IS1001-MTS FIRMWARE UPDATE v1.7.3
RELEASE NOTES | AUGUST 1, 2023

IS1001 Application Firmware v1.7.3 (and v2.7.3):

- Added support for keypad and Gate Out port through IS1001-MUX User Interface Board.

Updating Firmware Guidelines

The firmware update is done via Biomark Device Manager software. Please refer to IS1001-MTS User Manual, IS1001 Reader Standalone Operation User Manual or Biomark Device Manager User Manual for the procedure.

Important! Tags memory may be erased after the application firmware update is complete, so it is recommended to download content of the memory prior to updating.

All settings may be reset to manufacturer default values during the update process, so it is recommended to generate a Controller Settings Report (RCS command) for the reference prior to updating the IS1001-MTS system (for IS1001-MC v1.5.2 and earlier the command is RRS – Report Reader Settings).

Firmware of all devices must be updated in order for the system to function properly. Start with updating IS1001 Application of all nodes, then update IS1001-MC CBG and finish with updating IS1001-MC Application.

For technical assistance please contact the Technical Services Department of Biomark at (208) 275-0011 or email biomarkservice@merck.com.

IS1001-MTS FIRMWARE UPDATE v1.7.1
RELEASE NOTES | APRIL 29, 2020

IS1001-MC CBG Board Firmware v1.7.1:

- Implemented automatic external Flash drive disconnection, whenever process of creating a file or writing to a file takes significantly longer than expected. This should prevent failed external Flash drive from causing inability to write new records into the IS1001-MC memory or to collect records from the IS1001-MC memory.

IS1001 Application Firmware v1.7.1 (and v2.7.1):

- Eliminated relative phase measurement distortion in Slave Exciter Synchronization Mode.
- Fixed "Sync. Input Not Present" alarms in Slave Exciter Synchronization Mode, when Reader Idling Time is enabled.
- Re-worked Reader Idling Time functionality: Reader Idling Time is now not allowed with Secondary Master Exciter Synchronization Mode setting; when Reader Idling Time is enabled with Standalone Exciter Synchronization Mode setting, FDX-B and HDX cycle times will now vary depending on the presence of a tag in antenna field.
- Improved VTT Single-Shot functionality.
- Replaced "Reader Auto Standby Voltages" with "Auto Standby Voltages" in Full Status Report.
- Re-calibrated FDX-B signal level measurement.

IS1001-MTS FIRMWARE UPDATE v1.7.0
RELEASE NOTES | JUNE 12, 2019

IS1001-MC Application Firmware v1.7.0:

- Implemented FDX-B tag detection signal level measurement feature – when enabled, every time an FDX-B tag ID is successfully detected, signal level is measured and reported. The measured signal level value is appended to the end of the detected tag ID message; it is also stored with the tag ID in main memory and backup tag memory.

  TAG: 01 01 06/05/2019 11:06:35.750 3D9.2098AB0380 **202 mV**

  TAG: 01 01 06/05/2019 11:06:35.750 3D9.2098AB0380 30.0 C **202 mV**

  Added “DTS{1|0}” command and “FDXB Sig. Level Det.” line on LCD menu Detection Setup screen to enable/disable the functionality. By default, the tag signal measurement is disabled.
- Implemented BioTherm tag temperature detection. The measured temperature value is appended to the end of the detected tag ID message; it is also stored with the tag ID in main

memory and backup tag memory. The displayed temperature range is +25.0°C to +50.0°C. Temperature below range is displayed as "LL.L C", temperature above range is displayed as "HH.H C".

TAG: 01 01 06/05/2019 11:06:35.750 3D9.2098AB0380 **30.0 C**

TAG: 01 01 06/05/2019 11:06:35.750 3D9.2098AB0380 **30.0 C** 202 mV

Added "DTT{1|0}" command and "BioTherm Temp. Det." line on LCD menu Detection Setup screen to enable/disable the functionality. By default, the temperature detection is disabled.

Note: Specified BioTherm tag temperature measurement accuracy is ±0.5°C, BUT only from +33.0°C to +43.0°C. Accuracy is not specified and not guaranteed outside the +33.0°C to +43.0°C range.

- Changed backup tag memory format to allocate space for measured tag signal level and detected temperature values storage.

  Important! Backup tags memory will be erased after the application firmware update is complete, so it is recommended to download content of the memory prior to updating the IS1001-MC.

- Added ability to perform Full Tune process of all nodes in the Switching Sequence one after another, by using "NFTA" command.
- Added ability to cancel node(s) Full Tune process, by pressing "Esc" key.
- Removed "Controller Power Mode" line from LCD menu Controller Setup screen.
- Removed "AES256 Compliant" line from LCD menu Communication Setup screen.
- Added "Remote Communication Port Transfer Rate" setting ("CRR{F|S}" command) with "Full" and "Slow" options to be used whenever external communication hardware has limited data transfer capabilities.
- Corrected "Idling Time" value displayed in Full Status Report.
- Changed Full Status Report order and commands list order to match new format.

IS1001-MC CBG Board Firmware v1.7.0:

- Added support for FDX-B tag detection signal level value and BioTherm tag temperature value in tag records.

IS1001 Application Firmware v1.7.0 (and v2.7.0):

- Implemented FDX-B tag detection signal level measurement feature – when enabled, every time an FDX-B tag ID is successfully detected, signal level is measured and reported. The measured signal level value is appended to the end of the detected tag ID message; it is also stored with the tag ID in memory.

  TAG: 01 06/05/2019 11:06:35.750 3D9.2098AB0380 **202 mV**

  TAG: 01 06/05/2019 11:06:35.750 3D9.2098AB0380 30.0 C **202 mV**

  Added "DTS{1|0}" command to enable/disable the functionality. By default, the tag signal measurement is disabled.

- Implemented BioTherm tag temperature detection. The measured temperature value is appended to the end of the detected tag ID message; it is also stored with the tag ID in memory. The displayed temperature range is +25.0°C to +50.0°C. Temperature below range is displayed as "LL.L C", temperature above range is displayed as "HH.H C".

  TAG: 01 06/05/2019 11:06:35.750 3D9.2098AB0380 **30.0 C**

  TAG: 01 06/05/2019 11:06:35.750 3D9.2098AB0380 **30.0 C** 202 mV

  Added "DTT{1|0}" command to enable/disable the functionality. By default, the temperature detection is disabled.

  Note: Specified BioTherm tag temperature measurement accuracy is ±0.5°C, BUT only from +33.0°C to +43.0°C. Accuracy is not specified and not guaranteed outside the +33.0°C to +43.0°C range.

- Changed tag memory format to allocate space for measured tag signal level and detected temperature values storage. Tags memory size changed to 78,583 IDs.

  Important! Tags memory will be erased after the application firmware update is complete, so it is recommended to download content of the memory prior to updating the IS1001.

- Added "Remote Communication Port Transfer Rate" setting ("CRR{F|S}" command) with "Full" and "Slow" options to be used whenever external communication hardware has limited data transfer capabilities.
- Changed Full Status Report order and commands list order to match new format.
- In IS1001-12V version, re-calibrated input voltage measurement, due to changes in input voltage lower operating limits (minimum turn on voltage: 12V; minimum operating voltage when reader is on: 11.3V) and changed "Input Voltage Low" alarm threshold to 11.5V.

IS1001-MTS FIRMWARE UPDATE v1.6.5
RELEASE NOTES | FEBRUARY 15, 2019

IS1001-MC CBG Board Firmware v1.6.5:

- Added support for the new replacement Flash memory IC, as the original IC became obsolete in 2018.
- Added "Controller Internal Data Memory Error" alarm if the detected memory IC is not supported.

Note: This update is critical for preventing possible data loss and must be applied to all CBG PCBAs with the following s/ns:

- 46127.0001 thru 46127.0050
- 49078.0001 thru 49078.0050

These PCBAs were installed in IS1001-MCs starting with s/n: 1832.0319.

IS1001-MCs with s/ns below 1832.0319 that are already updated with CBG Board firmware v1.6.4 are not required to be updated to v1.6.5. Updating to v1.6.4 is strongly recommended.

Important! After the CBG Board firmware is updated to v1.6.5, the IS1001-MC's internal memory must be erased via its user interface or by using "MEE" command, so it is recommended to download content of the memory prior to updating the IS1001-MC.

IS1001-MTS FIRMWARE UPDATE v1.6.4
RELEASE NOTES | FEBRUARY 7, 2019

IS1001-MC Application Firmware v1.6.4:

- Added support for selective record type data collection by DCA.

IS1001-MC CBG Board Firmware v1.6.4:

- Improved memory write process by writing each new record into memory in two steps: first the data, then record validation bytes.
- Improved memory erase process by marking all records within a sector as invalid, in addition to marking all sectors as invalid.
- Improved memory erase process by starting from the present working sector instead of the first physical sector.
- Improved external Flash Drive handling by automatically creating a new subfolder for each one hundred data files.

IS1001-MTS FIRMWARE UPDATE v1.6.3
RELEASE NOTES | SEPTEMBER 10, 2018

IS1001-MC Application Firmware v1.6.3:

- Fixed node's status packets order and timeout delay to avoid MC reporting "0" values for node's diagnostic parameters whenever total nodes sequence cycle time exceeds 2 seconds.

IS1001-MC CBG Board Firmware v1.6.3:

- Added support for selective record type data collection by DCA.

IS1001 Application Firmware v1.6.3 (and v2.6.3):

- Fixed node's status packets order and timeout delay to avoid MC reporting "0" values for node's diagnostic parameters whenever total nodes sequence cycle time exceeds 2 seconds.
- Added Reader Periodic Standby feature and "RPS" command to set activation start time and duration.
- Implemented compact version of Short Status Report for use with Biomark's Data Collection Application software to minimize data traffic.
- Improved memory download process during remote communication port speed slowdown in order to work with BLE profile of Bluetooth devices where communication speed can be very slow.

IS1001-MTS FIRMWARE UPDATE v1.6.2
RELEASE NOTES | AUGUST 12, 2017

IS1001-MC Application Firmware v1.6.2:

- Corrected issue with deactivation of Automatic Standby function.
- Changed Alarms Unique Delay default value to 3600 seconds.
- Replaced "Error: Autostandby Voltage Deactivation Setting Is Too Low" message with "Error: Deactivation Setting Is Invalid".
- Replaced "Controller Temperature High/Low" alarms with "Temperature High/Low" in order to be suitable for use as alarms from nodes.
- Replaced "VTT For All Nodes In Sequence Enabled" message with "Node VTT Enabled" when VTT is activated on a single node.

IS1001-MC CBG Board Firmware v1.6.2:

- Updated MC's cycle synchronization functionality for multiple IS1001-MCs. The Slave MC(s) will wait for the "new cycle start" signal from Master MC before repeating its sequence. This way, if the Slave MC has fewer nodes in its sequence than the Master MC, synchronization of the sample sequence will be maintained.

IS1001 Application Firmware v1.6.2 (and v2.6.2):

- Added "MTD - Memory Tags Download" and "MSD - Memory Status Reports Download" commands to allow downloading different data types separately.
- Added Reader Automatic Standby feature and "RSV" command to set activation and deactivation voltages (IS1001-24V model only).
- Changed Alarms Unique Delay default value to 3600 seconds.

- Replaced “Reader Idling Time” with “Idling Time” in Full Status Report to match the rest of the lines.

IS1001-MTS FIRMWARE UPDATE v1.6.1
RELEASE NOTES | JANUARY 18, 2017

IS1001-MC Application Firmware v1.6.1:

- Corrected misspelling of “Reset to Factory Default Parameters” command execution message.
- Changed “Node Discovered” message type to “INF:” when node has no ID assigned to it. This message is rebroadcasted every 5 minutes.
- Implemented “MFN” command to change present USB storage file number.
- Added support for reading and writing of all settings at once to enable preserving the existing parameters' settings during firmware update and for allowing exchange of the settings between controllers.
- Changed to postpone periodic VTT, alarms rebroadcast and periodic reports until an antenna full tuning process is completed.
- Enhanced “CSV - Set Controller Automatic Standby Voltage” command to include voltage setting for switching back to Scan mode.
- Changed command “CAS - Set Controller Automatic Standby” to “CPS - Set Controller Periodic Standby”.

IS1001-MC CBG Board Firmware v1.6.1:

- Fixed an issue with collecting new records by Biomark’s Data Collection Application software from IS1001-MC’s memory after entire memory erase.

IS1001 Application Firmware v1.6.1 (and v2.6.1):

- Replaced “Reader Sync. Mode” with “Exciter Sync. Mode”.
- Added 10 seconds delay between automatic VTT activation and automatic status report generation to eliminate VTT influence on signal level measurement.
- Added “Gate Out” functionality at test point E6. Signal is inverted (active-low) with 454 microseconds pulse width. "Gate Out" is Unique Mode setting dependent and is not activated by VTT detections.
- Added overheating protection by automatically switching IS1001 into Standby mode if reader temperature reaches +75°C to reduce the amount of heat it is generating. Reader will switch back into Scan mode once the temperature drops below +70°C.

- Implemented "Idling Time" feature with “RIT{0-10000} - Set Reader Idling Time in Milliseconds” command. Reader will switch into Standby mode, to conserve power, for the period of time, set by this command, after each FDXB cycle, which is defined by "FDXB Scan Time" parameter, or after each HDX cycle, if HDX tag detection is enabled.
- Added support for reading and writing of all settings at once to enable preserving the existing parameters' settings during firmware update and for allowing exchange of the settings between readers.

IS1001-MTS FIRMWARE UPDATE v1.6.0
RELEASE NOTES | MARCH 31, 2016

IS1001-MC Application Firmware v1.6.0:

- Added ability to copy the entire content of MC memory onto External USB Flash Drive into a single file.
- Added support for node’s Antenna Dynamic Output Power functionality.
- Added ability to change Detection Unique Mode and Detection Unique Delay settings for each node individually, as well as for all nodes together.
- Extended maximum FDX-B Scan Time parameter to 500 milliseconds.
- Implemented 2 minutes delay before sending the first automatic Noise Report after system power up to ensure accurate data is reported.
- Implemented on-demand Diagnostic Data Report that contains only vital diagnostics information of the system.
- Added support for Biomark’s new IS1001 Data-Over-Power (DOP) devices and implemented on-demand DOP Devices Status Report that provides detailed information of the devices present on CAN Bus network.
- Removed ability to change node’s local USB port speed setting.
- Improved FDX-B Signal Level measurement accuracy throughout the operating temperature range.
- Changed FDX-B Signal Level measurement to be displayed in both millivolts and percent.
- Antenna Current and FDX-B Signal measurements are now cleared to 0 when system is in Standby mode (instead of keeping the last measurements received from nodes).
- Changed to not generate “Node Tuning Capacitance Low” and “Node Tuning Capacitance High” alarms if the condition calls for it but the present phase measurement is 0. Phase measurement of 0 indicates antenna is far out of tuning range or is not connected.
- Replaced “Half-Telegram Tag” with “Fastag” in the LCD menus, list of commands, messages and reports’ sections.

- Replaced “Reader” with “Controller” in the LCD menus, list of commands, messages, alarms and reports’ sections related to Master Controller.
- Replaced “Node” with “Reader Node” in the LCD menus, list of commands and reports’ sections related to IS1001 nodes.
- Updated content and items’ order in the LCD menus, list of commands and in several reports.
- “MFD - Download Full Memory” command replaced with “MED - Download Entire Memory”.
- “MFE - Erase Full Memory” command replaced with “MEE - Erase Entire Memory”.
- Added support for multiple Data Collection Application centers.
- Added support for system’s date/time synchronization with National Institute of Standards and Technology (NIST) through Data Collection Application.
- Improved speed of node’s firmware update through MC over internet connection. Requires BioTerm v.1.16.3 or later.

IS1001-MC CBG Board Firmware v1.6.0:

- Added support for FDX-B Scan Time up to 500 milliseconds.
- Added support for Biomark’s new IS1001 Data-Over-Power devices.
- Added support for multiple Data Collection Application centers.

IS1001 Application Firmware v1.6.0 (and v2.6.0):

- Implemented Antenna Dynamic Output Power functionality: if antenna current in excess of 11 A is detected, IS1001 will reduce its VE level to were antenna current is below 11 A. If after that antenna current drops by more than 5%, IS1001 will return VE level to its original, defined by user, setting in order to maintain highest possible antenna current.
- Extended maximum FDX-B Scan Time parameter to 500 milliseconds.
- Dynamic tuning capacitors are now switched off when reader is in Standby mode.
- Added support for Biomark’s new IS1001 Data-Over-Power devices.
- Implemented on-demand Diagnostic Data Report that contains only vital diagnostics information of the reader.
- Implemented 2 minutes delay before sending the first automatic Noise Report after system power up to ensure accurate data is reported.
- Modified antenna exciter oscillators synchronization signal presence detection to be independent from HDX and to display signal’s logical state instead of physical state in status reports.
- Updated real-time clocks (date/time settings) synchronization to trigger off-schedule clock synchronization whenever date or time setting of the Source IS1001 is changed.
- Changed "Antenna Current Exceeded 10.0 A" alarm behavior to clear once the condition that triggered it ceases, the same way as "Antenna Current Low" and "Noise High" alarms.
- Alarms are no longer broadcasted during Antenna Full Tune process.

- Updated content and items' order in the list of commands and in several reports.
- "MFD - Download Full Memory" command replaced with "MED - Download Entire Memory".
- "MFE - Erase Full Memory" command replaced with "MEE - Erase Entire Memory".
- Added support for reader's date/time synchronization with National Institute of Standards and Technology (NIST) through Data Collection Application.

IS1001-MTS FIRMWARE UPDATE v1.5.2
RELEASE NOTES | JULY 16, 2015

IS1001 Application Firmware v1.5.2 (and v2.5.2):

- Added detection of Fastag™ FDX-B Half-Telegram PIT tags.
- Added Secondary Master Synchronization mode for synchronizing antenna exciter oscillators between multiple IS1001s.
- Added real-time clocks (date/time settings) synchronization capability between multiple IS1001s.
- Improved FDX-B Signal Level measurement accuracy throughout the operating temperature range.
- Antenna Current Gain and Antenna Current Offset present values are now not affected by Reset to Factory Default Parameters command and will be preserved.

IS1001-MTS FIRMWARE UPDATE v1.5.1
RELEASE NOTES | DECEMBER 4, 2014

IS1001-MC Application Firmware v1.5.1:

- FDX-B Half-Telegram™ Tag detection default value changed to Off.
- Detection efficiency test changed to automatically turn on when VTT is set to On and turn off when VTT is set to Off.
- "HDX Decoding" replaced with "HDX Tag Detection" in Full Status Report.
- "Sync Input Present" parameter moved to "Diagnostics" section in Full Status Report.
- Changed settings order in "Communication" section in Commands List, Full Status Report Reader Settings Report and Keypad Menu Settings: Local Port settings are displayed first, followed by Remote Port settings.
- Added support for "AES-256 Compliant" Lantronix XPort Ethernet module (special order item).

- Fixed issue with "Auto Standby Time" being displayed incorrectly in status report when it was set to 10 hours or more.

IS1001-MC CBG Board Firmware v1.5.1:

- Fixed issue with dated memory download when two months are selected for the download range.
- Fixed issue with tag ID being written to USB drive in decimal format incorrectly.
- Added warning when USB drive cannot be recognized or its format is not supported - "EXT. MEM. READY" LED flashes the error code.

IS1001-MTS FIRMWARE UPDATE v1.5.0
RELEASE NOTES | AUGUST 6, 2014

IS1001-MC Application Firmware v1.5.0:

- Added support for detection of Half-Telegram™ FDX-B PIT tags. Half-Telegram™ FDX-B PIT tags were designed by Biomark, Inc. for use at high water velocity applications requiring high detection rates. This tag telegram consists of only 64 bits compared to 128 bits in ISO-standard FDX-B PIT tag. Thus, it takes the tag only 16 milliseconds to transmit its telegram vs. 32 milliseconds that takes ISO-standard FDX-B PIT tag to transmit its telegram.
- Changed Detection Unique Delay setting to values in seconds: 1 - 43200 (1 second to 12 hours).
- Minor issues fixed.

IS1001-MC CBG Board Firmware v1.5.0:

- Added support for detection of Half-Telegram™ FDX-B PIT tags.

IS1001-MTS FIRMWARE UPDATE v1.4.5
RELEASE NOTES | SEPTEMBER 25, 2014

IS1001 Application Firmware v1.4.5 (and v2.4.5):

- Save Tags To Memory, Save Status Reports To Memory and Save VTT To Memory default values changed to On.
- Detection efficiency test changed to automatically turn on when VTT is set to On and turn off when VTT is set to Off.

- Fixed issue with false “VTT Single Shot Aborted Due To System Activity” when FDX-B Half-Telegram™ Tag detection is enabled.
- "Relative Phase" parameter moved to "Sensors" section in Full Status Report.
- "HDX Decoding" replaced with "HDX Tag Detection" in Full Status Report.
- Added support for Dual-Reader real-time clock synchronization feature.
- Changed settings order in "Communication" section in Commands List and Full Status Report: Local Port settings are displayed first, followed by Remote Port settings.
- Changed Detection Unique Delay setting values to seconds: 1 - 43200 (1 second to 12 hours).
- Minor issues fixed.

IS1001-MTS FIRMWARE UPDATE v1.4.3
RELEASE NOTES | MAY 16, 2014

IS1001-MC Application Firmware v1.4.3:

- Added Backup Tag Memory. Backup Tag Memory is a dedicated tag IDs memory, physically separated from main internal Master Controller memory. Only tag IDs with date and time stamp are written to Backup Tag Memory following the same rules as for main memory (Unique Mode setting dependable). Backup Tag Memory size is 29120 tag IDs. When Backup Tag Memory gets full 3640 oldest tag IDs (oldest 12.5%) are erased. Backup Tag Memory cannot be disabled and has its own download and erase commands.
- Added Memory Status Report ("RMS" command). Memory Status Report contains main Memory status (usage in percent), Backup Tag Memory status (number of records and usage in percent), Store VTT To Memory setting (On/Off) and External Storage status (connection and buffer status, present file name).
- Fixed decimal conversion problem when reader is set to display tag IDs in Decimal.
- "Remore" replaced with "Remote" in status report.
- "Load Factory Default Parameters" replaced with "Reset To Factory Default Parameters" in commands list.

IS1001 Application Firmware v1.4.3 (and v2.4.3):

- Fixed decimal conversion problem when reader is set to display tag IDs in Decimal.
- "Remore" replaced with "Remote" in status report.
- "Load Factory Default Parameters" replaced with "Reset To Factory Default Parameters" in commands list.

IS1001-MTS FIRMWARE UPDATE v1.4.1
RELEASE NOTES | MAY 16, 2014

IS1001-MC CBG Board Firmware v1.4.1:

- Minor issue fixed.

IS1001-MTS FIRMWARE UPDATE v1.4.0
RELEASE NOTES | JANUARY 21, 2014

IS1001-MC Application Firmware v1.4.0:

- Added ability to see the progress of Node Antenna Full Tune process through MC's communication ports.
- Added adjustment for FDXB Detection Scan Time: sets node scan time or FDX cycle time when HDX detection is enabled. Available settings are from 45 to 200 milliseconds (in 5 milliseconds increments).
- Added start of switching sequence synchronization feature for multiple MCs synchronization.
- Added "Modem Protocol" to remote communication port and support for Biomark's new Remote Data Collection System (communication via Sierra wireless modems).
- "Antenna Noise" replaced with "Noise".

IS1001-MC CBG Board Firmware v1.4.0:

- Added adjustment for FDXB Detection Scan Time: sets node scan time or FDX cycle time when HDX detection is enabled. Available settings are from 45 to 200 milliseconds (in 5 milliseconds increments).
- Added start of switching sequence synchronization feature for multiple MCs synchronization.
- Added support for Biomark's new Remote Data Collection System (communication via Sierra wireless modems).

IS1001 Application Firmware v1.4.0 (and v2.4.0):

- Enhanced Antenna Full Tune algorithm.
- Added adjustment for FDXB Detection Scan Time: sets node scan time or FDX cycle time when HDX detection is enabled. Available settings are from 45 to 200 milliseconds (in 5 milliseconds increments).

- Added "Modem Protocol" to remote communication port and support for Biomark's new Remote Data Collection System (communication via Sierra wireless modems).
- Response to commands: "Print List of Commands", "Download Full Memory", "Report Reader Date and Time", "Report Full Status", "Report Firmware Version" and "Report Noise Status" - changed to be sent only to the port requesting them.
- "Antenna Noise" replaced with "Noise".