SCP1000 FAQ List

1   Introduction

This technical note gives answers to frequently asked SCP1000 related questions. All information related to the SCP1000 usage, operation, register description etc. can be found from the latest version of the document: "**SCP1000 Product Family Specification**" (doc no 8260800). Always when designing a new system for SCP1000, use the latest version of the SCP1000 PFS (SCP1000 Product Family Specification) as a reference. Please notice that there are two different SCP1000 asic versions:

- o B version asic, apply the SCP1000 PFS rev 0.06
- o C version asic (updated version), apply the SCP1000 PFS rev 0.07 or later

The document "TN59 SCP1000 Series ASIC Update" describes the differences between the two asic versions.

All SCP1000 related documentation is available from SCP1000 product pages:
http://www.vti.fi/en/products-solutions/products/pressure-sensors/scp1000-pressure-sensor/

2   SCP1000 FAQ list

Table 1. SCP1000 FAQ (Frequently Asked Questions) list.

ITEM	Prod. type	Problem	Actions	Refer to SCP1000 documentation
1	-D01 -D11	Communication / general operation problems	Check the SCP1000 circuit diagram → SCP1000 requires 3 supply filtering capacitors → check especially DVDDS-pin (pin #7) connection	The latest SCP1000 PFS section 7.2
2	-D01 -D11	Communication / general operation problems	Check the SCP1000 PCB layout → Supply filtering capacitors should be located as close the SCP1000 supply pins as possible	The latest SCP1000 PFS section 7.3
3	-D01 -D11	Communication / general operation problems	Are the soldering joints ok? SCP1000 is not designed for manual soldering. SCP1000 test PCB carrier can be used in application development for example for checking the system functionality.	TN51 SCP1000 Assembly Instructions TN38 SPC1000 Test PCB Carrier
4	-D01 -D11	Performance: Noise / unstable pressure readings	Does MCU wait for the rising edge from DRDY-pin before reading the pressure data?	The latest SCP1000 PFS section 2.2.1 figures 4, 5 section 2.2.2 figure 6
5	-D01 -D11	Performance: Noise / unstable pressure readings	Does MCU read the pressure data fast enough after the DRDY-pin rising edge? There is a certain period of time reserved for the data reading after the DRDY signals the interrupt (see the "Maximum time for servicing the DRDY interrupt")	The latest SCP1000 PFS section 2.2.4 tables 5, 6, 7 and 9
6	-D01 -D11	Performance: Noise / unstable pressure readings	Is the **B version asic** in use? Check the application software that the Low Noise Configuration is performed correctly (requires 3 register writings). If the configuration is not performed: - the noise level is increased - offset may be shifted (absolute pressure reading) - no affect on temperature reading With **C version asic** the Low Noise Configuration has no effect	**B version asic:** SCP1000 PFS **rev 0.06** section 2.1 figure 2 (phase 3) TN59 SCP1000 Series ASIC Update
7	-D01 -D11	Performance: Noise / unstable temperature readings	Apply the 2's complement conversion in to software. If the 2's complement conversion is not applied, the temperatures below 0°C are not converted correclty.	The latest SCP1000 PFS sections 2.2.3 and 2.2.3.1

ITEM	Prod. type	Problem / symptom	Actions	Refer to SCP1000 documentation
8	-D01 -D11	Problems in reading 16 bit registers (TEMPOUT or DATARD16)	With –D01 (SPI): Check the communication waveforms and that there are correct number of SCK pulses. Check that CSB is pulled up after each communication frame With –D11 (TWI): Check the communication waveforms and that there are correct number of SCL pulses. Check that the MCU acknowlegdes (=not ack) after the SCP1000 sends the data	The latest SCP1000 PFS section 4.1 (SPI) section 4.2 (TWI)
9	-D01	SPI communication problems	Check that CSB is pulled up to '1' after each communication frame. CSB is '1' also, when there is no communication with the SCP1000	The latest SCP1000 PFS section 4.1 (SPI)
10	-D01	SPI communication problems	Check that: - MCU reads / samples the bits from MISO line on correct edge of the SCK pulse - MCU writes the bits to MOSI line on correct edge of the SCK pulse	The latest SCP1000 PFS section 4.1 (SPI)
11	-D01	SPI communication problems	If DVDDS is connected to VDD, MOSI pin seems to be loaded by SCP1000	The latest SCP1000 PFS section 7.2
12	-D01 -D11	SPI communication problems: SCP1000 in SPI bus with other slave devices.	With **B version asic** the MISO-pin has to be configured to open drain mode (MISO configuration requires 3 register writings) and a pull-up resistor is required between the pins MISO and DVDD. SCP1000 REVID register is read in order to release the MISO line. When using **C version asic** the SCP1000 MISO pin does not require any configurations.	**B version asic:** SCP1000 PFS **rev 0.06** section 4.1.2 TN59 SCP1000 Series ASIC Update
13	-D11	TWI communication problems	Check the TWI waveforms. Notice that 'Restart' bit can not be replaced by separate "Stop" and "Start" bits (SCP1000 requires the restart bit and it has to be only a Start bit (without a stop bit before it).	The latest SCP1000 PFS section 4.2.1
14	-D11	TWI address	The SCP1000 TWI address can be changed by updating the register TWIADD. The register content is set to the default value (0x11) always after start-up, asic reset or power down mode.	The latest SCP1000 PFS section 3.2
15	-D01 -D11	SCP1000 does not start-up after asic reset	At least 150ms delay is required after asic reset, follow the start up sequence.	The latest SCP1000 PFS figure 2
16	-D01 -D11	Power down mode	The **B version asic** drives all digital output pins actively to zero when it is set in to Power Down mode. When using **C version asic**, all the digital output pins tri-state in power down mode.	**B version asic:** SCP1000 PFS **rev 0.06** section 2.6.1 (-D11, TWI) section 2.6.2 (-D01, SPI) TN59 SCP1000 Series ASIC Update
17	-D01 -D11	DRDY-pin connection	It is strongly recommended that DRDY pin is connected to the MCU. If DRDY pin is not connected, the MCU has to poll the STATUS register to detect the DRDY state if refreshed data is available. The refreshed data is allowed to be read out from the SCP1000 only after the DRDY interrupt signal, and the data has to be read within the specified time frame, see items 4 and 5 above.	The latest SCP1000 PFS section 2.3
18	-D01 -D11	How SCP1000 can be mounted and sealed in application?	SCP1000 can be mounted for example in to a round pressure port. There is a multi-functional sealing solution (I-seal gasket) available for the SCP1000.	TN57 Mounting and Sealing of the SCP1000 Pressure Sensor
19	-D01 -D11	Is there a flex print design for SCP1000?	SCP1000 can be assembled on a flex print (flexible PCB), reference design in SCP1000 documentation	The latest SCP1000 PFS section 7.6
20	-D01 -D11	Can SCP1000 used as an altimeter?	SCP1000 is an ideal component for altimeter use	AN33 SCP1000 Pressure Sensor as barometer and altimeter
21	-D01 -D11	Is there an evaluation kit for SCP1000?	The SCP1000 demo kit can be used as an evaluation/development kit. It supports all SCP1000 product types (both SPI and TWI) and the user has full SCP1000 register access as well as data logging capabilities	See SCP1000 demo kit link from SCP1000 product pages
22	-D01 -D11	How can I easily contact to SCP1000?	There are SCP1000 test PCBs (chip carrier PCBs) available.	TN38 SPC1000 Test PCB carrier rev1.1
23	-D01 -D11	Is there a reference code for SCP1000?	There is a C-code reference for SCP1000-D01 available.	TN46 C-code example for SCP1000-D01
24	-D01 -D11	Over pressure (OVP)	Over pressure functionality is removed from SCP1000 (from both B and C version asics)	
25	-D01 -D11	Can two SCP1000 demo kits used simultaneously?	Yes, two SCP1000 demo kits can be used simultaneously on one PC.	See the latest version of the SCP1000 Demo Kit User Manual, section 6.

3 Document Revision History

Revision	Date	Change Description
0.1	25.01.2007	First release
0.2	05.02.2007	Typos corrected, question of using two demo kits simultaneously added