

CIM Release Notes

v4.9.9 2/5/2026

- Hotfix

Fixed CIM Fault Counter updating

- Updated CIM fault counter logic to update on a bit-by-bit basis rather than with a single boolean.

v4.9.8 2/4/2026

- Hotfix

New qualifiers for gating Freeze Frame writes

- Added register 4012, 4013, 4014 as qualifiers for the gating of E_EEPROM Fault Freeze Frame writing -
a change in any register from 4011-4014 will now cause a new fault to be logged.
- Open Loop Functionality

New registers added for open loop testing

- Inverter registers 8864 and 8865 added to pass Open Loop Voltage and Frequency to the inverter.

v4.9.7 2/2/2026

- Hotfix

Uncommented internal testing registers

- Uncommented functionality for internal test registers 6907 and 6908.

v4.9.6 1/27/2026

- Hotfix

Added time between faults as qualifier for Freeze Frame writes

- Added an additional qualifier to E_EEPROM Fault Freeze Frame writing - occurrences of the same fault that happen with over 100 hours between them will be fully logged.

v4.9.5 1/22/2026

- Hotfix

Mitigate redundant E_EEPROM writes during fault logging

- Effectively gates fault writes using the last written fault word - if the same fault occurs again, the recent history will not be updated (fault counter for that word will be updated).

v4.9.4 1/15/2026

- Hotfix

E_EEPROM Register moved to Flash

- Moved non-volatile registers stored in Emulated EEPROM to Flash Sectors to protect them from being written or erased during fault & statistic logging.

v4.9.3 11/20/2025

- Hotfix

Bug Fix - Duplicate RS485 UART init calls

- Remove RS485 UART_Init from main_task as it is already done by modbus_rtu_task; this resulted in an bug on AFE (same bug not seen in Gen4.x, but needs to be removed regardless).

v4.9.2 11/19/2025

- Hotfix

Bug Fix - RTU 485 CRC errors with compressor

- Ensure proper inter-frame timing (was too short) to be Modbus RTU spec. compliant

v4.9.1 11/06/2025

- Hotfix

Bug Fix - RTU 485 hang-up on power-cycle

- Re-order RTU initialization to prevent RX of bytes before peripheral is ready

Bug Fix - RTU 485 CRC errors with compressor

- 5ms minimum inter-frame and inter-character time

Bug Fix - EEPROM wipe on power-cycle (could never reproduce)

- Preventative block of EEPROM writes once 24V 'good' ISR fires (24V is about to be lost)

v4.9.0 09/1/2025

- CIM Release candidate for Production v4.2 (includes all changes after v4.7.0)

v4.8.4 08/15/2025

- CIM Hotfix

Bug Fix - EEPROM Corruption On Power-Cycles Resulting in FSF erasure

- Added 200ms delay to the startup of code before Dave_Init()
 - Effectively de-bounces the power on startup; loss of power on a running motor may result in power-on blips which allow the CIM to boot and start initialization which can result in EEPROM corruption if the power is immediately lost again (this was first observed and fixed on AFE).

v4.8.1 08/08/2025

- CIM Hotfix

Inverter PI Loop Bandwidth and Delta additions

Modifed Modbus Registers

- Register 8853 (PI Bandwidth):
 - Added init (sent to inverter on startup)
 - Added value range check (20-500) with default of 35
 - Now saved in EEPROM to be persistent across power-cycles
- Register 8858 (PI Delta):
 - Added init (sent to inverter on startup)
 - Added value range check (6-60) with default of 6

- Now saved in EEPROM to be persistent across power-cycles

Bug Fix

- Changed type of EEPROM 'was empty' from bool to uint16_t. This is a read-only modbus register variable. There was no known issue with the variable, but it did result in a compiler warning which is now fixed.

v4.8.0 07/14/2025

Note v4.8.0 was never officially released to production and was bypassed.

CIM v4.7.x

New Modbus Registers

- Register 2014 (AI1 Fail Over Stop):
Response to loss of Analog signal below
AI1 Open Max (2010) if "Parameter 2011 set at or
above 100 RPM" and AI1 Open MAX set above 0.0%
 - 0 = Go to Analog Fail Over Speed
 - 1 = Stop Motor
- Register 2015 (AI1 Fail Over Timeout):
Time in seconds to detect loss of Analog signal if
"Parameter 2011 set at or above 100 RPM" and AI1 Open
MAX set above 0.0% 0-120 seconds
- Register 3005 (Input RMS Current):
Estimate of fan drive Input RMS VFD/Motor system Current (A).
- Register 3006 (Input RMS Voltage): Estimate of fan Input RMS Voltage (VAC).
- Register 8610 (RTU Stop Bits): Modbus RTU stop bit(s) (reconfigures Modbus
RS485 communication for one or two stop bits)
 - 0 = 1 Stop Bit
 - 1 = 2 Stop Bits
- Register 6000 Range: See Freeze Frame & Statistics Feature below

New Options to already existing modbus registers

- Register 4031
 - Fixed issue EESFW-18 where register value was not being sent to inverter on boot.
- Register 1210 (Speed Override Input Source):
 - 6 = DI1 and Start
- Register 2101 (DI1 Function):
 - 7 = Speed Override and Stop
- Requirement for DI1 and Start (Functionality already verified)
 - speed override input source 1210
 - 0 = Modbus
 - 1 = DI1
 - 2 = DI2
 - 3 = DI3
 - 4 = DI4
 - 5 = AI1
 - 6 = DI1 & start motor
- Register 1210 Option 6 definition
 - Low -> High
 - Start Motor and go to override speed
Will still accept new start/stop and speed Modbus commands from controller
 - High -> Low
 - Return to current (analog/digital/Modbus) current speed and start/stop state and accept new Modbus commands while in this state

BACnet Updates

- BACnet Object Updates for Gen 4.2

Freeze Frame & Statistics Feature - (JIRA ticket: EESWFW-9)

- Registers 6001-6300 Contain the last 10 recorded faults. May not be in order of occurrence. Once all 10 slots are filled, the next fault will overwrite the oldest fault. Use the 'drive time' field to determine order of faults.
- Registers 6401-6448 Contain the total number of times each fault has occurred over the life of the motor.
- Register 6901 - Indicates if the CIM came up and found the EEPROM empty; used for debugging.
- Register 6902 - Resets the flash write counter. Every time a fault/statistical save to the EEPROM occurs we increment the flash write counter (register 6905). There is a 10k limit on flash writes; once the 10k limit is reached, no further EEPROM saves will occur.
- Register 6903 - Manually clear a fault or all faults from the EEPROM; used for testing.
- Register 6905 - Flash write counter. Incremented for the life of the motor for each save to the EEPROM; 10k limit.
- Register 6906 - Flash writes in the last 24-hours of continuous operation; used for debugging and alerting customer to excessive flash writes.
- FOR INTERNAL RELEASE NOTES ONLY - REMOVE FOR EXTERNAL RELEASE NOTES
 - Registers 6501-6740 Contain statistical information. This is only recorded while the motor is running (being driven) and is recorded for the life of the motor. Measurements are made every 1 second, but only saved to the EEPROM every 24-hours of continual operation. If power is lost before the 24-hour period, that statistical data is lost. Writing 8701 1 or 9 will force a save of all EEPROM data, including statistics.
 - Register 6904 - Manually clear a statistic record or all records from the EEPROM; used for testing.

v4.7.0 08/20/2024

- CIM Release candidate for Production v4.1

v4.6.1 08/13/2024

- Hotfix Release Build rev 4.6.1, Adds a feature that restores a fault reset credit every 130 seconds as long as there are no new faults.

v4.6.0 07/31/2024

- release, includes Hotfix 4.5.1000.

V4.5.1000 07/24/2024

- Hotfix Release Build rev 4.5.1000 - Hotfix release with modifications for NVRam Factory Settings corruption issue.

V4.5.16 07/16/2024

- BACnet settings for configuration file changed to 19200 baud. Register.xlsx added info for BACnet script to parse PicoPort config file. Cleaned up temporary files from PicoPort(BACnet) development
- Release candidate, NV values only get updated from Modbus Writes, no longer get updated by INV responses. INV Reset is now initialized to enabled and is only released when the CIM is ready to start communication. MRS value to the INV now comes from register 1102 (User Max Speed)
- modifications to NV value save only from Modbus Writes. Previous RC broke some timing

V4.5.15 06/08/2024

- Fixed fault retry function running forever.

V4.5.14 06/08/2024

- Analog speed mode, stop on open if speed is 0
- Added register 1116 Load Inertia "LIN", changed 1105/1106 INV commands ACC/DEC to ACT/DET in INV_FLOAT format.

- RC again, put update of register 1003 back in based on present speed setting.
- Report more CIM status, 1003 reads back the set value for speed including overrides, reverts to last user set speed when override ends. Register map field added for Factory Setting.

V4.5.13 04/19/2024

- SW-1385 removed overwriting of register by CIM.

V4.5.12 04/09/2024

- REQ-004 BACnet MS/TP compatibility, wait longer on power-up to detect presence of PicoPort.

V4.5.11 04/05/2024

- REQ-004 begin BACnet MS/TP compatibility.

V4.5.10 03/27/2024

- SW-1315 DI1-DI4 not reporting correctly, fixed

V4.5.9 03/21/2024

- DI functions auto populated

V4.5.8 03/20/2024

- REQ-015 Override function implementation, Interlock function

V4.5.7 03/12/2024

-REQ-003 Analog speed & Stop & open failover

V4.5.6 03/11/2024

-REQ-003 Analog speed & Stop & open failover

V4.5.5 03/05/2024

-REQ-003 Analog speed & Stop & open failover

V4.5.4 03/04/2024

- Update NV.SpeedSW if skip speed modifies value.
- Allow minimum for CFG.MbMonTimeout to be 1 second, was 10. Request from sales for demo purposes

V4.5.3 03/01/2024

Allowed direction register being ignored

- Added override in DirSet routine to force compliance to Direction Allowed register.

V4.5.2 03/01/2024

(SW-1130) TCP "locking up"

- Restructured the Listener task and the Worker tasks to be more resilient.
- Also added task monitoring for eventual use with Watchdog function. This was useful to determine which task was causing the problem. It now appears to work reliably and not crash. Need future testing on live motor to verify.

V4.5.1 02/28/2024

- Changed Skip Speed behaviour
- Registers 1107 - 1110 changed name and function
- Previously we had 3 skip speeds and 1 common bandwidth for all three.
- Now we have 2 skip speeds each with their own Min and Max value.
- We have reused the existing 4 registers but have repurposed them as follows:
 - 1107 SkipSpeed1Min
 - 1108 SkipSpeed1Max
 - 1109 SkipSpeed2Min

- 1110 SkipSpeed2Max
- If the requested speed is within a Min/Max range it is modified to be either Min or Max (whichever is closer to the requested speed).
- SkipSpeed ranges are both checked in order. If ranges overlap, unexpected results may occur. It is up to the user to ensure this does not happen.

v4.5.0 02/05/2024

- New version number for Hot Fix release

V4.4.5 02/03/2024

- Change order of INV commands during polling

V4.4.2 01/30/2024

- Change command queuing to FIFO not LIFO

V4.4.1 01/26/2024

- Fix Auto Reset logic

v4.4.0 01/17/2024

- Version number updated for Hot fix release to address Acceleration/Deceleration issues
- Only changed version numbers from v4.3.6

v4.3.6 12/06/2023

- Summary of changes from v4.3.0
 - Changed ACC/DEC calculations based on S-Curve formula
 - Improved reporting of motor current

- Implemented Skip Speed behavior based on Gen2 motors

v4.3.0 11/02/2023

- Version number updated for release of firmware to production. No other changes.
- Summary of major changes from v4.2.0
 - Added a Boot Loader to handle updating of CIM firmware if a newer image is loaded
 - Added CIM firmware update over Modbus.
 - Added verification of Inverter image prior to trying to update.
 - Standardized .bin image formats for CIM and Inverter. Both now include a 16-byte header with code size, CRC32, Version info, and 32-bit timestamp of creation date.
 - Added handling of User 24V output.

v4.2.21 11/01/2023

- Updates to InvAutoRestart(), it now seems to behave correctly with the proper number of retries.

v4.2.20 11/01/2023

- Issues with fault retries. if retry count is set to anything but 0 it retries forever (ignores count).

v4.2.19 10/31/2023

- Was sending clear fault during normal polling loop.
- This caused repeated restart attempts when faulting.
- Locked rotor now faults 1 time and stops as expected.

v4.2.18 10/31/2023

- Remove inverter reset on continuous communications faults, did not fix the issue.
- Need to stop motor and not reset retry count.

v4.2.17 10/31/2023

- Added register 8863 UseRtdTempSensor

v4.2.16 10/25/2023

- Reverted register.xls back to v4.2.13 to eliminate unknown bugs causing motor startup issues.
- Reimplemented response for register 9168 to occur after action completed.
- This eliminates VHz register which was added, will be added to a later version.
- Modified [InvHeader.py](#) to accept and parse LL filename format

v4.2.15 10/24/2023

- Registers 8859 and 8862 have been swapped to keep consistency with previous releases.

v4.2.14 10/24/2023

- Changed Modbus response for writing register 9168 to wait until operation completes.
- (1 Update INV) use 45 second timeout
- (9 init INV upload) 7.5 second timeout
- (10 init CIM upload) 15 second timeout

v4.2.13 10/23/2023

- CRC calculation for Inverter images were not being calculated correctly in the [InvHeader.py](#) script. This was not a problem until after CIM v4.2.6 when CRC checking was implemented for Inverter updates.

v4.2.12 10/19/2023

- Register 1208 (Foldback Enable) was not being written and read from the inverter.
- Modified register map to include this register as an Inverter register.

v4.2.11 10/19/2023

- Changed python tool for CRC builder to also build a CRC hex file with appended bootloader

v4.2.10 10/17/2023

- Removed check for valid MP.Model number in inverter load routine.
- Started basic IoT logging routine, presently hard coded to output 8 registers in debug mode when a flag is set. Disabled for Release build.

v4.2.9 10/11/2023

- Active Fault register (4001) was not checking for new "inverter" faults reported by the shown in 4011

v4.2.8 10/09/2023

- More changes to inverter reset classification.
- Added USB Modbus RTU functionality. Working but needs better error recovery for connection.

v4.2.7 10/06/2023

- Changed optimization settings for Debug and Release to get similar performance for inverter reset timing functions. This was preventing the Release build from properly classify the Inverter startup characteristics.

v4.2.6 10/01/2023

- Fixed initialization of AO1 for voltage/current mode.
- Changed Inverter Reset function to recognize various modes of inverter reset: Normal, Erased Flash, Abnormal voltages/hard fault.

- This is what was preventing operation of the inverter processor with just 3.3V from the CIM.
- This is needed for low-voltage programming or Inverter code from the CIM.
- Added 2 inverter fault bits 13 & 14 to indicate INV_FLASH (13) or INV_ERROR (14).
- Added registers 9200-9223 to read Flash Headers for active, new, and inverter images.
- Added test for inverter image crc and size before allowing programming of inverter.

v4.2.5 09/28/2023

- Adds handling of User 24V output faults. It now properly shuts output off for over current, clear faults to re-enable

v4.2.4 09/27/2023

- Changed Inverter parameter initialization to do Factory Settings, then force updates to temperature fault and warning limits, then read all inverter values.
- Setting temps during initial loading was not working correctly
- Put Bootloader into automatic mode

v4.2.3 09/22/2023

- Inverter image moved back up to sector 13 and the entire 256k is reserved for the image to match the available flash size.
- Upload scripts updated to work for both INV and CIM.
- Still need work on filename parsing.

v4.2.2 09/20/2023

- CIM uploader works. Bootloader is in automatic mode for now.
- Will need to determine how to allow user to holdoff update on boot.
- Added cim_boot project and python util to create hex and bin versions with crc header.

- Bootloader is still in full manual mode for testing.

v4.2.0 08/31/2023

- Initial release to manufacturing for pilot builds
- Inverter code may be uploaded over Modbus
- CIM code update not implemented yet