LOKII-CE

Low-Cost Operating System with

Knowledge and Innovation Intelligence

LOKII-CE Programmer's Guide Version 1.8

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Introduction

LOKII is a platform that extends the open-sourced Arduino board to provide speech, voice, and computer vision functions. This innovative platform, developed by a team of professional engineers in Hong Kong, helps to:

- Lower the skill required to add speech, voice, and vision to robots built on Arduino-based microcontroller kits.
- Bring the cost of manufacturing Arduino-based robots down to a level acceptable to the toy industry.

Students of the STEM program can now use Arduino to quickly build digital devices and interactive objects (e.g., robots) that can sense and control objects in the physical world.

LOKII SYSTEM SOLUTION

LOKII provides a total solution for AI functions and robot makers. Our single board can do image processing/ Speech recognition/Text-to-Speech, and Smart device controls (motors and sensors)

A. The LOKII-CE Board



Fig. The Lokii-CE Board

LOKII is an electronic board with built-in onboard artificial intelligence, such as speech, voice, computer vision, and motor control functions. You need to know about a few components to get started.

- 1. Micro USB socket
- 2. Dip Switch unit
- 3. LCD



B. Getting the LOKII-CE Board Ready for Programming

There are two ways to connect the Lokii-CE board to a computer to access the LOKII-CE BLOCKY Editor.

I. Connecting via WIFI router (2.4G Hz ONLY)

- 1. Fip switch 1 to ON position to put the Lokii-CE board into USB mode.
- 2. Connect the Lokii-CE board to a computer using a USB cable.
- 3. Open the wifi file stored on the Lokii-CE board.
- 4. Change the SSID to the name of the WIFI router that the Lokii-CE board will connect to.
- 5. Change the login password to Login to the specified SSID.
- 6. Disconnect the Lokii -CE board from the computer.
- 7. Flip switch 1 to OFF position.



Fig. 2: The dip switches are set to zero

8. Connect the Lokii-CE board to an external charger for power (See Fig 2).

9. As the Lokii-CE board starts, it will display an IP address on the LCD screen.



Fig. 3: The IP addresses have been successfully set

- 10. Write down the Lokii-CE board's IP address (e.g., 10.0.0.121) on the LCD 3.
- 11. Opens a web browser on the computer.
- 12. Type in the Lokii-CE board's IP address (e.g., 10.0.0.121) in the web browser's address line
- 13. Press Enter.
- 14. The LOKII-CE BLOCKY Editor will appear in the web browser (Fig. 4).

II. Connecting via LOKII internal Soft – AP mode

- 1. Fip switch 1 ON position to put the Lokii-CE board into USB mode.
- 2. Connect the Lokii-CE board to a computer using a USB cable.
- 3. Delete the wifi file stored on the Lokii-CE board.
- 4. Disconnect the Lokii-CE board from the computer.
- 5. Flip switch 1 to OFF position.
- 6. Power up the Lokii-CE board by connecting to a computer with a USB cable.
- 7. Write down the Lokii-CE board's IP address (192.168.x.x) on the LCD 3.
- 8. Check the WIFI connections showing up on your computer.
- 9. Connect the computer to WIFI, starting with the Lokii prefix.
- 10. The password for this Lokii-CE board is 12345678.
- 11. Opens a web browser on the computer.
- 12. Type in the Lokii-CE board's IP address (192.168.x.x) in the web browser's address line
- 13. Press Enter.
- 14. The LOKII-CE BLOCKY Editor will appear in the web browser (Fig. 4).

C. THE LOKII-CE BLOCKY Editor



Fig. 4: The LOKII-CE BLOCKY Editor

LOKII-CE BLOCKY Editor Components

1. Title Bar



a) LOKII-CE Blocky Editor

The Lokii-CE Board Blockly Editor IDE.

b) Program storage

Let a user manage the Lokii-CE board's onboard internal memory.

LOKII-CE Blockly Editor Program storage F	emole control About
	LOKII-CE Program Storage
	LOKII-CE boards support up to 3 program slot storage. You can save / load /run the program stored inside the LOKII-CE boards.
	Uplead Elickly program to nternal storage Download program to Blickly workspace Run stored program

c) Remote control

A programmable button and joystick control pad.

Control buttons —	LORI CE Block får Program storge Periode control O 0 0 0 0 (F1) (F2) (F3) (F4)	
Analog johstick		Digital johstick

d) About

Let a user manage the firmware installed on the Lokii-CE board.

LOKII-CE OTA update								
Firmware Version: LOKII-1.35-119B								
LOKII-CE boards ID: LOKII_8B72BC								
Activation Code: F1A3877B9DF4956B6B23129D6015E6AA								
Choose File No file chosen								
Upload file from your computer.								
Choose File No file chosen								

2. Action Bar



a) Open

Upload a Blocky program from local computer into Blockly Editor workspace.

b) Import function

Integrate a Blocky program from local computer with Blockly program already existed in Blockly Editor.

c) Save

Save a Blocky program inside the Workspace into a file located in local computer.

d) Run

Execute the Blocky program inside the Workspace.

e) Clear

Remove the entire Blocky program inside the Workspace.

f) Select and Open LOKII-CE example function.

The dropdown menu shows a collection of Blocky programs with the Lokii-CE board to illustrate several Lokii-CE functions.

	Adams (Run (Stop (Char	Select and Open LOKE-CE example function *							
Journey Journey		0 - Face Detect							
Louis		1 - Color Tracking							
Loope		2 - Speech Detection							
Math		3 - TTS and MIDI demo							
Text		4 - Smart Direction							
Liss		 Based Decision 							
Colour									
LOKI INTARATO		6 - LOKE Car (4 DC Motors)							
LOKI I/O Extender		7 - LOKII Car (Face detection + Speech recognition)							
LOKI Impor Processing		8 - Baby Monitor							
LOKII Sound Processing									
LOKI Time and Print									
LOKI Matineda									
LOKI Smart Device									
LOKE Smart IOT									
LOKE Cloud Al									
Variables									
Functions									
			CONTRACTOR DURING MARKED						

3. Format Bar



Let a user switch the code format between Blocky and Javascript.

4. Library of Predefined Coding Block



Let a user select a predefined coding block from the categories of functions that come with the Blocky-CE board.

5. Workspace

The middle of the web page is the workspace for building a Blocky program. A user selects (drags from the library) a predefined coding block and drops it into the Workspace to make a logical connection with the other blocks in the Workspace.



A left click on a block will drop down a menu of options for users to work on the block.

6. Trash Can



Drag a block (or blocks) over the transh can would remove the block from the workspace.

D. How to Program the LOKII-CE Board

Lokii-CE board adopts the Google Blocky programming methodology, which uses a visual programming paradigm to make coding easier for beginners and users to program the board.

Each Lokii-CE board has a built-in IDE (Interactive Development Environment) Called LOKII-CE BLOCKY Editor, facilitating the writing of programs visually using building blocks with predefined functions. Users can apply programming principles without worrying about syntax, things like a missing semicolon, or a for loop that doesn't have all the right pieces. LOKII-CE BLOCKY Editor then generates JavaScript or Python code from these blocks.

LOKII BLOCKY differentiates from other Blocky variants by enriching the BLOCKY language with extensions built for programming the Lokii-CE boards. These extensions perform image, sound , online AI processing, and motor control functions.

I. Create a Simple Blocky Program

- Let's create a simple program to print "123" on the LCD. Every Blocky program begins with the block 'Connect' to upload the program to the Lokii-CE board.
- 2. The 'Connect' block is under "LOKII Initialization" as shown below.



- 3. Next, we will create a variable 'abc' and assign it a value '123'. This will take two steps.
 - i. Click "Create variable" a pop-up window lets us customize a new variable's name. Enter 'abc'.
 - ii. Select the 'Set abc to' block as shown below.



4. Drag and drop the block onto the Workspace and place it below the Connect Block.



5. Select the [123] block under Math

Logic	C 123
Math	
Text Lists	
Colour	square root

6. Interlock it with the [Set abc to] will change the variable 'abc 'value to the specified integer, 123. Lokii-CE will automatically interpret 'abc' as a numeric value of 123 whenever the program's variable 'abc' appears.



7. Select the [Show text on LCD "print hello" row 1] under "LOKII Time and Print".



8. Drag and drop the block onto the Workspace and place it below the [Set abc to] block.



9. Change this message 'print hello' to 123 by dropping variable abc from Variables.

⊖Open	Cimport function	Savلي	е	۰F	lun	0	Stop	8	Clea	r	Sele	ct an	d Op	en LC	OKII-O	CE e	xamp	le fui	nctio	۱ •		
Blockly	Javascript																					
Logic Loops Math Text Lists		*	•	•	•	*	•	•	•	•	•	* * *	* * *	•	•	•	•	•	•	•	•	*
Colour	Initialization		÷			*	κ.	C	onn	ect abc		to	1	23	Ľ.	÷				*		÷
LOKII	I/O Extender								hov	/ te	xt or			at		Ì		•	ĺ.			÷.
LOKI	Image Processing Sound Processing Time and Print	• •				*	*				*							•		*	+	*
LOKI	Multimedia	• •							2							•	•					
LOKII	Smart IOT Cloud Al							1	*			*		*	ł	*		*	*		*	ł
Variab Functio	les ons				•			8	÷	•	×.	л ж			2	÷	•					ł

- 10. Click the 'Run' button inside the Action Bar at the top.
- 11. You will see the value of the selected variable on the LCD screen instead of 'print hello'



12. Congratulations. You have successfully created and run your first Blocky program.

II. Predefined Coding Blocks

The foundation of Blocky visual programming is Predefined coding blocks. Richness in number and blocks is vital to a Blocky IDE's programming power and flexibility in creating applications. LOKII BLOCKY has a large stash of predefined blocks to facilitate Lokii-CE board users in programming the board.

On the left-hand side of the LOKII-CE BLOCKY Editor are categories of predefined coding blocks. Users can click on any of them to show the blocks under that particular group in the Workspace.

1. Logic





2. Loops

1	repeat t 10 times do
	A repeat_for block with a math_number block connected to it. It will perform the
	function of the connected functional block for the number of times specified in
	the math_number block. Users can change the value inside the math_number
	blocks.
2	repeat while
	A repeat_while block that has a control condition connected to it. It will perform
	the connected functional block to meet the control condition specified in the
	condition block. The dropdown menu will show other control condition operators.
3	count with ive from b 1 to b 10 by b 1 do
	A count_for block that has three math_number blocks connected to it. The value'
	i' takes on the values from the starting number to the ending number, counting by
	the specified interval to perform the connected functional block. Users can change
	the values inside the math_number blocks.
4	for each item in list a do
	A controls_for block with a list block connected to it. For each item retrieved from
	the list, perform the function of the connected function block to the item in the list.
	Users can change the value inside the math_number block.
	break out of loop
	Breaks out of the containing loop.

3. Math

1	123
	A math_number block. Users can change the value inside the block.
2	
	A math_arithmetic block that has two math_number connected to it. Users can change the values inside the math_number blocks. The dropdown menu contains other arithmetic operators such as - x etc.
3	outer artuinieue operators, such as -, x, etc.
5	square root - C 9
	A math arithmetic block to perform the square root on a math number. Users can
	change the value inside the math_number block. The dropdown menu contains other
	arithmetic operators.
4	sin 2 (45)
	A trigonometric_function block to perform the sin function on a math_number.
	Users can change the value inside the math_number block. The dropdown menu
	contains other trigonometric function operators, such as cosin, tan, etc.
5	π
	The dropdown menu contains these math functions:
	✓ П
	e φ
	sqrt(2)
	5411 <i>(2)</i>
6	t 0 is even
	A math_comparison block. Users can change the value inside the math_number
	block. The dropdown menu contains other comparison operators, such as odd, prime,
	etc.
7	round - t 3.1
	A math_arithmetic block that performs rounding of the value in the math_number
	blocks. Users can change the value inside the math_number block. The dropdown
	menu contains round-up and down operations.

8	sum sof list 🖡
	A math_arithmetic block that sums the values in a number list. The dropdown menu
	contains other arithmetic operators, such as min, max, etc.
9	remainder of 64 ÷ 10
	A math_arithmetic block that performs division on two values of the math_number
	blocks.
10	constrain 50 low 1 high 100
	A math arithmetic block to find the exact values of a Constraint
	equation variable within the low and high values specified in the math-
	number blocks.
11	random integer from 1 to 100
	A math_arithmetic block that produces a random number between the specified
	values of the math_number blocks inclusively
12	random fraction
	A math_arithmetic block that produces a random number between 0 and 1.
13	atan2 of X: 1 Y: 1
	A math_arithmetic block that performs 2-argument arctangent. (atan2)

4. Text

1	·· • • • • • • • • • • • • • • • • • •
	A Text_string block for specifying the text.
2	create text with
	A Text_string block to create text using connected functional blocks.
3	to item - append text 1 44 77
	A Text_string block for appending text to the specified items. The dropdown menu contains:
	item Rename variable Delete the 'item' variable
4	A Text, string block to find the length of a string.
5	The text of the text of the text of a stang.
	is empty
	A Text_string block to test if a string is an empty string.
6	in text (text) find first occurrence of text (46 abc)
	A Text_string block to find the first occurrence of the specified string in the text.
7	in text (text) get letter # .
	A Text_string block to get the letter at position # in a supplied string.
8	in text (text) get substring from letter # > + to letter # > +
	A Text_string block to get the substring from position # to position # in a supplied
	string.
9	to UPPER CASE - C - abc >>
	A Text_string block to change the letters in a string to upper case.



5. Lists

1	create empty list
	An action block to create an empty list.
2	create list with
	An action block to create lists according to the rules in the specified attached blocks.
3	create list with item k repeated 5 times
	An action block to create a list of repeated items with specified length inputted in the
	last block.
4	length of
	An action block to find out the length of a list.
5	is empty
	An action block to check if a list is an empty list.
6	in list list ind first occurrence of item
	An action block to find out the first occurrence of a specified item.
7	in list 📜 ist 🕶 get 💌 🗰 📕
	An action block to retreive the item from the specified list position #.
8	in list 📜 ist 🔹 🗰 🗰 as 🕨
	An action block to assign a new item in the specified list position #.
9	in list 🚺 ist 🔹 get sub-list from # 🖛 🛌 to # 🖛 🛌
	An action block to retrieve a sub-list from position # to position #.
10	make list from text - with delimiter
	An action block to create a list by splitting the supplied text using a specified
	delimiter.



6. Colour

1	
	An action block to set a color.
2	random colour
	An action block to set a color by random.
3	colour with red 100 green 50 blue 0 An action block to set a color using the specified RGB numbers.
4	blend colour 1 colour 2 ratio 0.5
	The action block to set a color using the specified fatto.

1

7. LOKII Initialization



An action block to connect and initialize the Lokii-CE board status. This block should always position at the top of other blocks

8. LOKII I/O Extender

1	Set GPIO O digital IN Set a GPIO number pin with specified GPIO number as either INPUT or OUTPUT usage Remark: For Analog PIN, only INPUT status is allowed
2	Read I/O Extender
	Read all INPUT pins status from SMART_IO Extender_V2 to blockly cache. This saves the reading time for multiple read operations in "read GPIO" block
3	Cread GPIO () Read an INPUTpin status with specified GPIO number from blockly cache instantly.
4	Write GPIO () LOW Write an OUTPUT pin with specified GPIO number for either low (0V) or high (3.3V) status.
5	
	Conditional block to check for an INPUT pin status. If the condition meets, execute the inner block action.

9. LOKII Image Processing



6	♥ Wait for QR Code isBlocking 🗸
	An Image_Processing block to wait for the QR code recognition result.
	IsBlocking means that the caller waits until the callee detect a QR code.
7	Read QR Code
	An Image_Processing block to read a QR Code as a text
8	registerColor
	An Image_Processing block to register the center of the camera image as a new
	customer color for "Recognize RGB Color" function
9	RED
	An Image_Processing block to depict Red color.
10	GREEN
	An Image_Processing block to depict Green color.

11	BLUE
	An Image_Processing block to depict Blue color.
12	CUSTOM color
	An Image_Processing block to set a custom color.
13	getBlobResult ID 11 attribute X coordinate
	An Image_Processing block to get the attribute of a color region detected, including:
	• X coordinate
	• Y coordinate
	• Width
	• Height
	• Color
	The ID specifies the index of the color blob retreived which is bounded by
	"getBlobCount" block

10. LOKII Sound Processing

1	Start speech Recognition for keyword groups: Number group
	A Sound processing block to start speech recognition under a specified
	keyword groups:
	$= \sum ["0" "1" "2" "3" "4" "5" "6" "7" "8"]$
	"9", "10"]
	 "Action group" ==> ["Action", "Move", "Turn", "Run", "Look", "Attack", "Stop", "Hello"]
	• "Movement group" ==> ["Turn Left", "Turn Right", "Move Up",
	"Move Down", "Go"]
	• "Demo group" ==> ["Tell me a joke", "Play me a song", "Stop the
	music", "Take a photo", "Show me the photo", "Track my face", "Follow
	the ball", "Record motor motion", "Play back motor", "List commands"]
2	stopSpeechRecognize
	A Sound processing block to stop speech recognition.
3	
	waitForSpeechResult isBlocking
	A Sound_processing block to wait for the result of speech recognition.
	IsBlocking means that the caller waits until the callee recognized a keyword from
	the specifid keywords' group.
4	getSpeechResult
	A Sound processing block to get the result of speech recognition. The result is an
	index number which indicates the keywords recognized.
	For example, -1 : No keywords recogized
	0 : first keywords recognized
	1: second keywords recognized
	etc
5	Set Volume (1-100) 1 100
	A Sound_processing block to set the speaker volume from scale 1 to 100.
6	Play Text-To-Speech 1 Hello, TTS >>> Voice: Default - Emotion: Natural - Speed: 5 Pitch: 5
	A Sound_processing block to perform text-to-speech with the specified speech

	parameters.
7	Play sound file 🔰 🍕 (a.mp3) 🥬 isBlocking 🗸
	A sound_processing block to play an audio file. Supported format includes: mp3
	and wav file.
	IsBlocking means that the caller waits until the whole audio playback completed
8	stopSound
	A Sound_processing block to stop the current audio playback
9	playMIDI note(0-61) 10 time (tempo) 1/8
	A Sound_processing block to play musical notes with the specified parameters.
10	checkAudioStatus
	An action block to check the audio status.
	1 : audio is playing
	0 : no audio is playing
	-1 : command sent fails

11. LOKII Time and Print

1	A Time and print block to get the remote joystick status from "Remote Control"
	The result is an integer value 0 or 1 if the joystick setted to DIGITAL state. On the
	other hand, the result is a floating point number between $0.0 - 1.0$ if the joystick
	setted to ANALOG state.
2	Remote Key button: A · PRESSED ·
	A Time_and_print block to check the remote key button status from "Remote
	Control" The result is 1 if the specified status fulfilled or 0 if the specified status
	is not met.
3	wait ms [1000]
	A Time_and_print block to set LOKII-CE boards to wait and idle for a specified

	time
4	show text on LCD to 44 print hello >>> row 1
	A Time_and_print block to show one line of text on LOKII-CE LCD specified row
5	show text on LCD
	A Time_and_print block to show five line of text message on the LOKII-CE LCD screen
6	clear Lcd
	A Time_and_print block to clear the LCD drawing
7	Print C 44 (test message) >>
	A Time_and_print block to print a specified message at the bottom of the Blockly
	IDE Editor window.
8	Comment
	A Time_and_print block for comments.
9	
	A Time_and_print block to turn ON or OFF the debug message of th LOKII-CE
	boards.
10	Random integer 1 to 1 10
	A Time_and_print block to generate a random integer between two specified
	numbers in connected math_number blocks.

12. LOKII Multimedia

1	Record video of 66 video ovi 11
	Viceo avi viceo avi
	A Multimedia block to record avi video with the specified file
	The recorded video is a H.264 format video with 480x360 resolution.
2	stopRecordVideo
	A Multimedia block to stop video recording.
3	Play video 🔰 🎸 video.avi 🥬 isBlocking 🖌
	A Multimedia block to play the specified video file.
	IsBlocking means that the caller waits until the whole video playback completed.
	You can use LOKII-CE Video Converter to convert your favorite video source into
	LOKII-CE playable video format.
4	Take photo 🔰 🎸 sample.jpg 🧦
	A Multimedia block to take a photo with the specified file name.
5	Display photo 🕻 🤲 sample.jpg 😕
	A Multimedia block to display the specified jpg file.
6	Record audio 1 44 audio.mp3 >>
	A Multimedia block to record the audio as a mono MP3 file with a specified file name
7	
,	stopRecAudio
	A Multimedia block to stop audio recording
8	startVideoStreaming resolution 1280 x 720 -
	A Multimedia block to start video streaming with a specified resolution to an
	Android device running LOKII-CE APP. The Android device and LOKII-CE
	boards must be connected in the same WIFI router.
9	ston Video Streaming
	stop video Streaming
	A Multimedia block to stop video streaming to the external device



13. LOKII Smart Device

1	Play Motor Preset (1-2) Dog 1/Dog 2 11 Motion Forward repeat: 11 isBlocking 🗸
	A Smart_Device block provides preset motor animatioin for LOKII Dog robot
	architecture, including:
	"Forward", "Backward", "Left", "Right", "Lay down", "Standby"
5	showSmartDeviceStatus showDevice 🗸
	A Smart_Device block to show/hideall smart devices status attached to LOKII-CE
	boards on the LCD screen.
6	setSmartDeviceAddress ID
	A Smart_Device block to set the address of a smart device. Make sure only one smart
	device is attached to the SMART_BUS before execute this function block.
7	getSmartDeviceCount
	A Smart_Device block to get the number of smart devices attached in SMART_BUS
15	setRGB ID 1 5 r (0-255) 0 g (0-255) 0 b (0-255) 0 Fading (0-255) 0
	A Smart_Device block to set a SMART_RGB (specified by ID) color with specified
	Red, Green, Blue value. (This function only work with SMART_LED device for some
	special customers)
16	RC Servo ID 9 speed (0-20) 0=Fastest 0 position (0-250) 0=Power OFF
	A Smart_Device block to move a RC Server (specified by ID) to a target position with
	specified PWM speed. (1-20) If the speed is 0, it means moving instantly.

17	RC Servo ID 9 Completion Time (100-10000) ms 1000 position (0-250) 0=Power OFF
	A Smart_Device block to move a RC Servo (specified by ID) to a target position with completion time specified in the second block.
18	Set all DC motors ID 10 speed0 (+/- 100) 10 speed1 (+/- 100) 10 speed2 (+/- 100) 10 speed3 (+/- 100)
	A Smart_Device block to move all four DC motors (with consecutive smart ID numbers)
	with specified speed at the same time for one second. The starting ID is specified in the
	first parameter.
19	DC Motor ID [13 speed (+/- 100) 0
	A Smart_Device block to move a DC motor with specified ID to a target speed (-100 to
	+100) for one second
	The DC motor can be attached in the SMART_POWER (Default ID: 0-3)
	Or
	Additional DC motor can be attached to SMART_BUS throught a SMART_DC board.

14. LOKII Smart IOT (These block functions are not released yet)

1	
1	startBLE
	A Smart_IOT block to start the BLE.
2	closeBLE
	A Smart_IOT block to close the BLE.
3	getBLE
	A Smart_IOT block to get the BLE status.
4	connectIOT deviceCount
	A Smart_IOT block to connect nearby SMART_IOT with up to specified device count value in the math_number block.
5	connect Cloud
	A Smart_IOT block to connect to LOKII-CE Board to the Cloud.
6	disconnect Cloud
	A Smart_IOT block to disconnect from the Cloud.
7	read SmartIOT ID
	A Smart_IOT block to read the sensor value of the SMART_IOT as specified by
	the value in the math_number block.
	The sensor values can be :
	Temperature(degree)
	Humidity(%)
	CO2(ppm)
	TVOC(ppm)
	Light Intensity (LUX)
	Distance (mm)
	Sound (dB)
	Accelerometer in X, Y, Z axis (ms-2)
	Gyro in X, Y, Z axis (rad/s)
	Magnetometer in X,Y,Z axis (uTesla)
	RGB LED color (24 bit RGB))



15. Cloud AI (Online Subscription Service is required)

2	Set ChatGPT API Key 1 44 CHATGPT_API_KEY 39
	A Cloud_AI block to set the ChatGPT API key. User should subscribe to ChatGPT
	service in order to acquire the key.
3	ChatGPT question: C 44 Who are you?
	A Cloud AI block to ask ChatGPT the question as specified by the text inside the Text
	block.
5	Speech To Text group
	A Cloud+AI block to ask LOKII-CE to convert the recorded audio to string text by
	using the online AI server LOKII-CE board will start the conversion after one
	second from its "Hey LOKII" audio playback.
6	
	check string pattern (44 text with keyword AAA >> (44 AAA,BBB >>
	A Cloud_AI block to check if there is a matching string pattern as specified by the
	value of the 2nd Text block (Each text pattern is delimilated by comma) against the
	string specified in the 1st Text block.
	If the string pattern found in the first text block, it will return the index starting from
	0 for the first pattern found. For example, above block will return 0 as "AAA" is found
	in the 1st Text block

16. Variables

1	Create variable
	set abc v to k
	change abc by t 1
	abc
	A Variable_block to set the value of a user-created Variable.

17. Functions

1	to do something
	A Function_block to create a Function block (No return value). User can specify the
	Function name and also the number of input parameters by tapping the "setting" icon.
	Once the function block is placed in the workspace, user can implement the function
	content by adding other blocks inside the Function block.
	The created function will be visible instantly under "Functions" category.
2	to do something
	A Function_block to create a Function block (with return value). User can specify the
	Function name, number of input parameters and return value by tapping the "setting" icon.
	The created function will be visible instantly under "Functions" category.
3	if Mareturn
	A Function_block to check the fulfillment of the first block condition and then return the
	second block value and exit the Function.

III. Sample Blocky Programs

Several Blocky programs showing how to use various built-in AI functions came with the Blocky IDE as sample codes. You may want to study these programs and learn how to make Lokii-CE behave as you want.

Ac	tion Bar					
⊖Open	⊖import function	, ⊥ Save	⊙Run	 Stop 	⊗Clear	Select and Open LOKII-CE example function -

A list of programs will show up as follows.

CE Blockly Editor Program	n stora	ge	Ret	note c	ontroi	C.,	Abo	at																						
Open Enimport function	.t.Se	ive	OF	Run		Stop	6	Clea	ar	Sel	ect a	nd C	pen	LOK	II-CE	exa	mpl	e fu	nctio	n•										
xikiy Javascript										0 -	Fac	De	lect																	
										1 -	Cold	r Tra	ickin	g								E								T.
Logic										2.	Sne	ach I	Dato	tion																
Loops											ope																			
Math										3 -	TTS	and	MID	l den	no															
Text										4 -	Sou	nd D	irecti	on																
Lists											Const	-		0	tion of															
Colour										0.	SIL	n Di	suce	CON	00															
LORD INTERNET										6 -	LOK	II Ca	ir (4	DC N	Aotor	s)														
LOKII Initialization										7.	LOK	II Cr	ir (Fr	ece d	letec	ion	+ Sp	eec	h rec	2001	nition									
LOKII I/O Extender										-	-																			
LOKII Image Processing										8-	Bap	/ 100	nitor																	
LOKII Sound Processing																														
LOKII Time and Print																														
LOKII Multimedia																														
LOKII Smart Device																												C		
LOKII Smart IOT																														
LOKII Cloud Al																												. E		
Variables																														
Functions																											2.5		2	

For example, if you select Face Detect, the program that can do face detection will appear in the Workspace like this.

(II-CE Blockly Editor Program	n sto	rag	e		Rem	note	cor	ntro	d.	A	bou	t																	
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Blockly Javascript																													
Logic	•	onn	ect																										
Loops	n		at	while			true	1																					
Math	d	lo	SE	Car	nena	еMo	ae i	can	iera		e F	ace	det	ecti	on														
Text				fa	ceR	esu	t P	to	C									\checkmark											
Lists				P	зX		0	9					X	2000	dina	ate	•												
Colour				po	xΥ	1							Yo	oor	dina	te													
LOKII leitieliestes				Wi	dth			9					Wi	dth	1	1													
LOKITINItialization			se	he	ight		to		ett	acel	Res	alt	н	eigh	nt -														
LOKII I/O Extender		~				-																							
LOKII Image Processing																													
LOKII Sound Processing																													
LOKII Time and Print																													
LOKII Multimedia																													
LOKII Smart Device																													
LOKII Smart IOT																													
LOKII Cloud AI																													
Variables																													
Functions																													
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IV. Connecting LOKII-CE Board to ChatGPT

ChatGPT is a natural language processing tool that predicts word sequences based on training data. GPT stands for **Generative Pre-trained Transformer**. It is generally available to the public.

To log in for ChatGPT, you'll need an email address and phone number to sign up. You'll also need to create a robust and unique password, which is particularly important if you're using ChatGPT.

Here are a few steps to get a ChatGPT API key for accessing the chat services.

- 1. Go to OpenAI's Platform website at platform.openai.com and sign in with an OpenAI account.
- Click your profile icon at the top-right corner of the page and select "View API Keys."
- 3. Click "Create New Secret Key" to generate a new API key.

https://www.howtogeek.com/885918/how-to-get-an-openai-api-key/

Appendix



LOKII-CE HARDWARE ARCHIOTECTUR