194 Main Rd
ABBOT, ME 04406

2GIG USB Inclinometer Guide

NOTE: Before attempting to communicate with the USB Inclinometer, please follow these instructions. Drivers must be installed first before plugging the inclinometer into your computer.

1. Download and Install FTDI VCP Drivers

Do not plug the USB Inclinometer into your computer. For PC and Mac users, go to FTDI's VCP Drivers page and download the appropriate drivers for your computer:

http://www.ftdichip.com/Drivers/VCP.htm

These drivers must be downloaded and then installed on your computer. After installing the drivers, you may then plug in the USB Inclinometer. Your computer should then automatically install and notify you of a newly installed COM port.

2. Download and Install Terminal Software

In order to communicate with the inclinometer for test purposes, terminal software is required. Terminal software is free software that can be downloaded online, and there are many different terminal programs out there. For the purpose of simplicity, we recommend specific terminal software below. We have created instructions and offer support for the following terminal software:

For PC Users:

Terminal: **RealTerm**
Download: https://realterm.i2cchip.com/
Instructions: https://www.2gig-eng.com/wp-content/uploads/2018/07/2GIG_USB_Communication_with_RealTerm.pdf

For Mac Users:

Terminal: **CoolTerm**
Download (Direct): http://freeware.the-meiers.org/CoolTermMac.zip
Instructions: https://www.2gig-eng.com/wp-content/uploads/2018/07/2GIG_USB_Communication_with_CoolTerm.pdf

WARNING: 2GIG Engineering cannot guarantee support for alternative terminal programs used outside of these recommended programs. We will do our best to accommodate.

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2GIG USB Protocol

The USB series of tilt sensors communicate via serial port through an FTDI cable. Please visit www.2gig-eng.com/mems-inclinometer for a link to the drivers. The sensor outputs the X (°), Y (°), and the output rate. The sensor output behavior is fully adjustable via sending it commands through a USB COM Port. The standard output message, input message, baud rate, and configuration settings can be modified to fit most systems.

Specification	USB COM Port				
Adjustable Output Rate (Hz)	1 – 100 (Default: 10 Hz)				
Adjustable Baud Rates (bits/sec) *(Max Output Rate (Hz))*	2400 *(8)*	9600 *(20)*	19200 (Default) *(40)*	57600 *(100)*	115200 *(100)*
Communication Specs	**Data Bits** 8		**Parity** None	**Stop Bits** 1	**Handshaking** None

2GIG Output Message Format

Dual Axis Format: $2gig,[X Angle],[Y Angle],[Output Rate]*[Checksum][LF]
Single Axis Format: $2gig,[X or Y Angle],[Output Rate]*[Checksum][LF]

Message Descriptions

X Angle	X Angle reading in hundredths of a degree (0.00)
Y Angle	Y Angle reading in hundredths of a degree (0.00)
Output Rate	Current Output Rate Frequency (Hz)
Checksum (Hex)	Data Validation Check by XORing all ASCII values between the $ and * characters
LF	Line Feed (New Line) Character – ASCII 10

Input Commands

Adjustment	Command Format	Values for 'x'	Description
Baud Rate	Rx[LF]	1	2400 Bps
		2	9600 Bps
		3	19200 Bps
		4	57600 Bps
		5	115200 Bps
Output Rate	Oxxx[LF]	1 – 100	1 Hz – 100 Hz*
Zero Device	Zx[LF]	1	Revert to Factory Zero
		2	Relative Zero
Protocol	Px[LF]	1	2GIG Format
		2	TSS1 Format (Pitch and Roll) *For models manufactured after 6/18/2018

If the adjusted output rate exceeds the max output rate for the current baud rate, then the max output rate will be chosen.

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EXAMPLE OUTPUT MESSAGES

Dual Axis Output Message

$2gig,-0.38,-0.19,10*75[LF]

X Angle = -0.38°
Y Angle = -0.19°
Output Rate = 10 Hz
Checksum = 0x75

Single Axis Output Message

$2gig,2.54,20*44[LF]

Angle = 2.54°
Output Rate = 20 Hz
Checksum = 0x44

EXAMPLE INPUT MESSAGES

R5[LF]
Set the baud rate to 115200

O50[LF]
Set the output rate to 50 Hz

Z2[LF]
Relative zero the device

- All input commands are ASCII values (not including [LF])
- [LF] is a decimal value of 10, and it's also known as line feed or '\n'