FAQ COMBIVIS studio 6

KEB_GearAxisControl instructions FAQ No.0015

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Content

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Introduction

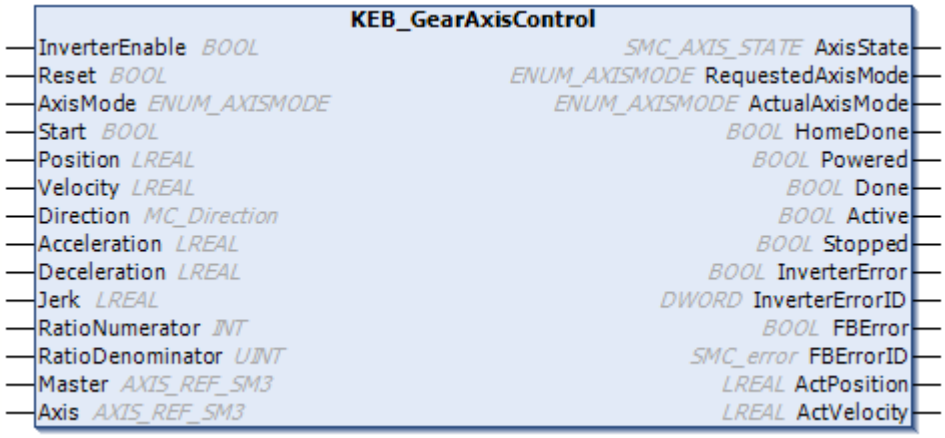
This document gives a general overview of the KEB_GearAxisControl function block. General terms and behaviour will be explained.

General description

The KEB_GearAxisControl function block allows the user to control a SoftMotion Drive in various modes using a single function block:

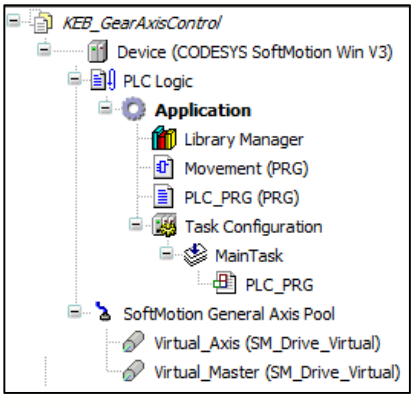
- Velocity
- Absolute Positioning
- Relative Positioning
- Set Position
- Homing
- Gearing

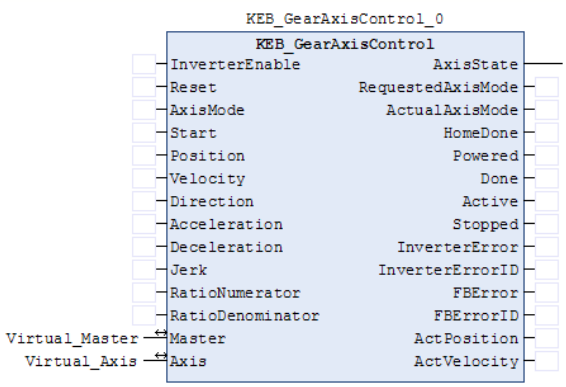
This function block is part of the KEB_SMC_Utility library.
The KEB_GearAxisControl function block is an extension of the KEB_SingleAxisControl block.
It contains all the features of the above-mentioned block plus the Phasing mode.
For further information about these modes please see FAQ Document KEB_SingleAxisControl.



Restrictions

This function block can be used with Pro/Advanced Drive only. In fact, it needs two AXIS_REF_SM3 structure as input variable, **Master** and **Slave** Axis, structure that is automatically created when a SoftMotion Drive is added in the project.





KEB_GearAxisControl

Variables

Input

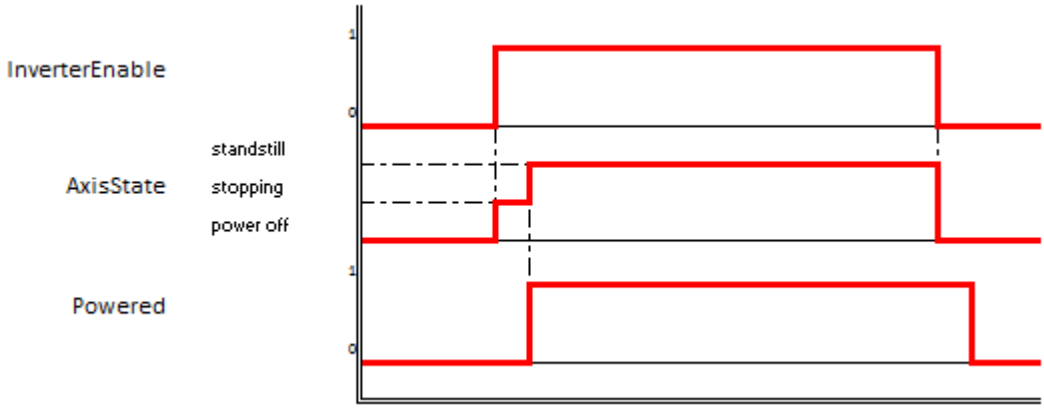
Name	Type	Comment
InverterEnable	BOOL	As long as this variable is TRUE, the drive is switched on.
Reset	BOOL	Reset Drive or FunctionBlock errors
AxisMode	ENUM_AXISMODE	AM_DEFAULT = 0 AM_VELOCITY = 1 AM_POSITIONINGABSOLUTE = 2 AM_POSITIONINGRELATIVE=4 AM_SETPOSITION = 6 AM_HOMING = 7 AM_GEARING = 9
Start	BOOL	Run/Stop Drive in AxisMode Function
Position	LREAL	Target position for the motion (technical unit [units])
Velocity	LREAL	Value of the target velocity (not necessarily to be reached) [units/s]
Direction	MC_Direction	This enumeration provides the desired direction; only relevant for rotating axes (modulo-axis). Supported values depending of AxisMode: -1 = negative 0 = shortest (seen from the current position) 1 = positive 2 = current (current direction) 3 = fastest (direction, which would finish movement as fast as possible)
Acceleration	LREAL	Desired acceleration (increasing energy of the motor) [units/s²]
Deceleration	LREAL	Desired deceleration (decreasing energy of the motor) [units/s²]
Jerk	LREAL	Maximum magnitude of the jerk [units/s³] (ignored for ramptype trapez)
RatioNumerator	INT	Counter of the gear ratio.
RatioDenominator	UINT	Denominator of the gear ratio.
Master	AXIS_REF_SM3	Master axis
Axis	AXIS_REF_SM3	Controlled/Slave axis

Output

Name	Type	Comment
AxisState	SMC_AXIS_STATE	0: power_off 1: errorstop 2: stopping 3: standstill 4: discrete_motion 5: continuous_motion 6: synchronized_motion 7: homing
RequestedAxisMode	ENUM_AXISMODE	Shows requested axis mode
ActualAxisMode	ENUM_AXISMODE	Shows actual axis mode
HomeDone	BOOL	TRUE indicates that if homing is done
Powered	BOOL	As long as this variable is TRUE, the drive is switched on
Done	BOOL	TRUE indicates that the movement is on
Active	BOOL	TRUE indicates that the drive is moving
Stopped	BOOL	TRUE indicates that the drive is not moving
InverterError	BOOL	TRUE indicates drive error
InverterErrorID	DWORD	Use GetInvStateD function to get a STRING errormessage
FBError	BOOL	TRUE indicates FunctionBlock error
FBErrorID	SMC_error	Use SMC_ErrorString function to get a STRING errormessage
ActPosition	LREAL	Actual position [units]
ActVelocity	LREAL	Actual velocity [units/s]

InverterEnable

To switch ON the drive, **InverterEnable** must be set to *TRUE*. Once *TRUE,* **AxisState** goes to *standstill* (after a brief moment in *stopping*), then **Powered** is set to *TRUE*. Now the drive is ready.
Once **Powered** is *TRUE* one can select an operational mode, insert the inputs and start the FB.
At the end of every operation, to switch OFF the drive, **InverterEnable** must be set to *FALSE.*
AxisState goes to *power off*, then **Powered** is set to *FALSE*.

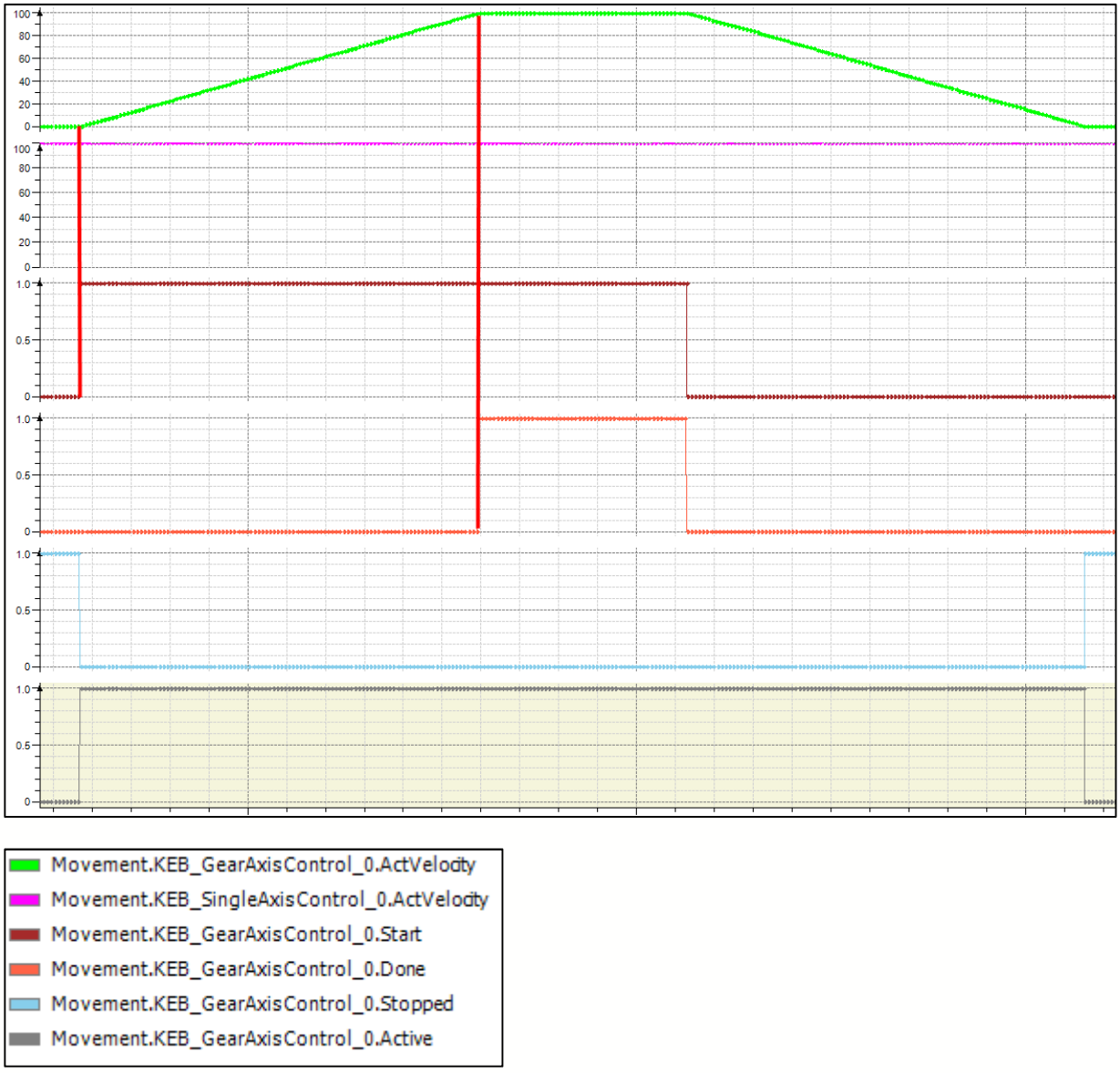


Modes

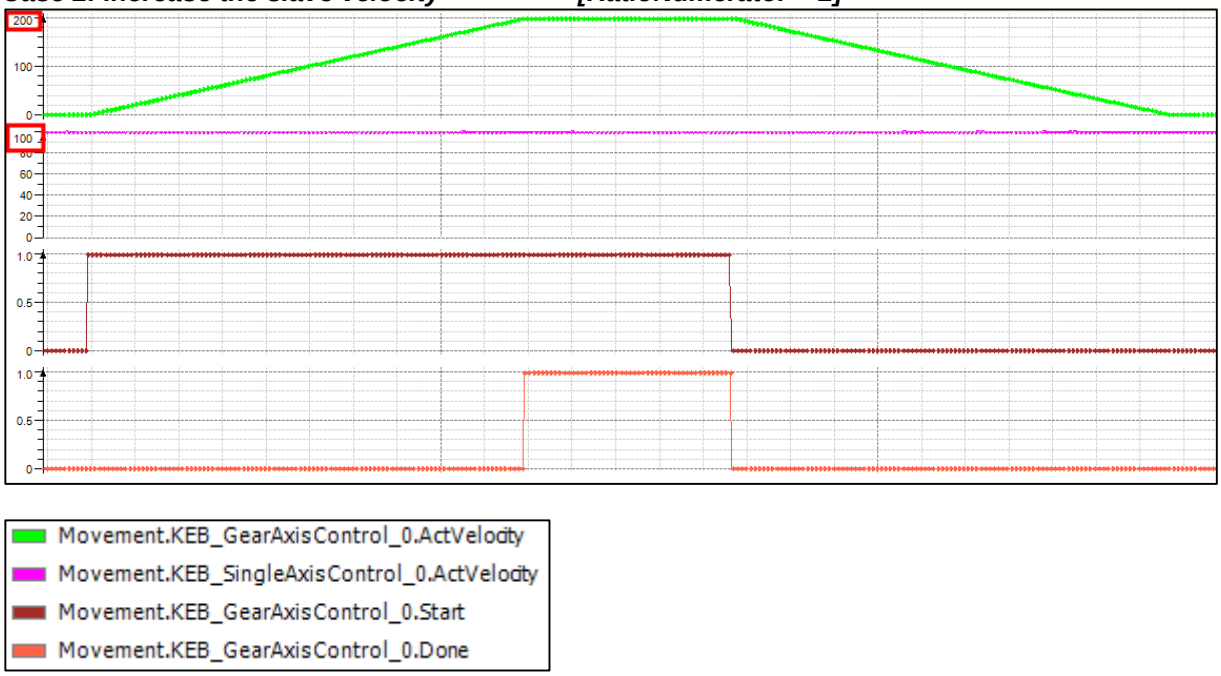
9: Gearing

By setting variable **AxisMode** to 9 the drive will be controlled in Gearing mode. In this mode it is mandatory to set **Acceleration** and **Deceleration** values (although **Velocity** will not affect the gearing behaviour).
Acceleration and **Deceleration** values will affect the behaviour of Slave Axis when it tries to reduce the gap with the Master.
As seen in the following diagrams, bit **Done** goes *TRUE* when **ActPosition** of Slave Axis reaches **ActPosition** of Master Axis. After that, Slave behaviour depends only by the Master.

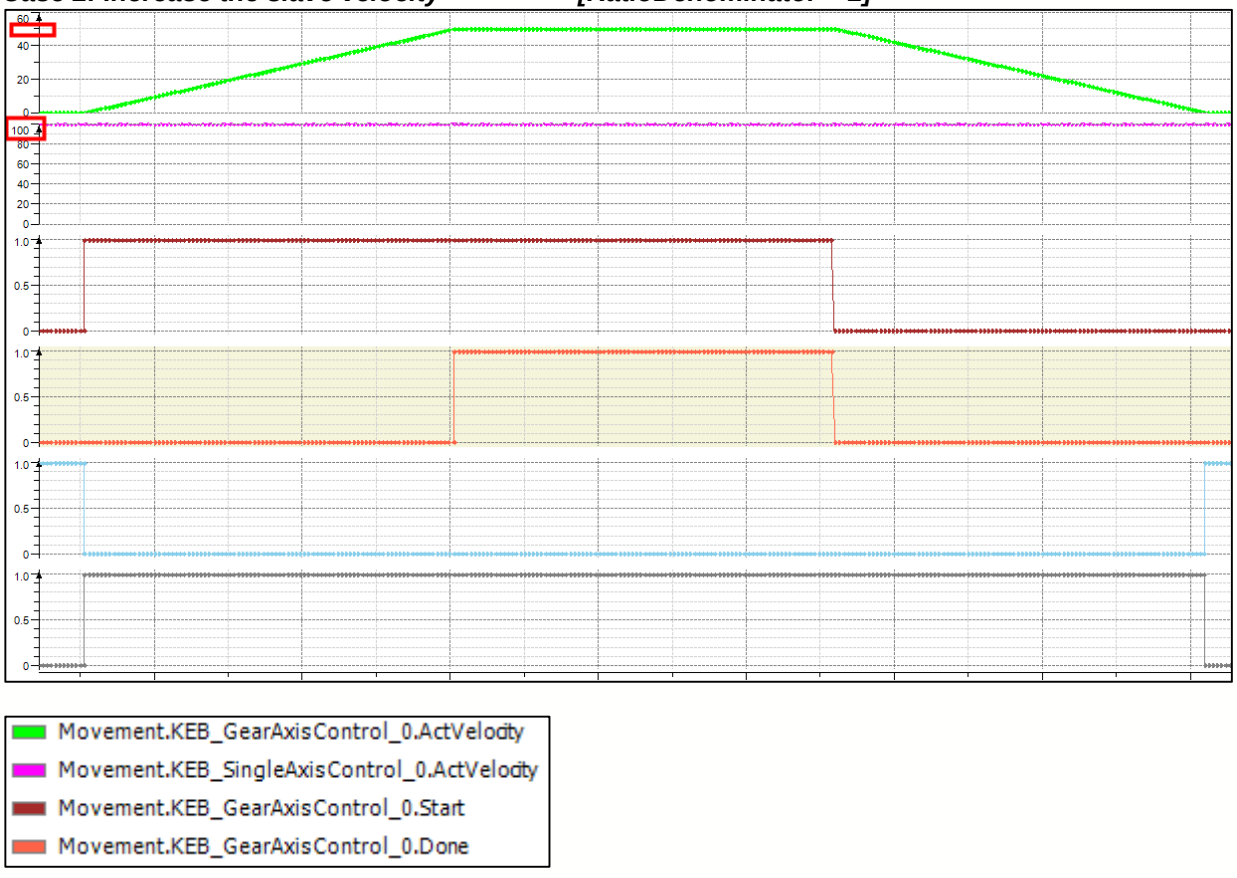
Case 1: Start Master first, then start Slave



Case 2: Increase the slave velocity [RatioNumerator = 2]



Case 2: Increase the slave velocity [RatioDenominator = 2]



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