CoreSense M10

Release Notes – 0048-00-3-00005-01 Rev G

Software Version 1.4.1.32

Table of Contents

1. CoreSense M10 Software Update Path

For CoreSense M10 analyzers programmed with the version on the left, please update it with the software on the right.

1.3.1.9	➔	1.4.1.32
1.4.0.14	➔	1.4.1.32
1.4.0.18	➔	1.4.1.32
1.4.1.12	➔	1.4.1.32

For analyzers programmed with version 1.3.0.5 or older:
1. First update to version 1.3.1.9.
2. Then do a web update to version 1.4.1.32.

Notes:

- The software installation can take as long as 60 minutes to complete. When using the USB key update, the CoreSense M10 local screen displays the progress status. During web update, the web interface displays the progress status. Analytical enclosure green led flashes green during USB key update and stays green during web update.
- The communication between the Head Unit and the Analytical Unit must be functional before software update is initiated.
- Before exchanging Head Units, make sure the right version is installed.

2. CoreSense M10 Software Content

Note: This document shall be read in conjunction with V1.4.1.12 Service Note.

2.1 Version 1.4.1.32 [0048-00-3-00005-01 RevG]

2.1.1 Available Packages

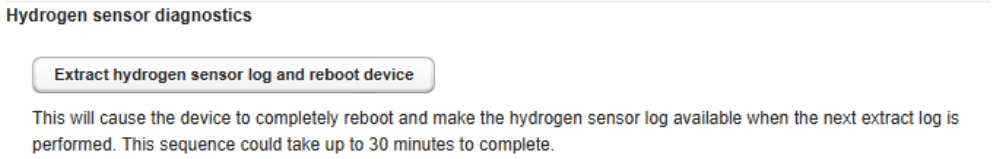
- M10_WEB_UPDATE_1.4.1.32.zip: Web **Update** install package
- M10_USBkey_UPDATE_1.4.1.32.zip: USB key **Update** install package
- M10_USBkey_WIPE_INSTALL_1.4.1.32.zip: USB Key **Wipe install** package

Please note that the preferred methods are either Web or USB updates as these retain the data logs.
Wipe Install removes all data and performs a factory reset.

2.1.2 Release Summary

- Fixed Issues
  1. File traversal vulnerability CVE ID: CVE-2025-3465 (COREMX-5442)
  2. Result from a Hydrogen sensor with Not Ready status is now deemed as invalid (COREMX-5688)
  3. Remove the need for acknowledgement for pump test warning (COREMX-6097)

- Improvements
  1. Hydrogen sensor log file can be obtained from the analyser web interface (COREMX-3816)



  2. Add SSD diagnostics to Service logs export file (COREMX-5536)
  3. IEC61850 Library is updated to version 6.4 (COREMX-5146)

2.1.3 Important Installation Notes

- Use a USB key built with M10_USBkey_UPDATE_1.4.1.32.zip package to update a system and keep the CoreSense M10 database and configuration.
- Use M10_WEB_UPDATE_1.4.1.32.zip package to update a system remotely using the web interface and keep the CoreSense M10 database and configuration.
- Use a USB key built with M10_USBkey_WIPE_INSTALL_1.4.1.32.zip package for all new installations.
- Use a USB key built with M10_USBkey_WIPE_INSTALL_1.4.1.32.zip package for installations that reset CoreSense M10 database and configuration.

2.1.4 Installation Procedure

Follow the steps below to update the CoreSense M10 software. The update procedure consists of two main steps, which can be executed either remotely using the web interface, or locally using a USB key.

2.1.4.1 Update CoreSense M10 Remotely Using Web Interface

CoreSense M10 software update:

1. Obtain the CoreSense M10 software images from ABB (see §0).
2. Open a web browser and enter the IP address of your system in the address bar. IP address is shown at the bottom of the CoreSense M10 local screen. Your computer must be configured in the same network subnet.
3. Click on the **Settings** tab and then click **System Logs**. Enter your password to gain access. The factory password is **Admin**.

Figure 1. System logs.

4. Click **Export all**. A download should start. Save and keep the *.zip* file as it may help ABB service in case a problem occurs during the update.
5. Click **History** and **fgs→Acetylene,** and then **Export**. A download should start. Save and keep the *.csv* history file.

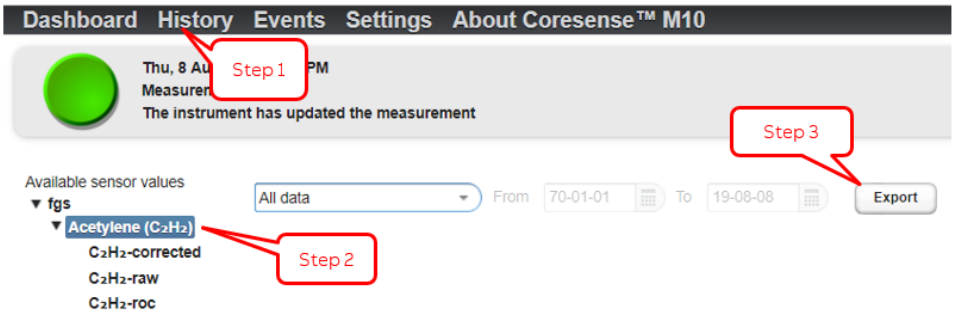


Figure 2. History.

6. Click **Settings** and **Update firmware**. A new page appears.

Figure 3. Update firmware.

7. Click **Choose File** and select the M10_WEB_UPDATE_1.4.1.32.zip file. Click **Open** and then **Update**. The update process will start and can last for few minutes. Messages will appear in the **Status** pane during the process and "Rebooting instrument now" will appear at the end of the process. The update is complete once a "Session Expired" red banner appears on the top of the web page.

   Note: Google Chrome browser (Version: Chromium 40.0.2214.91) is recommended for web update as it shows progress of the update process in the bottom left corner of the page.

8. Click the refresh button of your web browser to refresh your web session.
9. To validate that the update process completed successfully, click **About CoreSense™ M10** and validate that the version numbers are as follows:
   - BOOT.hddimg: 1.1.4.2
   - APP.img: 1.0.25
   - PERSISTENT.img: 1.0.4
   - MATLAB.img: 9.2.0
   - CS8_APP.img: 1.4.1.32
   - CS8_MODELS.img: 1.4.7
   - Sensor Board Firmware: 1.6.2348
   - Interface Board Firmware: 1.3.1412

2.1.4.2 Update CoreSense M10 Locally with USB key

Important Note:

- If the update process does not seem to work on your CoreSense M10, try it again with a different USB key from another brand or update remotely using the web interface (see §2.1.4.1).

Follow these steps to either wipe install or update the CoreSense M10 software:

1. Obtain the CoreSense M10 software images from ABB (see §0).
2. On the **USB key**, extract either the M10_USBkey_UPDATE_1.4.1.32.zip or the M10_USBkey_WIPE_INSTALL_1.4.1.32.zip package.
   IMPORTANT: make sure to install the extracted files **AT THE ROOT** of the USB key filesystem.
3. Open the CoreSense M10 cabinet.
4. Shutdown the instrument using the main power switch.

Figure 4. Instrument main power switch.

5. Insert the USB key on the USB port of the CoreSense M10 cabinet.

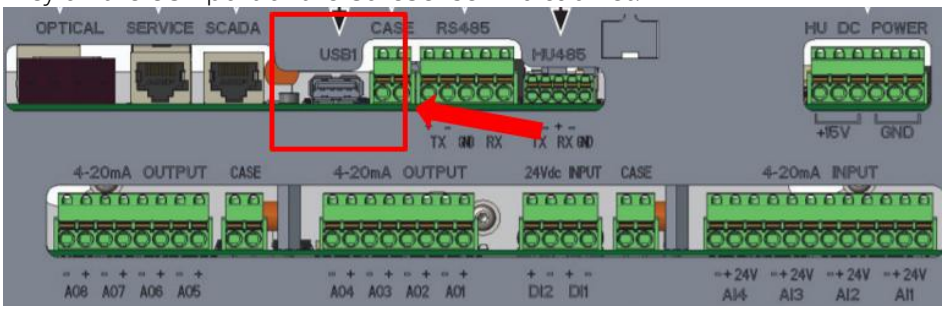


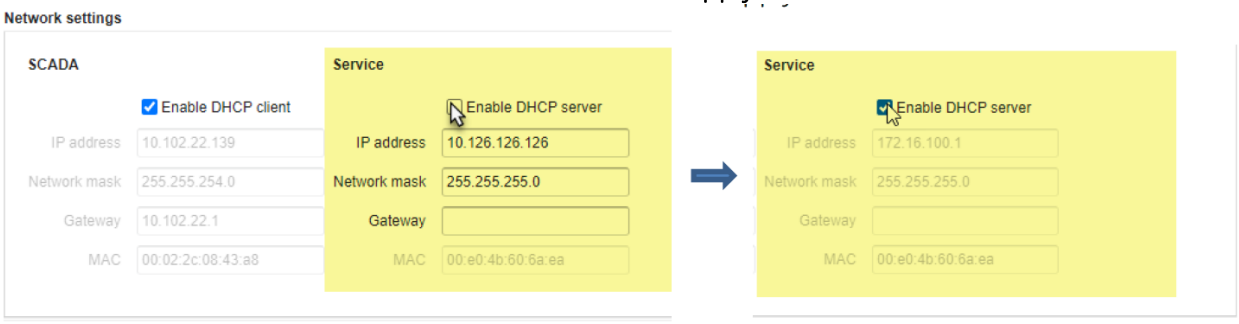
Figure 5. Instrument USB port.

6. Turn on the instrument using the main power switch (see Figure 4). The update process will start automatically.
7. Messages will appear on the local screen during the update process, which lasts a few minutes. The update process is complete when a message indicating to remove the USB key and to reboot appears.
8. After the “remove USB key and reboot” message appears on the screen, remove the USB key and power cycle the instrument.
9. A complete system update will be done after this step. During the process, the instrument may reboot two or three times depending on the required updates for your system. Wait until the dashboard page is displayed for at least 4 minutes. (The dashboard might be empty for the first 45 minutes).

2.1.4.3 Enable DHCP Server on Service Port

To enable the DHCP server on the Service port (like any new system, or after a Wipe Install), follow these steps:

1. Access system web page
2. Select **Settings->Administration settings**
3. Check the **Enable DHCP server** box and click **Apply**



2.1.4.4 Update Hydrogen Sensor Firmware

Important Note:

- Your CoreSense M10 does not require a Hydrogen sensor firmware update if the version number is 3.966J. To verify, click **About CoreSense™ M10** and look for **Hydrogen Sensor Firmware**.
- The hydrogen sensor update requires CoreSense M10 software version of 1.2.0.12 (or higher).

Follow these steps to update Hydrogen sensor firmware using web interface:

1. Click **Settings** and **Update firmware** (see Figure 3). A new page appears.
2. Click **Choose File** and select the M10_WEB_H2SUpdate_3.966J.zip file. Click **Open**, and **Update**. The update process starts and can last for few minutes. Messages will appear on the **Status** pane during the update process. It will be completed a few minutes after the "Rebooting instrument now" message. The update is complete once a "Session Expired" red banner appears on the top of the web page.
3. Click the refresh button of your web browser to refresh your web session.
4. To validate that the update process completed successfully, click on **About CoreSense™ M10** and validate that the H2Scan version number is:
   Hydrogen Sensor Firmware 3.966J
5. Verify that date and time are properly set and that the thermal pump is enabled in the **Settings→ Administration** page. Refer to CoreSense M10 User Guide for more information.
6. Still in the **Administration** page, make sure that the NTP server is not enabled if you do not intend to use it.
7. Wait 45 minutes and check if the system LED is still green. If the system LED turns blue and an event "Golden reference check failed" is generated in the **Events** page, call service to get an extra tool to fix this issue.

Follow these steps to update Hydrogen sensor firmware using USB key:

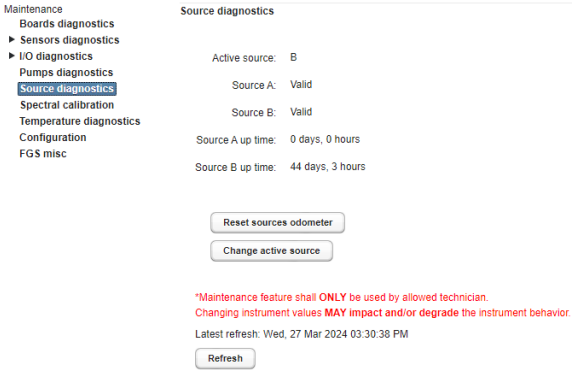
1. On a USB key, extract the M10_USBkey_H2SUpdate_3.966J.zip, making sure to install the extracted files **AT THE ROOT** of the USB key filesystem.
2. Shutdown the instrument using the main power switch (see Figure 4).
3. Insert the second USB key on the USB port of the CoreSense M10 cabinet (see Figure 5).

4. Turn on the instrument using the main power switch (see Figure 4). The update process will start automatically.
5. Messages will appear on the local screen during the update process, which will last a few minutes. The update process is complete when a message indicating that hydrogen sensor firmware updated successfully appears.
6. After the “update success” message appears on the screen, remove the USB key, and power cycle the instrument.
7. Using a computer, open a web browser and navigate to your CoreSense M10 web interface by entering its IP address in the address bar. IP address is shown at the bottom of the CoreSense M10 local screen. Your computer must be configured in the same network subnet.
8. To validate that the update process completed successfully, click **About CoreSense™ M10** and validate that the version numbers are:
   Hydrogen Sensor Firmware 3.966J
9. Verify that date and time are properly set and that the thermal pump is enabled in the **Settings→ Administration** page. Refer to CoreSense M10 User Guide for more information.
10. Wait 45 minutes and check if the system LED is still green. If the system LED turns blue call your service center for assistance.

2.2 Version 1.4.1.12 [0048-00-3-00005-01 RevE]

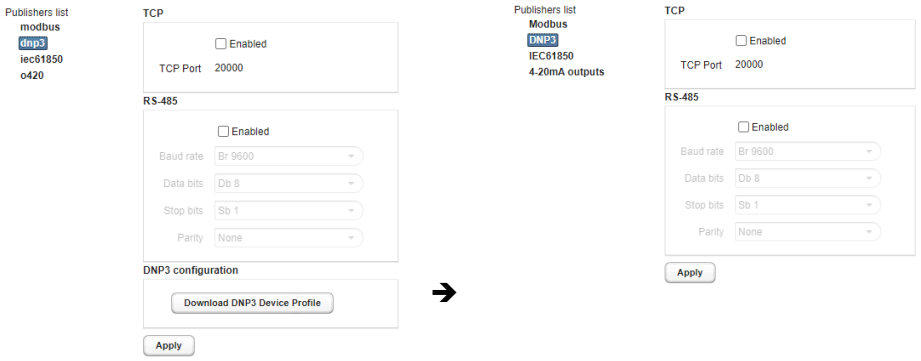
2.2.1 Release summary

- Improvements
  1. Gas circuit pressure monitoring & control is improved. Pump operation is now monitored during operation using pressure measurement on the gas circuit. The verification is based on actual pressure measurement in addition to current drawn by the pump. (COREMX-4805, COREMX-4840, COREMX-5179)
  2. Remove "Reinitialize initial data" (COREMX-4587)



  3. The pump operating time counter was reset upon instrument reboot. The pump cycling is now based on periods of 30 calender days (COREMX-4804)
  4. An open circuit error on IR source controller will trigger an IR source change (COREMX-4914)

- Fixed Issues
  1. The “ABB FTIR SSD Firmware Automated upgrade Tool” is run upon installation and every startup. This replace the need to run the service tool named : 20230530_script_SSDFWMU03_MG02.zip (COREMX-4580)
  2. In some situation the dashboard of the main web interface showed up empty and remained empty for ever. The mis-handling of the configuration file has been fixed along with the sensor UUID correspondence. This replace the need to run the service tool named: SensorUUIDSanityCheck-20230104.zip (COREMX-4269, COREMX-4368)
  3. Spectral Calibration only worked with the default IP address 172.16.100.1 of the analyzer. The spectral calibration task uses the current IP address that is set for the instrument (COREMX-4337)
  4. Gas measurement indication greys out on dashboard. Upon measurement of new valid data the dashboard will update with most updated values (COREMX-4570)
  5. Content of ABBDeviceProfile.xml for DNP3 protocol did not represent actual configuration. The « Download DNP3 Device Profile » function is removed from the DNP3 configuration interface (COREMX-498)



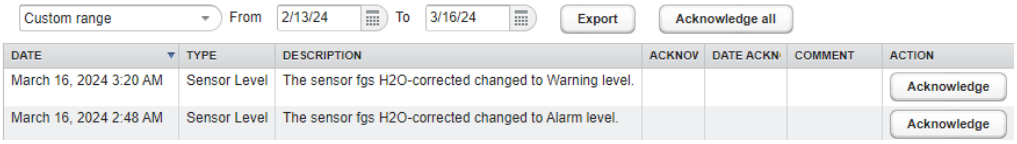
6. IEC 61850 IET could issue parameters with a character length that is more than the acceptable limit for the IEC 61850 protocol. All published parameters have been reviewed to comply with a limit of 12 characters in size (COREMX-4509)
7. FGS does not start -> Restart + 15 consecutives + gray dashboard. More time is allowed to the process to initialize. The new event is "FGS did not respond with new data in the allotted time" and it will continue to show up when FGS process does not start within approximately 90 minutes (COREMX-4519)
8. Leak in Gas circuit detected message in Event page. The message is changed to System warning 306 ,"Gas circuit integrity compromised warning" (COREMX-4567)
9. Instrument fails at first Source test and never repeat (COREMX-4575)
10. FATAL Error HV Heater Error [system: 122, message : Heater error (HV)]. High voltage test is run only at instrument startup (COREMX-4576)
11. Analog Channel status was not updated for IEC 61850 protocol. The status is now shown with proper values if the channel is Enabled (COREMX-4617)
12. Dashboard values for a disabled 4-20mA channel remained on display. The dashboard will not show a sensor that is Disable in the settings (COREMX-4672)

13. The Spectral calibration in the Maintenance page did not have enough instructions. Instructions have been added to the interface to help on spectral calibration. (COREMX-4975)
14. Configuration file restore did not worked. The function is fixed and works both for .bin and .xml files (COREMX-5060)
15. Event page did not show Configuration Change message type for a sensor disable action (COREMX-5062)
    Event log with 1.4.1.12 :

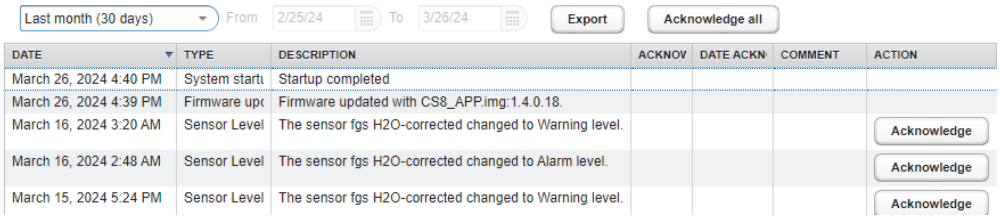
DATE	TYPE	DESCRIPTION
March 26, 2024 5:00 PM	Configuration Change	The configuration parameter Sensor Data : C3H8 changed to SensorData(enabled=true,
March 26, 2024 4:59 PM	Configuration Change	The configuration parameter Sensor Data : C3H8 changed to SensorData(enabled=false,

16. Correction on Custom range display for Events page. Default view will no longer limit the display to events that are acknowledgeable. The situation was confusing when standard events could be not visible without changing time period (COREMX-4711).

    Behaviour with 1.4.0.18:



    Behaviour with 1.4.1.12:



17. Operating system running on CoreSense M10 used a setting of 64ms for the “ping time to live” (TTL) value. The value is now changed to 128ms. (COREMX-5147)

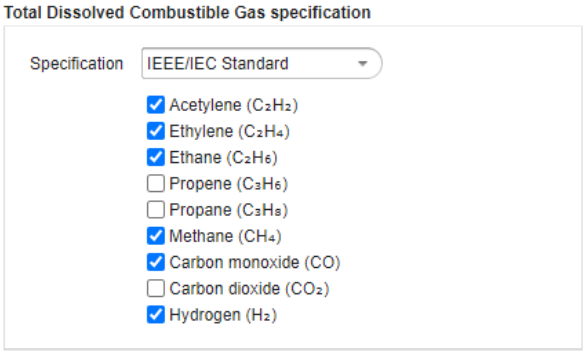
18. CoreSense M10 configured for Natural Esters will get a bug on the fgs setting (web UI) preventing any change to the specific type of Natural Esters to consider in the analysis (COREMX-2095).

2.3 Version 1.4.0.18 [0048-00-3-00005-01 RevD]

2.3.1 Release summary

- New Features

1. The Total Dissolved Combustible Gas (TDCG) computed value can be configured to represent different standards used in the industry. The choices are IEEE/IEC Standard (original and default), SGCC, or Custom. Change is made using **Advanced settings** on the TDCG **Sensors settings** page. (COREMX-2553)



2. Moisture monitoring inside the CoreSense M10 cabinet is performed by FTIR and stored on a file named hygrometer.csv that is downloaded with the system logs package. Service Level 2 trained personally can contact ABB service department for additional information if required. (COREMX-3965)

3. The set power of the IR source control circuit is lowered as part of an IR source management improvement to increase lifetime without compromising on performance. If needed to confirm the actual power on the analyzer, Service Level 2 trained personnel can contact ABB service department for addition information. (COREMX-3895/COREMX-4190)

4. Spectral Calibration is now part of the actions that can be performed from the Maintenance page. This action is required when a detector is replaced on the instrument and it is performed by a qualified technician. (COREMX-3941)

- Fixed Issues

1. CoreSense M10 shows multiple System Status Warning messages :

```
System status changed from NORMAL to WARNING [app: 0, message: ][system: 295, message : Cell temperature warning]
```

This status is reported when the gas cell temperature is not in operating range. Gas cell heater detects 120 VAC/50 Hz input voltage as 220 VAC/50 Hz. This limits the power range of the gas cell heating module and prevents stable operation at nominal temperature setpoints. Gas cell temperature is a critical parameter that is controlled to ensure gas measurements are within product specifications. (COREMX-3707).

2. The CoreSense M10 dashboard does not show gas values. In many situations, only C_2H_2 gas values appear. The situation is due to a mismatch between the configuration file and the

dashboard layout file. It is caused when restoring a configuration file that comes from a different instance of installation. All sensor identification codes are then reset and cannot be retrieved in the dashboard layout (COREMX-3603)

3. The residual ratio monitoring function is enabled on software version 1.4.0.14 and the Enable/Disable action of the spectrometer settings is not available. The possibility to disable this monitoring is useful when the gas circuit contains contaminants that prevent the instrument from performing within specifications. Disabling the residual ratio allows operation to continue with measurements on a subset of gas while a service visit is being scheduled (COREMX-3674, COREMX-3945)

```
System status changed from NORMAL to FATAL. FGS reported bad quality for at least 144 consecutive measurements.
```

4. Upon Software upgrade to version 1.4.0.14, some CoreSense M10 instruments have experienced an infinite loop of reboot. (COREMX-3771).

   At first startup the following message appears on the fgs.log file:

```
INFO OMEP - ICE Inst. Status Extended flag raised at pos: 0, description: Scanning
INFO OMEP - ICE Inst. Configuration Error flag raised at pos: 16, description: Disconnected IR Source
WARN OMEP - ICE is NOT ready for sampling
```

   For every other start sequences, the following message keeps repeating:

```
INFO OMEP - ICE status check already completed, skipping ICE status check
INFO OMEP - Gas cell temperature: 60.034634c is in range
INFO OMEP - Source startup check already completed, skipping source check
```

5. In the Sensor setting page, water (H_2O) sensor validation cannot be changed from PPM to AW. It affects validation on the moisture level and the rate of change. It is not possible to set Warning and Alarm based on values in AW units (COREMX-3698)

6. HeadUnit moisture LED remains green and does not change color according to Warning/Alarm status. (COREMX-3695)

7. Time stamps for Events on the CSV export file are in Local Time instead of UTC. (COREMX-2669)

8. IEC61850 does not update values and shows invalid / failure states .(COREMX-3930)

9. IEC61850 missing values for AW Rate of Change and Validation parameters (COREMX-4074)

2.4 Version 1.4.0.14 [0048-00-3-00005-01 RevC]

2.4.1 Release summary

- New Feature:
  1. Each generated measurement now includes an internal quality index called residual ratio. Values with an attached bad quality status can now be rejected by the application. This function is the core of the source monitoring improvement (COREMX-2685) [2.9]
- Improvements:
  1. Improved source health diagnostic to prevent premature or erroneous source failure (COREMX-2674, COREMX-2077)
  2. Minimum threshold parameter is now set to minimum detection limit value by default for new installation (COREMX-3583)
  3. Gas measurement algorithm is improved to version 1.4.2 (COREMX-3247)
  4. Added preliminary steps to check connection with the interface and sensor boards before launching the analysis sequence (COREMX-2905)
  5. The sensors displayed in the History view are expanded by default (COREMX-1349)
  6. When accessing the Events view, a custom date range is automatically preconfigured to include all unacknowledged events (COREMX-151)
  7. Local HMI touchscreen calibration is no longer required following Wipe Install (COREMX-1710)
- Fixed Issues:
  1. The FTIR instrument runs at an unexpected resolution, causing gas measurement failures (COREMX-2682)
  2. Source ID status possible values are not handled correctly and cause the instrument to consider the current source to be dead (COREMX-2677)
  3. The instrument's system status is green but does not acquire any data (COREMX-2584)
  4. Wait for the gas cell to reach its operational temperature before launching the analysis process (COREMX-2273, COREMX-2842)
  5. Application configuration is kept after a software update (COREMX-2957)
  6. Web page is not responding when there is no communication with the head unit (COREMX-2921)
  7. Local HMI initialization waits for the web server daemon (COREMX-3169)
  8. A Firmware Update event is generated even if the update process fails (COREMX-853)

2.5 Version 1.3.1.9 [0048-00-3-00005-01 RevB]

2.5.1 Release summary

- New Features:
  1. Transformer fluid selection is limited to the specific product configuration represented by the product number (COREMX-1838)
  2. Product configuration for the transformer fluid is stored on the head unit. As the head units are specifically configured according to the ordered fluid, CoreSense M10 verifies that head unit model matches the selected transformer fluid. On failure, Head model check fails ERROR will occur and the system status will change to FATAL (COREMX-1986, COREMX-2258)
  3. Iso-butane is added to the gas measurement algorithm as a potential contaminant. This ensures that gas measurement is performed when isobutane is found inside the transformer fluid (COREMX-2244)
  4. Default Warning and Error thresholds are tailored for each transformer fluid types (COREMX-2087)
  5. Minimum threshold parameter is added to the advanced settings for each Sensor. When activated (value set > 0) any value lower than threshold value is set to 0. This corrected data is shown on the dashboard, history data and published protocols. The raw data is still available in the csv file export (COREMX-2548)
- Improvements:
  1. The Gas LED on the instrument Head Unit will now follow ALL gas validation for Warning and Alarms (COREMX-1968)
  2. More configuration files have been added to the Getlog file package and the backup during Wipe Install using the USB key package. This gives more information to investigate anomalies in the instrument operation. More specifically the health monitoring history data and files for gas measurement algorithm configurations are among new files to be available for service technicians (COREMX-1972, COREMX-1973, COREMX-2001, COREMX-2364)
  3. Main web page interface esthetic enhancements. New top banner with software version display (COREMX-2213)
  4. About box contact information changed to display Hitachi Powergrids with phone number, hyperlink and email for service support (COREMX-2401)
  5. Head Unit SN on the About box is based on the actual serial number published on the head unit register. The old property file is used if no serial number is stored on the head unit (older instrument) (COREMX-286, COREMX-2214, COREMX-2067)

- Fixed Issues:

1. During a Wipe Install the process will no longer stop for missing Golden spectrum files. It will use default Golden files and resume the installation process (COREMX-2088)
2. Hydrogen measurement data is used only when status of the sensor is “Normal operation” (COREMX-2218)
3. Default Golden spectrum files changed for more representative spectrum curves. This corrects the situation where the intensity of the default Golden files was too high and triggered a source failure leaving the instrument unusable (COREMX-2215)[
4. Apply a fix for a missing file that prevents the instrument to start during first boot sequence when the hard drive is changed in the field (COREMX-2066)
5. Fix wrong error message text. The serial numbers were inverted on the Error Message for Golden verification when golden. This situation happened when serial number of the Golden spectrum did not match the instrument serial number (COREMX-877)
6. From the maintenance page, it is now possible to set the current pump selection to “NONE” without triggering a leak error (COREMX-1948)
7. Add H_2O AW value in the Modbus TCP publishing. Data is available at startup (COREMX-2151, COREMX-2492)
8. Fix HMI bug with Golden checkbox (COREMX-1745)
9. Fix missing event log file inside the Getlog file package (COREMX-1766)
10. Fix Maintenance page FTIR tool unable to start (COREMX-1971)
11. Fix bug that causes Warning message from Sensor Proxy: Communication error [sb][[61]]: 00000011 (COREMX-2229)
12. Fix a situation where unwanted AT command characters were sent over RS485 port on startup (COREMX-2138)
13. Added tube 2 pressure in Maintenance – Pump page (COREMX-2097)

2.6 Version 1.3.0.6

2.6.1 Release summary

- Fixed Issue:
  1. Strict Mode for IEC61850 protocol is removed from configuration interface (COREMX-1770)

2.7 Version 1.3.0.5 [0048-00-3-00005-01 RevA]

2.7.1 Release summary

- New Features:
  1. A DHCP server is now running on the Service Port. The system will provide an IP address to the client computer that can reach the CoreSense M10 interface on 172.16.100.1 (COREMX-1149)
  2. Moisture can now be display as AW (COREMX-1059)
- Improvements:
  1. Additional compounds are added to improve standard gas readings engine (COREMX-1085,1054)
  2. System warns the operator for data lost when the time is changed in the past (COREMX-1063)
  3. Local HMI time displays “UTC” label (COREMX-1088)
  4. Exported csv file has the column label with “UTC” (COREMX-1191)
  5. LEDs on the Head Unit are decoupled and can show states that are independent (COREMX-1066)
  6. More Events are created when actions are performed by the operator (COREMX-1061, 1207, 1307)
  7. Golden files are used if no first reference files are available on the system (COREMX-1056)
- Fixed Issues:
  1. Cold start pump heating (COREMX-1055,1065, 272, 1329)
  2. AW value on DNP3 publishing (COREMX-1058)
  3. Gas cell temperature control on 240Vac (COREMX-1057, 642, 1001)
  4. Database housekeeping script timeout (COREMX-1328)
  5. NaN value for Water Activity (COREMX-1298)
  6. Wrong Oil temperature over Modbus TCP/RTU (COREMX-742)
  7. Faulty configuration file management (COREMX-846, 847)
  8. Administration settings page error message (COREMX-1318)

2.8 Version 1.2.1.0 [0035-00-3-00003-01 Rev H]

2.8.1 Release summary

- New Feature:
  1. None
- Fixed Issues:
  1. Remote Web HMI server display error HTTP 500
  2. Delay added prior to get pump speed status
  3. Bad Golden References detection regression

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