Application Note
3 Axis Inclinometer – *Communication Protocols*

The *3 Axis Inclinometer*, p/n SSY0271, communication messages are based on a Modbus format.

Command format

:AADDDDLRC
: start of message
AA module address
DDD data
LRC Longitudinal Redundancy Check

Baud rate 9600 (can be modified, consult factory)
Number of data bits 8
Even parity
Number of stop bits 1
The address of the module is programmable by the user.

Commands
Should be sent in (ASCII) format

The LRC is calculated by adding all the bytes in the message except the ":" at the beginning, and the lf and cr at the end of the message. The addition is done ignoring the carry. Then the result is negated in 2"s complement format.
Example:
Command to read Roll of module 2
0266
ASCII bytes
30 + 32 + 36 + 36 = CE
2's complement
32
The command is then :026632

The command starts with a ":" then the message as the following format: the address of the module from 1 to 32, the command see the set of commands, the data depending on the command, the Longitudinal Redundancy Check (lrc) and the message finishes with a CR and LF
All the command are sent in ASCII format using Hex base numbering system. The letters have to be upper case.

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Application Note
3 Axis Inclinometer – Software Interface

Set of Commands:
0x50 Read Sensor Roll and Pitch (returned data is in decimal format)
0x65 Reset board
0x66 Read Sensor Roll
0x67 Read Temperature (Temperature value is in Hexadecimal Format and in tenth of a degree Celsius)
0x68 Write to EEPROM
0x69 Read EEPROM
0x6A Read Board Revision
0x6D Read Sensor Pitch
0x6E Read Sensor Z axis

EEPROM Location 8 is the module address.
EEPROM word locations available for the user
500 to 510 (32 bytes) even locations only

Command Format for EEPROM access:
0x68 write to EEPROM, address and data in HEX
Module Address(2bytes) 68 (cmd) EEPROM Location (4bytes) Data(4bytes)LRC(2 bytes)
send back :Address68LRC

0x69 read eeprom
Module Address (2Bytes) (cmd) 69 EEPROM Location (4bytes) LRC (2bytes)

Examples:
Read Roll and Pitch
send to unit
:01503A cr lf
the module returns
:0150-2760,-239611
Roll = -27.60 degrees
Pitch = -23.96 degrees

Write 2 in location 8 of module 1 to change the module address to 2. The change takes effect after you send the reset command or cycle the power.
:016800080002A7 cr lf

The module returns
:01680002 6F

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Examples cont.:
Write to location 500 the value 1055
:016801F4041F7B cr lf

The module returns
:0168041F56

Read the location 500
:016901F455 cr lf

The module returns
:0169041F55

Read the temperatures
:016732 cr lf

The module returns
:0167010E5C

Temperature = 010E(hex) = 270÷10=27°C

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