Table of contents

Encoders with ACURO®link interface

.Encoders with ACURO®link interface

.Application-related information for project planning

. Encoder types

Rexroth housing motors of the MS2N and MS2E types are optionally equipped with ACURO®^{link} motor encoder:

- Encoder performance Advanced - 20 bit/rev., code letter "C", "H"
- Encoder performance High - 24 bit/rev., code letter "D"
- For the "encoder type" it is possible to select single-1 rev. ("S") or multi-turn-4096 rev. ("M")

Only rotary encoders are supported!

A data memory range for user data (OEM memory range) with 7.5 kbytes is available on the encoder side.

.Encoder connection

Due to the high data transmission frequency of 10 MHz that is sensitive to interference, it is recommended to use the ready-made electrical connections by Rexroth and to observe the corresponding mounting recommendations.

Position encoders with ACURO®link interface can be connected via the standard encoder input of the ctrlX DRIVE controllers.

With the MS2N option "encoder performance C and D" (ACURO®link encoder), single-cable connection of the motor is possible. Refer to the Project Planning Manual "IndraDyn S Synchronous Servo Motors MS2N", DOK-MOTOR*-MS2N*******-PR, mat. no. R911347583.

.Commissioning

.Encoder configuration

MS2N motors are optionally available with a motor encoder with ACURO®link interface. In the beginning of commissioning, "load basic parameters" should have been carried out.

The ACURO®link encoder is automatically detected when the drive controller is switched on, and also after "load basic parameters" has been carried out. The data of the motor and of the encoder from the encoder data memory are already available in the controller in CM.

This is a "Plug & Play" encoder type which is configured automatically via the "encoder scan" function!

If it is required to reduce the initialization period, deactivate the "encoder scan" function in "S-0-0602.x.1, Phys. encoder type". See also .

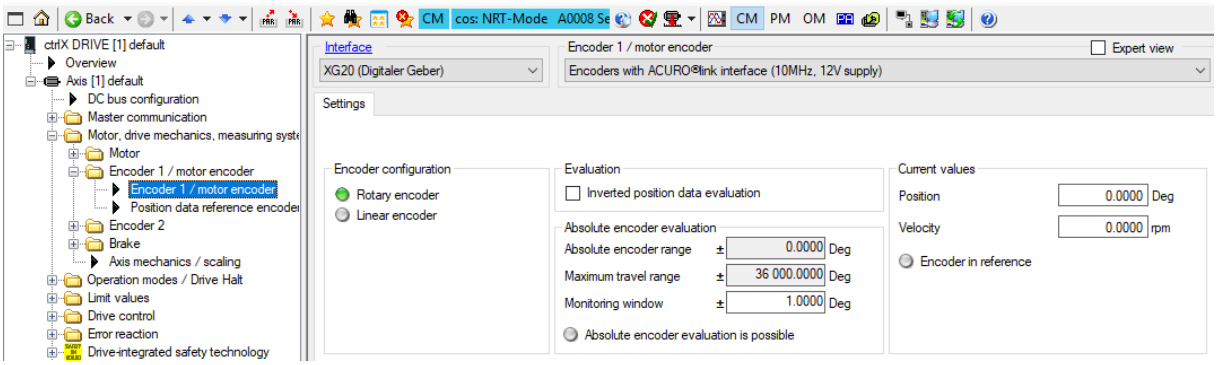

Fig. 182: ctrlX DRIVE Engineering encoder basic dialog for ACURO®link encoder (encoder option of MS2N motor)

.Encoder diagnostics

Diagnostics of the drive are chronologically listed in the "diagnostic trace" of the controller. The listing in the diagnostic trace can be comfortably displayed in ctrlX DRIVE Engineering. If encoder errors or warnings have occurred, these are registered in the respective bits of "S-0-0600.x.1, Encoder status" and listed in the diagnostic trace.

The encoder status is also displayed in the "Expert view" of the encoder dialog:

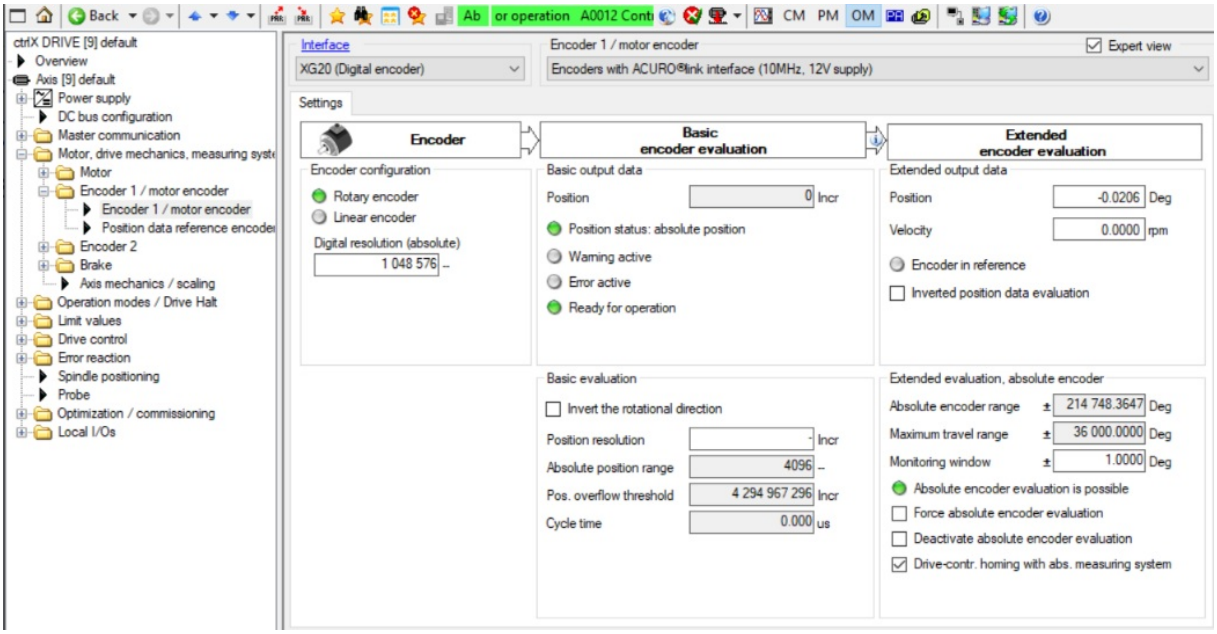

Fig. 183: Expert view of the settings dialog of ctrlX DRIVE Engineering for diagnostic purposes and for further configurations

.Additional information and details

The ACURO®link interface is a digital interface for Hengstler encoders for bidirectional, serial and secure communication between sensors, actuators and controls. The actual position values cyclically transmitted in so-called "telegrams" have an ACURO®link-specific transmission protocol:

.Protocol specification

- Telegram length: 4 bytes transmission, 20 bytes reception
- Diagnostic bits: 1 error, 1 warning bit
- Checksums: 8 bits (CRC), 16 bits (CRC) for position (standard and safety telegram), 32 bits (CRC) for total telegram (safety telegram only)
- Position bits: 24 bits with single-turn, 12 bits with multi-turn
- Transmission: 115 kBaud (initialization, acyclic operation), 10 MBaud (cyclic operation), transmission type: Semi-duplex

.Features of ACURO®link encoders

Encoders with ACURO®link interface are an encoder option for MS2N motors. They have an encoder data memory containing the manufacturer-side motor and encoder data ("electronic type plate"), including:

- Single-turn resolution: "S-0-0602.x.22, Phys. encoder resolution (digital)"
- Multi-turn range: "S-0-0601.10.23, Absolute position range" (no battery required!)
- Mechanical maximum velocity
- Encoder serial number: "S-0-0611.x.136, Serial number of encoder" unit-specific

Other features:

- Virtual reference marks at every single-turn overflow
- The encoder memory makes available an OEM memory range for user data.
- The encoder provides a standard telegram and two safety telegrams.
- Transmission of the motor temperature if a temperature sensor is connected to the encoder.

.Monitoring and diagnostics

- Telegram monitoring by means of several CRC (Cyclic Redundancy Check) of the data transmitted by the encoder. From this, warnings and error states can be derived.
- The bits for "error" and "warning" are set in "S-0-0600.x.1, Encoder status" if warning or error states occur.

.Application as motor encoder

There is a time offset between the recording of actual position values and their availability for drive control due to the serial transmission of the position data. Due to the transmission rate of 10 MHz for the cyclic position and status data, the time offset between the recording of actual position values and their availability for motor control is sufficiently small in the case of serial transmission by the ACURO®link format.

.Transmission of motor temperature

The ACURO®link protocol can also transmit additional information (motor temperature) besides the position data. For this purpose, the following requirements must have been complied with:

- A temperature sensor has to be connected to the dedicated connection points of the encoder.
- Transmission of the motor temperature has to be activated in "P-0-0512, Temperature sensor" by entering the matching characteristic number (automatic entry for MS2N motors).
- The motor temperature is transmitted in intervals of 64 ms.

.Parameterization

ACURO®link encoders track the encoder-specific data in the encoder data memory. If used as MS2N motor encoder, the encoder data memory also tracks the motor parameter values. Data and parameter values are automatically loaded to the respective parameters of the drive if...

- the characteristic number for this encoder was entered in "S-0-0602.x.1, Phys. encoder type",
- the encoder was automatically recognized by the controller by scanning the encoder interfaces after "load basic parameters" and the encoder data memory is read thereupon.

This parameterization/configuration is supported by dialogs in ctrlX DRIVE Engineering, see also ↘ “Commissioning ”.

.Data memory range for user data

ACURO®link encoders are equipped with an encoder data memory and also provide a data memory range for user data (OEM memory range) with 7.5 kbytes besides providing their own encoder-specific data. The data are stored in non-volatile form. That is to say, the stored data are maintained in the case of voltage failure. For MS2N motors, the motor parameter values are stored in the OEM memory range and provided with write protection. Otherwise, the user data memory range is available for additional data.