

- Scaling factor: Conversion from bus unit to technical unit in techn. units per unit received on bus
 - dwRatioTechUnitsDenom, iRatioTechUnitsNum
 - iRatioTechUnitsNum could be negative to change direction of rotation!

$$\text{Scaling factor} = \frac{\text{iRatioTechUnitsNum [IEC/rev]}}{\text{dwRatioTechUnitsDenom [Increments/rev]}}$$

$$\text{IEC} = \text{Scaling factor} * \text{Increments}$$

dwRatioTechUnitsDenom : DWORD $\rightarrow$ 0.....4294967295

iRatioTechUnitsNum : INT $\rightarrow$ -32768.....32767

Scaling $\rightarrow$ dwRatioTechUnitsDenom = *131072*

iRatioTechUnitsNum = *100*

SoftMotion Drive: Basic SoftMotion Drive: Scaling/Mapping SoftMotion property of Schneider Electric Lexium05 CAN drive I/O

scaling

☐ invert direction

16#20000	increments $\leftrightarrow$ motor turns	1
1	motor turns $\leftrightarrow$ gear output turns	1
1	gear output turns $\leftrightarrow$ units in application	100

Example

16# 20000 → 131072

Scaling → $32767 / 131072 \rightarrow \text{Accept}$

Scaling

☒ Invert direction

16#20000	increments <=> motor turns	1
1	motor turns <=> gear output turns	1
1	gear output turns <=> units in application	32767

Example

16# 20000 → 131072

Scaling → $32768 / 131072 \rightarrow 1/4 \rightarrow \text{Accept}$

-scaling

☐ invert direction

16#20000	increments <=> motor turns	1
1	motor turns <=> gear output turns	1
1	gear output turns <=> units in application	32768

-mapping

Scaling → 32769/ 131072 → Not Accept

32769 > 32767

☒ Invert direction

16#20000  increments <=> motor turns 1

1  The defined ratio cannot be expressed by a value of INT/DINT 1

1 gear output turns <=> units in application 32769

Mapping

☒ Automatic mapping

Inputs:

Cyclic object	Object number	Address	Type
status word (in.wStatusWord)	16#6041: 16#00	'%IW6'	'UINT'
actual position (diActPosition)	16#6064: 16#00	'%ID4'	'DINT'
actual velocity (diActVelocity)	16#606C: 16#00	'%ID5'	'DINT'
actual torque (wActTorque)	16#6077: 16#00	'%IW12'	'INT'
Modes of operation display (OP)	16#6061: 16#00	'%IB26'	'SINT'

Outputs:

Cyclic object	Object number	Address	Type
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Messages - Totally 1 error(s), 9 warning(s), 1 message(s)

Build  1 error(s)  9 warning(s)  1 message(s) 

Description	Project	Object
----- Build started: Application: MyController.Application -----		
typify code ...		
 The configured bus cycle time (1 ms) should work. The estimated processing IO time is 0.194 ms.	Flying_shear	TM5_Manager [MyController: TM5]
 C0032: Cannot convert type 'DINT' to type 'INT'	Flying_shear	SM_Drive_CAN_Schneider_Lexium_32_A [MyController: CAN1]

But

Scaling → $66491488 / 2097152 \rightarrow 2584 * (25732 / 811) \rightarrow$ Not accept

Why ?

Scaling

☐ Invert direction

16#200000  increments <=> motor turns 1

1 motor turns <=> gear output turns 1

1 gear output turns <=> units in application 66491488

Mapping

☒ Automatic mapping

Inputs:

Cyclic object	Object number	Address	Type
status word (in.wStatusWord)	16#6041:16#00	'%IW6'	'UINT'
actual position (diActPosition)	16#6064:16#00	'%ID4'	'DINT'
actual velocity (diActVelocity)	16#606C:16#00	'%ID5'	'DINT'
actual torque (wActTorque)	16#6077:16#00	'%IW12'	'INT'
Modes of operation display (OP)	16#6061:16#00	'%IB26'	'SINT'

Outputs:

Cyclic object	Object number	Address	Type
ControlWord (out.wControlWord)	16#6040:16#00	'%QW2'	'UINT'

Messages - Totally 1 error(s), 9 warning(s), 1 message(s)

Build 1 error(s) 9 warning(s) 1 message(s)

Description	Project	Object
----- Build started: Application: MyController.Application -----		
typify code ...		
The configured bus cycle time (1 ms) should work. The estimated processing IO time is 0.194...	Flying_shear	TM5_Manager [MyController: TM5]
C0032: Cannot convert type 'DINT' to type 'INT'	Flying_shear	SM_Drive_CAN_Schneider_Lexium_32_A [MyController: CAN1: CANmotion: Lexium]

And

Scaling → 258400 / 2097152 → 100 / 811 → Not accept

If Scaling → 25732 / 811 → 25732 / 16# 32B → Accept

? ? ?

Scaling

☐ Invert direction

16#32B increments <=> motor turns 1

1 motor turns <=> gear output turns 1

1 gear output turns <=> units in application 25732

Mapping

☒ Automatic mapping

Inputs:

Cyclic object	Object number	Address	Type
status word (in.wStatusWord)	16#6041: 16#00	'%IW6'	'UINT'
actual position (diActPosition)	16#6064: 16#00	'%ID4'	'DINT'
actual velocity (diActVelocity)	16#606C: 16#00	'%ID5'	'DINT'
actual torque (wActTorque)	16#6077: 16#00	'%IW12'	'INT'
Modes of operation display (OP)	16#6061: 16#00	'%IB26'	'SINT'

Outputs:

Cyclic object	Object number	Address	Type
ControlWord (out.wControlWord)	16#6040: 16#00	'%QW2'	'UINT'

essages - Totally 0 error(s), 9 warning(s), 1 message(s)