Versions

The extended EnDat interface version 2.2 is compatible in its communication, command set and time conditions with version 2.1, but also offers significant advantages. It makes it possible, for example, to transfer additional information with the position value without sending a separate request for it. The interface protocol was expanded and the time conditions were optimized. In addition, encoders with ordering designations EnDat 02 or EnDat 22 have an extended power supply range.

Both EnDat 2.1 and EnDat 2.2 are available in versions with or without incremental signals. EnDat 2.2 encoders feature a high internal resolution. Therefore, depending on the control technology being used, interrogation of the incremental signals is not necessary. To increase the resolution of EnDat 2.1 encoders, the incremental signals are evaluated in the subsequent electronics.

Command set

The command set is the sum of all available mode commands. The EnDat 2.2 command set includes EnDat 2.1 mode commands. When a mode command from the EnDat 2.2 command set is transmitted to EnDat-01 subsequent electronics, the encoder or the subsequent electronics may generate an error message.

EnDat with command set 2.2 (includes EnDat 2.1 command set)

- Position values for incremental and absolute encoders
- Additional information on position value
  - Diagnostics and test values
  - Absolute position values after reference run of incremental encoders
  - Parameter upload/download
  - Commutation
  - Acceleration
  - Limit position signal
  - Temperature of the encoder PCB
  - Temperature evaluation of an external temperature sensor (e.g. in the motor winding)

EnDat with command set 2.1

- Absolute position values
- Parameter upload/download
- Reset
- Test command and test values

Interface	Command set	Ordering designation	Version	Clock frequency
EnDat	EnDat 2.1 or EnDat 2.2	EnDat 01	With incremental signals	≤ 2 MHz
		EnDat 21	without incremental signals	
	EnDat 2.2	EnDat 02	With incremental signals	≤ 2 MHz
	EnDat 2.2	EnDat 22	without incremental signals	≤ 8 MHz

Benefits of the EnDat Interface

- **Automatic self-configuration:** All information required by the subsequent electronics is already stored in the encoder
- **High system security** through alarms and messages for monitoring and diagnosis
- **High transmission reliability** through cyclic redundancy checking
- Faster configuration during installation: **Datum shifting** through offsetting by a value in the encoder

Other benefits of EnDat 2.2

- **A single interface** for all absolute and incremental encoders
- **Additional information** (limit switch, temperature, acceleration)
- **Quality improvement:** Position value calculation in the encoder permits shorter sampling intervals (25 µs)

Advantages of purely serial transmission specifically for EnDat 2.2 encoders

- **Simple subsequent electronics** with EnDat receiver chip
- **Simple connection technology:** Standard connecting elements (M12 — 8-pin) single-shielded standard cable and low wiring costs
- **Minimized transmission times** through adaptation of the data word length to the resolution of the encoder
- **High clock frequencies** up to 8 MHz. Position values available in the subsequent electronics after only approx. 10 µs
- **Support for state-of-the-art machine designs** e.g. direct drive technology

Functions

The EnDat interface transmits absolute position values or additional physical quantities (only EnDat 2.2) in an unambiguous time sequence and serves to read from and write to the encoder's internal memory. Some functions are available only with EnDat 2.2 mode commands.

Position values can be transmitted with or without additional information. The additional information types are selectable via the Memory Range Select (MRS) code. Other functions such as parameter reading and writing can also be called after the memory area and address have been selected. Through simultaneous transmission with the position value, additional information can also be requested of axes in the feedback loop, and functions executed with them.

Parameter reading and writing is possible both as a separate function and in connection with the position value. Parameters can be read or written after the memory area and address is selected.

Reset functions serve to reset the encoder in case of malfunction. Reset is possible instead of or during position value transmission.

Servicing diagnosis makes it possible to inspect the position value even at standstill. A test command has the encoder transmit the required test values.

You can find more information in the *Technical Information for EnDat 2.2* document or on the Internet at www.endat.de.