EPC Power Checklist

Connecting to Board Process:

1. Download the PCAB (Peak System Software)
   1. Install Device Driver
   2. Connect the phytools USB to CAN (DB9) – installs driver and “ready to use”
2. Connect USB to CAN adapter to P2 Serial with adapter cable (serial cable without tabs)
3. Power Board with 24Vdc (@ 0.1A)
4. Open PCAN-View
   1. Default Bit Rate is 500kbits/second
   2. Filter Settings: Extended
   3. Click Ok
5. Status: BUSHEAVY => Need Terminating Resistors
   1. Connect Jumpers on J18 and J19 (for terminating resistors)
   2. Status: OK
6. The PCAN-View reads statuses

Bus Master can be downloaded or PCAN Explorer (GUI Panels)

Download New Code Process:

1. Go to the EPC Power Website and Download the tool
2. Open the tool and click ok to “DSP Flash” radio button
3. Jumper Pin 3 (SPI Boot Enable) to 24Vdc
4. Connect without power through the CAN (close other connections ex. PCAN)
5. Boot loader is one Green LED flashing
   1. Successful connection: “Connected to Bootloader Version “x””
6. Download to target (several minutes to complete)
7. Jump to Flash => leave boot loader and go to program

Signals to connect:

See the Excel spreadsheet (“Inverter Controller Connection Board”)

1. Power J25 with 24Vdc on 1(+) and 4(-) (screw terminals)
2. Temperature Sensor J4 and J5 (MICRO-FIT-2 connectors) with 2Vdc for 25 degrees C
3. Local Sense (Bus of MX1) (Voltage Line to Line) J23 with HIL Output (Aout 1, 2, and 3)
4. Remote Sense (Bus of MX2) (Voltage Line to Line) J20 with HIL Output (Aout 4, 5, and 6)
5. Inverter Phases 1-3 J11 (Header 13x2)
   1. Pin 1 (Return) to HIL Input (PWM Ground)
   2. Pins 2 (Bottom Switch Phase 1) and 4 (Top Switch Phase 1) to HIL Input (PWM 1 and 2)
   3. Pins 8 (Bottom Switch Phase 2) and 10 (Top Switch Phase 2) to HIL Input (PWM 3 and 4)
   4. Pin 13 (DC Link Voltage) to HIL Output (Aout 7)
   5. Pin 20 (Temperature) with 2Vdc for 25 degrees C (not needed)
   6. Pin 22 (Phase 1 Current) and 21 (Phase 1 Current Return) to HIL Output (Aout 8)
   7. Pin 26 (Phase 2 Current) and 25 (Phase 2 Current Return) to HIL Output (Aout 9)
6. Inverter Phases 4-6 J13 (Header 13x2)
   1. Pin 1 (Return) to HIL Input (PWM Ground)
   2. Pins 5 (Bottom Switch Phase 3) and 7 (Top Switch Phase 3) to HIL Input (PWM 5 and 6)
   3. Pin 13 (DC Link Voltage) to J11 Pin 13
   4. Pin 20 (Temperature) with 2Vdc for 25 degrees C (not needed)
   5. Pin 24 (Phase 3 Current) and 23 (Phase 3 Current Return) to HIL Output (Aout 10)
7. Relay Outputs J8 (MICRO-FIT-2X4) (optional?)
   1. Relay Out 0 (MX1) (less than 1kohm resistor divider) Pin 4(+) and Pin 8 (Common)
   2. Relay Out 1 (MX2) (not connected but needs the command first)
   3. Relay Out 2 (Precharge Contactor (K1)) Pin 2 (+) and Pin 6 (Common)
   4. Relay Out 3 (Battery Contactor (K2) Pin 1 (+) and Pin 5 (Common)
   5. A 5-20k ohm resistor should be connected between the relay and ground to ensure proper sensing of the relay. A 10kohm nominal value resistor can be choosen.
8. Isolated Digital Inputs J9 (MICRO-FIT-2X4) (optional?)
9. Isolated Digital Outputs J10 (MICRO-FIT-2X4) (optional?)

Testing of the Inverter Controller:

1. Power is connected, firmware is up to date, and CAN messages are being received (EPyQ).
2. Inverter Hardware Enable is set to “Inverted” when no signal high is connected.
3. Enable is set to “Enable” to send a command at least every second.
4. Voltage (value of “480”), Frequency (value of “60.0”), and Power (value of “100”) are set
5. PWM signals should be seen

Testing Procedure:

1. Validated the signal ranges of the input and output signals of the HIL Platform.
2. Connect all input and output signal wires to the HIL platform.
3. Invert the Enable, Clear Faults until the inverter is in Ready, Set the voltage and frequency setpoints, enable the enable command => now in grid forming mode
4. Check the local sense for correct waveform, phase, frequency, and voltage level
5. Check the remote sense for correct waveform, phase, frequency, and voltage level
6. Check the inverter gate drive signals for proper PWM pattern
7. Check the temperature sensors