# 1.8inch LCD for micro:bit

This is a colorful display module designed for the BBC micro:bit, 1.8inch diagonal, 160x128 pixels, capable of displaying 65K colors.

Tired of the 5x5 LED matrix? Time to get a tiny monitor for your micro:bit, this one would be the ideal choice.

### Specification

- Driver: ST7735S
- Resolution: 160x128
- Display color: RGB, 65K colors
- Operating voltage: 3.3V
- Dimension: 61mm x 51.5mm

#### Pinouts

PIN	micro:bit PIN	Description
Vcc	3V3	Power
GND	GND	Ground
MISO	P14	SPI data master input/slave output
MOSI	P15	SPI data master output/slave input
SCK	P13	SPI clock input
LCD_CS	P16	LCD chip selection
RAM_CS	P2	SRAM chip selection
DC	P12	LCD data/command
RST	P8	LCD reset
BL	P1	LCD backlight

### **Programming Guide**

Micor:bit has variety of programming methods like mbed, micropython, typescript and other programming methods, as well as code online websites which are abundant.

The official recommendation are two programming methods: typescript and micropython. Typescript is the graphical programming language.

Note:For this LCD, we only provide demo code of typescript

## Typescript

Typescript is a kind of graphical programming, its website is that: https://makecode.microbit.org/#

• Open a browser and input the next URL



• Create a new empty project

Click Project->New Project to create an empty project. Rename the project as LCD or any one you like to.

Microsoft MakeCode fc X							Wavesha	® — [	×
← → C ■ 安全   https://makecode.micro	bit.org/#							☆	2 :
💿 micro:bit 🛛 🝃 Projects	ج [	🛓 Blocks	{} Java	Script		?	٠	<b>Micr</b>	osoft
	Search	Q on	start	iii forev	er +	÷	÷ 1	Getting Starte	ed <sub>e</sub>
	Basic		+ +		÷ +				
	<ul> <li>Input</li> </ul>								
	O Music								
	🜑 Led								
	I Radio								
	C Loops								
	🔀 Logic								
$\odot$	Variables								
	Hath Math								
	✓ Advanced								
		÷		÷					
Download	LCD						ר ב ר	<b>۹</b>	•

• Add Packeage

You can get the package of 1.8inch LCD for micro; bit from github. Click More..->Add Package, then copy the URL to the Edittext.

#### If you have the old Micro bit

https://github.com/waveshare/WSLCD1in8

#### If you have the Micro bit V2

https://github.com/waveshare/PXT-WSLCD1in8

Note: add a space follow the address

→ C ● 安全   https://makecode.micro 应用	bit.org/# <mark></mark> Youtube <mark></mark> ≇	:3 📙	镜像链接	E 🛄	看看	, libin	put 📘	BB E	8lack	要整理	里的	1 蓝牙	<u>צ</u>	
Omicro:bit 📂 Projects	ج (	💼 Bl	locks	{}	JavaS	cript			?	0	•	Mi	icros	of
	Search	Q	on sta	art		foreve	r	+	+	+	Ge	tting Sta	rted	J
	Basic		*	÷	+									
· 🗖 · 👘 ·	<ul> <li>Input</li> </ul>													
	Music													
0_0_0_0_0	C Led													
0     1     2     3V    GND	Radio													
	C Loops													
	🔀 Logic													
	Variables													
4 2	🗰 Math													
	✓ Advanced													
							-							

# The Blocks

• Initiation

You need to initial LCD module first.

Microsoft MakeCode fc X						Wave	share —		<
← → C	bit.org/#							☆ 🙎	:
🗰 应用 📙 ERP 🛄 网站 🛄 平台 🛄 邮箱	<mark>,</mark> Youtube <mark>,</mark> 学习	。 镜像链接	- 看看	, libinput	📙 BB Bla	ick 📙 要整	理的 📙 蓝牙		
💿 micro: bit 🛛 📂 Projects	ج [	Blocks	{} JavaS	Script		0 ¢	e 📕 N	licrosoft	t
	Search	Q +	+ +	+ +	- +	+ +	Getting St	tarted	+
	Basic	+	+ +						
	<ul> <li>Input</li> </ul>	+ OT	n start			forever			
	Ω Music	+	+ +		+	+ +			+
	C Led	+							
	I Radio	+							
	C Loops								
× () = 3 = * )	X Logic	+							
	Variables	+							
	📰 Math	+							
	LCD1IN8	+							÷
	✓ Advanced	+		_				+	
Download	LCD		8			}	<u>ہ</u> م	• •	

• Clear the screen

Clear the screen to white. Create an buffer on RAM with the resolution size 160\*128 and initial it to white.

← → C ● 安全   https://makecode.mic Ⅲ 应用   ERP   网站   平台   邮	robit.org/# i 🔜 Youtube 🔜 学习 🔜 镜像链接 🔜 看看 🔜 lib	☆ 🙎 🚦 input 📙 BB Black 📙 要整理的 📙 蓝牙
💿 micro: bit 🕞 Projects	Blocks {} JavaScript	😧 🏟 🏪 Microsoft
	Search Q	Getting Started
	Basic	
·n	O Input	nit forever
	O Music	
0.0.0.0.0	C Led	
0      1      2      3V     GND	I Radio	
	C Loops	
	X Logic	
	Variables	
	🖬 Math	
	Advanced	) Janese,

• Set the backlight

Microsoft MakeCode fc ×						Wavesh	379 — 🗆	×
← → C ■ 安全   https://makecode.micro	bit.org/#						\$	2 :
🗰 应用 📙 ERP 📙 网站 📙 平台 📙 邮箱	📙 Youtube 📙 学习	镜像链接	_ 看着	libinput	📙 BB Black	< 📙 要整理的	3 🗌 蓝牙	
💿 micro:bit 🝃 Projects	<	Blocks	{} JavaS	Script	•	9 🗘	Hicr	osoft
	Search C	٤ +	+ +	+ +	+	+ +	Getting Starte	d +
	Basic	+	+ +					
	⊙ Input	+	LCD11	[N8 Init <sup>+</sup>		forever		
	O Music	+	Clear	r Clear scr	een and c	ache		+ +
	C Led	+						
	I Radio							
	C Loops							
× ()	🔀 Logic	+						
	Variables	+						
	🔛 Math	+						
° ∗ ° ~ ~ ~ * °	LCD1IN8	+						+ +
	✓ Advanced	+		_				
Image: Second state of the second state of	LCD		8			{ 	<b>0</b> n d	•

• Send display data

With this block, it will send one frame of buffer to the LCD and display. Note: it is always following drawing operation

Microsoft MakeCode fc X		Waveshar	e – 🗆 ×
← → C ● 安全   https://makecode.micro	bbit.org/#		☆ 🙎 :
🗰 应用 📙 ERP 📙 网站 📙 平台 📙 邮箱	📙 Youtube 📙 学习 📙 镜像链接 📙 看看 📙 I	ibinput 📙 BB Black 📙 要整理的	蓝牙
💿 micro:bit 🛛 🝃 Projects	Slocks {} JavaScrip	at 🚱 🌣	Microsoft
	Search Q	+ + + +	Getting Started
	Basic + + +		
	Input     Input	Init forever	
		ear screen and cache	
	Led	light level (123	
0 1 2 3V GND	I Radio		
	C Loops		
	Cogic		
	Variables		
	Hath + +		
			+ + + +
	✓ Advanced		++
Download			• • •

• Draw point

🖸 Microsoft MakeCode fc 🗙							Wavesha	- 179		(
← → C ● 安全   https://makecode.micro	bit.org/#							r	7 🙁 1	:
🗰 应用 📙 ERP 📙 网站 📙 平台 📕 邮箱	📙 Youtube 📙	学习 📙 镜像链接	e 📙 看着	i 📙 libinp	out <mark>.</mark> B	B Black 📙	要整理的	3 📙 蓝牙		
💿 micro:bit 🛛 🝃 Projects	4	Blocks	{} Jav	/aScript		3	٥	Hi Mi	crosoft	:
	Search	Q	+	+ +	+	+ +	÷	Getting Sta	rted	+
	Basic	+	+	+ +						+
· <b>n</b>	⊙ Input	+	on start	) 1IN8 Init	÷	III for	ever			+
	O Music	+	Cle	ar Clear	screen	and cache				
	C Led		🖵 Set	back lig	ght leve	1 ( 123)				
0    1    2    3V    GND	Radio		Ser	nd display	/ data					
	C Loops	+								
	🗴 Logic	+								
	Uariables	s								
	📰 Math	+								
		3 +								+
	✓ Advance	ed +		+					-	+
I Download	LCD	200.	B				ede a de		• •	

Place the block before send display data. You can choose the position, color and size. For the screen, (1,1) is on top-left, and (160,128) is on bottom-right

There are tow way to set the color, the one is use the color block as above, another is to set the value (RGB565) by drag the slider.

• Draw line

You can choose the the line's position, color, size and its sytle

solid line:

Microsoft MakeCode fc ×				Waves	hane – — X
← → C ● 安全   https://makecode.micro	bit.org/#	学习 - 箱優雑榜	: <b>王</b> 君君 Iibinput .	BB Black 要整理	☆ 🖄 :
micro:bit Projects	<	Blocks	{} JavaScript	Ø \$	Microsoft
	Search Basic Input In	Q -	n start Clear Clear scree Set back light le Send display data	en and cache	Getting Started         **           **         **         **
I 🕹 Download	Advanced				<b>• •</b> • •

dotted line: just need to change the Style



• Draw frame

Draw empty rectange:

← → C ■ 安全   https://makecode.micro	bit.org/#								☆	• 🙎	:
🛄 应用 📙 ERP 📙 网站 📙 平台 📙 邮箱	<mark>,</mark> Youtube <mark>,</mark> 学习	3 📙 镜像链接	- 看看	, libinput	BB E	lack 📙	要整理的	) <mark>.</mark>	蓝牙		
💿 micro:bit 🛛 🝃 Projects	≺ [	🛓 Blocks	{} JavaS	cript		?	٥	-	Mic	crosoft	
	Search	Q	+ +	+	+ +	+	+	Getti	ng Star	ted	+
	Basic	or	* * start		de de	+	*				
	<ul> <li>Input</li> </ul>	+		N8 Init	ф	fore	ver				
	O Music	+	Clear	Clear s	creen an t level	d cache	+				
00000	Led	+	Send	display (	data <sup>+</sup>	+	+				
0     1     2     3V     GND	I Radio	+	+ +								
	C Loops	+									
	🔀 Logic	4									
	Variables	+									
	📰 Math										
	LCD1IN8										U
·	✓ Advanced	· +		*							
	LCD		E				10	0 0	G	•	

Draw full rectange:

.

Microsoft MakeCode fc X		Ŵ	laveshare — 🗆 🗙
← → C 🔒 安全   https://makecode.micro	bit.org/#		☆ 🕺
🚻 应用 📙 ERP 📕 网站 📕 平台 📕 邮箱	📕 Youtube 📕 学习 📕 镜像链	接 📙 看看 📙 libinput 📕 BB Black 📕 🗄	要整理的 📙 蓝牙
💿 micro:bit 🛛 🝃 Projects	< 🖹 Blocks	{} JavaScript	🏟 🗧 Microsoft
	Search Q	on start	Getting Started
•	<ul><li>Input</li><li>Music</li></ul>	<ul> <li>LCD1IN8 Init</li> <li>Clear Clear screen and cache</li> <li>Set back light level (123)</li> </ul>	er
	C Led	Draw Rectangle     Xstart2 (0     Ystart2 (0)	
	C Loops	Xend2 ( 35 Yend2 ( 35 Color ( 📮 RE	D v
a. T	Math	Filled DRAW_EMPTY  Line width DOT_PIXEL_1  Send display data	
	↓     LCD1IN8       ↓     Advanced		а <u>а</u> а а
Image: Second state of the second state of	LCD		<u>v</u> v <b>o</b>

• Draw circle

Draw empty circle:

🗢 Microsoft MakeCode for X				Wave	share — 🗆 🗙
← → C ● 安全   https://makecode.micr	obit.org/#				☆ 🖄
🗰 应用 🧧 ERP 🧧 网站 🔜 平台 📕 邮箱	Voutube	学习 📙 镜像链接	ŧ 🔜 看看 📕 libinput	BB Black 📕 要整	里的 📙 蓝牙
🖸 micro:bit 🕞 Projects	4	📩 Blocks	{} JavaScript	0 ¢	Microsoft
	Search	٩	* * *	+ + +	Getting Started
	Basic		on start	+ + + +	
· <b>n</b>	⊙ Input		LCD1IN8 Init	forever	
	Music		Clear Clear s	t level (123	
	🜑 Led		Send display	data	
0      1      2      3Y     GND	I Radio		+ +		
	C Loops				
	🗙 Logic				
	Variables				
ай. Эй	📰 Math				
	LCD1IN8				
	Advanced				
I 🕹 Download	LCD			I	n u o o

Draw full circle:

・ ● Microsoft MakeCode fe x         ・ ● ● 安全   https://makecode.microbit.org/#         ・ ● ● ● 安全   https://makecode.microbit.org/#         ・ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									
💿 micro:bit 🕞 Projects	4	Blocks	{} JavaScript	0 ¢	Microsoft				
	Search Basic Input Husic Husic Led Loops C Loops C Loops C Logic E Variables Math LCD1IN8	Q d	n start LCD1IN8 Init Clear Clear screen Set back light lev Draw Circle X_Cen Y_Cen Rad Co Filled DRAW_EMPT Line width DOT_PIXEL Send display data	iii forever and cache el 123 ter 123 ter 123 ter 123 ter 126 ter 132 tor 15 tor 10 RED 1	Getting Started				
🗉 📥 Download	LCD			μ.	0 0 0 0				

• Draw string

	obit.org/#			Wa	reshare —	
·····································	Voutube	学习 🦲 镜像链接	ŧ 📙 看看 📙 libinput 📙	BB Black 📙 要語	整理的 📙 蓝	 伢
💿 micro:bit 🛛 🝃 Projects	4	📩 Blocks	{} JavaScript	<b>?</b>	•	Microsoft
	Search	۹		+ + +	Getting	Started
	Basic		on start	+ + +		
	<ul> <li>Input</li> </ul>		LCD1IN8 Init	III forever		
	🙃 Music		☐ Clear Clear scree	en and cache		+
0_0_0_0_0	🜑 Led		Send display data			
0     1     2     3V     GND	I Radio		· · · · · · · · · · · · · · · · · · ·			
	C Loops					
r	🔀 Logic					
	Variables	•				
	📰 Math					
	LCD1IN8					
	🗸 🗸 Advanced	d	· · · ·			
🗉 📥 Download	LCD		8		n a	00

• Partial refresh

You can set display windows and refresh it on LCD instead of full refresh

Initialize LCD, set the backlight and then draw a rectangle from (30, 30) to (80, 80)

😑 — 🗆 X															
$ ← → C $ ⓐ $g_{2}$   https://makecode.microbit.org/#														<u>S</u> e	☆ :
💿 micro:bit 🛛 De ja 😪 分享	(	🛓 方块	{} Ja	waScript							?	٠	•	Micr	osoft
	搜索 Q	+ +	当开机时	j CD1IN8 J	Init	+	+	+	+	+	+	+	+	λĭ	1
	■■ 基本		<b></b>	et back	light	level	180								
	◎ 输入	+ +	+	+ +	+	÷	÷	+							
	♀ 音乐														
	LED														
	.ul 无线														. 1
0000.	<b>C</b> 循环														
0      1       2       3V      GND	☆ 逻辑														
	■ 变量														
	■ 数学														
	🖵 LCD1IN8														
	✔ 高级														
					_										+ +
☑ ▲ 下载	无标题											رم ا	٩	•	•
🗋 microbit-无标题hex 🔹 🗋 microbit-无标题hex 🥠	ヽ │ □ microbit-无标题he	ex ^ C	microb	it-无标题	hex 🖌	~							[	全部显示	<b>⊼ ×</b>

Then set the display windows block and set its position

micro:bit 📂 Projects	4	📩 Blocks	{ } JavaScript	8	٠	Hicrosoft
	Search	۹	+ + +	+ + +	*	Getting Started
	Basic	or	n start	III forever	+ +	
	⊙ Input		Clear Clear sc	reen and cache		
	🙃 Music		🖵 Set back light	level (123		
	C Led		Show String	0		
	I Radio		ŶŬ	0		
	C Loops		char Color (	Waveshare **		
	X Logic					
	Variables					
	🛲 Math					
8						
	🗸 🗸 Advanced	t i				
					_	
Image: Second state of the second state of	Untitled				د م	○ ○ ○

# Resources

• <u>Schematic</u>

# Datasheet

- <u>23LC1024</u>
- <u>ST7735S</u>

# Software

• <u>makecode website</u>