FreeMASTER Sensor Tool

Release notes for the FreeMASTER sensor tool v1.3

Rev. 1.3 — 30 May 2023   **Release notes**

Document Information

Information	Content
Keywords	FreeMASTER, ISSDK, Sensors, Evaluation tool, Real-time monitoring, Data visualization
Abstract	FreeMASTER-Sensor-Tool v1.3 Release Notes

Revision history

Rev	Date	Description
1.3	20230530	• Global: revised version number from v1.2 to v1.3. • Added "Evaluation tool," to the keywords on the first page. • Section 2.2, Table 1, revised the table adding new rows for FXLS8961AF, FXLS8971CF, and NMH1000. • Section 2.4, Table 2, added three rows at the end of the table for LPCXpresso55S16-A8971, LPCXpresso55S16-A8961, and FRDMKE15Z-NMH1000. • Section 3, Table 3, revised as follows: – FreeMASTER_Sensor_Tool.exe: Added FXLS8971CF, FXLS8961AF, and NMH1000 to the details column. – FreeMASTER_Sensor_Projects.zip: Added FXLS8971CF, FXLS8961AF, and NMH1000 to the details column.
1.2	20220811	• Global: revised version number from v1.1 to v1.2. • Section 2.1, inserted new bullet for "Loss-less streaming". • Section 4, removed bullet item for "Packet losses".
1.1	20220111	• Global: revised version number from v1.0 to v1.1. • Section 2.2, Table 1, added two rows at the top of the table and revised the sensor part number "FXLS896xAFR1" to "FXLS8962AFR1". • Section 2.4, Table 2 added two rows at the top of the table. • Section 3, Table 3, added "FXLS896xAF, FXLS8974CF," to the "Details" column for each row. • Section 4, added content at the end of the "Control page update" bullet fpr regional format settings. • Revision history, relocated the revision history from the end to the start of the document to conform with NXP document content guidelines.
1	20210128	Initial release.

1 Overview

FreeMASTER sensor tool is an evaluation and application development software based on the NXP FreeMASTER framework for IoT/Industrial/Medical sensors.

The FreeMASTER sensor tool provides ease of use through common development platform integration. This tool utilizes the FreeMASTER tool framework for GUI development, and integrates with MCUXpresso SDK and ISSDK for embedded application development.

FreeMASTER sensor tool provides a quick out-of-box sensor demonstration and flexibility for end users to rapidly prototype customized GUIs.

2 Features

2.1 Supported features

- **Real-time sensor output monitoring:** Supports multiple memory variable monitoring at individual sampling rates and for up to eight streams in the oscilloscope/graph view.
- **Real-time sensor register control:** Supports modification of memory variables and registers in real-time. Control/configure sensor device in real-time with register write capabilities.
- **Data visualization:** Enables third-party instrumentation components inserted into the HTML code as embedded objects. Allows for the creation of user-friendly displays of complex, real-time data dashboards.
- **Sensor register page:** Provides a register map of the sensors and allows quick read and write of different register bit-fields in real-time, allowing detailed sensor evaluation.
- **Loss-less Streaming:** Character or binary I/O streaming using pipes feature enabling buffering to better utilize the communication line.
- **Out of the box sensor demonstration:** Provides quick visualization of sensor data and other sensor outputs based on the pre-configured sensor settings in the firmware.
- **Development Platform Integration:**
  - Integration with MCUXpresso SDK using ISSDK and FreeMASTER drivers for embedded application development.
  - Integration with FreeMASTER v 3.x with flexibility to extend JavaScript-powered HTML control forms. Users can provide an arbitrary collection of open source instrumentation gauges, dials, knobs, and sliders to create complex, elegant custom visual dashboards.

2.2 Supported sensors

The following NXP sensors are supported by FreeMASTER Sensor Tool v 1.3:

Table 1. Sensors supported by FreeMASTER Sensor Tool v 1.3

Sensor part number	Sensor type	Interface		
		SPI	I^2C	ADC
FXLS896xAF	3-axis accelerometer designed for key-fob and automotive security and convenience applications that require ultra-low-power wakeup on motion.	✓	✓	—
FXLS8961AF	3-axis MEMS accelerometer designed for use in a wide range of automotive security and convenience applications that require excellent offset and sensitivity stability over temperature.	✓	✓	—

Table 1. Sensors supported by FreeMASTER Sensor Tool v 1.3...*continued*

Sensor part number	Sensor type	Interface		
		SPI	I^{2}C	ADC
FXLS8971CF	3-axis MEMS accelerometer designed for use in a wide range of industrial and medical IOT applications that require excellent offset and sensitivity stability over temperature	✓	✓	—
FXLS8974CF	3-axis accelerometer designed for use in a wide range of industrial and medical IOT applications that require ultra-low-power wake-up on motion.	✓	✓	—
FXLS8962AFR1	Digital low-power accelerometer	✓	✓	—
FXLS8471QR1	Digital accelerometer	✓	✓	—
FXOS8700CQ	Digital accelerometer and magnetometer	—	✓	—
MMA8652FCR1	Digital accelerometer	—	✓	—
NMH1000	Ultra-low power monolithic Hall effect magnetic field sensor	—	✓	—

2.3 Supported development tools

The FreeMASTER Sensor Tool v 1.3 is supported with following NXP development software tools:

- **FreeMASTER v 3.x:** Integrates with FreeMASTER v3.x and utilizes the underlying framework for GUI development.
- **MCUXpresso SDK v 2.x:** Integrates with MCUXpresso SDK v2.x and tools utilizes ISSDK sensor drivers and FreeMASTER drivers for embedded development.

2.4 Supported development platforms

The FreeMASTER Sensor Tool v 1.3 supports the NXP development platforms shown in Table 2.

Table 2. Supported development platforms

Sensor kit	MCU board	Sensor shield board	Sensor Demo
FRDM-K22F-A8964 FRDM-K22F-A8967	FRDM-K22F	FRDM-STBA-A8964 FRDM-STBA-A8967	FXLS896xAF
FRDM-K22F-A8974	FRDM-K22F	FRDM-STBI-A8974	FXLS89674CF
FRDM-K64F-AGM01	FRDM-K64F	FRDM-STBC-AGM01	FXOS8700CQ
FRDM-K64F-AGM04	FRDM-K64F	FRDM-STBC-AGM04	MMA8652FCR1
FRDMKL27-A8471	FRDM-KL27Z	FRDMSTBC-A8471	FXLS8471QR1
FRDM-K22F-AGMP03	FRDM-K22F	FRDM-STBC-AGMP03	FXLS896xAFR1
LPCXpresso55S16-A8971	LPC55S16-EVK	FRDM-STBI-A8971	FXLS8971CF
LPCXpresso55S16-A8961	LPC55S16-EVK	FRDM-STBA-A8961	FXLS8961AF
FRDMKE15Z-NMH1000	FRDM-KE15Z	FRDMSTBI-NMH1000	NMH1000

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Table 3 shows the FreeMASTER Sensor Tool v1.3 deliverables. For additional details, refer to UM11555, the FreeMASTER sensor tool user manual.

Table 3. FreeMASTER sensor tool deliverables

Deliverable	Location	Details
FreeMASTER_Sensor_Tool.exe	FreeMASTER Sensor Tool Download tab	FreeMASTER Sensor Tool GUI Installer: Windows Host GUIs for FXLS8971CF, FXLS8961AF, NMH1000, FXLS896xAF, FXLS8974CF, FXOS8700, FXLS8962, FXLS8471 and MMA8652.
FreeMASTER_Sensor_Projects.zip	FreeMASTER Sensor Tool Download tab	FreeMASTER Sensor Tool MCUXpresso projects for FXLS8971CF, FXLS8961 AF, NMH1000, FXLS896xAF, FXLS8974 CF, FXOS8700, FXLS8962, FXLS8471 and MMA8652 using ISSDK and FreeMASTER drivers.

4 Known issues

- **Control page update:** The FreeMASTER classic framework makes a web socket connection to localhost: 41000 to talk to HTML control page implementation. Based on Windows PC performance, the server may start a bit slower. The slower start in-turn delays the control page update. If this occurs, reload the control page by pressing refresh button or F5 key after a few seconds, change the region format setting in windows setting from other regional languages e.g. "Chinese or Japanese" to "English(world)". Restart the laptop to make this configuration change effective.

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