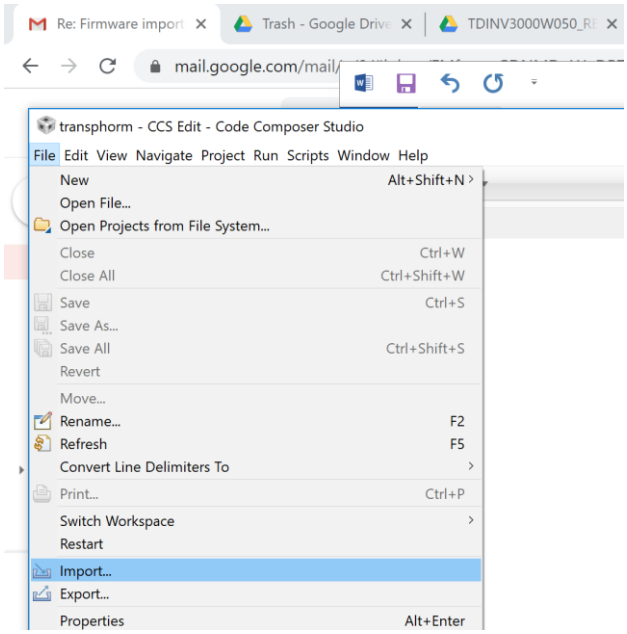
TDINV1000P100 Firmware Guide

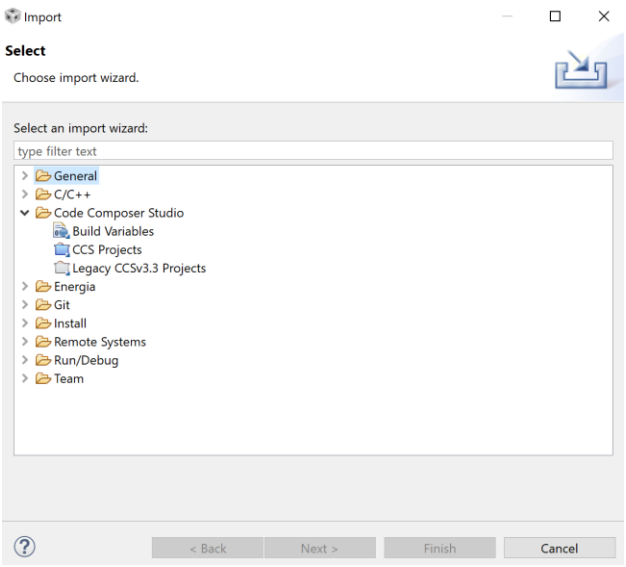
Please note: the control card is programmed with the default settings listed in the TDINV1000P100 user guide:

To modify the firmware, follow the steps below.

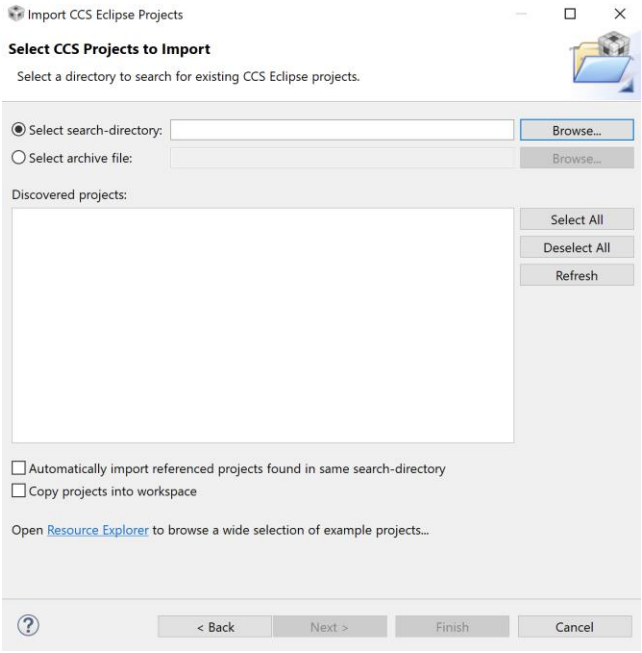
1. Download Code Composer Studio and create workspace folder.
2. Download the TDINV1000P100 firmware from the TRANSPHORMUSA.COM website and save the unzipped folder in the workspace folder you created.
3. Open up CCS program.
4. Under the FILE menu, select Import. See below.



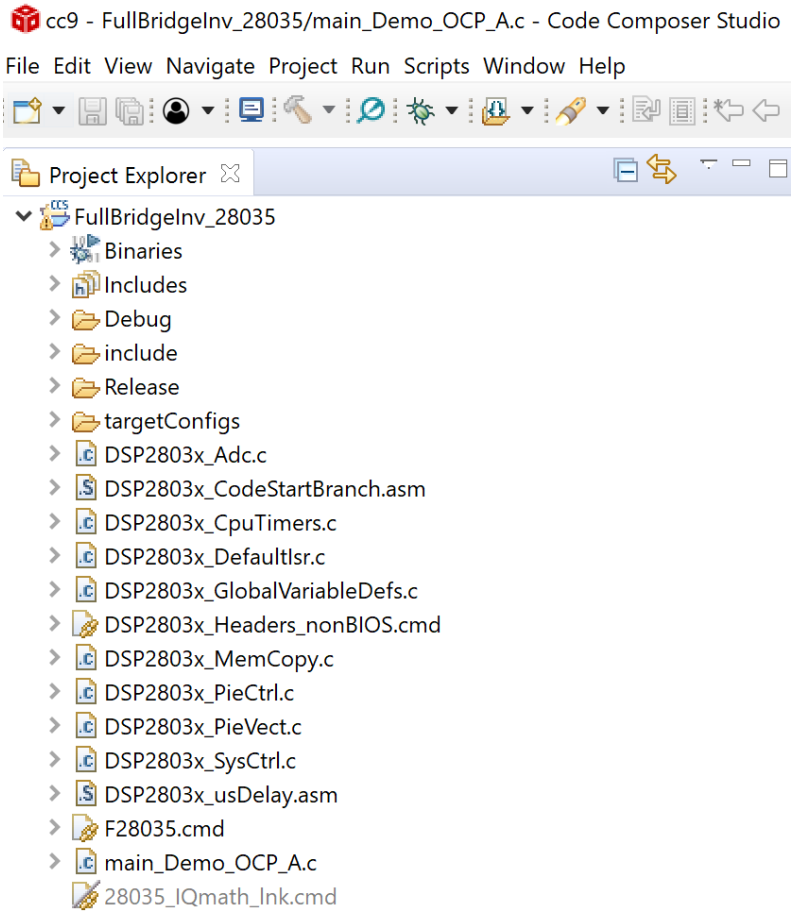
5. On the Import window, select Code Composer Studio and CCS Projects



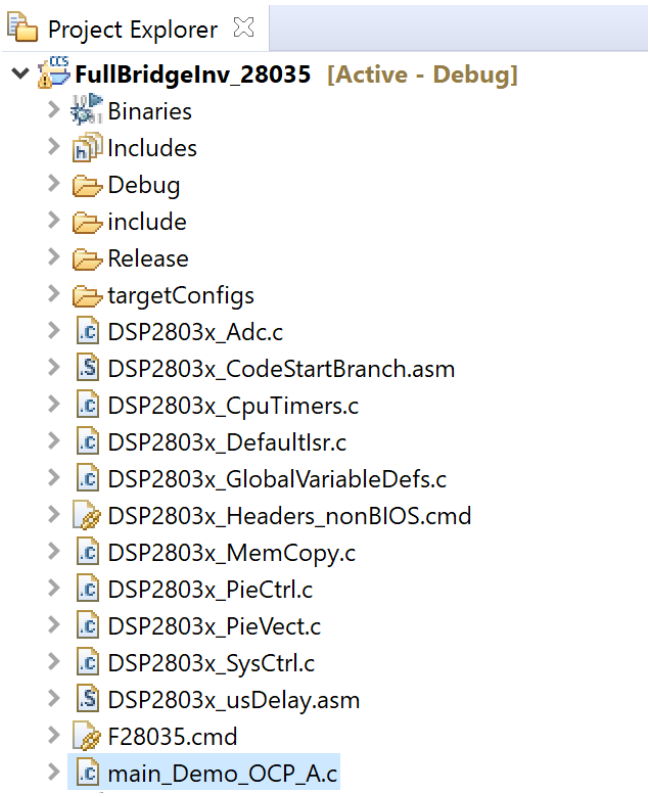
6. Search for the unzipped folder containing the TDINV1000P100 firmware and click finish.



7. The project window should show sometime similar to this below.



8. Scroll down to select main_Demo_OCP_A.c (See below)



9. The default switching frequency is 100kHz. It can be set at line 36. See below.

*main_Demo_OCP_ACS723.c

```
18 #include "DSP2803x_Examples.h"
19 #include "IQmathLib.h"
20 #include "math.h"
21 #include "DSP2803x_Adc.h"
22
23 /*************************************************************************/
24 /* Customer settings Begin                                               */
25 /* FSS_SETTING: 50, 66 OR 100 for 50kHz, 66kHz or 100kHz switching frequency  */
26 /* For 50kHz or 66kHz, choose 500uH inductor                             */
27 /*                                                                       */
28 /* FLINE_SETTING: Set 50 or 60 for 50Hz or 60Hz Line frequency           */
29 /*                                                                       */
30 /* MOD_INDEX: Modulation index 0~0.95                                    */
31 /*                                                                       */
32 /* OCP_LV_UP, 100 for 1A, 2000 for 20A                                   */
33 /*************************************************************************/
34
35 // Set switching frequency, //50 or 100 ,66,133kHz
36 #define FSW_SETTING  100
```

10. The default line frequency is set to 60Hz. It can be modified in line 39. See below.

main_Demo_OCP_A.c

```
/*****************************************************************************/
/* Customer settings Begin                                                   */
/* FSS_SETTING: 50, 66 OR 100 for 50kHz, 66kHz or 100kHz switching frequency */
/* For 50kHz or 66kHz, choose 500uH inductor                                 */
/*                                                                           */
/* FLINE_SETTING: Set 50 or 60 for 50Hz or 60Hz Line frequency               */
/*                                                                           */
/* MOD_INDEX: Modulation index 0~0.95                                        */
/*                                                                           */
/* OCP_LV_UP, 100 for 1A, 2000 for 20A                                       */
/*****************************************************************************/

// Set switching frequency, //50 or 100 ,66,133kHz
#define FSW_SETTING  50

// Set line frequency, 50, or 60 Hz
#define   FLINE_SETTING       60   //60 or 50

```

11. The default PWM modulation index is set to 0.95. It can be modified at line 42. See below.

*main_Demo_OCP_ACS723.c

```
/*                                                                           */
/* MOD_INDEX: Modulation index 0~0.95                                        */
/*                                                                           */
/* OCP_LV_UP, 100 for 1A, 2000 for 20A                                       */
/*****************************************************************************/

// Set switching frequency, //50 or 100 ,66,133kHz
#define FSW_SETTING  100 //50 for tdinv3000w050 //100 for tdinv3500p100 and tdinv1000p100

// Set line frequency, 50, or 60 Hz
#define   FLINE_SETTING       60   //60 or 50

// 0-1. PWM Modulation index
#define MOD_INDEX 0.95
```

12. The OCP (over current protection) default limit is set to 10A. It can be modified at line 45. See below.

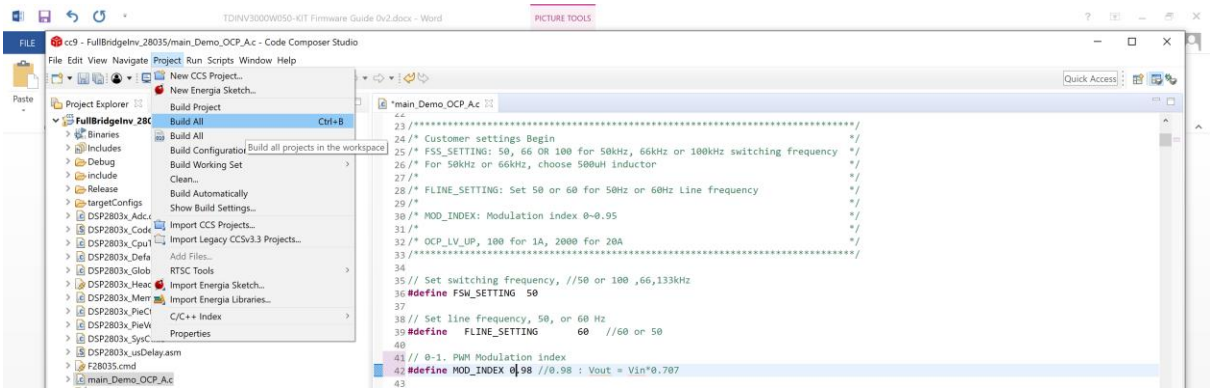
```
// OCP setting, 1 for 0.01A, OCP<2500 for 50mOhm, OCP<3400 for 35mOhm
#define OCP_LV_UP 1000  //500//1000 for 10A peak current
```

13. The dead time control is set at DBFED and DBRED of 1Regs and 2Regs (lines 876-877, 936-937). See below. Each count is 16.7nS. Therefore, 8*16.7nS = 120nS dead time.

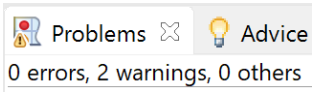
```
876     EPwm1Regs.DBFED = 8;
877     EPwm1Regs.DBRED = 8;
```

```
936     EPwm2Regs.DBFED = 8;
937     EPwm2Regs.DBRED = 8;
```

14. After changes have been made, select Build Project item under the Project Menu. See Below.



15. Verify 0 errors in the Problems window. See below.



16. To program the control card, connect the control card on the evaluation board and verify the appropriate USB is connected.
17. Select the debug option on CCS.