

RELEASE NOTE SUMMARY



iBRID™ MX6

Overview

This document provides a compilation of Release Notes that have been published by Industrial Scientific. *Table 1. Document Summary* provides a list of version numbers, release dates, and a brief overview of each Release Notes document. Following Table 1, you will find a copy of the complete version of each document.

Document Summary

Table 1. Release Notes Document Summary

Instrument	Version	Release Date	Summary of Features Added and Issues Addressed
MX6 iBrid			
	v4.5	09/21/2018	Updated PID response factors.
	v4.3	11/04/2014	MSHA approved data transfer solution; correct a French translation reversal of STEL and TWA labels.
	v4.2	05/05/2014	The audible frequency of the audible alarm is changed.
	v4.1	01/31/2014	Option to disable instrument alarms when docked; Option to disable the ability to turn off an instrument while in gas alarm; Option to disable bump tests in the field; Improvements to French, German, Italian, Portuguese and Spanish languages; Backlight flashes every 5 seconds while docked. Additional tickets addressed.
	v4.0	03/15/2013	Firmware update. Increased Text Font Size and Clarity; New Pump Test at Startup Required in Aspirated MX6s; Over Range LEL Sensor Alarm Acknowledgement Change; Expanded User & Site Lists; Minor bug fixes.
	v3.52	11/01/2012	Firmware was updated to enhance checks for pump and monitor communication.
	v3.5	05/24/2012	Firmware was updated to add Ethylene to the list of selectable LEL Calibration Gases; Firmware was

			updated to add Nonane to the list of selectable LEL Correlation Factors; Firmware was updated to add new Bump Test Overdue feature; Firmware was updated to operate with a soon to be released 0-100% LEL CH4 IR sensor; Firmware was updated to alter format of Next or Last Calibration Date on Start-up; Firmware was updated to show a bump fail status.
	v3.4	09/16/2011	Firmware was updated to detect during instrument diagnostics if either of the speakers are not properly connected or missing; firmware was updated to show CH4 in the event log of the instrument for the CH4 IR Sensor; firmware was updated to change the bump test and calibration timeout interval to 25 seconds; The bootloader and firmware was updated to support a new LCD driver and display controller.
	v3.30.02	07/28/2011	Update firmware so monitor does not log O2 readings as "0" and log an alarm event due to the O2 sensor being disabled prior to the datalogger during instrument shutdown; update firmware so a monitor in TWA or STEL alarm will indicate which sensor is in alarm; update firmware to distinguish between a CH4 IR and CH4 catalytic sensor.
	v3.00.05	01/13/2010	Able to display in the Russian, Polish, and Czech languages; Display translations in all languages have been verified and improved; Added the Oxygen span reserve reading to the calibration results screen; Corrected an issue where the instrument software could crash if a calibration was run when all sensors are disabled; The results screen after a zero-on-startup was showing an obsolete value for the oxygen sensor; this has been corrected; If an IR sensor was enabled while the instrument was running, it would go into "ERR"; in v3.00, the MX6 will show a Warming Up screen until the IR sensor warmup is complete; now stores results of manual bump tests and calibrations in a log that can be accessed via Modbus; If the analog-to-digital converter on a sensor went over-range during calibration, the MX6 will now detect this condition and immediately fail the calibration; The user can now configure the backlight to stay on for anywhere from 5 to 300 seconds since the last button press, or, as another option, keep the backlight on all the time.
	v2.10.05	09/21/2009	Initialized sensor min/max temperature values in RAM by loading them from the DAS; Storing an extra copy of each checksum for each DAS; Storing a copy of each

		<p>sensor’s EEPROM data in the MX6’s Dataflash; A sensor in the incorrect position (e.g., an LEL sensor not placed in position 5) will now generate an Err 3903 warning in the error log; Adding code so that a read or write error to the DAS EEPROM will immediately cause an error; Added the ability to load the startup Splash screen through the Datalink; Changed the O2 bump threshold from 19.7% to 19.5%; Changed the Zero Screen so that the progress bar will not display a value above 100%; The MX6 now sets a flag during shutdown, indicating that shutdown occurred Properly; Corrected all German translations of “LEL” to show “UEG” instead; Corrected misspelled German word “Kalibrien” “Kalibrieren”; Corrected Spanish translation for “Cal Due”; Made contact information darker and easier to read; Added audio and “Snapshot Saved” message when user initiates a datalog snapshot; Limited the maximum alarm threshold or cal gas concentration that can be set over Modbus to the measurement range of the sensor; Battery code was updated to inform instrument of imminent power down so that the instrument can perform an orderly shutdown. Other JIRA Tickets were corrected.</p>
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MX6 iBrid

v4.5 – released September 20, 2018

Upgrade recommendation

- Critical – All instruments must be upgraded to ensure continued safe operation.
- Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance if using PID response factors.
- Optional – Users may upgrade docking stations to take advantage of new features.

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What is new in MX6 v4.5?

PID Response Factors

PID Response Factors have been updated. (MGI-1578, MGI-1468)

Firmware Upgrades

An update was made to the .xml file required for performing instrument firmware upgrades. (MGI-1878, MGI-1887)

Miscellaneous Tickets

EOL-11, MGI-1872, MGI-1659

v4.3 – released November 4, 2014

Upgrade Recommendation – Optional

What's new in Version 4.3?

1. Data transfer feature for MSHA approved units to be used in conjunction with the Innovative Wireless Technologies (IWT) solution

We have implemented a new feature that, if enabled either in Manufacturing or Service, is capable of transferring data via the MX6 monitor's IrDA port. This MSHA approved data transfer solution, developed by Innovative Wireless Technologies (IWT) allows the MX6 to communicate with an IWT adapter which ultimately communicates instrument readings back to a central controller in near real-time. The data transfer interval is user configurable via the MX6 unit's configuration mode only and can be set between 1 – 300 seconds. The Innovative Wireless Technology solution is currently only available for use with select MSHA approved MX6 units. (MGI-1464)

2. Update firmware to correct a French translation reversal of STEL and TWA labels

Two screens had the French translation of STEL (VLE) and TWA (VME) reversed. (MGI-1489)

Other Tickets Addressed

MGI-1390

Related Products

- Docking Stations – No impact.
- Desktop Software – No impact.

Upgrade Methods

Industrial Scientific Service Center – Please contact your local service center for upgrade details

v4.2 – released May 5, 2014

Upgrade recommendation – optional

What's new in Version 4.2?

1. The audible frequency of the audible alarm is changed

Due to a new Agency Approval specification, we have changed the audible frequency of the audible alarm to achieve a minimum decibel level at a specific distance. As a result, some users may be able to detect a slight difference in the tone and loudness of the audible alarm between instruments with v4.2 firmware and instruments with earlier firmware. We will not be changing the audible alarm specification of 95 decibels (dB). (MGI-1453)

Other Tickets Addressed

No other tickets were addressed in this release.

Related Products

- Docking Stations – No impact.
- Desktop Software – No impact.

Upgrade Methods

- iNet DS docking station – This firmware upgrade can be completed on the iNet DS docking station in approximately 10-12 minutes
- Industrial Scientific Service Center – Please contact your local service center for upgrade details

v4.1 – released January 31, 2014

Upgrade recommendation – recommended

What's new in Version 4.1?

1. Option to disable instrument alarms when docked

Users now have the option to disable instrument alarms on docking stations. The feature is disabled by default. In order to enable this feature, remove the checkmark in “Config→Alarms→While Docked” in “Configuration Mode.” The instrument will automatically shutdown when the instrument is removed from the docking station and all alarm settings will return to their user-defined settings. This feature was introduced to eliminate nuisance alarms for customers docking multiple instruments at once or scheduling maintenance. (MGI-1100, MGI-1282, MGI-1348)

2. Option to disable the ability to turn off an instrument while in gas alarm

Users now have the option to disable the ability to turn off instruments in gas alarm. The feature is disabled by default. In order to enable this feature, remove the checkmark in “Config→Alarms→Allow Shutdown” in “Configuration Mode.” This feature was introduced to give users the option to eliminate the safety hazard of turning off instruments when alarming. If a user attempts to shutdown an instrument in alarm, the instrument will display “Shutdown Disabled in Alarm.” An exception is made for oxygen readings below 5% volume to prevent problems with failed sensors. (MGI-1273)

3. Option to disable bump tests in the field

Users now have the ability to disable bump tests in the field to simplify operation of the MX6. This mimics the functionality of the Field Zero, Field Cal and Field Peaks features. The feature is disabled by default. To enable this feature, remove the checkmark in “Sensor Options Field Bump” in “Configuration Mode.” (MGI-952)

4. Improvements to French, German, Italian, Portuguese and Spanish languages

Significant improvements have been made to the French, German, Italian, Portuguese and Spanish languages based on feedback from customers. The resulting changes will make the MX6 easier to use and understand in these languages. (MGI-1247, MGI-1254, MGI-1255, MGI-1256, MGI-1256, MGI-1272)

5. Backlight flashes every 5 seconds while docked

To confirm an instrument’s battery is properly charging, the display backlight will flash every 5 seconds while connected to a charger or docking station. The backlight flash will stop when the instrument is fully charged. (MGI-913)

Tickets Addressed

The following tickets have also been addressed in this release: MGI-652, MGI-717, MGI-776, MGI-919, MGI-933, MGI-965, MGI-1158, MGI-1184, MGI-1197, MGI-1227, MGI-1234, MGI-1235, MGI-1236

Related Products

- Docking Stations – iNet DS Firmware v5.7 or DS2 Firmware v9.1 is required to enable the three enhancements listed above (items 1, 2 & 3) using the docking station software. The instrument and docking station will operate normally with previous docking station firmware versions, but the three enhancements can only be modified on the instrument’s display.
- Desktop Software – ISAS Firmware v9.1 is required to enable the three enhancements listed above (items 1, 2 & 3) using the desktop software. The instrument and desktop software will operate normally with previous desktop software firmware versions, but the three enhancements can only be modified on the instrument’s display.

Upgrade Methods

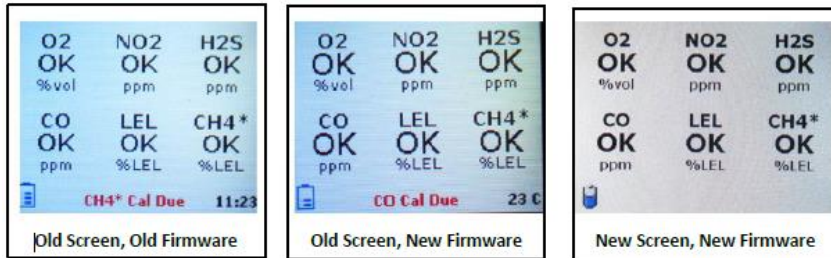
- iNet DS docking station – This firmware upgrade can be completed on the iNet DS docking station in approximately 10-12 minutes
- Industrial Scientific Service Center – Please contact your local service center for upgrade details

v4.0 – released March 15, 2013

Enhancements and Issues Addressed

1. Increased Text Font Size and Clarity

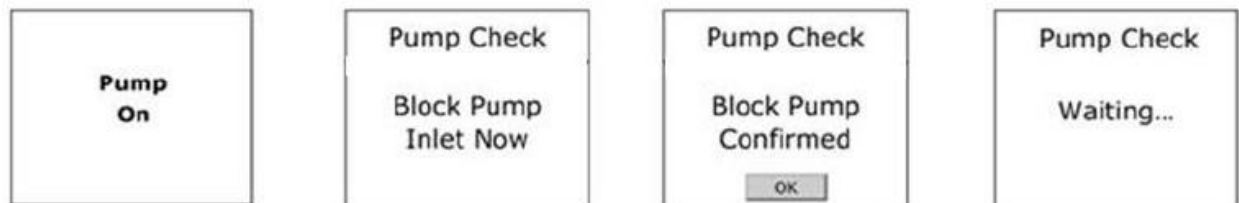
Two significant improvements have been made to the MX6 display. First, a new higher-resolution TFT LCD display will replace the now obsolete CSTN LCD previously used in the MX6. The new LCD will provide crisper, easier-to-read text even in bright sunlight. Second, the font size on both LCDs is now noticeably larger.



Please note the new LCD has not been approved by MSHA or China MA yet

2. New Pump Test at Startup Required in Aspirated MX6s

To ensure the safety of our customers, the MX6 will require users to block the pump during startup prior to advancing to the Normal Reading Screen. If the user does not acknowledge the screen prompts, the instrument will go into low alarm. This feature was added to notify customers of pump failures before entering unsafe environments, especially those working in high noise environments. This feature is disabled when connected to a docking station.



3. Over Range LEL Sensor Alarm Acknowledgement Change

Previously, customers were required to restart the MX6 to clear LEL sensor Over Range alarms. Customers now have the ability to reset the Over Range alarm without restarting the instrument by pressing the “Up” button and clicking “Ok” on the display. Please note the alarm may immediately alarm again if the environment did not change from the first alarm.

4. Expanded User & Site Lists

The User and Site Lists are now capable of storing 100 entries each. Previous firmware was limited to 5 users/sites each.

5. Minor bug fixes

This release also resolves minor bug fixes including alphabetizing the LEL Calibration Gas & Correlation Factor lists and removing 2-butanone from the PID response factor list as it is repetitive with MEK.

Recommendation & Upgrade Methods

We recommend this update as it improves the user experience with larger font sizes and increases safety with a required pump check at startup. As with all firmware updates, this update can only be completed through our Service Centers or with an iNet DS (v5.5 required). The update can be completed on the iNet DS in approximately 8-10 minutes.

v3.52 – released November 1, 2012

1. Firmware was updated to enhance checks for pump and monitor communication

This instrument firmware change includes additional checks to ensure that the communication between monitor and pump is secured upon instrument start-up.

v3.5 – released May 24, 2012

1. Firmware was updated to add Ethylene to the list of selectable LEL Calibration Gases.
2. Firmware was updated to add Nonane to the list of selectable LEL Correlation Factors.
3. Firmware was updated to add new Bump Test Overdue feature.

This feature is available in the configuration menu under, Sensor – Options – Bump OverDue. The feature is shipped from the factory disabled, but allows the user to set the bump interval between 0.5 and 7 days in 0.5 day increments. When a bump test has not been performed in the user selected time interval, the instrument can be made to notify the user through any combination of: Display “[Sensor Type] Bump Due”, Display + Visual, Display + Audio, or Display + Both (Audio and Visual). If enabled, the audio and visual indications alert the user every 15 seconds.

4. Firmware was updated to operate with a soon to be released 0-100% LEL CH4 IR sensor.

A Product Bulletin will be released soon launching this new sensor and informing of all applicable approvals.

5. Firmware was updated to alter format of Next or Last Calibration Date on Start-up.

Rather than the option of showing Days Since Last Cal or Days Until Next Cal at instrument start-up, with a number of days for each sensor, users can select Next or Last Calibration Date to be displayed at start-up and a single date will appear (i.e. – Next Calibration Date 23 June 2012). Since sensors can be

calibrated individually, the instrument goes off of the oldest calibrated sensor for this date. This option is available in the configuration menu under, Config – Startup – Cal Date.

6. Firmware was updated to show a bump fail status.

Prior to this firmware version, sensor bump failures would show as a calibration failure on the instrument display. With this update a bump failure is distinguished from a calibration failure on the instrument display and the sensor that failed the bump test shows, “B F”.

v3.4 – released September 16, 2011

Issues Addressed

1. Firmware was updated to detect during instrument diagnostics if either of the speakers are not properly connected or missing.

Prior to this update, the error code was only registered if both speakers were missing.

2. Firmware was updated to show CH4* in the event log of the instrument for the CH4 IR sensor.

Firmware v3.30 distinguished the CH4 IR sensor from the CH4 catalytic sensor. The CH4 IR sensor was designated in the instrument screens as CH4*. Firmware v3.4 carries the new designation of CH4* to the instrument event log.

3. Firmware was updated to change the bump test and calibration timeout interval to 25 seconds.

The bump test function timeout was set to 15 seconds making switching cylinders difficult for some customers. To resolve this issue, the bump test and calibration timeouts were reset to

25 seconds.

4. The bootloader and firmware was updated to support a new LCD driver and display controller.

v3.30.02 – released July 28, 2011

Note:

MX6 iBrid firmware v3.30.01 was released to production but then retracted and the firmware version was reverted to v3.2 in production. It was found that v3.30.01 included additional code changes that were not intended to be included and was likely the cause of production issues.

The additional code changes found in v3.30.01 were removed in v3.30.02.

MX6 iBrid Firmware v3.30.02 includes:

Issues Fixed

1. Update firmware so monitor does not log O2 readings as “0” and log an alarm event due to the O2 sensor being disabled prior to the datalogger during instrument shutdown

Depending on the datalogging interval, it was possible for the instrument’s O2 reading to record as a “0” in the datalogger and log an alarm event. This was due to the sensor being turned off prior to the datalogger during instrument shutdown. This firmware version addresses this issue.

2. Update firmware so a monitor in TWA or STEL alarm will indicate which sensor is in alarm

Prior to this firmware update, when an instrument was in STEL or TWA alarm, the TWA and STEL screens would not show which sensor was in alarm. The firmware was updated so that the sensor reading will be Red on the STEL screen if the sensor is in STEL alarm and the sensor reading will be Red on the TWA screen if the sensor is in TWA alarm.

3. Update firmware to distinguish between a CH4 IR and CH4 catalytic sensor

Prior to this firmware update, there was no way for the user to distinguish between a CH4 IR and CH4 catalytic sensor when calibrating sensors individually from the sensor menu. The firmware was updated so that that the CH4 IR sensor is now signified by CH4*.

v3.00.05 – released January 13, 2010

Changes to the MX6 firmware include the following:

- The MX6 now is able to display in the Russian, Polish, and Czech languages. To support this, the layout of many of the screens changed. User-entered fields, like Site ID’s, will continue to be limited to ASCII characters.
- Display translations in all languages have been verified and improved.
- Added the Oxygen span reserve reading to the calibration results screen. Before, it was only being displayed on the zero results screen.
- Corrected an issue where the instrument software could crash if a calibration was run when all sensors are disabled.
- The results screen after a zero-on-startup was showing an obsolete value for the oxygen sensor; this has been corrected.
- If an IR sensor was enabled while the instrument was running, it would go into “ERR”; in v3.00, the MX6 will show a Warming Up screen until the IR sensor warmup is complete.
- The MX6 now stores results of manual bump tests and calibrations in a log that can be accessed via Modbus.

- If the analog-to-digital converter on a sensor went over-range during calibration, the MX6 will now detect this condition and immediately fail the calibration.
- The user can now configure the backlight to stay on for anywhere from 5 to 300 seconds since the last button press, or, as another option, keep the backlight on all the time.

JIRA Tickets Corrected in this Version:

CCB JIRA tickets for v3.00:

Key	Summary
MGI-84	Span reserve not showing on O2 calibration that calibrates during the zeroing process
MGI-85	Instrument freezes on the apply cal gas screen on a single disabled O2 sensor
MGI-86	Cal passed due showing result for O2 zeroing
MGI-199	Enabling an IR sensor can cause it to go into "ERR".
MGI-310	Display continues to "Blink" when in alarm
MGI-402	Set User and sites screens timeout to the configuration menu instead of NRS
MGI-533	MX6 uploading incorrect error times to DS2 (and iNet)
MGI-566	Log manual bump tests so they can be downloaded to DS2 and sent to iNet
MGI-601	Incorrect spelling in PID response factor list
MGI-627	Cancel button on PID response factor screen is not working and should be removed.
MGI-631	Calibration result screen hard to read for sensor(s) that are skipped.
MGI-643	MX6 doesn't detect sensor A/D overrange during calibration.
MGI-645	Add feature to allow user to configure the backlight settings.
MGI-646	Make a separate screen to allow user to choose LEL mode.
MGI-66	Add Russian and Polish language support to the MX6 instrument
MGI-588	Autozeroing for MX6 ATEX certification

v2.10.05 – released September 18, 2009**Changes to the MX6 firmware include the following:**

- Initialized sensor min/max temperature values in RAM by loading them from the DAS. This wasn't happening correctly in v2.00.
- Storing an extra copy of each checksum for each DAS. When a new parameter is written to the DAS, the backup copy of the checksum will be written first, then the parameter itself, then the original copy

of the checksum. On powerup, if the original checksum doesn't match the calculated value of the data, the code will check the backup checksum. If the backup checksum matches the calculated value, Err 3905 or 3906 will be stored in the error log, the backup checksum will be copied to the original checksum, and operation will proceed normally.

- Storing a copy of each sensor's EEPROM data in the MX6's Dataflash. If the checksum for a DAS is incorrect at startup, the instrument will look at the backup data. If backup data for the sensor exists (the instrument checks by sensor serial number), it copies the backup data back into the DAS, writes an Err 3904 warning to the error log, and continues normally. At shutdown, the latest DAS data is backed up to the Dataflash again. If the backup needs to be used to reload the DAS several times in a row, the sensor goes into "ERR" mode because there is probably a serious problem with the sensor.
- A sensor in the incorrect position (e.g., an LEL sensor not placed in position 5) will now generate an Err 3903 warning in the error log.
- Adding code so that a read or write error to the DAS EEPROM will immediately cause an error. This will be reported as a warning to the error log, and the sensor will be marked as "ERR". (This will only occur after 3 in a row read/write attempts failed.)
- Added the ability to load the startup Splash screen through the Datalink.
- Changed the O2 bump threshold from 19.7% to 19.5%.
- Changed the Zero Screen so that the progress bar will not display a value above 100%.
- The MX6 now sets a flag during shutdown, indicating that shutdown occurred properly. If the shutdown occurred improperly, e.g. by the user removing the battery while the instrument was operating, a warning screen will be displayed during startup. (Warning message = "Instrument was previously not shut down properly. Please make sure the instrument is completely shut down before removing the battery.") This will also create a warning in the error log. The user must acknowledge the screen before the instrument will continue with start-up, unless the instrument is docked which will allow the start up to continue without acknowledgement.



- Corrected all German translations of "LEL" to show "UEG" instead.
- Corrected misspelled German word "Kalibrien" "Kalibrieren".

- Corrected Spanish translation for “Cal Due”.
- Made contact information darker and easier to read.
- Added audio and “Snapshot Saved” message when user initiates a datalog snapshot.
- Limited the maximum alarm threshold or cal gas concentration that can be set over Modbus to the measurement range of the sensor.
- Battery code was updated to inform instrument of imminent power down so that the instrument can perform an orderly shutdown.

JIRA Tickets Corrected in this Version:

CCB JIRA tickets for v2.10:

Key	Summary
MGI-526	MX6 sensor checksum error investigation.
MGI-550	MX6 losing datalog data when powered on/docked
MGI-552	Update MX6 code to allow the splash screens to be loaded via the datalink
MGI-535	German translation for LEL
MGI-532	Translation: "calibrating" German language
MGI-521	MX6 Spanish version has an issue on translation
MGI-482	MX6 alarms when low and high alarm values are set at 5000 and 6000 ppm
MGI-280	MX6 display - Contact information difficult to read
MGI-185	Progress bar for zeroing a CO2 sensor counts to 125%
MGI-67	Snapshot needs confirmation screen
MGI-93	Hard coded 19.7% for O2 prevents O2 alarm in Bump Test.
MGI-562	Bump Test criteria for MX6 O2 sensors is incorrect