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# EtherCAT Multi Axis 用户手册

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AMP & MOONS' Automation

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# 1 前言

## 1.1 关于手册

本手册提供了鸣志步进和步进伺服驱动器在EtherCAT通讯中的详细说明。可以为相关工程师或者技术人员在开发基于EtherCAT通讯的运动控制系统中提供帮助，阅读本文档同时需要用户了解基本的EtherCAT协议知识。

## 1.2 参考文档

Hardware Manual of MOONS' drive

CiA 402

ETG 1000

ETG 6010

MOONS' Host Command Reference

## 1.3 常用缩写

100Base-Tx	100M以太网
AL	应用层
CAN	控制局域网
CANopen	CAN总线上的应用层协议
CoE	CANopen在EtherCAT总线上的应用
DC	分布式时钟
DL	数据链路层
EMCY	紧急事件
ESI	EtherCAT节点信息
ESC	EtherCAT控制器
ETG	EtherCAT技术组织
PDO	过程数据对象
SDO	服务数据对象
XML	EtherCAT节点信息文件

## 1.4 Revisions

日期	版本	详细
8/12/2020	2.1	更正, 订正
5/30/2023	2.2	更正, 订正
5/30/2023	2.3	更正, 订正
2/1/2024	2.4	更正, 订正
7/25/2024	2.5	更正, 订正
1/27/2026	2.6	更正, 订正

该文档主要包含步进和步进伺服的描述信息。

步进驱动器型号:

型号	版本
STF05-4X-ECX	
STF05-4X-ECX-S	
STF10-4X-ECX	
STF10-4X-ECX-S	
STF05-2XU-ECX	
STF05-2XU-ECX-S	
STF10-2XU-ECX	
STF10-2XU-ECX-S	
STF05-4XU-ECX	
STF05-4XU-ECX-S	
STF10-4XU-ECX	
STF10-4XU-ECX-S	

步进伺服驱动器型号:

型号	版本
SSDC06-4X-ECX	
SSDC06-4X-ECX-S	
SSDC10-4X-ECX	
SSDC10-4X-ECX-S	
SSDC06-2XU-ECX	
SSDC06-2XU-ECX-S	
SSDC10-2XU-ECX	
SSDC10-2XU-ECX-S	
SSDC06-4XU-ECX	
SSDC06-4XU-ECX-S	
SSDC10-4XU-ECX	
SSDC10-4XU-ECX-S	

## 2 EtherCAT 通讯说明

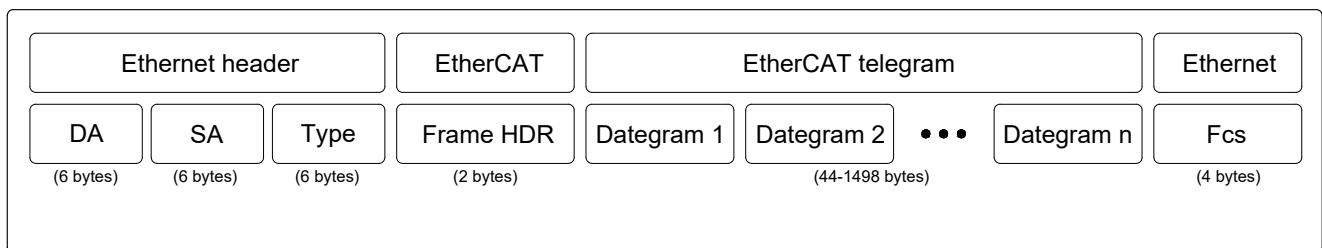
### 2.1 EtherCAT 简述

EtherCAT (Ethernet for Control Automation Technology)是由德国倍福自动化公司开发的一个实时工业以太网技术。IEC61158标准中公开描述了EtherCAT技术在自动化测量，测试或者其他应用中关于硬件或者是软件实时性需求方面的适用性。

EtherCAT技术应用中主要了解的方面是通讯延时短（不大于100us），低抖动，低负载等性能。

### 2.2 EtherCAT 协议

EtherCAT将其有效负载嵌入到标准以太网帧中。该帧由EtherType字段中的标识符（0x88A4）标识。由于EtherCAT协议针对短周期过程数据进行了优化，因此可以避免使用协议栈，例如TCP / IP或UDP / IP。



为了确保节点之间的以太网IT通信，可以选择通过邮箱通道建立TCP / IP连接的通道，而不会影响实时数据传输。启动期间，主设备在从设备上组态并映射过程数据。每个从站可以交换不同数量的数据，从一位到几个字节，甚至最大到千字节。

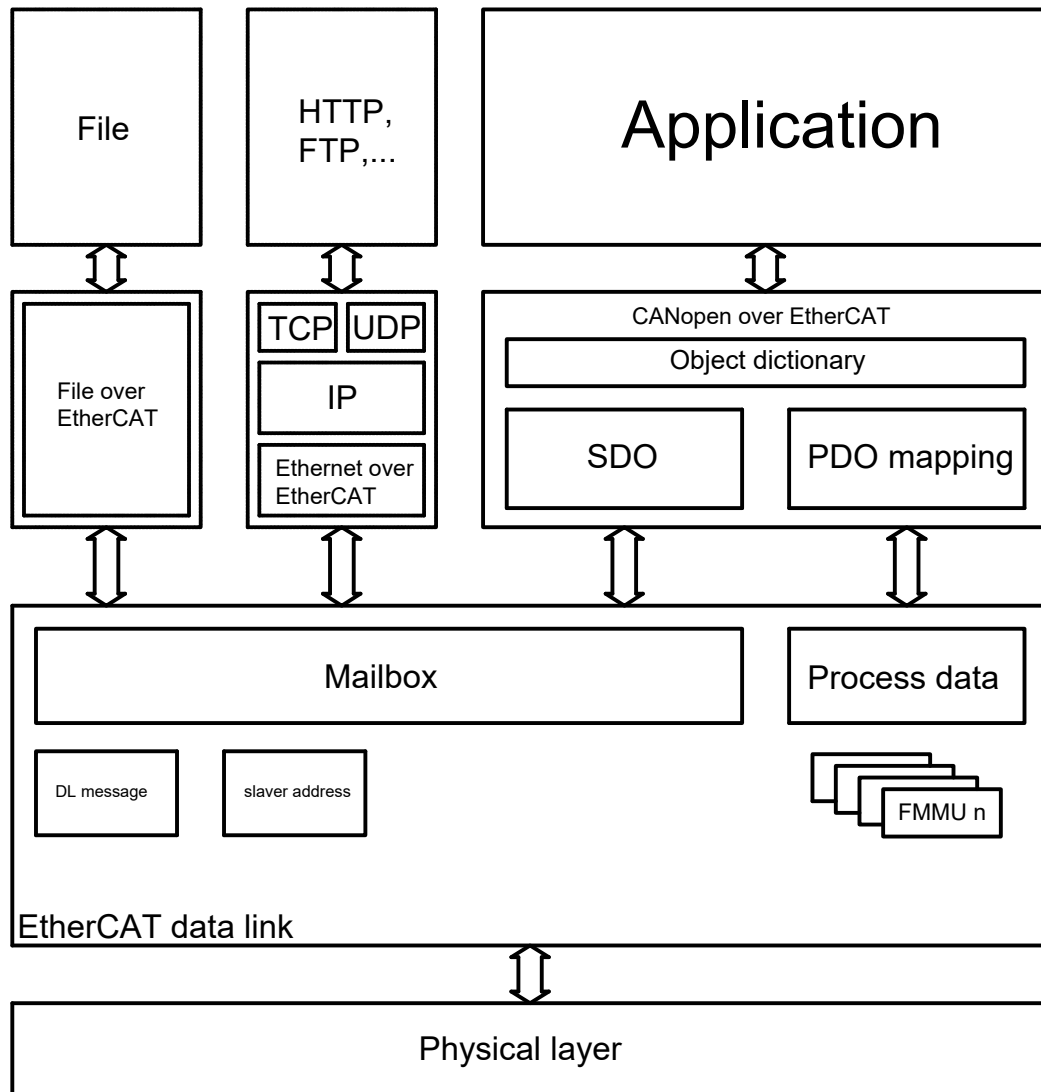
EtherCAT帧包含一个或多个数据报。数据报头指示主设备要执行的访问类型：

—读，写，读写

通过直接寻址访问特定的从属设备，或通过逻辑寻址（隐式寻址）访问多个从属设备。

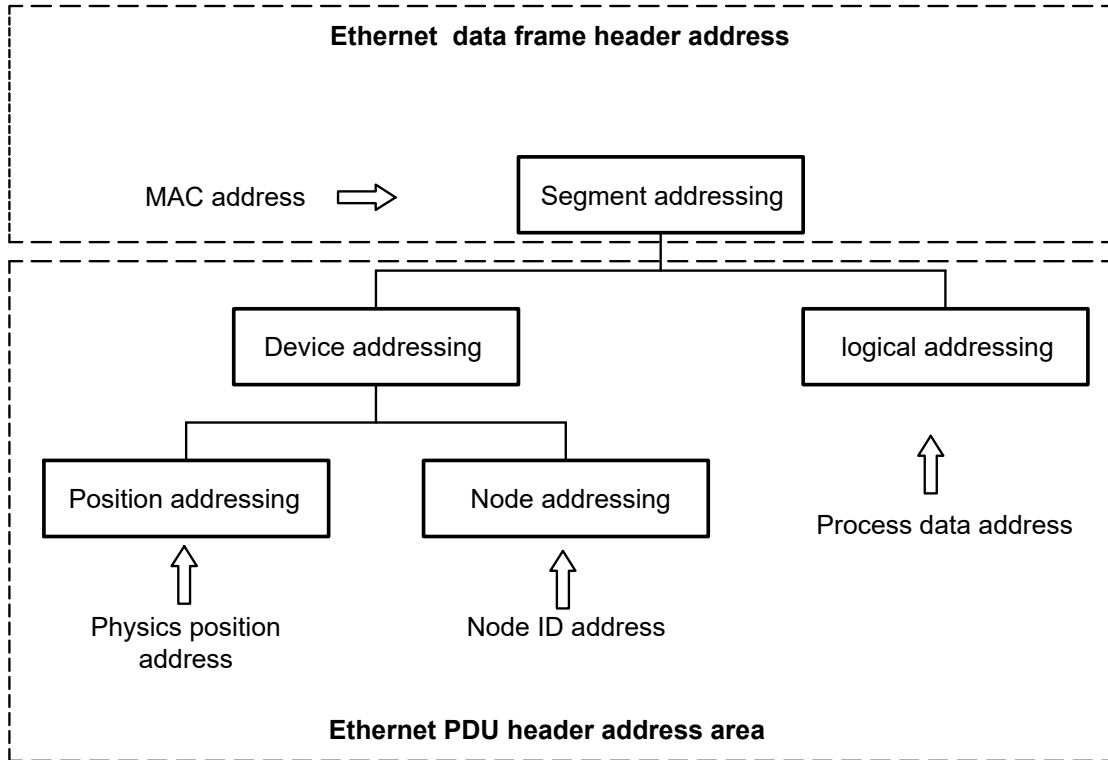
## 2.3 CANopen 协议在EtherCAT通讯上的使用

借助CoE协议，EtherCAT提供了与CANopen®标准EN 50325-4中相同的通信机制：对象字典，PDO映射（过程数据对象）和SDO（服务数据对象）甚至网络管理都是相似的。这样就可以在以前配备有CANopen®的设备中以最小的影响实现EtherCAT通讯，甚至大部分CANopen固件都可以重复使用。可以解除CANopen通讯的8字节PDO报文限制，还可以使用EtherCAT的增强带宽来支持整个对象字典的上传。设备配置文件（例如驱动器配置文件CiA 402）也可以重新用于EtherCAT。



## 2.4 EtherCAT 寻址

EtherCAT通信是指主设备从EtherCAT从设备的内部闪存读取和写入数据。通常有两种寻址方式来控制内部ESC寄存器。 EtherCAT寻址如下。



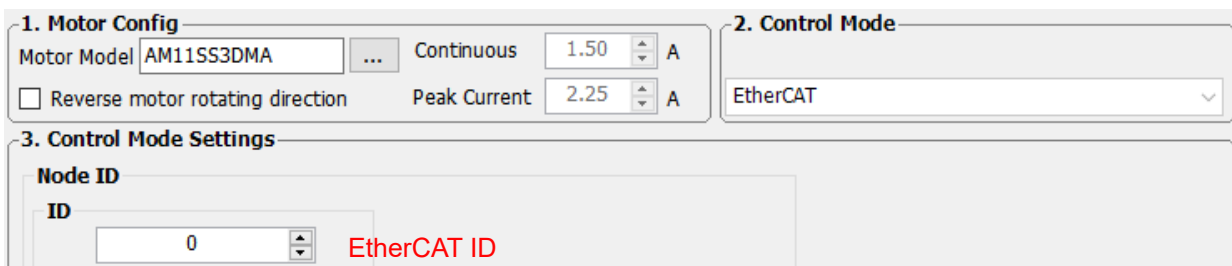
这里我们讨论节点寻址方式。节点寻址方式不需要了解物理拓扑结构和具体位置。

一般有两种选址方:

- 主站在数据链启动的时候配置EtherCAT ID给从站。
- 在数据链启动的时候从站点的EEPROM里面读取EtherCAT ID。

鸣志驱动器默认节点ID为0, 在第一次上电之后需要主站配置地址到驱动器做EtherCAT通讯。如果通过软件或者开关配置了除0以外的其他EtherCAT ID, 主站就可以通过驱动器EEPROM里面的别名地址寄存器分配地址。

下图描述了通过软件配置EtherCAT ID 的方法:



关于EtherCAT ID配置的详细信息, 请参考相关驱动器的硬件手册。

## 2.5 EtherCAT 节点信息

对于每个EtherCAT从站设备描述，必须提供所谓的EtherCAT从站信息（ESI）。这是以XML文件（可扩展标记语言）的形式完成的。它描述了从站特定于EtherCAT以及应用程序的功能。

ESI配置工具使用ESI文件生成EtherCAT网络信息（ENI）。

设备始终只有一个唯一的ESI文件。设备硬件或软件的修订更改必须反映在此设备的ESI中（通常通过修订编号）。

可以从我们的网站上找到XML文件：<https://www.moons.com.cn/>。

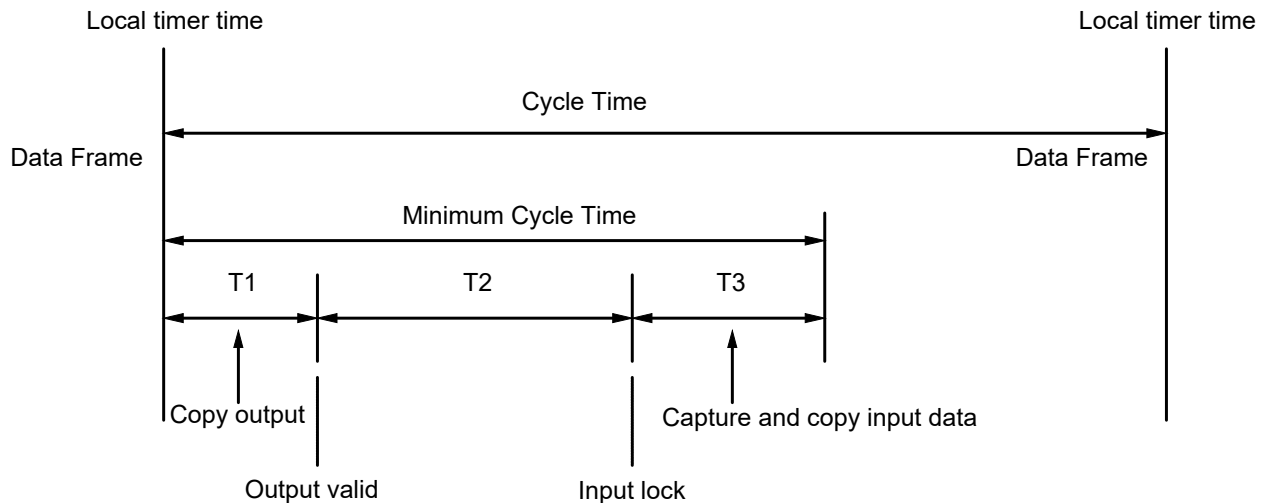
## 2.6 分布式时钟

分布式时钟可以使所有的EtherCAT节点同步于同一个参考时钟。节点支持分布式时钟的从站可以称谓DC节点。鸣志步进和步进伺服EtherCAT 通讯支持三种通讯方式：

- 自由模式
- SM 模式
- DC 模式

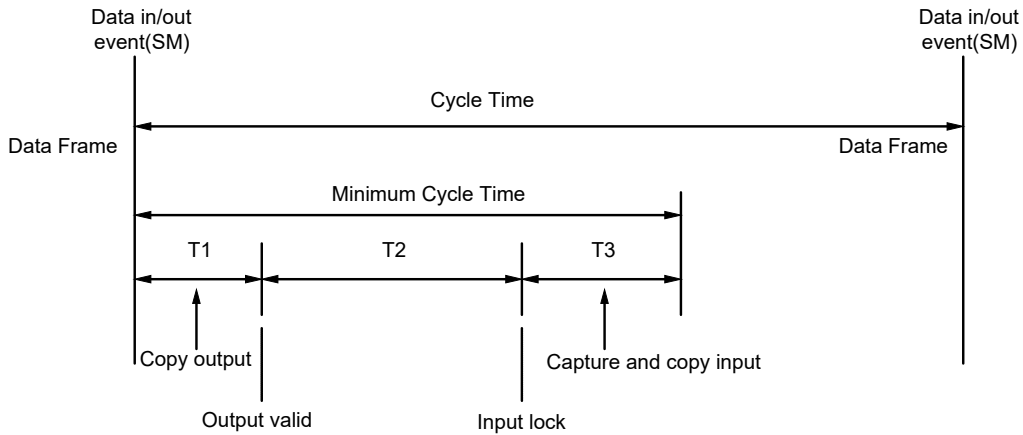
### 自由模式

在该模式下，数据帧依据本地时间定时器触发，T1和T2的时间由MPU通过数据帧复制数据产生，然后设置输出有效和计算时间，T3是硬件延时时间。



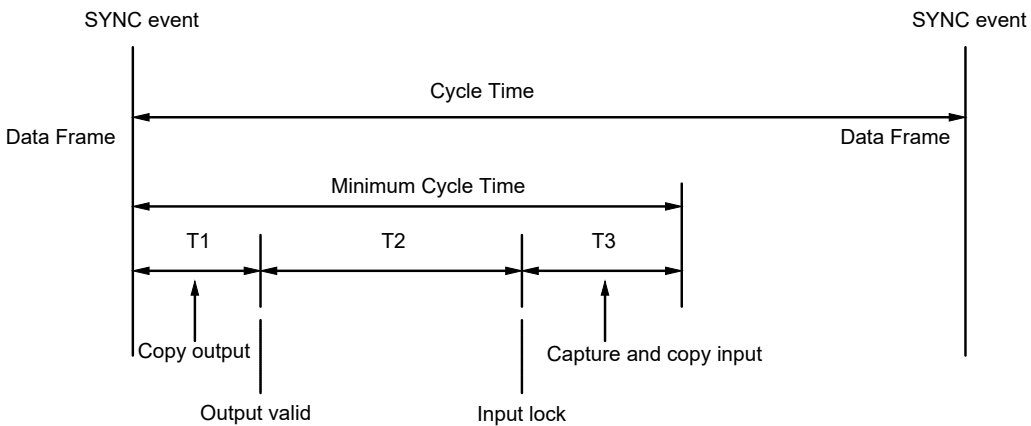
### SM模式

在该模式下数据输入输出事件触发的时候更新本地周期。本地时间寄存器通过数据输入输出事件触发。

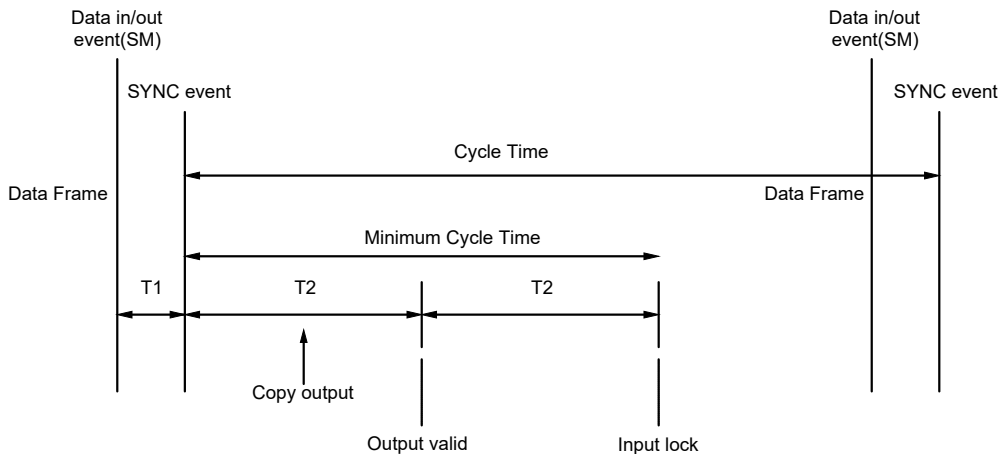


### DC模式

同步于同步事件信号，EtherCAT主站在同步信号触发之前发送数据帧，然后每次同步与同一个时钟。

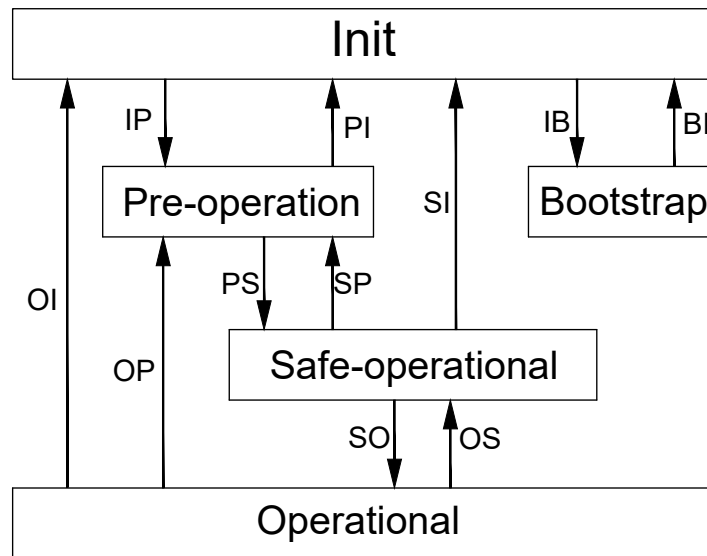


为了进一步优化从站同步性能，主站在数据收发事件发送时从接收到的过程数据复制输出信息。然后等待SYNC信号到达之后继续本地操作。



## 2.7 EtherCAT状态机制

ESM (EtherCAT state machine)是用来在启动或者工作时协调主站和从站关系用的。如下所示，它包含EtherCAT状态转换的过程。

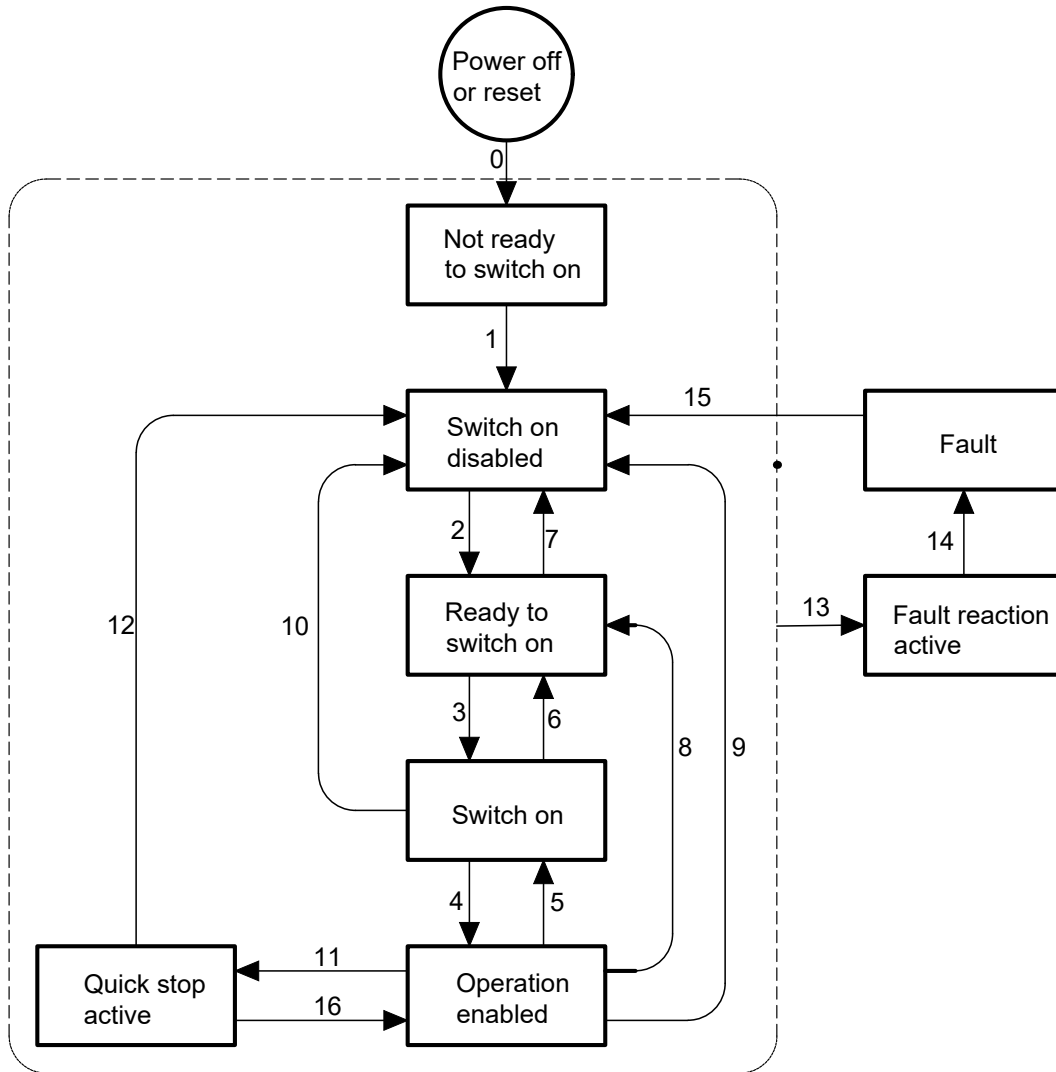


状态转换	描述
IP	启动邮箱通讯
PI	停止邮箱通讯
PS	启动输入更新
SP	停止输入更新
SO	启动输出更新
OS	停止输出更新
OP	停止输入输出更新
SI	停止输入更新，停止邮箱通讯
OI	停止输入输出更新，停止邮箱通讯
IB	启动bootstrap模式
BI	重启节点

### 3 运动控制

#### 3.1 控制电源驱动系统

鸣志驱动器在EtherCAT通讯应用层当中遵循CANopen协议，所以PDS FSA系统同样适用于EtherCAT应用。



FSA系统中的状态描述

状态字(6041h)	PDS FSA 状态
xxxx xxxx x0xx 0000	Not ready to switch on
xxxx xxxx x1xx 0000	Switch on disabled
xxxx xxxx x01x 0001	Ready to switch on
xxxx xxxx x01x 0011	Switch on
xxxx xxxx x01x 0111	Operation enabled
xxxx xxxx x00x 0111	Quick stop active
xxxx xxxx x0xx 1111	Fault reaction active
xxxx xxxx x0xx 1000	Fault

过程	事件(s)	动作(s)
0	电源启动之后或者重启之后自动过渡	驱动设备自检或者执行自行初始化
1	自动过渡	通讯开始生效激活
2	控制器发送Shut down指令或者本地信号	无
3	从控制器接收到Switch on指令或者本地信号	High-level power 将被打开
4	从控制器接收到激活Operation模式指令或者本地信号	驱动器功能被激活, 所有内部Set points被清除
5	从控制器接收到关闭Operation模式指令/或者本地信号	驱动器功能被关闭
6	从控制器接收到Shut down指令或者本地信号	High-level power被关闭
7	从控制器接收到Quick stop或者Disable voltage指令	无
8	从控制器接收到Shut down指令或者本地指令	驱动器功能将会被关闭, 并且High-level power也会被关闭
9	从控制器接收到Disable voltage指令或者本地信号	驱动器功能将会被关闭, 并且High-level power也会被关闭
10	从控制器接收到Quick stop或者Disable voltage指令或者本地信号	High-level power被关闭
11	从控制器接受到Quick stop 指令或者本地信	Quick stop功能被启动
12	当Quick stop指令在急停模式1, 2, 3或者4的情况下完成动作或者从控制器接收到Disable voltage指令将会自动过渡(依据Quick stop option code选择的方式)	驱动器功能和High-level power被关闭
13	Fault信号被触发	错误发送反馈功能机制将被执行
14	自动过渡	驱动器功能将会被关闭, 并且High-level power 也会被关闭
15	从控制器接收到Fault reset指令或者本地信号	如果驱动设备上当前不存在故障, 则将故障状态复位。退出故障状态后, 控制设备应清除控制字中的故障复位bit位。
16	如果Quick stop option code是5, 6, 7或者8, 控制器可以发送激活Operation指令	驱动器功能将被打开

对象0x6040 / 0x6840 / 0x7040 / 0x7840的指令代码

指令	Bits of the controlword					Transitions
	Bit7	Bit3	Bit2	Bit1	Bit0	
Shutdown	0	x	1	1	0	2,6,8
Switch on	0	0	1	1	1	3
Switch on + Enable operation	0	1	1	1	1	3+4
Quick stop	0	x	x	0	x	7,9,10,12
Disable operation	0	0	1	1	1	5
Enable operation	0	1	1	1	1	4,16
Fault reset	↑	x	x	x	x	15

### 3.2 操作模式

鸣志步进和步进伺服支持以下几种模式。

操作模式	代码(6060)
轮廓位置模式	1
轮廓速度模式	3
轮廓扭矩模式	4
原点模式	6
同步位置模式CSP	8
同步速度模式CSV	9

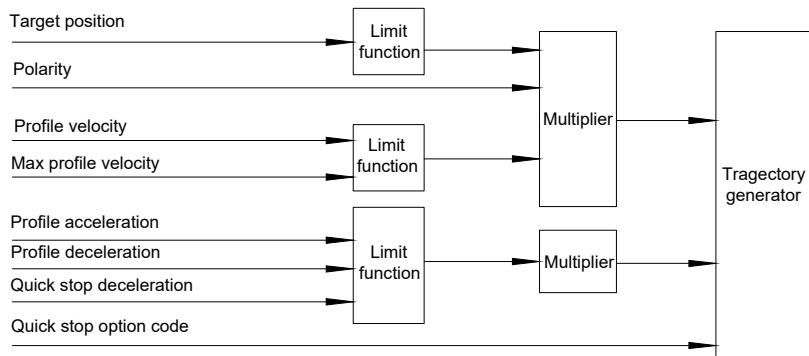
0x6060/0x6860/0x7060/0x7860作为切换控制模式寄存器,

当控制模式切换之后, 0x6061/0x6861/0x7061/0x7861将会同步更新模式信息。

### 3.3 轮廓位置模式

#### 3.3.1 模式说明

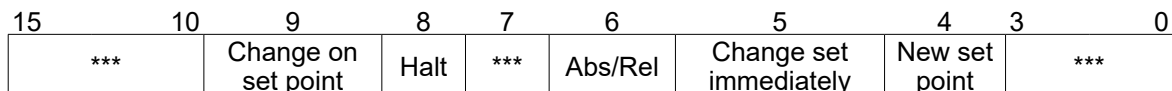
轮廓位置模式是一个点到点的运动模式。由速度，加速度，减速度，目标位置参数组成。当这些参数设置完成之后，驱动器将指令缓存到驱动器并执行动作。当使用单个点到点运动方式且当前正在执行点到点动作时，新的点到点运动动作可以被缓存到驱动器。



#### 3.3.2 主要控制寄存器对象

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT16	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT16	RO	YES
0x6060	0x6860	0x7060	0x7860	Modes of operation	INT8	WO	YES
0x6061	0x6861	0x7061	0x7861	Modes of operation display	INT8	RO	YES
0x607A	0x687A	0x707A	0x787A	Target position	INT32	RW	YES
0x6081	0x6881	0x7081	0x7881	Profile velocity	UINT32	RW	YES
0x6083	0x6883	0x7083	0x7883	Profile acceleration	UINT32	RW	YES
0x6084	0x6884	0x7084	0x7884	Profile deceleration	UINT32	RW	YES
0x6085	0x6885	0x7085	0x7885	Quick stop deceleration	UINT32	RW	YES
0x605A	0x685A	0x705A	0x785A	Quick stop option code	INT16	RW	NO

轮廓位置模式下的操作字 (6040h / 6840h / 7040h / 7840h)



\*\*\*: 详情参考对象字描述

Bit	Name	Value	Description
4	New set point	0	该位由0跳变为1将触发新的位置指令
		1	
5	Change set point immediately	0	在执行新的位置指令之前完成当前位置动作
		1	立刻更新并执行新的位置指令动作
6	Abs/Rel	0	目标位置为绝对位置
		1	目标位置为相对位置
8	Halt	0	位置指令被执行或者继续
		1	停止
9	Change of set point	0	在新的位置动作缓存之前驱动器完成之前的动作，且电机被复位
		1	电机将按照当前设定的速度运动直到到达设定位置之后再直接过渡到新的速度继续下一个位置动作

轮廓位置模式下的状态字 (6041h / 6841h / 7041h / 7841h).

15	14	13	12	11	10	9	0
****	Following error	Set point acknowledge	****	Target reached	****		

\*\*\*: 详情参考对象字描述

Bit	Name	Value	Description
10	Target reached	0	Halt (bit 8 in controlword) = 0: 目标位置未到达
			Halt (bit 8 in controlword) = 1: 电机减速
		1	Halt (bit 8 in controlword) = 0: 目标位置到达
			Halt (bit 8 in controlword) = 1: 速度为0
12	Set point ACK	0	当前位置已被缓存, 等待新的位置缓存
		1	当前位置正在缓存, 新的位置将被接受
13	Following error	0	没有跟随错误
		1	有跟随错误

### 3.3.3 功能描述

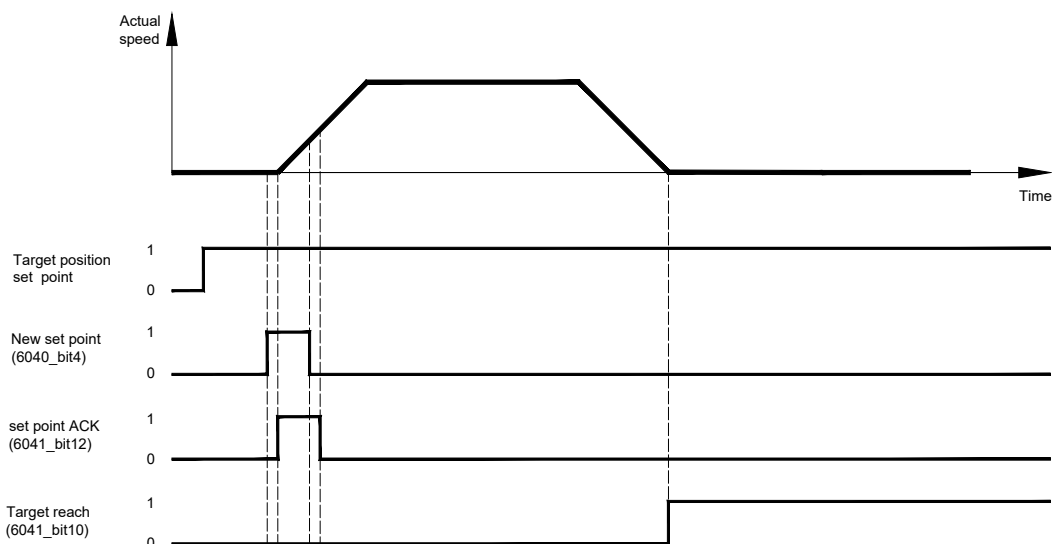
#### 概述

通过控制字中New set point与Change set point immediately位以及状态字中的Set-point ack位, 他们之间的时序控制和状态触发来设置位置模式动作。

如果控制字中的Change set immediately位设置为1, Single set-point模式将会在驱动器上生效, 如果控制字中的Change set immediately位设置为0, Set of set-point 将会在驱动器上生效。

#### Set point

当Set-point模式被应用到驱动器之后, 控制设备表示通过触发控制字中New set-point位上升沿使Set point模式生效, 状态字中Set point acknowledge位变为1, 然后驱动设备通过使Set-point acknowledge变为0表示确认, 同时接收新的New set point信号。



注: 时序图以1号轴为例。

控制对象数据:

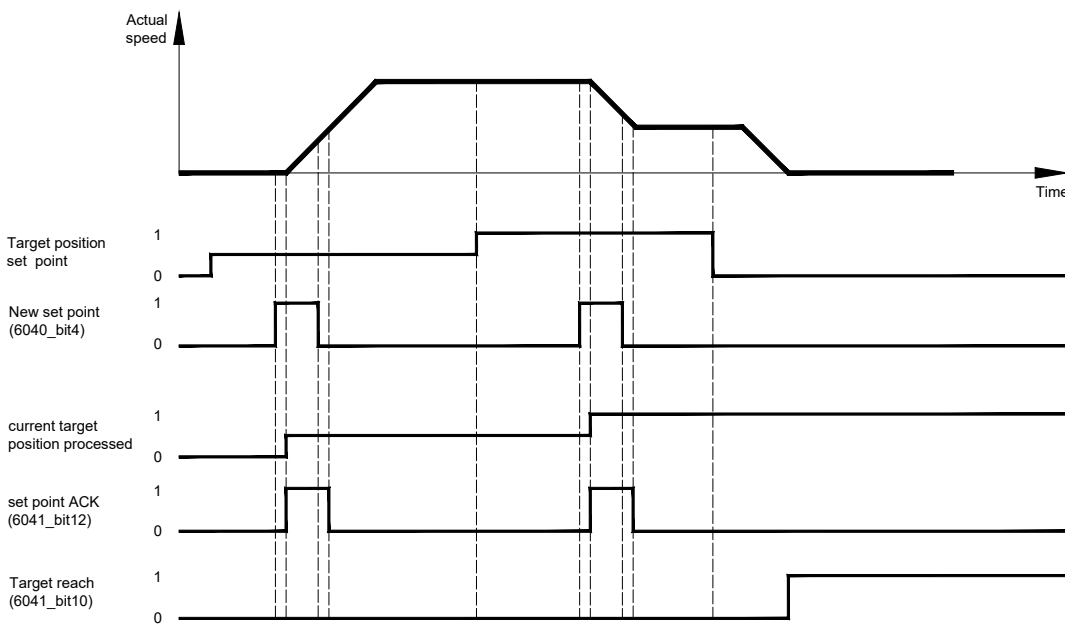
	Event	Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation	0x6040=15(0Fh)
Set mode of operation	Profile position mode	0x6060=1(01h)
Set motion parameters	Distance	0x607A=100000(0186A0h)
	Velocity	0x6081=20000(4E20h)
	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h)
Set point absolute	New set point	0x6040=31(1Fh)
	Clear new set point	0x6040=15(0Fh)
Set point relative	New set point	0x6040=95(5Fh)
	Clear new set point	0x6040=79(4Fh)

注：表格内容以1号轴为例。

如果一个Set-point 动作正在被缓存中执行，且一个新的已被确认，有两种处理方式可以支持：Single set-point(change set point immediately=1)和Set of set point(change set point immediately=0)。

Single set-point

当一个Set-point正在被缓存执行，一个新的Set-point动作通过控制字中的New set-point(bit4)被触发，新的Set-point动作将会立刻被缓存执行。



注：时序图以1号轴为例。

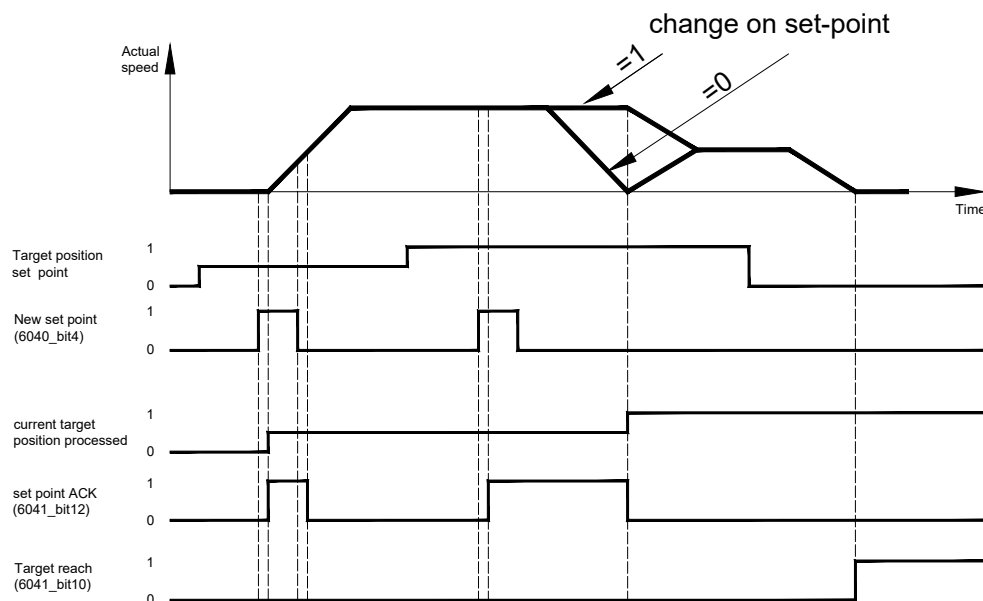
## 控制对象数据:

	Event	Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation	0x6040=15(0Fh)
Set mode of operation	Profile position mode	0x6060=1(01h)
Set motion parameters	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h)
Single set point	First part of velocity	0x6081=30000(7530h)
	First part of distance	0x607A=200000(030D40h)
	New set point	0x6040=639(27Fh)
	Clear new set point	0x6040=623(26Fh)
	Second part of velocity	0x6081=20000(4E20h)
	Second part of distance	0x607A=100000(0186A0h)
	New set point	0x6040=639(27Fh)
	Clear new set point	0x6040=623(26Fh)

注：表格内容以1号轴为例。

## Set of set-points

当一个Set-point正在被缓存执行，一个新的set-point动作通过控制字中的new set-point(bit4)被触发，新的Set-point将会在当前位置动作执行到达完成之后再被执行。



注：时序图以1号轴为例。

## 控制对象数据:

Event	Set parameter	Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation	0x6040=15(0Fh)
Set mode of operation	Profile position mode	0x6060=1(01h)
Set motion parameters	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h))
Set of set-points with change on set-point=0	First part of velocity	0x6081=30000(7530h)
	First part of distance	0x607A=400000(061A80h)
	New set point	0x6040=95(5Fh)
	Clear new set point	0x6040=79(4Fh)
	Second part of velocity	0x6081=20000(4E20h)
	Second part of distance	0x607A=300000(7530h)
	New set point	0x6040=95(5Fh)
	Clear new set point	0x6040=79(4Fh)
Set of set-points with change on set-point=1	First part of velocity	0x6081=30000(7530h)
	First part of distance	0x607A=400000(061A80h)
	New set point	0x6040=607(25Fh)
	Clear new set point	0x6040=591(24Fh)
	Second part of velocity	0x6081=20000(4E20h)
	Second part of distance	0x607A=300000(0493E0h)
	New set point	0x6040=607(25Fh)
	Clear new set point	0x6040=591(24Fh)

注：表格内容以1号轴为例。

**注意：鸣志CANopen驱动器支持设置两段缓存位置动作，当状态字(0x6041/0x6841/0x7041/0x7841)的第12位=1的时候说明缓存已满，新的位置动作将会被忽略。**

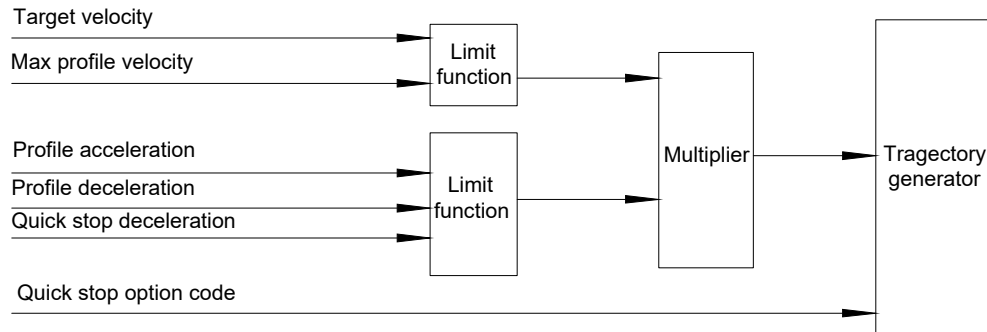
通过Halt指令停止电机(0x6040 / 0x7040 / 0x7840\_bit8)

如果一个驱动器正在缓存执行一个位置动作，Halt指令可以停止电机并且保持在当前位置模式。当复位Halt指令之后可以继续执行当前位置动作。

## 3.4 轮廓速度模式

### 3.4.1 模式说明

轮廓速度模式是一种相对简单的操作模式。一旦设置了速度，加速度和减速度，驱动器将根据加速度值驱动电机加速到运行速度，或者根据减速度值减速停止运动。



### 3.4.2 主要控制寄存器对象

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT16	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT16	RO	YES
0x6060	0x6860	0x7060	0x7860	Modes of operation	INT8	WO	YES
0x6061	0x6861	0x7061	0x7861	Modes of operation display	INT8	RO	YES
0x60FF	0x68FF	0x70FF	0x78FF	Target velocity	UINT32	RW	YES
0x6083	0x6883	0x7083	0x7883	Profile acceleration	UINT32	RW	YES
0x6084	0x6884	0x7084	0x7884	Profile deceleration	UINT32	RW	YES

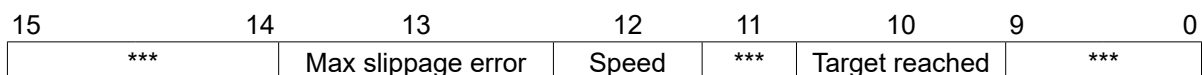
轮廓速度模式下的控制字(6040h / 6840h / 7040h / 7840h)



\*\*\*: 详情参考对象描述

Bit	Name	Value	Description
8	Halt	0	The motion shall be executed or continued
		1	Axis shall be stopped according to the halt option code (0x605D)

轮廓速度模式下的状态字(6041h / 6841h / 7041h / 7841h)



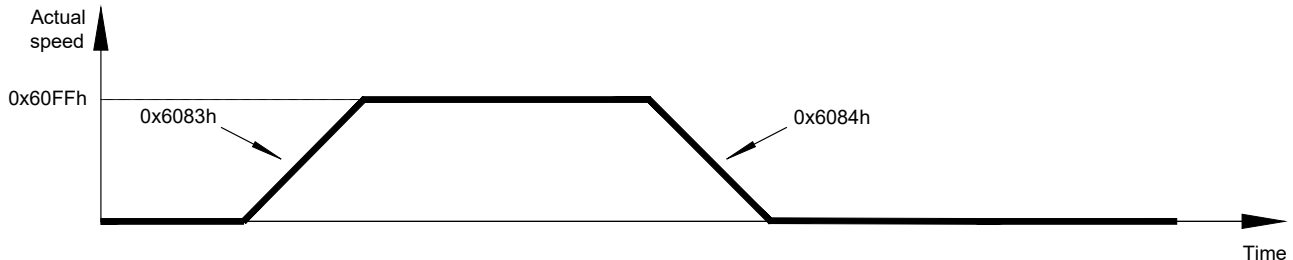
\*\*\*: 详情参考对象描述

Bit	Name	Value	Description
10	Target reached	0	Halt (bit 8 in controlword) = 0: Target not reached Halt (bit 8 in controlword) = 1: Axis decelerates
		1	Halt (bit 8 in controlword) = 0: Target reached Halt (bit 8 in controlword) = 1: Velocity of axis is 0
12	Speed	0	Speed is not equal 0
		1	Speed is equal 0
13	Max slippage error	0	Maximum slippage not reached
		1	Maximum slippage reached

### 3.4.3 功能描述

轮廓速度模式通过设定的速度，加速度，减速度运动。通过Halt(0x6040 / 0x6840 / 0x7040 / 0x7840\_bit8)停止运动控制。

1. Target velocity (60FFh / 68FFh / 70FFh / 78FFh)
2. Profile acceleration (6083h / 6883h / 7083h / 7883h)
3. Profile deceleration (6084h / 6884h / 7084h / 7884h)



注：上图以1号轴为例。

控制对象数据：

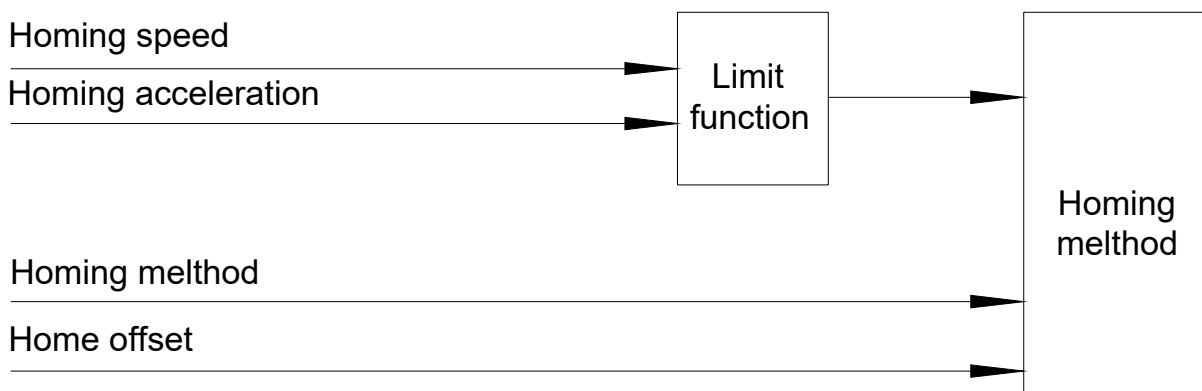
Event		Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation +halt	0x6040=271(010Fh)
Set mode of operation	Profile velocity mode	0x6060=3(3h)
Set motion parameter	Target velocity	0x60FF=20000(4E20h)
	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h)
Velocity mode	Start	0x6040=15(Fh)
	Stop	0x6040=271(010Fh)

注：表格内容以1号轴为例。

## 3.5 原点模式

### 3.5.1 模式说明

本节描述了驱动器寻找起始位置(也称为基准点，参考点或零点)的方法。通过限位有多种回原方法可以实现。通过行程末端的行程开关或行程中间的归零开关(零点开关)，以及大多数方法还使用增量编码器的index(Z相信号)脉冲信号来实现功能。



## 3.5.2 主要控制寄存器对象

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT16	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT16	RO	YES
0x6060	0x6860	0x7060	0x7860	Mode of operation	INT8	WO	YES
0x6098	0x6898	0x7098	0x7898	Home method	INT8	RW	NO
0x6099	0x6899	0x7099	0x7899	Homing speed	-	-	-
0x609A	0x689A	0x709A	0x789A	Homing acceleration	INT32	RW	YES
0x3271	0x3471	0x3671	0x3871	Home switch_Step Servo	INT8	RW	YES
0x2620	0x2820	0x2A20	0x2C20	Home switch_Step	INT32	RW	YES
0x607C	0x687C	0x707C	0x787C	Home offset	INT32	RW	YES

原点模式下的控制字(6040h / 6840h / 7040h / 7840h)

15	9	8	7	6	5	4	3	0
***	Halt		****	Reserved(0)		Homing operation start		***

\*\*\*: 详细参考对象描述

Bit	Name	Value	Description
4	Homing operation start	0	Do not start homing procedure
		1	Start or continue homing procedure
8	Halt	0	Enable bit4
		1	Stop axis according to halt option code

原点模式下的状态字(6041h / 6841h / 7041h / 7841h)

15	14	13	12	11	10	9	0	
***	Homing error		Homing attained		****	Target reached		***

\*\*\*: 详情参考对象描述

Bit13	Bit12	Bit10	Definition
0	0	0	Homing procedure is in progress
0	0	1	Homing procedure is interrupted or not started
0	1	0	Homing is attained, but target is not reached
0	1	1	Homing is procedure is completed successfully
1	0	0	Homing error occurred, velocity is not 0
1	0	1	Homing error occurred, velocity is 0
1	1	X	Reserved

### 3.5.3 功能描述

回原模式一般工作在限位开关和原点信号上(0x60FDh / 0x68FDh / 0x70FDh / 0x78FDh)。

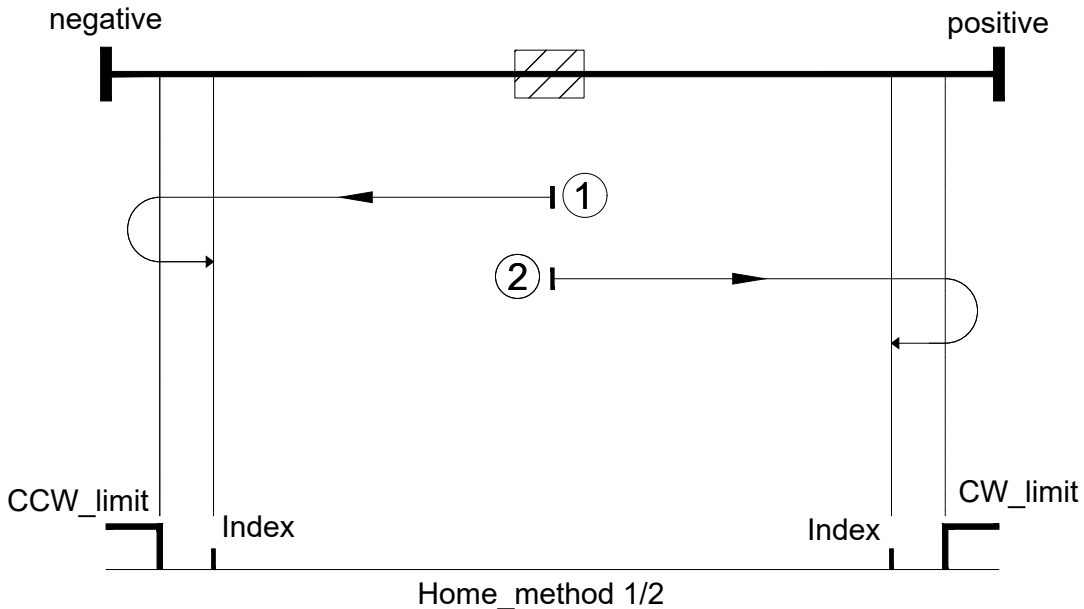
控制对象数据:

Event		Set parameter
Enable motor power	Shut down	0x6040=06(06h)
	Switch on	0x6040=07(07h)
	Switch on+ enable operation	0x6040=15(0Fh)
Set mode of operation	Homing mode	0x6060=06(06h)
Set home method	Home method=13	0x6098=13(0Dh)
Set motion parameters	Homing acceleration	0x609A=200000(030D40h)
	Velocity for switch	0x6099_sub1=20000(4E20h)
	Velocity for index	0x6099_sub2=2000(07D0h)
	Homing offset	0x607C=100000(0186A0h)
	Homing switch	0x3271=5(05h)
Homing mode	Homing start	0x6040=31(1Fh)
	Homing stop	0x6040=287(011Fh)

注：表格内容以步进伺服产品1号轴为例。

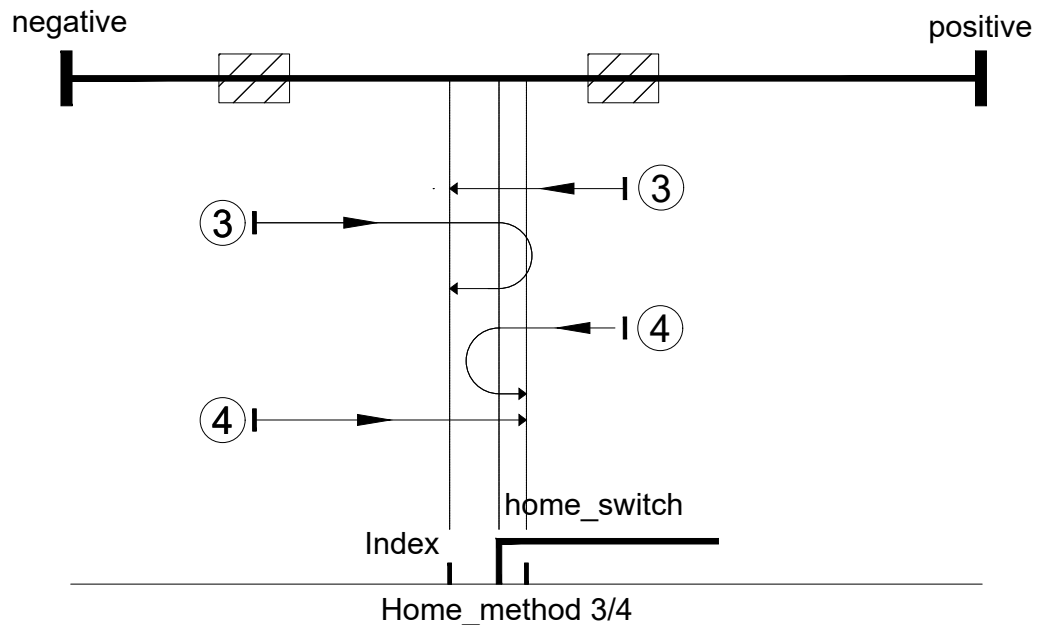
### 3.5.4 方式1和2

如果当前限位信号未激活，电机运动方向在方式1的时候向左(负限位)或者方式2的时候向右(正限位)。原点的位置在离开限位之后到达第一个Index信号的地方。



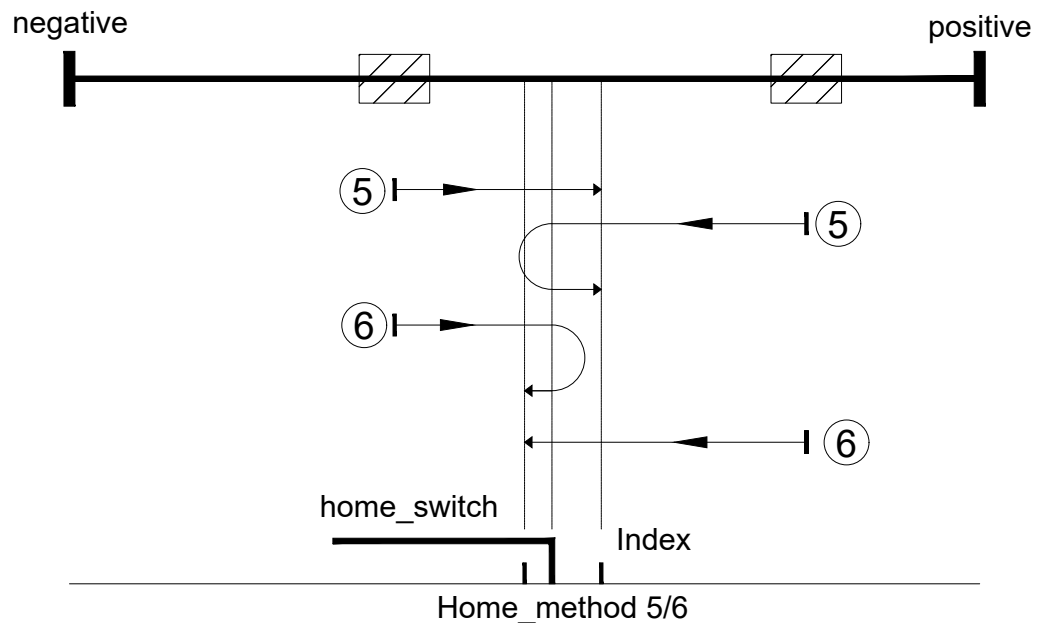
### 3.5.5 方式3和4

初始运动方向依据当前原点信号状态。原点的位置在原点信号发生变化之后触发第一个Index信号的地方。在执行回原点过程中，如果初始位置在原点位置方向之后，电机运动方向将发生改变，发生改变的点将在原点信号状态发生改变之后任意位置。



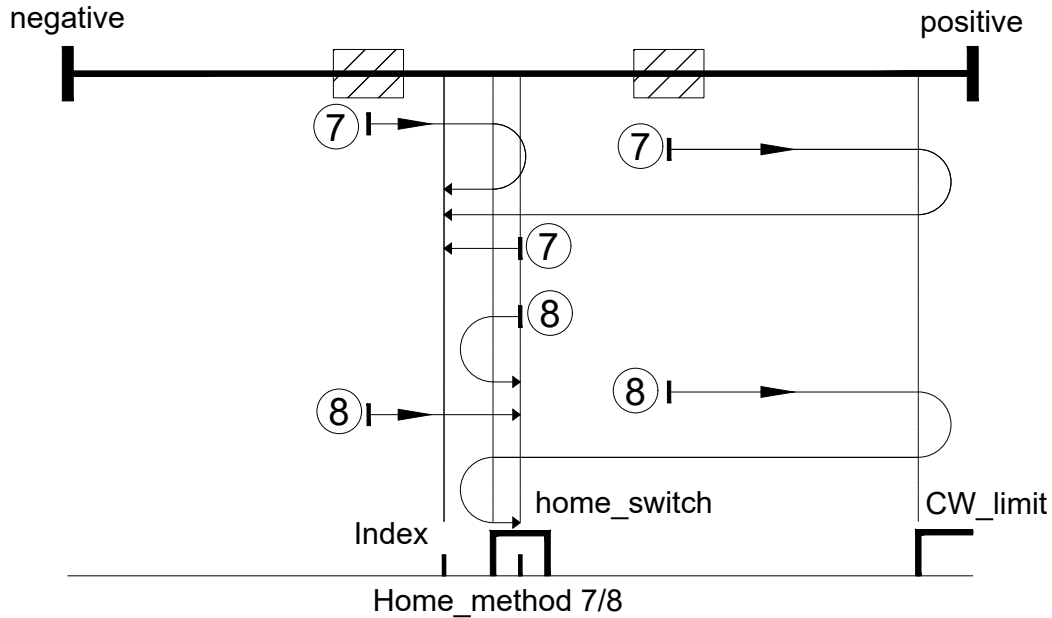
### 3.5.6 方式5和6

初始运动方向依据当前原点信号状态。原点的位置在原点信号发生变化之后触发第一个Index信号的地方。在执行回原点过程中，如果初始位置在原点位置方向之后，电机运动方向将发生改变，发生改变的点将在原点信号状态发生改变之后任意位置。



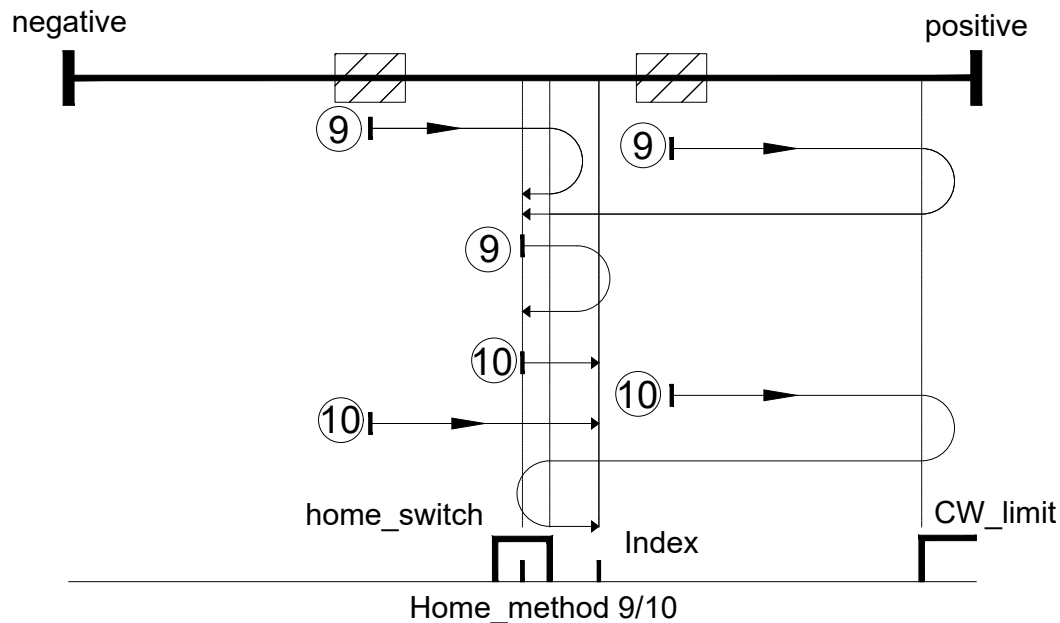
### 3.5.7 方式7和8

如果正向限位开关未激活，则初始运动方向应向右。使用方法7，原点位置应在原点开关的左侧，原点信号状态下降沿方向第一个Index信号处。方法8是原点位置应在原点开关左侧，原点信号状态上升沿方向第一个Index信号处。



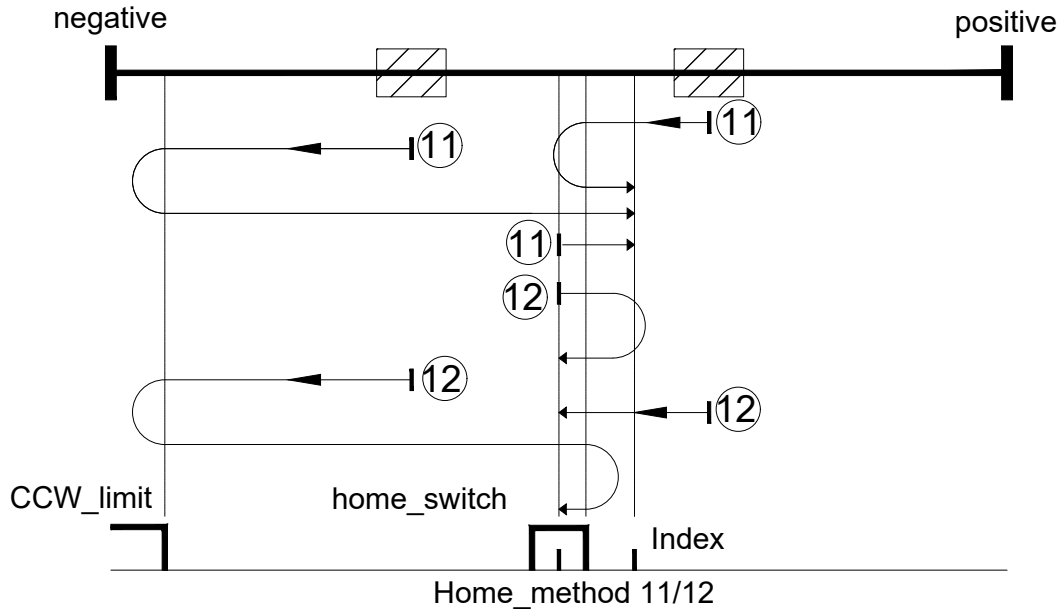
### 3.5.8 方式9和10

如果正向限位开关未激活，则初始运动方向应向右。使用方法9，原点位置应在原点开关的右侧，原点信号状态上升沿方向第一个Index信号处。方法10是原点位置应在原点开关右侧，原点信号状态下沿方向第一个Index信号处。



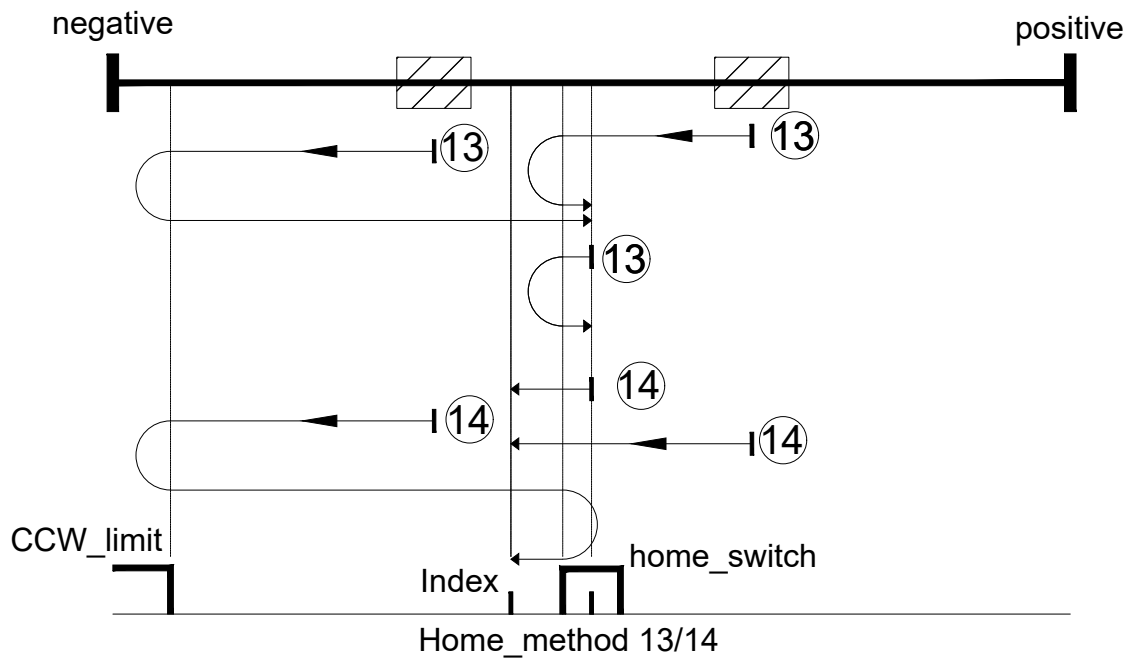
### 3.5.9 方式11和12

如果负限位开关未激活，则初始运动方向应向左。使用方法11，原点位置应在原点开关的右侧，原点信号状态下降沿方向第一个Index信号处。方法12是原点位置应在原点开关右侧，原点信号状态上升沿方向第一个Index信号处。



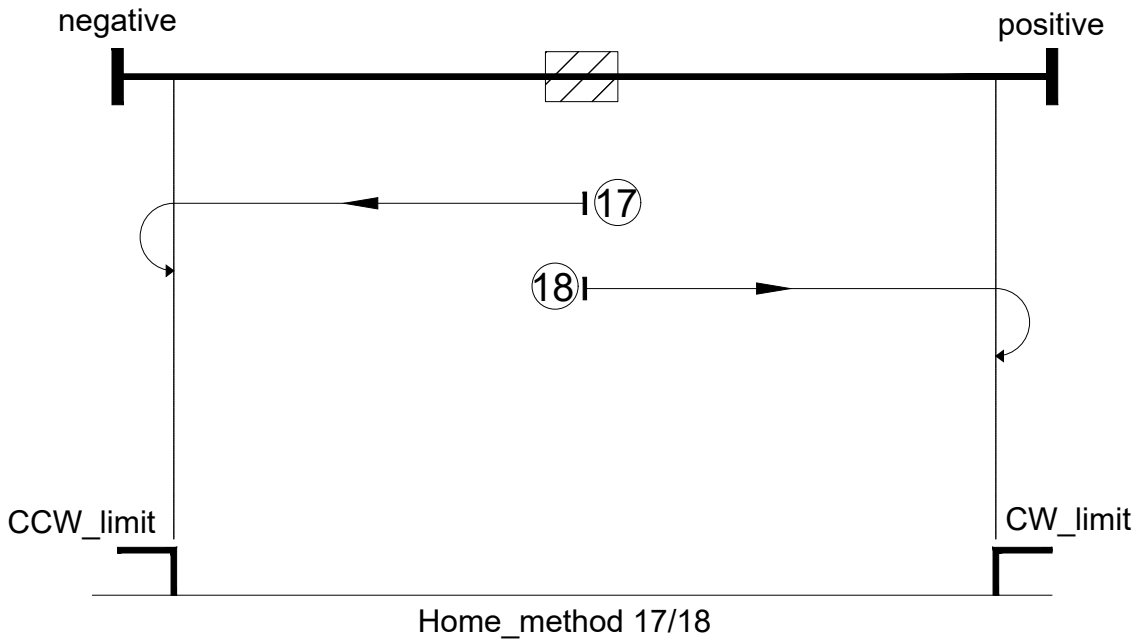
### 3.5.10 方式13和14

如果负向限位开关未激活，则初始运动方向应向左。使用方法13，原点位置应在原点开关的左侧，原点信号状态上升沿方向第一个Index信号处。方法14是原点位置应在原点开关左侧，原点信号状态下降沿方向第一个Index信号处。



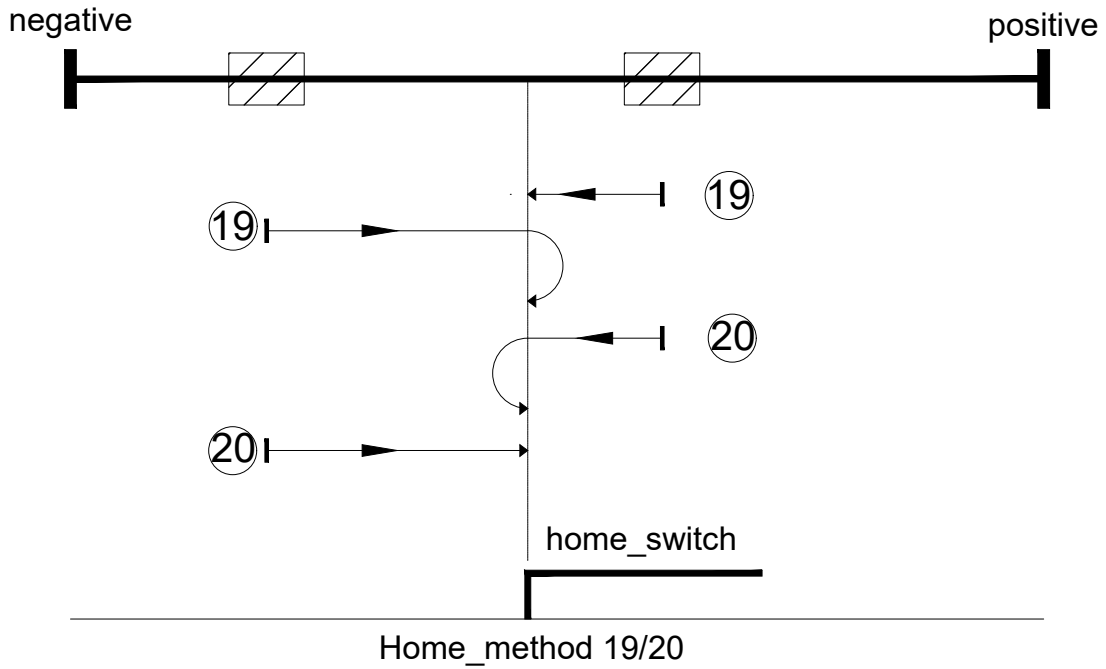
### 3.5.11 方法17和18

方法17和18与方法1和2相似。不同之处在于，原点位置不取决于Index信号，而仅取决于相关的原点信号或限位开关。



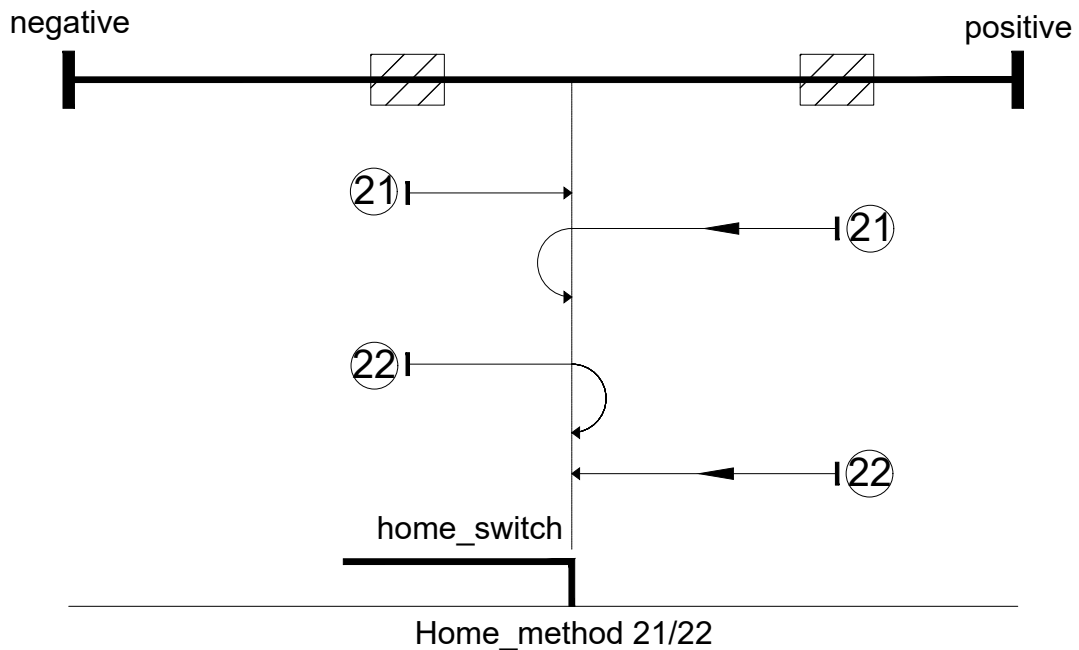
### 3.5.12 方法19和20

方法19和20与方法3和4相似。不同之处在于，原点位置不取决于Index信号，而仅取决于相关的原点信号或限位开关。



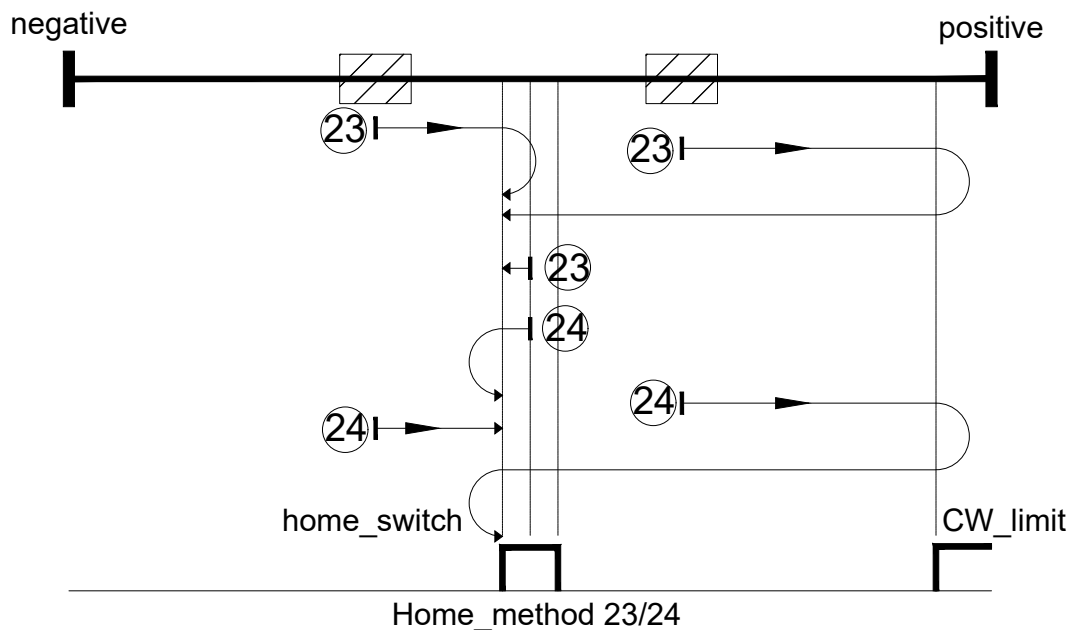
### 3.5.13 方法21和22

方法21和22与方法5和6相似。不同之处在于，原点位置不取决于Index信号，而仅取决于相关的原点信号或限位开关。



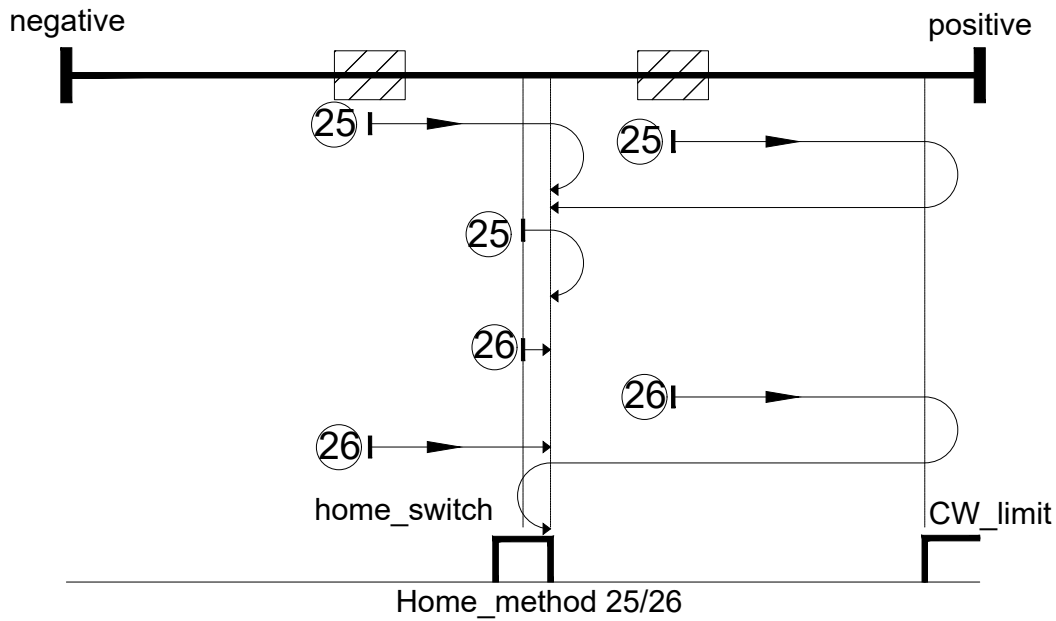
### 3.5.14 方法23和24

方法23和24与方法7和8相似。不同之处在于，原点位置不取决于Index信号，而仅取决于相关的原点信号或限位开关。



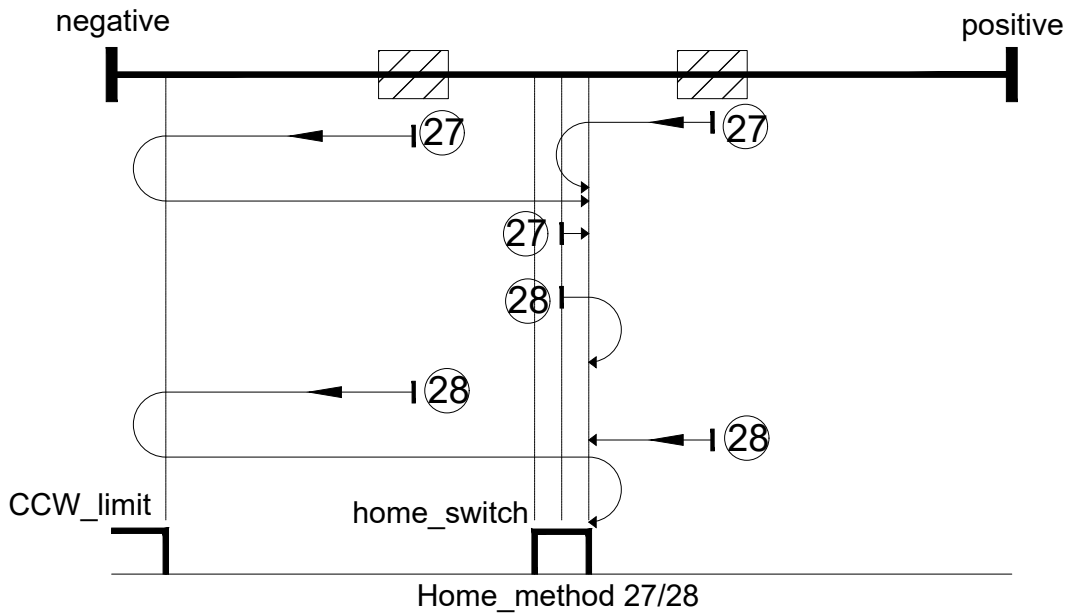
### 3.5.15 方法25和26

方法25和26与方法9和10相似。不同之处在于，原点位置不取决于Index信号，而仅取决于相关的原点信号或限位开关。



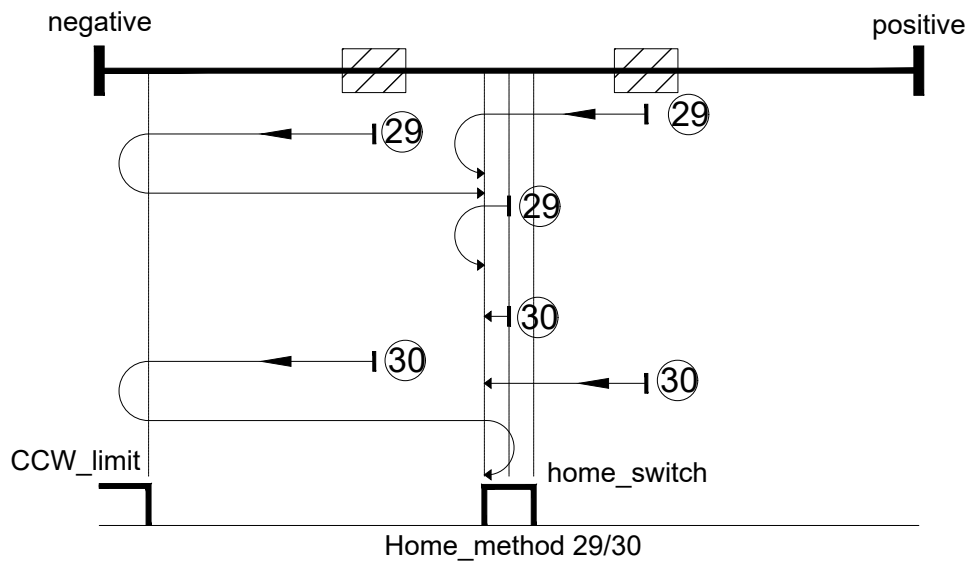
### 3.5.16 方法27和28

方法27和28与方法11和12相似。不同之处在于，原点位置不取决于Index信号，而仅取决于相关的原点信号或限位开关。



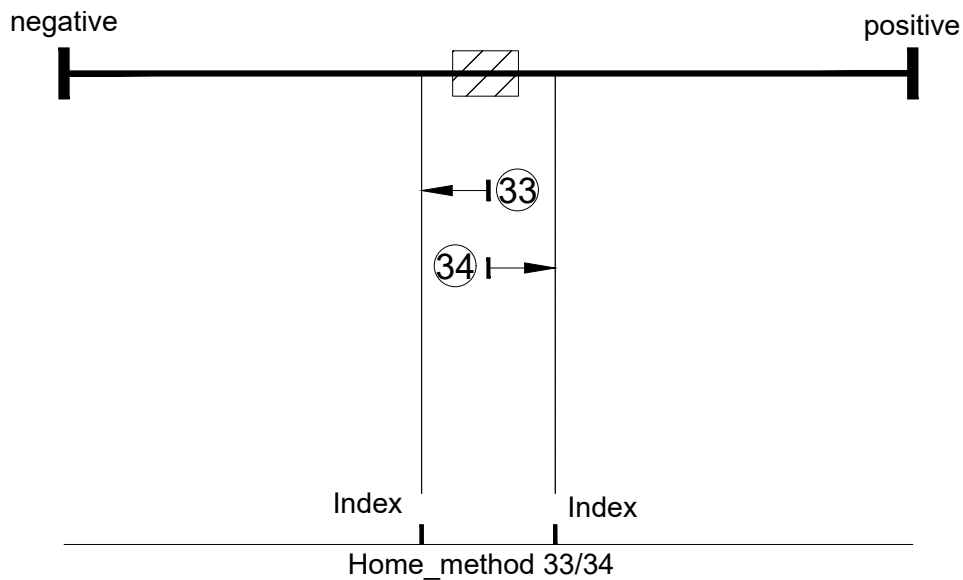
### 3.5.17 方法29和30

方法29和30与方法13和14相似。不同之处在于，原点位置不取决于Index信号，而仅取决于相关的原点信号或限位开关。



### 3.5.18 方法33和34

用方法33或34，方法33电机选择负方向移动，方法34选择正方向运动，原点位置即该方向第一个Index信号位置。



### 3.5.19 方法35

用这种方法，当前位置即为原点位置。此方法不需要驱动设备处于操作运行状态。

### 3.5.20 方法37

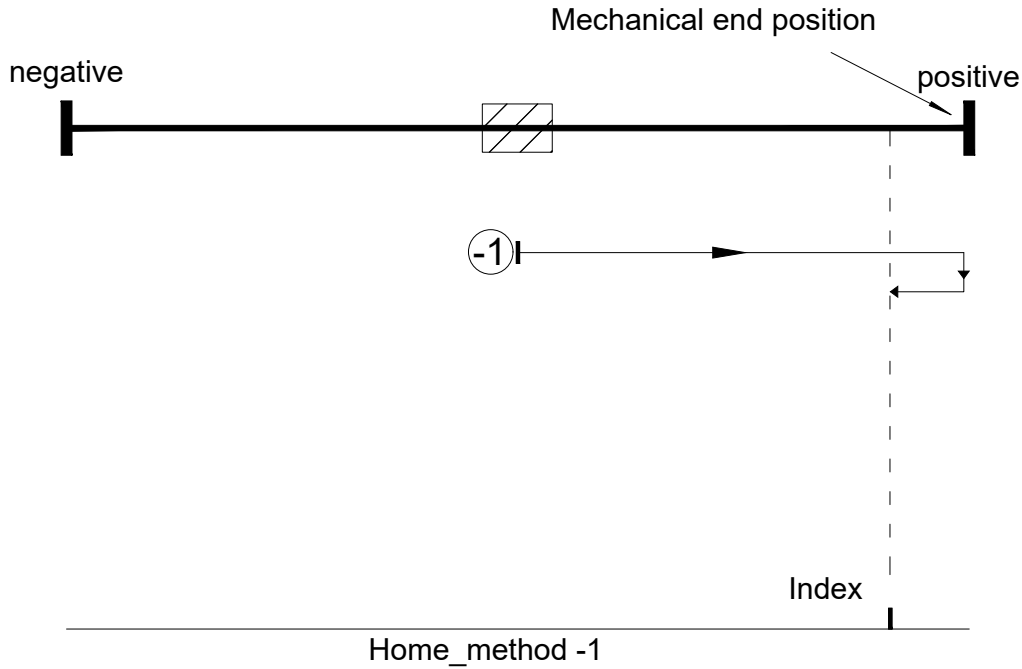
在这种方法中，位置传感器信息(以用户定义的位置单位转换)作为原点位置。此方法不需要驱动设备处于操作运行状态。在回原点位置(即回原点后)，位置实际值(6064h)的计算方式如下：

$$\text{Position actual value (6064h)} = \text{Home offset (607C}_h\text{)}$$

此外，我们提供了在没有限位传感器情况下利用硬限位回原点方式。

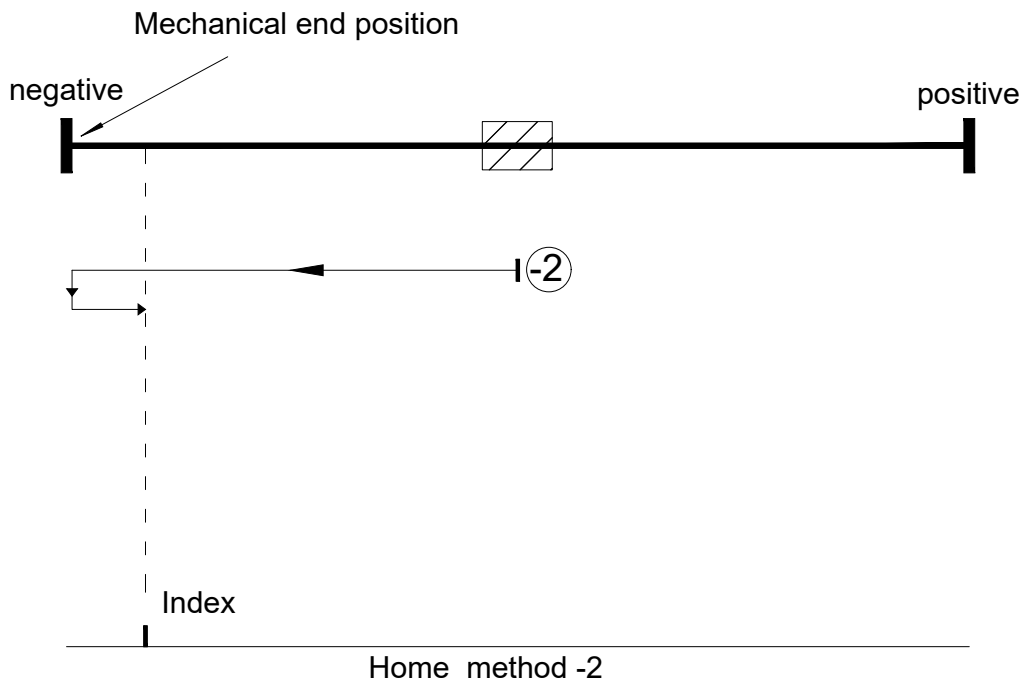
### 3.5.21 方法-1

在此模式下，初始方向为右，并且到达终端机械位置之后，电机将会返回并到达第一个Index信号处。。



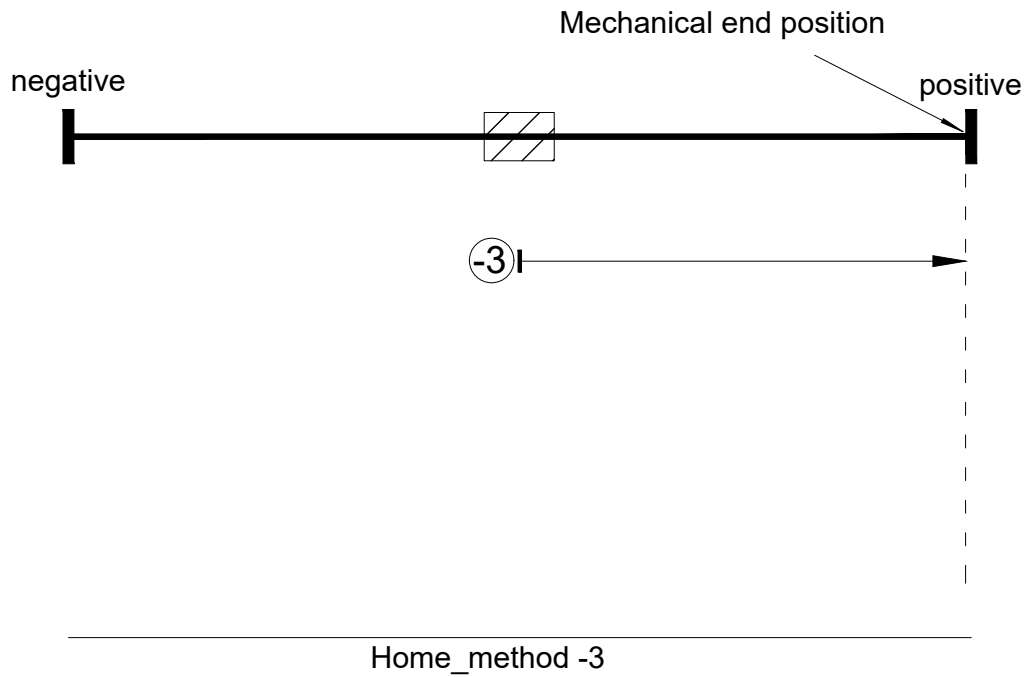
### 3.5.22 方法-2

在此模式下，初始方向为左，并且到达终端机械位置之后，电机将会返回并到达第一个Index信号处。



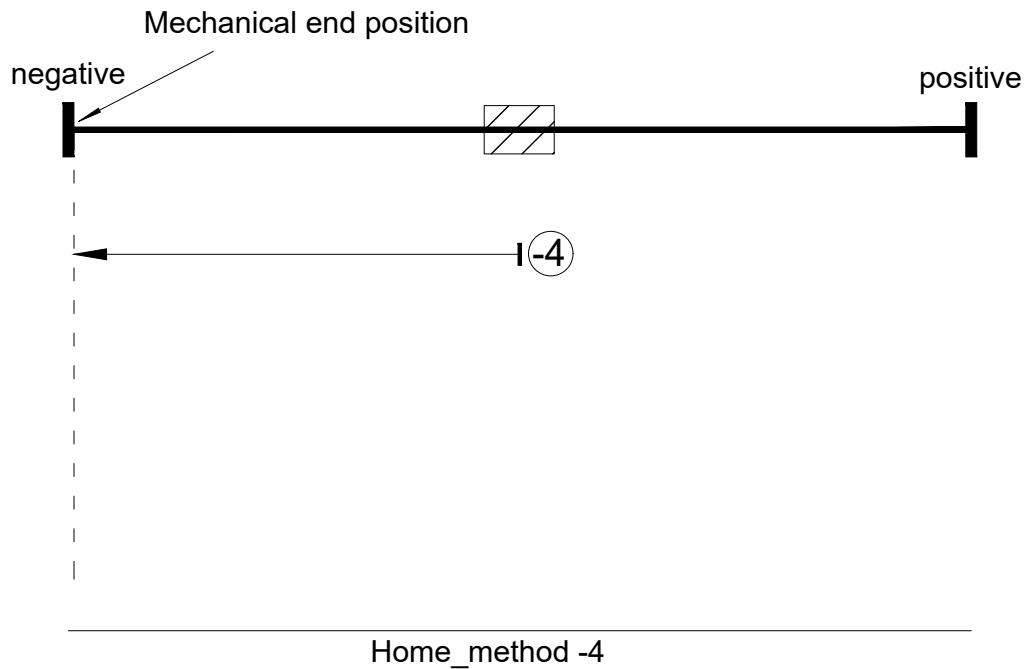
### 3.5.23 方法-3

在此模式下，初始方向为向右，并且到达终端机械位置停止。



### 3.5.24 方法-4

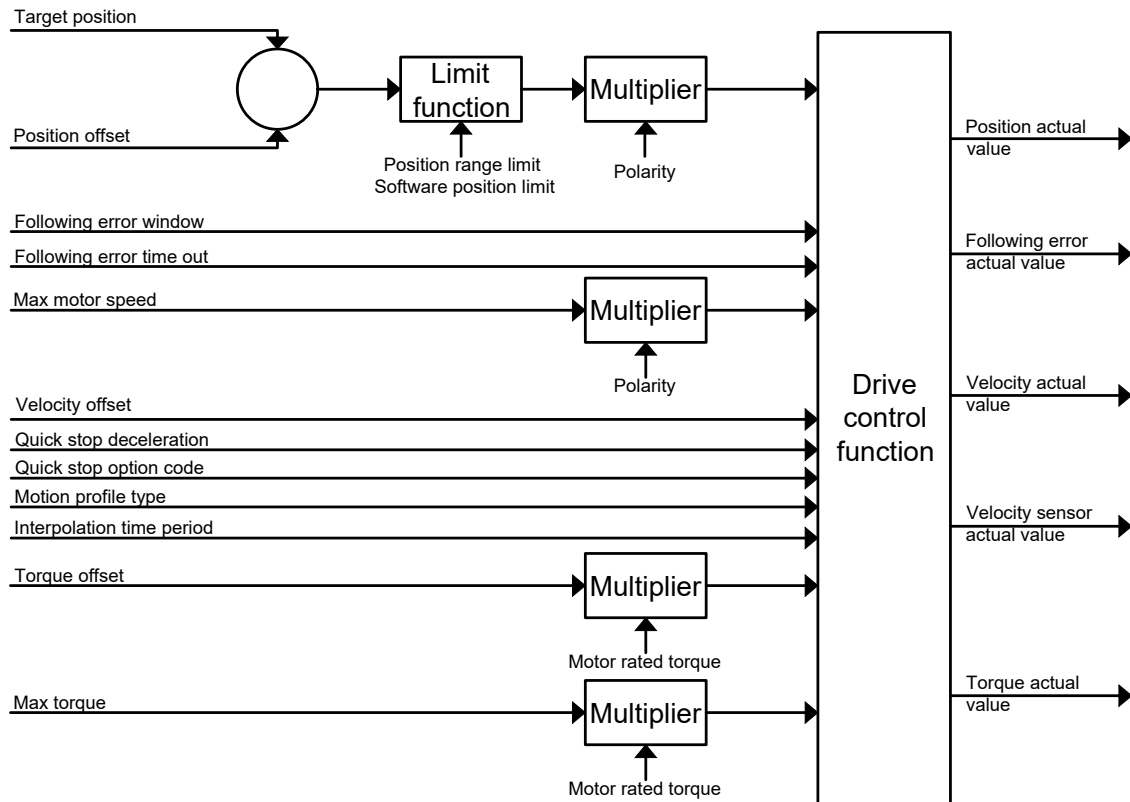
在此模式下，初始方向为向右，并且到达终端机械位置停止。



### 3.6 同步位置模式CSP

#### 3.6.1 模式说明

在此模式下，轨迹生成器位于控制设备中，而不位于驱动设备中。它以循环同步的方式向驱动装置提供目标位置，该驱动装置执行位置控制，速度控制和转矩控制。



#### 3.6.2 主要控制寄存器对象

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT	RO	YES
0x6060	0x6860	0x7060	0x7860	Mode of operation	INT	WO	YES
0x607A	0x687A	0x707A	0x787A	Target position	INT	WO	YES
0x60B0	0x68B0	0x70B0	0x78B0	Position offset	DINT	RW	YES
0x6085	0x6885	0x7085	0x7885	Quick stop deceleration	UDINT	RW	YES
0x605A	0x685A	0x705A	0x785A	Quick stop option code	INT	RW	YES
0x6064	0x6864	0x7064	0x7864	Position actual value	DINT	RO	YES
0x60F4	0x68F4	0x70F4	0x78F4	Following error actual value	DINT	RO	YES
0x606C	0x686C	0x706C	0x786C	Velocity actual value	DINT	RO	YES
0x6065	0x6865	0x7065	0x7865	Following error window	UDINT	RW	NO

控制字(6040h / 6840h / 7040h / 7840h)

同步位置模式下，控制字没有特定功能位。

## 状态字(6041h / 6841h / 7041h / 7841h)

15	14	13	12	11	10	9	0
***	Following error	Drive follows the command value	****	Status toggle	***		

\*\*\*: 详情参考对象描述

Bit	Value	definition
10	0	Reserved
	1	Reserved
12	0	Target position ignored
	1	Target position used as input to position control loop
13	0	No following error
	1	Following error

状态字bit12是必须有的，bit13为可选状态。

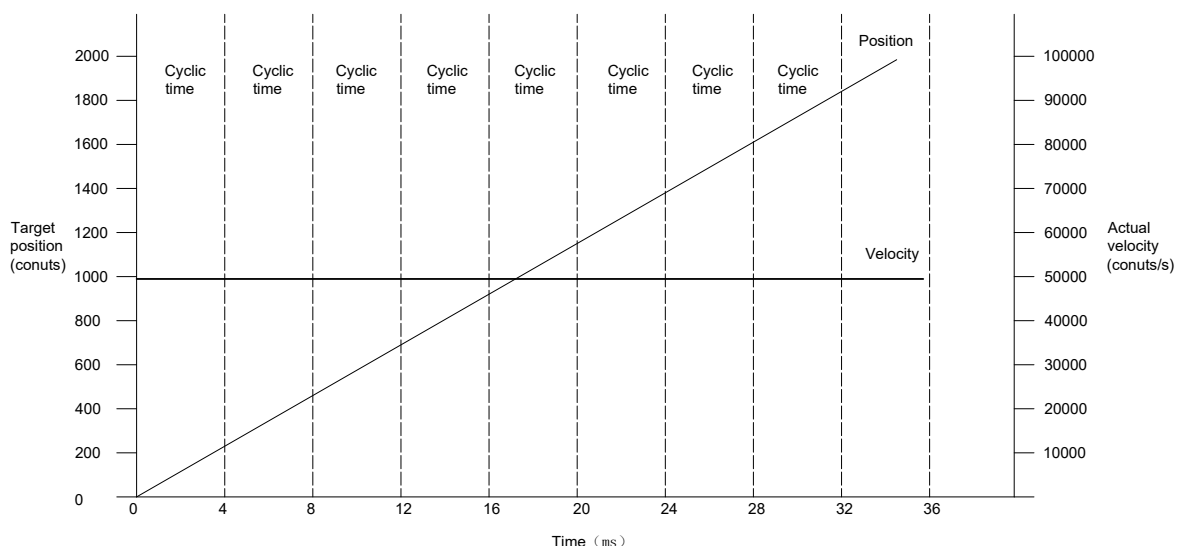
在轮廓位置模式中bit10作为目标位置到达状态信息。但是在CSP模式下，目标位置由控制器循环发送给驱动器，该位用作状态切换信息。以指示设备是否提供更新的输入数据。输入过程数据的每次更新都应切换该位。

如果由于局部原因（内部Set-point设置）而导致驱动器不跟随目标值(位置，速度或转矩)，则Bit12应为0。如果有将输入配置为停止功能或安全功能，则驱动器将无法遵循目标设定值运行。则控制设备应判断该位以做出相应动作。如果驱动器处于操作启用状态，并且遵循控制设备的目标值和设定值，则bit12应该为1。在所有其他情况下，该值为零。如果不支持该位，则应将其在状态字中固定设置为1。

### 3.6.3 功能描述

在这种模式下，控制设备应在每次循环通讯中提供目标位置。电机的速度，加速度，减速度基于循环时间和目标位置。

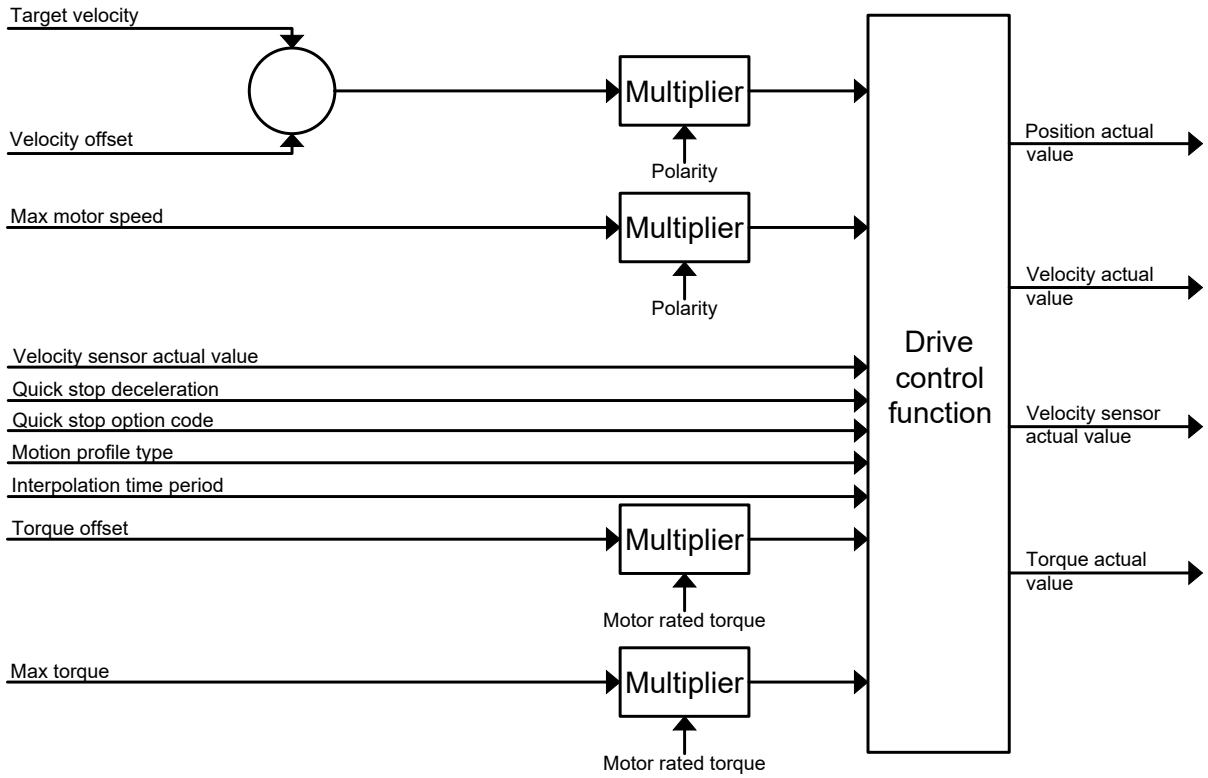
**注意：**在驱动器模式更改为CSP模式和操作状态之前，控制设备应将目标位置更新为与驱动器的实际位置相同的位置。如果它不等于驱动器的位置实际值，则激活操作模式后，驱动器将移动到新位置。



### 3.7 同步速度模式

#### 3.7.1 模式说明

在此模式下，轨迹生成器位于控制设备中，而不位于驱动设备中。它以循环同步的方式向驱动设备提供目标速度，驱动设备执行速度控制和转矩控制。



### 3.7.2 主要控制寄存器对象

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT	RO	YES
0x6060	0x6860	0x7060	0x7860	Mode of operation	INT	WO	YES
0x60B1	0x68B1	0x70B1	0x78B1	Velocity offset	DINT	RW	YES
0x6085	0x6885	0x7085	0x7885	Quick stop deceleration	UDINT	RW	NO
0x60FF	0x68FF	0x70FF	0x78FF	Target velocity	DINT	RW	YES

控制字(6040h / 6840h / 7040h / 7840h)

同步速度模式下，控制字没有特定功能位。

状态字(6041h / 6841h / 7041h / 7841h)

15	14	13	12	11	10	9	0
***	Reserved	Drive follows the command value		****	Reserved	***	

\*\*\*: 详情参考对象描述

Bit	Value	Definition
10	0	Reserved
	1	Reserved
12	0	Target velocity ignored
	1	Target velocity used as input to velocity control loop
13	0	Reserved
	1	Reserved

同步速度模式下，bit12为必须要的。

在CSV模式下，bit10用作状态切换信息，以指示设备是否提供更新的输入数据。输入过程数据的每次更新都应切换该位。

如果由于局部原因（内部Set-point设置）而导致驱动器不跟随目标值(位置，速度或转矩)，则Bit12应为0。如果有将输入配置为停止功能或安全功能，则驱动器将无法遵循目标设定值运行。则控制设备应判断该位以做出相应动作。如果驱动器处于操作启用状态，并且遵循控制设备的目标值和设定值，则bit12应该为1。在所有其他情况下，该值为零。如果不支持该位，则应将其在状态字中固定设置为1。

### 3.7.3 功能描述

在CSV模式下，驱动器你可以在每个循环事件改变速度。当驱动器切换到运行模式，电机的速度依据0x60FF/0x68FF/0x70FF/0x78FF对象更新，在一个循环时间内改变目标速度意味着更新当前运行速度。

加减速基于循环时间和目标速度单位时间内的变化改变。

## 3.8 探针功能

### 3.8.1 功能描述

探针功能一般通过捕获传感器和Index的上升或者下降沿的信号锁存反馈的位置。通过鸣志驱动器提供的配套软件配置X7或者X8的探针功能即可。

### 3.8.2 主要控制寄存器对象

Index				Name	Type	Access	Mapping
0x60B8	0x68B8	0x70B8	0x78B8	Touch probe function	INT	RW	YES
0x60B9	0x68B9	0x70B9	0x78B9	Touch probe status	UINT	RO	YES
0x60BA	0x68BA	0x70BA	0x78BA	Touch probe pos1 pos value	DINT	RO	YES
0x60BB	0x68BB	0x70BB	0x78BB	Touch probe pos1 neg value	DINT	RO	YES
0x60BC	0x68BC	0x70BC	0x78BC	Touch probe pos2 pos value	DINT	RO	YES
0x60BD	0x68BD	0x70BD	0x78BD	Touch probe pos2 neg value	DINT	RO	YES

### 3.8.3 功能

0x60B8 / 0x68B8 / 0x70B8 / 0x78B8 Touch probe function

该对象包含探针功能的配置信息。

Bit	Value	Definition
0	0	Swith off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continous
3,2	00	Trigger with touch probe 1 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index01
	11	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 negtive edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6,7	-	Reserved
8	0	Swith off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	Continous
11,10	00	Trigger with touch probe 2 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index02
	11	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 negtive edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14,15	-	Reserved

## 0x60B9 / 0x68B9 / 0x70B9 / 0x78B9 Touch probe function

该对象提供探针功能的状态。

Bit	Value	Definition
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...7	-	Reserved
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 probe 2 negative edge position stored
11...15	-	Reserved

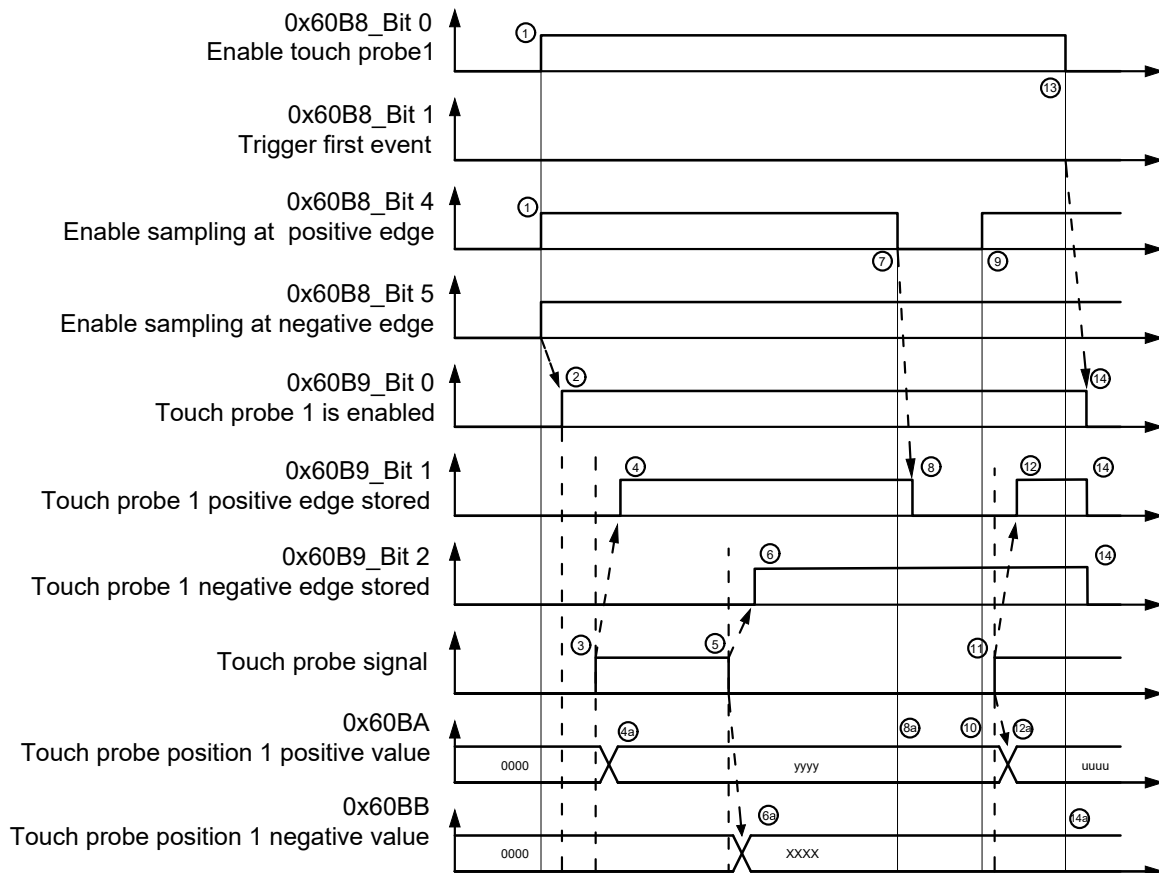
## 0x60BA / 0x68BA / 0x70BA / 0x78BA ~ 0x60BD / 0x68BD / 0x70BD / 0x78BD

Touch probe position value

该对象提供探针功能触发之后捕获的位置值。

### 3.8.4 时序图

下图显示说明了关于探针功能时序图和相应行为，同时下面的表格为时序图做了解释。



注：时序图中以1号轴为例。

Number	Touch probe behavior	
(1)	60B8_bit0 = 1 60B8_bit1,4,5	Enable touch probe 1 Configure and enable touch probe 1 positive and negative edge
(2)	→60B9_bit 0 = 1	Status"Touch probe 1 enabled" is set
(3)		External touch probe signal has positive edge
(4)	→60B9_bit 1 = 1	Status"Touch probe 1 positive edge stored" is set
(4a)	→60BA	Touch probe position 1 positive value is stored
(5)		External touch probe signal has negative edge
(6)	→60B9_bit 2 = 1	Status"Touch probe 1 negative edge stored" is set
(6a)	60BB	Touch probe position 1 negative value is stored
(7)	60B8_bit 4 = 0	Sample positive edge is disabled
(8)	→60B9_bit 0 = 0	Status"Touch probe 1 positive edge stored" is reset
(8a)	→60BA	Touch probe position 1 positive value is not changed
(9)	60B8_bit 4 = 1	Sample positive edge is enabled
(10)	→60BA	Touch probe position 1 positive value is not changed
(11)		External touch probe signal has positive edge
(12)	→ 60B9_bit 1 = 1	Status "Touch probe 1 positive edge stored" is set
(12a)	→ 60BA	Touch probe position 1 positive value is stored
(13)	60B8_bit 0 = 0	Touch probe 1 is disabled
(14)	→ 60B9_bit 0, 1, 2 = 0	Status bits are reset
(14a)	→ 60BA, 60BB	Touch probe position 1 positive/negative value are not changed

注：表中内容以1号轴为例。

## 4 对象字典

在CoE协议下，鸣志步进和步进伺服驱动器在EtherCAT通讯中遵循CANopen协议。对象字典内的内容与CANopen驱动器基本一致。

### 4.1 CoE 对象字典描述

Index	Description
0x0000~0x0FFF	Data type area
0x1000~0x1FFF	CoE communication area
0x2000~0x5FFF	Manufacturer specific area
0x6000~0x9FFF	Profile area
0xA000~0xFFFF	Reserved

### 4.2 双轴对象字典

#### 4.2.1 CoE(1000h) 配置文件

	Index	Sub	Name	Access	Type	Mapping
CoE(1000h)	<a href="#">0x1000</a>	-	Device type	RO	UDINT	NO
	<a href="#">0x1001</a>	-	Error register	RO	USINT	NO
	<a href="#">0x1008</a>	-	Device name	RO	STRING(20)	NO
	<a href="#">0x1009</a>	-	Manufacturer hardware version	RO	STRING(4)	NO
	<a href="#">0x100A</a>	-	Manufacturer software version	RO	STRING(4)	NO
	<a href="#">0x1010</a>	-	Store parameters	-	-	-
		1	Store all parameters	RW	UDINT	NO
	<a href="#">0x1011</a>	-	Restore default parameters	-	-	-
		1	Restore default parameters	RW	UDINT	NO
	<a href="#">0x1018</a>	-	Identity object	-	-	-
		1	Vendor ID	RO	UDINT	NO
		2	Product code	RO	UDINT	NO
		3	Revision	RO	UDINT	NO
	<a href="#">0x10F1</a>	-	Error settings	-	-	-
		1	Local error reaction	RW	UDINT	NO
		2	Sync error counter limit	RW	UINT	NO
		4	...	...	...	...

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
CoE	<a href="#">0x1600~1603</a>	<a href="#">0x1610~1613</a>	8	RPDO mapping parameter 1~4	-	-	-
			1	Mapping entry 1	RW	UDINT	NO
			2	Mapping entry 2	RW	UDINT	NO
			...	...	RW	UDINT	NO
			12	Mapping entry 12	RW	UDINT	NO
			-	TPDO mapping parameter1~4	-	-	-
	<a href="#">0x1A00~1A03</a>	<a href="#">0x1A10~1A13</a>	1	Mapping entry 1	RW	UDINT	NO
			2	Mapping entry 2	RW	UDINT	NO
			...	...	...	...	-
			12	Mapping entry 12	RW	UDINT	NO
			...	...	...	...	...
			...	...	...	...	...

	Index	Sub	Name	Access	Type	Mapping
CoE(1000h)	0x1C00	-	SYNC manager type	-	-	-
		1	SM0 communication type	RO	USINT	NO
		2	SM1 communication type	RO	USINT	NO
		3	SM2 communication type	RO	USINT	NO
		4	SM3 communication type	RO	USINT	NO
	0x1C12~ 1C13	-	RxPDO~TxPDO assign	-	-	-
		1	RxPDO~TxPDO 1 mapping object	RW	UINT	NO
		2	RxPDO~TxPDO 2 mapping object	RW	UINT	NO
		3	RxPDO~TxPDO 3 mapping object	RW	UINT	NO
		4	RxPDO~TxPDO 4 mapping object	RW	UINT	NO
	0x1C32~ 1C33	-	SM output~input parameter	-	-	-
		1	Synchronization type	RW	UINT	NO
		2	Cycle time	RO	UDINT	NO
		3	Shift time	RW	UDINT	NO
		4	Synchronization types supported	RO	UINT	NO
		5	Minimum cycle time	RO	UDINT	NO
		6	Calc and copy time	RO	UDINT	NO
		8	Get cycle time	RW	UINT	NO
		9	Delay time	RO	UDINT	NO
		10	Sync0 cycle time	RW	UDINT	NO
		11	SYNC-Event missed	RO	UINT	NO
		12	Cycle time too small	RO	UINT	NO
		32	Sync error	RO	BOOL	NO

### 0x1000 Device type

包含有关设备类型的信息。该对象描述了设备的类型及其功能。它包含一个16位的描述设备文件或者应用文件以及另外一个16位的附加信息组成。附加的信息参数是设备特定的配置文件。它的规范不属于标准的范围，它是在相应的设备配置文件中定义的。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1000	-	Device type	UDINT32	RO	NO	-

Bit 0-15: 设备配置文件编号

Bit 16-31: 附加信息

### 0x1001 Error register

该对象作为设备的错误寄存器。设备在该寄存器记录内部错误，所有设备必须记录。它是紧急对象的一部分。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1001	-	Error register	USINT8	RO	NO	-

Bit 0: 普通错误

Bit 1: 电路

Bit 2: 电压

Bit 3: 温度

Bit 4: 通讯错误 (过载, 状态错误)

Bit 5-7: 预留 (总是 0)

### 0x1008 Manufacturer device name

包含自定义设备名称

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1008	-	Manufacturer device name	STRING(20)	CONST	NO	-

Name of the manufacturer as string.

### 0x1009 Hardware version

包含硬件版本号描述

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1009	-	Hardware version	STRING(4)	CONST	NO	-

### 0x100A Software version

包含软件版本号描述

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x100A	-	Software version	STRING(4)	CONST	NO	-

### 0x1010 Store parameters

该对象支持将参数保存在非易失性存储器中。通过读取访问设备 提供有关其保存功能的信息。区分了几个参数组：

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1010	0	Number of sub-index	USINT8	RO	NO	1
	1	Store parameters	UDINT32	RW	NO	0

为了避免错误地存储参数，仅在特定参数被写入时才执行存储。参数为“save(保存)”。

	MSB		LSB	
Signature ISO	e	v	a	s
8859("ASCII")hex	65h	76h	61h	73h

Storage write access signature

### 0x1011 Restore default parameters

通过该对象可以将关于通讯和设备文件的默认参数初始化。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1011	0	Number of sub-index	USINT8	RO	NO	1
	1	Restore parameters	UDINT32	RW	NO	0

为了避免错误地储存参数，仅在特定参数被写入时才执行储存，参数为“load”。

	MSB		LSB	
Signature ISO	e	v	a	s
8859("ASCII")hex	64h	61h	6Fh	6Ch

Storage write access signature

## 0x1018 Identity object

该对象包含设备的一般信息。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1018	0	Number of sub-index	USINT8	RO	NO	4
	1	Vendor-ID	UDINT32	RO	NO	-
	2	Product code	UIDINT32	RO	NO	-
	3	Revision number	UDINT32	RO	NO	-
	4	Serial number	UDINT32	RO	NO	-

## 0x10F1 Error settings

预留。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x10F1	0	Number of sub-index	USINT8	RO	NO	4
	1	Local error reaction	UDINT32	RW	NO	1
	2	SYNC error counter limit	UIDINT32	RW	NO	4

## 0x1600~1603 / 0x1610~1613 Axis Receive PDO mapping parameter

包含设备可以接受PDO（RPDO）的映射内容。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x1600-1603	0x1610-1613	0	Number of sub-index	USINT8	RW	NO	4
		1	Mapping entry 1	UDINT32	RW	NO	-
		2	Mapping entry 2	UIDINT32	RW	NO	-
		3	Mapping entry 3	UDINT32	RW	NO	-
		4	Mapping entry 4	UDINT32	RW	NO	-
		5	Mapping entry 5	UDINT32	RW	NO	-
		6	Mapping entry 6	UDINT32	RW	NO	-
		7	Mapping entry 7	UDINT32	RW	NO	-
		8	Mapping entry 8	UDINT32	RW	NO	-
		9	Mapping entry 9	UDINT32	RW	NO	-
		10	Mapping entry 10	UDINT32	RW	NO	-
		11	Mapping entry 11	UDINT32	RW	NO	-
		12	Mapping entry 12	UDINT32	RW	NO	-

### 0x1A00~1A03 / 0x1A10~1A13 Transmit PDO mapping parameter

包含设备可以发送PDO（TPDO）的映射内容。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x1A00-1A03	0x1A10-1A13	0	Number of sub-index	USINT8	RW	NO	12
		1	Mapping entry 1	UDINT32	RW	NO	-
		2	Mapping entry 2	UIDINT32	RW	NO	-
		3	Mapping entry 3	UDINT32	RW	NO	-
		4	Mapping entry 4	UDINT32	RW	NO	-
		5	Mapping entry 5	UDINT32	RW	NO	-
		6	Mapping entry 6	UDINT32	RW	NO	-
		7	Mapping entry 7	UDINT32	RW	NO	-
		8	Mapping entry 8	UDINT32	RW	NO	-
		9	Mapping entry 9	UDINT32	RW	NO	-
		10	Mapping entry 10	UDINT32	RW	NO	-
		11	Mapping entry 11	UDINT32	RW	NO	-
12	Mapping entry 12	UDINT32	RW	NO	-		

### 0x1C00 Sync manager type

该对象设置每个SM发生器的通讯类型，其通讯类型如下：

1. 邮箱接受
2. 邮箱发送
3. RxPDO
4. TxPDO

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C00	0	Number of sub-index	USINT8	RW	NO	4
	1	SM0 communication type	UDINT32	RW	NO	1
	2	SM1 communication type	UIDINT32	RW	NO	2
	3	SM2 communication type	UDINT32	RW	NO	3
	4	SM3 communicaiton type	UDINT32	RW	NO	4

### 0x1C12 RxPDO assign object

RxPDO生效，则该对象子索引1-4用来设置映射的对象。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C12	0	Number of sub-index	USINT8	RW	NO	1
	1	RxPDO1 mapping object	UDINT32	RW	NO	0x1600
	2	RxPDO2 mapping object	UIDINT32	RW	NO	-
	3	RxPDO3 mapping object	UDINT32	RW	NO	-
	4	RxPDO4 mapping object	UDINT32	RW	NO	-

## 0x1C13 TxPDO assign object

TxPDO生效，则该对象子索引1-4用来设置映射的对象。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C13	0	Number of sub-index	USINT8	RW	NO	1
	1	TxPDO1 mapping object	UDINT32	RW	NO	0x1A00
	2	TxPDO2 mapping object	UDINT32	RW	NO	-
	3	TxPDO3 mapping object	UDINT32	RW	NO	-
	4	TxPDO4 mapping object	UDINT32	RW	NO	-

## 0x1C32 SM output parameter

包含同步发生器输出管理参数。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C32	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

## 0x1C33 SM input parameter

包含同步发生器输入管理参数。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C33	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

## 4.2.2 0x2000~2100h配置文件

0x2000~ 2100h	Index	Sub	Name	Access	Type	Mapping
	<a href="#">0x2001</a>	-	EtherCAT ID	RO	UINT16	NO
	<a href="#">0x2002</a>	-	Physical Address	RO	UINT16	NO
	<a href="#">0x2003</a>	-	Alias Source	RO	UINT	NO
	<a href="#">0x2005</a>	-	Bus Voltage	RO	UINT16	NO
	<a href="#">0x2006</a>	-	DSP Version	RO	STRING(10)	NO
	<a href="#">0x2007</a>	-	Drive Temperature 1	RO	UINT	NO
	<a href="#">0x2010</a>	-	Set EtherCAT ID	RW	UINT	NO

0x2000~ 2100h	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
	<a href="#">0x2020</a>	<a href="#">0x2040</a>	-	Axis Output Status	RO	UDINT	NO
	<a href="#">0x2021</a>	<a href="#">0x2041</a>	-	Axis DSP Status Code	RO	UINT32	YES
<a href="#">0x2022</a>	<a href="#">0x2042</a>	-	Axis DSP Alarm Code	RO	UINT32	YES	

## 0x2001 EtherCAT ID

该对象包含驱动器的EtherCAT ID。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2001	-	EtherCAT ID	RO	UINT	NO	-

## 0x2002 Physical Address

该对象包含驱动器的物理地址。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2002	-	Physical address	RO	UINT	NO	-

## 0x2003 Alias Source

该对象用来设置选择EtherCAT 地址方式，0表示由软件设置，1表示由EtherCAT主站设置。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2003	-	Alias Source	RO	UINT	NO	-

## 0x2005 Bus Voltage

该对象提供驱动器的母线电压值。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2005	-	Bus Voltage	RO	UINT	NO	-

## 0x2006 DSP Version

该对象提供驱动器的DSP版本信息。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2006	-	DSP Version	RO	UINT	NO	-

## 0x2007 Drive Temperature 1

该对象包含驱动器温度信息。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2007	-	Drive Temperature 1	RO	UINT	NO	0

该对象单位为0.1摄氏度。

### 0x2010 Set EtherCAT ID

该对象可以设置EtherCAT ID。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2010	-	Set EtherCAT ID	RW	UINT	NO	0

### 0x2020 / 0x2040 Axis Output Status

该对象包含数字输出信号的状态。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2020	0x2040	-	Axis Output Status	RO	UDINT	NO	0x000F0000

Bit	31	20	19	18	17	16	15	0
Output	Reserved	Y4	Y3	Y2	Y1	Reserved		

### 0x2021 / 0x2041 Axis DSP Status Code

该对象反馈当前驱动器DSP状态信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2021	0x2041	-	Axis 1 DSP Status Code	RO	UDINT	YES	-

BIT	Status Code Bit Definition
0	Motor Enabled - motor disabled is this bit = 0
1	Sampling - for Quick Tuner
2	Drive Fault - check alarm code
3	In Position - motor is in position
4	Moving - motor is moving
5	Jogging - currently in jog mode
6	Stopping - in the process of stopping from a stop command
7	Waiting - for an input
8	Saving - parameter data is being saved
9	Alarm present - check alarm code
10	Homing - executing an SH command
11	Wait Time - executing a WT command
12	Wizard running - timing wizard is running
13	Checking encoder - timing wizard is running
14	Q Program is running
15	Initializing

### 0x2022 / 0x2042 Axis DSP Alarm Code

该对象指明位于0x603F里面报警代码的高16位报警信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2022	0x2042	-	Axis DSP Alarm Code	RO	UDINT	YES	-

## 4.2.3 双轴步进伺服通用配置文件

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
0x3200~ 4000h	<a href="#">0x3200</a>	<a href="#">0x3400</a>	-	Continuous current	RW	UINT	NO
	<a href="#">0x3201</a>	<a href="#">0x3401</a>	-	Peak current	RW	UINT	NO
	<a href="#">0x3202</a>	<a href="#">0x3402</a>	-	Hard stop current limit	RW	UINT	NO
	<a href="#">0x3203</a>	<a href="#">0x3403</a>	-	Idle current	RW	UINT	NO
	<a href="#">0x3204</a>	<a href="#">0x3404</a>	-	Idle current delay time	RW	UINT	NO
	<a href="#">0x3205</a>	<a href="#">0x3405</a>	-	Acceleration current	RW	UINT	NO
	<a href="#">0x3206</a>	<a href="#">0x3406</a>	-	Stall prevention time	RW	UINT	NO
	<a href="#">0x3207</a>	<a href="#">0x3407</a>	-	Steps per rev	RO	UINT	NO
	<a href="#">0x3208</a>	<a href="#">0x3408</a>	-	Reverse motor direction	RW	UINT	NO
	<a href="#">0x3209</a>	<a href="#">0x3409</a>	-	Powerup probing	RW	UINT	NO
	<a href="#">0x320B</a>	<a href="#">0x340B</a>	-	Fault output on Y1	RW	UINT	NO
	<a href="#">0x320C</a>	<a href="#">0x340C</a>	-	Brake Output on Y2	-	-	-
			1	Brake Output	RW	UINT	NO
			2	Brake Disengage Delay	RW	UINT	NO
			3	Brake Engage Delay			
	<a href="#">0x320D</a>	<a href="#">0x340D</a>	-	Motion Output	-	-	-
			1	Motion Output on Y1	RW	UINT	NO
			2	Motion Output on Y2	RW	UINT	NO
			3	Motion Output on Y3	RW	UINT	NO
			4	Motion Output on Y4			
	<a href="#">0x320F</a>	<a href="#">0x340F</a>	-	Define limits	RW	UINT	NO
	<a href="#">0x3210</a>	<a href="#">0x3410</a>	-	Inputs filter	-	-	-
			1	Inputs filter X1 filter time	RW	UINT	NO
			2	Inputs filter X2 filter time	RW	UINT	NO
			...	...	...	...	...
			8	Inputs filter X8 filter time	RW	UINT	NO
	<a href="#">0x3211</a>	<a href="#">0x3411</a>	-	Notch filter	-	-	-
			1	Notch filter_paraA	RW	INT	NO
			2	Notch filter_paraB	RW	INT	NO
			...	...	...	...	...
			8	Notch filter_paraH	RW	INT	NO
	<a href="#">0x3212</a>	<a href="#">0x3412</a>	-	Analog configuration	-	-	-
1			Analog deadband	RW	UINT	NO	
2			Analog offset vallue	RW	UINT	NO	
3			Analog filter	RW	UINT	NO	
4			Analog threshold	RW	UINT	NO	
5			Analog scaling	RW	UINT	NO	
<a href="#">0x3213</a>	<a href="#">0x3413</a>	-	Analog auto zero	RW	UINT	NO	
<a href="#">0x3214</a>	<a href="#">0x3414</a>	-	Operation mode	RW	UINT	NO	
<a href="#">0x3215</a>	<a href="#">0x3415</a>	-	Jog mode	RW	UINT	NO	
<a href="#">0x3216</a>	<a href="#">0x3416</a>	-	Torque constant	RW	UINT	NO	

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
0x3200~ 4000h	<a href="#">0x3218</a>	<a href="#">0x3418</a>	-	Encoder resolution	RO	UINT	NO
	<a href="#">0x3220</a>	<a href="#">0x3420</a>	-	Position gain	RW	UINT	NO
	<a href="#">0x3221</a>	<a href="#">0x3421</a>	-	Positionderi gain	RW	UINT	NO
	<a href="#">0x3222</a>	<a href="#">0x3422</a>	-	Positionderi filter	RW	UINT	NO
	<a href="#">0x3224</a>	<a href="#">0x3424</a>	-	Velocity gain	RW	UINT	NO
	<a href="#">0x3225</a>	<a href="#">0x3425</a>	-	Velocityinterg gain	RW	UINT	NO
	<a href="#">0x3226</a>	<a href="#">0x3426</a>	-	Accfeedforward	RW	UINT	NO
	<a href="#">0x3227</a>	<a href="#">0x3427</a>	-	PID filter	RW	UINT	NO
	<a href="#">0x3252</a>	<a href="#">0x3452</a>	-	Inposition counts	RW	UINT	NO
	<a href="#">0x3253</a>	<a href="#">0x3453</a>	-	CSP complete time	RW	UINT	NO
	<a href="#">0x3254</a>	<a href="#">0x3454</a>	-	Inposition error range	RW	UINT	NO
	<a href="#">0x3255</a>	<a href="#">0x3455</a>	-	Inposition time	RW	UINT	NO
	<a href="#">0x3260</a>	<a href="#">0x3460</a>	-	Actual current	RO	INT	NO
	<a href="#">0x3261</a>	<a href="#">0x3461</a>	-	Analog Reading	RO	INT	NO
			1	Analog Reading Value	RO	INT	YES
			2	Analog Reading Input1	RO	INT	YES
			3	Analog Reading Input2	RO	INT	YES
	<a href="#">0x3262</a>	<a href="#">0x3462</a>	-	Motor name	RO	STRING(5)	NO
	<a href="#">0x3271</a>	<a href="#">0x3471</a>	-	Home switch	RW	UINT8	YES
	<a href="#">0x3272</a>	<a href="#">0x3472</a>	-	Clear alarm	WO	UINT8	YES
<a href="#">0x3274</a>	<a href="#">0x3474</a>	-	Zero position	WO	UINT8	NO	
<a href="#">0x3275</a>	<a href="#">0x3475</a>	-	S-Curve filter time	RW	UINT	NO	
<a href="#">0x3276</a>	<a href="#">0x3476</a>	-	Move homeoffset	RW	UINT	NO	
<a href="#">0x3280</a>	<a href="#">0x3480</a>	-	User registers	-	-	-	

### 0x3200 / 0x3400 Continuous current

该对象是步进伺服的运行电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3200	0x3400	-	Continuous current	RW	UINT	NO	-

### 0x3201 / 0x3401 Peak current

该对象是步进伺服的峰值(RMS)电流。峰值电流设置了给定电机应使用的最大电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3201	0x3401	-	Peak current	RW	UINT	NO	-

### 0x3202 / 0x3402 Hardstop current limit

该对象用来设置硬限位回原点模式下，当电机撞击硬限位位置的时候限制的电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3202	0x3402	-	Hardstop current limit	RW	UINT	NO	-

### 0x3203 / 0x3403 Idle current

该对象配置电机在空闲状态下的空闲电流，单位为0.01Amps。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3203	0x3403	-	Idle current	RW	UINT	NO	-

### 0x3204 / 0x3404 Idle current delay time

该对象用来设置驱动器从运行电流切换到空闲电流延迟的时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3204	0x3404	-	Idle current delay time	RW	UINT	NO	-

单位为0.1s

### 0x3205 / 0x3405 Acceleration current

该对象用来设置当驱动器在步进模式下运行的加速度电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3205	0x3405	-	Acceleration current	RW	UINT	NO	-

单位为0.01Amps。

### 0x3206 / 0x3406 Stall prevention time

该对象用来设置失速判断时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3206	0x3406	-	Stall precention time	RW	UINT	NO	-

单位为0.1s。

### 0x3207 / 0x3407 Steps per rev

该对象用来获取电机每转的步数。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3207	0x3407	-	Step per rev	RO	UINT	NO	-

单位为steps/rev。

### 0x3208 / 0x3408 Reverse motor direction

该对象可以用来改变电机默认方向。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3208	0x3408	-	Reverse motor direction	RW	UINT	NO	-

The value can be set to 0 - 1.

Value =0            default rotating direction  
          =1            reverse rotating direction

## 0x3209 / 0x3409 Powerup probing

该对象用来设置上电是否probing。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3209	0x3409	-	Powerup probing	RW	UINT	NO	-

Value =0 NO probing  
=1 Probing

## 0x320B / 0x340B Fault output on Y1

该对象用来设置Y1报警输出。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320B	0x340B	-	Fault output on Y1	RW	UINT	NO	-

Value =1 output Y1 is open when the driver is fault  
=2 output Y1 is closed when the driver is fault  
=3 output Y1 is used for general purpose

## 0x320C / 0x340C Brake output on Y2

该对象用来设置刹车输出功能相关参数，该对象有3个子索引，子索引一用作配置刹车输出，二配置刹车释放之后移动等待时间，三配置刹车抱闸之后去使能等待时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320C	0x340C	-	Fault output on Y1	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Brake output	RW	UINT	NO	-
		2	Brake disengage delay	RW	UINT	NO	-
		3	Brake engage delay	RW	UINT	NO	-

**Brake output:**

Value =1 output is closed when drive is enabled, and open when the drive is disabled.  
=2 output is open when drive is enabled, and closed when the drive is disabled.  
=3 output is not used as a brake output and can be used as g general purpose output.

**Brake disengage delay and brake engage delay**

单位为1ms。

## 0x320D / 0x340D Motion output

该对象用来定义电机运动输出口的功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320C	0x340C	-	Motion Output	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Motion output on Y1	RW	UINT	NO	-
		2	Motion output on Y2	RW	UINT	NO	-
		3	Motion output on Y3	RW	UINT	NO	-
		4	Motion output on Y4	RW	UINT	NO	-

They can be set to various functions.

Value =1	Open when static position error less than in-position counts.
=2	Closed when static position error less than in-position counts.
=3	General purpose
=4	Tach output with 100 pulses/rev
=5	Tach output with 200 pulses/rev
=6	Tach output with 400 pulses/rev
=7	Tach output with 800 pulses/rev
=8	Tach output with 1600 pulses/rev
=9	Closed (energized) when dynamic position error is less than set value.
=10	Open (de-energized) when dynamic position error is less than set value.
=11	Timing out (50 pulses/rev)

### 0x320F / 0x340F Define limits

该对象用来设置限位功能定义。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320F	0x340F	-	Define limits	RW	UINT	NO	-

=0x01	At end of travel, (X3=CW,X4=CCW)will be closed
=0x02	At end of travel, (X3=CW,X4=CCW)will be open
=0x07	At end of travel, X3=CW will be closed, X4=GP
=0x08	At end of travel, X3=CW will be open, X4=GP
=0x09	At end of travel, X4=CCW will be closed, X3=GP
=0x0A	At end of travel, X4=CCW will be open, X3=GP
=0x0B	At end of travel, (X3=CCW,X4=CW)will be closed
=0x0C	At end of travel, (X3=CCW,X4=CW)will be open
=0x11	At end of travel, X3=CCW will be closed, X4=GP
=0x12	At end of travel, X3=CCW will be open, X4=GP
=0x13	At end of travel, X4=CW will be closed, X3=GP
=0x14	At end of travel, X4=CW will be open, X3=GP
=0x15	At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
=0x16	At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
=0x1B	At end of travel, X3=CW will be closed, X4=GP[No Alarm]
=0x1C	At end of travel, X3=CW will be open, X4=GP[No Alarm]
=0x1D	At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
=0x1E	At end of travel, X4=CCW will be open, X3=GP[No Alarm]
=0x1F	At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
=0x20	At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
=0x25	At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
=0x26	At end of travel, X3=CCW will be open, X4=GP[No Alarm]
=0x27	At end of travel, X4=CW will be closed, X3=GP[No Alarm]
=0x28	At end of travel, X4=CW will be open, X3=GP[No Alarm]

### 0x3210 / 0x3410 Input filter

该对象在IO输入口设置一个数字滤波。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3210	0x3410	-	Input filter time	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	8
		1	Input X1 filter time	RW	UINT	NO	-
		2	Input X2 filter time	RW	UINT	NO	-
		3	Input X3 filter time	RW	UINT	NO	-
		4	Input X4 filter time	RW	UINT	NO	-
		5	Input X5 filter time	RW	UINT	NO	-
		6	Input X6 filter time	RW	UINT	NO	-
		7	Input X7 filter time	RW	UINT	NO	-
		8	Input X8 filter time	RW	UINT	NO	-

该参数单位为200us。如果该对象值为100表示20ms滤波延迟。

### 0x3211 / 0x3411 Notch filter

这8个对象用来配置陷波滤波器，该对象只在步进伺服驱动器有效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3211	0x3411	-	Notch filter	RW	INT	NO	-
		0	Number of sub-index	RO	USINT8	NO	8
		1	Notch filter_paraA	RW	INT	NO	-
		2	Notch filter_paraB	RW	INT	NO	-
		3	Notch filter_paraC	RW	INT	NO	-
		4	Notch filter_paraD	RW	INT	NO	-
		5	Notch filter_paraE	RW	INT	NO	-
		6	Notch filter_paraF	RW	INT	NO	-
		7	Notch filter_paraG	RW	INT	NO	-
		8	Notch filter_paraH	RW	INT	NO	-

### 0x3212 / 0x3412 Analog configuration

该对象用来配置关于模拟量的运行模式，当运行模拟量速度/位置/扭矩的时候，我们需要设置相关参数到该对象里面。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3212	0x3412	-	Analog Configuration	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	5
		1	Analog deadband	RW	UINT	NO	-
		2	Analog offset value	RW	UINT	NO	-
		3	Analog filter	RW	UINT	NO	-
		4	Analog threshold	RW	UINT	NO	-
		5	Analog scaling	RW	UINT	NO	-

#### 模拟量死区和模拟量偏置

单位为0.001V

#### 模拟量滤波

滤波值 =  $72090 / [(1400 / x) + 2.2]$

x 表示 模拟量滤波期望的值，单位为 Hz

#### Analog scaling

Value =0	single-ended +/- 10 volts
=1	single-ended 0 - 10 volts
=2	single-ended +/- 5 volts
=3	single-ended 0 - 5 volts
=4	differential +/- 10 volts
=5	differential 0 - 10 volts
=6	differential +/- 5 volts
=7	differential 0 - 5 volts

### 0x3213 / 0x3413 Analog auto zero

该对象用来设置当前模拟量为0，写1表示生效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3213	0x3413	-	Analog auto zero	RW	UINT	NO	-

### 0x3214 / 0x3414 Operation mode

该对象用来设置驱动器上电运行的模式。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3214	0x3414	-	Operation mode	RW	UINT	NO	-

Value =1	Si program
=2	Q/SCL(drive enabled)
=3	Quick tuner(servos) or Configurator(stepppers)
=4	SiNET Hub
=5	Q/SCL(drive disabled)
=6	not used
=7	Q program, auto-execute

### 0x3215 / 0x3415 Jog mode

该对象用来设置速度模式，鸣志驱动器有两种速度模式。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3215	0x3415	-	Jog mode	RW	UINT	NO	-

Value =1	位置模式下的速度控制
=2	纯速度模式下的速度控制

### 0x3216 / 0x3416 Torque constant

该对象配置电机的扭矩常数，单位为mN·m/Amps。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3216	0x3416	-	Torque constant	RW	UINT	NO	-

该对象只支持步进伺服驱动器。0x2216=最大输出扭矩/最大运行电流（依据不同参数设定）。

### 0x3218 / 0x3418 Encoder resolution

该对象应提供电动机的编码器配置。它包含每转多少个计数。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3218	0x3418	-	Encoder resolution	RO	UINT	NO	-

### 0x3220 / 0x3420 Position gain

该对象用来配置步进伺服在位置环下的比例增益，该对象只在步进伺服下有效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3220	0x3420	-	Position gain	RW	UINT	NO	-

### 0x3221 / 0x3421 Position derigain

该对象用来配置步进伺服在位置环控制下的微分增益，该对象只在步进伺服下有效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3221	0x3421	-	Positionderi gain	RW	UINT	NO	-

### 0x3222 / 0x3422 Position derifilter

该对象提供一个非常简单的单极点低通滤波器用来限制高频噪音，以及使系统变得更安静和稳定。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3222	0x3422	-	Positionderi filter	RW	UINT	NO	-

### 0x3224 / 0x3424 Velocity gain

该对象用来配置步进伺服在速度环控制中的比例增益，该对象只在步进伺服下有效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3224	0x3424	-	Velocity gain	RW	UINT	NO	-

### 0x3225 / 0x3425 Velocityinteg gain

该对象用来配置步进伺服，在速度环下的积分增益，该对象只在步进伺服下有效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3225	0x3425	-	Velocityinteg gain	RW	UINT	NO	-

### 0x3226 / 0x3426 Accfeedforward

该对象用来配置一个加速度/减速度前馈增益，用来加快系统在扭矩指令下的响应速度，该对象只在步进伺服下有效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3226	0x3426	-	Accfeedforward	RW	UINT	NO	-

### 0x3227 / 0x3427 PID filter

此对象在速度环的末尾提供一个扭矩指令过滤器。该滤波器是一个非常简单的单极点低通滤波器，用于限制速度的高频响应，从而限制位置控制环路。该对象仅在步进伺服驱动器上生效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3227	0x3427	-	PID filter	RW	UINT	NO	-

### 0x3252 / 0x3452 Inposition counts

该对象用来设置静态位置误差值，用来作为步进伺服运动状态的判断依据。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3252	0x3452	-	Inposition counts	RW	UINT	NO	-

### 0x3253 / 0x3453 CSP complete time

该对象用于设置电动机在CSP模式下完成动作的延迟时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3253	0x3453	-	CSP complete time	RW	UINT	NO	-

单位为0.001s。

### 0x3254 / 0x3454 In position error range

该对象用于设置静态定位误差范围。当实际位置在目标位置误差范围内且持续时间超过PE指定的时间时，驱动程序将定义运动完成或电机就位。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3254	0x3454	-	In position error range	RW	UINT	NO	-

### 0x3255 / 0x3455 In position time

该对象用于设置位置到达确定的持续时间。例如，当确定到位误差PD时，PE设置到位保持持续时间。当实际位置在目标位置范围(PD)内保持设置的最短时间(PE)时，驱动器将电动机定义为位置到达。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3255	0x3455	-	In position time	RW	UINT	NO	-

### 0x3260 / 0x3460 Actual current

该对象提供当前电机实际电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3260	0x3460	-	Actual current	RO	INT	NO	-

### 0x3261 / 0x3461 Analog reading

该对象提供当前驱动器模拟量值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3261	0x3461	-	Analog Reading	RW	INT	YES	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Analog reading	RW	INT	YES	-
		2	Analog reading input 1	RW	INT	YES	-
		3	Analog reading inupt 2	RW	INT	YES	-

### 0x3262 / 0x3462 Motor name

该对象包含电机名称。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3262	0x3462	-	Motor	RO	STRING(15)	NO	-

### 0x3271 / 0x3471 Home switch

该对象用来选择回原点的时候原点开关。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3271	0x3471	-	Home switch	RW	USINT	NO	-

Value	8	7	6	5	4	3	2	1
Output	X8	X7	X6	X5	X4	X3	X2	X1

### 0x3272 / 0x3472 Clear alarm

该对象提供一个清除驱动器报警的功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3272	0x3472	-	Clear alarm	RW	USINT	YES	-

多轴产品: 将该对象值由0x55变更为0xAA可以清除报警

### 0x3274 / 0x3474 Zero position

该对象提供设置所有位置参数为0的功能，例如当前位置信息(0x6064)。设置该对象值为01h可以清除所有位置信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3274	0x3474	-	Zero position	RW	USINT	NO	-

### 0x3275 / 0x3475 S-Curve filter time

该对象用来设置S曲线滤波时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3275	0x3475	-	S-Curve filter time	RW	UINT	NO	-

0x3276 / 0x3476 Move home offset

该对象用来设置原点偏置模式。

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

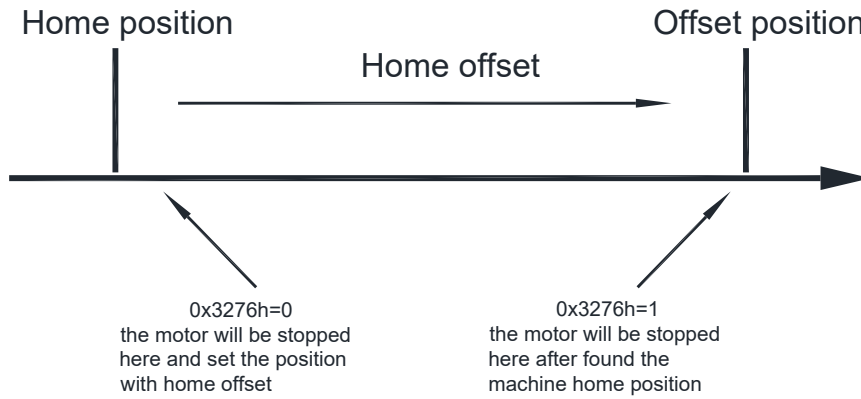
注：此功能仅对回原方式1~35生效。

设置为0:

电机会停止在机械原点位置，并且当前位置值由原点偏置(home offset)设定。

设置为1:

电机会在找到机械原点位置之后移动一个由原点偏置(home offset)提供的距离，并且当前位置值由原点偏置(home offset)设定。



## 0x3280 / 0x3480 User registers

该对象提供了23个普通用户寄存器，由于属于非保持性，所以里面的信息在重新上电之后不会保存。

Index		Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3280	0x3480	0	User Registers	RO	USINT	NO	23
		1	User register0	RO	DINT	YES	-
		2	User register1	RW	DINT	YES	-
		3	User register2	RW	DINT	YES	-
		4	User register3	RW	DINT	YES	-
		5	User register4	RW	DINT	YES	-
		6	User register5	RW	DINT	YES	-
		7	User register6	RW	DINT	YES	-
		8	User register7	RW	DINT	YES	-
		9	User register8	RW	DINT	YES	-
		10	User register9	RW	DINT	YES	-
		11	User register10	RW	DINT	YES	-
		12	User register11	RW	DINT	YES	-
		13	User register12	RW	DINT	YES	-
		14	User register13	RW	DINT	YES	-
		15	User register14	RW	DINT	YES	-
		16	User register15	RW	DINT	YES	-
		17	User register16	RW	DINT	YES	-
		18	User register17	RW	DINT	YES	-
		19	User register18	RW	DINT	YES	-
		20	User register19	RW	DINT	YES	-
		21	User register20	RW	DINT	YES	-
		22	User register21	RW	DINT	YES	-
23	User register22	RW	DINT	YES	-		

4.2.4 双轴步进通用配置文件

	Index		Sub	Name	Access	Type	mapping
	Aixs1	Aixs2					
<b>0x2600~ 2E00</b>	<a href="#">0x2600</a>	<a href="#">0x2800</a>	-	Running current	RW	UINT	NO
	<a href="#">0x2601</a>	<a href="#">0x2801</a>	-	Idle current	RW	UINT	NO
	<a href="#">0x2602</a>	<a href="#">0x2802</a>	-	Idle current delya time	RW	UINT	NO
	<a href="#">0x2603</a>	<a href="#">0x2803</a>	-	Acceleration current	RW	UINT	NO
	<a href="#">0x2604</a>	<a href="#">0x2804</a>	-	Steps per rev	RW	UINT	NO
	<a href="#">0x2605</a>	<a href="#">0x2805</a>	-	Reverse motor direction	RW	UINT	NO
	<a href="#">0x2606</a>	<a href="#">0x2806</a>	-	Fault output on Y1	RW	UINT	NO
	<a href="#">0x2607</a>	<a href="#">0x2807</a>	-	Brake Output on Y2	-	-	-
			1	Brake Output	RW	UINT	NO
			2	Brake Disengage Delay	RW	UINT	NO
			3	Brake Engage Delay	RW	UINT	NO
	<a href="#">0x2608</a>	<a href="#">0x2808</a>	-	Motion Output	-	-	-
			1	Motion Output on Y1	RW	UINT	NO
			2	Motion Output on Y2	RW	UINT	NO
			3	Motion Output on Y3	RW	UINT	NO
			4	Motion Output on Y4			
	<a href="#">0x260B</a>	<a href="#">0x280B</a>	-	Define limits	RW	UINT	NO
	<a href="#">0x260C</a>	<a href="#">0x280C</a>	-	Inputs Filter	-	-	-
			1	Input X1 Filter Time	RW	UINT	NO
			...	...	...	...	...
			8	Inputs X8 filter time	RW	UINT	NO
	<a href="#">0x260D</a>	<a href="#">0x280D</a>	-	Dynamic open winding detection	RW	UINT	NO
	<a href="#">0x260E</a>	<a href="#">0x280E</a>	-	Open winding detect speed limit	RW	UDINT	NO
	<a href="#">0x260F</a>	<a href="#">0x280F</a>	-	Powerup open winding detection	RW	UINT	NO
<a href="#">0x2610</a>	<a href="#">0x2810</a>	-	Motor model number	RW	UINT	NO	
<a href="#">0x2611</a>	<a href="#">0x2811</a>	-	Load ratio	RW	UINT	NO	

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
0x2600~ 2E00h	0x2612	0x2812	-	Third party motor parameters	-	ARRAY	NO
			1	MotorName 1	RW	UDINT	NO
			2	MotorName 2	RW	UDINT	NO
			3	MotorName 3	RW	UDINT	NO
			4	MotorName 4	RW	UDINT	NO
			5	MotorPara_01	RW	UINT	NO
			6	MotorPara_02	RW	UINT	NO
			...	...	...	...	...
			12	MotorPara_14	RW	UINT	NO
			13	Reserved_01	RW	UINT	NO
			14	Reserved_02	RW	UINT	NO
			...	..	...	...	...
	18	Reserved_06	RW	UINT	NO		
	0x2615	0x2815	-	StepInputs counts	RO	DINT	NO
	0x2618	0x2818	-	Waveform Smoothing	-	-	-
			1	Harmonic Gain	RW	INT	NO
			2	Harmonic Phase			
	0x2619	0x2819	-	Current coeff	RW	UINT	NO
	0x2620	0x2820	-	Home switch	RW	UINT8	YES
	0x2621	0x2821	-	Clear alarm	WO	UINT8	YES
0x2623	0x2823	-	Zero position	WO	UINT8	NO	
0x2624	0x2824	-	S-Curve filter time	RW	UINT	NO	
0x2625	0x2825	-	User Registers				
0x2626	0x2826	-	Move homeoffset	RW	UINT	NO	

### 0x2600 / 0x2800 Running current

该对象用来配置步进驱动器运行电流。单位为0.01Amps。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2600	0x2800	-	Running current	RW	UINT	NO	-

### 0x2601 / 0x2801 Idle current

该对象配置/监控电机在空闲状态下的电流大小。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2601	0x2801	-	Idle current	RW	UINT	NO	-

单位为0.01A。

### 0x2602 / 0x2802 Idle current delay time

该对象用来设置驱动器从运行电流切换到空闲电流延迟的时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2602	0x2802	-	Idle current delay time	RW	UINT	NO	-

单位为0.1s。

### 0x2603 / 0x2803 Acceleration current

该对象配置驱动器的加速电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2603	0x2803	-	Acceleration current	RW	UINT	NO	-

单位为0.01s。

### 0x2604 / 0x2804 Steps per rev

该对象指示电机每转的步数，它允许你改变当前驱动器每转一圈反馈的步数。单位为steps/rev。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2604	0x2804	-	Step per rev	RW	UINT	NO	-

### 0x2605 / 0x2805 Reverse motor direction

该对象可以用来改变电机默认方向。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2605	0x2805	-	Reverse motor direction	RW	UINT	NO	-

该对象可设置为 0 - 1.

Value =0            default rotating direction  
 =1                reverse rotating direction

### 0x2606 / 0x2806 Fault output on Y1

该对象用来设置报警输出功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2606	0x2806	-	Fault output on Y1	RW	UINT	NO	-

Value =1            output Y1 is open when the driver is fault  
 =2                output Y1 is closed when the driver is fault  
 =3                output Y1 is used for general purpose

## 0x2607 / 0x2807 Brake output on Y2

该对象用来设置刹车输出功能相关参数，该对象有3个子索引，第一个用作配置刹车输出，第二个配置刹车释放之后移动等待时间，最后一个配置刹车抱闸之后去使能等待时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2607	0x2807	-	Brake Output on Y2	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Brake output	RW	UINT	NO	-
		2	Brake disengage delay	RW	UINT	NO	-
		3	Brake engage delay	RW	UINT	NO	-

### 刹车输出:

Value =1	output is closed when drive is enabled, and open when the drive is disabled.
=2	output is open when drive is enabled, and closed when the drive is disabled.
=3	output is not used as a brake output and can be used as g general purpose output.

### Brake disengage delay and brake engage delay

单位为1ms。

## 0x2608 / 0x2808 Motion output

该对象用来定义电机运动输出口的功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2608	0x2808	-	Motion Output	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Motion output on Y1	RW	UINT	NO	-
		2	Motion output on Y2	RW	UINT	NO	-
		3	Motion output on Y3	RW	UINT	NO	-
		4	Motion output on Y4	RW	UINT	NO	-

他们可被配置为合适的功能:

Value =1	Open when static position error less than in-position counts.
=2	Closed when static positi
=3	General purpose (fault output or brake output)
=4	Tach output with 100 pulses/rev
=5	Tach output with 200 pulses/rev
=6	Tach output with 400 pulses/rev
=7	Tach output with 800 pulses/rev
=8	Tach output with 1600 pulses/rev
=9	Closed (energized) when dynamic position error is less than set value.
=10	Open (de-energized) when dynamic position error is less than set value.
=11	Timing out (50 pulses/rev)

0x260B / 0x280B Define limits

该对象用来设置限位功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260B	0x280B	-	Alarm reset on input X6	RW	UINT	NO	-

- Value =0x01 At end of travel, (X3=CW,X4=CCW)will be closed
- =0x02 At end of travel, (X3=CW,X4=CCW)will be open
- =0x07 At end of travel, X3=CW will be closed, X4=GP
- =0x08 At end of travel, X3=CW will be open, X4=GP
- =0x09 At end of travel, X4=CCW will be closed, X3=GP
- =0x0A At end of travel, X4=CCW will be open, X3=GP
- =0x0B At end of travel, (X3=CCW,X4=CW)will be closed
- =0x0C At end of travel, (X3=CCW,X4=CW)will be open
- =0x11 At end of travel, X3=CCW will be closed, X4=GP
- =0x12 At end of travel, X3=CCW will be open, X4=GP
- =0x13 At end of travel, X4=CW will be closed, X3=GP
- =0x14 At end of travel, X4=CW will be open, X3=GP
- =0x15 At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
- =0x16 At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
- =0x1B At end of travel, X3=CW will be closed, X4=GP[No Alarm]
- =0x1C At end of travel, X3=CW will be open, X4=GP[No Alarm]
- =0x1D At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
- =0x1E At end of travel, X4=CCW will be open, X3=GP[No Alarm]
- =0x1F At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
- =0x20 At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
- =0x25 At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
- =0x26 At end of travel, X3=CCW will be open, X4=GP[No Alarm]
- =0x27 At end of travel, X4=CW will be closed, X3=GP[No Alarm]
- =0x28 At end of travel, X4=CW will be open, X3=GP[No Alarm]

0x260C / 0x280C Inputs filter

该对象用来设置输入口数字滤波。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260C	0x280C	-	Inputs Filter	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	8
		1	Input X1 filter time	RW	UINT	NO	-
		2	Input X2 filter time	RW	UINT	NO	-
		3	Input X3 filter time	RW	UINT	NO	-
		4	Input X4 filter time	RW	UINT	NO	-
		5	Input X5 filter time	RW	UINT	NO	-
		6	Input X6 filter time	RW	UINT	NO	-
		7	Input X7 filter time	RW	UINT	NO	-
8	Input X8 filter time	RW	UINT	NO	-		

该参数单位为200us。如果该参数值为100，意思为20ms延迟。

### 0x260D / 0x280D Dynamic open winding detection

该对象用来设置动态监测电机开路功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260D	0x280D	-	Dynamic open winding detection	RW	UINT	NO	-

Value =0            disable  
          =1            enable

### 0x260E / 0x280E Open winding detection speed limit

该对象用来设置当电机在运动的时候，电机断线检测功能生效的最低速度限值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260E	0x280E	-	Open winding detection speed limit	RW	UDINT	NO	-

单位为counts/s。

### 0x260F / 0x280F Powerup open winding detection

该对象用来配置上电是否检测电机断线功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260F	0x280F	-	Powerup open winding detection	RW	UINT	NO	-

### 0x2610 / 0x2810 Motor model number

该对象提供电机的型号。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2610	0x2810	-	Motor model number	RW	UINT	NO	-

### 0x2611 / 0x2811 Load ratio

该对象用来设置电机负载惯量比。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2611	0x2811	-	Load ratio	RW	UINT	NO	-

Value =1            1x rotor inertia  
        =2            1x-3x rotor inertia  
        =3            3x-5x rotor inertia  
        =4            5x-7x rotor inertia  
        =5            7x-10x rotor inertia

## 0x2612 / 0x2812 Third party motor parameters

该对象包含第三方电机信息。

Index		Sub	Name	Access Type	Data Type	PDO mapping	-Default Value-
Aixs1	Aixs2						
0x2612	0x2812	-	Number of Entries	RW	UDINT	NO	-
		0	Motor Name1	RO	USINT8	NO	25
		1	Motor Name2	RW	UDINT	NO	-
		2	Motor Name3	RW	UDINT	NO	-
		3	Motor Name4	RW	UDINT	NO	-
		4	Motor Paramter1	RW	UDINT	NO	-
		5	Motor Paramter2	RW	UINT	NO	-
		6	Motor Paramter3	RW	UINT	NO	-
		7	Motor Paramter4	RW	UINT	NO	-
		8	Motor Paramter5	RW	UINT	NO	-
		9	Motor Paramter6	RW	UINT	NO	-
		A	Motor Paramter7	RW	UINT	NO	-
		B	Motor Paramter8	RW	UINT	NO	-
		C	Motor Paramter9	RW	UINT	NO	-
		D	Motor Paramter10	RW	UINT	NO	-
		E	Motor Paramter11	RW	UINT	NO	-
		F	Motor Paramter12	RW	UINT	NO	-
		10	Motor Paramter13	RW	UINT	NO	-
11	Motor Paramter14	RW	UINT	NO	-		
12	Reserved1	RW	UINT	NO	-		
13	Reserved2	RW	UINT	NO	-		
14	Reserved3	RW	UINT	NO	--		
15	Reserved4	RW	UINT	NO	-		
16	Reserved5	RW	UINT	NO	-		
17	Reserved6	RW	UINT	NO	-		

## 0x2615 / 0x2815 StepInputs counts

该对象用来提供驱动器在X1/STEP和X2/DIR接收到的脉冲数。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2615	0x2815	-	StepInputs counts	RO	DINT	YES	0

### 0x2618 / 0x2818 Waveform smoothing

该对象用来设置HG滤波参数。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2618	0x2818	-	Waveform Smoothing	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	2
		1	Harmonic gain	RW	UINT	NO	-
		2	Harmonic phase	RW	UINT	NO	-

### 0x2619 / 0x2819 Current coeff

该对象用来设置电流系数，单位为百分比。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2619	0x2819	-	Current coeff	RW	UINT	NO	-

### 0x2620 / 0x2820 Home switch

该对象用来选择回原点的时候原点开关。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2620	0x2820	-	Home switch	RW	USINT	NO	-

Value	8	7	6	5	4	3	2	1
Output	X8	X7	X6	X5	X4	X3	X2	X1

### 0x2621 / 0x2821 Clear alarm

该对象提供一个清除驱动器报警的功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2621	0x2821	-	Clear alarm	RW	USINT	YES	-

多轴产品: 将该对象值由0x55变更为0xAA可以清除报警

### 0x2623 / 0x2823 Zero position

该对象提供设置所有位置参数为0的功能，例如当前位置信息(0x6064)。设置该对象值为01h可以清除所有位置信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2623	0x2823	-	Zero position	RW	USINT	NO	-

### 0x2624 / 0x2824 S-Curve filter time

该对象用来设置S曲线滤波时间。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2624	0x2824	-	S-Curve filter time	RW	UINT	NO	-

## 0x2625 / 0x2825 User registers

该对象提供了23个普通用户寄存器，由于属于非保持性，所以里面的信息在重新上电之后不会保存。

Index		Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2625	0x2825	-	User Registers	RW	DINT	YES	-
		0	Number of sub-index	RO	USINT	NO	23
		1	User register0	RO	DINT	YES	-
		2	User register1	RW	DINT	YES	-
		3	User register2	RW	DINT	YES	-
		4	User register3	RW	DINT	YES	-
		5	User register4	RW	DINT	YES	-
		6	User register5	RW	DINT	YES	-
		7	User register6	RW	DINT	YES	-
		8	User register7	RW	DINT	YES	-
		9	User register8	RW	DINT	YES	-
		10	User register9	RW	DINT	YES	-
		11	User register10	RW	DINT	YES	-
		12	User register11	RW	DINT	YES	-
		13	User register12	RW	DINT	YES	-
		14	User register13	RW	DINT	YES	-
		15	User register14	RW	DINT	YES	-
		16	User register15	RW	DINT	YES	-
		17	User register16	RW	DINT	YES	-
		18	User register17	RW	DINT	YES	-
		19	User register18	RW	DINT	YES	-
		20	User register19	RW	DINT	YES	-
		21	User register20	RW	DINT	YES	-
22	User register21	RW	DINT	YES	-		
23	User register22	RW	DINT	YES	-		

## 0x2626 / 0x2826 Move home offset

该对象用来设置原点偏置模式。

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

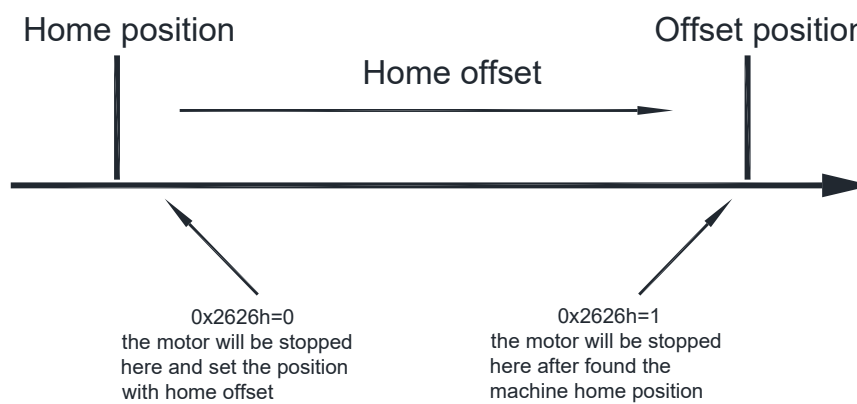
注：此功能仅对回原方式1~35生效。

设置为0:

电机会停止在机械原点位置，并且当前位置值由原点偏置(home offset)设定。

设置为1:

电机会在找到机械原点位置之后移动一个由原点偏置(home offset)提供的距离，并且当前位置值由原点偏置(home offset)设定。



## 4.2.5 双轴运动控制配置文件

	Index		Sub	Name	Access	Type	Mapping
	Axis1	Axis2					
CoE	<a href="#">0x603F</a>	<a href="#">0x683F</a>	-	Error code	RO	UINT16	YES
	<a href="#">0x6040</a>	<a href="#">0x6840</a>	-	Controlword	WO	UINT16	YES
	<a href="#">0x6041</a>	<a href="#">0x6841</a>	-	Statusword	RO	UINT16	YES
	<a href="#">0x605A</a>	<a href="#">0x685A</a>	-	Quick stop option code	RW	INT16	NO
	<a href="#">0x605B</a>	<a href="#">0x685B</a>	-	Shut down option code	RW	INT16	NO
	<a href="#">0x605C</a>	<a href="#">0x685C</a>	-	Disable operation option code	RW	INT16	NO
	<a href="#">0x605D</a>	<a href="#">0x685D</a>	-	Halt option code	RW	INT16	NO
	<a href="#">0x605E</a>	<a href="#">0x685E</a>	-	Fault reaction code	RW	INT16	NO
	<a href="#">0x6060</a>	<a href="#">0x6860</a>	-	Modes of operation	WO	INT8	YES
	<a href="#">0x6061</a>	<a href="#">0x6861</a>	-	Modes of operation display	RO	INT8	YES
	<a href="#">0x6064</a>	<a href="#">0x6864</a>	-	Position actual value	RO	INT32	YES
	<a href="#">0x6065</a>	<a href="#">0x6865</a>	-	Following error window	RW	UINT32	NO
	<a href="#">0x606C</a>	<a href="#">0x686C</a>	-	Velocity actual value	RO	INT32	YES
	<a href="#">0x6071</a>	<a href="#">0x6871</a>	-	Target torque	RW	INT16	YES
	<a href="#">0x6073</a>	<a href="#">0x6873</a>	-	Max current	RW	UINT16	YES
	<a href="#">0x6074</a>	<a href="#">0x6874</a>	-	Torque demand	RO	INT16	YES
	<a href="#">0x6077</a>	<a href="#">0x6877</a>	-	Torque actual value		INT	YES
	<a href="#">0x6078</a>	<a href="#">0x6878</a>	-	Current actual value	RO	INT16	YES
	<a href="#">0x607A</a>	<a href="#">0x687A</a>	-	Target position	RW	INT32	YES
	<a href="#">0x607C</a>	<a href="#">0x687C</a>	-	Home offset	RW	INT32	YES
	<a href="#">0x607D</a>	<a href="#">0x687D</a>	-	Software position limit	-	-	-
			1	Min position limit	RW	DINT	NO
			2	Max position limit	RW	DINT	NO
	<a href="#">0x607E</a>	<a href="#">0x687E</a>	-	Polarity	RW	UINT8	YES
	<a href="#">0x607F</a>	<a href="#">0x687F</a>	-	Max profile velocity	RW	UINT32	YES
	<a href="#">0x6081</a>	<a href="#">0x6881</a>	-	Profile velocity	RW	UINT32	YES
	<a href="#">0x6083</a>	<a href="#">0x6883</a>	-	Profile acceleration	RW	UINT32	YES
	<a href="#">0x6084</a>	<a href="#">0x6884</a>	-	Profile deceleration	RW	UINT32	YES
	<a href="#">0x6085</a>	<a href="#">0x6885</a>	-	Quick stop deceleration	RW	UINT32	YES
	<a href="#">0x6087</a>	<a href="#">0x6887</a>	-	Torque slope	RW	UINT32	YES
	<a href="#">0x6098</a>	<a href="#">0x6898</a>	-	Homing method	RW	INT8	YES
	<a href="#">0x6099</a>	<a href="#">0x6899</a>	-	Homing speed	-	ARRAY	-
			1	Search switch	RW	UDINT	YES
			2	Search zero	RW	UDINT	YES
	<a href="#">0x609A</a>	<a href="#">0x689A</a>	-	Homing acceleration	RW	UDINT32	YES
	<a href="#">0x60B0</a>	<a href="#">0x68B0</a>		Position offset	RW	DINT32	YES
	<a href="#">0x60B1</a>	<a href="#">0x68B1</a>	-	Velocity offset	RW	DINT	YES
	<a href="#">0x60B2</a>	<a href="#">0x68B2</a>		Torque offset	RW	DINT	YES
	<a href="#">0x60B8</a>	<a href="#">0x68B8</a>		Touch probe function	RW	UINT	YES
	<a href="#">0x60B9</a>	<a href="#">0x68B9</a>		Touch probe status	RO	UINT	YES
<a href="#">0x60BA</a>	<a href="#">0x68BA</a>		Touch probe pos1 pos value	RO	DINT	YES	
<a href="#">0x60BB</a>	<a href="#">0x68BB</a>		Touch probe pos1 neg value	RO	DINT	YES	

	Index		Sub	Name	Access	Type	Mapping
	Axis1	Axis2					
CoE	<a href="#">0x60E0</a>	<a href="#">0x68E0</a>		Positive torque limit value	RW	UINT	YES
	<a href="#">0x60E1</a>	<a href="#">0x68E1</a>	-	Negative torque limit value	RW	UINT	YES
	<a href="#">0x60F4</a>	<a href="#">0x68F4</a>	-	Following error actual value	RO	DINT	YES
	<a href="#">0x60FD</a>	<a href="#">0x68FD</a>	-	Digital inputs	RO	UDINT	YES
	<a href="#">0x60FE</a>	<a href="#">0x68FE</a>	2	Digital outputs	-	ARRAY	NO
			1	Physical outputs	RW	UDINT	YES
			2	Bit mask	RW	UDINT	NO
	<a href="#">0x60FF</a>	<a href="#">0x68FF</a>	-	Target velocity	RW	DINT	YES
	<a href="#">0x6502</a>	<a href="#">0x6D02</a>	-	Supported drive modes	RO	UDINT	NO

### 0x603F / 0x683F Error code

该对象捕获保存驱动器最后发生的错误报警信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x603F	0x683F	-	Error code	UINT	RO	YES	-

在错误代码中，每一bit位包含一类报警或者错误状态信息。

Error Code	Description
0x7500	EtherCAT Communication Error
0xFF01	<b>Over Current</b>
0xFF02	<b>Over Voltage</b>
0xFF03	<b>Over Temperature</b>
0xFF04	<b>Open Motor Winding</b>
0xFF05	<b>Internal Voltage Bad</b>
0xFF06	<b>Position limit</b>
0xFF07	<b>Encoder bad</b>
0xFF08	<b>Fc position limit</b>
0xFF09	<b>Fc encoder bad</b>
0xFF0A	<b>Regen failed</b>
0xFF0B	<b>STO</b>
0xFF0C	<b>E-stop error</b>
0xFF31	CW Limit
0xFF32	CCW Limit
0xFF33	<b>CCW CW limit</b>
0xFF34	<b>Current limit</b>
0xFF35	Move When Disable
0xFF36	Voltage Low
0xFF37	Qprogram Blank
0xFF41	Save Failed
0xFF42	Xmlread Failed
0xFFFF	Other Error

### 0x6040 / 0x6840 Controlword

该对象指明了控制PDS，FSA系统所需要接收到的指令。如下图所示，其中bit7、3、2、1和0必须支持。同时根据操作模式的不同，应支持bit0到9。如果相关功能不可实现，则应生成适当的紧急消息。可以支持制造商特定的位。所有控制字的bit功能实现都是有效独立于PDS FSA状态。任何运动的开始都是在指定的操作模式下进行，并在相关文档中进行了描述。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6040	0x6840	-	Controlword	RW	UINT	YES	-

控制字的每一位功能定义如下：

15	11	10	9	8	7	6	4	3	2	1	0
manufacturer specific	reserved		halt	Fault reset	Operation mode specific		Enable operation	Quick stop	Enable voltage	Switch on	
O	O		O	M	O		M	M	M	M	
MSB											LSB
0			- Optional			M			- Mandatory		

### 0x6041 / 0x6841 Statusword

该位包含驱动器当前状态。每一位都是动态变化。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6041	0x6841	-	Statusword	RO	UINT	YES	-

The bits of the statusword are defined as follows:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
ms	oms		ila	tr	rm	ms	w	sod	qs	ve	f	oe	so	rtso	

Key: ms manufacturer specific  
oms operation mode specific  
ila internal limit active  
tr target reached  
rm remote  
w warning  
sod switch on disabled  
qs quick stop  
ve voltage enabled  
f fault  
oe operation enabled  
so switched on  
rtso ready to switch on

statusword(6041h)	PDS FSA state
xxxx xxxx x0xx 0000	Not ready to switch on
xxxx xxxx x1xx 0000	Switch on disabled
xxxx xxxx x01x 0001	Ready to switch on
xxxx xxxx x01x 0011	Switch on
xxxx xxxx x01x 0111	Operation enabled
xxxx xxxx x00x 0111	Quick stop active
xxxx xxxx x0xx 1111	Fault reaction active
xxxx xxxx x0xx 1000	Fault

### 0x605A / 0x685A Quick stop option code

该对象定义了当执行快速停止功能之后该执行什么样的动作。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605A	0x685A	-	Quick stop option code	RW	INT	NO	-

Quick stop option code	Action
-32768...-1	Manufacturer Specific
0	Disable drive function
1	Slow down on slow down ramp and transit into switch on disabled
2	Slow down on quick stop ramp and transit into switch on disabled
3	Slow down on the current limit and transit into switch on disabled
4	Slow down on the voltage limit and transit into switch on disabled
5	Slow down on slow down ramp and stay in quick stop active
6	Slow down on quick stop ramp and stay in quick stop active
7	Slow down on slow current limit and stay in quick stop active
8	Slow down on voltage limit and stay in quick stop active
9...32767	Reserved

目前只支持1和2的动作方式。

### 0x605B / 0x685B Shutdown option code

该对象指出从operation状态到ready to switch on状态过渡时执行什么动作。减速度采用所用操作模式当前的减速度。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605B	0x685B	-	Shutdown option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Disable drive function (switch-off drive power stage)
1	Slow down on slow down ramp disable of the drive function
2...32767	Reserved

### 0x605C / 0x685C Disable operation option code

该对象指出从operation状态到switch on状态过渡时执行什么动作。减速度采用所用操作模式当前的减速度。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605C	0x685C	-	Disable operation option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Disable drive function (switch-off drive power stage)
1	Slow down on slow down ramp and then disable of the drive function
2...32767	Reserved

### 0x605D / 0x685D Halt option code

该对象指出当halt功能执行之后需要做什么动作。减速度采用所用操作模式当前的减速度。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605D	0x685D	-	Halt option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Reserved
1	Slow down on slow down ramp and stay in operation enabled
2	Slow down on quick stop ramp and stay in operation enabled
3	Slow down on current limit and stay in operation enabled
4	Slow down on voltage limit and atay in operation enabled
5 + 32767	Reserved

### 0x605E / 0x685E Fault reaction option code

该对象指出当fault产生之后需要做什么动作。减速度采用所用操作模式当前的减速度。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605E	0x685E	-	Fault reaction option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Disable drive function, motor is free t rotate
1	Slow down on slow down ramp
2	Slow down on quick stop ramp
3	Slow down on current limit
4	Slow down on voltage limit
5 + 32767	Reserved

### 0x6060 / 0x6860 Mode of operation

该对象用来选择需要执行的操作模式。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6060	0x6860	-	Mode of operation	RW	SINT	NO	-

Mode of operation	Value
Profile position mode	1
Profile velicity mode	3
Profile Torque mode	4
Homing mode	6
Cynclc synchronous position mode	8
Cynclc synchronous velocity mode	9
Q mode(manufacturer specific mode)	-1

### 0x6061 / 0x6861 Mode of operation display

该对象显示当前的操作模式，反馈的值与对象0x6060h设置的一致。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6061	0x6861	-	Modes of operation display	RO	SINT	YES	-

### 0x6064 / 0x6864 Position actual value

该对象反馈当前实际位置。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6064	0x6864	-	Position actual value	RO	DINT	YES	-

### 0x6065 / 0x6865 Following error window

该对象定义了位置误差允许的区间范围，如果当前位置超出了该对象定义的范围，将会产生跟随误差错误。单位为counts。

发生跟随误差错误的情况：

- 堵转
- 指定速度未达到
- 闭合系数错误

如果该对象的值设置为0或者0xFFFF FFFFh，表示关闭该功能。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6065	0x6865	-	Following error window	RW	UDINT	NO	-

### 0x606C / 0x686C Velocity actual value

该对象提供电机当前实际的速度值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x606C	0x686C	-	Velocity actual value	RO	DINT	YES	-

单位为counts/s。

### 0x6071 / 0x6871 Target torque

该对象参数用来输入在扭矩模式下的目标扭矩，单位为mN·m。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6071	0x6871	-	Target torque	RW	INT	YES	-

该对象只能允许在步进伺服下，并且该对象参数和其他扭矩值，如0x6078h和0x2216都有关联。

### 0x6073 / 0x6873 Max current

该值表示电机中允许的最大电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6073	0x6873	-	Max current	RW	UINT	NO	-

单位为0.01Amps。

### 0x6074 / 0x6874 Torque demand

该对象是输出扭矩限制值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6074	0x6874	-	Torque demand value	RO	INT	YES	-

该对象只能用在步进伺服驱动器，单位为mNm。

### 0x6077 / 0x6877 torque actual value

该对象提供当前电机扭矩值，该值随着电机动态瞬时变化。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6077	0x6877	-	Torque actual value	RO	INT	YES	-

### 0x6078 / 0x6878 Current actual value

该对象提供当前电机中的瞬时电流。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6078	0x6878	-	Current actual value	RO	INT	YES	-

该对象只能用在步进伺服驱动器，单位为0.01Amps。

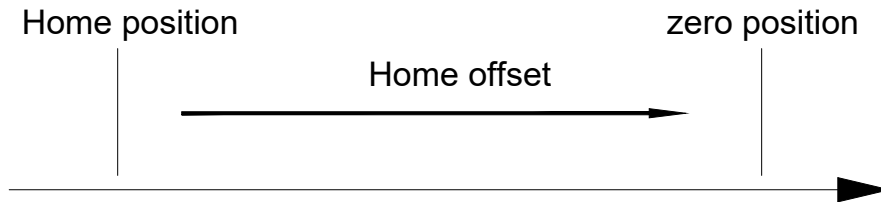
### 0x607A / 0x687A Target position

该对象是驱动器在当前运动控制参数设置生效，位置模式下将要移动的距离。就像速度，加速度，减速度一样。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607A	0x687A	-	Target position	RW	DINT	YES	-

### 0x607C / 0x687C Home offset

该原点偏置对象是应用在零位置与机器原点位置(归位期间找到的位置)之间的差，以位置单位进行测量。在回原点期间找到机器的原点位置，一旦完成原点复位，则通过将原点偏移量添加到原点位置来将零位置从原点位置偏移。随后所有绝对移动均应相对于该新的零位置进行。下图对此进行了说明。

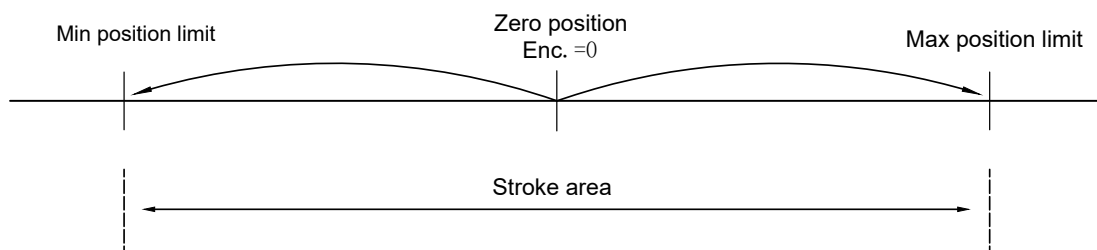


Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607C	0x687C	-	Home offset	RW	DINT	YES	-

### 0x607D / 0x687D Software position limit

该对象包含驱动器配置的最大和最小软限位值。这些参数应定义位置需求值和位置实际值的绝对位置极限，如下所示。

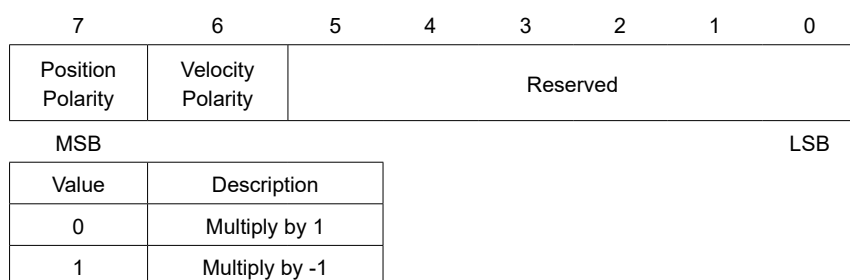
Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607D	0x687D	0	Number of sub-index	RW	USINT8	NO	2
		1	Min position limit	RW	DINT	NO	-
		2	Max position limit	RW	DINT	NO	-



### 0x607E / 0x687E Polarity

根据极性标志的值，位置给定值和位置实际值乘以1或-1。在PP PV模式下生效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607E	0x687E	-	Polarity	RW	USINT	YES	-



### 0x607F / 0x687F Max profile speed

最大轮廓速度是轮廓运动期间任一方向上的最大允许速度。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607F	0x687F	-	Max profile speed	RW	UDINT	YES	-

单位为counts/s。

### 0x6081 / 0x6881 Profile velocity

轮廓速度是轮廓运动期间通常在加速完成结束时达到的速度，正反运动方向均有效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6081	0x6881	-	Profile velocity	RW	UDINT	YES	-

单位为counts/s。

### 0x6083 / 0x6883 Profile acceleration

轮廓加速度单位为counts/s<sup>2</sup>。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6083	0x6883	-	Profile acceleration	RW	UDINT	YES	-

### 0x6084 / 0x6884 Profile deceleration

轮廓减速度单位为counts/s<sup>2</sup>。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6084	0x6884	-	Profile deceleration	RW	UDINT	YES	-

### 0x6085 / 0x6885 Quick stop deceleration

该对象是当驱动器执行快速停止指令之后电机停止用到的减速度，需要0x605A设置为2，单位为counts/s<sup>2</sup>。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6085	0x6885	-	Quick stop deceleration	RW	UDINT	NO	-

### 0x6087 / 0x6887 Torque slope

该对象描述扭矩变化率。以0.1% 额定转矩为单位变化

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6087	0x6887	-	Torque slope	RW	UDINT	YES	-

单位为 Nm/s。

### 0x6098 / 0x6898 Home method

该对象定义了回原点期间采用的回原点方式。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6098	0x6898	-	Home method	RW	SINT	YES	-

Value	Description
128	manufacturer specific
0	No homing operation required
1...37	Methods 1 to 37
38-127	Reserved

### 0x6099 / 0x6899 Homing speed

该对象定义了回原点期间的回原点速度。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6099	0x6899	-	Number of sub-index	RW	USINT8	NO	2

单位为counts/s<sup>2</sup>。

### 0x609A / 0x689A Homing acceleration

该对象定义了回原点加速度，在标准回原点模式下，该对象同时用在加速度和减速度下。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x609A	0x689A	-	Homing acceleration	RW	UDINT	YES	-

单位为counts/s<sup>2</sup>。

### 0x60B0 / 0x68B0 Position offset

该对象包含目标位置的偏置值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B0	0x68B0	-	Position offset	RW	DINT	YES	-

### 0x60B1 / 0x68B1 Velocity offset

该对象提供速度的偏置值。在循环同步位置模式下，该对象包含速度前馈的输入值。在循环同步速度模式下，它包含驱动设备的命令偏移量。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B1	0x68B1	-	Velocity offset	RW	DINT	YES	-

## 0x60B2 / 0x68B2 Torque offset

该对象提供扭矩值的偏移量。在循环同步位置模式和循环同步速度模式下，该对象包含转矩前馈的输入值。在循环同步转矩模式下，它包含驱动器指令的附加扭矩，该扭矩已添加到目标扭矩值中。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B2	0x68B2	-	Torque offset	RW	INT	YES	-

## 0x60B8 / 0x68B8 Touch probe function

该对象包含探针功能的配置信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B8	0x68B8	-	Touch probe function	RW	UINT	YES	-

Bit	Value	Definition
0	0	Swith off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continous
3,2	00	Trigger with touch probe 1 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index01
4	11	Reserved
	0	Switch off sampling at positive edge of touch probe 1
5	1	Enable sampling at positive edge of touch probe 1
	0	Switch off sampling at negtive edge of touch probe 1
6,7	1	Enable sampling at negative edge of touch probe 1
	-	Reserved
8	0	Swith off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	Continous
11,10	00	Trigger with touch probe 2 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index02
12	11	Reserved
	0	Switch off sampling at positive edge of touch probe 2
13	1	Enable sampling at positive edge of touch probe 2
	0	Switch off sampling at negative edge of touch probe 2
14,15	1	Enable sampling at negative edge of touch probe 2
	-	Reserved

## 0x60B9 / 0x68B9 Touch probe status

该对象提供探针功能的状态信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B9	0x68B9	-	Velocity offset	RW	DINT	YES	-

Bit	Value	Definition
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...7	-	Reserved
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 probe 2 negative edge position stored
11...15	-	Reserved

## 0x60BA / 0x68BA Touch probe 1 positive edge

该对象包含探针1正向边沿触发位置值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60BA	0x68BA	-	Touch probe 1 positive edge	RO	DINT	YES	-

## 0x60BB / 0x68BB Touch probe 1 negative edge

该对象包含探针1负向边沿触发位置值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60BB	0x68BB	-	Touch probe 1 negative edge	RO	DINT	YES	-

## 0x60E0 / 0x68E0 Positive torque limit value

该对象包含电机正方向扭矩最大值。正向转矩在运行为正速度或再生运行为负速度的情况下生效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60E0	0x68E0	-	Positive torque limit value	RW	UINT	YES	-

## 0x60E1 / 0x68E1 Negative torque limit value

该对象包含电机负方向扭矩最大值。负向转矩在运行为负速度或再生运行为正速度的情况下生效。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60E1	0x68E1	-	Positive torque limit value	RW	UINT	YES	-

### 0x60F4 / 0x68F4 Follow error actual value

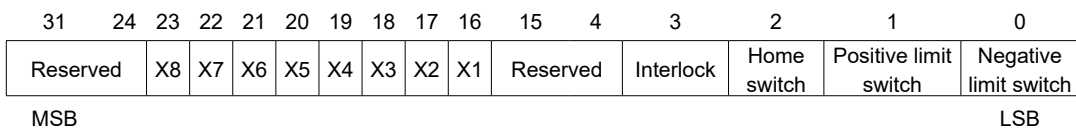
该对象提供跟随错误实际值。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60F4	0x68F4	-	Follow error actual value	RO	DINT	YES	-

### 0x60FD / 0x68FD Digital inputs

该对象提供数字输入信号，反应逻辑输入电平。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60FD	0x68FD	-	Digital inputs	RO	UDINT	YES	-



bit3（互锁）提供互锁输入的状态。如果逻辑输入信号变为未激活，则驱动器应进入禁用或故障反应激活状态。这意味着驱动器的功率级被禁用并被锁定以防打开。

### 0x60FE / 0x68FE Digital outputs

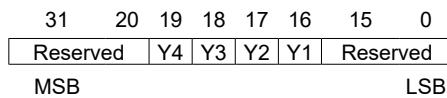
该对象控制数字输出信号，反应逻辑输出电平。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60FE	0x68FE	0	Number of sub-index	RW	USINT8	NO	2
		1	Physical outputs	RW	UDINT	YES	-
		2	Bit mask	RW	UDINT	NO	-

第一个子索引定义分配的输出。第二个子索引描述说明掩码，用于指定应使用哪个输出。

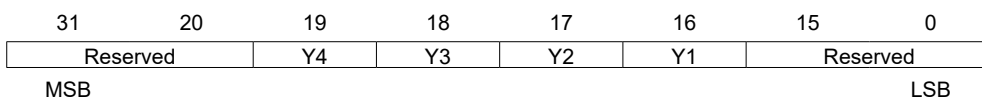
**注意：第二个索引是边沿触发的，必须先设置第二个索引，然后再设置第一个索引的位，才能改变输出状态。**

物理输出：



Field	Value	Definition
Each bit	0	Switch off
	1	Switch on

Bit mask:



Field	Value	Definition
Each bit	0	Disable output
	1	Enable output

### 0x60FF / 0x68FF Target velocity

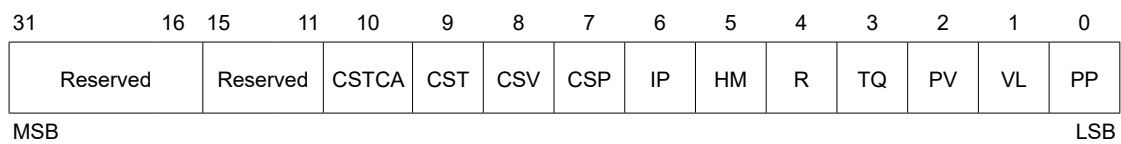
该对象包含配置的目标速度，并作为轨迹生成器的输入。该值单位为counts/s。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60FF	0x68FF	-	Target velocity	RW	DINT	YES	-

### 0x6502 / 0x6D02 Supported drive modes

该对象提供支持的运动操作模式信息。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6502	0x6D02	-	Supported drive modes	RO	UDINT	NO	-



鸣志驱动器支持以下模式：

- Bit0: Profile Position Mode
- Bit2: Profile Velocity Mode
- Bit3: Profile Torque Mode ( StepSERVO)
- Bit5: Homing Mode
- Bit7: CSP
- Bit8: CSV

### 4.3 四轴对象字典

#### 4.3.1 CoE(1000h) 配置文件

	Index	Sub	Name	Access	Type	Mapping
	CoE(1000h)	<a href="#">0x1000</a>	-	Device type	RO	UDINT
<a href="#">0x1001</a>		-	Error register	RO	USINT	NO
<a href="#">0x1008</a>		-	Device name	RO	STRING(20)	NO
<a href="#">0x1009</a>		-	Manufacturer hardware version	RO	STRING(4)	NO
<a href="#">0x100A</a>		-	Manufacturer software version	RO	STRING(4)	NO
<a href="#">0x1010</a>		-	Store parameters	-	-	-
		1	Store all parameters	RW	UDINT	NO
<a href="#">0x1011</a>		-	Restore default parameters	-	-	-
		1	Restore default parameters	RW	UDINT	NO
<a href="#">0x1018</a>		-	Identity object	-	-	-
		1	Vendor ID	RO	UDINT	NO
		2	Product code	RO	UDINT	NO
		3	Revision	RO	UDINT	NO
<a href="#">0x10F1</a>		-	Error settings	-	-	-
		1	Local error reaction	RW	UDINT	NO
		2	Sync error counter limit	RW	UINT	NO
		4	Serial number	RO	UDINT	NO

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
CoE	<a href="#">0x1600~1603</a>	<a href="#">0x1610~1613</a>	<a href="#">0x1620~1623</a>	<a href="#">0x1630~1633</a>	8	RPDO mapping parameter 1~4	-	-	-
					1	Mapping entry 1	RW	UDINT	NO
					2	Mapping entry 2	RW	UDINT	NO
					...	...	RW	UDINT	NO
					12	Mapping entry 12	RW	UDINT	NO
	<a href="#">0x1A00~1A03</a>	<a href="#">0x1A10~1A13</a>	<a href="#">0x1A20~1A23</a>	<a href="#">0x1A30~1A33</a>	-	TPDO mapping parameter1~4	-	-	-
					1	Mapping entry 1	RW	UDINT	NO
					2	Mapping entry 2	RW	UDINT	NO
					...	...	...	...	-
					12	Mapping entry 12	RW	UDINT	NO

	Index	Sub	Name	Access	Type	Mapping
CoE(1000h)	0x1C00	-	SYNC manager type	-	-	-
		1	SM0 communication type	RO	USINT	NO
		2	SM1 communication type	RO	USINT	NO
		3	SM2 communication type	RO	USINT	NO
		4	SM3 communication type	RO	USINT	NO
	0x1C12~ 1C13	-	RxPDO~TxPDO assign	-	-	-
		1	RxPDO~TxPDO 1 mapping object	RW	UINT	NO
		2	RxPDO~TxPDO 2 mapping object	RW	UINT	NO
		3	RxPDO~TxPDO 3 mapping object	RW	UINT	NO
		4	RxPDO~TxPDO 4 mapping object	RW	UINT	NO
	0x1C32~ 1C33	-	SM output~input parameter	-	-	-
		1	Synchronization type	RW	UINT	NO
		2	Cycle time	RO	UDINT	NO
		3	Shift time	RW	UDINT	NO
		4	Synchronization types supported	RO	UINT	NO
		5	Minimum cycle time	RO	UDINT	NO
		6	Calc and copy time	RO	UDINT	NO
		8	Get cycle time	RW	UINT	NO
		9	Delay time	RO	UDINT	NO
		10	Sync0 cycle time	RW	UDINT	NO
		11	SYNC-Event missed	RO	UINT	NO
		12	Cycle time too small	RO	UINT	NO
	32	Sync error	RO	BOOL	NO	

### 0x1000 Device type

包含有关设备类型的信息。该对象描述了设备的类型及其功能。它包含一个16位的描述设备文件或者应用文件以及另外一个16位的附加信息组成。附加的信息参数是设备特定的配置文件。它的规范不属于标准的范围，它是在相应的设备配置文件中定义的。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1000	-	Device type	UDINT32	RO	NO	-

Bit 0-15: 设备配置文件编号

Bit 16-31: 附加信息

### 0x1001 Error register

该对象作为设备的错误寄存器。设备在该寄存器记录内部错误，所有设备必须记录。它是紧急对象的一部分。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1001	-	Error register	USINT8	RO	NO	-

Bit 0: 普通错误

Bit 1: 电路

Bit 2: 电压

Bit 3: 温度

Bit 4: 通讯错误 (过载, 状态错误)

Bit 5-7: 预留 (总是 0)

### 0x1008 Manufacturer device name

包含自定义设备名称

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1008	-	Manufacturer device name	STRING(20)	CONST	NO	-

Name of the manufacturer as string.

### 0x1009 Hardware version

包含硬件版本号描述

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1009	-	Hardware version	STRING(4)	CONST	NO	-

### 0x100A Software version

包含软件版本号描述

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x100A	-	Software version	STRING(4)	CONST	NO	-

### 0x1010 Store parameters

该对象支持将参数保存在非易失性存储器中。通过读取访问设备 提供有关其保存功能的信息。区分了几个参数组：

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1010	0	Number of sub-index	USINT8	RO	NO	1
	1	Store parameters	UDINT32	RW	NO	0

为了避免错误地存储参数，仅在特定参数被写入时才执行存储。参数为“save(保存)”。

	MSB		LSB	
Signature ISO	e	v	a	s
8859("ASCII")hex	65h	76h	61h	73h

Storage write access signature

### 0x1011 Restore default parameters

通过该对象可以将关于通讯和设备文件的默认参数初始化。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1011	0	Number of sub-index	USINT8	RO	NO	1
	1	Restore parameters	UDINT32	RW	NO	0

为了避免错误地储存参数，仅在特定参数被写入时才执行储存，参数为“load”。

	MSB		LSB	
Signature ISO	e	v	a	s
8859("ASCII")hex	64h	61h	6Fh	6Ch

Storage write access signature

### 0x1018 Identity object

该对象包含设备的一般信息。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1018	0	Number of sub-index	USINT8	RO	NO	4
	1	Vendor-ID	UDINT32	RO	NO	-
	2	Product code	UIDINT32	RO	NO	-
	3	Revision number	UDINT32	RO	NO	-
	4	Serial number	UDINT32	RO	NO	-

### 0x10F1 Error settings

预留。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x10F1	0	Number of sub-index	USINT8	RO	NO	4
	1	Local error reaction	UDINT32	RW	NO	1
	2	SYNC error counter limit	UIDINT32	RW	NO	4

### 0x1600~1603 / 0x1610~1613 / 0x1620~1632 / 0x1630~1633 Axis Receive PDO mapping parameter

包含设备可以接受PDO（RPDO）的映射内容。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x1600-1603	0x1610-1613	0x1620-1623	0x1630-1633	0	Number of sub-index	USINT8	RW	NO	4
				1	Mapping entry 1	UDINT32	RW	NO	-
				2	Mapping entry 2	UIDINT32	RW	NO	-
				3	Mapping entry 3	UDINT32	RW	NO	-
				4	Mapping entry 4	UDINT32	RW	NO	-
				5	Mapping entry 5	UDINT32	RW	NO	-
				6	Mapping entry 6	UDINT32	RW	NO	-
				7	Mapping entry 7	UDINT32	RW	NO	-
				8	Mapping entry 8	UDINT32	RW	NO	-
				9	Mapping entry 9	UDINT32	RW	NO	-
				10	Mapping entry 10	UDINT32	RW	NO	-
				11	Mapping entry 11	UDINT32	RW	NO	-
				12	Mapping entry 12	UDINT32	RW	NO	-

## 0x1A00~1A03 / 0x1A10~1A13 / 0x1A20~1A23 / 0x1A30~1A33 Axis Transmit PDO mapping parameter

包含设备可以发送PDO（TPDO）的映射内容。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x1A00-1A03	0x1A10-1A13	0x1A20-1A23	0x1A30-1A33	0	Number of sub-index	USINT8	RW	NO	12
				1	Mapping entry 1	UDINT32	RW	NO	-
				2	Mapping entry 2	UDINT32	RW	NO	-
				3	Mapping entry 3	UDINT32	RW	NO	-
				4	Mapping entry 4	UDINT32	RW	NO	-
				5	Mapping entry 5	UDINT32	RW	NO	-
				6	Mapping entry 6	UDINT32	RW	NO	-
				7	Mapping entry 7	UDINT32	RW	NO	-
				8	Mapping entry 8	UDINT32	RW	NO	-
				9	Mapping entry 9	UDINT32	RW	NO	-
				10	Mapping entry 10	UDINT32	RW	NO	-
				11	Mapping entry 11	UDINT32	RW	NO	-
12	Mapping entry 12	UDINT32	RW	NO	-				

## 0x1C00 Sync manager type

该对象设置每个SM发生器的通讯类型，其通讯类型如下：

1. 邮箱接受
2. 邮箱发送
3. RxPDO
4. TxPDO

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C00	0	Number of sub-index	USINT8	RW	NO	4
	1	SM0 communication type	UDINT32	RW	NO	1
	2	SM1 communication type	UDINT32	RW	NO	2
	3	SM2 communication type	UDINT32	RW	NO	3
	4	SM3 communication type	UDINT32	RW	NO	4

## 0x1C12 RxPDO assign object

RxPDO生效，则该对象子索引1-4用来设置映射的对象。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C12	0	Number of sub-index	USINT8	RW	NO	1
	1	RxPDO1 mapping object	UDINT32	RW	NO	0x1600
	2	RxPDO2 mapping object	UDINT32	RW	NO	-
	3	RxPDO3 mapping object	UDINT32	RW	NO	-
	4	RxPDO4 mapping object	UDINT32	RW	NO	-

### 0x1C13 TxPDO assign object

TxPDO生效，则该对象子索引1-4用来设置映射的对象。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C13	0	Number of sub-index	USINT8	RW	NO	1
	1	TxPDO1 mapping object	UDINT32	RW	NO	0x1A00
	2	TxPDO2 mapping object	UDINT32	RW	NO	-
	3	TxPDO3 mapping object	UDINT32	RW	NO	-
	4	TxPDO4 mapping object	UDINT32	RW	NO	-

### 0x1C32 SM output parameter

包含同步发生器输出管理参数。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C32	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

### 0x1C33 SM input parameter

包含同步发生器输入管理参数。

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C33	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

## 4.3.2 0x2000~2100h配置文件

	Index	Sub	Name	Access	Type	Mapping
0x2000~2100h	<a href="#">0x2001</a>	-	EtherCAT ID	RO	UINT16	NO
	<a href="#">0x2002</a>	-	Physical Address	RO	UINT16	NO
	<a href="#">0x2003</a>	-	Alias Source	RO	UINT	NO
	<a href="#">0x2005</a>	-	Bus Voltage	RO	UINT16	NO
	<a href="#">0x2006</a>	-	DSP Version	RO	STRING(10)	NO
	<a href="#">0x2007</a>	-	Drive Temperature 1	RO	UINT	NO
	<a href="#">0x2010</a>	-	Set EtherCAT ID	RW	UINT	NO

0x2000~2100h	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
	<a href="#">0x2020</a>	<a href="#">0x2040</a>	<a href="#">0x2060</a>	<a href="#">0x2080</a>	-	Axis Output Status	RO	UDINT	NO
	<a href="#">0x2021</a>	<a href="#">0x2041</a>	<a href="#">0x2061</a>	<a href="#">0x2081</a>	-	Axis DSP Status Code	RO	UINT32	YES
	<a href="#">0x2022</a>	<a href="#">0x2042</a>	<a href="#">0x2062</a>	<a href="#">0x2082</a>	-	Axis DSP Alarm Code	RO	UINT32	YES

## 0x2001 EtherCAT ID

该对象包含驱动器的EtherCAT ID。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2001	-	EtherCAT ID	RO	UINT	NO	-

## 0x2002 Physical Address

该对象包含驱动器的物理地址。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2002	-	Physical address	RO	UINT	NO	-

## 0x2003 Alias Source

该对象用来设置选择EtherCAT 地址方式，0表示由软件设置，1表示由EtherCAT主站设置。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2003	-	Alias Source	RO	UINT	NO	-

## 0x2005 Bus Voltage

该对象提供驱动器的母线电压值。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2005	-	Bus Voltage	RO	UINT	NO	-

## 0x2006 DSP Version

该对象提供驱动器的DSP版本信息。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2006	-	DSP Version	RO	UINT	NO	-

## 0x2007 Drive Temperature 1

该对象包含驱动器温度信息。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2007	-	Drive Temperature 1	RO	UINT	NO	0

该对象单位为0.1摄氏度。

## 0x2010 Set EtherCAT ID

该对象可以设置EtherCAT ID。

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2010	-	Set EtherCAT ID	RW	UINT	NO	0

## 0x2020 / 0x2040 / 0x2060 / 0x2080 Axis Output Status

该对象包含数字输出信号的状态。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2020	0x2040	0x2060	0x2080	-	Axis Output Status	RO	UDINT	NO	0x000F0000

Bit	31	20	19	18	17	16	15	0
Output	Reserved	Y4	Y3	Y2	Y1	Reserved		

## 0x2021 / 0x2041 / 0x2061 / 0x2081 Axis DSP Status Code

该对象反馈当前驱动器DSP状态信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2021	0x2041	0x2061	0x2081	-	Axis 1 DSP Status Code	RO	UDINT	YES	-

BIT	Status Code Bit Definition
0	Motor Enabled - motor disabled is this bit = 0
1	Sampling - for Quick Tuner
2	Drive Fault - check alarm code
3	In Position - motor is in position
4	Moving - motor is moving
5	Jogging - currently in jog mode
6	Stopping - in the process of stopping from a stop command
7	Waiting - for an input
8	Saving - parameter data is being saved
9	Alarm present - check alarm code
10	Homing - executing an SH command
11	Wait Time - executing a WT command
12	Wizard running - timing wizard is running
13	Checking encoder - timing wizard is running
14	Q Program is running
15	Initializing

## 0x2022 / 0x2042 / 0x2062 / 0x2082 Axis DSP Alarm Code

该对象指明位于0x603F里面报警代码的高16位报警信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2022	0x2042	0x2062	0x2082	-	Axis DSP Alarm Code	RO	UDINT	YES	-

## 4.3.3 四轴步进伺服通用配置文件

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
0x3200~ 4000h	0x3200	0x3400	0x3600	0x3800	-	Continuous current	RW	UINT	NO
	0x3201	0x3401	0x3601	0x3801	-	Peak current	RW	UINT	NO
	0x3202	0x3402	0x3602	0x3802	-	Hard stop current limit	RW	UINT	NO
	0x3203	0x3403	0x3603	0x3803	-	Idle current	RW	UINT	NO
	0x3204	0x3404	0x3604	0x3804	-	Idle current delay time	RW	UINT	NO
	0x3205	0x3405	0x3605	0x3805	-	Acceleration current	RW	UINT	NO
	0x3206	0x3406	0x3606	0x3806	-	Stall prevention time	RW	UINT	NO
	0x3207	0x3407	0x3607	0x3807	-	Steps per rev	RO	UINT	NO
	0x3208	0x3408	0x3608	0x3808	-	Reverse motor direction	RW	UINT	NO
	0x3209	0x3409	0x3609	0x3809	-	Powerup probing	RW	UINT	NO
	0x320B	0x340B	0x360B	0x380B	-	Fault output on Y1	RW	UINT	NO
					-	Brake Output on Y2	-	-	-
	0x320C	0x340C	0x360C	0x380C	1	Brake Output	RW	UINT	NO
					2	Brake Disengage Delay	RW	UINT	NO
					3	Brake Engage Delay			
					-	Motion Output	-	-	-
	0x320D	0x340D	0x360D	0x380D	1	Motion Output on Y1	RW	UINT	NO
					2	Motion Output on Y2	RW	UINT	NO
					3	Motion Output on Y3	RW	UINT	NO
					4	Motion Output on Y4			
	0x320F	0x340F	0x360F	0x380F	-	Define limits	RW	UINT	NO
					-	Inputs filter	-	-	-
	0x3210	0x3410	0x3610	0x3810	1	Inputs filter X1 filter time	RW	UINT	NO
					2	Inputs filter X2 filter time	RW	UINT	NO
					...	...	...	...	...
					8	Inputs filter X8 filter time	RW	UINT	NO
					-	Notch filter	-	-	-
	0x3211	0x3411	0x3611	0x3811	1	Notch filter_paraA	RW	INT	NO
					2	Notch filter_paraB	RW	INT	NO
					...	...	...	...	...
					8	Notch filter_paraH	RW	INT	NO
					-	Analog configuration	-	-	-
0x3212	0x3412	0x3612	0x3812	1	Analog deadband	RW	UINT	NO	
				2	Analog offset vallue	RW	UINT	NO	
				3	Analog filter	RW	UINT	NO	
				4	Analog threshold	RW	UINT	NO	
				5	Analog scaling	RW	UINT	NO	
0x3213	0x3413	0x3613	0x3813	-	Analog auto zero	RW	UINT	NO	
0x3214	0x3414	0x3614	0x3814	-	Operation mode	RW	UINT	NO	
0x3215	0x3415	0x3615	0x3815	-	Jog mode	RW	UINT	NO	
0x3216	0x3416	0x3616	0x3816	-	Torque constant	RW	UINT	NO	

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
0x3200~ 4000h	<a href="#">0x3218</a>	<a href="#">0x3418</a>	<a href="#">0x3618</a>	<a href="#">0x3818</a>	-	Encoder resolution	RO	UINT	NO
	<a href="#">0x3220</a>	<a href="#">0x3420</a>	<a href="#">0x3620</a>	<a href="#">0x3820</a>	-	Position gain	RW	UINT	NO
	<a href="#">0x3221</a>	<a href="#">0x3421</a>	<a href="#">0x3621</a>	<a href="#">0x3821</a>	-	Positionderi gain	RW	UINT	NO
	<a href="#">0x3222</a>	<a href="#">0x3422</a>	<a href="#">0x3622</a>	<a href="#">0x3822</a>	-	Positionderi filter	RW	UINT	NO
	<a href="#">0x3224</a>	<a href="#">0x3424</a>	<a href="#">0x3624</a>	<a href="#">0x3824</a>	-	Velocity gain	RW	UINT	NO
	<a href="#">0x3225</a>	<a href="#">0x3425</a>	<a href="#">0x3625</a>	<a href="#">0x3825</a>	-	Velocityinterg gain	RW	UINT	NO
	<a href="#">0x3226</a>	<a href="#">0x3426</a>	<a href="#">0x3626</a>	<a href="#">0x3826</a>	-	Accfeedforward	RW	UINT	NO
	<a href="#">0x3227</a>	<a href="#">0x3427</a>	<a href="#">0x3627</a>	<a href="#">0x3827</a>	-	PID filter	RW	UINT	NO
	<a href="#">0x3252</a>	<a href="#">0x3452</a>	<a href="#">0x3652</a>	<a href="#">0x3852</a>	-	Inposition counts	RW	UINT	NO
	<a href="#">0x3253</a>	<a href="#">0x3453</a>	<a href="#">0x3653</a>	<a href="#">0x3853</a>	-	CSP complete time	RW	UINT	NO
	<a href="#">0x3254</a>	<a href="#">0x3454</a>	<a href="#">0x3654</a>	<a href="#">0x3854</a>	-	Inposition error range	RW	UINT	NO
	<a href="#">0x3255</a>	<a href="#">0x3455</a>	<a href="#">0x3655</a>	<a href="#">0x3855</a>	-	Inposition time	RW	UINT	NO
	<a href="#">0x3260</a>	<a href="#">0x3460</a>	<a href="#">0x3660</a>	<a href="#">0x3860</a>	-	Actual current	RO	INT	NO
					-	Analog Reading	RO	INT	NO
	<a href="#">0x3261</a>	<a href="#">0x3461</a>	<a href="#">0x3661</a>	<a href="#">0x3861</a>	1	Analog Reading Value	RO	INT	YES
					2	Analog Reading Input1	RO	INT	YES
					3	Analog Reading Input2	RO	INT	YES
	<a href="#">0x3262</a>	<a href="#">0x3462</a>	<a href="#">0x3662</a>	<a href="#">0x3862</a>	-	Motor name	RO	STRING(5)	NO
	<a href="#">0x3265</a>	<a href="#">0x3465</a>	<a href="#">0x3665</a>	<a href="#">0x3865</a>	-	E-Stop on input X8	RW	UINT	NO
	<a href="#">0x3271</a>	<a href="#">0x3471</a>	<a href="#">0x3671</a>	<a href="#">0x3871</a>	-	Home switch	RW	UINT8	YES
<a href="#">0x3272</a>	<a href="#">0x3472</a>	<a href="#">0x3672</a>	<a href="#">0x3872</a>	-	Clear alarm	WO	UINT8	YES	
<a href="#">0x3274</a>	<a href="#">0x3474</a>	<a href="#">0x3674</a>	<a href="#">0x3874</a>	-	Zero position	WO	UINT8	NO	
<a href="#">0x3275</a>	<a href="#">0x3475</a>	<a href="#">0x3675</a>	<a href="#">0x3875</a>	-	S-Curve filter time	RW	UINT	NO	
<a href="#">0x3276</a>	<a href="#">0x3476</a>	<a href="#">0x3676</a>	<a href="#">0x3876</a>	-	Move homeoffset	RW	UINT	NO	
<a href="#">0x3280</a>	<a href="#">0x3480</a>	<a href="#">0x3680</a>	<a href="#">0x3880</a>	-	User registers	-	-	-	

### 0x3200 / 0x3400 / 0x3600 / 0x3800 Continuous current

该对象是步进伺服的运行电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3200	0x3400	0x3600	0x3800	-	Continuous current	RW	UINT	NO	-

### 0x3201 / 0x3401 / 0x3601 / 0x3801 Peak current

该对象是步进伺服的峰值(RMS)电流。峰值电流设置了给定电机应使用的最大电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3201	0x3401	0x3601	0x3801	-	Peak current	RW	UINT	NO	-

### 0x3202 / 0x3402 / 0x3602 / 0x3802 Hardstop current limit

该对象用来设置硬限位回原点模式下，当电机撞击硬限位位置的时候限制的电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3202	0x3402	0x3602	0x3802	-	Hardstop current limit	RW	UINT	NO	-

**0x3203 / 0x3403 / 0x3603 / 0x3803 Idle current**

该对象配置电机在空闲状态下的空闲电流，单位为0.01Amps。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3203	0x3403	0x3603	0x3803	-	Idle current	RW	UINT	NO	-

**0x3204 / 0x3404 / 0x3604 / 0x3804 Idle current delay time**

该对象用来设置驱动器从运行电流切换到空闲电流延迟的时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3204	0x3404	0x3604	0x3804	-	Idle current delay time	RW	UINT	NO	-

单位为0.1s

**0x3205 / 0x3405 / 0x3605 / 0x3805 Acceleration current**

该对象用来设置当驱动器在步进模式下运行的加速度电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3205	0x3405	0x3605	0x3805	-	Acceleration current	RW	UINT	NO	-

单位为0.01Amps。

**0x3206 / 0x3406 / 0x3606 / 0x3806 Stall prevention time**

该对象用来设置失速判断时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3206	0x3406	0x3606	0x3806	-	Stall precention time	RW	UINT	NO	-

单位为0.1s。

**0x3207 / 0x3407 / 0x3607 / 0x3807 Steps per rev**

该对象用来获取电机每转的步数。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3207	0x3407	0x3607	0x3807	-	Step per rev	RO	UINT	NO	-

单位为steps/rev。

**0x3208 / 0x3408 / 0x3608 / 0x3808 Reverse motor direction**

该对象可以用来改变电机默认方向。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3208	0x3408	0x3608	0x3808	-	Reverse motor direction	RW	UINT	NO	-

The value can be set to 0 - 1.

Value =0            default rotating direction  
          =1            reverse rotating direction

### 0x3209 / 0x3409 / 0x3609 / 0x3809 Powerup probing

该对象用来设置上电是否probing。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3209	0x3409	0x3609	0x3809	-	Powerup probing	RW	UINT	NO	-

Value =0            NO probing  
          =1            Probing

### 0x320B / 0x340B / 0x360B / 0x380B Fault output on Y1

该对象用来设置Y1报警输出。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320B	0x340B	0x360B	0x380B	-	Fault output on Y1	RW	UINT	NO	-

Value =1            output Y1 is open when the driver is fault  
          =2            output Y1 is closed when the driver is fault  
          =3            output Y1 is used for general purpose

### 0x320C / 0x340C / 0x360C / 0x380C Brake output on Y2

该对象用来设置刹车输出功能相关参数，该对象有3个子索引，子索引一用作配置刹车输出，二配置刹车释放之后移动等待时间，三配置刹车抱闸之后去使能等待时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320C	0x340C	0x360C	0x380C	-	Fault output on Y1	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Brake output	RW	UINT	NO	-
				2	Brake disengage delay	RW	UINT	NO	-
				3	Brake engage delay	RW	UINT	NO	-

#### Brake output:

Value =1            output is closed when drive is enabled, and open when the drive is disabled.  
          =2            output is open when drive is enabled, and closed when the drive is disabled.  
          =3            output is not used as a brake output and can be used as g general purpose output.

#### Brake disengage delay and brake engage delay

单位为1ms。

## 0x320D / 0x240D / 0x360D / 0x380D Motion output

该对象用来定义电机运动输出口的功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320C	0x340C	0x360C	0x380C	-	Motion Output	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Motion output on Y1	RW	UINT	NO	-
				2	Motion output on Y2	RW	UINT	NO	-
				3	Motion output on Y3	RW	UINT	NO	-
				4	Motion output on Y4	RW	UINT	NO	-

They can be set to various functions.

Value =1	Open when static position error less than in-position counts.
=2	Closed when static position error less than in-position counts.
=3	General purpose
=4	Tach output with 100 pulses/rev
=5	Tach output with 200 pulses/rev
=6	Tach output with 400 pulses/rev
=7	Tach output with 800 pulses/rev
=8	Tach output with 1600 pulses/rev
=9	Closed (energized) when dynamic position error is less than set value.
=10	Open (de-energized) when dynamic position error is less than set value.
=11	Timing out (50 pulses/rev)

## 0x320F / 0x340F / 0x360F / 0x380F Define limits

该对象用来设置限位功能定义。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320F	0x340F	0x360F	0x380F	-	Define limits	RW	UINT	NO	-

Value =0x01	At end of travel, (X3=CW,X4=CCW)will be closed
=0x02	At end of travel, (X3=CW,X4=CCW)will be open
=0x07	At end of travel, X3=CW will be closed, X4=GP
=0x08	At end of travel, X3=CW will be open, X4=GP
=0x09	At end of travel, X4=CCW will be closed, X3=GP
=0x0A	At end of travel, X4=CCW will be open, X3=GP
=0x0B	At end of travel, (X3=CCW,X4=CW)will be closed
=0x0C	At end of travel, (X3=CCW,X4=CW)will be open
=0x11	At end of travel, X3=CCW will be closed, X4=GP
=0x12	At end of travel, X3=CCW will be open, X4=GP
=0x13	At end of travel, X4=CW will be closed, X3=GP
=0x14	At end of travel, X4=CW will be open, X3=GP
=0x15	At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
=0x16	At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
=0x1B	At end of travel, X3=CW will be closed, X4=GP[No Alarm]
=0x1C	At end of travel, X3=CW will be open, X4=GP[No Alarm]
=0x1D	At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
=0x1E	At end of travel, X4=CCW will be open, X3=GP[No Alarm]
=0x1F	At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
=0x20	At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
=0x25	At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
=0x26	At end of travel, X3=CCW will be open, X4=GP[No Alarm]
=0x27	At end of travel, X4=CW will be closed, X3=GP[No Alarm]
=0x28	At end of travel, X4=CW will be open, X3=GP[No Alarm]

## 0x3210 / 0x3410 / 0x3610 / 0x3810 Input filter

该对象在IO输入口设置一个数字滤波。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3210	0x3410	0x3610	0x3810	-	Input filter time	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	8
				1	Input X1 filter time	RW	UINT	NO	-
				2	Input X2 filter time	RW	UINT	NO	-
				3	Input X3 filter time	RW	UINT	NO	-
				4	Input X4 filter time	RW	UINT	NO	-
				5	Input X5 filter time	RW	UINT	NO	-
				6	Input X6 filter time	RW	UINT	NO	-
				7	Input X7 filter time	RW	UINT	NO	-
8	Input X8 filter time	RW	UINT	NO	-				

该参数单位为200us。如果该对象值为100表示20ms滤波延迟。

## 0x3211 / 0x3411 / 0x3611 / 0x3811 Notch filter

这8个对象用来配置陷波滤波器，该对象只在步进伺服驱动器有效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3211	0x3411	0x3611	0x3811	-	Notch filter	RW	INT	NO	-
				0	Number of sub-index	RO	USINT8	NO	8
				1	Notch filter_paraA	RW	INT	NO	-
				2	Notch filter_paraB	RW	INT	NO	-
				3	Notch filter_paraC	RW	INT	NO	-
				4	Notch filter_paraD	RW	INT	NO	-
				5	Notch filter_paraE	RW	INT	NO	-
				6	Notch filter_paraF	RW	INT	NO	-
				7	Notch filter_paraG	RW	INT	NO	-
				8	Notch filter_paraH	RW	INT	NO	-

## 0x3212 / 0x3412 / 0x3612 / 0x3812 Analog configuration

该对象用来配置关于模拟量的运行模式，当运行模拟量速度/位置/扭矩的时候，我们需要设置相关参数到该对象里面。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3212	0x3412	0x3612	0x3812	-	Analog Configuration	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	5
				1	Analog deadband	RW	UINT	NO	-
				2	Analog offset value	RW	UINT	NO	-
				3	Analog filter	RW	UINT	NO	-
				4	Analog threshold	RW	UINT	NO	-
				5	Analog scaling	RW	UINT	NO	-

## 模拟量死区和模拟量偏置

单位为0.001V

## 模拟量滤波

滤波值 =  $72090 / [(1400 / x) + 2.2]$

x 表示 模拟量滤波期望的值，单位为 Hz

## Analog scaling

Value =0	single-ended +/- 10 volts
=1	single-ended 0 - 10 volts
=2	single-ended +/- 5 volts
=3	single-ended 0 - 5 volts
=4	differential +/- 10 volts
=5	differential 0 - 10 volts
=6	differential +/- 5 volts
=7	differential 0 - 5 volts

### 0x3213 / 0x3413 / 0x3613 / 0x3813 Analog auto zero

该对象用来设置当前模拟量为0，写1表示生效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3213	0x3413	0x3613	0x3813	-	Analog auto zero	RW	UINT	NO	-

### 0x3214 / 0x3414 / 0x3614 / 0x3814 Operation mode

该对象用来设置驱动器上电运行的模式。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3214	0x3414	0x3614	0x3814	-	Operation mode	RW	UINT	NO	-

Value =1	Si program
=2	Q/SCL(drive enabled)
=3	Quick tuner(servos) or Configurator(steppers)
=4	SiNET Hub
=5	Q/SCL(drive disabled)
=6	not used
=7	Q program, auto-execute

### 0x3215 / 0x3415 / 0x3615 / 0x3815 Jog mode

该对象用来设置速度模式，鸣志驱动器有两种速度模式。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3215	0x3415	0x3615	0x3815	-	Jog mode	RW	UINT	NO	-

Value =1	位置模式下的速度控制
=2	纯速度模式下的速度控制

### 0x3216 / 0x3416 / 0x3616 / 0x3816 Torque constant

该对象配置电机的扭矩常数，单位为mN·m/Amps。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3216	0x3416	0x3616	0x3816	-	Torque constant	RW	UINT	NO	-

该对象只支持步进伺服驱动器。0x2216=最大输出扭矩/最大运行电流（依据不同参数设定）。

### 0x3218 / 0x3418 / 0x3618 / 0x3818 Encoder resolution

该对象应提供电动机的编码器配置。它包含每转多少个计数。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3218	0x3418	0x3618	0x3818	-	Encoder resolution	RO	UINT	NO	-

**0x3220 / 0x3420 / 0x3620 / 0x3820 Position gain**

该对象用来配置步进伺服在位置环下的比例增益，该对象只在步进伺服下有效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3220	0x3420	0x3620	0x3820	-	Position gain	RW	UINT	NO	-

**0x3221 / 0x3421 / 0x3621 / 0x3821 Position derigain**

该对象用来配置步进伺服在位置环控制下的微分增益，该对象只在步进伺服下有效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3221	0x3421	0x3621	0x3821	-	Positionderi gain	RW	UINT	NO	-

**0x3222 / 0x3422 / 0x3622 / 0x3822 Position derifilter**

该对象提供一个非常简单的单极点低通滤波器用来限制高频噪音，以及使系统变得更安静和稳定。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3222	0x3422	0x3622	0x3822	-	Positionderi filter	RW	UINT	NO	-

**0x3224 / 0x3424 / 0x3624 / 0x3824 Velocity gain**

该对象用来配置步进伺服在速度环控制中的比例增益，该对象只在步进伺服下有效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3224	0x3424	0x3624	0x3824	-	Velocity gain	RW	UINT	NO	-

**0x3225 / 0x3425 / 0x3625 / 0x3825 Velocityinterg gain**

该对象用来配置步进伺服，在速度环下的积分增益，该对象只在步进伺服下有效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3225	0x3425	0x3625	0x3825	-	Velocityinterg gain	RW	UINT	NO	-

**0x3226 / 0x3426 / 0x3626 / 0x3826 Accfeedforward**

该对象用来配置一个加速度/减速度前馈增益，用来加快系统在扭矩指令下的响应速度，该对象只在步进伺服下有效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3226	0x3426	0x3626	0x3826	-	Accfeedforward	RW	UINT	NO	-

**0x3227 / 0x3427 / 0x3627 / 0x3827 PID filter**

此对象在速度环的末尾提供一个扭矩指令过滤器。该滤波器是一个非常简单的单极点低通滤波器，用于限制速度的高频响应，从而限制位置控制环路。该对象仅在步进伺服驱动器上生效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3227	0x3427	0x3627	0x3827	-	PID filter	RW	UINT	NO	-

**0x3252 / 0x3452 / 0x3652 / 0x3852 Inposition counts**

该对象用来设置静态位置误差值，用来作为步进伺服运动状态的判断依据。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3252	0x3452	0x3652	0x3852	-	Inposition counts	RW	UINT	NO	-

**0x3253 / 0x3453 / 0x3653 / 0x3853 CSP complete time**

该对象用于设置电动机在CSP模式下完成动作的延迟时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3253	0x3453	0x3653	0x3853	-	CSP complete time	RW	UINT	NO	-

单位为0.001s。

**0x3254 / 0x3454 / 0x3654 / 0x3854 In position error range**

该对象用于设置静态定位误差范围。当实际位置在目标位置误差范围内且持续时间超过PE指定的时间时，驱动程序将定义运动完成或电机就位。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3254	0x3454	0x3654	0x3854	-	In position error range	RW	UINT	NO	-

**0x3255 / 0x3455 / 0x3655 / 0x3855 In position time**

该对象用于设置位置到达确定的持续时间。例如，当确定到位误差PD时，PE设置到位保持持续时间。当实际位置在目标位置范围(PD)内保持设置的最短时间(PE)时，驱动器将电动机定义为位置到达。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3255	0x3455	0x3655	0x3855	-	In position time	RW	UINT	NO	-

**0x3260 / 0x3460 / 0x3660 / 0x3860 Actual current**

该对象提供当前电机实际电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3260	0x3460	0x3660	0x3860	-	Actual current	RO	INT	NO	-

**0x3261 / 0x3461 / 0x3661 / 0x3861 Analog reading**

该对象提供当前驱动器模拟量值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3261	0x3461	0x3661	0x3861	-	Analog Reading	RW	INT	YES	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Analog reading	RW	INT	YES	-
				2	Analog reading input 1	RW	INT	YES	-
				3	Analog reading inupt 2	RW	INT	YES	-

## 0x3262 / 0x3462 / 0x3662 / 0x3862 Motor name

该对象包含电机名称。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3262	0x3462	0x3662	0x3862	-	Motor	RO	STRING(15)	NO	-

## 0x3265 / 0x3465 / 0x3665 / 0x3865 E-Stop on input X8 (仅-4X)

该对象用来设置X8的急停功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3265	0x3465	0x3665	0x3865	-	E-Stop on input X8	RW	UINT	NO	0

Value =1	Emergency stop when closed(fault)
=2	Emergency stop when open(fault)
=3	General purpose/Touch probe2
=5	Emergency stop when closed(warning)
=6	Emergency stop when open(warning)
=7	Emergency stop when closed(auto clear alarm)
=8	Emergency stop when open(auto clear alarm)

## 0x3271 / 0x3471 / 0x3671 / 0x3871 Home switch

该对象用来选择回原点的时候原点开关。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3271	0x3471	0x3671	0x3871	-	Home switch	RW	USINT	NO	-

Bit	Name	Value	Description
0	原点信号	可设置为3、4、7	X3、X4、X7
1			
2			
3			
4	设置原点的有效方式	0	触发时有效 (闭合)
		1	非触发时有效 (打开)
5-7	预留		

## 0x3272 / 0x3472 / 0x3672 / 0x3872 Clear alarm

该对象提供一个清除驱动器报警的功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3272	0x3472	0x3672	0x3872	-	Clear alarm	RW	USINT	YES	-

STF\*\*-EC, SSDC\*\*-EC: 设置为0x01可以清除报警

STF\*\*-ECX, SSDC\*\*-ECX: 将该对象值由0x55变更为0xAA可以清除报警

## 0x3274 / 0x3474 / 0x3674 / 0x3874 Zero position

该对象提供设置所有位置参数为0的功能，例如当前位置信息(0x6064)。设置该对象值为01h可以清除所有位置信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3274	0x3474	0x3674	0x3874	-	Zero position	RW	USINT	NO	-

## 0x3275 / 0x3475 / 0x3675 / 0x3875 S-Curve filter time

该对象用来设置S曲线滤波时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3275	0x3475	0x3675	0x3875	-	S-Curve filter time	RW	UINT	NO	-

## 0x3276 / 0x3476 / 0x3676 / 0x3876 Move home offset

该对象用来设置原点偏置模式。

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

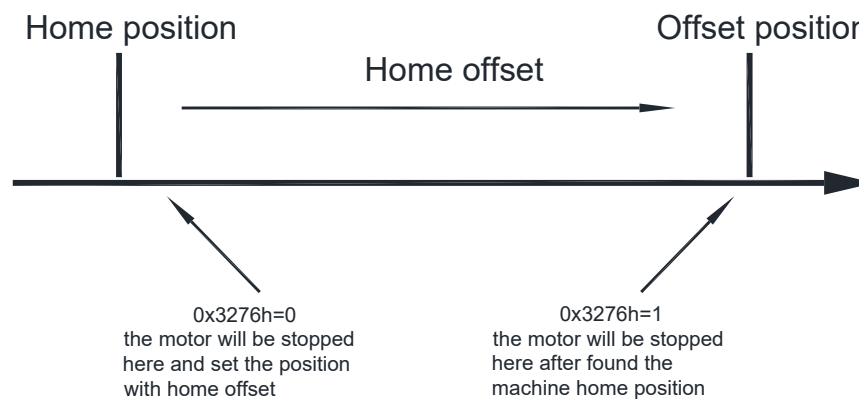
注：此功能仅对回原方式1~35生效。

设置为0:

电机会停止在机械原点位置，并且当前位置值由原点偏置(home offset)设定。

设置为1:

电机会在找到机械原点位置之后移动一个由原点偏置(home offset)提供的距离，并且当前位置值由原点偏置(home offset)设定。



## 0x3280 / 0x3480 / 0x3680 / 0x3880 User registers

该对象提供了23个普通用户寄存器，由于属于非保持性，所以里面的信息在重新上电之后不会保存。

Index				Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3280	0x3480	0x3680	0x3880	0	User Registers	RO	USINT	NO	23
				1	User register0	RO	DINT	YES	-
				2	User register1	RW	DINT	YES	-
				3	User register2	RW	DINT	YES	-
				4	User register3	RW	DINT	YES	-
				5	User register4	RW	DINT	YES	-
				6	User register5	RW	DINT	YES	-
				7	User register6	RW	DINT	YES	-
				8	User register7	RW	DINT	YES	-
				9	User register8	RW	DINT	YES	-
				10	User register9	RW	DINT	YES	-
				11	User register10	RW	DINT	YES	-
				12	User register11	RW	DINT	YES	-
				13	User register12	RW	DINT	YES	-
				14	User register13	RW	DINT	YES	-
				15	User register14	RW	DINT	YES	-
				16	User register15	RW	DINT	YES	-
				17	User register16	RW	DINT	YES	-
				18	User register17	RW	DINT	YES	-
				19	User register18	RW	DINT	YES	-
				20	User register19	RW	DINT	YES	-
				21	User register20	RW	DINT	YES	-
				22	User register21	RW	DINT	YES	-
23	User register22	RW	DINT	YES	-				

## 4.3.4 四轴步进通用配置文件

	Index				Sub	Name	Access	Type	mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
0x2600~ 2E00	<a href="#">0x2600</a>	<a href="#">0x2800</a>	<a href="#">0x2A00</a>	<a href="#">0x2C00</a>	-	Running current	RW	UINT	NO
	<a href="#">0x2601</a>	<a href="#">0x2801</a>	<a href="#">0x2A01</a>	<a href="#">0x2C01</a>	-	Idle current	RW	UINT	NO
	<a href="#">0x2602</a>	<a href="#">0x2802</a>	<a href="#">0x2A02</a>	<a href="#">0x2C02</a>	-	Idle current delay time	RW	UINT	NO
	<a href="#">0x2603</a>	<a href="#">0x2803</a>	<a href="#">0x2A03</a>	<a href="#">0x2C03</a>	-	Acceleration current	RW	UINT	NO
	<a href="#">0x2604</a>	<a href="#">0x2804</a>	<a href="#">0x2A04</a>	<a href="#">0x2C04</a>	-	Steps per rev	RW	UINT	NO
	<a href="#">0x2605</a>	<a href="#">0x2805</a>	<a href="#">0x2A05</a>	<a href="#">0x2C05</a>	-	Reverse motor direction	RW	UINT	NO
	<a href="#">0x2606</a>	<a href="#">0x2806</a>	<a href="#">0x2A06</a>	<a href="#">0x2C06</a>	-	Fault output on Y1	RW	UINT	NO
	<a href="#">0x2607</a>	<a href="#">0x2807</a>	<a href="#">0x2A07</a>	<a href="#">0x2C07</a>	-	Brake Output on Y2	-	-	-
					1	Brake Output	RW	UINT	NO
					2	Brake Disengage Delay	RW	UINT	NO
					3	Brake Engage Delay	RW	UINT	NO
	<a href="#">0x2608</a>	<a href="#">0x2808</a>	<a href="#">0x2A08</a>	<a href="#">0x2C08</a>	-	Motion Output	-	-	-
					1	Motion Output on Y1	RW	UINT	NO
					2	Motion Output on Y2	RW	UINT	NO
					3	Motion Output on Y3	RW	UINT	NO
					4	Motion Output on Y4			
	<a href="#">0x260B</a>	<a href="#">0x280B</a>	<a href="#">0x2A0B</a>	<a href="#">0x2C0B</a>	-	Define limits	RW	UINT	NO
	<a href="#">0x260C</a>	<a href="#">0x280C</a>	<a href="#">0x2A0C</a>	<a href="#">0x2C0C</a>	-	Inputs Filter	-	-	-
					1	Input X1 Filter Time	RW	UINT	NO
					...	...	...	...	
					8	Inputs X8 filter time	RW	UINT	NO
	<a href="#">0x260D</a>	<a href="#">0x280D</a>	<a href="#">0x2A0D</a>	<a href="#">0x2C0D</a>	-	Dynamic open winding detection	RW	UINT	NO
<a href="#">0x260E</a>	<a href="#">0x280E</a>	<a href="#">0x2A0E</a>	<a href="#">0x2C0E</a>	-	Open winding detect speed limit	RW	UDINT	NO	
<a href="#">0x260F</a>	<a href="#">0x280F</a>	<a href="#">0x2A0F</a>	<a href="#">0x2C0F</a>	-	Powerup open winding detection	RW	UINT	NO	
<a href="#">0x2610</a>	<a href="#">0x2810</a>	<a href="#">0x2A10</a>	<a href="#">0x2C10</a>	-	Motor model number	RW	UINT	NO	
<a href="#">0x2611</a>	<a href="#">0x2811</a>	<a href="#">0x2A11</a>	<a href="#">0x2C11</a>	-	Load ratio	RW	UINT	NO	

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
<b>0x2600~ 2E00h</b>	<a href="#">0x2612</a>	<a href="#">0x2812</a>	<a href="#">0x2A12</a>	<a href="#">0x2C12</a>	-	Third party motor parameters	-	ARRAY	NO
					1	MotorName 1	RW	UDINT	NO
					2	MotorName 2	RW	UDINT	NO
					3	MotorName 3	RW	UDINT	NO
					4	MotorName 4	RW	UDINT	NO
					5	MotorPara_01	RW	UINT	NO
					6	MotorPara_02	RW	UINT	NO
					...	...	...	...	...
					12	MotorPara_14	RW	UINT	NO
					13	Reserved_01	RW	UINT	NO
					14	Reserved_02	RW	UINT	NO
					...	..	...	...	...
	18	Reserved_06	RW	UINT	NO				
	<a href="#">0x2615</a>	<a href="#">0x2815</a>	<a href="#">0x2A15</a>	<a href="#">0x2C15</a>	-	StepInputs counts	RO	DINT	NO
	<a href="#">0x2617</a>	<a href="#">0x2817</a>	<a href="#">0x2A17</a>	<a href="#">0x2C17</a>	-	E-stop on input X8	RW	UINT	NO
	<a href="#">0x2618</a>	<a href="#">0x2818</a>	<a href="#">0x2A18</a>	<a href="#">0x2C18</a>	-	Waveform Smoothing	-	-	-
					1	Harmonic Gain	RW	INT	NO
					2	Harmonic Phase			
	<a href="#">0x2619</a>	<a href="#">0x2819</a>	<a href="#">0x2A19</a>	<a href="#">0x2C19</a>	-	Current coeff	RW	UINT	NO
	<a href="#">0x2620</a>	<a href="#">0x2820</a>	<a href="#">0x2A20</a>	<a href="#">0x2C20</a>	-	Home switch	RW	UINT8	YES
<a href="#">0x2621</a>	<a href="#">0x2821</a>	<a href="#">0x2A21</a>	<a href="#">0x2C21</a>	-	Clear alarm	WO	UINT8	YES	
<a href="#">0x2623</a>	<a href="#">0x2823</a>	<a href="#">0x2A23</a>	<a href="#">0x2C23</a>	-	Zero position	WO	UINT8	NO	
<a href="#">0x2624</a>	<a href="#">0x2824</a>	<a href="#">0x2A24</a>	<a href="#">0x2C24</a>	-	S-Curve filter time	RW	UINT	NO	
<a href="#">0x2625</a>	<a href="#">0x2825</a>	<a href="#">0x2A25</a>	<a href="#">0x2C25</a>	-	User Registers				
<a href="#">0x2626</a>	<a href="#">0x2826</a>	<a href="#">0x2A26</a>	<a href="#">0x2C26</a>	-	Move homeoffset	RW	UINT	NO	

**0x2600 / 0x2800 / 0x2A00 / 0x2C00 Running current**

该对象用来配置步进驱动器运行电流。单位为0.01Amps。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2600	0x2800	0x2A00	0x2C00	-	Running current	RW	UINT	NO	-

**0x2601 / 0x2801 / 0x2A01 / 0x2C01 Idle current**

该对象配置/监控电机在空闲状态下的电流大小。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2601	0x2801	0x2A01	0x2C01	-	Idle current	RW	UINT	NO	-

单位为0.01A。

**0x2602 / 0x2802 / 0x2A02 / 0x2C02 Idle current delay time**

该对象用来设置驱动器从运行电流切换到空闲电流延迟的时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2602	0x2802	0x2A02	0x2C02	-	Idle current delay time	RW	UINT	NO	-

单位为0.1s。

**0x2603 / 0x2803 / 0x2A03 0x2C03 Acceleration current**

该对象配置驱动器的加速电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2603	0x2803	0x2A03	0x2C03	-	Acceleration current	RW	UINT	NO	-

单位为0.01s。

**0x2604 / 0x2804 / 0x2A04 / 0x2C04 Steps per rev**

该对象指示电机每转的步数，它允许你改变当前驱动器每转一圈反馈的步数。单位为steps/rev。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2604	0x2804	0x2A04	0x2C04	-	Step per rev	RW	UINT	NO	-

**0x2605 / 0x2805 / 0x2A05 / 0x2C05 Reverse motor direction**

该对象可以用来改变电机默认方向。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2605	0x2805	0x2A05	0x2C05	-	Reverse motor direction	RW	UINT	NO	-

该对象可设置为 0 - 1.

Value =0            default rotating direction  
          =1            reverse rotating direction

**0x2606 / 0x2806 / 0x2A06 / 0x2C06 Fault output on Y1**

该对象用来设置报警输出功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2606	0x2806	0x2A06	0x2C06	-	Fault output on Y1	RW	UINT	NO	-

Value =1            output Y1 is open when the driver is fault  
          =2            output Y1 is closed when the driver is fault  
          =3            output Y1 is used for general purpose

## 0x2607 / 0x2807 / 0x2A07 / 0x2C07 Brake output on Y2

该对象用来设置刹车输出功能相关参数，该对象有3个子索引，第一个用作配置刹车输出，第二个配置刹车释放之后移动等待时间，最后一个配置刹车抱闸之后去使能等待时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2607	0x2807	0x2A07	0x2C07	-	Brake Output on Y2	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Brake output	RW	UINT	NO	-
				2	Brake disengage delay	RW	UINT	NO	-
				3	Brake engage delay	RW	UINT	NO	-

**刹车输出:**

Value =1	output is closed when drive is enabled, and open when the drive is disabled.
=2	output is open when drive is enabled, and closed when the drive is disabled.
=3	output is not used as a brake output and can be used as g general purpose output.

**Brake disengage delay and brake engage delay**

单位为1ms。

## 0x2608 / 0x2808 / 0x2A08 / 0x2C08 Motion output

该对象用来定义电机运动输出口的功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2608	0x2808	0x2A08	0x2C08	-	Motion Output	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Motion output on Y1	RW	UINT	NO	-
				2	Motion output on Y2	RW	UINT	NO	-
				3	Motion output on Y3	RW	UINT	NO	-
				4	Motion output on Y4	RW	UINT	NO	-

**他们可被配置为合适的功能:**

Value =1	Open when static position error less than in-position counts.
=2	Closed when static position error is less than set value.
=3	General purpose (fault output or brake output)
=4	Tach output with 100 pulses/rev
=5	Tach output with 200 pulses/rev
=6	Tach output with 400 pulses/rev
=7	Tach output with 800 pulses/rev
=8	Tach output with 1600 pulses/rev
=9	Closed (energized) when dynamic position error is less than set value.
=10	Open (de-energized) when dynamic position error is less than set value.
=11	Timing out (50 pulses/rev)

## 0x260B / 0x280B / 0x2A0B / 0x2C0B Define limits

该对象用来设置限位功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260B	0x280B	0x2A0B	0x2C0B	-	Alarm reset on input X6	RW	UINT	NO	-

Value =0x01	At end of travel, (X3=CW,X4=CCW)will be closed
=0x02	At end of travel, (X3=CW,X4=CCW)will be open
=0x07	At end of travel, X3=CW will be closed, X4=GP
=0x08	At end of travel, X3=CW will be open, X4=GP
=0x09	At end of travel, X4=CCW will be closed, X3=GP
=0x0A	At end of travel, X4=CCW will be open, X3=GP
=0x0B	At end of travel, (X3=CCW,X4=CW)will be closed
=0x0C	At end of travel, (X3=CCW,X4=CW)will be open
=0x11	At end of travel, X3=CCW will be closed, X4=GP
=0x12	At end of travel, X3=CCW will be open, X4=GP
=0x13	At end of travel, X4=CW will be closed, X3=GP
=0x14	At end of travel, X4=CW will be open, X3=GP
=0x15	At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
=0x16	At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
=0x1B	At end of travel, X3=CW will be closed, X4=GP[No Alarm]
=0x1C	At end of travel, X3=CW will be open, X4=GP[No Alarm]
=0x1D	At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
=0x1E	At end of travel, X4=CCW will be open, X3=GP[No Alarm]
=0x1F	At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
=0x20	At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
=0x25	At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
=0x26	At end of travel, X3=CCW will be open, X4=GP[No Alarm]
=0x27	At end of travel, X4=CW will be closed, X3=GP[No Alarm]
=0x28	At end of travel, X4=CW will be open, X3=GP[No Alarm]

## 0x260C / 0x280C / 0x2A0C / 0x2C0C Inputs filter

该对象用来设置输入口数字滤波。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260C	0x280C	0x2A0C	0x2C0C	-	Inputs Filter	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	8
				1	Input X1 filter time	RW	UINT	NO	-
				2	Input X2 filter time	RW	UINT	NO	-
				3	Input X3 filter time	RW	UINT	NO	-
				4	Input X4 filter time	RW	UINT	NO	-
				5	Input X5 filter time	RW	UINT	NO	-
				6	Input X6 filter time	RW	UINT	NO	-
				7	Input X7 filter time	RW	UINT	NO	-
8	Input X8 filter time	RW	UINT	NO	-				

该参数单位为200us。如果该参数值为100，意思为20ms延迟。

### 0x260D / 0x280D / 0x2A0D / 0x2C0D Dynamic open winding detection

该对象用来设置动态监测电机开路功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260D	0x280D	0x2A0D	0x2C0D	-	Dynamic open winding detection	RW	UINT	NO	-

Value =0            disable  
 =1                enable

### 0x260E / 0x280E / 0x2A0E / 2C0E Open winding detection speed limit

该对象用来设置当电机在运动的时候，电机断线检测功能生效的最低速度限值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260E	0x280E	0x2A0E	2C0E	-	Open winding detection speed limit	RW	UDINT	NO	-

单位为counts/s。

### 0x260F / 0x280F / 0x2A0F / 2C0F Powerup open winding detection

该对象用来配置上电是否检测电机断线功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260F	0x280F	0x2A0F	2C0F	-	Powerup open winding detection	RW	UINT	NO	-

### 0x2610 / 0x2810 / 0x2A10 / 2C10 Motor model number

该对象提供电机的型号。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2610	0x2810	0x2A10	2C10	-	Motor model number	RW	UINT	NO	-

### 0x2611 / 0x2811 / 0x2A11 / 0x2C11 Load ratio

该对象用来设置电机负载惯量比。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2611	0x2811	0x2A11	0x2C11	-	Load ratio	RW	UINT	NO	-

Value =1            1x rotor inertia  
 =2                1x-3x rotor inertia  
 =3                3x-5x rotor inertia  
 =4                5x-7x rotor inertia  
 =5                7x-10x rotor inertia

## 0x2612 / 0x2812 / 0x2A12 / 0x2C12 Third party motor parameters

该对象包含第三方电机信息。

Index				Sub	Name	Access Type	Data Type	PDO mapping	-Default Value-
Aixs1	Aixs2	Aixs3	Aixs4						
0x2612	0x2812	0x2A12	0x2C12	-	Number of Entries	RW	UDINT	NO	-
				0	Motor Name1	RO	USINT8	NO	25
				1	Motor Name2	RW	UDINT	NO	-
				2	Motor Name3	RW	UDINT	NO	-
				3	Motor Name4	RW	UDINT	NO	-
				4	Motor Paramter1	RW	UDINT	NO	-
				5	Motor Paramter2	RW	UINT	NO	-
				6	Motor Paramter3	RW	UINT	NO	-
				7	Motor Paramter4	RW	UINT	NO	-
				8	Motor Paramter5	RW	UINT	NO	-
				9	Motor Paramter6	RW	UINT	NO	-
				A	Motor Paramter7	RW	UINT	NO	-
				B	Motor Paramter8	RW	UINT	NO	-
				C	Motor Paramter9	RW	UINT	NO	-
				D	Motor Paramter10	RW	UINT	NO	-
				E	Motor Paramter11	RW	UINT	NO	-
				F	Motor Paramter12	RW	UINT	NO	-
				10	Motor Paramter13	RW	UINT	NO	-
11	Motor Paramter14	RW	UINT	NO	-				
12	Reserved1	RW	UINT	NO	-				
13	Reserved2	RW	UINT	NO	-				
14	Reserved3	RW	UINT	NO	--				
15	Reserved4	RW	UINT	NO	-				
16	Reserved5	RW	UINT	NO	-				
17	Reserved6	RW	UINT	NO	-				

## 0x2615 / 0x2815 / 0x2A15 / 0x2C15 StepInputs counts

该对象用来提供驱动器在X1/STEP和X2/DIR接收到的脉冲数。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2615	0x2815	0x2A15	0x2C15	-	StepInputs counts	RO	DINT	YES	0

0x2617 / 0x2817 / 0x2A17 / 0x2C17 E-stop on input X8 (仅-4x)

该对象用来设置E-STOP功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2617	0x2817	0x2A17	0x2C17	-	E-stop on input X8	RW	UINT	NO	-

- Value =1           Emergency stop when closed(fault)
- =2           Emergency stop when open(fault)
- =3           General purpose/Touch probe2
- =5           Emergency stop when closed(warning)
- =6           Emergency stop when open(warning)
- =7           Emergency stop when closed(auto clear alarm)
- =8           Emergency stop when open(auto clear alarm)

0x2618 / 0x2818 / 0x2A18 / 0x2C18 Waveform smoothiing

该对象用来设置HG滤波参数。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2618	0x2818	0x2A18	0x2C18	-	Waveform Smoothing	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	2
				1	Harmonic gain	RW	UINT	NO	-
				2	Harmonic phase	RW	UINT	NO	-

0x2619 / 0x2819 / 0x2A19 / 0x2C19 Current coeff

该对象用来设置电流系数，单位为百分比。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2619	0x2819	0x2A19	0x2C19	-	Current coeff	RW	UINT	NO	-

0x2620 / 0x2820 / 0x2A20 / 0x2C20 Home switch

该对象用来选择回原点的时候原点开关。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2620	0x2820	0x2A20	0x2C20	-	Home switch	RW	USINT	NO	-

Value	8	7	6	5	4	3	2	1
Output	X8	X7	X6	X5	X4	X3	X2	X1

0x2621 / 0x2821 / 0x2A21 / 0x2C21 Clear alarm

该对象提供一个清除驱动器报警的功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2621	0x2821	0x2A21	0x2C21	-	Clear alarm	RW	USINT	YES	-

STF\*\*-EC, SSSDC\*\*-EC: 设置为0x01可以清除报警

STF\*\*-ECX, SSSDC\*\*-ECX: 将该对象值由0x55变更为0xAA可以清除报警

### 0x2623 / 0x2823 / 0x2A23 / 0x2C23 Zero position

该对象提供设置所有位置参数为0的功能，例如当前位置信息(0x6064)。设置该对象值为01h可以清除所有位置信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2623	0x2823	0x2A23	0x2C23	-	Zero position	RW	USINT	NO	-

### 0x2624 / 0x2824 / 0x2A24 / 0x2C24 S-Curve filter time

该对象用来设置S曲线滤波时间。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2624	0x2824	0x2A24	0x2C24	-	S-Curve filter time	RW	UINT	NO	-

### 0x2625 / 0x2825 / 0x2A25 / 0x2C25 User registers

该对象提供了23个普通用户寄存器，由于属于非保持性，所以里面的信息在重新上电之后不会保存。

Index				Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2625	0x2825	0x2A25	0x2C25	-	User Registers	RW	DINT	YES	-
				0	Number of sub-index	RO	USINT	NO	23
				1	User register0	RO	DINT	YES	-
				2	User register1	RW	DINT	YES	-
				3	User register2	RW	DINT	YES	-
				4	User register3	RW	DINT	YES	-
				5	User register4	RW	DINT	YES	-
				6	User register5	RW	DINT	YES	-
				7	User register6	RW	DINT	YES	-
				8	User register7	RW	DINT	YES	-
				9	User register8	RW	DINT	YES	-
				10	User register9	RW	DINT	YES	-
				11	User register10	RW	DINT	YES	-
				12	User register11	RW	DINT	YES	-
				13	User register12	RW	DINT	YES	-
				14	User register13	RW	DINT	YES	-
				15	User register14	RW	DINT	YES	-
				16	User register15	RW	DINT	YES	-
				17	User register16	RW	DINT	YES	-
				18	User register17	RW	DINT	YES	-
				19	User register18	RW	DINT	YES	-
				20	User register19	RW	DINT	YES	-
				21	User register20	RW	DINT	YES	-
				22	User register21	RW	DINT	YES	-
23	User register22	RW	DINT	YES	-				

0x2626 / 0x2826 / 0x2A26 / 0x2C26 Move home offset

该对象用来设置原点偏置模式。

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

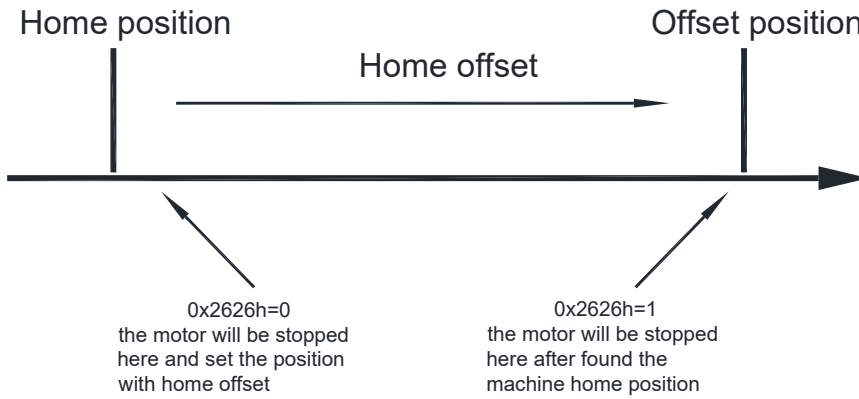
注：此功能仅对回原方式1~35生效。

设置为0:

电机会停止在机械原点位置，并且当前位置值由原点偏置(home offset)设定。

设置为1:

电机会在找到机械原点位置之后移动一个由原点偏置(home offset)提供的距离，并将该位置设置为零点位置。



## 4.3.5 四轴运动控制配置文件

	Index				Sub	Name	Access	Type	Mapping
	Axis1	Axis2	Axis3	Axis4					
CoE	<a href="#">0x603F</a>	<a href="#">0x683F</a>	<a href="#">0x703F</a>	<a href="#">0x783F</a>	-	Error code	RO	UINT16	YES
	<a href="#">0x6040</a>	<a href="#">0x6840</a>	<a href="#">0x7040</a>	<a href="#">0x7840</a>	-	Controlword	WO	UINT16	YES
	<a href="#">0x6041</a>	<a href="#">0x6841</a>	<a href="#">0x7041</a>	<a href="#">0x7841</a>	-	Statusword	RO	UINT16	YES
	<a href="#">0x605A</a>	<a href="#">0x685A</a>	<a href="#">0x705A</a>	<a href="#">0x785A</a>	-	Quick stop option code	RW	INT16	NO
	<a href="#">0x605B</a>	<a href="#">0x685B</a>	<a href="#">0x705B</a>	<a href="#">0x785B</a>	-	Shut down option code	RW	INT16	NO
	<a href="#">0x605C</a>	<a href="#">0x685C</a>	<a href="#">0x705C</a>	<a href="#">0x785C</a>	-	Disable operation option code	RW	INT16	NO
	<a href="#">0x605D</a>	<a href="#">0x685D</a>	<a href="#">0x705D</a>	<a href="#">0x785D</a>	-	Halt option code	RW	INT16	NO
	<a href="#">0x605E</a>	<a href="#">0x685E</a>	<a href="#">0x705E</a>	<a href="#">0x785E</a>	-	Fault reaction code	RW	INT16	NO
	<a href="#">0x6060</a>	<a href="#">0x6860</a>	<a href="#">0x7060</a>	<a href="#">0x7860</a>	-	Modes of operation	WO	INT8	YES
	<a href="#">0x6061</a>	<a href="#">0x6861</a>	<a href="#">0x7061</a>	<a href="#">0x7861</a>	-	Modes of operation display	RO	INT8	YES
	<a href="#">0x6064</a>	<a href="#">0x6864</a>	<a href="#">0x7064</a>	<a href="#">0x7864</a>	-	Position actual value	RO	INT32	YES
	<a href="#">0x6065</a>	<a href="#">0x6865</a>	<a href="#">0x7065</a>	<a href="#">0x7865</a>	-	Following error window	RW	UINT32	NO
	<a href="#">0x606C</a>	<a href="#">0x686C</a>	<a href="#">0x706C</a>	<a href="#">0x786C</a>	-	Velocity actual value	RO	INT32	YES
	<a href="#">0x6071</a>	<a href="#">0x6871</a>	<a href="#">0x7071</a>	<a href="#">0x7871</a>	-	Target torque	RW	INT16	YES
	<a href="#">0x6073</a>	<a href="#">0x6873</a>	<a href="#">0x7073</a>	<a href="#">0x7873</a>	-	Max current	RW	UINT16	YES
	<a href="#">0x6074</a>	<a href="#">0x6874</a>	<a href="#">0x7074</a>	<a href="#">0x7874</a>	-	Torque demand	RO	INT16	YES
	<a href="#">0x6077</a>	<a href="#">0x6877</a>	<a href="#">0x7077</a>	<a href="#">0x7877</a>	-	Torque actual value		INT	YES
	<a href="#">0x6078</a>	<a href="#">0x6878</a>	<a href="#">0x7078</a>	<a href="#">0x7878</a>	-	Current actual value	RO	INT16	YES
	<a href="#">0x607A</a>	<a href="#">0x687A</a>	<a href="#">0x707A</a>	<a href="#">0x787A</a>	-	Target position	RW	INT32	YES
	<a href="#">0x607C</a>	<a href="#">0x687C</a>	<a href="#">0x707C</a>	<a href="#">0x787C</a>	-	Home offset	RW	INT32	YES
					-	Software position limit	-	-	-
	<a href="#">0x607D</a>	<a href="#">0x687D</a>	<a href="#">0x707D</a>	<a href="#">0x787D</a>	1	Min position limit	RW	DINT	NO
					2	Max position limit	RW	DINT	NO
	<a href="#">0x607E</a>	<a href="#">0x687E</a>	<a href="#">0x707E</a>	<a href="#">0x787E</a>	-	Polarity	RW	UINT8	YES
	<a href="#">0x607F</a>	<a href="#">0x687F</a>	<a href="#">0x707F</a>	<a href="#">0x787F</a>	-	Max profile velocity	RW	UINT32	YES
	<a href="#">0x6081</a>	<a href="#">0x6881</a>	<a href="#">0x7081</a>	<a href="#">0x7881</a>	-	Profile velocity	RW	UINT32	YES
	<a href="#">0x6083</a>	<a href="#">0x6883</a>	<a href="#">0x7083</a>	<a href="#">0x7883</a>	-	Profile acceleration	RW	UINT32	YES
	<a href="#">0x6084</a>	<a href="#">0x6884</a>	<a href="#">0x7084</a>	<a href="#">0x7884</a>	-	Profile deceleration	RW	UINT32	YES
	<a href="#">0x6085</a>	<a href="#">0x6885</a>	<a href="#">0x7085</a>	<a href="#">0x7885</a>	-	Quick stop deceleration	RW	UINT32	YES
	<a href="#">0x6087</a>	<a href="#">0x6887</a>	<a href="#">0x7087</a>	<a href="#">0x7887</a>	-	Torque slope	RW	UINT32	YES
	<a href="#">0x6098</a>	<a href="#">0x6898</a>	<a href="#">0x7098</a>	<a href="#">0x7898</a>	-	Homing method	RW	INT8	YES
					-	Homing speed	-	ARRAY	-
	<a href="#">0x6099</a>	<a href="#">0x6899</a>	<a href="#">0x7099</a>	<a href="#">0x7899</a>	1	Search switch	RW	UDINT	YES
					2	Search zero	RW	UDINT	YES
	<a href="#">0x609A</a>	<a href="#">0x689A</a>	<a href="#">0x709A</a>	<a href="#">0x789A</a>	-	Homing acceleration	RW	UDINT32	YES
	<a href="#">0x60B0</a>	<a href="#">0x68B0</a>	<a href="#">0x70B0</a>	<a href="#">0x78B0</a>		Position offset	RW	DINT32	YES
	<a href="#">0x60B1</a>	<a href="#">0x68B1</a>	<a href="#">0x70B1</a>	<a href="#">0x78B1</a>	-	Velocity offset	RW	DINT	YES
	<a href="#">0x60B2</a>	<a href="#">0x68B2</a>	<a href="#">0x70B2</a>	<a href="#">0x78B2</a>		Torque offset	RW	DINT	YES
	<a href="#">0x60B8</a>	<a href="#">0x68B8</a>	<a href="#">0x70B8</a>	<a href="#">0x78B8</a>		Touch probe function	RW	UINT	YES
	<a href="#">0x60B9</a>	<a href="#">0x68B9</a>	<a href="#">0x70B9</a>	<a href="#">0x78B9</a>		Touch probe status	RO	UINT	YES
<a href="#">0x60BA</a>	<a href="#">0x68BA</a>	<a href="#">0x70BA</a>	<a href="#">0x78BA</a>		Touch probe pos1 pos value	RO	DINT	YES	
<a href="#">0x60BB</a>	<a href="#">0x68BB</a>	<a href="#">0x70BB</a>	<a href="#">0x78BB</a>		Touch probe pos1 neg value	RO	DINT	YES	
<a href="#">0x60BC</a>	<a href="#">0x68BC</a>	<a href="#">0x70BC</a>	<a href="#">0x78BC</a>		Touch probe pos2 pos value	RO	DINT	YES	

	Index				Sub	Name	Access	Type	Mapping
	Axis1	Axis2	Axis3	Axis4					
CoE	<a href="#">0x60BD</a>	<a href="#">0x68BD</a>	<a href="#">0x70BD</a>	<a href="#">0x78BD</a>		Touch probe pos2 neg value	RO	DINT	YES
	<a href="#">0x60E0</a>	<a href="#">0x68E0</a>	<a href="#">0x70E0</a>	<a href="#">0x78E0</a>		Positive torque limit value	RW	UINT	YES
	<a href="#">0x60E1</a>	<a href="#">0x68E1</a>	<a href="#">0x70E1</a>	<a href="#">0x78E1</a>	-	Negative torque limit value	RW	UINT	YES
	<a href="#">0x60F4</a>	<a href="#">0x68F4</a>	<a href="#">0x70F4</a>	<a href="#">0x78F4</a>	-	Following error actual value	RO	DINT	YES
	<a href="#">0x60FD</a>	<a href="#">0x68FD</a>	<a href="#">0x70FD</a>	<a href="#">0x78FD</a>	-	Digital inputs	RO	UDINT	YES
	<a href="#">0x60FE</a>	<a href="#">0x68FE</a>	<a href="#">0x70FE</a>	<a href="#">0x78FE</a>	2	Digital outputs	-	ARRAY	NO
					1	Physical outputs	RW	UDINT	YES
					2	Bit mask	RW	UDINT	NO
	<a href="#">0x60FF</a>	<a href="#">0x68FF</a>	<a href="#">0x70FF</a>	<a href="#">0x78FF</a>	-	Target velocity	RW	DINT	YES
	<a href="#">0x6502</a>	<a href="#">0x6D02</a>	<a href="#">0x7502</a>	<a href="#">0x7D02</a>	-	Supported drive modes	RO	UDINT	NO

### 0x603F / 0x683F / 0x703F / 0x783F Error code

该对象捕获保存驱动器最后发生的错误报警信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x603F	0x683F	0x703F	0x783F	-	Error code	UINT	RO	YES	-

在错误代码中，每一bit位包含一类报警或者错误状态信息。

Error Code	Description
0x7500	EtherCAT Communication Error
0xFF01	<b>Over Current</b>
0xFF02	<b>Over Voltage</b>
0xFF03	<b>Over Temperature</b>
0xFF04	<b>Open Motor Winding</b>
0xFF05	<b>Internal Voltage Bad</b>
0xFF06	<b>Position limit</b>
0xFF07	<b>Encoder bad</b>
0xFF08	<b>Fc position limit</b>
0xFF09	<b>Fc encoder bad</b>
0xFF0A	<b>Regen failed</b>
0xFF0B	<b>STO</b>
0xFF0C	<b>E-stop error</b>
0xFF31	CW Limit
0xFF32	CCW Limit
0xFF33	<b>CCW CW limit</b>
0xFF34	<b>Current limit</b>
0xFF35	Move When Disable
0xFF36	Voltage Low
0xFF37	Qprogram Blank
0xFF41	Save Failed
0xFF42	Xmlread Failed
0xFFFF	Other Error

### 0x6040 / 0x6840 / 0x7040 / 0x7840 Controlword

该对象指明了控制PDS，FSA系统所需要接收到的指令。如下图所示，其中bit7、3、2、1和0必须支持。同时根据操作模式的不同，应支持bit0到9。如果相关功能不可实现，则应生成适当的紧急消息。可以支持制造商特定的位。所有控制字的bit功能实现都是有效独立于PDS FSA状态。任何运动的开始都是在指定的操作模式下进行，并在相关文档中进行了描述。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6040	0x6840	0x7040	0x7840	-	Controlword	RW	UINT	YES	-

控制字的每一位功能定义如下：

15	11	10	9	8	7	6	4	3	2	1	0
manufacturer specific		reserved		halt	Fault reset	Operation mode specific	Enable operation	Quick stop	Enable voltage	Switch on	
O		O		O	M	O	M	M	M	M	
MSB		0		- Optional		M		- Mandatory		LSB	

### 0x6041 / 0x6841 / 0x7041 / 0x7841 Statusword

该位包含驱动器当前状态。每一位都是动态变化。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6041	0x6841	0x7041	0x7841	-	Statusword	RO	UINT	YES	-

The bits of the statusword are defined as follows:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
ms		oms		ila	tr	rm	ms	w	sod	qs	ve	f	oe	so	rtso

Key:	ms	manufacturer specific
	oms	operation mode specific
	ila	internal limit active
	tr	target reached
	rm	remote
	w	warning
	sod	switch on disabled
	qs	quick stop
	ve	voltage enabled
	f	fault
	oe	operation enabled
	so	switched on
	rtso	ready to switch on

statusword(6041h)	PDS FSA state
xxxx xxxx x0xx 0000	Not ready to switch on
xxxx xxxx x1xx 0000	Switch on disabled
xxxx xxxx x01x 0001	Ready to switch on
xxxx xxxx x01x 0011	Switch on
xxxx xxxx x01x 0111	Operation enabled
xxxx xxxx x00x 0111	Quick stop active
xxxx xxxx x0xx 1111	Fault reaction active
xxxx xxxx x0xx 1000	Fault

## 0x605A / 0x685A / 0x705A / 0x785A Quick stop option code

该对象定义了当执行快速停止功能之后该执行什么样的动作。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605A	0x685A	0x705A	0x785A	-	Quick stop option code	RW	INT	NO	-

Quick stop option code	Action
-32768...-1	Manufacturer Specific
0	Disable drive function
1	Slow down on slow down ramp and transit into switch on disabled
2	Slow down on quick stop ramp and transit into switch on disabled
3	Slow down on the current limit and transit into switch on disabled
4	Slow down on the voltage limit and transit into switch on disabled
5	Slow down on slow down ramp and stay in quick stop active
6	Slow down on quick stop ramp and stay in quick stop active
7	Slow down on slow current limit and stay in quick stop active
8	Slow down on voltage limit and stay in quick stop active
9...32767	Reserved

目前只支持1和2的动作方式。

## 0x605B / 0x685B / 0x705B / 0x785B Shutdown option code

该对象指出从operation状态到ready to switch on状态过渡时执行什么动作。减速度采用所用操作模式当前的减速度。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605B	0x685B	0x705B	0x785B	-	Shutdown option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Disable drive function(switch-off drive power stage)
1	Slow down on slow down ramp disable of the drive function
2...32767	Reserved

## 0x605C / 0x685C / 0x705C / 0x785C Disable operation option code

该对象指出从operation状态到switch on状态过渡时执行什么动作。减速度采用所用操作模式当前的减速度。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605C	0x685C	0x705C	0x785C	-	Disable operation option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Disable drive function(switch-off drive power stage)
1	Slow down on slow down ramp and then disable of the drive function
2...32767	Reserved

## 0x605D / 0x685D / 0x705D / 0x785D Halt option code

该对象指出当halt功能执行之后需要做什么动作。减速度采用所用操作模式当前的减速度。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605D	0x685D	0x705D	0x785D	-	Halt option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Reserved
1	Slow down on slow down ramp and stay in operation enabled
2	Slow down on quick stop ramp and stay in operation enabled
3	Slow down on current limit and stay in operation enabled
4	Slow down on voltage limit and atay in operation enabled
5 + 32767	Reserved

## 0x605E / 0x685E / 0x705E / 0x785E Fault reaction option code

该对象指出当fault产生之后需要做什么动作。减速度采用所用操作模式当前的减速度。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605E	0x685E	0x705E	0x785E	-	Fault reaction option code	RW	INT	NO	-

Value	Action
-32768...-1	Manufacturer Specific
0	Disable drive function, motor is free t rotate
1	Slow down on slow down ramp
2	Slow down on quick stop ramp
3	Slow down on current limit
4	Slow down on voltage limit
5 + 32767	Reserved

## 0x6060 / 0x6860 / 0x7060 / 0x7860 Mode of operation

该对象用来选择需要执行的操作模式。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6060	0x6860	0x7060	0x7860	-	Mode of operation	RW	SINT	NO	-

Mode of operation	Value
Profile position mode	1
Profile velicity mode	3
Profile Torque mode	4
Homing mode	6
Cynclc synchronous position mode	8
Cynclc synchronous velocity mode	9
Q mode(manufacturer specific mode)	-1

**0x6061 / 0x6861 / 0x7061 / 0x7861 Mode of operation display**

该对象显示当前的操作模式，反馈的值与对象0x6060h设置的一致。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6061	0x6861	0x7061	0x7861	-	Modes of operation display	RO	SINT	YES	-

**0x6064 / 0x6864 / 0x7064 / 0x7864 Position actual value**

该对象反馈当前实际位置。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6064	0x6864	0x7064	0x7864	-	Position actual value	RO	DINT	YES	-

**0x6065 / 0x6865 / 0x7065 / 0x7865 Following error window**

该对象定义了位置误差允许的区间范围，如果当前位置超出了该对象定义的范围，将会产生跟随误差错误。单位为counts。

发生跟随误差错误的情况：

- 堵转
- 指定速度未达到
- 闭合系数错误

如果该对象的值设置为0或者0xFFFF FFFFh，表示关闭该功能。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6065	0x6865	0x7065	0x7865	-	Following error window	RW	UDINT	NO	-

**0x606C / 0x686C / 0x706C / 0x786C Velocity actual value**

该对象提供电机当前实际的速度值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x606C	0x686C	0x706C	0x786C	-	Velocity actual value	RO	DINT	YES	-

单位为counts/s。

**0x6071 / 0x6871 / 0x7071 / 0x7871 Target torque**

该对象参数用来输入在扭矩模式下的目标扭矩，单位为mN·m。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6071	0x6871	0x7071	0x7871	-	Target torque	RW	INT	YES	-

该对象只能允许在步进伺服下，并且该对象参数和其他扭矩值，如0x6078h和0x2216都有关联。

**0x6073 / 0x6873 / 0x7073 / 0x7873 Max current**

该值表示电机中允许的最大电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6073	0x6873	0x7073	0x7873	-	Max current	RW	UINT	NO	-

单位为0.01Amps。

**0x6074 / 0x6874 / 0x7074 / 0x7874 Torque demand**

该对象是输出扭矩限制值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6074	0x6874	0x7074	0x7874	-	Torque demand value	RO	INT	YES	-

该对象只能用在步进伺服驱动器，单位为mNm。

**0x6077 / 0x6877 / 0x7077 / 0x7877 torque actual value**

该对象提供当前电机扭矩值，该值随着电机动态瞬时变化。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6077	0x6877	0x7077	0x7877	-	Torque actual value	RO	INT	YES	-

**0x6078 / 0x6878 / 0x7078 / 0x7878 Current actual value**

该对象提供当前电机中的瞬时电流。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6078	0x6878	0x7078	0x7878	-	Current actual value	RO	INT	YES	-

该对象只能用在步进伺服驱动器，单位为0.01Amps。

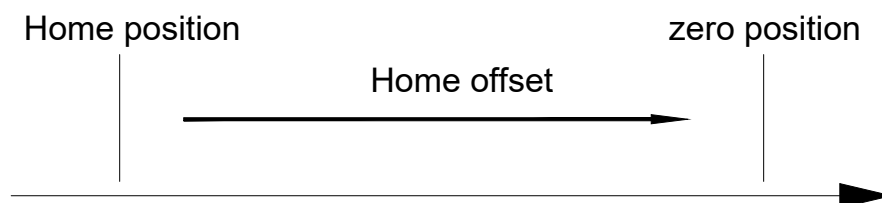
**0x607A / 0x687A / 0x707A / 0x787A Target position**

该对象是驱动器在当前运动控制参数设置生效，位置模式下将要移动的距离。就像速度，加速度，减速度一样。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607A	0x687A	0x707A	0x787A	-	Target position	RW	DINT	YES	-

**0x607C / 0x687C / 0x707C / 0x787C Home offset**

该原点偏置对象是应用在零位置与机器原点位置(归位期间找到的位置)之间的差，以位置单位进行测量。在回原点期间找到机器的原点位置，一旦完成原点复位，则通过将原点偏移量添加到原点位置来将零位置从原点位置偏移。随后所有绝对移动均应相对于该新的零位置进行。下图对此进行了说明。

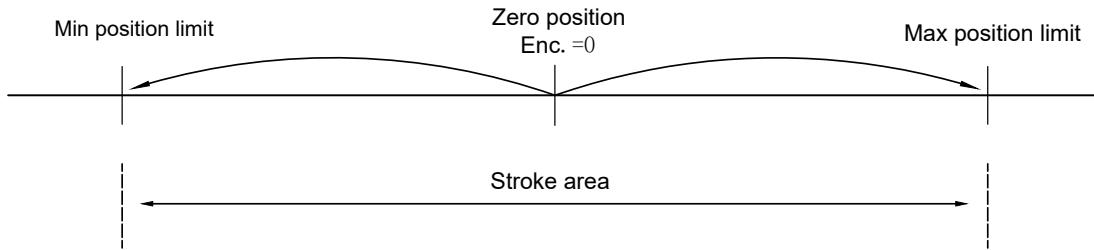


Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607C	0x687C	0x707C	0x787C	-	Home offset	RW	DINT	YES	-

0x607D / 0x687D / 0x707D / 0x787D Software position limit

该对象包含驱动器配置的的最大和最小软限位值。这些参数应定义位置需求值和位置实际值的绝对位置极限，如下所示。

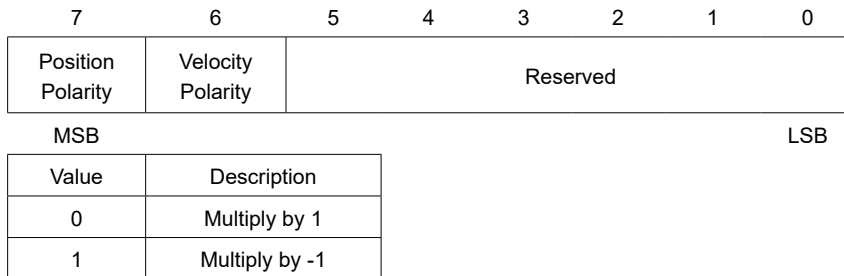
Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607D	0x687D	0x707D	0x787D	0	Number of sub-index	RW	USINT8	NO	2
				1	Min position limit	RW	DINT	NO	-
				2	Max position limit	RW	DINT	NO	-



0x607E / 0x687E / 0x707E / 0x787E Polarity

根据极性标志的值，位置给定值和位置实际值乘以1或-1。在PP PV模式下生效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607E	0x687E	0x707E	0x787E	-	Polarity	RW	USINT	YES	-



0x607F / 0x687F / 0x707F / 0x787F Max profile speed

最大轮廓速度是轮廓运动期间任一方向上的最大允许速度。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607F	0x687F	0x707F	0x787F	-	Max profile speed	RW	UDINT	YES	-

单位为counts/s。

0x6081 / 0x6881 / 0x7081 / 0x7881 Profile velocity

轮廓速度是轮廓运动期间通常在加速完成结束时达到的速度，正反运动方向均有效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6081	0x6881	0x7081	0x7881	-	Profile velocity	RW	UDINT	YES	-

单位为counts/s。

### 0x6083 / 0x6883 / 0x7083 / 0x7883 Profile acceleration

轮廓加速度单位为counts/s<sup>2</sup>。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6083	0x6883	0x7083	0x7883	-	Profile acceleration	RW	UDINT	YES	-

### 0x6084 / 0x6884 / 0x7084 / 0x7884 Profile deceleration

轮廓减速度单位为counts/s<sup>2</sup>。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6084	0x6884	0x7084	0x7884	-	Profile deceleration	RW	UDINT	YES	-

### 0x6085 / 0x6885 / 0x7085 / 0x7885 Quick stop deceleration

该对象是当驱动器执行快速停止指令之后电机停止用到的减速度，需要0x605A设置为2，单位为counts/s<sup>2</sup>。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6085	0x6885	0x7085	0x7885	-	Quick stop deceleration	RW	UDINT	NO	-

### 0x6087 / 0x6887 / 0x7087 / 0x7887 Torque slope

该对象描述扭矩变化率。以0.1% 额定转矩为单位变化

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6087	0x6887	0x7087	0x7887	-	Torque slope	RW	UDINT	YES	-

单位为 Nm/s。

### 0x6098 / 0x6898 / 0x7098 / 0x7898 Home method

该对象定义了回原点期间采用的回原点方式。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6098	0x6898	0x7098	0x7898	-	Home method	RW	SINT	YES	-

Value	Description
128	manufacturer specific
0	No homing operation required
1...37	Methods 1 to 37
38-127	Reserved

### 0x6099 / 0x6899 / 0x7099 / 0x7899 Homing speed

该对象定义了回原点期间的回原点速度。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6099	0x6899	0x7099	0x7899	-	Number of sub-index	RW	USINT8	NO	2

单位为counts/s<sup>2</sup>。

**0x609A / 0x689A / 0x709A / 0x789A Homing acceleration**

该对象定义了回原点加速度，在标准回原点模式下，该对象同时用在加速度和减速度下。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x609A	0x689A	0x709A	0x789A	-	Homing acceleration	RW	UDINT	YES	-

单位为counts/s<sup>2</sup>。

**0x60B0 / 0x68B0 / 0x70B0 / 0x78B0 Position offset**

该对象包含目标位置的偏置值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B0	0x68B0	0x70B0	0x78B0	-	Position offset	RW	DINT	YES	-

**0x60B1 / 0x68B1 / 0x70B1 / 0x78B1 Velocity offset**

该对象提供速度的偏置值。在循环同步位置模式下，该对象包含速度前馈的输入值。在循环同步速度模式下，它包含驱动设备的命令偏移量。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B1	0x68B1	0x70B1	0x78B1	-	Velocity offset	RW	DINT	YES	-

**0x60B2 / 0x68B2 / 0x70B2 / 0x78B2 Torque offset**

该对象提供扭矩值的偏移量。在循环同步位置模式和循环同步速度模式下，该对象包含转矩前馈的输入值。在循环同步转矩模式下，它包含驱动器指令的附加扭矩，该扭矩已添加到目标扭矩值中。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B2	0x68B2	0x70B2	0x78B2	-	Torque offset	RW	INT	YES	-

## 0x60B8 / 0x68B8 / 0x70B8 / 0x78B8 Touch probe function

该对象包含探针功能的配置信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B8	0x68B8	0x70B8	0x78B8	-	Touch probe function	RW	UINT	YES	-

Bit	Value	Definition
0	0	Swith off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continous
3,2	00	Trigger with touch probe 1 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index01
	11	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 negtive edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6,7	-	Reserved
8	0	Swith off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	Continous
11,10	00	Trigger with touch probe 2 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index02
	11	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 negtive edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14,15	-	Reserved

0x60B9 / 0x68B9 / 0x70B9 / 0x78B9 Touch probe status

该对象提供探针功能的状态信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B9	0x68B9	0x70B9	0x78B9	-	Velocity offset	RW	DINT	YES	-

Bit	Value	Definition
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...7	-	Reserved
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 probe 2 negative edge position stored
11...15	-	Reserved

0x60BA / 0x68BA / 0x70BA / 0x78BA Touch probe 1 positive edge

该对象包含探针1正向边沿触发位置值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60BA	0x68BA	0x70BA	0x78BA	-	Touch probe 1 positive edge	RO	DINT	YES	-

0x60BB / 0x68BB / 0x70BB / 0x78BB Touch probe 1 negative edge

该对象包含探针1负向边沿触发位置值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60BB	0x68BB	0x70BB	0x78BB	-	Touch probe 1 negative edge	RO	DINT	YES	-

0x60BC / 0x68BC / 0x70BC / 0x78BC Touch probe 2 positive edge

该对象包含探针2正向边沿触发位置值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60BC	0x68BC	0x70BC	0x78BC	-	Touch probe 1 negative edge	RO	DINT	YES	-

0x60BD / 0x68BD / 0x70BD / 0x78BD Touch probe 2 negative edge

该对象包含探针2负向边沿触发位置值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60BD	0x68BD	0x70BD	0x78BD	-	Touch probe 1 negative edge	RO	DINT	YES	-

**0x60E0 / 0x68E0 / 0x70E0 / 0x78E0 Positive torque limit value**

该对象包含电机正方向扭矩最大值。正向转矩在运行为正速度或再生运行为负速度的情况下生效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60E0	0x68E0	0x70E0	0x78E0	-	Positive torque limit value	RW	UINT	YES	-

**0x60E1 / 0x68E1 / 0x70E1 / 0x78E1 Negative torque limit value**

该对象包含电机负方向扭矩最大值。负向转矩在运行为负速度或再生运行为正速度的情况下生效。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60E1	0x68E1	0x70E1	0x78E1	-	Positive torque limit value	RW	UINT	YES	-

**0x60F4 / 0x68F4 / 0x70F4 / 0x78F4 Follow error actual value**

该对象提供跟随错误实际值。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60F4	0x68F4	0x70F4	0x78F4	-	Follow error actual value	RO	DINT	YES	-

**0x60FD / 0x68FD / 0x70FD / 0x78FD Digital inputs**

该对象提供数字输入信号，反应逻辑输入电平。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60FD	0x68FD	0x70FD	0x78FD	-	Digital inputs	RO	UDINT	YES	-

31	24	23	22	21	20	19	18	17	16	15	4	3	2	1	0
Reserved	X8	X7	X6	X5	X4	X3	X2	X1	Reserved	Interlock	Home switch	Positive limit switch	Negative limit switch		
MSB											LSB				

bit3（互锁）提供互锁输入的状态。如果逻辑输入信号变为未激活，则驱动器应进入禁用或故障反应激活状态。这意味着驱动器的功率级被禁用并被锁定以防打开。

### 0x60FE / 0x68FE / 0x70FE / 0x78FE Digital outputs

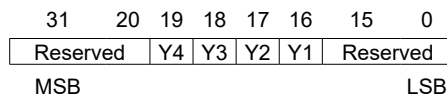
该对象控制数字输出信号，反应逻辑输出电平。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60FE	0x68FE	0x70FE	0x78FE	0	Number of sub-index	RW	USINT8	NO	2
				1	Physical outputs	RW	UDINT	YES	-
				2	Bit mask	RW	UDINT	NO	-

第一个子索引定义分配的输出。第二个子索引描述说明掩码，用于指定应使用哪个输出。

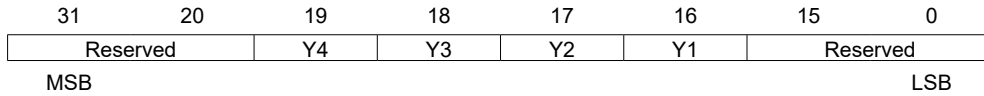
**注意：第二个索引是边沿触发的，必须先设置第二个索引，然后再设置第一个索引的位，才能改变输出状态。**

物理输出：



Field	Value	Definition
Each bit	0	Switch off
	1	Switch on

Bit mask:



Field	Value	Definition
Each bit	0	Disable output
	1	Enable output

### 0x60FF / 0x68FF / 0x70FF / 0x78FF Target velocity

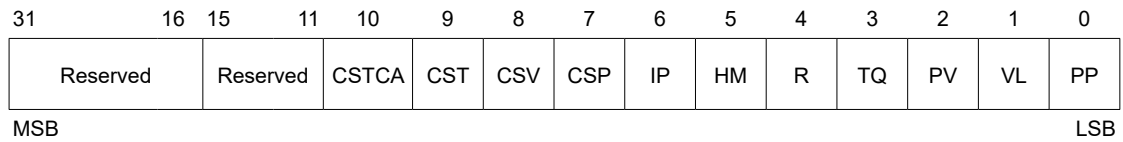
该对象包含配置的目标速度，并作为轨迹生成器的输入。该值单位为counts/s。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60FF	0x68FF	0x70FF	0x78FF	-	Target velocity	RW	DINT	YES	-

## 0x6502 / 0x6D02 / 0x7502 / 0x7D02 Supported drive modes

该对象提供支持的运动操作模式信息。

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6502	0x6D02	0x7502	0x7D02	-	Supported drive modes	RO	UDINT	NO	-



鸣志驱动器支持以下模式：

- Bit0: Profile Position Mode
- Bit2: Profile Velocity Mode
- Bit3: Profile Torque Mode ( StepSERVO)
- Bit5: Homing Mode
- Bit7: CSP
- Bit8: CSV

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### 鸣志总部

上海市闵行区闵北路88弄7号楼  
邮编：201107

### 鸣志电器（太仓）有限公司

江苏省太仓市港区银港路16、18号  
邮编：215434

### 国内办事处

#### 北京

北京市朝阳区东三环中路16号京粮大厦1206室  
邮编：100022

#### 青岛

山东省青岛市市北区山东路171号科技创新大厦1号楼19楼1913室  
邮编：266033

#### 西安

陕西省西安市唐延路1号旺座国际城D座1006室  
邮编：710065

#### 武汉

湖北省武汉市江汉区解放大道686号世贸大厦3001室  
邮编：430022

#### 合肥

安徽省合肥市蜀山区井岗路CBC拓基广场B座1521室  
邮编：230088

#### 南京

江苏省南京市江宁区天元中路126号新城发展中心2号楼11楼1101/1102室  
邮编：211106

#### 苏州

江苏省苏州市姑苏区南环东路758号汇邻广场4号北楼1103-1105室  
邮编：215007

#### 宁波

浙江省宁波市江东区惊驾路565号泰富广场B座309室  
邮编：315040

#### 成都

四川省成都市锦江区东御街19号茂业天地3907室  
邮编：610066

#### 重庆

重庆市江北区福泉路18号源著南区20栋2108室  
邮编：400000

#### 广州

广东省广州市天河区林和西路9号耀中广场B座40层06室  
邮编：510610

#### 东莞

广东省东莞市松山湖研发五路1号林润智谷5号楼1206-1207室  
邮编：523000

#### 深圳

广东省深圳市南山区留仙大道4168号众冠时代广场A座3901室  
邮编：518000

### 北美地区

#### 美国

**MOONS' INDUSTRIES (AMERICA), INC. (Chicago)**  
1113 North Prospect Avenue, Itasca, IL 60143, USA

**MOONS' INDUSTRIES (AMERICA), INC. (Boston)**  
36 Cordage Park Circle, Suite 310 Plymouth, MA 02360, USA

**APPLIED MOTION PRODUCTS, INC. (Morgan Hill)**  
18645 Madrone Parkway, Morgan Hill, CA 95037, USA

**LIN ENGINEERING, INC. (Morgan Hill)**  
16245 Vineyard Blvd., Morgan Hill, CA 95037, USA

### 欧洲地区

#### 德国

**AMP & MOONS' AUTOMATION(GERMANY)GMBH**  
Kaiserhofstr. 15  
60313 Frankfurt am Main Germany

#### 意大利

**MOONS' INDUSTRIES (EUROPE) HEAD QUARTER S.R.L.**  
Via Torri Bianche n.1 20871 Vimercate(MB) Italy

#### 瑞士

**TECHNOSOFT (SUISSE) SA**  
Avenue des Alpes 20 CH 2000 Neuchâtel Switzerland

#### 英国

**MOONS' INDUSTRIES (UK), LIMITED**  
Rooms 4&5, 1<sup>st</sup> Floor, Greenbank, London Road, Reading, UK. RG1 5AQ

### 亚洲地区

#### 新加坡

**MOONS' INDUSTRIES (SOUTH-EAST ASIA) PTE. LTD.**  
33 Ubi Avenue 3 #08-23 Vertex Singapore 408868

#### 日本

**MOONS' INDUSTRIES JAPAN CO., LTD. (Yokohama)**  
Room 602, 6F, Shin Yokohama Koushin Building,  
2-12-1, Shin-Yokohama, Kohoku-ku, Yokohama, Kanagawa  
Japan 222-0033

#### 印度

**MOONS' INTELLIGENT MOTION SYSTEM INDIA PVT. LTD.**  
Room. 908, 9th Floor, Amar Business Park,  
Tal. Haveli, Baner, Pune India 411045

#### 越南

**MOONS' INDUSTRIES (VIETNAM) COMPANY LIMITED.**  
Factory C1&D1, Lot IN3-11\*A, VSIP Hai Phong Industrial Park in Dinh  
Vu - Cat Hai Economic Zone, Lap Le Commune, Thuy Nguyen District,  
Hai Phong City, Vietnam  
Vietnam 04359



<http://www.moons.com.cn>  
E-mail: [ama-info@moons.com.cn](mailto:ama-info@moons.com.cn)

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