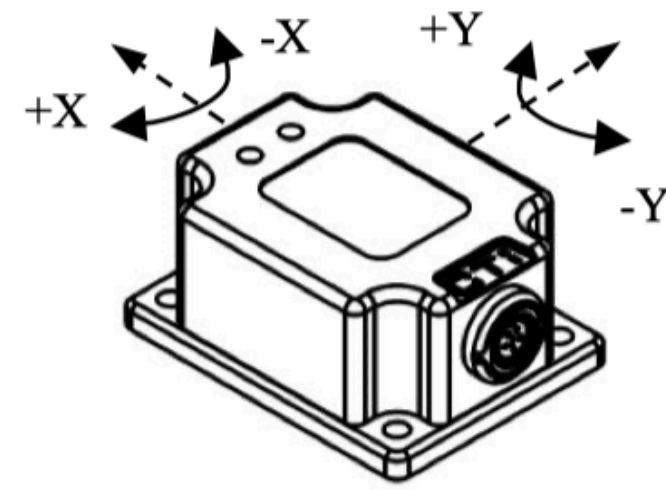
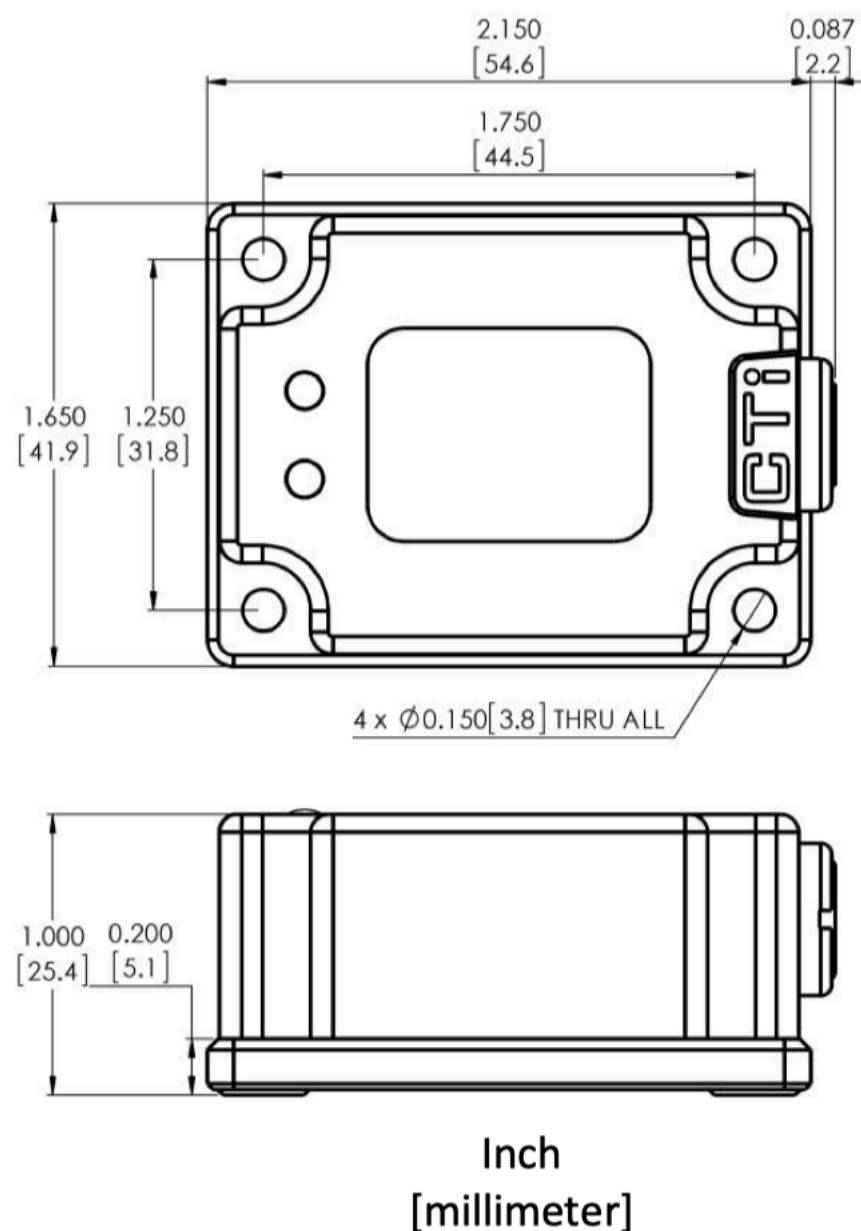


# **Inclinometers installation on ProtoDUNE-SP**

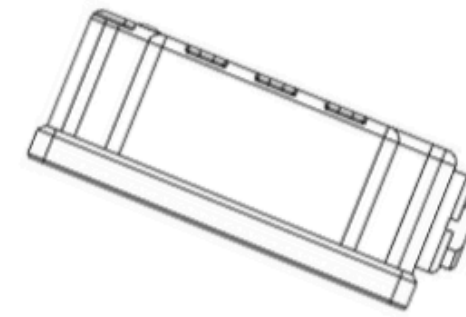
**Francesco, Mattia - 17 Jul 2020**

# TILT – 30A

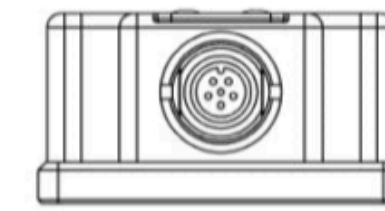
High Accuracy  
Three-Axis Accelerometer



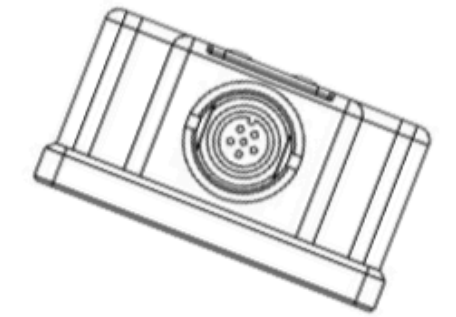
Default  
Y=0



Inclination  
Y=+30



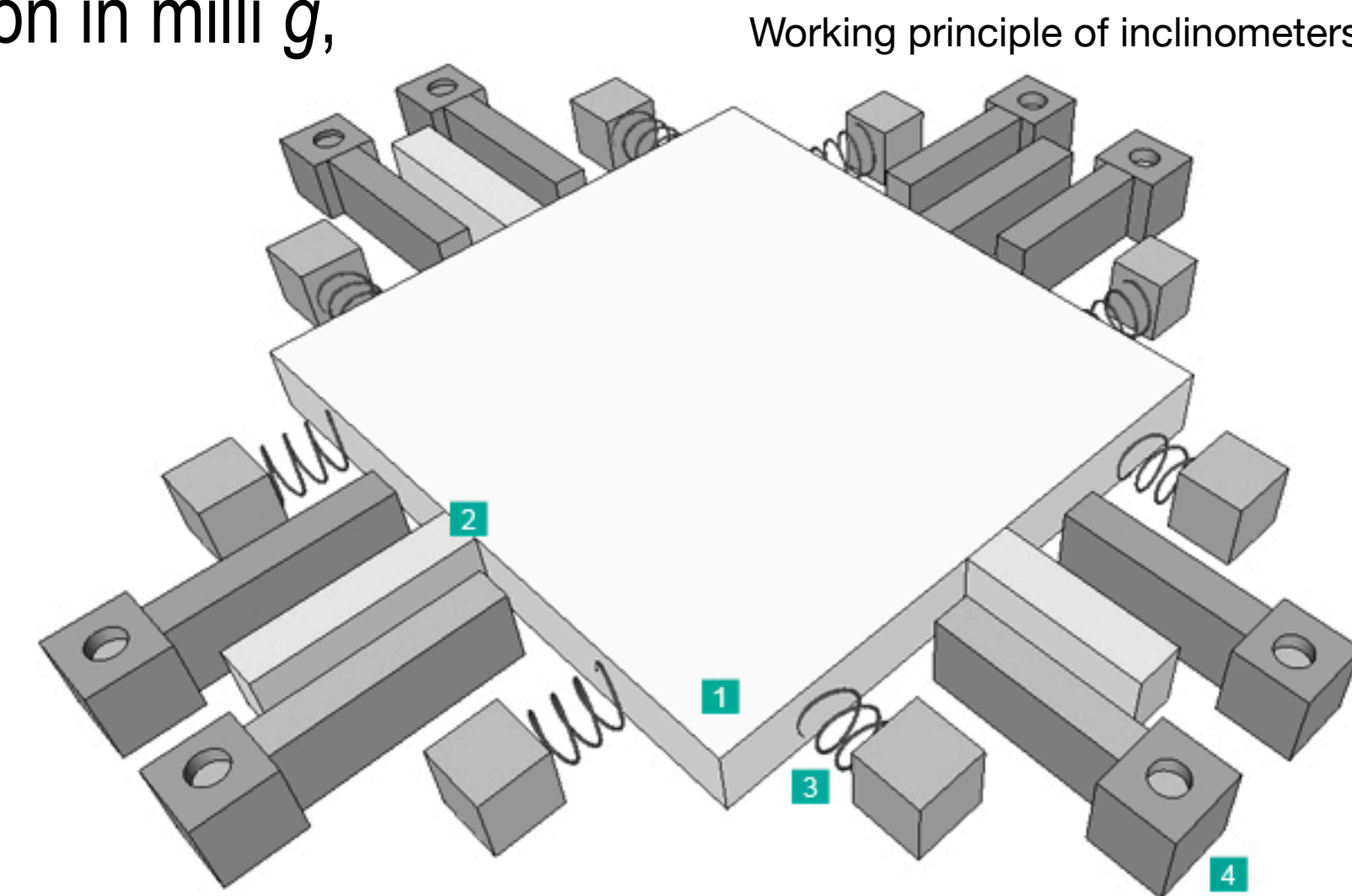
Default  
X=0



Inclination  
X=+30

- Returns:

- $A_{XN}, A_{YN}, A_{ZN}$ : direction cosines of measured acceleration in milli  $g$ ,
- $\alpha_X, \alpha_Y$ : Pitch (y) and Roll (x) angles in degrees,
- $\phi$ : Rotation angle in degrees,
- T: Internal temperature in  $^{\circ}C$ ,
- Additional digits: carriage, checksum

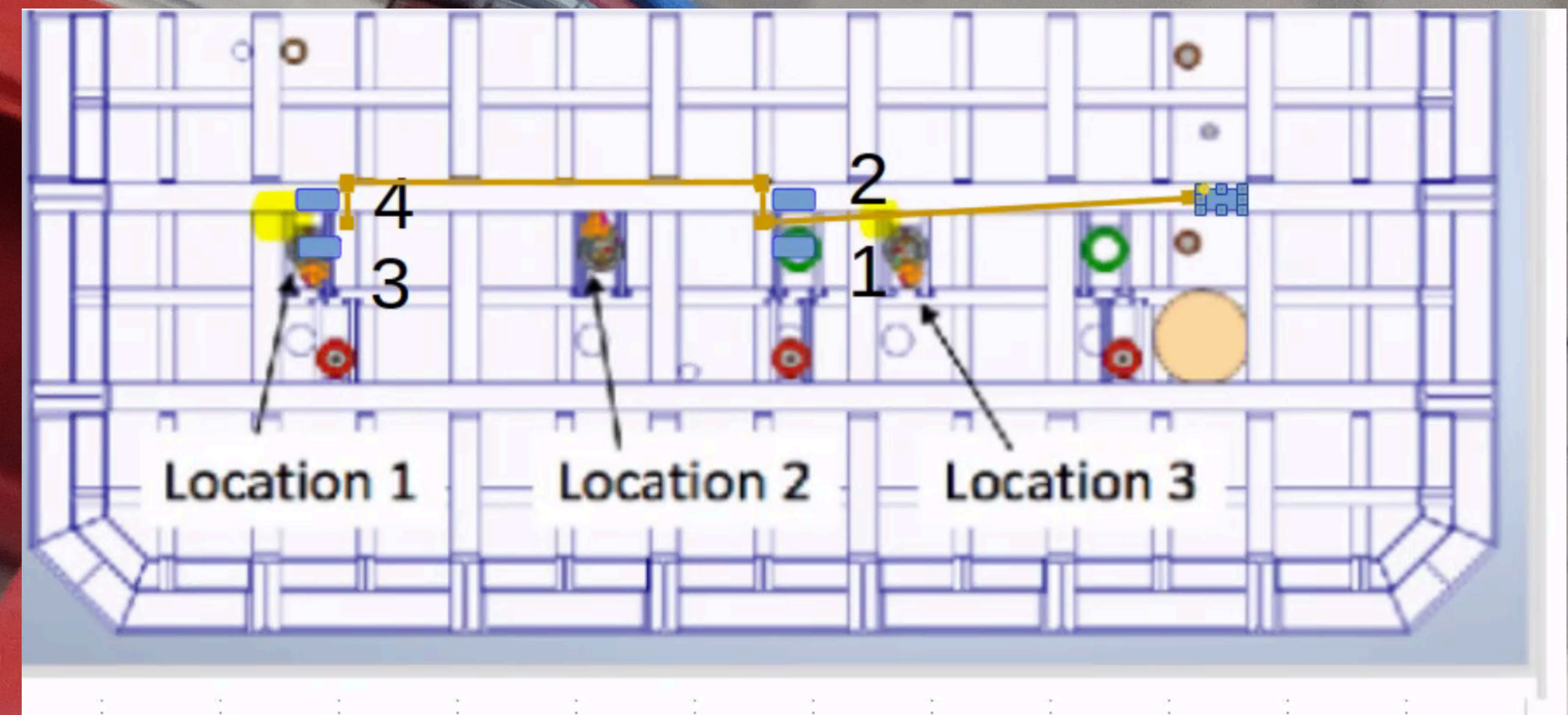
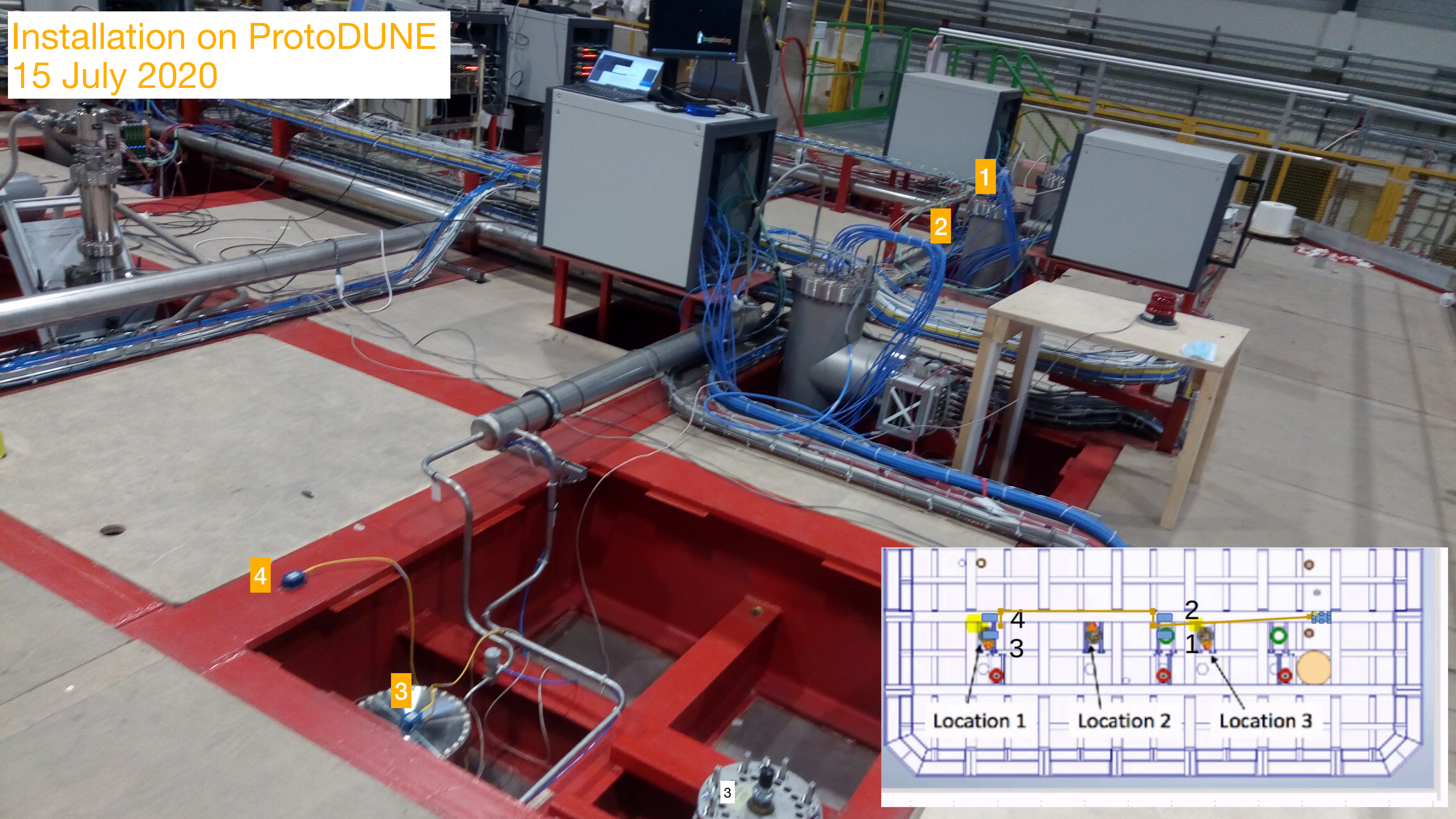


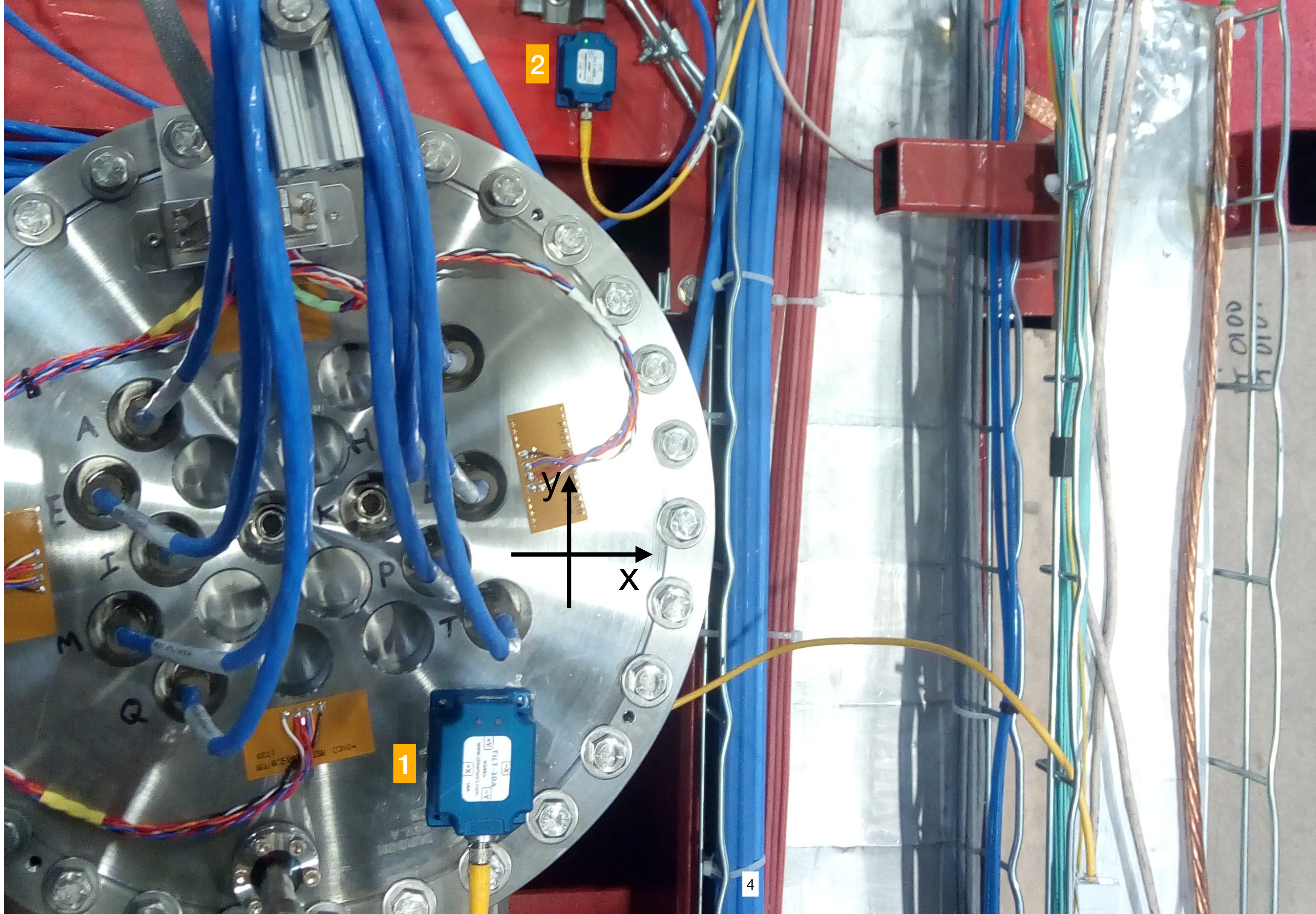
- Will be used to:

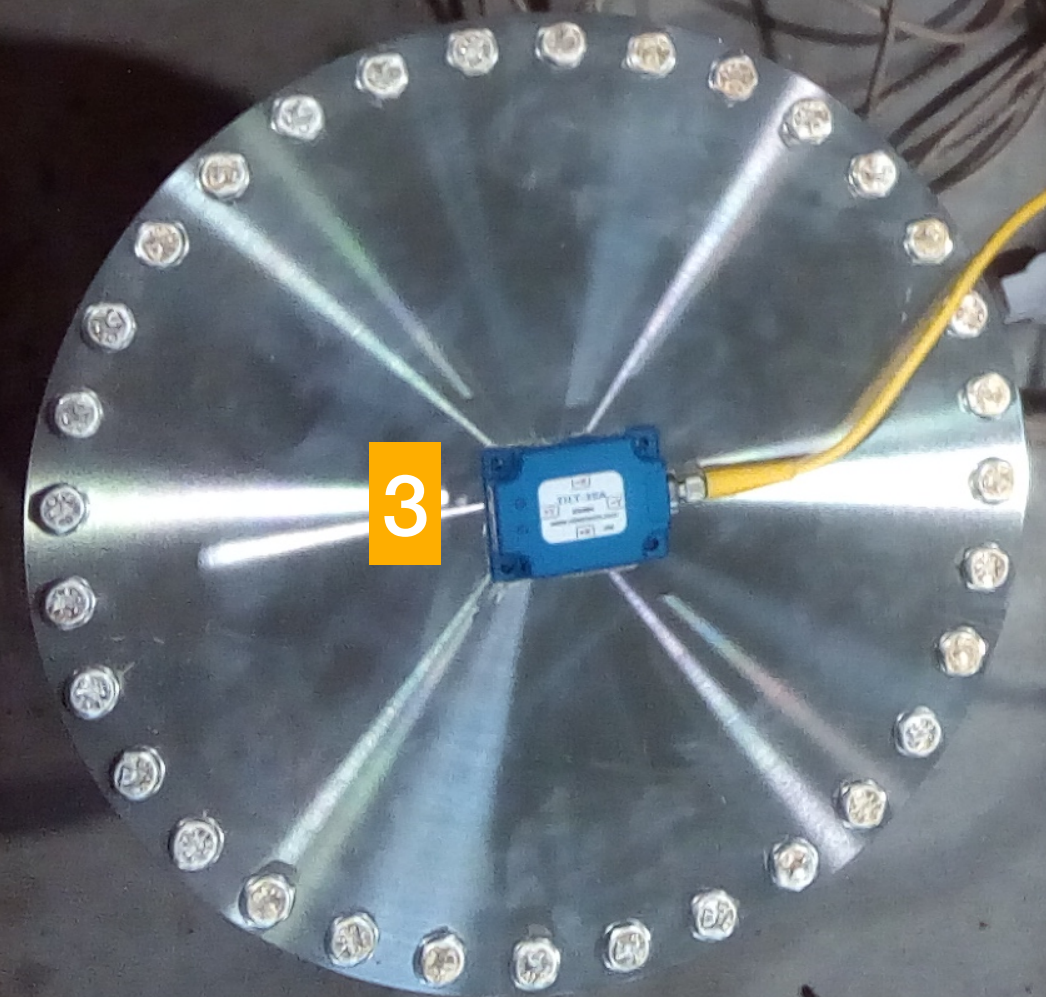
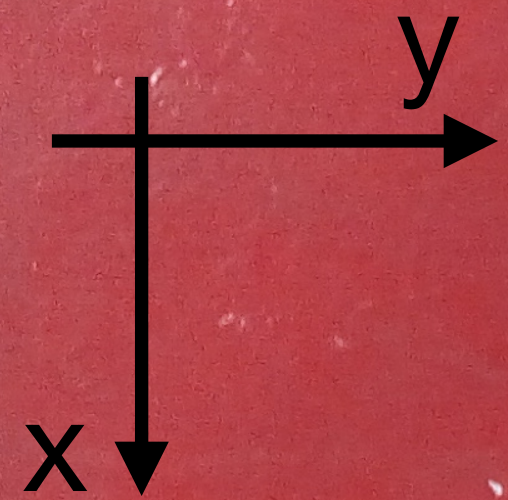
- Monitor how the pressure variations in the cryostat impact the upper detector components
- Monitor the top membrane/flange tilts to see whether the straightness of the laser periscope can be affected and to eventually evaluate which corrections apply (hw/sw level)

# Installation on ProtoDUNE

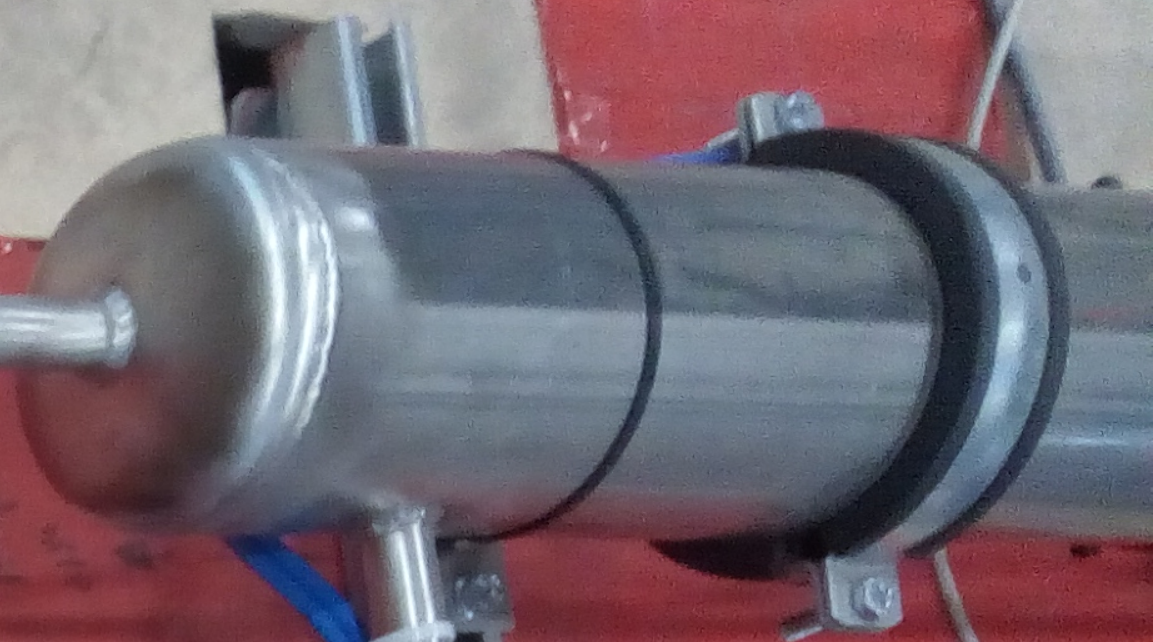
15 July 2020



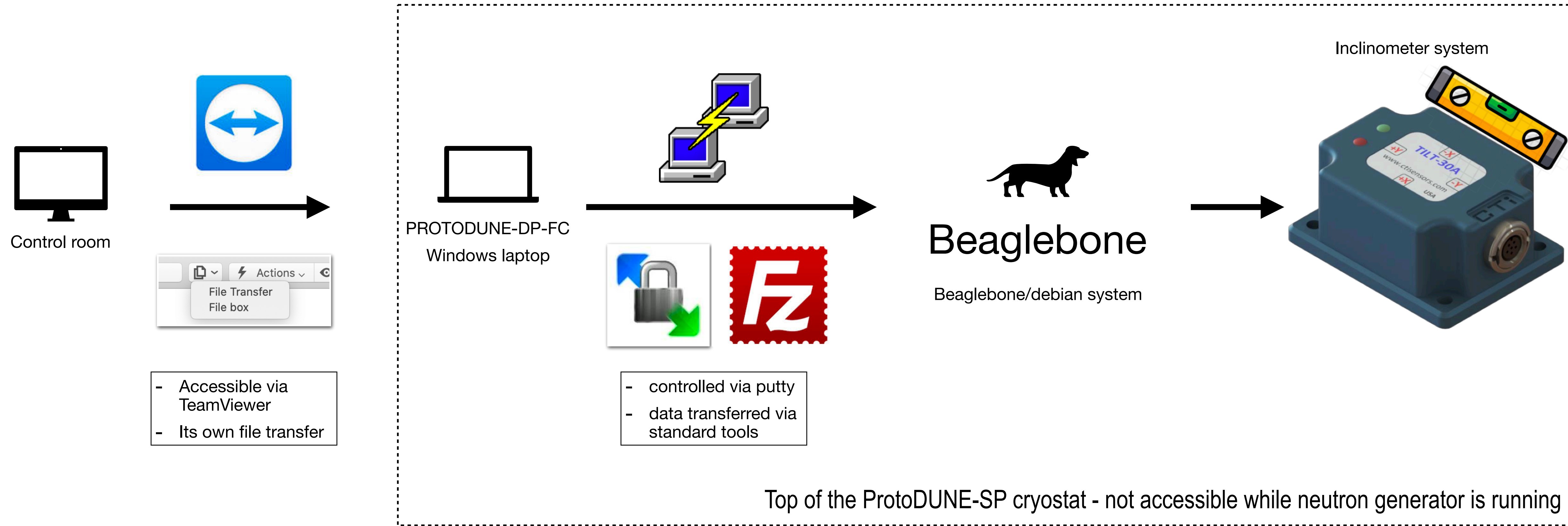




5

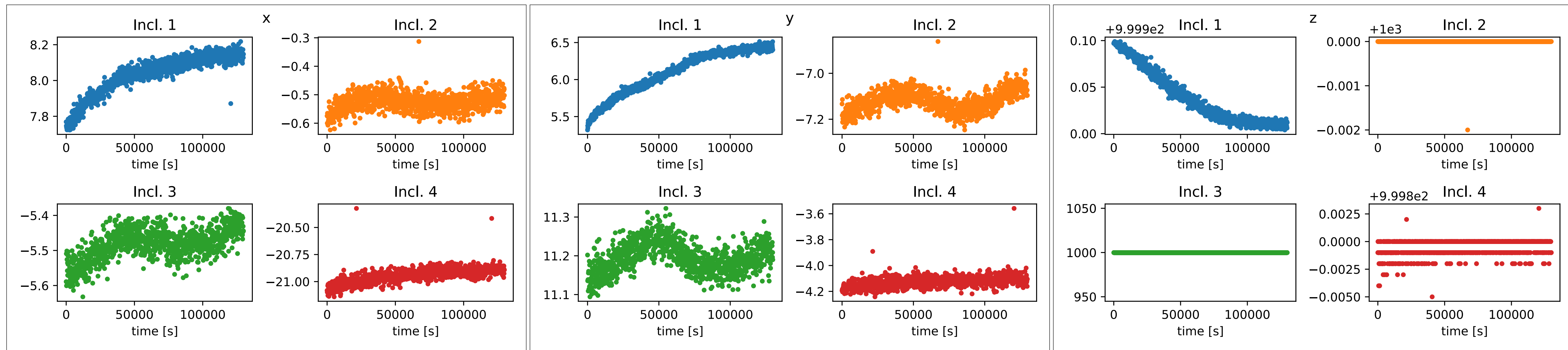


# Acquisition chain setup

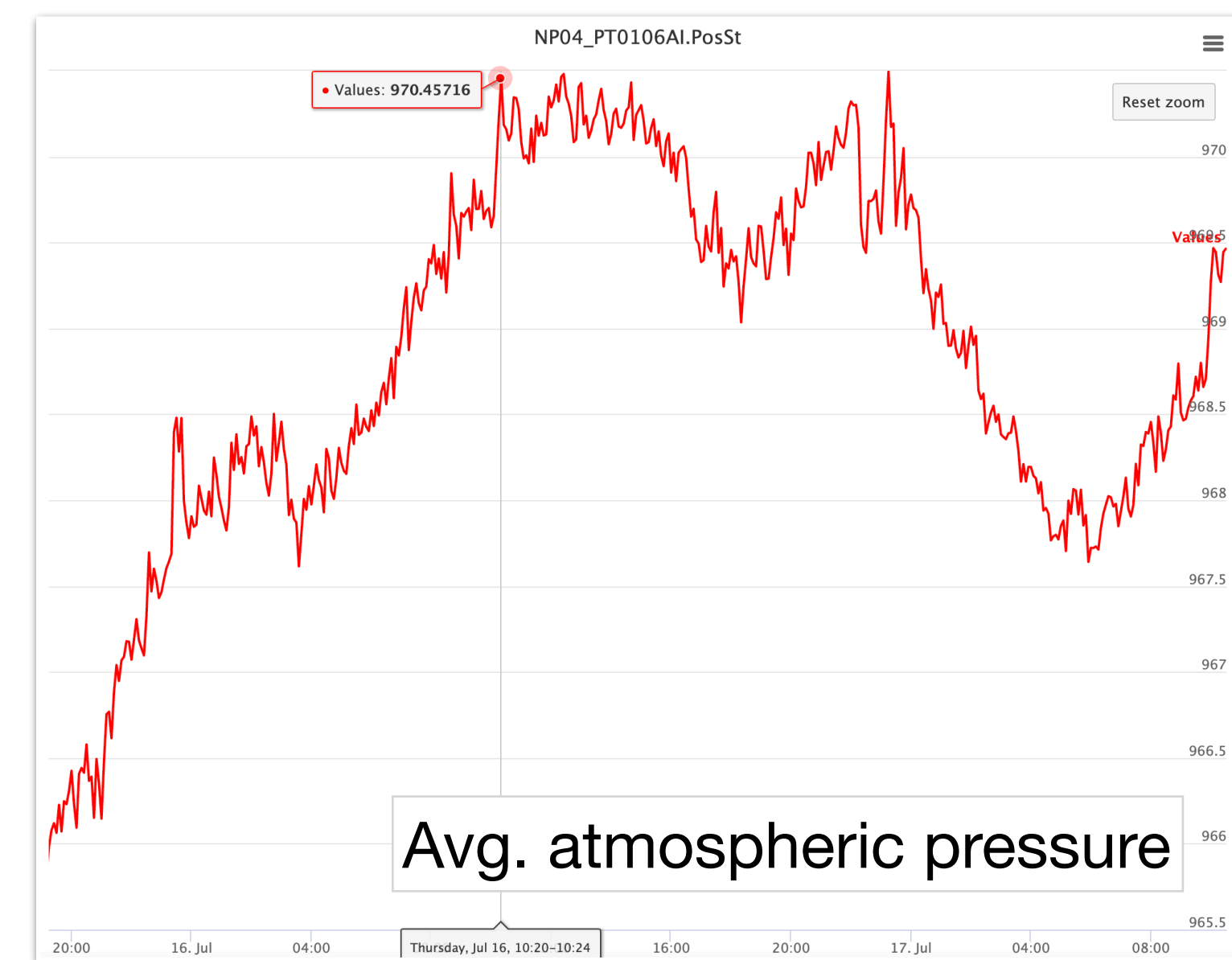
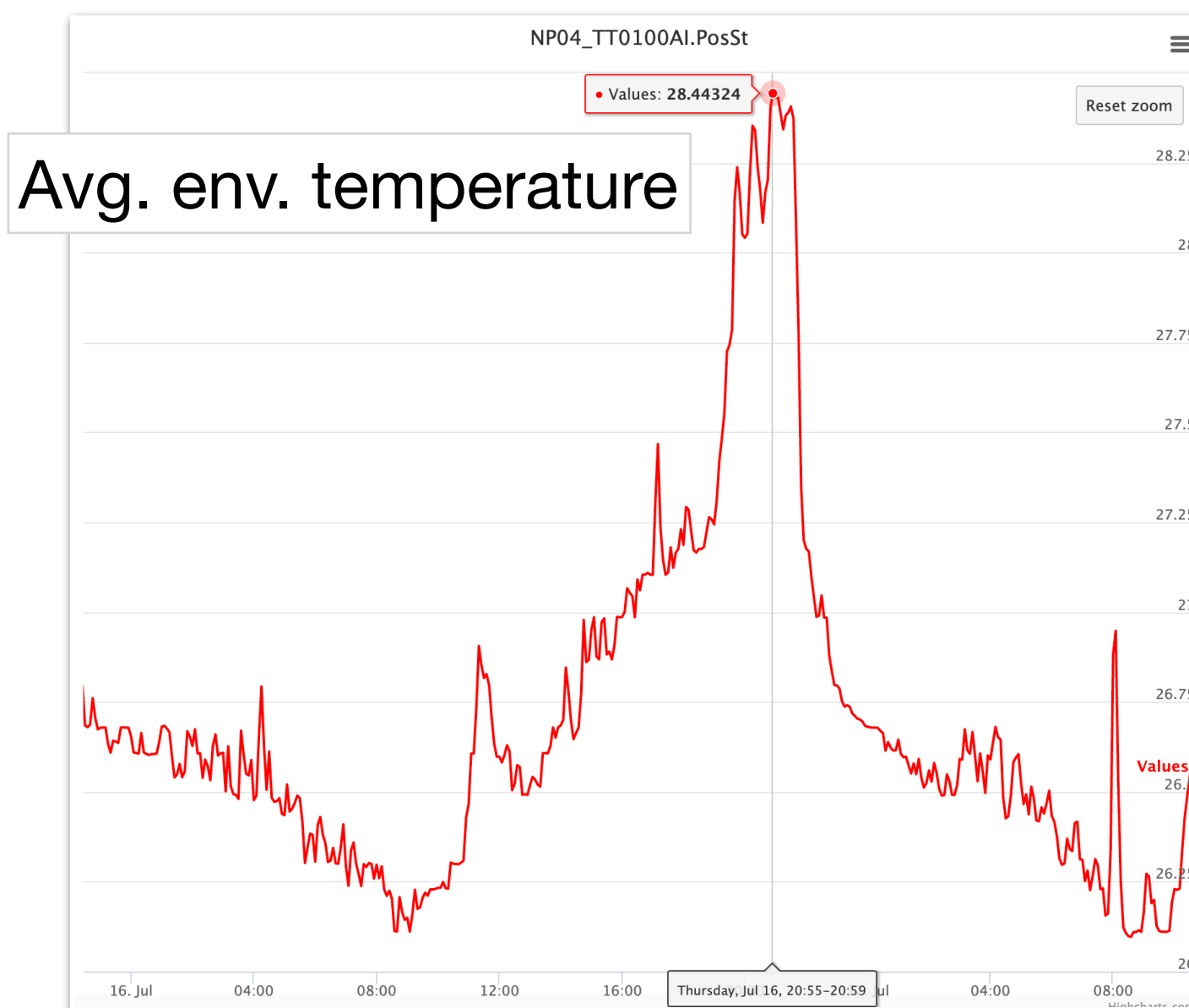
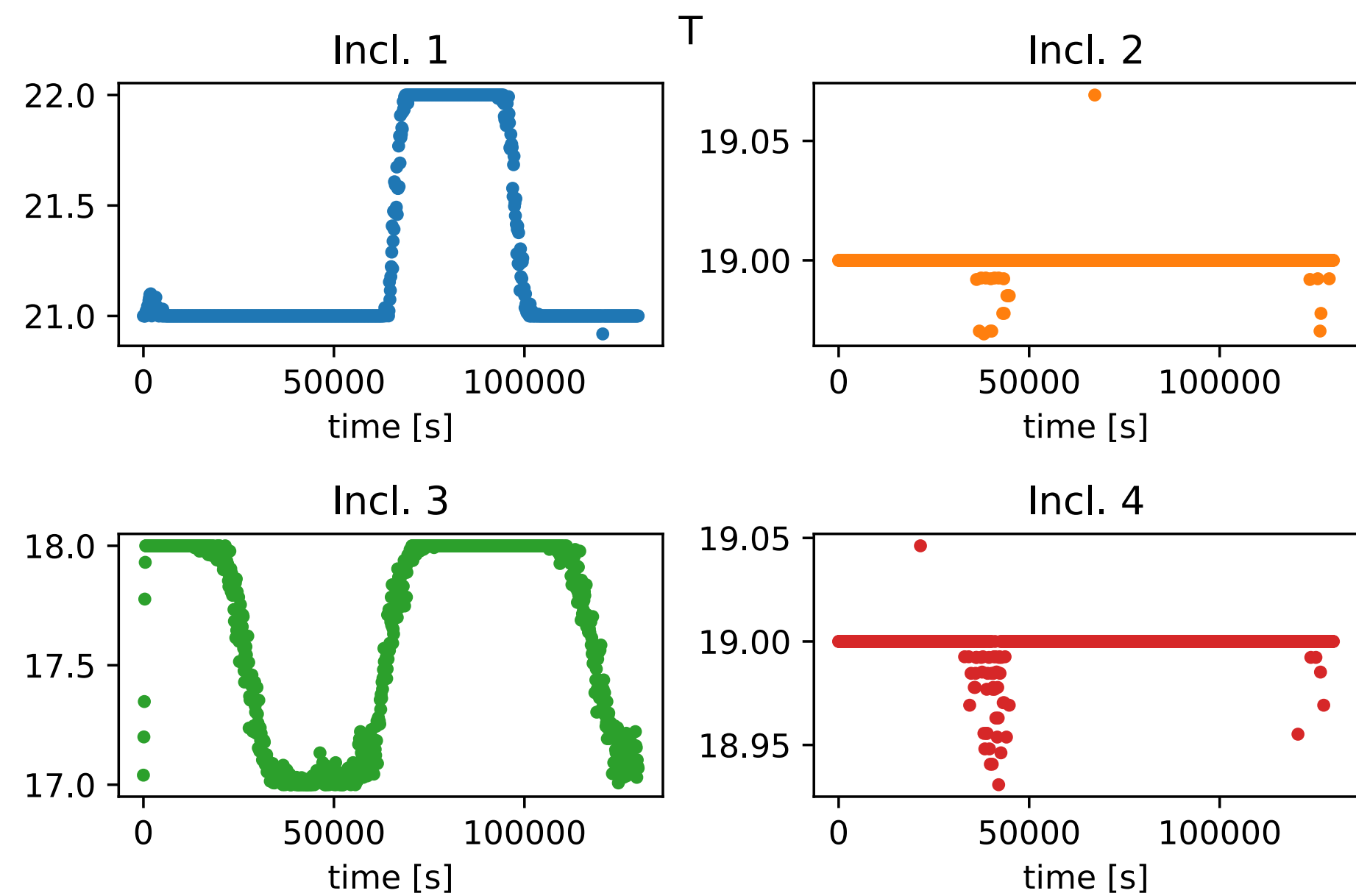


Data transfer works fine,  
data are readable

# Normalised X, Y and Z accelerations [ $10^{-3} g$ ]



# Internal temperature [ $^{\circ}C$ ]



# Rotation angles [deg]

