5

Communications Data for Modbus

This section lists the details of the communications data in the Modbus communications protocol.

5-1 Variable Area (Setting Range) List

- Four-byte Mode
  One element uses 4 bytes of data (H'00000000 to H'FFFFFFFF), so specify two-element units. Reading and writing in 4-byte units is executed by specifying an even address and specifying the number of elements in multiples of 2.
- Two-byte Mode
  One element uses 2 bytes of data (H'0000 to H'FFFF), so specify one-element units. Reading and writing in 2-byte data units is executed by specifying 1-element units.

The following table lists the variable area. Items expressed in hexadecimal in the "Setting (monitor) value" column are the setting range in the Modbus specifications. Values in parentheses "()" are the actual setting range.
When there is a section reference for a setting item, refer to that reference for details.

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0000	2000	PV	Temperature: Use the specified range for each sensor. Analog: Scaling lower limit − 5% FS to Scaling upper limit + 5% FS	Operation
0002	2001	Status*1*2	Refer to *5-2 Status* for details.	
0004	2002	Internal Set Point*1	SP lower limit to SP upper limit	
0006	2003	Heater Current 1 Value Monitor	H'00000000 to H'00000226 (0.0 to 55.0)	
0008	2004	MV Monitor (Heating)	Standard: H'FFFFFFCE to H'0000041A (−5.0 to 105.0) Heating and cooling: H'00000000 to H'0000041A (0.0 to 105.0)	
000A	2005	MV Monitor (Cooling)	H'00000000 to H'0000041A (0.0 to 105.0)	
0106	2103	Set Point	SP lower limit to SP upper limit	
0108	2104	Alarm Value 1	H'FFFFF831 to H'0000270F (−1999 to 9999)	
010A	2105	Alarm Value Upper Limit 1	H'FFFFF831 to H'0000270F (−1999 to 9999)	
010C	2106	Alarm Value Lower Limit 1	H'FFFFF831 to H'0000270F (−1999 to 9999)	
010E	2107	Alarm Value 2	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0110	2108	Alarm Value Upper Limit 2	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0112	2109	Alarm Value Lower Limit 2	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0404	2402	PV	Temperature: Use the specified range for each sensor. Analog: Scaling lower limit − 5% FS to Scaling upper limit + 5% FS	
0406	2403	Internal Set Point*1	SP lower limit to SP upper limit	
0408	2404	Multi-SP No. Monitor	H'00000000 to H'00000007 (0 to 7)	
040C	2406	Status*1*2	Refer to *5-2 Status* for details.	
040E	2407	Status*3	Refer to *5-2 Status* for details.	
0410	2408	Status 2*1*2	Refer to *5-2 Status* for details.	
0412	2409	Status 2*1*3	Refer to *5-2 Status* for details.	
0420	2410	Decimal Point Monitor	H'00000000 to H'00000003 (0 to 3)	

*1 Not displayed on the Controller display.
*2 In 2-byte mode, the rightmost 16 bits are read.
*3 In 2-byte mode, the leftmost 16 bits are read.

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0500	2500	Operation/Adjustment Protect	H'00000000 (0): No restrictions in operation and adjustment levels H'00000001 (1): Move to adjustment level is prohibited. H'00000002 (2): Display and change of only “PV” and “PV/SP” parameters is allowed. H'00000003 (3): Display of only “PV” and “PV/SP” parameters is allowed.	Protect
0502	2501	Initial Setting/Communications Protect	H'00000000 (0): Move to initial setting/communications setting level is allowed. (Move to advanced function setting level is displayed.) H'00000001 (1): Move to initial setting/communications setting level is allowed. (Move to advanced function setting level is not displayed.) H'00000002 (2): Move to initial setting/communications setting level is prohibited.	
0504	2502	Setting Change Protect	H'00000000 (0): OFF (Changing of setup on controller display is allowed.) H'00000001 (1): ON (Changing of setup on controller display is prohibited.)	
0506	2503	PF Key Protect	H'00000000 (0): OFF H'00000001 (1): ON	
0508	2504	Move to Protect Level	H'FFFFF831 to H'0000270F (–1999 to 9999)	
050A	2505	Password to Move to Protect Level	H'FFFFF831 to H'0000270F (–1999 to 9999) (Can only be set. The monitor value is always H’00000000.)	
050C	2506	Parameter Mask Enable	H'00000000 (0): OFF H'00000001 (1): ON	
050E	2507	Changed Parameters Only	H'00000000 (0): OFF H'00000001 (1): ON	
0600	2600	Manual MV	Standard Models Standard control: H'FFFFFFCE to H'0000041A (–5.0 to 105.0) Heating and cooling control: H'FFFFFBE6 to H'0000041A (–105.0 to 105.0) Position-proportional Models Close position-proportional control with the Direct Setting of Position Proportional MV parameter set to ON: H'FFFFFFCE to H'0000041A (–5.0 to 105.0)	Manual control
0602	2601	Set Point	SP lower limit to SP upper limit	Operation
0604	2602	Remote SP Monitor	Remote SP lower limit –10% FS to Remote SP upper limit +10% FS	
0608	2604	Heater Current 1 Value Monitor	H'00000000 to H'00000226 (0.0 to 55.0)	
060A	2605	MV Monitor (Heating)	Standard control: H'FFFFFFCE to H'0000041A (–5.0 to 105.0) Heating and cooling control: H'00000000 to H'0000041A (0.0 to 105.0)	
060C	2606	MV Monitor (Cooling)	H'00000000 to H'0000041A (0.0 to 105.0)	
060E	2607	Valve Opening Monitor	H'FFFFFF9C to H'0000044C (–10.0 to 110.0): Measured opening H'00000000 to H'000003E8 (0.0 to 100.0): Estimated opening*	

* You can use this selection only with the E5EC-PR□-8□□ or E5AC-PR□-8□□. (The Digital Controller must be manufactured in August 2014 or later (version 2.2 or higher).)

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0702	2701	Proportional Band (Cooling)	H'00000001 to H'0000270F (0.1 to 999.9)	Adjustment
0704	2702	Integral Time (Cooling)	H'00000000 to H'0000270F (0 to 9999: Integral/derivative time unit is 1 s.) (0.0 to 999.9: Integral/derivative time unit is 0.1 s.)	
0706	2703	Derivative Time (Cooling)	H'00000000 to H'0000270F (0 to 9999: Integral/derivative time unit is 1 s.) (0.0 to 999.9: Integral/derivative time unit is 0.1 s.)	
0708	2704	Dead Band	H'FFFFF831 to H'0000270F (−199.9 to 999.9 for temperature input) (−19.99 to 99.99 for analog input)	
070A	2705	Manual Reset Value	H'00000000 to H'000003E8 (0.0 to 100.0)	
070C	2706	Hysteresis (Heating)	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) (0.01 to 99.99 for analog input)	
070E	2707	Hysteresis (Cooling)	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) (0.01 to 99.99 for analog input)	
0710	2708	Control Period (Heating)	H'FFFFFFFE (−2): 0.1 s H'FFFFFFFF (−1): 0.2 s H'00000000 (0): 0.5 s H'00000001 to H'00000063 (1 to 99)	Initial setting
0712	2709	Control Period (Cooling)	H'FFFFFFFE (−2): 0.1 s H'FFFFFFFF (−1): 0.2 s H'00000000 (0): 0.5 s H'00000001 to H'00000063 (1 to 99)	
0714	270A	Position Proportional Dead Band	H'00000001 to H'00000064 (0.1 to 10.0)	Adjustment
0716	270B	Open/Close Hysteresis	H'00000001 to H'000000C8 (0.1 to 20.0)	
0718	270C	SP Ramp Time Unit	H'00000000 (0): EU/second H'00000001 (1): EU/minute H'00000002 (2): EU/hour	Advanced function setting
071A	270D	SP Ramp Set Value	H'00000000 (0): OFF H'00000001 to H'0000270F (1 to 9999)	Adjustment
071C	270E	SP Ramp Fall Value	H'FFFFFFFF (−1): Same (Same as SP Ramp Set Value.) H'00000000 (0): OFF H'00000001 to H'0000270F (1 to 9999)	
071E	270F	MV at Stop	Standard Models Standard control: H'FFFFFFCE to H'0000041A (−5.0 to 105.0) Heating and cooling control: H'FFFFFBE6 to H'0000041A (−105.0 to 105.0) Position-proportional Models Close position-proportional control with the Direct Setting of Position Proportional MV parameter set to ON: H'FFFFFFCE to H'0000041A (−5.0 to 105.0) Floating position-proportional control or the Direct Setting of Position Proportional MV parameter set to OFF: H'FFFFFFFF to H'00000001 (−1 to 1)	
0722	2711	MV at PV Error		
0726	2713	MV Change Rate Limit	H'00000000 to H'000003E8 (0.0 to 100.0)	
0730	2718	PV Input Slope Coefficient	H'00000001 to H'0000270F (0.001 to 9.999)	
0734	271A	Heater Current 1 Value Monitor	H'00000000 to H'00000226 (0.0 to 55.0)	Operation
0736	271B	Heater Burnout Detection 1	H'00000000 to H'000001F4 (0.0 to 50.0)	Adjustment
0738	271C	Leakage Current 1 Monitor	H'00000000 to H'00000226 (0.0 to 55.0)	Operation
073A	271D	HS Alarm 1	H'00000000 to H'000001F4 (0.0 to 50.0)	Adjustment
0746	2723	Process Value Input Shift	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0748	2724	Heater Current 2 Value Monitor	H'00000000 to H'00000226 (0.0 to 55.0)	Operation

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
074A	2725	Heater Burnout Detection 2	H'00000000 to H'000001F4 (0.0 to 50.0)	Adjustment
074C	2726	Leakage Current 2 Monitor	H'00000000 to H'00000226 (0.0 to 55.0)	Operation
074E	2727	HS Alarm 2	H'00000000 to H'000001F4 (0.0 to 50.0)	Adjustment
0750	2728	Soak Time Remain	H'00000000 to H'0000270F (0 to 9999)	Operation
0752	2729	Soak Time	H'00000001 to H'0000270F (1 to 9999)	Adjustment
0754	272A	Wait Band	H'00000000 (0): OFF H'00000001 to H'0000270F (0.1 to 999.9 for Temperature input) (0.01 to 99.99 for Analog input)	
0756	272B	Remote SP Input Shift	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0758	272C	Remote SP input Slope Coefficient	H'00000001 to H'0000270F (0.001 to 9.999)	
0800	2800	Input Digital Filter	H'00000000 to H'0000270F (0.0 to 999.9)	Advanced function setting
0808	2804	Moving Average Count	H'00000000 (0): OFF H'00000001 (1): 2 times H'00000002 (2): 4 times H'00000003 (3): 8 times H'00000004 (4): 16 times H'00000005 (5): 32 times	
081A	280D	FB Moving Average Count*1	H'00000000 (0): OFF H'00000001 (1): 2 times H'00000002 (2): 4 times H'00000003 (3): 8 times H'00000004 (4): 16 times H'00000005 (5): 32 times	

*1 You can use this parameter only with the E5EC-PR□-8□□ or E5AC-PR□-8□□. (The Digital Controller must be manufactured in August 2014 or later (version 2.2 or higher).)

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0810	2808	Extraction of Square Root Low-cut Point	H'00000000 to H'000003E8 (0.0 to 100.0)	Adjustment
0900	2900	SP 0	SP lower limit to SP upper limit	
0904	2902	Alarm Value 1	H'FFFFF831 to H'0000270F (−1999 to 9999)	Operation
0906	2903	Alarm Value Upper Limit 1	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0908	2904	Alarm Value Lower Limit 1	H'FFFFF831 to H'0000270F (−1999 to 9999)	
090A	2905	Alarm Value 2	H'FFFFF831 to H'0000270F (−1999 to 9999)	
090C	2906	Alarm Value Upper Limit 2	H'FFFFF831 to H'0000270F (−1999 to 9999)	
090E	2907	Alarm Value Lower Limit 2	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0910	2908	Alarm Value 3	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0912	2909	Alarm Value Upper Limit 3	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0914	290A	Alarm Value Lower Limit 3	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0916	290B	Alarm Value 4	H'FFFFF831 to H'0000270F (−1999 to 9999)	
0918	290C	Alarm Value Upper Limit 4	H'FFFFF831 to H'0000270F (−1999 to 9999)	
091A	290D	Alarm Value Lower Limit 4	H'FFFFF831 to H'0000270F (−1999 to 9999)	
091C	290E	SP 1	SP lower limit to SP upper limit	Adjustment
0938	291C	SP 2	SP lower limit to SP upper limit	
0954	292A	SP 3	SP lower limit to SP upper limit	
0970	2938	SP 4	SP lower limit to SP upper limit	
098C	2946	SP 5	SP lower limit to SP upper limit	
09A8	2954	SP 6	SP lower limit to SP upper limit	
09C4	2962	SP 7	SP lower limit to SP upper limit	
0A00	2A00	Proportional Band	H'00000001 to H'0000270F (0.1 to 999.9)	
0A02	2A01	Integral Time	Standard, heating/cooling, or close position proportional control: H'00000000 to H'0000270F (0 to 9999: Integral/derivative time unit is 1 s.) (0.0 to 999.9: Integral/derivative time unit is 0.1 s.) Floating position-proportional control: H'00000001 to H'0000270F (1 to 9999: Integral/derivative time unit is 1 s.) (0.1 to 999.9: Integral/derivative time unit is 0.1 s.)	
0A04	2A02	Derivative Time	H'00000000 to H'0000270F (0 to 9999: Integral/derivative time unit is 1 s.) (0.0 to 999.9: Integral/derivative time unit is 0.1 s.)	
0A0A	2A05	MV Upper Limit	Standard control or close position-proportional control: MV lower limit + 0.1 to H'0000041A (MV lower limit + 0.1 to 105.0) Heating and cooling control: H'00000000 to H'0000041A (0.0 to 105.0)	
0A0C	2A06	MV Lower Limit	Standard control or close position-proportional control: H'FFFFFFCE to MV upper limit −0.1 (−5.0 to MV upper limit −0.1) Heating and cooling control: H'FFFFFBE6 to H'00000000 (−105.0 to 0.0)	

Note: The alarm function can also be used in Digital Controllers that do not have any auxiliary outputs. In this case, confirm alarm occurrences via the status data.

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0C00	2C00	Input Type	H'00000000 (0): Pt (–200 to 850°C/–300 to 1500°F) H'00000001 (1): Pt (–199.9 to 500.0°C/–199.9 to 900.0°F) H'00000002 (2): Pt (0.0 to 100.0°C/0.0 to 210.0°F) H'00000003 (3): JPt (–199.9 to 500.0°C/–199.9 to 900.0°F) H'00000004 (4): JPt (0.0 to 100.0°C/0.0 to 210.0°F) H'00000005 (5): K (–200 to 1300°C/–300 to 2300°F) H'00000006 (6): K (–20.0 to 500.0°C/0.0 to 900.0°F) H'00000007 (7): J (–100 to 850°C/–100 to 1500°F) H'00000008 (8): J (–20.0 to 400.0°C/0.0 to 750.0°F) H'00000009 (9): T (–200 to 400°C/–300 to 700°F) H'0000000A (10): T (–199.9 to 400.0°C/–199.9 to 700.0°F) H'0000000B (11): E (–200 to 600°C/–300 to 1100°F) H'0000000C (12): L (–100 to 850°C/–100 to 1500°F) H'0000000D (13): U (–200 to 400°C/–300 to 700°F) H'0000000E (14): U (–199.9 to 400.0°C/–199.9 to 700.0°F) H'0000000F (15): N (–200 to 1300°C/–300 to 2300°F) H'00000010 (16): R (0 to 1700°C/0 to 3000°F) H'00000011 (17): S (0 to 1700°C/0 to 3000°F) H'00000012 (18): B (100 to 1800°C/300 to 3200°F) H'00000013 (19): W (0 to 2,300°C/0 to 3,200°F) H'00000014 (20): PLII (0 to 1,300°C/0 to 2,300°F) H'00000015 (21): Infrared temperature sensor (K 140°F/60°C) H'00000016 (22): Infrared temperature sensor (K 240°F/120°C) H'00000017 (23): Infrared temperature sensor (K 280°F/140°C) H'00000018 (24): Infrared temperature sensor (K 440°F/220°C) H'00000019 (25): 4 to 20 mA H'0000001A (26): 0 to 20 mA H'0000001B (27): 1 to 5 V H'0000001C (28): 0 to 5 V H'0000001D (29): 0 to 10 V H'0000001E (30): 0 to 50 mV* * Selection is possible only for E5CC-U Controllers and only if they are manufactured in May 2014 or later (version 2.2).	Initial setting
0C02	2C01	Temperature Unit	H'00000000 (0): °C H'00000001 (1): °F	
0C12	2C09	Scaling Lower Limit	H'FFFFF831 to scaling upper limit –1 (–1999 to scaling upper limit –1)	
0C16	2C0B	Scaling Upper Limit	Scaling lower limit + 1 to H'0000270F (Scaling lower limit + 1 to 9999)	
0C18	2C0C	Decimal Point	H'00000000 to 00000003 (0 to 3)	
0C1A	2C0D	Remote SP Upper limit	Input range lower limit to Input range upper limit for temperature input Scaling lower limit to Scaling upper limit for analog input	Advanced function setting
0C1C	2C0E	Remote SP Lower limit	Input range lower limit to Input range upper limit for temperature input Scaling lower limit to Scaling upper limit for analog input	
0C1E	2C0F	PV Decimal Point Display	H'00000000 (0): OFF H'00000001 (1): ON	
0D06	2D03	Control Output 1 Signal	H'00000000 (0): 4 to 20 mA H'00000001 (1): 0 to 20 mA	Initial setting
0D08	2D04	Control Output 2 Signal	H'00000000 (0): 4 to 20 mA H'00000001 (1): 0 to 20 mA	
0D1E	2D0F	SP Upper Limit	The range of values (without decimal point) is as follows: Temperature input: SP lower limit + 1 to Input range upper limit Analog input: SP lower limit + 1 to Scaling upper limit	
0D20	2D10	SP Lower Limit	The range of values (without decimal point) is as follows: Temperature input: Input range lower limit to SP upper limit – 1 Analog input: Scaling lower limit to SP upper limit – 1	
0D22	2D11	Standard or Heating/Cooling	H'00000000 (0): Standard H'00000001 (1): Heating and cooling	

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0D24	2D12	Direct/Reverse Operation	H'00000000 (0): Reverse operation H'00000001 (1): Direct operation	Initial setting
0D26	2D13	Close/Floating	H'00000000 (0): Floating H'00000001 (1): Close	
0D28	2D14	PID ON/OFF	H'00000000 (0): ON/OFF H'00000001 (1): 2 PID control	
0D2A	2D15	ST	H'00000000 (0): OFF H'00000001 (1): ON	
0D2C	2D16	Program Pattern	H'00000000 (0): OFF H'00000001 (1): STOP H'00000002 (2): CONT	
0D30	2D18	Remote SP Input	H'00000000 (0): 4 to 20 mA H'00000001 (1): 0 to 20 mA H'00000002 (2): 1 to 5 V H'00000003 (3): 0 to 5 V H'00000004 (4): 0 to 10 V	Advanced function setting
0D32	2D19	Minimum Output ON/OFF Band	H'00000000 to H'000001F4 (0.0 to 50.0)	
0E00	2E00	Transfer Output Type	H'00000000 (0): OFF H'00000001 (1): Set point H'00000002 (2): Set point during SP ramp H'00000003 (3): PV H'00000004 (4): MV (heating) H'00000005 (5): MV (cooling) H'00000006 (6): Valve opening (*Only for Position-proportional Models.)	Initial setting
0E02	2E01	Transfer Output Signal	H'00000000 (0): 4 to 20 mA H'00000001 (1): 1 to 5 V	

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0E0C	2E06	Control Output 1 Assignment	Control output 1 is a relay output or voltage output (for driving SSR): H'00000000 (0): Not assigned. H'00000001 (1): Control output (heating) H'00000002 (2): Control output (cooling) H'00000003 (3): Alarm 1 H'00000004 (4): Alarm 2 H'00000005 (5): Alarm 3 H'00000006 (6): Alarm 4 H'00000007 (7): Heater alarm H'00000008 (8): HB alarm H'00000009 (9): HS alarm H'0000000A (10): Input error H'0000000B (11): RSP input error H'0000000C (12): Program end output*1 H'0000000D (13): RUN output H'0000000E (14): Integrated alarm H'0000000F (15): Work bit 1 H'00000010 (16): Work bit 2 H'00000011 (17): Work bit 3 H'00000012 (18): Work bit 4 H'00000013 (19): Work bit 5 H'00000014 (20): Work bit 6 H'00000015 (21): Work bit 7 H'00000016 (22): Work bit 8 When control output 1 is a linear current output: H'FFFFFFFB (–5): Simple transfer MV (cooling)*2 H'FFFFFFFC (–4): Simple transfer MV (heating)*2 H'FFFFFFFD (–3):Simple transfer PV*2 H'FFFFFFFE (–2): Simple transfer ramp SP*2 H'FFFFFFFF (–1): Simple transfer SP*2 H'00000000 (0): Not assigned. H'00000001 (1): Control output (heating) H'00000002 (2): Control output (cooling)	Advanced function setting
0E0E	2E07	Control Output 2 Assignment	Control output 2 is a relay output or voltage output (for driving SSR): H'00000000 to H'0000006 (0 to 22) Note: Same as for the Control Output 1 Assignment parameter. When control output 2 is a linear current output: H'00000000 to H'00000002 (0 to 2) Note: Same as for the Control Output 1 Assignment parameter, except for items marked with "*2."	

*1 P.END (program end output) can be set even when the program pattern is set to OFF, but the function will be disabled.

*2 Selection is possible only with the E5CC-U, E5DC, E5DC-B, and E5GC and only when there is a control output that is a linear current output.
(The E5CC-U must be manufactured in May 2014 or later (version 2.2 or higher) and the E5DC must be manufactured in July 2014 or later (version 2.2 or higher).)

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0E14	2E0A	Event Input Assignment 1	H'00000000 (0): None H'00000001 (1): RUN/STOP H'00000002 (2): Auto/Manual Switch H'00000003 (3): Program Start*1 H'00000004 (4): Direct/Reverse Operation H'00000005 (5): SP Mode Switch*2 H'00000006 (6): 100% AT Execute/Cancel H'00000007 (7): 40% AT Execute/Cancel H'00000008 (8): Setting Change Enable/Disable H'00000009 (9): Communications Writing Enable/Disable*3 H'0000000A (10): Alarm Latch Cancel H'0000000B (11): Multi-SP No. Switch, Bit 0 H'0000000C (12): Multi-SP No. Switch, Bit 1 H'0000000D (13): Multi-SP No. Switch, Bit 2	Initial setting
0E16	2E0B	Event Input Assignment 2	H'00000000 to H'0000000D (0 to 13) Note: Same as for Event Input Assignment 1.	
0E18	2E0C	Event Input Assignment 3	H'00000000 to H'0000000D (0 to 13) Note: Same as for Event Input Assignment 1.	
0E1A	2E0D	Event Input Assignment 4	H'00000000 to H'0000000D (0 to 13) Note: Same as for Event Input Assignment 1.	
0E1C	2E0E	Event Input Assignment 5	H'00000000 to H'0000000D (0 to 13) Note: Same as for Event Input Assignment 1.	
0E1E	2E0F	Event Input Assignment 6	H'00000000 to H'0000000D (0 to 13) Note: Same as for Event Input Assignment 1.	
0E20	2E10	Auxiliary Output 1 Assignment	H'00000000 (0): Not assigned. H'00000001 (1): Control output (heating) H'00000002 (2): Control output (cooling) H'00000003 (3): Alarm 1 H'00000004 (4): Alarm 2 H'00000005 (5): Alarm 3 H'00000006 (6): Alarm 4 H'00000007 (7): Heater alarm H'00000008 (8): HB alarm H'00000009 (9): HS alarm H'0000000A (10): Input error H'0000000B (11): RSP input error H'0000000C (12): Program end output*4 H'0000000D (13): RUN output H'0000000E (14): Integrated alarm H'0000000F (15): Work bit 1 H'00000010 (16): Work bit 2 H'00000011 (17): Work bit 3 H'00000012 (18): Work bit 4 H'00000013 (19): Work bit 5 H'00000014 (20): Work bit 6 H'00000015 (21): Work bit 7 H'00000016 (22): Work bit 8	Advanced function setting
0E22	2E11	Auxiliary Output 2 Assignment	H'00000000 to H'00000016 (0 to 22) Note: Same as for the Auxiliary Output 1 Assignment parameter.	
0E24	2E12	Auxiliary Output 3 Assignment	H'00000000 to H'00000016 (0 to 22) Note: Same as for the Auxiliary Output 1 Assignment parameter.	
0E26	2E13	Auxiliary Output 4 Assignment	H'00000000 to H'00000016 (0 to 22) Note: Same as for the Auxiliary Output 1 Assignment parameter.	
0E28	2E14	Transfer Output Upper Limit	H'FFFFF831 to H'0000270F (−1999 to 9999) *2	Initial setting
0E2A	2E15	Transfer Output Lower Limit	H'FFFFF831 to H'0000270F (−1999 to 9999) *2	

*1 PRST (program start) can be set even when the program pattern is set to OFF, but the function will be disabled.

*2 Selection is possible only if there is a remote SP input.

*3 Selection is possible only if external communications is supported.

*4 The setting (monitor) range depends on the transfer output type setting. Refer to *Section 6 Parameters* in the *E5□C Digital Temperature Controller User's Manual* (Cat. No. H174).

*5 P.END (program end output) can be set even when the program pattern is set to OFF, but the function will be disabled.

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0E2C	2E16	Simple Transfer Output 1 Upper Limit	H'FFFFF831 to H'0000270F (−1999 to 9999)*1	Initial setting
0E2E	2E17	Simple Transfer Output 1 Lower Limit	H'FFFFF831 to H'0000270F (−1999 to 9999)*1	

*1 Selection is possible only with the E5CC-U, E5DC, E5DC-B, and E5GC and only when there is a control output that is a linear current output.
(The E5CC-U must be manufactured in May 2014 or later (version 2.2 or higher) and the E5DC must be manufactured in July 2014 or later (version 2.2 or higher).)

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0E48	2E24	Extraction of Square Root Enable	H'00000000 (0): OFF H'00000001 (1): ON	Initial setting
0E60	2E30	Travel Time	H'00000001 to H'000003E7 (1 to 999)	
0F00	2F00	Alarm 1 Type	H'00000000 (0): Alarm function OFF H'00000001 (1): Upper and lower-limit alarm H'00000002 (2): Upper-limit alarm H'00000003 (3): Lower-limit alarm H'00000004 (4): Upper and lower-limit range alarm H'00000005 (5): Upper and lower-limit alarm with standby sequence H'00000006 (6): Upper-limit alarm with standby sequence H'00000007 (7): Lower-limit alarm with standby sequence H'00000008 (8): Absolute-value upper-limit alarm H'00000009 (9): Absolute-value lower-limit alarm H'0000000A (10): Absolute-value upper-limit alarm with standby sequence H'0000000B (11): Absolute-value lower-limit alarm with standby sequence H'0000000C (12): LBA (Loop Burnout Alarm) H'0000000D (13): PV change rate alarm H'0000000E (14): SP absolute-value upper-limit alarm H'0000000F (15): SP absolute-value lower-limit alarm H'00000010 (16): MV absolute-value upper-limit alarm H'00000011 (17): MV absolute-value lower-limit alarm H'00000012 (18): RSP absolute-value upper-limit alarm * H'00000013 (19): RSP absolute-value lower-limit alarm * * Valid only with a remote SP input.	
0F02	2F01	Alarm 1 Latch	H'00000000 (0): OFF H'00000001 (1): ON	Advanced function setting
0F04	2F02	Alarm 1 Hysteresis	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) (0.01 to 99.99 for analog input)	Initial setting
0F06	2F03	Alarm 2 Type	H'00000000 to H'00000013 (0 to 19) Note: Same settings as the Alarm 1 Type. However, the LBA (loop burnout alarm) cannot be set.	
0F08	2F04	Alarm 2 Latch	H'00000000 (0): OFF H'00000001 (1): ON	Advanced function setting
0F0A	2F05	Alarm 2 Hysteresis	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) (0.01 to 99.99 for analog input)	Initial setting
0F0C	2F06	Alarm 3 Type	H'00000000 to H'00000013 (0 to 19) Note: Same settings as the Alarm 1 Type. However, the LBA (loop burnout alarm) cannot be set.	
0F0E	2F07	Alarm 3 Latch	H'00000000 (0): OFF H'00000001 (1): ON	Advanced function setting
0F10	2F08	Alarm 3 Hysteresis	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) (0.01 to 99.99 for analog input)	Initial setting
0F12	2F09	Alarm 4 Type	H'00000000 to H'00000013 (0 to 19) Note: Same settings as the Alarm 1 Type. However, the LBA (loop burnout alarm) cannot be set.	
0F14	2F0A	Alarm 4 Latch	H'00000000 (0): OFF H'00000001 (1): ON	Advanced function setting
0F16	2F0B	Alarm 4 Hysteresis	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) (0.01 to 99.99 for analog input)	Initial setting
0F18	2F0C	Standby Sequence Reset	H'00000000 (0): Condition A H'00000001 (1): Condition B	Advanced function setting
0F1A	2F0D	Auxiliary Output 1 Open in Alarm	H'00000000 (0): Close in alarm H'00000001 (1): Open in alarm	

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
0F1C	2F0E	Auxiliary Output 2 Open in Alarm	H'00000000 (0): Close in alarm H'00000001 (1): Open in alarm	Advanced function setting
0F1E	2F0F	Auxiliary Output 3 Open in Alarm	H'00000000 (0): Close in alarm H'00000001 (1): Open in alarm	
0F20	2F10	Auxiliary Output 4 Open in Alarm	H'00000000 (0): Close in alarm H'00000001 (1): Open in alarm	
0F22	2F11	Alarm 1 ON delay	H'00000000 to H'000003E7 (0 to 999)	
0F24	2F12	Alarm 2 ON delay	H'00000000 to H'000003E7 (0 to 999)	
0F26	2F13	Alarm 3 ON delay	H'00000000 to H'000003E7 (0 to 999)	
0F28	2F14	Alarm 4 ON delay	H'00000000 to H'000003E7 (0 to 999)	
0F2A	2F15	Alarm 1 OFF delay	H'00000000 to H'000003E7 (0 to 999)	
0F2C	2F16	Alarm 2 OFF delay	H'00000000 to H'000003E7 (0 to 999)	
0F2E	2F17	Alarm 3 OFF delay	H'00000000 to H'000003E7 (0 to 999)	
0F30	2F18	Alarm 4 OFF delay	H'00000000 to H'000003E7 (0 to 999)	
1000	3000	PV/SP No. 1 Display Selection	H'00000000 (0):Nothing displayed. H'00000001 (1):PV/SP H'00000002 (2):PV H'00000003 (3):PV/SP (character display) H'00000004 (4):PV/SP/MV H'00000005 (5):PV/SP/Multi-SP No. H'00000006 (6):PV/SP/Soak time remain H'00000007 (7):PV/SP/Ramp SP H'00000008 (8):PV/SP/Alarm value 1	
1002	3001	MV Display Selection	H'00000000 (0): MV (heating) H'00000001 (1): MV (cooling)	
1006	3003	Automatic Display Return Time	H'00000000 (0): OFF H'00000001 to H'00000063 (1 to 99)	
1008	3004	Display Refresh Period	H'00000000 (0):OFF H'00000001 (1): 0.25 H'00000002 (2): 0.5 H'00000003 (3): 1.0	
1010	3008	PV/SP No. 2 Display Selection	H'00000000 to H'00000008 (0 to 8) Note: Same as PV/SP No. 1 Display Selection.	
1012	3009	Valve Opening Monitor Selection*2	H'00000000 (0): Measured opening H'00000001 (1): Estimated opening	Initial setting
1014	300A	Display Brightness	H'00000001 to H'00000003 (1 to 3)	Advanced function setting
1016	300B	MV Display	H'00000000 (0): OFF H'00000001 (1): ON	
1018	300C	Move to Protect Level Time	H'00000001 to H'0000001E (1 to 30)	
101E	300F	Auto/Manual Select Addition	H'00000000 (0): OFF H'00000001 (1): ON	
1022	3011	PV Status Display Function	H'00000000 (0): OFF H'00000001 (1): Manual H'00000002 (2): Stop H'00000003 (3): Alarm 1 H'00000004 (4): Alarm 2 H'00000005 (5): Alarm 3 H'00000006 (6): Alarm 4 H'00000007 (7): Alarm 1 to 4 OR status H'00000008 (8): Heater alarm H'00000009 (9): Status display message*1	
1024	3012	SV Status Display Function	H'00000000 to H'00000009 (0 to 9) Note: Same as for PV Status Display Function.	

*1 Selection is possible only with the E5DC, E5DC-B, and E5GC. (The D5DC must be manufactured in July 2014 or later (version 2.2 or higher).)

*2 You can use this parameter only with the E5EC-PR□-8□□ or E5AC-PR□-8□□. (The Digital Controller must be manufactured in August 2014 or later (version 2.2 or higher).)

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
1100	3100	Protocol Setting (See note.)	H'00000000 (0): CompoWay/F H'00000001 (1): Modbus	Communications setting
1102	3101	Communications Unit No. *	H'00000000 to H'00000063 (0 to 99)	
1104	3102	Communications Baud Rate *	H'00000003 (3): 9.6 H'00000004 (4): 19.2 H'00000005 (5): 38.4 H'00000006 (6): 57.6	
1106	3103	Communications Data Length *	H'00000007 (7): 7 H'00000008 (8): 8	
1108	3104	Communications Stop Bits *	H'00000001 (1): 1 H'00000002 (2): 2	
110A	3105	Communications Parity *	H'00000000 (0): None H'00000001 (1): Even H'00000002 (2): Odd	
110C	3106	Send Data Wait Time *	H'00000000 to H'00000063 (0 to 99)	
1200	3200	PF Setting	H'00000000 (0): Disabled H'00000001 (1): Run H'00000002 (2): Stop H'00000003 (3): RUN/STOP H'00000004 (4): 100% AT execute/cancel H'00000005 (5): 40% AT execute/cancel H'00000006 (6): Alarm latch cancel H'00000007 (7): Auto/manual switch H'00000008 (8): Monitor/setting item H'00000009 (9): Digit shift key	Advanced function setting
1204	3202	Monitor/Setting Item 1	H'00000000 (0): Disabled H'00000001 (1): PV/SP/multi-SP H'00000002 (2): PV/SP/MV H'00000003 (3): PV/SP/soak time remain H'00000004 (4): Proportional band H'00000005 (5): Integral time H'00000006 (6): Derivative time H'00000007 (7): Alarm value 1 H'00000008 (8): Alarm value upper limit 1 H'00000009 (9): Alarm value lower limit 1 H'0000000A (10): Alarm value 2 H'0000000B (11): Alarm value upper limit 2 H'0000000C (12): Alarm value lower limit 2 H'0000000D (13): Alarm value 3 H'0000000E (14): Alarm value upper limit 3 H'0000000F (15): Alarm value lower limit 3 H'00000010 (16): Alarm value 4 H'00000011 (17): Alarm value upper limit 4 H'00000012 (18): Alarm value lower limit 4 H'00000013 (19): PV/SP/Internal set point H'00000014 (20): PV/SP/Alarm value 1 H'00000015 (21): Proportional Band (Cooling) H'00000016 (22): Integral Time (Cooling) H'00000017 (23): Derivative Time (Cooling)	
1206	3203	Monitor/Setting Item 2	H'00000000 to H'00000017 (0 to 23) Note: Same as for Monitor/Setting Item 1.	
1208	3204	Monitor/Setting Item 3	H'00000000 to H'00000017 (0 to 23) Note: Same as for Monitor/Setting Item 1.	
120A	3205	Monitor/Setting Item 4	H'00000000 to H'00000017 (0 to 23) Note: Same as for Monitor/Setting Item 1.	
120C	3206	Monitor/Setting Item 5	H'00000000 to H'00000017 (0 to 23) Note: Same as for Monitor/Setting Item 1.	

* After communications parameters have been changed, reset the Digital Controller to enable them.

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
1302	3301	SP Tracking	H'00000000 (0): OFF H'00000001 (1): ON	Advanced function setting
1308	3304	PV Dead Band	H'00000000 to H'0000270F (0 to 9999)	
130A	3305	Cold Junction Compensation Method	H'00000000 (0): OFF H'00000001 (1): ON	
1312	3309	Integral/Derivative Time Unit	H'00000000 (0): 1 s H'00000001 (1): 0.1 s	
1314	330A	α	H'00000000 to H'00000064 (0.00 to 1.00)	
1318	330C	Manual Output Method	H'00000000 (0): HOLD H'00000001 (1): INIT	
131A	330D	Manual MV Initial Value	Standard control or close position-proportional control: H'FFFFFFCE to H'0000041A (−5.0 to 105.0) Heating and cooling control: H'FFFFFBE6 to H'0000041A (−105.0 to 105.0)	
131E	330F	AT Calculated Gain	H'00000001 to H'00000064 (0.1 to 10.0)	
1320	3310	AT Hysteresis	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) H'00000001 to H'000003E7 (0.01 to 9.99 for analog input)	
1322	3311	Limit Cycle MV Amplitude	H'00000032 to H'000001F4 (5.0 to 50.0)	
1328	3314	Heater Burnout Latch	H'00000000 (0): OFF H'00000001 (1): ON	
132A	3315	Heater Burnout Hysteresis	H'00000001 to H'000001F4 (0.1 to 50.0)	
132C	3316	HS Alarm Latch	H'00000000 (0): OFF H'00000001 (1): ON	
132E	3317	HS Alarm Hysteresis	H'00000001 to H'000001F4 (0.1 to 50.0)	
1336	331B	Number of Multi-SP Points	H'00000001 (1): OFF H'00000002 to H'00000008 (2 to 8)	
1338	331C	HB ON/OFF	H'00000000 (0): OFF H'00000001 (1): ON	
133C	331E	Integrated Alarm Assignment	H'00000000 to H'000000FF (0 to 255)	
1340	3320	MV at Stop and Error Addition	H'00000000 (0): OFF H'00000001 (1): ON	
1342	3321	ST Stable Range	H'00000001 to H'0000270F (0.1 to 999.9)	
1344	3322	RT	H'00000000 (0): OFF H'00000001 (1): ON Note: Valid only with temperature input.	
1346	3323	HS Alarm Use	H'00000000 (0): OFF H'00000001 (1): ON	
1348	3324	LBA Detection Time	H'00000000 to H'0000270F (0 to 9999)	
134A	3325	LBA Level	H'00000001 to H'0000270F (0.1 to 999.9 for temperature input) (0.01 to 99.99 for analog input)	
134C	3326	LBA Band	H'00000000 to H'0000270F (0.0 to 999.9 for temperature input) (0.00 to 99.99 for analog input)	
134E	3327	Soak Time Unit	H'00000000 (0): Minutes H'00000001 (1): Hours H'00000002 (2): Seconds*1	
1350	3328	Alarm SP Selection	H'00000000 (0): Set point during SP ramp H'00000001 (1): Set point	
1352	3329	Remote SP Enable	H'00000000 (0): OFF H'00000001 (1): ON	
1356	332B	Manual MV Limit Enable	H'00000000 (0): OFF H'00000001 (1): ON	
1358	332C	Direct Setting of Position Proportional MV	H'00000000 (0): OFF H'00000001 (1): ON	
135A	332D	PV Rate of Change Calculation Period	H'00000001 to H'000003E7 (1 to 999)	

*1 Selection is possible only with the E5DC, E5DC-B, and E5GC. (The D5DC must be manufactured in July 2014 or later (version 2.2 or higher).)

Address		Parameter name	Setting (monitor) value	Level
Four-byte mode	Two-byte mode			
135C	332E	Heating/Cooling Tuning Method	H'00000000 (0): Same as heating control. H'00000001 (1): Linear H'00000002 (2): Air cooling H'00000003 (3): Water cooling	Advanced function setting
136A	3335	LCT Cooling Output Minimum ON Time (Not supported on version 2.0 or earlier of the E5CC, E5EC, or E5AC.)	H'00000001 to H'0000000A (0.1 to 1.0)	

5-2 Status

The status data for Modbus is the same as that for CompoWay/F. Refer to page 3-23.

6

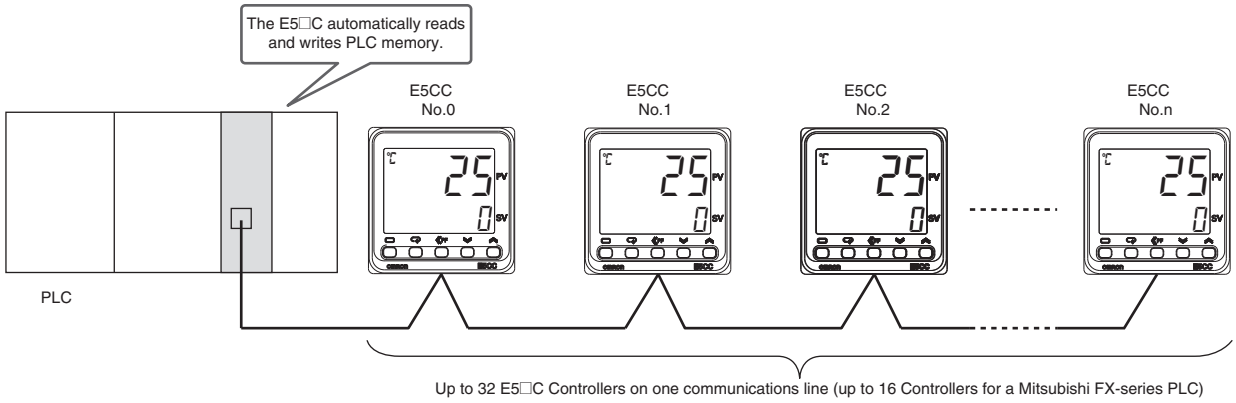
Programless Communications

This section describes programless communications for the E5□C.
Programless communications are not supported by version 1.0 of the E5CC/EC.

6-1 Programless Communications

6-1-1 Introduction

With programless communications you can read and write E5□C parameters or start and stop the E5□C from a Programmable Controller (PLC). Communications with the PLC are performed automatically by the E5□C, so there is no need to program communications.



6-1-2 Features

- You can connect to an OMRON CS/CJ-series or CP-series PLC, to a Mitsubishi Q-series, L-series, or FX-series PLC, or to a Keyence KV-series PLC.
- Up to 13 E5□C parameters can be assigned for reading and up to 13 E5□C parameters can be assigned for writing in PLC memory. Each E5□C Controller is allocated 30 words of PLC memory. (Only 12 parameters can be read for Mitsubishi FX-series or Keyence KV-series PLCs.)
- You can set the PLC memory area and addresses to use for programless communications.
- You can copy settings between E5□C Controllers to greatly reduce setup work and setting mistakes.