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|  | | Title: LMT Software Data Release Notes | | | | Doc id : 3KXL140000G0140 | | |
| Owner Organization: R&D SH Level Products | Issued by Dept.: R&D | Approved by: | Approved Date: | Lang.: en | Status: Draft | Reason: GLBCR2011009 | Revision: Draft | Page : 1 (6) |
| Doc. Kind: Release Notes and Technical Reports | | | Controlled Distribution location: http://10.138.116.31:7990/projects/LMTH/repos/cb_application/browse | | | | | |


LMT Magnetostrictive Liquid Transmitter Release Notes

| Document Number | Description |
|-----------------|--|
| 3KXL000065U0113 | LMT-Front End-FPGA Firmware in stp format |
| 3KXL000065U0213 | LMT-Front End-Application |
| 3KXL000065U0313 | LMT-Front End-Application + Bootloader |
| 3KXL000065U0413 | LMT-Front End-Bootloader |
| 3KXL000065U0513 | LMT-Front End-FPGA Firmware in bin format |
| 3KXL000711U0113 | LMT-HMI-Application |
| 3KXL000712U0113 | LMT-Communication Board-Application |
| 3KXL000712U0213 | LMT-Communication Board-Application + Bootloader |
| 3KXL000712U0313 | LMT-Communication Board-Bootloader |
| 3KXL140000G0113 | LMT-Factory Setup |

LMT Software Release History

06/11/2021 Firmware Updates

- CB Application 3KXL000712U0113_02.02.00_21.06.10.bin
- CB Application + Bootloader 3KXL000712U0213_02.02.00_21.06.10.mot
 - o Add gain to adjust signal strength in HMI menu and HART command
 - o Add fast menu POL to waveform interface to set the signal polarity
 - o Fix Linearization table bugs in HMI and Factory setup tool
 - o Fix waveform display abnormal: no threshold line and axis scale
 - o Add the cyber security feature:
 - Add menu service account and HART command that disable/enable service user
 - Change user password storage from Hash 32 to SHA 256 algorithm
 - o Fix the bug that reset calibration carry out wrong action
 - o Fix issue that some value range shown in HMI are incorrect
 - o Fix issue that alarm of current out uncertain produce with out of limit or communication error
 - o Fix bug that hardware revision changes after carrying out NV format
 - o Fix issue that level range will be changed once entering the calibrate menu
 - o Fix Chinese language cannot be saved successfully
 - o Fix issue that PV percentage is not matched with level value when linearization enables
 - o Fix issue that safety manual and device implementation are mismatches between for current out readback alarm
 - o Extend level range limit to meet more application scenarios
 - o Add communication retry times to improve robustness for some special condition
 - o Make firmware compatibility with previous firmware revision and hardware revision
- FE Application 3KXL000065U0213_02.02.00_21.06.07.bin
 - o Fix sensor board fault alarm for HFXO issue
 - o Add access interface to adjust signal strength and record the gain readback value
 - o Fix bug that unreasonable parameter for trim value will cause sensor reference value error
 - o Change 3V and 6V power supply monitor mode from single mode to oversample mode
 - o Change signal threshold setup from digital potentiometer to FPGA control
 - o Add periodically diagnosis for gain read back from digital potentiometer
 - o Optimize 1.2V power supply diagnosis to avoid false alarm
 - o This change can supports FE hardware revision 02.00.00 and 01.01.00
- FE Bootloader 3KXL000065U0413_02.01.01_21.03.25.bin
 - o Fix bug that will block the programming for FPGA thru JTAG port
- FE Application + Bootloader 3KXL000065U0313_02.02.00_21.06.07.bin
- FE FPGA Application 3KXL000065U0513_02.01.00_20.08.17.bin
- FE FPGA Application 3KXL000065U0113_02.01.00_20.08.17.stp
 - o Add the FPGA logic circuit for support threshold value setting thru MCU
 - o Add OR gate to block the unexpected TH signal for proper measurement test function
 - o Add SAVE_BLK_EXTD logic signal to extend blanking factor

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- Use one 17-bit counter directly instead of one 16 bits counter and one 1-bit counter to assembled as one 17-bit counter.
- Level measurement strategy update: FPGA detects a rising edge of the Zero Crossing signal and the following falling edge of the Threshold signal. MCU will get both of these level detection value and perform a combination algorithm to figure out an effective value for valid level detection
- Fix bug fixe for measurement task watch dog
- Change logic schematics to Verilog language for FPGA measurement module design

09/02/2019 **Firmware Updates**

- CB Application 3KXL000712U0113_2.1.3_19.08.26.bin
 - Fix NV failure issues
 - Fix CB cannot start with FE existing
 - Fix CB not retaining configuration changes after power cycling when sensor configured with temperature
 - Fix CB max & min sensor temperature wrongly stored
 - Fix calibration not precise issue
 - Add the language of Polish
 - Make CB compatible with push button HMI
 - This change supports CB hardware version 1.0.0.
- CB Application + Bootloader 3KXL000712U0213_2.1.3_19.08.26.bin
- FE Application 3KXL000065U0213_2.1.2_19.08.30.bin
 - Fix sensor out of limits
 - Enable direct write to objects to write FE
 - Solve issue that current outputs abnormally when a sensor out of limit is detected
 - This change supports FE hardware version 1.0.0 and 1.1.0.
- FE Bootloader 3KXL000065U0413_2.1.0_19.08.20.bin
 - Fix the bug that FE bootloader cannot show the correct version of FPGA after upgrading
 - Remove timeout feature in FE bootloader to avoid firmware damaged
- FE Application + Bootloader 3KXL000065U0313_2.1.2_19.08.30.bin
- FE FPGA Application 3KXL000065U0513_1_0_8_19.08.20.bin
 - Change the flashing library for FE FPGA to make it not coupling with FE bootloader
(Precaution: using bootloader to upgrade FPGA to version 1.0.8 requires 3KXL000065U0513_1_0_8_19.08.20.bin if FE bootloader version is 3KXL000065U0413_2.1.0_19.08.20.bin, while it requires 3KXL000065U0513_1_0_8_180927.bin if FE bootloader version is 3KXL000065U0413_2.0.0_18.09.29.bin)

06/12/2019 **Firmware Updates (US Warminster Factory Only)**


- CB Application 3KXL000712U0113_2.1.2_19.06.12.bin
 - Fix the issue that NV data storing does not work if the device is configured as level plus temperature

11/14/2018 **Firmware Updates**

- CB Application 3KXL000712U0113_2.1.1_18.11.14.bin
 - Fix communication error issues
 - This change supports CB hardware version 1.0.0.
- CB Application + Bootloader 3KXL000712U0213_2.1.1_18.11.14.bin
- FE Application 3KXL000065U0213_2.1.1_18.11.13.bin
 - Fix sensor board fault issues
 - Fix communication error issues
 - This change supports FE hardware version 1.0.0 and 1.1.0.
- FE Application + Bootloader 3KXL000065U0313_2.1.1_18.11.13.bin

9/30/2018 **Firmware Updates**

- FE Application 3KXL000065U0213_2.1.1_18.09.30.bin (Service Only)
 - Fix sensor board fault issues
 - Add internal data objects to track Sensor Board Fault causes
 - Modify the threshold value which restricts the input of lower trim value
 - Optimize power consumption when measuring current through ADC
 - This change supports FE hardware version 1.0.0 and 1.1.0.
- FE Application + Bootloader 3KXL000065U0313_2.1.1_18.09.30.bin (Service Only)

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| R&D SH Level Products | R&D | | | en | Draft | GLBCR2011009 | Draft | 3 (6) |
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- FE Bootloader 3KXL000065U0413_2.0.0_18.09.29.bin
 - o Add FPGA programming feature
 - o This change supports FE hardware version 1.0.0 and 1.1.0.
- FE FPGA Application + Lib 3KXL000065U0513_1_0_8_180927.bin
- FE FPGA Application 3KXL000065U0113_1_0_8_180927.stp
 - o Bug fix related to unexceptional level detection signal when the level measurement test implements.

4/8/2018 Firmware Updates


- CB Application 3KXL000712U0113_2.1.0_18.03.14.bin
- CB Application + Bootloader 3KXL000712U0213_2.1.0_18.04.08.mot
- CB Bootloader 3KXL000712U0313_1.0.0_17.12.04.bin
 - o Update Signal Polarity Reversal logic when changing mount orientation: Signal Polarity will be reversed each time mount orientation is changed;
 - o Enable waveform horizontal scrolling to go below zero;
 - o Add support for future hardware version to automatically adjust the vertical scale in the waveform to the correct range;
 - o Separate calibration preparation logic from HMI;
 - o Change default level limit/ullage limit when changing probe length;
 - o Add validation function for sensor calibration;
 - o Correct ranges for several data objects;
 - o Bug fix related to OS_Unuse() for resource semaphores with communications;
 - o Bug fix related to Level/Interface range update;
 - o Bug fix related to 2 float unit direction reversal;
 - o Bug fix related to calibration result validation on 2 float unit;
 - o Bug fix service port cannot communicate with FE board;
 - o This change support CB hardware version 1.0.0.
- FE Application 3KXL000065U0213_2.1.0_18.03.26.bin
- FE Application + Bootloader 3KXL000065U0313_2.1.0_18.03.26.bin
- FE Bootloader 3KXL000065U0413_1.0.0_17.12.04.bin
 - o Remove useless test signal output;
 - o Update SRP calculation method;
 - o Remove legacy module test code from sensor interface sub-system;
 - o Bug fix related to FPGA Measurement test;
 - o Bug fix related to FPGA Write Probe Length test.
 - o This change support FE hardware version 1.0.0 and 1.1.0.
- FE FPGA Application 3KXL000065U0113_v_1_0_7_180201.stp
 - o Removed Test Points used for development;
 - o Removed reverse function of the data during External Bus Interface Test for SIL Certification;
 - o Added Probe Length Read-back Test for SIL Certification;
 - o Added FPGA internal watchdog of the Measurement Task for SIL Certification;
 - o General cleanup and minor design simplification.

5/16/2017 Firmware Updates

- FE Bootloader 3KXL000065U0413_0.0.6_17.05.16.bin
- FE Application 3KXL000065U0213_1.0.2_17.05.16.bin
- FE Application + Bootloader 3KXL000065U0313_1.0.2_17.05.16.bin
 - o Use 11 MHz oscillator to clock the UART for the bootloader
 - o Change 7 MHz oscillator for waveform scaling to 14 MHz oscillator with proper prescaler selected
 - o Modify sensor trimming rules to allow 25% minimum span between trim points
 - o Sensor reference point is back-calculated to 0 counts based on trim gain/slope calculation
 - o Lower trim value can be up to probe length – 5"
 - o Combined image release

1/16/2017 Firmware Updates

- CB Application 3KXL000712U0113_1.0.1_17.01.12.bin
- CB Application + Bootloader 3KXL000712U0213_1.0.1_17.01.12.mot
 - o Fix software write protect bug
 - o Implement software reset to FE on consecutive missed messages
 - o Fix diagnostic alarm behavior for current read back hi/lo


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- Fix PV, SV, TV, QV selection overwrites

- FE Application 3KXL000065U0213_1.0.1_17.01.11.bin
- FE Application + Bootloader 3KXL000065U0313_1.0.1_17.01.11.bin
 - Fix median filter bug
 - Fix sensor stuck diagnostic

11/18/2016 Initial Production Release:

- CB Application 3KXL000712U0113_1.0.0_16.11.18.bin
- CB Application + Bootloader 3KXL000712U0213_1.0.0_16.11.18.mot
- CB Bootloader 3KXL000712U0313_0.9.5_13.03.25.bin
- FE FPGA Application 3KXL000065U0113_0.3.2_13.08.27.stp
- FE Application 3KXL000065U0213_1.0.0_16.11.17.bin
- FE Application + Bootloader 3KXL000065U0313_1.0.0_16.11.17.bin
- FE Bootloader 3KXL000065U0413_0.0.5_14.05.19.bin
- HMI Application 3KXL000711U0113_0.5.1_16.06.10.a43

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Firmware Checksum Data for Current Release:

CB Application 3KXL000712U0113_02.02.00_21.06.10.bin
CB Application + Bootloader 3KXL000712U0213_02.02.00_21.06.10.mot
CB Bootloader 3KXL000712U0313_01.00.00_17.12.04.bin

CRC-32-S: FBA4648A
CRC-32-S: 00150ADB
CRC-32-S: 76A284DF

FE Application 3KXL000065U0213_02.02.00_21.06.07.bin
FE Application + Bootloader 3KXL000065U0313_02.02.00_21.06.07.bin
FE Bootloader 3KXL000065U0413_02.01.01_21.03.25.bin
FE FPGA Application + Lib 3KXL000065U0513_02.01.00_20.08.17.bin
FE FPGA Application 3KXL000065U0113_02.01.00_20.08.17.stp

CRC-32-S: A01843DE
CRC-32-S: F0957A1B
CRC-32-S: 84490EDC
CRC-32-S: B1C740F8
CRC-32-S: 34B62006

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Release History:

| Revision | Description | Reason | Date |
|----------|--|---|----------|
| NC | Initial Release | ECN1252 | 11/18/16 |
| A | Updated release history for CB & FE updates Updated checksums for FE binaries Moved Release notes from Release History for document to its own section | ECN1272 | 01/16/17 |
| B | Updated release history for FE firmware Updated checksums for FE binary releases | ECN1298 | 05/16/17 |
| C | Updated release history for CB & FE firmware Updated checksums for CB & FE binary releases | GLBCR1803003 | 04/08/18 |
| D | Updated release history for FE & FPGA firmware Updated checksums for FE & FPGA firmware | GLBCR1803008 | 09/30/18 |
| E | Updated release history for CB & FE firmware Updated release history for CB & FE binary releases | GLBCR1809008 | 11/14/18 |
| F | Updated release history for CB firmware | Required from US Warminster Factory | 06/12/19 |
| G | Updated release history for CB & FE firmware Updated release history for CB & FE binary releases | GLBCR1908001 | 09/02/19 |
| H | Updated release history for FPGA in v1.0.8 Updated checksums for FE & FPGA binary releases | GLBCR1911005 | 12/12/19 |
| 00 | Updated release history for CB, FE and FPGA firmware Updated checksums for CB,FE & FPGA binary releases | GLBCR2011009 | 06/11/21 |