



Microsoft Azure IoT Plant Kit

Quick Start handbook

Thank you for buying the product from Smarthon!

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Introduction



Microsoft Azure IoT Plant Kit

Build it yourself, managed, monitored and controlled on Microsoft Azure IoT Central with cloud computing.

"Microsoft Azure IoT for Smarthon Plant Kit" is the first advanced kit to let your micro:bit connecting to Microsoft Azure cloud! The KIT is developed by Smarthon working with Microsoft and K-Solves. It is an advanced kit set go beyond with Wi-Fi ability! Let's get started to the Real IoT world with cloud computing right now!

Everything you need is provided in the kit, including the bbc micro:bit.



KIT SET INCLUDE



1. BBC micro:bit main board

- 2. Core cloud main board Multiple sensors
- 3. Multiple actuators
- 4. Connecting wire 21cm long
- 5. Soil moisture sensor
- 6. LED grow light (purple)
- 7. USB Stand
- 8. USB Base (For LED grow light)
- 9. Water pump and pipe
- 10. Motor fan

11. Motor fan base

- 12. Humidifier
- 13. USB (for humidifier)
- 14. Cardboard
- 15. USB cable (for micro:bit main board)

Core Structure diagram

There is a screen, 3v/5v switch and a WIFI module on the shield. The screen is indeed very useful - it shows the information like IP address and the battery status.



Multiple Sensors for plant (WiFi)

Multiple Actuators for plant (WiFi)



Main Features

- Wi-Fi cloud module
- 128x64 OLED screen
- Micro USB Direct energy supply
- 3 data logging mode (SD card, Wi-Fi, USB)
- Direct reading mode with NEXT Button
- ALL-IN-ONE Sensors board
- ALL-IN-ONE Actuators board
- Sensors and actuators focusing on plant growth
- Well cardboard wrapped
- Microsoft Makecode platform

Key functions and benefits

- Experience REAL IoT Platform to monitor and manage all your Internet of Things (IoT) assets
- Get Access to Wi-Fi and connect to the popular Microsoft azure cloud (Microsoft IoT Central)
- Get the online fancy data dashboard for data analysis and nice presentation
- Get controlled on the plant from the cloud directly (Bi-directional)
- Get Access on powerful cloud computing tool Microsoft Flow

- Get Access on all Microsoft IoT services such as Microsoft Team, office and all others including AI features like vision API



Data Dashboard

Microsoft Flow (Cloud computing)



Microbit PXT platform

Microsoft TEAM

Involved projects focusing on plant

- > There are 4 main projects student can do on!
 - 1. Smart LED grow light
 - 2. Automatic irrigation (watering)
 - 3. Smart Environment (temperature control)
 - 4. Automatic humidity control



Smart LED grow light

Automatic irrigation

Smart Environment

Automatic humidity

There are 4 different LED grow light color for you! However, the default color one is purple only. If you need other color, you need to buy and contact us.



Purple

Blue

Green

Red

How to program Kit on micro:bit

To program Smarthon modules with micro:bit, you will need to add the Smarthon PXT packages to your makecode environment.

STEP 1: Find the "Add Package" option at the bottom.

Pins	+			
🔶 Serial	+			
🛢 Control	+			
Add Package	+			

STEP 2. Enter the name "https://github.com/SMARTHON/data-logger".



STEP 3. You can find 2 more tabs that are "OLED" and "Plant".



FIRST STEP: Connect Wi-Fi

Before we go, we have to initialize the Kit.



STEP 0: Switch to Online Mode – WIFI (Mode 2)

STEP 1: Go to Plant -> Initialize Muselab Wi-Fi Booster and OLED

1	Basic	
	O Input	Initialize Data Logger [Offline mode - SD Card and OLED]
l	Music	Initialize Data Logger [Online mode - WiFi module and OLED]
	C Led	Initialize Data Loggen [Computer mode (Pead by conial USP) 011
	🖵 OLED	Inicialize baca Logger [computer mode (nead by Serial 038) - Ocraj
	🕤 Plant	Get Light intensity (Lx)
	on start	
	Initialize Data	Logger [Online mode - WiFi module and OLED]
		+ + + + + + + +

If you open the shield, the screen will show "SMARTOHN WIFI v1.0" and "Online mode" afterward.



STEP 2: Find the Set wifi to ssid pwd from "More" tab.

on start	+							
Initialize Data	Logger	[Onli	ne mo	de - I	WiFi	modul	e and	OLED]
set wifi to ssid	d (' smai	rthon	pwd	" 12	34567	8"		

Result:

> When it is connected, the IP address will be shown.

1. Get started on Microsoft Azure IoT Central

1.1 Login your account

STEP 1: Go to the website and login with your account.

https://azure.microsoft.com/en-in/services/iot-central/

STEP 2: Select the application

STEP 3: You will go to the Dashboard home page. There are some useful information on the dashboard.

Smarthon Limited			
≡	Dashboard		
Dashboard			
Ø Devices	Concession of the second	dasda Firmware version	
88 Device sets	Contraction of the second	1	
🖾 Analytics			
🖧 Jobs			
Davice Templates			

1.2 Device Template

STEP 1: Go to the "Device templates" on left menu, you will see there is a device template for the Smarthon Plant Kit.

=		D	evice Templates		
⊞	Dashboard		3 templates found		
Ø	Devices		Name	Version	Devices
88	Device sets		Plant	1.4.0	2
ß	Analytics				
Ŀ	Jobs				
0	Device Templates				

STEP 2: After clicked it, you will see there are 6 tabs on the upper part. They are "Measurements", "Settings", "Properties", "Commands", "Rules" and "Dashboard".

F	Device Template	Device Template Plant (1.4.0)									
	Measurements	Settings	Properties	Commands	Rules	Dashboard					
+ New			View:	⊞ Å							
Telemetry	/	^									
Air Pressure AVERAGE	\$ \$	1									
humidity AVERAGE	\$ \$ \$	1									

(i) Measurement

For one plant, there are 5 telemetry for the kit to upload data here. It is used for showing the data on chart. The telemetries are (1) air pressure, (2) humidity, (3) light intensity, (4) soil moisture and (5) temperature.

(ii) Settings

There are no settings here.

F	Device Template Plant (1.4. Measurements Settings	O) Properties Cor	nmands Rules	Dashboard
Library				
12 Number				
≡) Text				
🛅 Date				
Toggle				
🗖 Label				Settings control the behavior, such as fan speed, of your device. Get started by adding a new setting. Learn more □ about device settings.

(ii) Properties

The properties of each kit are different. The <u>serial number</u> and <u>firmware version</u> of the kit will be shown here once the kit is connected to the cloud. For the <u>Last Service</u> <u>Date</u> and <u>Location</u>, those can be edited by the user.

Device Template Plant (1.4.0	0)		
Measurements Settings	Properties Commands Rules Dashboard		
Library	Serial Number	Last Service Date ①	
12 Number	598633	05/19/2019	
≊⊉ Text	Firmware version		
🗰 Date	1	Hong Kong	
Toggle			
Device Property			

(iv) Commands

For the commands, it is used to control the output of the Kit. The (1) water pump, (2) Grow LED Light, (3) Humidifier and (4) Motor can be controlled. All can be controlled in different intensity.

Device Template Plant (1.4.0 Measurements Settings)) Properties Commands Rules	Dashboard		
+ New Command	Water pump control I I I I I I I I I I I I I I I I I I I	Grow LED control (5) intensity 0	Humidifier Control 🕚 intensity 0	Motor Fan ACW Control S intensity
	Run	Run Command Delivery	Run Command Delivery	Run
	No messages found	Failed at 12:31 5/24/2019 (UTC)	Failed at 09:42 5/23/2019 (UTC)	Motor Fan CW control ③ intensity 0 Run

(v) Rules

This is the rules page. It is used to set the general rule for all device you will create later. We will cover this function later.

Ţ	Device Template Plant (1.4.0)								
	Measurements	Settings	Properties	Commands	Rules	Dashboard			
+ New									

(iv) Dashboard

This is the dashboard for user to show data in different manner. For example, the upper 5 value is "<u>Last Known Value</u>" of the telemetry. And the downside "light chart", it is the "<u>Line Chart</u>".

Device Template Plant (1.4.0) Measurements Settings Properties Commands Rules Dashboard										
Library	liaht	Air procesure	Tomporature	Humidity (%)	Soil Moisture (%)					
🖾 Image	iigiit	Air pressure	lemperature	Humary (%)	Son Moisture (76)					
😂 Line Chart	Nº	NՉ	N₽	N₽	N⁰					
all Bar Chart										
KPI										
 Settings and Properties 	light	light								
Label	()							
🖞 Мар										
Event History										
III State History	MISS No data	ing Data available in								
Last Known Value	this ti	ime range								
	9:48:36 PM	10:19:12 PM								