E201-9Q
Matlab Interface

The E2019Q.m file is intended for communication between Matlab and the E201-9Q USB encoder interface. It supports an almost complete command set, which is described in detail in the E201 USB encoder interface data sheet.

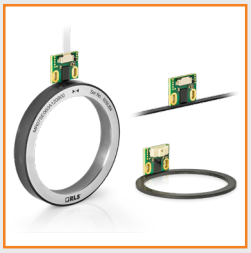
Matlab functions are defined as methods of a common class called E2019Q. This allows several different functions to be stored in a single Matlab ».m« file. The methods are intended to:

- establish the connection between Matlab and E201-9Q,
- read the status of E201-9Q and encoder,
- check and control the power supply of the encoder,
- read the position of the encoder in different formats.

To establish a connection, the user must first determine which Virtual COM port has been assigned to the E201-9Q interface.

A short description of all functions supported by the E2019Q.m interface can be found on the following pages.

Related products



RLC2IC Miniature Incremental Magnetic Encoder

RLM Miniature Incremental Magnetic Encoder

LM10 Incremental Magnetic Encoder

LM13 Incremental Magnetic Encoder

1. Open COM port:

```
% Function call:
E2019Q_ID = E2019Q.Open_COM_Port('COM49');

% E2019Q_ID is here used as a name for the serial port object and could be choosen freely.
% This object will be used as an input parameter for other functions.
% When calling Open_COM_Port function, COM number (COM49 in upper case) has to be placed
% between single quotes.
% The actual port number depends on how many COM ports are already in use on the PC.
% In Windows 7 this can be found under:
%       Control Panel > System > Device Manager > Ports (COM & LPT)
```

2. Close COM port:

```
% Function call:
E2019Q.Close_COM_Port(E2019Q_ID);

% User has to close COM port with this function before physically disconnecting USB cabel
% from a PC.
```

3. Read E201-9Q software version:

```
% Function call:
SW_Version = E2019Q.GetSoftwareVersion(E2019Q_ID);

% Return value is a string (version + CR).
```

Example of returned value: SW_Version = E201-9Q V1.19

4. Read E201-9Q serial number:

```
% Function call:
Serial_Num = E2019Q.GetSerialNumber(E2019Q_ID);

% Return value is a string (aaaaaaaa : bbbbbbbb : cccccccc + CR).
```

Example of returned value: Serial_Num = 05d9ff35 : 39365041 : 43226728

5. Read encoder supply status, voltage and current consumption:

```
% Function call:
Enc_Supply = E2019Q.GetEncSupply(E2019Q_ID);

% Return value is a string (s : a.aaa V : bbbb mA + CR), where "s" represents
% power supply status (1 or 0), "a.aaa" represents voltage and "bbbb"
% represents current consumption.
```

Example of returned value: Enc_Supply = 1 : 4.889 V : 0089 mA

6. Read status of hardware input pins on interface:

```
% Function call:
Pin_Status  = E2019Q.GetInputPinStatus(E2019Q_ID);

% Return value is a string (abz + CR).
```

Example of returned value: Pin_Status = 110

7. Turn off power supply to encoder:

```
% Function call:
Power_Supply = E2019Q.EncSupply_OFF(E2019Q_ID);

% Return value is a string (OFF + CR).
```

Example of returned value: Power_Supply = OFF

8. Turn on power supply to encoder:

```
% Function call:
Power_Supply = E2019Q.EncSupply_ON(E2019Q_ID);

% Return value is a string (ON + CR).
```

Example of returned value: Power_Supply = ON

9. Read encoder position (string, decimal):

```
% Function call:
Enc_Position = E2019Q.GetEncPosition(E2019Q_ID);

% Return value is a string (nnnn:rrrr:ssss + CR), where "n" represents
% encoder count, "r" represents count value when reference/index was last
% seen, "s" represents status (status value of 1 shows that a reference was
% already detected).
```

Example of returned value: Enc_Position = 198460: 175852: 1

10. Read encoder position (string, decimal) with position timestamp in µs:

```
% Function call:
Enc_Position = E2019Q.GetEncPosition_Timestamp(E2019Q_ID);

% Return value is a string (nnnn:rrrr:ssss:tttt + CR), where "n" represents
% encoder count, "r" represents count value when reference/index was last
% seen, "s" represents status (status value of 1 shows that a reference was
% already detected), "t" represents position timestamp in microseconds.

% Note: available in E201 interface version 1.18 (and later)
```

Example of returned value: Enc_Position = 198455: 175852: 1: 1098036264

11. Read encoder position (string, HEX):

```
% Function call:
Enc_Position = E2019Q.GetEncPositionHEX(E2019Q_ID);

% Return value is a string (nnnnnnnnrrrrrrrrssssssss + CR), where "n" represents
% encoder count (signed 32 bit) in HEX format, "r" represents count value when reference/index
% was last seen (signed 32 bit) in HEX format, "s" represents status (status value of 1 shows
% that a reference was already detected).
```

Example of returned value: Enc_Position = 000307370002aeec00000001

12. Read encoder position (string, HEX) with position timestamp in µs:

```
% Function call:
Enc_Position = E2019Q.GetEncPositionHEX_Timestamp(E2019Q_ID);

% Return value is a string (nnnnnnnnrrrrrrrrssssssssttttttttt + CR), where "n" represents
% encoder count (signed 32 bit) in HEX format, "r" represents count value when reference/index
% was last seen (signed 32 bit) in HEX format, "s" represents status (status value of 1 shows
% that a reference was already detected), "t" represents position timestamp in microseconds in
% HEX format.

% Note: available in E201 interface version 1.18 (and later)
```

Example of returned value: Enc_Position = 00068db80003c1f40000000101de39a6

13. Clear reference status flag:

```
% Function call:
E2019Q.ClearReferenceFlag(E2019Q_ID);

% Return value - none. Function clears reference status flag and leaves
% encoder count and reference mark intact.
```

14. Set current count value to zero:

```
% Function call:
E2019Q.ResetCurrentCount(E2019Q_ID);

% Return value - none. Function resets encoder count value to 0. This also affects the
% reference mark.
```

15. Clear zero offset value stored by “ResetCurrentCount” function:

```
% Function call:
E2019Q.ClearZeroOffset(E2019Q_ID);

% Return value - none. Function clears offset value stored by
% "ResetCurrentCount" function.
```

16. Read encoder count in double precision format:

```
% Function call:
Enc_Count = E2019Q.GetEncCountDOUBLE(E2019Q_ID);

% Return value is an encoder count value in double precision format.
```

Example of returned value: Enc_Count = 206849

17. Read encoder reference mark in double precision format:

```
% Function call:
Enc_Reference = E2019Q.GetEncReferenceDOUBLE(E2019Q_ID);

% Return value is an encoder reference mark in double precision format.
```

Example of returned value: Enc_Reference = 43400

18. Read timestamp of position in double precision format:

```
% Function call:
Pos_Timestamp = E2019Q.GetTimestampDOUBLE(E2019Q_ID);

% Return value is a position timestamp in double precision format.
```

Example of returned value: Pos_Timestamp = 51804753

All functions which return any value have integrated timeout set to 3 seconds. If COM port reading is not completed during that time, reading procedure is terminated and »Timeout occurs while reading COM port« is displayed in Command Window.

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Document issues

Date	Issue	Page	Description
27. 6. 2016	1	-	New document
7. 9. 2023	2	-	New design