AN_651X_00x

APPLICATION NOTE

JUNE 2006

Development Tools

This Application Note describes the various development and programming tools available for the 71M651X Family of Energy Meter ICs.

This Application Note applies also to the 71M6521 Family of Energy Meter ICs.

Compiler

TERIDIAN recommends using the CA51 “Compiler Kit” by Keil (www.keil.com), which contains the µVision 3 Integrated Development Environment (IDE), complete with 8051 assembler, editor, C compiler, linker, and locator.

The Demo Code shipped with the Demo Kits for TERIDIAN Energy Meter ICs is written using this tool. Keil offers the best support for the memory model of the 80515 core used in the 71M651X ICs. It is possible to use alternative compilers, but these are not supported by TERIDIAN.

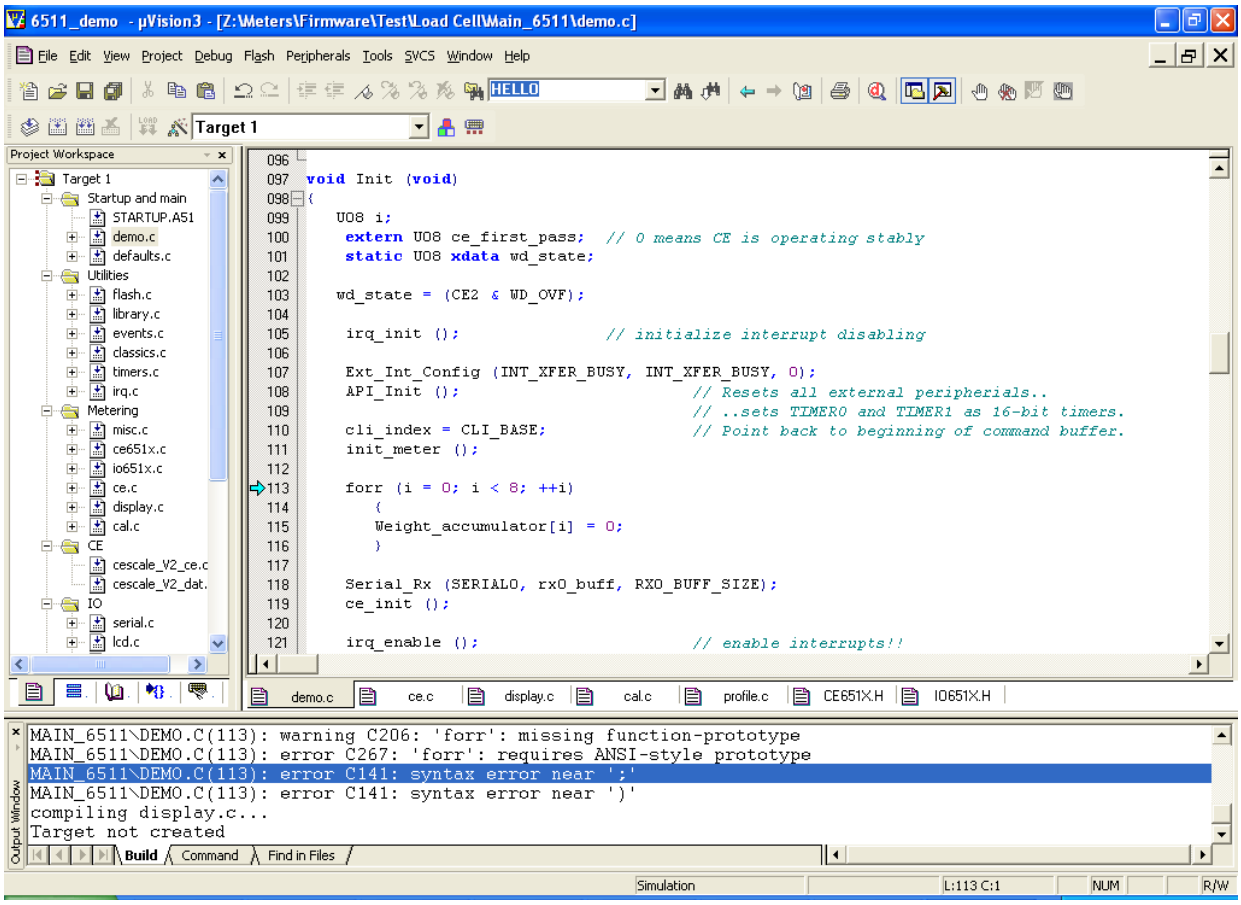

Figure 1: Keil µVision3 User Interface

While all Demo Code is written using the standard CA51 tool by Keil, significant improvements in memory usage can be made by using the PK51 “Professional Developer’s Kit” by Keil. The PK51 contains the LX51 advanced linker that can reduce code size by up to 8%, using special optimization techniques.

In-Circuit Emulator (ICE)

The Signum Systems ADM51 (www.signum.com) supports the 71M651X ICs, and is useful to perform the following tasks:

- Code emulation with breakpoints, watch windows, etc.
- Support of source code symbols
- Memory monitoring and manipulation (SFRs, XRAM, I/O RAM)
- Code loading into flash memory of the 71M651X
- Compatible with Keil symbolic output format

TERIDIAN supplies the ADM51 to customers at a preferred price (P/N DB6510-ADM51).

Figure 2: Signum ADM51 Emulator Pod

Emulators are available from Signum Systems that support trace memory. Trace memory can only be used with the 71M6513 and 71M6513H ICs.

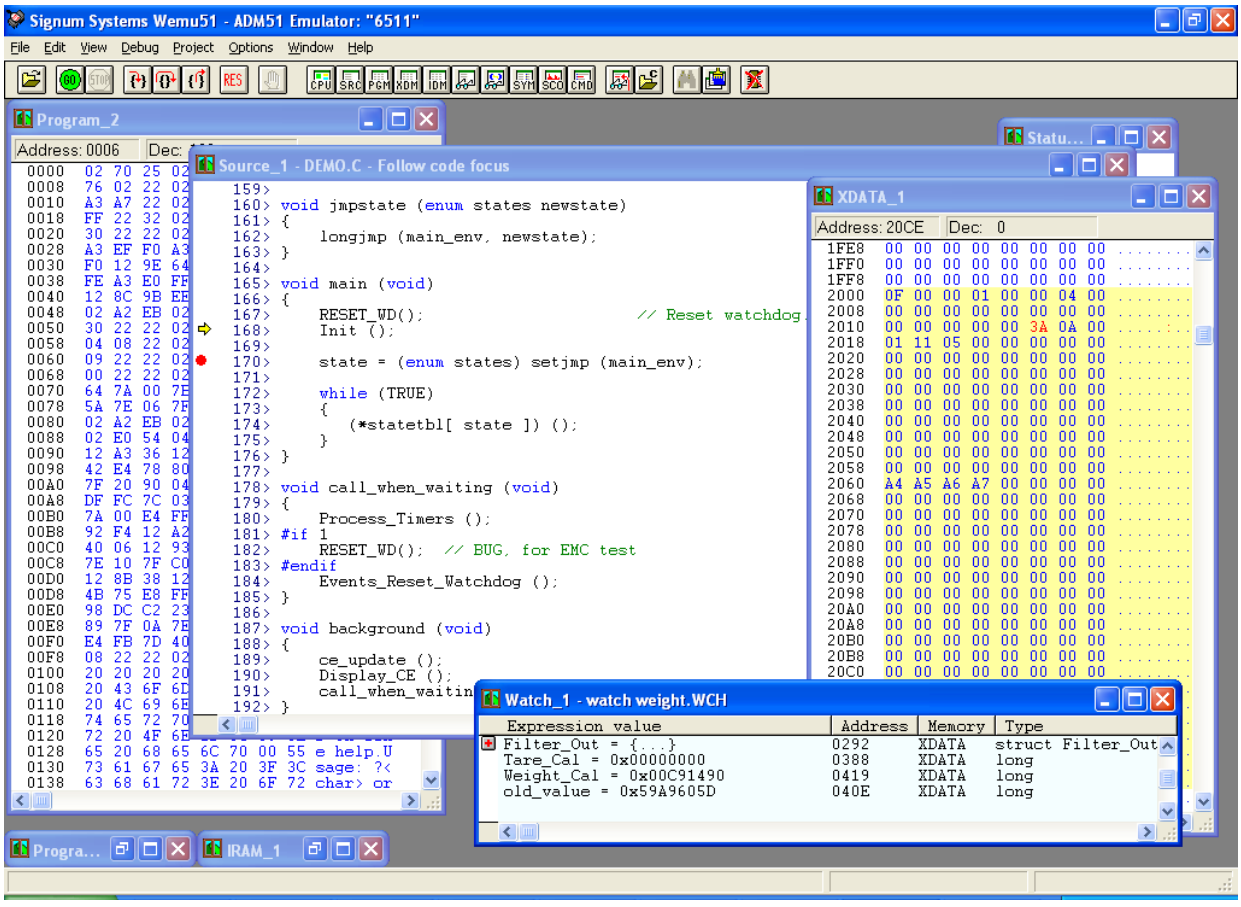

Figure 3: Signum WEMU51 User Interface

Flash Programmer

The Signum ADM51 can serve as a programmer for prototyping and small quantities. For mass production, TERIDIAN offers the TFP-1 Flash Programming Module, which is a stand-alone programmer that can be operated manually or in an ATE environment (see Figure 4).

For even larger quantities, ROM-based ICs are an option.

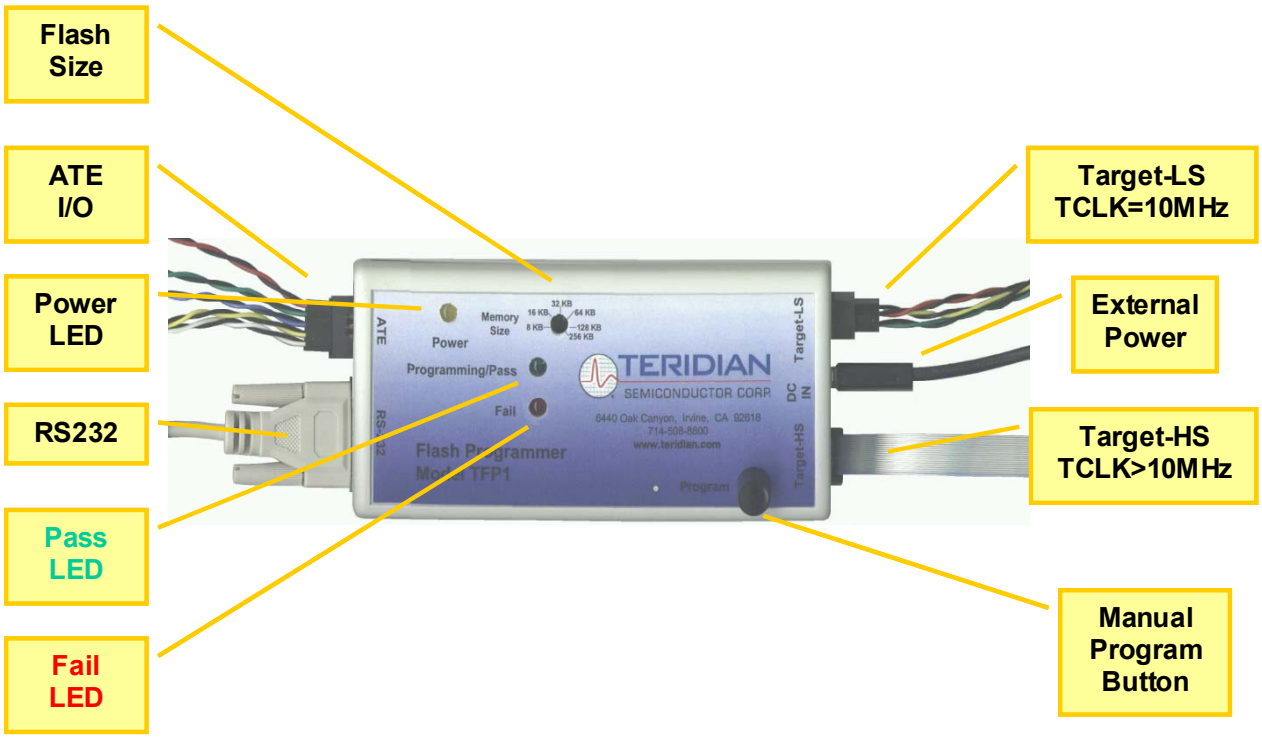

Figure 4: TERIDIAN TFP-1 Flash Programmer

Software/Firmware

The complete set of sources for the MPU Demo Code is available to the customer as well as images of CE code and CE data. The source modules can be combined to quickly implement a working meter. Software development is supported by documentation in form of a Software User's Guide (SUG). The SUG contains:

- HW and SW requirements
- Description of SW utilities
- Command line interface description
- Tool installation guide
- Demo Code description
- 80515 Core Reference

Demo Boards and Demo Kits

Demo Kits are the quickest way to get familiar with the TERIDIAN 71M651X family of energy metering ICs. They are very useful to evaluate the performance of the ICs without having to write any software.

Each Demo Kit contains the following:

1) 71M6513/6513H or 71M6511/6511H IC on a Demo Board implementing a pre-programmed demonstration meter, complete with resistor dividers, connectors for voltage and current sensor inputs, EEPROM, pulse LEDs, power supply and LCD display. In addition, various test points, configuration jumpers and access to the emulator interface of the 71M651X IC are provided.
2) Debug Board. This board provides isolation and translation to RS-232 voltage levels. It enables the user to control various parameters of the Demo Board via a simple serial command line interface.
3) Two power supplies (for Demo Board and Debug Board).
4) Serial cable for connection of the Debug Board to a terminal or PC (COM port).
5) CD-ROM with documentation (Data Sheet, User's Manual, Software User's Guide), Demo Code (executable files and source files), and various utilities.

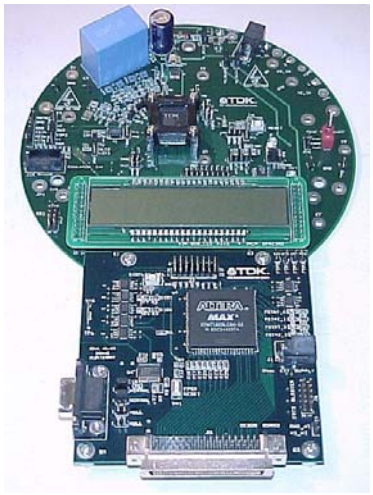

Figure 5: 71M6513 Demo Board with Debug Board

After the evaluation phase, the Demo Board can serve as a platform for code development, which can be done simultaneously with schematic design and layout.

Application Notes

Application Notes are provided by TERIDIAN to help with general or special applications and tools, with interfacing to sensors and peripherals, design for EMI/EMC, or to explain procedures, algorithms and mechanisms used in conjunction with the 71M651X Family of metering ICs.

Below is a partial list of the available Application Notes:

1) Connecting the V3 pin
2) Rogowski Coil
3) Optical Port
4) Temperature Compensation
5) EMC/EMI Design Guidelines
6) LCD
7) Chop Enable
8) RX Pin
9) Infrequent Temperature Measurements
10) RTM Tool
11) Boot Loader
12) Crystal Frequency Variations
13) Current Shunt
14) Weigh Scale – Load Cell
15) Migration from 6511 to 6521
16) Calibration for Shunt and CT
17) Neutral Current
18) Harmonics Performance
19) Broadband VAR Harmonics Performance

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