

## Series Specifications



- **Semi-absolute Multiturn Encoder**
- **High Resolution and Accuracy**
- **Programmable Functions**
- **Encoder Diagnostics**
- **Communication via RS485 Interface**
- **Field Bus and Point-to-Point Communication**
- **Fast Response for Real-time Applications**
- **Available in several housing and shaft / hollow shaft options**

### Description

The Scancon *eCODE* encoders are a series of optical absolute multiturn encoders.

The *eCODE* series are communicating encoders that communicate over a standard RS485 serial interface and therefore do not need any specialized hardware. Only four wires are needed for power and communication.

The *eCODE* series is based on incremental encoders which will need to be calibrated after each power-up, thus the term semi-absolute. After an encoder is calibrated all functionality is identical to a “true” absolute encoder. The *eCODE* encoders have internal functions to assist in the calibration procedure.

Encoders in this series use a precision interpolating optical system which provides high resolution and accuracy. All data from the interpolating system are processed by a powerful microprocessor insuring that all position data is accurate and recent within a few microseconds.

The *eCODE* series implements several programmable functions including resolution, direction of rotation and preset/reset functions. It also implements diagnostic functions with warning and error status.

Encoders in this series utilize the *eCODE* and the Modbus protocols. The *eCODE* protocol consists of three sub-protocols:

- ***eCODE-P2P*** is a fast point-to-point protocol for real-time applications and is suitable, due to its low latency, for closed-loop motor control.
- ***eCODE-FB*** is a fast field-bus protocol with the ability to address 247 devices.
- ***eCODE-ASCII*** is a somewhat slower, but also more detailed, field-bus protocol with the ability to address 247 devices.

For a description of the Modbus protocol, please visit [www.modbus.org](http://www.modbus.org).

The *eCODE* series can be delivered in a broad range of encoder housings with both shaft and hollow shaft options of various dimensions.

Scancon’s *eCODE* encoders are an ideal solution for applications in industries such as Assembly, Machine Tools, Elevators, Material Handling, Oil & Gas, Wind Energy, Mining, Motors and Drive Systems.

General Specifications	
<b>Encoder Type:</b>	Optical semi-absolute multiturn
<b>Resolution:</b>	32 bit total 13 bit (8,192) revolutions 19 bit (524,288) per revolution
<b>Accuracy:</b>	±0.01° mechanical (36 arc sec.)
<b>Repeatability:</b>	±0.005° mechanical (18 arc sec.)
<b>Operating Speed:</b>	4,500 rpm max.
<b>Programmable Functions:</b>	Positions per revolution Direction of rotation Min. and max limits Position preset and reset Calibration position Calibration assistance Communication protocol Device address Baud rate Termination resistor on/off
<b>Diagnostic Functions:</b>	Error and warning status Encoder temperature Supply voltage Light intensity of internal LED Operational time counter

Electrical Specifications	
<b>Supply Voltage:</b>	5 VDC ±10% 9 - 30 VDC as option
<b>Current Consumption:</b>	< 80 mA @ 5 V (no load) < 60 mA @ 9 - 30 V (no load)
<b>Electrical Protection:</b>	Reverse polarity, overvoltage (voltage clamp) Short circuit protection on outputs (bus driver)
<b>Immunity and Emission:</b>	EN61000-6-2, EN61000-6-4
<b>Maximum Cable Length:</b>	Dependent on baud rate: - 200 meter for low baud rates - 30 meter for highest baud rate If the encoder is powered through the cable, voltage drop over the cable length must be taken into consideration

Communication Specifications	
<b>Interface:</b>	EIA-RS485
<b>Protocols:</b>	<i>eCODE</i> -P2P (point-to-point) <i>eCODE</i> -FB (field-bus) <i>eCODE</i> -ASCII (field-bus) Modbus RTU (field-bus)
<b>Communication Parameters:</b>	8 databit, no parity, 1 stop bit 8 databit, even parity, 1 stop bit selectable for Modbus protocol
<b>Baud Rates:</b>	All common baud rates from 19,200 to 3.68 Mbaud
<b>Data Format:</b>	Binary ( <i>eCODE</i> -P2P, <i>eCODE</i> -FB, and Modbus RTU) ASCII ( <i>eCODE</i> -ASCII)
<b>Address Range:</b>	1 to 247 for all bus protocols
<b>Request Cycle Time:</b>	40 µsec. min. ( <i>eCODE</i> -P2P protocol @ 3,68 Mbaud)

Environmental Specifications	
<b>Operating Temperature:</b>	-40° to +85° C
<b>Storage Temperature:</b>	-40° to +85° C
<b>Shock:</b>	100 G @ 11 ms
<b>Vibration:</b>	10 - 2000 Hz @ 10 G
<b>Bump:</b>	10 G @ 16 ms (1000 x 3 axis)
<b>Humidity:</b>	98% RH non-condensing

Connection Options	
<b>Connector:</b>	5-pin M12 male (specify 1 or 2 connectors)

Mechanical Specifications	
<b>Housing:</b>	Available in several Scancon housings from Ø50 mm to Ø115 mm
<b>Shaft/Hollow Shaft:</b>	Available in both shaft and hollow shaft versions