This document contains information on the SMBus Smart Battery Emulator Software including equipment setup and use.
DISCLAIMER: Micro Computer Control Corporation makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Further, Micro Computer Control Corporation reserves the right to revise the product described in this publication and to make changes from time to time in the content hereof without the obligation to notify any person of such revisions or changes.

WARNING - Life Support Applications: MCC products are not designed for use in life support appliances, devices, or systems where the malfunction of the product can reasonably be expected to result in a personal injury.

WARNING - Radio Frequency Emissions: This equipment can radiate levels of radio frequency energy that may cause interference to communications equipment. Operation of this equipment may cause interference with radio, television, or other communications equipment. The user is responsible for correcting such interference at the expense of the user.

WARNING - Electrostatic Discharge (ESD) Precautions: Any damage caused by Electrostatic Discharge (ESD) through inadequate earth grounding is NOT covered under the warranty of this product. See the “Electrostatic (ESD) Precautions” section of this guide for more information.

Printed in the United States of America

13-NOV-06
WARNING
SMBus TIMING VIOLATIONS

As a Windows based application, the SMBus Smart Battery Emulator Software cannot meet all message timing requirements as stated in the System Management Bus specifications.

In particular, reading SMBus Smart Battery Data from the Smart Battery Emulator software will violate the TTIMEOUT and TLOW:SEXT maximum limits of 25 milliseconds. Depending on your system configuration and concurrent processing activity, TTIMEOUT and TLOW:SEXT with the Smart Battery Emulator Software may exceed 150 milliseconds.

Use of the SMBus Smart Battery Emulator Software requires that timing requirements be suspended during message testing activities.

NOTICE

This software is not intended for the validation of compliance with SMBus or Smart Battery Data Specifications.

Reference Specifications:

System Management Bus Specification Revision 1.0
Smart Battery Data Specification Revision 1.0
The SMBus Smart Battery Emulator Software is designed to emulate SMBus Smart Battery communications, enabling the user to exercise SMBus devices by easily changing Smart Battery Data, and automating sequences of such data.

The program consists of a main screen, used to display, enter and save Smart Battery Data, and a Frame Sequencer, used to automatically step the emulator through a series Smart Battery Data frames that model changing battery conditions over time.

**System Requirements:**

1. MCC iPort (# MIIC-201) or iPort DLL/USB (#MIIC-201D/U) Windows to I²C Bus Host Adapter.
2. SMBus Smart Battery host or charger device with interfacing cable.
3. Windows 95 or above for RS-232 support. Win2K, XP or above for USB support.
4. One serial communications port (RS-232 or USB).

**Installation:**

1. Insert the installation CD.
2. If installation does not automatically start, run setup.exe.
3. Follow instructions on screen.

**Equipment Setup:**

1. Connect iPort Host Adapter to a ComPort or USB port.
2. Connect iPort Host Adapter to target SMBus Smart Battery host or charger device. (See suggested setup above)

**Note:**

When connected to an SMBus Smart Battery system, the Pull-Up switch on the iPort Host Adapter should be OFF, and external Pull-Up resistors (approximately 15K Ohm) should be applied to the \( \text{i}^{2}\text{C} \) Clock and Data lines.

3. If using an RS-232 to \( \text{i}^{2}\text{C} \) adapter, apply power to the adapter. (See iPort User’s Guide)

**To Start Program:**

Click Start | Programs | Smart Battery Emulator 2.0 | Smart Battery Emulator.

**To communicate with SMBus Smart Battery devices:**

1. Select the COM port connected to the iPort Host Adapter.
2. Set the Smart Battery parameters by, a) enter parameters on main screen, b) load a previously saved parameter frame file, or c) configure and start the frame sequencer.

3. Click the "Go OnLine" button.

The Smart Battery Emulator is now "OnLine", ready to perform SMBus Smart Battery messaging operations.

**Program Controls:**

**Go OnLine/Go Offline Button**

This button controls connection of the Smart Battery Emulator to the SMBus. When "OnLine", the emulator is ready to perform SMBus Smart Battery messaging operations as provided in the Smart Battery Data Specification.

**Using Com List**

Select the communications port connected to the iPort Host Adapter.

**Status Display**

Indicates if the Smart Battery Emulator is ON or OFF the SMBus.

**Charger Display**

Indicates when messages are sent or received from the SMBus Charger device.

**Host Display**

Indicates when messages are sent or received from the SMBus Host device.

**Sequencer Display**

Indicates if the Frame Sequencer is Stopped or Running.
Status Text Box

Displays status information.

Smart Battery Data Text Boxes

These text boxes contain Smart Battery Data that is:

1. Writable data received from another SMBus device.
2. Readable data reported to other SMBus devices.

This data also controls automatic emulator Alarm, Warning, and Data transmission to other SMBus devices (Refer to Smart Battery Data Specifications).

Smart Battery Data may be entered directly into a text box, or modified by clicking the View/Edit button in the lower corner of some boxes.

The current values Smart Battery Data may also be saved to a Frame File for retrieval or replay with the Frame Sequencer.

Menu Controls:

File|New Frame

Used to dis-associate the current Frame file.

File|Open Frame

Used to load an existing Frame file.

File|Save Frame

Used to update the current Frame file.
File|Save Frame As

Used to save current Smart Battery Data to a new Frame file.

File|Exit

Exit the program.

Edit|BatteryMode
Edit|BatteryStatus
Edit|SpecificationInfo
Edit|ManufactureDate
Edit|ManufactureData

Used to pop-up the Viewer/Editor for the specified data.

View|Status

Displays status information log.

Sequencer

Used to pop-up the Frame Sequencer.

Options|Show Hints

Enables/Disables display of Smart Battery parameter information.

Options|Fast Message Mode

Enables rapid transmission of Alarm, Warning, and Data to other SMBus devices. Normally, when CHARGER_MODE is enabled, the Smart Battery Emulator transmits messages at 10 second intervals. Fast Message Mode causes the emulator to send these messages at approximately 2 second intervals. This feature can be used to reduce testing time, and to stress other system devices.
Frame Sequencer

The Frame Sequencer provides a way to automate Smart Battery Emulator operations by playing a sequence pre-recorded Smart Battery Data Frames.

A Smart Battery Data Frame consists of set of Smart Battery Data values displayed on the emulator's main screen. These data values can be saved to a Frame file using the File|Save Frame menu on the main screen.

Typically, multiple Frame files are created. Each Frame represents one step in a battery's condition over a period of time. The Frame Sequencer automates the replay of a series of Frame files over time.

Frame Sequencer Controls:

Frame Grid Control

This spreadsheet-like control is used to display and enter Frame File sequences and timing parameters.
Each row of the Frame Grid Control identifies a Smart Battery Data Frame File saved from the main program screen, and specifies the amount of time the Frame will be active.

To enter or change a Frame File, double click of a Frame File cell to pop-up the file selection dialog box. Once a Frame file is selected, the Time Adjust control can be used to set the frame active time.

**Time Adjust Control**

This control is used to adjust the amount of time the currently selected Frame File is active. When the Frame active time is completed, the Frame Sequencer moves to the next Frame.

**Time Remaining Control**

When the Frame Sequencer is running, this control display the remaining active time for the current Frame.

**Auto Repeat Check Box**

This control directs the Frame Sequencer to restart the sequence upon completion of the current sequence.

**Hide Button**

Hides the Frame Sequencer from view.

**Run Button**

Starts or resumes the current Frame sequence.

**Stop Button**

Stops the current Frame sequence.
Menu Controls:

File|New Sequence

Used to clear the Frame Sequencer.

File|Open Sequence

 Loads a previously stored sequence into the Frame Sequencer.

File|Save Sequence

Updates the current Frame Sequence file.

File Save Sequence As

Creates a new Frame Sequence file.

File|Hide Sequencer

Hides the Frame Sequencer from view.

Run|Run Sequencer

Starts or resumes the current Frame sequence.

Run|Stop Sequencer

Stops the current Frame sequence.

Run|Reset Sequencer

Resets the Sequencer to the first frame in the sequence.

Options|Use Full Pathnames

Instructs the Frame File selector to use full pathnames for Frame Files. When off, the Frame Files must be in the current sub-directory/folder, making it easier to move Frame and Sequence files to another system.
Edit/View Battery Data

You can edit/view the battery data on the main screen, or by clicking on the small buttons you can edit/view selected data in more specific Smart Battery language.
1. Battery Mode

- INTERNAL_CHARGE_CONTROLLER
- PRIMARY_BATTERY_SUPPORT
- CONDITION_FLAG
- CHARGE_CONTROLLER_ENABLED
- PRIMARY_BATTERY
- CHARGER_MODE
- CAPACITY_MODE

OK Cancel

2. Battery Status

Alarms
- OVER_CHARGED_ALARM (1)
- TERMINATE_CHARGE_ALARM (1)
- OVER_TEMP_ALARM (1)
- TERMINATE_DISCHARGE_ALARM (1)
- REMAINING_CAPACITY_ALARM (2)
- REMAINING_TIME_ALARM (2)

1. Sends AlarmWarning() to SMBus Host and Smart Battery Charger.
2. Sends AlarmWarning() to SMBus Host Only.

Status
- INITIALIZED
- DISCHARGING
- FULLY_CHARGED
- FULLY_DISCHARGED

Error Codes
- OK
- Busy
- ReservedCommand
- UnsupportedCommand
- AccessDenied
- Overflow/Underflow
- BadSize
- UnknownError

OK Cancel
3

Specification Info

Scaling Information

VScale

IPS\nScale

0

0

1

1

SMBus Specification Supported

Version

Revision

3

2

1

0

1

OK

Cancel

4

Manufacture Date

Manufacture Date

Year

Month

Day

1997

1998

5

6

7

8

OK

Cancel
Revision Report:

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-NOV-06</td>
<td>Release SBEMMY V2.0.0</td>
</tr>
<tr>
<td>10-NOV-06</td>
<td>Add ComPort discovery.</td>
</tr>
<tr>
<td>09-NOV-06</td>
<td>Convert to Win32 to support USB-based adapters.</td>
</tr>
<tr>
<td>29-NOV-97</td>
<td>Release SBEMMY V1.10</td>
</tr>
</tbody>
</table>
Direct Comments/Feedback to:

Attn: Product Support
Micro Computer Control Corporation
P.O. Box 275
Hopewell, NJ 08525

Voice - (609) 466-1751
Fax   - (609) 466-4116
Email - info@mcc-us.com
WWW   - http://www.mcc-us.com