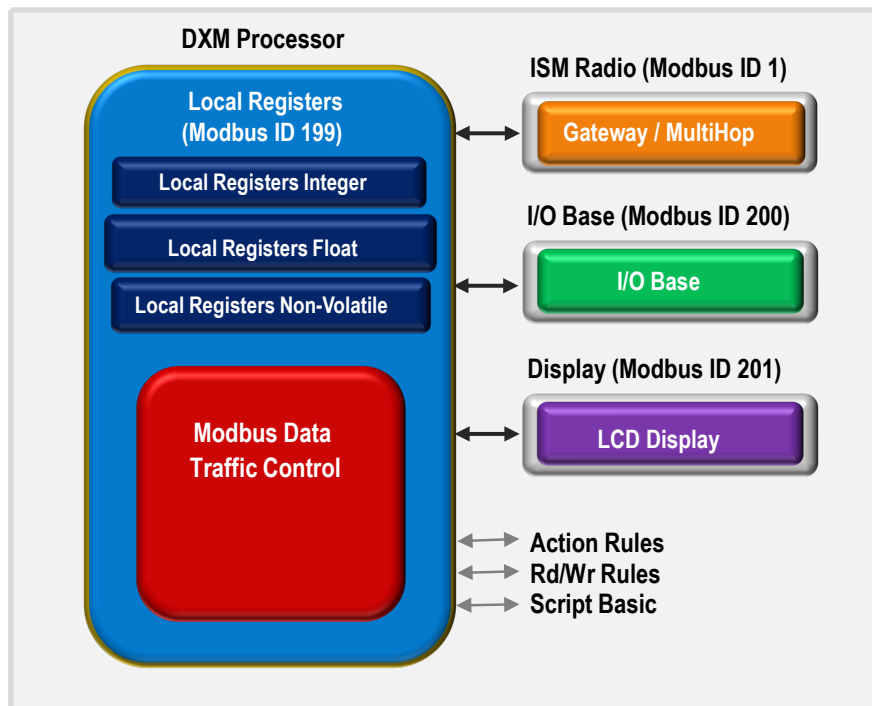


## Modbus Registers for the DXM100



## Modbus Registers for the Gateway (Slave ID 1)

Although only seven Nodes are listed in the table, the Modbus register numbering continues for as many Nodes as are in the network. For example, the register number for Node 10, I/O point 15, is 175. Calculate the Modbus register number for each device using the equation:

$$\text{Register Number} = \text{I/O\#} + (\text{Node\#} \times 16)$$

Table 1: Modbus Holding Registers

I/O Point	Gateway	Node 1	Node 2	Node 3	Node 4	Node 5	Node 6	Node 7
1	1	17	33	49	65	81	97	113
2	2	18	34	50	66	82	98	114
3	3	19	35	51	67	83	99	115
4	4	20	36	52	68	84	100	116
5	5	21	37	53	69	85	101	117
6	6	22	38	54	70	86	102	118
7	7	23	39	55	71	87	103	119
8	8	24	40	56	72	88	104	120
9	9	25	41	57	73	89	105	121
10	10	26	42	58	74	90	106	122
11	11	27	43	59	75	91	107	123

I/O Point	Gateway	Node 1	Node 2	Node 3	Node 4	Node 5	Node 6	Node 7
12	12	28	44	60	76	92	108	124
13	13	29	45	61	77	93	109	125
14	14	30	46	62	78	94	110	126
15	15	31	47	63	79	95	111	127
16	16	32	48	64	80	96	112	128

## Modbus Registers for the Local Registers (Slave ID 199)

Registers	Description
1–845	Local Registers (Internal processor memory)
846–849	Local Registers (Reset, Constant, Timer)

Registers	Description
851–900	Local Registers (Data flash, non-volatile)

Registers	Description
1001–1900	Local Registers (Floating point registers, internal processor memory)

Virtual Registers	
Registers	Definition
10001	GPS latitude direction (N, S, E, W)
10002	GPS latitude
10003	GPS longitude direction (N, S, E, W)
10004	GPS longitude
GPS Coordinate Data if the DXM is configured to read an external GPS unit.	
10011–10012	Resync timer
Engineering use	
10013–10014	Resync timer rollover
Engineering use	
10015–10016	Reboot cause (Restart Codes above)
Reboot Type	
10017–10018	Watchdog reset count
Counter to track how many resets have been caused by the Watchdog	
10021	IO Board Battery Voltage (mV)
10022	IO Board Battery Charging Current (mA)
10023	IO Board Incoming Supply (mV)
10024	IO Board On board thermistor ( degrees C)
DXM Base I/O board battery / solar charger statistics. Refer to the DXM Instruction Manual for more information.	
10025–10026	Http Push SSL Acquires
10027–10028	Http Push SSL Releases
10029–10030	Http Push SSL Forced Releases
Statistical counts of connections, disconnections and forced disconnects when the DXM Controller creates a connection using SSL/TLS (Encrypted connections)	
10031–10032	Http Push Attempts
10033–10034	Http Push Successes
10035–10036	Http Push Failures
Statistical counts of connections, disconnections and forced disconnects when the DXM controller creates a connection using HTTP non-encrypted	
10037–10038	Http Push Last Status
Last DXM Controller push status 0 = Initial state, no push attempt as finished yet 1 = Attempt complete 2 = Attempt aborted	

Virtual Registers		
Registers	Definition	
10039–10040	Cellular Strength, BER	Cellular signal strength. Value range: 0–31 0 = –113 dBm or less 1 = –111 dBm 2–30 = –109 dBm through –53 dBm in 2 dBm steps 31 = –51 dBm or greater 99 = not known or not detectable; BER not used
10055–10056	Alarms, smtp, attempts	Email attempts
10057–10058	Alarms, smtp, fails	Email failures
10059–10060	Alarms, sms, attempts	SMS text message attempts
10061–10062	Alarms, sms, fails	SMS text message failures
10100	Number of read maps in default	Read Map statistics
10101	Number of read map successes	
10102	Number of read map timeouts	
10103	Number of read map errors	
10104	Read map success streak	
10105	Number of write map successes	Write Map statistics
10106	Number of write map timeouts	
10107	Number of write map errors	
10108	Write map success streak	
10109	Number of passthrough successes	API message passing statistics
10110	Number of passthrough timeouts	
10111	Number of passthrough errors	
10112	Passthrough success streak	
10113	Number of 43 buffer successes	DX80 Gateway automatic messaging buffer statistics
10114	Number of 43 buffer timeouts	
10115	Number of 43 buffer errors	
10116	43 buffer success streak	
11000	Read map success count	Read/Write maps statistics
12000	Write map success count	
13000	Read map timeout count	
14000	Write map timeout count	
15000	Read map error count	
16000	Write map error count	
17000	Read map success streak	
18000	Write map success streak	
19000	Read map is in default	

## Modbus I/O Registers for the DXM100-B1 I/O Base Board

The I/O base board stores the input and output values in Modbus holding registers. Since the I/O base board is defined as a separate device, configure the DXM Controller to read or write the values on the I/O base board.

Base Board Input Connection		
Modbus Register	Range	Description
1	0-65535	Universal input 1
2	0-65535	Universal input 2
3	0-65535	Universal input 3
4	0-65535	Universal input 4

Universal Input Register Ranges			
Register Types	Unit	Minimum Value	Maximum Value
Discrete input/output		0	1
Universal input 0 to 10 V	mV	0	10000 *
Universal input 0 to 20 mA	μA	0	20000 *
Universal input temperature (-40 °C to +85 °C)	C or F, signed, in tenths of a degree	-400	850
Universal potentiometer	unsigned	0	65535

\* Setting Enable Full Scale to 1 sets the ranges to a linear scale of 0 to 65535.

DXM100-B1 Controller Base Board Output Connection		
Modbus Register	Range	Description
501	0-1	NMOS Output 1
502	0-1	NMOS Output 2
503	0-1	NMOS Output 3
504	0-1	NMOS Output 4
505	0-1	Switched Power 1 (5 V or 16 V)
506	0-1	Switched Power 2 (5 V or 16 V)
507	0-20000	Analog Output 1 default (0-20.000 mA)
	0-10000	Analog Output 1 (0-10.000 V)
508	0-20000	Analog Output 2 default (0-20.000 mA)
	0-10000	Analog Output 2 (0-10.000 V)

## Modbus I/O Registers for the DXM100-B2 I/O Base Board

The I/O base board stores the input and output values in Modbus holding registers. Since the I/O base board is defined as a separate device, configure the DXM Controller to read or write the values on the I/O base board.

Base Board Input Connection		
Modbus Register	Range	Description
1	0-65535	Universal input 1
2	0-65535	Universal input 2
3	0-65535	Universal input 3
4	0-65535	Universal input 4

Universal Input Register Ranges			
Register Types	Unit	Minimum Value	Maximum Value
Discrete input/output		0	1

Universal Input Register Ranges			
Register Types	Unit	Minimum Value	Maximum Value
Universal input 0 to 10 V	mV	0	10000 *
Universal input 0 to 20 mA	μA	0	20000 *
Universal input temperature (-40 °C to +85 °C)	C or F, signed, in tenths of a degree	-400	850
Universal potentiometer	unsigned	0	65535

\* Setting Enable Full Scale to 1 sets the ranges to a linear scale of 0 to 65535.

DXM100-B2 Controller Base Board Output Connection		
Modbus Register	Range	Description
501	0-1	NMOS Output 1
502	0-1	NMOS Output 2
503	0-1	NMOS Output 3
504	0-1	NMOS Output 4
505	0-1	Switched Power 1 (5 V to 24 V)
506	0-1	Switched Power 2 (5 V to 24 V)
507	0-1	DC Latching Output 1
508	0-1	DC Latching Output 2
509	0-10000	Analog Output 1 (0-10.000 V)
510	0-10000	Analog Output 2 (0-10.000 V)

## Modbus Configuration Registers for the I/O

Each input or output on the I/O base board has associated Modbus registers that configure its operation.

Universal Input Parameters Registers				
Universal Inputs	1	2	3	4
Enable Full Scale Registers	3303	3323	3343	3363
Temperature °C/°F Registers	3304	3324	3344	3364
Input Type Registers	3306	3326	3346	3366
Threshold Registers	3308	3328	3348	3368
Hysteresis Registers	3309	3329	3349	3369
Enable Rising Registers	4908	4928	4948	4968
Enable Falling Registers	4909	4929	4949	4969
High Register for Counter Registers	4910	4930	4950	4970
Low Register for Counter Registers	4911	4931	4951	4971

## Modbus Configuration Registers for Power

To monitor the input power characteristics of the DXM Controller, read the following power Modbus registers. The on-board thermistor is not calibrated, but can be used as a non-precision temperature input.

Modbus Register	Description
6071	Battery backup charging algorithm. 0 = Battery is recharged from a solar panel 1 = Battery is recharged from 12 to 30 V dc . (default)
6081	Battery voltage (mV)
6082	Battery charging current (mA)
6083	Incoming supply voltage (mV) (solar or power supply)
6084	On-board thermistor temperature (°C)

## Modbus Configuration Registers for the Analog Output

The DXM100-B1 I/O base board has two analog outputs that are selectable as 0 to 20 mA (factory default) or 0 to 10 V. To change the analog output characteristic, physical jumpers must be change on the I/O board and a parameter Modbus register must be changed. For step by step instructions on changing the output characteristics see [Analog \(DAC\) Outputs](#).

Modbus Register	Analog Output	Description
4008	Analog Output 1	0 to 20 mA or 0 to 10 V dc output (I/O board jumper selectable) Accuracy: 0.1% of full scale +0.01% per °C Resolution: 12-bit After changing the jumper position, write the appropriate value to the Modbus registers to define your analog output to match the setting selected by the jumper. 2 = 0 to 20 mA output (default) 3 = 0 to 10 V output
4028	Analog Output 2	

## Modbus Registers for the LCD Board (Modbus Slave ID 201)

Control the four user-defined LEDs using the display board's Modbus registers. Using write maps or ScriptBasic, write the Modbus registers shown below with 0 (off) or 1 (on). The LCD display is Modbus Slave 201.

Modbus Register	I/O Connection	Modbus Register	I/O Connection
1102 : bit 0	LED 1	1104 : bit 0	LED 3
1103 : bit 0	LED 2	1105 : bit 0	LED 4