Write 1 to Drive 15.00 % Enable PV mode

Write 0 to Drive 15.01 % Enable voltage reference control mode

Write 2 to Drive 15.32 % Enable PV input

Write 2 to Drive 00.00 % Select SVPWM control

Write 2 to Drive 00.01 % Select communication running command channel

Write 0 to Drive 01.08 % Select deceleration to stop

Write 0 to Drive 02.00 % Select motor type as asynchronous

Write 2200 to Drive 02.01 % Set the rated power

Write 50 to Drive 02.02 % Set the rated frequency

Write 2870 to Drive 02.03 % Set the rated speed

Write 220 to Drive 02.04 % Set the rated voltage

Write 13.8 to Drive 02.05 % Set the rated current

Write 50 to Drive 00.03 % Set the maximum frequency

Write 50 to Drive 00.04 % Set the upper limit frequency

Write 0 to Drive 00.05 % Set the lower limit frequency

Stop the drive

Inv_BESS_Current_Ref = 50;

Write Inv_BESS_Current_Ref to the inverter 2nd program

While (Active once every 15 seconds)

Dri_DC_Voltage: Read input DC link voltage from the drive

Dri_Frequency: Read frequency from the drive

Dri_Power: Extract from the curve

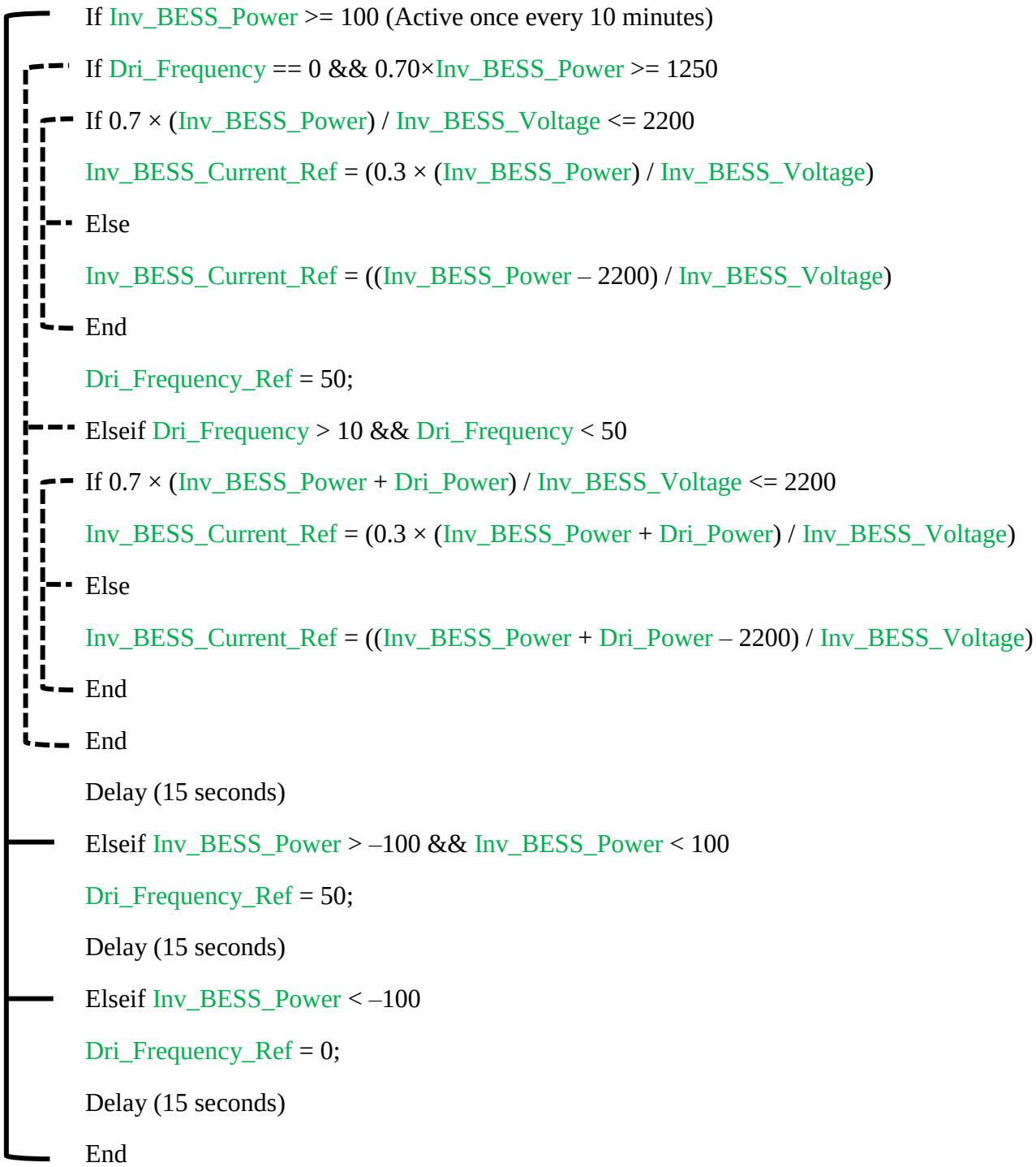
Inv_PV_Power: Read input PV power from the inverter

Inv_Load_Power: Read output load power from the inverter

Inv_BESS_Power = Inv_PV_Power - Inv_Load_Power;

Inv_BESS_Voltage: Read BESS voltage from the inverter

Inv_BESS_Current: Read BESS current from the inverter


If Inv_BESS_Power >= 100 (Active once every 10 minutes)
If Dri_Frequency == 0 && 0.70×Inv_BESS_Power >= 1250
If 0.7 × (Inv_BESS_Power) / Inv_BESS_Voltage <= 2200
Inv_BESS_Current_Ref = (0.3 × (Inv_BESS_Power) / Inv_BESS_Voltage)
Else
Inv_BESS_Current_Ref = ((Inv_BESS_Power – 2200) / Inv_BESS_Voltage)
End
Dri_Frequency_Ref = 50;
Elseif Dri_Frequency > 10 && Dri_Frequency < 50
If 0.7 × (Inv_BESS_Power + Dri_Power) / Inv_BESS_Voltage <= 2200
Inv_BESS_Current_Ref = (0.3 × (Inv_BESS_Power + Dri_Power) / Inv_BESS_Voltage)
Else
Inv_BESS_Current_Ref = ((Inv_BESS_Power + Dri_Power – 2200) / Inv_BESS_Voltage)
End
End
Delay (15 seconds)
Elseif Inv_BESS_Power > –100 && Inv_BESS_Power < 100
Dri_Frequency_Ref = 50;
Delay (15 seconds)
Elseif Inv_BESS_Power < –100
Dri_Frequency_Ref = 0;
Delay (15 seconds)
End

If Dri_Frequency >= 50

If abs (Inv_BESS_Current – Inv_BESS_Current_Ref) <= 1;

Inv_BESS_Current_Ref = Inv_BESS_Current_Ref + 2;

End

End

If Dri_Frequency == 0

Inv_BESS_Current_Ref = 50;

End

If Inv_BESS_Power > –100 && Inv_BESS_Power < 100

Inv_BESS_Current_Ref = 5;

End

End (While)

Function Set_Inv_BESS_Current_Ref (Inv_BESS_Current_Ref)

Inv_BESS_Current_Ref = min (Inv_BESS_Current_Ref , 50);

Inv_BESS_Current_Ref = max (Inv_BESS_Current_Ref , 5);

Write Inv_BESS_Current_Ref to the inverter 2nd program

End

Function Run_Stop_Dri (Dri_Frequency_Ref)

Written before…

End

Notes:

1) Two functions for the drive and inverter run in the back constantly by sending references to the corresponding devices.

2) The main algorithm which is fitted inside the “While” loop sends the references to each one of these functions.

3) There is a setup section in which certain parameters are set just once before running the program. Do NOT make them into functions. A simple line of code for each one is enough.

4) A time step of 10 minutes is carefully chosen for the control subsection inside the main algorithm (first if). Different cases of transients have been considered on this subject such as to avoid interference, immature changes, and motor start-up delay. Please do NOT change this value.

5) A time step of 15 seconds is chosen for the main algorithm (measurements and 2^{nd},3^{rd}, and 4^{th} ifs). Again, this value has been chosen with care. Shorter times could lead to the failure of the control algorithm. Do Not change this value.

6) Parameter names have been selected in a standard manner. Please write them as written.

7) Measurements will be taken once every 15 seconds. Do NOT attempt to extract the measurement part outside the main algorithm (While loop) in order to gather measurements more often. A good programmer takes measurements just as much as he needs not more, not less. A huge amount of data makes troubleshooting at this stage very difficult. I stress this again, do NOT decrease this value.

8) If you have any comments be sure to run them by me first before applying them. We will discuss them thoroughly just like we have done so far.

9) Please understand that we are working with high-rated and very expensive equipment. So, we have responsibilities and have to be super cautious to protect ourselves and the testbench. We do not want to cause any financial problems and set ourselves back. Please write the code as it is. Check it over and over. I will check the code couple of times before we test it.