

## ADIS16400/ADIS16405 ANOMALIES

This anomaly list describes the known bugs, anomalies, and workarounds for the [ADIS16400/ADIS16405](#).

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 here.

### ANOMALY STATUS

Reference Number	Description	Status	Date Code
er001	MSC_CTRL register programmed with an incorrect default value	Fixed	0918
er002	Magnetometer glitches (Y and Z axes)	Fixed	0902
er003	DIO2 and DIO3 assignments were reversed, with respect to legacy pin assignments	Fixed	0918
er004	Temperature sensor noise	Fixed	0925
er005	Reset in external clock mode	Fixed	1015
er006	Failure to recover from sleep mode in external clock mode	Fixed	1015
er007	Data ready delay extension	Fixed	1015
er008	Erroneous data after sleep mode recovery	Fixed	1015
er009	Magnetometer glitches	Fixed	1034
er0010	GPIO_CTRL input bits for DIO3 and DIO4 reversed	Fixed	1247
er0011	XGYRO_OFF error after burst-mode read	Fixed	1247

### MSC\_CTRL DEFAULT VALUE INCORRECT [er001]

<b>Background</b>	The <a href="#">ADIS16400/ADIS16405</a> offers a data ready option with either DIO1 or DIO2, depending on the setting in the MSC_CTRL register, Bits[2:0].
<b>Issue</b>	The factory default setting for the MSC_CTRL register is 0x0006, which sets DIO1 as a positive pulse, data ready signal. For some parts with a date code earlier than 0918, the factory default value was 0x0000, which disables the data ready function on DIO1. This has been resolved, and all new parts have a factory default setting of 0x0006 for the MSC_CTRL register. In addition, after this error was discovered, all existing inventory was corrected.
<b>Workaround</b>	When the power supply reaches 4.75 V, wait 500 ms to ensure that the part has started up, and then set the MSC_CTRL register, Bits[7:0] = 0x06 by writing DIN = 0xB406. Next, execute a manual flash update by writing DIN = 0xBE08 (GLOB_CMD Bit 3 = 1). Wait 100 ms, and then the device will operate with DIO1 as a positive pulse, data ready signal, and the setting will be nonvolatile.
<b>Related Issues</b>	None.

### MAGNETOMETER GLITCHES (Y AND Z AXES) [er002]

<b>Background</b>	The magnetometer in the <a href="#">ADIS16400/ADIS16405</a> includes a set-reset function for managing the initial bias errors.
<b>Issue</b>	The y-axis and z-axis magnetometer outputs contained glitches at approximately 1.5 Hz. Investigation into this matter revealed that the sensor samples were occurring before a transient behavior was settling.
<b>Workaround</b>	An internal firmware update adjusted the internal sample times, which eliminated these glitches. Firmware Revision 1.1 incorporated these adjustments. Read the content of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x11, the unit will not exhibit this behavior. If Address 0x52 contains a number that is less than 0x11 and this issue is limiting the performance in the application, contact the factory for further support. This issue does not exist on date codes equal to 0902 and above.
<b>Related Issues</b>	None.

#### Rev. B

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**DIO3 AND DIO4 PIN ASSIGNMENT REVERSED [er003]**

<b>Background</b>	The <a href="#">ADIS16400/ADIS16405</a> advertises pin compatibility with the ADIS1636x product family, which includes four digital I/O lines: DIO1, DIO2, DIO3, and DIO4. The pin assignments in the <a href="#">ADIS16400/ADIS16405</a> data sheet reflect this consistency.
<b>Issue</b>	The internal firmware assignment of Pin DIO3 and Pin DIO4 was the opposite of the ADIS1636x family's assignment of these pins.
<b>Workaround</b>	An internal firmware update corrected the pin assignments for DIO3 and DIO4 so that they are now consistent with the <a href="#">ADIS16400/ADIS16405</a> data sheet. Firmware Revision 1.2 incorporated these adjustments. Read the contents of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x12, the unit will not exhibit this behavior. If the contents of Address 0x52 are less than 0x12 and these pins are required for the application, manage this issue using the GPIO_CTRL register. Reverse the assignment of the GPIO_CTRL register, Bit[11] and the GPIO_CTRL register, Bit[10] for data level assignment and reverse the assignment of the GPIO_CTRL register, Bit[3] and the GPIO_CTRL register, Bit[2] for data direction control. For management of multiple units, use the contents in Address 0x52 as a switch variable for the assignment/use of these bits. This issue does not exist on date codes 0918 and above.
<b>Related Issues</b>	None.

**TEMPERATURE SENSOR NOISE [er004]**

<b>Background</b>	The <a href="#">ADIS16400/ADIS16405</a> provides access to an internal temperature measurement, using the TEMP_OUT register.
<b>Issue</b>	TEMP_OUT showed excessive noise in some conditions; in particular, when noise was on the AUX_ADC input.
<b>Workaround</b>	An internal firmware update added a digital filter that lowers the variation of this measurement to a $\pm 1$ LSB (typical) level. Firmware Revision 1.3 incorporated these adjustments. Read the contents of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x13, the unit will not exhibit this behavior. If the contents of Address 0x52 are less than 0x13 and this presents an issue in the application, use a digital filter to average the outputs. This issue does not exist on date codes 0925 and above.
<b>Related Issues</b>	None.

**RESET IN EXTERNAL CLOCK MODE [er005]**

<b>Background</b>	The <a href="#">ADIS16400/ADIS16405</a> offers an option to drive internal sensor sampling with an external clock. Set SMPL_PRD = 0x0000 to enable this function and place the clock input signal on the DIO4 pin.
<b>Issue</b>	Parts occasionally reset when using the external clock mode, and a read happens on the SPI port.
<b>Workaround</b>	Firmware Revision 1.4 incorporated changes that address this issue. Read the contents of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x14, the unit will not exhibit this behavior. If the contents of Address 0x52 are less than 0x14 and the clock mode is a requirement in the application, contact the factory for additional support. This issue does not exist on date codes 1015 and above.
<b>Related Issues</b>	None.

**FAILURE TO RECOVER FROM SLEEP MODE IN EXTERNAL CLOCK MODE [er006]**

<b>Background</b>	The <a href="#">ADIS16400/ADIS16405</a> offers an option to drive internal sensor sampling with an external clock. Set SMPL_PRD = 0x0000 to enable this function and place the clock input signal on the DIO4 pin. The <a href="#">ADIS16400/ADIS16405</a> also offers a sleep mode, using the SLP_CNT register.
<b>Issue</b>	The device does not recover from sleep mode when using the device in external clock mode, and the external clock signal remains after the device is placed in sleep mode.
<b>Workaround</b>	Firmware Revision 1.4 incorporated changes that address this issue. Read the contents of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x14, the unit will not exhibit this behavior. If the contents of Address 0x52 are less than 0x14, the application requires both external clock mode and sleep mode; however, remove the clock signal prior to putting the device into sleep mode. This issue does not exist on date codes 1015 and above.
<b>Related Issues</b>	None.

**DATA READY DELAY EXTENSION [er007]**

<b>Background</b>	The ADIS16400/ADIS16405 offers a data ready function using the MSC_CTRL register and either DIO1 or DIO2.
<b>Issue</b>	The time between the data ready pulses can extend by ~400 $\mu$ s in some cases.
<b>Workaround</b>	Firmware Revision 1.4 incorporated changes that address this issue. Read the contents of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x14, the unit will not exhibit this behavior. If the contents of Address 0x52 are less than 0x14 and the application requires the use of the data ready function, contact the factory for more information. This issue does not exist on date codes 1015 and above.
<b>Related Issues</b>	None.

**ERRONEOUS DATA AFTER SLEEP MODE RECOVERY [er008]**

<b>Background</b>	The ADIS16400/ADIS16405 also offers a sleep mode, using the SLP_CNT register.
<b>Issue</b>	Upon recovery from sleep mode, the first few samples of output data are not valid.
<b>Workaround</b>	Firmware Revision 1.4 incorporated changes that address this issue. Read the contents of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x14, the unit will not exhibit this behavior. If the contents of Address 0x52 are less than 0x14, discard the first six samples or use the data ready to wait for at least six sample cycles to ensure that the first data read cycle produces valid data. This issue does not exist on date codes 1015 and above.
<b>Related Issues</b>	None.

**MAGNETOMETER GLITCHES [er009]**

<b>Background</b>	The magnetometer of the ADIS16400/ADIS16405 includes a set/reset function for managing initial bias errors.
<b>Issue</b>	Previous firmware updates resulted in additional glitches on the magnetometer outputs that were associated with the internal set/reset function.
<b>Workaround</b>	Firmware Revision 1.6 incorporated changes that address this issue. Read the contents of Address 0x52 to check for this firmware update. If the contents are greater than or equal to 0x16, the unit will not exhibit this behavior. If the contents of Address 0x52 are less than 0x16 and this presents an issue in the application, contact the factory for additional support. This issue will not exist on date codes 1034 and above.
<b>Related Issues</b>	None.

**GPIO\_CTRL INPUT BITS FOR DIO3 AND DIO4 REVERSED [er010]**

<b>Background</b>	The GPIO_CTRL register provides general-purpose configuration and monitoring for the configurable input/output pins: DIO1, DIO2, DIO3, and DIO4. GPIO_CTRL[3:0] provide four individual configuration bits that establish data direction for these pins, while GPIO_CTRL[11:8] provide monitoring bits for them when they are operating as an input line. GPIO_CTRL[11] reflects the input level on DIO4, when GPIO_CTRL[3] = 0 (DIO4 data direction = input). GPIO_CTRL[10] reflects the input level on DIO3, when GPIO_CTRL[2] = 0 (DIO3 data direction = input).
<b>Issue</b>	In previous firmware revisions, GPIO_CTRL[11] monitored the input state of DIO3, not DIO4. Also, GPIO_CTRL[10] monitored the state of DIO4, not DIO3.
<b>Workaround</b>	Firmware Revision 1.7 incorporated changes that address this issue. The contents of Address 0x52 can serve as a switch variable in system firmware. If the contents of Address 0x52 are less than 0x17, and the system uses DIO3 or DIO4 as input signals, assign GPIO_CTRL[11] to monitor DIO3 and GPIO_CTRL[10] to monitor DIO4. For a visual reference, this issue will not exist on date codes 1247 and above.
<b>Related Issues</b>	None.

**XGYRO\_OFF REGISTER ERROR AFTER BURST READ [er011]**

<b>Background</b>	This product provides two different read functions: single-register and burst-read. The XGYRO_OFF register provides a configurable offset correction register, which applies to the XGYRO_OUT output.
<b>Issue</b>	After executing a burst-read sequence, XGYRO_OFF[15] resets to zero. If XGYRO_OFF contains a negative number, this causes a corruption of the offset correction in the x-axis gyroscope.
<b>Workaround</b>	Firmware Revision 1.8 incorporated changes that address this issue. The contents of Address 0x52 can serve as a switch variable in system firmware. If the contents of Address 0x52 are less than 0x18, then there are two choices for workarounds: (1) do not use burst-read or (2) avoid using XGYRO_OFF and implement the offset correction function in the system processor. For a visual reference, this issue will not exist on date codes 1247 and above.
<b>Related Issues</b>	None.

**NOTES**