DAIKIN APPLIED EUROPE S.p.A.

BAS integration guide

Modbus protocol

Doc. Name:
D-EIGOC00203-21EN-DZ

Product name:
EWWD-DZ
EWWH-DZ

Control software name:
VORTEX

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1. Introduction

This document contains information to incorporate a MicroTech® III and Microtech 4 Unit Controllers into a building automation system (BAS) via Modbus communication protocols.

Microtech III and Microtech 4 are suitable for network integration. Data points accessible from a Modbus network are made available to a BAS provided that the proper communication module (Microtech III and Microtech 4) or the corresponding software option (Microtech 4) are installed / acrivated.

Modbus terms are not defined. Refer to the standard Modbus specifications for definitions and details about the protocol.

2. About this document

2.1 Revision History

Version	Date	Description
D-EIGOC00203-21EN-DZ	16/03/2021	Revision #2 • Document code changed • Added “Heat Setpoint Network” in the integration list
D-EOMOC00201-21EN-DZ	29/01/2021	First edition

2.2 Notice

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- **Modbus** from Schneider Electric (originally from Modicon)
- **MicroTech** III from Daikin Applied Europe.
- **MicroTech 4** from Daikin Applied Europe.

2.3 Before starting

Application range

This document refers to the following components:

Microtech III	Controller
Microtech 4	Controller
POL902.00/STD	Modbus MSTP module

Users

Users of this document are intended to be:

- Modbus systems integrators
- Service Technicians
- Plant Engineers
- Sales staff

Conventions

Microtech III e Microtech 4 further in this document and when proper will be referred to as “Microtech”

Abbreviation

BSP	**B**oard **S**upport **P**ackage (operating system)

References

- Siemens Building Technologies - CB1J3960en - **Modbus** communication, slave mode
- Siemens Building Technologies - CB1Q3934en - Climatix™ **Modbus** communication modules POL902.00
- The Modbus Organization - www.modbus.org

3. Safety information

Only personnel qualified in accordance with IEC (International Electrotechnical Commission) recommendations may be permitted access to electrical components. It is particularly recommended that all sources of electricity to the unit be shut off before any work is begun. Shut off main power supply at the main circuit breaker or isolator.

IMPORTANT: This equipment uses and emits electromagnetic signals. Tests have shown that the equipment conforms to all applicable codes with respect to electromagnetic compatibility.

	**RISK OF ELECTROCUTION: Even when the main circuit breaker or isolator is switched off, certain circuits may still be energized, since they may be connected to a separate power source.**
	**RISK OF BURNS: Electrical currents cause components to get hot either temporarily or permanently. Handle power cable, electrical cables and conduits, terminal box covers and motor frames with great care.**

Field of application



Use Modbus communication module only for control and monitoring functions in ventilation, air conditioning and refrigeration plants.

Intended use



Trouble-free and safe product operation of the above products presupposes transport, storage, mounting, installation, and commissioning as intended as well as careful operation.

Electrical installation



Fuses, switches, wiring and grounding must comply with local safety regulations for electrical installations.

Wiring



When wiring, strictly separate AC 230 V mains voltage from AC 24 V safety extralow voltage (SELV) to protect against electrical shock!

Commissioning and maintenance



Only qualified staff trained accordingly may prepare for use, commission, and maintain Modbus communication modules.

Maintenance of Modbus communication modules generally only means regular cleaning. We recommend removing dust and dirt from system components installed in the control panels during standard service.

Faults



Only authorized staff may diagnose and correct faults and recommission the plant. This applies to working within the panel as well (e.g. testing or changing fuses).

Storage and transport



Refer to the environmental conditions specified in the respective data sheets for storage and transport. If in doubt, contact your supplier.

Disposal



Devices contain electrical and electronic components; do not dispose of them in household garbage. Observe all local and applicable laws.

4. Commission this unit in a Modbus network

4.1 General information

Unit controller is a Microtech III or a POL638

Microtech III controller can be integrated in a Modbus network provided that it is equipped with the proper communication module. See “Communication modules” section below in this page.

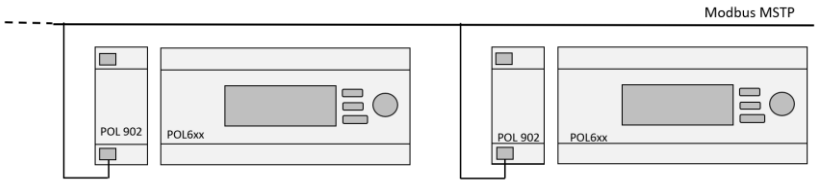
Unit controller is a Microtech 4

Microtech 4 controller can be integrated in a Modbus network provided one of the followings:

a) it is equipped with the proper communication module
b) the onboard communication has been made available (software option).

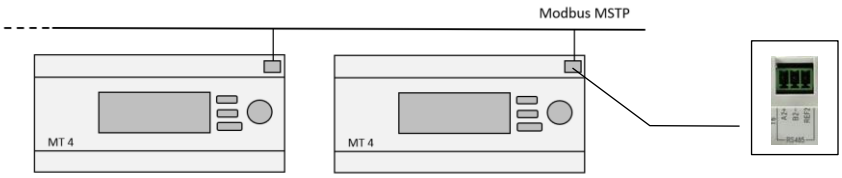
Modbus MSTP (POL902)

Communication module to configure Microtech controllers in Modbus network is the POL902:



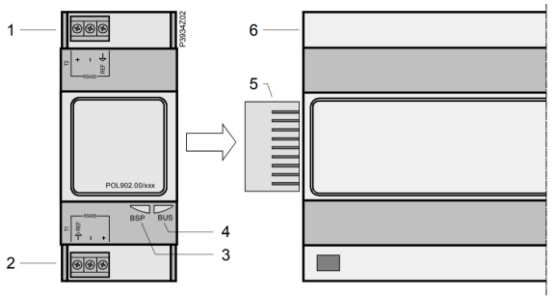
Communication software option

For Microtech 4, Modbus communication is also available onborad the controller as a software option.



4.2 Modbus MSTP module (POL902)

Module description



Part	Description
1	Modbus RS485 interface T1 (slave, channel 0).
2	Modbus RS485 interface T2 (slave, channel 1).
3	Status display "BSP" (Board Support Package).
4	Status display "BUS" (bus connections o.k. / bus traffic).
5	Plug connection "Communication extension bus".
6	Microtech III controller.

BSP Led

Color	Flashing frequency	Meaning
Green	Steady on	BSP operating and communication with controller working.
Yellow	Steady on	BSP operating, but no communication with controller.
Red	Steady on	Hardware fault.
Red/Yellow	Flashing at 1 Hz (1 second on/ 1 second off)	Upgrade mode running.
Red	Flashing at 2 Hz (0,5 second on/ 0,5 second off)	BSP error (software error).

BUS Led

Color	Flashing frequency	Meaning
Green	Steady on	Communication active.
Yellow	Steady on	Initializing
Red	Steady on	Communication interrupted.

Module connection

Step	Action
1	Power off the controller
2	Connect POL902 module to the controller via plug connection (part 5).
4	Power on the controller

Configuration procedure

Step	Action
1	Check that BUS led status is steady on green coloured.
2	Navigate the unit's keypad/display to the main menu page and set the "service" password
3	Navigate the unit's keypad/display following the path below: **Main menu→Commissioning→Modbus**
4	Set parameters in the table below as needed according to the local network

Configuration parameters

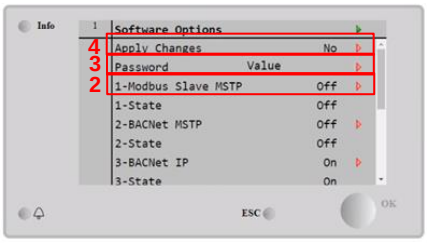
Parameter	Default value
Address T1	1
Parity T1	None
2 Stop bits T1	Yes
Baud rate T1	19200
Rspnce Dly T1	5 ms
Port T2	Passive
Address T2	1
Parity T2	None
2 Stop bits T2	Yes
Baud rate T2	19200
Rspnce Dly T2	5 ms

4.3 Modbus MSTP software option (Microtech 4)

Option enabling

1. From the HMI main menu choose:

Commissioning→ Configuration→ Software Options

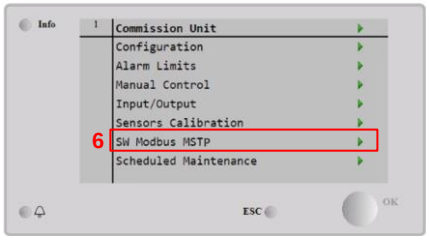


2. Select “On” for option #1-Modbus Slave MSTP
3. Insert the unlock password
4. Apply Changes

Option configuration

5. From the HMI main menu choose:

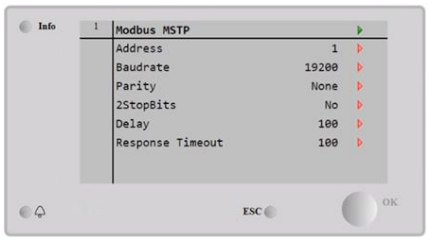
Commissioning→



6. Select “SW Modbus MSTP”

7. Select proper parameters for Modbus communication

Parameter	Default value
Address	Variable
Baudrate	19200
Parity	None
2StopBits	No
Delay	100 ms
Response Timeout	100 ms



5. VORTEX integration list

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Chiller Local/Remote	1	-	0 = Local 1 = Remote	1	Unsigned Word	1	R
Chiller Enable Status	2	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Run Enabled	3	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Capacity Limited	4	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Chiller Alarm	5	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Flow Status	6	-	0 = No flow 1 = Flow ok	1	Unsigned Word	1	R
Condenser Flow Status	7	-	0 = No flow 1 = Flow ok	1	Unsigned Word	1	R
Chiller On/Off Status	8	-	0 = Off 1 = On	1	Unsigned Word	1	R
Chiller Enable Setpoint	9	-	0 = No 1 = Yes	1	Unsigned Word	1	RW
Clear Alarm	10	-	0 = No 1 = Yes	1	Unsigned Word	1	RW
HVAC Mode Output[1]	11	-	0 = Ice 1 = Cool	1	Unsigned Word	1	R

[1] *It is the actual unit mode, determined by the input selection and the available modes of the unit. See note about "HVAC Mode Input setpoint.*

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
			2 = Heat 3=Pursuit 4=Cool/Heat Recovery				
Active Setpoint	12	°C	4.0..15.6	0.1	Signed Word	10	R
Actual Capacity	13	%	0.0..100.0	0.1	Unsigned Word	10	R
Capacity Limit Output	14	%	0.0..100.0	0.1	Unsigned Word	10	R
Chiller Status	15	-	0 = Off 1 = Start 2 = Run 3 = PreShutdown 4 = Service	1	Unsigned Word	1	R
Evaporator Entering Water Temp	16	°C	-	0.1	Signed Word	10	R
Evaporator Leving Water Temp	17	°C	-	0.1	Signed Word	10	R
Condenser Entering Water Temp	19	°C	-	0.1	Signed Word	10	R
Condenser Leaving Water Temp	20	°C	-	0.1	Signed Word	10	R
Energy Meter - Average Voltage	26	Volts	-	0.1	Signed Word	10	R
Energy Meter - Active Power	27	kW	-	0.1	Signed Word	10	R
Active Warning Index	28	-	See Annex 1	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Active Problem Index	29	-	See Annex 1	1	Unsigned Word	1	R
Active Fault Index	30	-	See Annex 1	1	Unsigned Word	1	R
Active Warning Code	31	-	See Annex 1	1	Unsigned Word	1	R
Active Problem Code	32	-	See Annex 1	1	Unsigned Word	1	R
Active Fault Code	33	-	See Annex 1	1	Unsigned Word	1	R
HVAC Mode Input[2]	34	-	1 = Ice 2 = Cool 3 = Heat 4 = Pursuit 5 = Cool/Heat Recovery	1	Unsigned Word	1	RW
Cool Setpoint Network	35	°C	-	0.1	Signed Word	10	RW
Heat Setpoint Network	37	°C	-	0.1	Signed Word	10	RW
Capacity Limit Input	38	%	0.0..100.0	0.1	Unsigned Word	10	RW
Condensing Refrigerant Pressure	39	kPa	-	0.1	Signed Word	10	R
Condensing Saturated Refrigerant Temperature	40	°C	-	0.1	Signed Word	10	R

[2] The set unit mode must be compliant with the unit actual available modes. The available modes setpoint is located in View/Set Unit submenu of the controller HMI.

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Evaporating Refrigerant Pressure	41	kPa	-	0.1	Signed Word	10	R
Evaporating Saturated Refrigerant Temperature	42	°C	-	0.1	Signed Word	10	R
Comp1 - Suction Temperature	65	°C	-	0.1	Signed Word	10	R
Comp2 - Suction Temperature	78	°C	-	0.1	Signed Word	10	R
Comp3 - Suction Temperature	143	°C	-	0.1	Signed Word	10	R
Comp1 - Discharge Temperature	68	°C	-	0.1	Signed Word	10	R
Comp2 - Discharge Temperature	81	°C	-	0.1	Signed Word	10	R
Comp3 - Discharge Temperature	146	°C	-	0.1	Signed Word	10	R
Comp1 - Motor Current	70	Amperes	-	1	Signed Word	1	R
Comp1 - Mains Voltage	71	Volts	-	0.1	Unsigned Word	10	R
Comp1 - Actual Power	72	kW	-	0.1	Signed Word	10	R
Comp1 - Starts	73	-	0...4294967292	1	Signed Word	1	R
Comp2 - Starts	86	-	0...4294967292	1	Signed Word	1	R
Comp3 - Starts	99	-	0...4294967292	1	Signed Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp1 - Run Hours	74	Hours	0...4294967292	1	Unsigned Long	1	R
Comp2 - Run Hours	87	Hours	0...4294967292	1	Unsigned Long	1	R
Comp3 - Run Hours	100	-	0...4294967292	1	Unsigned Long	1	R
Comp2 - Motor Current	83	Amperes	-	1	Signed Word	1	R
Comp2 - Mains Voltage	84	Volts	-	0.1	Unsigned Word	10	R
Comp2 - Actual Power	111	kW	-	0.1	Signed Word	10	R
Comp3 - Motor Current	96	Amperes	-	1	Signed Word	1	R
Comp3 - Mains Voltage	97	Volts	-	0.1	Unsigned Word	10	R
Comp3 - Actual Power	150	kW	-	0.1	Signed Word	10	R
Condenser Pump 1 Run Hours	297	Hours	0...4294967292	1	Unsigned Long	1	R
Condenser Pump 1 Status	299	-	0 = Off 1 = On	1	Unsigned Word	1	R
Condenser Pump 2 Run Hours	300	Hours	0...4294967292	1	Unsigned Long	1	R
Condenser Pump 2 Status	302	-	0 = Off 1 = On	1	Unsigned Word	1	R
Evaporator Pump 1 Run Hours	303	Hours	0...4294967292	1	Unsigned Long	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Evaporator Pump1 Status	305	-	0 = Off 1 = On	1	Unsigned Word	1	R
Evaporator Pump2 Run Hours	306	Hours	0…4294967292	1	Unsigned Long	1	R
Evaporator Pump 2 Status	308	-	0 = Off 1 = On	1	Unsigned Word	1	R
Year	309	-	-	1	Unsigned Word	1	RW
Month	310	-	-	1	Unsigned Word	1	RW
Day	311	-	-	1	Unsigned Word	1	RW
DayOfWeek	312	-	-	1	Unsigned Word	1	RW
Hour	313	-	-	1	Unsigned Word	1	RW
Minute	314	-	-	1	Unsigned Word	1	RW
Second	315	-	-	1	Unsigned Word	1	RW
Units Of Measure	316	-	0 = English 1 = Metric	1	Unsigned Word	1	RW
Chiller Model	317	-	0 = Centrifugal 1 = Water Cooled 2 = Air Cooled 3 = HeatPump	1	Unsigned Word	1	R
Unit Location1	318	-	-	1	Unsigned Word	1	RW

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Unit Location2	319	-	-	1	Unsigned Word	1	RW
Unit Location3	320	-	-	1	Unsigned Word	1	RW
Unit Location4	321	-	-	1	Unsigned Word	1	RW
Unit Location5	322	-	-	1	Unsigned Word	1	RW
Unit Location6	323	-	-	1	Unsigned Word	1	RW
Unit Location7	324	-	-	1	Unsigned Word	1	RW
Unit Location8	325	-	-	1	Unsigned Word	1	RW
Unit Location9	326	-	-	1	Unsigned Word	1	RW
Unit Location10	327	-	-	1	Unsigned Word	1	RW
Application ID1	334	-	-	1	Unsigned Word	1	R
Application ID2	335	-	-	1	Unsigned Word	1	R
Application ID3	336	-	-	1	Unsigned Word	1	R
Application ID4	337	-	-	1	Unsigned Word	1	R
Application ID5	338	-	-	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp1 - Alarm Active	914	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Condenser Entering Water Temp Sensor fault	365	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Alarm Active	366	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - Alarm Active	367	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Condenser Leaving Water Temp Sensor fault	368	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Bad setpoint override warning	377	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Bad demand limit warning	378	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - Power Loss	384	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Condenser Pump 1 fault	428	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Condenser Pump 2 fault	429	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Pump 1 fault	430	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Pump 2 fault	431	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - High Motor Amps	447	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - High Motor Amps	449	-	0 = No 1 = Yes	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp3 - High Motor Amps	451	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - High Motor Temp	478	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - High Motor Temp	479	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - High Motor Temp	480	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Condenser Freeze Alarm	514	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Condenser flow loss	515	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - High Discharge Temperature	535	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - High Discharge Temperature	536	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - High Discharge Temperature	537	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Flow Loss	542	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Freeze Alarm	543	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Leaving Water temp sensor fault	589	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - Suction Temperature sensor fault	698	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Suction Temperature sensor fault	699	-	0 = No 1 = Yes	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp3 - Suction Temperature sensor fault	700	-	0 = No 1 = Yes	1	Unsigned Word	1	R
EEXV extension fault	723	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Unit Power Restore	740	-	0 = No 1 = Yes	1	Unsigned Word	1	R
External Event	745	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Unit Board Offline	746	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Entering water temperature sensor fault	755	-	0 = No 1 = Yes	1	Unsigned Word	1	R
CPMState	765	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - Vfd Comm Fail	774	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Vfd Comm Fail	776	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - Vfd Comm Fail	778	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Leakage Alarm	797	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Emergency stop alarm	798	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Evaporator Inverted temps alarm	799	-	0 = No 1 = Yes	1	Unsigned Word	1	R
External Alarm	800	-	0 = No 1 = Yes	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp1 - Low Discharge SuperHeat alarm	808	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Low Discharge SuperHeat alarm	809	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - Low Discharge SuperHeat alarm	811	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Option Extension Fault	815	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - Economizer Pressure	862	kPa	-	0.1	Signed Word	10	R
Comp2 - Economizer Pressure	863	kPa	-	0.1	Signed Word	10	R
Comp3 - Economizer Pressure	864	kPa	-	0.1	Signed Word	10	R
Energy Meter Communication fault	898	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - BMC fault	908	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - BMC fault	909	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - BMC fault	910	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - Check Valve fault	912	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Check Valve fault	913	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - Check Valve fault	457	-	0 = No 1 = Yes	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp1 - Discharge Pressure sensor fault	920	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Discharge Pressure sensor fault	921	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - Discharge Pressure sensor fault	922	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - Suction Pressure sensor fault	461	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Suction Pressure sensor fault	462	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - Suction Pressure sensor fault	463	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp1 - Vfd fault	928	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp2 - Vfd fault	929	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Comp3 - Vfd fault	930	-	0 = No 1 = Yes	1	Unsigned Word	1	R
Refrigerant Type	1606	-	0 = R22 1 = R134a2 2 = R407c 3 = R410a 4 = R1234ze 5 = R513a	1	Unsigned Word	1	R
Number of compressors	1608	-	-	1	Unsigned Word	1	R
Chiller Tons	1609	-	-	1	Signed Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp3 - IGV Opening percentage	1817	%	0.0..100.0	0.1	Unsigned Word	10	R
Comp3 - Actual Speed	1818	rpm	-	1	Unsigned Word	1	R
Comp3 - Status	1825	0	See Comp1	1	Unsigned Word	1	R
Comp2 - IGV Opening percentage	1830	%	0.0..100.0	0.1	Unsigned Word	10	R
Comp2 - Actual Speed	1831	rpm	-	1	Unsigned Word	1	R
Comp2 - Status	1838	0	See Comp1	1	Unsigned Word	1	R
Comp1 - Actual Capacity	1840	%	0.0..100.0	0.1	Unsigned Word	10	R
Comp2 - Actual Capacity	1800	%	0.0..100.0	0.1	Unsigned Word	10	R
Comp3 - Actual Capacity	1761	%	0.0..100.0	0.1	Unsigned Word	10	R
Comp1 - IGV Opening percentage	1844	%	0.0..100.0	0.1	Unsigned Word	10	R
Comp1 - Actual Speed	1845	rpm	-	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp1 - Status	1852	0	0 = 'Interlock Open' 1 = 'Interlock Closed' 2 = 'Compressor Idle' 3 = 'Normal Operation' 4 = 'Minimum IGV Position' 5 = 'Maximum Capacity' 6 = 'Ramping Up' 7 = 'Part Vane Operation' 8 = 'Locked Out'	1	Unsigned Word	1	R
Energy Meter - Active Energy	1900	kW	-	0.1	Unsigned Long	10	R
Energy Meter - CosPhi	1902	-	-1..1	0.1	Signed Word	10	R
EXV Position	1982	%	0.0..100.0	0.1	Unsigned Word	10	R
Liquid Temperature	1984	°C	-	0.1	Signed Word	10	R
Condenser Approach Temperature	1987	°C	-	0.1	Signed Word	10	R
Evaporator Approach Temperature	1988	°C	-	0.1	Unsigned Word	10	R
HeatSptNetwrkMod'	37	°C	25.0...65.0	0.1	Signed Word	10	RW
NumberCircuits'	1607	-	-	1	Unsigned Word	1	R
Comp1 - Sensor fault	915	-	-	1	Unsigned Word	1	R

Name	Holding Register (4xxxx)	Measure Units	Value range	Accuracy	Data Type	Gain	R/W
Comp1 - Over Voltage	925	-	-	1	Unsigned Word	1	R
Comp1 - Under Voltage	935	-	-	1	Unsigned Word	1	R
Comp1 - Power Loss	916	-	-	1	Unsigned Word	1	R
Comp2 - Sensor fault	926	-	-	1	Unsigned Word	1	R
Comp2 - Over Voltage	936	-	-	1	Unsigned Word	1	R
Comp2 - Under Voltage	385	-	-	1	Unsigned Word	1	R
Comp2 - Power Loss	917	-	-	1	Unsigned Word	1	R
Comp3 - Sensor fault	927	-	-	1	Unsigned Word	1	R
Comp3 - Over Voltage	937	-	-	1	Unsigned Word	1	R
Comp3 - Under Voltage	386	-	-	1	Unsigned Word	1	R

6. Annex 1 - Alarming

Data point	Holding Register	Values
Fault Alarm Code	33	0=No Alarms 32551=COMP SHUTDOWN–Low pressure ratio Circ #1, Comp #1 32583=COMP SHUTDOWN – Low pressure ratio Circ #2, Comp #1 32615=COMP SHUTDOWN–Low pressure ratio Circ #3, Comp #1 32651=COMP SHUTDOWN – Minimum Delta Pressure Circuit #1 32652= COMP SHUTDOWN – Minimum Delta Pressure Circuit #2 32653= COMP SHUTDOWN – Minimum Delta Pressure Circuit #3 32771=COMP SHUTDOWN-Outside Air Temp Sensor Fault, 33063=COMP SHUTDOWN-Current Overload Circ #1, Comp #1 33095=COMP SHUTDOWN-Current Overload Circ #2, Comp #1 33127= COMP SHUTDOWN-Current Overload Circ #3, Comp #1 34087= COMP SHUTDOWN– Motor Protector Circ #1 Comp #1 34119= COMP SHUTDOWN– Motor Protector Circ #2 Comp #1 34599=COMP SHUTDOWN–Motor Temp High Circ #1, Comp #1 34631=COMP SHUTDOWN-Motor Temp High Circ #2, Comp #1 34663=COMP SHUTDOWN–Motor Temp High Circ #3, Comp #1 34855= COMP SHUTDOWN–Motor Temp Sensor Fault Circ #1, Comp #1 34887= COMP SHUTDOWN–Motor Temp Sensor Fault Circ #2, Comp #1 34919= COMP SHUTDOWN–Motor Temp Sensor Fault Circ #3, Comp #1 36387=CIRC SHUTDOWN – Condenser Pressure Sensor Circ #1 Fault 36391=COMP SHUTDOWN-Condenser Pressure Sensor Fault Circ #1, Comp #1 36419=CIRC SHUTDOWN – Condenser Pressure Sensor Circ #2 Fault 36423=COMP SHUTDOWN-Condenser Pressure Sensor Fault Circ #2, Comp #1 36455=COMP SHUTDOWN-Condenser Pressure Sensor Fault Circ #3, Comp #1 36611=UNIT SHUTDOWN-Condenser Flow Loss 37155=CIRC SHUTDOWN – Condenser Pressure High Circ #1 Fault 37159=COMP SHUTDOWN-Condenser Pressure High Circ #1, Comp #1 37187=CIRC SHUTDOWN – Condenser Pressure High Circ #2 Fault 37191=COMP SHUTDOWN-Condenser Pressure High Circ #2, Comp #1 37223=COMP SHUTDOWN-Condenser Pressure High Circ #3, Comp #1 37671=COMP SHUTDOWN-Discharge Temp Sensor Fault Circ #1, Comp #1 37703=COMP SHUTDOWN-Discharge Temp Sensor Fault Circ #2, Comp #1 37735=COMP SHUTDOWN-Discharge Temp Sensor Fault Circ #3, Comp #1 37927=COMP SHUTDOWN-Discharge Temp High Circ #1, Comp #1 37959=COMP SHUTDOWN-Discharge Temp High Circ #2, Comp #1 37991=COMP SHUTDOWN-Discharge Temp High Circ #3, Comp #1 38403=UNIT SHUTDOWN-Evaporator Water Flow Loss 38659=UNIT SHUTDOWN–Evaporator Leaving Water Temp Low (Freeze) 38915=COMP SHUTDOWN-Evaporator Pressure Low 39203=CIRC SHUTDOWN – Low Evaporator Pressure Circ #1 Fault 39207=COMP SHUTDOWN-Evaporator Pressure Low Circ #1, Comp #1 39235=CIRC SHUTDOWN – Low Evaporator Pressure Circ #2 Fault 39239=COMP SHUTDOWN–Evaporator Pressure Low Circ #2, Comp #1 39271=COMP SHUTDOWN-Evaporator Pressure Low Circ #3, Comp #1 39715=CIRC SHUTDOWN – Evaporator Pressure Sensor Circ #1 Fault 39719=COMP SHUTDOWN-Evaporator Pressure Sensor Fault Circ #1, Comp #1 39747=CIRC SHUTDOWN – Evaporator Pressure Sensor Circ #2 Fault 39751=COMP SHUTDOWN-Evaporator Pressure Sensor Fault Circ #2, Comp #1 39783=COMP SHUTDOWN-Evaporator Pressure Sensor Fault Circ #3, Comp #1 41255=COMP LOCKOUT- Num of Allowed Re-Starts Exceeded Circ #1, Comp #1 41287=COMP LOCKOUT- Num of Allowed Re-Starts Exceeded Circ #2, Comp #1 41319=COMP LOCKOUT- Num of Allowed Re-Starts Exceeded Circ #3, Comp #1 41475=UNIT SHUTDOWN-Evaporator Leaving Water Temp Sensor Fault 41731=UNIT SHUTDOWN-Evaporator Entering Water Temp Sensor Fault 42535=COMP SHUTDOWN-Mechanical High Pressure Circ #1, Comp #1 42567=COMP SHUTDOWN-Mechanical High Pressure Circ #2, Comp #1 42599=COMP SHUTDOWN-Mechanical High Pressure Circ #3, Comp #1 44071= COMP SHUTDOWN-Oil Delta Pressure High Circuit #1, Comp #1 44327=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault Circ #1, Comp #1 44359=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault Circ #2, Comp #1 44391=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault Circ #3, Comp #1 45059= UNIT SHUTDOWN-Phase Voltage Protection 45091= COMP SHUTDOWN– Phase Voltage Protection Circ #1, Comp #1 45123= COMP SHUTDOWN– Phase Voltage Protection Circ #2, Comp #1 45155= COMP SHUTDOWN– Phase Voltage Protection Circ #3, Comp #1

Data point	Holding Register	Values
		45351=COMP SHUTDOWN–Starter Fault Comp Circ #1, Comp #1 45383=COMP SHUTDOWN–Starter Fault Comp Circ #2, Comp #1 45415=COMP SHUTDOWN–Starter Fault Comp Circ #3, Comp #1 46887=COMP SHUTDOWN-Suction Temp Sensor Fault Circ #1, Comp #1 46919=COMP SHUTDOWN-Suction Temp Sensor Fault Circ #2, Comp #1 46951=COMP SHUTDOWN-Suction Temp Sensor Fault Circ #3, Comp #1 47911=COMP SHUTDOWN–Mechanical Low Pressure Circ #1, Comp #1 47943=COMP SHUTDOWN–Mechanical Low Pressure Circ #2, Comp #1 47975=COMP SHUTDOWN–Mechanical Low Pressure Circ #3, Comp #1 48131=Unit Controller offline 48163=Controller board offline Circ #1 48195=Controller board offline Circ #2 48227=Controller board offline Circ #3 48911=Circuit Global Alarm, Circuit #1 48912=Circuit Global Alarm, Circuit #2 48913=Circuit Global Alarm, Circuit #3 48419=COMP SHUTDOWN–No Pressure Change After Start Circ #1 48451=COMP SHUTDOWN–No Pressure Change After Start Circ #2 48483=COMP SHUTDOWN–No Pressure Change After Start Circ #3 48675=COMP SHUTDOWN–No Pressure at Startup Circ #1 48707=COMP SHUTDOWN–No Pressure at Startup Circ #2 48739=COMP SHUTDOWN–No Pressure at Startup Circ #3 48935=COMP SHUTDOWN-Slide position sensor fault Circ #1, Comp#1 48967=COMP SHUTDOWN-Slide position sensor fault Circ #2, Comp#1 48999=COMP SHUTDOWN-Slide position sensor fault Circ #3, Comp#1 49155=UNIT STOP–Emergency Stop Alarm 49411=UNIT STOP–Evaporator Water Temps Inverted 49667=UNIT STOP–External Alarm 49923=Evaporator Leaving Water Temp 1 Sensor Fault 50179=Evaporator Leaving Water Temp 2 Sensor Fault 50435=CIRC SHUTDOWN-Evaporator 1 Freeze Protection 50691=CIRC SHUTDOWN-Evaporator 2 Freeze Protection 50983=COMP SHUTDOWN-COMP VFD Fault Circ #1, Comp #1 51015=COMP SHUTDOWN-COMP VFD Fault Circ #2, Comp #1 51047=COMP SHUTDOWN-COMP VFD Fault Circ #3, Comp #1 51239=COMP SHUTDOWN-COMP VFD Over Heat Fault Circ #1, Comp #1 51271=COMP SHUTDOWN-COMP VFD Over Heat Fault Circ #2, Comp #1 51303=COMP SHUTDOWN-COMP VFD Over Heat Fault Circ #3, Comp #1 51495=COMP SHUTDOWN-COM ERROR With COMP VFD Circ #1, Comp #1 51527=COMP SHUTDOWN-COM ERROR With COMP VFD Circ #2, Comp #1 51559=COMP SHUTDOWN-COM ERROR With COMP VFD Circ #3, Comp #1 51755 = COMP SHUTDOWN -Low Discharge Superheat Circ #1, Comp #1 51783 = COMP SHUTDOWN -Low Discharge Superheat Circ #2, Comp #1 51815 = COMP SHUTDOWN -Low Discharge Superheat Circ #3, Comp #1 58371= UNIT STOP - PVM GFP Fault 58403= CIRC SHUTDOWN- PVM GFP Circ #1 Fault 58435= CIRC SHUTDOWN- PVM GFP Circ #2 Fault 58915=COMP SHUTDOWN-Refrig Charge Circ #1 58947=COMP SHUTDOWN-Refrig Charge Circ #2 58979=COMP SHUTDOWN-Refrig Charge Circ #3 59235=UNIT STOP – Gas Leakage Alarm 59747=UNIT SHUTDOWN – Condenser Freeze Protection

Fault Alarm Index	30	0=No Alarms
		127=COMP SHUTDOWN–Low pressure ratio #n
		128=COMP SHUTDOWN-Outside Air Temp Sensor Fault
		129=COMP SHUTDOWN-Current Overload Circuit #n, Comp #n
		135=COMP SHUTDOWN–Motor Temp High Circuit #n
		136=COMP SHUTDOWN–Motor Temp Sensor Fault #n
		142=COMP SHUTDOWN-Condenser Pressure Sensor Fault #n
		143=UNIT SHUTDOWN-Condenser Flow Loss
		145=COMP SHUTDOWN-Condenser Pressure High #n
		147=COMP SHUTDOWN-Discharge Temp Sensor Fault #n
		148=COMP SHUTDOWN-Discharge Temp High #n
		150=UNIT SHUTDOWN-Evaporator Water Flow Loss
		151=UNIT SHUTDOWN–Evaporator Leaving Water Temp Low (Freeze)
		153=COMP SHUTDOWN-Evaporator Pressure Low #n,
		155=COMP SHUTDOWN-Evaporator Pressure Sensor Fault #n
		161=COMP LOCKOUT-Number of Allowed Re-Starts Exceeded #n
		162=UNIT SHUTDOWN-Evaporator Leaving Water Temp Sensor Fault
		163=UNIT SHUTDOWN-Evaporator Entering Water Temp Sensor Failure
		166=COMP SHUTDOWN-Mechanical High Pressure #n

Data point	Holding Register	Values

		172=COMP SHUTDOWN-Oil Delta Pressure High Circuit #1, Comp #1
		173=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault #n
		176=SHUTDOWN–Phase Voltage Protection
		177=COMP SHUTDOWN–Starter Fault Comp #n
		183=COMP SHUTDOWN-Suction Temp Sensor Fault #n
		187=COMP SHUTDOWN–Mechanical Low Pressure #n
		188=Controller board offline Circuit #n
		189=COMP SHUTDOWN –No Pressure Change After Start
		190=COMP SHUTDOWN–No Pressure at Startup
		191=CIRCUIT SHUTDOWN–Slide Position Sensor Fault
		192=UNIT STOP–Emergency Stop Alarm
		193=UNIT STOP–Evaporator Water Temps Inverted
		194=UNIT STOP–External Alarm
		195=Evaporator Leaving Water Temp 1 Sensor Fault
		196=Evaporator Leaving Water Temp 2 Sensor Fault
		197=CIRCUIT SHUTDOWN-Evaporator 1 Freeze Protection
		198=CIRCUIT SHUTDOWN-Evaporator 2 Freeze Protection
		199=COMP SHUTDOWN-COMP VFD Fault Circuit #n, Comp #n
		200=COMP SHUTDOWN-COMP VFD Over Heat Fault Circuit #n, Comp #n
		201=COMP SHUTDOWN-COM ERROR With COMP VFD Circuit #n, Comp #n
		202=COMP SHUTDOWN-Low Discharge Superheat Circuit #n, Comp #n
		230=COMP SHUTDOWN-Refrig Charge Circuit #n
		231=UNIT STOP – Gas Leakage Alarm
		233=UNIT SHUTDOWN – Condenser Freeze Protection
		251=CIRCUIT STOP – Global Alarm, Circuit #1
		252=CIRCUIT STOP – Global Alarm, Circuit #2
		253= CIRCUIT STOP – Global Alarm, Circuit #3
		261=CIRCUIT SHUTDOWN - Minimum Delta Pressure Circuit #1
		262= CIRCUIT SHUTDOWN - Minimum Delta Pressure Circuit #2
		263= CIRCUIT SHUTDOWN - Minimum Delta Pressure Circuit #3

Problem Alarm Code	32	0=No Alarms 16418=RESTART DELAYED - Power Loss While Running Circuit #1 16450=RESTART DELAYED - Power Loss While Running Circuit #2 16482=RESTART DELAYED - Power Loss While Running Circuit #3 16642=START INHIBITED - Ambient Temp Low 16898=INHIBIT LOAD – Condenser Pressure High 17186=INHIBIT LOAD – Condenser Pressure High Circuit #1 17218=INHIBIT LOAD – Condenser Pressure High Circuit #2 17250=INHIBIT LOAD – Condenser Pressure High Circuit #3 17282=INHIBIT LOAD –Condenser Pressure High Circuit #1 17730=UNLOAD Condenser Pressure High Circuit #2 17762=UNLOAD Condenser Pressure High Circuit #3 17794=UNLOAD LOAD - Evaporator Pressure Low Circuit #1 18178=PUMP #2 START ATTEMPTED - Condenser Pump #1 Failure 18434=PUMP #1 START ATTEMPTED - Condenser Pump #2 Failure 19522=INHIBIT LOAD - Evaporator Pressure Low Circuit #2 19554=INHIBIT LOAD - Evaporator Pressure Low Circuit #3 19586=INHIBIT LOAD - Evaporator Pressure Low Circuit #1 20034=UNLOAD - Evaporator Pressure Low Circuit #2 20066=UNLOAD - Evaporator Pressure Low Circuit #3 20098=UNLOAD - Evaporator 20262=UNLOAD-Comp Motor Current High Circuit #1, Comp #1 20294=UNLOAD-Comp Motor Current High Circuit #2, Comp #1 20326=UNLOAD-Comp Motor Current High Circuit #3, Comp #1 20738=PUMP #2 START ATTEMPTED - Evaporator Pump #1 Failure 20994=PUMP #1 START ATTEMPTED - Evaporator Pump #2 Failure 21542=INHIBIT LOAD-Comp Motor Current High Circuit #1, Comp #1 21574=INHIBIT LOAD-Comp Motor Current High Circuit #2, Comp #1 21606= INHIBIT LOAD-Comp Motor Current High Circuit #3, Comp #1 32258=Expansion Alarm – Problem

Problem Alarm Index	29	0=No Alarms
		64=RESTART DELAYED-Power Loss While Running Circuit #n
		65=START INHIBITED - Ambient Temp Low
		67=INHIBIT LOAD – Condenser Pressure High Circuit #n
		69=UNLOAD – Condenser Pressure High Circuit #n
		71=PUMP #2 START ATTEMPTED - Condenser Pump #1 Failure
		72=PUMP #1 START ATTEMPTED - Condenser Pump #2 Failure
		76=INHIBIT LOAD - Evaporator Pressure Low Circuit #n
		78=UNLOAD - Evaporator Pressure Low Circuit #n
		79=UNLOAD - Comp Motor Current High Circuit #n, Comp #n
		81=PUMP #2 START ATTEMPTED - Evaporator Pump #1 Failure
		82=PUMP #1 START ATTEMPTED - Evaporator Pump #2 Failure

Data point	Holding Register	Values

		84= INHIBIT LOAD-Comp Motor Current High Circuit #n, Comp #n
		126=Expansion Alarm

Warning Alarm Code	31	0=No Alarms 513=Evaporator Entering Water Temp Sensor Failure 2049=Bad setpoint override input 2305=Bad demand limit input 2401=Circuit 1 failed pumpdown Hi Press 2402=Circuit 2 Failed pumpdown Hi Press 2403=Circuit 3 Failed pumpdown Hi Press 2817=Unit power restore 3105=Circuit 1 failed pumpdown 3137=Circuit 2 Failed pumpdown 3169=Circuit 3 failed pumpdown 3201=Circuit 4 failed pumpdown 3329=External Event 3585=Bad Current Limit Input 3841=Option Controller Communication Failed 4352=Chiller Network Communication Failure
Warning Alarm Index	28	0=No Alarms 8=Bad setpoint override input 9=Bad demand limit input 11=Unit power restore 12=Circuit failed pumpdown 13=External Event 14 = Bad Current Limit Input 15=Option Controller Communication Failed 17=Chiller Network Communication Failure 21= Circuit 1 failed pumpdown Hi Press 22= Circuit 2 failed pumpdown Hi Press 23= Circuit 3 failed pumpdown Hi Press

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