

The System Configuration Interface On Toshiba Laptops

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1 Overview

The System Configuration Interface (SCI) is a software interface that allows applications to read or setup configurations on Toshiba portable computers. It aims to conceal differences in hardware between different models from the software.

The System Configuration Interface is implemented using the System Management Mode (SMM) of the Intel processor. To call the SCI the necessary registers are loaded with the values to indicate what function we wish to ask and a value is then read from port B2h. On reading from port B2h the SMM mode of the processor is enabled, whatever function requested is carried out and execution of the software

The calls to the SCI can take place at *any* time and in whatever mode the processor happens to be in at the time i.e. real, protected, virtual8086 etc. While a call to the SCI is in progress all other functions of the processor are queued pending completion of the call. This includes all maskable and non-maskable interrupts.

2 General

With the SCI the calling software can check whether SCI is implemented or not on a target machine. Read the current configuration, and/or set a new configuration. They can also set the default configuration. The caller must first open the interface to the SCI before reading or setting the current configuration and close the interface after it has finished. This enables the caller to ensure it has exclusive access to the SCI, as when the interface is open further request to open the interface will fail.

When the reading the current configuration, you can also get all possible configurations on the target system, if it is possible to change the configuration and whether any change will require a reboot before it takes effect.

3 Interface

Reading a byte from port B2h into the AL register activates the interface. The function that is then executed depends on the value held in the AX register, according to the following list.

- F000h Support Check
- F100h Open Interface
- F200h Close Interface
- F300h Get System Configuration
- F400h Set System Configuration
- F500h Set Default Configuration

3.1 Support Check

This function allows the caller to determine if the system's BIOS supports the SCI functionality and if so which version is supported.

Call:

AX = F000h

Return successful:

CF = 0

AX = 0044h

DH = major version number

DL = minor version number

Return unsuccessful:

CF = 1

AH = 86h - SCI not present

3.2 Open Interface

This function opens the SCI interface and allows the calling program to start getting and setting the system configuration. If another program has already opened the SCI interface this function will return with the carry flag set and ah=81h. To ensure that software has exclusive access to the SCI programs should halt at this point. After this function has been called, the Close, Get, Set and Default SCI calls are activated.

Call:

AX = F100h

Return successful:

CF = 0

AX = 0044h

Return unsuccessful:

CF = 1

AH = 81h - Interface already opened

86h - SCI not present

3.3 Close Interface

When a program has finished getting or setting the system configuration it should call this function. Until the interface has been closed other programs will be unable to open the SCI and will be locked out. After this function has been called, the Close, Get, Set and Default SCI calls are disabled.

Call:

AX = F200h

Return successful:

CF = 0

AX = 0044h

Return unsuccessful:

CF = 1

AH = 82h - Interface not opened

86h - SCI not present

3.4 Get System Configuration

This returns the current system configuration information. The configuration required is selected by placing the configuration code in the BX register. Due to the nature by which this document was compiled it is unlikely that all possible configuration codes are covered.

The **attribute** returned in AL shows extra information of specified function, such as indicating whether or not modification of system configuration is valid only after system reboot. The **data type** returned in BX defines the format of data stored in **current setting** in CX register and **possible settings**

in DX register. The **possible settings** shows the range of valid settings on the target machine. The SI register holds the factory default for configuration, and the value it will be set to if the Default SCI call is made.

Call:

AX = F300h

BX = configuration code

Return successful:

CF = 0

AH = 00h

AL = attribute

BX = data type

CX = current setting

DX = possible settings

SI = default setting

Return unsuccessful:

CF = 1

AH = 80h - Function not supported

82h - Interface not opened yet

86h - SCI not present

8Eh - Device not installed

3.5 Set System Configuration

This function sets a new system configuration. The new configuration is selected by placing the configuration code in the BX register, and the setting in the CX register. Due to the nature by which this document was compiled it is unlikely that all possible configuration codes are covered. The **attribute** returned in AL indicates if whether the system needs rebooting before the new configuration takes effect.

Call:

AX = F400h

BX = configuration code

CX = new configuration to be set

Return successful:

CF = 0

AH = 00h

AL = attribute

BX = data type

CX = current setting

DX = possible settings

SI = default setting

Return unsuccessful:

CF = 1

AH = 80h - Function not supported

82h - Interface not opened yet

83h - Input data error

84h - Write Protect error

86h - SCI not present

8Eh - Device not installed

3.6 Set Default Configurations

This function sets *all* system configuration parameters to their default values and updates the CMOS. There is no way to set individual configurations to their default values.

Call:

AX = F500h

Return successful:

CF = 0

AH = 00h

AL = 01h

Return unsuccessful:

CF = 1

AH = 82h - Interface not opened

86h - SCI not present

86h - SCI not present

Set

Call:

BX = 0100h

CX = 0000h - Boot mode

0001h - Resume mode

0002h - Hibernation mode

0003h - Quick Hibernation mode

Return successful:

CF = 0

AH = 00h

Return unsuccessful:

CF = 1

AH = 80h - Function not supported

82h - Interface not opened

83h - Input data error

86h - SCI not present

4 Data Types

5 Configuration Codes

5.1 Power-Up Mode

This setting controls the the power up mode of the computer is boot or suspend/resume (Case 1). On models that support hibernation it also controls whether the power up mode is Hibernation or Quick Hibernation (Case 2).

Get

Call:

BX = 0100h

Return successful Case 1:

CF = 0

AH = 00h

BX = 0000h - Binary data type

CX = 0000h - Boot mode

0001h - Resume mode

SI = default setting

Return successful Case 2:

CF = 0

AH = 00h

BX = 8009h - Power up mode type

CX = 0000h - Boot mode

0001h - Resume mode

0002h - Hibernation mode

0003h - Quick Hibernation mode

SI = default setting

Return unsuccessful:

CF = 1

AH = 80h - Function not supported

82h - Interface not opened

5.2 Alarm Power On (Date)

5.3 Alarm Power On (Time)

This function controls the time of the alarm power on function. If the system supports **Disable** and **Enable (hh:mm)** it returns DX=0FFFh. When setting the time it updates the CMOS checksum after storing the new configuration in the CMOS RAM

Get

Call:

BX = 010Fh

Return successful:

CF = 0

AH = 00h

BX = 8004h - Time data type

CX = the current mode

DX = possible modes

SI = default setting

Return unsuccessful:

CF = 1

AH = 80h - Function not supported

82h - Interface not opened

86h - SCI not present

Set

Call:

BX = 012Dh

CX = new configuration

Return successful:

CF = 0

AH = 00h

Return unsuccessful:

CF = 1
AH = 80h - Function not supported
82h - Interface not opened
83h - Input data error
86h - SCI not present

SI = default setting

Return unsuccessful:

CF = 1
AH = 80h - Function not supported
82h - Interface not opened
86h - SCI not present

5.4 Hibernation Mode

This setting controls whether the hibernation mode is enabled or disabled.

Get

Call:

BX = 012Dh

Return successful:

CF = 0
AH = 00h
BX = 0000h - Binary data type
CX = 0000h - Disabled
0001h - Enabled

Set

Call:

BX = 012Dh
CX = 0000h - Disable
0001h - Enable

Return successful:

CF = 0
AH = 00h

Return unsuccessful:

CF = 1
AH = 80h - Function not supported
82h - Interface not opened
83h - Input data error
86h - SCI not present