MICRO CONTROL SYSTEMS

MCS Total Solutions for all your HVAC/R Control Needs

MCS-Nitromag Upgrade Brochure
Smardt Air Cooled Chillers

MCS-NITROMAG-DOOR

Optional Package shown with MCS-NitroMag-15.4

Click for Brochure Upgrades▶

This brochure describes a standard upgrade package for the Turbocor series chillers. Each control upgrade installation is unique. It may be necessary to add additional options to the standard upgrade as described in this brochure.

Fill out the brief questionnaire in the back of this brochure and forward to your sales representative for an estimate.

Revision - 2025-08-22

Example MCS-NitroMag Upgrade Photos

Package with Industrial Control Panel

Concerns:

- Old controls failed
- Wanted controls that were easier to understand and greater reliability, plus better and clear information

Equipment:

- Smardt and other brands Water Cooled Chillers
- One to Four Turbocor Compressors
- One to Four Staging Valves
- Load balancing EXV control

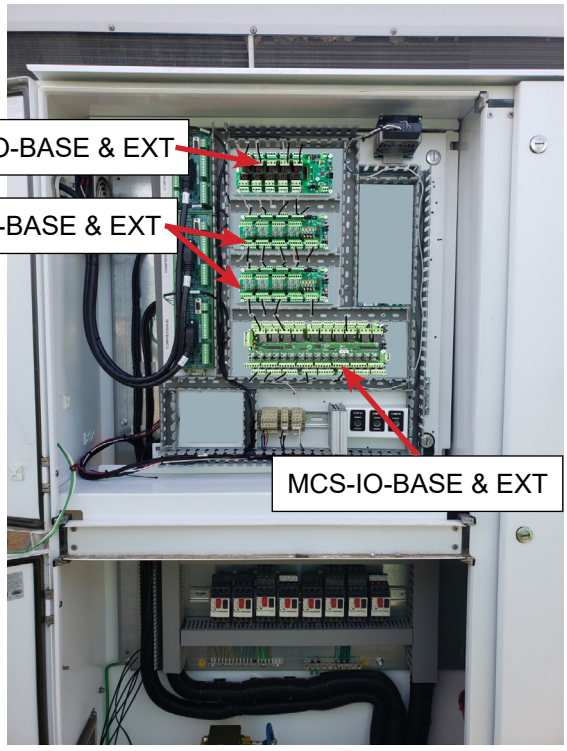
Steps Taken:

- Remove existing controls
- Install MCS controls
- Reprogram boards for communication
- Provide on-site training and support for contractor to better understand MCS controls.

Results:

One Smardt Chiller upgraded with MCS controls and one satisfied customer who is very happy with all the information and data available compared to the competitor's controls.

Old Controls



Package for
MCS NitroMag-15.4

MCS-NitroMag-DOOR
Description & Specifications

File No: E169780

RoHS Compliant

Part # MCS-NitroMag-DOOR

Description

The **MCS-NitroMag-DOOR** is a control system containing a Keypad, a processor, memory, eMMC Flash, and supporting power circuitry. The Broadcom quad-core processor delivers a blazing speed of 1.5GB.

The **MCS-NitroMag-DOOR** features an easy-to-use keypad with three function keys, four directions keys and two selection keys (Menu & Enter).

The display LCD is 128 x 64 dot pixel graphics, 2.8" diagonal viewing area with White characters on a dark background (reversible). Includes a NEMA Type 1 faceplate for easy mounting to an enclosure door.

The MCS-NitroMag-DOOR controller allows for 144 SI inputs, 90 RO outputs, and 36 AO outputs. (Expansion Boards required).

It comes with a built-in WiFi interface for Ethernet connectivity, and an onboard WiFi antenna mounted on the front.

Includes a **Modbus interface** which enables it to act as a Modbus Master using the Modbus RTU protocol, which allows communication with Modbus slave devices for parameter access.

It features various connection ports for:

- 2 HDMI ports (1 Standard & 1 Micro)
- WiFi antenna connection
- 12vdc power input connection
- Ethernet port (10 Mbps/100 Mbps/1Gbps)
- Two RS-485 Ports up to 115200 baud rate
- MCS-IO port for communicating with expansion boards

Specifications

Keypad Door

Dimensions.....7.25"w x 8.50"h 1.42"d
(184.15 mm x 215.9 mm x 36.17 mm)
Mounts using supplied #6-32 Kep nut

Display.....128 x 64 dot pixel STN monochrome graphics LCD with 2.8" diagonal viewing area

Color.....White characters on a blue background (Reversible)

Keypad Size.....5.26"w x 8.50"h (8 mounting studs)

Keypad Layout.....9 keys (3 function keys)

Operating Temperature....-4°F to +185°F (-20°C to +85°C)

Operating Humidity.....0-95% Non-Condensing

Controller

Microprocessor..... Broadcom BCM2711 quad core Cortex (ARMv8) 64-bit SoC @ 1.5Ghz

INPUT	MINIMUM	NOMINAL	MAXIMUM
VOLTAGE	10	12	12.5
AMPS			0.5

Flash Memory ..... 16 GB EMMC
RAM ..... 2 GB DDR3
MCS-I/O Comm Port. ..... 1 @ 38,400 baud
RS-485 Ports. ..... 2 @ go up to 115200 baud rate
Ethernet..... 10 Mbps/100Mbps/1Gbps
HDMI ..... 2 HDMI 2.0 ports-Standard and Micro
WiFi .....2.4 GHz, 5.0GHz 8.02 b/g/n/ac wireless
USB ..... 2 USB type B 2.0 ports 480Mbps signalling
Protocols..... .BACnet IP, BACnet MSTP, Modbus IP, Modbus RTU Slave, Modbus RTU Master (BTL certification pending)

Real Time Clock .....Battery backup(Type BR2032)

Power Detection .....Automatic power fail reset

POWER SUPPLY NOT INCLUDED

Ship Weight ..... 2.00 lbs (approx)

Box Dimensions..... 9" x 6-1/2" x 2-3/4" (approx)

5580 Enterprise Pkwy., Fort Myers, FL 33905
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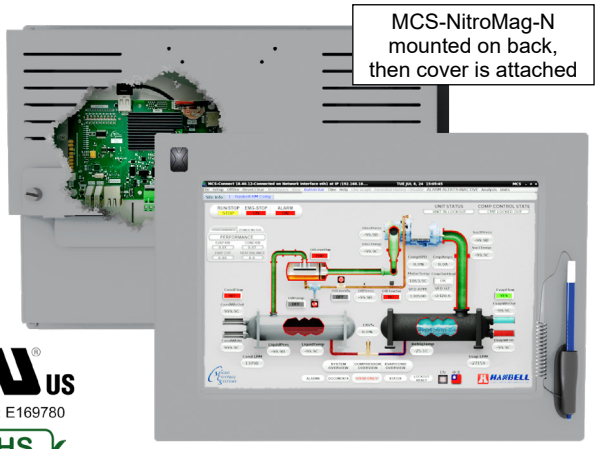
Revision - 2025-07-01

MCS-NitroMag-15.4
Description & Specifications



File No: E169780

RoHS Compliant

Part # MCS-NitroMag-15.4

Description

The **MCS-NitroMag-15.4** is a control system containing a Capacitive Touchscreen, and a MCS-NitroMag-N controller. It includes a processor, memory, eMMC Flash, and supporting power circuitry. The Broadcom quad-core processor on the MCS-NitroMag-N delivers a blazing speed of 1.5GHz.

The MCS-NitroMag-N controller connects with MCS Expansion boards and Extension boards, allowing for a maximum of 144 SI inputs, 90 RO outputs, and 36 AO outputs.

The Capacitive touchscreen interface designed to simplify user access with the MCS Expansion Boards and utilizing MCS-Connect to provide both graphics and service mode access to technicians. Highly accurate and does not require calibration - easy to clean glass surface. Works outdoors, bright screen, water resistant, Exceptional Optics - 1280x800 resolution, sharp and vibrant images.

MCS-NitroMag-15.4 comes pre loaded with the MCS-CONNECT program that allows you to view the 'unit's status', 'extended history', 'alerts', 'alarms', setpoints, and more, all in a user-friendly graphic format.

The MCS-NitroMag-15.4 comes with a built-in WiFi interface for Ethernet connectivity, and an onboard WiFi antenna connection mounted on the front of the touchscreen.

It features various connections ports for:

- 2 HDMI ports (1 Standard and 1 Micro port)
- WiFi antenna connection
- 12vdc power input connection
- Ethernet port (10 Mbps/100 Mbps/1 GHz)
- MCS-IO port for communicating with expansion boards.

Includes a MODBUS interface which enables it to act as a Modbus Master using the Modbus RTU protocol, allowing communication with Modbus slave devices for parameter access.

Specifications

Dimensions..... 17"L x 12.11"W x 3.228"H
432mm L x 308mm W x 82mm H

Mounting
- Door Mount. .....Template included
- 10 mount studs thru customers enclosure.
- MS4745 silicone gasket
- NEMA 4 IP66 rated
- Indoor or outdoor (Mounted in Nema4 Enclosure)

VESA Mount ..... 75 x 75 or 100 x 100 mm (indoor only)

LCD Screen. ..... 15.4" (16:10 Diagonal)
- 16.2 Million Colors
- 1280x800 Resolution
- View Angle 70°U, 70°D, 70°L, 70°R
- Capacitive Stylus pen
- White LED Backlight (Min Life 50,000 Hrs)
- Luminance Min. 350 Min. 450 Typical

Touchscreen Surface..... UV Degradation Protection

Operating Temperature..... -22°F to 176°F (-30°C to +80°C)

Operating Humidity.....90 %RH (Non Condensing)

Storage Temperature..... -22°F to 176°F (-30°C to +80°C)

Controller

Microprocessor ..... Broadcom BCM2711 Quad core
Cortex (ARMv8) 64-bit SoC @ 1.5Ghz

INPUT	MINIMUM	NOMINAL	MAXIMUM
VOLTAGE	10	12	12.5
AMPS			2

Flash Memory .....16 GB EMMC

RAM .....2 GB DDR3

MCS-I/O Comm Port. ..... 1 @ 38,400 baud

RS-485 Ports. ..... 2 @ go up to 115200 baud rate

Ethernet..... 10 Mbps/100Mbps/1Gbps

HDMI .....2 HDMI 2.0 ports-Standard and Micro

WiFi.....2.4 GHz, 5.0GHz 8.02 b/g/n/ac wireless

USB .....2 USB type B 2.0 ports 480Mbps signalling

Protocols.....BACnet IP, BACnet MSTP, Modbus IP,
Modbus RTU Slave, Modbus RTU Master
(BTL certification pending)

Real Time Clock .....Battery backup(Type BR2032)

Power Detection .....Automatic power fail reset

POWER SUPPLY NOT INCLUDED

Packaging

Ship Weight.....2.00 lb (approx)

Box Dimensions..... 20-1/8" x 15-1/8" x 6-1/2" (approx)

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Office: 239-694-0089 • Fax: 239-694-0031 www.mcscontrols.com

Revision - 2025-07-30

Example Graphics MCS-Nitromag-15.4

Touchscreen

The **MCS-NitroMag-15.4** capacitive touchscreen interface designed to simplify user access with MCS Expansion boards utilizing MCS-Connect to provide both graphics and service mode access to technicians. Input method: Finger, glove, stylus.

Highly accurate and does not require calibration - easy to clean glass surface. Works outdoors, bright screen, water resistant, Exceptional Optics - 1280x800 resolution, sharp and vibrant images.

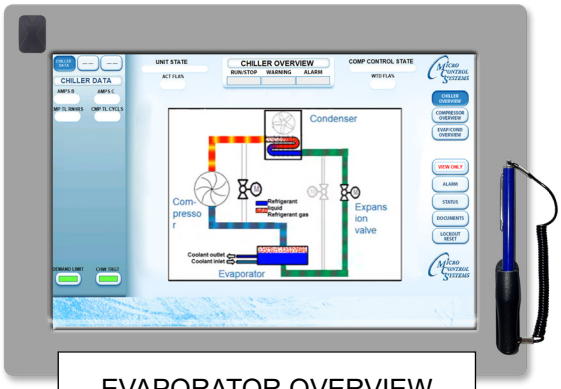
MCS-MCS-NitroMag-15.4 comes preloaded with the MCS-CONNECT program that allows you to view the ‘unit’s status’, ‘extended history’, ‘alerts’, ‘alarms’, setpoints, and more, all in a user-friendly graphic format.

Standard screens include:

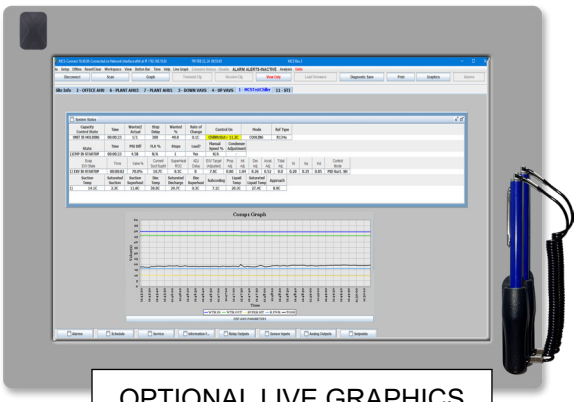
- ***SYSTEM OVERVIEW, COMPRESSOR OVERVIEW and EVAPORATOR/CONDENSER OVERVIEW***

SYSTEM OVERVIEW

COMPRESSOR OVERVIEW

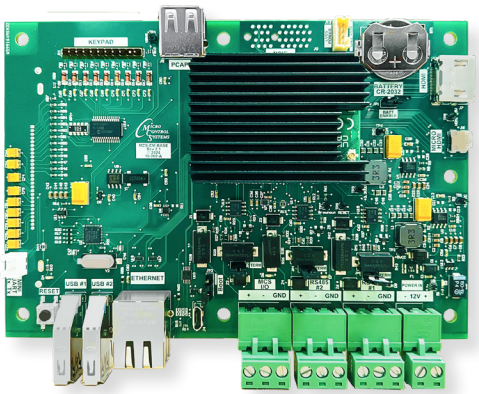


EVAPORATOR OVERVIEW



OPTIONAL LIVE GRAPHICS

Example Typical Upgrade with Optional Boards



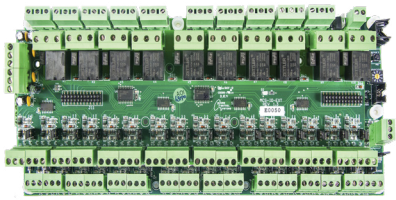
MCS-NitroMag-N

The **MCS-NitroMag-N** is a control system containing a processor, memory, eMMC Flash, and supporting power circuitry. The Broadcom quad-core processor delivers a blazing speed of 1.5GHz.

The MCS-NitroMag-N controller connects with MCS Expansion boards and Extension boards, allowing for a maximum of 144 SI inputs, 90 RO outputs, and 36 AO outputs.

The MCS-NitroMag-N comes with a built-in WiFi interface for Ethernet connectivity, and an onboard WiFi antenna connection.

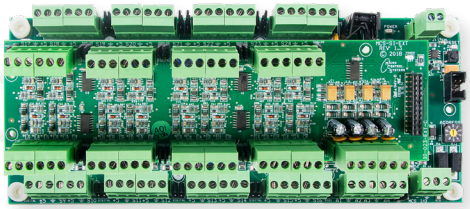
MCS-IO-Base & MCS-IO-EXT



MCS-IO-BASE has a stand-alone microprocessor which communicates with a MCS-NitroMag over the MCS-I/O port at 38,400 baud. The MCS-IO-BASE has 16 SI inputs, 10 RO outputs, and 4 AO outputs. All data is check summed with auto error correction. Each MCS-IO-BASE board can be powered by a 12VDC regulated power supply and has a automatic power fail reset system.

The **MCS-IO-EXT** provides a flexible and cost effective way to allow relay output, sensor input and analog output expansion for MCS-NitroMag. Each MCS-IO-EXT can be paired with a MCS-IO-BASE to double the number of inputs and outputs.

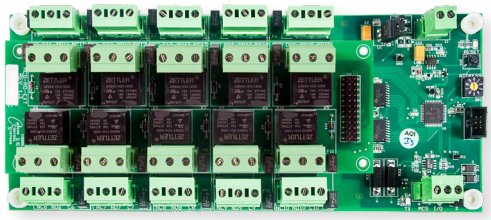
MCS-SI-Base & MCS-SI-EXT



The **MCS-SI-BASE** provides a flexible and cost effective way to allow sensor input and analog output expansion for the **MCS-NitroMag**. Each MCS-SI-BASE has a stand-alone microprocessor which communicates with the MCS-Nitromag over the MCS-I/O port at 38,400 baud. The MCS-SI-BASE has 16 SI inputs and 4 AO ouputs. All data is check summed with auto error correction. MCS-SI-BASE board can be powered by a 12VDC regulated power supply and has a automatic power fail reset system.

The **MCS-SI-EXT** provides a flexible and cost effective way to allow sensor input and analog output expansion for the **MCS MAGNUM**. Each MCS-SI-EXT can be paired with a MCS-SI-BASE to double the number of inputs and outputs.

MCS-RO-Base & MCS-RO-EXT



The **MCS-RO-BASE** provides a flexible and cost effective way to allow relay output expansion for the **MCS-Nitromag**. Each MCS-RO-BASE has a stand-alone microprocessor which communicates over the MCS-I/O port at 38,400 baud. All data is check summed with auto error correction. Because the communication is over a RS-485 long distance two-wire differential network transmission system, the MCS-RO-BASE may be located up to 5,000 feet away.

The MCS-RO-BASE board is powered by a 12VDC regulated power supply.

The **MCS-RO-EXT** provides a flexible and cost effective way to allow relay output expansion for the **MCS NitroMag**.

Each MCS-RO-EXT can be paired with a MCS-RO-BASE to double the number of outputs.

Example Typical Control Upgrade

MCS-PRESSURE TRANSDUCERS

The **MCS Pressure Transducers** are one of the most economical and durable options on the market for dealing with high-pressure industrial applications.

In addition to being CE and UL approved, MCS transducers are capable of surviving high vibration. They include a cavity built out of solid 17-4 PH stainless steel ¼" SAE Female Flare fitting & Schrader valve; 7/16-20 UNF pipe thread which creates a leak-proof, all metal sealed system that makes the transducers ideal for use with rugged HVAC environments.

MCS-T100

An extremely fast acting temperature sensor built for demanding environments. It is ideal for high moisture locations with continuous freeze and thaw cycles. The sensor is potted with a thermally conductive RTV Cure Silicon Adhesive to guarantee durability and response. Its high accuracy allows for interchangeability in the field. The large resistance range allows the use of over 1000' of cable with no noticeable effect. The MCS-T100 sensor has the ability to move from 32ºF to 212ºF in approximately 10 to 15 seconds.

MCS-Wells/Tubes

The MCS-WELL was designed to be used with the MCS-T100 temperature sensor, although it has other applications. It is used in the 23XL series chillers in the chilled water and condenser water lines. It comes pre-filled with heat conductive compound to aid in temperature to the sensor.

The **MCS-TUBE** can be epoxied to a discharge or suction line on the 23XL series chillers in order to obtain temperature readings without the use of a well. It was designed to be used with the MCS-T100 temperature sensor and comes pre-filled with heat conductive compound to aid in transferring temperature to the sensor.

MCS-USB-RS485

The **MCS-USB-RS485** is a USB to RS485 cable that provides a fast simple way to connect a **MCS-MAGNUM** to a Laptop or PC.

The MCS-USB-RS485 cable contains a small internal electronic circuit board, which converts USB to RS485 with LED indicators for transmit (TX=Red) and receive (RX=Green).

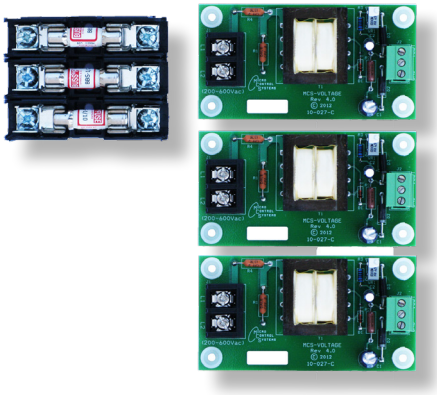
Example Typical Control Upgrade

MCS-EPOXY

- Pre-measured resins and hardeners in one tube
- Easy to use - bonds, seals, plugs, molds and rebuilds
- No special tools needed
- Can even harden under water

- Pressure tested to ..... 1300 psi
- Temperatures up to ..... 500 degree F
- Color..... Gray
- Density ..... 15.9 lb/gal (1.9 g/cc)
- Hardness (Shore D) 85
- Tensile Strength ..... 6000 psi
- Compressive Strength ..... 18.000 psi
- Modulus of Elasticity ..... 6 x 105 psi
- Shear Strength ..... 700 psi

MCS-VOLTAGE-3PH



The **MCS-VOLTAGE-3PH** measures AC voltage between 200-600 AC. It is designed to monitor the voltage of each phase of the main input power to the unit.

The MCS-VOLTAGE-3PH sensor provides three separate DC voltage outputs that correspond to the AC voltage it is measuring.

MCS-PHASE-B

The **MCS-PHASE-B** is a programmable 3-phase line voltage monitor, high temperature LCD display, easy setup and clear diagnostic readout of system faults. The MCS-PHASE-B was specifically designed to protect motors and other 3-phase loads from premature failure and damage due to common voltage faults such as unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling.

Typical Options

MCS-EXV-DRIVER

The **MCS-EXV-DRIVER** is used for the positioning and control of Sporlan, Alco, Carel, and Danfoss bipolar expansion valves.

MCS-SEHI/SERI

The **MCS-SEHI/SERI** are Electronically Operated Step motor flow control valves, intended for the precise control of liquid refrigerant flow. The MCS-SEHI/SERI valves are easily interfaced with MCS microprocessor based controllers.

Example Typical Points list with optional boards

Relay Outputs (MCS-IO-BASE)

#	Output Name	Type	Description
1-1	SPARE 1-1	Standard	Relay output not used
1-2	SPARE 1-2	Standard	Relay output not used
13	SPARE 1-3	Standard	Relay output not used
1-4	SPARE 1-4	Standard	Relay output not used
1-5	SPARE 1-5	Standard	Relay output not used
1-6	Cmp1I-Lock	Standard	Comp 1 J2 TurboCor Interlock
1-7	Cmp2I-Lock	User Logic	Comp 2 J2 TurboCor Interlock
1-8	Cmp3I-Lock	User Logic	Comp 3 J2 TurboCor Interlock
1-9	Warning	Standard	Warning Light: unit is in a safety condition prior to a safety shutdown
1-10	Alarm	Standard	Alarm Light: unit is in a safety shutdown

Relay Outputs (MCS-IO-EXT)

2-1	Comp 1	Step w\ EXV	Compressor 1 Run Enable
2-2	SPARE 2-2	Standard	Relay output not used
2-3	SPARE 2-3	Standard	Relay output not used
2-4	SPARE 2-4	Standard	Relay output not used
2-5	SPARE 2-5	Standard	Relay output not used
2-6	SPARE 2-6	Standard	Relay output not used
2-7	SPARE 2-7	Standard	Relay output not used
2-8	SPARE 2-8	Standard	Relay output not used
2-9	SPARE 2-9	Standard	Relay output not used
2-10	SPARE 2-10	Standard	Relay output not used

Relay Outputs (MCS-RO-BASE)

3-1	Comp 2	Step w\ EXV	Compressor 2 Run Enable
3-2	SPARE 3-2	Standard	Relay output not used
3-3	SPARE 3-3	Standard	Relay output not used
3-4	SPARE 3-4	Standard	Relay output not used
3-5	SPARE 3-5	Standard	Relay output not used
3-6	SPARE 3-6	Standard	Relay output not used
3-7	SPARE 3-7	Standard	Relay output not used
3-8	SPARE 3-8	Standard	Relay output not used
3-9	SPARE 3-9	Standard	Relay output not used
3-10	SPARE 3-10	Standard	Relay output not used

Example Typical Points list with optional boards

Relay Outputs (MCS-RO-EXT)

#	Output Name	Type	Description
4-1	Comp 3	Step w\ EXV	Compressor 3 Run Enable
4-2	SPARE2-2	Standard	Relay output not used
4-3	Cmp1Alarm	Standard	Comp 1 In Alarm Output
4-4	Cmp2Alarm	Standard	Comp 2 In Alarm Output
4-5	Cmp3Alarm	Standard	Comp 3 In Alarm Output
4-6	SPARE4-6	Standard	Relay output not used
4-7	SPARE4-7	Standard	Relay output not used
4-8	SPARE4-8	Standard	Relay output not used
4-9	SPARE4-9	Standard	Relay output not used
4-10	SPARE4-10	Standard	Relay output not used

Sensor Inputs (MCS-IO-BASE)

#	Output Name	Type	Description
1-1	ChilWtrIn	MCST100	Chilled Water In Temperature
1-2	ChilWtrOut	MCST100	Chilled Water Leaving Temperature
1-3	CndWtrIn	MCST100	Condenser water incoming temperature
1-4	CndWtrOut	MCST100	Condenser water leaving temperature
1-5	CndLevel	User Defined	Condenser Level Sensor
1-6	LoPsi SW 1	DIGITAL	Mechanical Low Psi Switch Comp 1
1-7	HiPsi SW 1	DIGITAL	Mechanical High Psi Switch Comp 1
1-8	LoPsi SW 2	DIGITAL	Mechanical Low Psi Switch Comp 2
1-9	HiPsi SW 2	DIGITAL	Mechanical High Psi Switch Comp 2
1-10	LoPsi SW 3	DIGITAL	Mechanical Low Psi Switch Comp 3
1-11	HiPsi SW 3	DIGITAL	Mechanical High Psi Switch Comp 3
1-12	CndFlow	DIGITAL	Monitors the condenser flow
1-13	ChwFlow	DIGITAL	Monitors the chilled water flow
1-14	Phaseloss	DIGITAL	Phase loss: phase imbalance
1-15	Run/Stop	DIGITAL	Run/Stop/Hand Switch
1-16	Emg/Stop	DIGITAL	Emergency Stop Switch

Example Typical Points list with optional boards

Sensor Inputs (MCS-IO-EXT)

#	Output Name	Type	Description
2-1	Cmp1 Fault	TurboCorFault	Compressor 1 Fault Message
2-2	Ctrl Mode1	ModbusHex	Compressor 1 Control Mode
2-3	IGV Open%	MODBUS	Inlet Guide Vane%-Compressor 1
2-4	SuctPsi 1	MODBUS	Suction Pressure - Compressor 1
2-5	DiscPsi 1	MODBUS	Discharge Pressure - Compressor 1
2-6	CavityTmp1	MODBUS	Cavity Temperature-Compressor 1
2-7	InvertTmp1	MODBUS	Inverter Temperature-Compressor 1
2-8	ChokSpeed1	MODBUS	Choke Speed-Compressor 1
2-9	SurgSpeed1	MODBUS	Surge Speed-Compressor 1
2-10	ActSpeed1	MODBUS	Actual Speed-Compressor 1
2-11	ComPSIRat1	MODBUS	Compressor 1 Pressure Ratio
2-12	Cmp1Amps	MODBUS	Compressor 1 Amperage
2-13	M IGV1STPS	MODBUS	Inlet Guide Vane Steps-Compressor 1
2-14	SPARE 2-14	SPARE	Sensor input not used
2-15	SPARE 2-15	SPARE	Sensor input not used
2-16	SPARE 2-16	SPARE	Sensor input not used

Sensor Inputs (MCS-SI-BASE)

3-1	Cmp2 Fault	TurboCorFault	Compressor 2 Fault Message
3-2	Ctrl Mode2	ModbusHex	Compressor 2 Control Mode
3-3	IGV Open%	MODBUS	Inlet Guide Vane%-Compressor 2
3-4	SuctPsi 2	MODBUS	Suction Pressure - Compressor 2
3-5	DiscPsi 2	MODBUS	Discharge Pressure - Compressor 2
3-6	CavityTmp2	MODBUS	Cavity Temperature-Compressor 2
3-7	InvertTmp2	MODBUS	Inverter Temperature-Compressor 2
3-8	ChokSpeed2	MODBUS	Choke Speed-Compressor 2
3-9	SurgSpeed2	MODBUS	Surge Speed-Compressor 2
3-10	ActSpeed2	MODBUS	Actual Speed-Compressor 2
3-11	ComPSIRat2	MODBUS	Compressor 2 Pressure Ratio
3-12	Cmp2Amps	MODBUS	Compressor 2 Amperage
3-13	M IGV2STPS	MODBUS	Inlet Guide Vane Steps-Compressor 2
3-14	SPARE3 -14	SPARE	Sensor input not used
3-15	SPARE 3-15	SPARE	Sensor input not used
3-16	SPARE 3-16	SPARE	Sensor input not used

Example Typical Points list with optional boards

Sensor Inputs (MCS-SI-EXT)

#	Output Name	Type	Description
4-1	Cmp3 Fault	TurboCorFault	Compressor 3 Fault Message
4-2	Ctrl Mode2	ModbusHex	Compressor 3 Control Mode
4-3	IGV Open%	MODBUS	Inlet Guide Vane%-Compressor 3
4-4	SuctPsi 2	MODBUS	Suction Pressure - Compressor 3
4-5	DiscPsi 2	MODBUS	Discharge Pressure - Compressor 3
4-6	CavityTmp2	MODBUS	Cavity Temperature-Compressor 3
4-7	InvertTmp2	MODBUS	Inverter Temperature-Compressor 3
4-8	ChokSpeed2	MODBUS	Choke Speed-Compressor 3
4-9	SurgSpeed2	MODBUS	Surge Speed-Compressor 3
4-10	ActSpeed2	MODBUS	Actual Speed-Compressor 3
4-11	ComPSIRat2	MODBUS	Compressor 3 Pressure Ratio
4-12	Cmp2Amps	MODBUS	Compressor 3 Amperage
4-13	M IGV2STPS	MODBUS	Inlet Guide Vane Steps-Compressor 3
4-14	SPARE 4-14	SPARE	Sensor input not used
4-15	SPARE 4-15	SPARE	Sensor input not used
4-16	SPARE 4-16	SPARE	Sensor input not used

Sensor Inputs (MCS-SI-BASE#2)

5-1	EvapPsi	MCS-200	Evaporator Pressure
5-2	DiscPsi 1	MCS-500	Discharge Pressure 1
4-3	DiscPsi 2	MCS-500	Discharge Pressure 2
5-4	DiscPsi 3	MCS-500	Discharge Pressure 3
5-5	LiqPsi	MCS-500	Liquid Pressure
5-6	SuctTmp 1	MCST100	Suction Temperature - Compressor 1
5-7	SuctTmp 2	MCST100	Suction Temperature - Compressor 2
5-8	SuctTmp 3	MCST100	Suction Temperature - Compressor 3
5-9	DiscTmp 1	MCST100	Discharge Temperature - Compressor 1
5-10	DiscTmp 2	MCST100	Discharge Temperature - Compressor 2
5-11	DiscTmp 3	MCST100	Discharge Temperature - Compressor 3
5-12	LiqTmp	MCST100	Liquid Temperature
5-13	Disable 1	DIGITAL	Turns Off Compressor 1
5-14	Disable 2	DIGITAL	Turns Off Compressor 2
5-15	Disable 3	DIGITAL	Turns Off Compressor 3
5-16	Ambient	MCST100	Outdoor Air Temperature

Example Typical Points list with optional boards

Sensor Inputs (MCS-SI-EXT#2)

#	Output Name	Type	Description
6-1	Net R/S	BMS RUN	Building Management interface Run/Stop
6-2	NetReset	BMS CW RSET	Building Management interface target reset
6-3	NetDmdLmt	BMS Dmd FLA%	Building Management interface for Demand %
6-4	SPARE 6-4	SPARE	Sensor input not used
6-5	SPARE 6-5	SPARE	Sensor input not used
6-6	SPARE 6-6	SPARE	Sensor input not used
6-7	SPARE 6-7	SPARE	Sensor input not used
6-8	SPARE 6-8	SPARE	Sensor input not used
6-9	SPARE 6-9	SPARE	Sensor input not used
6-10	SPARE 610	SPARE	Sensor input not used
6-11	SPARE 6-11	SPARE	Sensor input not used
6-12	SPARE 6-12	SPARE	Sensor input not used
6-13	SPARE 6-13	SPARE	Sensor input not used
6-14	SPARE 6-14	SPARE	Sensor input not used
6-15	SPARE 6-15	SPARE	Sensor input not used
6-16	SPARE 6-16	SPARE	Sensor input not used

Analog Outputs (MCS-IO-BASE)

#	Output Name	Description
1-1	Exv%	Electronic Expansion Valve Control Signal
1-2	StgValve1%	Compressor 1 Staging Valve
1-3	StgValve2%	Compressor 2 Staging Valve
1-4	StgValve3%	Compressor 3 Staging Valve

Analog Outputs (MCS-IO-EXT)

1-1	Demand 1%	Compressor 1 Speed Demand
1-2	SPARE1-2	Analog input not used
1-3	SPARE1-3	Analog input not used
1-4	SPARE1-4	Analog input not used

Example Typical Points list with optional boards

Analog Outputs (MCS-SI-BASE)

2-1	Demand 2%	Compressor 2 Speed Demand
2-2	SPARE2-2	Analog input not used
2-3	SPARE2-3	Analog input not used
2-4	SPARE2-4	Analog input not used

Analog Outputs (MCS-IO-EXT)

3-1	Demand 3%	Compressor 2 Speed Demand
3-2	SPARE2-2	Analog input not used
3-3	SPARE2-3	Analog input not used
3-4	SPARE2-4	Analog input not used

Sample Questionnaire

Visit https://www.mcscontrols.com/brochures.html for a fillable form to email to sales@mcscontrols.com

General Information

Company:_____ Phone: _____

Name:_____ Title:_____ Email:_____

Mobile:_____ Site:_____

Unit Information

Installation Site Name _____

Model # _____ Unit Serial # _____ Site Unit # _____

What is the Voltage of the Unit? ☐ 208V, ☐ 230V, ☐ 460V, ☐ 4160V, Other Voltage _____

What is the Control voltage in the unit? ☐ 24V, ☐ 115V, ☐ 230V, What type of Refrigerant is being used? _____

Is MCS monitoring Main Voltage? ☐ Yes ☐ No. Will Phase loss need to be monitored? ☐ Yes ☐ No.

Network Information

1. Integrating to Building Management System (BMS) ☐ Yes ☐ No, If yes, complete the form provided on page 2.

Motor Information

2. What is the Starter Type?_____ Are we monitoring the Transition OK or Starter Fault?_____
   a. Does the Compressor Have a Remote Starter? ☐ Yes ☐ No.
3. Is there a Variable Frequency Drive? ☐ Yes ☐ No
   a. What is the VFD Make and Model? VFD Make _____ VFD Model _____
   b. Will the VFD be hardwired to MCS controls, over MODBUS _____.
   c. Is MCS required to control VFD Cabinet Auxiliary Fan? ☐ Yes ☐ No.
4. What are the Motor "RUN LOAD AMPS'(FLA)? **COMP 1**: _____ **COMP 2**: _____.
5. Is Hot Gas Bypass present? ☐ Yes ☐ No, How does it operate?_____.

Purge Information

6. What is the Purge Type on the unit, how is it controlled ? _____.

Evap/Condenser/Pump Information

7. Is MCS controlling the chiller Water Pump(s)? ☐ Yes ☐ No, How will they be wired? _____
8. Is MCS controlling the Condenser water Pump(s)? ☐ Yes ☐ No, How will they be wires?_____
9. Is MCS controlling Condenser/Evaporator Isolation Valve? ☐ Yes ☐ No ☐ BMS.
10. Is MCS controlling tower fan(s)? ☐ Yes ☐ No, How many are there _____, how are they wired?_____.
11. Will the Chilled/Condenser Water Flow be measured by?_____.

Ambient Information

12. Will Ambient temperature need to be monitored? ☐ Yes ☐ No.

CVHA Information Only

13. Is there a Motor Cooler? ☐ Yes ☐ No, Will MCS be monitoring the Oil Feed? ☐ Yes ☐ No, Return Temperature? ☐ Yes ☐ No

COMMENTS (Is there any other Infomation we need to know?):

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