

X300_HF



**EUROTHERM
DRIVES**

Feedback system HIPERFACE®



**PRODUCT
DESCRIPTION**



Further documentations associated with this document

UL: 07-02-09-01



Product – manual 637+

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Made in Germany, 2002

“**HIPERFACE**®” registered trade-mark from the company Max Stegmann GmbH



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The most important thing first

We thank you for the trust that you have shown in our product.

The operating instructions presented here serves as an overview of the technical data and features.

Please read the operating instructions before putting the product to use.

If you have any questions, please contact your nearest Eurotherm representative.

Improper application of the product in connection with dangerous voltage, can lead to injuries.

In addition, damage can also occur to motors or other products.

Therefore please observe strictly our safety precautions.

Topic: Safety precautions

We assume that as an expert, you are familiar with the relevant safety regulations, especially in accordance with VDE 0100, VDE 0113, VDE 0160, EN 50178, the accident prevention regulations of the employers liability insurance company and the DIN regulations and that you can use and apply them. Also the CE - regulations are to be observed and guaranteed.

Depending on the kind of application, additional norms e.g. UL, DIN are to be observed.

If our products are employed in connection with components from other manufacturers, their operating instructions are also to be strictly observed.

1 General

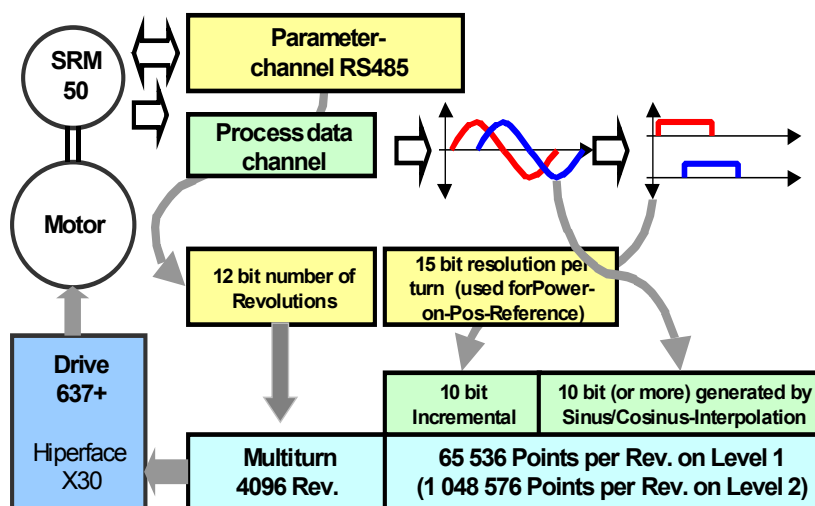
The term “**HIPERFACE**®” is derived from “**High Performance Interface**“ and typifies a certain kind of connection from encoder towards controller.

The system is a compound of incremental- and absolute-encoder. The absolute value will be generated at power-on of the device and transmitted via RS485 interface to an external counter, which counts further incremental with a sine/cosine track, starting from this absolute value. Optionally you can choose between a Singleturn or a Multiturn variant.

Advantages of feedback -HIPERFACE® system - over the traditional resolver system

- Multiturn possible
- High resolution possible by sine/cosine interpolation
- High accuracy
- Operable instantly after power-on, without search for home reference

Parameter-channel for Absolute Position and general Data
 Process data-channel for Analog Sine and Cosine signal



Technical data	Version LEVEL 1	Version LEVEL 2
Encoder-Types		being prepared
Stegmann SRS (Singleturn)	Ok	
Stegmann SRM (Multiturn) 4096 Revolutions	Ok	
Number of sine- cosine period per revolution	1024	
Encoder - EEPROM	Not used	
Baudrate RS485	9600 Baud	
Position - Preset	Stored in EEPROM of drive	
Max. Speed	6000 rpm	
Validated resolution per turn	65536	
Speed - Ripple (reference – measurements AC MHM 0090-4/1-3)	< 0.3% at 4000 rpm	
Max. mechanical Position - Error	+0.75 min.	
FIRMWARE 637+ Version	>=6.13	
EASYRIDER Version	>=6.15	



Important!

Kindly note Chapter 7: Maintenance, Repair and Service



General

Singleturn:

On applications of HIPERFACE® motors AC MHS only one revolution can be absolute. The feedback does not differ from the standard Resolver handling.

Multiturn:

HIPERFACE® motors AC MHM provide an absolute resolution of 4096 revolutions. The absolute position is available instantly (without search for home reference). At initial start-up or replacement of motor or controller, an absolute position related to the mechanical system must be set and saved in fail-safe store. (see Chapter 6, Step 4)

Operation of motors from other manufacturers:

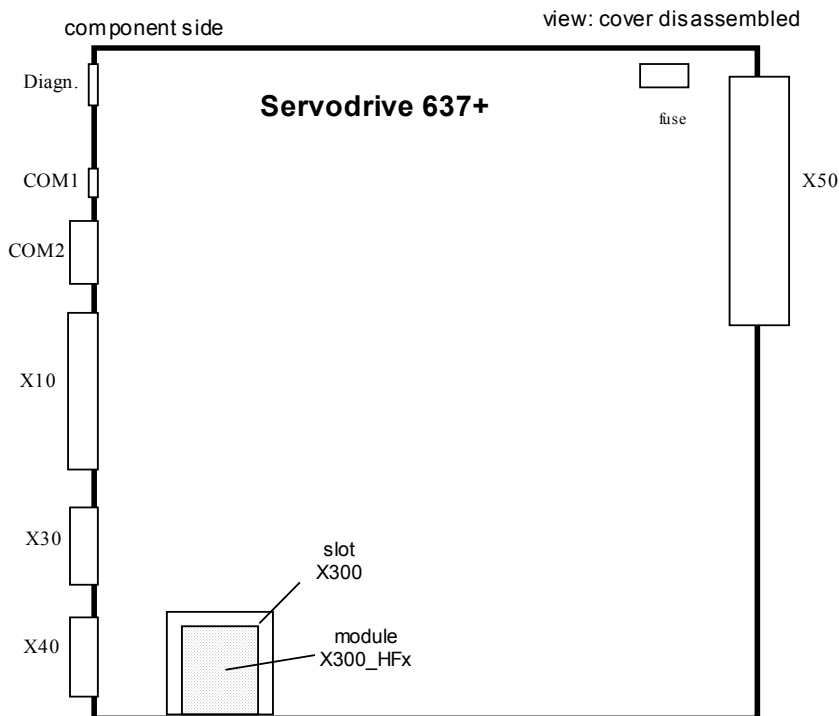
Operation of motors from other manufacturers requires general consultation with Eurotherm, especially for evaluation of proper encoder adjusting parameters.

Machine starting:

On power-on of a servo axis, the absolute mechanical position stored in the encoder will be transmitted via parameter channel.
To prevent position errors at starting, the motor should not move during power-on.

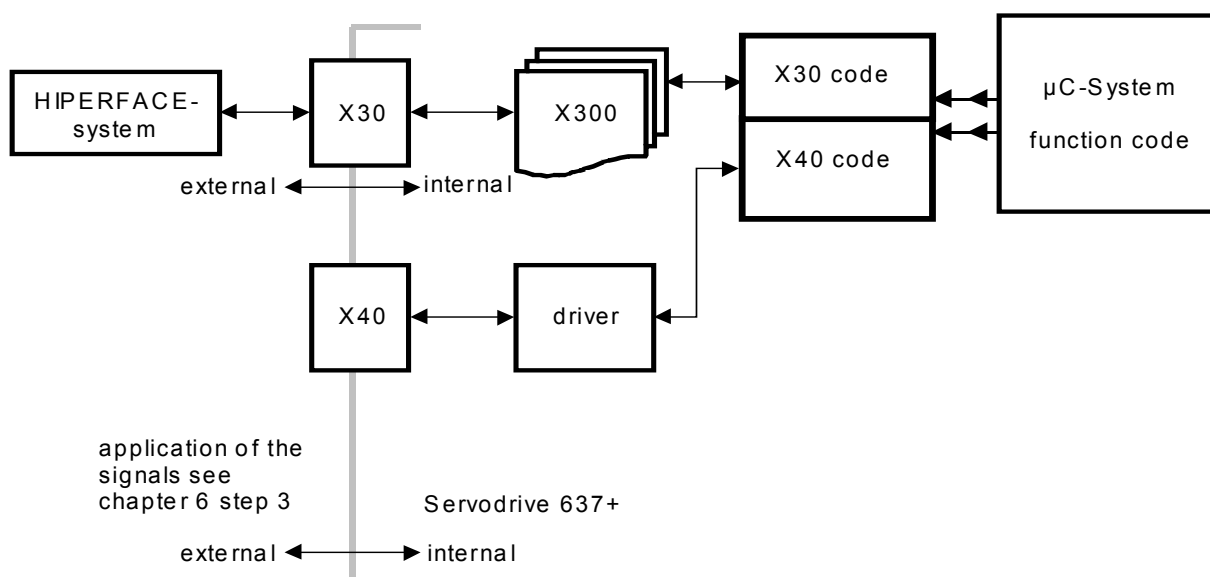
2 Mechanical design

Layout of controller board



Note: The module X300_HFx can only be reached after removing the cooling plate.

3 Electrical block diagram



4 Feedback Cable

Hiperface connector

motor side

Eurotherm - motor size 1...3
Model: AC MHS / MHM

regulator side

Eurotherm - servo drive
Model: 637+

view solderside

keying

case - black

view solderside

SIR ST.0200.0001	KIR-B KA.0003.6301		SUB - D 09 S/M ST.1002.2001
PIN - Nr.	color	function	PIN - Nr.
1	white	sin +	4
2	brown	Ref sin	8
3	green	cos +	3
4	yellow	Ref cos	7
9	pink	Data +	9
10	gray	Data -	5
11	red	10 VDC	2
12	blue	GND	1
case		screen	case

 EUROTHERM ANTRIEBE				Maßstab / scale:	
				Typ / model: KK H MHx-xx.x/B	
		Bear.	22.04.02	DL	Bezeichnung / designation: Blue Hiperface cable for Eurotherm AC MHS / MHM motors and 637+ servo drives
		Gep.	23.04.02	EH	
		Norm			
		Zeichnungsnummer / drawing No:			Blatt sheet 1
		Z-RK.8630.xxxx			
Zust	Änderung	Datum	Name	Ursprung	Dateiname / File name: Z-RK.8630.xxxx_E.cdr

Kindly note keying of plugs / motor flange connectors !

Important:

The signals of the HIPERFACE® encoder are sensitive signals with low amplitude of 0,5 V. Please take special care of correct screening of the encoder cable and the motor cable. Further motor cables and encoder cables must run separately. Please observe minimum space of 300 mm.

Note:

Setting in software EASYRIDER® Windows

Configuration – Motor – Temperature sensor must be: **sensor type “NTC“**

5 Commissioning / Configuration



CAUTION !

**Wiring errors or incompatible operation may cause unpredictable motions.
Avoid danger for man and machine !**

Preparation

- Expertise of the function of a 637+ Servo controller (see documentation 07-02-09-01)
- For PC-link use the Eurotherm communication software EASYRIDER® Windows. This chapter presumes the knowledge of how to handle EASYRIDER. Suggestions: Use test equipment to train yourself. EASYRIDER® - Windows contains interactive HELP functions.
- For security reasons the access to several functions is blocked by password. Commissioning has to be executed by trained staff only.
- Users may have their application-adapted commissioning method when familiar with the product, on their own responsibility.
- The system must be in accordance with all valid safety specifications. The function of all safety equipment (limit-switches for example) has to be checked.



6 HIPERFACE® – Configuration

The following steps relate to special configuration settings for HIPERFACE®.
Know-how of general controller configuration is presupposed.

Step 1

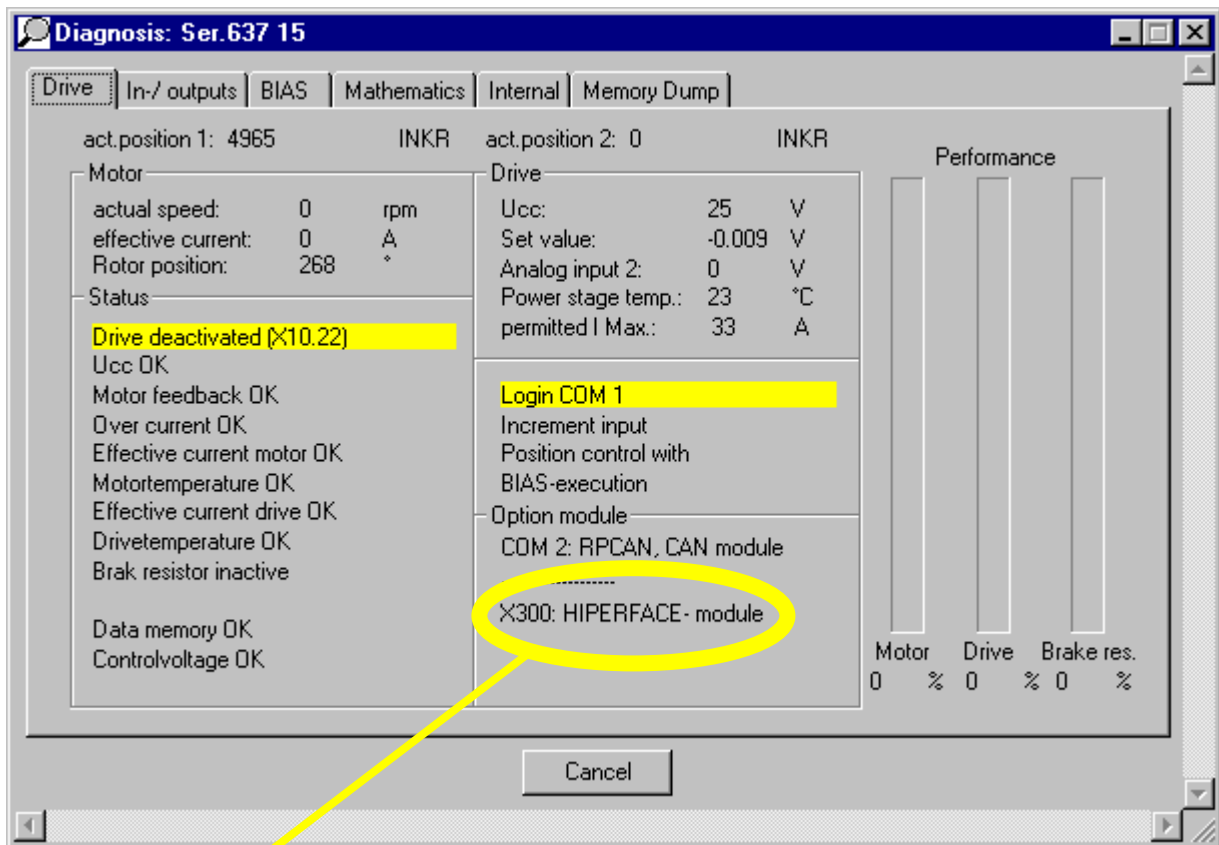
Establishing preconditions

- PC operable with **EASYRIDER® Windows - Software** from Version 6.15 onwards
- Interface connection PC with controller (COM1/RS232) from Firmware 6.13 onwards
- Connection HIPERFACE® with controller (X30 connection)
- Control supply voltage +Us (24 V DC) power-on

Step 2

Menu: **Diagnosis \ Diagnosis Drive**

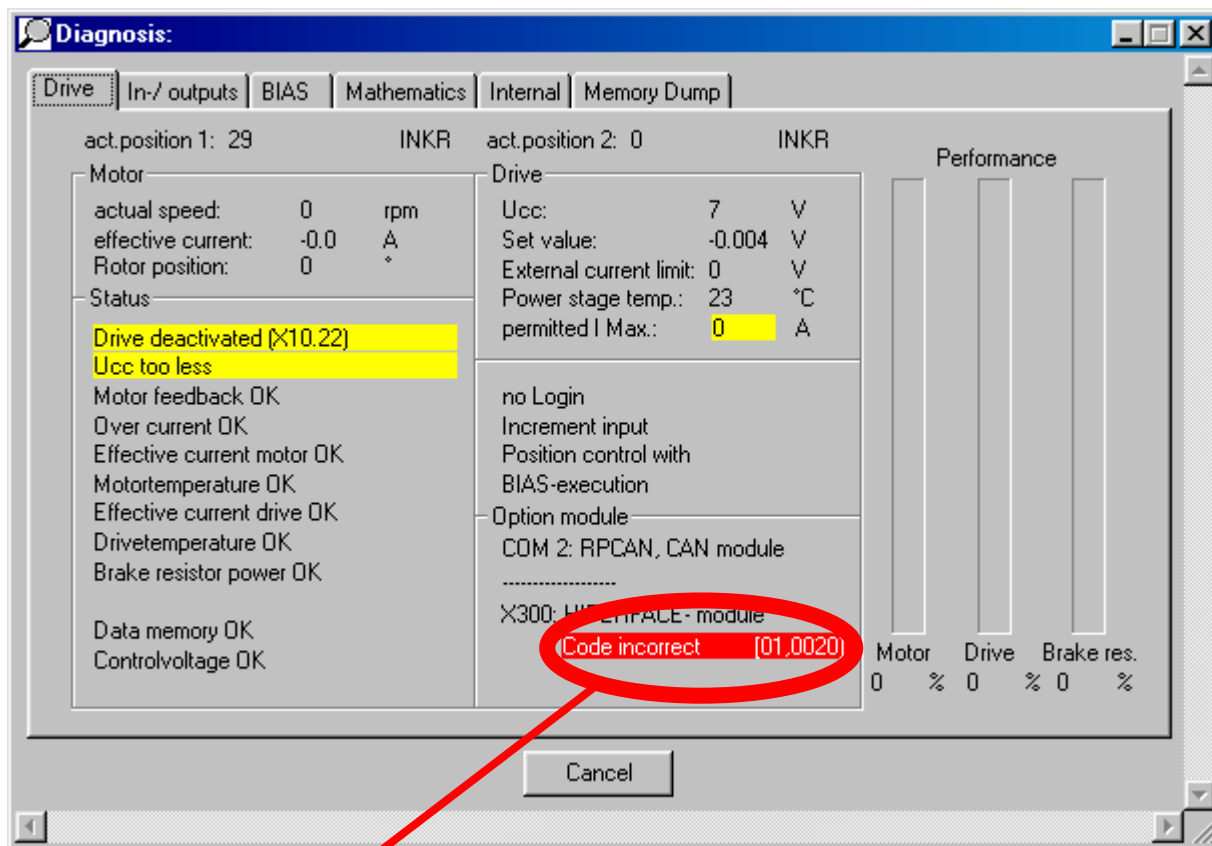
press F9



If HIPERFACE® module X300_HFx is identified by software - go to Step 3

HIPERFACE® – Configuration

Step 2 (continued)



Status report appears under fault condition only

Status reports possible	Interpretation / Cause	Counter-measure
no module	no X300 module mounted	mount module
unknown module	the module identification is not known to the Firmware	load more recent Firmware or replace module
module not supported	module is not supported by the Firmware	load more recent Firmware
Code unknown	Firmware does not support this (more recent) code	load more recent Firmware
Code not up to date	this code is not supported by the Firmware	load more recent function code
wrong Code	loaded code does not suit the X300 module	load proper function code
Code incorrect	code does not suit the X40 setting	check X40 configuration
download error	at download of X30/X40 function code an error occurred	re-load function code

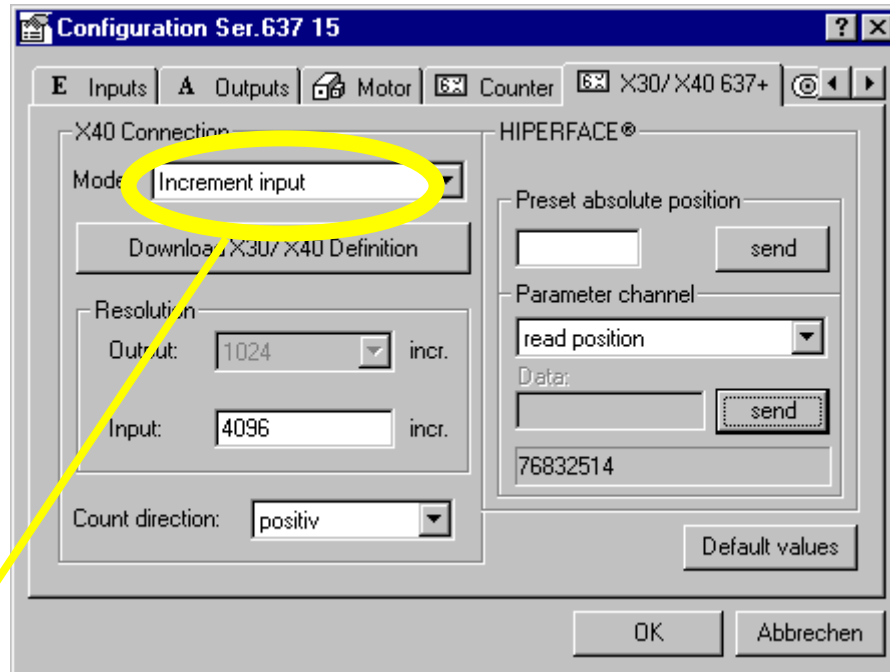


HIPERFACE® – Configuration

Step 3

Menu: Configuration \ X30/X40 637+

X40 Connection / Mode:



Select as X40 connection mode: Increment input or Increment output.

For detailed X40 operating mode instructions please see 637+ manual 07-02-09-01 Chapter 2.5.

X40 Connection / Download X30/X40 Definition

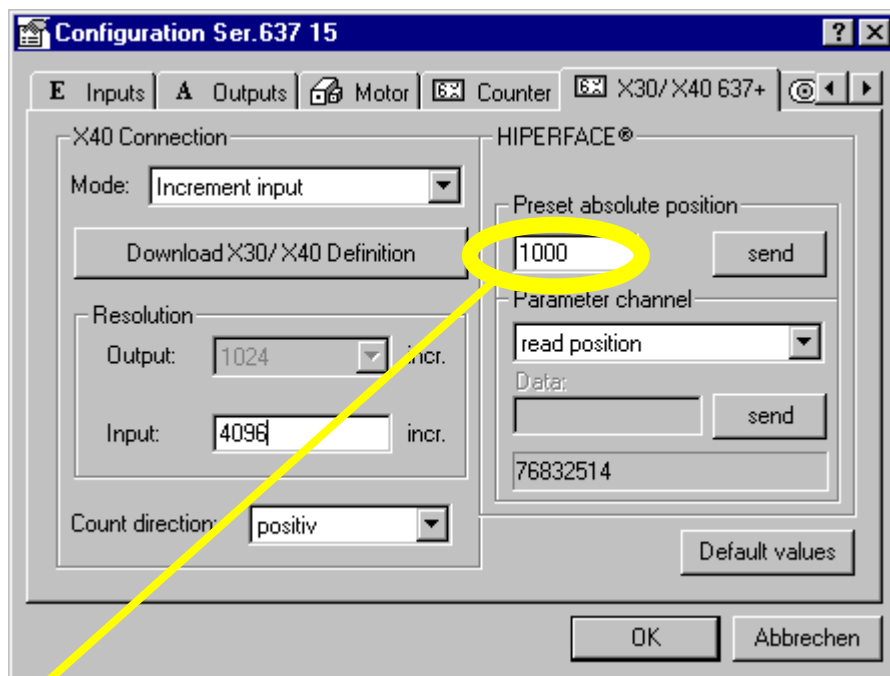
By pressing the button **Download X30/X40 Definition** the corresponding function code will be loaded and stored in the controller. Close procedure with F7 (storing of mode specifier). After Power-on Reset (US 24 V DC off and restart) the selected configuration will be active.

HIPERFACE® – Configuration

Step 4

Menu: **Configuration** \ X30/X40 637+

HIPERFACE® / Preset absolute position



The absolute position will be defined by a numerical data between 0 and 268,435,455 (increments).

By pressing the button **send** the absolute position will be set.

To prevent loss of modifications at power-off, you should store them power fail-safe! [F7]

Please note:

Negative values are not valid. The machine zero point must always be greater than the lower limit. It may never lie on the limit switch.

Travel range = (end position +) – (end position -)

Recommendation:

Reference position = (end position -) + 1000 increments

Fixing absolute position

Procedure	Installing
mathematical	mathematically by mechanical data (1 motor shaft revolution = 65536 increments)
experimental	determination by manual intervention or crawl speed along to mechanical end positions. Read out end positions in menu Diagnosis.

Absolute position value = actual position – reference position

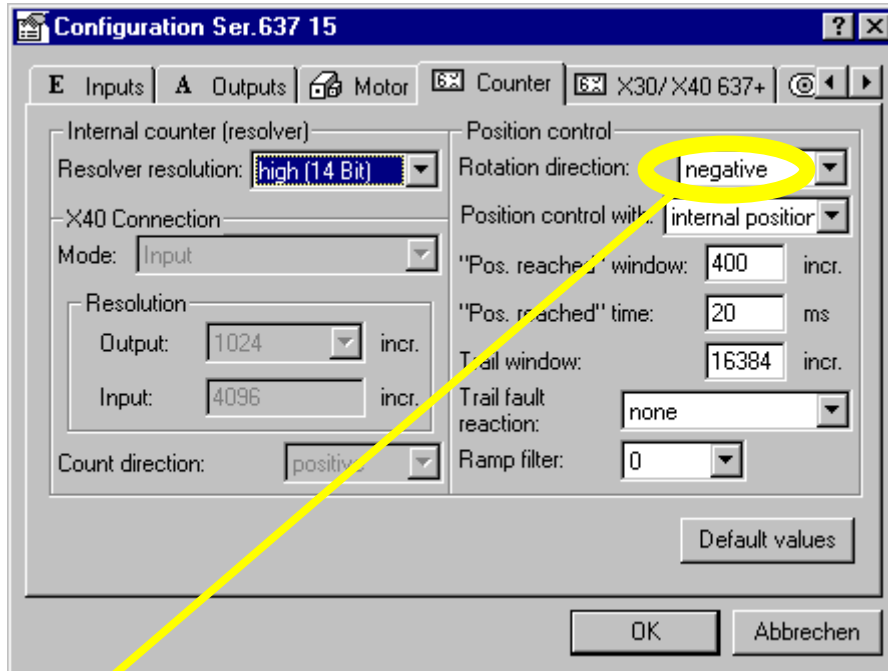


HIPERFACE® – Configuration

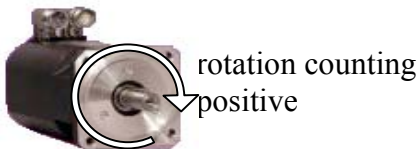
Step 5

Menu: **Configuration \ Counter**

Position control / Rotation direction:



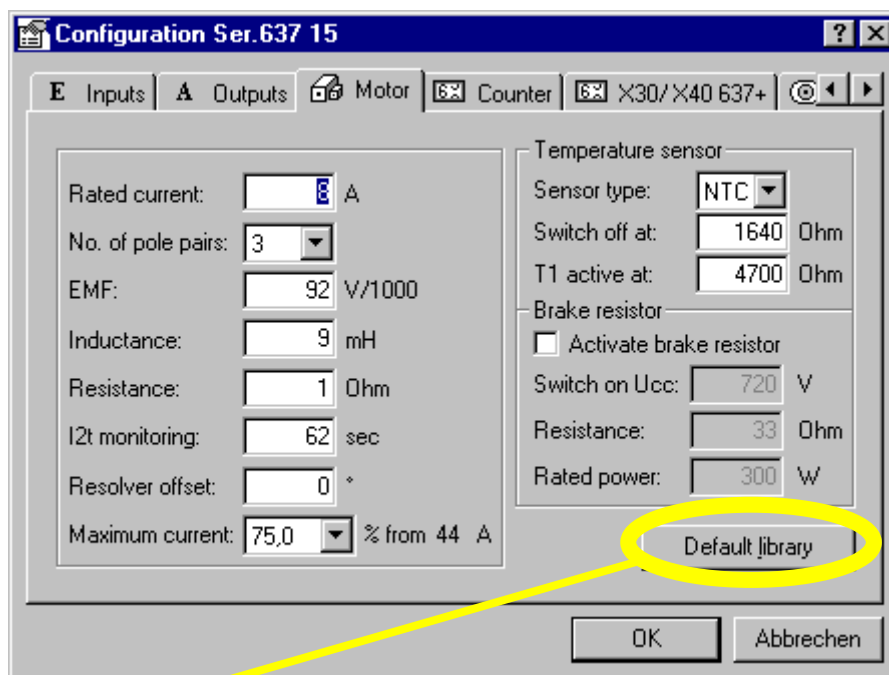
Entry of rotation direction negative (default value) results in the following rotational counting



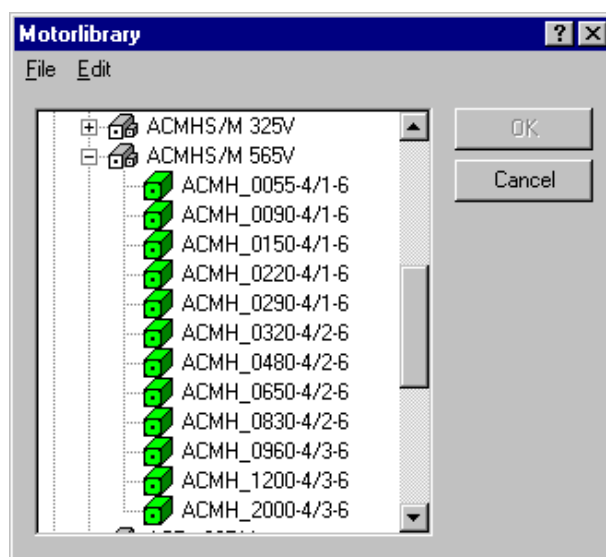
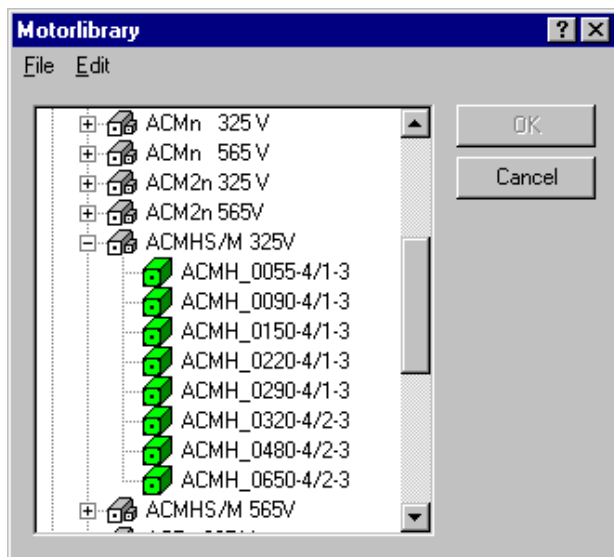
HIPERFACE® – Configuration

Step 6

Menu: **Configuration \ Motor**



Please select the corresponding HIPERFACE® motor from the default library.



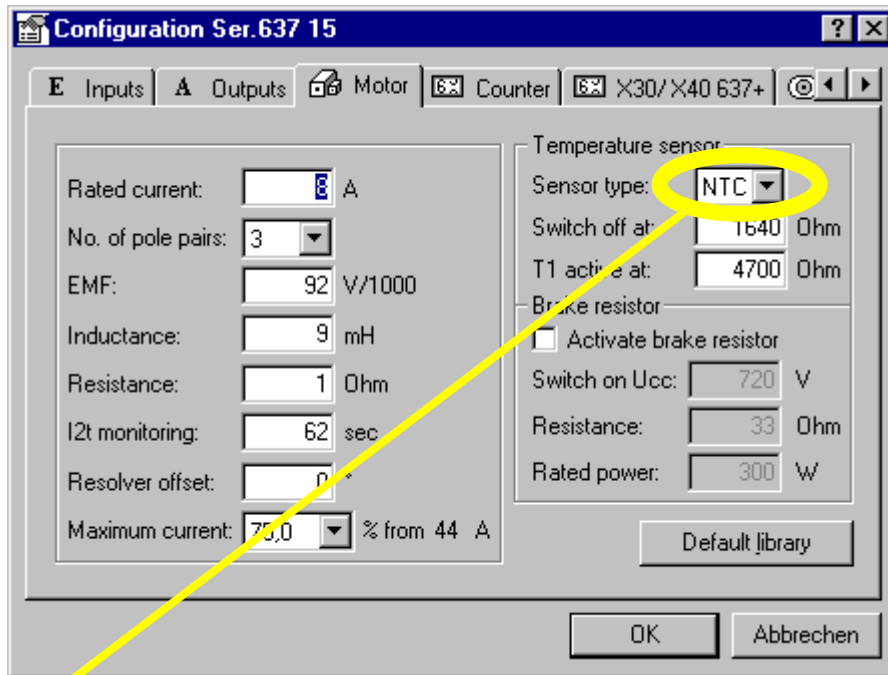


HIPERFACE® – Configuration

Step 7

Menu: **Configuration** \ **Motor**

Temperature sensor / Sensor type:



With HIPERFACE® motors, the motor–thermistor interpretation is not active in standard. Therefore the sensor type has to be adjusted to NTC.

7 Maintenance, Repair and Service



General:

Services or repairs should be carried out by **EUROTHERM** personnel only!

Please note:

Motor will be shipped with mechanical adjusted encoder (instead of resolver).
It is not possible to handle motor and encoder as separate components.

Warning:

For Speed-Loop-Tuning, too high loop-gains may generate torsion-resonances.

Important:

At initial start-up, in case of Multiturn-encoders, initial position-preset must be performed using EASYRIDER PC-software. This is also needed after replacement of HIPERFACE[®] motors.
(see Chapter 6, Step 4)

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