SMT8047

User Manual

Revision History

Date	Comments	Engineer	Version
05/08/03	First release	PSR	1.0

Table of Contents

Contacting Sundance.

You can contact Sundance for additional information by sending email to support@sundance.com.

Notes.

- SHB stands for **S**undance **H**igh-speed **B**us.

- ComPort denotes an 8-bit communication port following the TI C4x standards.

Precautions

In order to guarantee that Sundance's boards function correctly and to protect the module from damage, the following precautions should be taken:

- They are static sensitive products and should be handled accordingly. Always place the modules in a static protective bag during storage and transition.

- The *SMT364* reaches a temperature close to the maximum temperature ratings of the ADCs, FPGA and DC/DC when operated in a closed environment. By mounting a fan inside the PC case, it increases the airflow and therefore reduces the board temperature down, away from the maximum ratings. It is to the customer's responsibility to make sure that a minimum airflow circulates along the carrier board where the *SMT364* seats.

Outline description.

The *SMT8047* is a dual-C67xx based (floating point) module (*SMT374*) combined with a quad high-speed ADC module (*SMT364*).

SMT374 characteristics:

⇒ TMS320C6711/13 processor running at 225MHz

⇒ Six 20MB/s communication ports (comm.-ports)

⇒ 128MB of SDRAM (100MHz)

⇒ 8MByte Flash ROM for boot code and FPGA programming

⇒ High bandwidth data I/O via 2 Sundance High-speed Buses (SHB)

⇒ Global expansion connector

⇒ General Purpose I/O connector.

SMT364 characteristics:

⇒ Four 14-bit ADCs (AD6645-105) sampling at up to 105MHz,

⇒ Two **S**undance **H**igh-speed **B**us (SHB) connectors,

⇒ Four 20 MegaByte/s communication ports,

⇒ Low-jitter on-board system clock,

⇒ Xilinx Virtex-II FPGA,

⇒ 50-Ohm terminated analogue inputs and outputs, external triggers and clocks via MMBX (Huber and Suhner) connectors,

⇒ User defined pins for external connections,

⇒ Compatible with a wide range of Sundance *SHB* modules,

⇒ TIM standard compatible,

⇒ Default FPGA firmware implementing all the functions described in this documentation.

The *SMT8047* is a demonstration software for the evaluation of the *SMT374* and *SMT364* modules. It can be used for prototyping IF, base-band radar systems, spectrum analysis, digital radio receiver, multi-channel receivers or cellular base stations. This document is an installation guide for the *SMT8047* demonstration system.

The *SMT8047* application gets the DSP on the *SMT374* to configure the on-board low-jitter clock synthesizers (up to 105 MHz) and the ADCs via ComPort. The DSP then grabs data from both channels and stores them into a file, which can be read by a Matlab application for data displaying and FFT processing. The SMT364

implements ComPort 4 to receive control word, which allows using the SMT310Q ComPort switches and avoid cables at the back of the carrier board.

Architecture.

The following diagram shows the architecture of the *SMT8047* system:
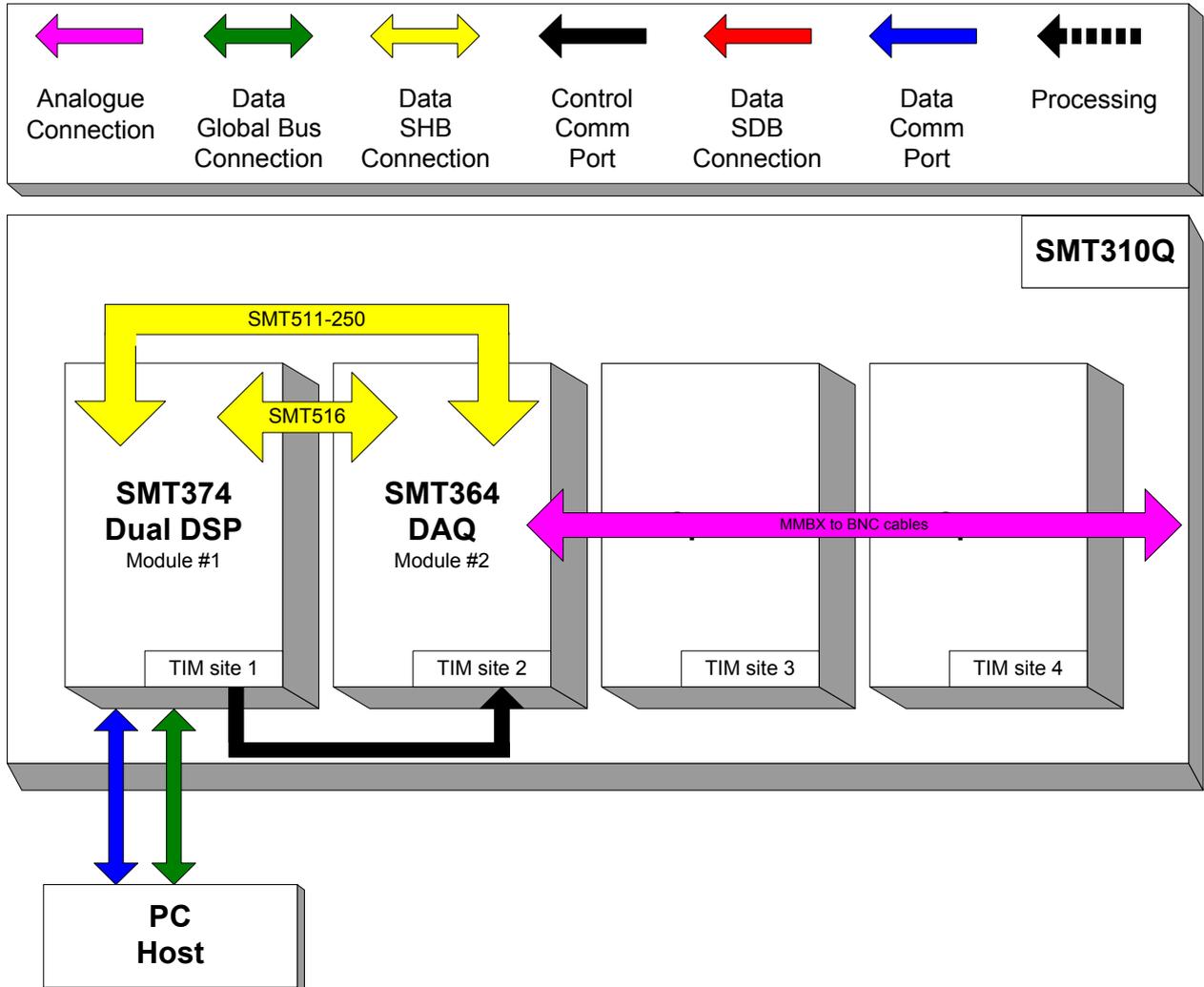
Hardware involved.

The *SMT8047* is built around two main modules but also involves an other board and some cables to connect them and allow them to communicate with each other and to access the PC.

⇒ 1x **SMT310Q**: PCI carrier

⇒ 1x **SMT374**: Dual-C67xx-based module; to be plugged on site 1 of *SMT310Q*.

⇒ 1x **SMT364**: Quad-ADC module; to be plugged on site 2 of *SMT310Q*.

⇒ 1x **SHB cable** (standard length): to connect SHBB on the *SMT374* to SHBB on the *SMT364*.

⇒ 1x **SMT516** (SHB to SHB PCB): to connect SHBA (*SMT374*) to SHBA (*SMT364*).

⇒ 4x **MMBX to BNC** cables to connect J7 to J8 and J9 to J10 on the *SMT364*.

Hardware installation.

Here are the steps to follow to install the *SMT8047* system.

1 – Place the *SMT374* on TIM site 1 of the carrier board (*SMT310Q*).

2 – Place the *SMT364* on TIM site 2 of the carrier board (*SMT310Q*).

3 – Make sure that the boards are firmly seated, then provide the 3.3V to the boards by screwing in the bolts and screws through one of the mounting holes on the *SMT374* and *SMT364*.

4 – Connect SHBA on the *SMT374* to SHBA on the *SMT364* via the *SMT516*.

5 – Connect SHBB on the *SMT374* to SHBB on the *SMT364* via a standard SHB cable.

6 – Place the carrier board in the host system.

7 – Connect ComPort 1 of the *SMT374* to ComPort 4 of the *SMT364 via ComPort switch.* To do so, simply run the BoardInfo application that comes with *SMT6300* package. By right-clicking the current active carrier board, you have access to a menu. Select ComPort Switch an click the connection **T1C1 -> T2C4**.

The following picture shows how connections are made at the top of the system:
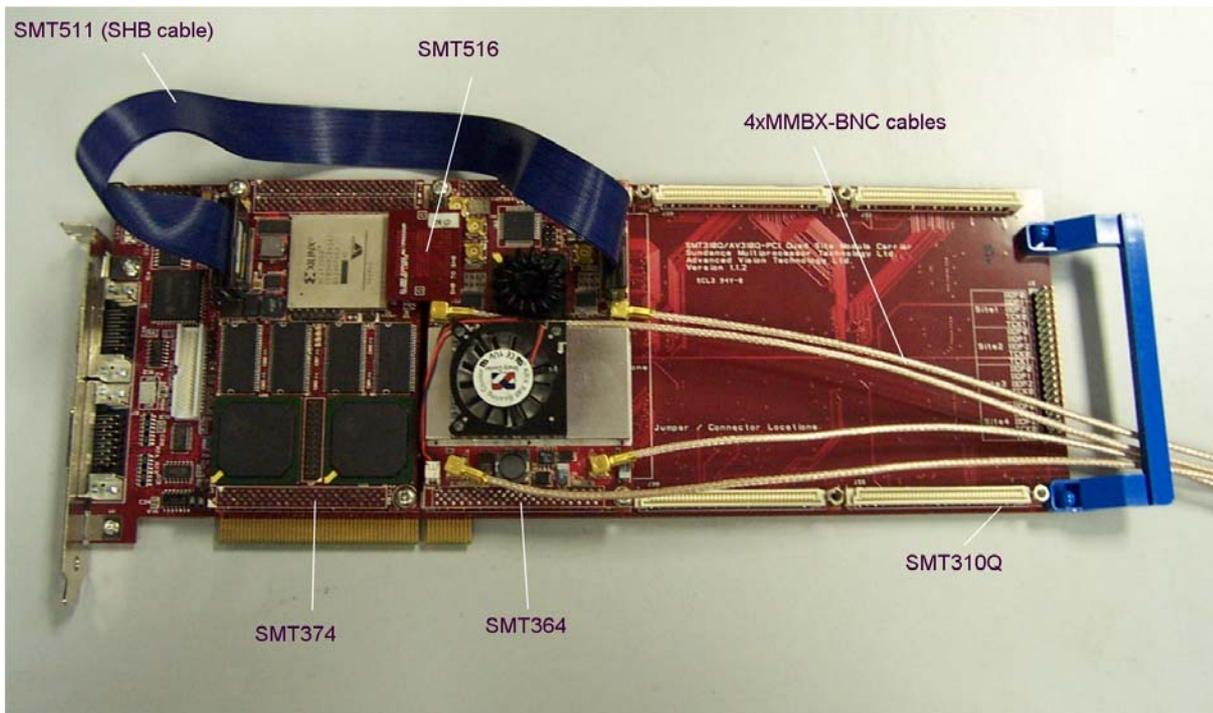
Software applications.

3L application.

In a sub-folder labelled 3L, you will find a C (*Test.c*), a configuration (*Test.cfg*) and a make (*nmake*) files.

In a DOS prompt window, simply type *nmake* to generate the 3L application file, which can be loaded into the *SMT374* by using the 3L Server (3L Diamond needs to be installed first).

This application allows the user to execute simple commands such as configuring the clock synthesizers, capturing data, setting up data paths, etc.

Pegasus application.

The *SMT8047* is also provided with a Pegasus application (*Pegasus* folder), which shows the user the dynamic performance of the system.