

# REIMS Module

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## Application Module for the Freescale MXYP8300

### Hardware User Guide

**Reference Documentation:**

- 1) Freescale example REIMS application software and documentation for MXYP8300 specific application notes.
- 2) Freescale MXYP8300 device reference manuals for detailed device operation and electrical specifications.

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## Cautionary Notes:

- 1) Electrostatic Discharge (ESD) prevention measures should be applied whenever handling this product. ESD damage is not a warranty repair item.
- 2) Axiom Manufacturing reserves the right to make changes without further notice to any products to improve reliability, function or design. Axiom Manufacturing does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under patent rights or the rights of others.

### 3) EMC Information on the REIMS Module:

- a) This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - 1) This device may not cause harmful interference, and
  - 2) This device must accept any interference received, including interference that may cause undesired operation.

TX FCC ID# TFY042201 (315Mhz version)

TX FCC ID# TFY042202 (434Mhz version)

- b) Changes or modifications to this unit not expressly approved by Axiom Manufacturing, could void the user's authority to operate this equipment under FCC or other regulatory agency rules.
- c) This product is designed and intended for use as an application development or evaluation platform in an educational or professional laboratory. This product is not intended for application or installation in end user equipment or systems.
- d) In a domestic environment this product may cause radio interference in which case the user may be required to take adequate prevention measures.
- e) RF Exposure – This device exceeds the FCC requirements for RF exposure when the antenna used for this transmitter has a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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## Terminology

This module applies option selection jumpers. Terminology for application of the option jumpers is as follows:

Jumper on, in, or installed = jumper is a plastic wired shunt that fits across 2 pins and the shunt is installed so that the 2 pins are connected with the shunt.

Jumper off, out, or idle = jumper or shunt is installed so that only 1 pin holds the shunt, no 2 pins are connected, or jumper is removed. It is recommended that the jumpers be placed idle by installing on 1 pin so they will not be lost.

Signal names in this document that are followed by an asterisk (\*) denote an active-low signal.

## Module Features

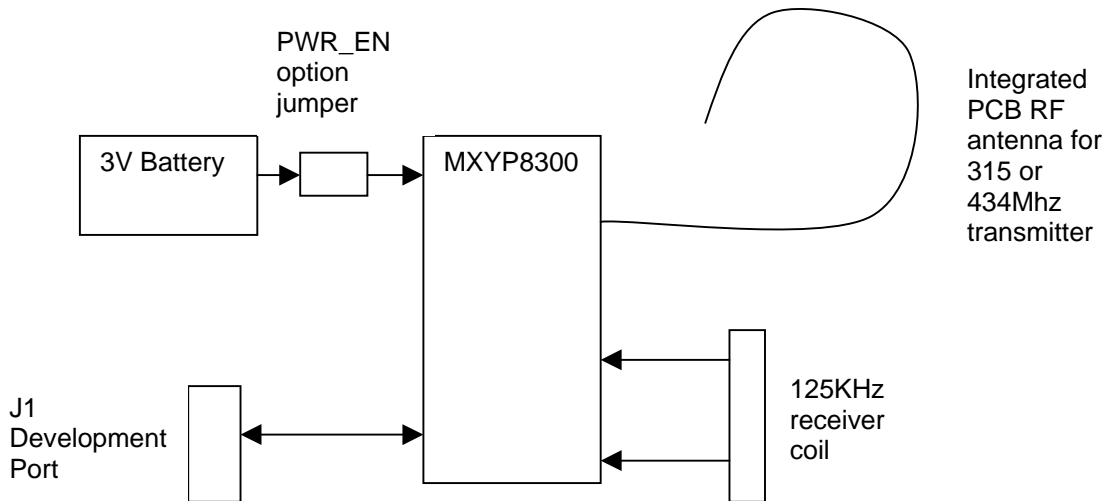
The REIMS Module is a demonstration, evaluation, or application development platform for the Freescale MXYP8300 device. Module operation is controlled by dedicated firmware contained in the MXYP8300 memory. The MXYP8300 provides air pressure, temperature, and accelerometer measurements with a 315MHz or 434MHz RF transmitter and 125KHz LF receiver. Typical application would be to monitor and transmit tire pressure and status in a vehicle Tire Pressure Monitoring System (TPMS). The device is well suited for many industrial monitoring or safety applications.

The Module applies an embedded RF antenna and does not provide external connections for measurements, RF, or LF signals. Access to the MXYP8300 device is provided by an adapter cable and the J1 development port connector. A HCS08 BDM cable with 2.5 to 3.3V I/O may be applied, see the J1 Development Port section for more details.

The module is a component of the Freescale REIMS TPMS demonstration kit. See the kit documentation for a system overview and demonstration operation details.

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## REIMS Module Block Diagram



## Operational Description

The REIMS Module is a basic demonstration platform for the MXYP8300 device. Two module configurations are available, 315MHz and 434MHz transmit frequency versions. All other features and operational characteristics are the same for the modules. The MXYP8300 device integrates pressure, temperature, and accelerometer sensors with a HCS08 MCU, wireless ISM band RF transmitter, and wireless LF band 125KHz receiver. Typical application provides for measurement data to be transmitted to a system host. The transmissions are sent at a slightly random time interval greater than 10 seconds and/or may be keyed by reception of a 125KHz LF reception. Either method will meet Agency approval requirements for transmitter certification.

Module power is derived from the on-board 3V battery. The MXYP8300 monitors the battery and will not operate or transmit if too low. Option JP1 allows the module to be powered on or off. During development port connection the BDM may provide 3.3V to the module to save the battery. The transmitter should not be applied during development port connection due to possible RF coupling into the development cable.

Agency approved operation of the transmitter applies fixed power setting with +/-35KHz FSK modulation from center carrier frequency. The module 125KHz receiver coil should be at least 6 inches from the 125KHz transmitter applied or overdriving the detector is possible.

The REIMS TPMS demonstration software and application documentation package provides all necessary functions, operations, and controls to operate the module correctly. Preset software definitions and C language function calls provide an easy method to modify or adjust operation for particular applications. **Default software settings for TX Power or Frequency must not be modified or the module Agency approvals are void and the application may violate government regulations.**

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## **PWR\_EN Option**

PWR\_EN installed on both pins will power the module from the battery. Always idle the PWR\_EN option when the module is not being applied or unnecessary battery life loss will occur. Always open PWR\_EN when connecting the J1 development port. For best operation of the module with development port application is to provide 3.3V via the BDM connection (**PWR\_EN OPEN**).

## **J1 Connector – Development Access Port**

J1 provides BDM connection to the HCS08 microcontroller in the MXYP8300 device. An adapter cable is provided in the demonstration kit to allow a standard BDM cable to be applied.

## **Battery**

The battery is a lithium coin cell type, model CR2325 or same. If the module does not operate, the battery voltage should be measured with a suitable voltmeter and replaced if the voltage is at or below 2.7V. W

Refer to the referenced internet web sights for additional applications information.