



Models

- CMMB100** (without expansion option)
CMMB100E (with plug-in connectors for expansion)

Description

The CMMB extends your BACnet or Modbus network when your application requires additional inputs on a physical controller. Combining the 8 inputs of the CMMB with your Building Automation System provides simple expansion of a new or existing controller and reduces unnecessary costs of additional components.

Features

Power & Communication

- 24Vac or 24Vdc supply
- BACnet® MS/TP or Modbus communication port (selectable)

Inputs

- 8 universal inputs

Installation

- LED status indication of each input
- DIN rail mounting
- Removable, non-strip, raising clamp terminals
- Removable see-through panel for easy access to DIP switches
- Plug-in connectors allowing for expansion (CMMB100E models only)



CMMB100 Series

Network Communication

- BACnet® MS/TP or Modbus communication port (selectable via DIP switch)
- Select MAC address via DIP switch or via network

BACnet®

- MS/TP @ 9600, 19200, 38400 or 76800 bps
- Automatic baud rate detection
- Automatic device instance configuration
- Copy & broadcast configuration to other CMMB modules

Modbus

- Modbus @ 9600, 19200, 38400 or 57600 bps
- RTU Slave, 8 bits (configurable parity and stop bits)
- Connects to any Modbus master

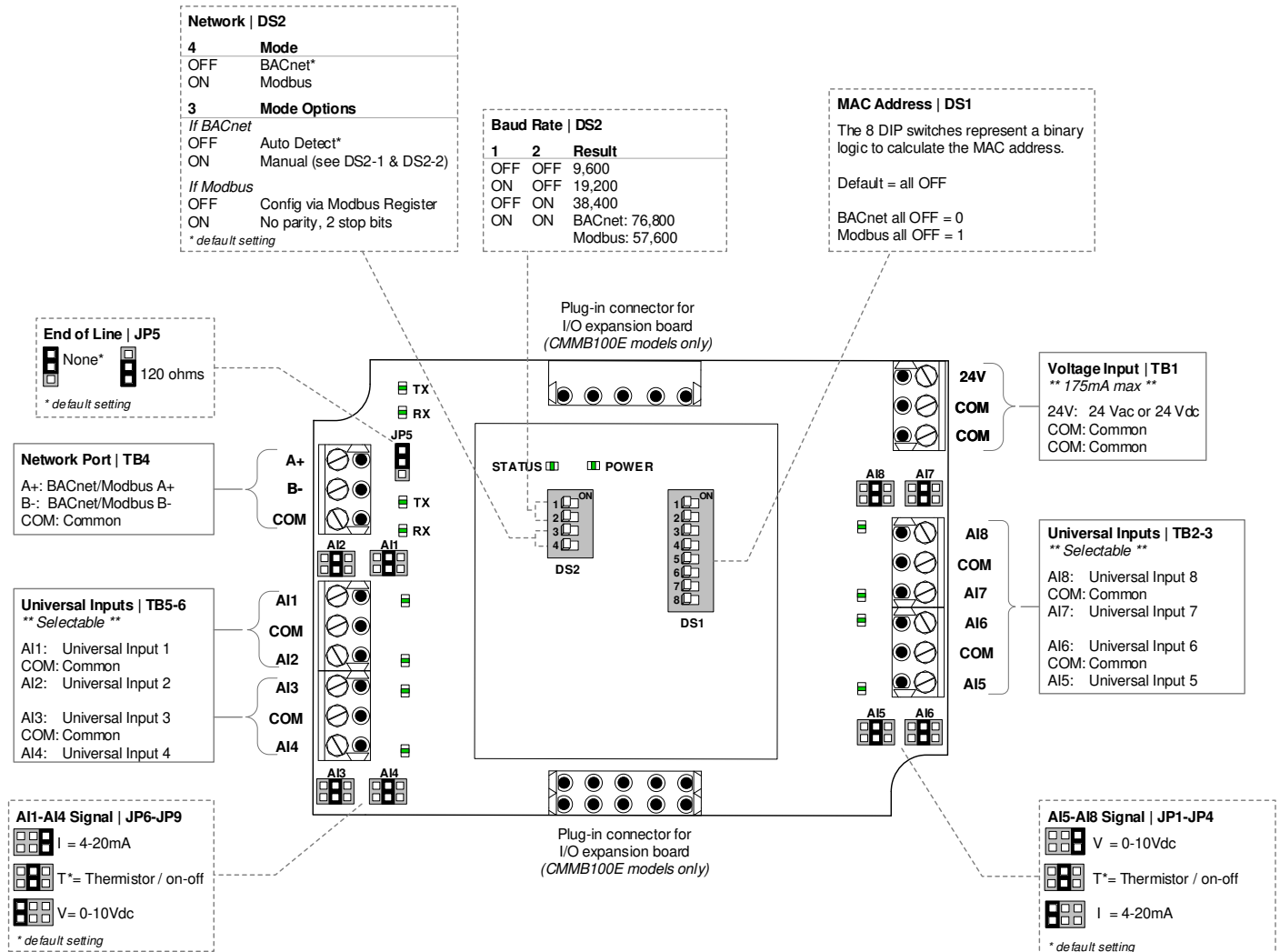
Technical Specifications

Specifications	CMMB100 Series
Input Voltage	24 Vac or 24 Vdc
Consumption	3VA (175mA @ 24 Vac)
Universal Inputs (12-bit)	8 [0-10Vdc, Thermistor, on/off (dry contact), 4-20mA] / 12-bit resolution
BACnet	BACnet® MS/TP @ 9600, 19200, 38400 or 76800 bps (BAS-C)
Modbus	Modbus RTU slave @ 9600, 19200, 38400 or 57600. Selectable parity and stop bit configuration: • No parity, 2 stop bit • Even parity, 1 stop bit • Odd parity, 1 stop bit
Communication Connections	24 AWG twisted-shield cable (Belden 9841 or equivalent)
Electrical Connections	0.8 mm ² [18 AWG] minimum
Operational Temperature	0°C to 50°C [32°F to 122°F]
Storage Temperature	-30°C to 50°C [-22°F to 122°F]
Relative Humidity	5 a 95% non condensed
Weight	0.2 kg [0.4 lb]
Dimensions A = 3.18" / 81 mm B = 4.93" / 125 mm C = 2.27" / 58 mm	



Connections and Configurations

Please note that all jumper settings must also be set to the same value through BACnet. Some additional configurations are only available through BACnet (see Network Conditions on page 3).



LEDs

Power

On = Input voltage normal
Off = No power

Status

Flashing = Normal operation (watchdog)

RX/TX (BACnet)

Flashing = Receiving (RX) and/or transmitting (TX) data.

RX/TX (Modbus)

Flashing = Receiving (RX) and/or transmitting (TX) data.

Input Status

On = Input on

Off = Input off

Flashing = Input not connected (thermistor setting only)

Analog = When Universal Inputs are set to analog values (Vdc, mA, or Thermistor); the LED intensity corresponds to the input value. For example: At 10Vdc, the LED will be fully on. At 5Vdc, the LED will be at 50% intensity. At 0 Vdc, the LED will be off.



MAC Address DIP Switch (DS1)

MAC address for BACnet and Modbus communication, are selectable by DIP switch DS1 using binary logic.

BACnet

- Highest MAC address is 254.
- Default is all switches OFF = MAC address 0
- If you do not change device instance in program mode, it will be automatically modified according to the MAC address.

MAC Address	DS.1 = 1	DS.2 = 2	DS.3 = 4	DS.4 = 8	DS.5 = 16	DS.6 = 32	DS.7 = 64	DS.8 = 128	Default Device Instance
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	153000
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	153001
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	153002
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	153003
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	153004
...	...	...	...	...	...	...	...	...	...
126	OFF	ON	ON	ON	ON	ON	ON	OFF	153126
...	...	...	...	...	...	...	...	...	...
254	OFF	ON	ON	ON	ON	ON	ON	ON	153254

Modbus

- Highest MAC address is 247.
- Default is all switches OFF = MAC address 1
- MAC address is **binary value +1**
- There is no device instance for Modbus.

MAC Address	DS.1 = 1	DS.2 = 2	DS.3 = 4	DS.4 = 8	DS.5 = 16	DS.6 = 32	DS.7 = 64	DS.8 = 128
0+1 = 1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1+1 = 2	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2+1 = 3	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3+1 = 4	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4+1 = 5	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
...	...	...	...	...	...	...	...	...
126+1 = 127	OFF	ON	ON	ON	ON	ON	ON	OFF
...	...	...	...	...	...	...	...	...
246+1 = 247	OFF	ON	ON	OFF	ON	ON	ON	ON

Network Conditions

Please note that all jumper settings must also be set to the same value through BACnet or Modbus. The following is a list of conditions and additional BACnet or Modbus objects.

Universal Inputs (AI1-AI8)

- **For temperature thermistor reading:** with the jumper set to *Thermistor*, set the AI input type to *10K_TypeG*, *10K_Type3A1*, *10K_Type4A1*, *10K_NTC*, *20K_Type6A1* or *30K_Type6A1*.
- **For on/off contact input reading:** with the hardware jumper set to *Thermistor*, set the AI input type to *Digital_Input*. The polarity can also be set to direct or reverse. For example, in Reverse an "on" signal would be recognized as an "off" signal.
- **For analog 0-10 Vdc input reading:** with the hardware jumper set to *0-10 Vdc*, set the AI input type to *0_10V*.



BACnet Objects Table

ID ¹	Name	Description	Writable?	Notes (* = default) (* = only when <i>UniversalInputxFunction</i> is set to <i>10K_Type3/G</i>)
AI.1	UniversalInput1	Universal input 1 mode selected by MSV.1	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AI.2	UniversalInput2	Universal input 2 mode selected by MSV.12	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AI.3	UniversalInput3	Universal input 3 mode selected by MSV.15	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AI.4	UniversalInput4	Universal input 4 mode selected by MSV.48	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AI.5	UniversalInput5	Universal input 5 mode selected by MSV.57	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AI.6	UniversalInput6	Universal input 6 mode selected by MSV.58	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AI.7	UniversalInput7	Universal input 7 mode selected by MSV.59	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AI.8	UniversalInput8	Universal input 8 mode selected by MSV.60	Out of service	0 to 10Volt or -40 to 100°C (150°C) [†] or -40 to 212°F (302°F) [†] or 4 to 20mA or 0 to 1 Resolution: 0.01Volt or 0.01°C/0.02°F or 0.01mA or 1
AV.226	UniversalInput1Offset	Universal input 1 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.227	UniversalInput2Offset	Universal input 2 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.228	UniversalInput3Offset	Universal input 3 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.229	UniversalInput4Offset	Universal input 4 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.230	UniversalInput5Offset	Universal input 5 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.231	UniversalInput6Offset	Universal input 6 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.232	UniversalInput7Offset	Universal input 7 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.233	UniversalInput8Offset	Universal input 8 offset	Present Value	-5.00 to 5.00 °C/°F/Volt/mA (default 0*) Resolution: 0.1 °C/°F/Volt/mA
AV.468	CopyCfgStartAdd	Copy configuration start address	Present Value	0-254 Address of first CMMB to copy Available only if BV.101 is set to No
AV.469	CopyCfgEndAdd	Copy configuration end address	Present Value	AV.468 – (AV.468 + 64) Address of last CMMB to copy Available only if BV.101 is set to No
AV.470	CopyCfgResult ²	Copy configuration result	Present Value	AV.468 – AV.469 Result of copy is available on Description property and is available only if BV.101 is set to Yes. Results: Succeed, Prog_Error, Type_Error, Model_Error, FW_Error, Mem_Error, Size_Error, Comm_Error, SlaveDevice, InProgress, AllSucceed
BV.93	UI1_DI_Polarity	Polarity of universal input 1 when used in digital input mode	Present Value	0= Direct * 1= Reverse

¹ ID is equal to ObjectType.Instance

² Write address in present value, result will be available in description.



ID¹	Name	Description	Writable?	Notes (* = default) (¹ = only when <i>UniversalInputxFunction</i> is set to <i>10K_Type3/G</i>)
BV.94	UI2_DI_Polarity	Polarity of universal input 2 when used in digital input mode	Present Value	0= Direct * 1= Reverse
BV.95	UI3_DI_Polarity	Polarity of universal input 3 when used in digital input mode	Present Value	0= Direct * 1= Reverse
BV.96	UI4_DI_Polarity	Polarity of universal input 4 when used in digital input mode	Present Value	0= Direct * 1= Reverse
BV.97	UI5_DI_Polarity	Polarity of universal input 5 when used in digital input mode	Present Value	0= Direct * 1= Reverse
BV.98	UI6_DI_Polarity	Polarity of universal input 6 when used in digital input mode	Present Value	0= Direct * 1= Reverse
BV.99	UI7_DI_Polarity	Polarity of universal input 7 when used in digital input mode	Present Value	0= Direct * 1= Reverse
BV.100	UI8_DI_Polarity	Polarity of universal input 8 when used in digital input mode	Present Value	0= Direct * 1= Reverse
BV.101	CopyCfgExecute	Start or stop copy configuration	Present Value	0= No * 1= Yes Start copy and give results, must be reset by user.
BV.102	SystemUnit	Select the unit system to use on the device	Present Value	0= Celsius * 1= Fahrenheit
MSV.1	UniversalInput1Function	Selected analog input 1 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input
MSV.12	UniversalInput2Function	Selected analog input 2 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input
MSV.15	UniversalInput3Function	Selected analog input 3 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input
MSV.48	UniversalInput4Function	Selected analog input 4 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input
MSV.57	UniversalInput5Function	Selected analog input 5 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input
MSV.58	UniversalInput6Function	Selected analog input 6 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input
MSV.59	UniversalInput7Function	Selected analog input 7 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input
MSV.60	UniversalInput8Function	Selected analog input 8 mode	Present Value	1= 0_10V 2= 4_20mA 3= 10K_Type3/G * 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input

Modbus Registers

- Register address
 - As per protocol base (base 0); for PLC add 1 to protocol base.
 - As per holding register (base 40001)
- Functions :
 - 03 Read Holding Register
 - 06 Write Single Register
 - 16 Write Multiple Registers
- Error Codes :
 - 02 Illegal Data Address
 - 03 Illegal Value
 - 06 Slave Device Busy
- W = Writable register, [blank] = read only.
- No Real number in modbus register, use scale to calculate real number. Register = Real number * Scale => Real number = Register / Scale. Scale could be 1, 10 or 100
- Attention when writing a register that contains a bit string. If bit is writable (conditional or not), the write will always be accepted. If bit is reserved or not writable, the write will be ignored and will keep its actual state.
- Use READ-MODIFY-WRITE sequence.

Protocol Base	Holding Register	Description	Data Type	MSB/LSB		Units/Values	Writable	Default Value	
								MB	LB
0	40001	MSB = Neptronic Device ID LSB = MAC Address	Unsigned	105 (69h)	[1..247] (1h- F7h)	* MAC address is writable if all DIP switches of DS2 are OFF.	W*	69h	1h
1	40002	Device Baud Rate	Unsigned Scale 0.01	[96] [192] [384] [576]		9,600 19,200 38,400 57,600	W	96	
2	40003	COM Port Configuration IMPORTANT: The default value is "no parity, 2 stop bits". To change the value, you must set DIP switch DS1-3 to OFF. If set to ON, it will always remain at the default value. Refer to Connections and Configurations on page 2.	Unsigned	[0..2]		0 = no parity, 2 stop bits 1 = even parity, 1 stop bit 2 = odd parity, 1 stop bit	W	0	
3	40004	Product Name (characters 8 & 7)	2 x ASCII	char 8	char 7	Valid ASCII character: 32 (20h) – 122 (7ah), Empty = 0	W	43h [C]	40h [M]
4	40005	Product Name (characters 6 & 5)	2 x ASCII	char 6	char 5	Valid ASCII character: 32 (20h) – 122 (7ah), Empty = 0	W	40h [M]	42h [B]
5	40006	Product Name (characters 4 & 3)	2 x ASCII	char 4	char 3	Valid ASCII character: 32 (20h) – 122 (7ah), Empty = 0	W	31h [1]	30h [0]
6	40007	Product Name (characters 2 & 1)	2 x ASCII	char 2	char 1	Valid ASCII character: 32 (20h) – 122 (7ah), Empty = 0	W	36h [6]	20h []
7	40008	Firmware Version	Unsigned Scale 100	102		1.02		102	

Protocol Base	Holding Register	Description	Data Type	MSB/LSB	Units/Values	Writable	Default Value	
							MB	LB
8	40009	Application Version	Unsigned Scale 100	100	1.00		100	
9	40010	System Status 1	Bit String	[B0..B15]	0 = Normal 1 = Fault ----- B0 = System operation		0000, 0001, 1111, 1110b	
10	40011	System Status 2	Bit String	[B0..B15]	Always 0		0000, 0000, 0000, 0000b	
11	40012	Analog Input 1	0-10V: Type: Unsigned, Scale:100, Unit: Volt, Range: 0.00-10.00V, Resolution: 0.01 4-20mA: Type: Unsigned, Scale:100, Unit: mA, Range: 4.00-20.00 mA, Resolution: 0.01 10K Type 3A1, 10K Type 4AI, 10K Type 2, 20K Type 6AI, 30K Type 6AI: Type: Signed, Scale:100, Unit: °C, Range: -40.00 - 100.00 °C, Resolution: 0.01 Type: Signed, Scale:100, Unit: °F, Range: -40.00 - 212.00 °F, Resolution: 0.02 10K Type 3/G: Type: Signed, Scale:100, Unit: °C, Range: -40.00 - 150.00 °C, Resolution: 0.01 Type: Signed, Scale:100, Unit: °F, Range: -40.00 - 302.00 °F, Resolution: 0.02 DI: Type: Unsigned, Scale:1, No Unit, Range: 0-1, Resolution: 1				0	
12	40013	Analog Input 2					0	
13	40014	Analog Input 3					0	
14	40015	Analog Input 4					0	
15	40016	Analog Input 5					0	
16	40017	Analog Input 6					0	
17	40018	Analog Input 7					0	
18	40019	Analog Input 8					0	
19 to 25	40020 to 40026	Reserved						
26	40027	Universal Input 1 Function	Unsigned	[1..9]	1= 0_10V 2= 4_20mA 3= 10K_Type3/G 4= 10K_Type3A1 5= 10K_Type4A1 6= 10K_Type2 7= 20K_Type6A1 8= 30K_Type6A1 9= Digital_Input	W	3	
27	40028	Universal Input 2 Function					3	
28	40029	Universal Input 3 Function					3	
29	40030	Universal Input 4 Function					3	
30	40031	Universal Input 5 Function					3	
31	40032	Universal Input 6 Function					3	
32	40033	Universal Input 7 Function					3	
33	40034	Universal Input 8 Function					3	
34	40035	Universal Input 1 Offset	Signed Scale 100	[0..100]	Range: +/- 5.00, Resolution: 0.1	W	0	
35	40036	Universal Input 2 Offset					0	
36	40037	Universal Input 3 Offset					0	
37	40038	Universal Input 4 Offset					0	
38	40039	Universal Input 5 Offset					0	
39	40040	Universal Input 6 Offset					0	

Protocol Base	Holding Register	Description	Data Type	MSB/LSB	Units/Values	Writable	Default Value	
							MB	LB
40	40041	Universal Input 7 Offset	Signed Scale 100	[0..100]	Range: +/- 5.00, Resolution: 0.1	W	0	
41	40042	Universal Input 8 Offset					0	
42 to 53	40043 to 40054	<i>Reserved</i>						
54	40055	System Options <i>* = digital input mode only</i>	Bit String	[B0..B15]	0 = Direct 1 = Reverse ----- <i>B0 to B3 = Reserved</i> B4 = AI1 polarity * B5 = AI2 polarity * B6 = AI3 polarity * B7 = AI4 polarity * B8 = AI5 polarity * B9 = AI6 polarity * B10 = AI7 polarity * B11 = AI8 polarity * <i>B8 to B14 = Reserved</i> ----- 0 = Celsius 1 = Fahrenheit ----- B15 = System Unit	W	0000, 0000, 0000, 0000b	



Recycling at end of life: please return this product to your Neptronic local distributor for recycling. If you need to find the nearest Neptronic authorized distributor, please consult www.neptronic.com.