MONITORING

OpenComms - 485

Modbus Reference Guide

EMERSON™
Network Power

Revision Level Updates:

Revision	Date	Description
1	11/30/04	Initial Revision
2	04/10/06	Added Liebert DS Modbus Registers
3	09/15/06	Updated DS Registers with additional BMS Fan Control data
4	12/06/06	Update S300/S600 register map
5	7/6/2007	Document Holding/Input Register, Status and Coil

TABLE OF CONTENTS

Modbus Communications

Connectivity to OpenComms-485 using Modbus

This design specification describes the Modbus communications protocol as supported by the OC-485 interface card. It includes information on how to pass information to and from the OC-485 card via Modbus. It is also intended to help facilitate answering questions regarding supported types, frame format, function code support etc.

Implementation Basics

Protocol controls the language structure or message format between devices in other words, the rules for communication. The rules for communication include how master and slave devices initiate communications, as well as unit identification, message handling and error checking. Modbus protocol simply refers to the control of the query and response cycles between master and slave devices.
The OC-485 card is configured to act as a slave device on a common network. This common network can be a multi-drop configuration over EIA-485, where multiple slaves reside on a common wire or loop.

Transmission Format

The OC-485 interface card supports Modbus RTU (Remote Terminal Unit) transmission modes. . See chart below.

Physical Port	Transmission Mode	Baud Rate	Data Bits	Parity Bits	Stop Bits	Default
EIA-485/422 2 wire	RTU	9600, 19200 or 38400	Configurable	Configurable	Configurable	No

Modbus Packet Format

Each Modbus packet consists of the following fields:

- Device Address
- Function Code
- Data Field(s)
- Error Check Field

Device Address:

The address field immediately follows the beginning of the frame and consists of 8-bits (RTU). This bit indicates the user assigned address of the slave device that is to receive the message sent by the attached master device.
Each slave must be assigned a unique address and only the addressed slave will respond to a query that contains its address.

Function Code:

The function code field tells the addressed slaves what function to perform. Function codes are specifically designed invoke a specific action by the slave device. The function code range is from 1 to 127.

OC-485 Modbus server supports the following Modbus function codes.

Code	Function	Description
01	Read Coils	Read from 1 to 2000 contiguous status of coils managed by the server. Coils in the response message are packed as one per bit of a byte, 1=ON and 0=OFF. If the requested quantity of coils is not a multiple of 8, zeros are padded in the final byte.
02	Read Discrete Inputs	Read from 1 to 2000 contiguous status of input status managed by the server. Discrete inputs in the response message are packed as one per bit of a byte, 1=ON and 0=OFF. If the requested quantity of inputs is not a multiple of 8, zeros are padded in the final byte.
03	Read Holding Registers	Read the contents of contiguous block of 1 to 127 holding registers. Data are packed as two bytes per register; the first byte contains the high order bits.
04	Read InputRegisters	Read the contents of contiguous block of 1 to 127 input registers. Data are packed as two bytes per register; the first byte contains the high order bits.
05	Write Single Coil	Write a single output to either ON(1) or OFF(0) mapped in coil section.
06	Write Single Register	Write a value into a single holding register;
15	Write Multiple Coils	Force each coil in a sequence of coils to either ON or OFF.

16	Write multiple Registers	Write values into a block of contiguous registers (1 to 120)

Data Field(s):

The data field varies in length depending on whether the message is a request or a response to a packet. This field typically contains information required by the slave device to perform the command specified or to pass back data to the master device.

Error Check Field:

The Error Check Field consists of a 16-bit (2 byte) Cyclical Redundancy Check (CRC16). It allows the receiving device to detect a packet that has been corrupted with transmission errors.

RTU Framing

The example below shows a typical Q/R from a OC-485 interface card. In common terms, the master device initiates a query asking **slave device 2** for **holding registers** starting at **holding register 40051** (decimal 50) and including next **2 Registers** (3 total).

Query Sample

Slave Address	Function Code	Starting Register "Hi Byte"	Starting Register "Lo Byte"	Number of Registers "Hi Byte"	Number of Registers "Lo Byte"	CRC16 "Hi Byte"	CRC16 "Lo Byte"
02	03	00	32	00	03	E5	FA

Response Sample

Slave Address	Function Code	Count: Bytes of Data	Register 40051 Data Hi	Register 40051 Data Lo	Register 40052 Data Hi	Register 40052 Data Lo	Register 40053 Data Hi	Register 40053 Data Lo	CRC16 "Hi Byte	CRC16 "Lo Byte"
02	03	6	01	58	00	FA	00	54	1B	0D

Slave address 2 responds to Function Code 3 with 6 bytes of hexadecimal data and ends with CRC16 checksum.

Register values:40051 = 158(hex) = 344(decimal)
40052 = FA (hex) = 250 (decimal)
40053 = 54 (hex) = 84 (decimal)

Liebert Nfinity

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes/ Units
Automatic Battery Test Enabled	10003	3	1	1	
Battery Charger On	10044		1	1	
Inverter Ready	10047		1	1	
Power Factor Correction State	10050		1	1	
Load On Inverter	10073		1	1	
Bypass Active	10074		1	1	
Replace Battery	10081		1	1	
Battery Under Test	10082		1	1	
Load On Battery	10128		1	1	
Load On Bypass	10129		1	1	
Load On Manual Bypass	10132		1	1	
Load Transferred To Bypass Due To UPS Fault	10134		1	1	
Transfer Inhibit	10146		1	1	
Output Off Pending	10151		1	1	
Low Battery - Shutdown Imminent	10152		1	1	
Output Overload	10154		1	1	
UPS Overload	10155		1	1	
Output Off	10158		1	1	
Check Air Filter - Replace	10170		1	1	
Transformer Over Temperature	10178		1	1	
Input Power Supply Fail	10186		1	1	
Internal Device Communication Failure	10284		1	1	
Device Active Alarm	10290		1	1	
Main Control Warning	10291		1	1	
Redundant Control Warning	10292		1	1	
Control Module Failure	10293		1	1	
Redundant Control Module Failed	10294		1	1	
User Interface Module Failed	10295		1	1	

UPS Power Not Redundant	10296		1	1	
Power Module Failure	10298		1	1	
Battery Module Failure	10299		1	1	
Power Module Warning	10300		1	1	
Battery Module Warning	10301		1	1	
Data Point	**Input Register**	**Holding Register**	**# of Reg.**	**Scale**	**Notes/ Units**
Number Of Input Lines	30004	40004	1	1	Bits 12 - 15
Number Of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number Of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of Power Mod.	30010	40010	1	1	
Number Of Battery Modules Installed	30011	40011	1	1	
Device Maximum Frame Capacity	30023	40023	2	1	
Device System Capacity	30025	40025	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	
Nominal Battery Voltage	30034	40034	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Auto Restart Percent Setpt	30052	40052	1	1	%
Device Low Battery Time	30053	40053	1	1	min
Next Battery Auto Test Time	30057	40057	1	1	minutes
Overload Alarm Limit	30067	40067	2	1	VA
Minimum Redundant Power Modules	30074	40074	1	1	
Load (Apparent Power)	30102		2	1	VA
Load (Real Power)	30104		2	1	W
Load / Capacity	30106		1	1	%
Input Frequency	30107		1	10	Hz
Output Frequency	30108		1	10	Hz
Bypass Frequency	30109		1	10	Hz
Battery Charge Status	30112		1		1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113		1	1	V
Battery Time Remaining	30115		1	1	min

Battery Charge Percentage	30116		1	1	%
Battery Temperature	30117		1	1	deg C
Transformer Temperature	30121		1	1	deg C
Redundant Power Modules	30124		1	1	
Active Power Module Count	30126		1	1	
Battery Module Active Count	30127		1	1	
Battery Test Result	30130		1	1	
Input Voltage L1	30153		1	1	V
Input Current L1	30154		1	1	A
Bypass Voltage L1	30159		1	1	V
Bypass Current L1	30160		1	1	A
Output Voltage L1	30163		1	1	V
Output Current L1	30164		1	1	A
Power Module Failure Count	30304		1	1	
Battery Module Failure Count	30305		1	1	
Power Module Warning Count	30306		1	1	
Battery Module Warning Count	30307		1	1	

Liebert Nx

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes / Units
Economode	10005	5			
DC-To-DC Converter On	10042				
Battery Charge Compensation	10046				
Inverter Ready	10047				
Power Factor Correction State	10050				
Battery Charge Mode	10051				
Load On Inverter	10073				
Bypass Active	10074				
Battery Under Test	10082				
Load On Battery	10128				
Overload Transfer To Bypass	10131				
Input Switch Open	10137				
Generator Disconnected	10141				
Bypass Transfer Count Block	10147				
Static Bypass Switch Disabled	10148				
Low Battery - Shutdown Imminent	10152				
Output Overload	10154				
UPS Load Joint Mode	10156				
Output Off	10158				
Inverter Unsynchronized	10160				
Main Neutral Lost	10161				
Fan Failure	10169				
Ambient Over Temperature	10173				
Rectifier Over Temperature	10174				
Rectifier Inductor Over Temperature	10175				
Inverter Over Temperature	10176				
Inverter Inductor Over Temperature	10177				
Battery Converter	10179				

Over Temperature					
DC Bus Balancer Over Temperature	10180				
Input Power Supply Fail	10186				
Input BrownOut	10189				
Bad Input Frequency	10190				
Bypass Phase Rotation Error	10191				
Bypass Phase Loss	10201				
Bypass Input Voltage/Frequency Fault	10202				
Output Fuse Blown	10217				
Output Over Voltage	10219				
Charger Failed	10234				
Battery Fault	10235				
Battery Contact Fail	10236				
Battery Converter Over Current	10237				
Battery Converter Fail	10238				
DC Bus Balancer Over Current	10239				
DC Bus Balancer Fault	10240				
DC Bus 1 Power Supply Fail	10251				
Rectifier Fuse Fail	10257				
Rectifier Startup Failure	10258				
Rectifier Fault	10259				
Rectifier Current Limit	10260				
Inverter DC Voltage Low Shutdown	10262				
Inverter Fault	10263				
Inverter DC Offset Overload	10264				
Inverter Contactor Fail	10265				
Inverter Current Limit	10266				
Parallel Low Battery Warning	10267				
Load Share Fault	10268				
Parallel System Fault	10269				
Parallel Connection Error	10270				
Parallel System Overload	10271				
Parallel Transfer To	10272				

Static Bypass Switch					
Inverter Communication Fail	10281				
Rectifier Communication Failure	10282				
Parallel Communication Fault	10283				
Operation Fault	10289				
Data Point	**Input Register**	**Holding Register**	**# of Reg.**	**Scale**	**Notes / Units**
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of SubModules	30009	40009	1		
Load Circuit Present	30013	40013	1		There are 16 possible Load Circuits. So each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1 then the Load Circuit is supported.
Module Number	30014	40014	1		
Device Module Count	30015	40015	1		
Device Redundant Count	30016	40016	1		
Device Module Mode	30017	40017	1		
Nominal Power Rating	30021	40021	2		VA
Nominal Input Voltage	30027	40027	1		V
Nominal Output Voltage	30028	40028	1		V
Nominal Static Bypass Switch Voltage	30029	40029	1		V
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	
Nominal DC Bus #1 Voltage	30035	40035	1		V
Nominal DC Bus #2 Voltage	30036	40036	1		

Nominal Battery Float Voltage	30038	40038	1		V
Load Bus Sync Mode	30040	40040	1		
Auto Restart Delay	30051	40051	1	1	Seconds
Device Low Battery Time	30053	40053	1		Minutes
Input Frequency	30107		1	10	Hz
Output Frequency	30108		1	10	Hz
Bypass Frequency	30109		1	10	Hz
Battery Charge Status	30112		1		1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113		1		V
Battery Current (Charge/Discharge)	30114		1		A

Data Point	Register	Coil	# of Reg.	Scale	Notes / Units
Battery Time Remaining	30115		1		Minutes
Battery Charge Percentage	30116		1		%
Battery Temperature	30117		1		C
Ambient Temperature	30119		1		C
Parallel Load Source	30128		1		
Rotary Breaker	30129		1		
Battery Test Result	30130		1		1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 6 - Inhibited
Input Voltage L1-L2	30151		2		W
Input Voltage L1	30153		1		V
Input Current L1	30154		1		A
Input Power Factor L1	30155		1	100	
Bypass Voltage L1	30159		1		V
Output Voltage L1	30163		1		V
Output Current L1	30164		1		A
Output Load L1	30165		1	1	
Output Power Factor L1	30166		1	100	
Apparent Output Power L1	30168		2		VAR
Reactive Output	30170		1		%

Power L1					
Output Power L1	30172		2		VA
Output Current Crest Factor L1	30186		1		V
Input Voltage L2-L3	30201		2		W
Input Voltage L2	30203		1		V
Input Current L2	30204		1		A
Input Power Factor L2	30205		1	100	
Bypass Voltage L2	30209		1		V
Output Voltage L2	30213		1		V
Output Current L2	30214		1		A
Output Load L2	30215		1	1	
Output Power Factor L2	30216		1	100	
Apparent Output Power L2	30218		2		VAR
Reactive Output Power L2	30220		1		%
Output Power L2	30222		2		VA
Output Current Crest Factor L2	30236		1		V
Input Voltage L3-L1	30251		2		W
Input Voltage L3	30253		1		V
Input Current L3	30254		1		A
Input Power Factor L3	30255		1	100	
Bypass Voltage L3	30259		1		V
Output Voltage L3	30263		1		V
Output Current L3	30264		1		A
Output Load L3	30265		1	1	
Output Power Factor L3	30266		1	100	
Apparent Output Power L3	30268		2		VAR
Reactive Output Power L3	30270		1		%
Output Power L3	30272		2		VA
Output Current Crest Factor L3	30286		1		V

Liebert PowerSure Interactive

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes /Units
Audible Alarm Enabled	10002	2	1	1	
Automatic Battery Test Enabled	10003	3	1	1	
Battery Charge Compensation	10046		1	1	
Inverter Ready	10047		1	1	
Load Circuit 1 State	10057		1	1	
Load Circuit 2 State	10058		1	1	
Load Circuit 3 State	10059		1	1	
Load Circuit 4 State	10060		1	1	
Load Circuit 5 State	10061		1	1	
Load Circuit 6 State	10062		1	1	
Load Circuit 7 State	10063		1	1	
Load Circuit 8 State	10064		1	1	
Load Circuit 9 State	10065		1	1	
Load Circuit 10 State	10066		1	1	
Load Circuit 11 State	10067		1	1	
Load Circuit 12 State	10068		1	1	
Load Circuit 13 State	10069		1	1	
Load Circuit 14 State	10070		1	1	
Load Circuit 15 State	10071		1	1	
Load Circuit 16 State	10072		1	1	
Load On Inverter	10073		1	1	
Boost Mode On	10075		1	1	
Buck Mode On	10076		1	1	
Battery Under Test	10082		1	1	
Shutdown Reason - Over Temperature	10086		1	1	
Shutdown Reason - Overload	10087		1	1	
Shutdown - Output Short	10089		1	1	
Shutdown Reason - Remote Shutdown	10093		1	1	
Load On Battery	10128		1	1	
Output Off Pending	10151		1	1	
Low Battery - Shutdown Imminent	10152		1	1	
Output Overload	10154		1	1	
Over Temperature Warning	10171		1	1	
Battery Over Temperature CB Trip	10172		1	1	

Input Power Supply Fail	10186		1	1	
Input Over Voltage	10187		1	1	
Input Under Voltage	10188		1	1	
Bad Input Frequency	10190		1	1	
Output Under Voltage	10218		1	1	
Output Over Voltage	10219		1	1	
Data Point	**Input Register**	**Holding Register**	**# of Reg.**	**Scale**	**Notes /Units**
Number Of Input Lines	30004	40004	1	1	Bits 12 - 15
Number Of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number Of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of SubModules	30009	40009	1	1	
Load Circuit Present	30013	40013	1		There are 16 possible Load Circuits. So each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1 then the Load Circuit is supported.
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	
Nominal Battery Voltage	30034	40034	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Low Battery Time	30053	40053	1	1	min
Load (Apparent Power)	30102		2	1	VA
Load / Capacity	30106		1	1	%
Input Frequency	30107		1	10	Hz
Output Frequency	30108		1	10	Hz
Battery Charge Status	30112		1		1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113		1	1	V
Battery Time Remaining	30115		1	1	min
Battery Charge Percentage	30116		1	1	%
Battery Test Result	30130		1	1	1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 7 - Inhibited
Input Voltage L1	30153		1	1	V

Output Voltage L1	30163		1	1	V
Output Current L1	30164		1	1	A
Input Maximum Voltage L1	30180		1	1	V
Input Minimum Voltage L1	30181		1	1	V
Output Maximum Voltage L1	30182		1	1	V
Output Minimum Voltage L1	30183		1	1	V
Black Out Count	30301		1	1	
Brown Out Count	30302		1	1	

Liebert PowerSure Interactive 2

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes / Units
Audible Alarm Enabled	10002	2	1	1	
Automatic Battery Test Enabled	10003	3	1	1	
DC-To-DC Converter On	10042		1	1	
Battery Charger On	10044		1	1	
Load Circuit 1 State	10057		1	1	
Load Circuit 2 State	10058		1	1	
Load Circuit 3 State	10059		1	1	
Load Circuit 4 State	10060		1	1	
Load Circuit 5 State	10061		1	1	
Load Circuit 6 State	10062		1	1	
Load Circuit 7 State	10063		1	1	
Load Circuit 9 State	10065		1	1	
Load Circuit 10 State	10066		1	1	
Load Circuit 11 State	10067		1	1	
Load Circuit 12 State	10068		1	1	
Load Circuit 13 State	10069		1	1	
Load Circuit 14 State	10070		1	1	
Load Circuit 15 State	10071		1	1	
Load Circuit 16 State	10072		1	1	
Load On Inverter	10073		1	1	
Boost Mode On	10075		1	1	
Buck Mode On	10076		1	1	
Replace Battery	10081		1	1	
Battery Under Test	10082		1	1	
Shutdown Reason - Over Temperature	10086		1	1	
Shutdown Reason - Overload	10087		1	1	
Shutdown Reason - Output Short	10089		1	1	
Shutdown Reason - Line Neutral Swap	10090		1	1	
Shutdown Reason - Low Battery	10092		1	1	
Shutdown Reason - Remote Shutdown	10093		1	1	
Shutdown Reason - Input Under Voltage	10094		1	1	
Shutdown Reason -	10096		1	1	

Hardware					
Load On Battery	10128		1	1	
Output Off Pending	10151		1	1	
Low Battery - Shutdown Imminent	10152		1	1	
Output Overload	10154		1	1	
Over Temperature Warning	10171		1	1	
Input Power Supply Fail	10186		1	1	
Input Over Voltage	10187		1	1	
Input Under Voltage	10188		1	1	
Input BrownOut	10189		1	1	
Bad Input Frequency	10190		1	1	
Output Under Voltage	10218		1	1	
Output Over Voltage	10219		1	1	
Charger Failed	10234		1	1	
Battery Under Voltage	10241		1	1	
Battery Over Voltage	10242		1	1	
Data Point	**Input Register**	**Holding Register**	**# of Reg.**	**Scale**	**Notes / Units**
Number Of Input Lines	30004	40004	1	1	Bits 12 - 15
Number Of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of SubModules	30009	40009	1	1	
Load Circuit Present	30013	40013	1		There are 16 possible Load Circuits. So each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1 then the Load Circuit is supported.
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	
Nominal Battery Voltage	30034	40034	1	1	V
Nominal Battery Capacity	30037	40037	1	1	minutes
Nominal Battery Float Voltage	30038	40038	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Low Battery Time	30053	40053	1	1	min

Ambient Temperature Warning Point	30069	40069	1	1	deg C
Over Temperature Limit Point	30072	40072	1	1	deg C
Load (Apparent Power)	30102		2	1	VA
Load (Real Power)	30104		2	1	W
Load / Capacity	30106		1	1	%
Input Frequency	30107		1	10	Hz
Output Frequency	30108		1	10	Hz
Battery Charge Status	30112		1		1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113		1	1	V
Battery Time Remaining	30115		1	1	min
Battery Charge Percentage	30116		1	1	%
Ambient Temperature	30119		1	1	deg C
Battery Test Result	30130		1	1	
Input Voltage L1	30153		1	1	V
Input Current L1	30154		1	1	A
Output Voltage L1	30163		1	1	V
Output Current L1	30164		1	1	A
Input Maximum Voltage L1	30180		1	1	V
Input Minimum Voltage L1	30181		1	1	V
Output Maximum Voltage L1	30182		1	1	V
Output Minimum Voltage L1	30183		1	1	V
Black Out Count	30301		1	1	
Brown Out Count	30302		1	1	

Liebert GXT2

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes / Units
Audible Alarm Enabled	10002	2	1	1	
Automatic Battery Test Enabled	10003	3	1	1	
DC-To-DC Converter On	10042		1	1	
Battery Charge Compensation	10046		1	1	
Inverter Ready	10047		1	1	
Power Factor Correction State	10050		1	1	
Load Circuit 1 State	10057		1	1	
Load Circuit 2 State	10058		1	1	
Load Circuit 3 State	10059		1	1	
Load Circuit 4 State	10060		1	1	
Load Circuit 5 State	10061		1	1	
Load Circuit 6 State	10062		1	1	
Load Circuit 7 State	10063		1	1	
Load Circuit 8 State	10064		1	1	
Load Circuit 9 State	10065		1	1	
Load Circuit 10 State	10066		1	1	
Load Circuit 11 State	10067		1	1	
Load Circuit 12 State	10068		1	1	
Load Circuit 13 State	10069		1	1	
Load Circuit 14 State	10070		1	1	
Load Circuit 15 State	10071		1	1	
Load Circuit 16 State	10072		1	1	
Load On Inverter	10073		1	1	
Bypass Active	10074		1	1	

Replace Battery	10081		1	1	
Battery Under Test	10082		1	1	
Shutdown Reason - Over Temperature	10086		1	1	
Shutdown Reason - Overload	10087		1	1	
Shutdown Reason - Link Over Voltage	10088		1	1	
Shutdown Reason - Output Short	10089		1	1	
Shutdown Reason - Line Neutral Swap	10090		1	1	
Shutdown Reason - Low Battery	10092		1	1	
Shutdown Reason - Remote Shutdown	10093		1	1	
Shutdown Reason - Input Under Voltage	10094		1	1	
Shutdown Reason - PFC Startup	10095		1	1	
Shutdown Reason - Hardware	10096		1	1	
Load On Battery	10128		1	1	
Output Off Pending	10151		1	1	
Low Battery - Shutdown Imminent	10152		1	1	
Output Overload	10154		1	1	
Over Temperature Warning	10171		1	1	
Battery Over Temperature CB Trip	10172		1	1	
Input Power Supply Fail	10186		1	1	
Input Over Voltage	10187		1	1	
Input Under Voltage	10188		1	1	
Bad Input Frequency	10190		1	1	
Bypass Input Voltage/Frequency Fault	10202		1	1	
Output Under Voltage	10218		1	1	
Output Over	10219		1	1	

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Voltage					
Number Of Input Lines	30004	40004	1	1	Bits 12 - 15
Number Of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number Of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of SubModules	30009	40009	1	1	
Load Circuit Present	30013	40013	1		There are 16 possible Load Circuits. So each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1 then the Load Circuit is supported.
Battery Cabinet Type	30018	40018	2	1	
Battery Cabinet Number	30019	40019	1	1	
Battery AmpHour	30020	40020	1	1	AH
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	
Nominal Battery Voltage	30034	40034	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Low Battery Time	30053	40053	1	1	min
Load (Apparent Power)	30102		2	1	VA
Load (Real Power)	30104		2	1	W
Load / Capacity	30106		1	1	%
Input Frequency	30107		1	10	Hz
Output Frequency	30108		1	10	Hz
Bypass Frequency	30109		1	10	Hz

Battery Charge Status	30112		1		1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113		1	1	V
Battery Time Remaining	30115		1	1	min
Battery Charge Percentage	30116		1	1	%
Ambient Temperature	30119		1	1	deg C
Battery Test Result	30130		1		1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 6 - Inhibited
Input Voltage L1	30153		1	1	V
Bypass Voltage L1	30159		1	1	V
Output Voltage L1	30163		1	1	V
Output Current L1	30164		1	1	A
Input Maximum Voltage L1	30180		1	1	V
Input Minimum Voltage L1	30181		1	1	V
Output Maximum Voltage L1	30182		1	1	V
Output Minimum Voltage L1	30183		1	1	V
Black Out Count	30301		1	1	
Brown Out Count	30302		1	1	

Liebert HiNet

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes / Units
DC-To-DC Converter On	10042		1	1	
Load On Inverter	10073		1	1	
Bypass Active	10074		1	1	
Load On Battery	10128		1	1	
Permanently On Bypass	10133		1	1	
Bypass SCR Open Circuit	10149		1	1	
Low Battery - Shutdown Imminent	10152		1	1	
Output Overload	10154		1	1	
Inverter Unsynchronized	10160		1	1	
Input Power Supply Fail	10186		1	1	
Bypass Input Voltage/Frequency Fault	10202		1	1	

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number Of Input Lines	30004	40004	1	1	Bits 12 - 15
Number Of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number Of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of SubModules	30009	40009	1	1	
Number Of Battery Cells	30012	40012	1	1	
Load Circuit Present	30013	40013	1		There are 16 possible Load Circuits. So each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1 then the Load Circuit is supported.
Load (Apparent Power)	30102		2	1	VA
Load (Real Power)	30104		2	1	W
Input Frequency	30107		1	10	Hz
Output Frequency	30108		1	10	Hz
Battery Voltage	30113		1	1	V
Battery Current (Charge/Discharge)	30114		1	1	A
Battery Charge Percentage	30116		1	1	%
Ambient Temperature	30119		1	1	deg C
Input Voltage L1	30153		1	1	V
Input Current L1	30154		1	1	A
Output Voltage L1	30163		1	1	V
Output Current L1	30164		1	1	A
Input Voltage L2	30203		1	1	V

Input Current L2	30204	1	1	A
Input Voltage L3	30253	1	1	V
Input Current L3	30254	1	1	A

Liebert UPS Series 600

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes / Units
Battery Charger On	10044		1	1	
Battery Charge Compensation	10046		1	1	
Inverter Ready	10047		1	1	
Auto Retransfer Primed	10049		1	1	
Load On Inverter	10073		1	1	
Load On Bypass	10074		1	1	
Buck On	10076		1	1	
Battery data Buffer Full	10084		1	1	
Shutdown Reason – Hardware	10096		1	1	
Load On Battery	10128		1	1	
Manual Reset Transfer	10130		1	1	
Load On Bypass Permanent	10133		1	1	
Load On Bypass-UPS fault	10134		1	1	
Battery Switch Open	10136		1	1	
Input Switch Open	10137		1	1	
Output Switch open	10138		1	1	
Emergency Load Transfer to Inverter	10145		1	1	
Transfer inhibited – Asynchronous Sources	10146		1	1	
Transfer inhibited – over predefined limit	10147		1	1	
SBS SCR Open	10149		1	1	
SBS SCR Short	10150		1	1	
Low Battery - Shutdown Imminent	10152		1	1	
Output Overload	10154		1	1	
Over Temperature Warning	10171		1	1	
Battery Over Temperature CB Trip	10172		1	1	
Input Power Supply Fail	10186		1	1	
Input Under Voltage	10188		1	1	
Input Brown Out	10189		1	1	

Input Phase Rotation Error	10191		1	1	
Bypass Phase Missing	10201		1	1	
Bypass Input Voltage Fail	10202		1	1	
Bypass Under Voltage Fail	10203		1	1	
Bypass Under Voltage Warning	10204		1	1	
Bypass Over Voltage Fail	10205		1	1	
Bypass Over Voltage Warning	10206		1	1	
Output Under Voltage	10218		1	1	
Output Over Voltage	10219		1	1	
Output Short Circuit	10220		1	1	
Module with Active Alarm	10304		1	1	
Data Point	**Input Register**	**Holding Register**	**# of Reg.**	**Scale**	**Notes / Units**
Number Of Input Lines	30004	40004	1	1	Bits 12 - 15
Number Of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number Of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of Sub-Modules	30009	40009	1	1	
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	
Nominal Battery Voltage	30034	40034	1	1	V
Load (Apparent Power)	30102		2	1	VA
Load (Real Power)	30104		2	1	W
Load / Capacity	30106		1	1	%
Output Frequency	30108		1	10	Hz
Bypass Frequency	30109		1	10	Hz
Battery Charge Status	30112		1		1 - 100% Charged 2 - Less than 100% Charged
Battery Voltage	30113		1	1	V
Battery Current	30114		1	1	A
Battery Time Remaining	30115		1	1	min
Battery Charge Percentage	30116		1	1	%

Battery Temperature	30117	1	1	deg C
PFC Temperature	30118	1	1	deg C
Ambient Temperature	30119	1	1	deg C
Local 1 Temperature	30118	1	1	deg C
Local 2 Temperature	30119	1	1	deg C
Input Voltage L1	30153	1	1	V
Input Current L1	30154	1	1	A
Bypass Voltage L1	30159	1	1	V
Bypass Current L1	30160	1	1	A
Output Voltage L1	30163	1	1	V
Output Current L1	30164	1	1	A
Input Max. Voltage L1	30180	1	1	V
Input Min. Voltage L1	30181	1	1	V
Output Max. Voltage L1	30182	1	1	V
Output Mini. Voltage L1	30183	1	1	V
Input Voltage L2	30203	1	1	V
Input Current L2	30204	1	1	A
Bypass Voltage L2	30209	1	1	V
Bypass Current L2	30210	1	1	A
Output Voltage L2	30213	1	1	V
Output Current L2	30214	1	1	A
Input Max. Voltage L2	30230	1	1	V
Input Min. Voltage L2	30231	1	1	V
Output Max. Voltage L2	30232	1	1	V
Output Min. Voltage L2	30233	1	1	V
Input Voltage L3	30253	1	1	V
Input Current L3	30254	1	1	A
Bypass Voltage L3	30259	1	1	V
Bypass Current L3	30260	1	1	A
Output Voltage L3	30263	1	1	V
Output Current L3	30264	1	1	A
Input Max. Voltage L3	30280	1	1	V
Input Min. Voltage L3	30281	1	1	V
Output Max. Voltage L3	30282	1	1	V
Output Min. Voltage L3	30283	1	1	V

Liebert UPS Series 300

Supported Modbus Points

Data Point	Status	Coil	# of Reg.	Scale	Notes / Units
Automatic Restart Enabled	10001	1	1	1	
Battery Charge Compensation	10046		1	1	
Inverter Ready	10047		1	1	
Load Circuit 1 State	10057		1	1	
Load Circuit 2 State	10058		1	1	
Load Circuit 3 State	10059		1	1	
Load Circuit 4 State	10060		1	1	
Load Circuit 5 State	10061		1	1	
Load Circuit 6 State	10062		1	1	
Load Circuit 7 State	10063		1	1	
Load Circuit 8 State	10064		1	1	
Load Circuit 9 State	10065		1	1	
Load Circuit 10 State	10066		1	1	
Load Circuit 11 State	10067		1	1	
Load Circuit 12 State	10068		1	1	
Load Circuit 13 State	10069		1	1	
Load Circuit 14 State	10070		1	1	
Load Circuit 15 State	10071		1	1	
Load Circuit 16 State	10072		1	1	
Load On Inverter	10073		1	1	
Bypass Active	10074		1	1	
Buck On	10076		1	1	
Replace Battery	10081		1	1	
Battery Under Test	10082		1	1	
Load On Battery	10128		1	1	
Low Battery - Shutdown Imminent	10152		1	1	
Output Overload	10154		1	1	
Over Temperature Warning	10171		1	1	
Battery Over Temperature CB Trip	10172		1	1	
Input Power Supply Fail	10186		1	1	
Input Over Voltage	10187		1	1	
Input Under Voltage	10188		1	1	
Bad Input Frequency	10190		1	1	
Bypass Input Voltage/Frequency Fault	10202		1	1	
Output Under Voltage	10218		1	1	
Output Over Voltage	10219		1	1	

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Battery Charger Fail	10234		1	1	
Number Of Input Lines	30004	40004	1	1	Bits 12 - 15
Number Of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number Of Output Lines	30004	40004	1	1	Bits 8 - 11
Number Of SubModules	30009	40009	1	1	
Load Circuit Present	30013	40013	1		There are 16 possible Load Circuits. So each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1 then the Load Circuit is supported.
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	
Nominal Battery Voltage	30034	40034	1	1	V
Device Low Battery Time	30053	40053	1	1	min
Load (Apparent Power)	30102		2	1	VA
Load (Real Power)	30104		2	1	W
Load / Capacity	30106		1	1	%
Input Frequency	30107		1	10	Hz
Output Frequency	30108		1	10	Hz
Bypass Frequency	30109		1	10	Hz
Battery Charge Status	30112		1	1	1 - 100% Charged 2 - Less than 100% Charged
Battery Voltage	30113		1	1	V
Battery Current	30114		1	1	A
Battery Time Remaining	30115		1	1	min
Battery Charge Percentage	30116		1	1	%
Battery Test Result	30130		1	1	1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 6 - Inhibited

Input Voltage L1	30153		1	1	V
Input Current	30154		1	1	A
Bypass Voltage L1	30159		1	1	V
Bypass Current L1	30160		1	1	A
Output Voltage L1	30163		1	1	V
Output Current L1	30164		1	1	A
Input Voltage L2	30203		1	1	V
Input Current L2	30204		1	1	A
Bypass Voltage L2	30209		1	1	V
Bypass Current L2	30210		1	1	A
Output Voltage L2	30213		1	1	V
Output Current L2	30214		1	1	A
Input Voltage L3	30253		1	1	V
Input Current L3	30254		1	1	A
Bypass Voltage L3	30259		1	1	V
Bypass Current L3	30260		1	1	A
Output Voltage L3	30263		1	1	V
Output Current L3	30264		1	1	A
Black Out Count	30301		1	1	
Brown Out Count	30302		1	1	
Transient Count	30301		1	1	
Silent Audible Alarm		40101			any value
Battery Start		40102	1	1	1=Start, 0=Abort
Open UPS Output Switch		40104			Delay time in Second, last digit will be ignored
Reboot UPS Output Switch		40105	1	1	Delay time in Second, last digit will be ignored
Close UPS Output Switch		40106			Delay time in Second, last digit will be ignored
Transfer Load to Bypass		40107	1	1	any value
Transfer Load to Inverter		40108			any value
Reset UPS Statistic data		40111	1	1	any value
Turn UPS Outlets On		40112	1	1	Bitmap mask for Outlet 1-16. all bits set to 1 will be turn On
Turn UPS Outlets Off		40113	1	1	Bitmap mask for Outlet 1-16. all bits set to 1 will be turn Off

Liebert DS

Data points Mapped to Input Status and Coils

Reference Document: ST100I&C PA Parameters and Events, Version 18.0

Data Description	Status	Coil#	# bit	-	Notes	iCOM Reference
Sleep on Monday	10001	1	1			U603
Sleep on Tuesday	10002	2	1			U603
Sleep on Wednesday	10003	3	1			U603
Sleep on Thursday	10004	4	1			U603
Sleep on Friday	10005	5	1			U603
Sleep on Saturday	10006	6	1			U603
Sleep on Sunday	10007	7	1			U603
Supply Limit Enable	10008	8	1			S105
Reheat Lockout	10009	9	1			S271
Humidifier Lockout	10010	10	1			S272
Temperature Indication [1]	10011	11	1			U404
Timer Mode Type	10012	12	1			U610
Minimum Chilled Water Temp Enable	10013	13	1			S128
Std. Sensor Alarms Enable	10019	19	1			U202
Sensor A Alarms Enable	10020	20	1			U207
Compressor Lockout	10021	21	1			S274
VSD Fan speed	10022	22	1			S131
Unit Control	-	25	1			EnvState. SysCtrl
Reset Alarm	-	26	1		..	EnvState. AlarmCtrl.1
Acknowledge Alarm	-	27	1		..	EnvState. AlarmCtrl.2
Reset Total Run Hours Fan Motor	-	28	1		..	U502
Reset Comp1Run Hour	-	29	1		..	U503
Reset Comp2Run Hour	-	30	1		..	U504
Reset Humidifier Run Hour	-	31	1		..	U510
Reset Dehumidifier Run Hour	-	32	1		..	U511
Reset CW/FC Run Hour	-	33	1		..	U505
Reset E-Heater1RunHour	-	34	1		..	U507
Reset E-heater2RunHour	-	35	1		..	U508
Reset E-heater3 Run Hour	-	36	1		..	U509
Reset HG/HW Run Hour	-	37	1		..	U506
Fan On	10025	-	1			FanSym
Cool On	10026	-	1			CoolSym
Free Cool On	10027	-	1			FCSym
Hot Water On	10028	-	1			HWSym
Electrical Heater On	10029	-	1			HeatSym

Humidification On	10030	-	1	HumSym
Dehumidification On	10031	-	1	DehumSym
Audible Alarm On	10032	-	1	HornSym
Reserved	10033	-	1	087
MAIN FAN OVERLOAD	10034	-	1	006
LOSS OF AIRFLOW	10035	-	1	007
LOSS OF FLOW	10036	-	1	107
COMP 1 HIGH PRESSURE	10037	-	1	001
COMP 1 LOW PRESSURE	10038	-	1	002
COMP 1 OVERLOAD	10039	-	1	071
COMP 1 PUMPDOWN FAIL	10040	-	1	091
COMP 2 HIGH PRESSURE	10041	-	1	058
COMP 2 LOW PRESSURE	10042	-	1	059
COMP 2 OVERLOAD	10043	-	1	072
COMP 2 PUMPDOWN FAIL	10044	-	1	096
DIG SCROLL1 HIGH TEMP	10045	-	1	097
DIG SCROLL2 HIGH TEMP	10046	-	1	098
SMOKE DETECTED	10047	-	1	104
WATER UNDER FLOOR	10048	-	1	105
HUMIDIFIER PROBLEM	10049	-	1	086
STBY GLYCOL PUMP ON	10050	-	1	108
STANDBY UNIT ON	10051	-	1	109
COND PUMP-HIGH WATER	10052	-	1	106
ROOM SENSOR FAILURE	10053	-	1	031
LOSS COMPRESSOR POWER	10054	-	1	135
LOSS OF AIR BLOWER 1	10055	-	1	017
HUMIDIFIER LOW WATER	10058	-	1	153
HUMIDIFIER HIGH AMPS	10059	-	1	152
HIGH TEMPERATURE	10060	-	1	016
LOSS OF POWER	10061	-	1	142
UNSPECIFIED EVENT(S) [1]	10064	-	1	
HIGH CW TEMP	10065	-	1	003
RESERVED	10066	-	1	005
HIGH ROOM TEMP	10067	-	1	018
LOW ROOM TEMP	10068	-	1	019
HIGH ROOM HUM	10069	-	1	020
LOW ROOM HUM	10070	-	1	021
HIGH TEMP SENSOR A	10071	-	1	022
LOW TEMP SENSOR A	10072	-	1	023
HIGH HUM SENSOR A	10073	-	1	024
LOW HUM SENSOR A	10074	-	1	025
LOSS OF CW FLOW	10075	-	1	004
CLOGGED FILTERS	10076	-	1	008
SUPPLY SENSOR FAILURE	10077	-	1	029
FREECOOL TEMP SENSOR	10078	-	1	062

SENSOR A FAILURE	10079	-	1		032
UNIT HRS EXCEEDED	10080	-	1		026
COMP 1 HRS EXCEEDED	10081	-	1		027
COMP 2 HRS EXCEEDED	10082	-	1		060
FC HRS EXCEEDED	10083	-	1		089
EL HEAT1 HRS EXCEEDED	10084	-	1		111
EL HEAT2 HRS EXCEEDED	10085	-	1		112
EL HEAT3 HRS EXCEEDED	10086	-	1		113
HW/HG HRS EXCEEDED	10087	-	1		110
HUM HRS EXCEEDED	10088	-	1		028
DEHUM HRS EXCEEDED	10089	-	1		088
NETWORK FAILURE	10091	-	1		034
NO CONNECTION W/UNIT 1	10092	-	1	..	070
UNIT(S) DISCONNECTED	10093	-	1		(042)-(057)
UNIT CODE MISSING	10094	-			114
UNIT CODE MISMATCH	10095	-			115-132
CALL SERVICE	10096	-			015
Low Memory 1	10097	-			069
RAM / Battery Failure	10098	-			068
HCB not connected	10099	-			094
(Parallel flash) MEMORY 1 FAIL	10100	-			092
(Serial flash) MEMORY 2 FAIL	10101	-			093
CUSTOMER INPUT 1	10104	-			009
CUSTOMER INPUT 2	10105	-			010
CUSTOMER INPUT 3	10106	-			011
CUSTOMER INPUT 4	10107	-			012
DSCROLL 1 SENSOR FAIL	10108	-			030
DSCROLL 2 SENSOR FAIL	10109	-			061

Data Points Mapped to Input and Holding Registers

(A value read from an input register is the real-time data value. A value read from a holding register is the value last set to this modbus server by a user.)
Reference Document: ST100I&C PA Parameters and Events, Version 18.0

Data Description	Input Register	Holding Reg	# Regs	Scale	Note	iCOM Reference
Vendor Id	30001	40001	1	1		-
Device ID	30002	40002	1	1		-
version number	30003	40003	1	1		-
Ups/Env/Pwr	30004	40004	1	1		-
Timer Mode[2]	30016	40016	1	1	..	U609
Type of DT Room-FC[3]	30017	40017	1	1		S126
Humidity Control Type [4]	30018	40018	1	1		S114
VSD Setpoint	30019	40019	1	1	% (HP)	S132
Supply temperature Limit	30020	40020	1	x10	C°	U106
DT between Room and FC	30021	40021	1	x10	C°	S127
Minimum CW Temperature	30022	40022	1	x10	C°	S128
Temperature Setpoint	30023	40023	1	x10	C°	S102
Temperature proportional band	30024	40024	1	x10	C°	S104
Temperature Dead band	30025	40025	1	x10	C°	S108
Temperature Integration time	30026	40026	1	1	Min	S105
Humidity Setpoint	30027	40027	1	1	%	S113
Humidity proportional band	30028	40028	1	1	%	S115
Humidity Integration time	30029	40029	1	1	Min	S116
Humidity Dead band	30030	40030	1	1	%	S117
Single unit Auto-restart Delay	30031	40031	1	1	Sec	S417
Infrared Flush Rate	30032	40032	1	1	%	S414
Temp Control Type [5]	30033	40033	1	1		S103
Sleep Interval 1 Start Time Hour:Minute	30040	40040	1		MSB:Hr	U605(FROM)
Sleep Interval 1 End Time	30041	40041	1		MSB:Hr	U605(TO)

Hour:Minute						
Sleep Interval 2 Start Time Hour:Minute	30042	40042	1		MSB:Hr	U607(FROM)
Sleep Interval 2 End Time Hour:Minute	30043	40043	1		MSB:Hr	U607(TO)
Timer Dead Band	30044	40044	1	X10	C°	U611
Manual VSD Timer/Counter[6]	30045	40045	1			
High Temperature	30050	40050	1	X10	C°	U203
Low Temperature	30051	40051	1	X10	C°	U204
High Temperature Sensor A	30052	40052	1	X10	C°	U208
Low Temperature Sensor A	30053	40053	1	X10	C°	U209
High Humidity	30054	40054	1	1	%	U205
Low Humidity	30055	40055	1	1	%	U206
High Humidity Sensor A	30056	40056	1	1	%	U210
Low Humidity Sensor A	30057	40057	1	1	%	U211
Fan Run Hour Threshold	30070	40070		1	Hour	U502
Compressor 1 Run Hour Threshold	30071	40071		1	Hour	U503
Compressor 2 Run Hour Threshold	30072	40072		1	Hour	U504
Humidifier run hours Threshold	30073	40073		1	Hour	U510
Dehumidification run hours Threshold	30074	40074		1	Hour	U511
CW/FC run hours Threshold	30075	40075		1	Hour	U505
Electrical Heaters #1 run hours Threshold	30076	40076		1	Hour	U507
Electrical Heaters #2 run hours Threshold	30077	40077		1	Hour	U508
Electrical Heaters #3 run hours Threshold	30078	40078		1	Hour	U509
Hot Water / Hot Gas run hours Threshold	30079	40079		1	Hour	U506
Operating State [7]	30100	-		1	-	EnvState. OperatingState
Number of Active	30101	-		-	-	EnvState.

Events/Alarm					EventCount
Summary Alarm Status [8]	30102	-	-	-	EnvState. AlarmState
Fan Ramp	30103	-	1	%	EnvState. FanRamp
Cooling Ramp	30104	-	1	%	EnvState. CoolRamp
Free Cooling Ramp	30105	-	1	%	EnvState. FCRamp
Heating Ramp	30106	-	1	%	EnvState. HeatRamp
Humidification Ramp	30107	-	1	%	EnvState. HumRamp
Dehumidifier Ramp	30108	-	1	%	EnvState. DehumRamp
FreeCooling Status [9]	30109	-	1	%	U312
Return Temperature	30110	-	x10	C°	EnvState. ActTemp
Actual Temperature SP	30111	-	x10	C°	U301(ActTemp Set)
Supply Temperature	30112	-	x10	C°	EnvState.ActSup
Actual Supply Temperature SP	30113	-	x10	C°	EnvState. ActSupSet
FC Temperature	30115	-	x10	C°	U309
Sensor A Temperature	30116	-	x10	C°	U303
Sensor B Temperature	30117	-	x10	C°	U305
Sensor C Temperature	30118	-	x10	C°	U307
Digi Scroll 1 Temperature	30119	-	x10	C°	U310
Digi Scroll 2 Temperature	30120	-	x10	C°	U311
Return Humidity	30130	-	1	%	EnvState.ActTemp
Actual Humidity SP	30131	-	1	%	U302(ActHumSet)
Sensor A Humidity	30132	-	1	%	U304
Sensor B Humidity	30133	-	1	%	U306
Sensor C Humidity	30134	-	1	%	U308
Fan Run Hour	30141	-	1	Hour	S502
Compressor 1 Run Hour	30142	-	1	Hour	S503
Compressor 2 Run Hour	30143	-	1	Hour	S504
Humidifier run hours	30144	-	1	Hour	S510
Dehumidification run hours	30145	-	1	Hour	S511

Free cooling run hours	30146	-	1	Hour	S505
Electrical Heaters #1 run hours	30147	-	1	Hour	S507
Electrical Heaters #2 run hours	30148	-	1	Hour	S508
Electrical Heaters #3 run hours	30149	-	1	Hour	S509
Hot Water / Hot Gas run hours	30150	-	1	Hour	S506
Daily High Temperature	30151	-	x10	C°	S313
Daily High Temp Time	30152	-	x1	Hh:mm	S313
Daily Low Temperature	30153	-	x10	C°	S314
Daily Low Temp Time	30154	-	x1	Hh:mm	S314
Daily High Humidity	30155	-	x1	%RH	S315
Daily High Hum Time	30156	-	x1	Hh:mm	S315
Daily Low Humidity	30157	-	x1	%RH	S316
Daily Low Hum Time	30158	-	x1	Hh:mm	S316

[1] Any non-recognized alarm code by current firmware received from the DS control will trigger this event.
[2] Timer mode: 0 = no, 1= yes.
[3] Type of DT Room-Glycol: 0 = no, 1=contact, 2=value.
[4] Predictive Hum Control: 0=relative, 1=compensated, 2=predictive.
[5] Temp Control Algorithm: 0=proportional, 1=PD, 2=PDI; 3=intelligent;
[6] When VFD is set to manual mode(coil 22), the host can control the VFD by the value of register 40019. The Manual VSD Timer will start to count down. Once it reaches 0, the VFD control mode will switch to auto. The host will need to periodically reset this timer in order to maintain the manual mode. Consult factory for BMS timer information.

[7] Operating State: Bit 0-1: 00 unit off, 01 unit on, 10 unit standby
Bit 2-3: 00 auto, 01 manual
Bit 4-7: 0000 none,
0001 local user,
0010 alarm,
0011 schedule,
0100 remote user,
0101 external device,
0110 local display

[8] Alarm state bit map: Bit0 =. Reset state
bit1 = Active state ;
bit2 = Acknowledge state,
bit3-7 = Alarm Type,: 00000: Message
00001: Warning
00010: Alarm

[9] Free-cool state: 0= Off, 1= Start, 2= On.

MONITORING

OpenComms - 485 Modbus Reference Guide

THE COMPANY BEHIND THE PRODUCTS

With over a million installations around the globe, Liebert is the world leader in computer protection systems. Since its founding in 1965, Liebert has developed a complete range of support and protection systems for sensitive electronics.

While every precaution has been taken to ensure the accuracy and completeness of this literature, Liebert Corporation assumes no responsibility and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

Technical Support/Service
Web Site
www.liebert.com
Monitoring
800-222-5877
monitoring@liebert.com
Outside the US: 614-841-6755

Locations
United States
1050 Dearborn Drive
P.O. Box 29186
Columbus, Ohio 43229

Italy
Via Leonardo Da Vinci 8
Zona Industriale Tognana
35028 Piove Di Sacco (PD)
+39 049 9719 111
Fax +39 049 5841 257

Asia
23F, Allied Kajima Bldg.
138 Gloucester Road
Wanchai
Hong Kong
852.2.572.2201 Phone
852.2.831.0114 Fax

525502R5 REV.5