

Updating FAULHABER EtherCAT controller

Summary

FAULHABER motion controllers with EtherCAT interface may receive a firmware update. Then, it is necessary to update the EtherCAT EEPROM manually, since this cannot be updated by the firmware update process.

Applies To

All FAULHABER Motion Controllers with EtherCAT.

Licensing

EtherCAT is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Description

The object dictionary of an EtherCAT device is defined in two places: The first one is the firmware; the other is the EtherCAT EEPROM. Unfortunately, these two are not automatically synchronized.

When the firmware of a device is updated, the EtherCAT EEPROM is **not** automatically updated as well. This has to be done by the user.

The easiest way to do this is by using TwinCAT 3 software from Beckhoff Automation.

Install TwinCAT 3

Download TwinCAT 3 Engineering & Runtime from the Beckhoff web site:

<https://www.beckhoff.com/english.asp?twincat/twincat-3.htm>

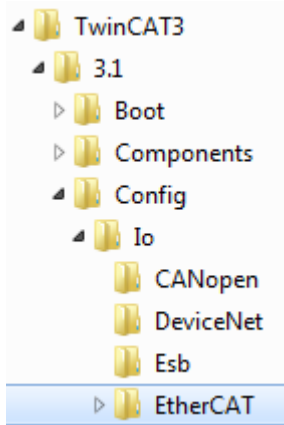
You need TwinCAT Engineering (TwinCAT 3 XAE) and TwinCAT 3 Runtime (TwinCAT 3 XAR). XAE is royalty-free, while XAR might need to be licensed. However, the limited functionality used for updating the EEPROM is free of charge.

Install ESI Files

Go to the installation directory of FAULHABER MotionManager. In the EDS directory you will find ESI files for FAULHABER Motion Manager, normally here: C:\Program Files (x86)\Faulhaber\Motion Manager 6\ESI.

Mark all *.XML files and copy them to the TwinCAT directory:

You will need to locate the installation directory of TwinCAT. For TwinCAT 3, it is normally something like C:\TwinCAT3. Copy the files into the Config\Io\EtherCAT directory:

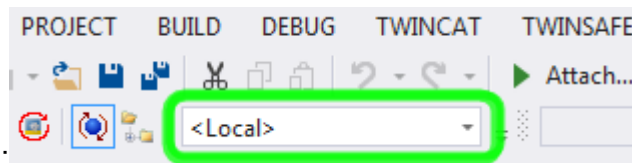


Restart TwinCAT to put these changes into effect.

Update EtherCAT-EEPROM of Motion Controller

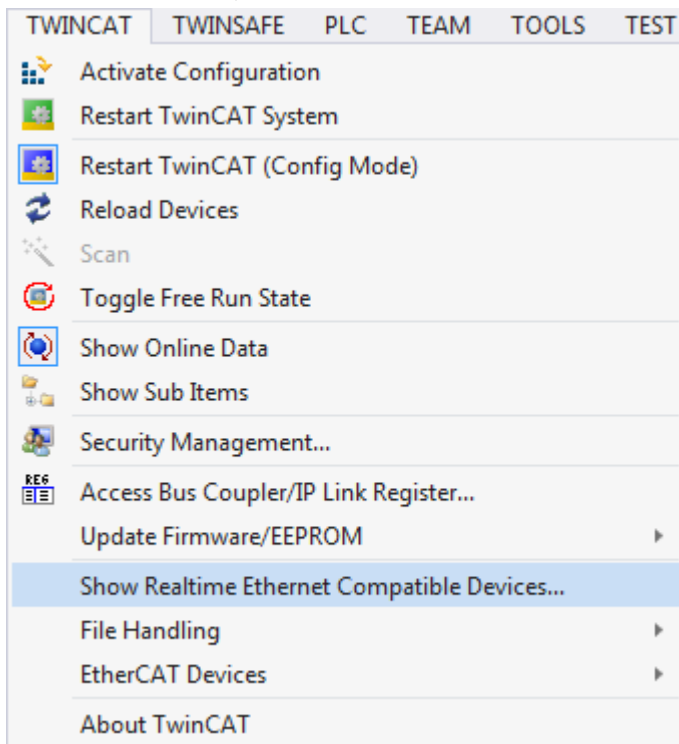
Connect to device

Create new TwinCAT 3 Project

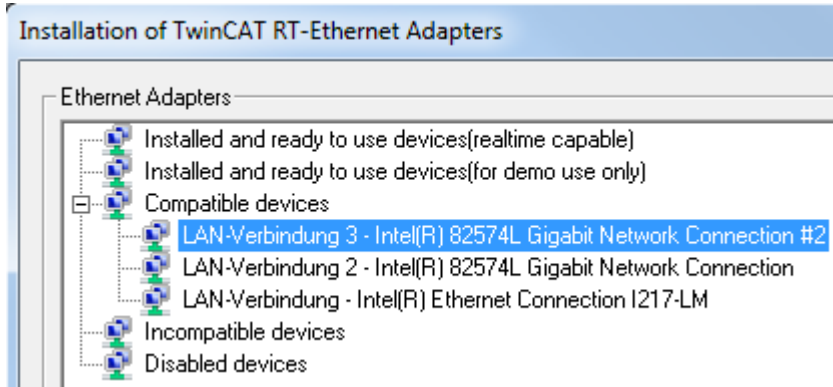


Make sure, destination is set to ,local':

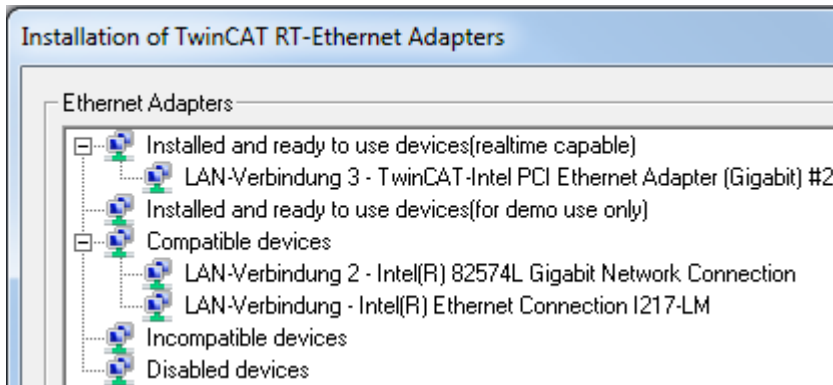
In the main menu, select 'Show Real-time Ethernet Compatible Devices' in the 'TwinCAT' entry:



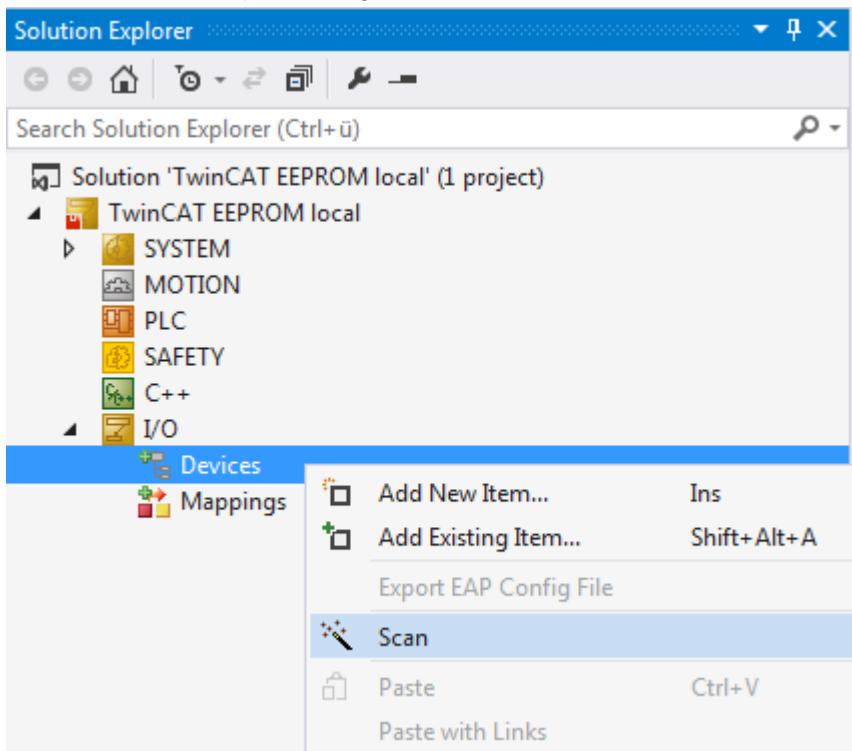
Hopefully, your Ethernet adapter is to TwinCAT's taste. Highlight it and hit 'Install':



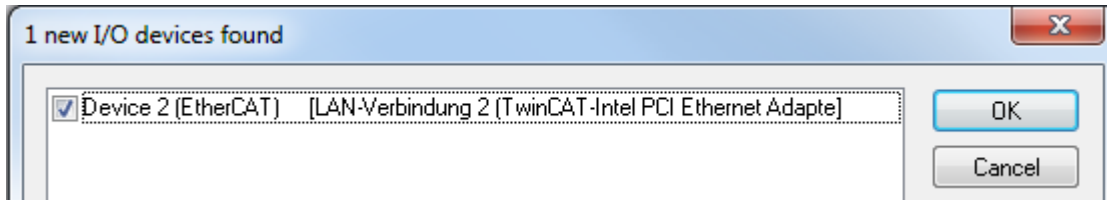
After this, the LAN connection has moved into the 'installed devices' section and the dialog looks like this:



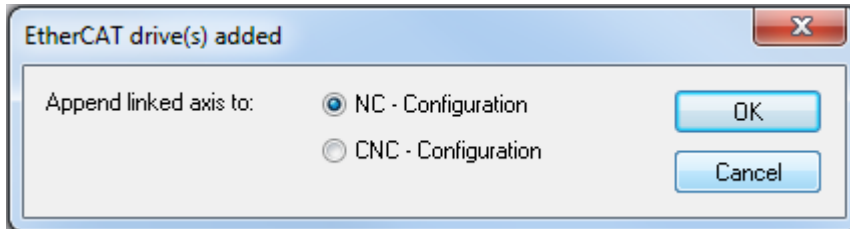
In the 'Solution Explorer', right-click on 'Devices' and select 'Scan':



In the following dialog, your network card should already be checked. Hit OK:

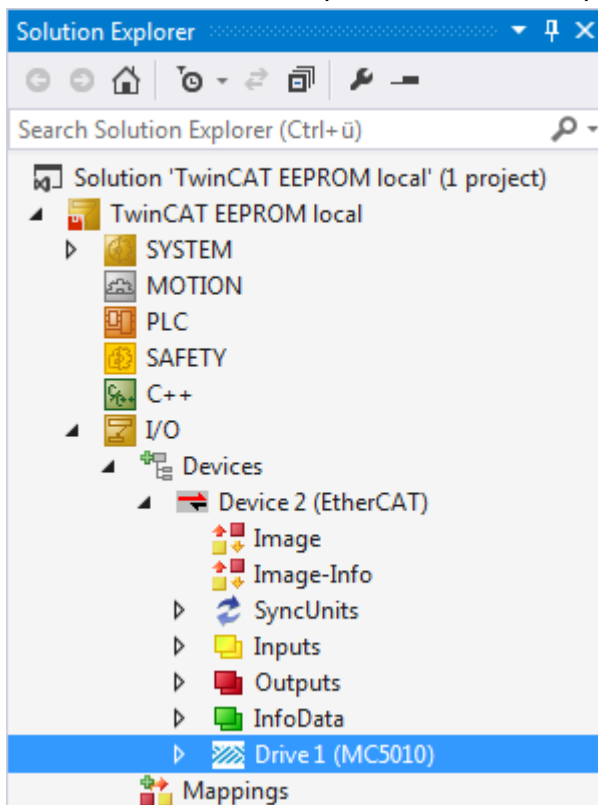


Confirm the following dialog, but do not add axis to NC-configuration. Hit 'Cancel':

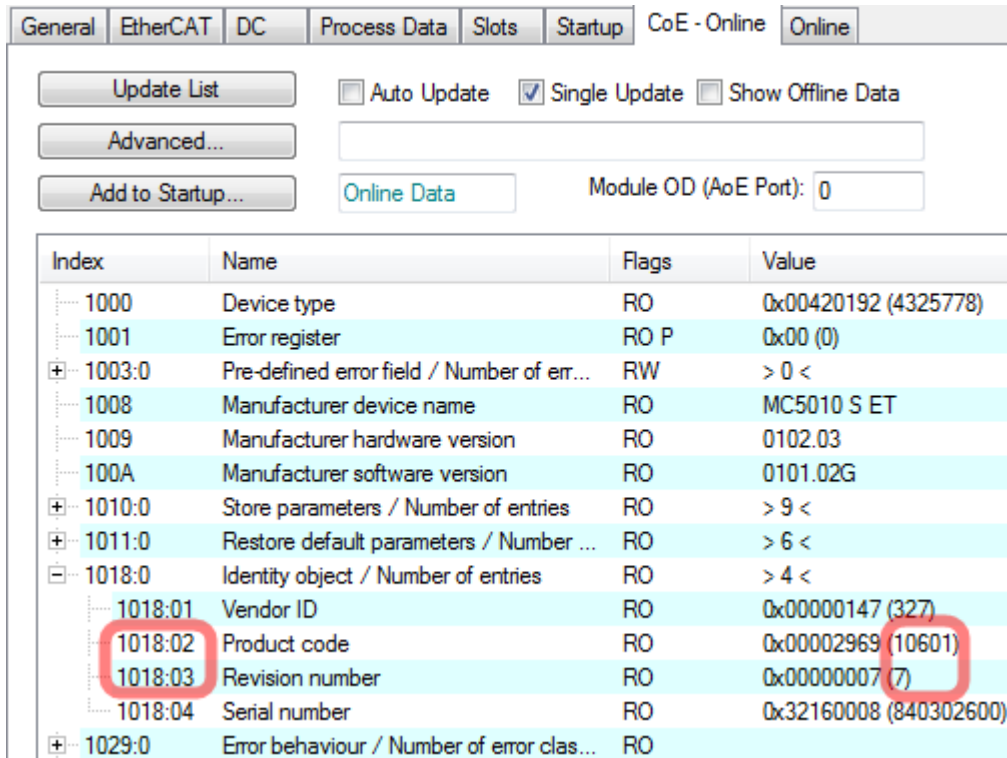


Update EtherCAT EEPROM

The drive should show up in the 'Solution Explorer'. Double click on it:



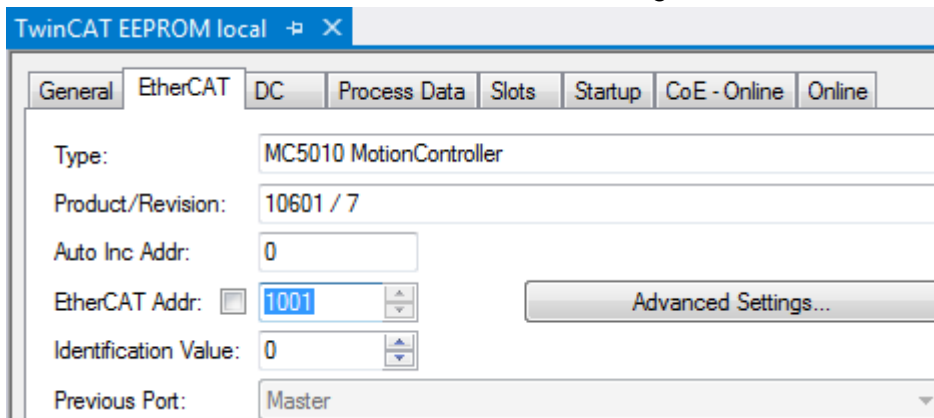
In the newly opened screen, activate 'CoE – Online' and open the 1018-entries. You need to memorize the value of **1018.02** and **1018.03**:



The screenshot shows the 'CoE - Online' window with the 'Online' tab selected. The 'Update List' button is visible, along with checkboxes for 'Auto Update', 'Single Update', and 'Show Offline Data'. The 'Advanced...' button is also present. Below these are 'Add to Startup...' and 'Online Data' buttons, and a 'Module OD (AoE Port): 0' field.

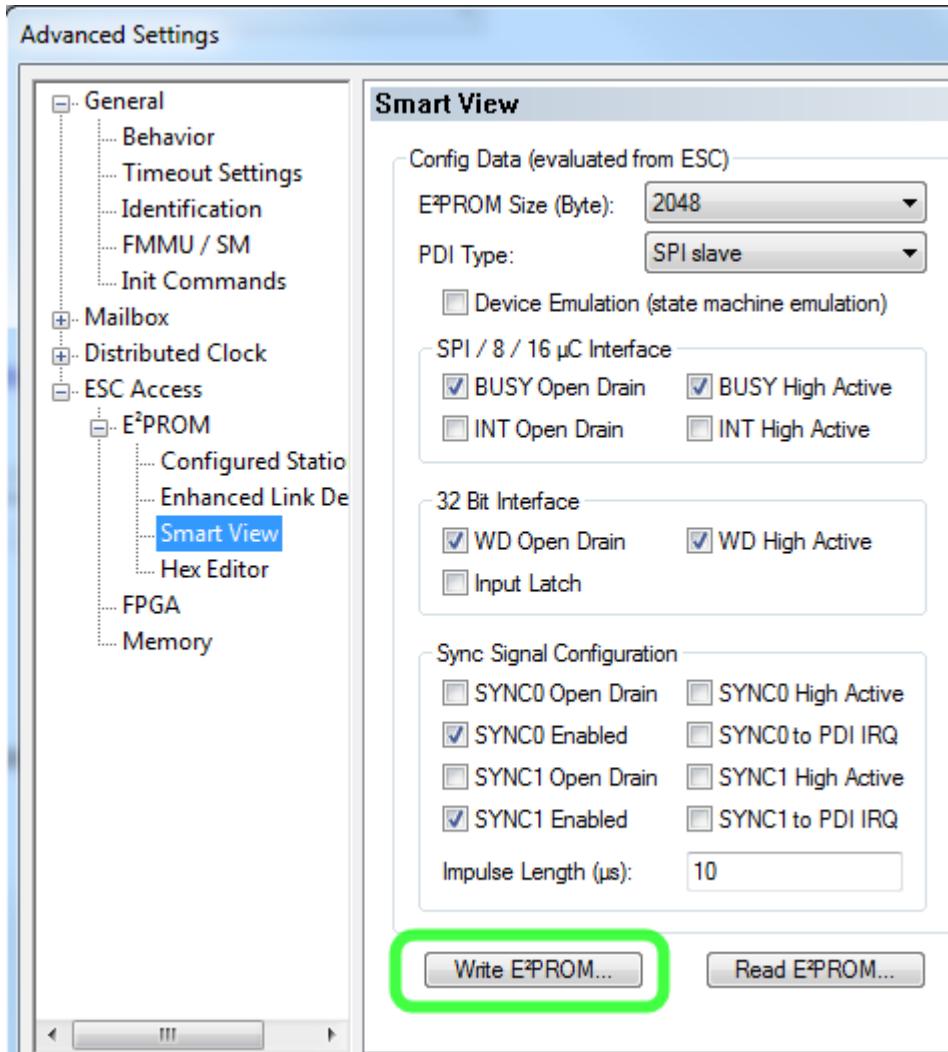
Index	Name	Flags	Value
1000	Device type	RO	0x00420192 (4325778)
1001	Error register	RO P	0x00 (0)
1003:0	Pre-defined error field / Number of er...	RW	> 0 <
1008	Manufacturer device name	RO	MC5010 S ET
1009	Manufacturer hardware version	RO	0102.03
100A	Manufacturer software version	RO	0101.02G
1010:0	Store parameters / Number of entries	RO	> 9 <
1011:0	Restore default parameters / Number ...	RO	> 6 <
1018:0	Identity object / Number of entries	RO	> 4 <
1018:01	Vendor ID	RO	0x00000147 (327)
1018:02	Product code	RO	0x00002969 (10601)
1018:03	Revision number	RO	0x00000007 (7)
1018:04	Serial number	RO	0x32160008 (840302600)
1029:0	Error behaviour / Number of error clas...	RO	

Activate 'EtherCAT' and click on 'Advanced Settings...':



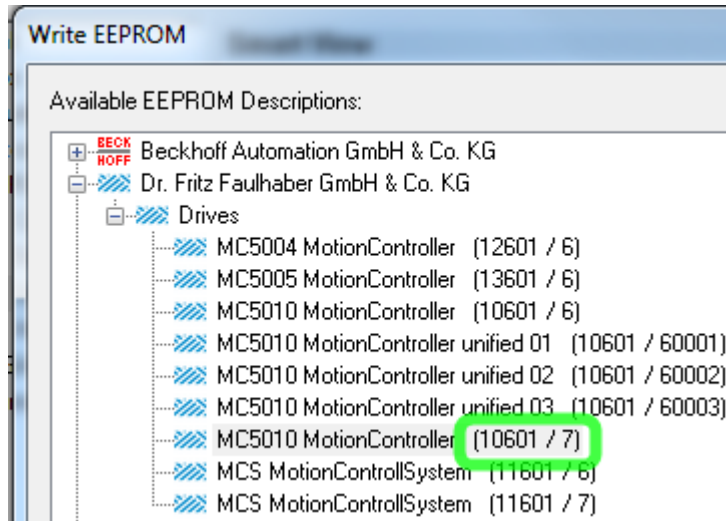
The screenshot shows the 'TwinCAT EEPROM local' window with the 'EtherCAT' tab selected. The 'Type' is set to 'MC5010 MotionController'. The 'Product/Revision' is '10601 / 7'. The 'Auto Inc Addr' is '0'. The 'EtherCAT Addr' is '1001'. The 'Identification Value' is '0'. The 'Previous Port' is 'Master'. The 'Advanced Settings...' button is highlighted.

In the dialog, navigate to 'SmartView' and click on 'Write E²PROM':



Select the entry that has exactly the same product ID and revision number as you looked up in the 1018 entries. This must correspond to the two numbers in brackets. Product ID 1018.02 is the first one, after the slash is Revision Number 1018.03.

In the above dialog, those numbers were 10601 and 7. Thus, in the example below, we had to select the entry “MC5010 ... (10601 / 7)”. Look for **your** numbers, highlight the appropriate entry, and then hit OK:



Programming will take some time.

If you are done, close everything and power-cycle your device.

You successfully updated the EtherCAT EEPROM.

Rechtliche Hinweise

Urheberrechte. Alle Rechte vorbehalten. Ohne vorherige ausdrückliche schriftliche Genehmigung der Dr. Fritz Faulhaber & Co. KG darf insbesondere kein Teil dieser Application Note vervielfältigt, reproduziert, in einem Informationssystem gespeichert oder be- oder verarbeitet werden.

Gewerbliche Schutzrechte. Mit der Veröffentlichung der Application Note werden weder ausdrücklich noch konkludent Rechte an gewerblichen Schutzrechten, die mittelbar oder unmittelbar den beschriebenen Anwendungen und Funktionen der Application Note zugrunde liegen, übertragen noch Nutzungsrechte daran eingeräumt.

Kein Vertragsbestandteil; Unverbindlichkeit der Application Note. Die Application Note ist nicht Vertragsbestandteil von Verträgen, die die Dr. Fritz Faulhaber GmbH & Co. KG abschließt, soweit sich aus solchen Verträgen nicht etwas anderes ergibt. Die Application Note beschreibt unverbindlich ein mögliches Anwendungsbeispiel. Die Dr. Fritz Faulhaber GmbH & Co. KG übernimmt insbesondere keine Garantie dafür und steht insbesondere nicht dafür ein, dass die in der Application Note illustrierten Abläufe und Funktionen stets wie beschrieben aus- und durchgeführt werden können und dass die in der Application Note beschriebenen Abläufe und Funktionen in anderen Zusammenhängen und Umgebungen ohne zusätzliche Tests oder Modifikationen mit demselben Ergebnis umgesetzt werden können.

Keine Haftung. Die Dr. Fritz Faulhaber GmbH & Co. KG weist darauf hin, dass aufgrund der Unverbindlichkeit der Application Note keine Haftung für Schäden übernommen wird, die auf die Application Note zurückgehen.

Änderungen der Application Note. Änderungen der Application Note sind vorbehalten. Die jeweils aktuelle Version dieser Application Note erhalten Sie von Dr. Fritz Faulhaber GmbH & Co. KG unter der Telefonnummer +49 7031 638 688 oder per Mail von mcsupport@faulhaber.de.

Legal notices

Copyrights. All rights reserved. No part of this Application Note may be copied, reproduced, saved in an information system, altered or processed in any way without the express prior written consent of Dr. Fritz Faulhaber & Co. KG.

Industrial property rights. In publishing the Application Note Dr. Fritz Faulhaber & Co. KG does not expressly or implicitly grant any rights in industrial property rights on which the applications and functions of the Application Note described are directly or indirectly based nor does it transfer rights of use in such industrial property rights.

No part of contract; non-binding character of the Application Note. Unless otherwise stated the Application Note is not a constituent part of contracts concluded by Dr. Fritz Faulhaber & Co. KG. The Application Note is a non-binding description of a possible application. In particular Dr. Fritz Faulhaber & Co. KG does not guarantee and makes no representation that the processes and functions illustrated in the Application Note can always be executed and implemented as described and that they can be used in other contexts and environments with the same result without additional tests or modifications.

No liability. Owing to the non-binding character of the Application Note Dr. Fritz Faulhaber & Co. KG will not accept any liability for losses arising in connection with it.

Amendments to the Application Note. Dr. Fritz Faulhaber & Co. KG reserves the right to amend Application Notes. The current version of this Application Note may be obtained from Dr. Fritz Faulhaber & Co. KG by calling +49 7031 638 688 or sending an e-mail to mcsupport@faulhaber.de.