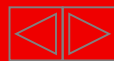
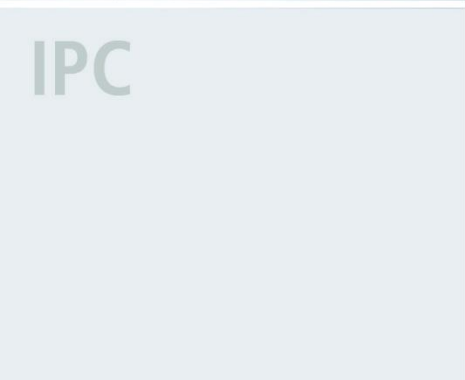
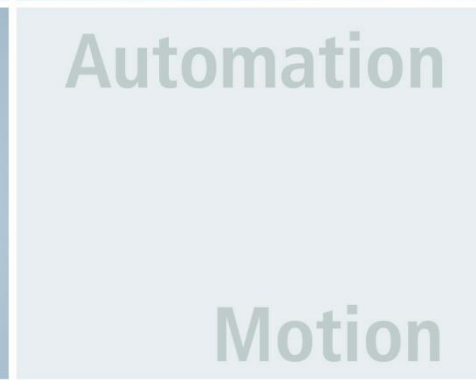
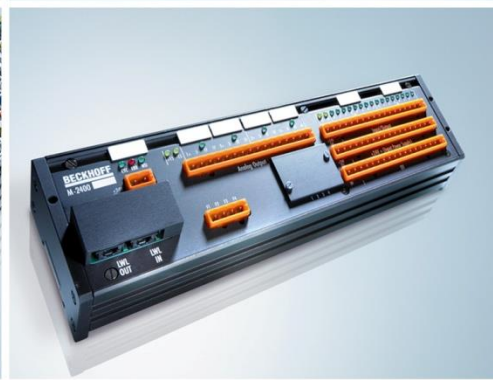
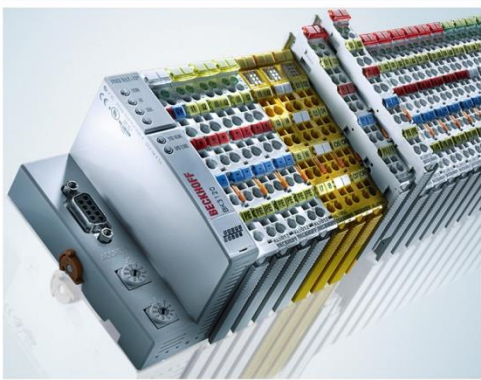
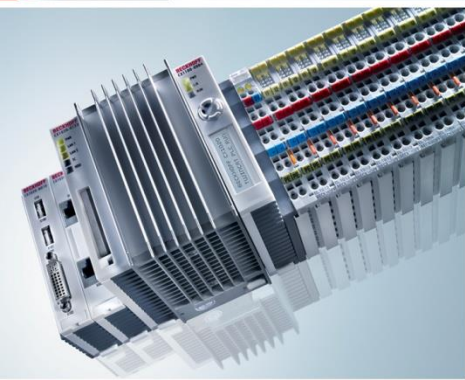
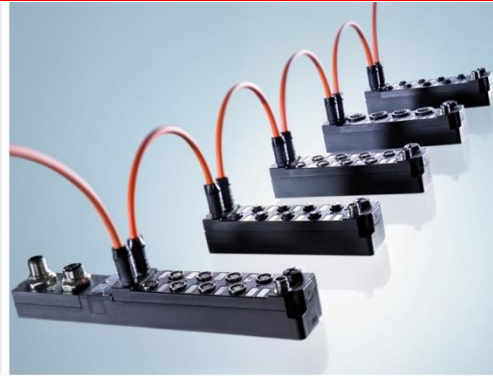
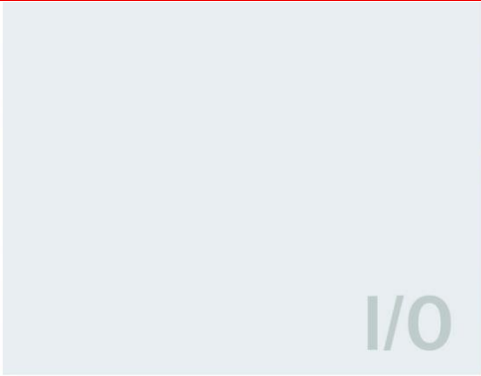


# 基于PLC OPEN的运动控制指令



# TwinCAT NC PTP 功能

普通定位运动(Point to Point)

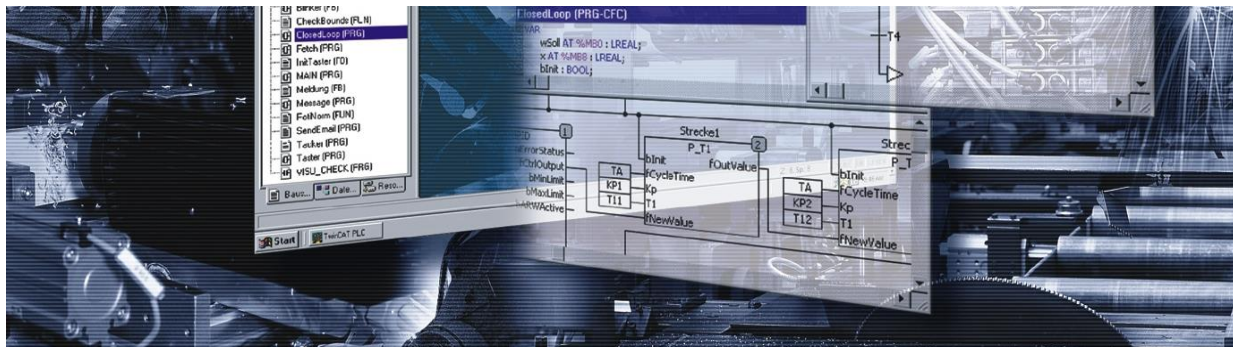
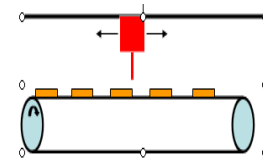
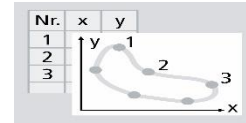
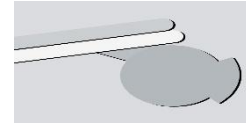
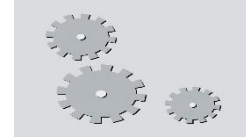
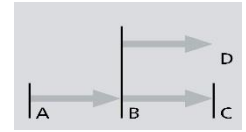
电子齿轮同步

数字凸轮开关

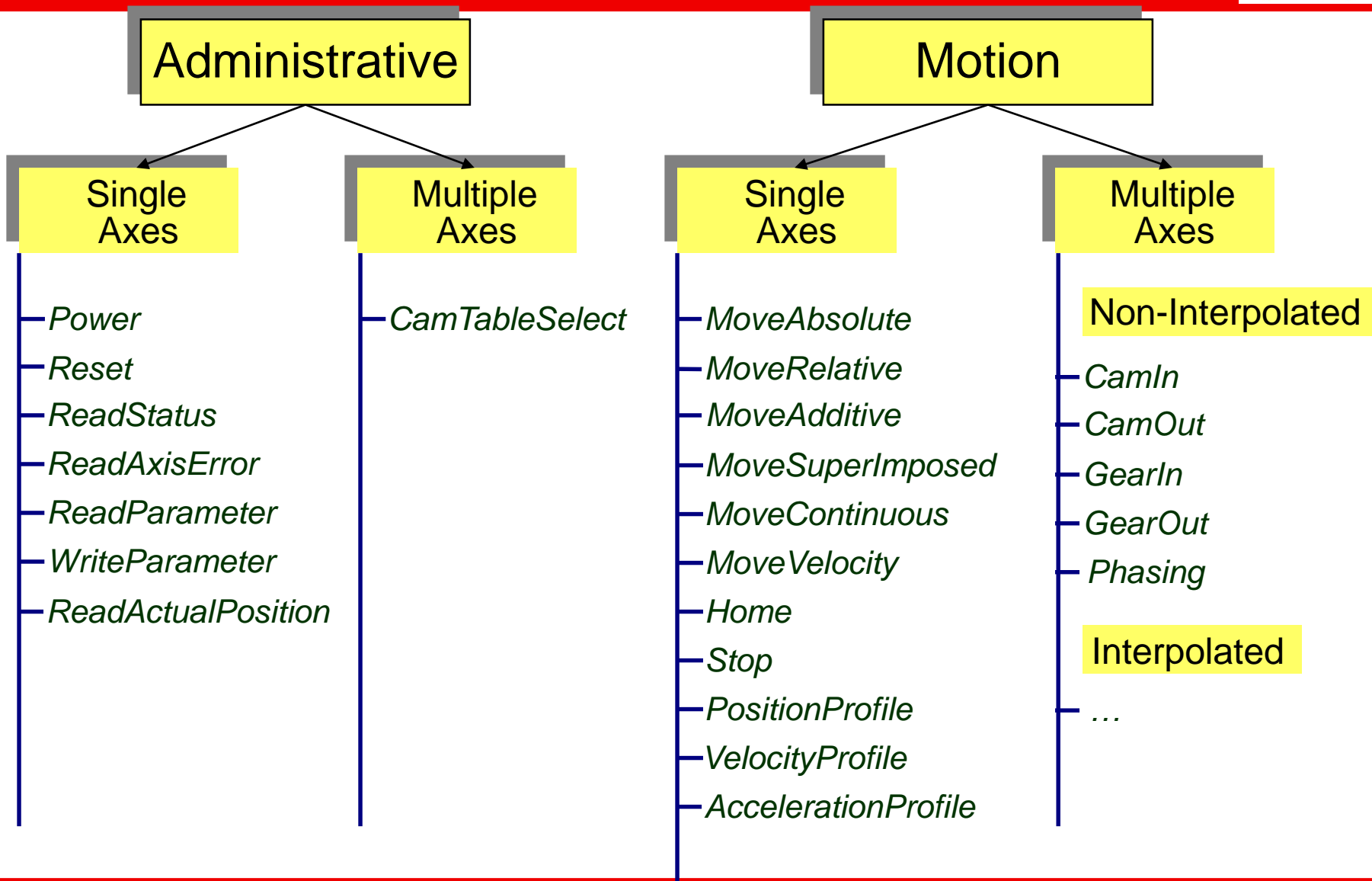
凸轮轴

运动叠加（合成）

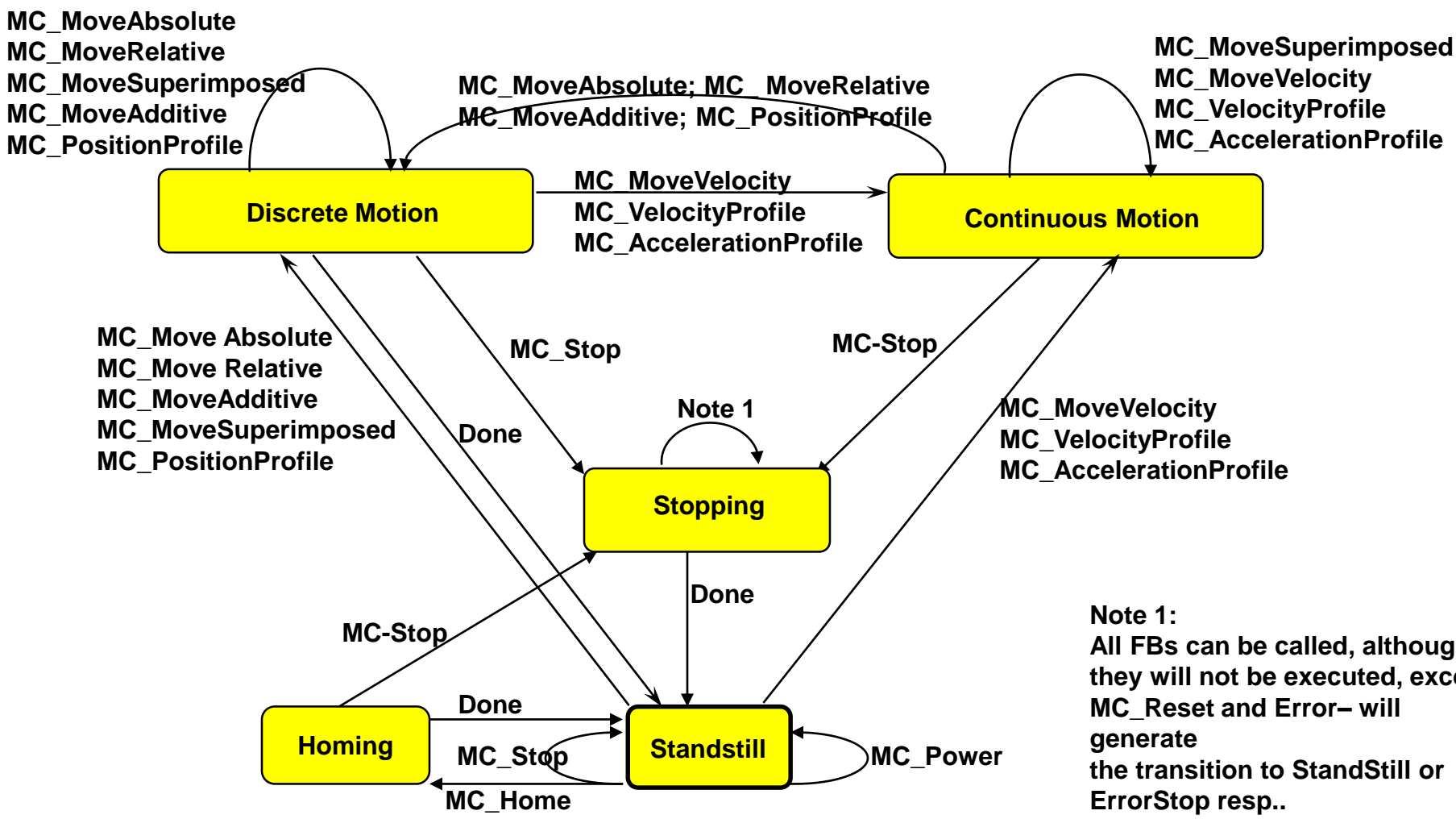
飞剪



# TwinCAT NC PTP--PLCopen 功能块概览



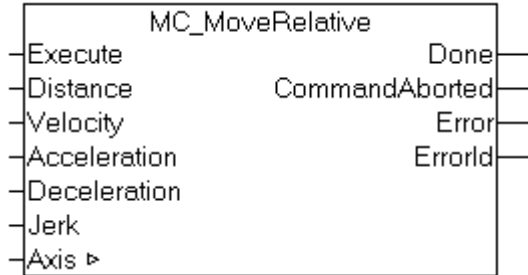
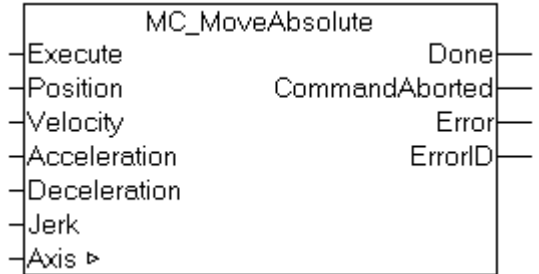
# TwinCAT NC PTP- --PLCopen 功能块概览



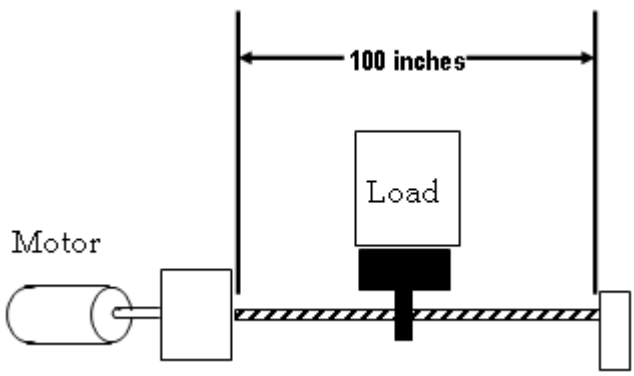
Root: Task Force Motion Control presentation Version Febr2002.



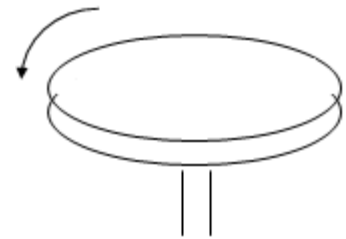
# TwinCAT NC PTP- --点到点运动



直线运动方式



旋转运动方式

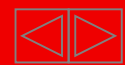


伺服点到点的定位指令分为两类：

- 绝对值定位
- 相对指定位

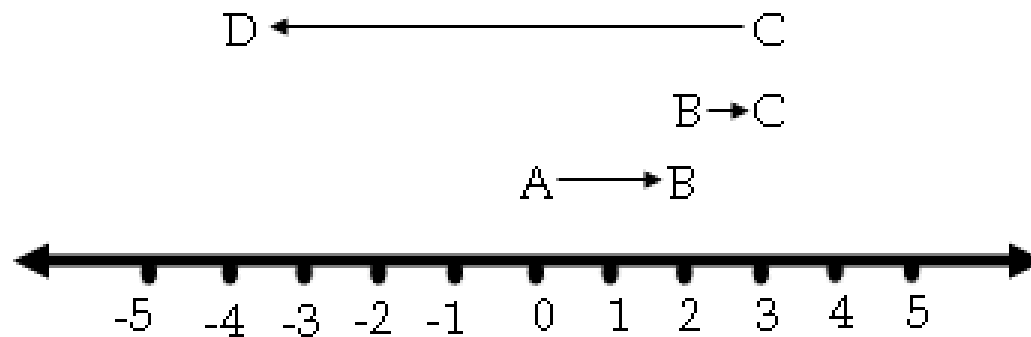
绝对值定位：执行机构移动到**到**设定的坐标位置,实现绝对值定位。

相对值定位：执行机构移动**到**设定的位置**值**,是一种增量的定位方式。





# TwinCAT NC PTP- --点到点运动



绝对值运行:

**A 到 B: 2**

**B 到 C: 3**

**C 到 D: -4**

相对值运行:

**A 到 B: +2**

**B 到 C: +1**

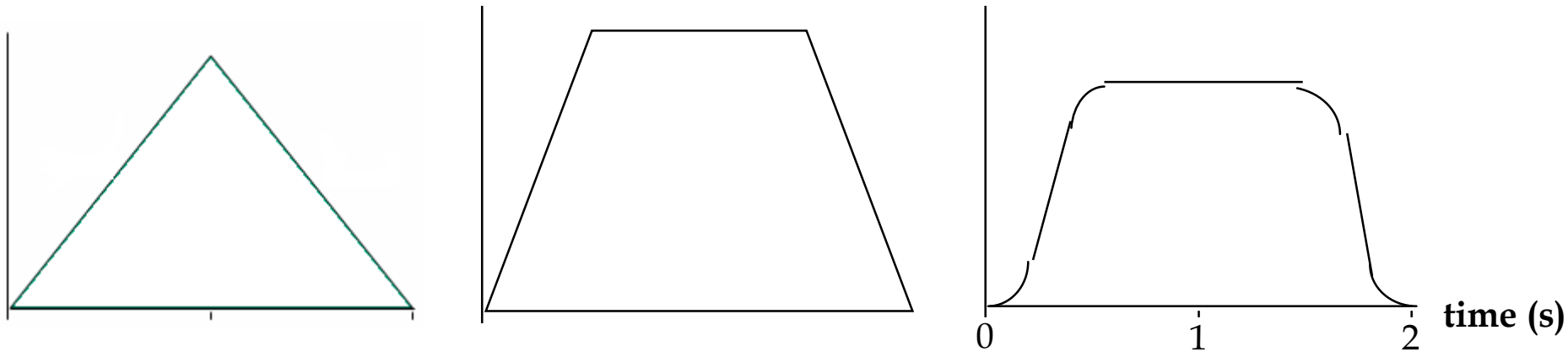
**C 到 D: -7**







# TwinCAT NC PTP- --点到点运动



## 点到点定位的速度曲线类型

- 梯形曲线,三角波曲线

该曲线类型能够以最快的时间达到工艺所要求的速度,并走完定位.

- **S**形曲线

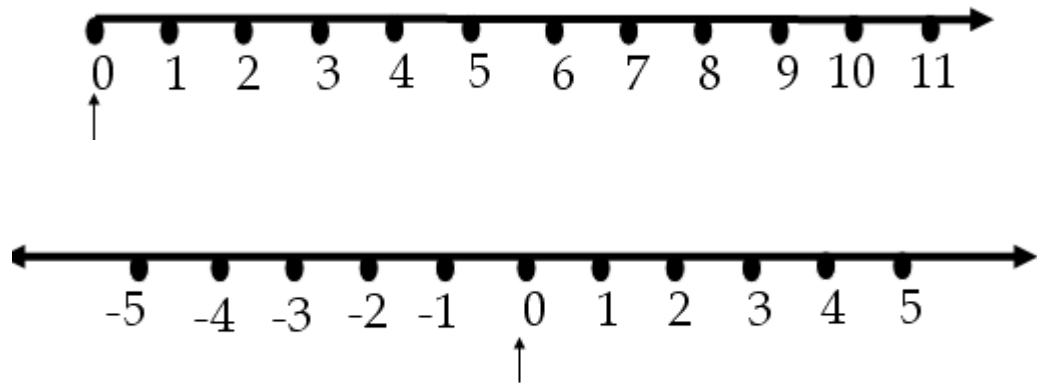
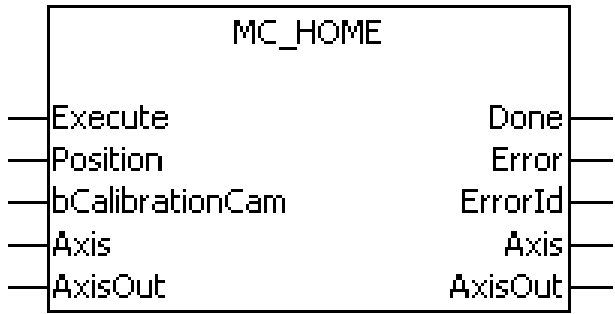
该曲线类型能够减少执行元件对机械的冲击,即jerk值.

**S**曲线的柔滑度是可以修改的,用来调节点到点的运行时间和抗冲击性之间的平衡.

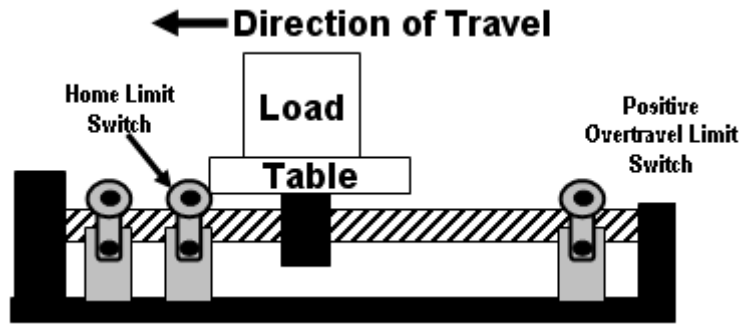




# TwinCAT NC PTP- --回原点运动



一些运动机构常常要用到回原点的方式. 原因是一些机构必须要找到一个基准点, 从基准点开始走绝对值运动或相对值运动. 这个基准点就是原点.



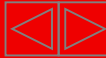
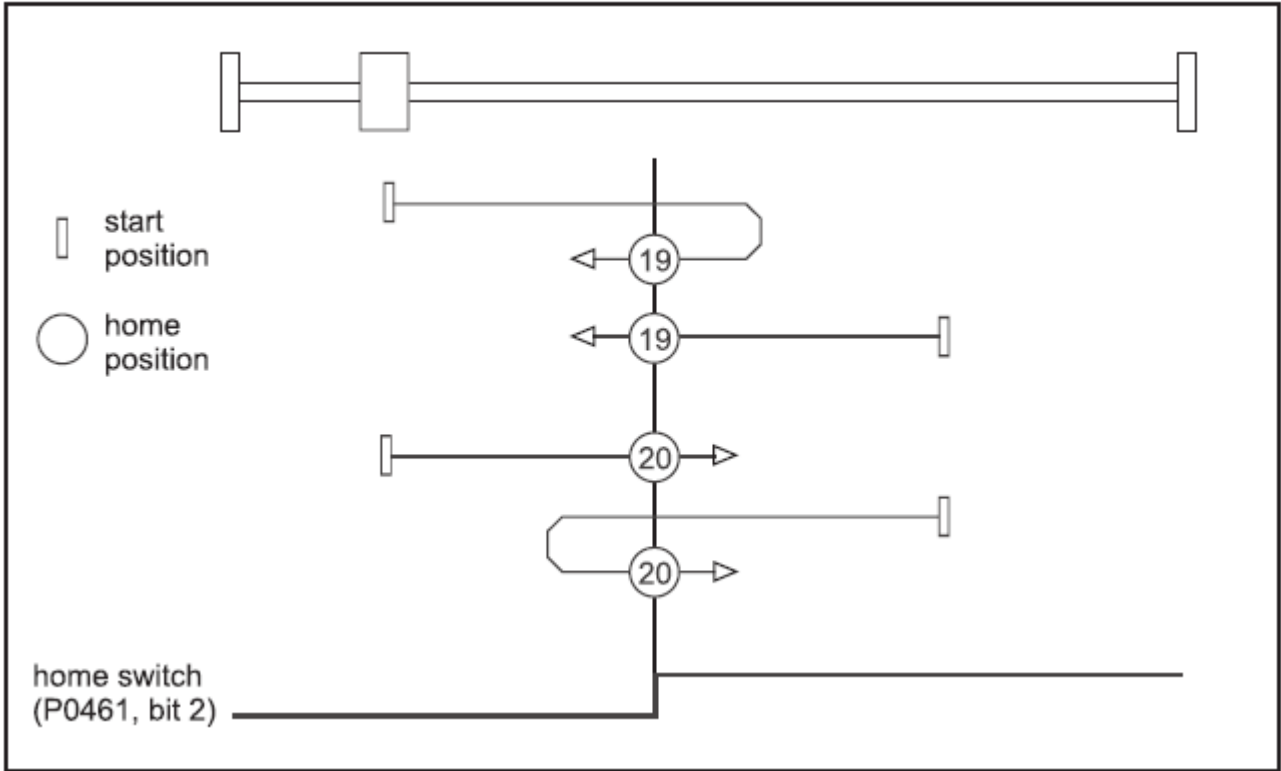
回原点的方式很多, 可以根据工艺的需求进行选择.







# TwinCAT NC PTP- --回原点运动





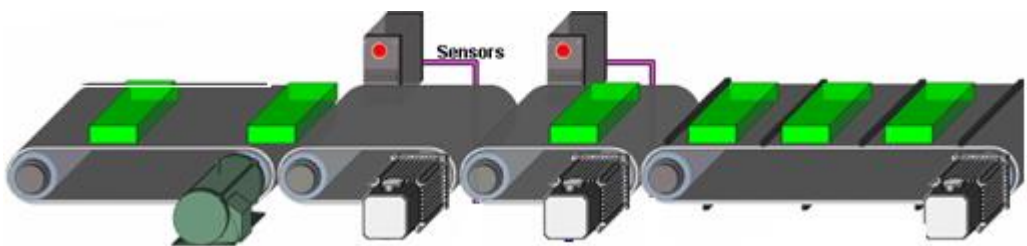
# TwinCAT NC PTP- --点到点叠加运动

MoveSuperImposed	
MC_MoveSuperImposed	
Execute	Done
Mode	Busy
Distance	Active
VelocityDiff	CommandAborted
Acceleration	Error
Deceleration	ErrorId
Jerk	ActualVelocityDiff
VelocityProcess	ActualDistance
Length	ActualLength
Options	
Axis ▾	

```

TYPE E_SuperpositionMode :
(
  SUPERPOSITIONMODE_VELOREDUCTION_ADDITIVEMOTION := 1,
  SUPERPOSITIONMODE_VELOREDUCTION_LIMITEDMOTION,
  SUPERPOSITIONMODE_LENGTHREDUCTION_ADDITIVEMOTION,
  SUPERPOSITIONMODE_LENGTHREDUCTION_LIMITEDMOTION
);
END_TYPE

```

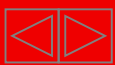


## 叠加运动指令

该指令主要用于伺服轴运动过程中进行一个点到点位置的叠加。

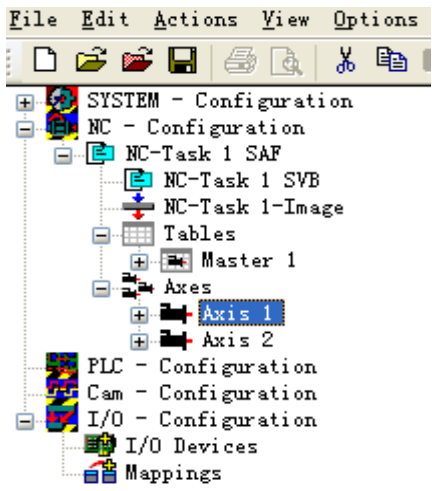
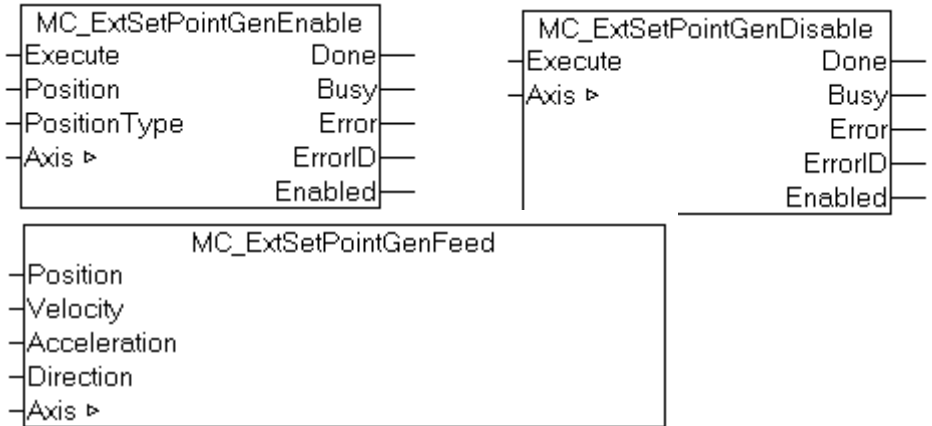
该指令运行模式E\_SuperpositionMode有4种类型：

1. 叠加区域内,走完长度Length后,叠加位置Distance刚好走完.区域行程为Length+ Distance.
2. 叠加区域内,走完长度Length后,叠加位置Distance刚好走完,包含在Length内.区域行程为 Length.
3. 叠加区域内,在区域行程Length+ Distance内,走完叠加位置Distance.
3. 叠加区域内,在区域行程Length,走完叠加位置Distance.

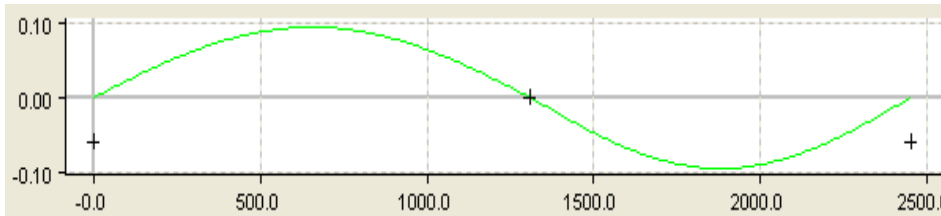




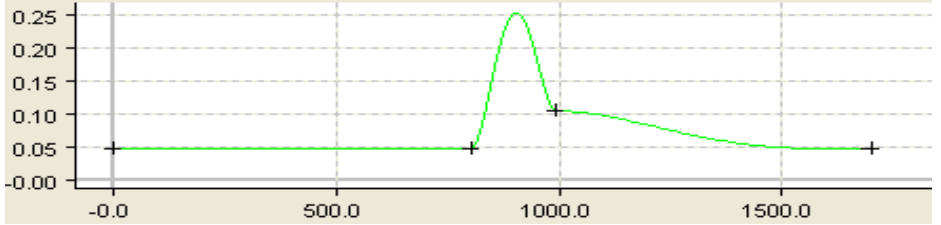
# TwinCAT NC PTP- --多个曲线的叠加运动



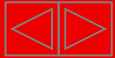
电机轴



虚拟轴



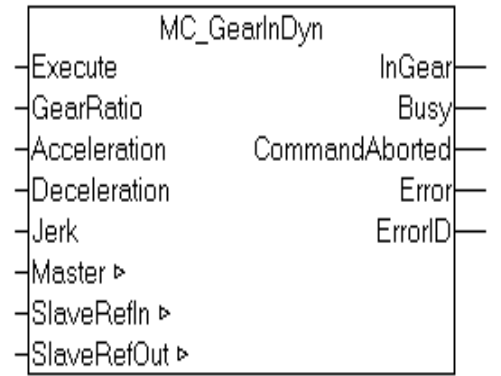
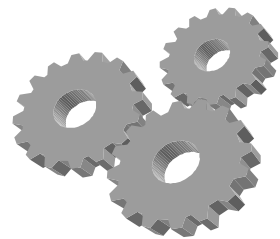
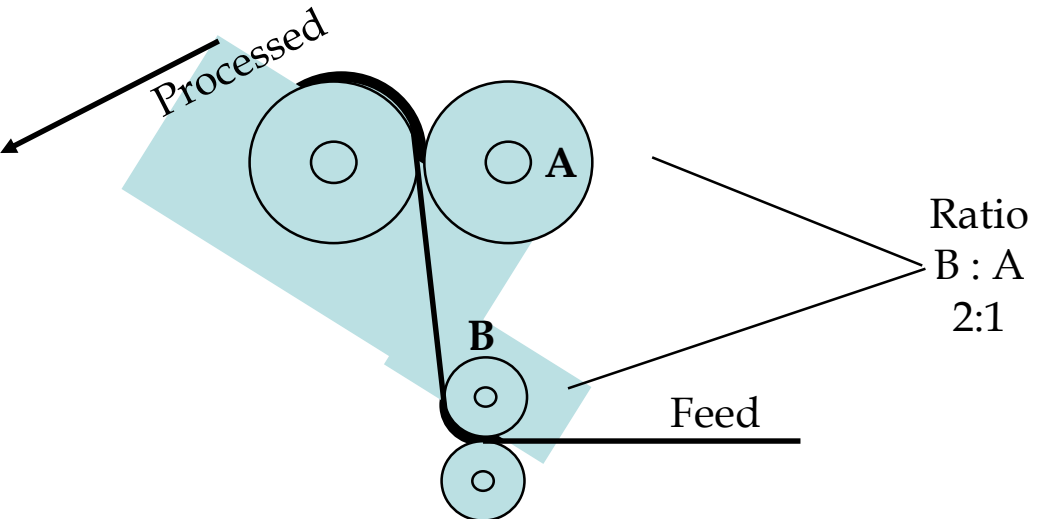
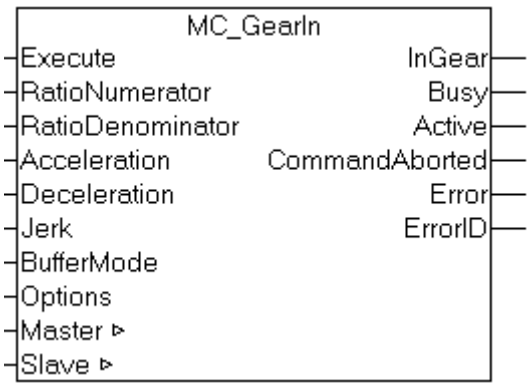
- 该系统指令的组合,可达到曲线叠加的效果.
- 在system manager中配一个电机轴,和一个虚拟轴.通过指令可以将右图的两条曲线叠加到一起,大大提高了电子凸轮控制的灵活性.
- 同样你仍然可以将多个虚拟轴和一个电机轴叠加在一起,实现两个以上曲线的叠加.





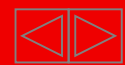
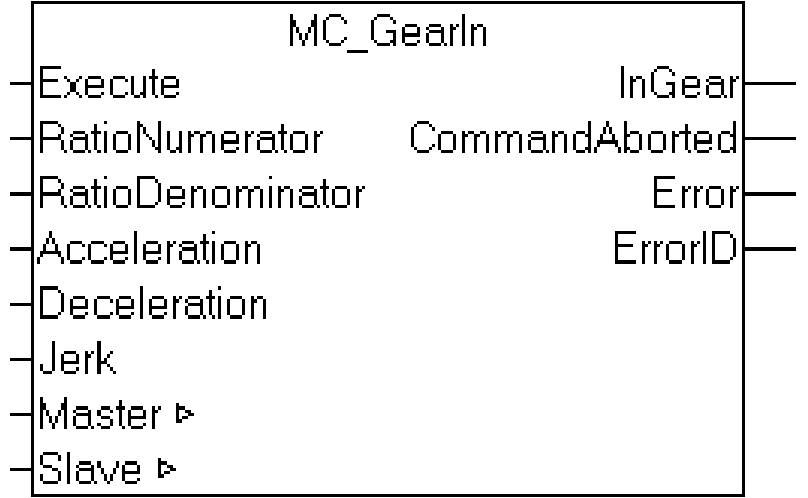
# TwinCAT NC PTP- --电子齿轮同步

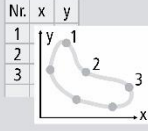
- 线性同步 耦合之后:
- 从轴 **set position = coupling factor\*主轴 set position**
- 使用标准的功能块, 简单方便
- **MC\_GearInDyn**是**MC\_GearIn**的升级版,可以动态的修改电子齿轮比.
- 电子齿轮是从机械齿轮转换过来的思路,而且更加灵活,电子齿轮是一种特殊的电子凸轮.





# TwinCAT电子齿轮同步—龙门钻床





# TwinCAT NC PTP—电子凸轮指令

## Camming

- 主从轴之间非线性耦合
- 凸轮设计遵循 VDI guideline 2143
- 凸轮设计工具 TwinCAT cam design editor

Nr.	x	y
1	0.000000	0.000000
2	30.000000	0.000000
3	150.000000	20.000000
4	240.000000	40.000000
5	340.000000	0.000000





# TwinCAT NC PTP—电子凸轮指令

	Function	X start	Y start	Y' start
1	Synchron	0.000000	0.000000	0.000000
2	Automatic	30.000...	0.000000	0.000000
3	Synchron	150.00...	20.000000	0.222222
4	Automatic	240.00...	40.000000	0.222222
5	Synchron	340.00...	0.000000	0.000000

Position

Velocity

Acceleration

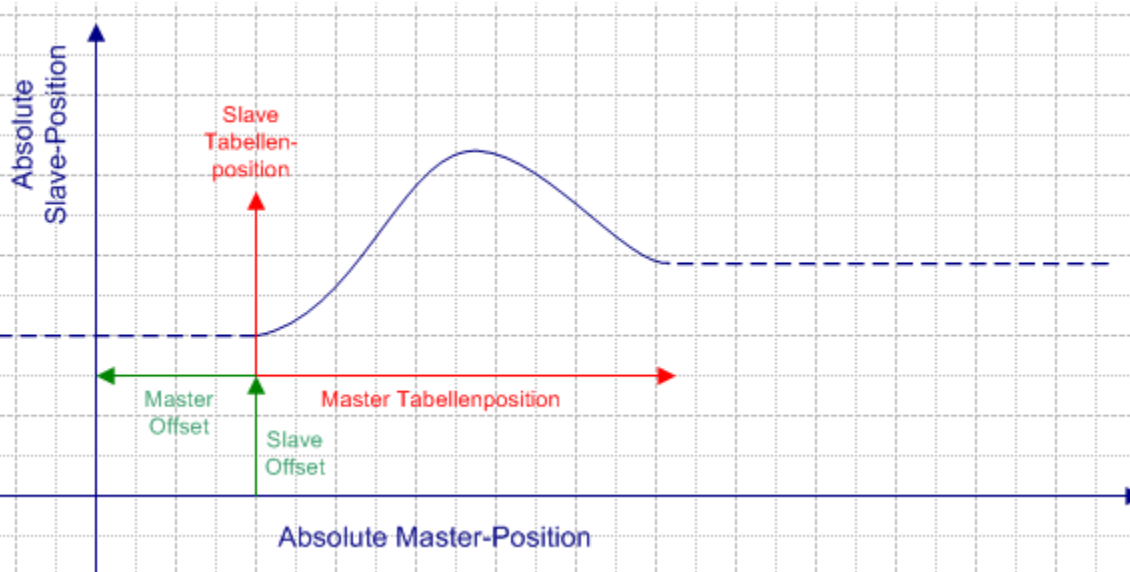
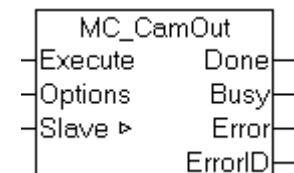
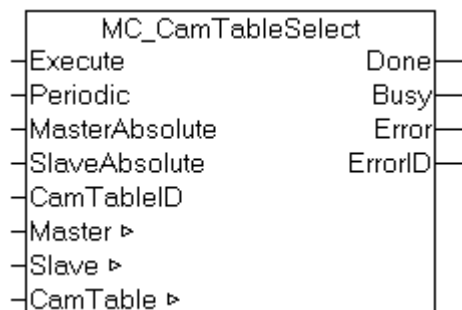
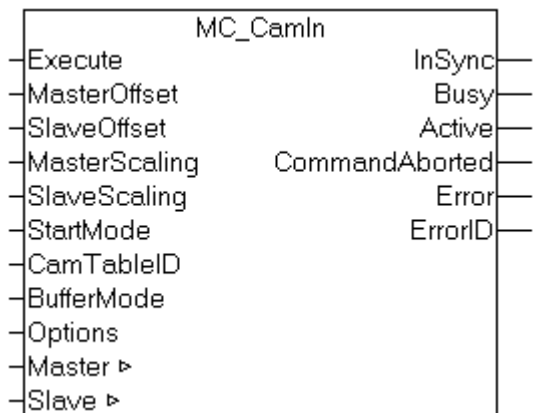
Ready NUM







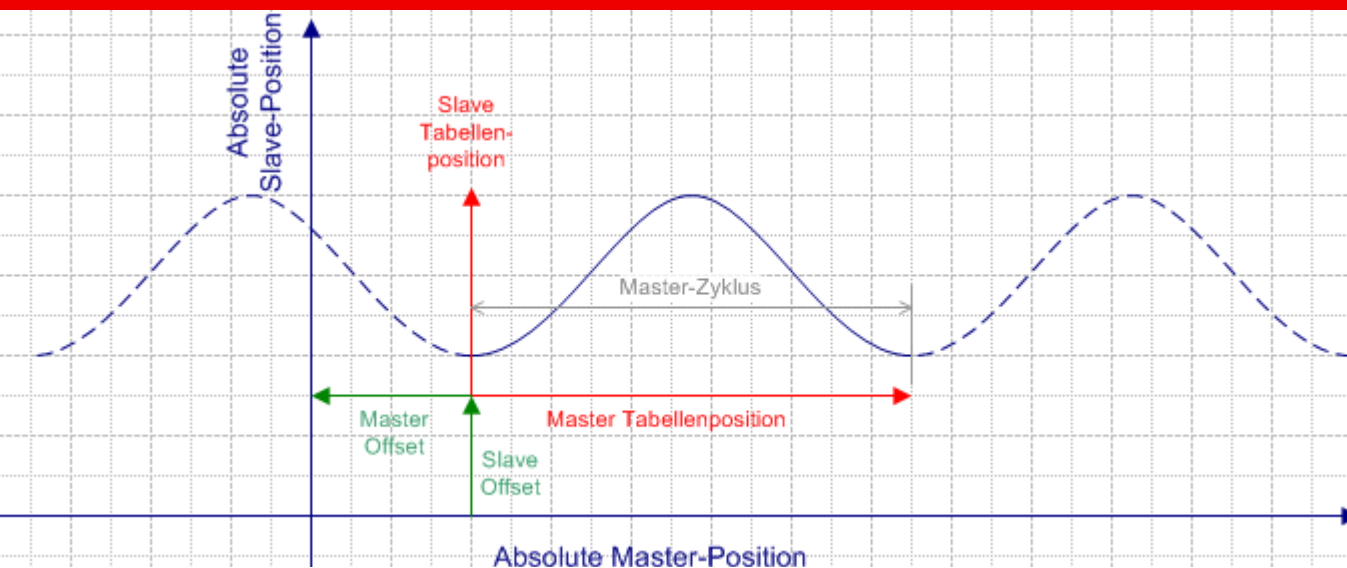
# TwinCAT NC PTP—电子凸轮指令



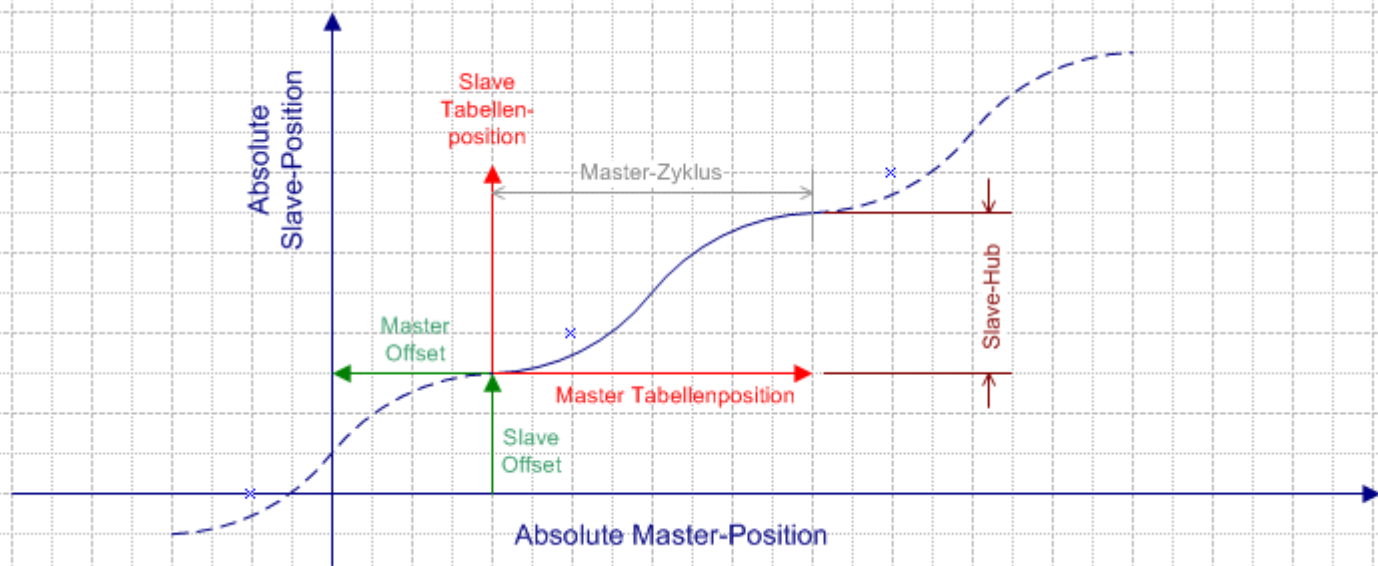
该类凸轮曲线类型完成一个周期。



# TwinCAT NC PTP—电子凸轮指令



该类凸轮曲线类型是循环型的。  
主轴和从轴都为绝对值坐标类型。

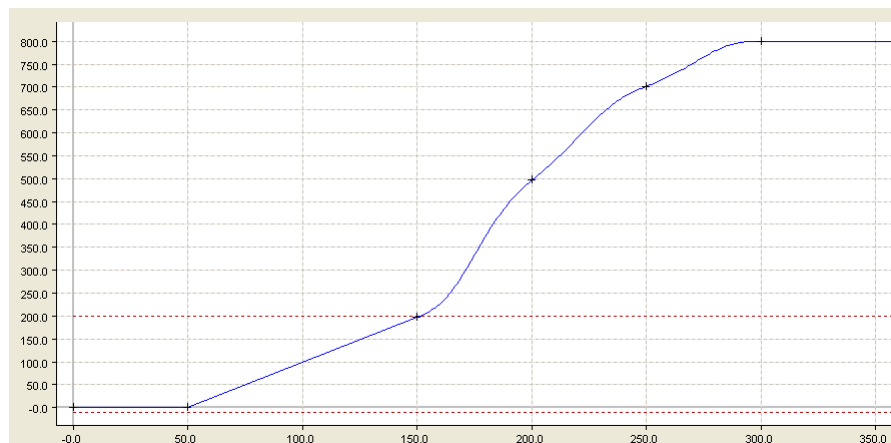
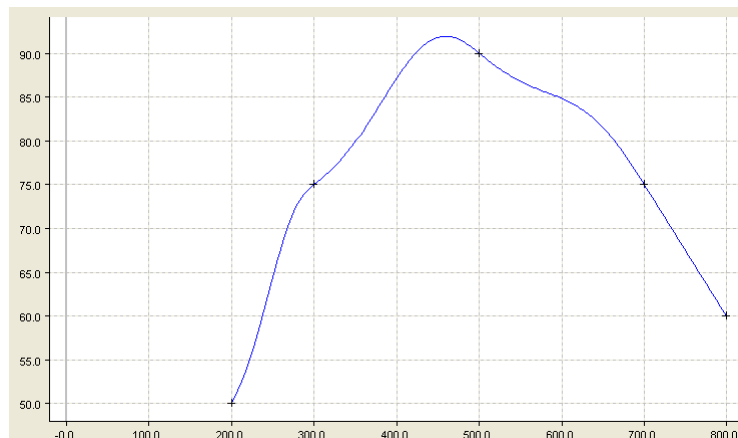


该类凸轮曲线类型是循环型的。  
主轴为绝对值坐标类型,从轴回相对值坐标类型。



# TwinCAT NC PTP—电子凸轮指令

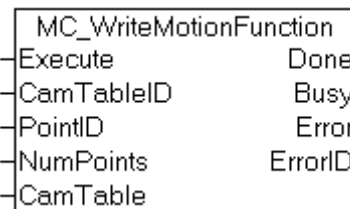
应用案例:膜包机,卸箱机



# TwinCAT NC PTP—WriteFunction

```

TYPE MC_CAM_REF :
STRUCT
    pArray      : UDINT;
    ArraySize   : UDINT;
    TableType   : MC_TableType
    NoOfRows    : UDINT;
    NoOfColumns : UDINT;
END_STRUCT
END_TYPE
    
```



```

FOR i:=1 TO 4096 DO
    MotionFunctionRead[i].PointIndex:=i;
    MotionFunctionRead[i].MasterPos := i-1;
    MotionFunctionRead[i].SlavePos := i-1;
    MotionFunctionRead[i].PointType:=MOTIONPOINTTYPE_ACTIVATION;
    MotionFunctionRead[i].FunctionType := MOTIONFUNCTYPE_POLYNOM1;
END_FOR
    
```

建立凸轮数据表的数组,该数组内数据的数量根据客户工艺曲线的需要.如**512,1024,4096**个.通过自己进行数学建模,通过分段函数的方式,实现各类复杂曲线.本质上复杂的工艺曲线如旋切,追剪以及各类特殊工艺曲线都是由这种方法实现的.

将分段函数通过离散的方法赋值给如上所述的**512,1024**或**4096**点.

该类凸轮曲线的优点是:非常灵活,可以满足一切工艺曲线的需求.

缺点:要求客户有很强的数学建模能力,对高次函数和微积分有一定的造诣.

Example 1: Position table structure description

<b>pArray</b>	Address of a two-dimensional array. The first column contains an ascending list of master positions. The second column contains the associated slave positions. The address can be assigned with the ADR function. Example: Table1 : ARRAY[0..360, 0..1] OF LREAL; pArray := ADR( Table1 );
<b>ArraySize</b>	Storage capacity of the two-dimensional array, which can be determined with the SIZEOF function. Example: ArraySize := SIZEOF( Table1 );
<b>TableType</b>	The table type is TABULARTYPE_EQUIDIST, if the master positions have the same distance, or TABULARTYPE_NONEQUIDIST if the distance is variable.
<b>NoOfRows</b>	The number of rows corresponds to the number of table points.
<b>NoOfColumns</b>	The number of columns is 2.

# TwinCAT NC PTP—WriteFunction

1	Spline Natural	0.000000	0.000000	30.85...	0.000264	0.000000	1.000000	30.85...	30.85...	-0.00...	0.000000	0.500000
2	Spline	1.000000	30.85...	30.85...	-0.00...	0.000000	2.000000	61.71...	30.85...	-0.00...	0.000000	0.500000
3	Spline	2.000000	61.71...	30.85...	-0.00...	0.000000	3.000000	92.56...	30.85...	-0.00...	0.000000	0.500000
4	Spline	3.000000	92.56...	30.85...	-0.00...	0.000000	4.000000	123.4...	30.85...	-0.00...	0.000000	0.500000
5	Spline	4.000000	123.4...	30.85...	-0.00...	0.000000	5.000000	154.2...	30.84...	-0.00...	0.000000	0.500000
6	Spline	5.000000	154.2...	30.84...	-0.00...	0.000000	6.000000	185.1...	30.84...	-0.00...	0.000000	0.500000
7	Spline	6.000000	185.1...	30.84...	-0.00...	0.000000	7.000000	215.9...	30.84...	-0.00...	0.000000	0.500000
8	Spline	7.000000	215.9...	30.84...	-0.00...	0.000000	8.000000	246.7...	30.83...	-0.00...	0.000000	0.500000
9	Spline	8.000000	246.7...	30.83...	-0.00...	0.000000	9.000000	277.6...	30.82...	-0.00...	0.000000	0.500000
10	Spline	9.000000	277.6...	30.82...	-0.00...	0.000000	10.000000	308.4...	30.82...	-0.00...	0.000000	0.500000
11	Spline	10.000000	308.4...	30.82...	-0.00...	0.000000	11.000000	339.2...	30.81...	-0.00...	0.000000	0.500000
12	Spline	11.000000	339.2...	30.81...	-0.00...	0.000000	12.000000	370.0...	30.80...	-0.00...	0.000000	0.500000
13	Spline	12.000000	370.0...	30.80...	-0.00...	0.000000	13.000000	400.8...	30.80...	-0.00...	0.000000	0.500000
14	Spline	13.000000	400.8...	30.80...	-0.00...	0.000000	14.000000	431.6...	30.79...	-0.00...	0.000000	0.500000
15	Spline	14.000000	431.6...	30.79...	-0.00...	0.000000	15.000000	462.4...	30.78...	-0.01...	0.000000	0.500000
16	Spline	15.000000	462.4...	30.78...	-0.01...	0.000000	16.000000	493.2...	30.77...	-0.01...	0.000000	0.500000

该凸轮表中定义了4096个点

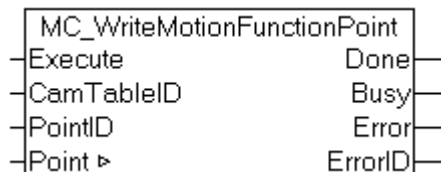
该凸轮曲线是在程序中进行数学计算，然后生成到凸轮表中的



# TwinCAT NC PTP—WriteFunctionPoint

```

TYPE MC_CAM_REF :
STRUCT
  pArray          : UDINT;
  ArraySize       : UDINT;
  TableType       : MC_TableType;
  NoOfRows        : UDINT;
  NoOfColumns     : UDINT;
END_STRUCT
END_TYPE
  
```



适用于凸轮编辑表中若干点连接所组成的凸轮曲线。

该类凸轮曲线是通过凸轮表编辑所得到的。

使用该指令可以改变这类凸轮表中的任何点的位置,从而达到改变曲线的效果。

优点:该方法曲线的实现方法比较简单,不需要编程者有数学建模能力,在凸轮编辑中根据工艺描点即可

缺点:不能满足复杂工艺曲线的需求.

## Example 2: Structure description of a motion function

<b>pArray</b>	Address of a one-dimensional array of type <i>MC_MotionFunctionPoint</i> . Each array element contains a description of a cam plate interpolation point. Example: MotionFunction : ARRAY[1..10] OF MC_MotionFunctionPoint; pArray := ADR( MotionFunction );
<b>ArraySize</b>	Storage capacity of the one-dimensional array, which can be determined with the SIZEOF function. Example: ArraySize := SIZEOF( MotionFunction );
<b>TableType</b>	The table type is TABULARTYPE_MOTIONFUNC.
<b>NoOfRows</b>	The number or rows corresponds to the number of table points.
<b>NoOfColumns</b>	The number of columns is 1.

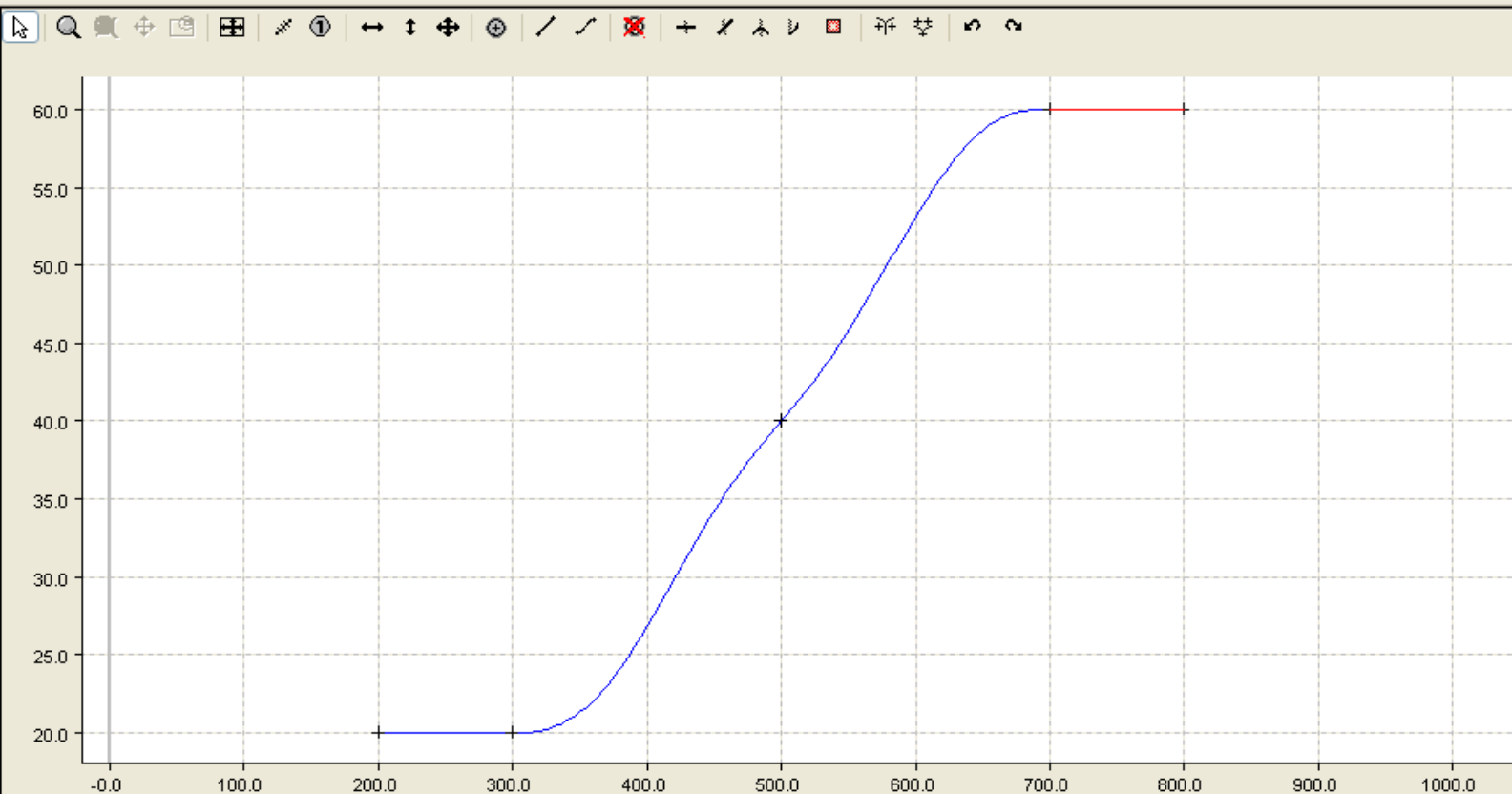
# TwinCAT NC PTP—WriteFunctionPoint

	Function	X start	Y start	Y' start	Y'' s...	Y''' ...	X end	Y end	Y' end	Y'' end	Y''' end	Symmetry
1	Synchron	⊕ 200.00...	20.00...	0.000000	0.000000	0.000000	✗ 300.00...	20.00...	0.000000	0.000000	0.000000	0.500000
2	Automatic	✗ 300.00...	20.00...	0.000000	0.000000	0.000000	↘ 500.00...	40.00...	0.100000	0.000000	0.000000	0.500000
3	Automatic	↘ 500.00...	40.00...	0.100000	0.000000	0.000000	✗ 700.00...	60.00...	0.000000	0.000000	0.000000	0.500000
4	Synchron	⊕ 700.00...	60.00...	0.000000	0.000000	0.000000	⊕ 800.00...	60.00...	0.000000	0.000000	0.000000	0.500000

该凸轮表中定义了4个点

该凸轮曲线是通过凸轮工具描点法实现的,比较简单.

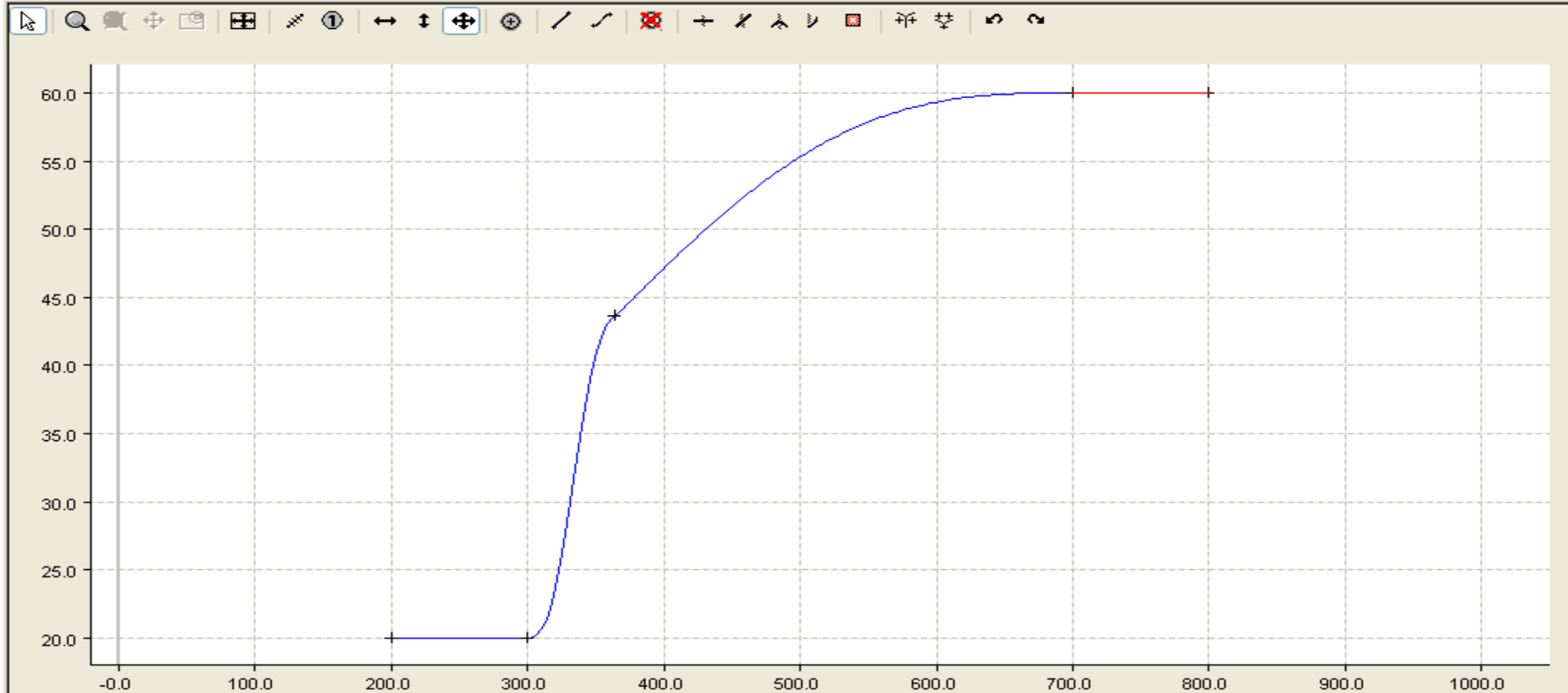
该凸轮表的每个位置点都可以在程序中修改其位置,以满足曲线的变化





# TwinCAT NC PTP—WriteFunctionPoint

	Function	X start	Y start	Y' start	Y'' s...	Y''' ...	X end	Y end	Y' end	Y'' end	Y''' end	Symmetry
1	Synchron	⊕ 200.00...	20.00...	0.000000	0.000000	0.000000	✗ 300.00...	20.00...	0.000000	0.000000	0.000000	0.500000
2	Automatic	✗ 300.00...	20.00...	0.000000	0.000000	0.000000	✗ 364.56...	43.70...	0.100000	0.000000	0.000000	0.500000
3	Automatic	✗ 364.56...	43.70...	0.100000	0.000000	0.000000	✗ 700.00...	60.00...	0.000000	0.000000	0.000000	0.500000
4	Synchron	⊕ 700.00...	60.00...	0.000000	0.000000	0.000000	⊕ 800.00...	60.00...	0.000000	0.000000	0.000000	0.500000

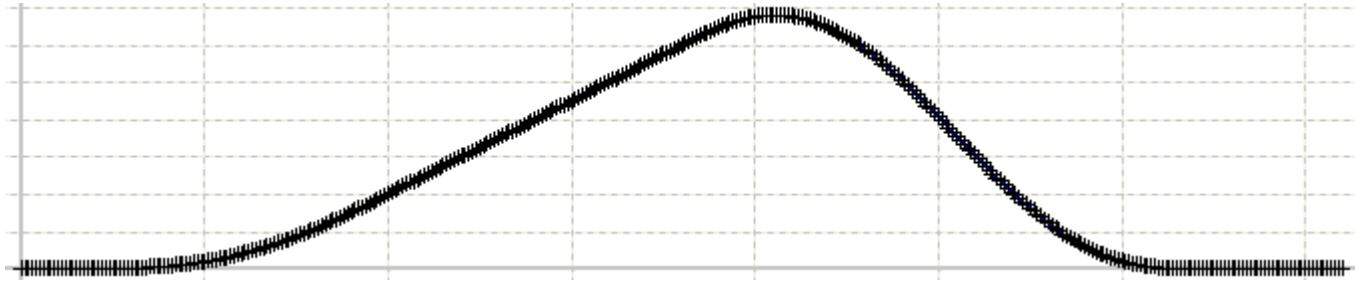




# TwinCAT NC PTP—凸轮设计工具

数据表

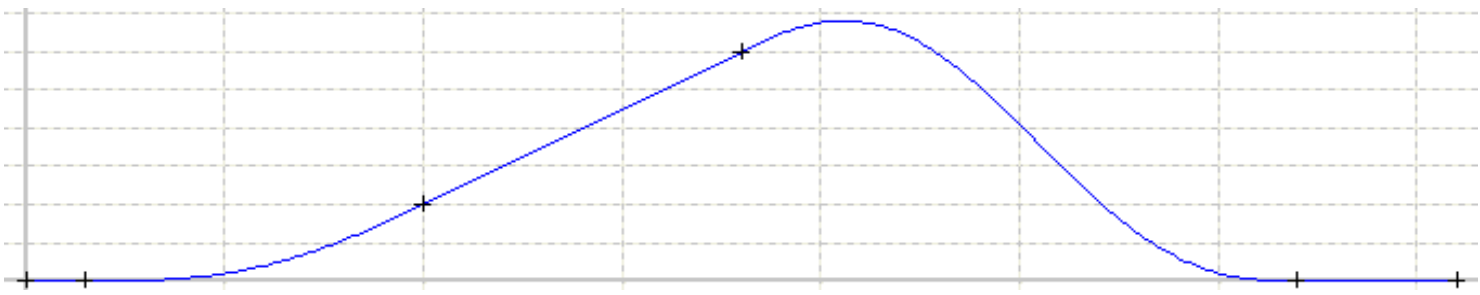
## Positiontable



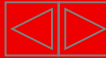
The position values of a slave depending on a master value are interpolated in the NC

动态修改

## Motion Function

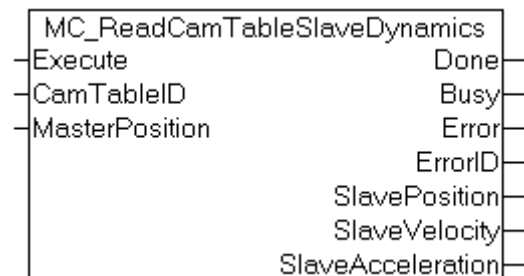
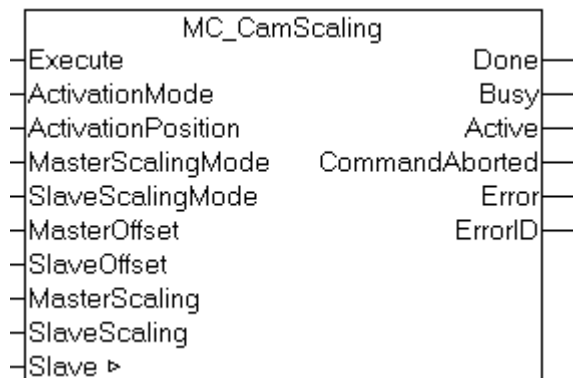


Only segment points needed. The intermediate points are calculated depending on the actual function in the NC





# TwinCAT NC PTP—电子凸轮指令



## • MC\_CamScaling的指令的功能

- 1.能够动态的拉伸或收缩X轴和Y轴大小.
- 2.能够灵活的修改X轴或Y轴的起始位置.
- 3.可以灵活的选择何时生效变化结果.

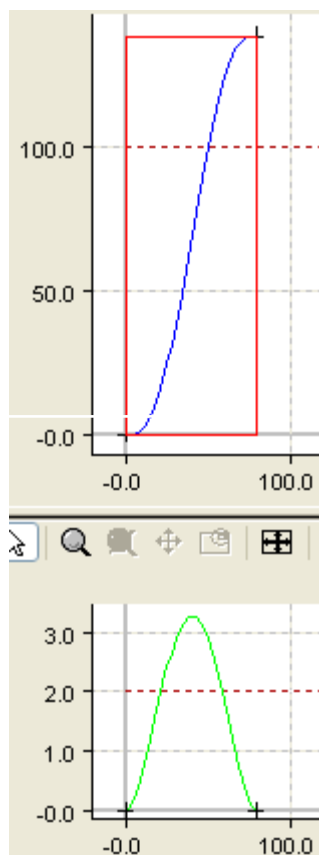
## • MC\_ReadCamTableSlaveDynamics.

- 1.通过输入主轴位置,计算出相应Cam Table表的从轴位置.
- 2.由以上得到从轴位置,可以在凸轮表的任一位置去启动凸轮曲线.



# TwinCAT NC PTP—MC\_CamScaling

## MC\_CamScaling的指令的效果



CamScaling可以看成是动态修改曲线的指令.

不仅仅是使用offset,主从轴scaling的方式改变凸轮曲线.

还可以通过上述的WriteFunctionPoint或WriteFunction改变曲线.



# TwinCAT NC PTP—MC\_CamScaling

通过MC\_CamActivationMode,可以让camscaling更加灵活的动态改变曲线。

## Data type MC\_CamActivationMode

```

TYPE MC_CamActivationMode :
(
  MC_CAMACTIVATION_INSTANTANEOUS, (* instantaneous change *)
  MC_CAMACTIVATION_ATMASTERCAMPOS, (* modify the data at a defined master
                                     position referring to the cam tables
                                     master position *)
  MC_CAMACTIVATION_ATMASTERAXISPOS, (* modify the data at a defined master
                                       position referring to the absolute
                                       master axis position *)
  MC_CAMACTIVATION_NEXTCYCLE, (* modify the data at the beginning of
                                the next cam table cycle *)
  MC_CAMACTIVATION_NEXTCYCLEONCE, (* not yet implemented!
                                     modify the data at the beginning of
                                     the next cam table cycle, activation
                                     is valid for one cycle only *)
  MC_CAMACTIVATION_ASSOONASPOSSIBLE, (* modify the data as soon as the
                                        cam table is in a safe state to
                                        change its data *)
  MC_CAMACTIVATION_OFF, (* don't accept any modification *)
  MC_CAMACTIVATION_DELETEQUEUEDDATA (* delete all data which was written
                                       to modify the cam table but is
                                       still not activated *)
);
END_TYPE

```

有以下一些动态改变曲线的类型:

立即修改曲线。

主轴在凸轮表的指定位置时修改曲线。

在主轴绝对值的指定位置时修改曲线。

在下一个周期的开始修改曲线。

凸轮表在一个安全的状态时修改曲线。

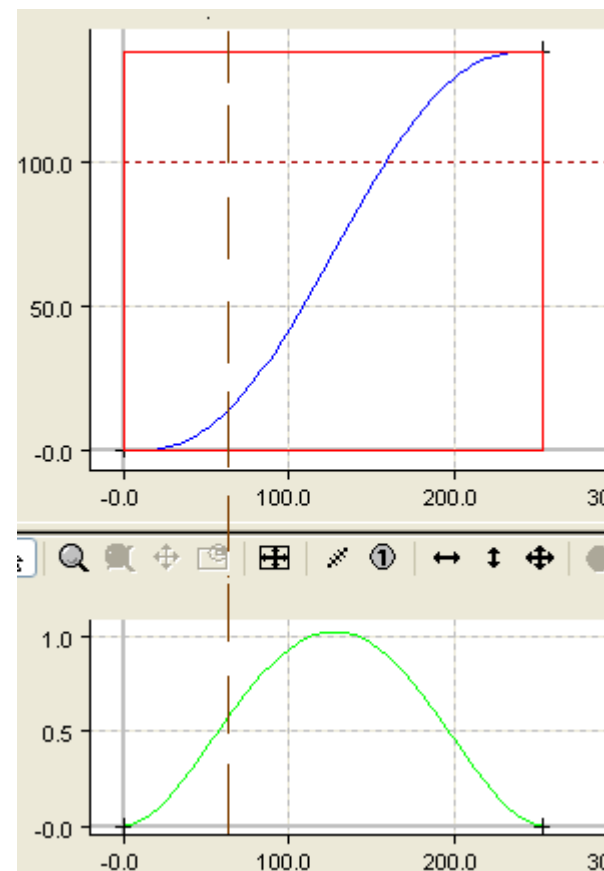
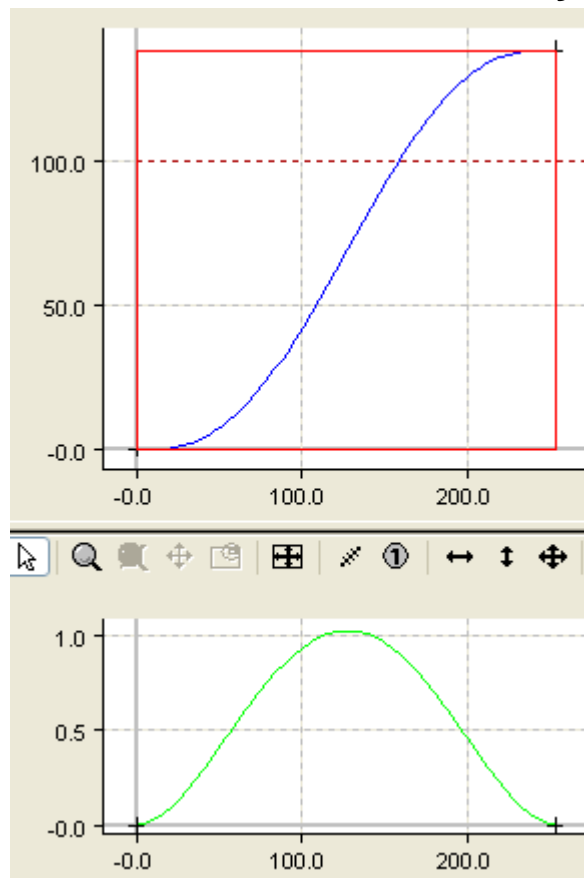
取消修改的曲线的计划。





# TwinCAT NC PTP— MC\_ReadCamTableSlaveDynamics

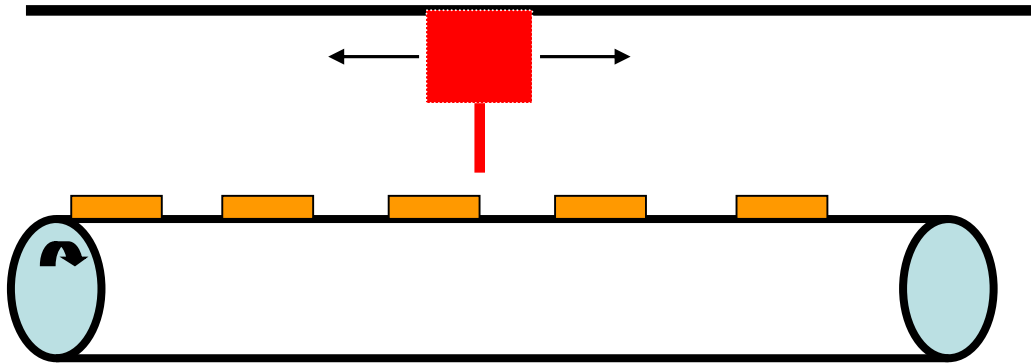
MC\_ReadCamTableSlaveDynamics的指令的效果



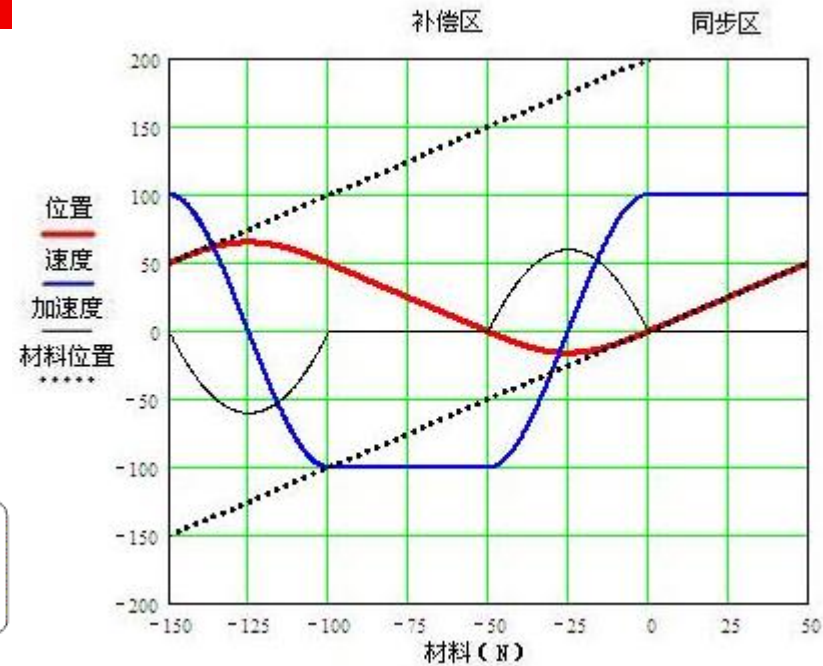
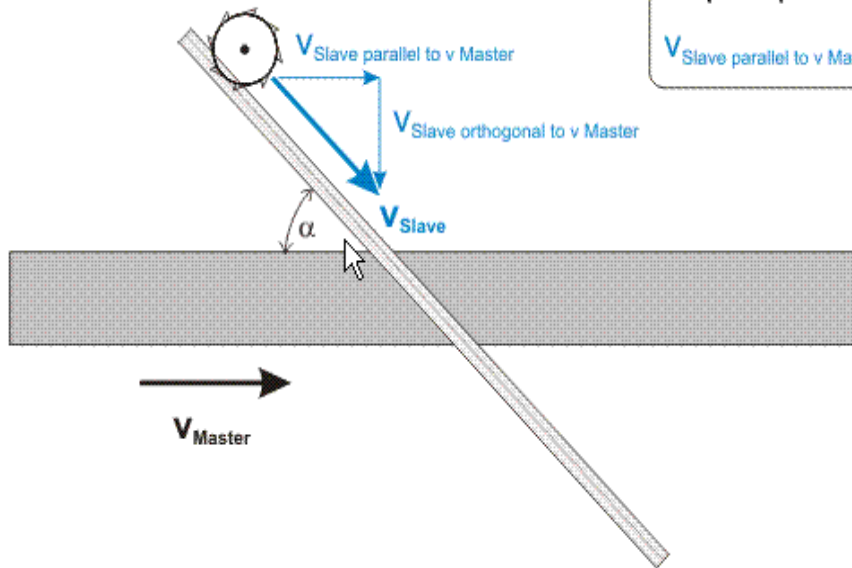
```
MasterCamTablePos := (MasterPosition + MasterOffset) / MasterScaling;
SlaveCamTablePosition := ReadSlaveDynamics.SlavePosition;
Lift number := MODTURNS( (SlavePosition - SlaveOffset), SlaveHub );
NewSlaveOffset := SlaveOffset + (SlaveHub * lift number);
SlavePosition := (SlaveCamTablePosition * SlaveScaling) + NewSlaveOffset;
```



# TwinCAT NC PTP : 追锯



couple requirement:  
 $V_{\text{Slave parallel to } v_{\text{Master}}} = v_{\text{Master}}$



## 追剪功能块:

该功能块常用于物料剪切.(通常用在一些比较厚的中长物料的场所,如钢板剪切等)

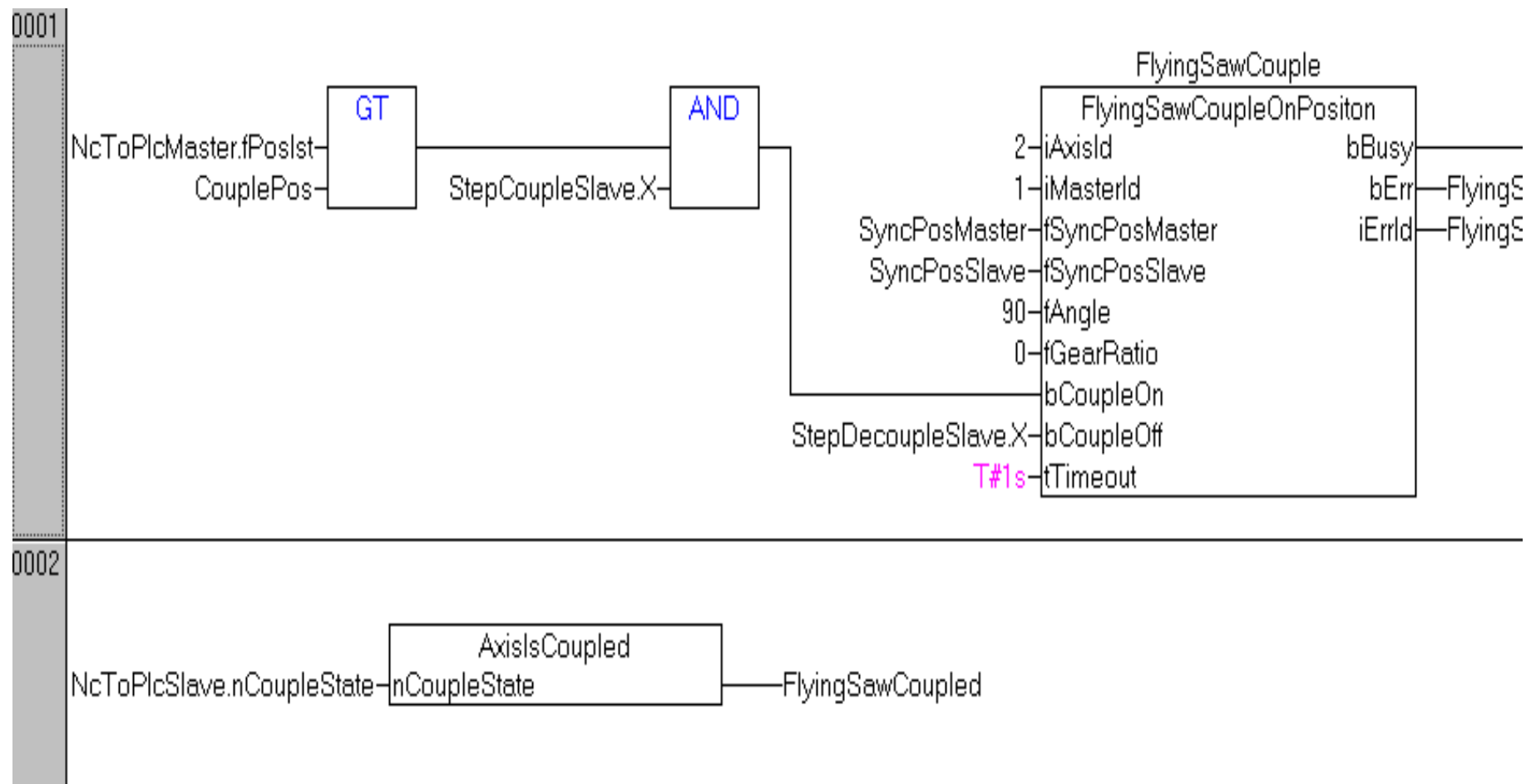
该工艺的特点是:

剪切从轴追上物料以后,和物料保持速度同步后,剪切物料,并保持同步一段时间.(可以充分的对物料进行剪切).

同步区结束以后,剪切从轴反向,回到当初的起始点,准备下一次的追锯.

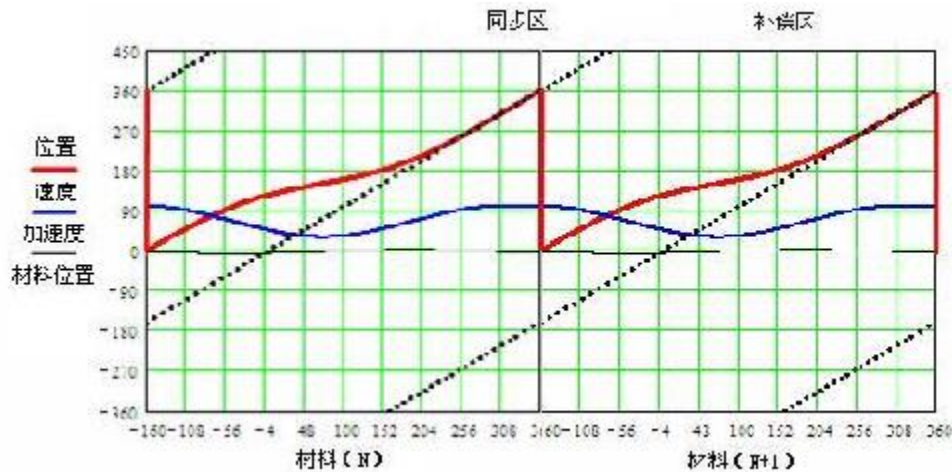
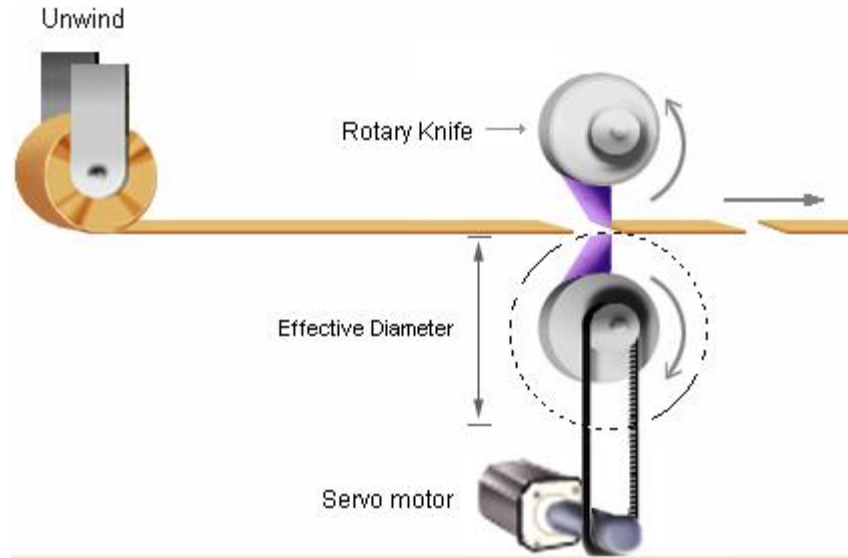


# TwinCAT NC PTP :追锯功能块



# TwinCAT NC PTP : 旋切功能块

PS_FlyingSync	
Enable	InSync
CoupleOn	Done
MasterStartPosition	Busy
MasterSyncPosition	CommandAborted
RatioNumerator	Error
RatioDenominator	ErrorID
SlaveSyncPosition	▸ Master
SlaveEndPosition	▸ Slave
SlaveWaitPosition	
SlaveVelocity	
SlaveAcceleration	
SlaveDeceleration	
SlaveJerk	
Timeout	
Master ▸	
Slave ▸	

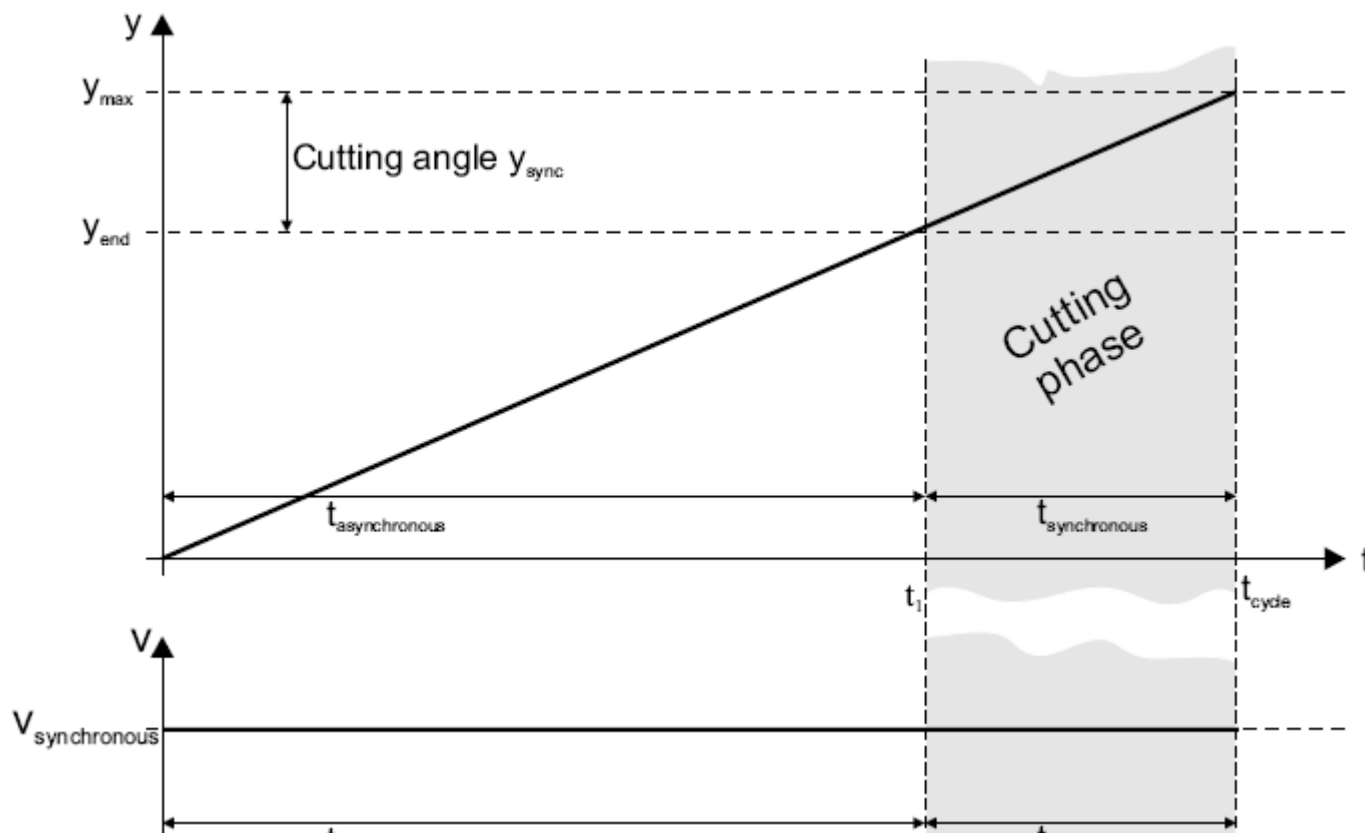


## 旋切功能块:

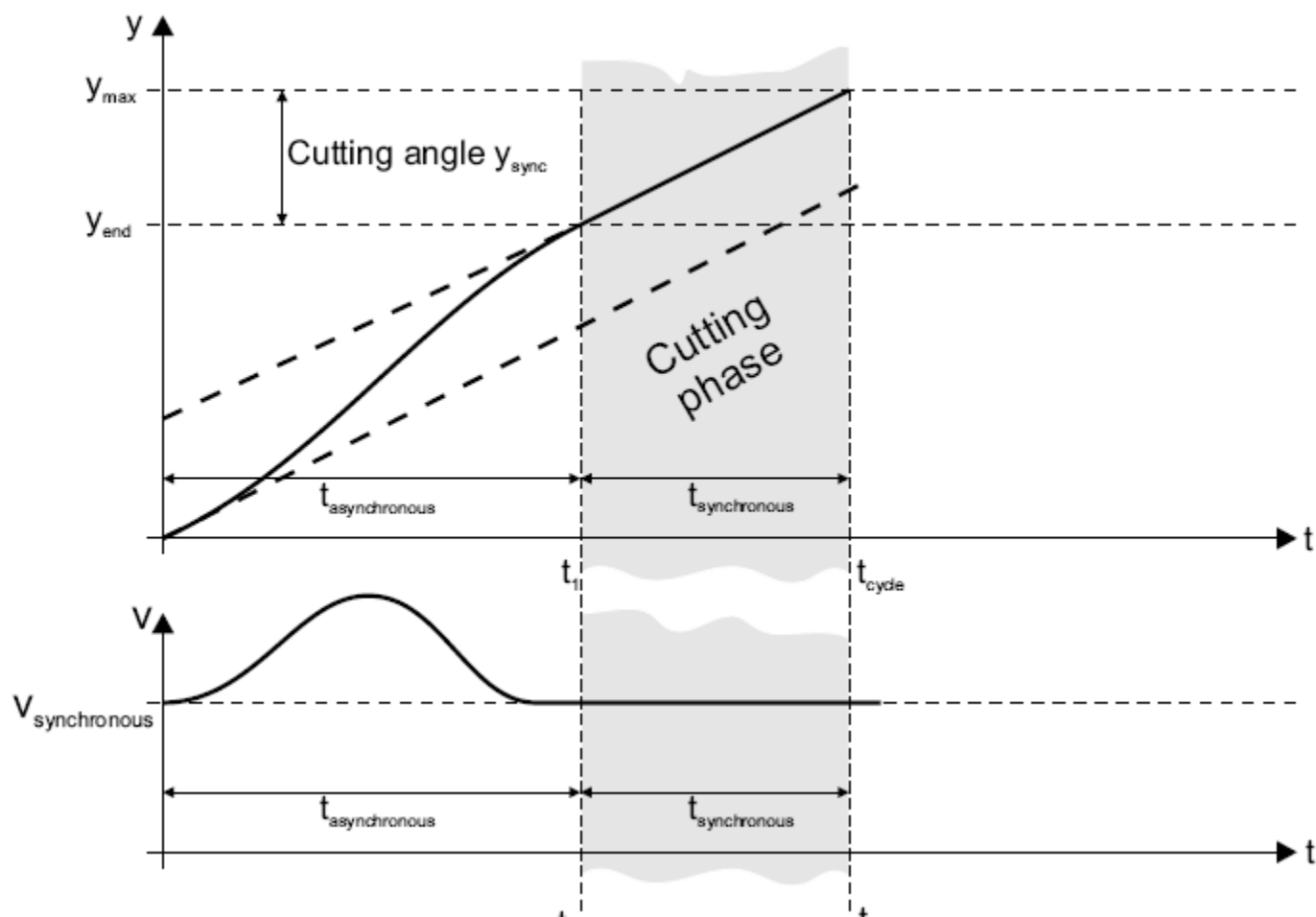
一种应用非常广泛的物料剪切案例.如钢板剪切,瓦楞纸剪切,连续式包装机的薄膜剪切.通常和收放卷配合使用.

特点是:旋刀在运行过程中不停止(长料剪切除外),比停剪的速度快很多.曲线特点主要为在剪切的同步区速度保持一致,其他区域为补偿区,用来解决不同长度物料的位置补偿.

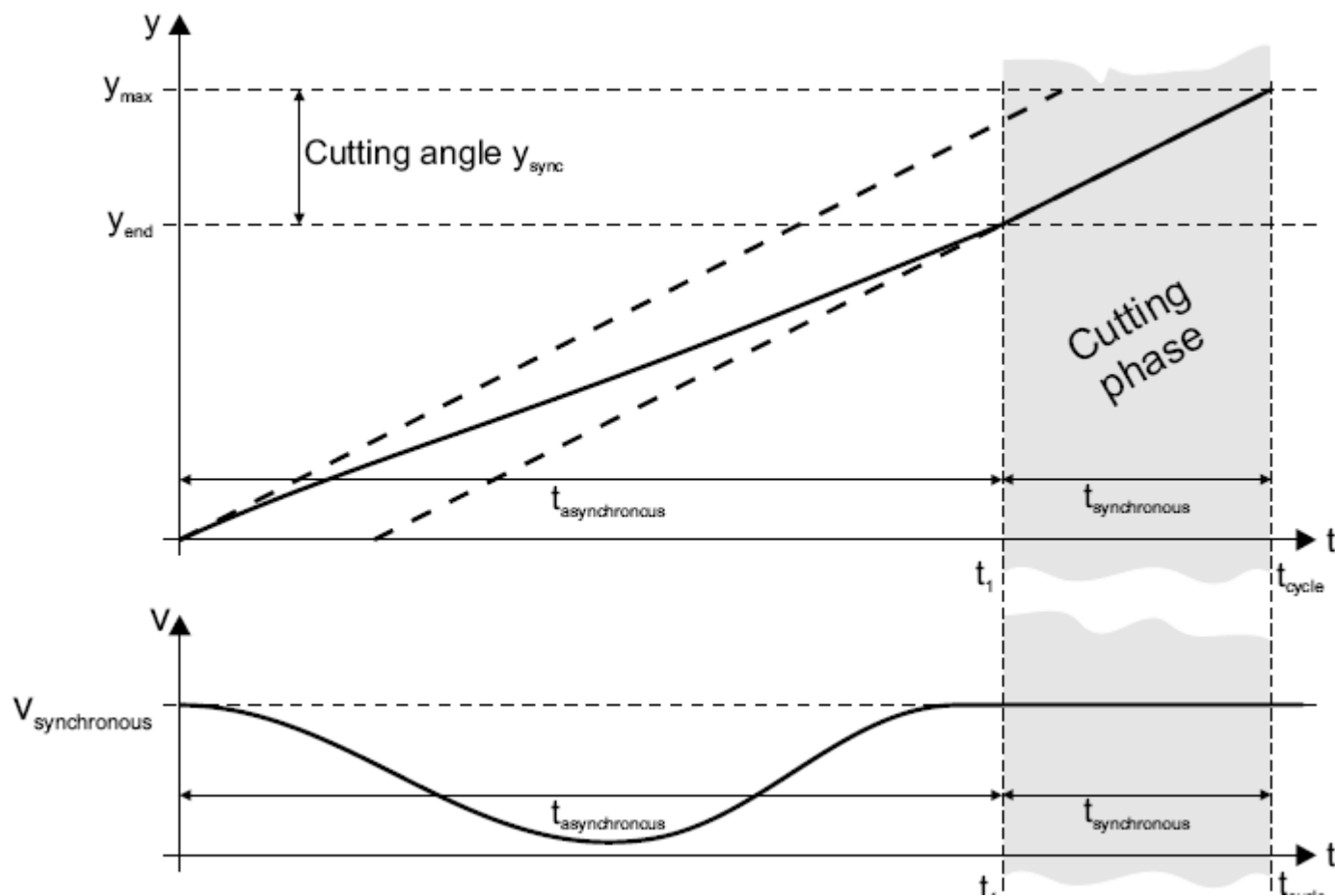
# TwinCAT NC PTP : 旋切功能块



# TwinCAT NC PTP : 旋切功能块

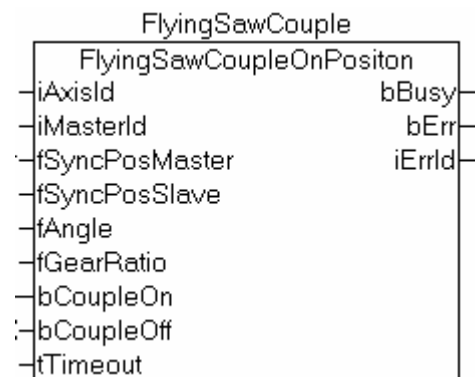
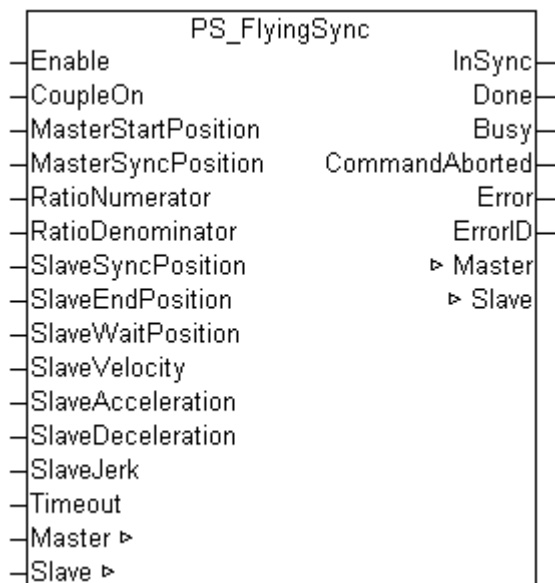


# TwinCAT NC PTP : 旋切功能块





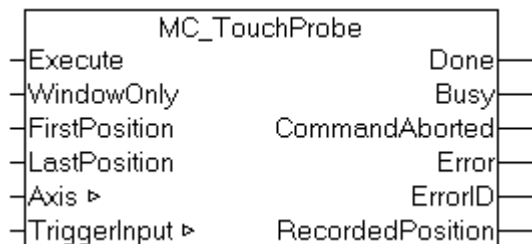
# TwinCAT NC PTP : 旋切功能块



该功能块也可以通过参数的修改完成飞锯的功能



# TwinCAT NC PTP : 动态捕捉功能块

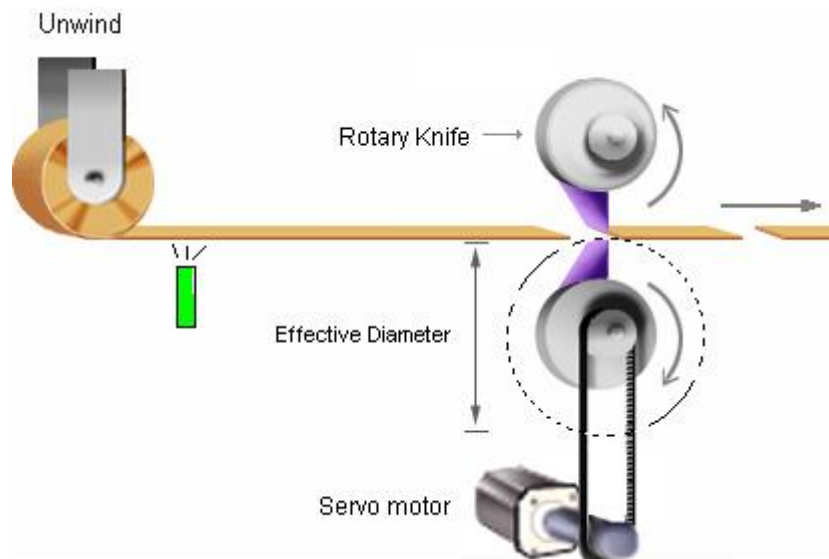


动态捕捉功能块:

该功能块的特点:当通过旋切功能块去剪切薄膜或纸张时,如果材料上有色标,而旋刀必须剪在色标上时,就必须用**TouchProbe**功能.

此时**TouchProbe**的作用是色标传感器检测到材上的色标后,将此时电机轴的位置记录下来.该位置记录是不受嵌入式**PC**扫描周期的影响,是微秒级别的.

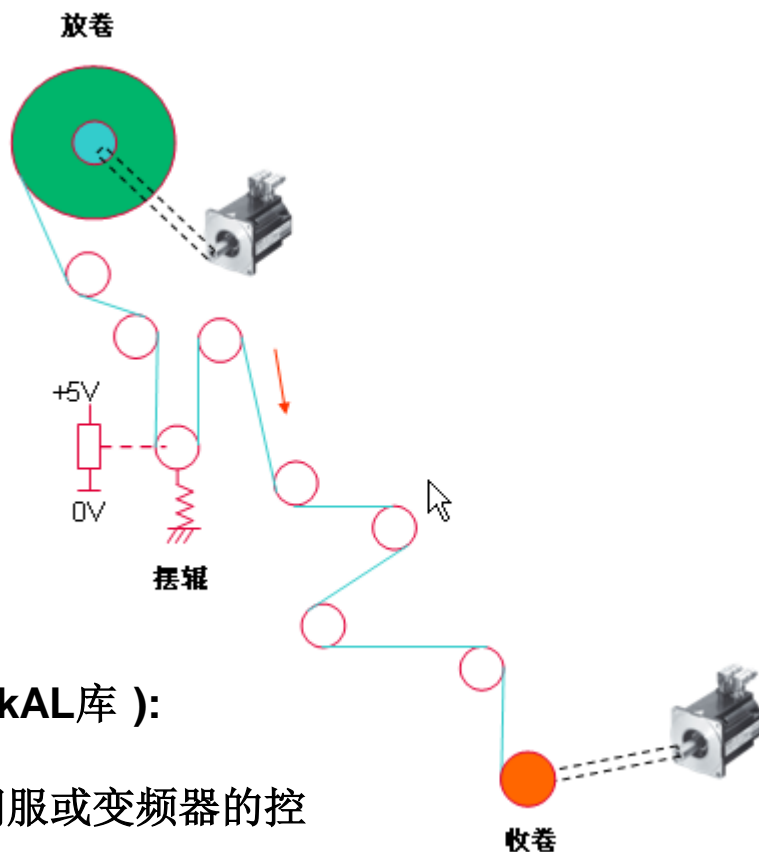
该数据走的是**Ethercat process data**的通道,是**real time**的数据,动态记录的位置非常精确.



将前后两个色标的位置记录下来,相减,就可以得到下次剪切所需要的长度.



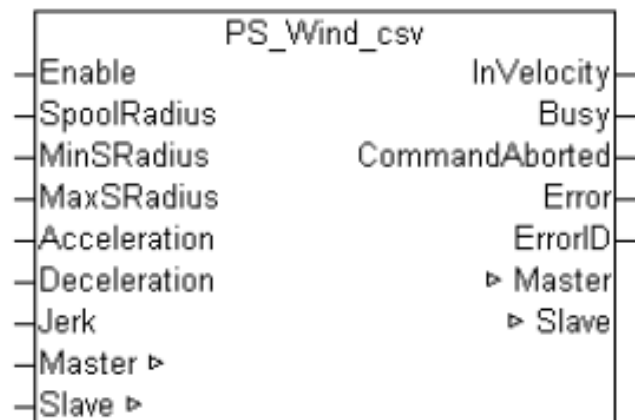
# TwinCAT运动控制: 自动收放卷



收放卷功能(TcPackAL库):  
应用非常广泛。  
该库适用于NC对伺服或变频器的控制。  
在收放卷的过程中,随着卷径的不断变化,根据指令算法,通过修改电机角速度的方法,来达到收放卷材料线速度不变。

TwinCAT PLC Library: TcPackAL

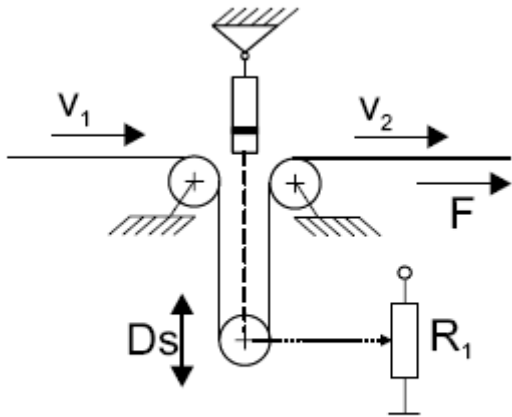
## FUNCTION\_BLOCK PS\_Wind\_csv



计算卷径的方法有

- 1.通过计算伺服或变频器实际走过的距离进行累加,再根据材料的厚度,进行卷径的计算。
- 2.根据外部传感器,进行实际卷径的测算,并反馈给上位。

# TwinCAT运动控制: Dancer



a) Dancer

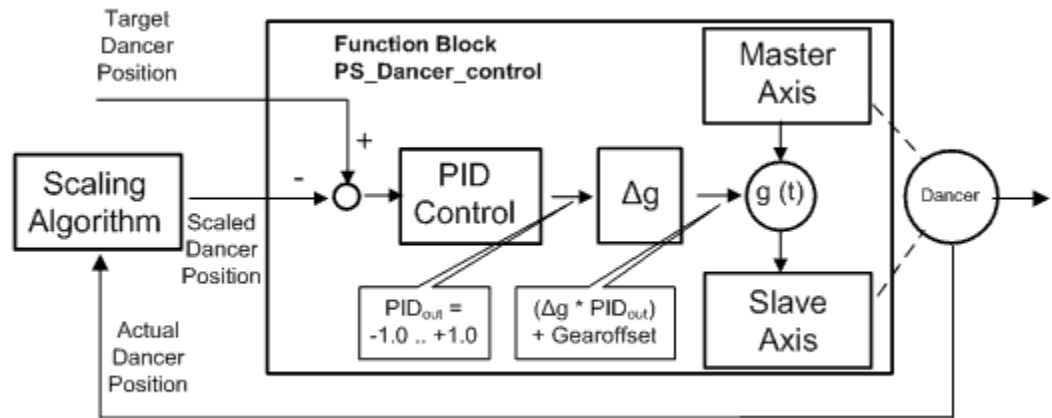
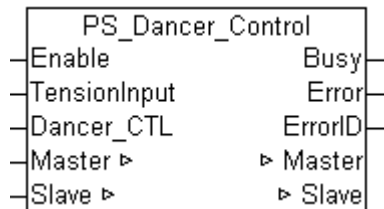


Figure: PS\_Dancer\_Control\_Structure\_Diagram

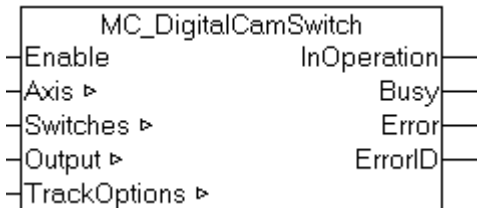


## Dancer功能(TcPackAL库):

是张力控制的一个典型应用。

通过修改主轴电机和从轴电机的速度齿轮比的方法,根据能够反应张力变化的模拟量输入反馈,通过PID调节来修改电子齿轮比,从而达到张力控制的效果。

# TwinCAT运动控制:MC\_DigitalCamSwitch



## CamSwitch功能(XFC库):

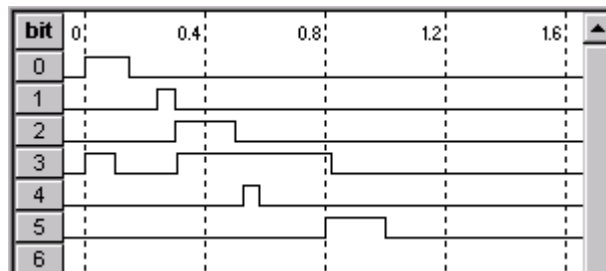
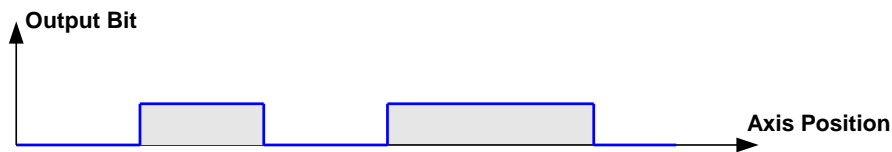
凸轮开关功能.

所谓凸轮开关,就是当伺服轴达到一个初始位置时,数字量输出打开.

就是当伺服轴达到一个终点位置时,数字量输出关闭.

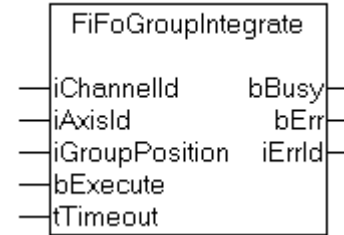
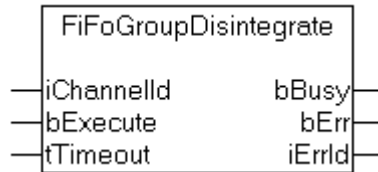
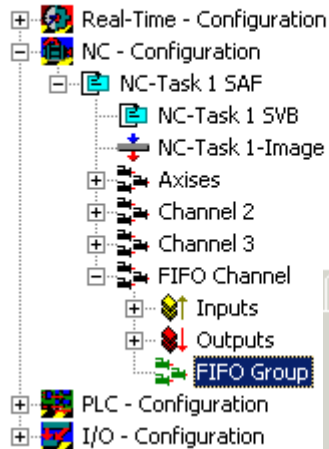
配合XFC使用,可以让系统的数字开关量输出的场合在最精确的伺服轴位置打开,关闭,满足对时间极其苛刻场合的应用.

可以考虑使用该功能来提高包装机械的运行速度.



# TwinCAT运动控制:FIFO

## Parameterisation of the FIFO Group



Parameter	Value
FIFO-Dimension (Anzahl Achsen)	r D 1
FIFO-Länge (Anzahl Einträge)	r D 1000
Fifo-Overridetyp [1: instantan, 2: P-T2]	D 2
P-T2 Zeit für Fifo-Overrideänderung	F 1.0 §
Zeitbasis der FIFO-Einträge	F 0.01 §

**FIFO**的特点:可以将它理解成一个电子凸轮.

将需要走的点存在一个文件里,也就是说一个特殊的**File**.这点和凸轮表的存储方式比较类似.

和凸轮不同之处它可以更加灵活的修改所要走的位置点.例如:只需修改存储文件中的数据就可以改变下一个**PC**扫描周期的位置.

适用范围:一些随时都有可能改变位置目标的应用.一些无规则的曲线.



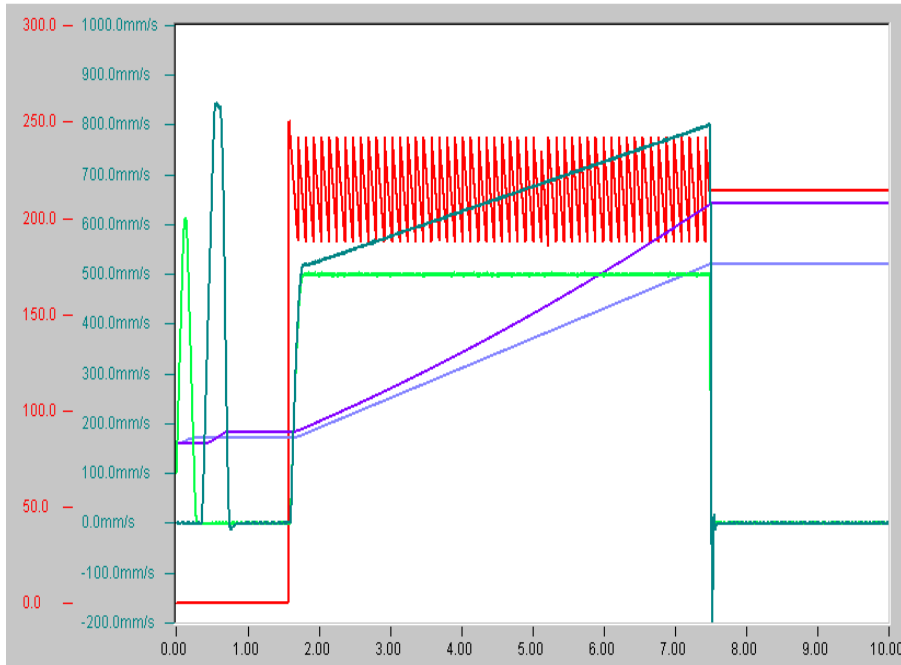
# TwinCAT运动控制:FIFO

下列的两个图表,非常形象的将图表中相邻两个点的变化类型表示了出来.

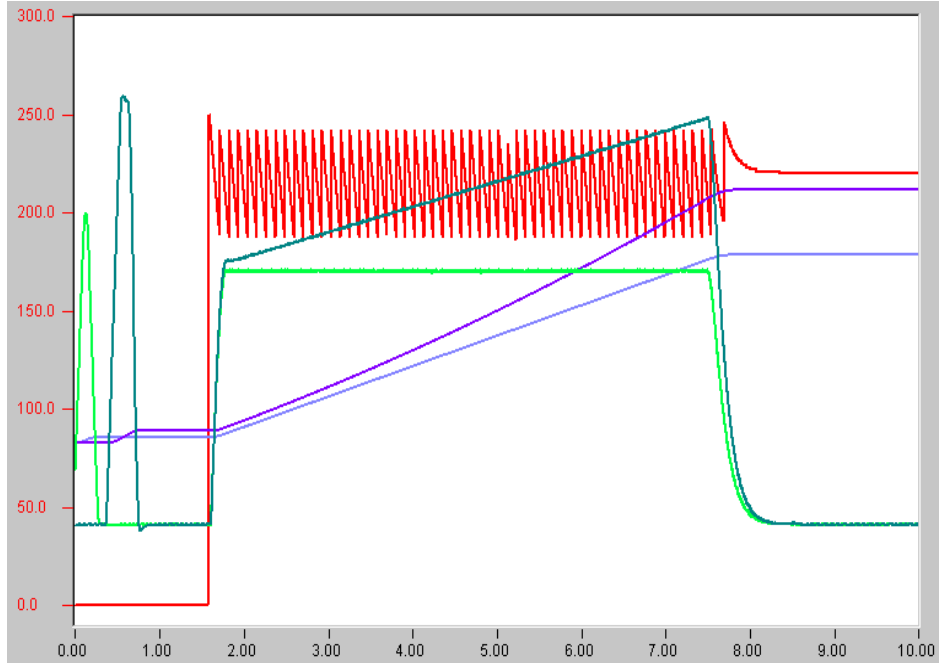
**Instantaneous override:**立即修改, 以最快的速度从一个点切换到其相邻位置点.

**PT-2 Override override:**PT-2的修改类型,该类方式更加柔滑,减少了机械系统的冲击.

## Instantaneous override



## PT-2 Override



# TwinCAT运动控制:TwinCAT DriveCOM OPC

**BECKHOFF** New Automation Technology

**OPC acting as a data channel : Motion Control**

**Engineering**

**Fieldbus**

**Drive**

**Setup**

**Diagnostic**

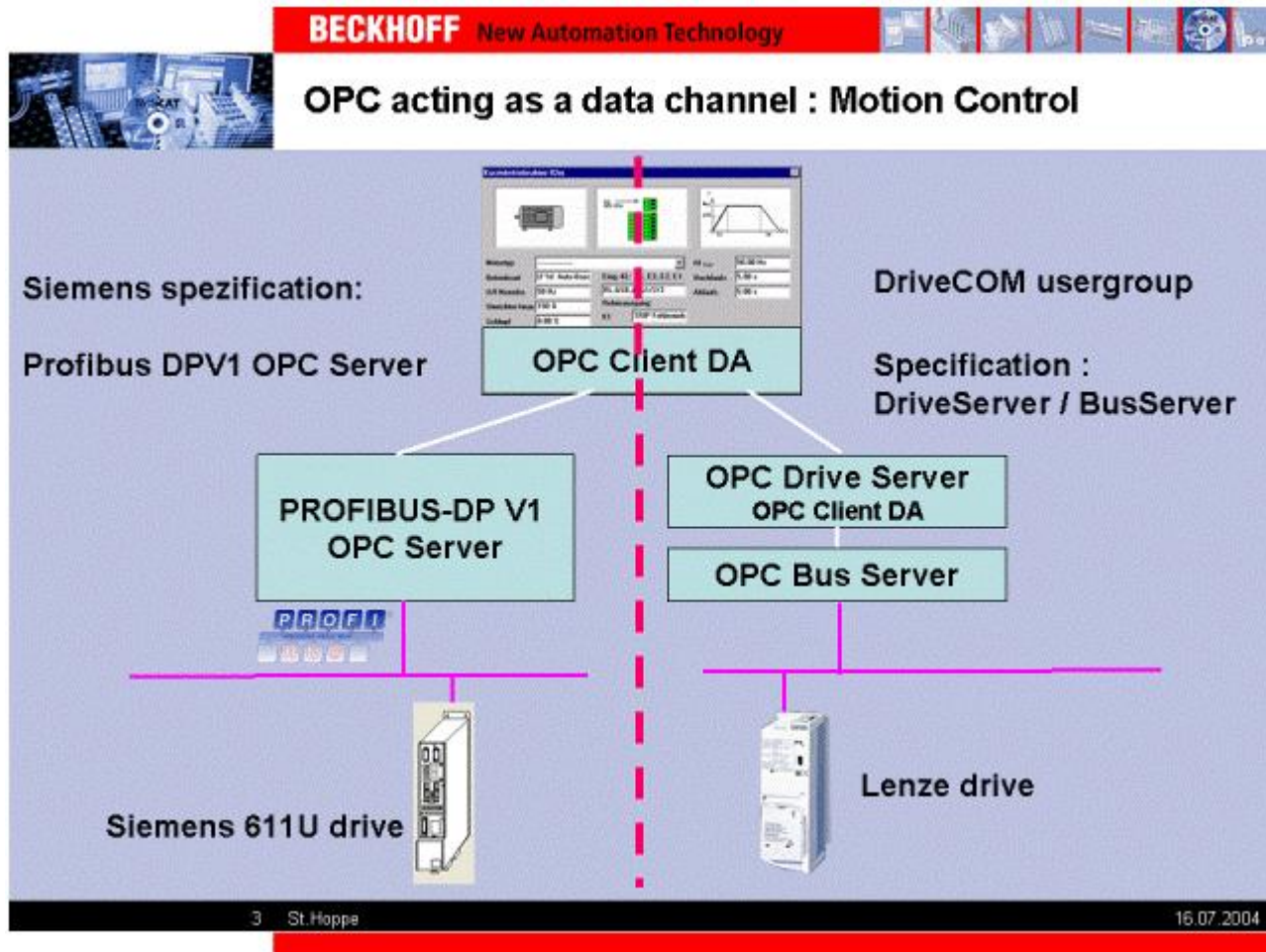
**Wish :**

- standard access
- easy (plug and play)
- fieldbus independent
- access to all parameters and functions
- remote access

Drives may not support serial interfaces !  
→ requires configuration via fieldbus

2 St.Hoppe 16.07.2004

# TwinCAT运动控制: TwinCAT DriveCOM OPC





# TwinCAT运动控制: TwinCAT DriveCOM OPC

**BECKHOFF** New Automation Technology

## OPC acting as a data channel : Motion Control

The screenshot shows the TwinCAT OPC Client interface. On the left, a tree view lists various OPC server configurations. The main area displays a control diagram for a motion control system, including a motor and a controller. Below the diagram, a box labeled 'OPC Client' is connected to a 'PROFIBUS-DP V1 OPC Server'. To the right, a 'Sample namespace' window shows a tree structure for 'BECKHOFF.TwinCATopcServerDA' with nodes for 'dp2://brd0/seg1/dev15' and 'dp2://brd1/seg1/dev9'. The 'Leaf Filter' section lists parameters like 'DS\_MSAC2\_Parameter/SL\_Profile\_Features', 'DS\_MSAC2\_Parameter/SL\_ProfileIdentNum', 'DS\_MSAC2\_Parameter/Timeout', 'DS\_VENDORNAME', and 'Slot0005000D8205xDT'. Below the screenshot, a 'Siemens Spec: Profibus DPV1 OPC Server' is shown with a physical device image.

OPC Client

PROFIBUS-DP V1 OPC Server

Siemens Spec:  
Profibus DPV1 OPC Server

Sample namespace :

DPV1 OPC Server offers a specific profile in his namespace

Browsing  
Branch Filter:  
Leaf Filter: Type: Access:  
BECKHOFF.TwinCATopcServerDA  
dp2://brd0/seg1/dev15  
dp2://brd1/seg1/dev9  
DS\_MSAC2\_Parameter/SL\_Profile\_Features  
DS\_MSAC2\_Parameter/SL\_ProfileIdentNum  
DS\_MSAC2\_Parameter/Timeout  
DS\_VENDORNAME  
Slot0005000D8205xDT  
Browse flat address space on selected branch  
Add Leaves

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# TwinCAT运动控制: TwinCAT DriveCOM OPC

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## OPC acting as a data channel : Motion Control

The diagram illustrates the data flow for motion control. It starts with PLC, NC, and NCI components connected to TwinCAT IO Mapper. This leads to TwinCAT DriveCOM OPC, which then connects to TwinCAT protocol ADS. The ADS protocol is used to interface with Siemens SimoComU. A screenshot of the Siemens SimoComU software interface is shown, displaying drive parameters and a motor diagram. Below this, the text 'Reality : Siemens SimoComU accessing Siemens 611U drives via BECKHOFF TwinCAT' is displayed. At the bottom left, a Siemens SimoDrive 611 U / Posmo drive is shown with the PROFIBUS logo.

TwinCAT DriveCOM OPC

TwinCAT protocol ADS

PLC NC NCI

TwinCAT IO Mapper

Siemens SimoComU

Reality :  
Siemens SimoComU accessing Siemens 611U drives via BECKHOFF TwinCAT

Siemens SimoDrive 611 U / Posmo

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# TwinCAT运动控制: TwinCAT DriveCOM OPC

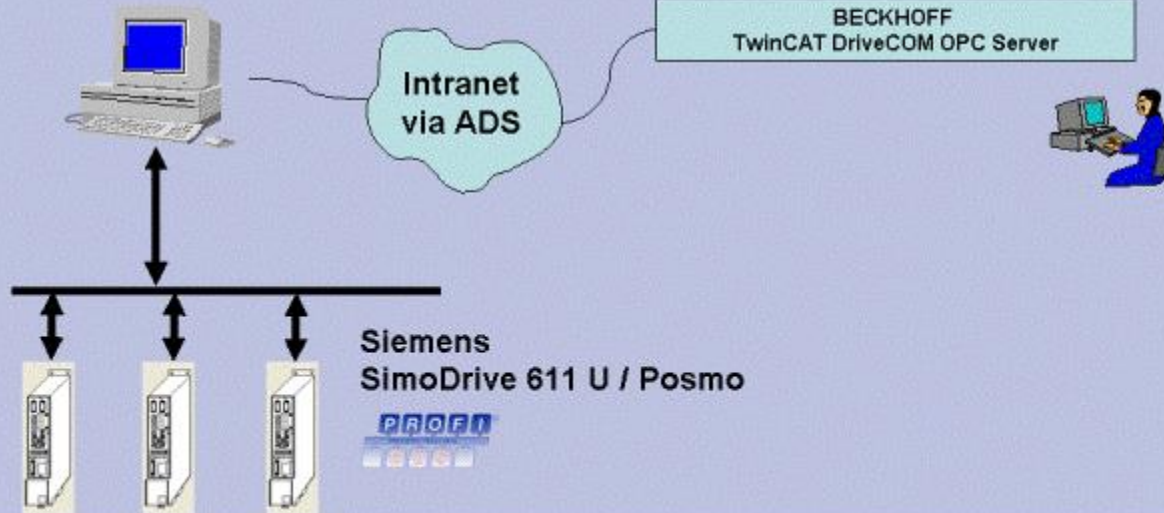
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## OPC acting as a data channel : Motion Control

### Benefit :

Central, network wide access for setup and diagnostic



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TwinCAT运动控制:

# 谢谢大家!

