Modbus Transducer Digital Communication

User's Manual

Firmware Version 224475D

Stellar Technology Incorporated

P/N 225268 Rev. C

Contents

Modbus commands

Modbus implementation:
RTU mode over RS-485.

Communication parameters:
1 start bit, 8 data bits, 1 stop bit, EVEN parity, 9600 baud.

Device Address 0
Broadcast transmission mode, no reply received from a slave.

Device Address 1 – 249
Unicast transmission mode, addressed slave will reply.

In addition, address 250 is a Transparent Address – a single slave on a bus will reply regardless of it's own unique address. Can be used to query the address of a device.

0x03 Read Holding Registers

Description:
This function used to read the contents of a contiguous block of holding registers in a remote device. Supported parameters are listed in a table below.

Request

Device Address	Function Code	Start Addr HI	Start Addr LO	# of Regs HI	# of Regs LO	CRC16 LO	CRC16 HI

Response

Device Address	Function Code	Byte Count	Data	CRC16 LO	CRC16 HI

Available parameter values

Channel	Description	Start Address		# Of Registers		Unit
		HI	LO	HI	LO	
Ch1 (IEEE754)	Pressure	00	00	00	02	PSI
Ch2 (IEEE754)	Temperature*	00	02	00	02	°F
Ch1 (Custom)	Pressure	00	04	00	01	PSI
Ch2 (Custom)	Temperature*	00	06	00	01	°F

Error

Device Address	0x83	0x02	CRC16 LO	CRC16 HI

Example

Request

0x01	0x03	0x00	0x00	0x00	0x02	0xC4	0x0B

Response

0x01	0x03	0x04	0x41	0x8B	0x40	0x1F	0x2D	0xEE

Note:
* - RTD must be installed (optional) for a unit to provide a valid temperature data.

0x06 Write Single Register

Description:
This function code is used to write a single holding register in a remote device. Supported parameters are listed in a table below.

Request

Device Address	Function Code	Start Addr HI	Start Addr LO	Regs HI	Regs LO	CRC16 LO	CRC16 HI

Response

Echo of the command.

Device Address	Function Code	Start Addr HI	Start Addr LO	Regs HI	Regs LO	CRC16 LO	CRC16 HI

Available parameter values

Description	Address	
	HI	LO
Slave ID	00	00
Baud Rate	00	01

Error

Device Address	0x86	Exception Code	CRC16 LO	CRC16 HI

Example

1. Set Baud Rate to 9600:

Request

0x01	0x06	0x00	0x01	0x25	0x80	0xC3	0x3A

Response

0x01	0x06	0x00	0x01	0x25	0x80	0xC3	0x3A

2. Set Slave ID to 2:

Request

0x01	0x06	0x00	0x00	0x00	0x02	0x08	0x0B

Response

0x01	0x06	0x00	0x00	0x00	0x02	0x08	0x0B

0x11 Report Slave ID

Description:

This function code is used to read the description of the type, the current status, and other information specific to a remote device.

Request

Device Address	Function Code	CRC16 LO	CRC16 HI

Response

Device Address	Function Code	Byte Count	Slave ID	Run Indicator Status	Additional Data	CRC16 LO	CRC16 HI

0x2B Read Device Identification

Description:
This function code allows reading the identification information relative to the remote device. The Read Device Identification interface is modeled as an address space composed of a set of addressable data elements. The data elements called objects and an object Id identifies them. The current implementation supports only the Basic Device Identification, which consists of Vendor Name, Product Code and revision number.

Request

Device Address	Function Code	MEI Type	Read Dev Id	Object ID	CRC16 LO	CRC16 HI

Response

Device Address	Function Code	MEI Type	Read Dev Id	Conformity Level	More Follows	Next Obj. Id	# Of Obj.

Obj. ID	Obj. Length	Obj. Value

...

CRC16 LO	CRC16 HI

Error

Device Address	0xAB	0x0E	0x01	CRC16 LO	CRC16 HI

Example

Request

0x01	0x2B	0x0E	0x01	0x00	CRC16 LO	CRC16 HI

Response

0x01	0x2B	0x0E	0x01	0x01	0x00	0x00	0x03

0x00	0x16	"STELLAR TECHNOLOGY INC"		
0x01	0x10	"GT2511-5801G-102"		
0x02	0x05	"V1.00"	CRC16 LO	CRC16 HI

0x44 Read Info Structure

Description:
This function code allows reading data from the Info structure.

Request

Device Address	Function Code	Sub Code	CRC16 LO	CRC16 HI

Response

Device Address	Function Code	Data Field	CRC16 LO	CRC16 HI

Sub Code	Data Field	
	Size, Bytes	Description
0x21	1	Bus Address
0x22	4	Offset, in IEEE 754 format
0x23	4	Span, in IEEE 754 format
0x24	3	Calibration Date (MMDDYY)

Error

Device Address	0xC4	0x01	CRC16 LO	CRC16 HI

Example

Request

0x01	0x44	0x21	0xD3	0x18

Response

0x01	0x44	0x01	0xC0	0xD2

0x51 Set Info Structure

Description:
This function code allows setting various values in the Info structure.

Request

Device Address	Function Code	Sub Code	Data Field	CRC16 LO	CRC16 HI

Response
None

Sub Code	Data Field	
	Size, Bytes	Description
0x21	1	Bus Address
0x22	4	Offset, in IEEE 754 format
0x23	4	Span, in IEEE 754 format
0x2B	4	Baud Rate, in IEEE 754 format

Error

Device Address	0xC5	0x01	CRC16 LO	CRC16 HI

Example

Request

0x01	0x51	0x21	0x01	0xC9	0x9D

Sets the Modbus address to 0x01

0x01	0x51	0x2B	0x46	0x16	0x00	0x00	0xD7	0x23

Sets Baud Rate to 9600

0x47 Read Serial Number

Description:
This function code queries the transducer's serial number.

Request

Device Address	Function Code	CRC16 LO	CRC16 HI

Response

Device Address	Function Code	SN1	SN2	SN3	SN4	CRC16 LO	CRC16 HI

Error

Device Address	0xC7	0x01	CRC16 LO	CRC16 HI

Example

Request

0x01	0x47	0x40	0x12

Response

0x01	0x47	0x00	0x06	0x0F	0x60	0xAD	0xE8

The preceding serial number 0x00, 0x06, 0x0F, 0x60 is interpreted as 00061596.

0x48 NULL Pressure Output

Description:
This function code allows to NULL the pressure output of a transducer. Use this command when the transducer is at 0 PSIG.

Request

Device Address	Function Code	CRC16 LO	CRC16 HI

Response
None

Error

Device Address	0xC8	0x01	CRC16 LO	CRC16 HI

Example

Request

0x01	0x48	0x00	0x16

Response
None