SIEMENS

SEZ50MB
RWD Primary Controls Modbus Interface
Basic Documentation

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Building Technologies

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1 About This Document

1.1 Before Starting

RWD Products

This document applies to the following products:

Name	Type (ASN)
RWD Modbus Interface Unit, AC 24 V	SEZ50MB
RWD Standard Primary Controls, AC 230 V	RWD32
RWD Standard Primary Controls, AC 24 V	RWD62
RWD Standard Primary Controls, AC 24 V	RWD68
RWD Standard Primary Controls, AC 24 V	RWD82
RWD Heat Pump Controls, AC 230 V	RWD34
RWD Heat Pump Controls, AC 24 V	RWD44
RWD Heat Pump Controls, AC 24 V	RWD45
RWD Solar Controls, AC 230 V	RWD32S
RWD & SEZ50MB Accessory: Wall or Panel Mounting Enclosure	ARG62.21

Use

This document explains the general functions of the SEZ50MB and how to use it to monitor all control parameters and update some writable control parameters for RWD's applications.

Target Audience

Product & Sales managers, Re-seller & OEM customers who use SEZ50MB to build Modbus network for RWD devices.

Prerequisites

It is assumed that the target audience has:

- Basic understandings on RWD products, Modbus protocol and their applications. Detailed information about Modbus can be obtained from www.Modbus.org;
- Knowledge of HVAC system and local electrical installation regulations where SEZ50MB is employed;
- Basic knowledge of instrumentation and control operation.

1.2 Additional Documents

Further Information

You can refer to the following documents for further information:

Document	Document No.
SEZ50MB RWD Modbus Interface Unit, Datasheet	N3099
RWD32 Standard Primary Controls, Datasheet	N3341
RWD62 Standard Primary Controls, Datasheet	N3341
RWD68 Standard Primary Controls, Datasheet	N3342
RWD82 Standard Primary Controls, Datasheet	N3343
RWD34 Heat Pump Controls, Datasheet	N3346
RWD44 Heat Pump Controls, Datasheet	N3346
RWD45 Heat Pump Controls, Datasheet	N3347
RWD32S Solar Controls, Datasheet	N3344
SEZ50MB, Datasheet	N3099
SEZ50MB, Installation Manual	M3099
SEZ50MB, Operating Instructions	B3099

1.3 Abbreviations & Terminologies

NA	Not Available
R-only	Read Only
W-only	Write Only
R-W	Read & Write
Hex	Hexadecimal Value
Modbus	Modbus is a serial communication protocol published by Modicon. It has become a standard communications protocol in industry.

1.4 Important Notes

⚠ This symbol draws your attention to special safety notes and warnings. If such notes are not observed, personal injury and / or considerable damage to property would occur.

Field of use

The products listed under "Product Overview" in Section 2 must be used for the applications in accordance with product listed on Section 1.2 of this document (For details, please refer to datasheet of individual products)

Correct use

The prerequisites for safe and trouble-free operation of this product are correct transportation, storage, installation and commissioning, as well as careful operation.

Electrical installation

Fuses, switches, wiring and grounding should be in compliance with local safety regulations for electrical installations.

Commissioning

Commissioning of this product and products connected with it must be undertaken by qualified staff that has been appropriately trained by Siemens Building Technologies.

Wiring

When wiring the system, the AC 230 V section must be strictly segregated from the safety extra low-voltage (SELV) section in order to ensure protection against electric shock hazard! For the AC 24 V supply, the AC 24 V input (G) and Ground (G0) terminals are clearly labeled on each product. These two wires must not be swapped.

Faults

Should system faults occur and you are not authorized to make diagnostics and to rectify faults, please call your service staff of Siemens Building Technologies.

⚠ Only authorized staffs are permitted to perform diagnostics, to rectify faults and to restart the plant.

Storage and transport

For storage and transport, the limits given in the relevant datasheets must always be observed. If you have any questions, please contact your local supplier.

Disposal

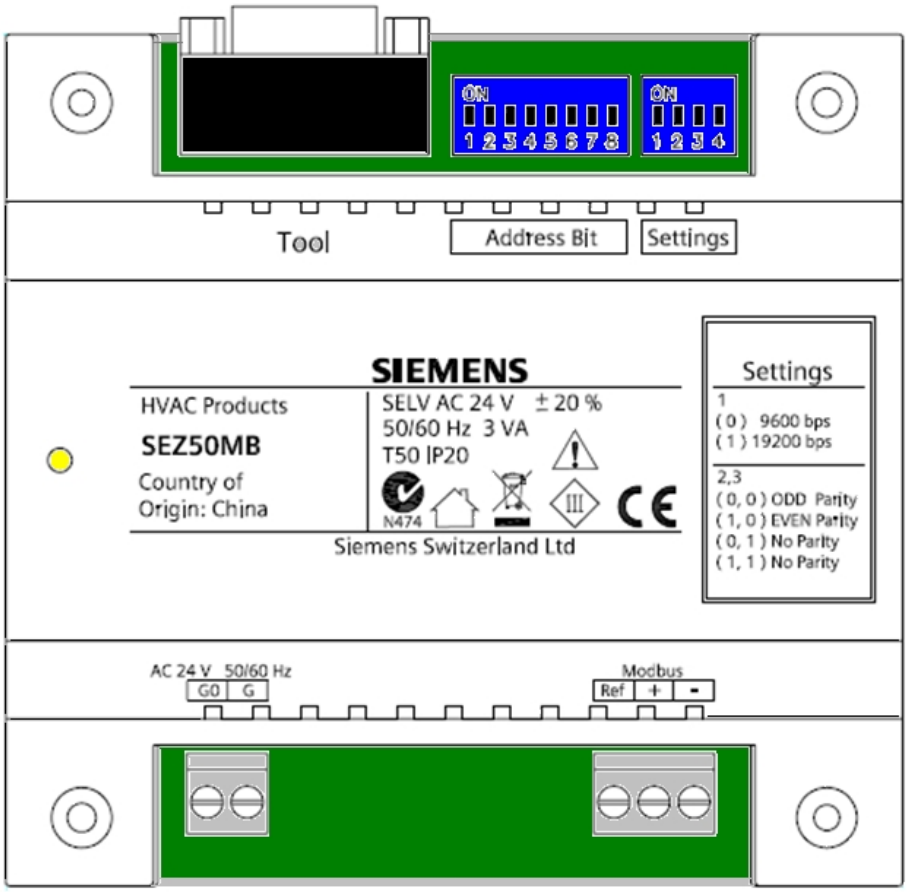
The products contain electrical and electronic components and must **not** be disposed of as domestic waste.
Current local legislations must be observed!

2 Product Overview

SEZ50MB Overview

The SEZ50MB enables remote monitoring on RWD devices in the same Modbus network. Please referred to SEZ50MB datasheet CB1N3099.

The SEZ50MB product is shown as below:



Interface Summary

There are terminals, connector and indicator on the SEZ50MB summarizing in the following table:

SEZ50MB Interface Terminals, Connector and Indicator
AC 24 V SELV Power Supply Interface (G, G0)
Modbus RS485 Interface (+, -, Ref)
RS232 Interface (DB9 Male Connector)
The Amber LED Indicator Power Supply Connection & Communication (it will flash when data going in/out from SEZ50MB)

Interface Descriptions

AC 24 V SELV Power Supply Interface (2-Pin Terminal)
G & G0 terminals are for AC 24 V SELV power supply (LED indicates power on)

Modbus RS485 Interface (3-Pin Terminal)
+, - Differential Signals
Ref Differential COMMON

RS232 Interface

A 1.5 meters long RS232 cable is provided together with SEZ50MB and the RS232 cable is one-to-one type (the same pin numbers are connected at both ends of this cable). The DB9 male socket of the RS232 cable will be connected to RWD device while the female plug will be connected to SEZ50MB.

The table below lists the pin numbers and their corresponding functions of DB9 female plugs of RS232 interface connected to SEZ50MB:

Pin No.	Descriptions	Functions (SEZ50MB side)
1	Not Used	Not Used
2	RXD	Receive Input
3	TXD	Transmit Output
4	Voltage Output 1	DC +12 V
5	Reference Ground RS232	0 V
6	Not Used	Not Used
7	Voltage Output 2	DC -12 V
8	Not Used	Not Used
9	Not Used	Not Used

Note: *The DB9 male socket of RS232 interface connected on the RWD device will have TXD at Pin 2 and RXD at Pin3; Pin 4 & 7 will be "Inputs".*

Device Address Bit

The SEZ50MB device address can be set via a 8-way DIP switch and the valid addresses are 1 to 247.

DIP switch Position à	1	2	3	4	5	6	7	8
Address No.	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
Broadcast Address (=0)	0	0	0	0	0	0	0	0
User Addresses (=1 to 247)	0	0	0	0	0	0	0	1
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	1	1	1	1	0	1	1	1
Reserved Address (=248 to 255)	1	1	1	1	1	0	0	0
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	1	1	1	1	1	1	1	1

Device Setting

The communication settings such as baud rate, parity and stop bits can be set via a 4-way DIP switch.

DIP switch Position	Function Settings	ON (1) or OFF (0)		
1	Baud Rate Selection	**ON**		**19200 bps (Default)**
		OFF		9600 bps
2, 3	Parity & Stop Bits	OFF	OFF	ODD Parity, 1 Stop Bit
		ON	**OFF**	**Even Parity, 1 Stop Bit (Default)**
		OFF	ON	None Parity, 2 Stop Bits
		ON	ON	None Parity, 2 Stop Bits
4	Reserved	ON		No Function
		OFF		**No Function (Default)**

3 Commissioning SEZ50MB

Before connecting any RWD products to SEZ50MB, the RWD device must be configured to one of its available applications manually or via RWD SW configuration tool (Please refer to RWD documentation for more information).

Configuring RWD Manually

The RWD device connected with SEZ50MB must be configured to a selected application first. Various applications for each RWD can be selected via key buttons with the help of the LCD display on the RWD. The steps or details about how to configure RWD device should be referred to RWD datasheet and its Installation and Commissioning Guide.

Configuring RWD Via SW TOOL

Apart from manual configuration for RWD, a RWD SW configuration tool is available. It is a SW program to run on a PC for configuring RWD via the RS232 connection. More information about the SW tool, please contact your local sales office for further supports.

Power up

Before turning on the power supply, please MAKE SURE the followings are checked:

- Check all required connections on the RWD device;
- Configure RWD device to a desired application manually or via the RWD SW tool and check if the standalone operation of this RWD is working properly (Please refer to RWD Installation and Commissioning Guide or datasheet for more details);
- Install SEZ50MB according to the installation manual CB1M3099;
- Set the 8-way DIP switch for SEZ50MB address (1 to 247). If more than one SEZ50MBs are used within the same Modbus network, different DIP switch combinations should be used for other SEZ50MBs;
- Set the 4-way DIP switch on SEZ50MB device for communication settings and the same communication settings should be applied to all SEZ50MBs connected to the same Modbus network;
- Connect the RS232 cable (provided) between RWD device and SEZ50MB;
- For the Modbus network, connect the 3-wire Modbus terminals (+, -, Ref) of the SEZ50MB device to either the RS232 COM port or USB port of a PC via a RS232-TO-RS485 or a USB-TO-RS485 converter (Please refer to “Modbus connection” of next page);
- If multiple SEZ50MBs are used in the same Modbus network, it is recommended to use a single BUS type topology (repeaters required if > 32 x SEZ50MBs) and to terminate the Modbus network at both ends with 150 Ω resistors for best performance. However, it is not allowed to place more than 2 line terminations on one passive balanced pair and never place any line termination on a derivation cable;
- Connect power supply as per diagrams on next page “Power supplies”. Special cares should be taken in the reference ground of each power supply. The SEZ50MB device is recommended to use a SELV AC 24 V supply voltage when connecting with a AC 230 V RWD device.

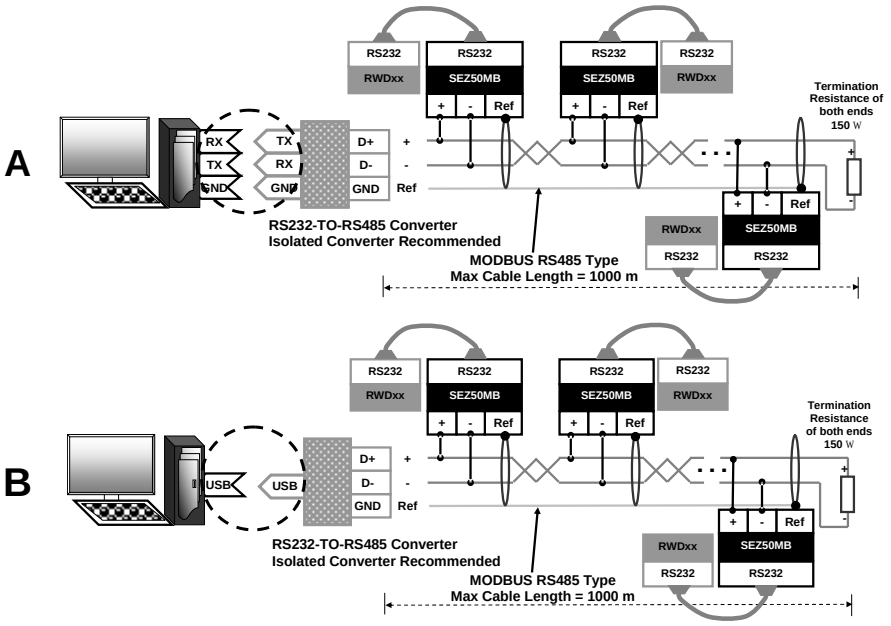
Recommendations:

In order to shorten the trouble shooting time, it is recommended to test the Modbus connection with just one RWD and one SEZ50MB device first. Then, check if the remote monitoring functions via PC can be executed properly, and then connect all SEZ50MBs to the same network.

Due to potential high surge currents along the network cable, it is highly recommended to use RS485 converters with good electrical isolation for protecting the PC.

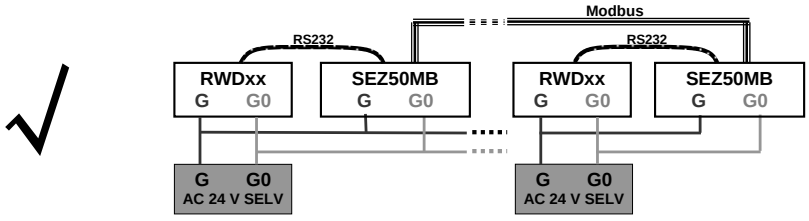
Modbus Connection

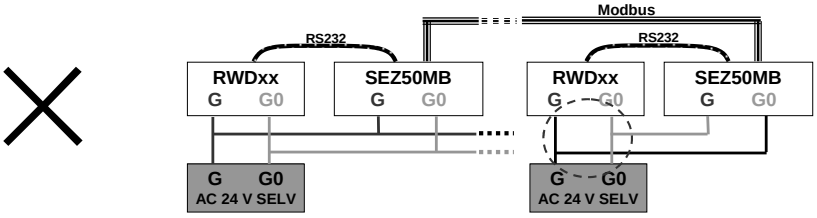
For best performance, the single BUS topology is highly recommended.

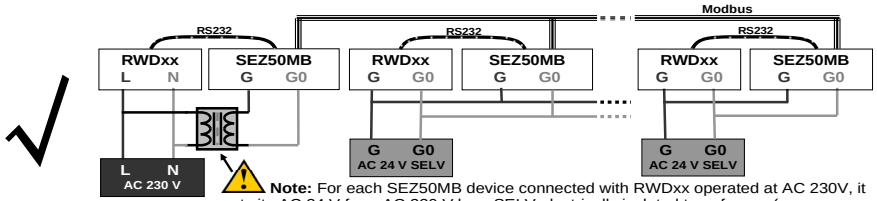


Power Supplies

⚠ Inconsistent and wrong wirings to G & G0 supply terminals for internetworking SEZ50MB Modbus system may cause permanent damages to the devices.







4 Modbus Operation

Modbus Function Codes

The valid Function Codes are as follows:

Function Code (Hex)	Data Length	Functions	RWD Parameter Addressable Ranges
0x01	1	Read R/W Flag (Coil)	0xxxx e.g. 00001, 00003
0x05	1	Write R/W Flag (Coil)	
0x02	1	Read R-only Flag (Discrete Input)	1xxxx e.g. 10004
0x03	2	Read R/W Register (Holding Register)	4xxxx e.g. 40109, 40111
0x10	2	Write R/W Register	
0x04	2	Read R-only Register (Input Register)	3xxxx e.g. 30001, 30007

Examples Of Using Different Modbus Function Codes

The following examples will illustrate how users can construct Modbus messages with all available function codes above and the returned messages from the RWD via SEZ50MB. (To interpret the meanings of the returned messages, please refer to the next section RWD Parameters & Addresses).

Function Code 0x01 **à**

Read RWD32S parameter (ADDR = 00001) called "**bFrostEnable**" with Modbus ADDR = 0000:

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		CRC16 Check	
Send	F7	01	00	00	00	01	E9	5C

	SEZ50MB Device Address	Function Code	Byte Count	Status	CRC16 Check	
Respond	F7	01	01	01 (bFrostEnable = Enable)	A3	C0

Function Code 0x02 **à**

Read RWD68 parameter (ADDR = 10005) called "**Q1_output**" with Modbus ADDR = 0004:

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		CRC16 Check	
Send	F7	02	00	04	00	01	EC	9D

	SEZ50MB Device Address	Function Code	Byte Count	Status	CRC16 Check	
Respond	F7	02	01	00 (Q1_output = Off)	92	00

Function Code 0x03 **à** Read RWD68 parameter (ADDR = 40117, 40118) called "**SP3day**" with Modbus ADDR = 0116, 0117:

	SEZ50MB Device Address	**Function Code**	**Modbus Address**		**Data Length**		**CRC16 Check**	
Send	F7	03	00	74	00	02	90	87

	SEZ50MB Device Address	**Function Code**	**Byte Count**	**Status (IEEE 754 format)**	**CRC16 Check**	
Respond	F7	03	04	41 E0 00 00 (SP3 day setpoint 28 °C)	79	F6

Function Code 0x04 **à** Read RWD68 parameter (ADDR = 30055, 30056) called "**RWDAPP**" with Modbus ADDR = 0054, 0055:

	SEZ50MB Device Address	**Function Code**	**Modbus Address**		**Data Length**		**CRC16 Check**	
Send	F7	04	00	36	00	02	85	53

	SEZ50MB Device Address	**Function Code**	**Byte Count**	**Status (IEEE 754 format)**	**CRC16 Check**	
Respond	F7	04	04	42 48 00 00 (Application No. is 50)	92	00

Function Code 0x05 **à** Write RWD32S parameter (ADDR = 00001) called "**bFrostEnable**" with Modbus ADDR = 0000:

	SEZ50MB Device Address	**Function Code**	**Modbus Address**		**Value**		**CRC16 Check**	
Send	F7	05	00	00	FF	00	98	AC

	SEZ50MB Device Address	**Function Code**	**Modbus Address**		**Value**		**CRC16 Check**	
Respond	F7	05	00	00	FF	00	98	AC

Note: *Only two possibilities for Value above - writing a "0" using Value = 0x 00 00*
or writing a "1" using Value = 0x FF 00

Function Code 0x10 **à** Write RWD68 parameter (ADDR = 40117, 40118) called "**SP3day**" with Modbus ADDR = 0116, 0117:

	SEZ50MB Device Address	**Function Code**	**Modbus Address**		**Data Length**		**Byte Count**
Send	F7	10	00	74	00	02	To below

Data Length	**Byte Count**	**Status (IEEE 754 format)**	**CRC16 Check**	
From Above	04	41 E8 00 00 (SP3 day setpoint 29 °C)	7C	FB

	SEZ50MB Device Address	**Function Code**	**Modbus Address**		**Data Length**		**CRC16 Check**	
Respond	F7	10	00	74	00	02	15	44

Exception Codes

Whenever an unexpected message is received or an error is encountered by SEZ50MB, the SEZ50MB would return a RESPOND for such errors. Modbus communicaton frame contains an error field for exception codes, which can be used by network application to determine what appropriated action will be taken.

Exception Code (Hex)	Function Code Descriptions
0x01	Illegal Function Code
0x02	Modbus ID Check Error
0x03	Range Check Error
0x04	RWD is Lost
0x06	SEZ50MB is Busy
0x07	Gateway Device Lost
0x14	Wrong Setting For Quantity of Items In Modbus Frame

Examples Of Errors

The same examples for the constructing Function Codes are used but errors are added to illustrate how SEZ50MB responses and handles abnormal situation by returning a message containing exception codes to the users.

Function Code 0x01 **à** (Error Message)

Read RWD32S parameter (ADDR = 00001) called "**bFrostEnable**" with Modbus ADDR = 0000:

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		CRC16 Check	
Send	F7	01	00	00	00	00	E9	5C

- **WRONG INFO**

	SEZ50MB Device Address	Function Code	Exception Code	CRC16 Check	
Respond	F7	81	14	A3	C0

Function Code 0x02 **à** (Error Message)

Read RWD68 parameter (ADDR = 10005) called "**Q1_output**" with Modbus ADDR = 0004:

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		CRC16 Check	
Send	F7	02	00	04	00	00	EC	9D

- **WRONG INFO**

	SEZ50MB Device Address	Function Code	Exception Code	CRC16 Check	
Respond	F7	82	14	2D	5D

Function Code 0x03 **à** (Error Message)

Read RWD68 parameter (ADDR = 40117, 40118) called "**SP3day**" with Modbus ADDR = 0116, 0117:

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		CRC16 Check	
Send	F7	03	00	74	00	00 or 01	D0	86

- **WRONG INFO**

	SEZ50MB Device Address	Function Code	Exception Code	CRC16 Check	
Respond	F7	83	14	A1	0D

Function Code 0x04 **à** (Error Message)

Read RWD68 parameter (ADDR = 30055, 30056) called "**RWDAPP**" with Modbus ADDR = 0054, 0055:

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		CRC16 Check	
Send	F7	04	00	36	00	00 or 01	85	53

- **WRONG INFO**

	SEZ50MB Device Address	Function Code	Exception Code	CRC16 Check	
Respond	F7	84	14	A3	3D

Function Code 0x05 **à** (Error Message)

Write RWD32S parameter (ADDR = 00001) called "**bFrostEnable**" with Modbus ADDR = 0000:

	SEZ50MB Device Address	Function Code	Modbus Address		Value		CRC16 Check	
Send	F7	05	00	00	FF	FF	98	AC

- **WRONG INFO**

OR

	SEZ50MB Device Address	Function Code	Modbus Address		Value		CRC16 Check	
Send	F7	05	00	00	00	FF	98	AC

- **WRONG INFO**

	SEZ50MB Device Address	Function Code	Exception Code	CRC16 Check	
Respond	F7	85	03	E2	A3

Note: *Only two possibilities for Value column – writing a "0" using Value = 0x 00 00*

or writing a "1" using Value = 0x FF 00

Function Code 0x10 **à** (Error Message)

Write RWD68 parameter (ADDR = 40117, 40118) called "**SP3day**" with Modbus ADDR = 0116, 0117:

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		Byte Count
Send	F7	10	00	74	00	01	To below

- **WRONG INFO**

Data Length	Byte Count	Status (IEEE 754 format)	CRC16 Check	
From Above	04	41 E8 00 00 (SP3 day setpoint 29 °C)	7C	FB

OR

	SEZ50MB Device Address	Function Code	Modbus Address		Data Length		Byte Count
Send	F7	10	00	74	00	02	To below

Data Length	Byte Count	Status (IEEE 754 format)	CRC16 Check	
From Above	05	41 E8 00 00 (SP3 day setpoint 29 °C)	7C	FB

- **WRONG INFO**

	SEZ50MB Device Address	Function Code	Exception Code	CRC16 Check	
Respond	F7	90	14	AC	3D

Notes:

- The SEZ50MB only support Modbus commands for either READ or WRITE of one parameter each time. If access to consecutive parameters is required, users should issue multiple commands manually or via any Modbus SW tool;
- Each command string may vary depending on function code used, some function codes may take longer time to be processed by SEZ50MB. The longest process time of SEZ50MB would be around 6 seconds;
- Some values may be rounded by SEZ50MB before passing to RWD in order to fulfill the current STEP SIZE and RESOLUTION. For example, if a setpoint is entered as 16.7, it will be presented as 16.7 or rounded to 16.5 – depends on its resolution settings;
- The parameter with # is not recommended to be used during the normal operation of RWD, but can be used during maintenance.

  E.g. Write specific value to parameter address “40179” with function code “0x10” and it will cause reset.

  Therefore, special attention is required:
  Write 12 (0x0C) to device address “40179” to reset RWD32/62/68/82
  Write 167 (0xA7) to device address “40179” to reset RWD34/44/45

5 RWD Parameters & Addresses

The following parameter table contains all available RWD parameters including all input and output signal status. These parameters are mainly for monitoring functions via Modbus network and some of them can be modified during operation.

Besides function codes (READ or WRITE) provided in section 4, you also can refer to the following parameter table for the interpretation of the correct responds or returned values. For more details about RWD parameters, please check individual RWD datasheet.

Notes:

- Please refer to SEZ50MB Parameter Tool for valid parameters of different RWD models;
- Avoid frequent daily WRITE actions to RWD via Modbus because there are limited write cycles allowed for the memory and storage devices where all RWD SW parameters stored;
- The ***** next to the parameter addresses indicate that this parameter can execute both READ and WRITE function codes;
- The # means this parameter should not be used for normal operation;
- If error occurs during the operation or error message received, please refer to the section "Trouble Shooting" for more information.

Parameters

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
00001 *	bFrostEnable	0xFF00 represent 1 0x0000 represent 0	For RWD32S only, 0: Frost Protect Disabled 1: Frost Protect Enabled
00002 *	bGRADEnable	0xFF00 represent 1 0x0000 represent 0	For RWD32S only, 0: GRAD Disable 1: GRAD Enable
00003 *	B3_Display	0xFF00 represent 1 0x0000 represent 0	For RWD32S only, 0: Disable the display of B3 sensor 1: Enable the display of B3 sensor
10001	Ind_Flag	BCD	Configuration of 'Cooling/Direct' or 'Heating /Reverse' 0: Cooling/Direct 1: Heating/Reverse
10002	Relay	BCD	Reversing Valve ON/OFF during no demand 0: Reverse valve OFF 1: Reverse valve ON
10003	State_H/C	BCD	Output Configuration for 1H/1C or 2H/2C 0: 1H/1C 1: 2H/2C
10004	D1_Input	BCD	For RWD32/62/68/82 & RWD34/44/45, Digital Input for D1 (Day/Night) 0: Close (Night) 1: Open (Day)
10005	Q1_output	BCD	Digital Output for Q1 0: Relay de-energized 1: Relay Energized
10006	Q2_output	BCD	Digital Output for Q2 0: Relay de-energized 1: Relay Energized
10007	Q3_output	BCD	Digital Output for Q3 0: Relay de-energized 1: Relay Energized
10008	Q4_output	BCD	Digital Output for Q4 0: Relay de-energized 1: Relay Energized
10009	D1_Input_RWD32S	BCD	For RWD32S only, Digital Input for D1 0: Close 1: Open
10010	Flag_monitor	BCD	Remote monitoring - i.e. Y1 (0 to 10V) represents X1 (0 to 50C) 0: Not selected 1: Selected
30001	X1_input	IEEE754	X1 (Sensor) Input
30003	X2_input	IEEE754	X2 (Sensor) Input
30005	X3_input	IEEE754	X3 (Sensor) Input

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
30007	Y1_output	IEEE754	Analog Output of Y1
30009	Y2_output	IEEE754	Analog Output fo Y2
30011	TempUnit	IEEE754	For RWD32S Temp Unit 0: Celsius 1: Fahrenheit
30013	SensorType	IEEE754	For RWD32S Sensor Type 0: NI 1000 1: PI 1000
30015	D1_func	IEEE754	For RWD34/44/45 only, Function Setting for Input D1 0: ON/OFF 1: Day/Night 2: Alarm 3: Filter Alarm
30017	UNIT	IEEE754	For RWD32/62/68/82 & RWD34/44/45, Unit Setting for Input X1 0: Celsius 1: Fahrenheit 2: Null 3: %
30019	UNIT3	IEEE754	For RWD34/44/45, Unit Setting for Input X3 0: Celsius 1: Fahrenheit 2: % 3: Null 4: Remote monitoring
30021	TYPE1	IEEE754	For RWD32/62/68/82 & RWD34/44/45, Selection of Sensor Type for Input X1 0: Ni1000 1: Pt1000 2: 0 to 10 V 3: VR
30023	TYPE2	IEEE754	For RWD32/62/68/82 & RWD34/44/45, Selection of Sensor Type for Input X2 0: Ni1000 1: Pt1000 2: 0 to 10 V 3: VR or Digital Input
30025	TYPE3	IEEE754	For RWD34/44/45, Selection of Sensor Type for Input X3 0: Ni1000 1: Pt1000 2: 0 to 10 V 3: VR or Digital Input
30027	Compressor_Stage	IEEE754	Compress Stage Selection Status: 1: Stage1 2: Stage2

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
			3: Stage3
30029	RWDType	IEEE754	RWD Type 0: RWD62 1: RWD34 2: RWD32S 3: RWD68 4: RWD32/82 5: NA 6: RWD45 7: RWD44
30031	X1_H	IEEE754	High Range for X1 (Sensor) Input
30033	X1_L	IEEE754	Low Range for X1 (Sensor) Input
30035	X2_H	IEEE754	High Range for X2 (Sensor) Input
30037	X2_L	IEEE754	Low Range for X2 (Sensor) Input
30039	X3_H	IEEE754	High Range for X3 (Sensor) Input
30041	X3_L	IEEE754	Low Range for X3 (Sensor) Input
30043	3P_Output	IEEE754	% of valve opened
30045	B1_TEMP	IEEE754	Temperature sampled via B1 sensor input 32767: B1 input OPEN 32767 to -32768: Value as per IEEE754 -32768: B1 input Shorted to Ground
30047	B2_TEMP	IEEE754	Temperature sampled via B2 sensor input 32767: B2 input OPEN 32767 to -32768: Value as per IEEE754 -32768: B2 input Shorted to Ground
30049	B3_TEMP	IEEE754	Temperature sampled via B3 sensor input 32767: B3 input OPEN 32767 to -32768: Value as per IEEE754 -32768: B3 input Shorted to Ground
30051	COST_SAVED	IEEE754	Total cost saved by heating system
30053	LIMIT_STATUS	Refer to each bit for explanation	Status of the relays Bit 0: B2_Limit_Min_Charge 0: Not in limitation status 1: In minimum charging limitation via B2 Bit 1: B3_Limit_Min_Charge 0: Not in limitation status 1: In minimum charging limitation via B3 Bit 2: B3_Limit_Max_Tank 0: Not in limitation status 1: In maximum tank temperature limitation via B3 Bit 3: B1_Limit_Max_Tank 0: Not in limitation status 1: In maximum tank temperature limitation via B1 Bit 4: B2_Limit_FrostProtect 0: Not in frost protect status 1: In frost protect status via B2 Bit 5: B3_Limit_FrostProtect 0: Not in frost protect status 1: In frost protect status via B3 Bit 6: COST_OUT_RANGE 0: Still in range of 0 to 9999

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
			1: The cost has passed 9999 Bit 7: Reserved and fixed to 0
30055	RWDAPP	IEEE754	RWD Application Number
30057	SensorStat	Refer to each bit for explanation	Status of Various Sensors For RWD32/62/68/82, (only Bits 0 to 3 are for users) Bit 0: X1 error status 0: No error, 1: Error Bit 1: X2 error status 0: No error 1: Error Bit 2: X1 range status 0: Within range 1: Out of range Bit 3: X2 range status 0: Within range 1: Out of range Bit 4 to Bit 7: non-user status ---------- For RWD34/44/45, (only Bits 0 to 5 are for users) Bit 0: X1 error status 0: No error 1: Error Bit 1: X2 error status 0: No error 1: Error Bit 2: X3 error status 0: No error 1: Error Bit 3: X1 range status 0: Within range 1: Out of range Bit 4: X2 range status 0: Within range 1: Out of range Bit 5: X3 range status 0: Within range 1: Out of range Bit 6 & Bit 7: non-user status
30059	X2_digit	IEEE754	Status of digital input X2 0: Close 1: Open
30061	X3_digit	IEEE754	Status of digital input X3 0: Close 1: Open
30063	WinSum_Mode	IEEE754	Status of Winter/Summer Mode 0: Summer mode 1: Winter mode
40001	ALTSUM	IEEE754	Summer ChangeOver Set Point

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
40003	ALTWIN	IEEE754	Winter ChangeOver Set Point
40005	Eco_xp	IEEE754	P Band in Economy Cool Mode
40007	LIMMAX_Cas	IEEE754	Maximum of Absolute Limiter. (Used in RWD32/62/68/82, application no = 15, 25, 35, 45, etc.)
40009	LIMMIN_Cas	IEEE754	Minimum of Absolute Limiter. (Used in RWD32/62/68/82, application no = 15, 25, 35, 45, etc.)
40011	LIMTn1	IEEE754	I_action Time of Heating in Limiter Mode
40013	LIMTn3	IEEE754	I_action Time of Cooling in Limiter Mode
40015	LIMXP1	IEEE754	P Band of Heating in Limiter Mode
40017	LIMXP3	IEEE754	P Band for Limiter Cooling 1
40019	Rly_On	IEEE754	Relay Turning ON Set Point in % of Output Y
40021	Rly_Off	IEEE754	Relay Turning OFF Set Point in % of Output Y
40023	SD	IEEE754	Switch Differential Q1+Q2
40025	SD1	IEEE754	Switch Differential of Q1
40027	SD2	IEEE754	Switch Differential of Q2
40029	SD_H1	IEEE754	Switch Differential of H1
40031	SD_H2	IEEE754	Switch Differential of H2
40033	SD_H3	IEEE754	Switch Differential of H3
40035	SD_C1	IEEE754	Switch Differential of C1
40037	SD_C2	IEEE754	Switch Differential of C2
40039	SD_C3	IEEE754	Switch Differential of C3
40041	SFTC	IEEE754	Shift Cooling
40043	SFTH	IEEE754	Shift Heating
40045	SHENC	IEEE754	Shift End Point of Cooling
40047	SHENH	IEEE754	Shift End Point of Heating
40049	SHSTC	IEEE754	Shift Start Point of Cooling
40051	SHSTH	IEEE754	Shift Start Point of Heating
40053 *	SP_C1	IEEE754	Set Point of Cooling 1
40055 *	SP_C1_day	IEEE754	Set Point of Cooling 1 for Day
40057 *	SP_C1_night	IEEE754	Set Point of Cooling 1 for Night
40059 *	SP_C2	IEEE754	Set Point of Cooling 2
40061 *	SP_C2_day	IEEE754	Set Point of Cooling 2 for Day
40063 *	SP_C2_night	IEEE754	Set Point of Cooling 2 for Night
40065 *	SP_C3	IEEE754	Set Point of Cooling 3
40067 *	SP_C3_day	IEEE754	Set Point of Cooling 3 for Day
40069 *	SP_C3_night	IEEE754	Set Point of Cooling 3 for Night
40071 *	SP_H1	IEEE754	Set Point of Heating 1
40073 *	SP_H1_day	IEEE754	Set Point of Heating 1 for Day
40075 *	SP_H1_night	IEEE754	Set Point of Heating 1 for Night
40077 *	SP_H2	IEEE754	Set Point of Heating 2
40079 *	SP_H2_day	IEEE754	Set Point of Heating 2 for Day
40081 *	SP_H2_night	IEEE754	Set Point of Heating 2 for Night
40083 *	SP_H3	IEEE754	Set Point of Heating 3
40085 *	SP_H3_day	IEEE754	Set Point of Heating 3 for Day
40087 *	SP_H3_night	IEEE754	Set Point of Heating 3 for Night
40089 *	SP_ind_C	IEEE754	Set Point of Cooling for ind Y (Used in RWD45 application no = 70 to 99)

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
40091 *	SP_ind_C_day	IEEE754	Set Point of Cooling for ind Y for Day (Used in RWD45 application no = 70 to 99)
40093 *	SP_ind_C_night	IEEE754	Set Point of Cooling for ind Y for Night (Used in RWD45 application no = 70 to 99)
40095 *	SP_ind_H	IEEE754	Set Point of Heating for ind Y (Used in RWD45 application no = 70 to 99)
40097 *	SP_ind_H_day	IEEE754	Set Point of Heating for ind Y for Day (Used in RWD45 application no = 70 to 99)
40099 *	SP_ind_H_night	IEEE754	Set Point of Heating for ind Y for Night (Used in RWD45 application no = 70 to 99)
40101 *	SP1day	IEEE754	Set Point of Heating 1 for Day
40103 *	SP1night	IEEE754	Set Point of Heating 1 for Night
40105 *	SP1daysummer	IEEE754	Set Point of Heating for Summer Day (Used in RWD32/62/68/82, application no =16, 26, 36, etc. & 17, 27, 37, etc.)
40107 *	SP1nightsummer	IEEE754	Set Point of Heating for Summer Night (Used in RWD32/62/68/82, application no = 16, 26, 36, etc. & 17, 27, 37, etc.)
40109 *	SP1daywinter	IEEE754	Set Point of Heating for Winter Day (Used in RWD32/62/68/82, application no = 16, 26, 36, etc. & 17, 27, 37, etc.)
40111 *	SP1nightwinter	IEEE754	Set Point of Heating for Winter Night (Used in RWD32/62/68/82, application no = 16, 26, 36, etc. & 17, 27, 37, etc.)
40113 *	SP2day	IEEE754	Set Point of Heating 2 for Day
40115 *	SP2night	IEEE754	Set Point of Heating 2 for Night
40117 *	SP3day	IEEE754	Set Point of Cooling 1 for Day
40119 *	SP3night	IEEE754	Set Point of Cooling 1 for Night
40121 *	SP4day	IEEE754	Set Point of Cooling 2 for Day
40123 *	SP4night	IEEE754	Set Point of Cooling 2 for Night
40125	Swpoint	IEEE754	Q1 On Set Point in % of total SD (Q1+Q2)
40127	T1	IEEE754	Minimum Switch Off Time for Q1
40129	T3	IEEE754	Minimum Switch Off Time for Q2
40131	Tcyc	IEEE754	Time of Cycle and Delay (Tdelay is a function of Tcyc)
40133	Tn_Ind	IEEE754	I_action Time for ind Y
40135	Tn1	IEEE754	I_action Time for Heating 1
40137	Tn1_cas	IEEE754	I_action Time for Cascade Heating 1
40139	Tn3	IEEE754	I_action Time for Cooling 1
40141	Tn3_cas	IEEE754	I_action Time for Cascade Cooling 1
40143	-	-	Not used
40145 *	XDZ_AppA	IEEE754	Dead Zone for, RWD62 application no = 31 RWD32/82 application no = 41 RWD68 application no = 41 & 51
40147 *	XDZ_C1	IEEE754	Offset for C1
40149 *	XDZ_C2	IEEE754	Offset for C2
40151 *	XDZ_C3	IEEE754	Offset for C3
40153	SD1_RWD68	IEEE754	SD1 for RWD68 in application no = 45 & 55
40155 *	XDZ_H2	IEEE754	Offset for H2

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
40157 *	XDZ_H3	IEEE754	Offset for H3
40159	XP_ind	IEEE754	P Band for Ind Y
40161	XP1	IEEE754	P Band for Heating 1
40163	XP1_cas	IEEE754	P Band for Cascade Heating 1
40165	XP2	IEEE754	P Band for Heating 2
40167	XP3_cas	IEEE754	P Band for Cascade Cooling 1
40169	XP_3P	IEEE754	P Band for 3P (Used in RWD82, application no = 30 to 39 and 70 to 79)
40171	Y1_max	IEEE754	Max Output for Y1
40173	Y1_min	IEEE754	Min Output for Y1
40175	Y2_max	IEEE754	Max output for Y2
40177	Y2_min	IEEE754	Min output for Y2
40179 #	GetRWDReset	IEEE754	Reset RWD62 & RWD34 only - not recommended in normal operation - Write 12 (0x0C) to reset RWD32/62/68/82 - Write 167 (0xA7) to reset RWD34/44/45
40181 *	SD1_RWD32S	IEEE754	Switching differential of Q1. If TempUnit = C, 2 to 20 representing 2K to 20K respectively If the TempUnit is F, 4 to 40 representing 4 ℉ to 40 ℉ respectively
40183 *	SD2_RWD32S	IEEE754	Switching differential of Q2. If the TempUnit = C, 1 to 10 representing 1K to 10K respectively If the TempUnit is F, 2 to 20 representing 2 ℉ to 20 ℉ respectively
40185 *	MinOffTime1	IEEE754	The minimum off time of Q1 Range is from 0 up to 900 seconds (@ 30 seconds each step)
40187 *	MinOffTime2	IEEE754	The minimum off time of Q2 Range is from 0 up to 900 seconds (@ 30 seconds each step)
40189 *	T_C	IEEE754	Minimum charging temperature If the TempUnit = C, 0: OFF 30 to 90: 30 ℃ to 90 ℃ If the TempUnit is F, 0: OFF 86 to 194: 86 ℉ to 194 ℉
40191 *	T_Max1	IEEE754	The maximum temperature of tank 1 If the TempUnit = C, 0: OFF 30 to 130: 30 ℃ to 130 ℃ If the TempUnit is F, 0: OFF 86 to 266: 86 ℉ to 266 ℉
40193 *	T_Max2	IEEE754	The maximum temperature of tank 2 If the TempUnit = C, 0: OFF

RWD Parameter Addresses	RWD Parameters	Data Format	Detailed Descriptions & Data Interpretation
			30 to 130: 30 ℃ to 130 ℃ If the TempUnit is F, 0: OFF 86 to 266: 86 ℉ to 266 ℉
40195 *	T_Abs	IEEE754	The absolute charging temperature If the TempUnit is C, 30 to 90 representing 30 ℃ to 90 ℃ If the TempUnit is F, 86 to 194 representing 86 ℉ to 194 ℉
40197 *	D_SP	IEEE754	Delta Set Point If the TempUnit = C, 0 to 40 representing 0 ℃ to 40 ℃ If the TempUnit =F, 0 to 80 representing 0 ℉ to 80 ℉
40199	LIMMAX_Abs	IEEE754	Maximum of Absolute Limiter (Used in RWD32/6268/82, application no = 12, 22, 32, etc.)
40201	LIMMIN_Abs	IEEE754	Minimum of Absolute Limiter (Used in RWD32/6268/82, application no = 12, 22, 32, etc.)
40203	LIMMAX_Rel	IEEE754	Maximum of Rel Limiter (Used in RWD32/6268/82, application no = 13, 23, 33, etc.)
40205	LIMMIN_Rel	IEEE754	Minimum of Rel Limiter (Used in RWD32/6268/82, application no = 13, 23, 33, etc.)
40207	XP3	IEEE754	P Band for Cooling 1
40209	XP4	IEEE754	P Band for Cooling 2
40211	XP4_cas	IEEE754	P Band for cascade Cooling 2
40213	XP2_cas	IEEE754	P Band for cascade Heating 2
40215 *	XDZ_AppB	IEEE754	Dead Zone for, RWD32/82 application no = 61 RWD68 application no = 71
40217 *	XDZ_AppC	IEEE754	Dead Zone for, RWD32/82 application no = 21 RWD68 application no = 31

6 Appendix A:Standard IEEE-754 Format

According to IEEE Standard 754-1985, IEEE754 specifies binary representations for floating point numbers.

6.1.1 General Description

A real-valued number is represented in a floating-point format as:

$$(-1)^{Sign} \times Significant \times 2^{Exponent}$$

- *Sign* is 0 for positive values, 1 for negative values.
- *Significant* is a real number, composed as *integer fraction*, while integer=1.
- *Exponent* is an integer value.

6.1.2 Data Formats

The sizes of the components, in binary form, are as follows:

Name, Storage Size	**Sign** *s*	**Exponent** *E*		**Significant**		**754R Name**
		Width	**(Bias), Range**	**Integer** *j*	**Fraction** *f*	
"Single Precision" 32 bits	1 bit: 0 → positive 1 → negative	8 bits	(127) -126≤*E*≤127	1	23 bits	binary32

Note: When reading the IEEE754 format, the SEZ50MB always use "Float Inverse" for the correct display mode for all values.

For example:
If a value is 28.6, its 32 bits binary representation is:

0100 0001 1110 0100 1100 1100 1100 1101 **à** 41 E4 CC CD

The byte reading sequence (in Float Inverse) of IEEE754 is 41 E4 CC CD

7 Appendix B: Generating A CRC16 Check Sum

The following CRC Generation Function is based on docuement called:

Modbus over serial line specification and implementation guide V1.02

from www.Modbus.org

CRC Generation Function

```
unsigned short CRC16 ( puchMsg, usDataLen ) /* The function returns the CRC as a
unsigned short type */
unsigned char *puchMsg ; /* message to calculate CRC upon */
unsigned short usDataLen ; /* quantity of bytes in message */
{
unsigned char uchCRCHi = 0xFF ; /* high byte of CRC initialized */
unsigned char uchCRCLo = 0xFF ; /* low byte of CRC initialized */
unsigned uIndex ; /* will index into CRC lookup table */
while (usDataLen--) /* pass through message buffer */
{
uIndex = uchCRCLo ^ *puchMsg++ ; /* calculate the CRC */
uchCRCLo = uchCRCHi ^ auchCRCHi[uIndex];
uchCRCHi = auchCRCLo[uIndex] ;
}
return (uchCRCHi << 8 | uchCRCLo);
}
```

High-Order Byte Table

```
/* Table of CRC values for high–order byte */
static unsigned char auchCRCHi[] = {
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80,
0x41, 0x00, 0xC1, 0x81,
0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1,
0x81, 0x40, 0x01, 0xC0,
0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00,
0xC1, 0x81, 0x40, 0x01,
0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81,
0x40, 0x00, 0xC1, 0x81,
0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
0x80, 0x41, 0x01, 0xC0,
0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01,
0xC0, 0x80, 0x41, 0x01,
0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80,
0x41, 0x00, 0xC1, 0x81,
0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
0x81, 0x40, 0x01, 0xC0,
0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00,
0xC1, 0x81, 0x40, 0x01,
0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80,
0x41, 0x00, 0xC1, 0x81,
0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
0x81, 0x40, 0x01, 0xC0,
0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01,
0xC0, 0x80, 0x41, 0x01,
0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80,
0x41, 0x00, 0xC1, 0x81,
0x40
} ;
```

Low-Order Byte Table

```
/* Table of CRC values for low–order byte */
static char auchCRCLo[] = {
0x00, 0xC0, 0xC1, 0x01, 0xC3, 0x03, 0x02, 0xC2, 0xC6, 0x06, 0x07,
0xC7, 0x05, 0xC5, 0xC4,
0x04, 0xCC, 0x0C, 0x0D, 0xCD, 0x0F, 0xCF, 0xCE, 0x0E, 0x0A, 0xCA,
0xCB, 0x0B, 0xC9, 0x09,
0x08, 0xC8, 0xD8, 0x18, 0x19, 0xD9, 0x1B, 0xDB, 0xDA, 0x1A, 0x1E,
0xDE, 0xDF, 0x1F, 0xDD,
0x1D, 0x1C, 0xDC, 0x14, 0xD4, 0xD5, 0x15, 0xD7, 0x17, 0x16, 0xD6,
0xD2, 0x12, 0x13, 0xD3,
0x11, 0xD1, 0xD0, 0x10, 0xF0, 0x30, 0x31, 0xF1, 0x33, 0xF3, 0xF2,
0x32, 0x36, 0xF6, 0xF7,
0x37, 0xF5, 0x35, 0x34, 0xF4, 0x3C, 0xFC, 0xFD, 0x3D, 0xFF, 0x3F,
0x3E, 0xFE, 0xFA, 0x3A,
0x3B, 0xFB, 0x39, 0xF9, 0xF8, 0x38, 0x28, 0xE8, 0xE9, 0x29, 0xEB,
0x2B, 0x2A, 0xEA, 0xEE,
0x2E, 0x2F, 0xEF, 0x2D, 0xED, 0xEC, 0x2C, 0xE4, 0x24, 0x25, 0xE5,
0x27, 0xE7, 0xE6, 0x26,
0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0, 0xA0, 0x60, 0x61,
0xA1, 0x63, 0xA3, 0xA2,
0x62, 0x66, 0xA6, 0xA7, 0x67, 0xA5, 0x65, 0x64, 0xA4, 0x6C, 0xAC,
0xAD, 0x6D, 0xAF, 0x6F,
0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB, 0x69, 0xA9, 0xA8, 0x68, 0x78,
0xB8, 0xB9, 0x79, 0xBB,
0x7B, 0x7A, 0xBA, 0xBE, 0x7E, 0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C,
0xB4, 0x74, 0x75, 0xB5,
0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71, 0x70,
0xB0, 0x50, 0x90, 0x91,
0x51, 0x93, 0x53, 0x52, 0x92, 0x96, 0x56, 0x57, 0x97, 0x55, 0x95,
0x94, 0x54, 0x9C, 0x5C,
0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E, 0x5A, 0x9A, 0x9B, 0x5B, 0x99,
0x59, 0x58, 0x98, 0x88,
0x48, 0x49, 0x89, 0x4B, 0x8B, 0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F,
0x8D, 0x4D, 0x4C, 0x8C,
0x44, 0x84, 0x85, 0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42, 0x43,
0x83, 0x41, 0x81, 0x80,
0x40
};
```

8 Trouble Shooting Hints

1. What does it mean when I receive “02” exception code?
   [Reason]
   It’s often caused by wrong Modbus ID setting.
   [Resolve]
   Check Modbus ID setting in third party software and make sure it’s the same as ID setting of DIP switch.

2. What does it mean when I receive “03” exception code?
   [Reason]
   It’s often caused by write operation attempting to write an out-of-range value into RWD.
   [Resolve]
   Check the value written to RWD.

3. What does it mean when I receive “04” exception code?
   [Reason]
   It’s often caused by improper device setup.
   [Resolve]
   Make sure RWD is powered on, communication cable between RWD and SEZ50MB is connected.

4. Why there is no response from SEZ50MB?
   [Reason]
   Wrong CRC16 value, SEZ50MB address (for example, out of range 1~247) or wrong Modbus connection (for example, lines +, -, Ref are swapped) may lead to this situation.
   [Resolve]
   Check CRC16 value, ensure all valid and no duplicate SEZ50MB addresses and proper Modbus connection.

5. Why I can’t set a value into RWD when both RWD type and application no. are correct?
   [Reason]
   This is caused by range check mechanism (value exceed the range limits) required by RWD.
   [Resolve]
   Make sure values to be written are complied with the range check rules.

6. Why value shown on LCD is slightly different with the value I wrote?
   [Reason]
   Because of the rounding mechanism, there may be some difference between actual written value and value shown on LCD, for example, 16.7 & 16.5.
   [Resolve]
   Values may be rounded by SEZ50MB before transmitting to RWD due to Step Size or Resolution settings.

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