Connect Touch Control for Powerciat LX/LW chillers

MODBUS COMMUNICATION

User's guide

REVISIONS HISTORY

REV	DATE yyy mm dd	DESCRIPTION	DONE BY
Preliminary	2018-05-02	Original for Powerciat LX/LW	**Sylvain douzet**

TABLE OF CONTENT

1 INTRODUCTION

1.1 Purpose

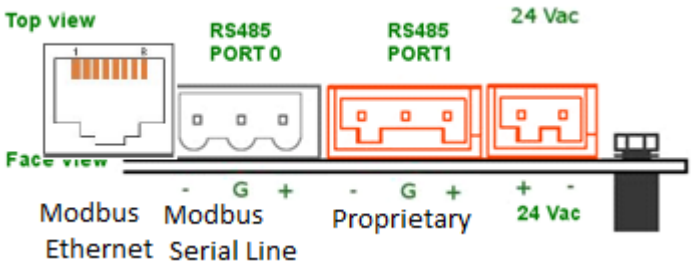
This guide is intended to be used by Building Management System (BMS) engineer inside or outside the CIAT Corporation.
It describes in details the Modbus communication with Powerciat LX/LW units.
All information already provided in the product IOM are not available in this document.

1.2 Definitions, Abbreviations and acronyms

Acronym /Abbreviation	Definition
DI	Discrete Input
EXV	Expansion Valve
FC	Free Cooling
HR	Holding Register
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
IR	Input Register
Net	Network
OAT	Outside Air Temperature
RTU	Remote Terminal United Technologies Corporation
SCT	Saturated Condensing Temperature
SST	Saturated Suction Temperature
TCP	Transmission Control Protocol
xxLS	..Low Speed
xxHS	..High Speed

2 CONNECTION CHANNELS

Here below sockets available for communication purposes with external devices.



sockets identification available for communication

2.1 RS485 socket details

Bus "port0" is intended to Modbus serial line with RS485 (i.e. no control flow)

Transmission mode:

Used for Local area network communication type by external devices.

- With twisted shielded pair
- distance up to 1000m without amplifier
- Normally configurable at 9600, 19200 or 38400 baud in half duplex.
- Parity bit may be active or deactivated. If parity is disabled, additional stop bits are automatically set for frame timing considerations. Otherwise, parity may be odd or even according to the settings chosen.

  Exclusively RTU mode operates with configurable combination (No ASCII mode permission)

  1 start, 8 data, even parity, 1 stop bit

  1 start, 8 data, odd parity, 1 stop bit

  1 start, 8 data, even parity forced, 1 stop bit

  1 start, 8 data, odd parity forced, 1 stop bit

  1 start, 8 data, 2 stop bit

  ~~1 start, 8 data, no parity , 1 stop bit~~ (EXCLUDED)

- RTU protocol is compatible with both Little/ Big Endian for data field (i.e. either most significant byte is sent first or Least significant byte is sent first)
- Unit identifier must be declared from 1 to 247 as slave product number setup (i.e. station number)
- Cyclic Redundancy Check is made by the RTU protocol layer as defined in Appendix A of "Modbus over serial line" specification available at modbus.org

- Due to floating no native floating point representation for the Modbus communication protocol, IEEE754 representation has been integrated. As the opposite, float handled as integer is also available (i.e. float X 10) depending on setup.

Bus "port1" is proprietary and therefore reserved for internal purpose.

2.2 RJ45 socket details

Modbus Ethernet is intended to Modbus IP.

Used for wide area network communication type by external devices (building management system tool or maintenance tool and so on…)

- Cross pair wired cable shall be used for nominal configuration.
- distance up to 100m without amplifier
- Speed communication at 10 Mega baud not configurable
- IPv4 address configurable for class address with DHCP NOT active for

  Class A (0.xxx.xxx.xxx to 127.xxx.xxx.xxx)

  Class B (128.0.xxx.xxx to 191. 255.xxx.xxx)

  Class C (192.0.0.xxx to 223.255.255.xxx)

  (IP address declared on the control unit needed to set up connection with external device)
- All requests are sent via Transfer Control Protocol on registered port 502 by default but other port number may be set as calibrate value.
- TCP/IP Modbus protocol is compatible with both Little/ Big Endian for data field (i.e. either most significant byte is sent first or Least significant byte is sent first)
- Unit identifier must be declared from 1 to 247 as slave product number setup (i.e. station number)

3 MODBUS FUNCTIONS

The following standard functions are supported:

Code	Modbus function	Address register range	Application
01 with quantity 1	READ COIL STATUS	0 to 9999 (decimal)	None
01 with quantity N	READ MULTIPLE COIL STATUS (from 1 to 2000max. contiguous)		None
15 with quantity 1	WRITE COIL		None
15 with quantity N	WRITE MULTIPLE COILS (from 1 to 2000max. contiguous)		None
02 with quantity 1	READ DISCRETE INPUT		Alarms
02 with quantity N	READ MULTIPLE DISCRETE INPUTS (from 1 to 2000max. contiguous)		
04 with quantity 2	READ INPUT REGISTER	0 to 9999 (decimal)	Useful user parameters
04 with quantity NX2	READ MULTIPLE INPUT REGISTERS (from 1 to 123 max. contiguous)		Useful user parameters
03 with quantity 2	READ HOLDING REGISTER		Configuration or service dataset
03 with quantity NX2	READ MULTIPLE HOLDING REGISTERS (from 1 to 123 max. contiguous)		Configuration or service dataset
16 with quantity 2	WRITE HOLDING REGISTER		Configuration or service dataset
16 with quantity NX2	WRITE MULTIPLE HOLDING REGISTERS (from 1 to 123 max. contiguous)		Configuration or service dataset

4 MAPPING INTERFACE

Table	Item	Description	Media Type	Address (hex)	Format
ALM	COOLER_FREEZE_F	Cooler Freeze Protection	DI	1 (0001)h	"1 bit (Boolean)"
ALM	LOW_SUCTION_A_F	Circuit A Low Suction Temperature	DI	5 (0005)h	"1 bit (Boolean)"
ALM	LOW_SUCTION_B_F	Circuit B Low Suction Temperature	DI	6 (0006)h	"1 bit (Boolean)"
ALM	HIGH_SH_A_F	Circuit A High Superheat	DI	8 (0008)h	"1 bit (Boolean)"
ALM	HIGH_SH_B_F	Circuit B High Superheat	DI	9 (0009)h	"1 bit (Boolean)"
ALM	LOW_SH_A_F	Circuit A Low Superheat	DI	11 (000B)h	"1 bit (Boolean)"
ALM	LOW_SH_B_F	Circuit B Low Superheat	DI	12 (000C)h	"1 bit (Boolean)"
ALM	LOCK_F	Customer Interlock Failure	DI	14 (000E)h	"1 bit (Boolean)"
ALM	COND_FLOW_F	Condenser Flow Switch Failure	DI	15 (000F)h	"1 bit (Boolean)"
ALM	ELEC_BOX_F	Electrical Box Thermostat or Electrical Interlock failure	DI	28 (001C)h	"1 bit (Boolean)"
ALM	LOSS_COM_MS_F	Master/Slave communication Failure	DI	30 (001E)h	"1 bit (Boolean)"
ALM	NETWORK_EMSTOP_F	Unit is in Network emergency stop	DI	31 (001F)h	"1 bit (Boolean)"
ALM	COOL_PUMP1_F	Cooler pump #1 default	DI	32 (0020)h	"1 bit (Boolean)"
ALM	COOL_PUMP2_F	Cooler pump #2 default	DI	33 (0021)h	"1 bit (Boolean)"
ALM	COND_PMP1_F	Condenser pump #1 default	DI	73 (0049)h	"1 bit (Boolean)"
ALM	COND_PMP2_F	Condenser pump #2 default	DI	74 (004A)h	"1 bit (Boolean)"
ALM	HR_HIGH_SCT_A_F	Circuit A Reclaim Operation Failure	DI	34 (0022)h	"1 bit (Boolean)"
ALM	HR_HIGH_SCT_B_F	Circuit B Reclaim Operation Failure	DI	35 (0023)h	"1 bit (Boolean)"
ALM	SCT_OUT_OF_CP_M_A_F	Circ A - High condensing temperature out of map compressor	DI	37 (0025)h	"1 bit (Boolean)"
ALM	SCT_OUT_OF_CP_M_B_F	Circ B - High condensing temperature out of map compressor	DI	38 (0026)h	"1 bit (Boolean)"
ALM	REPEATED_LO_SST_A_F	Circuit A - Repeated low suction temp overrides	DI	40 (0028)h	"1 bit (Boolean)"
ALM	REPEATED_LO_SST_B_F	Circuit B - Repeated low suction temp overrides	DI	41 (0029)h	"1 bit (Boolean)"
ALM	HEAT_LOW_EWT_F	Low entering water temperature in heating	DI	43 (002B)h	"1 bit (Boolean)"
ALM	COOLER_FLOW_F	Cooler Flow Switch Failure	DI	51 (0033)h	"1 bit (Boolean)"
ALM	FLOW_CONFIG_F	Cooler Flow Switch Setpoint Configuration Failure	DI	90 (005A)h	"1 bit (Boolean)"
ALM	FC_OP_A_F	Circuit A Free Cooling Operation	DI	94 (005E)h	"1 bit (Boolean)"

		Failure			
ALM	FC_OP_B_F	Circuit B Free Cooling Operation Failure	DI	95 (005F)h	"1 bit (Boolean)"
ALM	SENSORS_SWAP_F	Water Exchanger Temperature Sensors Swapped	DI	97 (0061)h	"1 bit (Boolean)"
ALM	LOSS_COM_SM_F	Loss of communication with System Manager	DI	29 (001D)h	"1 bit (Boolean)"
ALM	REFRIGERANT_F	Refrigerant Leakage Detection	DI	99 (0063)h	"1 bit (Boolean)"
ALM	FCDC_PROCESS_F	Free Cooling Dry Cooler Process Failure	DI	101 (0065)h	"1 bit (Boolean)"
ALM	COND_FREEZE_A_F	Circuit A Condenser Freeze Protection	DI	2 (0002)h	"1 bit (Boolean)"
ALM	COND_FREEZE_B_F	Circuit B Condenser Freeze Protection	DI	3 (0003)h	"1 bit (Boolean)"
ALM	HIGH_DGT_A_F	Circuit A High Discharge Gas Temperature	DI	78 (004E)h	"1 bit (Boolean)"
ALM	HIGH_DGT_B_F	Circuit B High Discharge Gas Temperature	DI	79 (004F)h	"1 bit (Boolean)"
ALM	LOW_ECON_PRESS_A_F	Circuit A Low economizer pressure or Suction valve closed	DI	81 (0051)h	"1 bit (Boolean)"
ALM	LOW_ECON_PRESS_B_F	Circuit B Low economizer pressure or Suction valve closed	DI	82 (0052)h	"1 bit (Boolean)"
ALM	COND_FREEZE_C_F	Circuit C Condenser Freeze Protection	DI	4 (0004)h	"1 bit (Boolean)"
ALM	LOW_SUCTION_C_F	Circuit C Low Suction Temperature	DI	7 (0007)h	"1 bit (Boolean)"
ALM	HIGH_SH_C_F	Circuit C High Superheat	DI	10 (000A)h	"1 bit (Boolean)"
ALM	LOW_SH_C_F	Circuit C Low Superheat	DI	13 (000D)h	"1 bit (Boolean)"
ALM	LOW_OIL_A_P_F	Circuit A Low Oil Pressure	DI	67 (0043)h	"1 bit (Boolean)"
ALM	LOW_OIL_B_P_F	Circuit B Low Oil Pressure	DI	68 (0044)h	"1 bit (Boolean)"
ALM	LOW_OIL_C_P_F	Circuit C Low Oil Pressure	DI	69 (0045)h	"1 bit (Boolean)"
ALM	OIL_FILT_A_P_F	Circuit A Max Oil Filter Differential Pressure	DI	70 (0046)h	"1 bit (Boolean)"
ALM	OIL_FILT_B_P_F	Circuit B Max Oil Filter Differential Pressure	DI	71 (0047)h	"1 bit (Boolean)"
ALM	OIL_FILT_C_P_F	Circuit C Max Oil Filter Differential Pressure	DI	72 (0048)h	"1 bit (Boolean)"
ALM	OIL_DROP_A_P_F	Circuit A High Oil Filter Drop Pressure	DI	84 (0054)h	"1 bit (Boolean)"
ALM	OIL_DROP_B_P_F	Circuit B High Oil Filter Drop Pressure	DI	85 (0055)h	"1 bit (Boolean)"
ALM	OIL_DROP_C_P_F	Circuit C High Oil Filter Drop Pressure	DI	86 (0056)h	"1 bit (Boolean)"

ALM	LOW_OIL_LEVEL_A_F	Circuit A Low Oil level	DI	75 (004B)h	"1 bit (Boolean)"
ALM	LOW_OIL_LEVEL_B_F	Circuit B Low Oil level	DI	76 (004C)h	"1 bit (Boolean)"
ALM	LOW_OIL_LEVEL_C_F	Circuit C Low Oil level	DI	77 (004D)h	"1 bit (Boolean)"
ALM	SCT_OUT_OF_CP_M_C_F	Circ C - High condensing temperature out of map compressor	DI	39 (0027)h	"1 bit (Boolean)"
ALM	REPEATED_LO_SST_C_F	Circuit C - Repeated low suction temp overrides	DI	42 (002A)h	"1 bit (Boolean)"
ALM	HIGH_DGT_C_F	Circuit C High Discharge Gas Temperature	DI	80 (0050)h	"1 bit (Boolean)"
ALM	LOW_ECON_PRESS_C_F	Circuit C Low economizer pressure or Suction valve closed	DI	83 (0053)h	"1 bit (Boolean)"
ALM	SLIDE_A_F	Circuit A Slive Valve Control Unverifiable	DI	87 (0057)h	"1 bit (Boolean)"
ALM	SLIDE_B_F	Circuit B Slive Valve Control Unverifiable	DI	88 (0058)h	"1 bit (Boolean)"
ALM	SLIDE_C_F	Circuit C Slive Valve Control Unverifiable	DI	89 (0059)h	"1 bit (Boolean)"
ALM	ELEC_BOX_FAN_F	Electrical Box Fan Failure	DI	100 (0064)h	"1 bit (Boolean)"
ALM	A_TCPM_F	Compressor A Failure	DI	1119 (045F)h	"1 bit (Boolean)"
ALM	B_TCPM_F	Compressor B Failure	DI	1219 (04C3)h	"1 bit (Boolean)"
ALM	C_TCPM_F	Compressor C Failure	DI	1319 (0527)h	"1 bit (Boolean)"
ALM	DP_A_F	Circuit A Discharge Transducer	DI	2001 (07D1)h	"1 bit (Boolean)"
ALM	DP_B_F	Circuit B Discharge Transducer	DI	2002 (07D2)h	"1 bit (Boolean)"
ALM	SP_A_F	Circuit A Suction Transducer	DI	2004 (07D4)h	"1 bit (Boolean)"
ALM	SP_B_F	Circuit B Suction Transducer	DI	2005 (07D5)h	"1 bit (Boolean)"
ALM	PD_P_A_F	Circuit A Reclaim Pumpdown Pressure Transducer	DI	2007 (07D7)h	"1 bit (Boolean)"
ALM	PD_P_B_F	Circuit B Reclaim Pumpdown Pressure Transducer	DI	2008 (07D8)h	"1 bit (Boolean)"
ALM	FC_IN_P_A_F	Circuit A Free Cooling Pump Inlet Pressure Transducer	DI	2016 (07E0)h	"1 bit (Boolean)"
ALM	FC_IN_P_B_F	Circuit B Free Cooling Pump Inlet Pressure Transducer	DI	2017 (07E1)h	"1 bit (Boolean)"
ALM	FC_OUT_P_A_F	Circuit A Free Cooling Pump Outlet Pressure Transducer	DI	2018 (07E2)h	"1 bit (Boolean)"
ALM	FC_OUT_P_B_F	Circuit B Free Cooling Pump Outlet Pressure Transducer	DI	2019 (07E3)h	"1 bit (Boolean)"
ALM	WATER_P_1_F	Water Pressure before cooler Transducer	DI	2024 (07E8)h	"1 bit (Boolean)"
ALM	WATER_P_2_F	Water Pressure after cooler	DI	2025 (07E9)h	"1 bit (Boolean)"

		Transducer			
ALM	WATER_P_3_F	Water Pressure before filter Transducer	DI	2026 (07EA)h	"1 bit (Boolean)"
ALM	WATER_P_4_F	Water Pressure after filter Transducer	DI	2027 (07EB)h	"1 bit (Boolean)"
ALM	DP_C_F	Circuit C Discharge Transducer	DI	2003 (07D3)h	"1 bit (Boolean)"
ALM	SP_C_F	Circuit C Suction Transducer	DI	2006 (07D6)h	"1 bit (Boolean)"
ALM	OIL_P_A_F	Circuit A Oil Pressure Transducer	DI	2010 (07DA)h	"1 bit (Boolean)"
ALM	OIL_P_B_F	Circuit B Oil Pressure Transducer	DI	2011 (07DB)h	"1 bit (Boolean)"
ALM	OIL_P_C_F	Circuit C Oil Pressure Transducer	DI	2012 (07DC)h	"1 bit (Boolean)"
ALM	ECO_P_A_F	Circuit A Economizer Pressure Transducer	DI	2013 (07DD)h	"1 bit (Boolean)"
ALM	ECO_P_B_F	Circuit B Economizer Pressure Transducer	DI	2014 (07DE)h	"1 bit (Boolean)"
ALM	ECO_P_C_F	Circuit C Economizer Pressure Transducer	DI	2015 (07DF)h	"1 bit (Boolean)"
ALM	HP_APPROACH_P_A_F	Circuit A Heatpump Approach Pressure Transducer	DI	2022 (07E6)h	"1 bit (Boolean)"
ALM	HP_APPROACH_P_B_F	Circuit B Heatpump Approach Pressure Transducer	DI	2023 (07E7)h	"1 bit (Boolean)"
ALM	WATER_P_TOO_HIGH	Water Pressure too high	DI	2028 (07EC)h	"1 bit (Boolean)"
ALM	WATER_P_TOO_LOW	Water Pressure too low - pump cavitaion risks	DI	2029 (07ED)h	"1 bit (Boolean)"
ALM	WATER_FILTER_DIRTY	Water filter dirty	DI	2030 (07EE)h	"1 bit (Boolean)"
ALM	SERVICE_MAINT_ALRT	Service maintenance alert Number # nn	DI	3000 (0BB8)h	"1 bit (Boolean)"
ALM	FGAS_NEEDED	Fgas check needed, call your maintenance company	DI	3005 (0BBD)h	"1 bit (Boolean)"
ALM	STEPPER_EXV_A_F	Main EXV stepper motor Failure - cir A	DI	4020 (0FB4)h	"1 bit (Boolean)"
ALM	STEPPER_EXV_B_F	Main EXV stepper motor Failure - cir B	DI	4021 (0FB5)h	"1 bit (Boolean)"
ALM	STEPPER_EXV_C_F	Main EXV stepper motor Failure - cir C	DI	4022 (0FB6)h	"1 bit (Boolean)"
ALM	STEPPER_ECO_A_F	EXV eco stepper motor Failure - cir A	DI	4023 (0FB7)h	"1 bit (Boolean)"
ALM	STEPPER_ECO_B_F	EXV eco stepper motor Failure - cir B	DI	4024 (0FB8)h	"1 bit (Boolean)"
ALM	STEPPER_ECO_C_F	EXV eco stepper motor Failure - cir C	DI	4025 (0FB9)h	"1 bit (Boolean)"
ALM	SIOB_CIR_A_COM_F	Loss of communication with SIOB Board Number A	DI	4901 (1325)h	"1 bit (Boolean)"

ALM	SIOB_CIR_B_COM_F	Loss of communication with SIOB Board Number B	DI	4902 (1326)h	"1 bit (Boolean)"
ALM	SIOB_FC_COM_F	Loss of communication with SIOB Board Free Cooling	DI	4904 (1328)h	"1 bit (Boolean)"
ALM	SIOB_RECL_COM_F	Loss of communication with SIOB Board Heat Reclaim	DI	4905 (1329)h	"1 bit (Boolean)"
ALM	SIOB_EMM_COM_F	Loss of communication with SIOB Board Energy Management	DI	4906 (132A)h	"1 bit (Boolean)"
ALM	FCDC_AUX1_COM_F	Loss of communication with FC Dry Cooler Board	DI	4602 (11FA)h	"1 bit (Boolean)"
ALM	CPA_COM_F	Loss of communication with Compressor Board A	DI	4101 (1005)h	"1 bit (Boolean)"
ALM	CPB_COM_F	Loss of communication with Compressor Board B	DI	4201 (1069)h	"1 bit (Boolean)"
ALM	CPC_COM_F	Loss of communication with Compressor Board C	DI	4301 (10CD)h	"1 bit (Boolean)"
ALM	FAN1_COM_F	Loss of communication with Fan Board Number 1	DI	4501 (1195)h	"1 bit (Boolean)"
ALM	FAN2_COM_F	Loss of communication with Fan Board Number 2	DI	4502 (1196)h	"1 bit (Boolean)"
ALM	FAN3_COM_F	Loss of communication with Fan Board Number 3	DI	4503 (1197)h	"1 bit (Boolean)"
ALM	VLT_DRIVE1_COM_F	Loss of communication with VLT board 1	DI	4801 (12C1)h	"1 bit (Boolean)"
ALM	VLT_DRIVE2_COM_F	Loss of communication with VLT board 2	DI	4802 (12C2)h	"1 bit (Boolean)"
ALM	VLT_DRIVE3_COM_F	Loss of communication with VLT board 3	DI	4803 (12C3)h	"1 bit (Boolean)"
ALM	FAN_DRIVEA1_COM_F	Loss of communication with FAN VLT board A1	DI	4704 (1260)h	"1 bit (Boolean)"
ALM	FAN_DRIVEA2_COM_F	Loss of communication with FAN VLT board A2	DI	4705 (1261)h	"1 bit (Boolean)"
ALM	FAN_DRIVEA3_COM_F	Loss of communication with FAN VLT board A3	DI	4706 (1262)h	"1 bit (Boolean)"
ALM	FAN_DRIVEB1_COM_F	Loss of communication with FAN VLT board B1	DI	4707 (1263)h	"1 bit (Boolean)"
ALM	FAN_DRIVEB2_COM_F	Loss of communication with FAN VLT board B2	DI	4708 (1264)h	"1 bit (Boolean)"
ALM	FAN_DRIVEB3_COM_F	Loss of communication with FAN VLT board B3	DI	4709 (1265)h	"1 bit (Boolean)"
ALM	FAN_DRIVEC1_COM_F	FAN_DRIVEC1_COM_F	DI	4710 (1266)h	"1 bit (Boolean)"
ALM	FAN_DRIVEC2_COM_F	FAN_DRIVEC2_COM_F	DI	4711 (1267)h	"1 bit (Boolean)"

ALM	FAN_DRIVEC3_COM_F	FAN_DRIVEC3_COM_F	DI	4712 (1268)h	"1 bit (Boolean)"
ALM	SIOB_CIR_C_COM_F	Loss of communication with SIOB Board Number C	DI	4903 (1327)h	"1 bit (Boolean)"
ALM	COOL_EWT_F	Cooler Entering Fluid Thermistor	DI	5001 (1389)h	"1 bit (Boolean)"
ALM	COOL_LWT_F	Cooler Leaving Fluid Thermistor	DI	5002 (138A)h	"1 bit (Boolean)"
ALM	COND_EWT_F	Condenser Entering Fluid Thermistor	DI	5006 (138E)h	"1 bit (Boolean)"
ALM	COND_LWT_F	Condenser Leaving Fluid Thermistor	DI	5007 (138F)h	"1 bit (Boolean)"
ALM	DEFROST_T_A_F	Circuit A Defrost Thermistor	DI	5003 (138B)h	"1 bit (Boolean)"
ALM	DEFROST_T_B_F	Circuit B Defrost Thermistor	DI	5004 (138C)h	"1 bit (Boolean)"
ALM	HR_EWT_F	Reclaim Condenser Entering Thermistor	DI	5008 (1390)h	"1 bit (Boolean)"
ALM	HR_LWT_F	Reclaim Condenser Leaving Thermistor	DI	5009 (1391)h	"1 bit (Boolean)"
ALM	OAT_F	OAT Thermistor	DI	5010 (1392)h	"1 bit (Boolean)"
ALM	CHWSTEMP_F	MASTER/Slave Common Fluid Thermistor	DI	5011 (1393)h	"1 bit (Boolean)"
ALM	DRYCOOL_LWT_T_F	Dry Cooler Leaving thermistor Failure	DI	5036 (13AC)h	"1 bit (Boolean)"
ALM	DGT_A_T_F	Circuit A Discharge Gas Thermistor	DI	5044 (13B4)h	"1 bit (Boolean)"
ALM	DGT_B_T_F	Circuit B Discharge Gas Thermistor	DI	5045 (13B5)h	"1 bit (Boolean)"
ALM	SUCTION_T_A_F	Circuit A Suction Gas Thermistor	DI	5012 (1394)h	"1 bit (Boolean)"
ALM	SUCTION_T_B_F	Circuit B Suction Gas Thermistor	DI	5013 (1395)h	"1 bit (Boolean)"
ALM	SUBCOOL_T_A_F	Circuit A Condenser Subcooling Liquid Thermistor	DI	5018 (139A)h	"1 bit (Boolean)"
ALM	SUBCOOL_T_B_F	Circuit B Condenser Subcooling Liquid Thermistor	DI	5019 (139B)h	"1 bit (Boolean)"
ALM	SPACE_TEMP_F	Space Temperature Thermistor	DI	5021 (139D)h	"1 bit (Boolean)"
ALM	FCDC_WLOOP_F	FC Dry Cooler Water Loop Thermistor Failure	DI	5046 (13B6)h	"1 bit (Boolean)"
ALM	FCDC_LWT_F	FC Dry Cooler Leaving Water Thermistor Failure	DI	5047 (13B7)h	"1 bit (Boolean)"
ALM	FCDC_OAT_F	FC Dry Cooler OAT Thermistor Failure	DI	5048 (13B8)h	"1 bit (Boolean)"
ALM	SUCTION_T_C_F	Circuit C Suction Gas Thermistor	DI	5014 (1396)h	"1 bit (Boolean)"
ALM	DGT_C_T_F	Circuit C Discharge Gas Thermistor	DI	5017 (1399)h	"1 bit (Boolean)"
ALM	COOL_HEAT_T_F	Cooler heater feedback thermistor	DI	5023 (139F)h	"1 bit (Boolean)"
ALM	ECO_GAS_A_T_F	Circuit A Economizer Gas thermistor	DI	5024 (13A0)h	"1 bit (Boolean)"
ALM	ECO_GAS_B_T_F	Circuit B Economizer Gas thermistor	DI	5025 (13A1)h	"1 bit (Boolean)"

ALM	ECO_GAS_C_T_F	Circuit C Economizer Gas thermistor	DI	5026 (13A2)h	"1 bit (Boolean)"
ALM	FC_LIQUID_A_T_F	Circuit A Free Cooling Liquid Thermistor Failure	DI	5030 (13A6)h	"1 bit (Boolean)"
ALM	FC_LIQUID_B_T_F	Circuit B Free Cooling Liquid Thermistor Failure	DI	5031 (13A7)h	"1 bit (Boolean)"
ALM	FAN_VLT_DRIVE_A_ALT	Circuit A VLT Fan Drive Warning	DI	7999 (1F3F)h	"1 bit (Boolean)"
ALM	FAN_VLT_DRIVE_B_ALT	Circuit B VLT Fan Drive Warning	DI	7998 (1F3E)h	"1 bit (Boolean)"
ALM	FAN_VLT_DRIVE_C_ALT	Circuit C VLT Fan Drive Warning	DI	7997 (1F3D)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_A1_ALERT	Circuit A Fan VFD 1 Warning	DI	7995 (1F3B)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_A2_ALERT	Circuit A Fan VFD 2 Warning	DI	7994 (1F3A)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_A3_ALERT	Circuit A Fan VFD 3 Warning	DI	7993 (1F39)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_B1_ALERT	Circuit B Fan VFD 1 Warning	DI	7992 (1F38)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_B2_ALERT	Circuit B Fan VFD 2 Warning	DI	7991 (1F37)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_B3_ALERT	Circuit B Fan VFD 3 Warning	DI	7990 (1F36)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_C1_ALERT	FAN_DRIVE_C1_ALERT	DI	7989 (1F35)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_C2_ALERT	FAN_DRIVE_C2_ALERT	DI	7988 (1F34)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_C3_ALERT	FAN_DRIVE_C3_ALERT	DI	7987 (1F33)h	"1 bit (Boolean)"
ALM	FAN_VLT_DRIVE_A_F	Circuit A VLT Fan Drive Failure	DI	7001 (1B59)h	"1 bit (Boolean)"
ALM	FAN_VLT_DRIVE_B_F	Circuit B VLT Fan Drive Failure	DI	7002 (1B5A)h	"1 bit (Boolean)"
ALM	FAN_VLT_DRIVE_C_F	Circuit C VLT Fan Drive Failure	DI	7003 (1B5B)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_A1_F	Circuit A Fan VFD 1 Failure	DI	7005 (1B5D)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_A2_F	Circuit A Fan VFD 2 Failure	DI	7006 (1B5E)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_A3_F	Circuit A Fan VFD 3 Failure	DI	7007 (1B5F)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_B1_F	Circuit B Fan VFD 1 Failure	DI	7008 (1B60)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_B2_F	Circuit B Fan VFD 2 Failure	DI	7009 (1B61)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_B3_F	Circuit B Fan VFD 3 Failure	DI	7010 (1B62)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_C1_F	FAN_DRIVE_C1_F	DI	7011 (1B63)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_C2_F	FAN_DRIVE_C2_F	DI	7012 (1B64)h	"1 bit (Boolean)"
ALM	FAN_DRIVE_C3_F	FAN_DRIVE_C3_F	DI	7013 (1B65)h	"1 bit (Boolean)"
ALM	ILL_FACT_CONF_F	Illegal factory configuration Number #1 to nn	DI	8001 (1F41)h	"1 bit (Boolean)"
ALM	INI_FACT_CONF_F	No factory configuration	DI	8000 (1F40)h	"1 bit (Boolean)"
ALM	M_S_CONFIG_F	Master chiller configuration error Number #1 to nn	DI	8101 (1FA5)h	"1 bit (Boolean)"
ALM	DATABASE_F	Database module Failure	DI	9001 (2329)h	"1 bit (Boolean)"
ALM	LENSCAN_F	Lenscan module Failure	DI	9002 (232A)h	"1 bit (Boolean)"
PROTOCOL	SP_OCC	Setpoint Occupied?	HR	0 (0000)h	"Signed Integer (32-bit)"
PROTOCOL	CHIL_S_S	Chiller Start/Stop	HR	2 (0002)h	"Signed

					Integer (32-bit)"
PROTOCOL	CHIL_OCC	Chiller occupied?	HR	4 (0004)h	"Signed Integer (32-bit)"
PROTOCOL	EMSTOP	Emergency Stop	HR	6 (0006)h	"Signed Integer (32-bit)"
PROTOCOL	HC_SEL	Heatcool Select	HR	8 (0008)h	"Signed Integer (32-bit)"
PROTOCOL	SP_SEL	Setpoint Select	HR	10 (000A)h	"Signed Integer (32-bit)"
PROTOCOL	DEM_LIM	Demand Limit	HR	12 (000C)h	"Signed Integer (32-bit)"
PROTOCOL	CTRL_PNT	Control Point	HR	14 (000E)h	"IEEE Float (32-bit)"
PROTOCOL	LAG_LIM	Slave demand limit	HR	16 (0010)h	"Signed Integer (32-bit)"
RESETCFG	cr_sel	Cooling Reset Select	HR	18 (0012)h	"Signed Integer (32-bit)"
RESETCFG	hr_sel	Heating Reset Select	HR	20 (0014)h	"Signed Integer (32-bit)"
RESETCFG	oat_crno	OAT No Reset Value	HR	22 (0016)h	"IEEE Float (32-bit)"
RESETCFG	oat_crfu	OAT Full Reset Value	HR	24 (0018)h	"IEEE Float (32-bit)"
RESETCFG	dt_cr_no	Delta T No Reset Value	HR	26 (001A)h	"IEEE Float (32-bit)"
RESETCFG	dt_cr_fu	Delta T Full Reset Value	HR	28 (001C)h	"IEEE Float (32-bit)"
RESETCFG	cr_deg	Cooling Reset Deg. Value	HR	30 (001E)h	"IEEE Float (32-bit)"
RESETCFG	oat_hrno	OAT No Reset Value	HR	32 (0020)h	"IEEE Float (32-bit)"
RESETCFG	oat_hrfu	OAT Full Reset Value	HR	34 (0022)h	"IEEE Float (32-bit)"
RESETCFG	dt_hr_no	Delta T No Reset Value	HR	36 (0024)h	"IEEE Float (32-bit)"
RESETCFG	dt_hr_fu	Delta T Full Reset Value	HR	38 (0026)h	"IEEE Float (32-bit)"
RESETCFG	hr_deg	Heating Reset Deg. Value	HR	40 (0028)h	"IEEE Float (32-bit)"
RESETCFG	v_cr_no	Current No Reset Value	HR	42 (002A)h	"IEEE Float (32-bit)"
RESETCFG	v_cr_fu	Current Full Reset Value	HR	44 (002C)h	"IEEE Float (32-bit)"

RESETCFG	v_hr_no	Current No Reset Value	HR	50 (0032)h	"IEEE Float (32-bit)"
RESETCFG	v_hr_fu	Current Full Reset Value	HR	52 (0034)h	"IEEE Float (32-bit)"
CP_UNABL	un_cp_a	Compressor A Disable	HR	60 (003C)h	"Signed Integer (32-bit)"
CP_UNABL	un_cp_b	Compressor B Disable	HR	68 (0044)h	"Signed Integer (32-bit)"
SETPOINT	csp1	Cooling Setpoint 1	HR	76 (004C)h	"IEEE Float (32-bit)"
SETPOINT	csp2	Cooling Setpoint 2	HR	78 (004E)h	"IEEE Float (32-bit)"
SETPOINT	hsp1	Heating Setpoint 1	HR	80 (0050)h	"IEEE Float (32-bit)"
SETPOINT	hsp2	Heating Setpoint 2	HR	82 (0052)h	"IEEE Float (32-bit)"
SETPOINT	hramp_sp	Heating Ramp Loading	HR	84 (0054)h	"IEEE Float (32-bit)"
SETPOINT	cauto_sp	Cool Changeover Setpt	HR	86 (0056)h	"IEEE Float (32-bit)"
SETPOINT	hauto_sp	Heat Changeover Setpt	HR	88 (0058)h	"IEEE Float (32-bit)"
SETPOINT	lim_sp1	Switch Limit Setpoint 1	HR	90 (005A)h	"Signed Integer (32-bit)"
SETPOINT	lim_sp2	Switch Limit Setpoint 2	HR	92 (005C)h	"Signed Integer (32-bit)"
SETPOINT	lim_sp3	Switch Limit Setpoint 3	HR	94 (005E)h	"Signed Integer (32-bit)"
SETPOINT	w_sct_sp	Water Val Condensing Stp	HR	96 (0060)h	"IEEE Float (32-bit)"
SETPOINT	ice_sp	Cooling Ice Setpoint	HR	98 (0062)h	"IEEE Float (32-bit)"
SETPOINT	cramp_sp	Cooling Ramp Loading	HR	100 (0064)h	"IEEE Float (32-bit)"
SETPOINT	rsp	Reclaim Setpoint	HR	102 (0066)h	"IEEE Float (32-bit)"
SETPOINT	hr_deadb	Reclaim Deadband	HR	104 (0068)h	"IEEE Float (32-bit)"
MODBUSRS	metric	Metric Unit	HR	106 (006A)h	"Signed Integer (32-bit)"
MODBUSRS	swap_b	Swap Bytes	HR	108 (006C)h	"Signed Integer (32-bit)"
MODBUSRS	real_typ	Real type management	HR	110 (006E)h	"Signed

					Integer (32-bit)"
MODBUSIP	metric	Metric Unit	HR	112 (0070)h	"Signed Integer (32-bit)"
MODBUSIP	swap_b	Swap Bytes	HR	114 (0072)h	"Signed Integer (32-bit)"
MODBUSIP	real_typ	Real type management	HR	116 (0074)h	"Signed Integer (32-bit)"
GENCONF	curr_sel	Current Limit Select	HR	118 (0076)h	"IEEE Float (32-bit)"
GENCONF	curr_ful	CurrentLimit at 100%	HR	120 (0078)h	"IEEE Float (32-bit)"
GENUNIT	SP_OCC	Setpoint Occupied?	IR	0 (0000)h	"Signed Integer (32-bit)"
GENUNIT	CHIL_S_S	Net.: Cmd Start/Stop	IR	2 (0002)h	"Signed Integer (32-bit)"
GENUNIT	CHIL_OCC	Net.: Cmd Occupied	IR	4 (0004)h	"Signed Integer (32-bit)"
GENUNIT	EMSTOP	Emergency Stop	IR	6 (0006)h	"Signed Integer (32-bit)"
GENUNIT	CTRL_TYP	Local=0 Net.=1 Remote=2	IR	8 (0008)h	"Signed Integer (32-bit)"
GENUNIT	STATUS	Run Status	IR	10 (000A)h	"Signed Integer (32-bit)"
GENUNIT	min_left	Minutes Left for Start	IR	12 (000C)h	"IEEE Float (32-bit)"
GENUNIT	HEATCOOL	Heat/Cool status	IR	14 (000E)h	"Signed Integer (32-bit)"
GENUNIT	SP_SEL	Setpoint Select	IR	16 (0010)h	"Signed Integer (32-bit)"
GENUNIT	CAP_T	Percent Total Capacity	IR	18 (0012)h	"Signed Integer (32-bit)"
LOADFACT	cap_t_a	Actual Capacity cir A	IR	20 (0014)h	"Signed Integer (32-bit)"
LOADFACT	cap_t_b	Actual Capacity cir B	IR	22 (0016)h	"Signed Integer (32-bit)"
GENUNIT	DEM_LIM	Active Demand Limit Val	IR	24 (0018)h	"Signed Integer (32-bit)"
GENUNIT	sp	Current Setpoint	IR	26 (001A)h	"IEEE Float (32-bit)"
GENUNIT	CTRL_PNT	Control Point	IR	28 (001C)h	"IEEE Float (32-bit)"
UNIT	ALM	Alarm Status	IR	30 (001E)h	"Signed Integer (32-bit)"

MODBUSRS	modrt_en	RTU Server Enable	IR	32 (0020)h	"Signed Integer (32-bit)"
MODBUSRS	ser_UID	Server UID	IR	34 (0022)h	"Signed Integer (32-bit)"
MODBUSRS	baudrate	Baudrate	IR	40 (0028)h	"Signed Integer (32-bit)"
MODBUSRS	parity	Parity	IR	42 (002A)h	"Signed Integer (32-bit)"
MODBUSRS	stop_bit	Stop bit	IR	44 (002C)h	"Signed Integer (32-bit)"
LOADFACT	ctrl_avg	Average Ctrl Water Temp	IR	46 (002E)h	"IEEE Float (32-bit)"
TEMP	COOL_EWT	Cooler Entering Fluid	IR	48 (0030)h	"IEEE Float (32-bit)"
TEMP	COOL_LWT	Cooler Leaving Fluid	IR	50 (0032)h	"IEEE Float (32-bit)"
TEMP	OAT	External Temperature	IR	52 (0034)h	"IEEE Float (32-bit)"
TEMP	CHWSTEMP	CHWS Temperature	IR	54 (0036)h	"IEEE Float (32-bit)"
TEMP	SCT_A	Saturated Cond Tmp cir A	IR	56 (0038)h	"IEEE Float (32-bit)"
TEMP	SST_A	Saturated Suction Temp A	IR	58 (003A)h	"IEEE Float (32-bit)"
TEMP	SCT_B	Saturated Cond Tmp cir B	IR	60 (003C)h	"IEEE Float (32-bit)"
TEMP	SST_B	Saturated Suction Temp B	IR	62 (003E)h	"IEEE Float (32-bit)"
DEFROST2	DEFRT_A	Defrost Temperature A 1	IR	64 (0040)h	"IEEE Float (32-bit)"
DEFROST2	DEFRT_B	Defrost Temperature B 1	IR	66 (0042)h	"IEEE Float (32-bit)"
TEMP	SUCT_A	Compressor Suction Tmp A	IR	68 (0044)h	"IEEE Float (32-bit)"
TEMP	SUCT_B	Compressor Suction Tmp B	IR	70 (0046)h	"IEEE Float (32-bit)"
EXV_CTRL	SH_A	Suction Superheat A	IR	72 (0048)h	"IEEE Float (32-bit)"
EXV_CTRL	SH_B	Suction Superheat B	IR	74 (004A)h	"IEEE Float (32-bit)"
TEMP	CHWSHEAT	CHWS Heat Temp	IR	78 (004E)h	"IEEE Float (32-bit)"
TEMP	COND_EWT	Condenser Entering Fluid	IR	80 (0050)h	"IEEE Float (32-

					bit)"
TEMP	COND_LWT	Condenser Leaving Fluid	IR	82 (0052)h	"IEEE Float (32-bit)"
TEMP	DGT_A	Discharge Gas Temp cir A	IR	84 (0054)h	"IEEE Float (32-bit)"
TEMP	DGT_B	Discharge Gas Temp cir B	IR	86 (0056)h	"IEEE Float (32-bit)"
TEMP	SPACETMP	Optional Space Temp	IR	92 (005C)h	"IEEE Float (32-bit)"
PRESSURE	DP_A	Discharge Pressure A	IR	94 (005E)h	"IEEE Float (32-bit)"
PRESSURE	SP_A	Main Suction Pressure A	IR	96 (0060)h	"IEEE Float (32-bit)"
PRESSURE	DP_B	Discharge Pressure B	IR	98 (0062)h	"IEEE Float (32-bit)"
PRESSURE	SP_B	Main Suction Pressure B	IR	100 (0064)h	"IEEE Float (32-bit)"
PUMPSTAT	watpres1	Water pres before cooler	IR	102 (0066)h	"IEEE Float (32-bit)"
PUMPSTAT	watpres2	Water pres after cooler	IR	104 (0068)h	"IEEE Float (32-bit)"
INPUTS	ONOFF_SW	Remote On/Off Switch	IR	106 (006A)h	"Signed Integer (32-bit)"
INPUTS	HC_SW	Remote HeatCool Switch	IR	108 (006C)h	"Signed Integer (32-bit)"
INPUTS	SETP_SW	Remote Setpoint Switch	IR	112 (0070)h	"Signed Integer (32-bit)"
INPUTS	LIM_SW1	Limit Switch 1	IR	114 (0072)h	"Signed Integer (32-bit)"
INPUTS	LIM_SW2	Limit Switch 2	IR	116 (0074)h	"Signed Integer (32-bit)"
PUMPSTAT	FLOW_SW	Cooler Flow Switch	IR	118 (0076)h	"Signed Integer (32-bit)"
INPUTS	REM_LOCK	Customer Interlock	IR	136 (0088)h	"Signed Integer (32-bit)"
OUTPUTS	hd_pos_a	Head Press Act Pos A	IR	156 (009C)h	"IEEE Float (32-bit)"
OUTPUTS	hd_pos_b	Head Press Act Pos B	IR	158 (009E)h	"IEEE Float (32-bit)"
EXV_CTRL	EXV_A	EXV Position Circuit A	IR	160 (00A0)h	"IEEE Float (32-bit)"
EXV_CTRL	EXV_B	EXV Position Circuit B	IR	162 (00A2)h	"IEEE Float (32-bit)"

OUTPUTS	RV_A	4 Way Refrig Valve A	IR	168 (00A8)h	"Signed Integer (32-bit)"
OUTPUTS	RV_B	4 Way Refrig Valve B	IR	170 (00AA)h	"Signed Integer (32-bit)"
OUTPUTS	COOLHEAT	Cooler Heater Command	IR	174 (00AE)h	"Signed Integer (32-bit)"
OUTPUTS	COMP_A	Compressor A	IR	182 (00B6)h	"Signed Integer (32-bit)"
OUTPUTS	COMP_B	Compressor B	IR	190 (00BE)h	"Signed Integer (32-bit)"
OUTPUTS	ALARM	Alarm Relay Status	IR	222 (00DE)h	"Signed Integer (32-bit)"
OUTPUTS	RUNNING	Running Relay Status	IR	224 (00E0)h	"Signed Integer (32-bit)"
OUTPUTS	ALERT	Alert Relay State	IR	226 (00E2)h	"Signed Integer (32-bit)"
OUTPUTS	SHUTDOWN	Shutdown Indicator State	IR	228 (00E4)h	"Signed Integer (32-bit)"
PUMPSTAT	SET_FLOW	Cooler Flow Setpoint Out	IR	230 (00E6)h	"Signed Integer (32-bit)"
OUTPUTS	FAN_ST_A	Fan Staging Number A	IR	232 (00E8)h	"Signed Integer (32-bit)"
OUTPUTS	FAN_ST_B	Fan Staging Number B	IR	234 (00EA)h	"Signed Integer (32-bit)"
PUMPSTAT	CPUMP_1	Cooler Pump #1 Command	IR	240 (00F0)h	"Signed Integer (32-bit)"
PUMPSTAT	CPUMP_2	Cooler Pump #2 Command	IR	242 (00F2)h	"Signed Integer (32-bit)"
PUMPSTAT	HPUMP_1	Condenser Pump Command1	IR	244 (00F4)h	"Signed Integer (32-bit)"
PUMPSTAT	HPUMP_2	Condenser Pump Command2	IR	246 (00F6)h	"Signed Integer (32-bit)"
PUMPSTAT	ROTCPUMP	Rotate Cooler Pumps ?	IR	248 (00F8)h	"Signed Integer (32-bit)"
PUMPSTAT	wat_flow	Water flow	IR	268 (010C)h	"IEEE Float (32-bit)"
PUMPSTAT	cool_pwr	Cooling power	IR	274 (0112)h	"IEEE Float (32-bit)"
RUNTIME	HR_MACH	Machine Operating Hours	IR	294 (0126)h	"IEEE Float (32-bit)"
RUNTIME	st_mach	Machine Starts Number	IR	296 (0128)h	"IEEE Float (32-bit)"
RUNTIME	hr_cp_a	Compressor A Hours	IR	298 (012A)h	"IEEE Float (32-

					bit)"
RUNTIME	hr_cp_b	Compressor B Hours	IR	306 (0132)h	"IEEE Float (32-bit)"
RUNTIME	st_cp_a	Compressor A Starts	IR	314 (013A)h	"IEEE Float (32-bit)"
RUNTIME	st_cp_b	Compressor B Starts	IR	322 (0142)h	"IEEE Float (32-bit)"
RUNTIME	hr_cpum1	Cooler Pump #1 Hours	IR	330 (014A)h	"IEEE Float (32-bit)"
RUNTIME	hr_cpum2	Cooler Pump #2 Hours	IR	332 (014C)h	"IEEE Float (32-bit)"
MODES	m_demlim	Demand limit Active	IR	370 (0172)h	"Signed Integer (32-bit)"
MODES	m_ice	Ice Mode In Effect	IR	394 (018A)h	"Signed Integer (32-bit)"
GENCONF	lead_cir	Cir Priority Sequence	IR	428 (01AC)h	"Signed Integer (32-bit)"
GENCONF	off_on_d	Unit Off to On Delay	IR	434 (01B2)h	"Signed Integer (32-bit)"
GENCONF	nh_limit	Night Capacity Limit	IR	436 (01B4)h	"Signed Integer (32-bit)"
GENCONF	nh_start	Night Mode Start Hour	IR	438 (01B6)h	"Signed Integer (32-bit)"
GENCONF	nh_end	Night Mode End Hour	IR	440 (01B8)h	"Signed Integer (32-bit)"
GENCONF	ice_cnfg	Ice Mode Enable	IR	446 (01BE)h	"Signed Integer (32-bit)"
RESETCFG	both_sel	HSM Both Command Select	IR	448 (01C0)h	"Signed Integer (32-bit)"
RESETCFG	auto_sel	Auto Changeover Select	IR	450 (01C2)h	"Signed Integer (32-bit)"
GENCONF	lim_sel	Demand Limit Type Select	IR	452 (01C4)h	"Signed Integer (32-bit)"
RESETCFG	heat_th	Heating OAT threshold	IR	454 (01C6)h	"IEEE Float (32-bit)"
PUMPCONF	cpumpseq	Cooler Pumps Sequence	IR	456 (01C8)h	"Signed Integer (32-bit)"
PUMPCONF	hpumpseq	Condenser Pumps Sequence	IR	458 (01CA)h	"Signed Integer (32-bit)"
FACTORY	unit_typ	Unit Type (Heatpump = 2)	IR	484 (01E4)h	"Signed Integer (32-bit)"
FACTORY	unitsize	Unit Capacity	IR	486 (01E6)h	"Signed Integer (32-bit)"

FACTORY	leak_chk	Leakage Charge Detection	IR	514 (0202)h	"Signed Integer (32-bit)"
FACTORY	emm_opt	Energy Management Module	IR	522 (020A)h	"Signed Integer (32-bit)"
FACTORY	recl_opt	Air Cooled Reclaim Sel	IR	524 (020C)h	"Signed Integer (32-bit)"
FACTORY	freecool	Free Cooling Select	IR	526 (020E)h	"Signed Integer (32-bit)"
MAINTCFG	s_alert	Servicing Alert	IR	540 (021C)h	"Signed Integer (32-bit)"
MST_SLV	ms_sel	Master/Slave Select	IR	554 (022A)h	"Signed Integer (32-bit)"
MST_SLV	ms_ctrl	Master Control Type	IR	556 (022C)h	"Signed Integer (32-bit)"
MST_SLV	slv_addr	Slave Address	IR	558 (022E)h	"Signed Integer (32-bit)"
MST_SLV	lag_mini	Lag Minimum Running Time	IR	562 (0232)h	"Signed Integer (32-bit)"
MST_SLV	lag_pump	Lag Unit Pump Control	IR	570 (023A)h	"Signed Integer (32-bit)"
MST_SLV	ll_serie	Chiller In Series	IR	574 (023E)h	"Signed Integer (32-bit)"
M_MSTSLV	ms_activ	Master/Slave Ctrl Active	IR	578 (0242)h	"Signed Integer (32-bit)"
M_MSTSLV	lead_sel	Lead Unit is the:	IR	580 (0244)h	"Signed Integer (32-bit)"
M_MSTSLV	slv_stat	Slave Chiller State	IR	582 (0246)h	"Signed Integer (32-bit)"
M_MSTSLV	slv_capt	Slave Chiller Total Cap	IR	584 (0248)h	"Signed Integer (32-bit)"
M_MSTSLV	ms_error	Master/Slave Error	IR	594 (0252)h	"Signed Integer (32-bit)"
M_MSTSLV	cap_max	Max Available Capacity ?	IR	596 (0254)h	"Signed Integer (32-bit)"
M_MSTSLV	slav_ewt	Slave Cooler Ent. Fluid	IR	602 (025A)h	"IEEE Float (32-bit)"
M_MSTSLV	slav_lwt	Slave Cooler Leav. Fluid	IR	604 (025C)h	"IEEE Float (32-bit)"
FACTORY	flui_typ	Cooler Fluid Type	IR	606 (025E)h	"Signed Integer (32-bit)"
SERVICE1	ewt_opt	Entering Fluid Control	IR	608 (0260)h	"Signed Integer (32-bit)"
SERVICE1	hd_pg	Prop PID gain Varifan	IR	610 (0262)h	"IEEE Float (32-

					bit)"
SERVICE1	hd_ig	Int PID gain Varifan	IR	612 (0264)h	"IEEE Float (32-bit)"
SERVICE1	hd_dg	Deri PID gain Varifan	IR	614 (0266)h	"IEEE Float (32-bit)"
SERVICE1	hp_th	High Pressure Threshold	IR	622 (026E)h	"IEEE Float (32-bit)"
SERVICE1	heatersp	Cooler Heater Delta Spt	IR	624 (0270)h	"IEEE Float (32-bit)"
SERVICE1	freezesp	Brine Freeze Setpoint	IR	628 (0274)h	"IEEE Float (32-bit)"
SERVICE1	mini_lwt	Brine Minimum fluid temp	IR	630 (0276)h	"IEEE Float (32-bit)"
LOADFACT	ctrl_avg	Average Ctrl Water Temp	IR	720 (02D0)h	"IEEE Float (32-bit)"
LOADFACT	diff_wt	Differential Water Temp	IR	722 (02D2)h	"IEEE Float (32-bit)"
LOADFACT	delta_t	Water Delta T	IR	724 (02D4)h	"IEEE Float (32-bit)"
LAST_POR	date_on1	Power On 1 :day-mon-year	IR	892 (037C)h	"IEEE Float (32-bit)"
LAST_POR	time_on1	Power On 1 :hour-minute	IR	894 (037E)h	"IEEE Float (32-bit)"
LAST_POR	date_of1	PowerDown 1:day-mon-year	IR	896 (0380)h	"IEEE Float (32-bit)"
LAST_POR	time_of1	PowerDown 1:hour-minute	IR	898 (0382)h	"IEEE Float (32-bit)"
LAST_POR	date_on2	Power On 2 :day-mon-year	IR	900 (0384)h	"IEEE Float (32-bit)"
LAST_POR	time_on2	Power On 2 :hour-minute	IR	902 (0386)h	"IEEE Float (32-bit)"
LAST_POR	date_of2	PowerDown 2:day-mon-year	IR	904 (0388)h	"IEEE Float (32-bit)"
LAST_POR	time_of2	PowerDown 2:hour-minute	IR	906 (038A)h	"IEEE Float (32-bit)"
LAST_POR	date_on3	Power On 3 :day-mon-year	IR	908 (038C)h	"IEEE Float (32-bit)"
LAST_POR	time_on3	Power On 3 :hour-minute	IR	910 (038E)h	"IEEE Float (32-bit)"
LAST_POR	date_of3	PowerDown 3:day-mon-year	IR	912 (0390)h	"IEEE Float (32-bit)"
LAST_POR	time_of3	PowerDown 3:hour-minute	IR	914 (0392)h	"IEEE Float (32-bit)"

LAST_POR	date_on4	Power On 4 :day-mon-year	IR	916 (0394)h	"IEEE Float (32-bit)"
LAST_POR	time_on4	Power On 4 :hour-minute	IR	918 (0396)h	"IEEE Float (32-bit)"
LAST_POR	date_of4	PowerDown 4:day-mon-year	IR	920 (0398)h	"IEEE Float (32-bit)"
LAST_POR	time_of4	PowerDown 4:hour-minute	IR	922 (039A)h	"IEEE Float (32-bit)"
LAST_POR	date_on5	Power On 5 :day-mon-year	IR	924 (039C)h	"IEEE Float (32-bit)"
LAST_POR	time_on5	Power On 5 :hour-minute	IR	926 (039E)h	"IEEE Float (32-bit)"
LAST_POR	date_of5	PowerDown 5:day-mon-year	IR	928 (03A0)h	"IEEE Float (32-bit)"
LAST_POR	time_of5	PowerDown 5:hour-minute	IR	930 (03A2)h	"IEEE Float (32-bit)"
PR_LIMIT	sdtlim_a	Discharge A Gas Limit	IR	934 (03A6)h	"IEEE Float (32-bit)"
PR_LIMIT	sdtlim_b	Discharge B Gas Limit	IR	944 (03B0)h	"IEEE Float (32-bit)"
SERMAINT	S_RESET	Reset Maintenance Alert	IR	952 (03B8)h	"Signed Integer (32-bit)"
SERMAINT	s_date1	Date numeric	IR	958 (03BE)h	"IEEE Float (32-bit)"
SERMAINT	s_hour1	Hour mntn numeric	IR	960 (03C0)h	"Signed Integer (32-bit)"
SERMAINT	s_days1	Days running numeric	IR	962 (03C2)h	"Signed Integer (32-bit)"
SERMAINT	f_date1	Fgas Date numeric	IR	964 (03C4)h	"IEEE Float (32-bit)"
ALARMRST	alarm_1c	Current Alarm 1	IR	968 (03C8)h	"Signed Integer (32-bit)"
ALARMRST	alarm_2c	Current Alarm 2	IR	970 (03CA)h	"Signed Integer (32-bit)"
ALARMRST	alarm_3c	Current Alarm 3	IR	972 (03CC)h	"Signed Integer (32-bit)"
ALARMRST	alarm_4c	Current Alarm 4	IR	974 (03CE)h	"Signed Integer (32-bit)"
ALARMRST	alarm_5c	Current Alarm 5	IR	976 (03D0)h	"Signed Integer (32-bit)"
INPUTS	ICE_SW	Ice Done Storage Switch	IR	996 (03E4)h	"Signed Integer (32-bit)"
OUTPUTS	CAPT_010	Chiller Capacity signal	IR	1006 (03EE)h	"IEEE Float (32-

					bit)"
MODBUSIP	modip_en	TCP/IP Server Enable	IR	1032 (0408)h	"Signed Integer (32-bit)"
MODBUSIP	ser_UID	Server UID	IR	1034 (040A)h	"Signed Integer (32-bit)"
MODBUSIP	port_nbr	Port Number	IR	1036 (040C)h	"Signed Integer (32-bit)"
GENUNIT	TOT_CURR	Actual Chiller Current	IR	1154 (0482)h	"IEEE Float (32-bit)"
PUMPSTAT	ROTHPUMP	Rotate Condenser Pumps ?	IR	1180 (049C)h	"Signed Integer (32-bit)"
PUMPSTAT	CONDFLOW	Condenser Flow Status	IR	1182 (049E)h	"Signed Integer (32-bit)"
FACTORY	cond_val	Condenser Water Val Sel	IR	1302 (0516)h	"Signed Integer (32-bit)"
FACTORY	max_clwt	Max condenser LWT=45degC	IR	1306 (051A)h	"Signed Integer (32-bit)"
FACTORY	highcond	High Condensing Select	IR	1308 (051C)h	"Signed Integer (32-bit)"
FACTORY	cpass_nb	Cooler pass number	IR	1310 (051E)h	"Signed Integer (32-bit)"
HR	PARTIAL_DOWNTIME	Cumulated Downtime when alarm state is partial	IR	1314 (0522)h	"IEEE Float (32-bit)"
HR	TOTAL_DOWNTIME	Cumulated Downtime when alarm state is tripout	IR	1316 (0524)h	"IEEE Float (32-bit)"
GENUNIT	CURR_LIM	Chiller Current Limit	IR	1324 (052C)h	"IEEE Float (32-bit)"
TEMP	SCT_C	Saturated Cond Tmp cir C	IR	1326 (052E)h	"IEEE Float (32-bit)"
TEMP	SST_C	Saturated Suction Temp C	IR	1328 (0530)h	"IEEE Float (32-bit)"
TEMP	SUCT_C	Compressor Suction Tmp C	IR	1330 (0532)h	"IEEE Float (32-bit)"
TEMP	DGT_C	Discharge Gas Temp cir C	IR	1332 (0534)h	"IEEE Float (32-bit)"
TEMP	CP_TMP_A	Motor Temperature cir A	IR	1334 (0536)h	"IEEE Float (32-bit)"
TEMP	CP_TMP_B	Motor Temperature cir B	IR	1336 (0538)h	"IEEE Float (32-bit)"
TEMP	CP_TMP_C	Motor Temperature cir C	IR	1338 (053A)h	"IEEE Float (32-bit)"
TEMP	T_HEATER	Cooler Heater Temp	IR	1340 (053C)h	"IEEE Float (32-bit)"

TEMP	T_HEAT_C	Circuit C Heater Temp	IR	1342 (053E)h	"IEEE Float (32-bit)"
TEMP	ECO_TP_A	Economizer Gas Temp A	IR	1344 (0540)h	"IEEE Float (32-bit)"
TEMP	ECO_TP_B	Economizer Gas Temp B	IR	1346 (0542)h	"IEEE Float (32-bit)"
TEMP	ECO_TP_C	Economizer Gas Temp C	IR	1348 (0544)h	"IEEE Float (32-bit)"
TEMP	dc_lwt	Dry Cool Leav Water Tmp	IR	1350 (0546)h	"IEEE Float (32-bit)"
PRESSURE	OP_A	Oil Pressure A	IR	1352 (0548)h	"IEEE Float (32-bit)"
PRESSURE	OP_B	Oil Pressure B	IR	1354 (054A)h	"IEEE Float (32-bit)"
PRESSURE	OP_C	Oil Pressure C	IR	1356 (054C)h	"IEEE Float (32-bit)"
PRESSURE	DOP_A	Oil Pressure DifferenceA	IR	1358 (054E)h	"IEEE Float (32-bit)"
PRESSURE	DOP_B	Oil Pressure DifferenceB	IR	1360 (0550)h	"IEEE Float (32-bit)"
PRESSURE	DOP_C	Oil Pressure DifferenceC	IR	1362 (0552)h	"IEEE Float (32-bit)"
PRESSURE	ECON_P_A	Economizer Pressure A	IR	1364 (0554)h	"IEEE Float (32-bit)"
PRESSURE	ECON_P_B	Economizer Pressure B	IR	1366 (0556)h	"IEEE Float (32-bit)"
PRESSURE	ECON_P_C	Economizer Pressure C	IR	1368 (0558)h	"IEEE Float (32-bit)"
PRESSURE	DP_C	Discharge Pressure C	IR	1370 (055A)h	"IEEE Float (32-bit)"
PRESSURE	SP_C	Main Suction Pressure C	IR	1372 (055C)h	"IEEE Float (32-bit)"
INPUTS	RECL_SW	Remote Reclaim Switch	IR	1374 (055E)h	"Signed Integer (32-bit)"
INPUTS	FC_SW	Free Cooling Disable Sw	IR	1376 (0560)h	"Signed Integer (32-bit)"
INPUTS	OIL_L_A	Oil Level Input A	IR	1378 (0562)h	"Signed Integer (32-bit)"
INPUTS	OIL_L_B	Oil Level Input B	IR	1380 (0564)h	"Signed Integer (32-bit)"
INPUTS	OIL_L_C	Oil Level Input C	IR	1382 (0566)h	"Signed Integer (32-bit)"
INPUTS	CURREN_A	Motor Current A	IR	1384 (0568)h	"IEEE Float (32-

					bit)"
INPUTS	CURREN_B	Motor Current B	IR	1386 (056A)h	"IEEE Float (32-bit)"
INPUTS	CURREN_C	Motor Current C	IR	1388 (056C)h	"IEEE Float (32-bit)"
INPUTS	ELEC_BOX	Electrical Box Interlock	IR	1390 (056E)h	"Signed Integer (32-bit)"
INPUTS	HEATR_SW	Cooler Heater Feedback	IR	1392 (0570)h	"Signed Integer (32-bit)"
OUTPUTS	OIL_SL_A	Oil Solenoid Output A	IR	1400 (0578)h	"Signed Integer (32-bit)"
OUTPUTS	SLID_1_A	Slide Valve 1 Output A	IR	1402 (057A)h	"Signed Integer (32-bit)"
OUTPUTS	SLID_2_A	Slide Valve 2 Output A	IR	1404 (057C)h	"Signed Integer (32-bit)"
OUTPUTS	CAPT010A	Capacity Signal Cir A	IR	1406 (057E)h	"IEEE Float (32-bit)"
OUTPUTS	OIL_SL_B	Oil Solenoid Output B	IR	1408 (0580)h	"Signed Integer (32-bit)"
OUTPUTS	SLID_1_B	Slide Valve 1 Output B	IR	1410 (0582)h	"Signed Integer (32-bit)"
OUTPUTS	SLID_2_B	Slide Valve 2 Output B	IR	1412 (0584)h	"Signed Integer (32-bit)"
OUTPUTS	CAPT010B	Capacity Signal Cir B	IR	1414 (0586)h	"IEEE Float (32-bit)"
OUTPUTS	COMP_C	Compressor C	IR	1416 (0588)h	"Signed Integer (32-bit)"
OUTPUTS	OIL_SL_C	Oil Solenoid Output C	IR	1418 (058A)h	"Signed Integer (32-bit)"
OUTPUTS	SLID_1_C	Slide Valve 1 Output C	IR	1420 (058C)h	"Signed Integer (32-bit)"
OUTPUTS	SLID_2_C	Slide Valve 2 Output C	IR	1422 (058E)h	"Signed Integer (32-bit)"
OUTPUTS	CAPT010C	Capacity Signal Cir C	IR	1424 (0590)h	"IEEE Float (32-bit)"
OUTPUTS	pos_3wv	Cond 3 Way Valve Pos	IR	1426 (0592)h	"IEEE Float (32-bit)"
OUTPUTS	COOLHEAT	Cooler Heater Command	IR	1428 (0594)h	"Signed Integer (32-bit)"
OUTPUTS	READY	Ready or Running Status	IR	1430 (0596)h	"Signed Integer (32-bit)"
OUTPUTS	cond_htr	Reclaim Condenser Heater	IR	1432 (0598)h	"Signed Integer (32-bit)"

OUTPUTS	iso_cl_a	Ball Valve Close Out A	IR	1434 (059A)h	"Signed Integer (32-bit)"
OUTPUTS	iso_op_a	Ball Valve Open Out A	IR	1436 (059C)h	"Signed Integer (32-bit)"
OUTPUTS	iso_cl_b	Ball Valve Close Out B	IR	1438 (059E)h	"Signed Integer (32-bit)"
OUTPUTS	iso_op_b	Ball Valve Open Out B	IR	1440 (05A0)h	"Signed Integer (32-bit)"
OUTPUTS	iso_cl_c	Ball Valve Close Out C	IR	1442 (05A2)h	"Signed Integer (32-bit)"
OUTPUTS	iso_op_c	Ball Valve Open Out C	IR	1444 (05A4)h	"Signed Integer (32-bit)"
OUTPUTS	FAN_ST_C	Fan Staging Number C	IR	1446 (05A6)h	"Signed Integer (32-bit)"
OUTPUTS	hd_pos_c	Head Press Act Pos C	IR	1448 (05A8)h	"IEEE Float (32-bit)"
OUTPUTS	OIL_HT_A	Oil Heater Output A	IR	1450 (05AA)h	"Signed Integer (32-bit)"
OUTPUTS	OIL_HT_B	Oil Heater Output B	IR	1452 (05AC)h	"Signed Integer (32-bit)"
OUTPUTS	OIL_HT_C	Oil Heater Output C	IR	1454 (05AE)h	"Signed Integer (32-bit)"
OUTPUTS	iso_refa	Ball Valve Position A	IR	1456 (05B0)h	"Signed Integer (32-bit)"