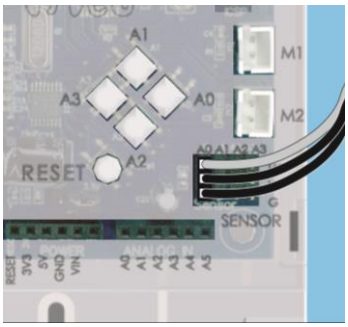
③ Connects to A0-A7. The gray signal wire should face inward.

Temperature






Connects to A0-A7.

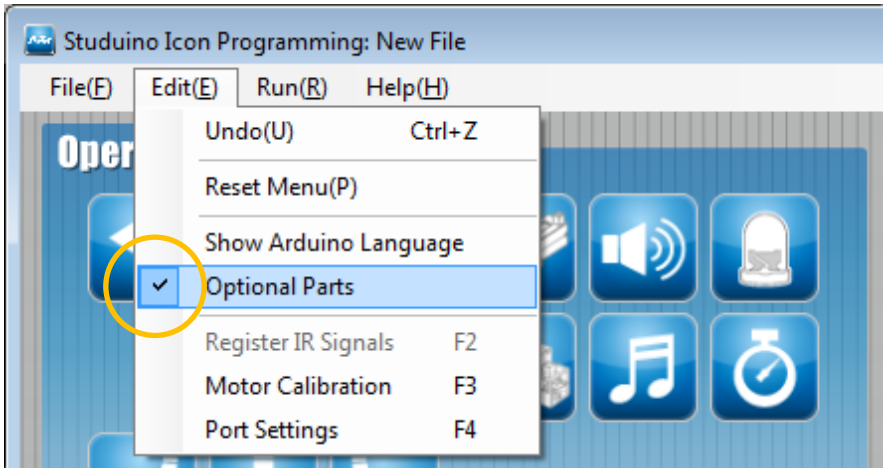



Make sure the cables are inserted correctly!

## 3. In the Studuino Icon Programming Environment

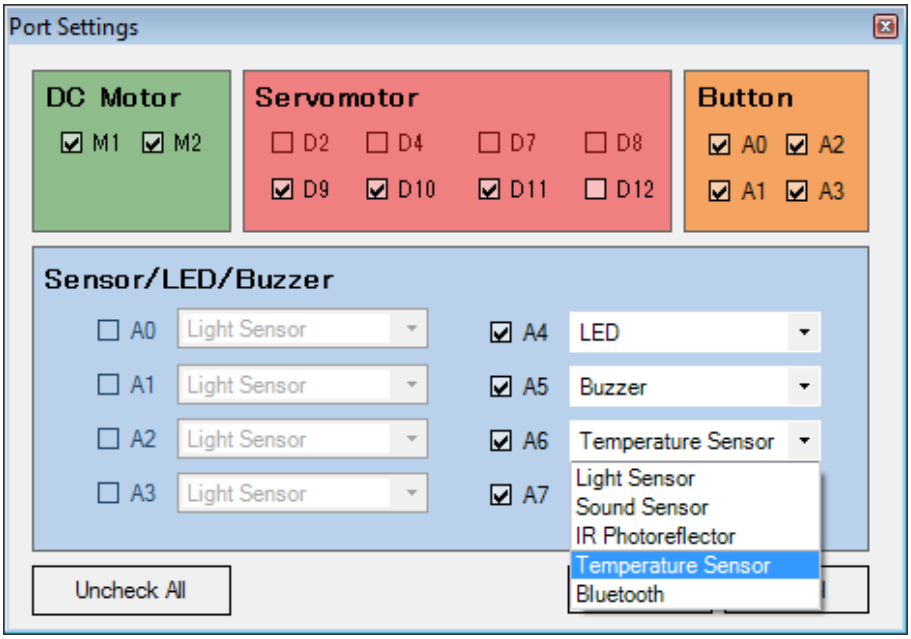
Familiarize yourself with the basics of the Studuino Programming Environment by reading the Studuino Programming Environment Manual and the Icon Programming Environment Guide.

From the Edit menu click Optional Parts. A check will appear beside this option when enabled.



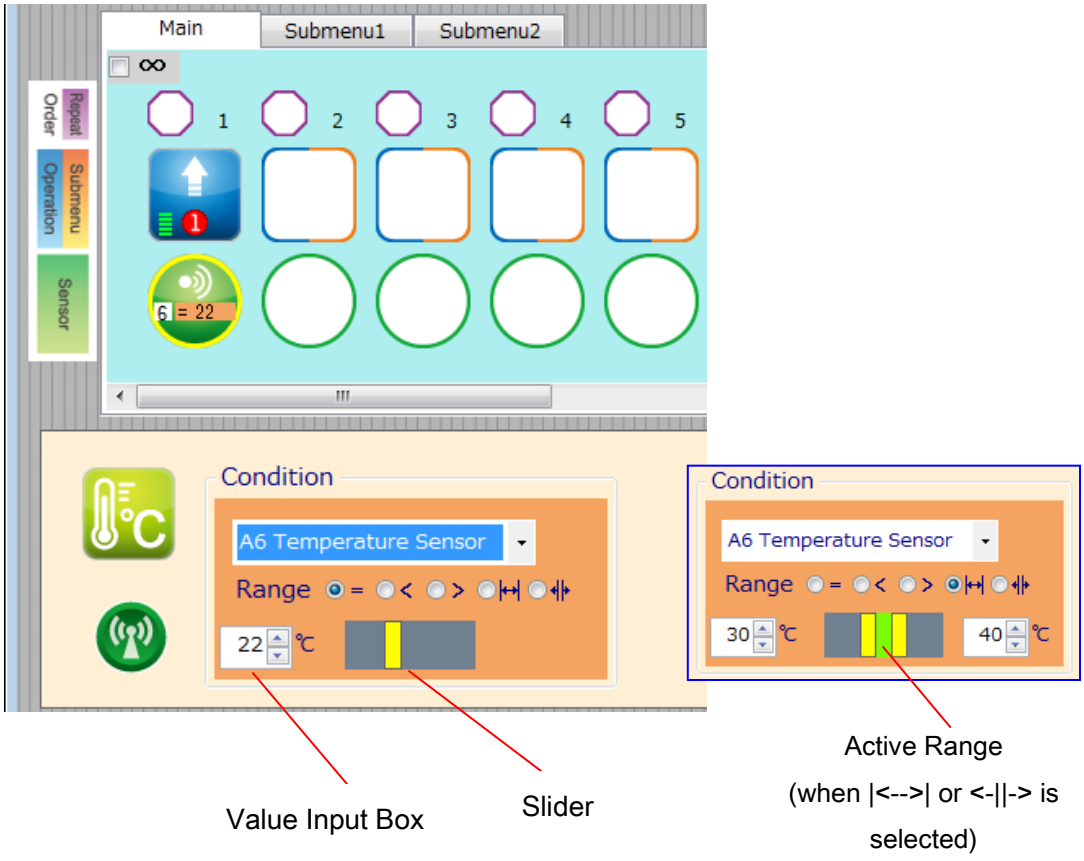

Enabled when checked

The Temperature Sensor can be used with connectors A0-A7.



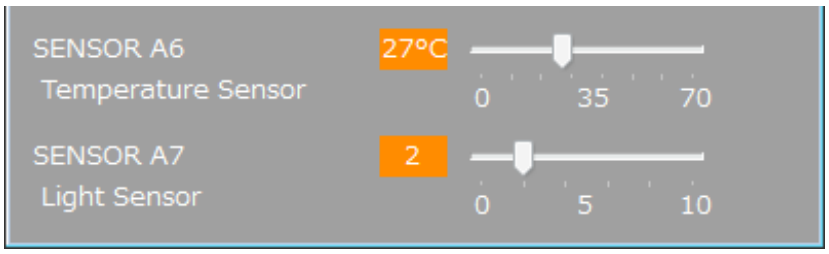

Shown connected to A6

Place the icons shown below and choose A6 Temperature Sensor. Select a conditional expression and use your mouse to drag the (yellow) Range slider to set the values of the condition. You can also type values directly into the value input box. Click the arrows on the right to raise or lower the value. The |<-->| and <-||-> conditions have two sliders and the active range will be shown in neon green. Values can be set from 0-70℃.




## 3.1. Using the Sensor Viewer

The Sensor Viewer below shows the values from the Temperature Sensor in Celsius (℃).

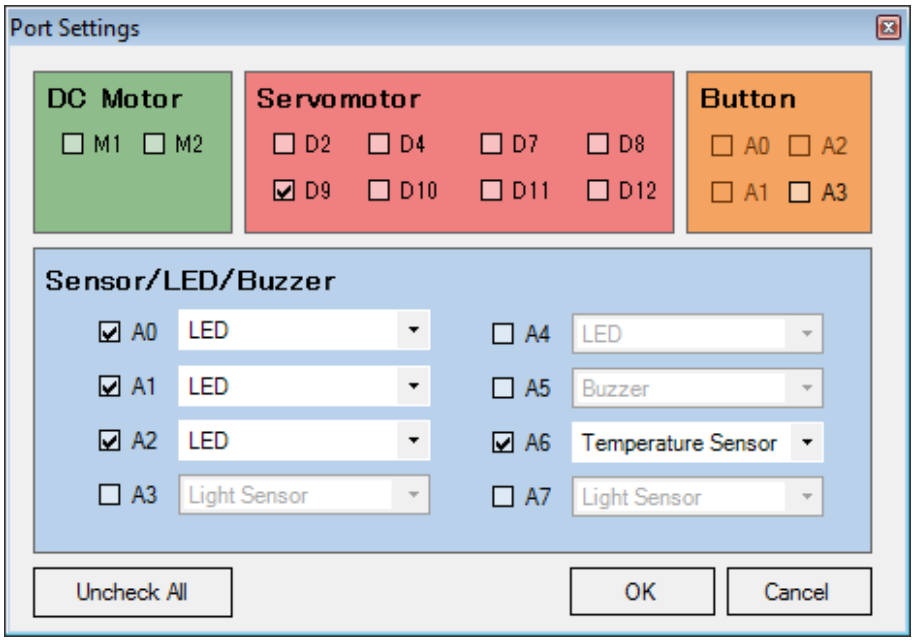


## 3.2. Sample Program

Familiarize yourself with the basics of the Studuino Programming Environment by reading the Studuino Programming Environment Manual and the Icon Programming Environment Guide.

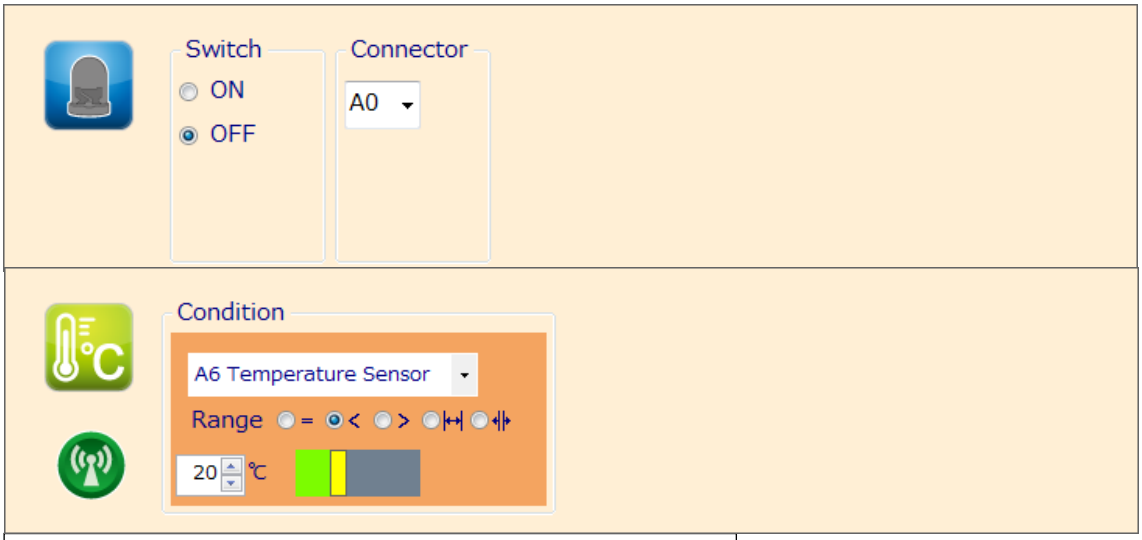
This program flashes a different number of LEDs depending on the temperature.

① Open Port Settings and set them as shown below.




② Check the Repeat Indefinitely box, place icons, and set them as shown below.

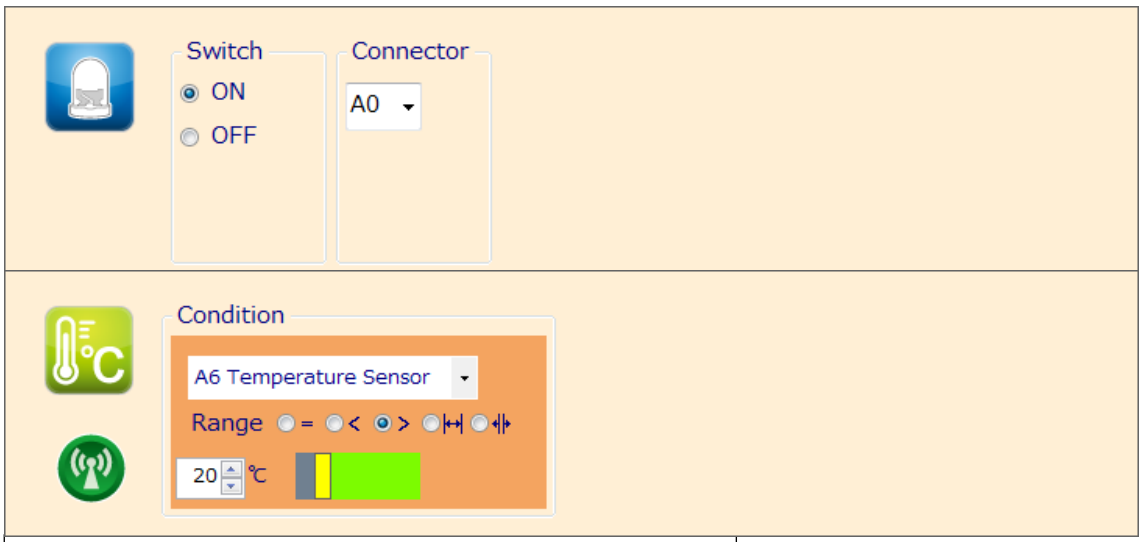
No. 1




Action: LED, Switch OFF, Connector A0

Condition: Temperature Sensor > 20℃

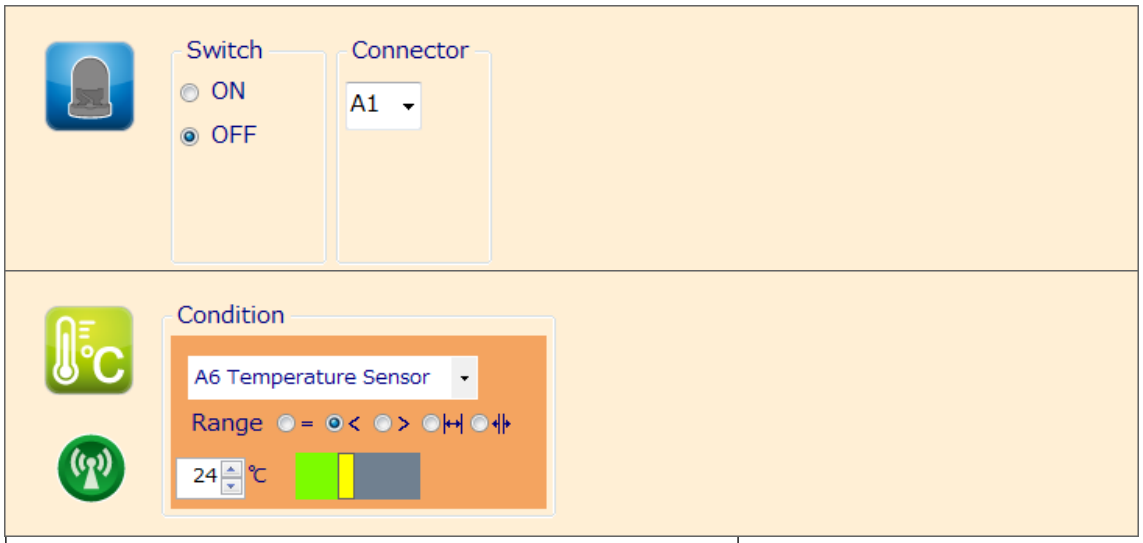
No. 2




Action: LED, Switch OFF, Connector A0

Condition: Temperature Sensor > 20℃

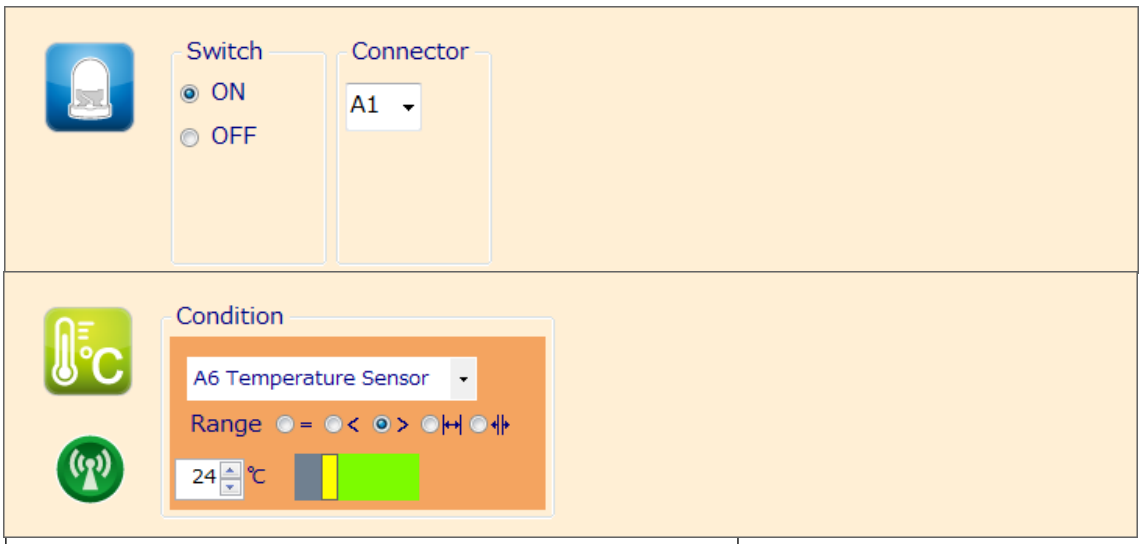
No. 3




Action: LED, Switch ON, Connector A1

Condition: Temperature Sensor < 24℃

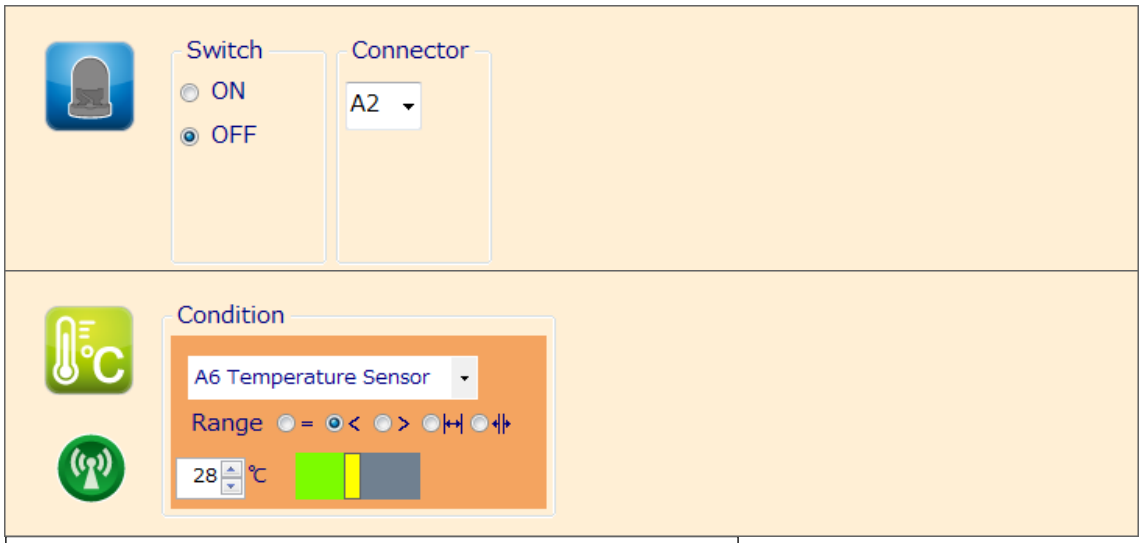
No. 4




Action: LED, Switch OFF, Connector A1

Condition: Temperature Sensor > 24℃

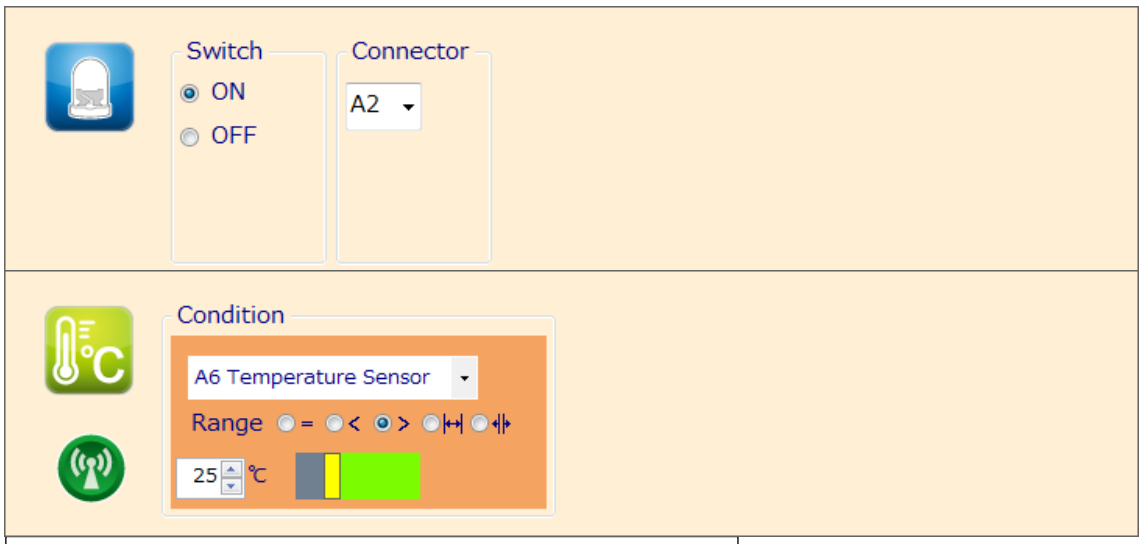
No. 5




Action: LED, Switch ON, Connector A2

Condition: Temperature Sensor < 28℃

No. 6



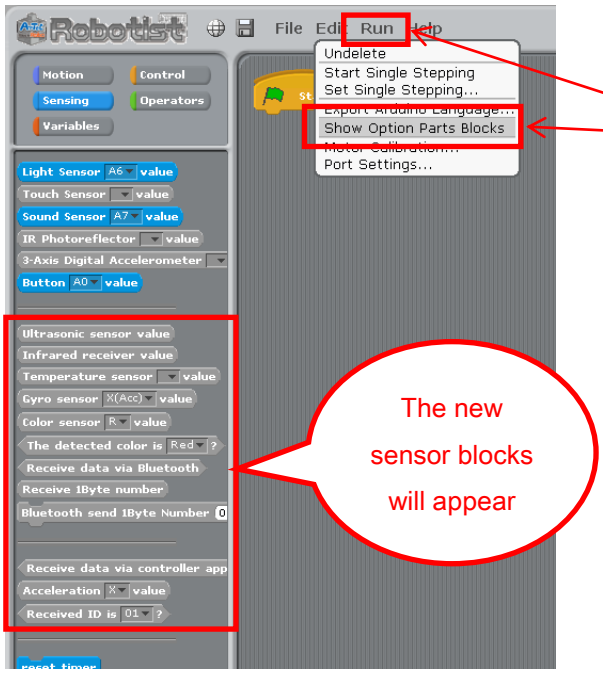

Action: LED, Switch OFF, Connector A2

Condition: Temperature Sensor > 28℃

## 4. In the Studuino Block Programming Environment

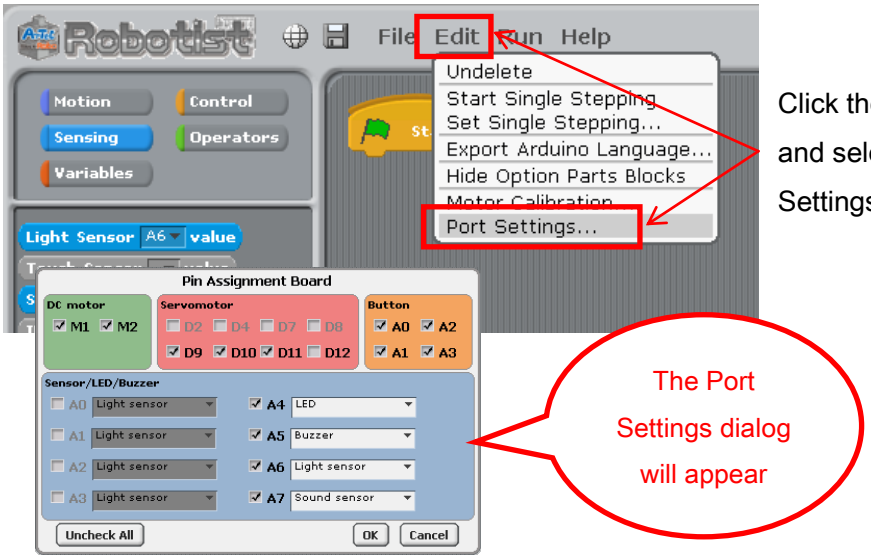
To use your Temperature Sensor in the Block Programming Environment you will need to make sure the Temperature Sensor block is available and active. Follow the steps below to do this:

① From the Edit menu, choose Show Optional Parts to display the new sensor blocks.



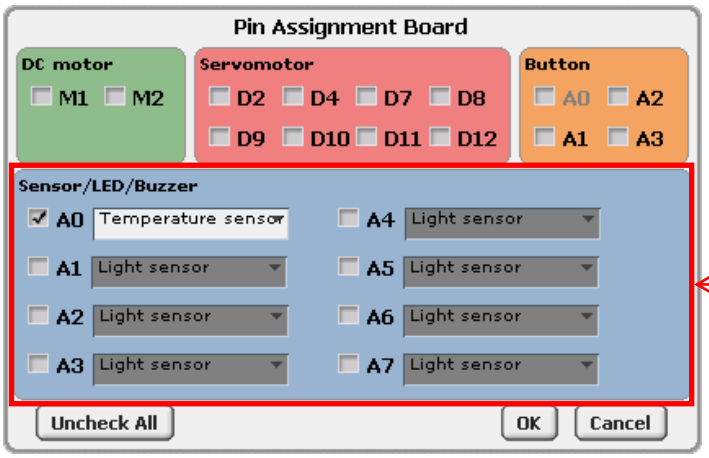

Click the Edit menu and select Show Optional Parts.

② Click the Edit menu and choose Port Settings... to open the Port Settings dialog.



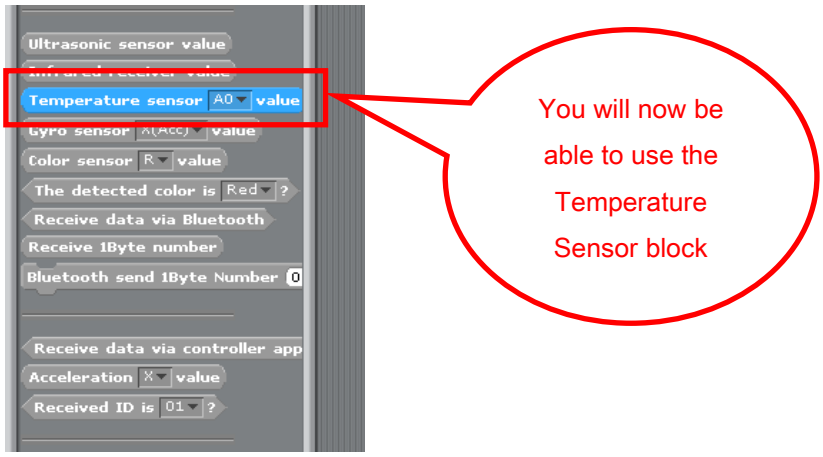

Click the Edit menu and select Port Settings...

③ Your Temperature Sensor can use any connector from A0-A7. Under the Sensor / Buzzer / LED section of the Port Settings dialog, check any box from A0 to A7 and use the combo box to select the Temperature Sensor. Click OK. The following sections assume the Temperature Sensor is connected to A0.



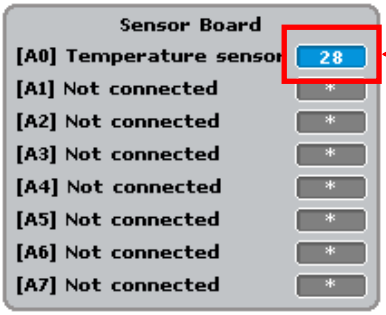

Choose Temperature Sensor for the corresponding connector on your Studuino

④ The Temperature Sensor block will become active.



## 4.1. Temperature Sensor Values

Your Temperature Sensor detects ambient temperature. The Temperature Sensor block is used to return these values, which are real numbers from -40 to 125℃. You can open Test mode and use the Sensor Board to check the values, which are shown as whole numbers.




Shows whole numbers

## 4.2. Sample Program Using the Temperature Sensor

The picture below shows an example program using a Temperature Sensor. It will cause an LED to turn on when the temperature rises above 25℃.