AKD1G Touch Probes Rev B. 8/20/24

Touch Probe Overview

The touch probe feature of EtherCAT is simply a position capture from a trigger source (typically a digital input to the drive but could also be from the feedback device such as a Z/marker pulse). The EtherCAT touch probes, in fact, uses the position capture engines in the AKD.

There are two touchprobes (Touch Probe 1 and Touch Probe 2) available corresponding to CAP0 and CAP1 in the AKD.

Each touch probe is configurable to use positive edge, negative edge, or both and to be armed (triggered) continuously or on first event (one-shot). There is a touch probe function (control) word that configures both Touch Probe 1 and Touch Probe 2.

There is a status word which includes the status bit information for both Touch Probe 1 and Touch Probe 2 for monitoring if the Touch Probe is switch off or enable and if a positive or negative edge value is stored or not.

There is an object that provides the ability to define the sources (trigger) for Touch Probe 1 and 2.

Touch Probe support from the AKD EtherCAT manual is as follows:

5.3.82 Object 60B8h: Touch probe function

This object indicates the configured function of the touch probe.

Index	60B8h
Name	Touch probe function
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/W
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the possible functions:

Bit	Value	Meaning
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continuous
3, 2	00b*	Trigger with touch probe 1 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 01h
	11b	reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6, 7	-	User-defined (e.g. for testing)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
11, 10	00b	Trigger with touch probe 2 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 02h
	11b	reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14, 15	-	User-defined (e.g. for testing)

* b = binary

If both edges are selected at the same time (bit 4=1 and bit 5=1 for probe 1 or bit 12=1 and bit 13=1 for probe 2), the first edge (positive or negative) triggers the probe function. The position, latched at this edge, is taken over for both edges (positive and negative).

5.3.92 Object 60D0h: Touch probe source

This object provides the source of the touch probe function, when the dedicated bits 2/3 or 10/11 of the touch probe function (object 60B8h) are set accordingly.

Index	60D0h
Name	Touch probe source
Object code	Array
Data type	Integer 16
Category	optional

Subindex	**0**
Description	Highest sub-index supported
Category	mandatory
Access	R/O
PDO mapping	not possible
Value range	2
Default value	2

Subindex	**1**
Description	Touch probe 1 source
Category	mandatory
Access	R/W
PDO mapping	not possible
Value range	-11 to -1, 1 to 5
Default value	1

Subindex	2
Description	Touch probe 2 source
Category	mandatory
Access	R/W
PDO mapping	not possible
Value range	-11 to -1, 1 to 5
Default value	1

Value description:

Value	Description	Value	Description
1	Touch Probe 1 Input	3	Touch Probe 3 Input
2	Touch Probe 2 Input	4	Touch Probe4 Input
-1 to -11	AKD Input related to CAPx.TRIGGER 0 to 10		

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

5.3.84 Object 60BAh: Touch probe 1 positive edge

This object provides the position value of the touch probe 1 at positive edge.

Index	60BAh
Name	Touch probe 1 positive edge
Object code	Variable
Data type	INTEGER32
Category	optional
Access	R/O
PDO Mapping	yes
Value range	INTEGER32
Default value	no

5.3.85 Object 60BBh: Touch probe 1 negative edge

This object provides the position value of the touch probe 1 at negative edge.

Index	60BBh
Name	Touch probe 1 negative edge
Object code	Variable
Data type	INTEGER32
Category	optional
Access	R/O
PDO Mapping	yes
Value range	INTEGER32
Default value	no

5.3.86 Object 60BCh: Touch probe 2 positive edge

This object provides the position value of the touch probe 2 at positive edge.

Index	60BCh
Name	Touch probe 2 positive edge
Object code	Variable
Data type	INTEGER32
Category	optional
Access	R/O
PDO Mapping	yes
Value range	INTEGER32
Default value	no

5.3.87 Object 60BDh: Touch probe 2 negative edge

This object provides the position value of the touch probe 2 at negative edge.

Index	60BDh
Name	Touch probe 2 negative edge
Object code	Variable
Data type	INTEGER32
Category	optional
Access	R/O
PDO Mapping	yes
Value range	INTEGER32
Default value	no

5.3.92 Object 60D0h: Touch probe source

This object provides the source of the touch probe function, when the dedicated bits 2/3 or 10/11 of the touch probe function (object 60B8h) are set accordingly.

Index	60D0h
Name	Touch probe source
Object code	Array
Data type	Integer 16
Category	optional

Subindex	**0**
Description	Highest sub-index supported
Category	mandatory
Access	R/O
PDO mapping	not possible
Value range	2
Default value	2

Subindex	**1**
Description	Touch probe 1 source
Category	mandatory
Access	R/W
PDO mapping	not possible
Value range	-11 to -1, 1 to 5
Default value	1

Subindex	2
Description	Touch probe 2 source
Category	mandatory
Access	R/W
PDO mapping	not possible
Value range	-11 to -1, 1 to 5
Default value	1

Value description:

Value	Description	Value	Description
1	Touch Probe 1 Input	3	Touch Probe 3 Input
2	Touch Probe 2 Input	4	Touch Probe4 Input
-1 to -11	AKD Input related to CAPx.TRIGGER 0 to 10		

In section 4.7 of the AKD EtherCAT manual there are lists of supported Cyclic Setpoint and Actual Values.

Related to Touch Probes:

4.7 Supported Cyclical Setpoint and Actual Values

Supported cyclical setpoint values

Name	CANopen object	Data type	Description
Touch probe function	0x60B8	16 bit	

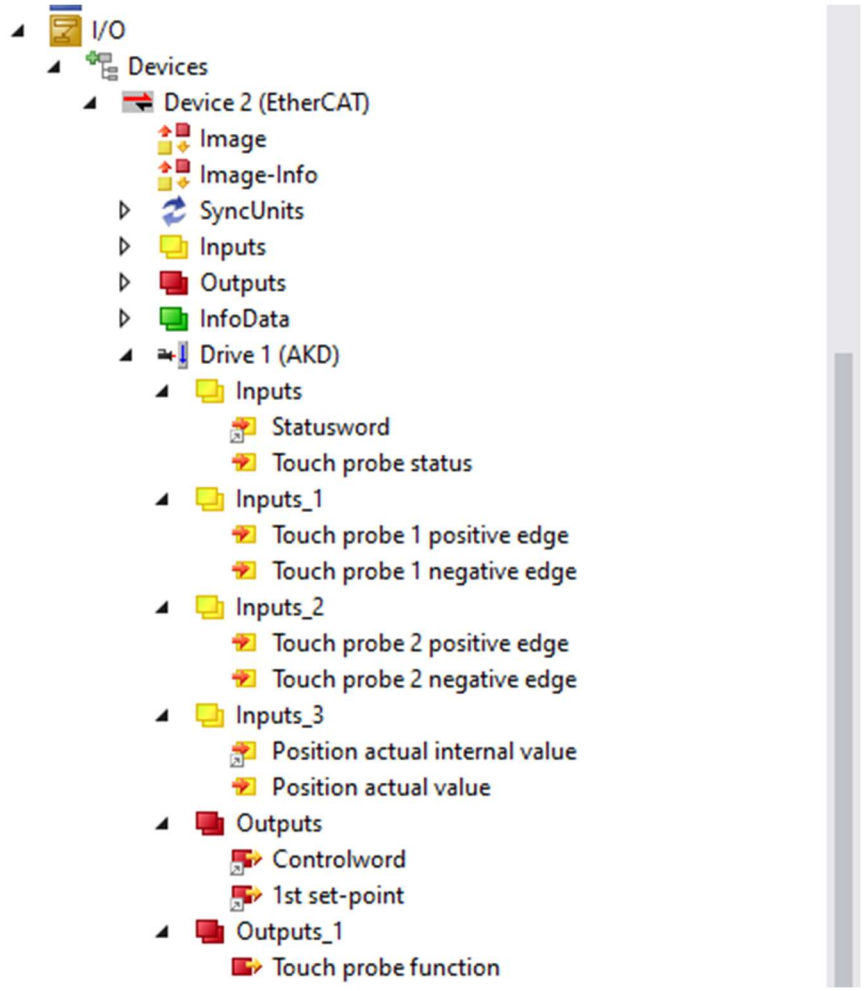
Supported cyclical actual values

Name	CANopen object	Data type	Description
Touch probe status	0x60B9 sub 0	16 bit	
Touch probe 1 positive edge pos	0x60BA sub 0	32 bit	
Touch probe 1 negative edge pos	0x60BB sub 0	32 bit	
Touch probe 2 positive edge pos	0x60BC sub 0	32 bit	
Touch probe 2 negative edge pos	0x60BD sub 0	32 bit	

From Appendix 5 CANopen object tables:

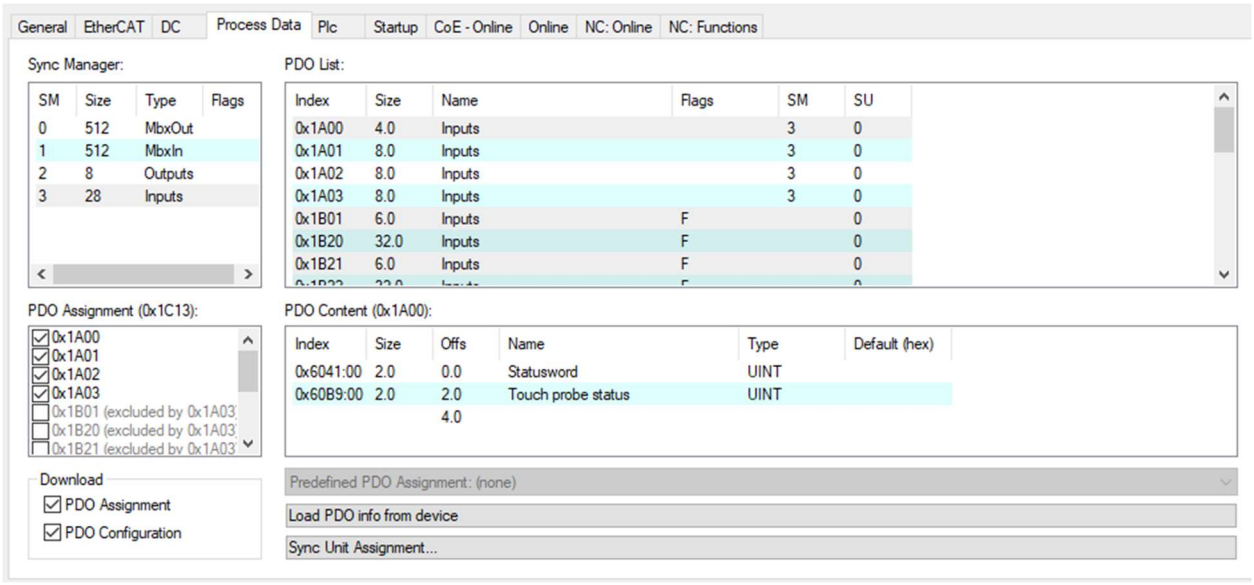
Index	Sub-index	Data Type	Float Scale	Access	PDO map.	Description	ASCII object
60B8h	0	U16		RW	yes	Touch probe function	—
60B9h	0	U16		RW	yes	Touch probe status	—
60BAh	0	INT32		RW	yes	Touch probe 1 positive edge	—
60BBh	0	INT32		RW	yes	Touch probe 1 negative edge	—
60BCh	0	INT32		RW	yes	Touch probe 2 positive edge	—
60BDh	0	INT32		RW	yes	Touch probe 2 negative edge	—
60D0h		Array				Touch probe source	—
60D0h	0	U8		RO	no	highest sub-index	-
60D0h	1	INT16		RW	no	Touch probe 1 source	—
60D0h	2	INT16		RW	no	Touch probe 2 source	—

There are no Predefined Fixed PDOs for Touch Probes in the AKD1G drive so flexible PDO mapping is ultilized.

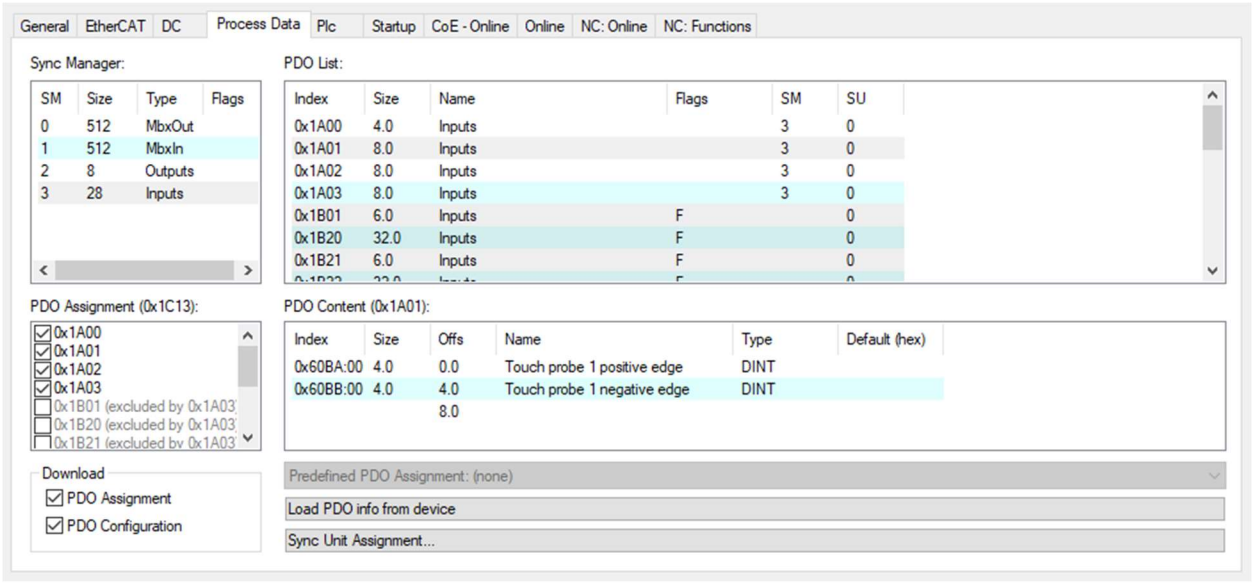


Summary of Input PDOs used in this test

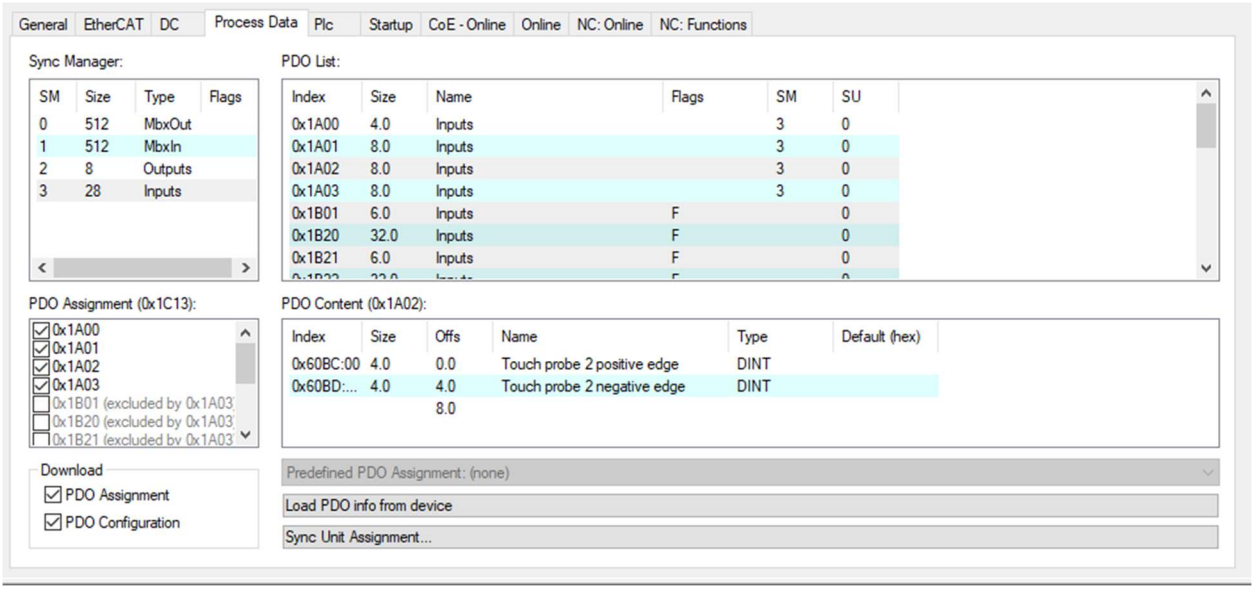
0x1A00



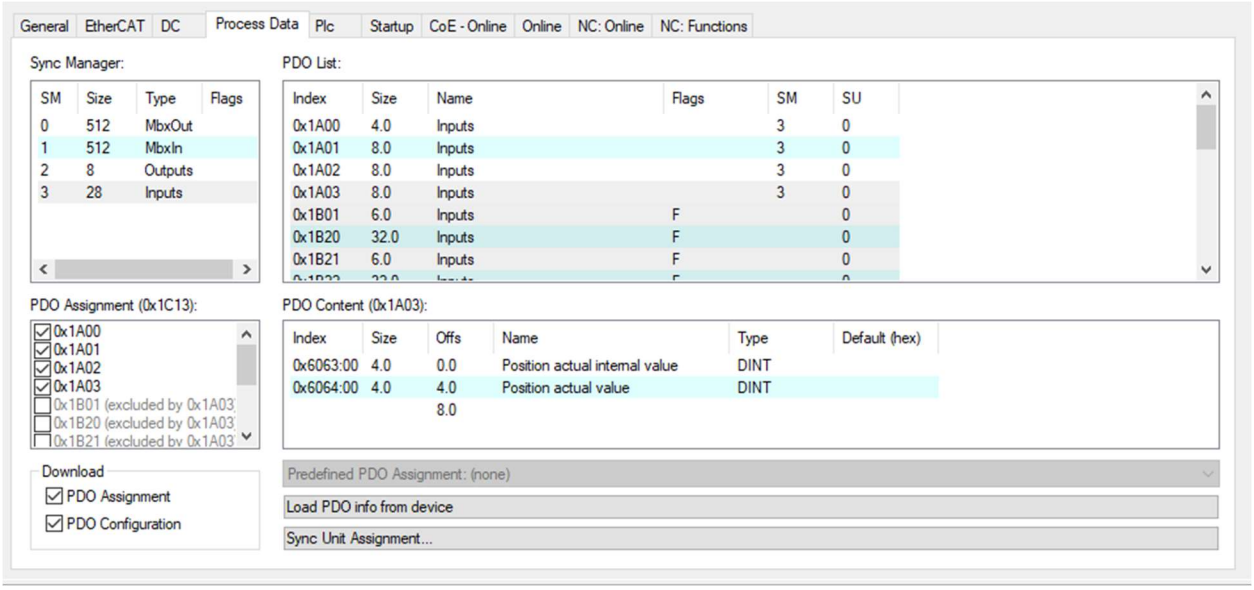
0x1A01



0x1A02

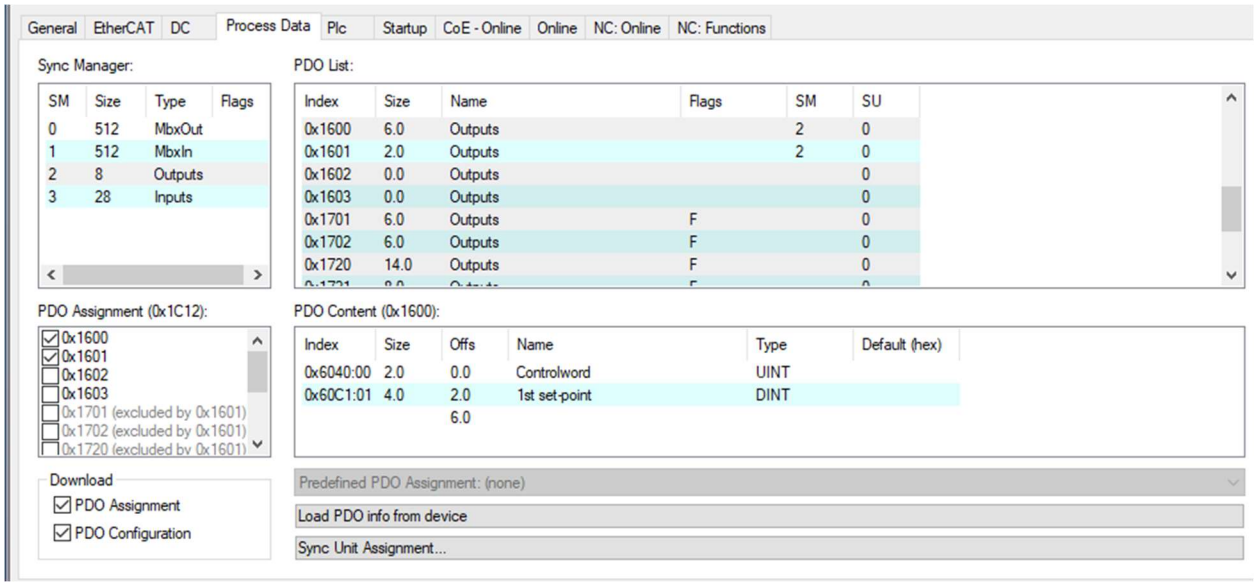


0x1A03

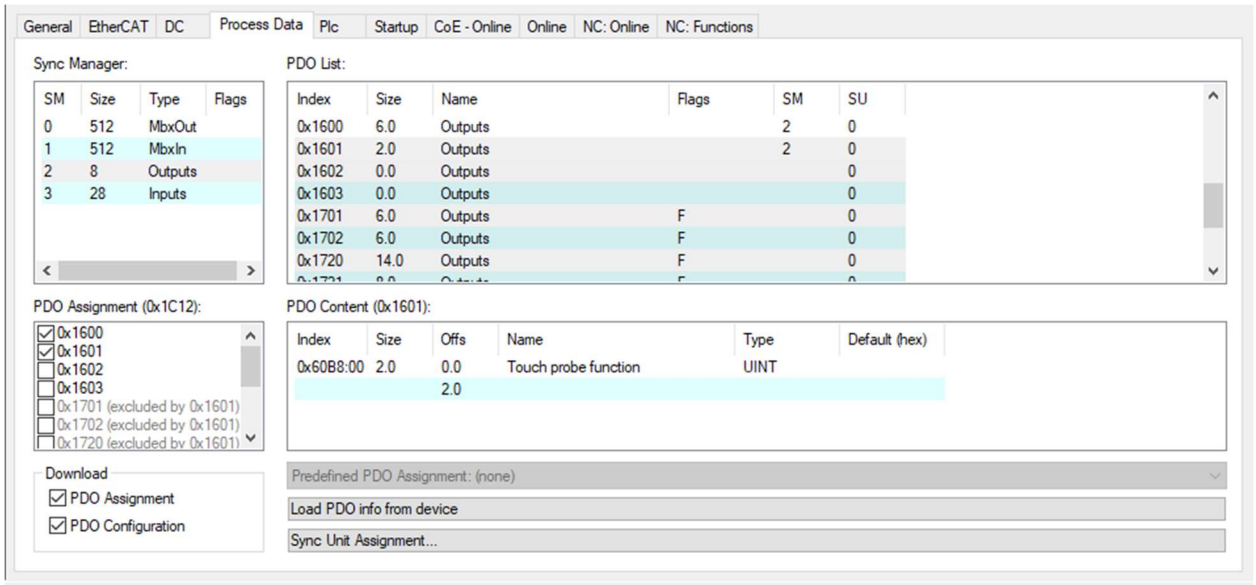


Summary of Output PDOs used for this test

0x1600



0x1601



0x1602

Not Used

0x1603

Not Used

The first setpoint (Output), Statusword (Input), and Position actual internal value Input) are all linked to the NC-Task->Axis 1 per normal as if using the ESI file defaults.

Touchprobe Scaling

Touchprobe Scaling is scaled by either:

Case#1: The default where FBUS.PARAM05 bit 4=0 and the scaling of the PDO value of the captured positive or negative edge touchprobe is defined by FB1.PSCALE (i.e. default of 20) which results in a value that is 2^20 counts per motor rev. This is the same scaling as object 6063 Position actual internal value.

Case#2: DS402 scaling factors are used where FBUS.PARAM05 bit 4=1 and the scaling of the PDO value of the positive or negative edge touchprobe is defined by:

DS402.POSFCFEED or 6092h sub 1

DS402.POSFCSHAFTREV or 6092h sub 2

DS402.POSGEARMOTORREV or 6091 h sub 1

DS402.POSGEARSHAFTREV or 6091h sub 2

I chose DS402 scaling to scale the touch probe values it is necessary to configure FBUS.PARAM05 and set bit 4 to 1.

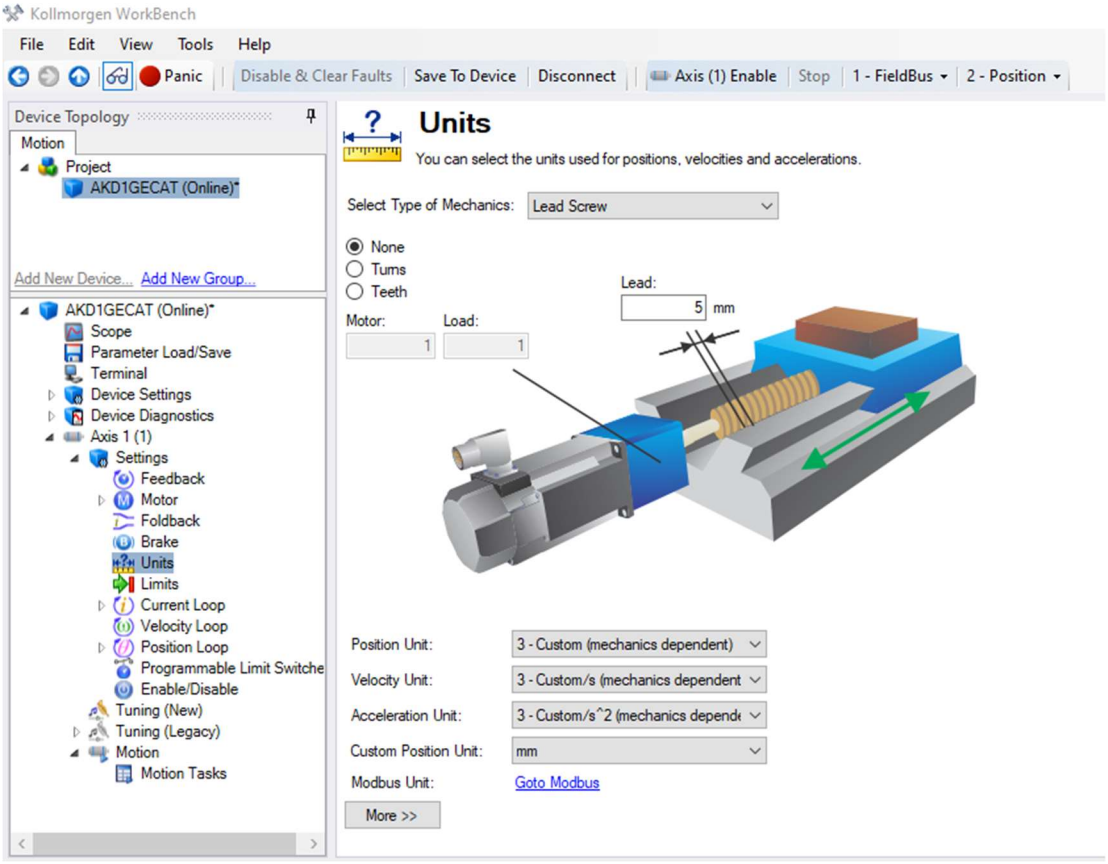
FBUS.PARAM05 Additional Notes

Bit 0 configures the behavior of DS402 state machine in case of fault resets.

Bit 0	1	Faults can only be reset using DS402 controlword bit 7.
	0	The reset can also be done using Telnet or digital input and the DS402 state machine reflects this condition.
Bit 1	1	The state of the hardware enable does not change the state machine to state Operation enable.
	0	If the state Operation enable or Switched on is active, it falls back to the state Switch on disabled, if the Hardware enable goes to 0.
Bit 2	1	WorkBench/Telnet cannot software enable the drive when CANopen / EtherCAT are operational.
	0	WorkBench/Telnet can software enable the drive. **NOTE** During commissioning this bit should be set to 1 to avoid influences to DS402 power stage state machine. The fieldbus should not be in operation to avoid influence to test functions of WorkBench.
Bit 3	1	DS402 - state machine is not influenced if the software enable is taken away using Telnet.
	0	DS402 - state machine is influenced if the software enable is taken away using Telnet.
Bit 4	1	Scaling is done using special DS402 - objects (independent on units)
	0	Scaling for position, velocity and acceleration objects is done using UNIT parameters.

FBUS.PARAM05=16.

In this application note Axis 1 was setup accordingly:



In order to scale the positional values over EtherCAT for 1000=1 mm (or 5000=5mm),

the following scaling was used for this application note:

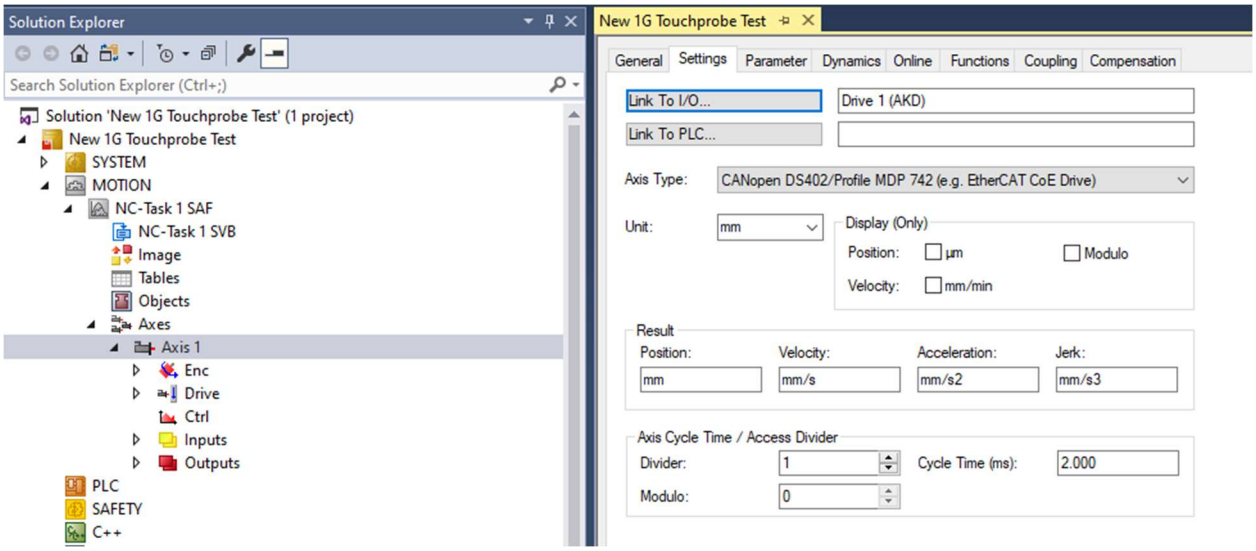
DS402.POSFCFEED= 5000

DS402.POSFCSHAFTREV=1

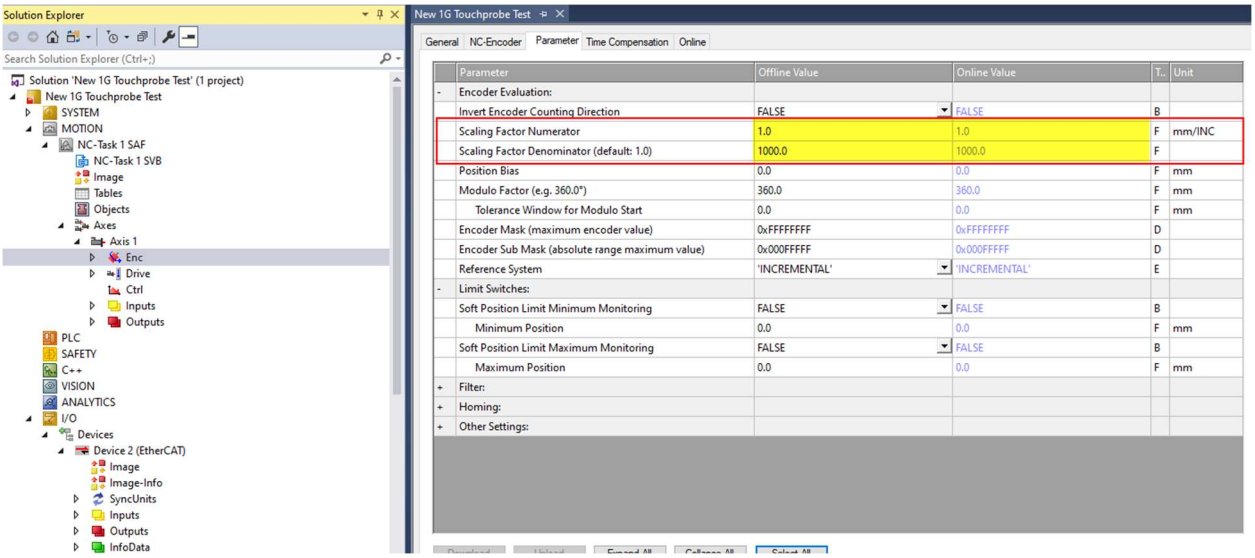
DS402.POSGEARMOTORREV=1

DS402.POSGEARSHAFTREV=1

The NC-Task->Axis 1 was set for mm.



Under NC Task->Axes->Axis 1->Enc->Parameter tab the scaling factor numerator was set to 1.0 mm and the denominator was set to 1000.



Note this is not a requirement for the Touchprobes but it conveniently scales the position units in TwinCAT3 to match the DS402 scaling.

Example 1: Use Touchprobe 1 to continously sample on the positive edge of DIN1

5.3.82 Object 60B8h: Touch probe function

This object indicates the configured function of the touch probe.

Index	60B8h
Name	Touch probe function
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/W
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the possible functions:

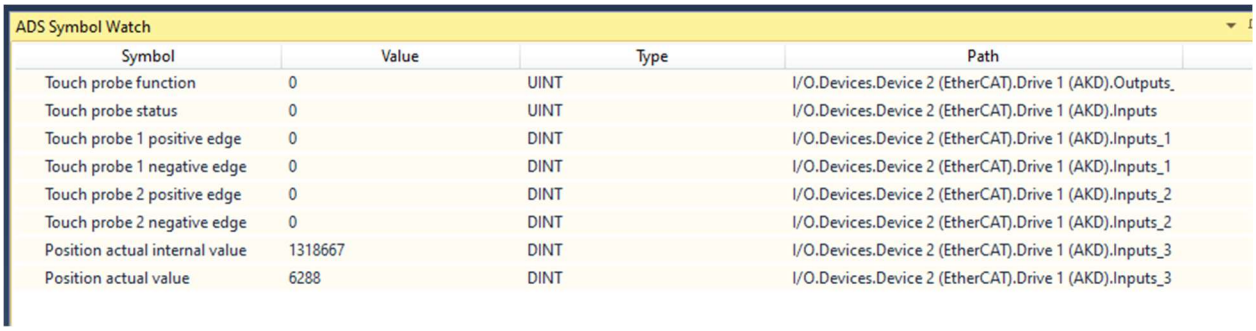
Bit	Value	Meaning
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continuous
3, 2	00b*	Trigger with touch probe 1 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 01h
	11b	reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6, 7	-	User-defined (e.g. for testing)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
11, 10	00b	Trigger with touch probe 2 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 02h
	11b	reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14, 15	-	User-defined (e.g. for testing)

* b = binary

If both edges are selected at the same time (bit 4=1 and bit 5=1 for probe 1 or bit 12=1 and bit 13=1 for probe 2), the first edge (positive or negative) triggers the probe function. The position, latched at this edge, is taken over for both edges (positive and negative).

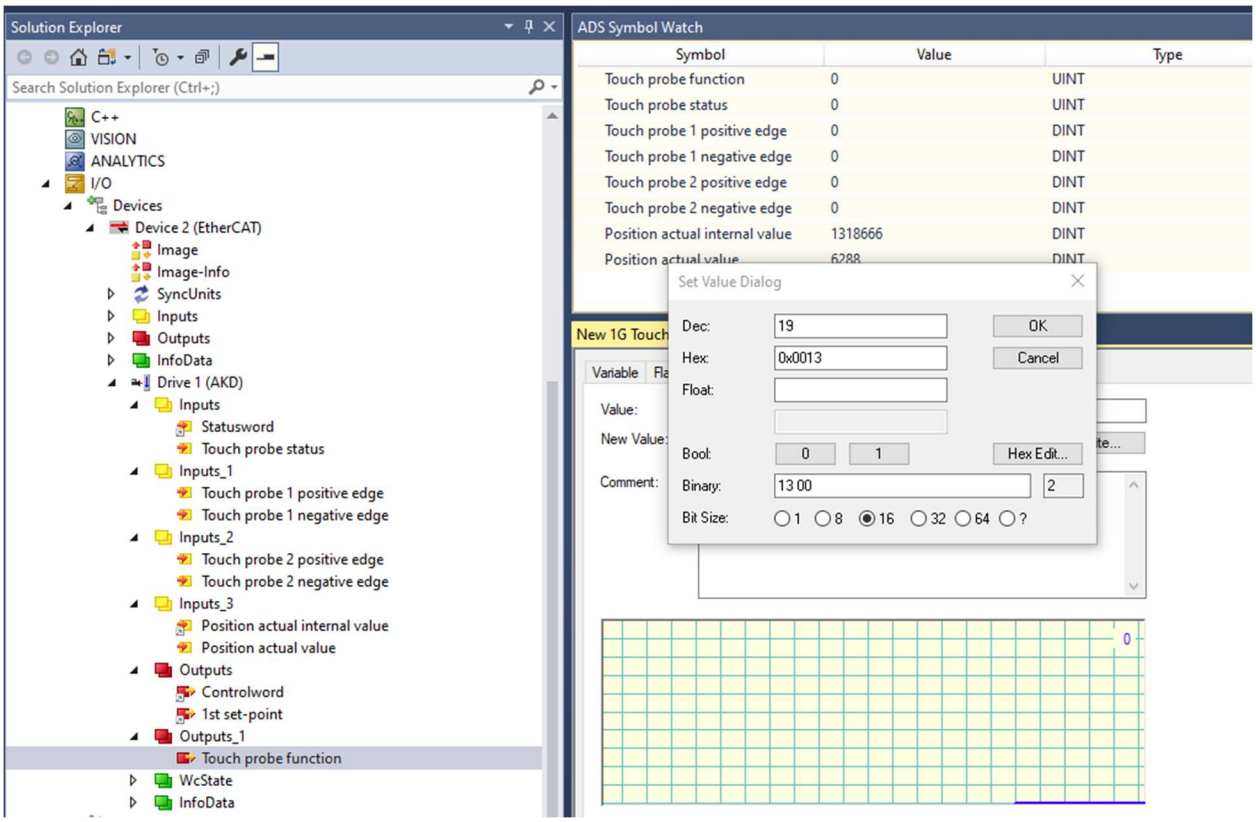
In this example the touch probe function is to be set to 2#10011 (19 dec).

The touchprobe function is 0 at first (viewed in the ADS Symbol Watch in TwinCAT3).



Next to enable Touch Probe 1 (and arm) set theTouch Probe Function to 19.

I used Online Force for this purpose.



The Touch Probe Status changes to a value of 1 indicating the touch probe is enabled (and armed).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	19	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	1	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	1318665	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	6288	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

On rising edge of DIN1 the status changes from 1 to 3 indicating Touch Probe 1 positive edge is stored and a “new” Touch Probe 1 positive edge value is shown. The value is the Workbench value of CAP0.PLFB x 1000. Also note the “Position actual value” which is the position feedback is also the same value of the Touch Probe 1 Positive Edge value because both are scaled by the DS402 scaling.

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	19	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	3	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	6288	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	1318666	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	6288	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

From Workbench Watch:

Watch

Device	Parameter	Value	
no_name (Online)*	PL.FB	6.288	mm
no_name (Online)*	CAP0.PLFB	6.288	mm

A value of 3 in the Touch Probe Status Word is:

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

Since this is a continuous trigger Axis 1 can be moved to change the feedback position and DIN1 and be toggled low and then high again for a new capture (again the Workbench value x 1000).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	19	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	3	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	3057884	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

From Workbench Watch.

Watch

Device	Parameter	Value	
no_name (Online)*	PL.FB	14.581	mm
no_name (Online)*	CAP0.PLFB	14.581	mm

Example 2: Continue to use Touch Probe 1 positive edge trigger but also add negative edge trigger as well. Add Touch Probe 2 positive edge trigger functionality.

For this example the following must be set in the Touch Probe Function:

5.3.82 Object 60B8h: Touch probe function

This object indicates the configured function of the touch probe.

Index	60B8h
Name	Touch probe function
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/W
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the possible functions:

Bit	Value	Meaning
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continuous
3, 2	00b*	Trigger with touch probe 1 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 01h
	11b	reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6, 7	-	User-defined (e.g. for testing)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
11, 10	00b	Trigger with touch probe 2 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 02h
	11b	reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14, 15	-	User-defined (e.g. for testing)

* b = binary

If both edges are selected at the same time (bit 4=1 and bit 5=1 for probe 1 or bit 12=1 and bit 13=1 for probe 2), the first edge (positive or negative) triggers the probe function. The position, latched at this edge, is taken over for both edges (positive and negative).

The Touch Probe Function then will be set to the following:

2#1 0011 0011 0011 (4915 dec).

Start with the Touch Probe Function set to 0.

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	3057884	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

Then change the Touch Probe Fuction to 4915 (dec).

The Touch Probe Status changes to 257 (dec).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	4915	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	257	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	3057886	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

257(dec) is 2#1 0000 0001.

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

Next toggle DIN1 positive and then negative and then DIN2 positive.

Touch Probe 1 positive and negative edges are populated with a captured position and Touch Probe 2 Positive Edge as well.

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	4915	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	775	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	14581	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	3057986	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	14582	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

From the Watch in Workbench:

Watch

Device	Parameter	Value	
no_name (Online)*	PL.FB	14.582	mm
no_name (Online)*	CAP0.PLFB	14.581	mm

Note from above the Touch Probe Status changed to 775 (dec) which is 2#0011 0000 0111.

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

DIN1 and DIN2 can be toggled as many times as desired since both Touch Probe 1 and Touch Probe 2 are setup for trigger continuous in the Touch Probe Function.

Setting the Touch Probe Function to 0 resets the Touch Probe Status to 0 as well.

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	4640577	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

Example 3: Demonstrate changing the trigger for Touch Probe 1 to Event instead of Continuous.

The primary change in the Touch Probe Function is changing Bit 1 from a 1 (continuous) to 0 (trigger first event). Trigger first event is like a one-shot capture.

5.3.82 Object 60B8h: Touch probe function

This object indicates the configured function of the touch probe.

Index	60B8h
Name	Touch probe function
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/W
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

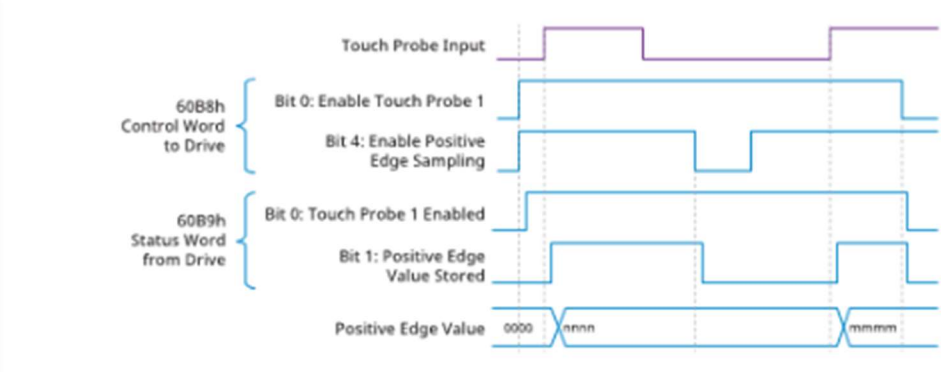
Definition of the possible functions:

Bit	Value	Meaning
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continuous
3, 2	00b*	Trigger with touch probe 1 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 01h
	11b	reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6, 7	-	User-defined (e.g. for testing)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
11, 10	00b	Trigger with touch probe 2 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 02h
	11b	reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14, 15	-	User-defined (e.g. for testing)

* b = binary

If both edges are selected at the same time (bit 4=1 and bit 5=1 for probe 1 or bit 12=1 and bit 13=1 for probe 2), the first edge (positive or negative) triggers the probe function. The position, latched at this edge, is taken over for both edges (positive and negative).

The timing diagram for this example is shown:



The Touch Probe Function will then be set to 2#1 0001 (17 dec).

Beginning with the Touch Probe Function set to 0 (Touch Probes disabled).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	4640579	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

Set the Touch Probe Function to 17.

The Touch Probe Status chagnes from 0 to 1 indicating the Touch Probe is enabled (and armed).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	17	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	1	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	4640578	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

On trigger of DIN1 the status changes to 3 and even if DIN1 toggles on and off a new positive value is not captured.

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	17	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	3	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	5635836	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	26874	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

In order to reset for a first (new) event (one-shot) toggle Bit 4 (Enable sampling at positive edge of touch probe 1) from 1->0 to disarm the trigger.

2#0 0001 (1 dec).

5.3.82 Object 60B8h: Touch probe function

This object indicates the configured function of the touch probe.

Index	60B8h
Name	Touch probe function
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/W
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the possible functions:

Bit	Value	Meaning
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continuous
3, 2	00b*	Trigger with touch probe 1 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 01h
	11b	reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6, 7	-	User-defined (e.g. for testing)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
11, 10	00b	Trigger with touch probe 2 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 02h
	11b	reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14, 15	-	User-defined (e.g. for testing)

* b = binary

If both edges are selected at the same time (bit 4=1 and bit 5=1 for probe 1 or bit 12=1 and bit 13=1 for probe 2), the first edge (positive or negative) triggers the probe function. The position, latched at this edge, is taken over for both edges (positive and negative).

The Touch Probe Status indicates 1 (Touchprobe enabled but no touch probe 1 positive edge value stored).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	1	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	1	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	5635837	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	26874	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

5.3.83 Object 60B9h: Touch probe status

This object indicates the status of the touch probe.

Index	60B9h
Name	Touch probe status
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/O
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the status:

Bit	Value	Meaning
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3 to 5	0	reserved
6, 7	-	User-defined (e.g. for testing)
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe2 negative edge position stored
11 to 13	0	reserved
14, 15	-	User-defined (e.g. for testing)

To take a new capture (rearm) toggle bit 4 of the Touch Probe Function from 0->1 (rising edge).

The Touch Probe Function value transistions from 2# 0 0001 (1) to 2#1 0001 (17).

5.3.82 Object 60B8h: Touch probe function

This object indicates the configured function of the touch probe.

Index	60B8h
Name	Touch probe function
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/W
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the possible functions:

Bit	Value	Meaning
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continuous
3, 2	00b*	Trigger with touch probe 1 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 01h
	11b	reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6, 7	-	User-defined (e.g. for testing)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
11, 10	00b	Trigger with touch probe 2 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 02h
	11b	reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14, 15	-	User-defined (e.g. for testing)

* b = binary

If both edges are selected at the same time (bit 4=1 and bit 5=1 for probe 1 or bit 12=1 and bit 13=1 for probe 2), the first edge (positive or negative) triggers the probe function. The position, latched at this edge, is taken over for both edges (positive and negative).

The Touch Probe Status shows it is rearmed (1).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	17	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	1	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	5635838	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	26874	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

On rising edge of DIN 1 the Touch Probe Status changes from 1 to 3 (touch probe 1 is enabled and a new positive edge position is stored).

A new positive edge position is captured.

ADS Symbol Watch

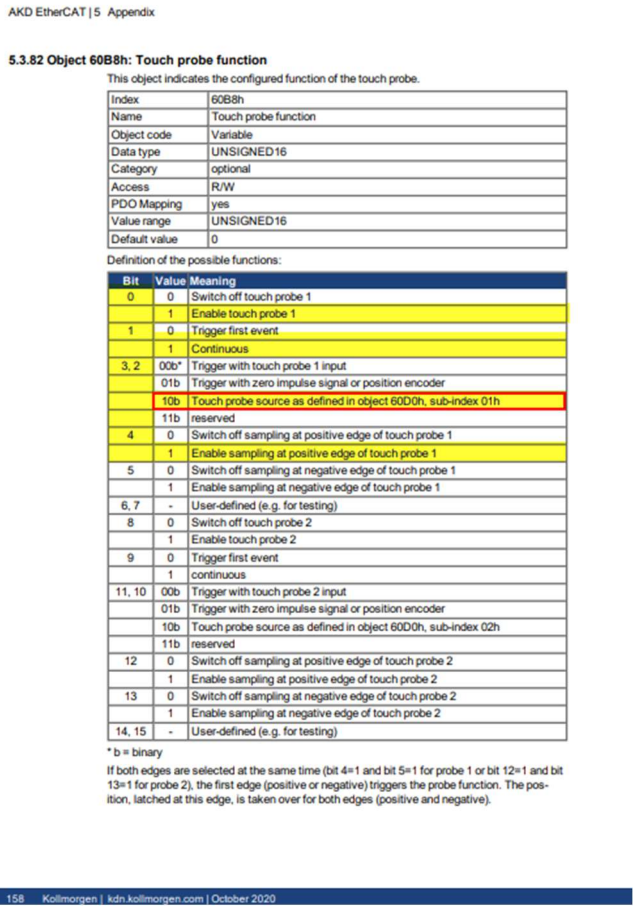
Symbol	Value	Type	Path
Touch probe function	17	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	3	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	31675	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	7242252	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	34534	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

As before toggling DIN1 off and on does not result in a new capture. Disarm and Arm the capture in this mode by toggling bit 4 in the Touch Probe Function to Arm and Disarm the trigger.

Example #4: Demonstrate using the Touch Probe Source object to set what trigger is used for the Touch Probe instead of the default DIN1 and DIN2.

Example#1 used Touch Probe 1 to continuously sample on the positive edge of DIN1. Let's change the source to be DIN3.

The difference in setting up the Touch Probe Function is bits 3,2 and instead of using 00b (Trigger with touch probe 1 input(DIN1)), bits 3,2 are set to 10b (Trigger defined in object 60D0h sub 1h).



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5.3.82 Object 60B8h: Touch probe function

This object indicates the configured function of the touch probe.

Index	60B8h
Name	Touch probe function
Object code	Variable
Data type	UNSIGNED16
Category	optional
Access	R/W
PDO Mapping	yes
Value range	UNSIGNED16
Default value	0

Definition of the possible functions:

Bit	Value	Meaning
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continuous
3, 2	00b*	Trigger with touch probe 1 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 01h
	11b	reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negative edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6, 7	-	User-defined (e.g. for testing)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
11, 10	00b	Trigger with touch probe 2 input
	01b	Trigger with zero impulse signal or position encoder
	10b	Touch probe source as defined in object 60D0h, sub-index 02h
	11b	reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negative edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14, 15	-	User-defined (e.g. for testing)

* b = binary

If both edges are selected at the same time (bit 4=1 and bit 5=1 for probe 1 or bit 12=1 and bit 13=1 for probe 2), the first edge (positive or negative) triggers the probe function. The position, latched at this edge, is taken over for both edges (positive and negative).

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Later in the procedure the Touch Probe Function will then be set to 2#1 1011 (27 dec).

To set DIN3 as the touch probe source object 60Dh must be set to -3 for DIN3. Note negative values are manufacturer specific.

5.3.92 Object 60D0h: Touch probe source

This object provides the source of the touch probe function, when the dedicated bits 2/3 or 10/11 of the touch probe function (object 60B8h) are set accordingly.

Index	60D0h
Name	Touch probe source
Object code	Array
Data type	Integer 16
Category	optional

Subindex	**0**
Description	Highest sub-index supported
Category	mandatory
Access	R/O
PDO mapping	not possible
Value range	2
Default value	2

Subindex	**1**
Description	Touch probe 1 source
Category	mandatory
Access	R/W
PDO mapping	not possible
Value range	-11 to -1, 1 to 5
Default value	1

Subindex	2
Description	Touch probe 2 source
Category	mandatory
Access	R/W
PDO mapping	not possible
Value range	-11 to -1, 1 to 5
Default value	1

Value description:

Value	Description	Value	Description
1	Touch Probe 1 Input	3	Touch Probe 3 Input
2	Touch Probe 2 Input	4	Touch Probe4 Input
-1 to -11	AKD Input related to CAPx.TRIGGER 0 to 10		

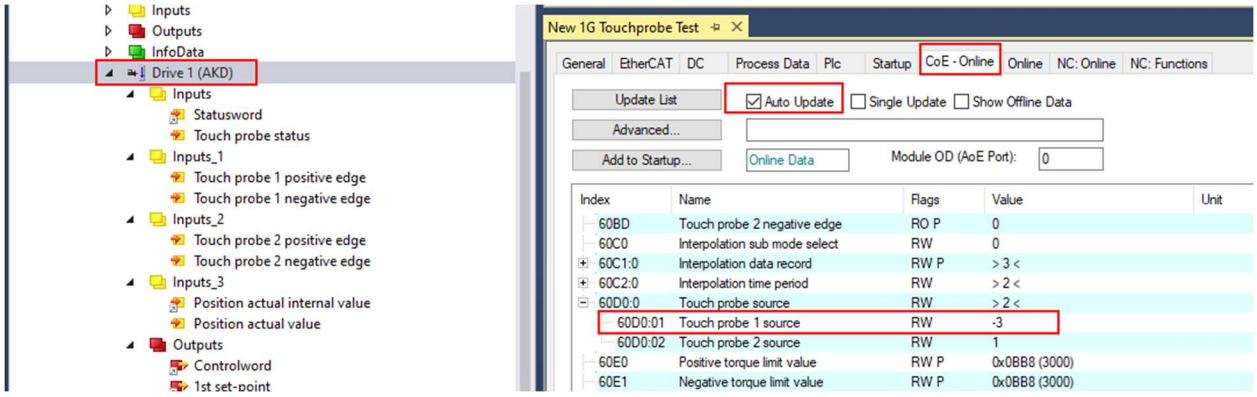
CAP0.TRIGGER, CAP1.TRIGGER

Description

This parameter specifies the trigger source (capture input signal).

Trigger Source	Input Name
0	General Input 1
1	General Input 2
2	General Input 3
3	General Input 4
4	General Input 5
5	General Input 6
6	General Input 7
7	X9 Connector, RS485 Input 1
8	X9 Connector, RS485 Input 2
9	X9 Connector, RS485 Input 3
10	Primary Index
11	Tertiary Index

I elected to set 60D0 via CoE Online where 60D0h sub 1 Touch Probe 1 Source= -3 for DIN3.



Start with the Touch Probe fuction set to 0.

ADS Symbol Watch

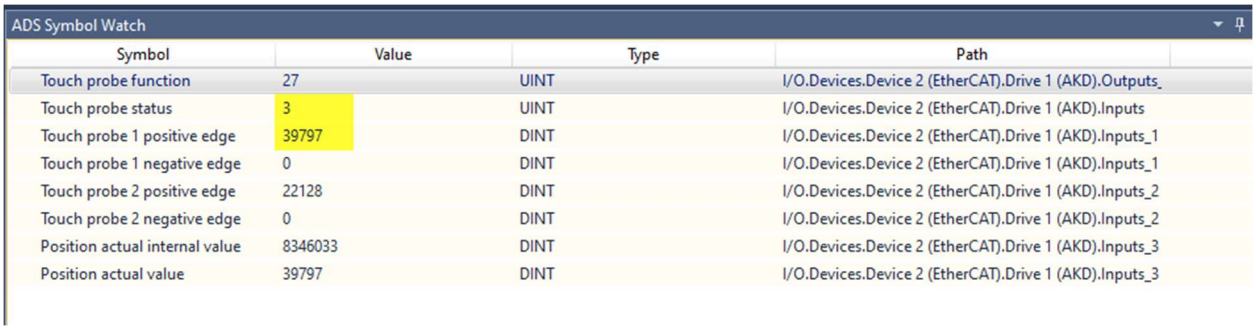
Symbol	Value	Type	Path
Touch probe function	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	0	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	31675	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	7242253	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	34534	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

Next set the Touch Probe function as predetermined (27 dec). The Touch Probe Status changes to 1 to indicated enabled (armed).

ADS Symbol Watch

Symbol	Value	Type	Path
Touch probe function	27	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	1	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	7242252	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	34534	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3

On rising edge of DIN3 the Touch Probe Status changes to a 3 and a positive edge value is captured in the Touch Probe 1 Positive Edge.



Symbol	Value	Type	Path
Touch probe function	27	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Outputs_
Touch probe status	3	UINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs
Touch probe 1 positive edge	39797	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 1 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_1
Touch probe 2 positive edge	22128	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Touch probe 2 negative edge	0	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_2
Position actual internal value	8346033	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3
Position actual value	39797	DINT	I/O.Devices.Device 2 (EtherCAT).Drive 1 (AKD).Inputs_3