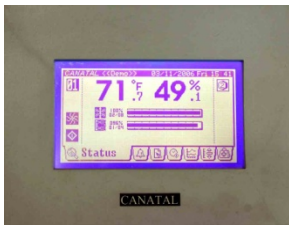




CLIMATEWORX
INTERNATIONAL

MISSION CRITICAL Air Conditioning Systems

M52/BMS Interface Set-up Document



**M52 Fascia c/w
Touch Screen
Graphical LCD
Display**



M52 Control Board



Embedded Bridges – 500 Points Capacity

**Building Management System
(BMS) Interfaces
also referred to as
“Bridges” or “Gateways”**

ClimateWorx International Inc.

14 Chelsea Lane, Brampton, Ontario, Canada L6T 3Y4

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Purpose

The purpose of the **M52/BMS Interface Set-up document** is to provide needed information to ClimateWorx for the proper programming and configuration of the gateway and to simplify the field execution of the communication between the **ClimateWorx M52** and a **BMS front end system**.

The most important part of programming the gateway is:

1. Knowing the proper addresses of the ClimateWorx units
2. Their relationship to each other in a Co-Work Network and
3. The points that are required to be monitored.

The Set-up document provides a list of points offered by ClimateWorx which is included with the gateway. If there are points that you need that are not on the list it is possible that ClimateWorx can offer them but this requires a custom configuration file and will be subject to additional charges.

Terms and Definitions:

Unit Designation: The unique tag given to a machine to identify it in a building and to differentiate it from other like units. ie. CRAC-1 or AC-2.1

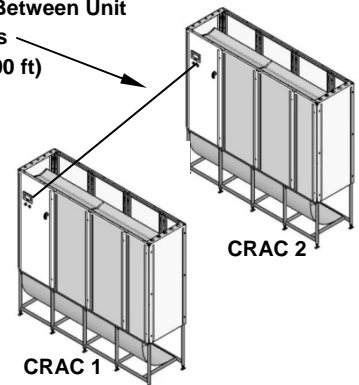
Network Address: The RS485 address ClimateWorx will use to identify a unique unit in a BMS network. Must be 01 to 63.

Baud Rate: The communication speed used to transmit and receive data between gateway and ClimateWorx unit. Factory set and must match baud rate in configuration file.

Co-Work Address: The address of each circuit board in a ClimateWorx unit that identifies it in a local area network of units servicing the same space. This is set using DIP switches on the ClimateWorx circuit boards. See the M52 Users Guide for more information. Units must be of the same Series.



RS-485 Cable (By Others) Between Unit
M52 Controllers
(Max Distance 1,000 ft)



Point Summary

The Summary of Points below describes the standard points available from ClimateWorx with a gateway. Please note that single compressor ClimateWorx units point count is 39 and dual compressor ClimateWorx units point count is 45. Chilled Water units count is 39, the same as single compressor ClimateWorx units. You may monitor 500 points per gateway. If you exceed the gateway point count you will need to purchase additional gateways or purchase a custom configuration file with reduced point count in order not to exceed 500.

Identification of units in a Co-Work Network

Units of the same ClimateWorx Series that are serving a common space may be connected in a Co-Work Network to manage the operation of the units to share duty, provide back-up and to prevent units from fighting each other. When units are connected in a Co-Work network the configuration file for the BMS gateway must be created in such a way as to identify units correctly. Therefore it is vital that the following information be provided.

Please note:

1. The Co-Work Network is limited to eight compressor circuits which means 8 Series 6, 6AU05 or 4 Series 9AU12.
2. The Co-Work Network is an I²C network and is a completely separate network operating on a different protocol than the RS485, BMS network. This means there will be two networks between units. One is the RS485 and the other is the Co-Work.
3. Units alone in a room or not part of a Co-Work Network are programmed as Co-Work address 1.

Sample Unit Identification Table:

The example below shows that there are six **Series 9, 9AD30VEBHAX** units in the Main Data Center and two separate Co-Work Networks. CRAC-1, 2 and 3 form Co-Work Network #1 and CRAC-4, 5 and 6 form a second Co-Work Network, #2. This requires two Co-Work I²C networks of three units and one RS485 BMS network of six units.

Room Number or Name:	Main Data Center			
Unit Designation	ClimateWorx Model Number	Co-Work Address (Network / Address)	Network Address	Point Count
CRAC-1	9AD30VEBHAX	1-1	01	45
CRAC-2	9AD30VEBHAX	1-2	02	45
CRAC-3	9AD30VEBHAX	1-3	03	45
CRAC-4	9AD30VEBHAX	2-1	04	45
CRAC-5	9AD30VEBHAX	2-2	05	45
CRAC-6	9AD30VEBHAX	2-3	06	45

Please fill in the Table 1 in Appendix A and fax back to ClimateWorx.

NOTE: FIELD SUPPLY NEEDS TO BE PROVIDED BY OTHERS.

Mark
 Selection as
 required

Points Menu for Series 6,7,8,11 and P DX Single Circuit Satchwell SNP Protocol
☐ **All Points Below (Std. Configuration)**
Table 5: Key code - Access type : Read / Write

Data	Settings Section Parameters
<input type="checkbox"/> No. of Duty Unit	Units required to run together in a Co-Work network to satisfy the load
<input type="checkbox"/> Temperature Setpoint	Controls space temperature base on return air temperature
<input type="checkbox"/> Temperature High Limit	Maximum allowable return temperature before activating alarm
<input type="checkbox"/> Temperature Low Limit	Minimum return air temperature before activating alarm
<input type="checkbox"/> Humidity Setpoint	Controls space humidity based on return air humidity
<input type="checkbox"/> Humidity High Limit	Maximum allowable return humidity before activating alarm
<input type="checkbox"/> Humidity Low Limit	Minimum return air humidity before activating alarm
<input type="checkbox"/> On/Off Mode (0-Local / 1-Timer / 2-Remote)	Sets unit to turn "ON" and "OFF" by local keypad, remote signal or timer schedule
<input type="checkbox"/> Display Mode (0-°C/1-°F)	Sets temperature display on Status page to °F or °C

Table 6: Sensor Reading - Access type : Read only

Data	Settings Section Parameters
<input type="checkbox"/> Site temperature	The average of all the duty temperature 1 sensors in a Co-Work network
<input type="checkbox"/> Site humidity	The average of all the duty humidity 1 sensors in a Co-Work network
<input type="checkbox"/> Local temperature 1	Return air temperature sensor.
<input type="checkbox"/> Local temperature 2	Spare temperature sensor. Also used for Free cool unit.
<input type="checkbox"/> Local humidity 1	Return air humidity sensor.
<input type="checkbox"/> Local humidity 2	spare humidity sensor

Table 9: Switched Output Status - Access type : Read only

Data	Settings Section Parameters
<input type="checkbox"/> Standby Start	Emergency start signal received from duty unit
<input type="checkbox"/> Remote ON	Normal operation start signal received from external source
<input type="checkbox"/> Standby Enable	Emergency enable signal to back-up unit
<input type="checkbox"/> Common Alarm	Common alarm signal
<input type="checkbox"/> Unit 1: Fan	Fan run demand signal
<input type="checkbox"/> Unit 1: Compressor	Compressor run demand signal
<input type="checkbox"/> Unit 1: Humidifier	Humidifier run demand signal
<input type="checkbox"/> Unit 1: Dehumid. Valve	Cooling run demand signal
<input type="checkbox"/> Unit 1: SCR Heater	Reheat run demand signal

Table 10: Analogue Output Status - Access type : Read only

Data	Settings Section Parameters
<input type="checkbox"/> Heating Analogue Output	Heating run analogue demand signal
<input type="checkbox"/> Cooling Analogue Output	Cooling run analogue demand signal
<input type="checkbox"/> Humidifying Analogue Output	Humidification run analogue demand signal
<input type="checkbox"/> Dehumidifying Analogue Output	Dehumidification run analogue demand signal

Table 11: Alarm Status - Access type : Read / Write

Data	Settings Section Parameters
Unit 1: Fan Overload	Fan overload alarm or drain pan float switch on Series 11
Unit 1: Low Airflow	Loss of air flow
Unit 1: Boiler Dirty	Humidifier service
Unit 1: Heater Overheat	Reheat heater over heat conditor
Unit 1: Filter Dirty	Change filter
Unit 1: Fire	Fire alarm
Unit 1: Flood	Liquid detected
Unit 1: High Humidity	High return air humidity alarm
Unit 1: High Humidity 2	High spare humidity sensor alarm
Unit 1: High Temperature	High return air temperature alarm
Unit 1: High Temperature 2	High spare temperature sensor alarm
Unit 1: Low Humidity	Low return air humidity sensor alarm
Unit 1: Low Humidity 2	Low spare humidity sensor alarm
Unit 1: Low Temperature	Low return air temperature alarm
Unit 1: Low Temperature 2	Low spare temperature sensor alarm
Unit 1: Compressor High Pressure	High refrigeration pressure alarm
Unit 1: Compressor Low Pressure	Low refrigeration pressure alarm
Unit 1: Compressor Short Cycling	Reoccurring low pressure refrigeration alarm

The byte value represents the alarm status as follows:

- 0 - No Alarm
- 1 - Alarm Active
- 2 - Alarm Acknowledged

Table 12: Control Status - Access type : Read only

Data	Settings Section Parameters
Unit 1 - On/Off Status	Unit on off state
Unit 1 - Connection	RS485 network connection status
Dehumidifying	Dehumidification demand status
Humidifying	Humidification demand status
Cooling	Cooling demand status
Heating	Reheat demand status

Table 14: Stage Output Status - Access type : Read only

Data	Settings Section Parameters
Heating Stage	Reheat stages energized
Cooling Stage	Cooling stages energized
Humidification Stage	Humidification stages energized
Dehumidification Stage	Dehumidification stages energized

Table 15: Accumulating Run-Time - Access type : Read / Write

Data	Settings Section Parameters
Unit 1 - Accumulated Fan Run-time	Fan run time totalizer
Unit 1 - Accumulated Compressor Run-time	Compressor run time totalizer
Unit 1 - Accumulated Humidifier Run-time	Humidifier run time totalizer
Unit 1 - Accumulated Heater Run-time	Reheat run time totalizer
Unit 1 - Accumulated Dehumid. Valve Run-time	Cooling mode run time totalizer (Series 6)
Unit 1 - Accumulated SCR Heater Run-time	SCR Reheat run time totalizer

Table 16: Machine Remote Control - Access type : Read / Write (see notes below)

Control	Settings Section Parameters
System On/Off Control (As local on/off control)	Turns on and off unit when in Local on/off mode

Notes:

- 1) On/Off control is synchronized when the units are connected in a Co-Work Network. You cannot sequence units through the BMS when Co-Worked.
- 2) Only works if no alarms are active or when On/Off mode is set to Local.

Mark
Selection as
required

Points Menu for Series 9 or P-Series DX Dual Circuit Satchwell SNP Protocol

☐ All Points Below (Std. Configuration)

Table 5: Key code - Access type : Read / Write

Data	Settings Section Parameters
No. of Duty Unit	Units required to run together in a Co-Work network to satisfy the load.
Temperature Setpoint	Controls space temperature base on return air temperature.
Temperature High Limit	Maximum allowable return temperature before activating alarm
Temperature Low Limit	Minimum return air temperature before activating alarm
Humidity Setpoint	Controls space humidity based on return air humidity
Humidity High Limit	Maximum allowable return humidity before activating alarm
Humidity Low Limit	Minimum return air humidity before activating alarm
On/Off Mode (0-Local / 1-Timer / 2-Remote)	Sets unit to turn "ON" and "OFF" by local keypad, remote signal or timer schedule.
Display Mode (0-°C/1-°F)	Sets temperature display on Status page to °F or °C

Table 6: Sensor Reading - Access type : Read only

Data	Settings Section Parameters
Site temperature	The average of all the duty temperature 1 sensors in a Co-Work network
Site humidity	The average of all the duty humidity 1 sensors in a Co-Work network
Local temperature 1	Return air temperature sensor.
Local temperature 2	Spare temperature sensor. Also used for Free cool units
Local humidity 1	Return air humidity sensor.
Local humidity 2	spare humidity sensor

Table 9: Switched Output Status - Access type : Read only

Data	Settings Section Parameters
Standby Start	Emergency start signal received from duty unit
Remote ON	Normal operation start signal received from external source
Standby Enable	Emergency enable signal to back-up unit
Common Alarm	Common alarm signal
Unit 1: Fan	Fan run demand signal
Unit 1 – Humidifier	Humidifier run demand signal
Unit 1 – SCR Heater	Reheat run demand signal
Unit 1 – Compressor 1	Compressor 1 run demand signal
Unit 1 – Compressor 2	Compressor 2 run demand signal

Table 10: Analogue Output Status - Access type : Read only

Data	Settings Section Parameters
Heating Analogue Output	Heating run analogue demand signal
Cooling Analogue Output	Cooling run analogue demand signal
Humidifying Analogue Output	Humidification run analogue demand signal
Dehumidifying Analogue Output	Dehumidification run analogue demand signal
Free-cooling 1 Output	Free cooling 1 run analogue demand signal
Free-cooling 2 Output	Free cooling 2 run analogue demand signal

Table 11: Alarm Status - Access type : Read / Write

Data	Settings Section Parameters
Unit 1: Fan Overload	Fan overload alarm or drain pan float switch on Series 11
Unit 1: Low Airflow	Loss of air flow
Unit 1: Boiler Dirty	Humidifier service
Unit 1: Heater Overheat	Reheat heater over heat condition
Unit 1: Filter Dirty	Change filter
Unit 1: Fire	Fire alarm
Unit 1: Flood	Liquid detected
Unit 1: Fault 1	User defined digital input fault
Unit 1: High Humidity	High return air humidity alarm
Unit 1: High Humidity 2	High spare humidity sensor alarm
Unit 1: High Temperature	High return air temperature alarm
Unit 1: High Temperature 2	High spare temperature sensor alarm
Unit 1: Low Humidity	Low return air humidity sensor alarm
Unit 1: Low Humidity 2	Low spare humidity sensor alarm
Unit 1: Low Temperature	Low return air temperature alarm
Unit 1: Low Temperature 2	Low spare temperature sensor alarm
Unit 1: Compressor High Pressure 1	Compressor 1 High refrigeration pressure alarm
Unit 1: Compressor Low Pressure 1	Compressor 1 Low refrigeration pressure alarm
Unit 1: Compressor Short Cycling 1	Compressor 1 Reoccurring low pressure refrigeration alarm
Unit 1: Compressor High Pressure 2	Compressor 2 High refrigeration pressure alarm
Unit 1: Compressor Low Pressure 2	Compressor 2 Low refrigeration pressure alarm
Unit 1: Compressor Short Cycling 2	Compressor 2 Reoccurring low pressure refrigeration alarm

The byte value represents the alarm status as follows:

0 - No Alarm

1 - Alarm Active

2 - Alarm Acknowledged

Table 12: Control Status - Access type : Read only

Data	Settings Section Parameters
Unit 1 - On/Off Status	Unit on off state
Unit 1 - Connection	RS485 network connection status
Dehumidifying	Dehumidification demand status
Humidifying	Humidification demand status
Cooling	Cooling demand status
Heating	Reheat demand status
Unit - Free cooling	Free Cooling demand status

Table 14: Stage Output Status - Access type : Read only

Data	Settings Section Parameters
Heating Stage	Reheat stages energized
Cooling Stage	Cooling stages energized
Humidification Stage	Humidification stages energized
Dehumidification Stage	Dehumidification stages energized
Free-cooling Stage	Free Cooling stages energized

Table 15: Accumulating Run-Time - Access type : Read / Write

Data	Settings Section Parameters
Unit 1 - Accumulated Fan Run-time	Fan run time totalizer
Unit 1 - Accumulated Humidifier Run-time	Humidifier run time totalizer
Unit 1 - Accumulated SCR Heater Run-time	SCR Reheat run time totalizer
Unit 1 - Accumulated Compressor 1 Run-time	Cooling stage 1 run time totalizer
Unit 1 - Accumulated Compressor 2 Run-time	Cooling stage 2 run time totalizer

Table 16: Machine Remote Control - Access type : Read / Write (see notes below)

Control	Settings Section Parameters
System On/Off Control (As local on/off)	Turns on and off unit when in Local on/off mode
Notes:	
1) On/Off control is synchronized when the units are connected in a Co-Work Network. You cannot sequence units through the BMS when Co-Worked.	
2) Only works if no alarms are active or when On /Off mode is set to Local.	

Mark
Selection as
required

Points Menu for Chilled Water Circuit Modbus RTU Protocol

☐ All Points Below (Std. Configuration)

Table 5: Key code - Access type : Read / Write

Data	Settings Section Parameters
No. of Duty Unit	Units required to run together in a Co-Work network to satisfy the load
Temperature Setpoint	Controls space temperature base on return air temperature
Temperature High Limit	Maximum allowable return temperature before activating alarm
Temperature Low Limit	Minimum return air temperature before activating alarm
Humidity Setpoint	Controls space humidity based on return air humidity
Humidity High Limit	Maximum allowable return humidity before activating alarm
Humidity Low Limit	Minimum return air humidity before activating alarm
On/Off Mode (0-Local / 1-Timer / 2-Remote)	Sets unit to turn "ON" and "OFF" by local keypad, remote signal or timer schedule
Display Mode (0-°C/1-°F)	Sets temperature display on Status page to °F or °C
Chilled Water Circuit 1	Flow status of CW loop per from BMS sensors
Chilled Water Circuit 2	Flow status of alternate CW loop per BMS sensors
Chilled Water 1 temperature in °C	Temperature of alternate CW loop per BMS sensors °C
Chilled Water 2 temperature in °C	Temperature of alternate CW loop per BMS sensors °C
Primary Circuit	Sets the circuit number for use as primary cooling source
Changeover delay	Provides minimum time delay during which both primary and secondary CW circuits are functioning
Chilled Water temperature limit in °C	Temperature when primary to secondary CW source takes place °C
Normal Fan Speed	Normal fan energized
Backup Fan Speed	Sets fan speed under alarm condition

Table 6: Sensor Reading - Access type : Read only

Data	Settings Section Parameters
Site temperature	The average of all the duty temperature 1 sensors in a Co-Work network
Site humidity	The average of all the duty humidity 1 sensors in a Co-Work network
Local temperature 1	Return air temperature sensor.
Local temperature 2	Spare temperature sensor. Also used for Free cool units
Local humidity 1	Return air humidity sensor.
Local humidity 2	spare humidity sensor

Table 9: Switched Output Status - Access type : Read only

Data	Settings Section Parameters
Standby Start	Emergency start signal received from duty unit
Remote ON	Normal operation start signal received from external source
Standby Enable	Emergency enable signal to back-up unit
Common Alarm	Common alarm signal
Unit 1: Fan	Fan run demand signal
Unit 1: Humidifier	Humidifier run demand signal
Unit 1: SCR Heater	Reheat run demand signal

Table 10: Analogue Output Status - Access type : Read only

Data	Settings Section Parameters
Heating Analogue Output	Heating run analogue demand signal
Cooling Analogue Output	Cooling run analogue demand signal
Humidifying Analogue Output	Humidification run analogue demand signal
Dehumidifying Analogue Output	Dehumidification run analogue demand signal

Table 11: Alarm Status - Access type : Read / Write

Data	Settings Section Parameters
Unit 1: Fan Overload	Fan overload alarm or drain pan float switch on Series 11
Unit 1: Low Airflow	Loss of air flow
Unit 1: Boiler Dirty	Humidifier service
Unit 1: Heater Overheat	Reheat heater over heat condition
Unit 1: Filter Dirty	Change filter
Unit 1: Fire	Fire alarm
Unit 1: Flood	Liquid detected
Unit 1: High Humidity	High return air humidity alarm
Unit 1: High Humidity 2	High spare humidity sensor alarm
Unit 1: High Temperature	High return air temperature alarm
Unit 1: High Temperature 2	High spare temperature sensor alarm
Unit 1: Low Humidity	Low return air humidity sensor alarm
Unit 1: Low Humidity 2	Low spare humidity sensor alarm
Unit 1: Low Temperature	Low return air temperature alarm
Unit 1: Low Temperature 2	Low spare temperature sensor alarm

The byte value represents the alarm status as follows:

0 - No Alarm

1 - Alarm Active

2 - Alarm Acknowledged

Table 12: Control Status - Access type : Read only

Data	Settings Section Parameters
Unit 1 - On/Off Status	Unit on off state
Unit 1 - Connection	RS485 network connection status
Dehumidifying	Dehumidification demand status
Humidifying	Humidification demand status
Cooling	Cooling demand status
Heating	Reheat demand status

Table 14: Stage Output Status - Access type : Read only

Data	Settings Section Parameters
Heating Stage	Reheat stages energized
Cooling Stage	Cooling stages energized
Humidification Stage	Humidification stages energized
Dehumidification Stage	Dehumidification stages energized

Table 15: Accumulating Run-Time - Access type : Read / Write

Data	Settings Section Parameters
Unit 1 - Accumulated Fan Run-time	Fan run time totalizer
Unit 1 - Accumulated Humidifier Run-time	Humidifier run time totalizer
Unit 1 - Accumulated Heater Run-time	Reheat run time totalizer
Unit 1 - Accumulated SCR Heater Run-time	SCR Reheat run time totalizer

Table 16: Machine Remote Control - Access type : Read / Write (see notes below)

Control	Settings Section Parameters
System On/Off Control (As local on/off control)	Turns on and off unit when in Local on/off mode

Notes:

1) On/Off control is synchronized when the units are connected in a Co-Work Network. You cannot sequence units through the BMS when Co-Worked.

2) Only works if no alarms are active or when On /Off mode is set to Local.

NOTES:

