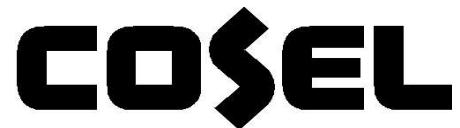


Modbus-RTU



CR-PC-2

Communication Manual

CR-PC-2 ---Modbus-RTU---

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Note: The information contained in this document is current as of the date of publication and is subject to change without notice due to changes in product specifications and/or improvements. For the latest version, please check the Cosel website.

Although every effort has been made to ensure the accuracy of the contents of this document, please note that we cannot be held responsible for any errors or omissions, or for any damages, including indirect damages, resulting from the use of the information herein.

1. Overview

The CR-PC-2 is a conversion unit which can be connected to our PCA/AME series power supplies (which are equipped with an extended UART). Its function is to mutually convert the extended UART signal and the RS485 signal (Modbus-RTU).

The conversion unit operates as a slave for Modbus communication. Note that some extended UART commands may not be used.

Refer to the CR-PC-2 catalog for electrical specifications and mounting/installation methods.

2. Communication specifications

2.1 Transmission specifications

Table 2.1 shows the transmission specifications of the CR-PC-2(RS485 side).

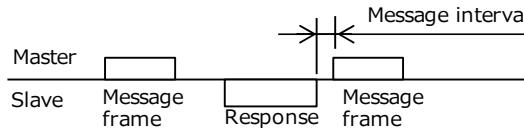
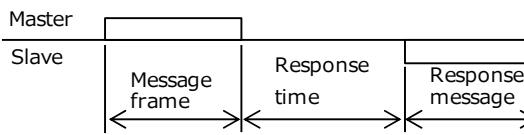
Table 2.1 Transmission specifications

No.	Name	Specifications	
1	Communication method	Half duplex	
2	Synchronous method	Start stop synchronous	
3	Connection configuration	1: N (Master: Slave)	
4	Communication speed	2400, 4800, 9600, 19200(default) bps Reception : ±2% error tolerance	
5	Flow control	NA	
6	Data configuration	Data length	8 bits
7		Stop bit	1 bit (default), 2 bits
8		Parity	Even (default), Odd, NA
9		Transfer direction	LSB first

2.2 Protocol specifications

Table 2.2 shows the protocol specifications of the CR-PC-2(RS485 side).

Table 2.2 Protocol specifications

No.	Name	Specifications
1	Message type	Modbus-RTU
2	Message interval	More than 10ms (From response to next message) 
3	Response time	Max 450ms (From message frame end to response message start) 
4	Turnaround time	450ms
5	Transmission time	100ms or less (From start to end of the message frame transmission)

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3. Communication protocol

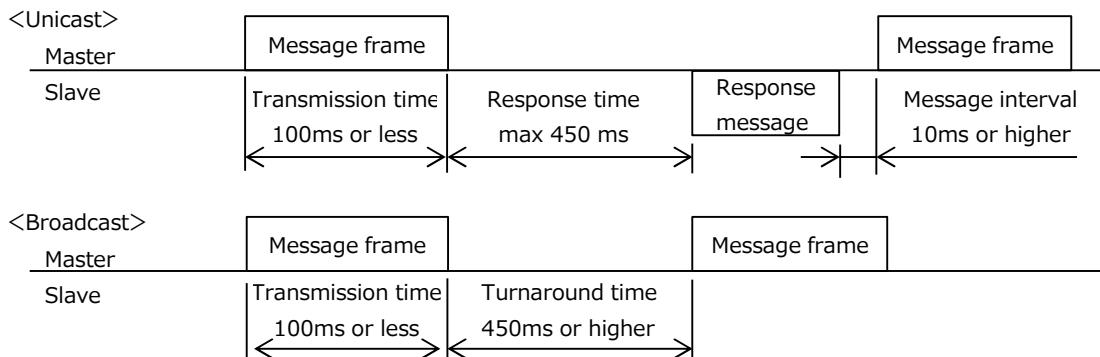
3.1 Communication protocol overview

- The CR-PC-2 communication protocol is Modbus-RTU.
- Modbus is a master/slave (1: N) protocol. Communication is always initiated by the master.
- The slave does not communicate with other slaves.
- For unicast (transmission to individual slaves), the master transmits a message frame to the slave, and the specified slave transmits a response message to the master after completing the requested processing.
- If the requested process ends abnormally, an exception response message is transmitted.
- If a transmission error occurs in the message frame from the master, the slave does not return a response message. In this case, the master should detect the communication timeout and take appropriate action
- Set the master communication timeout to 450ms or higher, in consideration of the slave response processing time.
- When broadcasting (transmission to all slaves), each slave performs only the requested processing and does not reply with a response message, so the master should send a message frame after the turnaround time (more than 450ms) has elapsed, before sending the next message frame.

Publisher : Modbus Organization (<http://modbus.org/>)

MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b (Modbus_Application_Protocol_V1_1b3.pdf)

MODBUS over Serial Line Specification and Implementation Guide V1.02 (Modbus_over_series_line_V1_02.pdf)



Some Modbus protocol specifications are not supported by this conversion unit, as detailed below.

- This conversion unit supports only function code (FC) "3" (Holding register "Read"), "4" (INPUT register "Read"), and "6" (Holding register "Write").
- Broadcast (transmission to all slaves) is only supported on "6" FC in this conversion unit. Broadcast transmissions using "3" or "4", results in the message being discarded (the request is not processed and there is no response).
- When FC "3" and "4" are executed, the quantity of registers that can be "read" is only "1" in this conversion unit. If the value for the quantity of registers is set to "2" or more, an exception response message is transmitted.
- This conversion unit does not perform message frame delimiter judgment (T 3.5 character time). The message frame is recognized as one message frame per 8 characters.

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- 5) This conversion unit does not detect a character reception interval error (reception interval > T1.5 character time). The message frame is recognized as a single message frame if the time from the start of transmission to the completion of transmission is within 100ms, regardless of the baud rate setting.
- 6) If a register address outside those listed in the register list is set, it will result in an exception response .

Numerical values

A number ending with "h" indicates a hexadecimal number. A number ending in "b" indicates a binary number. A number without an "h" or "b" indicates a decimal number.

3.2 Message frame structure

(1) Message frame from master to slave

The message frame consists of the fields shown below.

Slave address	FC	Data	CRC check
1 byte	1 byte	4 bytes	2 bytes

Slave address : 1 byte to specify the slave to be communicated with
(numerals from 1 to 64 can be selected)

FC (function code) : "3", "4", or "6" are available to be selected

Data : Data field (big endian, upper byte, lower byte in that order)

CRC check : 16-bit cyclic redundancy check from slave address to data
Generation polynomial : A001h

CRC initial value : FFFFh

Note that only the CRC check field is little endian
(lower byte, upper byte in that order).

For CRC calculation, refer to "MODBUS over Serial Line Specification and Implementation Guide" for the Modbus specifications.

(2) Response message frame from slave to master

The message frame when responding consists of the fields shown below.

Slave address	FC	Data	CRC check
1 byte	1 byte	3 or 4 bytes	2 bytes

(3) Message frame for an exception response

The message frame when an exception response occurs consists of the fields shown below.

Slave address	FC	Exception code	CRC check
1 byte	1 byte	1 byte	2 bytes

FC is the value obtained by adding "128 (80h)" to the FC of the master to slave message frame.

Example: If the FC of the master to slave message frame is "3 (03h)", when an exception response occurs the FC is "131 (83h)".

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Exception code: 1 byte for indicating the content of the error

Table 3.1 Exception codes

No.	Name	Content
1	ILLEGAL FUNCTION	Unsupported function code (ie. other than FC: 3, 4, 6)
2	ILLEGAL DATA ADDRESS	Undefined register address
3	ILLEGAL DATA VALUE	Incorrect data
4	SLAVE DEVICE FAILURE	Slave device error/Slave device busy

3.3 FC: 4 Input register "Read"

The contents of one register are read from the input register. Broadcast is disabled.

(1) Master to slave message frame

Field	Slave address	FC	Register address	Qty of registers	CRC check
Qty of bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Field value	1–64 (40h)	4 (04h)	See the register list	1 (0001h)	CRC Lo CRC Hi

Register address: Specify the address of the INPUT register to be read. An exception response (exception code: 02h) is returned when a register address not in the Input register list is specified.

Qty of registers : Specifies the quantity of registers to be read. As only one register can be read by this conversion unit, if a register quantity other than "1" is specified, an exception response (exception code: 03h) is returned.

(2) Slave to master response message frame

Field	Slave address	FC	Qty of data bytes	Register data	CRC check
Qty of bytes	1 byte	1 byte	1 byte	2 bytes	2 bytes
Field value	1–64 (40h)	4 (04h)	2 (02h)	Read data	CRC Lo CRC Hi

Qty of data bytes: Returns the quantity of bytes of register data in the response message. Since this conversion unit reads only one register, the quantity of data bytes equals 2 bytes. (As there is one Input register of 16 bits)

Register data : The register value of the register address specified in the master to slave message frame is returned.

(3) Exception response message frame

Field	Slave address	FC	Exception code	CRC check
Qty of bytes	1 byte	1 byte	1 byte	2 bytes
Field value	1–64 (40h)	132 (84h)	See table 3.1	CRC Lo CRC Hi

FC : "132 (84h)" is returned by adding "128 (80h)" to the FC code "4 (04h)".

Exception code : An exception code is returned indicating the reason for the error detected during processing. (See Table 3.1 for exception codes)

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(4) Example message

Slave address : 1 (01h) Register address : 21 (0015h)

Master to slave message frame

Message frame	Slave address	FC	Register address		Qty of registers		CRC check	
			Upper	Lower	Upper	Lower	Lower	Upper
	1 (01h)	4 (04h)	0 (00h)	21 (15h)	0 (00h)	1 (01h)	32 (20h)	14 (0Eh)

Slave to master response message frame

Message frame	Slave address	FC	Qty of data bytes	Register data		CRC check	
				Upper	Lower	Lower	Upper
	1 (01h)	4 (04h)	2 (02h)	19 (13h)	136 (88h)	180 (B4h)	102 (66h)

The register address "21 (15h)" of the master to slave message is the monitored value of the output voltage, and the register data of the response message can be read as follows:

1388h = 5000 → 5.000V

3.4 FC: 3 Holding register "Read"

The contents of one register are read from the Holding register. Broadcast is disabled.

(1) Master to slave message frame

Field	Slave address	FC	Resister address	Qty of registers	CRC check
Qty of bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Field value	1–64 (40h)	3 (03h)	See the register list	1 (0001h)	CRC Lo CRC Hi

Register address: Specifies the address of the Holding register to be read. An exception response (exception code: 02h) is returned when a register address not in the Holding register list is specified.

Qty of registers: Specifies the quantity of registers to be read. As only one register can be read by this conversion unit, if a register quantity other than "1" is specified, an exception response (exception code: 03h) is returned.

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(2) Slave to master response message frame

Field	Slave address	FC	Qty of data bytes	Register data	CRC check
Qty of bytes	1 byte	1 byte	1 byte	2 bytes	2 bytes
Field value	1–64 (40h)	3 (03h)	2 (02h)	Read data	CRC Lo CRC Hi

Qty of data bytes : Returns the quantity of bytes of register data in the response message. Since this conversion unit reads only one register, the quantity of data bytes equals 2 bytes. (As there is one Holding register of 16 bits)

Register data : The register value of the register address specified in the master to slave message frame is returned.

(3) Exception response message frame

Field	Slave address	FC	Exception code	CRC check
Qty of bytes	1 byte	1 byte	1 byte	2 bytes
Field value	1–64 (40h)	131 (83h)	See table 3.1	CRC Lo CRC Hi

FC : "131 (83h)" is returned by adding "128 (80h)" to the FC code "3 (03h)".

Exception code : An exception code is returned indicating the reason for the error detected during processing. (See Table 3.1 for exception codes)

(4) Example message

Slave address : 1(01h) Register address : 0(0000h)

Master to slave message frame

Message frame	Slave address	FC	Register address		Qty of registers		CRC check	
			Upper	Lower	Upper	Lower	Lower	Upper
	1 (01h)	3 (03h)	0 (00h)	0 (00h)	0 (00h)	1 (01h)	132 (84h)	10 (0Ah)

Slave to master response message frame

Message frame	Slave address	FC	Qty of data bytes	Register data		CRC check	
				Upper	Lower	Lower	Upper
	1 (01h)	3 (03h)	2 (02h)	46 (2Eh)	224 (E0h)	164 (A4h)	108 (6Ch)

The register address "0 (00h)" of the master to slave message frame is the set value of the output voltage, and the register data of the response message can be read as follows:

2EE0h = 12000 → 12.000V

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3.5 FC: 6 Holding register "Write"

Writes the contents of one register in the Holding register. Broadcast enabled.

(1) Master to slave message frame

Field	Slave address	FC	Register address	Register data	CRC check
Qty of bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Field value	1–64 (40h)	6 (06h)	See the register list	Write data	CRC Lo CRC Hi

Register address : Specifies the address of the Holding register to be written to. An exception response (exception code: 02h) is returned when a register address not in the Holding register list is specified.

Register data : Specifies the data to be written to the Holding register specified by the register address. If the register data is out of the allowable range, an exception response (exception code: 03h) is returned.
When broadcasting, no response message will be returned.

(2) Slave to master response message frame

Field	Slave address	FC	Register address	Register data	CRC check
Qty of bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Field value	1–64 (40h)	6 (06h)	See the register list	Write data	CRC Lo CRC Hi

Register address : The register address specified in the master to slave message frame is returned.

Register data : The register data specified in the master to slave message frame is returned.

(3) Exception response message frame

Field	Slave address	FC	Exception code	CRC check
Qty of bytes	1 byte	1 byte	1 byte	2 bytes
Field value	1–64 (40h)	134 (86h)	See table 3.1	CRC Lo CRC Hi

FC : "134 (86h)" is returned by adding "128 (80h)" to the FC code "6 (06h)".

Exception code : An exception code is returned indicating the reason for the error detected during processing. (See Table 3.1 for exception codes)

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(4) Example message

Slave address : 1 (01h) Register address : 1 (0001h) Register data : 1200 (04B0h)

Master to slave message frame

Message frame	Slave address	FC	Register address		Register data		CRC check	
			Upper	Lower	Upper	Lower	Lower	Upper
	1 (01h)	6 (06h)	0 (00h)	1 (01h)	4 (04h)	176 (B0h)	219 (DBh)	126 (7Eh)

Slave to master response message frame

Message frame	Slave address	FC	Register address		Register data		CRC check	
			Upper	Lower	Upper	Lower	Lower	Upper
	1 (01h)	6 (06h)	0 (00h)	1 (01h)	4 (04h)	176 (B0h)	219 (DBh)	126 (7Eh)

The response message returns the same message to the master.

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4. Modbus-RTU register List

16-bit Input and Holding registers can be used with this conversion unit but Discrete and Coil registers can not be used.

4.1 Input register list

The Input register is a read-only 16-bit register.

See below for a brief the register descriptions and the corresponding extended UART names.

No.	Input register address								Register description (Extended UART command name)	
	PCA	AME								
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6		
1	0 0000h	0 0000h							Returns the input voltage value. MON_VIN	
2	1 0001h	1 0001h							Returns the input voltage frequency. MON_VIN_FREQUENCY	
3	2 0002h	2 0002h							Returns the fan 1 speed. MON_FAN_SPEED_1	
4	—	3 0003h							Returns the fan 2 speed. MON_FAN_SPEED_2	
5	—	4 0004h							Returns the AUX output voltage value. MON_AUX_VOUT	
6	5 0005h	5 0005h							Returns the internal temperature. MON_TEMPERATURE_1	
7	—	6 0006h							Returns the PR alarm status. READ_PR_ALARM	
8	—	7 0007h							Returns the PG alarm status. READ_PG_ALARM	
9	8 0008h	8 0008h							Returns the cumulative input voltage time (in minutes). TOTAL_INPUT_TIME_1	
10	9 0009h	9 0009h							Returns the cumulative input voltage time (in hour, lower 16-bits). TOTAL_INPUT_TIME_2	
11	10 000Ah	10 000Ah							Returns the cumulative input voltage time (in hours, upper 16-bits). TOTAL_INPUT_TIME_3	
12	11 000Bh	11 000Bh							Returns the product serial number. READ_SERIAL	

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No.	Input register address								Register description (Extended UART command name)	
	PCA	AME								
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6		
13	12 000Ch	12 000Ch							Returns the top 3 digits of the product lot number. <u>READ_LOT_H</u>	
14	13 000Dh	13 000Dh							Returns the last 4 digits of the product lot number. <u>READ_LOT_L</u>	
15	14 000Eh	—	—	—	—	—	—	—	Returns the product code indicating the model number (upper 16-bits). <u>READ_PRODUCT_CODE_H</u>	
16	15 000Fh	—	—	—	—	—	—	—	Returns the product code indicating the model number (lower 16-bits). <u>READ_PRODUCT_CODE_L</u>	
17	21 0015h	—	21 0015h	85 0055h	149 0095h	213 00D5h	277 0115h	341 0155h	Returns the output voltage value. <u>MON_VOUT</u>	
18	22 0016h	—	22 0016h	86 0056h	150 0096h	214 00D6h	278 0116h	342 0156h	Returns the output current value. <u>MON_IOUT</u>	
19	23 0017h	—	23 0017h	87 0057h	151 0097h	215 00D7h	279 0117h	343 0157h	Returns the output power value. <u>MON_OUTPUT_POWER</u>	
20	24 0018h	408 0198h	24 0018h	88 0058h	152 0098h	216 00D8h	280 0118h	344 0158h	Returns a code indicating the stop status. <u>READ_STOP_CODE</u>	
21	—	—	25 0019h	89 0059h	153 0099h	217 00D9h	281 0119h	345 0159h	Returns the LV alarm status. <u>READ_LV_ALARM</u>	
22	26 001Ah	410 019Ah	26 001Ah	90 005Ah	154 009Ah	218 00DAh	282 011Ah	346 015Ah	Returns the cumulative output voltage time (in minutes). <u>TOTAL_OUTPUT_TIME_1</u>	
23	27 001Bh	411 019Bh	27 001Bh	91 005Bh	155 009Bh	219 00DBh	283 011Bh	347 015Bh	Returns the cumulative output voltage time (in hours, lower 16-bits). <u>TOTAL_OUTPUT_TIME_2</u>	
24	28 001Ch	412 019Ch	28 001Ch	92 005Ch	156 009Ch	220 00DCh	284 011Ch	348 015Ch	Returns the cumulative output voltage time (in hours, upper 16-bits). <u>TOTAL_OUTPUT_TIME_3</u>	
25	—	413 019Dh	29 001Dh	93 005Dh	157 009Dh	221 00DDh	285 011Dh	349 015Dh	Returns module information. <u>READ_PRODUCT_INFO</u>	
26	30 001Eh	—	30 001Eh	94 005Eh	158 009Eh	222 00DEh	286 011Eh	350 015Eh	Returns the rated voltage value. <u>READ_RATED_VOUT</u>	
27	31 001Fh	—	31 001Fh	95 005Fh	159 009Fh	223 00DFh	287 011Fh	351 015Fh	Returns the rated current value. <u>READ_RATED_IOUT</u>	

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4.2 Holding register list

The Holding register is a 16-bit read/write register. The register mainly related to the power supply settings are located. When the input is shut down, the settings data will be cleared. In order to keep the settings data, write to the register address in no. 32.

See below for a brief the register descriptions and the corresponding extended UART names.

No.	Holding register address								Register description (Extended UART command name)	
	PCA	AME								
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6		
1	0 0000h	—	0 0000h	64 0040h	128 0080h	192 00C0h	256 0100h	320 0140h	Sets the output voltage. Read: READ_VOUT_PRM Write: SET_VOUT	
2	1 0001h	—	1 0001h	65 0041h	129 0081h	193 00C1h	257 0101h	321 0141h	Sets the constant current operating value. Read: READ_CC_PRM Write: SET_CC	
3	—	—	2 0002h	66 0042h	130 0082h	194 00C2h	258 0102h	322 0142h	Sets the delay time from when power conversion is ready, to when it starts. Read: READ_TON_DELAY_SLOT_PRM Write: SET_TON_DELAY_SLOT	
4	—	—	3 0003h	67 0043h	131 0083h	195 00C3h	259 0103h	323 0143h	Sets the delay time from when a stop signal or GI communication is received to when power conversion stops. Read: READ_TOFF_DELAY_SLOT_PRM Write: SET_TOFF_DELAY_SLOT	
5	6 0006h	—	—	—	—	—	—	—	Sets the start-up delay time from the RC2 terminal operation. Read: READ_TON_DELAY_RC_PRM Write: SET_TON_DELAY_RC	
6	7 0007h	7 0007h							Sets the delay time from input ON to operating start (output voltage). Read: READ_TON_DELAY_VIN_PRM Write: SET_TON_DELAY_VIN	
7	—	8 0008h							Turns on the output of any slot. Read: — Write: CLT_CH_REMOTE_ON	
8	—	9 0009h							Turns off the output of any slot. Read: — Write: CLT_CH_REMOTE_OFF	
9	10 000Ah	10 000Ah							Sets the start-up voltage for AC input. Read: READ_START_UP_VIN_AC_PRM Write: SET_START_UP_VIN_AC	
10	11 000Bh	11 000Bh							Sets the stop voltage for AC input. Read: READ_STOP_VIN_AC_PRM Write: SET_STOP_VIN_AC	
11	12 000Ch	—	—	—	—	—	—	—	Sets the start-up voltage for DC input. Read: READ_START_UP_VIN_DC_PRM Write: SET_START_UP_VIN_DC	
12	13 000Dh	—	—	—	—	—	—	—	Sets the stop voltage for DC input. Read: READ_STOP_VIN_DC_PRM Write: SET_STOP_VIN_DC	

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No.	Holding register address								Register description (Extended UART command name)	
	PCA	AME								
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6		
13	14 000Eh	14 000Eh								
14	—	15 000Fh								
15	—	16 0010h								
16	22 0016h	—	22 0016h	86 0056h	150 0096h	214 00D6h	278 0116h	342 0156h	Sets the adjustable output voltage upper limit. Read: READ_VOUT_UPPER_LIMIT_PRM Write: SET_VOUT_UPPER_LIMIT	
17	23 0017h	—	23 0017h	87 0057h	151 0097h	215 00D7h	279 0117h	343 0157h	Sets the adjustable output voltage lower limit. Read: READ_VOUT_LOWER_LIMIT_PRM Write: SET_VOUT_LOWER_LIMIT	
18	24 0018h	—	24 0018h	88 0058h	152 0098h	216 00D8h	280 0118h	344 0158h	Sets the adjustable upper limit of the constant current operation. Read: READ_CC_UPPER_LIMIT_PRM Write: SET_CC_UPPER_LIMIT	
19	—	—	25 0019h	89 0059h	153 0099h	217 00D9h	281 0119h	345 0159h	Selects the constant current operation control amount. Read: READ_CC_CONTROL_PRM Write: SET_CC_CONTROL	
20	26 001Ah	—	26 001Ah	90 005A	154 009Ah	218 00DAh	282 011Ah	346 015Ah	Selects the output voltage ramp rate. Read: READ_RAMP_RATE_PRM Write: SET_RAMP_RATE	
21	—	—	27 001Bh	91 005Bh	155 009Bh	219 00DBh	283 011Bh	347 015Bh	Sets the output voltage value which activates the LV alarm signal when the output voltage drops. Read: READ_VOUT_LV_ALARM_PRM Write: SET_VOUT_LV_ALARM	
22	—	—	28 001Ch	92 005Ch	156 009Ch	220 00DCh	284 011Ch	348 015Ch	Sets the output voltage value which activates the LV alarm signal when the output voltage rises. Read: READ_VOUT_HV_ALARM_PRM Write: SET_VOUT_HV_ALARM	
23	32 0020h	32 0020h ※								
24	—	34 0022h								

※ PCA:Read and write AME:Write only

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No.	Holding register address								Register description (Extended UART command name)	
	PCA	AME								
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6		
25	—	36 0024h								
26	38 0026h	38 0026h								
27	40 0028h	40 0028h								
28	—	42 002Ah								
29	44 002Ch	44 002Ch								
30	—	—	54 0036h	118 0076h	182 00B6h	246 00F6h	310 0136h	374 0176h	Turns the selected slot output ON or OFF. Read: READ_REMOTE_PRM Write: CTL_REMOTE_OFF_CH CTL_REMOTE_ON_CH	
31	56 0038h	—	56 0038h	120 0078h	184 00B8h	248 00F8h	312 0138h	376 0178h	Sets whether the constant current value of the ITRM terminal or the Holding register address is enabled. Read: READ_CC_MODE_PRM Write: SET_CC_MODE_ITRIM SET_CC_MODE_INFO	
32	58 003Ah	442 01BAh	58 003Ah	122 007Ah	186 00BAh	250 00FAh	314 013Ah	378 017Ah	Stores the Holding register values and settings in the power supply's internal non-volatile memory. Read: — Write: SYS_STORE_USER_SETTING	
33	60 003Ch	444 01BCh	60 003Ch	124 007Ch	188 00BCh	252 00FCh	316 013Ch	380 017Ch	Restores the Holding register values and settings to the factory defaults. Read: — Write: SYS_RESTORE_FACTORY_SETTING	

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4.3 Unsupported command list (for the extended UART)

See below for a list of extended UART commands that are not supported by this conversion unit.

No.	Extended UART command name	PCA	AME	Function
1	READ_REMOTE_CH_PRM	—	×	Returns the power output ON/OFF setting status for all slots.
2	READ_REMOTE_CONTROL	×	×	Returns the power output ON/OFF status.
3	READ_REMOTE_START_UP_PRM	—	×	Returns the power output ON/OFF setting status immediately after AC input.
4	SET_VOUT_FACTORY_SETTING	×	×	Restores the output voltage setting value to the factory default.
5	READ_VOUT_REFERENCE	×	×	Returns the output voltage control value.
6	SET_VOUT_LIMIT_FACTORY_SETTING	×	×	Restores the adjustable upper and lower limits of the output voltage to the factory defaults.
7	SET_CC_FACTORY_SETTING	×	×	Restores the constant current operating value to the factory default.
8	READ_CC_REFERENCE	×	×	Returns the constant current operation control value.
9	SET_CC_LIMIT_FACTORY_SETTING	×	×	Restores the upper limit of the constant current operating value to the factory default.
10	SET_TON_DELAY_FACTORY_SETTING	—	×	Restores the startup delay time to the factory default.
11	SET_TOFF_DELAY_FACTORY_SETTING	—	×	Restores the stop delay time to the factory default.
12	SET_MS	×	—	Sets master mode or slave mode.
13	READ_MS_PRM	×	—	Returns the setting values for master mode or slave mode.
14	READ_MS	×	—	Returns the current master-slave setting status.
15	SET_VOUT_ALARM_FACTORY_SETTING	—	×	Restores the output voltage for alarm signal activation to the factory default.
16	SET_SELECTION_CH	—	×	Sets a selected slot.
17	READ_SELECTION_CH	—	×	Returns the currently selected slot for setting.
18	READ_STORE_USER_SETTING	—	×	Returns the recording status of the internal non-volatile memory setting.
19	CTL_ACCUMULATE_MODE_ON	×	×	Enables accumulate mode
20	CTL_ACCUMULATE_MODE_OFF	×	×	Disables accumulate mode.
21	READ_ACCUMULATE_MODE	×	×	Returns the setting status of accumulate mode.
22	CTL_ACCUMULATE_EXEC	×	×	Executes the command in accumulate mode.
23	CTL_ACCUMULATE_CLEAR	×	×	Clears the buffer in accumulate mode
24	SET_ADDRESS	×	×	Sets the communication address.
25	READ_ADDRESS_PRM	×	×	Returns the set value of the communication address.
26	READ_ADDRESS	×	×	Returns the communication address.
27	READ_VIN_POINT	×	×	Returns the decimal point position of the return value of the MON_VIN command.
28	READ_VOUT_POINT	×	×	Returns the decimal point position of the return value of the MON_VOUT command.
29	READ_IOUT_POINT	×	×	Returns the decimal point position of the return value of the MON_IOUT command.

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5. Register details

5.1 Input register details

Input register address	PCA	AME																														
	0 (0000h)	0 (0000h)																														
Register function	Returns the input voltage value. AC and DC are automatically determined.																															
Register data	Register data / 100 → Input voltage value [V] Ex. 24010 (5DCAh) → AC 240.10 V																															
Extended UART (Read)	MON_VIN																															
Read message example	Slave address: 1 Reads input voltage. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>00h</td> <td>00h</td> <td>01h</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>5Dh</td> <td>CAh</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	00h	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	5Dh	CAh	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
01h	04h	00h	00h	00h	01h																											
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																											
01h	04h	02h	5Dh	CAh	CRC Lo CRC Hi																											

Input register address	PCA	AME																														
	1 (0001h)	1 (0001h)																														
Register function	Returns the input voltage frequency. DC input returns "0". Undefined for 5 seconds after the unit is turned on.																															
Register data	Register data /10 → Frequency [Hz] of the input voltage Ex. 600 (0258h) → 60.0 Hz																															
Extended UART (Read)	MON_VIN_FREQUENCY																															
Read message example	Slave address: 1 Reads input voltage frequency. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>01h</td> <td>00h</td> <td>01h</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>02h</td> <td>58h</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	01h	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	02h	58h	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
01h	04h	00h	01h	00h	01h																											
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																											
01h	04h	02h	02h	58h	CRC Lo CRC Hi																											

Input register address	PCA	AME																														
	2 (0002h)	2 (0002h)																														
Register function	Returns the fan 1 speed.																															
Register data	Register data → Rotation speed [rpm] of fan 1 Ex. 7500 (1D4Ch) → 7500 rpm																															
Extended UART (Read)	MON_FAN_SPEED_1																															
Read message example	Slave address: 1 Reads the fan 1 speed. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>02h</td> <td>00h</td> <td>01h</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>1Dh</td> <td>4Ch</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	02h	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	1Dh	4Ch	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
01h	04h	00h	02h	00h	01h																											
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																											
01h	04h	02h	1Dh	4Ch	CRC Lo CRC Hi																											

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Input register address	PCA	AME																													
	—	3 (0003h)																													
Register function	Returns the fan 2 speed. ※AME400F and AME600F cannot be used, doing so will return Register data "0(0000h)".																														
Register data	Register data → Rotation speed [rpm] of fan 2 Ex. 7500 (1D4Ch) → 7500 rpm																														
Extended UART (Read)	MON_FAN_SPEED_2																														
Read message example	Slave address: 1 Reads the fan 2 speed.																														
	<table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>03h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>1Dh 4Ch</td> <td>CRC Lo CRC Hi</td> </tr> </table>	Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	03h	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	1Dh 4Ch	CRC Lo CRC Hi							
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
01h	04h	00h	03h	00h 01h	CRC Lo CRC Hi																										
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																										
01h	04h	02h	1Dh 4Ch	CRC Lo CRC Hi																											

Input register address	PCA	AME																													
	—	4 (0004h)																													
Register function	Returns the AUX output voltage value.																														
Register data	Register data/1000 → AUX output voltage value [V] Ex. 5100 (13ECh) → 5.100 V																														
Extended UART (Read)	MON_AUX_VOUT																														
Read message example	Slave address: 1 Reads AUX voltage.																														
	<table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>04h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>13h ECh</td> <td>CRC Lo CRC Hi</td> </tr> </table>	Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	04h	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	13h ECh	CRC Lo CRC Hi							
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
01h	04h	00h	04h	00h 01h	CRC Lo CRC Hi																										
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																										
01h	04h	02h	13h ECh	CRC Lo CRC Hi																											

Input register address	PCA	AME																													
	5 (0005h)	5 (0005h)																													
Register function	Returns the internal temperature. The register data (signed hexadecimal number) indicates the temperature in degrees Celsius [°C].																														
Register data	Register data (signed hexadecimal number) → Internal temperature [°C] Range: -30 – 100 °C Ex. 0000 0000 0001 1001b (0019h) → 25 °C 1111 1111 1110 0111b (FFE7h) → -25 °C																														
Extended UART (Read)	MON_TEMPERATURE_1																														
Read message example	Slave address: 1 Reads the internal temperature.																														
	<table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>05h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>FFh E7h</td> <td>CRC Lo CRC Hi</td> </tr> </table>	Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	05h	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	FFh E7h	CRC Lo CRC Hi							
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Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																										
01h	04h	02h	FFh E7h	CRC Lo CRC Hi																											

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Input register address	PCA	AME																													
	—	6 (0006h)																													
Register function	Returns the PR alarm status.																														
Register data	<p>0 → Normal operation 1 → Abnormal operation Ex. 0000 0000 0000 0010b(0002h) → Fan stopped 0000 0000 0000 0011b(0003h) → Low input voltage and fan stopped</p>																														
Extended UART (Read)	READ_PR_ALARM																														
Read message example	Slave address: 1 Reads PR alarm status.																														
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Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
	01h	04h	00h	06h	00h 01h CRC Lo CRC Hi																										
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																										
	01h	04h	02h	00h 03h	CRC Lo CRC Hi																										

Input register address	PCA	AME																													
	—	7 (0007h)																													
Register function	Returns the PG alarm status.																														
Register data	0000h → Normal operation 0001h → Input module stopped																														
Extended UART (Read)	READ_PG_ALARM																														
Read message example	Slave address: 1 Reads PG alarm status.																														
	<table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>04h</td> <td>00h</td> <td>07h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </tbody> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	04h	00h	07h	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check		01h	04h	02h	00h 01h	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
	01h	04h	00h	07h	00h 01h CRC Lo CRC Hi																										
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																										
	01h	04h	02h	00h 01h	CRC Lo CRC Hi																										

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Input register address	PCA	AME																																			
	8 (0008h)	8 (0008h)																																			
Register function	Returns the cumulative input voltage time (in minutes). This register (TOTAL_INPUT_TIME_1) indicates "minutes" and is reset to "0" every 60 minutes. The total accumulated input time (hours) is returned as 32-bit data. The input register address "9 (0009h)" (TOTAL_INPUT_TIME_2) returns the lower 16 bits, and the input register address "10 (000Ah)" (TOTAL_INPUT_TIME_3) returns the upper 16 bits.																																				
Register data	Register data → Cumulative input voltage time [minutes] Range: 0-59 Ex. 57 (0039h) → 57 minutes																																				
Extended UART (Read)	TOTAL_INPUT_TIME_1																																				
Read message example	Slave address: 1 Reads the cumulative input voltage time (in minutes). <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td colspan="2">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>08h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td colspan="2">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h</td> <td>39h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	04h	00h	08h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check		01h	04h	02h	00h	39h	CRC Lo	CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																
	01h	04h	00h	08h	00h	01h	CRC Lo	CRC Hi																													
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																																
	01h	04h	02h	00h	39h	CRC Lo	CRC Hi																														

Input register address	PCA	AME																																			
	9 (0009h)	9 (0009h)																																			
Register function	Returns the cumulative input voltage time (in hours, lower 16-bits). Returns the accumulated time operating with input voltage (hours) as 32-bit data. This register returns the lower 16 bits, and the input register address "10 (000Ah)" (TOTAL_INPUT_TIME_3) returns the upper 16 bits.																																				
Register data	Register data1, Register data2 → Cumulative input voltage time [hours] lower 16-bit : Register address 9(0009h) TOTAL_INPUT_TIME_2 (0-65,535 hours) upper 16-bit : Register address 10(000Ah) TOTAL_INPUT_TIME_3 Range: 0- 2^{32} - 1 hours																																				
Extended UART (Read)	TOTAL_INPUT_TIME_2																																				
Read message example	Slave address: 1 Reads the cumulative input voltage time (in hours, lower 16-bits). <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td colspan="2">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>09h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td colspan="2">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>03h</td> <td>E8h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	04h	00h	09h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check		01h	04h	02h	03h	E8h	CRC Lo	CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																
	01h	04h	00h	09h	00h	01h	CRC Lo	CRC Hi																													
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																																
	01h	04h	02h	03h	E8h	CRC Lo	CRC Hi																														

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Input register address	PCA	AME																												
	10 (000Ah)	10 (000Ah)																												
Register function	Returns the cumulative input voltage time (in hours, upper 16-bits). Returns the accumulated time operating with input voltage (hours) as 32-bit data. This register returns the upper 16 bits, and the input register address "9 (0009h)" (TOTAL_INPUT_TIME_2) returns the lower 16 bits.																													
Register data	See input register address "9(0009h) " (TOTAL_INPUT_TIME_2)																													
Extended UART (Read)	TOTAL_INPUT_TIME_3																													
Read message example	Slave address: 1 Reads the cumulative input voltage time (in hours, upper 16-bits). <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>10h</td> <td>00h 01h</td> </tr> </table> <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h 00h</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	10h	00h 01h	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	00h 00h	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																									
	01h	04h	00h	10h	00h 01h																									
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																									
	01h	04h	02h	00h 00h	CRC Lo CRC Hi																									

Input register address	PCA	AME																												
	11 (000Bh)	11 (000Bh)																												
Register function	Returns the product serial number. Returns the serial number within the product lot.																													
Register data	Register data → Product serial number Range: 000–999 Ex. 010 (000Ah)																													
Extended UART (Read)	READ_SERIAL																													
Read message example	Slave address: 1 Reads product serial Number. <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h 0Bh</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h 0Ah</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h 0Bh	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	00h 0Ah	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																									
	01h	04h	00h 0Bh	00h 01h	CRC Lo CRC Hi																									
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																									
	01h	04h	02h	00h 0Ah	CRC Lo CRC Hi																									

Input register address	PCA	AME																												
	12 (000Ch)	12 (000Ch)																												
Register function	Returns the top 3 digits of the product lot number.																													
Register data	Register data → Top 3 digits of the product lot number Range: 001–954 Ex. 124 (007Ch)																													
Extended UART (Read)	READ_LOT_H																													
Read message example	Slave address: 1 Reads the top 3 digits of the product lot number. <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h 0Ch</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h 7Ch</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h 0Ch	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	00h 7Ch	CRC Lo CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																									
	01h	04h	02h	00h 7Ch	CRC Lo CRC Hi																									

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Input register address	PCA 13 (000Dh)	AME 13 (000Dh)																													
Register function	Returns the last 4 digits of the product lot number.																														
Register data	Register data → Last 4 digits of the product lot number Range: 0000–9999 Ex. 9999 (270Fh)																														
Extended UART (Read)	READ_LOT_L																														
Read message example	Slave address: 1 Reads the last 4 digits of the product lot number. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>0Dh</td> <td>00h</td> <td>01h</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>27h</td> <td>0Fh</td> <td>CRC Lo CRC Hi</td> </tr> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	0Dh	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	27h	0Fh	CRC Lo CRC Hi
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01h	04h	02h	27h	0Fh	CRC Lo CRC Hi																										

Input register address	PCA 14 (000Eh)	AME —																																																																				
Register function	Returns the product code indicating the model number (upper 16-bits). Returns the product code as 32-bit data. This register returns the upper 16bits, and the Input register address "15(000Fh)" (READ_PRODUCT_CODE_L) returns the lower 16-bits.																																																																					
Register data	Register data1, Register data2 → Product code upper 16-bit : Register address 14 (000Eh) READ_PRODUCT_CODE_H lower 16-bit : Register address 15 (000Fh) READ_PRODUCT_CODE_L Range: 000000–999999																																																																					
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Model</th> <th colspan="6">Rated voltage</th> </tr> <tr> <th>5</th> <th>12</th> <th>15</th> <th>24</th> <th>32</th> <th>48</th> </tr> </thead> <tbody> <tr> <td>PCA300F-□</td> <td>150413</td> <td>150414</td> <td>150415</td> <td>150416</td> <td>150417</td> <td>150418</td> </tr> <tr> <td>PCA300F-□-T</td> <td>150419</td> <td>150420</td> <td>150421</td> <td>150422</td> <td>150423</td> <td>150424</td> </tr> <tr> <td>PCA600F-□</td> <td>145688</td> <td>145689</td> <td>145690</td> <td>145691</td> <td>147976</td> <td>145692</td> </tr> <tr> <td>PCA600F-□-T</td> <td>—</td> <td>146831</td> <td>146834</td> <td>146837</td> <td>148739</td> <td>148740</td> </tr> <tr> <td>PCA1000F-□</td> <td>150364</td> <td>150365</td> <td>150366</td> <td>150367</td> <td>150368</td> <td>150369</td> </tr> <tr> <td>PCA1000F-□-T</td> <td>—</td> <td>—</td> <td>—</td> <td>150370</td> <td>150371</td> <td>150372</td> </tr> <tr> <td>PCA1500F-□</td> <td>153477</td> <td>153472</td> <td>153473</td> <td>153474</td> <td>153475</td> <td>153476</td> </tr> </tbody> </table> Ex. 145688 (00023918h) → PCA600F-5 145689 (00023919h) → PCA600F-12								Model	Rated voltage						5	12	15	24	32	48	PCA300F-□	150413	150414	150415	150416	150417	150418	PCA300F-□-T	150419	150420	150421	150422	150423	150424	PCA600F-□	145688	145689	145690	145691	147976	145692	PCA600F-□-T	—	146831	146834	146837	148739	148740	PCA1000F-□	150364	150365	150366	150367	150368	150369	PCA1000F-□-T	—	—	—	150370	150371	150372	PCA1500F-□	153477	153472	153473	153474	153475	153476
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Extended UART (Read)	READ_PRODUCT_CODE_H																																																																					
Read message example	Slave address: 1 Reads the product code indicating the model number (upper 16-bits). <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th rowspan="2">Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>0Eh</td> <td>00h</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th rowspan="2">Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h</td> <td>02h</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	0Eh	00h	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	00h	02h																																								
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Input register address	PCA	AME													
	15 (000Fh)	—													
Register function	Returns the product code indicating the model number (lower 16-bits). Returns the product code as 32-bit data. This register returns the lower 16bits, and the Input register address "14(000Eh)" (READ_PRODUCT_CODE_H) returns the upper 16-bits.														
Register data	See input register address "14(000Eh)" (READ_PRODUCT_CODE_H)														
Extended UART (Read)	READ_PRODUCT_CODE_L														
Read message example	Slave address: 1 Reads the product code indicating the model number (lower 16-bits).														
Message frame		Slave address	FC	Register address	Qty of Registers	CRC check									
01h		04h	00h	0Fh	00h	01h	CRC Lo	CRC Hi							
Response message frame		Slave address	FC	Qty of data bytes	Register data	CRC check									
01h		04h	02h		39h	18h	CRC Lo	CRC Hi							

Input register address	PCA	AME						
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
	21 (0015h)	—	21 (0015h)	85 (0055h)	149 (0095h)	213 (00D5h)	277 (0115h)	341 (0155h)
Register function	Returns the output voltage (between sensing terminals) value. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.							
Register data	Other than AME V,V4,V5 module : Register data /1000 → Output voltage value [V] EX. 24200 (5E88h) → 24.200V AME V,V4,V5 module : Register data /100 → Output voltage value [V] Ex. 7550 (1D7Eh) → 75.50V							
Extended UART (Read)	MON_VOUT							
Read message example	Slave address: 1 Reads the output voltage of AME slot 6.							
Message frame		Slave address	FC	Register address	Qty of Registers	CRC check		
01h		04h	01h	55h	00h	01h	CRC Lo	CRC Hi
Response message frame		Slave address	FC	Qty of data bytes	Register data	CRC check		
01h		04h	02h		5Eh	88h	CRC Lo	CRC Hi

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Input register address	PCA	AME																																					
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																															
	22 (0016h)	—	22 (0016h)	86 (0056h)	150 (0096h)	214 (00D6h)	278 (0116h)	342 (0156h)																															
Register function	Returns the output current value. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. ※ AME output module types "E, E4, F, F4, G, G4, H, H4, S, T, U, V, V4, V5" can use this function. AME output module types "A, B, C, D, J, K, L, M, R" cannot use this function. If specified, an exception response (exception code: 3) will be returned.																																						
Register data	Register data /100 → Output current value [A] Ex. 1350 (0546h) → 13.50 A																																						
Extended UART (Read)	MON_IOUT																																						
Read message example	Slave address: 1 Reads the output current of AME slot 5. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>01h</td> <td>16h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>05h</td> <td>46h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			01h	04h	01h	16h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check			01h	04h	02h	05h	46h	CRC Lo	CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																																		
	01h	04h	02h	05h	46h	CRC Lo	CRC Hi																																

Input register address	PCA	AME																																					
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																															
	23 (0017h)	—	23 (0017h)	87 (0057h)	151 (0097h)	215 (00D7h)	279 (0117h)	343 (0157h)																															
Register function	Returns the output power value. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. ※ AME output module types "E, E4, F, F4, G, G4, H, H4, S, T, U, V, V4, V5" can use this function. AME output module types "A, B, C, D, J, K, L, M, R" cannot use this function. If specified, an exception response (exception code: 3) will be returned.																																						
Register data	Register data /100 → Output power value [W]. Ex. 6000 (1770h) → 600 W																																						
Extended UART (Read)	MON_OUTPUT_POWER																																						
Read message example	Slave address: 1 Reads output power of AME slot 4. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>D7h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>17h</td> <td>70h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			01h	04h	00h	D7h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check			01h	04h	02h	17h	70h	CRC Lo	CRC Hi
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		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																																																																			
		24 (0018h)	408 (0198h)	24 (0018h)	88 (0058h)	152 (0098h)	216 (00D8h)	280 (0118h)	344 (0158h)																																																																		
Register function	Returns a code indicating the stop status. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. When the output module is stopped by "input module stop" in AME, an exception response (exception code: 4) will be returned when slots 1 through 6 are selected.																																																																										
Register data	[PCA] <table border="1"> <thead> <tr> <th>Register data</th> <th>Cause of stop</th> </tr> </thead> <tbody> <tr><td>000(0000h)</td><td>Not stopped.</td></tr> <tr><td>001(0001h)</td><td>Stop by RC2 terminal.</td></tr> <tr><td>002(0002h)</td><td>Stop by command CTL_REMOTE_OFF.</td></tr> <tr><td>010(000Ah)</td><td>Stop due to input voltage drop.</td></tr> <tr><td>020(0014h)</td><td></td></tr> <tr><td>050(0032h)</td><td>Stop by activation of overcurrent protection.</td></tr> <tr><td>051(0033h)</td><td></td></tr> <tr><td>054(0036h)</td><td>Stop due to abnormal fan rotation.</td></tr> <tr><td>060(003Ch)</td><td>Stop due to DS terminal function.</td></tr> <tr><td>061(003Dh)</td><td></td></tr> <tr><td>101(0065h)</td><td>Stop due to output overvoltage.</td></tr> <tr><td>106(006Ah)</td><td>Stop by activation of overheat protection.</td></tr> <tr><td>210(00D2h)</td><td>Stop due to non-spec pulse load.</td></tr> <tr><td>230(00E6h)</td><td>Stop due to DS terminal connection error.</td></tr> <tr><td>233(00E9h)</td><td>Stop due to use of outside derating.</td></tr> </tbody> </table>				Register data	Cause of stop	000(0000h)	Not stopped.	001(0001h)	Stop by RC2 terminal.	002(0002h)	Stop by command CTL_REMOTE_OFF.	010(000Ah)	Stop due to input voltage drop.	020(0014h)		050(0032h)	Stop by activation of overcurrent protection.	051(0033h)		054(0036h)	Stop due to abnormal fan rotation.	060(003Ch)	Stop due to DS terminal function.	061(003Dh)		101(0065h)	Stop due to output overvoltage.	106(006Ah)	Stop by activation of overheat protection.	210(00D2h)	Stop due to non-spec pulse load.	230(00E6h)	Stop due to DS terminal connection error.	233(00E9h)	Stop due to use of outside derating.	[AME] <table border="1"> <thead> <tr> <th>Register data</th> <th>Module</th> <th>Cause of stop</th> </tr> </thead> <tbody> <tr><td>000(0000h)</td><td rowspan="8">input</td><td>Not stopped.</td></tr> <tr><td>003(0003h)</td><td>Stop by GI (All outputs except AUX are OFF).</td></tr> <tr><td>010(000Ah)</td><td>Stop due to input voltage drop.</td></tr> <tr><td>054(0036h)</td><td>Stop due to abnormal fan rotation.</td></tr> <tr><td>062(003Eh)</td><td>Stop by overpower protection.</td></tr> <tr><td>106(006Ah)</td><td>Stop by activation of overheat protection.</td></tr> <tr><td>130(0082h)</td><td>Stop by overvoltage or overheat protection in the output module.</td></tr> <tr><td>131(0083h)</td><td></td></tr> <tr><td>000(0000h)</td><td rowspan="7">output</td><td>Not stopped.</td></tr> <tr><td>001(0001h)</td><td>Stop by RC terminal.</td></tr> <tr><td>013(000Dh)</td><td>Stop by command from input module (message to stop output, etc.).</td></tr> <tr><td>050(0032h)</td><td>Stop by activation of overcurrent protection.</td></tr> <tr><td>051(0033h)</td><td></td></tr> <tr><td>071(0047h)</td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>				Register data	Module	Cause of stop	000(0000h)	input	Not stopped.	003(0003h)	Stop by GI (All outputs except AUX are OFF).	010(000Ah)	Stop due to input voltage drop.	054(0036h)	Stop due to abnormal fan rotation.	062(003Eh)	Stop by overpower protection.	106(006Ah)	Stop by activation of overheat protection.	130(0082h)	Stop by overvoltage or overheat protection in the output module.	131(0083h)		000(0000h)	output	Not stopped.	001(0001h)	Stop by RC terminal.	013(000Dh)	Stop by command from input module (message to stop output, etc.).	050(0032h)	Stop by activation of overcurrent protection.	051(0033h)		071(0047h)			
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Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																																																						
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				CRC Lo	CRC Hi																																																																						
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																																																																						
01h	04h	02h	00h	32h	CRC Lo																																																																						
					CRC Hi																																																																						

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Input register address	PCA	AME																													
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																							
		—	—	25 (0019h)	89 (0059h)	153 (0099h)	217 (00D9h)	281 (0119h)																							
Register function	Returns the LV alarm status. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																														
Register data	0000h → Normal operation 0001h → Error: Output voltage drop 0002h → Error: Output voltage rise																														
Extended UART (Read)	READ_LV_ALARM																														
Read message example	Slave address: 1 Reads the LV alarm status of AME slot 2.																														
	<table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>59h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	59h	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	00h 01h	CRC Lo CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
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Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																										
01h	04h	02h	00h 01h	CRC Lo CRC Hi																											

Input register address	PCA	AME																													
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																							
		26 (001Ah)	410 (019Ah)	26 (001Ah)	90 (005Ah)	154 (009Ah)	218 (00DAh)	282 (011Ah)																							
Register function	Returns the cumulative output voltage time (in minutes). This register (TOTAL_INPUT_TIME_1) indicates "minutes" and is reset to "0" every 60 minutes. The total accumulated output time (hours) is returned as 32-bit data. The Holding register address "27 (001Bh),91(005Bh),..." (TOTAL_OUTPUT_TIME_2) returns the lower 16 bits, and the Holding register address "28 (001Ch),92(005C),..." (TOTAL_OUTPUT_TIME_3) returns the upper 16 bits. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																														
Register data	Register data → Cumulative output voltage time [minutes] Range: 0–59 Ex. 57 (0039h) → 57 minutes																														
Extended UART (Read)	TOTAL_OUTPUT_TIME_1																														
Read message example	Slave address: 1 Reads cumulative output voltage time (in minutes) of AME slot 1.																														
	<table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>1Ah</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h 39h</td> <td>CRC Lo CRC Hi</td> </tr> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	00h	1Ah	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	00h 39h	CRC Lo CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
01h	04h	00h	1Ah	00h 01h	CRC Lo CRC Hi																										
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																										
01h	04h	02h	00h 39h	CRC Lo CRC Hi																											

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Input register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
		27 (001Bh)	411 (019Bh)	27 (001Bh)	91 (005Bh)	155 (009Bh)	219 (00DBh)	283 (011Bh)	347 (015Bh)																							
Register function	Returns the cumulative output voltage time (in hours, lower 16-bits). The total accumulated output time (hours) is returned as 32-bit data. This register returns the lower 16 bits, and the Holding register address "28 (001Ch),92(005Ch),..." (TOTAL_OUTPUT_TIME_3) returns the upper 16 bits. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																															
Register data	Register data1, Register data2 → Cumulative output voltage time [hours] lower 16-bit : Register address 27 (001Bh) TOTAL_OUTPUT_TIME_2 (0-65,535hours) upper 16-bit : Register address 28 (001Ch) TOTAL_OUTPUT_TIME_3 Range: 0-2 ³² – 1 hours																															
Extended UART (Read)	TOTAL_OUTPUT_TIME_2																															
Read message example	Slave address: 1 Reads the cumulative output voltage time (lower 16-bits) of AME slot 6. <table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>04h</td> <td>01h</td> <td>5Bh</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>04h</td> <td>02h</td> <td>03h E8h CRC Lo CRC Hi</td> <td></td> </tr> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	04h	01h	5Bh	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check		01h	04h	02h	03h E8h CRC Lo CRC Hi		
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
	01h	04h	01h	5Bh	00h 01h CRC Lo CRC Hi																											
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																											
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Input register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
		28 (001Ch)	412 (019Ch)	28 (001Ch)	92 (005Ch)	156 (009Ch)	220 (00DCh)	284 (011Ch)	348 (015Ch)																							
Register function	Returns the cumulative output voltage time(in hours, upper 16-bits). The total accumulated output time (hours) is returned as 32-bit data. This register returns the upper 16 bits, and the Holding register address "27 (001Bh),91(005Bh),..." (TOTAL_OUTPUT_TIME_2) returns the lower 16 bits. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																															
Register data	See input register address "27(001Bh) ,91(005Bh),...." (TOTAL_OUTPUT_TIME2_)																															
Extended UART (Read)	TOTAL_OUTPUT_TIME_3																															
Read message example	Slave address: 1 Reads the cumulative output voltage time (upper 16-bits) of AME slot 5. <table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>04h</td> <td>01h 1Ch</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>04h</td> <td>02h</td> <td>00h 00h</td> <td>CRC Lo CRC Hi</td> </tr> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	04h	01h 1Ch	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check		01h	04h	02h	00h 00h	CRC Lo CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
	01h	04h	01h 1Ch	00h 01h	CRC Lo CRC Hi																											
Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																											
	01h	04h	02h	00h 00h	CRC Lo CRC Hi																											

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Input register address	PCA	AME																																																					
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																																															
		—	413 (019Dh)	29 (001Dh)	93 (005Dh)	157 (009Dh)	221 (00DDh)	285 (011Dh)	349 (015Dh)																																														
Register function	Returns module information. When input module is selected, returns the input module information. When slot 1–6 is selected, returns the output module information installed in the corresponding slot. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																																																						
Register data	<table border="1"> <thead> <tr> <th>Register data</th><th>Module information</th><th>Register data</th><th>Module information</th></tr> </thead> <tbody> <tr><td>00400(0190h)</td><td>Input module : AME400F</td><td>12048(2F10h)</td><td>Output module : D</td></tr> <tr><td>00600(0258h)</td><td>Input module : AME600F</td><td>24005(5DC5h)</td><td>Output module : E,E4</td></tr> <tr><td>00800(0320h)</td><td>Input module : AME800F</td><td>24007(5DC7h)</td><td>Output module : S</td></tr> <tr><td>01200(04B0h)</td><td>Input module : AME1200F</td><td>24012(5DCCh)</td><td>Output module : F,F4</td></tr> <tr><td>12003(2EE3h)</td><td>Output module : J</td><td>24015(5DCFh)</td><td>Output module : T</td></tr> <tr><td>12005(2EE5h)</td><td>Output module : A</td><td>24024(5DD8h)</td><td>Output module : G,G4</td></tr> <tr><td>12007(2EE7h)</td><td>Output module : K</td><td>24036(5DE4h)</td><td>Output module : U</td></tr> <tr><td>12012(2EECh)</td><td>Output module : B</td><td>24048(5DF0h)</td><td>Output module : H,H4</td></tr> <tr><td>12015(2EEFh)</td><td>Output module : L</td><td>24075(5E0Bh)</td><td>Output module : V,V4,V5</td></tr> <tr><td>12024(2EF8h)</td><td>Output module : C</td><td>02424(0978h)</td><td>Output module : R</td></tr> <tr><td>12036(2F04h)</td><td>Output module : M</td><td>00000(0000h)</td><td>Blank</td></tr> </tbody> </table>							Register data	Module information	Register data	Module information	00400(0190h)	Input module : AME400F	12048(2F10h)	Output module : D	00600(0258h)	Input module : AME600F	24005(5DC5h)	Output module : E,E4	00800(0320h)	Input module : AME800F	24007(5DC7h)	Output module : S	01200(04B0h)	Input module : AME1200F	24012(5DCCh)	Output module : F,F4	12003(2EE3h)	Output module : J	24015(5DCFh)	Output module : T	12005(2EE5h)	Output module : A	24024(5DD8h)	Output module : G,G4	12007(2EE7h)	Output module : K	24036(5DE4h)	Output module : U	12012(2EECh)	Output module : B	24048(5DF0h)	Output module : H,H4	12015(2EEFh)	Output module : L	24075(5E0Bh)	Output module : V,V4,V5	12024(2EF8h)	Output module : C	02424(0978h)	Output module : R	12036(2F04h)	Output module : M	00000(0000h)	Blank
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Extended UART (Read)	READ_PRODUCT_INFO																																																						
Read message example	<p>Slave address: 1 Reads module information of AME input module.</p> <table border="1"> <thead> <tr> <th rowspan="2">Message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Qty of Registers</th><th>CRC check</th></tr> <tr> <td>01h</td><td>04h</td><td>01h</td><td>9Dh</td><td>00h 01h</td><td>CRC Lo CRC Hi</td></tr> </thead> <tbody> <tr> <th rowspan="2">Response message frame</th><th>Slave address</th><th>FC</th><th>Qty of data bytes</th><th>Register data</th><th>CRC check</th></tr> <tr> <td>01h</td><td>04h</td><td>02h</td><td>04h B0h</td><td>CRC Lo CRC Hi</td></tr> </tbody> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	04h	01h	9Dh	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check	01h	04h	02h	04h B0h	CRC Lo CRC Hi																									
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	01h	04h	02h	04h B0h	CRC Lo CRC Hi																																																		

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Input register address	PCA	AME																																				
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																														
	30 (001Eh)	—	30 (001Eh)	94 (005Eh)	158 (009Eh)	222 (00DEh)	286 (011Eh)	350 (015Eh)																														
Register Function	Returns the rated voltage value. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																																					
Register data	Other than AME V,V4,V5 module : Register data /1000 → Rated output voltage [V] Ex. 12000 (2EE0h) → 12.000V AME V,V4,V5 module : Register data /100 → Rated output voltage [V] Ex. 7500 (1D4Ch) → 75.00V																																					
Extended UART (Read)	READ_RATED_VOUT																																					
Read Message Example	Slave address: 1 Read rated voltage value of the AME slot 4. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>slave address</td> <td>FC</td> <td>resistor address</td> <td>no. of resistors</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>DEh</td> <td>00h</td> <td>01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Resistor data</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>2Eh</td> <td>E0h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	slave address	FC	resistor address	no. of resistors	CRC check			01h	04h	00h	DEh	00h	01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Resistor data	CRC check			01h	04h	02h	2Eh	E0h	CRC Lo	CRC Hi
Message frame	slave address	FC	resistor address	no. of resistors	CRC check																																	
	01h	04h	00h	DEh	00h	01h	CRC Lo CRC Hi																															
Response message frame	Slave address	FC	Qty of data bytes	Resistor data	CRC check																																	
	01h	04h	02h	2Eh	E0h	CRC Lo	CRC Hi																															

Input register address	PCA	AME																																				
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																														
	31 (001Fh)	—	31 (001Fh)	95 (005Fh)	159 (009Fh)	223 (00DFh)	287 (011Fh)	351 (015Fh)																														
Register function	Returns the rated current value. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																																					
Register data	Resister data/100 → Rated current value[A] Ex. 3200 (0C80h) → 32.00A																																					
Extended UART (Read)	READ_RATED_IOUT																																					
Read message example	Slave address: 1 Reads the rated current value of AME slot 3. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>00h</td> <td>9Fh</td> <td>00h</td> <td>01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register data</td> <td colspan="3">CRC check</td> </tr> <tr> <td>01h</td> <td>04h</td> <td>02h</td> <td>0Ch</td> <td>80h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			01h	04h	00h	9Fh	00h	01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check			01h	04h	02h	0Ch	80h	CRC Lo	CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																	
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Response message frame	Slave address	FC	Qty of data bytes	Register data	CRC check																																	
	01h	04h	02h	0Ch	80h	CRC Lo	CRC Hi																															

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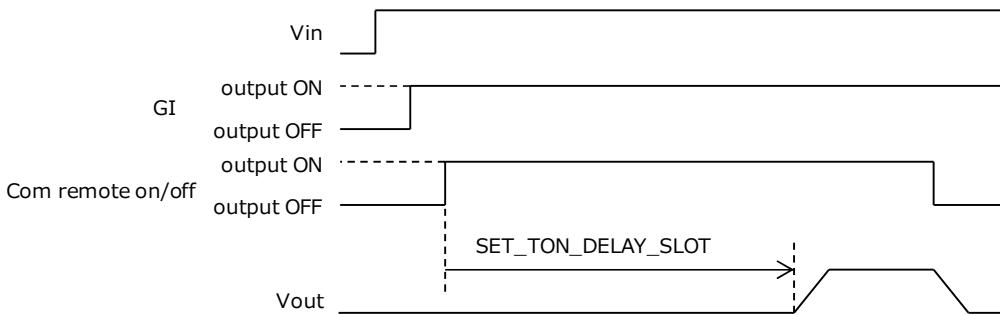
5.2 Holding register details

Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
0 (0000h)	—	0 (0000h)	64 (0040h)	128 (0080h)	192 (00C0h)	256 (0100h)	320 (0140h)																									
Register function	<p>Sets the output voltage. When the output voltage setting function using the VTRM pin is enabled, this register does not operate. A value exceeding 120% of the rated voltage cannot be set. The specified value must be within the parameters set by the Holding register address "22(0016h), 86(0056h)..." (SET_VOUT_UPPER_LIMIT) and the Holding register address "23(0017h), 87(0057h)..." (SET_VOUT_LOWER_LIMIT). After writing to this register, the output voltage is set by this register, regardless of whether the output voltage is adjusted by the main unit volume. The output voltage can be adjusted with volume even after writing to this register. When the input voltage is shut down, the setting by the register is reset, but the adjustment by the volume is not reset. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p>																															
Register data	<p>Other than AME V,V4,V5 module : Register data/1000 → Output voltage setting value [V] Ex. 5000 (1388h) → 5.000 V</p> <p>AME V,V4,V5 module : Register data /100 → Output voltage setting value [V] Ex. 7520 (1D60h) → 75.20 V</p>																															
Extended UART (Read)	READ_VOUT_PRM			Extended UART (Write)	SET_VOUT																											
Write message example	<p>Slave address: 1 Sets the output voltage of AME slot 3 to 5.0V.</p> <table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>80h</td> <td>13h 88h CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>80h</td> <td>13h 88h CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	80h	13h 88h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	80h	13h 88h CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Register Data	CRC check																											
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																											
	01h	06h	00h	80h	13h 88h CRC Lo CRC Hi																											
Read message example	<p>Slave address: 1 Reads the output voltage setting value of AME slot 3.</p> <table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>00h</td> <td>80h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>02h</td> <td>13h 88h</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	03h	00h	80h	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check		01h	03h	02h	13h 88h	CRC Lo CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																											
	01h	03h	02h	13h 88h	CRC Lo CRC Hi																											

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Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
		1 (0001h)	—	1 (0001h)	65 (0041h)	129 (0081h)	193 (00C1h)	257 (0101h)																								
Register function	<p>Sets the constant current operating value. A value higher than the maximum upper limit set by the Holding register address "24 (0018h), 88 (0058h)..." (SET_CC_UPPER_LIMIT) cannot be specified. A value higher than the rated current cannot be specified. When shipped from the factory, the constant current value set by the ITRM terminal is the default. Writing "1 (0001h)" to the Holding register address "56 (0038h), 120 (0078h)..." (SET_CC_INFO) enables the settings for this register.</p> <p>When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. ※ AME output module types "E, E4, F, F4, G, G4, H, H4, S, T, U, V, V4, V5" can use this function. AME output module types "A, B, C, D, J, K, L, M, R" cannot use this function. If specified, an exception response (exception code: 3) will be returned.</p>																															
Register data	Register data/100 → Constant current operating value [A] Ex. 1350(0546h) → 13.50 A																															
Extended UART (Read)	READ_CC_PRM			Extended UART (Write)	SET_CC																											
Write message example	Slave address: 1 Sets the constant current operating value of AME slot 2 to 13.50A.																															
	<table border="1"> <tr> <td>Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>41h</td> <td>05h 46h CRC Lo CRC Hi</td> </tr> </table>		Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	41h	05h 46h CRC Lo CRC Hi	<table border="1"> <tr> <td>Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>41h</td> <td>05h 46h CRC Lo CRC Hi</td> </tr> </table>		Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	41h	05h 46h CRC Lo CRC Hi				
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Read message example	Slave address: 1 Reads the constant current operating value of AME slot 2.																															
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Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
		—	—	2 (0002h)	66 (0042h)	130 (0082h)	194 (00C2h)	258 (0102h)																								
Register function	Sets delay time [ms] from when power conversion is ready, to when it starts. This function is also applied when the input is turned on while the output voltage is ready to be turned on. In this case, an internal delay (up to 800 msec) will occur. The factory default setting is "0". No delay time is set for the RC terminal in each slot. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																															
	 <p>※ The power conversion starts after time set by "SET_TON_DELAY_SLOT" command when conditions such as AC input, disabling the GI and enabling the Remote ON are met.</p>																															
Register data	Register data → Delay time [msec] (from power conversion ready to start-up) Range : 0~30,000 [msec] Ex. 900 (0384h) → 900 msec																															
Extended UART (Read)	READ_TON_DELAY_SLOT_PRM	Extended UART (Write)	SET_TON_DELAY_SLOT																													
Write message example	Slave address: 1 Sets the delay time (from power conversion ready to start-up) of AME slot1 to 900ms.	<table border="1" data-bbox="460 1280 1413 1437"> <tr> <th>Message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr> <tr> <td>01h</td><td>06h</td><td>00h</td><td>02h</td><td>03h</td><td>84h</td></tr> </table> <table border="1" data-bbox="460 1370 1413 1437"> <tr> <th>Response message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr> <tr> <td>01h</td><td>06h</td><td>00h</td><td>02h</td><td>03h</td><td>84h</td></tr> </table>	Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	02h	03h	84h	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	02h	03h	84h	CRC Lo	CRC Hi				
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Read message example	Slave address: 1 Reads the delay time(from power conversion ready to start-up) of AME slot 1.	<table border="1" data-bbox="460 1482 1413 1639"> <tr> <th>Message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Qty of Registers</th><th>CRC check</th></tr> <tr> <td>01h</td><td>03h</td><td>00h</td><td>02h</td><td>00h</td><td>01h</td></tr> </table> <table border="1" data-bbox="460 1594 1413 1639"> <tr> <th>Response message frame</th><th>Slave address</th><th>FC</th><th>Qty of data bytes</th><th>Register Data</th><th>CRC check</th></tr> <tr> <td>01h</td><td>03h</td><td>02h</td><td>03h</td><td>84h</td><td>CRC Lo</td></tr> </table>	Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	00h	02h	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	02h	03h	84h	CRC Lo	CRC Lo	CRC Hi				
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Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
		—	—	3 (0003h)	67 (0043h)	131 (0083h)	195 (00C3h)	259 (0103h)																								
Register function	<p>Sets delay time [msec] from when a stop signal or GI (Global Inhibit) communication is received to when power conversion stops.</p> <p>The factory default setting is "0". The delay time is not set for the RC terminal of each slot. The delay time is not set for conditions where power supply operation cannot be maintained, such as when the input voltage is below the stop voltage.</p> <p>When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p> <p>※ The power conversion stops after delay time set by "SET_TOFF_DELAY SLOT" command, when meeting the stop-condition by the GI or communication remote on/off.</p>																															
Register data	<p>Register data → Delay time [msec] from receiving the stop signal until the output voltage is stopped</p> <p>Range : 0~30,000 [msec]</p> <p>Ex. 900 (0384h) → 900 msec</p>																															
Extended UART (Read)	READ_TOFF_DELAY_SLOT_PRM			Extended UART (Write)	SET_TOFF_DELAY_SLOT																											
Write message example	<p>Slave address: 1 Sets the delay time from receiving the stop signal until the output voltage is stopped of AME slot 6 to 900ms.</p> <table border="1"> <tr> <th>Message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr> <tr> <td>01h</td><td>06h</td><td>01h</td><td>43h</td><td>03h</td><td>84h</td></tr> </table> <table border="1"> <tr> <th>Response message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr> <tr> <td>01h</td><td>06h</td><td>01h</td><td>43h</td><td>03h</td><td>84h</td></tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	43h	03h	84h	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	43h	03h	84h
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Read message example	<p>Slave address: 1 Read the delay time from receiving the stop signal until the output voltage is stopped of AME slot 6.</p> <table border="1"> <tr> <th>Message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Qty of Registers</th><th>CRC check</th></tr> <tr> <td>01h</td><td>03h</td><td>01h</td><td>43h</td><td>00h</td><td>01h</td></tr> </table> <table border="1"> <tr> <th>Response message frame</th><th>Slave address</th><th>FC</th><th>Qty of data bytes</th><th>Register Data</th><th>CRC check</th></tr> <tr> <td>01h</td><td>03h</td><td>02h</td><td>03h</td><td>84h</td><td>CRC Lo</td></tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	01h	43h	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	02h	03h	84h	CRC Lo
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01h	03h	02h	03h	84h	CRC Lo																											

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Holding register address	PCA 6 (0006h)	AME —																								
Register function	Sets the start-up delay time [msec] from the RC2 terminal operation. The factory default setting is "0". The settings in this register are also applied when using remote control communication, but some delay may occur due to signal transmission. This also applies to when the input is turned on while the RC2 terminal is ON. In this case, an internal delay (up to 700msec) occurs.																									
Register data	Register data → Start-up delay time [msec] for RC2 terminal operation Range : 0~3900 [msec] Ex. 900 (0384h) → 900 msec																									
Extended UART (Read)	READ_TON_DELAY_RC_PRM	Extended UART (Write) SET_TON_DELAY_RC																								
Write message example	Slave address: 1 Sets the start-up delay time for RC2 terminal operation to 900 msec.	<table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h 06h</td> <td>03h 84h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h 06h</td> <td>03h 84h</td> <td>CRC Lo CRC Hi</td> </tr> </table>	Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h 06h	03h 84h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h 06h	03h 84h	CRC Lo CRC Hi
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Read message example	Slave address: 1 Reads start-up delay time for RC2 terminal operation.	<table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>00h 06h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>02h</td> <td>03h 84h</td> <td>CRC Lo CRC Hi</td> </tr> </table>	Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	03h	00h 06h	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check		01h	03h	02h	03h 84h	CRC Lo CRC Hi
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	01h	03h	02h	03h 84h	CRC Lo CRC Hi																					

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Holding register address	PCA 7 (0007h)	AME 7 (0007h)
Register function		
Sets the delay time [msec] from input ON to operating start (output voltage). When shipped, the specification value for the start-up time is set to the factory default. After writing to this register, write "0 (0000h)" to the Holding register address "PCA: 58 (003Ah), AME: 442 (001BAh)" (SYS_STORE_USER_SETTING). And shut down the input for at least 10 seconds (for PCA), or at least 30 seconds (for AME). The setting will be applied from the next startup.		
<PCA> When the delay time of the Holding register address "6(0006h)" (SET_TON_DELAY_RC) is set, the actual start-up delay time is the slower of the following two operations : Holding register address "6(0006H)" (SET_TON_DELAY_RC) operation or this register operation (SET_TONDELAY_VIN).		
<p>(a) When following "SET_TON_DELAY_RC" setting</p>		
<p>(b) When following "SET_TON_DELAY_VIN" setting</p>		
<AME> When the delay time of the Holding register address "2(0002h),66(0042h)..." (SET_TON_DELAY_SLOT) is set, the delay operation by this register (SET_TON_DELAY_SLOT) is performed after the delay operation by the Holding register address "7(0007h)" (SET_TON_DELAY_VIN).		
Register data	Register data → Delay time [msec] from input ON to operating start [PCA] Range : Startup time specification value ※ up to 65,535 ※ Ex. PCA600F: 700 Ex. 900 (0384h) → 900 msec	[AME] Range : 800~60,000
Extended UART (Read)	READ_TON_DELAY_VIN_PRM	Extended UART (Write) SET_TON_DELAY_VIN

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Write message example	Slave address: 1 Sets the delay time from input ON to operating start to 900ms.								
	Message frame	Slave address	FC	Register address	Register Data		CRC check		
Read message example	Response message frame	01h	06h	00h	07h	03h	84h	CRC Lo	CRC Hi
		01h	06h	00h	07h	03h	84h	CRC Lo	CRC Hi

Holding register address	PCA	AME															
	-	8 (0008h)															
Register function	Turn on the output of any slot. ※ Write-only, Read is not supported.																
Register data	 0 → No change 1 → Output voltage ON Ex. 0000 0000 0000 1010b (000Ah) → Set slot 1 and slot 3 to ON state 0000 0000 0000 0001b (0001h) → Set all slots to ON state																
Extended UART (Read)	-			Extended UART (Write)	CLT_CH_REMOTE_ON												
Write message example	Slave address: 1 Sets slot 1 and slot 3 to ON state.																
	Message frame	Slave address	FC	Register address	Register Data		CRC check										
	Response message frame	01h	06h	00h	08h	00h	0Ah	CRC Lo	CRC Hi								
		01h	06h	00h	08h	00h	0Ah	CRC Lo	CRC Hi								

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Holding register address	PCA	AME					
	-	9 (0009h)					
Register function	Turn off the output of any slot. ※ Write-only, Read is not supported.						
Register data	 ※ It cannot be set for AME400F,AME600F						
Extended UART (Read)	-			Extended UART (Write)	CLT_CH_REMOTE_OFF		
Write message example	Slave address: 1 Sets slot 1 and slot 3 to OFF.						
	Message frame	Slave address	FC	Register address	Register Data	CRC check	
		01h	06h	00h 09h	00h 0Ah	CRC Lo CRC Hi	
	Response message frame	Slave address	FC	Register address	Register Data	CRC check	
		01h	06h	00h 09h	00h 0Ah	CRC Lo CRC Hi	

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Holding register address	PCA 10 (000Ah)	AME 10 (000Ah)																													
Register function	<p>Sets the start-up voltage for AC input. After writing to this register, write "0(0000h)" to the Holding register address "PCA: 58 (003Ah), AME: 442 (001BAh)" (SYS_STORE_USER_SETTING), and shut down the input for at least 10 seconds (for PCA), or at least 30 seconds (for AME). The setting will be applied from the next startup. A value of +5V or lower from the value set by Holding register address "11 (000Bh)" (SET_STOP_VIN_AC) cannot be specified for this register. Load derating is required for use with AC 90V or less. Please refer to the power supply instruction manual for details.</p>																														
Register data	Register data → Star-tup voltage [V] for AC input [PCA] Range : 60~240 VAC [AME] Range : 80~240 VAC Ex. 170 (00AAh) → 170 VAC																														
Extended UART (Read)	READ_START_UP_VIN_AC_PRM			Extended UART (Write)	SET_START_UP_VIN_AC																										
Write message example	Slave address: 1 Sets the start-up voltage for AC input to 170 VAC. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Ah</td> <td>00h AAh CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Ah</td> <td>00h AAh CRC Lo CRC Hi</td> </tr> </tbody> </table>							Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Ah	00h AAh CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Ah	00h AAh CRC Lo CRC Hi
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Read message example	Slave address: 1 Reads the start-up voltage for AC input. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>03h</td> <td>00h</td> <td>0Ah</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h</td> <td>AAh CRC Lo CRC Hi</td> </tr> </tbody> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	03h	00h	0Ah	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check		01h	03h	02h	00h	AAh CRC Lo CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																										
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Holding register address	PCA 11 (000Bh)	AME 11 (000Bh)																													
Register function	<p>Sets the stop voltage for AC input. After writing to this register, write "0(0000h)" to the Holding register address [PCA: 58 (003Ah), AME: 442 (001BAh)] (SYS_STORE_USER_SETTING), and shut down the input for at least 10 seconds (for PCA), and at least 30 seconds (for AME). The setting will be applied from the next startup. A value of -5V or higher cannot be specified for this register from the value set by Holding register address "0010(0Ah)" (SET_START_UP_VIN_AC). Load derating is required for use with AC 90V or less. Please refer to the power supply instruction manual for details.</p>																														
Register data	Register data → Stop voltage [V] for AC input [PCA] Range : 50~200 VAC [AME] Range : 75~150 VAC Ex. 90 (005Ah) → 90 VAC																														
Extended UART (Read)	READ_STOP_VIN_AC_PRM			Extended UART (Write)	SET_STOP_VIN_AC																										
Write message example	Slave address: 1 Sets the stop voltage for AC input to 90 VAC. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Bh</td> <td>00h 5Ah CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Bh</td> <td>00h 5Ah CRC Lo CRC Hi</td> </tr> </tbody> </table>							Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Bh	00h 5Ah CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Bh	00h 5Ah CRC Lo CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																										
	01h	03h	02h	00h	5Ah CRC Lo CRC Hi																										

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Holding register address	PCA 12 (000Ch)	AME																														
Register function	<p>Sets the start-up voltage for DC input (except for PCA1000F and 1500F). After writing to this register, write "0(000h)" to the Holding register address [58(003Ah)] (SYS_STORE_USER_SETTING), and shut down the input for at least 10 seconds. The setting will be applied from the next startup.</p> <p>A value of +10V or lower than the value set by the Holding register address "13 (000Dh)" (SET_STOP_VIN_DC) cannot be specified for this register.</p> <p>Load derating is required for use with low input voltage. Please refer to the power supply instruction manual for details.</p>																															
Register data	<p>Register data → Start-up voltage [V] for DC</p> <p>Range : 80~340 VDC</p> <p>Ex. 120 (0078h) → 120 VDC</p>																															
Extended UART (Read)	READ_START_UP_VIN_DC_PRM			Extended UART (Write)	SET_START_UP_VIN_DC																											
Write message example	<p>Slave address: 1 Sets start-up voltage at DC input to 120 VDC.</p> <table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Ch</td> <td>00h 78h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Ch</td> <td>00h 78h CRC Lo CRC Hi</td> </tr> </tbody> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Ch	00h 78h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Ch	00h 78h CRC Lo CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																											
	01h	03h	02h	00h 78h	CRC Lo CRC Hi																											

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Holding register address	PCA 13 (000Dh)	AME																														
Register function	<p>Sets the stop voltage for DC input (except for PCA1000F and 1500F). After writing to this register, write "0(0000h)" to the Holding register address [58(003Ah)] (SYS_STORE_USER_SETTING), and shut down the input for at least 10 seconds. The setting will be applied from the next startup. A value of -10V or higher than the value set by the Holding register "12(000C)" (SET_START_UP_VIN_DC), cannot be specified for this register. Load derating is required for use with low input voltage. Please refer to the power supply instruction manual for details.</p>																															
Register data	Register data → Stop voltage [V] for DC Range : 70~280 VDC Ex. 90 (005Ah) → 90 VDC																															
Extended UART (Read)	READ_STOP_VIN_DC_PRM				Extended UART (Write)	SET_STOP_VIN_DC																										
Write message example	Slave address: 1 Sets stop voltage at DC input to 90 VDC. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Dh</td> <td>00h 5Ah CRC Lo CRC Hi</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Dh</td> <td>00h 5Ah CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Dh	00h 5Ah CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Dh	00h 5Ah CRC Lo CRC Hi
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																											
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Read message example	Slave address: 1 Reads stop voltage at DC input. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>00h</td> <td>0Dh</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h</td> <td>5Ah CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	03h	00h	0Dh	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check		01h	03h	02h	00h	5Ah CRC Lo CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																											
	01h	03h	02h	00h	5Ah CRC Lo CRC Hi																											

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Holding register address	PCA 14 (000Eh)	AME 14 (000Eh)																													
Register function	Sets the AUX output voltage. The factory default is set to 12V for PCA and 5V for AME. The AUX rated load current varies depending on the AUX output voltage.																														
	<p>[PCA]</p> <table border="1"> <thead> <tr> <th>AUX voltage</th> <th>AUX rated current</th> </tr> </thead> <tbody> <tr><td>5</td><td>0.5</td></tr> <tr><td>12</td><td>0.1</td></tr> </tbody> </table>							AUX voltage	AUX rated current	5	0.5	12	0.1																		
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AUX voltage	AUX rated current																														
5	1.0																														
12	0.1																														
Register data	Register data/10 → AUX output voltage [V] Range : 4.7–12.6 V Ex. 50 (0032h) → 5.0 V																														
Extended UART (Read)	READ_AUX_VOUT_PRM			Extended UART (Write)	SET_AUX_VOUT																										
Write message example	Slave address: 1 Sets the AUX output voltage to 5 VDC.																														
	<table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Eh</td> <td>00h 32h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>0Eh</td> <td>00h 32h CRC Lo CRC Hi</td> </tr> </tbody> </table>							Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Eh	00h 32h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	0Eh	00h 32h CRC Lo CRC Hi
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																										
	01h	06h	00h	0Eh	00h 32h CRC Lo CRC Hi																										
Read message example	Slave address: 1 Reads the AUX output voltage.																														
	<table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>03h</td> <td>00h</td> <td>0Eh</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h 32h</td> <td>CRC Lo CRC Hi</td> </tr> </tbody> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	03h	00h	0Eh	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check		01h	03h	02h	00h 32h	CRC Lo CRC Hi
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																										
	01h	03h	02h	00h 32h	CRC Lo CRC Hi																										

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Holding register address	PCA	AME													
	—	15 (000Fh)													
Register function	Sets the input voltage value which activates the PR alarm signal if the input voltage drops below that value.														
Register data	Register data → Input voltage [V] which activates the PR alarm signal Range : 75~240 VAC Ex. 95 (005F) → 95 VAC														
Extended UART (Read)	READ_VIN_LV_ALARM_PRM			Extended UART (Write)	SET_VIN_LV_ALARM										
Write message example	Slave address: 1 Sets the input voltage which activates the PR alarm signal to 95VAC.														
	Message frame	Slave address	FC	Register address	Register Data	CRC check									
		01h	06h	00h	0Fh	00h	5Fh	CRC Lo CRC Hi							
	Response message frame	Slave address	FC	Register address	Register Data	CRC check									
		01h	06h	00h	0Fh	00h	5Fh	CRC Lo CRC Hi							
Read message example	Slave address: 1 Reads the input voltage which activates the PR alarm signal.														
	Message frame	Slave address	FC	Register address	Qty of Registers	CRC check									
		01h	03h	00h	0Fh	00h	01h	CRC Lo CRC Hi							
	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check									
		01h	03h	02h	00h	5Fh	CRC Lo	CRC Hi							

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Holding register address	PCA	AME																														
	—	16 (0010h)																														
Register function	Sets the condition which activates the PR alarm signal if the specified condition is detected.																															
Register data	<p>0 0 0 0 0 0 0 0 0 1 1 1 1 1 b</p> <table border="1"> <tr> <td>0bit : Abnormal input voltage (low input voltage)</td> </tr> <tr> <td>1bit : Fan stopped</td> </tr> <tr> <td>2bit : Thermal protection in input module activated</td> </tr> <tr> <td>3bit : Overpower protection in input module activated</td> </tr> <tr> <td>4bit : Thermal protection in output module activated</td> </tr> </table>								0bit : Abnormal input voltage (low input voltage)	1bit : Fan stopped	2bit : Thermal protection in input module activated	3bit : Overpower protection in input module activated	4bit : Thermal protection in output module activated																			
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3bit : Overpower protection in input module activated																																
4bit : Thermal protection in output module activated																																
	<p>The factory default of the argument is "0000000000000011b".</p> <p>0 → The alarm signal will not be activated from the PR terminal, even when an abnormal condition is detected.</p> <p>1 → The alarm signal is activated from the PR terminal when an abnormal condition is detected.</p> <p>Ex. 0000 0000 0001 0100b (0014h) → Activates the alarm when input module overheat protection is activated or when output module overheat protection is activated.</p>																															
Extended UART (Read)	READ_ALARM_STATUS_PRM			Extended UART (Write)	SET_ALARM_STATUS																											
Write message example	<p>Slave address: 1 Sets the condition to activate the PR alarm when input module overheat protection or output module overheat protection is activated.</p> <table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>10h</td> <td>00h 14h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>10h</td> <td>00h 14h CRC Lo CRC Hi</td> </tr> </tbody> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	10h	00h 14h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	10h	00h 14h CRC Lo CRC Hi
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Read message example	<p>Slave address: 1 Reads the conditions which activate the PR alarm signal.</p> <table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>03h</td> <td>00h</td> <td>10h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td></td> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h 14h CRC Lo CRC Hi</td> <td></td> </tr> </tbody> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	03h	00h	10h	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check		01h	03h	02h	00h 14h CRC Lo CRC Hi	
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Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
22 (0016h)	—	22 (0016h)	86 (0056h)	150 (0096h)	214 (00D6h)	278 (0116h)	342 (0156h)																									
Register function	<p>Sets the adjustable output voltage upper limit. This setting applies to all variable voltage operations (volume, VTRM terminal, and Holding register address "0(0000h), 64(0040h)..." (SET_VOUT)). Voltage exceeding this upper limit is not output even under constant current control operation. If a lower value than the voltage currently being output is specified, the output voltage will be change to the specified value. A value lower than the lower limit set by the Holding register address "23 (0017h), 87 (0057h) ..." (SET_VOUT_LOWER_LIMIT) cannot be specified. A value exceeding 120% of the rated voltage cannot be specified. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p>																															
Register data	<p>Other than AME V,V4,V5 module : Register data/10 → Output voltage upper limit [V] Ex. 241 (00F1h) → 24.1 V</p> <p>AME V,V4,V5 module : Register data → Output voltage upper limit [V] Ex. 101 (0065h) → 101 V</p>																															
Extended UART (Read)	READ_VOUT_UPPER_LIMIT_PRM				Extended UART (Write)	SET_VOUT_UPPER_LIMIT																										
Write message example	<p>Slave address: 1 Sets the adjustable output voltage upper limit of AME slot 5 to 24.1 V.</p> <table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td>01h</td> <td>06h</td> <td>01h</td> <td>16h</td> <td>00h</td> <td>F1h CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td>01h</td> <td>06h</td> <td>01h</td> <td>16h</td> <td>00h</td> <td>F1h CRC Lo CRC Hi</td> </tr> </tbody> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	16h	00h	F1h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	16h	00h	F1h CRC Lo CRC Hi
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																											
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Read message example	<p>Slave address: 1 Reads the adjustable output voltage upper limit of AME slot 5.</p> <table border="1"> <thead> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td>01h</td> <td>03h</td> <td>01h</td> <td>16h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> </thead> <tbody> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h F1h</td> <td>CRC Lo CRC Hi</td> </tr> </tbody> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	01h	16h	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	02h	00h F1h	CRC Lo CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																											
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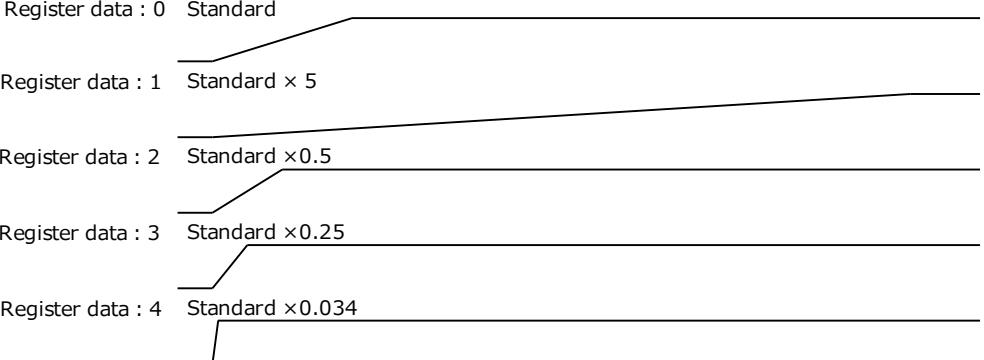
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Holding register address	PCA	AME																													
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																							
		23 (0017h)	—	23 (0017h)	87 (0057h)	151 (0097h)	215 (00D7h)	279 (0117h)																							
Register function	<p>Sets the adjustable output voltage lower limit. This setting applies to all variable voltage operations (volume, VTRM terminal, and Holding register address "0(0000h), 64(0040h)..." (SET_VOUT)). During constant current control operation, the output voltage may be lower than this setting value. If a higher value than the voltage being output is specified, the output voltage will be changed to the specified value. A value higher than the upper limit set by the Holding register address "22(16h), 86(56h)..." (SET_VOUT_UPPER_LIMIT) cannot be specified. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p>																														
Register data	<p>Other than AME V,V4,V5 module : Register data/10 → Output voltage lower limit [V] Ex. 241 (00F1h) → 24.1 V AME V,V4,V5 module : Register data → Output voltage lower limit [V] Ex. 65 (0041h) → 65 V</p>																														
Extended UART (Read)	READ_VOUT_LOWER_LIMIT_PRM			Extended UART (Write)	SET_VOUT_LOWER_LIMIT																										
Write message example	<p>Slave address: 1 Sets the adjustable output voltage lower limit of AME slot 4 to 24.1 V.</p> <table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>D7h</td> <td>00h</td> <td>F1h</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>D7h</td> <td>00h</td> <td>F1h</td> </tr> </table>							Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	D7h	00h	F1h	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	D7h	00h	F1h
Message frame	Slave address	FC	Register address	Register Data	CRC check																										
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01h	06h	00h	D7h	00h	F1h																										
Read message example	<p>Slave address: 1 Reads the adjustable output voltage lower limit of AME slot 4.</p> <table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>D7h</td> <td>00h</td> <td>01h</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>02h</td> <td>00h</td> <td>F1h</td> </tr> </table>							Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	00h	D7h	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	00h	02h	00h	F1h
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																										
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Holding register address	PCA	AME							
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	
24 (0018h)		—	24 (0018h)	88 (0058h)	152 (0098h)	216 (00D8h)	280 (0118h)	344 (0158h)	
Register function	<p>Sets the adjustable upper limit of the constant current operation. If a lower value than the set constant current operating value is specified, the constant current operating value will be changed to that specified value. A value exceeding the rated current cannot be set. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p> <p>※ AME output module types "E, E4, F, F4, G, G4, H, H4, S, T, U, V, V4, V5" can use this function. AME output module types "A, B, C, D, J, K, L, M, R" cannot use this function. If specified, an exception response (exception code: 3) will be returned.</p>								
Register data	<PCA>		<AME>						
	Register data → Constant current operation upper limit [A]				Register data/10 → Constant current operation upper limit [A]				
	Ex. 115 (0073h) → 115 A				Ex. 115 (0073h) → 11.5 A				
Extended UART (Read)	READ_CC_UPPER_LIMIT_PRM				Extended UART (Write)	SET_CC_UPPER_LIMIT			
Write message example	Slave address: 1 Sets the constant current operating value upper limit of AME slot 3 to 11.5 A.								
	Message frame	Slave address	FC	Register address	Register Data	CRC check			
		01h	06h	00h	98h	00h	73h	CRC Lo CRC Hi	
	Response message frame	Slave address	FC	Register address	Register Data	CRC check			
		01h	06h	00h	98h	00h	73h	CRC Lo CRC Hi	
Read message example	Slave address: 1 Reads the constant current operating value upper limit of AME slot 3.								
	Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			
		01h	03h	00h	98h	00h	01h	CRC Lo CRC Hi	
	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check			
		01h	03h	02h	00h	73h	CRC Lo	CRC Hi	

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Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
		—	—	25 (0019h)	89 (0059h)	153 (0099h)	217 (00D9h)	281 (0119h)																								
Register function	<p>Selects the constant current operation control amount. When the constant current operation is set by the Holding register address "01 (01h)" (SET_CC), et al., this function sets the time until the current is controlled to the value indicated. This setting is applicable to when constant current operating. The factory default setting is "0". When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. ※ AME output module types "E, E4, F, F4, G, G4, H, H4, S, T, U, V, V4, V5" can use this function. AME output module types "A, B, C, D, J, K, L, M, R" cannot use this function. If specified, an exception response (exception code: 3) will be returned.</p>																															
Register data	<p>0 (0000h) → Standard 1 (0001h) → Standard × 5 (SLOW) 2 (0002h) → Standard × 0.5 (Fast) 3 (0003h) → Standard × 0.25 (Fast) 4 (0004h) → Standard × 0.034 (Very Fast)</p> 																															
Extended UART (Read)	READ_CC_CONTROL_PRM				Extended UART (Write)	SET_CC_CONTROL																										
Write message example	<p>Slave address: 1 Selects the constant current operation control amount of AME slot 2 to (standard × 0.25).</p> <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>59h</td> <td>00h 03h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>59h</td> <td>00h 03h</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	59h	00h 03h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	59h	00h 03h	CRC Lo CRC Hi
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																											
	01h	06h	00h	59h	00h 03h	CRC Lo CRC Hi																										
Read message example	<p>Slave address: 1 Reads the constant current operation control amount of AME slot 2.</p> <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h 59h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h 03h</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	00h 59h	00h 01h	CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	02h	00h 03h	CRC Lo CRC Hi		
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																											
	01h	03h	02h	00h 03h	CRC Lo CRC Hi																											

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Holding register address	PCA	AME																																					
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																															
		26 (001Ah)	—	26 (001Ah)	90 (005Ah)	154 (009Ah)	218 (00DAh)	282 (011Ah)	346 (015Ah)																														
Register function	<p>Selects the output voltage ramp rate. This setting is applicable to power-on, remote control power-on, VTRM terminal voltage adjustment, and the Holding register address "00(0000H), 64(0040h)..." (SET_VOUT) voltage adjustment. The factory default setting is "0". When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. ※ AME output module types "E, E4, F, F4, G, G4, H, H4, S, T, U, V, V4, V5" can use this function. AME output module types "A, B, C, D, J, K, L, M, R" cannot use this function. If specified, an exception response (exception code: 3) will be returned.</p>																																						
Register data	<p><PCA> 0 (0000h) → Standard (Fast) 1 (0001h) → Rated voltage 10%–90%/approx.. 100 msec (Slow) 2 (0002h) → Rated voltage 10%–90%/approx.. 500 msec (Very slow)</p> <p><AME> 0 (0000h) → Standard (Fast) 1 (0001h) → Rated voltage 10%–90%/approx.. 50 msec (Slow) 2 (0002h) → Rated voltage 10%–90%/approx.. 280 msec (Very slow)</p>																																						
Extended UART (Read)	READ_RAMP_RATE_PRM			Extended UART (Write)	SET_RAMP_RATE																																		
Write message example	<p>Slave address: 1 Selects the output voltage ramp rate of AME slot 1 to Very slow (280 ms).</p> <table border="1"> <tr> <th rowspan="2">Message frame</th> <th>Slave address</th> <th>FC</th> <th colspan="2">Register address</th> <th>Register Data</th> <th colspan="2">CRC check</th> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>1Ah</td> <td>00h</td> <td>02h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <th rowspan="2">Response message frame</th> <th>Slave address</th> <th>FC</th> <th colspan="2">Register address</th> <th>Register Data</th> <th colspan="2">CRC check</th> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>1Ah</td> <td>00h</td> <td>02h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>							Message frame	Slave address	FC	Register address		Register Data	CRC check		01h	06h	00h	1Ah	00h	02h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Register address		Register Data	CRC check		01h	06h	00h	1Ah	00h	02h	CRC Lo	CRC Hi
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Response message frame	Slave address	FC	Register address		Register Data	CRC check																																	
	01h	06h	00h	1Ah	00h	02h	CRC Lo	CRC Hi																															
Read message example	<p>Slave address: 1 Reads the output voltage ramp rate of AME slot 1.</p> <table border="1"> <tr> <th rowspan="2">Message frame</th> <th>Slave address</th> <th>FC</th> <th colspan="2">Register address</th> <th>Qty of Registers</th> <th colspan="2">CRC check</th> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>1Ah</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <th rowspan="2">Response message frame</th> <th>Slave address</th> <th>FC</th> <th colspan="2">Qty of data bytes</th> <th>Register Data</th> <th colspan="2">CRC check</th> </tr> <tr> <td>01h</td> <td>03h</td> <td colspan="2">02h</td> <td>00h</td> <td>02h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>							Message frame	Slave address	FC	Register address		Qty of Registers	CRC check		01h	03h	00h	1Ah	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes		Register Data	CRC check		01h	03h	02h		00h	02h	CRC Lo	CRC Hi
Message frame	Slave address	FC	Register address		Qty of Registers	CRC check																																	
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Response message frame	Slave address	FC	Qty of data bytes		Register Data	CRC check																																	
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Holding register address	PCA	AME																												
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																						
		—	—	27 (001Bh)	91 (005Bh)	155 (009Bh)	219 (00DBh)	283 (011Bh)																						
Register function	<p>Sets the output voltage value which activates the LV alarm signal when the output voltage drops below that value.</p> <p>Cannot be set to a value higher than the value obtained by subtracting 20% of the rated voltage from the value in the Holding register address "28 (001Ch), 92 (005CH)..." (SET_VOUT_HV_ALARM).</p> <p>When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p>																													
Register data	<p>Other than AME V,V4,V5 module :</p> <p>Register data/10 → Output voltage value [V] which activates the LV alarm signal when the output voltage drops</p> <p>Range : Rated voltage × 5%–Rated voltage × 180% (Maximum 55.9 V) EX. 35 (0023h) → 3.5 V</p> <p>AME V,V4,V5 module :</p> <p>Register data → Output voltage value [V] which activates the LV alarm signal when the output voltage drops</p> <p>Range : Rated voltage × 5%–Rated voltage × 180% EX. 55 (0037h) → 55 V</p>																													
Extended UART (Read)	READ_VOUT_LV_ALARM_PRM				Extended UART (Write)	SET_VOUT_LV_ALARM																								
Write message example	<p>Slave address: 1 Sets the output voltage value which activates the LV alarm signal of AME slot 6 to 3.5 V.</p> <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>01h</td> <td>5Bh</td> <td>00h 23h CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>01h</td> <td>5Bh</td> <td>00h 23h CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	5Bh	00h 23h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	5Bh	00h 23h CRC Lo CRC Hi
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Read message example	<p>Slave address: 1 Reads the output voltage value which activates the LV alarm signal of AME slot 6.</p> <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>03h</td> <td>01h</td> <td>5Bh</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h 23h CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	01h	5Bh	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	02h	00h 23h CRC Lo CRC Hi	
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	01h	03h	02h	00h 23h CRC Lo CRC Hi																										

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Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
		—	—	28 (001Ch)	92 (005Ch)	156 (009Ch)	220 (00DCh)	284 (011Ch)																								
Register function	<p>Sets the output voltage value which activates the LV alarm signal when the output voltage rises above that value.</p> <p>Cannot be set to a value lower than the value obtained by more than 20% of the rated voltage from the value in the Holding register address "27 (001Bh), 91 (005Bh)..." (SET_VOUT_LV_ALARM).</p> <p>When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p>																															
Register data	<p>Other than AME V,V4,V5 module :</p> <p>Register data/10 → Output voltage value [V] which activates the LV alarm signal when the output voltage rises</p> <p>Range : Rated voltage × 25% to Rated voltage × 200% (Maximum 65.5 V) Ex. 520 (0208h) → 52.0 V</p> <p>AME V,V4,V5 module :</p> <p>Register data → Output voltage value [V] which activates the LV alarm signal when the output voltage rises</p> <p>Range : Rated voltage × 25% to Rated voltage × 200% Ex. 90 (005Ah) → 90 V</p>																															
Extended UART (Read)	READ_VOUT_HV_ALARM_PRM				Extended UART (Write)	SET_VOUT_HV_ALARM																										
Write message example	<p>Slave address: 1 Sets the output voltage value which activates the LV alarm signal of AME slot 5 to 52.0 V.</p> <table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>06h</td> <td>01h</td> <td>1Ch</td> <td>02h</td> <td>08h</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>06h</td> <td>01h</td> <td>1Ch</td> <td>02h</td> <td>08h</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	1Ch	02h	08h	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h	1Ch	02h	08h
Message frame	Slave address	FC	Register address	Register Data	CRC check																											
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Read message example	<p>Slave address: 1 Reads the output voltage value which activates the LV alarm signal of AME slot 5.</p> <table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>03h</td> <td>01h</td> <td>1Ch</td> <td>00h</td> <td>01h</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>02h</td> <td>08h</td> <td>01h</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	01h	1Ch	00h	01h	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	02h	02h	08h	01h
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																											
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Holding register address	PCA	AME																																						
	32 (0020h)	32 (0020h)																																						
Register function	Turn the output voltage ON or OFF (for AME, turn all slots ON or OFF). For PCA, the output voltage will not turn ON when it is set to OFF by the RC2 terminal. For AME, it is Write-only and Read is not supported.																																							
Register data	0 (0000h) → OFF 1 (0001h) → ON																																							
Extended UART (Read)	READ_REMOTE_PRM (PCA only)			Extended UART (Write)	CTL_REMOTE_OFF CTL_REMOTE_ON																																			
Write message example	Slave address: 1 Sets the output voltage to ON. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>20h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>20h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	20h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	20h	00h	01h	CRC Lo	CRC Hi
Message frame	Slave address	FC	Register address	Register Data	CRC check																																			
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																																			
	01h	06h	00h	20h	00h	01h	CRC Lo	CRC Hi																																
Read message example	Slave address: 1 Reads the output voltage ON/OFF setting. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>20h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			01h	03h	00h	20h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check			01h	03h	02h	00h	01h	CRC Lo	CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																			
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																																			
	01h	03h	02h	00h	01h	CRC Lo	CRC Hi																																	

Holding register address	PCA	AME																																						
	-	34 (0022h)																																						
Register function	Sets the GI or deactivated state. In the GI (Global Inhibit, stops all output simultaneously) state, the output voltage of all slots except AUX is turned off. The internal fan also stops.																																							
Register data	0(0000h) → GI state (output voltage OFF for all slots) 1(0001h) → Normal output state																																							
Extended UART (Read)	READ_CTL_GI			Extended UART (Write)	CTL_POWER_OFF_GI CTL_POWER_ON_GI																																			
Write message example	Slave address: 1 Sets to GI state. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>22h</td> <td>00h</td> <td>00h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>22h</td> <td>00h</td> <td>00h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	22h	00h	00h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	22h	00h	00h	CRC Lo	CRC Hi
Message frame	Slave address	FC	Register address	Register Data	CRC check																																			
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Read message example	Slave address: 1 Reads the GI state setting. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>22h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h</td> <td>00h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			01h	03h	00h	22h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check			01h	03h	02h	00h	00h	CRC Lo	CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																			
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																																			
	01h	03h	02h	00h	00h	CRC Lo	CRC Hi																																	

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Holding register address	PCA	AME																													
	-	36 (0024h)																													
Register function	Sets the GI2 terminal to be used as a GI function or as a remote control function. After setting this register, applying current to the GI2 terminal activates this function. • The GI function stops all output simultaneously (except the AUX output). • The remote control function stops all output voltage but does not stop the active filter and FAN.																														
Register data	0(0000h) → Set GI2 terminal to GI function. 1(0001h) → Set GI2 terminal to remote control function.																														
Extended UART (Read)	READ_GI_TERMINAL_MODE_PRM				Extended UART (Write)	SET_GI_TERMINAL_MODE_GI SET_GI_TERMINAL_MODE_RC																									
Write message example	Slave address: 1 Sets the GI2 terminal to the remote control function. <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>24h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>24h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table>									Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	24h	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	24h	00h 01h CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Register Data	CRC check																										
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																										
	01h	06h	00h	24h	00h 01h CRC Lo CRC Hi																										
Read message example	Slave address: 1 Reads the setting of the GI2 terminal function. <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>24h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table>									Message frame	Slave address	FC	Register address	Qty of Registers	CRC check	01h	03h	00h	24h	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check	01h	03h	02h	00h 01h	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																										
	01h	03h	00h	24h	00h 01h CRC Lo CRC Hi																										
Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																										
	01h	03h	02h	00h 01h	CRC Lo CRC Hi																										

Holding register address	PCA	AME																													
	-	38 (0026h)																													
Register function	Release latch stop. Release should be executed after removal of the abnormal condition. ※ Write only, Read is not supported.																														
Register data	0(0000h) → release latch stop Write "0". If a value other than "0" is written, an exception response (exception code: 2 or 3) will be returned.																														
Extended UART (Read)	-				Extended UART (Write)	CTL_RESET_LATCH																									
Write message example	Slave address: 1 Sets latch stop release. <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>26h</td> <td>00h 00h CRC Lo CRC Hi</td> </tr> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>26h</td> <td>00h 00h CRC Lo CRC Hi</td> </tr> </table>									Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	26h	00h 00h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	26h	00h 00h CRC Lo CRC Hi
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																										
	01h	06h	00h	26h	00h 00h CRC Lo CRC Hi																										

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Holding register address	PCA 40 (0028h)	AME 40 (0028h)																																																						
Register function	Sets the fan speed control to be automatic or fixed at the maximum value. The factory default is set to automatic.																																																							
Register data	0 (0000h) → Automatic 1 (0001h) → Fixed at maximum																																																							
Extended UART (Read)	READ_FAN_MODE_PRM			Extended UART (Write)	SET_FAN_MODE_AUTO SET_FAN_MODE_FIXED_SPEED																																																			
Write message example	Slave address: 1 Sets the fan speed control to be fixed at the maximum value.																																																							
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							CRC Hi																																																	
Read message example	Slave address: 1 Reads the fan speed control settings.																																																							
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																																																			
	01h	03h	02h	00h	01h	CRC Lo	CRC Hi																																																	

Holding register address	PCA —	AME 42 (002Ah)																																																						
Register function	Sets the PR terminal to PR alarm function or PG alarm function. PR alarm function: Activates an alarm signal when an abnormal state is detected. The detection condition is set by the Holding register address "16 (0010h)" (SET_ALARM_STATUS). PG alarm function: Activates an alarm signal when the input module is stopped. The factory default is set to the PR alarm function.																																																							
Register data	0 (0000h) → Set to PR alarm function 1 (0001h) → Set to PG alarm function																																																							
Extended UART (Read)	READ_PR_TERMINAL_MODE_PRM			Extended UART (Write)	SET_PR_TERMINAL_MODE_PR SET_PR_TERMINAL_MODE_PG																																																			
Write message example	Slave address: 1 Sets PR terminal to PG alarm function.																																																							
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Response message frame	Slave address	FC	Register address	Register Data	CRC check																																																			
	01h	06h	00h	2Ah	00h	01h	CRC Lo																																																	
							CRC Hi																																																	
Read message example	Slave address: 1 Reads the alarm function setting of the PR terminal.																																																							
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Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																																																			
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Holding register address	PCA 44 (002Ch)	AME 44 (002Ch)																																						
Register function	Enables or disables the Holding register Write protection. When protection is enabled, "Write" will not be executed. Transmitting "Write" to the Holding register will result in an exception response (exception code: 3) being returned. This register and the Holding register addresses "58(003Ah), 122(007Ah)..." (SYS_STORE_USER_SETTING), "60(003Ch), 124(007Ch)..." (SYS_RESTORE_FACTORY_SETTING) are exceptions. The factory default is set to Write protection OFF.																																							
Register data	0 (0000h) → Disable Holding register Write protection 1 (0001h) → Enable Holding register Write protection																																							
Extended UART (Read)	READ_WRITE_PROTECT_PRM				Extended UART (Write)	SET_WRITE_PROTECT_OFF SET_WRITE_PROTECT_ON																																		
Write message example	Slave address: 1 Sets to enable Write protection. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>2Ch</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>2Ch</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	2Ch	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	2Ch	00h	01h	CRC Lo	CRC Hi
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	01h	06h	00h	2Ch	00h	01h	CRC Lo	CRC Hi																																
Read message example	Slave address: 1 Reads the Write protection setting. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>2Ch</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			01h	03h	00h	2Ch	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check			01h	03h	02h	00h	01h	CRC Lo	CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																			
	01h	03h	00h	2Ch	00h	01h	CRC Lo	CRC Hi																																
Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																																			
	01h	03h	02h	00h	01h	CRC Lo	CRC Hi																																	
Holding register address	PCA —	AME Input module Slot 1 Slot 2 Slot 3 Slot 4 Slot 5 Slot 6 — 54 (0036h) 118 (0076h) 182 (00B6h) 246 (00F6h) 310 (0136h) 374 (0176h)																																						
Register function	Turns the selected slot output ON or OFF. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.																																							
Register data	0 (0000h) → Set to OFF 1 (0001h) → Set to ON																																							
Extended UART (Read)	READ_REMOTE_PRM				Extended UART (Write)	CTL_REMOTE_OFF_CH CTL_REMOTE_ON_CH																																		
Write message example	Slave address: 1 Sets the output to of AME slot 4 to ON. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>F6h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>06h</td> <td>00h</td> <td>F6h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	F6h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check			01h	06h	00h	F6h	00h	01h	CRC Lo	CRC Hi
Message frame	Slave address	FC	Register address	Register Data	CRC check																																			
	01h	06h	00h	F6h	00h	01h	CRC Lo	CRC Hi																																
Response message frame	Slave address	FC	Register address	Register Data	CRC check																																			
	01h	06h	00h	F6h	00h	01h	CRC Lo	CRC Hi																																
Read message example	Slave address: 1 Reads the output ON/OFF setting of AME slot 4. <table border="1"> <tr> <td rowspan="2">Message frame</td> <td>Slave address</td> <td>FC</td> <td>Register address</td> <td>Qty of Registers</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>00h</td> <td>F6h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table> <table border="1"> <tr> <td rowspan="2">Response message frame</td> <td>Slave address</td> <td>FC</td> <td>Qty of data bytes</td> <td>Register Data</td> <td>CRC check</td> <td></td> <td></td> </tr> <tr> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h</td> <td>01h</td> <td>CRC Lo</td> <td>CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check			01h	03h	00h	F6h	00h	01h	CRC Lo	CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check			01h	03h	02h	00h	01h	CRC Lo	CRC Hi	
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																																			
	01h	03h	00h	F6h	00h	01h	CRC Lo	CRC Hi																																
Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																																			
	01h	03h	02h	00h	01h	CRC Lo	CRC Hi																																	

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Holding register address	PCA	AME																														
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																								
56 (0038h)	—	56 (0038h)	120 (0078h)	184 (00B8h)	248 (00F8h)	312 (0138h)	376 (0178h)																									
Register function	<p>Sets whether the constant current operating value of the ITRM terminal voltage is enabled or the constant current operating value of the Holding register address "01(0001h), 65(0041h)..." (SET_CC) is enabled. The factory default is set to use the ITRM terminal voltage.</p> <p>When selecting a slot that is not in use, an exception response (exception code: 3) will be returned.</p> <p>※ AME output module types "E, E4, F, F4, G, G4, H, H4, S, T, U, V, V4, V5" can use this function.</p> <p>AME output module types "A, B, C, D, J, K, L, M, R" cannot use this function. If specified, an exception response (exception code: 3) will be returned.</p>																															
Register data	<p>0 (0000h) → Sets the constant current operating value of the ITRM terminal voltage is enabled</p> <p>1 (0001h) → Sets the constant current operating value of the Holding register address "01(0001h), 65(0041h)..." (SET_CC) is enabled</p>																															
Extended UART (Read)	READ_CC_MODE_PRM			Extended UART (Write)	SET_CC_MODE_ITRIM SET_CC_MODE_INFO																											
Write message example	<p>Slave address: 1 Sets the constant current operating value of the Holding register address "129(0081h)" (SET_CC) of AME slot 3 is enabled.</p> <table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>B8h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>06h</td> <td>00h</td> <td>B8h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	B8h	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check		01h	06h	00h	B8h	00h 01h CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Register Data	CRC check																											
	01h	06h	00h	B8h	00h 01h CRC Lo CRC Hi																											
Response message frame	Slave address	FC	Register address	Register Data	CRC check																											
	01h	06h	00h	B8h	00h 01h CRC Lo CRC Hi																											
Read message example	<p>Slave address: 1 Read the constant current operating value setting of AME slot 3.</p> <table border="1"> <tr> <th>Message frame</th> <th>Slave address</th> <th>FC</th> <th>Register address</th> <th>Qty of Registers</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>00h</td> <td>B8h</td> <td>00h 01h CRC Lo CRC Hi</td> </tr> </table> <table border="1"> <tr> <th>Response message frame</th> <th>Slave address</th> <th>FC</th> <th>Qty of data bytes</th> <th>Register Data</th> <th>CRC check</th> </tr> <tr> <td></td> <td>01h</td> <td>03h</td> <td>02h</td> <td>00h 01h</td> <td>CRC Lo CRC Hi</td> </tr> </table>								Message frame	Slave address	FC	Register address	Qty of Registers	CRC check		01h	03h	00h	B8h	00h 01h CRC Lo CRC Hi	Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check		01h	03h	02h	00h 01h	CRC Lo CRC Hi
Message frame	Slave address	FC	Register address	Qty of Registers	CRC check																											
	01h	03h	00h	B8h	00h 01h CRC Lo CRC Hi																											
Response message frame	Slave address	FC	Qty of data bytes	Register Data	CRC check																											
	01h	03h	02h	00h 01h	CRC Lo CRC Hi																											

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Holding register address	PCA	AME																												
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																						
	58 (003Ah)	442 (01BAh)	58 (003Ah)	122 (007Ah)	186 (00BAh)	250 (00FAh)	314 (013Ah)	378 (017Ah)																						
Register function	Stores the Holding register values and settings changed by the communication function in the power supply's internal non-volatile memory. By writing to this register, the settings are stored even if the input voltage is interrupted or restarted. AME stores the setting for specified input module or slot. For PCA, all of the corresponding Write registers are stored. The registers to be stored in the specified AME module are as shown in Table 5.1 and 5.2. Any values changed after writing to this register are not stored. Do not shut down the input for 5 seconds after writing to this register. Doing so may result in the data not being stored. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. ※ Write only, Read is not supported.																													
Register data	0 (0000h) Write "0". If a value other than "0" is written, an exception response (exception code: 2 or 3) will be returned.																													
Extended UART (Read)	—			Extended UART (Write)	SYS_STORE_USER_SETTING (Write only)																									
Write message example	Slave address: 1 Stores AME slot 2 settings in non-volatile memory. <table border="1"><tr><th rowspan="2">Message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr><tr><td>01h</td><td>06h</td><td>00h</td><td>7Ah</td><td>00h 00h CRC Lo CRC Hi</td></tr></table> <table border="1"><tr><th rowspan="2">Response message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr><tr><td>01h</td><td>06h</td><td>00h</td><td>7Ah</td><td>00h 00h CRC Lo CRC Hi</td></tr></table>							Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	7Ah	00h 00h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	00h	7Ah	00h 00h CRC Lo CRC Hi	
Message frame	Slave address	FC	Register address	Register Data	CRC check																									
	01h	06h	00h	7Ah	00h 00h CRC Lo CRC Hi																									
Response message frame	Slave address	FC	Register address	Register Data	CRC check																									
	01h	06h	00h	7Ah	00h 00h CRC Lo CRC Hi																									

Holding register address	PCA	AME																										
		Input module	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6																				
	60 (003Ch)	444 (01BCh)	60 (003Ch)	124 (007Ch)	188 (00BCh)	252 (00FCh)	316 (013Ch)	380 (017Ch)																				
Register function	Restores the Holding register values and settings to the factory defaults. Reset the values and settings stored in the power supply's internal non-volatile memory to the factory defaults using Holding register address "58(003Ah), 122(007Ah)...". (SYS_STORE_USER_SETTING). After writing to this register, shut down the input voltage and restart to return to the factory defaults. AME restores the settings to factory defaults for specified input module or slot. PCA, restores all of the corresponding Write registers to the factory defaults. The registers to be restored in the specified AME module are as shown in Table 5.1 and 5.2. Do not shut down the input for 5 seconds after writing to this register. Doing so may result in the data not being restored. When selecting a slot that is not in use, an exception response (exception code: 3) will be returned. If the process does not complete, an error response (code: 3) will be returned. ※ Write only, Read is not supported.																											
Register data	0(0000h) Write "0". If a value other than "0" is written, an exception response (exception code: 2 or 3) will be returned.																											
Extended UART (Read)	—			Extended UART (Write)	SYS_RESTORE_FACTORY_SETTING (Read only)																							
Write message example	Slave address: 1 Restores AME input module settings to factory defaults. <table border="1"><tr><th rowspan="2">Message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr><tr><td>01h</td><td>06h</td><td>01h BCh</td><td>00h 00h CRC Lo CRC Hi</td></tr></table> <table border="1"><tr><th rowspan="2">Response message frame</th><th>Slave address</th><th>FC</th><th>Register address</th><th>Register Data</th><th>CRC check</th></tr><tr><td>01h</td><td>06h</td><td>01h BCh</td><td>00h 00h CRC Lo CRC Hi</td></tr></table>							Message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h BCh	00h 00h CRC Lo CRC Hi	Response message frame	Slave address	FC	Register address	Register Data	CRC check	01h	06h	01h BCh	00h 00h CRC Lo CRC Hi	
Message frame	Slave address	FC	Register address	Register Data	CRC check																							
	01h	06h	01h BCh	00h 00h CRC Lo CRC Hi																								
Response message frame	Slave address	FC	Register address	Register Data	CRC check																							
	01h	06h	01h BCh	00h 00h CRC Lo CRC Hi																								

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Table 5.1 List of Holding register address stored in input module

Holding register address stored in the input module	Register description
2,66,130,194,258,322	Sets the delay time from when power conversion is ready, to when it starts.
3,67,131,195,259,323	Sets the delay time from when a stop signal or GI communication is received to when power conversion stops.
7	Sets the delay time from input ON to operating start (output voltage).
8	Turns on the output of any slot.
9	Turns off the output of any slot.
10	Sets the start-up voltage for AC input.
11	Sets the stop voltage for AC input.
14	Sets the AUX output voltage.
15	Sets the input voltage value which activates an PR alarm signal.
16	Sets the condition which activates the PR alarm signal.
32	Turn the output voltage ON or OFF
34	Sets the GI (stops all output simultaneously) or deactivated state.
36	Sets the GI2 terminal to be used as a GI function or as a remote control function.
40	Sets the fan speed control to be automatic or fixed at the maximum value.
42	Sets the PR terminal to PR alarm function or PG alarm function.
44	Enables or disables the Holding register Write protection.
54,118,182,246,310,374	Turns the selected slot output ON or OFF.

Table 5.2 List of Holding register address stored in each output module

Holding register address stored in the output module						Register description
Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	
0	64	128	192	256	320	Sets the output voltage.
1	65	129	193	257	321	Sets the constant current operating value.
22	86	150	214	278	342	Sets the adjustable output voltage upper limit.
23	87	151	215	279	343	Sets the adjustable output voltage lower limit.
24	88	152	216	280	344	Sets the adjustable upper limit of the constant current operation.
25	89	153	217	281	345	Selects the constant current operation control amount.
26	90	154	218	282	346	Selects the output voltage ramp rate.
27	91	155	219	283	347	Sets the output voltage value which activates the LV alarm signal when the output voltage drops.
28	92	156	220	284	348	Sets the output voltage value which activates the LV alarm signal when the output voltage rises.
56	120	184	248	312	376	Sets whether the constant current value of the ITRM terminal or the Holding register address is enabled.

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Appendix 1. List of available register addresses by AME module

See below for a list of register addresses corresponding to the AME modules.

Appendix1 List of available Input register addresses by AME module (1/3)

Input register address	Register Description	AME			
		Input module	Output module		
			A-D, J-M	E-H, S-V ※1	R
0	Returns the input voltage value.	○	-	-	-
1	Returns the input voltage frequency.	○	-	-	-
2	Returns the fan 1 speed.	○	-	-	-
3	Returns the fan 2 speed.	○※2	-	-	-
4	Returns the AUX output voltage value.	○	-	-	-
5	Returns the internal temperature.	○	-	-	-
6	Returns the PR alarm status.	○	-	-	-
7	Returns the PG alarm status.	○	-	-	-
8	Returns the cumulative input voltage time (in minutes).	○	-	-	-
9	Returns the cumulative input voltage time (in hour, lower 16-bits).	○	-	-	-
10	Returns the cumulative input voltage time (in hours, upper 16-bits).	○	-	-	-
11	Returns the product serial number.	○	-	-	-
12	Returns the top 3 digits of the product lot number.	○	-	-	-
13	Returns the last 4 digits of the product lot number.	○	-	-	-
14	Returns the product code indicating the model number (upper 16-bits).	-	-	-	-
15	Returns the product code indicating the model number (lower 16-bits).	-	-	-	-
21,85,149,213,277,341	Returns the output voltage value.	-	○	○	-
22,86,150,214,278,342	Returns the output current value.	-	-	○	-
23,87,151,215,279,343	Returns the output power value.	-	-	○	-
24,88,152,216,280,344	Returns a code indicating the stop status.	○	○	○	-
25,89,153,217,281,345	Returns the LV alarm status.	-	○	○	-
26,90,154,218,282,346,410	Returns the cumulative output voltage time (in minutes).	○	○	○	-
27,91,155,219,283,347,411	Returns the cumulative output voltage time (in hours, lower 16-bits).	○	○	○	-
28,92,156,220,284,348,412	Returns the cumulative output voltage time (in hours, upper 16-bits).	○	○	○	-
29,93,157,221,285,349,413	Returns module information.	○	○	○	-
30,94,158,222,286,350	Returns the rated voltage value.	-	○	○	-
31,95,159,223,287,351	Returns the rated current value.	-	○	○	-



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Appendix1 List of available Holding register addresses by AME module (2/3)

Holding register address	Register Description	AME			
		Input module	Output module		
			A-D, J-M	E-H, S-V ※1	R
0,64,128,192,256,320	Sets the output voltage.	-	○	○	-
1,65,129,193,257,321	Sets the constant current operating value.	-	-	○	-
2,66,130,194,258,322	Sets the delay time from when power conversion is ready, to when it starts.	-	○	○	○
3,67,131,195,259,323	Sets the delay time from when a stop signal or GI communication is received to when power conversion stops.	-	○	○	○
6	Sets the start-up delay time from the RC2 terminal operation.	-	-	-	-
7	Sets the delay time from input ON to operating start (output voltage).	○	-	-	-
8	Turns on the output of any slot.	○	-	-	-
9	Turns off the output of any slot.	○	-	-	-
10	Sets the start-up voltage for AC input.	○	-	-	-
11	Sets the stop voltage for AC input.	○	-	-	-
12	Sets the start-up voltage for DC input.	-	-	-	-
13	Sets the stop voltage for DC input.	-	-	-	-
14	Sets the AUX output voltage.	○	-	-	-
15	Sets the input voltage value which activates an PR alarm signal.	○	-	-	-
16	Sets the condition which activates the PR alarm signal.	○	-	-	-
22,86,150,214,278,342	Sets the adjustable output voltage upper limit.	-	○	○	-
23,87,151,215,279,343	Sets the adjustable output voltage lower limit.	-	○	○	-
24,88,152,216,280,344	Sets the adjustable upper limit of the constant current operation.	-	-	○	-
25,89,153,217,281,345	Selects the constant current operation control amount.	-	-	○	-
26,90,154,218,282,346	Selects the output voltage ramp rate.	-	-	○	-
27,91,155,219,283,347	Sets the output voltage value which activates the LV alarm signal when the output voltage drops.	-	○	○	-
28,92,156,220,284,348	Sets the output voltage value which activates the LV alarm signal when the output voltage rises.	-	○	○	-
32	Turn the output voltage ON or OFF	○	-	-	-
34	Sets the GI (stops all output simultaneously) or deactivated state.	○	-	-	-
36	Sets the GI2 terminal to be used as a GI function or as a remote control function.	○	-	-	-
38	Release latch stop.	○	-	-	-
40	Sets the fan speed control to be automatic or fixed at the maximum value.	○	-	-	-
42	Sets the PR terminal to PR alarm function or PG alarm function.	○	-	-	-



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Appendix1 List of available Holding register addresses by AME module (3/3)

Holding register address	Extended UART command name	AME			
		Input module	Output module		
			A-D, J-M	E-H, S-V ※1	R
44	Enables or disables the Holding Register Write protection.	○	-	-	-
54,118,182,246,310,374	Turns the selected slot output ON or OFF.	-	○	○	○
56,120,184,248,312,376	Sets whether the constant current value of the ITRM terminal or the Holding register address is enabled.	-	-	○	-
58,122,186,250,314,378,442	Stores the Holding register values and settings in the power supply's internal non-volatile memory.	○	○	○	-※3
60,124,188,252,316,380,444	Restores the Holding register values and settings to the factory defaults.	○	○	○	-※3

※1 Include E4-H4, V4, V5

※2 Cannot be used with AME400 and AME600.

※3 When using with the R module, selects the input module.

A. Revision history

No.	Date	ver	Page	Note
1	2021.10.04	1.0E	-	First edition issued
2				
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