Procon
MelcoBEMS MINI (A1M)

FTC4 / FTC5 MODBUS REGISTER TABLES

Document version 1.0.3

Firmware version 3.0.23

For safe and correct use of the PROCON MelcoBEMS MINI please read the *MelcoBEMS MINI (A1M) - Installation Instructions* document.

Preface

Disclaimer

⚠ **Warning:**

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Amendment Register

Document Version	Latest Firmware Version	Date	Author	Notes
1.0.0	3.0.18	04/02/19	GD	Initial version.
1.0.1	3.0.19	01/05/19	GD	Latest firmware version is V3.0.19.
1.0.2	3.0.19	27/09/19	NB	Update to Holding Registers 39, 40 and 42
1.0.3	3.0.23	10/08/20	NB	Firmware version updated to V3.0.23.

Any additional notes since printing will be appended to the rear of this document on separate sheets of paper.

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1. Modbus tables – FTC4 and FTC5 systems

Some BMS controllers can only read Modbus Holding Registers, so the MelcoBEMS MINI (A1M) also exposes all Discrete, Coil and Input Registers as Holding Registers. The Discrete Input registers and Input registers are not writable so their equivalent Holding Register is read only and marked [**READ ONLY**].

Some BMS controllers may not be able to read signed register values (i.e. values which can be negative in value), so the A1M also exposes an unsigned version of those registers (these registers will not return a negative value).

1.1. Holding registers

Holding Registers are read using function code 03 and written to using either function code 06 or 16. Function code 06 is used when writing to a single holding register, function code 16 is used for writing to multiple holding registers in the same command.

Holding Register (Analogue Output)				**Applicable Unit Type**	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Modbus Slave ID	4	40005	Values 1 – 247 valid	✓	✓
Modbus RS-485 Baud Rate	5	40006	0 = 9600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 14400 6 = 19200 7 = 28800 8 = 38400 9 = 56000 10 = 57600 11 = 115200	✓	✓
RS-485 Parity Type	6	40007	0 = None 1 = Even 2 = Odd	✓	✓
Fault/Error Code (hex) [**READ ONLY**]	9	40010	0x8000 = No error 0x6999 = Bad communication with unit (Refer to indoor unit documentation for description of other fault code values)	✓	✓
MelcoBEMS MINI (A1M) Firmware Version [**READ ONLY**]	10	40011	MelcoBEMS MINI (A1M) Firmware Version	✓	✓
Modbus Comms Counter [**READ ONLY**]	11	40012	Value of a counter which increments upon every valid Modbus command received. Counter is reset to zero when value exceeds 65535.	✓	✓
Fault Code (decimal) [**READ ONLY**]	12	40013	8000 = No error 6999 = Bad communication between A1M and unit (Refer to unit documentation for description of other fault code values)	✓	✓
System Type Detected [**READ ONLY**]	13	40014	0 = ATA unit connected 1 = ATW system connected 2 = Lossnay system connected 255 = Undetermined (no unit detected yet)	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
System On/Off	25	40026	0 = System OFF 1 = System ON 2 = Emergency Run (read only value) 3 = Test Run (read only value)	✓	✓
Operating Mode (DHW)	27	40028	0 = Normal 1 = Eco		✓
A/C Mode – Zone 1	28	40029	0 = Heating Room Temp 1 = Heating Flow Temp 2 = Heating Heat Curve 3 = Cooling Room Temp (not on 13K model) 4 = Cooling Flow Temp 5 = Floor Dryup	✓	✓
A/C Mode – Zone 2	29	40030	0 = Heating Room Temp 1 = Heating Flow Temp 2 = Heating Heat Curve 3 = Cooling Room Temp (not on 13K model) 4 = Cooling Flow Temp 5 = Floor Dryup	✓	✓
Set Tank Water Temperature (signed)	30	40031	Temperature value in ºC multiplied by 100. (see note *)	✓#1	✓
Set Tank Water Temperature	31	40032	Temperature value in ºC multiplied by 100. (see note **)	✓#1	✓
H/C Thermostat Target Temperature – Zone 1 (signed)	32	40033	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
H/C Thermostat Target Temperature – Zone 1	33	40034	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
H/C Thermostat Target Temperature – Zone 2 (signed)	34	40035	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
H/C Thermostat Target Temperature – Zone 2	35	40036	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
MRC Prohibit	36	40037	Bit packed value: Bit 0 – System On/Off (0 = ON, 1 = Prohibit) Bit 1 – Running Mode (0 = ON, 1 = Prohibit) Bit 2 – Setting Temp (0 = ON, 1 = Prohibit) Bit 3 – Undefined (always 0) Bit 4 – Function Setting (0 = Normal, 1 = Function Setting) Bits 5, 6 and 7 – Undefined (always 0) (Before using this register see note ††)	✓	✓
Force DHW	37	40038	0 = Normal 1 = Force DHW	✓	✓
Holiday	38	40039	0 = Normal 1 = Holiday	✓	✓
DHW On Prohibit **[READ ONLY]**	39	40040	0 = On 1 = Prohibit	✓	✓
Heating On Prohibit – Zone 1 **[READ ONLY]**	40	40041	0 = On 1 = Prohibit	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Cooling On Prohibit – Zone 1	41	40042	0 = On 1 = Prohibit	✓#1	✓
Heating On Prohibit – Zone 2 **[READ ONLY]**	42	40043	0 = On 1 = Prohibit	✓	✓
Cooling On Prohibit – Zone 2	43	40044	0 = On 1 = Prohibit		✓
Unused	44	40045	Value 0 always returned		
Thermostat Target Temperature – Zone 1 (signed)	54	40055	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Thermostat Target Temperature – Zone 1	55	40056	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Thermostat Target Temperature – Zone 2 (signed)	56	40057	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Thermostat Target Temperature – Zone 2	57	40058	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
HC Control Type	58	40059	0 = Heating 1 = Cooling	✓	✓
Own Refrigerant Address **[READ ONLY]**	66	40067	0 … 32	✓	✓
Defrost **[READ ONLY]**	67	40068	0 = Normal 1 = Standby 2 = Defrost 3 = Waiting Restart	✓	✓
Residual Heat Removal **[READ ONLY]**	68	40069	0 = Normal 1 = Prepared 2 = Residual Heat Removal	✓	✓
Refrigerant Error Info [**READ ONLY**]	69	40070	0 = Normal 1 = Error (System) 2 = Error (Startup) 3 = Maintenance Error	✓	✓
7-Segment Display Error Code Digit 1 [**READ ONLY**]	70	40071	(see note ^)	✓	✓
7-Segment Display Error Code Digit 2 **[READ ONLY]**	71	40072	(see note ^^)	✓	✓
Status Of Heating **[READ ONLY]**	72	40073	0 = No type 1 = Heating C1 2 = Heating C2 3 = Heating C3	✓	
			0 = No type 1 = Heating/Cooling A1, Heating/Cooling B1, Heating/Cooling C1 2 = Heating/Cooling A2, Heating/Cooling B2, Heating/Cooling C2 3 = Heating/Cooling A3, Heating/Cooling B3, Heating/Cooling C3		✓
Heat Pump Frequency – Master **[READ ONLY]**	73	40074	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 1 **[READ ONLY]**	74	40075	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 2 **[READ ONLY]**	75	40076	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Heat Pump Frequency – Slave 3 **[READ ONLY]**	76	40077	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 4 **[READ ONLY]**	77	40078	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 5 **[READ ONLY]**	78	40079	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 6 **[READ ONLY]**	79	40080	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Source Status **[READ ONLY]**	80	40081	0 = H/P 1 = IH 2 = BH 3 = IH + BH 4 = Boiler	✓	✓
Temperature Setpoint – Zone 1 (signed) **[READ ONLY]**	81	40082	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Temperature Setpoint – Zone 1 **[READ ONLY]**	82	40083	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Temperature Setpoint – Zone 2 (signed) **[READ ONLY]**	83	40084	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Temperature Setpoint – Zone 2 **[READ ONLY]**	84	40085	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Flow Temperature Setpoint – Zone 1 (signed) **[READ ONLY]**	85	40086	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature Setpoint – Zone 1 **[READ ONLY]**	86	40087	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Flow Temperature Setpoint – Zone 2 (signed) **[READ ONLY]**	87	40088	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature Setpoint – Zone 2 **[READ ONLY]**	88	40089	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Legionella Temperature Setpoint (signed) **[READ ONLY]**	89	40090	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Legionella Temperature Setpoint **[READ ONLY]**	90	40091	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
DHW Temperature Drop (signed) **[READ ONLY]**	91	40092	Temperature value in ºC multiplied by 10. 0xFF38 = -20.0ºC … 0x0433 = 107.5ºC	✓	✓
DHW Temperature Drop **[READ ONLY]**	92	40093	Temperature value in ºC multiplied by 10. 0x0000 = 0ºC … 0x0433 = 107.5ºC 0 = 0.0ºC … 1075 = 107.5ºC	✓	✓
Room Temperature – Zone 1 (signed) **[READ ONLY]**	93	40094	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Room Temperature – Zone 1 **[READ ONLY]**	94	40095	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Room Temperature – Zone 2 (signed) **[READ ONLY]**	95	40096	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Room Temperature – Zone 2 **[READ ONLY]**	96	40097	Temperature value in ºC multiplied by 100. (see note **)	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Refrigerant Liquid Temperature (signed) **[READ ONLY]**	97	40098	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Refrigerant Liquid Temperature **[READ ONLY]**	98	40099	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Outdoor Ambient Temperature (signed) **[READ ONLY]**	99	40100	Temperature value in ºC multiplied by 10. 0xFE70 = -40.0ºC … 0x036B = 87.5ºC	✓	✓
Outdoor Ambient Temperature **[READ ONLY]**	100	40101	Temperature value in ºC multiplied by 10. 0x0000 = 0.0ºC ... 0x036B = 87.5ºC.	✓	✓
Flow Temperature (signed) **[READ ONLY]**	101	40102	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature **[READ ONLY]**	102	40103	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Return Temperature (signed) **[READ ONLY]**	103	40104	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Return Temperature **[READ ONLY]**	104	40105	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Tank Water Temperature (signed) **[READ ONLY]**	105	40106	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Tank Water Temperature **[READ ONLY]**	106	40107	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Flow Temperature – Zone 1 (signed) **[READ ONLY]**	107	40108	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature – Zone 1 **[READ ONLY]**	108	40109	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Return Temperature – Zone 1 (signed) **[READ ONLY]**	109	40110	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Return Temperature – Zone 1 **[READ ONLY]**	110	40111	Temperature value in ºC multiplied by 100. (see note **)	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Flow Temperature – Zone 2 (signed) **[READ ONLY]**	111	40112	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature – Zone 2 **[READ ONLY]**	112	40113	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Return Temperature – Zone 2 (signed) **[READ ONLY]**	113	40114	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Return Temperature – Zone 2 **[READ ONLY]**	114	40115	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Boiler Flow Temperature (signed) **[READ ONLY]**	115	40116	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Boiler Flow Temperature **[READ ONLY]**	116	40117	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Boiler Return Temperature (signed) **[READ ONLY]**	117	40118	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Boiler Return Temperature **[READ ONLY]**	118	40119	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Room Thermo 1 (IN1) **[READ ONLY]**	119	40120	0 = OFF, 1 = ON	✓	✓
Room Thermo 2 (IN6) **[READ ONLY]**	120	40121	0 = OFF, 1 = ON	✓	✓
Flow SW1 (IN2) **[READ ONLY]**	121	40122	0 = OFF, 1 = ON	✓	✓
Flow SW2 (IN3) **[READ ONLY]**	122	40123	0 = OFF, 1 = ON	✓	✓
Flow SW3 (IN7) **[READ ONLY]**	123	40124	0 = OFF, 1 = ON	✓	✓
Demand (IN4) **[READ ONLY]**	124	40125	0 = OFF, 1 = ON	✓	✓
Outdoor Thermo (IN5) **[READ ONLY]**	125	40126	0 = OFF, 1 = ON	✓	✓
DIP Switch SW2 **[READ ONLY]**	126	40127	Bit 0 = Switch 2-1 (0 = OFF, 1 = ON) … Bit 9 = Switch 2-10 (0 = OFF, 1 = ON)	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Heat Pump Master ON/OFF **[READ ONLY]**	127	40128	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 1 ON/OFF (address 2 for CAHV/CRHV) **[READ ONLY]**	128	40129	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 2 ON/OFF (address 3 for CAHV/CRHV) **[READ ONLY]**	129	40130	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 3 ON/OFF (address 4 for CAHV/CRHV) **[READ ONLY]**	130	40131	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 4 ON/OFF (address 5 for CAHV/CRHV) **[READ ONLY]**	131	40132	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 5 ON/OFF (address 6 for CAHV/CRHV) **[READ ONLY]**	132	40133	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 6 ON/OFF (address 7 for CAHV/CRHV) **[READ ONLY]**	133	40134	0 = Stop, 1 = Run	✓	✓
Heat Pump Run Time (hours) **[READ ONLY]**	136	40137	Value in hours 0 = 0 Hours … 99 = 99 Hours	✓	✓
Heat Pump Run Time (hours x100) **[READ ONLY]**	137	40138	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 1 Run Time (hours x100) **[READ ONLY]**	138	40139	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 2 Run Time (hours x100) **[READ ONLY]**	139	40140	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 3 Run Time (hours x100) **[READ ONLY]**	140	40141	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 4 Run Time (hours x100) **[READ ONLY]**	141	40142	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 5 Run Time (hours x100) **[READ ONLY]**	142	40143	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 6 Run Time (hours x100) **[READ ONLY]**	143	40144	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Boiler ON/OFF **[READ ONLY]**	144	40145	0 = Stop, 1 = Run	✓	✓
Booster Heater 1 ON/OFF **[READ ONLY]**	145	40146	0 = Stop, 1 = Run	✓	✓
Booster Heater 2 ON/OFF **[READ ONLY]**	146	40147	0 = Stop, 1 = Run	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Booster Heater 2+ ON/OFF **[READ ONLY]**	147	40148	0 = Stop, 1 = Run	✓	✓
Immersion Heater ON/OFF **[READ ONLY]**	148	40149	0 = Stop, 1 = Run	✓	✓
Water Pump 1 ON/OFF **[READ ONLY]**	149	40150	0 = Stop, 1 = Run	✓	✓
Water Pump 2 ON/OFF **[READ ONLY]**	150	40151	0 = Stop, 1 = Run	✓	✓
Water Pump 3 ON/OFF **[READ ONLY]**	151	40152	0 = Stop, 1 = Run	✓	✓
3-Way Valve ON/OFF **[READ ONLY]**	152	40153	0 = Stop, 1 = Run	✓	✓
2-Way Valve 2 ON/OFF **[READ ONLY]**	153	40154	0 = Stop, 1 = Run	✓	✓
Mixing Valve Step **[READ ONLY]**	154	40155	0 = Step 0 … 10 = Step 10	✓	✓
Refrigerant 1 Error Code Digit 1 **[READ ONLY]**	155	40156	(see note ^)	✓	✓
Refrigerant 1 Error Code Digit 2 **[READ ONLY]**	156	40157	(see note ^^)	✓	✓
Refrigerant 2 Error Code Digit 1 **[READ ONLY]**	157	40158	(see note ^)	✓	✓
Refrigerant 2 Error Code Digit 2 **[READ ONLY]**	158	40159	(see note ^^)	✓	✓
Refrigerant 3 Error Code Digit 1 **[READ ONLY]**	159	40160	(see note ^)	✓	✓
Refrigerant 3 Error Code Digit 2 **[READ ONLY]**	160	40161	(see note ^^)	✓	✓
Refrigerant 4 Error Code Digit 1 **[READ ONLY]**	161	40162	(see note ^)	✓	✓
Refrigerant 4 Error Code Digit 2 **[READ ONLY]**	162	40163	(see note ^^)	✓	✓
Refrigerant 5 Error Code Digit 1 **[READ ONLY]**	163	40164	(see note ^)	✓	✓
Refrigerant 5 Error Code Digit 2 **[READ ONLY]**	164	40165	(see note ^^)	✓	✓
Refrigerant 6 Error Code Digit 1 **[READ ONLY]**	165	40166	(see note ^)	✓	✓
Refrigerant 6 Error Code Digit 2 **[READ ONLY]**	166	40167	(see note ^^)	✓	✓
	199 - 214	40200 - 40215	Reserved		
Version of Protocol (upper) **[READ ONLY]**	265	40266	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Version of Protocol (lower) **[READ ONLY]**	266	40267	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓
Version of Model (upper) **[READ ONLY]**	267	40268	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓
Version of Model (lower) **[READ ONLY]**	268	40269	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓
Capacity of Supplying Electricity **[READ ONLY]**	269	40270	Value in Watts 0 = 0,0 W … 255 = 25,5 W	✓	✓
Model Profile 1 **[READ ONLY]**	270	40271	0 = FTC2B 1 = FTC4 2 = FTC5 128 = CAHV1A 129 = CAHV1B 130 = CRHV1A 131 = CRHV1B 132 = EAHV1A 133 = EAHV1B 134 = QAHV1A 135 = QAHV1B 144 = PWFY1	✓	✓
Model Profile 2 (refrigerant address) **[READ ONLY]**	271	40272	0 = Address 0 … 255 = Address 255 (addresses 7 – 255 not used for FTC)	✓	✓
Energy Consumption Measured Date – Year **[READ ONLY]**	279	40280	Date of last energy consumption measurement – Year		✓
Energy Consumption Measured Date – Month **[READ ONLY]**	280	40281	Date of last energy consumption measurement – Month		✓
Energy Consumption Measured Date – Day **[READ ONLY]**	281	40282	Date of last energy consumption measurement – Day		✓
Last Measured Heating Energy Consumption – kWh part **[READ ONLY]**	282	40283	Last measured heating energy consumption – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Heating Energy Consumption – Wh part **[READ ONLY]**	283	40284	Last measured heating energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Cooling Energy Consumption – kWh part **[READ ONLY]**	284	40285	Last measured cooling energy consumption – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Cooling Energy Consumption – Wh part **[READ ONLY]**	285	40286	Last measured cooling energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured DHW Energy Consumption – kWh part **[READ ONLY]**	286	40287	Last measured DHW energy consumption – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured DHW Energy Consumption – Wh part **[READ ONLY]**	287	40288	Last measured DHW energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Total Energy Consumption – kWh **[READ ONLY]**	288	40289	Last measured total energy consumption in Kwh. 0 = 0kWh … 65535 = 65535kWh		✓
Energy Produced Measured Date – Year **[READ ONLY]**	289	40290	Date of last energy produced measurement – Year		✓

Holding Register (Analogue Output)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Energy Produced Measured Date – Month **[READ ONLY]**	290	40291	Date of last energy produced measurement – Month		✓
Energy Produced Measured Date – Day **[READ ONLY]**	291	40292	Date of last energy produced measurement – Day		✓
Last Measured Heating Energy Produced – kWh part **[READ ONLY]**	292	40293	Last measured heating energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Heating Energy Produced – Wh part **[READ ONLY]**	293	40294	Last measured heating energy produced – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Cooling Energy Produced – kWh part **[READ ONLY]**	294	40295	Last measured cooling energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Cooling Energy Produced – Wh part **[READ ONLY]**	295	40296	Last measured cooling energy produced – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured DHW Energy Produced – kWh part **[READ ONLY]**	296	40297	Last measured DHW energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured DHW Energy Produced – Wh part **[READ ONLY]**	297	40298	Last measured DHW energy produced – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Total Energy Produced – kWh **[READ ONLY]**	298	40299	Last measured total energy produced in Kwh. 0 = 0kWh … 65535 = 65535kWh		✓
Flow Rate **[READ ONLY]**	299	40300	Litres per minute 0 = 0 l/min … 255 = 255 l/min		✓

* Temperature in ºC multiplied by 100.
  0x8000 = -327.68ºC
  0x8001 = -327.67ºC
  …
  0xFFFF = -0.01ºC
  0x0000 = 0.00ºC
  …
  0x7FFE = 327.66ºC
  0x7FFF = 327.67ºC

** Temperature in ºC multiplied by 100.
  0x0000 = 0.00ºC
  0x0001 = 0.01ºC
  …
  0x7FFE = 327.66ºC
  0x7FFF = 327.67ºC

^ 7-Segment Display Error Code Digit 1
  0 = A
  1 = b
  2 = E
  3 = F
  4 = J
  5 = L
  6 = P
  7 = U

^^ 7-Segment Display Error Code Digit 2
1 – 15 = 1 - F
16 = O
17 = H
18 = J
19 = L
20 = P
21 = U

[#6] This value is read only on FTC4 models

1.2. Input registers

Input Registers are read using function code 04.

Input Register (Analogue Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Fault/Error Code (hex)	1	30002	0x8000 = No error 0x6999 = Bad communication with unit (Refer to indoor unit documentation for description of other fault code values)	✓	✓
MelcoBEMS MINI (A1M) Firmware Version	3	30004	MelcoBEMS MINI (A1M) Firmware Version	✓	✓
Modbus Comms Counter	5	30006	Value of a counter which increments upon every valid Modbus command received. Value will automatically reset to zero when value exceeds 65535.	✓	✓
Fault Code (decimal)	8	30009	8000 = No error 6999 = Bad communication between A1M and unit (Refer to unit documentation for description of other fault code values)	✓	✓
System Type Detected	9	30010	0 = ATA unit connected 1 = ATW system connected 2 = Lossnay system connected 255 = Undetermined (no unit detected yet)	✓	✓
Own Refrigerant Address	25	30026	0 … 32	✓	✓
Defrost	26	30027	0 = Normal 1 = Standby 2 = Defrost 3 = Waiting Restart	✓	✓
Residual Heat Removal	27	30028	0 = Normal 1 = Prepared 2 = Residual Heat Removal	✓	✓
Refrigerant Error Info	28	30029	0 = Normal 1 = Error (System) 2 = Error (Startup) 3 = Maintenance Error	✓	✓
7-Segment Display Error Code Digit 1	29	30030	(see note ^)	✓	✓
7-Segment Display Error Code Digit 2	30	30031	(see note ^^)	✓	✓
Status Of Heating	31	30032	0 = No type 1 = Heating C1 2 = Heating C2 3 = Heating C3	✓	
			0 = No type 1 = Heating/Cooling A1, Heating/Cooling B1, Heating/Cooling C1 2 = Heating/Cooling A2, Heating/Cooling B2, Heating/Cooling C2 3 = Heating/Cooling A3, Heating/Cooling B3, Heating/Cooling C3		✓
Heat Pump Frequency – Master	32	30033	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 1	33	30034	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓

Input Register (Analogue Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Heat Pump Frequency – Slave 2	34	30035	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 3	35	30036	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 4	36	30037	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 5	37	30038	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Pump Frequency – Slave 6	38	30039	Frequency value in Hz 0 = 0Hz … 255 = 255Hz	✓	✓
Heat Source Status	39	30040	0 = H/P 1 = IH 2 = BH 3 = IH + BH 4 = Boiler	✓	✓
Temperature Setpoint – Zone 1 (signed)	40	30041	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Temperature Setpoint – Zone 1	41	30042	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Temperature Setpoint – Zone 2 (signed)	42	30043	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Temperature Setpoint – Zone 2	43	30044	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Flow Temperature Setpoint – Zone 1 (signed)	44	30045	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature Setpoint – Zone 1	45	30046	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Flow Temperature Setpoint – Zone 2 (signed)	46	30047	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature Setpoint – Zone 2	47	30048	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Legionella Temperature Setpoint (signed)	48	30049	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Legionella Temperature Setpoint	49	30050	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
DHW Temperature Drop (signed)	50	30051	Temperature value in ºC multiplied by 10. 0xFF38 = -20.0ºC … 0x0433 = 107.5ºC	✓	✓
DHW Temperature Drop	51	30052	Temperature value in ºC multiplied by 10. 0x0000 = 0ºC … 0x0433 = 107.5ºC 0 = 0.0ºC … 1075 = 107.5ºC	✓	✓
Room Temperature – Zone 1 (signed)	52	30053	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Room Temperature – Zone 1	53	30054	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Room Temperature – Zone 2 (signed)	54	30055	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Room Temperature – Zone 2	55	30056	Temperature value in ºC multiplied by 100. (see note **)	✓	✓

Input Register (Analogue Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Refrigerant Liquid Temperature (signed)	56	30057	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Refrigerant Liquid Temperature	57	30058	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Outdoor Ambient Temperature (signed)	58	30059	Temperature value in ºC multiplied by 10. 0xFE70 = -40.0ºC … 0x036B = 87.5ºC	✓	✓
Outdoor Ambient Temperature	59	30060	Temperature value in ºC multiplied by 10. 0x0000 = 0.0ºC ... 0x036B = 87.5ºC.	✓	✓
Flow Temperature (signed)	60	30061	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature	61	30062	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Return Temperature (signed)	62	30063	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Return Temperature	63	30064	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Tank Water Temperature (signed)	64	30065	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Tank Water Temperature	65	30066	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Flow Temperature – Zone 1 (signed)	66	30067	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature – Zone 1	67	30068	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Return Temperature – Zone 1 (signed)	68	30069	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Return Temperature – Zone 1	69	30070	Temperature value in ºC multiplied by 100. (see note **)	✓	✓

Input Register (Analogue Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Flow Temperature – Zone 2 (signed)	70	30071	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Flow Temperature – Zone 2	71	30072	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Return Temperature – Zone 2 (signed)	72	30073	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Return Temperature – Zone 2	73	30074	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Boiler Flow Temperature (signed)	74	30075	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Boiler Flow Temperature	75	30076	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
Boiler Return Temperature (signed)	76	30077	Temperature value in ºC multiplied by 100. (see note *)	✓	✓
Boiler Return Temperature	77	30078	Temperature value in ºC multiplied by 100. (see note **)	✓	✓
DIP Switch SW2	78	30079	Bit 0 = Switch 2-1 (0 = OFF, 1 = ON) … Bit 9 = Switch 2-10 (0 = OFF, 1 = ON)	✓	✓
Heat Pump Run Time (hours)	79	30080	Value in hours 0 = 0 Hours … 99 = 99 Hours	✓	✓
Heat Pump Run Time (hours x100)	80	30081	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 1 Run Time (hours x100)	81	30082	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 2 Run Time (hours x100)	82	30083	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 3 Run Time (hours x100)	83	30084	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓

Input Register (Analogue Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Heat Pump Refrigerant Address 4 Run Time (hours x100)	84	30085	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 5 Run Time (hours x100)	85	30086	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Heat Pump Refrigerant Address 6 Run Time (hours x100)	86	30087	Value in hours multiplied by 100 0 = 0 hours … 65535 = 6553500 hours	✓	✓
Mixing Valve Step	87	30088	0 = Step 0 … 10 = Step 10	✓	✓
Refrigerant 1 Error Code Digit 1	88	30089	(see note ^)	✓	✓
Refrigerant 1 Error Code Digit 2	89	30090	(see note ^^)	✓	✓
Refrigerant 2 Error Code Digit 1	90	30091	(see note ^)	✓	✓
Refrigerant 2 Error Code Digit 2	91	30092	(see note ^^)	✓	✓
Refrigerant 3 Error Code Digit 1	92	30093	(see note ^)	✓	✓
Refrigerant 3 Error Code Digit 2	93	30094	(see note ^^)	✓	✓
Refrigerant 4 Error Code Digit 1	94	30095	(see note ^)	✓	✓
Refrigerant 4 Error Code Digit 2	95	30096	(see note ^^)	✓	✓
Refrigerant 5 Error Code Digit 1	96	30097	(see note ^)	✓	✓
Refrigerant 5 Error Code Digit 2	97	30098	(see note ^^)	✓	✓
Refrigerant 6 Error Code Digit 1	98	30099	(see note ^)	✓	✓
Refrigerant 6 Error Code Digit 2	99	30100	(see note ^^)	✓	✓
H/C Control Type	144	30145	0 = Heating 1 = Cooling	✓	✓
MRC Prohibit	145	30146	Bit packed value: Bit 0 – System On/Off (0 = ON, 1 = Prohibit) Bit 1 – Running Mode (0 = ON, 1 = Prohibit) Bit 2 – Setting Temp (0 = ON, 1 = Prohibit) Bit 3 – Undefined (always 0) Bit 4 – Function Setting (0 = Normal, 1 = Function Setting) Bits 5, 6 and 7 – Undefined (always 0)	✓	✓
Version of Protocol (upper)	146	30147	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓

Input Register (Analogue Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Version of Protocol (lower)	147	30148	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓
Version of Model (upper)	148	30149	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓
Version of Model (lower)	149	30150	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓
Capacity of Supplying Electricity	150	30151	Value in Watts 0 = 0,0 W … 255 = 25,5 W	✓	✓
Model Profile 1	151	30152	0 = FTC2B 1 = FTC4 2 = FTC5 128 = CAHV1A 129 = CAHV1B 130 = CRHV1A 131 = CRHV1B 132 = EAHV1A 133 = EAHV1B 134 = QAHV1A 135 = QAHV1B 144 = PWFY1	✓	✓
Model Profile 2 (refrigerant address)	152	30153	0 = Address 0 … 255 = Address 255 (addresses 7 – 255 not used for FTC)	✓	✓
Energy Consumption Measured Date – Year	153	30154	Date of last energy consumption measurement – Year		✓
Energy Consumption Measured Date – Month	154	30155	Date of last energy consumption measurement – Month		✓
Energy Consumption Measured Date – Day	155	30156	Date of last energy consumption measurement – Day		✓
Last Measured Heating Energy Consumption – kWh part	156	30157	Last measured heating energy consumption – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Heating Energy Consumption – Wh part	157	30158	Last measured heating energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Cooling Energy Consumption – kWh part	158	30159	Last measured cooling energy consumption – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Cooling Energy Consumption – Wh part	159	30160	Last measured cooling energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured DHW Energy Consumption – kWh part	160	30161	Last measured DHW energy consumption – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured DHW Energy Consumption – Wh part	161	30162	Last measured DHW energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Total Energy Consumption – kWh	162	30163	Last measured total energy consumption in Kwh. 0 = 0kWh … 65535 = 65535kWh		✓
Energy Produced Measured Date – Year	163	30164	Date of last energy produced measurement – Year		✓
Energy Produced Measured Date – Month	164	30165	Date of last energy produced measurement – Month		✓

Input Register (Analogue Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Energy Produced Measured Date – Day	165	30166	Date of last energy produced measurement – Day		✓
Last Measured Heating Energy Produced – kWh part	166	30167	Last measured heating energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Heating Energy Produced – Wh part	167	30168	Last measured heating energy produced – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Cooling Energy Produced – kWh part	168	30169	Last measured cooling energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured Cooling Energy Produced – Wh part	169	30170	Last measured cooling energy produced – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured DHW Energy Produced – kWh part	170	30171	Last measured DHW energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓
Last Measured DHW Energy Produced – Wh part	171	30172	Last measured DHW energy produced – Wh part of the value multiplied by 10. 0 = 0Wh … 99 = 990Wh		✓
Last Measured Total Energy Produced – kWh	172	30173	Last measured total energy produced in Kwh. 0 = 0kWh … 65535 = 65535kWh		✓
Flow Rate	173	30174	Litres per minute 0 = 0 l/min … 255 = 255 l/min		✓

* Temperature in ºC multiplied by 100.
  0x8000 = -327.68ºC
  0x8001 = -327.67ºC
  …
  0xFFFF = -0.01ºC
  0x0000 = 0.00ºC
  …
  0x7FFE = 327.66ºC
  0x7FFF = 327.67ºC

** Temperature in ºC multiplied by 100.
  0x0000 = 0.00ºC
  0x0001 = 0.01ºC
  …
  0x7FFE = 327.66ºC
  0x7FFF = 327.67ºC

^ 7-Segment Display Error Code Digit 1
  0 = A
  1 = b
  2 = E
  3 = F
  4 = J
  5 = L
  6 = P
  7 = U

^^ 7-Segment Display Error Code Digit 2
1 – 15 = 1 - F
16 = O
17 = H
18 = J
19 = L
20 = P
21 = U

1.3. Coils

Coils are read using function code 01 and written to using either function code 05 or 15. Function code 05 is used when writing to a single coil register, function code 15 is used for writing to multiple coil registers in the same command.

Coil (Digital Output)					
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
System ON/OFF	1	00002	0 = System OFF 1 = System ON (Note: Reading back value 1 could indicate the unit is in Emergency Run or Test Run mode)	✓	✓

1.4. Discrete Inputs

Discrete Inputs are read using function code 02.

Discrete Input (Digital Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Room Thermo 1 (IN1)	0	10001	0 = OFF, 1 = ON	✓	✓
Room Thermo 2 (IN6)	1	10002	0 = OFF, 1 = ON	✓	✓
Flow SW1 (IN2)	2	10003	0 = OFF, 1 = ON	✓	✓
Flow SW2 (IN3)	3	10004	0 = OFF, 1 = ON	✓	✓
Flow SW3 (IN7)	4	10005	0 = OFF, 1 = ON	✓	✓
Demand (IN4)	5	10006	0 = OFF, 1 = ON	✓	✓
Outdoor Thermo (IN5)	6	10007	0 = OFF, 1 = ON	✓	✓
Heat Pump Master ON/OFF	7	10008	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 1 ON/OFF (address 2 for CAHV/CRHV)	8	10009	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 2 ON/OFF (address 3 for CAHV/CRHV)	9	10010	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 3 ON/OFF (address 4 for CAHV/CRHV)	10	10011	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 4 ON/OFF (address 5 for CAHV/CRHV)	11	10012	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 5 ON/OFF (address 6 for CAHV/CRHV)	12	10013	0 = Stop, 1 = Run	✓	✓
Heat Pump Slave 6 ON/OFF (address 7 for CAHV/CRHV)	13	10014	0 = Stop, 1 = Run	✓	✓
Boiler ON/OFF	16	10017	0 = Stop, 1 = Run	✓	✓
Booster Heater 1 ON/OFF	17	10018	0 = Stop, 1 = Run	✓	✓
Booster Heater 2 ON/OFF	18	10019	0 = Stop, 1 = Run	✓	✓

Discrete Input (Digital Input)				Applicable Unit Type	
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**
Booster Heater 2+ ON/OFF	19	10020	0 = Stop, 1 = Run	✓	✓
Immersion Heater ON/OFF	20	10021	0 = Stop, 1 = Run	✓	✓
Water Pump 1 ON/OFF	21	10022	0 = Stop, 1 = Run	✓	✓
Water Pump 2 ON/OFF	22	10023	0 = Stop, 1 = Run	✓	✓
Water Pump 3 ON/OFF	23	10024	0 = Stop, 1 = Run	✓	✓
3-Way Valve ON/OFF	24	10025	0 = Stop, 1 = Run	✓	✓
2-Way Valve 2 ON/OFF	25	10026	0 = Stop, 1 = Run	✓	✓

Please be sure to put the contact address/telephone number on this manual before handing it to the customer.

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