Calculates the current to be set in the MPS; formula used in this rung is based in the sample table provided (by Mike Fowler) from previous measuremnts in the Dipole. Formula can be modify as needed

0

I_Cal_Enable Enable_Regulation

ABS
Absolute Value
Source DI_B_Target 1.56564
Dest DI_B_Target_ABS 1.5772799

CPT
Compute
Dest DI_I_ApproxTarget 1851.2543
Expression 446.81282*(DI_B_Target_ABS**6)-2461.49006*(DI_B_Target_ABS**5)+(5123.23647*(DI_B_Target_ABS**4))-(4870.96181*(DI_B_Target_ABS**3))+(2062.26825*(DI_B_Target_ABS**2))+(805.20251*DI_B_Target_ABS)+4.9559

1

I_Cal_Enable Regulation_On DI_B_InLimits

ABS
Absolute Value
Source DI_B_Target 1.56564
Dest DI_B_Target_ABS 1.5772799

CPT
Compute
Dest DI_I_ApproxTarget 1851.2543
Expression 446.81282*(DI_B_Target_ABS**6)-2461.49006*(DI_B_Target_ABS**5)+(5123.23647*(DI_B_Target_ABS**4))-(4870.96181*(DI_B_Target_ABS**3))+(2062.26825*(DI_B_Target_ABS**2))+(805.20251*DI_B_Target_ABS)+4.9559

Calculated value for current is sent to MPS.

2

I_Cal_Enable

MOV
Move
Source DI_I_ApproxTarget 1851.2543
Dest MPS_Wa 1851

Enables the bolean only once to send the MPS_Wa value to the MPS. When MPS_current_send bit is enable in "MPS_Commands" routine (Currently running in HMS and SHMS) this send the command to the MPS
When Enable_Regualtion is enable, the value for the current sent is based on setB+offsetB
When Disable_Regulation is enable, the vaule for the current sent is based only on set B

3

Enable_Regulation
Disable_Regaulation

MPS_current_send
<Boolean_3[8]>

Readback current from MPS read at PLC analog input (Dipole:6:I.Ch13Data) is evaluated against upper/lower limits. This rung will help with the ocilations read from the I readback.
Limits can be modified as needed

4

I_Cal_Enable

MUL
Multiply
Source A DI_I_ApproxTarget 1851.2543
Source B 0.0005
Dest DI_I_Lim_Cal 0.9256272

ADD
Add
Source A DI_I_ApproxTarget 1851.2543
Source B DI_I_Lim_Cal 0.9256272
Dest DI_I_Upper_Lim 1852.1799

SUB
Subtract
Source A DI_I_ApproxTarget 1851.2543
Source B DI_I_Lim_Cal 0.9256272
Dest DI_I_Lower_Lim 1850.3286

LIM
Limit Test (CIRC)
Low Limit DI_I_Lower_Lim 1850.3286
Test I_coarse 1851.0
High Limit DI_I_Upper_Lim 1852.1799

MPS_In_Limits

5

MPS_In_Limits

MPS_Ramping

Waiting for MPS to settled down

6

MPS_In_Limits

TON
Timer On Delay
Timer t3
Preset 10000
Accum 10000
EN
DN

Checks if MPS is at desired set current

7

t3.DN MPS_Ramping
MPS_at_SetPoint

MPS_at_SetPoint

Check status of the MPS. PSU_Ready is bit status read from MPS as digital input signal in PLC (Dipole:1:I.Data.14).

8

t3.DN PSU_Ready MPS_Ramping
MPS_Set

MPS_Set

(End)