

ESC30xxZ RS485 Interface User Manual

This interface can be transmitted and received using Transceiver for RS485.

Differential output of RS485 +D is connected to Yellow wire of ESC30xxZ, -D is connected to Brown wire of ESC30xxZ.

Interface

Be communicated according to the following communication protocol.

Regarding to this communication protocol is half-duplex, after transmitting side completes the transmission, it will be changed to reception state.

It is master/slave communication system. Master (controller) is ID=0, Slave (sensor) is IP=0001~9998.

Interface	RS485 2 wires Master (Controller) ID: 0 Slave (Sensor) ID: 0001~9998 (9999 is broadcast) UP to 32 slaves can be connected by multi-drop.
Communication speed	9600bps (default) or 115200bps
Format	Start bit : 1 bit Data : 8 bits Stop bit : 1 bit No Parity bit.

Command frame

DUMMY 0x2a (1)	'< 0x3c (1)	ID (4)	Space 0x20 (1)	Command (1~)	Space 0x20 (1)	Data (1~)	'> 0x3e (1)	CRC (4)	CR 0x0d (1)
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Response frame

DUMMY 0x2a (1)	'[' 0x5b (1)	ID (4)	Space 0x20 (1)	Command (1~)	Space 0x20 (1)	Data (1~)	Error code (3)	']' 0x5d (1)	CRC (4)	CR 0x0d (1)
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CRC

CRC is used instead of Parity.

The calculation objects are from ID to Data.

CCIT

Bit length	16bits
Polynomial	$1+X^5+X^{12}+x^{16}$
Initial value	0xFFFF
Feed	LSB First (right-feed)
Output operation	No output inverting

Error code

R00	Not error
R01	Wrong command
R07	Violating value

Commands

1. Retrieving and changing of ID

Command frame	<0001 ID xxxx >
Response frame	[0001 ID xxxx R00]
Data value	0001~9999 Default : '0001'
Function	Changing ID

2. Retrieving of Serial number

Command frame	<0001 SERIAL>
Response frame	[0001 SERIAL xxxxxxxxx R00]
Data value	000000001~999999999
Function	Retrieving Serial number

3. Single retrieving of tilt angle data

Command frame	<0001 A>
Response frame	[0001 A "X" "Y" R00]
Data value	"X" : Tilt angle data of X axis "Y" : Tilt angle data of Y axis -999.99~999.99 (deg.)
Function	Retrieving tilt angle data singly

4. Serial retrieving of tilt angle data (Start)

Command frame	<0001 A_ START>
Response frame	[0001 A "X" "Y" R00]
Data value	"X" : Tilt angle data of X axis "Y" : Tilt angle data of Y axis -999.99~999.99 (deg.)
Function	Start serial tilt angle data retrieving

5. Serial retrieving of tilt angle data (End)

Command frame	<0001 STOP>
Response frame	[0001 STOP R00]
Function	End serial tilt angle data retrieving

6. Setting output cycle of serial data

If data is not attached to command, response will be current setting value.

Command frame	<0001 INTERVAL xxx>
Response frame	[0001 INTERVAL xxx R00]
Data value	100~10000 / Step : 10 Default : '200' (ms)
Function	Setting output cycle of serial data

Note: If you will need to set less than 100ms, baud rate will be needed to set to 115200.

7. Changing damper setting

If data is not attached to command, response will be current setting value.

Command frame	<0001 DAMPER xx>
Response frame	[0001 DAMPER xx R00]
Data value	00~15 Default : 00
Function	Changing damper setting

8. Setting of Index point

Command frame	<0001 INDEX_SET>
Response frame	[0001 INDEX_SET "X" "Y" R00]
Data value	"X" : Index point of X axis "Y" : Index point of Y axis -5.000~+5.000 Default : '0.0' (deg.)
Function	Setting the state position to be the index point. Except out of -5.000~+5.000.

9. Resetting all data

Command frame	<0001 RESTORE>
Response frame	[0001 RESTORE R00]
Function	Resetting all parameter values which changeable by the user.

Appendix I : Digital damper setting value and cut-off frequency

Damper	Cut-off frequency (Hz)	Time constant (ms)
00	11.22	64
01	9.27	79
02	7.65	94
03	6.32	111
04	5.21	131
05	4.30	155
06	3.55	184
07	2.93	217
08	2.42	257
09	2.00	304
10	1.65	360
11	1.36	425
12	1.12	504
13	0.93	596
14	0.77	704
15	0.63	840

-4-

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