User and developer manual for SHM Plot Tool V1

1. Start a new project by clicking **Start Project** button
   A. **Category** window will open; here all possible types of **main categories monitoring equipment** type can be defined
   B. Use the predefined **dropdown list** to insert the monitoring type or define a new category by typing the name in the **text input line**
   C. Click **Add to list** button
   D. Insert the **maximum number of type with in category** (integer value) (Optional)
   E. **Generate table** : this will generate a table to enter **sub categories**

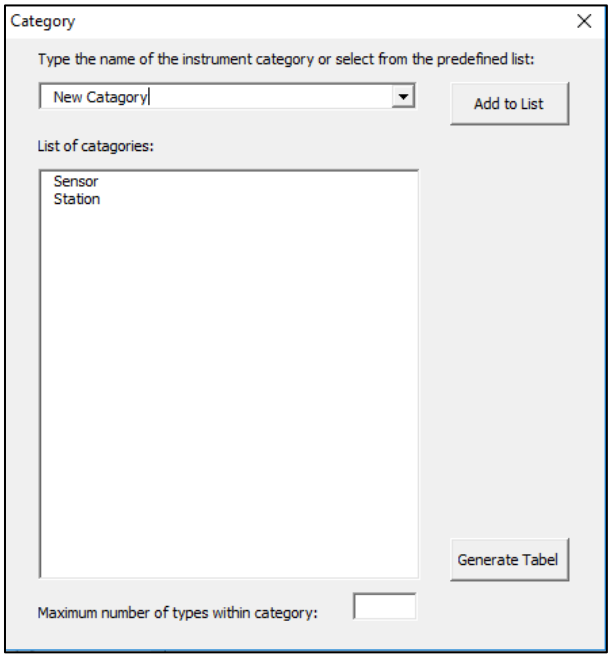

Figure 1 Category Window

Tips: After generating the table if you need to modify the **category** option (or table) please first save the **sub-categories** in another sheet if any.

2. After filling the sub-categories under **type** click the **Generate Table** button to generate an input table for the sub-sub-categories. (**No.** is optional to define length of the sub-category table)

Category

Category	Sensor		Station		Monitoring Cross Section		Junctions		Entry	
	Type	No.	Type	No.	Type	No.	Type	No.	Type	No.
	Strain_Gauge	22	Masterstation	1	section1	1	j1	5	e1	2
	accelerometer	20	Substation	1	section2	1	j2	6	e2	3
	anemometer	5			s3	2	j3	8	e3	6
	Temp.	3								

Sub-categories

Figure 2 Sub-category input table

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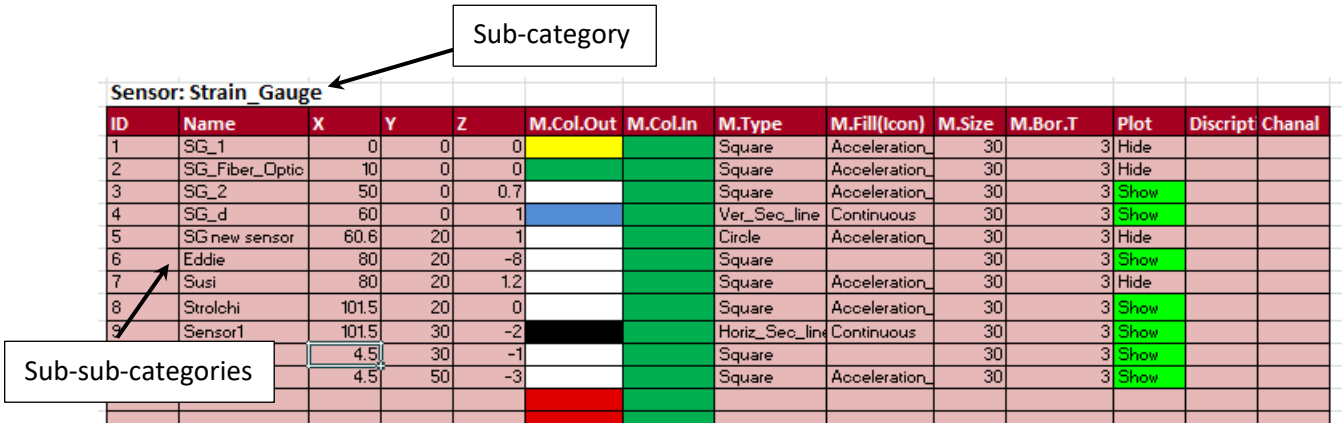
Tips: After generating the table if you need to modify the **Sub-category** option (or table) please first save the **sub-sub-categories** in another sheet if any.

3. Format of Sub-category table



Sensor: Strain_Gauge

ID	Name	X	Y	Z	M.Col.Out	M.Col.In	M.Type	M.Fill(Icon)	M.Size	M.Bor.T	Plot	Discript	Chanal
1	SG_1	0	0	0			Square	Acceleration_	30	3	Hide		
2	SG_Fiber_Optic	10	0	0			Square	Acceleration_	30	3	Hide		
3	SG_2	50	0	0.7			Square	Acceleration_	30	3	Show		
4	SG_d	60	0	1			Ver_Sec_line	Continuous	30	3	Show		
5	SG new sensor	60.6	20	1			Circle	Acceleration_	30	3	Hide		
6	Eddie	80	20	-8			Square		30	3	Show		
7	Susi	80	20	1.2			Square	Acceleration_	30	3	Hide		
8	Strolchi	101.5	20	0			Square	Acceleration_	30	3	Show		
9	Sensor1	101.5	30	-2			Horiz_Sec_line	Continuous	30	3	Show		
		4.5	30	-1			Square		30	3	Show		
		4.5	50	-3			Square	Acceleration_	30	3	Show		

Figure 3 Sub category table

A. **Name** of sub-sub-categories at a specific coordinate (**X Y Z**)

B. **M.Col.Out** (MarkerForegroundColor in vba)**:**
   - is the color of the marker border in case of the **M.Type** (MarkerStyle in vba) : *Square, Circle, Diamond, Dash, Dot, Dash, Plus, Star, Triangle, None, X*
   - is the color of the section line in case of **M.Type** : *Ver_Sec_line* (changes the marker to a vertical section line) and *Horz_Sec_line* (changes the marker to a horizontal section line)
   - color can be assigned by simply changing the color of the cell in **M.Col.Out** column

C. **M.Col.In** (MarkerBackgroundColor in vba)**:** Defines the marker fill color in case of the **M.fill(Icon)** is left blank.

D. **M.fill(Icon)** can be can be changed to the desired icon figure by typing the name of the icon in to the cell. The list of all available icons can be found in the icon folder.

Icon Type (M.Fill(Icon)) in case of the M.Type: *Square, Circle, Diamond, Dash, Dot, Dash, Plus, Star, Triangle, None, X*

Acceleration_1D
Acceleration_3D
AirTemperature
CableVibration
Corrosion
CrackWidth
MasterStation
StrainGauge..... More can be found in icon folder

Note that: The Icon folder should always be kept in the same directory as the excel file.

Line Type (M.Fill(Icon)) in case of the M.Type: *Ver_Sec_line and Horz_Sec_line*

Continuous
Dash
Dash Dot
Dash Dot Dot
Dot
Double
Line Style None
Slant Dash Dot

(If left blank the default value will be Continuous or solid line)

E. **M.Size** defines the size of the marker **or** the length of the section in case of vertical or horizontal M.type.
F. **M.Bor.T** define the thickness or weight of the border or the section line.
G. **Plot** column can be used to show or hide the marker on the chart.

4. After filling the necessary tables create charts for a specific sub-category or categories using the following procedure.
   A. Create a chart using excel standard method and change the background to the desired section picture of the structure under monitoring (keeping the scale and position of the center coordinate point).
   B. Assign a specific **unique** name for the chart created.
   To do this, follow these steps:
   - Select the **chart**.
   - Click the Layout tab under **Chart** Tools, and then click Properties.
   - In the **Chart Name** box, type the **name** of the **chart**, and then press ENTER.

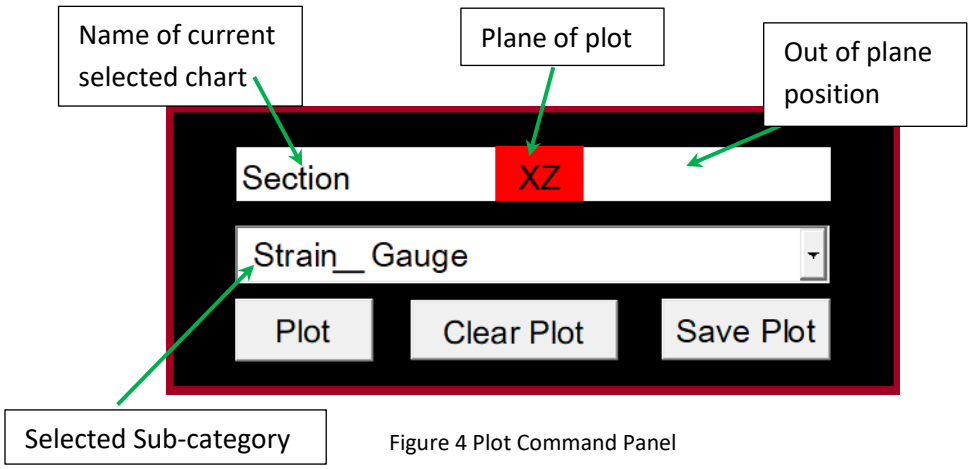


Figure 4 Plot Command Panel

C. If the dropdown menu is not available for the **name of the chart** or **plane of plot** or **sub-category** click the **refresh** button.
D. Insert a number in **Out of plane position** (optional) if a specific detail cross section plot is required. If left blank it will plot all points on the current **Plane of plot**
E. Use **Plot** button to generate a chart for the **selected parameters**
F. Use **Clear Plot** button to delete the series from the chart for the **selected parameters**
G. Use **Clear All Plot** button to deletes **All series** from the chart selected or from all charts if **All Plots(Save)** option is selected under the name of chart.
H. Use **Save Plot** button to save the chart selected or all charts if **All Plots(Save)** option is selected under the name of chart.
    - Saved charts will be available in the same directory a excel file**.**
    - The file name for saving the charts will be a combination of : **Object Name + Project Name + all plotted sub-category names + chart name**
    - **Object name** and **Project name** can be defined using :

Object Name:	OBJ_name
Project Name:	PROJ_name

Please note that: this manual is not inclusive of all case or possible errors

For future clarification and question please contact:

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