Probe Application

1. Overview

The probe function is the position latching function. It can latch the position information (user unit, load end) when the DI signal or motor Z signal changes. Currently, it supports 2 sets of probes, which can be used in parallel simultaneously, record the position information corresponding to the rising and falling edges of each set of probe signals, and accumulate the number of trigger times, that is, it can latch 4 position information and trigger count values simultaneously.

2. Related Object

Index	sub-index	Name	Attribute	Type	Unit	Parameter Range	Default Value
0x359B	0x00~0x1F	DigitalIOInput Rising Edge Trigger Transaction Table	RW	UNS8	-	0~255	0
0x359C	0x00~0x1F	DigitalIOInput Falling Edge Trigger Transaction Table	RW	UNS8	-	0~255	0
0x60B8	0x00	Probe Function	RW	UNS16	-	0x0000 ~ 0x3737	0
0x60B9	0x00	Probe Status	RO	UNS16	-	0x0000 ~ 0x0707	0
0x60BA	0x00	Probe 1 rising edge latch position value	RO	INTEGER 32	p	-2147483648 ~ 2147483647	0
0x60BB	0x00	Probe 1 falling edge latch position value	RO	INTEGER 32	p	-2147483648 ~ 2147483647	0
0x60BC	0x00	Probe 2 rising edge latch position value	RO	INTEGER 32	p	-2147483648 ~ 2147483647	0
0x60BD	0x00	Probe 2 falling edge latch position value	RO	INTEGER 32	p	-2147483648 ~ 2147483647	0

0x60D5	0x00	Probe 1 Rising Edge Trigger Count Value	RO	UNS16	-	0 ~ 65535	0
0x60D6	0x00	Probe 1 falling edge trigger count value	RO	UNS16	-	0 ~ 65535	0
0x60D7	0x00	Probe 2 rising edge trigger count value	RO	UNS16	-	0 ~ 65535	0
0x60D8	0x00	Probe 2 falling edge trigger count value	RO	UNS16	-	0 ~ 65535	0

2.1 The Touch probe function (0x60B8) is used to set various configuration information for the probe function. The description of each Bit of the parameter is as follows:

Bit	Function Description	Value	Specific meaning
0	Probe 1 Function Switch	0	Turn off the function of Probe 1
		1	Turn on the function of Probe 1
1	Probe 1 Trigger Mode	0	First trigger
		1	Continuous Trigger
2	Probe 1 Trigger Source	0	DigitalIO Input Signal
		1	Encoder zero position signal
3	Retain	-	-
4	Probe 1 Rising Edge Trigger Enable Switch	0	Turn off the latch position value of the rising edge of the trigger source signal for Probe 1
		1	Enable the rising edge latch position value of the trigger source signal for Probe 1 and save it to Object 0x60BA

5	Probe 1 falling edge trigger enable switch	0	Turn off the latch position value of the falling edge of the trigger source signal for Probe 1
		1	Enable the latch position value of the falling edge of the trigger source signal for Probe 1, and save it to Object 0x60BB
6、7	Customize	-	-
8	Probe 2 Function Switch	0	Turn off Probe 2 function
		1	Turn on Probe 2 function
9	Probe 2 Trigger Mode	0	First trigger
		1	Continuous Trigger
10	Probe 2 Trigger Source	0	DigitalIO Input Signal
		1	Encoder zero position signal
11	Retain	-	-
12	Probe 2 Rising Edge Trigger Enable Switch	0	Turn off the latch position value of the rising edge of the trigger source signal for Probe 2
		1	Enable the rising edge latch position value of the trigger source signal for Probe 2 and save it to Object 0x60BC
13	Probe 2 falling edge trigger enable switch	0	Turn off the latch position value of the falling edge of the trigger source signal for Probe 2
		1	Enable the latch position value of the falling edge of the trigger source signal for Probe 2, and save it to object 0x60BD
14、15	Customize	-	-

2.2 The Touch probe status (0x60B9) is used to provide the operating status of the probe. The description of each bit of the parameter is as follows:

Bit	Function Description	Value	Specific meaning
0	Probe 1 Function On State	0	Probe 1 Function Off
		1	Probe 1 Function Enable
1	Probe 1 Rising Edge Latch Status	0	Probe 1 trigger source signal rising edge unlatch position value
		1	The latched position value of the rising edge of the trigger source signal for Probe 1
2	Probe 1 falling edge latch state	0	Probe 1 trigger source signal falling edge unlatched position value
		1	Probe 1 Trigger Source Signal Falling Edge Latched Position Value
3 ~ 5	Retain	-	-
6、7	Customize	-	-
8	Probe 2 Function On State	0	Probe 2 Function Off
		1	Probe 2 Function Enable
9	Probe 2 Rising Edge Latch Status	0	Probe 2 trigger source signal rising edge unlatch position value
		1	The position value of the rising edge of the trigger source signal of Probe 2 has been latched
10	Probe 2 falling edge latch state	0	Probe 2 trigger source signal falling edge unlatched position value
		1	Probe 2 Trigger Source Signal Falling Edge Latched Position Value
11 ~ 13	Retain	-	-

14、15	Customize	-	-

2.3 4 position information of probe latching Touch Probe 1/2 Positive/Negative Edge Position (0x60BA ~ 0x60BD):

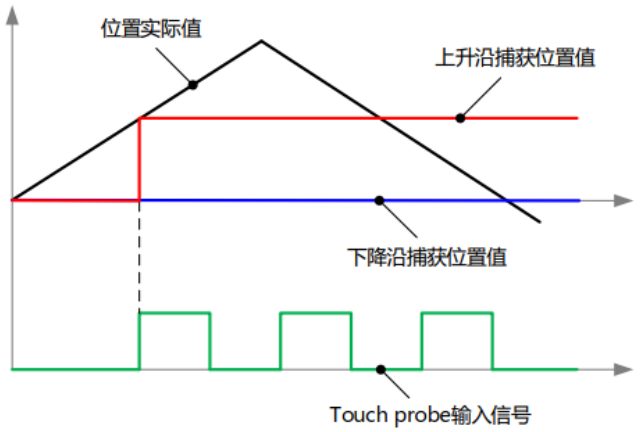
The stored location information is the user unit.

2.4 4 count information of probe latching Touch Probe 1/2 Positive/Negative Edge Counter (0x60D5 ~ 0x60D8):

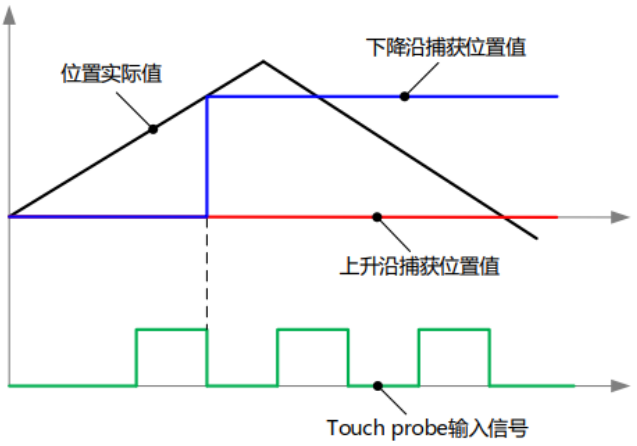
In the first trigger mode, after latching the position information once, this value is set to 1; in the continuous trigger mode, each time the position information is latched, this value increments by 1, and after recording the maximum number of 65535, it naturally overflows and restarts from 0.

3. Trigger Schematic Diagram

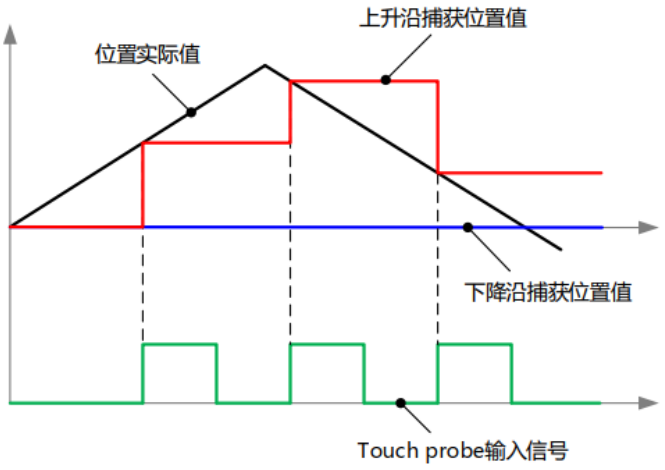
- Touch probe 输入信号上升沿捕获位置值，仅首次触发。



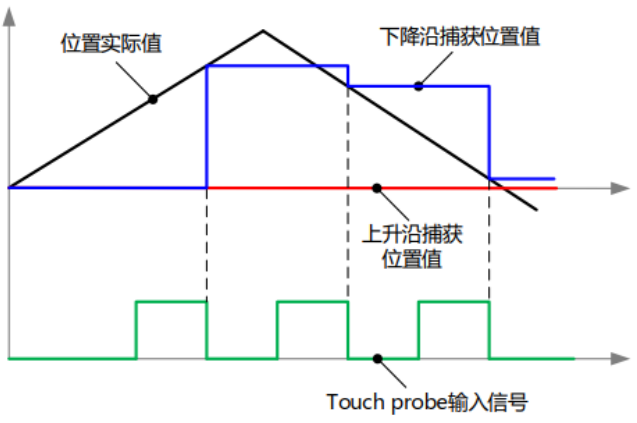
- Touch probe 输入信号下降沿捕获位置值，仅首次触发。



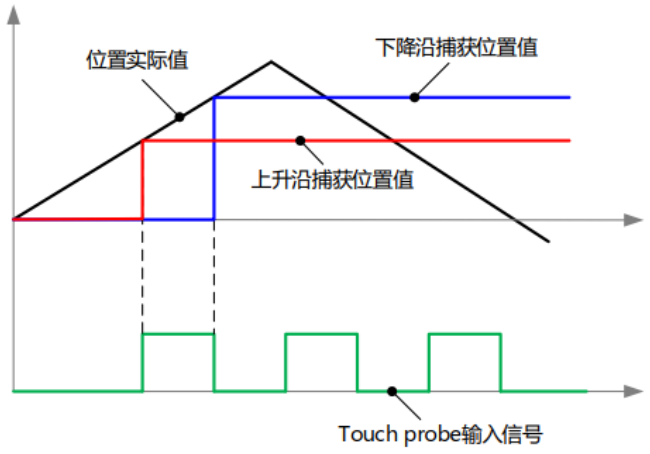
- Touch probe 输入信号上升沿捕获位置值，连续触发。



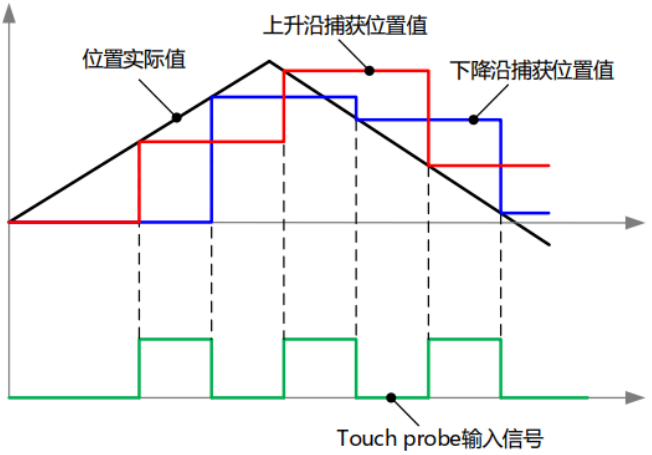
- Touch probe 输入信号下降沿捕获位置值，连续触发。



- Touch probe 输入信号上升沿及下降沿捕获位置值，仅首次触发。



- Touch probe 输入信号上升沿及下降沿捕获位置值，连续触发。



4. Usage Steps

Uniformly change the following settings to object 0x60B8, then set them to enter the drive to avoid situations where they do not take effect.

All setting changes take effect only when the probe enable switch (0x60B8: Probe 1 bit0, Probe 2 bit8) changes simultaneously, i.e., when the probe enable switch is toggled and other control variables are set at the same time.

4.1 Set the control variable

4.1.1 Trigger Mode

Single trigger: Once enabled, after a trigger is completed, it enters standby mode, and the probe function needs to be turned off and on again to trigger it again;

Continuous Trigger: Once enabled, it will trigger when the trigger conditions are met, and the number of times will be accumulated.

4.1.2 Trigger Source

DigitalIO Input Signal: Please first connect the trigger signal to the digital IO input port, and then configure the corresponding IO settings in the digital IO input trigger transaction table to the Probe 1/2 event;

Encoder zero position signal: Please confirm whether the connected position sensor supports the Z pulse signal. If it does not support it, a virtual Z pulse signal will be automatically generated whenever the encoder position crosses the zero point, but it does not support Hall encoders;

In application scenarios such as full closed-loop dual encoder systems, the actual usage involves the Z pulse signal and position information of the encoder at the load (outer loop) end.

4.1.3 Rising Edge Trigger Enable Switch

Only after the probe function is enabled and the corresponding trigger edge is enabled can the trigger operation be executed normally;

When the trigger source selects the encoder zero position signal, selecting any edge enable will actually be treated as a rising edge.

4.2 Illustration of Probe Function Execution Steps

