# User manual SMTO1002S

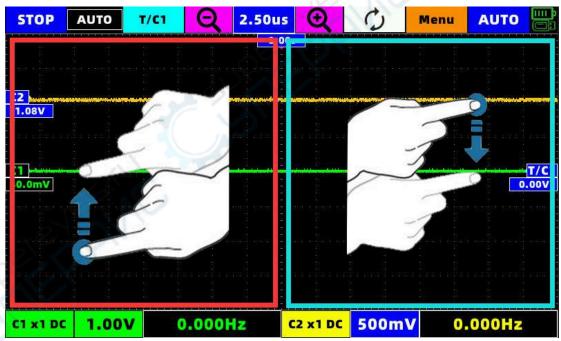


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## SMTO1002S series manual

# 1. Operation guide:

### 1.1 Operating area

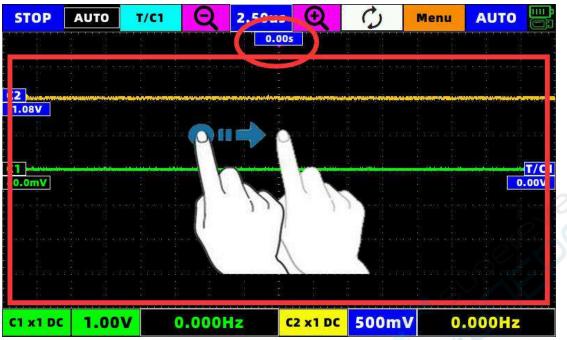


In the red area in the figure, slide up and down with a single finger, and the operability icon is C1, C2, V1

In the blue area in the figure, slide up and down with a single finger, and the operability icon is T/C1, V2

Select the icon you want to slide to turn it blue (active), and slide your finger up and down anywhere in the corresponding operation area to move the icon.

The icon will move with the speed of the finger.



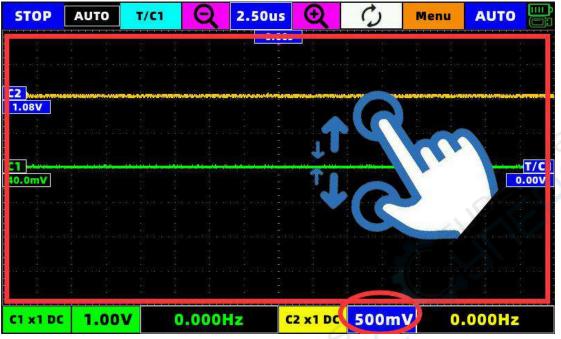
Swipe left and right with one finger in the red area in the picture, and the operability icon is T (Icon in red circle) S1, S2

Select the icon you want to slide to turn it blue (active), and slide your finger up and down anywhere in the corresponding operation area to move the icon.

The icon will move with the speed of the finger.

### **1.2 Multi-point gesture operation**

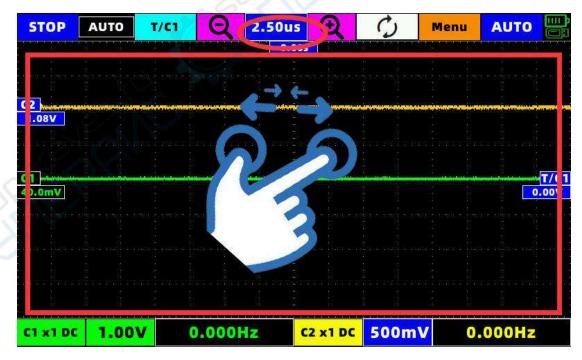
This machine supports 2-point gesture operation and 3-point touch screen capture.



#### 1.2.1 Two-point gesture operation

When the C1 or C2 channel is selected and the red circle turns blue, the two-point touch will take effect for that channel.

(Portrait) Two-point touch you can change the magnification of the waveform (that is, change the voltage gear)

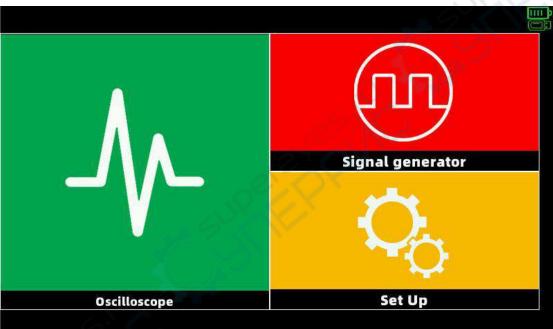


(Horizontal) Two-point touch the time base of the waveform can be changed (the value in the red circle in the figure)

#### 1.2.2 Three-point gesture operation

After inserting the U disk, at any position on the screen, tap three fingers at the same time for 1 second after the buzzer sounds, a progress bar will appear, and the screenshot will be completed after the progress bar runs through the buzzer prompt.

# 2. Interface description:



Boot into the main interface:

The main interface can choose oscilloscope, signal generator and setting interface.



Click settings to see

Language selection, sound switch, brightness adjustment and software and hardware version number. You can modify it as needed.

Click on the oscilloscope to enter the oscilloscope interface:

STOP	AUTO	T/C1	Q	2.50us	Q	0	Menu	AUTO
				0.00s				
2				e mair y cu deriven				
1.08V								
1 0.0mV							-	T/C
na sina s								a sala sad saa
<u></u>								
C1 x1 DC	1.00		0.000		2 x1 DC	500m\	0.	.000Hz

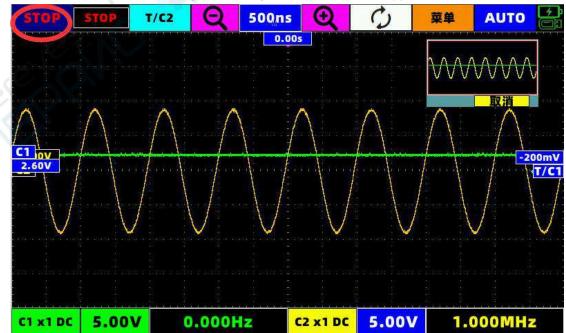
Click on the signal generator to enter the signal generator interface:

1		٦		$\wedge$		N	1	1		Mm-	Ç	)	Dı	uty_o	cycle		
W	lax	free	110	MH	2				11			+	+	+			
-					1							0	5	0	%		
												-	-	-			
													Amp	litu	de		
												+		+	+		
												1		0	0	V	2
												-		-	-		Z'
		<b>1</b> 1	F	requ	iend	y(H	z)			19			01	ffset		,0,	6
+	+	+	+	+	+	+	+		+	+	+	+		+	+		$\sum$
0	0	0	0	1	0	0	0		0	1	+	0	•	0	0	V	
-	-	-	-	-		-	-		-		-	-	1	1-	-	1	
		-															

# 3. Oscilloscope instructions:

### 3.1 STOP key:

Press stop to stop the waveform, and the stopped waveform can be zoomed in and out to view the details. There is a small image of the original waveform in the upper left corner.



### 3.2 Trigger option key:

C AUTO Θ 2.50us Œ AUTO STOP T Menu 0.00s ource C1 Rising C2 Auto 1.08V Intelligent T/C1 C1 -40.0mV 0.00V 1.00V 0.000Hz C2 x1 DC 500mV 0.000Hz C1 x1 DC

Click the red circle T/C1 button, and the trigger option will pop up

Can choose

Signal source C1 or C2

Rising edge or falling edge

Auto trigger, normal trigger and single trigger

Smart trigger or manual trigger

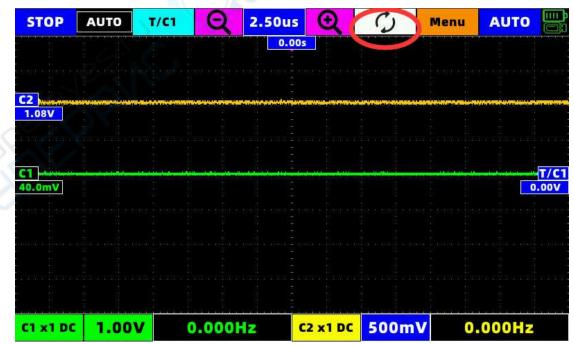
Note: There is no need to manually adjust the trigger position of the waveform under smart trigger, the program will automatically find the appropriate trigger position and trigger the waveform.

### 3.3 Time base button:

STOP	AUTO	T/C1	Q	2.50us	A	0	Menu	AUTO
				0.00				
annen erannen er								
C2 1.08V								
C1			the second states of the se	1 - 2				
40.0mV								0.00V
less cliss c 								
C1 x1 DC	1.00	/		-	C2 x1 DC	500mV	0	.000Hz

The button in the red circle in the picture is to reduce the time base, and the button in the basket is to zoom in the time base, while the button in the yellow circle displays the current time base value, the time position (that is, the parameter in the white circle) can be returned to zero with one key.

### 3.4 Oscilloscope-signal generator switch button



This switch key can switch between oscilloscope and signal generator with one key.

### 3.5 Menu:

#### 3.5.1 Mathematical calculation

STOP	AUTO	T/C1	Q	2.50us	Q	0	Menu	AUTO	
				0.00	s		Math	Show On	N.
							Ruler	CH1+CH2	5:0
C2				in das Schrödicher en Horizon			Parameter	YT	
a 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							Features	05.0	
<u> </u>	+ +		· · ·		1		Ba	ick	
40.0mV						ŧ.	1	0.00V	
i Shikirao Akirao									
C1 x1 DC	1.00	v	0.0001	lz 🤇	2 x1 DC	500	mV 0	.000Hz	

In this interface, you can choose to turn on or off the display of mathematical calculations, and you can choose YT or XY (Li Shayu) display mode

STOP	AUTO	T/C1	Q	5.00us	Ð	C	Menu	
XY				0.00				
1.04V		🛤 atotoa e Alato Ri						T/C1 -20.0mV
0.00V C2		- tat tat						
nori stri si S								
C1 x1 DC	500mV	0	.000H	2	2 x1 DC	500m\	0.	.000Hz

#### 3.5.2 Ruler menu:

STOP	AUTO	T/C1 Q	2.50us	Q	0	Menu	AUTO
		51 10.0us	0.005	- Anna anna		Math	S On
						Ruler	V On
						Parameter	Source C1
C2 740mV	1.96V	ng sa		va sikava se		Features	
<b>C1</b>						Ba	ick .
40.0mV			1		4.00		0.00V
						enna pora elor	
			20.0us				
2 200 - Nora - N		<b>1977</b> - 1989 - 1989 - 1989 - 1989	nang nang san	- 			, and a set area
C1 x1 DC	1.00	0.000	Hz c	2 x1 DC	500	mV O	.000Hz

The horizontal and vertical rulers can be opened in this interface. As shown in the figure, the movements and selections marked follow the operation guide. The signal source for simultaneous calculation can be C1 or C2

### 3.5.3 Parameter display:

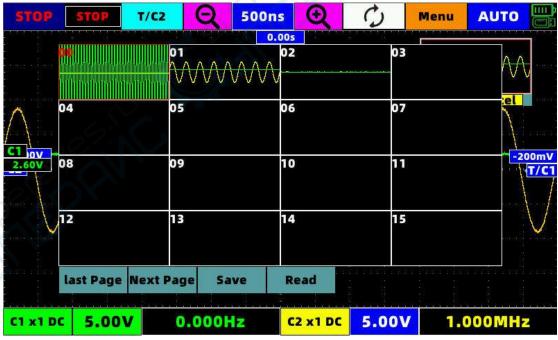
ST	OP AUTO	т/с1	Q 2.50u	s 🔍	C Men	AUTO
			0.1	005		
	010	C1			C2	
C2	Frequency	Cycle	Max	Frequency	Cycle	Max Max
740	Min	Amplitude	Average	Min	Amplitude	Average
C1 40.0	RMS	+Duty	-Duty	RMS	+Duty	-Duty
	Rise	Fall	<b>Pulse width</b>	Rise	Fall	Pulse width
19464 -		e state i state e i state		San Angelanda	e na de la composición de la c	ila ole out ou
Rise		<u>i</u> 1		+Wid 0.00s	-Wid 0.00	
freq C1 )			000Hz	Vmax 0.00V C2 x1 DC	avg 0.001 500mV	0.000Hz

After opening the parameter display, you can select the parameter to be displayed by the corresponding channel, and the parameter will be displayed at the bottom of the screen.

#### **3.5.4 Function options:**

STOP	STOP	T/C1	Q	2.50us	Ð	C	Menu	
				0.00	)s		Math	Storage
						ana na 1	Ruler	Calibration
						iyes an	Parameter	Factory mode
740mV		en de la composition de la composition Composition de la composition de la comp		rodia rodi 5			Features	Set Up
C1							В	ack
40.0mV								0.00V
					i Kara a			
C1 x1 DC	1.00	V	0.0001	Iz	C2 x1 DC	500	mV 0	.000Hz

3.5.4.1 Store waveform



After clicking to store the waveform, the current waveform will automatically stop and enter the stop state.

In this interface, you can choose to save or read the waveform data of the previous waveform. The read waveform data can be arbitrarily zoomed in and out to view the details, which is equivalent to the stop state.

#### 3.5.4.2 Automatic calibration

This button will automatically calibrate the oscilloscope parameters. Warning! Do not operate the device during automatic calibration, and do not connect any external connectors!!!

#### 3.5.4.3 Restore Factory

This button will return the machine's settings and some parameters to the factory state.

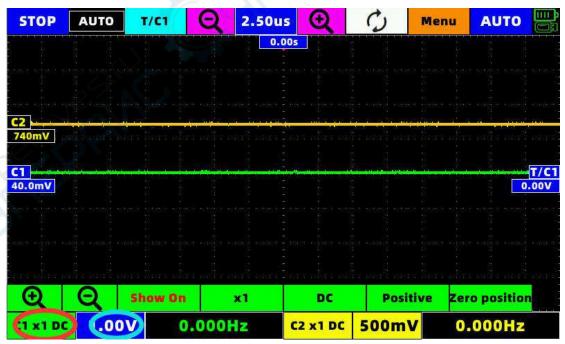
#### 3.5.4.4 Set up

Equivalent to the settings of the main interface

#### 3.5.4.5 Return

Can return to the main interface under the oscilloscope interface.

### 3.6 C1 channel menu



In this interface, you can zoom in and out the waveform voltage range of C1,

You can choose whether to display the C1 waveform

Select the X multiple of the probe

Choose AC, DC Select whether the display of C1 waveform is inverted The vertical position of C1 can be returned to zero with one key

The red circle in the picture can select the C1 channel, and the basket ring can quickly open or close the C1 channel

STOP AUTO	т/с1 С	2.50us	Q	C) M	enu AUTO	
		0.0	Os			
u e four e pôr e poir e	neu (neu e jeu e n		han a han a pi a - an			
10mV						
1 0.0mV	<del>n an an</del>			<b></b>		T/C1 0.00V
	101 101 101 10		1075707575		on i lon i rên i r	
$\Theta \mid \Theta \mid$	Show On	x1	DC	Positive	Zero positi	on

### 7 C2 channel manu

In this interface, you can zoom in and out the waveform voltage range of C2,

You can choose whether to display the C2 waveform

Select the X multiple of the probe

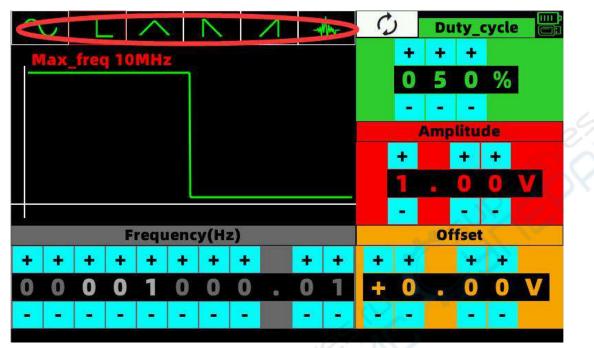
Choose AC, DC

Select whether the display of C2 waveform is inverted

The vertical position of C2 can be returned to zero with one key

The red circle in the picture can select the C2 channel, and the basket ring can quickly open or close the C2 channel

# 4. Signal generator instructions:



Through the corresponding +,- to modify the frequency, amplitude, offset, duty cycle and other signals, the waveform will be directly changed in real time. The red circle area can select the waveform to be output.

# 5. Screenshot

After inserting the U disk, at any position on the screen, tap three fingers at the same time for 1 second after the buzzer sounds, a progress bar will appear, and the screenshot will be completed after the progress bar runs through the buzzer prompt.

# 6. Program upgrade

When the machine is turned on, insert the U disk containing the upgrade file, and then power on, the device will automatically enter the U disk upgrade program, click the upgrade button in the upgrade program, wait for the upgrade progress to 100% and automatically shut down.

Warning! Make sure that the battery level of the device is in the green mode when upgrading!!

### 7. Oscilloscope parameters:

Number of channels Maximum sampling rate Bandwidth Impedance Storage depth Vertical resolution Vertical gear

Horizontal gear

Automatic measurement parameters

- Trigger mode Trigger type Auto range Cursor Waveform record
- Screenshot Mathematical calculation Display mode Automatic calibration

Display Battery

Recharge

2 1GSa/s for single channel, 500MSa/s for double channel 100M 1MΩ, 25pF 32K per channel 8bit In the case of probe X1, 10mV - 5V (1, 2.5, 5 step) maximum measuring voltage X1 (40V), X10 (400V). Use high-voltage probes, the maximum voltage is determined by the quality of the probe. 5s - 10ns (1, 2.5, 5 step) 5s - 100ms (scan mode) 13 kinds (frequency, period, amplitude, maximum, minimum, average, effective value, positive duty cycle, duty cycle negative, positive pulse width, negative pulse width, rise time, fall time) Automatic, normal, single Rising edge, falling edge 50Hz - 30MHz Both vertical and horizontal support cursor measurement 32 groups (recording waveform supports zoom in and zoom out to view details) Support U disk screenshot (picture format jpg) CH1+CH2, CH1-CH2, CH2-CH1 YT mode + XY mode (Li Shayu mode) stand by

7 inch capacitive touch screen 8000mA large-capacity lithium-ion battery (full charge can be used for more than 7 hours) Maximum support 5V 2.1A DC charging. (the light reflects the charging status in real time)

## 8. Signal generator parameters:

Amplitude: Offset: Duty cycle: frequency: Sine wave: Fang Bo: Other waveforms (triangular wave, sawtooth wave, ringing wave): 0 V – 8 V (minimum resolution 10mV) 0 V - ( + - 4 V) (minimum resolution 10mV) 0 % - 100 % (minimum resolution 1%)

0.01 Hz – 30 MHz (minimum resolution 1/1000) 0.01 Hz – 10 MHz (minimum resolution 1/1000)

0.01 Hz – 1 MHz (minimum resolution 1 / 1000)