



SOFTWARE RELEASE NOTES

MCS-MAGNUM

Version 17.32D

05/01/2018

Updates from previous versions: 17.25S

New Features:

1. Created new header file and modified Phy initialization function to support new Microchip KSZ8091MLX single-supply 10BASE-T/100BASE-TX Ethernet physical layer transceiver.
2. In order to be back compatible, I modified the Phy initialization function to dynamically identify and initialize the Ethernet physical layer transceiver based on the chip manufacturer.
3. All Firmware versions - Add low suction pressure opening logic to the fast exv logic. This new low pressure opening logic will drive the valve open extremely fast when a low suction pressure occurs.
4. HVAC V17 Firmware only - Add logic to support two rotation groups. If setpoint #103 is setup as "DELAY" type then two groups of rotation are supported by the custom rotation logic. If setpoint type is "Target" then old single group rotation. And if setpoint type is neither the normal comp rotation is used. Similar setup for setpoint #103 for the new 2 group rotation logic as used with the old single group custom rotation.
5. All Firmware versions - Add low suction pressure opening logic to the fast exv logic. This new low pressure opening logic will drive the valve open extremely fast when a low suction pressure occurs.
6. JGW added Fast Subcooler superheat staging logic. Loaded into MCS-5580 chiller on 06/15/2017.
7. All Firmware versions - Add low suction pressure opening logic to the fast exv logic. This new low pressure opening logic will drive the valve open extremely fast when a low suction pressure occurs.
8. HVAC & REFR firmware - Added logic to display the second lead (two group comp rotation) comp on the magnum LCD display in the status screens.
9. REFR Firmware - Add two group comp rotation logic into REFR firmware.
10. REFR Firmware Only - Add new feature to balance the comp between two skids when one skid had comp disabled/locked out. This feature is enable when setpoint #26 "Step Delay" time field is not zero.
11. HVAC V17 Firmware only - Add logic to support two rotation groups. If setpoint #103 is setup as "DELAY" type then two groups of rotation are supported by the custom rotation logic. If setpoint type is "Target" then old single group rotation. And if setpoint type is neither the normal comp rotation is used. Similar setup for setpoint #103 for the new 2 group rotation logic as used with the old single group custom rotation.
12. HVAC & REFR firmware - Added logic to display the second lead (two group comp rotation) comp on the magnum LCD display in the status screens.
13. REFR Firmware - Add two group comp rotation logic into REFR firmware.

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14. REFR Firmware Only - Add new feature to balance the comp between two skids when one skid had comp disabled/locked out. This feature is enable when setpoint #26 "Step Delay" time field
15. RTU FIRMWARE ONLY - Added Subcooler EXV logic into RTU.C.
16. RTU ONLY FIRMWARE - Added logic to keep the tandem comp running for few second after jumping the EXV closed- this will help pumpout the evap and help keep the superheat from going too low when the tandem comp turns off.
17. All Firmware - All Fast EXV Logic - Modified exv adjustment delay timer to make adjustment based on difference between actual superheat and target, bound by min of 1 and max of 10.
18. All Firmware version - Added low superheat logic into the FAST EXV control logic.
19. HVAC Only: Added call to enable Tandem exv spread logic.
20. All Firmware Version - Allow the condenser fan bank to decide if common condenser for common suction compressor. Removed the test for common suction comp to group condenser fans. This will allow for common suction comp with separator condensers.
21. REFR firmware only - if setpoint #118 is configured as a "Target" type, then setpoint #118 high zone column is used as the ambient disable temperature for rotating coil defrost. Otherwise if setpoint #118 is not configured at "Target" type the old logic of using setpoint #118 value as the ambient disable point for rotating coil defrost is used
22. . REFR firmware only - Set the manual defrost time delay based on the enter temp, high return temp less defrost time required. If setpoint #120 is setup as "Target" type then manual defrost time delay is based on the enter temp compared to setpoint #118, 121, and 124 and uses the values in the high zone column from setpoint #120, 123, or 126 as the defrost time delay.
23. REFR Firmware only - correct the logic for the new feature to disable the rotation coil logic based on it own setpoint value. if setpoint #118 is a target type then it should use the high zone value to disable the rotating coil logic. code was add usign the wrong setpoint index.
24. HVAC firmware only - If setpoint #25 is setup as TIME type and time column has value of 1, then in the control sensor is in the control zone and capacity control is holding and step wanted is greater than step turned on, set steps wanted on equal to steps turned on. We in the zone and holding with the current step turned on, no need to increase steps turned on. Step wanted on was increase outside the zone but no comps where available to start and before any become available, the temp reach the zone. This change was request by SKM.
25. HVAC Firmware only - If setpoint #1 TYPE is setup as TARGET type, then the low zone value is used to turn off all running compressor when the control temperature sensor falls below the value. Force all running compressor off, control temperature is too low. Try to avoid tripping on freeze protection.
26. code for forcing all comp off at a adjustable low temp was not added correctly, have wrong variable name. Correct variable name and recompiled.
27. CPM: Added support to display in MCS-Connect the Chiller(s) capacity control state and Alarm
28. HVAC ONLY: Bluestar (BSL) requires extra information from the Turbocor compressor.
29. SENSORS.C: Added a secondary field to save and transmit the analog input value of Modbus Fault/Alarm SIs. These sensors were originally treated as DIs.
30. Turbocor compressors: Added Control Status state text to the Compressor's #1 page, under the Magnum-Circuit state. The State time is now only going to be displayed on the Compressor's #2 page.
31. REFR Firmware only - If setpoint #31 is a "Target" type setpoint and only 1 comp is running on the suction group force the min comp speed to the value of setpoint #31 low zone column. This will override the capacity control logic min speed and force the comp to run slightly fast to bring the oil back.

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32. REFR firmware only - modified the firmware's unloading logic to allow the config to define the unloading step delay adjustment multipliers. In the existing the logic the unloading step delay multipliers are hardcode at 4, 6 and 8.
33. HVAC, RTU, MHRC, REFR, PAO versions - Add option for low disch superheat reload offset value. if low disch superheat setpoint type = TARGET then used high zone field as offset for reloading, else use the original diff_temp offset.
34. HVAC Firmware only - For turbocor comp type only - if setpoint #181 is active use it value as offset from the surge RPM to stop unloading the turbocor comp and force comp into SURGE HOLD state. Then if the setpoint is a target type, use the high zone field as the offset for allow the comp to unloading again. Else the offset for allow comp to unloading is half the setpoint value.
35. HVAC frimware only - For turbocor comp only do not allow a safety unload (low suct psi, high disch psi, etc.) override the RPM Surge Hold logic. Do not allow turbocor comp to do safety unlaod if RPM are within the Surge RPM setpoint.
36. Finished adding CDI project for Tyson Truck. Omit calls to LWC code. " Got a clean compiled Magsoft_CDI_V17.hex"
37. Modified EXTENDED_LOCKOUT history to pull all the SIs, ROs, AOs, Unit information for the last 15 Safety lockout alarms. This requieres changes to MCS-Connect
38. (extended alarm history): Moved function that saves the lockout point data from stpscrew into alarms . This is going to be a common function for all different SW.
39. New Feature (extended alarm history):
40. (extended alarm history): Added Turbocor alarms to the is_this_a_lockout_alarm test
41. (extended alarm history): Commented out lockout point data function and function calls from CENT.C . This is going to be a common function for all different Software versions . save_lockout_point_data is handled in alarms.c.
42. (extended alarm history): Initialized extended history alarm head , tail pointers and index array.
43. (extended alarm history): Commented out lockout point data function and function calls from CDI,RTU,CPM, HCRF, MAGREF, MHRC, PAO, ACU AND HVAC . This is going to be a common function for all different Software versions . save_lockout_point_data is handled in alarms.c..
44. (extended alarm history): Removed conditional compiler that was added during preliminary testing of the new extended alarm history. This new feature was initially only added to HVAC code.
45. All Firmware Versions - Add refrigerant R453a into the pressure to saturated temperature charts. Used <http://www.comstarproducts.com/rs-44b-refrigerant-r22-replacement>, http://www.comstarproducts.com/amfilerating/file/download/file_id/1730/ and Danfoss APP.
46. Magref: (As per BWW)New option for Dehumid mode with rotating coils defrost. Only stage 1 compressor at a time, instead of all compressors together.
47. Removed ! New Feature - REFR, - Add option for low disch superheat reload offset value. if low disch superheat setpoint type = TARGET then used high zone field as offset for reloading, else use the original diff_temp offset. (Refrigeration sw doesn't have a differential STP, all differential values are hard coded).
48. CPM New feature : Implemented Emergency Stop and Phase Loss safety logic.
49. RTU Firmware Only - Add support for Danfoss FD scroll comp special defrost logic. After defrost stop comp for X second, x is defined by setpoint #62. Then after this delay start comp and run at 30hz for 10 second, then speed up to 50hz for 15 second, then back to normal operating mode. Also during defrost force comp speed to 75%.

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50. HVAC firmware only - add unit and comp alarm indicator ram fields so we can transmit alarm indicator over modbus. See excel file "Unit & Comp Alarm indicator for Modbus & Bacnet.xlsx" file for alarm names and their register #.
51. All firmware versions - Add support to allow user to enter the "FACTORY STARTUP" auth code from MCS-Connect. Needed the code to check if the flag was set to do factory startup. Previous you could only enter the factory startup password from the keypad and keypad code would force the unit into and out of "FACTORY STARTUP".
52. Add test on all modbus alarm faults to use time delay in setpoint Comp Speed (#212 for HVAC). If setpoint comp speed is not active then use hard code 5 second. This is a delay that fault bit must be set on before magnum will generate an alarm. This corrects an issue with getting false alarms from the turbocor.
53. SKM needs a critical suction Safety STP. They do not want to use the STP80 because they need to be able to set the STP safety time value to 15 seconds at a higher PSI and they want to keep the 80 at 5psi for 3 sec.

Bug Fixes:

1. magref.c: Logic that allows to tie specific compressors to specific RO & SI boards for the purpose of only locking out that compressor when its RO or SI loses communication (still allows other comps to run) isn't working.
2. CPM.c: As per BWW a non rotating system (SP_LEAD_CHILLER != 0) must follow First ON last OFF sequence.
3. CPM Bacnet BMS alarms: While testing Napps 7 CHILLER CPM with BQT I found that we were not passing the last 5 alarms .
4. CPM: While testing NYC Victoria Secret cfg Brian Reed found that the chillers were getting stuck in closing valve state. Added check to bypass chiller opening and closing valves states for units with no isolation valves.
5. CPM: While testing Napps 7 CHILLER CPM configuration I found the the Pump Lead indicator will change/rotate every pass of the algo (2sec).
6. CPM: Added test in first ON first OFF rotation logic to check when to rotate based on the configuration setting under control options. The two options are Rotate when "All Chillers Shut Down" and "Any Chiller Shuts Down"
7. exv code: This firmware solves the issue of an Invalid Config Checksum after a power cycle to the Magnum. The issue occurs only with config files that are using Tandem EXV circuits with Fast SSH and the self exv start % learning feature is enable.
8. exv code: This firmware solves the issue of an Invalid Config Checksum after a power cycle to the Magnum. The issue occurs only with config files that are using Tandem EXV circuits with Fast SSH and the self exv start % learning feature is enable.
9. HVAC : Problem reported by Sandeep at Gami on 07/09/2017. Even though the compressor is lockout the sub cooler exv is still trying to modulate. * Solution: Set sub cooler EXV to CHL_EXV_LOCKOUT state when unit or circuit lockout occurs.
10. Subcooler EXV: Problem reported by Daniel Chapman-> Subcooler exv getting stuck in Lockout state after a lost IO follow by a lockout reset command.
11. RTU: Added code to support subcooler exv. HVAC was used as a base code.

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12. MHRC : Added fix from commit 741adedc95d8c8e339e0ca9f069a821ba8415ef1 (Even though the compressor is lockout the sub cooler exv is still trying to modulate.)
13. HVAC Firmware - Correction for two rotation groups logic - add bound checks on the lead and second_lead variables at power up to make sure they are within their rotation groups limits.
14. HVAC Firmware only - Change the slide stop pulsing logic from using comp amp when setup for slide position control. At DB Si group job the amps where going down after the comp started causing the stop pulsing logic to stop moving the slide when config was setup for slide position control and the slide was loading. Now when config setup for slide position the loading will only stop if the slide position is not moving.
15. HVAC Firmware - Correction for two rotation groups logic - add bound checks on the lead and second_lead variables at power up to make sure they are within their rotation groups limits.
16. CENT: Reported by Dan Chapman: "HenryWurst unit has an issue with the lead compressor not holding during the lag compressors prelube. Lead compressor will load back up even though our unit state is in holding and lag compressor is in prelube"
17. CENT: Moved capacity hold logic call "Start Next Comp - Force all running comps to unload first" - compressor state timer was not being ticked.
18. CENT: Added conditional compiler around second_lead_circuit lcd indicator logic. - Two rotation logic is not supported in centrifugal.
19. CENT: Using the time field of STP41 SP_LUBE_TIME added option for the customer to tweak the capacity hold time. Before it was a hard coded timer == (SP_LUBE_TIMER value + 30) new logic will use (SP_LUBE_TIMER value + SP_LUBE_TIMER.time)
20. CENT: Corrected problem with lag compressor bumping variable steps wanted when going from Lubing into holding state. Force starting min slide % to SP_MIN_VARIABLE_STEP .
21. RTU: The pointer subcooler_exv_valve_percent_ptr was properly initialized in stpscrew.c:setup_circuit_ptrs_indexes() and MHRC:setup_circuit_ptrs_indexes() but not in RTU.
22. RTU Firmware Only - Starting working on the bug for circuit pump/Valve control not working. Have
23. RTU Firmware Only - Finish working on the bug for circuit pump/Valve control not working. Pump/Valve was coming ON until the cmp was running. Released for beta test
24. RTU:Reportyed by Dan Chapman ->" Attached is a config and screenshot of a fire alarm trip where the running compressors get stuck in a unload pump down state and don't shut down".
25. RTU Firmware Only - circuit pump/Valve control not working Reported by Aaron Negron . 1) All Pump/Valve are coming ON after switching the unit from OFF to ON. 2) Lead Circuit's pump staying ON after switching the unit OFF.
26. RTU "During a flow loss and also a fire alarm and possibly all hard shut downs I've found that any compressor in Defrosting state will not shut down and continue to run.Only once the defrost completes for the given compressor will it shut down."
27. all SW user_defined_ro_logic: Reported by Dan Chapman: "When trying to control an RO based on the value of an AO using user logic it doesn't work correctly. For example: If I have this said RO set to turn on at 10% and off at 5%. It will turn on at 10% but turn off at 9.9% instead of the 5% I'm telling it to. I've tried all different values and also Tried 0, 1, and 2 decimal places and it works the same no matter what."
28. RTU: The pointer subcooler_exv_valve_percent_ptr was properly initialized in stpscrew.c:setup_circuit_ptrs_indexes() and MHRC:setup_circuit_ptrs_indexes() but not in RTU.
29. Replaced regular exv subcooler control with fast_subcooler_exv_superheat_staging. Started working on tandem exv spread control logic (AAON Cypress One Job site)

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30. Continued working on new exv spread logic: made spread into a function. JGW->Loaded 17.25#u into RTU6 ->AAON Cypress
31. Continued working on new exv spread logic: made spread into a function. JGW->Loaded 17.25#v into RTU4 & RTU1 ->AAON Cypress.
32. RTU Firmware ONLY - Remove the EXV spread logic by mistake - need to add back!
33. RTU FIRMWARE ONLY - Created new test for jumping EXV closed when turn off comp - only skip the bump if comp is in low suction pressure unloading or holding.
34. RTU FIRMWARE ONLY - Do not turn on Comp Speed AO when delaying the comp start due to EXV pre-open logic - need to keep AO off with comp. Also correct Comp with VFD logic not keep comp off to allow exv to open when using the EXV pre-open logic.
35. All Firmware - EXV logic - the new calculated control values for PID logic were not using the same setpoints as fast exv logic. Can to use the sample setpoints so these calculated values can be used in the fast exv logic
36. All Firmware - Fast EXV logic - Low Suction pressure logic - change the hard code EXV adjustment from 1.0% to 0.5% time the time field of setpoint #13
37. All Firmware - FAST EXV Logic - Above the Zone and Slope is negative - if 2 times the fast zone hold, if between 2 times and above fast and ROC drop slowly, if in the fast zone and drop very slow HOLD
38. All Firmware - Fast EXV Logic - Below Zone and ROC is Positive - if below the fast zone hold, if in fast zone and ROC <= 0.2 hold, else open
39. All Firmware - Fast EXV logic - above fast zone and ROC is positive open using largest exv adjustment, else if above Target and ROC > 0 use smallest exv adjustment.
40. Fast EXV Logic - Below Target and ROC is negative, if in fast zone and ROC is < -0.2 close EXV using largest else if ROC >= -0.2 close using smallest. Else if below the fast zone close valve and if ROC less than -0.6 use largest adjustment times 3, else if ROC < -0.4 use largest adjustment times 2, else use largest adjustment.
41. All Firmware - Fast EXV Logic - in Hold Deadband(fast zone div 4) and ABS ROC < 0.3 Hold, else if ROC = 0.0 and (superheat in the fast zone hold, else ROC = 0.0 and above the fast zone open exv 0.1, else if ROC = 0.0 and below fast zone close exv 0.1.
42. All Firmware - Fast EXV Logic - JGW changes and BWW change Sterling VA AAON job site.
43. 1. Reset variable jgw_hold to a filler 2. Delete variable curr_valve_position[MAX_CIRCUITS];
Variables are declared by never used
44. Revert "RTU Firmware ONLY - Remove the EXV spread logic by mistake - need to add back!"
45. cosmetic ONLY: EXV Spread functions name was misspelled.
46. all SW EXV Subcooler logic: Added an option to enable/disable Fast subcooler exv control based on the type of control selected in the configuration file under circuit/ evaporator exv control.
47. Magref Condenser logic: Reported by Jeff T and BWW "For unit with hot gas defrost, when the comp goes into defrost it is switching the condenser control as if the unit was reverse cycle defrost".
48. CPM: Reported by BCL (CPM for 2 Hardwire chillers)"When you trip both chillers both valves stay on " . Commented out lines that turn/keep ON isolation valves for chillers that are faulted . Valves should be close if chiller is faulted and pumps are not running
49. HVAC FIRMWARE ONLY - Copied RTU change done by BWW "Created new test for jumping EXV closed when turn off comp - only skip the bump if comp is in low suction pressure unloading or holding."

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50. HVAC FIRMWARE ONLY - Copied RTU change done by BWW "Do not turn on Comp Speed AO when delaying the comp start due to EXV pre-open logic - need to keep AO off with comp. Also correct Comp with VFD logic not keep comp off to allow exv to open when using the EXV pre-open logic."
51. HVAC FIRMWARE ONLY - Copied RTU change done by BWW "Added logic to keep the tandem comp running for few second after jumping the EXV closed- this will help pumpout the evap and help keep the superheat from going too low when the tandem comp turns off."
52. RTU: Added code to allow auxiliary heat to run if the heatpump is disabled due to a low ambient condition.
53. RTU.c: Reported by Daniel Bigby AAON-> "On the test bench and on job sites for RL units., I have seen this economizer issue where the O/a and R/a differential does not seem to have a deadband. Example if the O/A is at 80 and the R/A is at 83 it would be enabled, if the O/A stays at 80 and R/A drops to 82.9 if will disable the economizer and go to minimum position. This causes a sawtooth control for the economizer swinging back and forth from 0 to 100%. Can we have a deadband in there so maybe at a difference of 5 it is enable and at a difference of 3 it is disabled?"
54. Bacnet MSV state text alarm: While testing Bacnet communications with BQT I found the MV142-MV146 were returning the incorrect state-text for indexes 79 and 80.
55. REFR firmware only - Correct issue with LLS not turn off during the pumpdown cycle when configure to use rotating coil defrost.
56. REFR firmware only - forgot one line on the last commit - this is bug fix for the LLS not turn off when going into pumodwn and configured for rotating coils.
57. REFR firmware only - Correct issue with Force defrost timer get set to the setpoint #145 value for a instant when using the new feature to set the forced defrost delay based on the entering/return temp. This is display issue only - no logic change. The froce defrost time was getting set to the old way for bimp, then logic was setting it correctly.
58. CPM: If the CPM is running and the R/S is set to Stop force CPM unit state/mode to CPM_OFF_RUN_STOP_SWITCH for 60 seconds (STARTUP_DELAY) to ensure that all the valves closed fully and the chillers go OFF.
59. CPM: Added an option to use STP108 value field instead of the hard coded timer added in commit 10764f17994795b6dfa81fc29ab8e205fd6c7afc that allows a pump to run for 60 seconds with one less valve than the minimum valves per pump value specified in the configuration.
60. b393d36 - 2017-10-09 cag@mcscontrols.com - Bug Fix: Added new CHL state "Disabled" . A chiller will be Disable if it is commanded ON or it is Running and reports zero compressors available. The chiller will auto reset to CHL OFF READY as soon as it starts reporting back that a compressors is available .
61. CPM: 1. Changed logic to only shut down a chiller based on the alarm RO, if it is not hardwired and the chiller is reporting back that it is in CHL_CHILLER_LOST_IO, CHL_CHILLER_LOCKOUT or CHL_CHILLER_SMOKE_ALARM_OFF. It is okay to keep a chiller ON if its alarm RO is ON and at least one compressors is available.
62. fixup! Added missing variable declaration --> Bug Fix CPM: Added an option to use STP108 value field instead of the hard coded timer added in commit 10764f17994795b6dfa81fc29ab8e205fd6c7afc that allows a pump to run for 60 seconds with one less valve than the minimum valves per pump value specified in the configuration.
63. CPM:Do not allow inactive chillers to load If the total number of active chillers is equal to the max allowed chillers and the cpm is loading .
64. CPM: Do not count chillers that are set to CHL_DISABLED or CHL_NO_CMPS_AVAILABLE as an available CHL .

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65. Evap condenser low sump level fault: Problem reported by Daniel B at AAON ->I have a double ended-chiller in the testrack. We have 2 condenser sections one on each side of the chiller. We have 1 pump and 2 fan vfds for each side. So we have land the Ro like follows;
66. HVAC Firmware only - correct issue that oyu could not have two relay outputs with the same alarm indicator. Only the first relay output would turn on when the alarm occurred. the second relay output would stay off always.
67. RTU: Reported by Dan Chapman "Economizer not working in low ambient off: Currently seeing Economizer get set to minimum when putting unit into low ambient off. Recently we corrected an issue with hot water not modulating when in low ambient off and that was fixed and probably messed up this logic as I loaded 17.26A3 and Economizer works fine in low ambient off. "
68. SENSORS.C: modbus_fault_alarm function was only printing one alarm even though multiple bits were set in the Modbus alarm/Fault SI value .
69. HVAC : Corrected problem were the turbocor_control_mode_status is not being set when Unit capacity control state is in "Unit in LockOut". Also updated Turbocor Control Mode/Status variable ram name.
70. LWC: Corrected test that was subtracting 1 from pump_ptr and pump_off_ptr and compering the resut to a negative value ; These variables cannot drop below 0 because they are defined as byte/unsigned character.
71. Bug Fix Bacnet TCPIP: Problem communicating to a Trane BMS system because the MCS-Magnum is replying with the wrong broadcast address and this is locking up the Bacnet TCPIP thread. Rewrote set_broadcast_address to use the subnet mask and the IP address.
72. Bug Fix - RTU Firmware Only - Correct issue with Evap Fan Post delay when turn off due to run stop switch. The fan post delay was not occurring when the run/stop switch was turned off., the evap fan would stop as soon as the last comp when off.
73. Bug Fix HVAC ECONOMIZER_AS_LAST_STEP: Reported by BCL on 10/11/2017. All Economizer stages are turning OFF together instead of staging off.
74. HVAC, RTU, MHRC, & PAO firmware versions only - Corrected issue on the low suction superheat and high suction superheat safeties, only test these safeties if we have suct temp sensor. Logic would allow the safeties to run without a suct temp and we can not calculate the suct superheat without suct temp sensor and it was generating bogus alarms.
75. Turbocor Bearing And Motor Alarms: During my visit to BSL India Sandeep decided that we need to read and display the Bearing and Motor Faults instead of the alarm registers.
76. HVAC, RTU, REFR, MHRC, PAO firmware versions only - Correct issue with the new low disch superheat unload and reload offset. Can not look at setpoint #84 setpoint type to be target to use high/low zone as offset because setpoint #84 type has to be ALARM or Lockout type for the low disch superheat safety. Instead change the logic to us setpoint #191 high & low zone as offset for the low discharge superheat unloading /reload. If setpoint #191 is a target type, then low disc superheat unload and reload logic uses setpoint #191 high and low zone, else it diff temp and diff_temnp x2.
77. HVAC, RTU, REFR, MHRC, PAO firmware version only - Correct issue with new surge rpm hold logic for turbocor. Comp was not allowed to load back up on temp when it went into surge hold.
78. HVAC, RTU, REFR, MHRC, PAO firmware versions only - Correct issue with the new low disch superheat unload and reload offset. Can not look at setpoint #84 setpoint type to be target to use high/low zone as offset because setpoint #84 type has to be ALARM or Lockout type for the low disch superheat safety. Instead change the logic to us setpoint #191 high & low zone as offset for the low discharge superheat unloading /reload. If setpoint #191 is a target type, then low disc superheat unload and reload logic uses setpoint #191 high and low zone, else it diff temp and diff_temnp x2.

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79. HVAC, RTU, REFR, MHRC, PAO firmware version only - Correct issue with new surge rpm hold logic for turbocor. Comp was not allowed to load back up on temp when it went into surge hold.
80. As per BSL/Sandeep requirements Surge Hold wins over any safety unload condition, they prefer that the unit trips on safety over a surge because the surge causes a lot of vibration and then a calibration is required.
81. HVAC: Fixed problem with circuit state bouncing between Surge Hold and Suction Unload
82. Bug Fix - HVAC Firmware only - Turbocor Surge RPM unloading logic - correct issue with the comp state time not counting when in surge holding state.
83. Keypad LCD Display-->State Timer changes to 000:00:00 when greater than 255. Resolution: Adding new structure(HHMMSS_long) with new function(LCD_putHHMMSS_long) to handle new structure. This allows for the first parameter to accept a long instead of a byte data type. Now instead of 3 digit lcd display rolling over at 255 it will stay at 999 once the timer reaches greater than 999.
84. Extended Alarm history: After trying to receive Extended Circuit Alarm over the RS485 Ray found the MCS-Magnum was transmitting incorrect values for the extended Circuit info. After reviewing the RS485 message reply code I found that I was using the incorrect structure start address for the reply.
85. Git extensions-> Ignore Zilog generate files.
86. MHRC and PAO Compiled errors: in common code (key.c): Missing Declaration for critical_suction_safety_counter[MAX_CIRCUITS].
87. Removed ! New Feature - REFR, - Add option for low disch superheat reload offset value. if low disch superheat setpoint type = TARGET then used high zone field as offset for reloading, else use the original diff_temp offset. (Refrigeration sw doesn't have a differential STP, all differential values are hard coded)
88. CENT (reported by Ken Lee on 01/12/2018): We found that there is a problem of VGD control for centrifugal config. Below is some description on the problem after i have simulated in the office
89. Dew point Calculation: D2 reported that the Dewpoint calculation was wrong at 72F temp and a relative humidity (RH) between 30% and 40% . At 72F & 30%RH we were getting 72 and the correct answer is around 38.91.
90. CPM: Brian Reed Reported that in a N+2 configuration if the capacity control goes from holding 4/4 to loading 5/4 and the lead chiller(#4) that was previously disable on R/S is enable the array controller will open an extra valve for 30+seconds causing the running chillers to lose flow.
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93. MHRC and PAO Compiled errors: in common code (key.c): Missing Declaration for critical_suction_safety_counter[MAX_CIRCUITS].
94. Bug Fix LCD Screens: Corrected Min , Max and Average display values for Modbus RPM sensors. These values need to be multiply by 10 because Modbus/RPM sensor readings are truncated by a factor of 1/10.
95. MHRC: Corrected problem reported by Mike from Multiaqua. If the mode is cool/Heat and a freeze safety trip occurs the unit state will toggle between Lockout and Switching modes for the time specify in STP164(HEATPUMP_SWITCHING_MODE_TIME_DELAY) and a Freeze alarm will be generated every second.

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96. MHRC: Clear cmp_relays_off_timer before setting it to PumpDown state. This is done to ensure that the Scroll VFD compressor stays in the Special Turn off Logic for the number of seconds specify in the time field of STP 62(SP_SPIN_DOWN_TIMER).
97. HVAC: Reported by Jeff T->Moved Demand limit bounding check to after SP_MIN_VARIABLE_STEP calculation logic.
98. Problem with change " 14.00y-004-rct 07/09/13 stpscrew.c,add if too many low suction unloads within a given time alarm and lock out the circuit." EXV is still modulating even through the CMP state is set to LOCKOUT
99. CPM: Reported by Brian Reed; Lockout reset command only works for chillers in Lockout state.
100. CPM: Problem staging 2nd chiller ON when unit is set to cycle pumps based on number of chillers ON and number of valves to force ON is set to one.
101. CPM: Reported by Brian Reed; Lockout reset command only works for chillers in Lockout state.
102. CPM: Problem staging 2nd chiller ON when unit is set to cycle pumps based on number of chillers ON and number of valves to force ON is set to one.
103. CPM: Sometimes chillers do not reset after a LockOut reset command.
104. CPM: Sometimes chillers do not reset after a LockOut reset command.
105. All firmware versions - Correct issue with manual value for modbus digital inputs type. it was treating modbus DI as analog sensor type.
106. 98aec1c - 2018-02-25 bww@mcscontrols.com - Bug Fix - HVAC firmware only - Alarm Relay Output type for Lube Oil Temp and Lube oil PSI alarm where crossed(interchanged).
107. a7ea72d - 2018-02-26 cag@mcscontrols.com - Bug Fix CPM: Jeff and Brian Reed reported issue with non-rotation logic not working staging is following First ON First OFF instead of First ON last OFF
108. CPM: Do no allow CheckChillerflow function to decrement stages wanted. This must be done in the chiller stage loop
109. RTU: Andy T reported that the reversing valve doesn't stay OFF (10Sec) after defrost cycle is terminated and unit goes into Defrost pumpdown.
110. condenser: Fabian at DB Malaysia reported that condenser fans are not modulating during RTU Defrost cycle.
111. Turbocor Fault SI: DB Malaysia keeps reporting that in jobs with multiple Turbocor CMPs they keep getting nuisance Modbus Fault alarms.
112. RTU: Reported by Fabian at DB "The defrost control which had been modified already looks fine, just required some touch up at the finishing part where it starts back all compressor together at same time where its going to cause an high inrush at this point. For the delay time, give a 30 sec interval in between each compressor turn on after defrost. Below complete write up as requested.
113. LWC: Corrected bug reported by Jeff-> Having an issue with pump rotation on loop... ON a config where there are 2 pumps, only allowing 1 to run. They'll rotate every time the run/stop cycles OFF like they should. BUT, when pump 2 is the lead and has a trip... it'll start pump 1 like normal. When the fault is cleared, pump 2 is still the lead... but not rotation doesn't work. Every cycle of the run/stop leaves pump 2 as the lead, but starts pump 1.
114. The FDD feedback delay wasn't implemented, causing to trigger wrong FDD alarms. By implementing the feedback delay counter solve the FDD alarms problems that Daniel Bigby from AAON reported
115. HVAC Firmware only - correct issue with the Relay output alarm indicator for Low superheat and High Discharge temp. The array to cross setpoint # to the alarm RO # was incorrect and these two relay output alarms were not working.

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116. STPSCREW: During testing of new CMP alarm indicator logic BWW found that RO_BOILER_PUMP_FAULT, RO_BOILER_PUMP_HIGH_AMPS, RO_BOILER_PUMP_LOW_AMPS and RO_BOILER_STAGE_FAULT were not working .
117. Alarms: Linking... WARNING (724) --> Symbol _loop (.\alarms.obj) is not defined. Added missing variable definition in clear_comp_alarm_indicators function
118. correct issue reading modbus register alarm indicators for circuit #2 and greater. The check for valid address was wrong, it was not multiplying the number of circuit available time the total # of indicator per circuit.
119. REFR firmware only - Correct issue with not rotating coils(LLS) when setup for recip/scroll comps.
120. REFR firmware only - Corrected issue with recip comp with unloaders not stage off correctly. The recip comp logic was not moving to the correct comp state when setup with unloaders. Loading work correctly, but unload was not correct.
121. CPM: As per BWW change lockout reset logic to send the lockout reset message one time, instead of two times, and to keep the unit in Alarm OFF until the alarm status indicator reads OFF and the check chiller alarm functions returns False.
122. CPM: reported by Dan Chapman ->CPM is rotating to the least amount of run hours each time the unit cycles off. This is causing issues with valves constantly going on and off to adjust to the new lead chiller. Also on two chiller unit it was causing an issue of the lead (Chiller #1)shutting down first making the valve close and leaving only valve on chiller #2 open which is correct. The issue is now chiller #1 is still lead based on run hours. And the logic is starting chiller #2 first anyways because its valve is open and not the leads
123. CPM: When unit is switched off by the run/stop via CPM All chillers go into a CHL SWITCHED OFF state. Once the run/stop is put the RUN the first unit out of the switched off state will start opening its valve when really the lead chiller needs to open its valve first.
124. CPM Reported by Brian Reed and D2: Balanced loading does not work when the CPM is setup to only open a chiller valve when the chiller is called to run. Balanced loading at present requires valves to already be open and chiller ready to run to work. If the cpm is setup to only require one valve to be open for the pump to run and other valves remain closed until the chiller is needed balanced does not work. The logic gets hungup.. chiller 1 goes 2/2 and cpm cap control state sits at 3/2 stage up hold and never starts chiller #2.
125. reported by Brian Reed and D2: When running CPM fully loaded at 10/10 I'll lockout or disable a compressor on one chiller. As the CPM receives the info that only one compressor is available on that chiller it will go to wanted 10/actual 9 and set the cpm state to loading above zone. The issue is it will also for about a second, change the wanted on the lead chiller to wanted 1/ actual 2, then it will go back to 2/2. Sometimes it will shut down a compressor on that chiller and sometimes it will get back to 2/2 before it shuts one of the compressors down. When it does shut a compressor down the CPM will go back to loading 9/8.
126. CPM: In order to provide good a better feedback of the chillers (Steps Available) we must command the chiller BMS R/S ON during PUMP ONLY MODE.
127. CPM: Problem reported by D2-> If the CPM goes OFF on R/S or Schedule and none of the chillers were running rotation on min run hours doesn't work.
128. CPM Bug Fix: In order to prevent units from short cycling Alarm/Safety-OFF to ON I implemented the Switched OFF state.
129. reported by Brian Reed and D2-> If Run/stop is switched to STOP on a CHILLER while the chiller is running, the cpm will lockout that chiller because I took away its steps while it was running.
130. 56f8c7a- 2018-04-13 cag@mcscontrols.com - Bug Fix CPM: Added logic to lockout chillers that report 0 steps available and its unit alarm RO status is ON.

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131. CPM: Problem reported by D2-> 3 chillers running 4 locked out. Unit would get stuck at 6/6 Fully loaded when one of the chillers were brought out of a lockout with 2 stages available. Meaning we could now go to 8/8 but CPM remains Fully loaded at 6/6
132. CPM: Added code to ensure that a chiller that is switch OFF is consider available during the first 24 second of PUMP_ONLY mode. (we want to make sure that the chiller receives the R/S command)
133. CPM: Removed code that was decrementing the chiller control stages wanted off after a chiller was commanded OFF due to an Alarm.
134. CPM: Reported by Brian Reed -> The very first thing I tried was to lock out both circuits on the lead chiller. (chiller 3). CPM sends an open valve command to chiller 1. Soon after that it sends an open valve command to chiller 2. It will wait until chiller 2s valve is reported open and then it will shut chiller 1s valve. It never tries to start chiller 1. The result is 6 valves open temporarily. This will cause the individual chillers to lose differential pressure through the evaporators and they will drop out on low flow. This is the only thing I've done so far.
135. CPM: Reported by D2-> When I lockout 3 chillers and have 4 running one of the locked out chillers will be forced to have its valve open to maintain 5 valves open. When a lockout reset is done and all three chillers that were locked out become available the three chillers temporarily go into a switched off state on the CPM. This is all fine until we start bringing those 3 chillers out of switched off. The CPM doesn't bring them out of switched off at the exact same moment so if the chiller that is now off with the valve open isn't the first one out of switched off the CPM will begin to open the chillers valve that first comes out of the switched off state. This will result in 6 valves open for about 30 seconds. So now were opening a sixth valve for no reason just to shut off the valve that was already open and ready to run. What should have happened is to just start the chiller that already had its valve open and keep the other two reset chillers off on standby as they had the valves closed.
136. CPM: Reported by D2-> If two chillers lock out at the same time within say 10 seconds. The CPM will close one of the locked out chillers valves and start opening a standby valve. The problem starts here as the first standby chiller will now load up to 2/2 before opening the second standby valve and running that chiller. With balanced loading selected it needs to start the first standby 1/1 then go and open the second standby valve and run that chiller 1/1 etc.
137. CPM: Reported by D2-> If a chiller trips on a safety and is reset on the CPM right away the CPM will keep that valve open and also open one of the standby chillers valves resulting in 6 valves being on for a short time.
138. CPM: Reported by D2 ->When either unit went off on Run/Stop or schedule the chillers that were running and had valves open would get stuck in CHL SWITCHED OFF and the timer would freeze leaving the valves open and not rotating the chillers once they were told to run again
139. HVAC and MHRC: Reported by Dan Chapman -> "I have two compressors that are tandem and utilizing a common modulating hot gas bypass. The issue is when you tie the suction groups together on circuit one. Circuit two will not be in control of the hot gas AO if compressor one locks out. The AO will just go to 0% and not move. Both compressors need to have control of the AO regardless of what state the compressors are in."
140. HVAC: Reported by D2->In a tandem configuration, a compressors safety trip will cause the Hot Gas Modulating By-pass Valve to close for a second and then modulate back open.
141. EXV: As per BWW -> Corrected problem with low superheat adjust time test using wrong SETPOINT field.
142. Minor - Corrected the test for the EXV low superheat adjustment delay to use setpoint #18 time field instead of setpoint #13 value field. This allow for low suction psi and low suction to have there only delay timers.
143. HVAC Firmware only - corrected Modulating hot gas bypass logic for tandem compressors. If the suction group comp was off and the other comp running the on safeties for the suction group comp were run = cmp speed ao and modulating hot gas ao are the same field.

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- 144. HVAC firmware only - Fixed Modulating Hot gas bypass for tandem comps, in pre-pumpdown and pumpdown the hot gas was still running. Need to utnr off hot gas when pumping down.
- 145. Program is crashing due to insufficient ram. (No 485 & IP communication) . In order to free some RAM, reduced number of extended alarm records from 15 to 10 .
- 146. HVAC Firmware Only - Correct issue with tandem recip/scrol/vfd comp when the second comp is locked out, modulating hot gas was not set to zero.

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