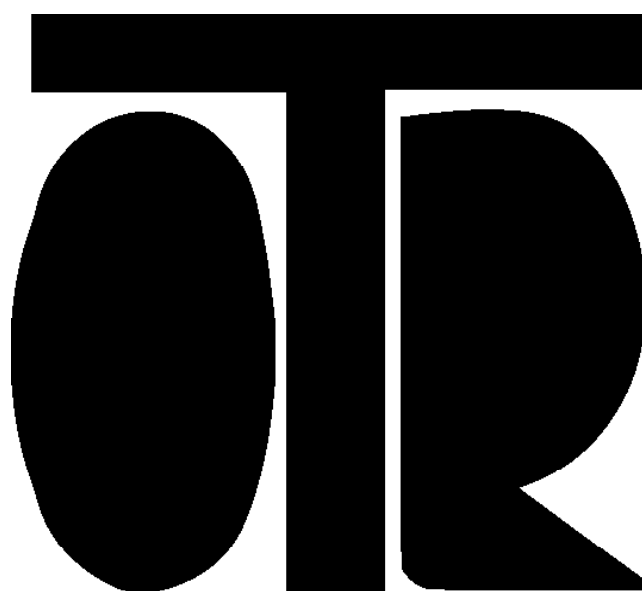




In-Place Digital Inclinator Chain



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In-Place Digital Inclinator Chain



WARNINGS



This instrument must be utilized only for the application it has been designed for, OTR declines all responsibility for any improper use.



Do not let the instrument fall into the hole quickly.



Do not put the instrument in flammable liquids or potentially explosive gases.



Do not use the instrument in water where an electric dissipation is in progress.



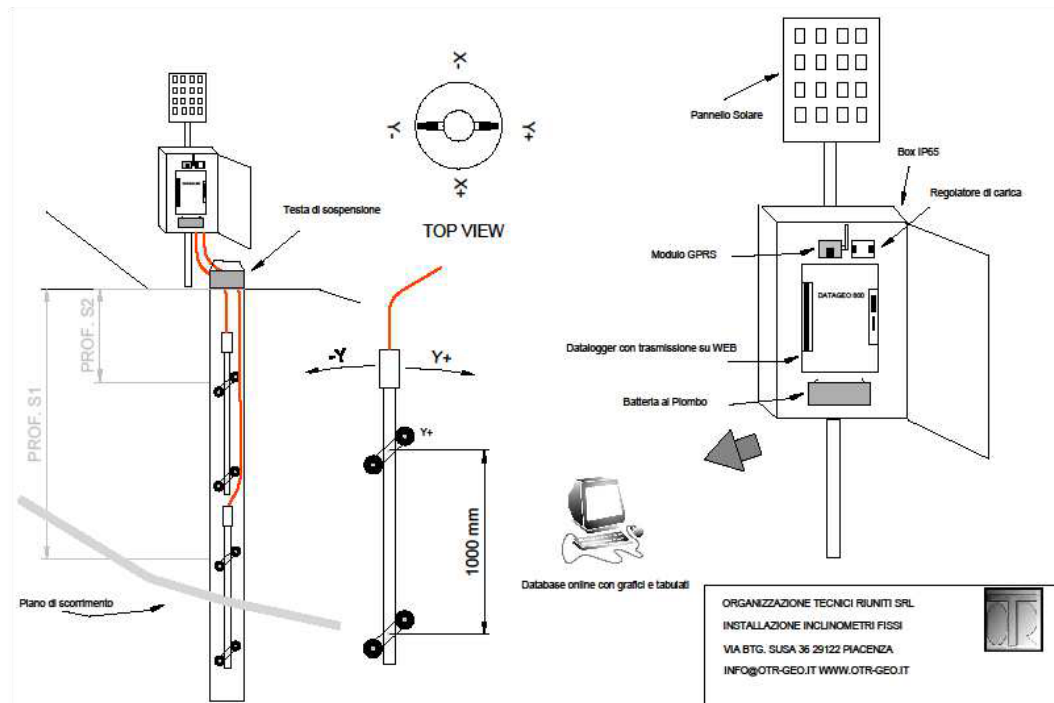
Use protective gloves.

Furthermore

- Do not open the instrument, contact the manufacturer for checks and repairs;
- Keep out of reach of children;
- Do not connect the instrument to the readout unit with wet hands;
- Clean the instrument and its cable with alcohol or water, do not use acetone or aggressive liquids for plastics or labels;
- Use surge arresters for installations with unprotected cables longer than 30 meters.

Application

In-place inclinometers chain are used to permanently and automatically monitor variations in the inclination of landslides, geologically unstable areas, rock masses and unsteady walls. They can also be used in the field of civil engineering, especially in tunnels and underground structures, slurry walls and retaining walls, earth fill, concrete dams and foundation piles. The measuring system consists of series inclinometer probes with a carbon fibre tail, which are bonded at the bottom with screws, lowered into a preinstalled vertical tube. The chain is suspended at the proper depth by means of a steel cable connected to a top cap with a fastening device. Vertical in-place inclinometers chain can be equipped with uniaxial or biaxial MEMS sensors.



Description



In-place inclinometers chain consist of a cylinder equipped with a sensor and a suspension ring, which is mounted on a stainless steel bogie. The bogie features a pair of castor wheels which make it possible to make the sensor slide into the tube while maintaining its orientation. On the bottom of the bogie there's a carbon fibre rod with a joint used to link the pieces of the chain with screws and connecting cable. The distance between the two sets of wheels (wheelbase) is 1000 mm.

The probe can be equipped with uniaxial or biaxial micro electromechanical MEMS sensors, which ensure great sturdiness. The sensors inside the cylinder are embedded in resin, and can withstand high pressure. The full scales of or $\pm 15^\circ$ or $\pm 30^\circ$ allow measurement resolution and stability which are appropriate to the normal conditions of use.

Identification

Every InPlace Inclinator is identified:

- Serial number associated to calibration report;
- Model;
- Input/Output;

Technical Specifications

Voltage Supply	12-18 Vdc
Current Consumption	Max 25 mA
Output	± 4 Vdc, 280 mV/ $^{\circ}$
Temp Output	NTC 3 K on demand
Resoluton	0.001 $^{\circ}$
Thermal drift	$\pm 0.002^{\circ}$ /K
Wheels step	1000 mm



Installation

Before installing a vertical in-place inclinometer chain, it is advised to take some measurements using a removable probe, so as to find the right depth and location at which the inclinometer probes will be positioned.

The wheelbase makes it easier to position the probe at the established depth. A suspension head attached to the top cap of the probe makes it possible to lower the inclinometer into the borehole and to suspend it at the proper depth.

The inclinometer sensors detect 2 axes. The Y-axis runs along the plane of the castor wheels, and the X-axis runs perpendicularly to the plane of the castor wheels.

For the chain installation, it is advised to acquire the following materials (which can be provided by OTR as accessories): top cap, and fastening clamps.

In order to install the instrument, proceed as follows:

Probes are inserted end fixes connected each other one in a row to the other.

- Start connecting the connectors of every probe with the addiacents;
- Insert the first probe inside the casing taking care to direct the higher wheel towards the direction of maximum slope and lower the instrument since only seen of the fixing hole on its tail;
- Overlap the head of the second probe to the tail of the first and proceeds binding them with a screw;
- Previous point are repeeted till the mounting of the last probe;
- It ends fixing the last tail to the suspention head to keep the instrument at the estimated hight of measuring;
- The cable are connected to the datalogger that will supply in real time -using internet- the variation of the inclination of the in-place inclinometer chain making spiring the alerts in case of exceeding of thresholds.



Probe's Setting

Every inclinometric chain has to be customized indicating in ascending order the numbering of the probes that made up it. Before the delivery of the system the parent company effectuate this process by its own, but if the customer have to change - cause various factors - the probe's order or substitute one of them, he has to check to name it correctly in order of the position inside the chain.

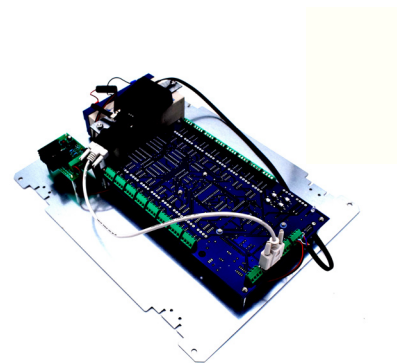
Connecting cable to adaptor



Connect the cables to the adapter as shown in the images

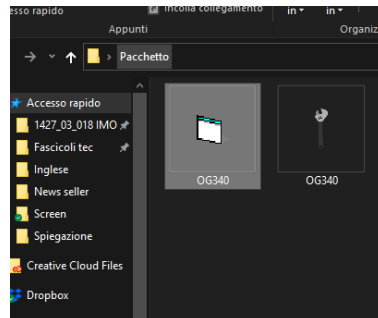
Readout

Measurements are taken by datalogger and they are expressed in electrical units (mV) or they can directly be converted into angles [°]. Depending on the number of probes, the most suitable Datalogger will be recommended for managing the parameters to be checked.

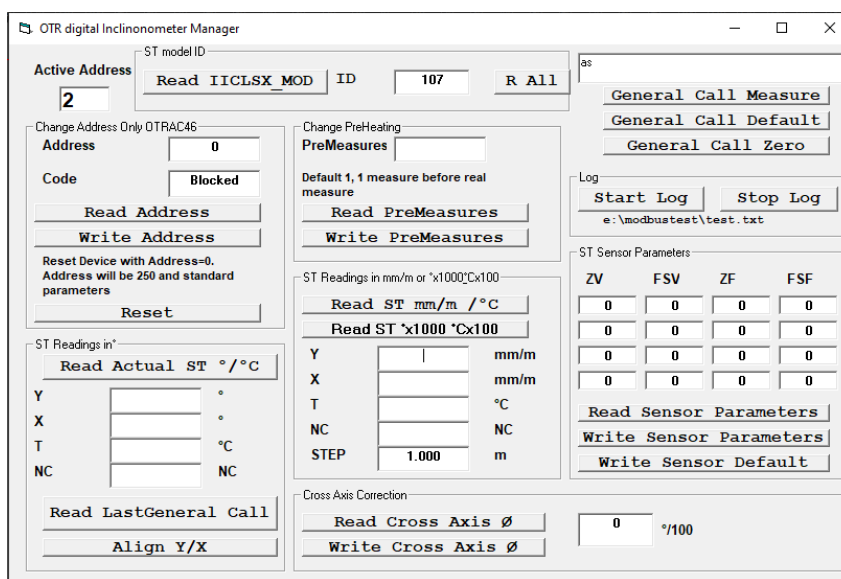


What to do?

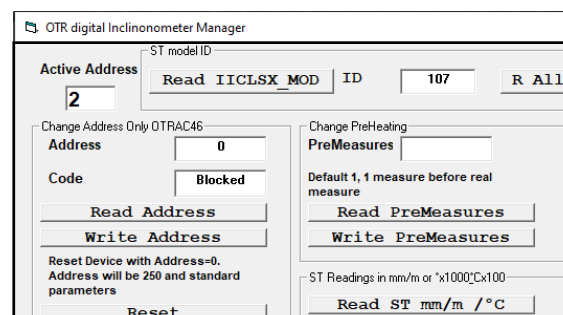
1. Open the OG340 program provided on the installation key



2. The OTR digital inclinometer manager start screen will open



Changing probe number



3. Once connected the probe to the PC will be view in Active Address the number of the probe.
4. Press "Read ITCLSX_MOD" to identificate ID of the sensor which will be 107.
5. Write in Address the number of the probe corresponding to the one which are setting and insert the code OTRAC46 to validate the operation with "Write Address".

ST model ID

Active Address: 2

Read ITCLSX_MOD ID

Change Address Only OTRAC46

Address: 1

Code: OTRAC46

Read Address

Write Address

6. In case of error press on "Reset" and the probe will be renamed 250.
7. Repeete the operation on 5 point to modify the probe number.

Check courent parameter

To check the courent parameter press on: "Read Actual ST°/C°"

ST Readings in°

Read Actual ST °/°C

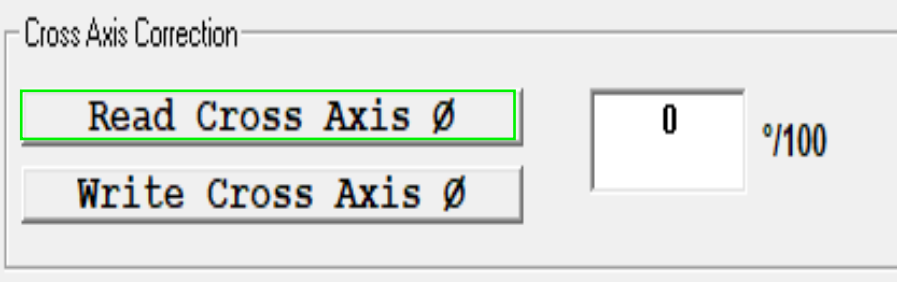
Y	-20.126	°
X	-29.996	°
T	24.998	°C
NC	00.000	NC

Read LastGeneral Call

Align Y/X

Read cross axis

To che Cross axis press "Read Cross Axis Ø"



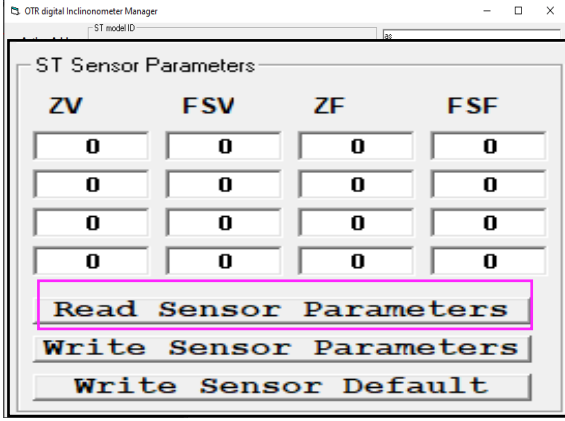
Cross Axis Correction

Read Cross Axis Ø

Write Cross Axis Ø

0 %/100

Check sensor's parameters



OTR digital Inclonometer Manager

ST model ID

ST Sensor Parameters

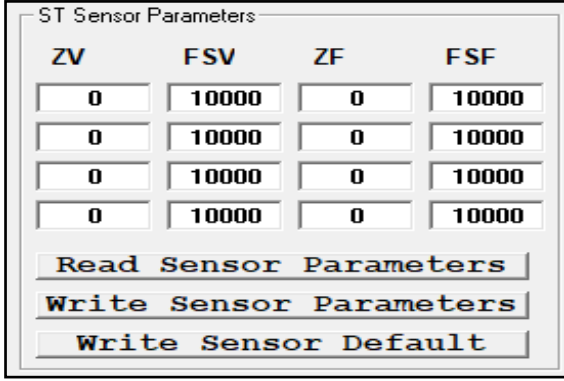
ZV	FSV	ZF	FSF
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Read Sensor Parameters

Write Sensor Parameters

Write Sensor Default

Press on "Read Sensor Parameters" to veew the default settings of the inclinometric probe



ST Sensor Parameters

ZV	FSV	ZF	FSF
0	10000	0	10000
0	10000	0	10000
0	10000	0	10000
0	10000	0	10000

Read Sensor Parameters

Write Sensor Parameters

Write Sensor Default