SEW-EtherCAT-Drives on a Beckhoff-TwinCAT-PLC

Getting Started Guide

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Preface

This document is intended to support sales activities by dealing with current and general questions relating to technology and the project planning of products.

Please do not hesitate to contact the author if you have any questions or suggestions.

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1 Introduction

With the Industrial Ethernet Option DFE24B (EtherCAT) MOVIDRIVE® and MOVITRAC® B can be connected to PLC’s and motion controller via the extreme fast and efficient communication system EtherCAT.

The basic functionality of the DFE24B in MOVIDRIVE® and MOVITRAC® B is described in the Manual to the DFE24B.

The following documentation describes the first steps to start up a MOVIDRIVE® or a MOVITRAC® B with an EtherCAT Interface DFE24B on one of the most used EtherCAT master devices, a Beckhoff TwinCAT PLC.
This document shows the usage of EtherCAT as a simple field bus interface similar to Profibus or DeviceNet and how to proceed when running a MOVIDRIVE® in Motion Control.
It further explains the required settings to route through diagnose data from MOVITOOLS® MotionStudio via the TwinCAT-System and EtherCAT down to the SEW-Drives.
2 Basic Requirements and settings

2.1 TwinCAT

- Check that TwinCAT Version v2.10.0 (Build 1307) or newer is installed
- Copy device description file “SEW_DFE24B.xml” to \TwinCAT\IO\Ethercat\"
- Add an EtherCAT-Master to the System-Configuration

![Image of TwinCAT System Manager](image1)

- If realtime functionality is planned please check if an EtherCAT direct driver is installed for Ethernet interface.

![Image of TwinCAT System Manager](image2)

At the moment, Beckhoff has EtherCAT direct driver only for Ethernet interfaces with Intel chipset. If no EtherCAT direct driver is installed please follow the instructions for a driver update for the Ethernet interface in the Windows System Manager.
2.2 MOVITOOLS® MotionStudio

- Version 5.40 or newer

2.3 Firmware of SEW-Drives

- MOVITRAC® B: No special firmware version required
- MOVIDRIVE® MDX61B: firmware .18 or newer
3 Running MOVITRAC® B with DFE24B via EtherCAT

3.1 Mounting and Cabling

With MOVITRAC® B the DFE24B EtherCAT Interface works as a gateway from EtherCAT to the SEW-SBus and allows to connect up to 8 MOVITRAC® to the EtherCAT network via one interface. The following wiring diagrams apply when either the DFE24B is mounted into a MOVITRAC® B or the DFE24B is mounted into the Universal Option Housing (UOH) as a stand-alone gateway.

The EtherCAT cabling allows daisy chaining, the upper RJ45 (X30) leads to the PLC or a PLC nearer device.

The terminals are assigned as follows:

**X46**  **X26**

X46:1  X26:1  SC11 SBus +, CAN high
X46:2  X26:2  SC12 SBus −, CAN low
X46:3  X26:3  GND, CAN GND
X46:7  X26:7  DC 24 V

**X12**

X12:8  +24 V Input Supply
X12:9  GND

The SBus which uses the physical layer of CAN requires termination resistors (120 Ohm between CAN high and CAN low) at both ends of the bus line. Inside the EtherCAT SBus gateways there is always one termination resistor connected, so the gateway must be connected to one end of the SBus. On the other end of the SBus a termination resistor could be activated e.g. by switching on the DIP switch S1 on the communication option FSC11B.
3.2 Parameter settings in MOVITRAC® B

After commissioning the drive to fit to motor and application (see System Manual of MOVITRAC®) Parameter P100 and P101 are set to “SBus1” to allow control via the EtherCAT-Interface.

Please assign via Parameter P881 unique SBus addresses (≠0) to all drives connected to the SBus of the EtherCAT-Interface und make sure that the SBus baud rate on all drives (P884) is equal to the baud rate set in the EtherCAT-Interface via Parameter P816 (default baud rate = 500 kBaud).

Parameter P870 to P875 define the content of the 3 data words (16 bit) to the drive (PO1..3) and from the drive to the PLC (PI1..3). Please make sure that Parameter P876 is set to “ON”!

After setting the SBus addresses and the baud rate of all drives connected to the SBus and all drives are powered on (e.g. connected to the mains or to 24 V aux power supply) switch on the DIP switch AS (Auto Setup) on the DFE24B from OFF to ON to perform a bus-scan and to activate and monitor the communication to the drives connected via SBus.

When switching on the DIP switch AS the LED H1 will flash several times to remain off when the scan is completed. When the LED H1 is on, a SysFault is indicated meaning no drive found on the SBus or a drive found during scan is not communicating any longer. When a cyclic communication is active to all drives found during the scan phase the LED H1 is off again.
3.3 Integration in TwinCAT

To add a MOVITRAC® B to the configuration use "Append Box":

or "Scan Sub Devices" to add the drives connected to the EtherCAT to the configuration:

When running the DFE24B as an EtherCAT Gateway PD01 has a size of 48 data bytes. This 24 words process data (PI and PO) are assigned to the drives connected via SBus as follows:
PD1-3 to drive 1 (the drive with the smallest SBus address),
PD4-6 to drive 2 (the drive with the next higher SBus address),
PD7-9 to drive 3, etc.
3.4 Run MOVITRAC® B and check communication

When writing the output data words to the drives (in this case to drive 1):

![Parameter tree of MOVITOOLS® MotionStudio](image)

the values can be monitored e.g. in the parameter tree of MOVITOOLS® MotionStudio (09. Bus diagnostics):

![Set Value Dialog](image)

For running the drive connect the digital input DI01 to 24 V (ref. Manual MOVITRAC®) and write

6   to PO1 (run command) and
5000 to PO2 (n = 1000 rpm).

For further information describing the transferred process data, to Controlword and Statusword please refer SEW field-bus unit-profile.
4 Running MOVIDRIVE® B with DFE24B via EtherCAT (Fieldbus-Mode)

4.1 Mounting and Cabling

Please refer System Manual of MOVIDRIVE® for the mounting of a fieldbus option into a MOVIDRIVE®. The EtherCAT cabling allows daisy chaining, the upper RJ45 (X30) leads to the PLC or a PLC nearer device.

4.2 Parameter settings in MOVIDRIVE® B

After commissioning the drive to fit to motor, encoder and application (see System Manual of MOVIDRIVE®) Parameter P100 and P101 are set to “FIELDBUS” to allow control via EtherCAT. Parameter P870 to P875 define the content of the data words 1,2 and 3 (16 bit) to the drive (P01..3) and from the drive to the PLC (P11..3). Please make sure that Parameter P876 is set to “Yes”!
4.3 Integration in TwinCAT

To add a MOVIDRIVE® to the configuration use “Append Box”:

or “Scan Sub Devices” to add the drives connected to the EtherCAT to the configuration, for this operation mode you needn’t add the found drives to the NC configuration:

When running EtherCAT as a field bus to the drives, 10 process data words in each direction are sufficient, Input PDO2 and Output PDO2 can be switched off by unmarking 0x1A02 and 0x1602.
4.4 Run MOVIDRIVE® B and check communication

When writing the output data words to the drive:

- For running the drive connect the digital input DI00 to 24 V (ref. Manual MOVIDRIVE®) and write
  - 6 to PO1 (run command) and
  - 5000 to PO2 (n = 1000 rpm).

For further information to the transferred process data, to Controlword and Statusword please refer SEW field-bus unit-profile.
5 Running MOVIDRIVE® B in Motion Control (Velocity-Mode)

5.1 Mounting and Cabling

Please refer System Manual of MOVIDRIVE® for the mounting of a field bus option into a MOVIDRIVE®.

5.2 Parameter settings in MOVIDRIVE® B
Parameter 888 must fit to the synchronization cycle in TwinCAT.

Parameter P730 “Brake function” should be switched “off” if no mechanical brake is applied. The digital input DI00 is to be wired for “Controller Inhibit.”
5.3 Integration in TwinCAT

To add the MOVIDRIVE®s to the configuration e.g. “Scan Sub Devices” and add the found drives to the NC configuration:
5.3.1 Configure the NC-Axis for a rotary system

1st set the cycle time of the NC-Task to the same value as set for the synchronization time (Parameter P888) of the connected MOVIDRIVE® in this case to 1 ms:

2nd Define Axis Type and physical units:
3rd step is to enter the maximum velocity and acceleration time.
The Maximum Velocity (Vmax) in °/s is calculated from
\[ V_{\text{max}} = \frac{\text{MaximumMotorSpeed (rpm)} \times (360°/\text{rev})}{60 \text{ sec/min}} \]
→ \[ V_{\text{max}} = (\text{Parameter P302}) \times 6 \]

When defining Acceleration & Deceleration TwinCAT allows to enter a time that easily can be set to a value fitting to the Acceleration Times set in MOVIDRIVE® during commissioning.
Than the settings for the Encoder (input of the position feedback) is to be defined:

The Scaling Factor is calculated by $360^\circ/ (4096 \text{ inc/rev}) = 0.087890625^\circ/\text{INC}$.

The encoder mask is to be set to 0xFFFFFFFF (32-bit resolution).
Than the settings for the Drive are to be made:

To scale the output value to the drive back to the scaling in rpm used by the drives, the Reference Velocity is scaled as described above (MaximumMotorSpeed x 6).

The value for "at Output Ratio [0.0…1.0]" depends on the selected NC-Drive. In this example:

"at Output Ratio [0.0…1.0]" = \( \text{MaximumMotorSpeed (rpm)} \times \frac{5}{2^{16}} \)

which is suitable for "Drive (universal)".

Attention, when using another drive type for the NC-Axis please make sure that the output for speed is a signed 16-bit value!
5.3.2 Configure the NC-Axis for a linear system

The configuration of the linear system is similar to the configuration of the rotary system mentioned above, only physical units and conversion factors differ:

![Image of System Manager software interface]

In this case the Maximum Velocity ($V_{\text{max}}$) in mm/s can be calculated as follows:

\[
(V_{\text{max}} \text{MotorSpeed (rpm)} \times 2.5 \text{ (mm/rev)}) / (60 \text{ s/min}) = 41.6666666666667 \text{ mm/s}
\]

With MaxMotorSpeed = 2000 rpm, gradient of the jack screw = 2.5 mm/rev and gear ratio $i = 2$
The Scaling Factor of the Encoder of the NC-Axis here is calculated by
\[
\frac{2.5 \text{ (mm/rev)}}{((4096 \text{ inc/rev}) \times i)} = 0.0003051757813 \text{ mm/INC} \quad \text{with gradient of the jackscrew} = 2.5 \text{ mm/rev and gear ratio } i = 2.
\]
The encoder mask is to be set to 0xFFFFFFFF (32-bit resolution).

Than the settings for the drive of the NC-Axis are to be made:
To scale the output value to the drive back to the scaling in rpm used by the drives, the Reference Velocity is scaled as described below:
\[
\frac{\text{MaximumMotorSpeed} \text{ (rpm)} \times 2.5 \text{ (mm/rev)}}{((60 \text{ s/min}) \times i)} = 41.6666666666667 \text{ mm/s} \quad \text{with MaxMotorSpeed} = 2000 \text{ rpm, gradient of the jackscrew} = 2.5 \text{ mm/rev and gear ratio } i = 2.
\]
The value for " at Output Ratio [0.0…1.0]" depends on the selected NC-Drive. In this example:
" at Output Ratio [0.0…1.0]" = MaximumMotorSpeed (rpm) \times \frac{5}{2^i} = 0.152587890625 is suitable for "Drive (universal)"

Attention, when using another drive type for the NC-Axis please make sure that the output for speed is a signed 16-bit value!
5.3.3 Configure the Communication to the drive

First load device description file. The Speed-Reference to the drive is set via H499:
The Position-Feedback from the drive is read in via H511.

Then with a right mouse-click on ActPos_Mot (H511) gets linked to Data1 of the Encoder input and SetPosBus (H499) gets linked to Data1 of the Drive output of the NC Axis.
5.3.4 Enable Distributed Clock for synchronization

To enable the synchronization via EtherCAT the "Distributed Clock for synchronization" has to be set.

The timeout-time in the MOVIDRIVE® for the field bus monitoring (Parameter P819) is set from the EtherCAT master, please check the following entries for all monitored axis by clicking on “Advanced Settings”.

The Multiplier of 25000 defines the time base and is a must! The timeout time is set via SM Watchdog to 100 ms. If a slower or a faster watchdog is needed it’s possible to change the parameter “SM Watchdog”. Please check that the value for the watchdog time is greater than the one for the cycle time.
Select the Sync Manager (FMMU/SM) for the output data (0x1000) and check via a click on the Edit button, that the Watchdog trigger is activated.

The trigger must not be activated for the other Sync Manager.

The timeout reaction can be defined by setting Parameter P831 with MOVITOOLS® MotionStudio.
5.4 Run MOVIDRIVE® B and check communication

To run the drive in velocity mode via the 10 standard PI and PO data words only the Controlword in PO1 is to be set to the value “6”:

The status on the drive than is indicating “A” meaning “TECHNOLOG.OPTION”.
For further information to Controlword and Statusword please refer SEW field-bus unit-profile.

After setting KV-Faktor for the Controller, Target-Position and Target Velocity (1000 rpm in this example) the Axis is to be enabled. Than the drive can be started and stopped via the buttons or function keys.
Settings for Optimization:
Before optimizing the NC-Axis in TwinCAT the drive must be optimized itself! Therefore run “DriveStartup → Optimize speed controller” in MOVITOOLS® Shell and read the MOVIDRIVE® Manual.

Depending on the defined acceleration in the NC-Axis and the given inertia of the mechanical system the Position Lag Monitoring must be set to suitable values and the Dead Time Compensation should be set to something like 4 ms.

If the drive is accelerating and decelerating properly the Acceleration Times can be optimized and via “Functions” the Actual Position of the NC-Axis can be set to a defined value.

Attention, Position Lag Monitoring and the monitoring of the drives status which is read in via P11 is essential to make sure that the drive is following the NC-Axis and doesn't have a status like “no enable” because of e.g. hardware-limit-switches, controller inhibit via terminals etc. !

In the case that the drive is not following the NC-Axis the NC-Axis must adopt the drives status.
5.5 Reference travel and limit switches

To reference the axis please start the reference travel in the MOVIDRIVE® via the IPOS-Controlword. Please check that the NC-Axis in TwinCAT is disabled. The reference travel type can be set in the parameter tree (parameter 903). In this example the reference travel type is set to “Cam CCW”. The reference cam is set to DI01. For endless movements it’s advisable to define limit switches (DI02 und DI03).

To start the reference travel via the IPOS control word it’s necessary to configure it in the configurable PO.
The IPOS Statusword can be configured to the configurable PIs.

To start the reference travel please deactivate the NC-axis.
Enable the MOVIDRIVE® and start the reference travel by setting bit 18 of the IPOS Controlword.

By enabling the NC-Axis after the reference travel, the NC-Axis will transfer the referenced position of the MOVIDRIVE®.
6  Running MOVIDRIVE® B in Motion Control (Position-Mode)

6.1  Mounting and Cabling

Please refer System Manual of MOVIDRIVE® for the mounting of a fieldbus option into a MOVIDRIVE®.

6.2  Parameter settings in MOVIDRIVE® B

Similar to chapter 5.2 (Running MOVIDRIVE® B in Motion Control (Velocity-Mode)) but change PD description and Ramp type as follows:

The Ramp Type (P916) POS. INTERPOL. 16 BIT defines that the target position is defined as 16 bit per motor revolution and that linear interpolation (by 1 ms steps) smoothes the steps in the target position.

When using a synchronization period of 1 ms to 5 ms 16 bit per motor revolution is a suitable resolution. With slower synchronization periods also 12 bit per motor revolution would be OK.

To be able to use the TwinCAT NC-Axis in Position-Mode or TwinCAT CNC functionality, Statusword and Controlword of MOVIDRIVE® and CNC or NC-Axis must be linked together.

Because of ongoing changes in the NC-Statemachine in TwinCAT, as by now there is no fixed link between the state machines, but the possibility of using an IPOS Program or some lines of PLC-code.

MOVIDRIVE®s interface is the IPOS-Controlword (H484), the IPOS-Statusword (H473) or the Fieldbus-Control- & Statuswords as described in the manual “fieldbus unit profile”

Depending on the planned functionality and the knowledge about the state machine of NC or CNC IPOS or PLC can be programmed accordingly.
6.3 Integration in TwinCAT

When the MOVIDRIVE®s are added to the configuration (see chapter 5.3 “Scan Sub Devices” and add the found drives to the NC configuration) and the cycle time of the NC-Task is set, now the configuration of the NC-Axis differs from the settings used for the simple Velocity-Mode:

2nd Define Axis Type and physical units:

3rd step is to enter the maximum velocity and acceleration time. The Maximum Velocity in °/s can be calculated from MaximumMotor-Speed (rpm) x (360°/rev) / (60 sec/min) $V_{\text{max}} = (\text{Parameter P302}) \times 6$

Than the settings for the Encoder (Input of the position feedback) is automatically set to:
The Scaling Factor now is calculated by $360^\circ / (2^{16} \text{ inc/rev}) = 0.0054931640625^\circ/\text{INC}$.

$2^{16} \text{ inc/rev}$ comes from the setting in MOVIDRIVE® Parameter P916: “POS. INTERPOL. 16BIT”

Then the settings for the drive are to be made. The NC-Drive type is automatically set:

To scale the output value to the drive back to the scaling in rpm used by the drives, the Reference Velocity is scaled as described above ($\text{MaximumMotorSpeed} \times 6$).

The values for “– at Output Ratio [0.0…1.0]” and “Output Scaling Factor” needn’t be changed from “1”.
Configure the Communication to the drive:

First load device description file.

The target-position to the drive is set via H499.

PDO1 (OutputData1: 0x1600) is not needed in this mode and could be switched off, the Controlword to the drive is transferred via a 2nd double-word in the Configurable PDO (OutputData2).
The Position-Feedback from the drive read in via H508 is scaled in $2^{16}$ inc/rev.

PDO1 (InputData1: 0x1A00) is not needed in this mode and could be switched off, the Statusword of the drive is transferred via a 2nd double-word in the Configurable PDO (InputData2).

PDO1 (InputData1: 0x1A00) is not needed in this mode and could be switched off, the Statusword of the drive is transferred via a 2nd double-word in the Configurable PDO (InputData2).
6.3.1 Linking the state machines via IPOS

Index 11018dez in this example links to the IPOS-Variable H018 of MOVIDRIVE®, where the Controlword is taken from by IPOS.

Index 11019dez links to the IPOS-Variable H019 of MOVIDRIVE®, where in this example the Statusword is written to by IPOS.
As by now SEW can't provide a 'ready to use' IPOS program! SEW supports an example PLC-program. If you want to use this, please have a look on chapter 6.3.2.

Then with right mouse-clicks the data from and to the drive gets linked to the data of the NC-Axis:

To enable the required synchronization via EtherCAT and to monitor a communication timeout the necessary settings are explained in 5.3.
6.3.2 Linking the state machines via PLC-code

The more flexible way of linking the state machines is reading the IPOS Statusword (H473) and writing IPOS Controlword (H484), which enables to use all firmware functions of MOVIDRIVE®.

With knowledge about the required Control- and Statusbits of the planned NC or CNC functionality a short PLC-Program can be written which achieves the linking.

Example Project

First add an instance of FCB “PositionMode_MDX” to your PLC code. To use the FCB you have to add the EtherCAT.lib to your library. This FCB can only be used with TwinCAT v2.10 build 1313 or newer.

Description of the FCB

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Bit Length</th>
<th>Sub Index</th>
<th>Sub Index</th>
<th>Bit Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>PositionMode_MDX</td>
<td>XML</td>
<td>32</td>
<td>0</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>EnableMOVIDRIVE</td>
<td>XML</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Reference</td>
<td>XML</td>
<td>32</td>
<td>0</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>Error</td>
<td>XML</td>
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<td>0</td>
<td>0</td>
<td>1</td>
</tr>
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<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>SlaveAddr</td>
<td>XML</td>
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<td>0</td>
<td>0</td>
<td>32</td>
</tr>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>AxisIn</td>
<td>XML</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

FBD Diagram:
Inputs:

EnableMOVIDRIVE® [BOOL]: Enable for MOVIDRIVE®
Reference [BOOL]: a rising edge on this input starts the reference travel down in the drive. You can choose the reference travel type in the parametertree in MOVITOOLS® MotionStudio with parameter P903. To start the reference travel the linked NC-axis of your system must be disabled!
AMSNetID: AMSNetID of the EtherCAT master.
SlaveAddr: EtherCAT Slave address of the MOVIDRIVE® for example: 1001
StatuswordNC[BYTE]: feedback of the DS402 state machine.
StatuswordMDX: This input gets linked with the IPOS Status word.
AxisIn: NCTOPLC_AXLESTRUCT

Outputs:
Error[BOOL]: = true if FCB as an error
ErrorID: Error ID of the FCB-error
ControlWordMDX [WORD]: This Output gets linked to IPOS Control word.
ControlWordNC[BYTE]: Control word of the DS402 state machine in the NC-Axis.

Then define the interface to the system configuration.
For example:

Connect the variables to the interface of the FCB. The AMSNetID is to find in the system manager of your TwinCAT system.
StartReferenceTravel is an example for a variable in your PLC code to start the reference travel.

Append the PLC program to the PLC configuration and link the variables.
After mapping the variables please click 1st on generate mappings, 2nd check configuration and 3rd activate configuration.

Than download your PLC code and start the PLC program.

To enable the required synchronization via EtherCAT and to monitor a communication timeout the necessary settings are explained in 5.3.
6.4 Run MOVIDRIVE® B and check communication

If the drive is booted and the TwinCAT system is active the status on the drive is indicating "A" meaning "TECHNOLOG.OPTION".

After setting Kv-Faktor for the Controller, Target-Position and Target Velocity (1000 rpm in this example) the Axis is to be enabled. Than the drive can be started and stopped via the buttons or function keys.

Settings for optimization are given in 5.4.
6.5 Start reference travel

To start the reference travel deactivate the NC-axis and give a rising edge to input “Reference” of the FCB “PositionMode_MDX”. The reference travel type can be chosen in parameter 903 in the parameter tree.

6.6 Limit switch release

If you want to use limit switches please configure the limit switches in the parameter tree of MOVITOOLS® MotionStudio (parameter group 60). For example:

If the input “EnableMOVIDRIVE®” is true the FCB will automatically release the limit switch and reset the error in the MOVIDRIVE® and the NC-axis as soon as the NC-axis is disabled. The speed to release the limit switches can set via Parameter 160 (n11) for the right limit switch and parameter 162 (n12) for the left limit switch.
Run MOVITOOLS® MotionStudio via EtherCAT down to the drives

7.1 Settings in the drives

There are no further settings in the drives required than the settings mentioned above (chapter 3 or 4) for proper EtherCAT (and SBus) communication.

7.2 Settings in TwinCAT

To allow the access from MOVITOOLS® MotionStudio through the EtherCAT master you have to activate the EoE Support:

Please note the IP Address of the Mailbox gateway as access point for MOVITOOLS® MotionStudio and set the Cycle Time for the Mailbox polling to 20 ms to get a speed-optimized engineering access:
Finally Set/Reset TwinCAT system into “Config Mode” or “Run Mode”:

7.3 MOVITOOLS® MotionStudio

After starting MOVITOOLS® MotionStudio 1st click on the button “Communication plugs” to define the communication interfaces of MOVITOOLS® MotionStudio. After selecting one plug to Ethernet activate the checkbox “Activate Ethercat”. To configure the EtherCAT settings click on “Configure ethercat”. By clicking the “+” button it’s possible to enter an IP-Address. Now enter the IP Address of the Mailbox gateway in TwinCAT in the field “IP Address (EtherCAT-Master).”
7.4 Routing

If TwinCAT and MOVITOOLS® MotionStudio are not on the same PC there are two ways to establish connection from MOVITOOLS® MotionStudio via the TwinCAT System down to the drives anyway. In both cases first activate the setting “IP Enable Router” for the EtherCAT-Master mailbox gateway.

After changing the Windows IP Routing a restart of the TwinCAT system is necessary.

A) Set on the PC running MOVITOOLS® MotionStudio the Gateway Address (TCP/IP settings of the Ethernet interface) on the IP-Address the TwinCAT system has on its TCP/IP interface

If the Engineering PC running MOVITOOLS® MotionStudio is connected via a Router to an upper network-layer the standard gateway must not be changed use B) find below.
B) Define a static route. To do this enter the following command in the dosbox:

```
route -p add "Target-IP" MASK "Subnet-Mask" "Gateway-IP"
```

- “Target-IP” is the IP-Address of the Mailbox-Gateway in TwinCAT (here 169.254.36.254)
- “Subnet-Mask” is the Subnet-Mask valid for the PC running MOVITOOLS® MotionStudio
- “Gateway-IP” is the IP-Address the TwinCAT system has on its TCP/IP interface (here 10.3.64.170)

Please notice, both ways mentioned above only work, if the TwinCAT system and the PC running MOVITOOLS® MotionStudio are connected to the same Ethernet-Subnet (no further gateways or router in-between)!

Use the PING command in the dosbox on the engineering-PC to check if the communication-path down to the EtherCAT-Mailbox-Gateway is set up properly:
In this sample Ping 169.254.36.254

Finally perform an online-scan:

SEW-Drives connected via SBus to the DFE24B EtherCAT-Gateway are also accessible from MOVITOOLS® MotionStudio via the EtherCAT-Master.
8 Notes
How we’re driving the world