



SIA B

Self and Dual Powered Overcurrent & Earth Fault Protection Relay **with Standard Current Transformers.**

MODBUS RTU PROTOCOL MANUAL

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1. MODBUS RTU PROTOCOL

Communication parameters are:

Modbus RTU:

- Address and Baudrate
- 8 data bits
- No parity
- 1 stop bit

This document describes the steps to follow to read and write data on the SIA-B relay, as per the Modbus protocol. This memory map is only valid for one piece of equipment and one version of the memory. The positions of existing objects in the memory remain fixed from one version to the next, but new objects will naturally have new addresses which will, in turn, remain fixed in future versions. The memory map is described further on.

The standard Modbus protocol is used, so any program or PC can communicate easily with the equipment.

The SIA-B always acts as a slave, which means that it never initiates communications. The master is always responsible for initiating communications.

Only a subset of the Modbus functions is implemented:

- Reading function 3.
- Writing function 16.

The MODBUS/RTU protocol is independent from the hardware. Therefore, the physical layer can exist in different hardware configurations: RS232, RS485, fibre optic or Ethernet.

Specifically, the relay has a front RS232 port and, as an option, a rear RS485 port. The data stream in any of the configurations is "half-duplex".

Each byte of data is transmitted asynchronously and is made up of: 1 start bit, 8 data bits, 1 stop bit and 1 parity bit, if this is how it is programmed. Therefore, the data has 10 or 11 bits, depending on whether it includes parity.

If the relay only offers with Modbus on the front port, the address (1 to 247) is configurable but the rest of the parameters are fixed and equal to: baudrate 19200, No parity and stop bit 1.

If the relay offers RS485 Modbus protocol the the address (1 to 247) and the baudrate (4800, 9600, 19200 or 38400) can be but the rest of the parameters are fixed: without parity and with 1 stop bit.

The master must know the address of the slave that it is going to communicate with. No unit will act on requests from the master if the message is not addressed to them. The exception is when the 0 address, or "broadcast" address, is used, in which case the relay will act but will not send an answer of any type.

Communications are made in packages or frames, which are groups of data that are sent asynchronously. The master transmits a frame to the slave, and the slave then replies with another frame (except in the case of "broadcast" messages).

The end of the frame is marked by a dead time or silence time in the communication medium. The length of this time of silence varies depending on the transmission speed, as it is equivalent to 3 characters.

The following table shows the generic package format that is valid for transmission and reception. However, each function has its own peculiarities, as will be described further on.

1.1. Modbus RTU package format

CUSTOMER ADDRESS	1 byte	Each device on a communication bus must have a unique address, otherwise two different units could reply simultaneously to the same request. All ports of the relay will use this address which can be set a value between 1 and 247. When the master transmits a frame with the slave address to 0 indicates a Broadcast. All the slaves in the communications bus will carry out the requested action, but no one will reply to the master. The Broadcast will only be accepted to write, as it makes no sense to make a read request in the Broadcast, as no one will reply this request.
FUNCTION CODE	1 byte	This is one of the function codes supported by the equipment. In this case, the only function codes supported are 3 to read and 16 to write. When the slave has to reply with an exception one of these frames, it is indicated by putting 1 in the most important bit of the correspondent function. Thus, an exception for the function 3, will be indicated with a 83 as a function code; and an exception for the function code 16 or 0x10 in hexadecimal, will be indicated with an 0x90.
DATA	N bytes	This part consists of a variable number of bytes, depending on the function code. It may include: addresses, data lengths, settings, commands or exception codes sent by the user.
CRC	2 bytes	Control code of two bytes. The ModBus/RTU includes a 16-bit CRC in each frame, to detect errors. If the slave detects an erroneous frame, based on a CRC that is not correct, it won't take any action, nor will reply anything to the master. The management of the CRC is LSB-MSB.
DEAD TIME	Necessary time to transmit 3,5 Bytes	A frame is terminated when nothing is received for a period of 3,5 bytes. It means: 15 ms at 2400 bps 2 ms at 19200 bps ...etc.

1.2. Function Codes

HEX DEC CODE	MODBUS NAME	DEFINITION	COMMENT
0x03 3	Read Holding Registers	Reading of Any Value	This function allows the master to read 1 or more consecutive addresses of a relay. The registers always are of 16 bits, with the most important byte at first. The maximum number of registers to be read in a package are 60.
HEX DEC CODE	MODBUS NAME	DEFINITION	COMMENT
0x10 16	Preset Multiple Registers	Script	This function allows to write one or more registers that represent one or more settings. The registers are values of 2 bytes of length, transmitted with the most important byte at first. The maximum number of registers to be written in a package is 60.

1.3. Exceptions Responses

The error codes defined by the ModBus protocol are as follows:

01	ILLEGAL FUNCTION	The slave does not support any function with the function code received in this message.
02	ILLEGAL DATA ADDRESS	The master is trying to do an operation in a wrong address.
03	ILLEGAL DATA VALUE	The slave has detected that the value sent by the master is not valid.
04	SLAVE DEVICE FAILURE	Indicates an error occurred in the slave while trying to execute the request of the master.
05	ACKNOWLEDGE	Generic recognition.
06	SLAVE DEVICE BUSY	The slave is busy and unable to perform the required operation.
07	NEGATIVE ACKNOWLEDGE	Generic non-recognition.

When the data format takes up more than one BYTE, the most important BYTE is sent through the communications first, and the least important BYTE is sent last.

1.4. Data type

TYPE	LENGTH	DESCRIPTION
UCHAR	1/2	Integer without sign of 1 byte
BYTE	1/2	Integer with sign of 1 byte
BIT16	1	Gathered bits type, groups of 16. E. g.: 0x1A41 = 0001101001000001b
BIT32	2	Gathered bits type, groups of 32.
ENUM	1	Integer without sign of 16 bits. Each of the possible values of the integer will have a correspondence in the auxiliary list of the database. This list is the correspondence chain which must be shown for each of the values. Memory will only receive an integer value. E. g.: 0, 1 Correspondence to "CLOSED", "OPEN"
DENUM	2	Integer without sign of 32 bits
UINT	1	Integer without sign of 2 bytes
INT	1	Integer with sign of 2 bytes

LONG	2	Integer without sign of 4 bytes
DWORD	2	Integer with sign of 4 bytes
FLOAT INVERSE	2	Number in FLOAT INVERSEing decimal point "FLOAT INVERSE" of 4 bytes
ASCIIxx	xx/2	String: In length variable character chain. Final of String marked with '\0'. E. g.: "ABC" 0x41x42x43x00....
MILIS	3	<i>Minutes</i> (passed since 00:00 of 1/1/2000) (LONG). <i>milliseconds</i> (UINT)
FH	5	<i>Year</i> (UINT). <i>month</i> (UCHAR). <i>day</i> (UCHAR). <i>hour</i> (UCHAR). <i>minutes</i> (UCHAR). <i>seconds</i> (UCHAR). <i>hundredth</i> (UCHAR). <i>thousandth</i> (UINT)
CONT	13	Directory (UINT).Value(DWORD).Description(ASCII20)
EVENT	9	Criteria Directory (UINT).Event Identifier(UINT).Value(UINT).Associated Measure(UINT).Date and Time(FH)
EVENTO	10	Antiquity (UINT).Event (EVENT)
CCRIT	6	Criteria Number (UINT). Criteria Directory(UINT).Descriptive text(ASCII8)
PEST	61	Number of States (UINT). Protection State-1(BIT16). ... Protection State-60(BIT16)
PCRIT	61	Number of Criteria (UINT). Index of Criteria-1(UINT). ... Index of Criteria-60(UINT).
CMED	8	Number of Measure (UINT). Descriptive text(ASCII7).Unit(ASCII3).Primary Unit(ASCII5).Number of decimals(UCHAR)
GAJU	61	Number of Groups (UINT). Index of the Criteria-1(UINT).Index of the first setting of the Criteria-1(UINT). ... Index of the Criterion-30(UINT). Index of the first setting of the Criteria-30(UINT).
ENUM TRIP VOLT	1	Integer without sign of 16 bits. E. g.: 0, 1, 2 Correspondence to "12V", "17V", "22V"

When the data format takes up more than one BYTE, the most important BYTE is sent through the communications first, and the least important BYTE is sent last.

1.5. General Memory Map

Function	Description	Start address	Number of registries	Format	Reference
16	Write the Directory of Event	1	1	UINT	
16	Load data Profiling	2	1		
16	Write the number of the Setting List	6	1	UINT	
03	Read of Model and Version	100	44	ASCII88	
16	Write access code	168	2	UCHAR4	See Passwords and Access Levels
03 & 16	Date and Time	170	5	FH	
16	Selection of Command	200	2	UINT	See Commands map
16	Confirmation of Command	201	1	UINT	See Commands map
03 & 16	Counters	202	2	CONT	Openings Number
03 & 16	Counters	204	2	CONT	Accumulated Amperes
03	Serial number	252	2	LONG	
03	Equipment identifier	254	44	ASCII88	
03	Read and Delete the oldest Event	400	11	EVENTO2	See States map (Event Number)
03	One event reading	410	11	EVENTO2	See States map (Event Number)
16	Delete All Events	420	1	dummy	

1.5.1. States Map

The function code implemented to **State reading** is **0x03 (Read Holding Registers)**

Address	Description	Bit	Event NO	Status	Associated Measurement
500	General	00	1	Trip	I _{max} (A)
		01	2	External Trip	-
		02	6	No Trip Power	-
		03	7	50 Hz	-
		04	8	Trip Block Enable	-
		05	16	Measure Error	-

	06	17	Ready	1: Vaux power 2: Self-powering 4: USB power
	07	19	Settings Changed	-
	08	21	Set Date/Time	-
	09	22	Local Activity	-
	10	23	Factory Settings	-
	11	24	EEPROM Error	-
	12	28	EEPROM Changed	-
	13	32	Events Error	-
	15	15	Reset	-
	16	49	Pickup	I _{max} (A)
	17	50	Phase A Pickup	I _A (A)
	18	51	Phase B Pickup	I _B (A)
	19	52	Phase C Pickup	I _C (A)
	20	53	Neutral Pickup	I _N (A)
	21	54	Phase A Trip	I _A (A)
	22	55	Phase B Trip	I _B (A)
	23	56	Phase C Trip	I _C (A)
	24	57	Neutral Trip	I _N (A)
	25	58	50 Trip	-
	26	59	50G Trip	-
	27		Phase Trip	-
	28	3	Auxiliary Power	-
	29	4	Self-powering	-
	30	-	USB Power	-
	31	5	Battery	-
	-	30	New DFR	
	-	45	Date/Time Error	-
	-	46	New DFR	DFR number

		-	47	Identification	-
		-	48	Events Erased	-

Address	Description	Bit	Event NO	Status	Associated Measurement
8000	Oscilo	-	16	DFR Erased	

Address	Description	Bit	Event NO	Status	Associated Measurement
502	Local COM	00		Local communication	
		01		HMI Activity	
		17	2	Open Breaker	
		18	3	Close Breaker	
		25	8	Reset thermal image	

Address	Description	Bit	Event NO	Status	Associated Measurement
504	50-1	00	01	50-1 Phase A Pickup	IA (A)
		01	02	50-1 Phase B Pickup	IB (A)
		02	03	50-1 Phase C Pickup	IC (A)
		03	04	50-1 Pickup	Imax (A)
		09	05	50-1 Phase A Trip	IA (A)
		10	06	50-1 Phase B Trip	IB (A)
		11	07	50-1 Phase C Trip	IC (A)
		12	08	50-1 Trip	Imax (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
506	51	00	01	51 Phase A Pickup	IA (A)
		01	02	51 Phase B Pickup	IB (A)
		02	03	51 Phase C Pickup	IC (A)
		03	04	51 Pickup	Imax (A)
		08	05	51 Phase A Trip	IA (A)
		09	06	51 Phase B Trip	IB (A)
		10	07	51 Phase C Trip	IC (A)
		11	08	51 Trip	Imax (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
508	50G-1	04	01	50G-1 Pickup	IN (A)
		12	02	50G-1 Trip	IN (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
510	51G	04	01	51G Pickup	IN (A)
		12	02	51G Trip	IN (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
512	Inputs	00	17	Input 1	-
		01	18	Input 2	-
		02	19	Input 3	-

Address	Description	Bit	Event NO	Status	Associated Measurement
514	Outputs	00	01	Output 1	-
		01	02	Output 2	-
		02	03	Output 3	-
		03	04	Trip Output	-

Address	Description	Bit	Event NO	Status	Associated Measurement
516	Trip Block (*)	08	01	Phase A Block	IA (A)
		09	02	Phase B Block	IB (A)
		10	03	Phase C Block	IC (A)
		11	04	Phase Block	Imax (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
518	49	04	01	49 Alarm	Thermal Image (%)
		12	02	49 Trip	Thermal Image (%)

Address	Description	Bit	Event NO	Status	Associated Measurement
520	50BF (*)	04	01	50BF Pickup	Imax (A)
		12	02	50BF Trip	Imax (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
522	52	00	01	52 Start	-
		01	02	52 Error	-
		02	03	52 Open	Opening Time
		03	04	52 Opening time	-
		04	05	52 Opening Error	Opening Time
		05	06	52 Closed	Closing time
		06	07	52 Closing time	-
		07	08	52 Closing Error	Closing time
		08	09	52 Max. Number of openings	-
		09	10	52 Max. Accumulated amperes (I2t).	-
		10	11	52 Max. openings/Time	-

Address	Description	Bit	Event NO	Status	Associated Measurement
524	Remote Modbus	00		Remote communication	None
		17	2	Open Breaker	None
		18	3	Close Breaker	None
		25	8	Reset thermal image	None

Address	Description	Bit	Event NO	Status	Associated Measurement
528	50-2 (*)	00	01	50-2 Phase A Pickup	IA (A)
		01	02	50-2 Phase B Pickup	IB (A)
		02	03	50-2 Phase C Pickup	IC (A)
		03	04	50-2 Pickup	I _{max} (A)
		09	05	50-2 Phase A Trip	IA (A)
		10	06	50-2 Phase B Trip	IB (A)
		11	07	50-2 Phase C Trip	IC (A)
		12	08	50-2 Trip	I _{max} (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
530	50G-2 (*)	04	01	50G-2 Pickup	IN (A)
		12	02	50G-2 Trip	IN (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
532	46 (*)	04	01	46 Pickup	I2 (A)
		12	02	46 Trip	I2 (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
534	CLP (*)	00		CLP Disable	
		01		52 Closed	
		02		52 Open	
		03		52 definitive Opening	
		04		Close Cold Load	
		05		Open Cold Load	
		11	02	Cold Load Pickup	I _{max} (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
536	SHB	08	01	Phase A Block	IA-2H (A)
		09	02	Phase B Block	IB-2H (A)
		10	03	Phase C Block	IC-2H (A)
		11	04	Phase Block	I _{max} -2H (A)

Address	Description	Bit	Event NO	Status	Associated Measurement
538	Leds	00	-	Led 1	-
		01	-	Led 2	-
		02	-	Led 3	-
		03	-	Led 4	-

Address	Description	Bit	Event NO	Status	Associated Measurement
540	Logic	00	18	52 A	-
		01	19	52 B	-
		02	22	External Trip	-
		03	20	Block 50/51	-
		04	21	Block 50/51G	-
		05	24	Settings Group 1	-
		06	25	Settings Group 2	-
		07	23	Reset	-
		08	-	Logic Signal 1	-
		09	-	Logic Signal 2	-
		10	-	Logic Signal 3	-
		11	-	Logic Signal 4	-

Address	Description	Bit	Event NO	Status	Associated Measurement
542	Remote DNP3	00	-	Remote communication	None
		17	2	Open Breaker	None
		18	3	Close Breaker	None
		25	8	Reset thermal image	None

Address	Description	Bit	Event NO	Status	Associated Measurement
250	Test Menu	00		Output 1	-
		01		Output 2	-
		02		Output 3	-
		03		Trip Output	-
		15		IN TEST MODE	

1.5.2. Measurements Map

Address	Description	Format
300	Phase A current IA	FLOAT INVERSE
302	Phase B current IB	
304	Phase C current IC	
306	Neutral current IN	
308	Negative sequence current I-2	
310	Phase A second harmonic current IA-2H	
312	Phase B second harmonic current IB-2H	
314	Phase C second harmonic current IC-2H	
316	Maximum phase current IMAX	
318	Thermal Image TI	

1.5.3. Settings Map

Settings	Address	Description	Format	Enumeration
General	600 (*)	Identification	ASCII20	-
	800 (**)			
	610 (*)	Frequency	DENUM	0 → 60 Hz 1 → 50 Hz
	810 (**)			
	612 (*)	Serial Number	LONG	-
	812 (**)			
	614 (*)	Language	DENUM	0 → English 1 → Spanish 2 → Depends on Relay model
	814 (**)			
	616 (*)	Active Setting Group	LONG	-
	816 (**)			
	618 (*)	Trip Voltage Level	DENUM	0 → 12 VDC 1 → 17 VDC 2 → 22 VDC 3 → 24 VDC
	818 (**)			
	620 (*)	CT Phase Ratio	FLOAT INVERSE	-
	820 (**)			
	622 (*)	CT Neutral Ratio	FLOAT INVERSE	-
	822 (**)			
	624 (*)	Local COM Address	LONG	-
	824 (**)			
	626 (*)	Remote COM Address	LONG	-
	826 (**)			
	628 (*)	Remote Baud Rate	DENUM	0 → 4800 Bd 1 → 9600 Bd 2 → 19200 Bd 3 → 38400 Bd
	828 (**)			
	728 (*)	Remote Protocol	DENUM	0 → ModBus 1 → DPN3.0
	928 (**)			
	730 (*)	DNP3.0 Master Address	LONG	-
	930 (**)			
	732 (*)	DNP3.0 Serial Settings	DENUM	0 → 8-N-1 1 → 8-N-2 2 → 8-E-1 3 → 8-E-2 4 → 8-O-1 5 → 8-O-2 6 → 9-N-1 7 → 9-N-2
	932 (**)			
	734 (*)	DNP3.0 IA Deadband	LONG	-
	934 (**)			

(*) Read/Write Address (FC = 03 / 16).

(**) Address for Confirmation (FC = 16)

Settings	Address	Description	Format	Enumeration
General	736 (*)	DNP3.0 IB Deadband	LONG	-
	936 (**)			
	738 (*)	DNP3.0 IC Deadband	LONG	-
	938 (**)			
	740 (*)	DNP3.0 IN Deadband	LONG	-
	940 (**)			

Settings	Address	Description	Format	Enumeration
50-1	630 (*)	Function Enable	DENUM	0 → Disable 1 → Enable 2 → SHB
	830 (**)			
	632 (*)	Tap	FLOAT INVERSE	-
	832 (**)			
	634 (*)	Time Delay	FLOAT INVERSE	-
	834 (**)			

Settings	Address	Description	Format	Enumeration
51	636 (*)	Function Enable	DENUM	0 → Disable 1 → Enable 2 → SHB
	836 (**)			
	638 (*)	Curve Type	DENUM	0 → IEC Inverse 1 → IEC Very Inverse 2 → IEC Extremely Inverse 3 → Defined Time 4 → IEEE Inverse 5 → IEEE Very Inverse 6 → IEEE Extremely Inverse 7 → IEC Long Time Inverse
	838 (**)			
	640 (*)	Time Dial (TMS)	FLOAT INVERSE	-
	840 (**)			
	642 (*)	Tap	FLOAT INVERSE	-
	842 (**)			
	644 (*)	Time Delay	FLOAT INVERSE	-
	844 (**)			

Settings	Address	Description	Format	Enumeration
50G-1	646 (*)	Function Enable	DENUM	0 → Disable 1 → Enable 2 → SHB
	846 (**)			
	648 (*)	Tap	FLOAT INVERSE	-
	848 (**)			
	650 (*)	Time Delay	FLOAT INVERSE	-
	850 (**)			

(*) Read/Write Address (FC = 03 / 16).

(**) Address for Confirmation (FC = 16)

Settings	Address	Description	Format	Enumeration
51G	652 (*)	Function Enable	DENUM	0 → Disable 1 → Enable 2 → SHB
	852 (**)			
	654 (*)	Curve Type	DENUM	0 → IEC Inverse 1 → IEC Very Inverse 2 → IEC Extremely Inverse 3 → Defined Time 4 → IEEE Inverse 5 → IEEE Very Inverse 6 → IEEE Extremely Inverse 7 → IEC Long Time Inverse
	854 (**)			
	656 (*)	Time Dial (TMS)	FLOAT INVERSE	-
	856 (**)			
	658 (*)	Tap	FLOAT INVERSE	-
	858 (**)			
	660 (*)	Time Delay	FLOAT INVERSE	-
860 (**)				

Settings	Address	Description	Format	Enumeration
49	662 (*)	Function Enable	DENUM	0 → Disable 1 → Enable
	862 (**)			
	664 (*)	Tap	FLOAT INVERSE	-
	864 (**)			
	666 (*)	Heating Constant τ	LONG	-
	866 (**)			
	668 (*)	Cooling Constant	LONG	-
	868 (**)			
	670 (*)	Alarm Level	LONG	-
870 (**)				

Settings	Address	Description	Format	Enumeration
Trip Block	672 (*)	Function Enable	DENUM	0 → Disable 1 → Enable
	872 (**)			
	674 (*)	Tap	FLOAT INVERSE	-
	874 (**)			

(*) Read/Write Address (FC = 03 / 16).
 (**) Address for Confirmation (FC = 16)

Settings	Address	Description	Format	Enumeration
50-2	676 (*)	Function Enable	DENUM	0 → Disable 1 → Enable 2 → SHB
	876 (**)			
	678 (*)	Tap	FLOAT INVERSE	-
	878 (**)			
	680 (*)	Time Delay	FLOAT INVERSE	-
	880 (**)			

Settings	Address	Description	Format	Enumeration
50G-2	682 (*)	Function Enable	DENUM	0 → Disable 1 → Enable 2 → SHB
	882 (**)			
	684 (*)	Tap	FLOAT INVERSE	-
	884 (**)			
	686 (*)	Time Delay	FLOAT INVERSE	-
	886 (**)			

Settings	Address	Description	Format	Enumeration
46	688 (*)	Function Enable	DENUM	0 → Disable 1 → Enable 2 → SHB
	888 (**)			
	690 (*)	Curve Type	DENUM	0 → IEC Inverse 1 → IEC Very Inverse 2 → IEC Extremely Inverse 3 → Defined Time 4 → IEEE Inverse 5 → IEEE Very Inverse 6 → IEEE Extremely Inverse 7 → IEC Long Time Inverse
	890 (**)			
	692 (*)	Time Dial (TMS)	FLOAT INVERSE	-
	892 (**)			
	694 (*)	Tap	FLOAT INVERSE	-
	894 (**)			
	696 (*)	Time Delay	FLOAT INVERSE	-
	896 (**)			

(*) Read/Write Address (FC = 03 / 16).
(**) Address for Confirmation (FC = 16)

Settings	Address	Description	Format	Enumeration
52	698 (*)	Max Number of Openings	LONG	-
	898 (**)			
	700 (*)	Max Accumulated Amperes	LONG	-
	900 (**)			
	702 (*)	Opening Time	FLOAT INVERSE	-
	902 (**)			
	704 (*)	Closing Time	FLOAT INVERSE	-
	904 (**)			
	706 (*)	Excessive Repeated Openings	LONG	-
	906 (**)			
	708 (*)	Repetitive Openings/Time	FLOAT INVERSE	-
	908 (**)			

Settings	Address	Description	Format	Enumeration
50BF	710 (*)	Function Enable	DENUM	0 → Disable 1 → Enable
	910 (**)			
	712 (*)	Time Delay	FLOAT INVERSE	-
	912 (**)			

Settings	Address	Description	Format	Enumeration
SHB	714 (*)	Function Enable	DENUM	0 → Disable 1 → Enable
	914 (**)			
	716 (*)	Current Tap	LONG	-
	916 (**)			
	718 (*)	Reset Time	FLOAT INVERSE	-
	918 (**)			

Settings	Address	Description	Format	Enumeration
CLP	720 (*)	Function Enable	DENUM	0 → Disable 1 → Enable
	920 (**)			
	722 (*)	Active Settings Group	LONG	-
	922 (**)			
	724 (*)	No Load Time	FLOAT INVERSE	-
	924 (**)			
	726 (*)	Cold Load Time	FLOAT INVERSE	-
	926 (**)			

(*) Read/Write Address (FC = 03 / 16).

(**) Address for Confirmation (FC = 16)

1.6. Command List

Index	Format	Description
2	UINT16	Open Breaker
3	UINT16	Close Breaker
10	UINT16	Reset Thermal Image

1.7. Setting-up the session: Password and access levels

The relay is provided with different passwords associated to access levels allowing the user to carry out different actions depending on the selected password:

ACCESS LEVEL	Read-only Function Enable: Status and measurements Settings Configuration Events/DFR	Function Enable to: Change settings	Function Enable to: Delete Events Delete DFR	Function Enable to: Execute Commands	Function Enable to: Change Configuration	Function Enable to: Change Protected Settings
2	YES	YES	YES	NO	NO	NO
3	YES	NO	NO	YES	NO	NO
4	YES	YES	YES	YES	NO	NO
5	YES	YES	YES	YES	YES	NO

Four passwords and their associated levels of access are set up when the relay is configured using the Slcom program. The password must be made up of 4 characters (passwords with more or less characters will not be accepted). By default, the relay is programmed with the following passwords and their associated levels:

PASSWORD	ACCESS LEVEL
2222	2
3333	3
4444	4
5555	5

1.8. Example of Modbus Frames

Writing the access password "5555" to equipment no. 1

Address	Function	H Pickup Address	L Pickup Address	Number of H Registers	Number of L Registers	Number of Bytes	Password	Checksum H	Checksum L
0x01	0x10	0x00	0xA8	0x00	0x02	0x04	0x35 0x35 0x35 0x35	0x30	0xF4

And the SIA-B will reply OK:

Address	Function	H Pickup Address	L Pickup Address	Number of H Registers	Number of L Registers	Checksum H	Checksum L
0x01	0x10	0x00	0xA8	0x00	0x02	0xC0	0x28



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