

This anomaly list describes the known bugs, anomalies, and workarounds for the [ADIS16488](#).

Analog Devices, Inc., is committed, through future silicon revisions, to continuously improve silicon functionality. Analog Devices tries to ensure that these future silicon revisions remain compatible with your present software/systems by implementing the recommended workarounds outlined within this document.

PERFORMANCE ISSUES

Table 1. Incorrect Scale Factors for the x_DELTANG_OUT, x_DELTANG_LOW Registers [er001]

Background	The ADIS16488 provides delta angle registers, which contain sample-to-sample angle displacement estimates for all three axes. The x_DELTANG_OUT registers provide the upper 16 bits, and the x_DELTANG_LOW registers provide the lower 16 bits. The x_DELTANG_OUT registers typically provide a scale factor of $720 \div 2^{15}$ degrees per LSB, and the x_DELTANG_LOW registers provide additional resolution ($720 \div 2^{31}$ degrees per LSB).
Issue	On units that have firmware Revision 1.02 (or earlier), the delta angle registers do not have the same scale factors as those listed in the product data sheet. For these units, the scale factors are $274 \div 2^{15}$ degrees per LSB for x_DELTANG_OUT and $274 \div 2^{31}$ degrees per LSB for x_DELTANG_LOW.
Workaround	Use $274 \div 2^{15}$ degrees per LSB for the x_DELTANG_OUT scale factor and $274 \div 2^{31}$ degrees per LSB for the x_DELTANG_LOW scale factor. Use the FIRM_REV register to determine the firmware revision of a unit. For example, FIRM_REV = 0x0103 equates to a firmware revision of 1.03.
Related Issues	None.

Table 2. Incorrect Scale Factors for the x_DELTVEL_OUT, x_DELTVEL_LOW Registers [er002]

Background	The ADIS16488 provides delta velocity registers, which contain sample-to-sample velocity estimates for all three axes. The x_DELTVEL_OUT registers provide the upper 16 bits and the x_DELTVEL_LOW registers provide the lower 16 bits. The x_DELTVEL_OUT registers typically provide a scale factor of $200 \div 2^{15}$ mm/sec per LSB, and the x_DELTVEL_LOW registers provide additional resolution ($200 \div 2^{31}$ mm/sec per LSB). The ADIS16488 (Rev. A) data sheet incorrectly documents these scale factors as $160 \div 2^{15}$ and $160 \div 2^{31}$, respectively; these errors are being addressed in Rev. B of the data sheet.
Issue	On units that have firmware Revision 1.02 (or earlier), the delta velocity registers do not have the same scale factors as those listed in the product data sheet. For these units, the scale factors are $97.65 \div 2^{15}$ mm/sec per LSB for x_DELTVEL_OUT and $97.65 \div 2^{31}$ mm/sec per LSB for x_DELTVEL_LOW.
Workaround	Use $97.65 \div 2^{15}$ mm/sec per LSB for the x_DELTVEL_OUT scale factor and $97.65 \div 2^{31}$ mm/sec per LSB for the x_DELTVEL_LOW scale factor. Use the FIRM_REV register to determine the firmware revision of a unit. For example, FIRM_REV = 0x0103 equates to a firmware revision of 1.03.
Related Issues	None.

Table 3. Inaccurate TEMP_OUT Readings [er003]

Background	The TEMP_OUT register provides the internal temperature measurement, which serves as an input to the inertial calibration outputs and also provides a variable that enables users to monitor relative temperature changes inside of the unit.
Issue	On units that have firmware Revision 1.02 (or earlier), the TEMP_OUT bias error is -10°C and the scale factor was approximately 5% lower than reflected in the datasheet.
Workaround	Use devices that have firmware revision 1.03 or later, to benefit from the improvement in the TEMP_OUT accuracy. For specific, in-application accuracy, user may want to consider their own calibration process, since attachment, airflow and other mechanical variables can impact the TEMP_OUT's relationship with ambient temperature conditions.
Related Issues	None.

Table 4. Incorrect Output Data String After Writing to FUNCIO_CTRL Register [er004]

Background	The FUNCIO_CTRL register provides user configuration control for the digital I/O pins and the TEMP_OUT register provides the internal temperature measurement, which serves as an input to the inertial calibration outputs.
Issue	On units that have firmware Revision 1.02 (or earlier), a write to the FUNCIO_CTRL register would cause the TEMP_OUT variable to contain an incorrect value for 120 samples. Since this is an input to the calibration function for the gyroscopes and accelerometers, this will cause the appearance of a discrete bias change, between sample 120 and sample 121.
Workaround	Ignore the first 120 samples of the output registers after writing to the FUNCIO_CTRL register.
Related Issues	None.

Table 5. Incorrect FIRM_REV Value [er005]

Background	The FIRM_REV register identifies the firmware revision (internal) that the ADIS16488 is using. It uses a BCD format for ones, tenths and hundredths digits. For example, when FIRM_REV = 0x0103, the firmware revision is 1.03.
Issue	On units that have firmware Revision 1.02, FIRM_REV contains 0x0120, rather than 0x0102.
Workaround	No units that have Date Codes of 1226, or higher, will have a firmware revision of 1.20.
Related Issues	None.

Table 6. Incorrect Offset and Scale Correction Order [er006]

Background	Each accelerometer and gyroscope has unique user-configurable offset and scale correction registers. For instance, on the x-axis gyroscope, the XG_BIAS_HIGH and XG_BIAS_LOW registers combine to provide 32-bit, two's complement bias (offset) correction factor, while the X_GYRO_SCALE register provides the scale correction function. The proper order of applying these correction factors is bias correction first, and then scale correction second.
Issue	On units that have firmware Revision 1.02 (or earlier), the order of application was in reverse order, where the ADIS16488 applies the scale correction value first, then the offset value second.
Workaround	Do not use the scale correction registers on these units. Apply the scale correction function in the system processor.
Related Issues	None.

Table 7. Factory Restore Command in GLOB_CMD Not Working Properly [er007]

Background	GLOB_CMD[6] provides a factory restore function that enables users to reset all user-configurable calibration registers to 0x0000 (factory default). In order to activate this function, user would turn to page 3 by setting DIN = 0x8003, and then set GLOB_CMD[6] = 1 by writing the following two 16-bit commands to the DIN line: 0x8240 and 0x8300.
Issue	On units that have firmware Revision 1.03 (or earlier), setting GLOB_CMD = 1 does not reset all of these registers.
Workaround	Write 0x0000 to each calibration register, individually.
Related Issues	None.

ANOMALY STATUS

Reference Number	Description	Status	Date Code
er001	Incorrect scale factors for the x_DELTANG_OUT, x_DELTANG_LOW registers.	Fixed	1226
er002	Incorrect scale factors for the x_DELTVEL_OUT, x_DELTVEL_LOW registers.	Fixed	1226
er003	Inaccurate TEMP_OUT readings.	Fixed	1226
er004	Incorrect output data string after writing to FUNCIO_CTRL register.	Fixed	1226
er005	Incorrect FIRM_REV value.	Fixed	1226
er006	Incorrect offset and scale correction order.	Fixed	1226
er007	Factory restore command not working properly.	Fixed	1314