# AN49502A Evaluation Software User Manual

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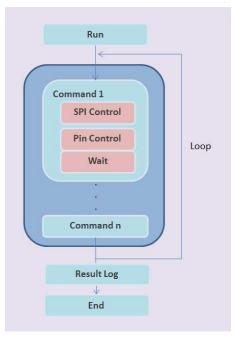
#### 1. Software Overview

AN49502A Evaluation Software is designed for evaluation of Panasonic Battery Monitoring IC AN49502A. The software allows user to evaluate AN49502A with SPI command sequence set by user and also allows user to export the result for reviewing.

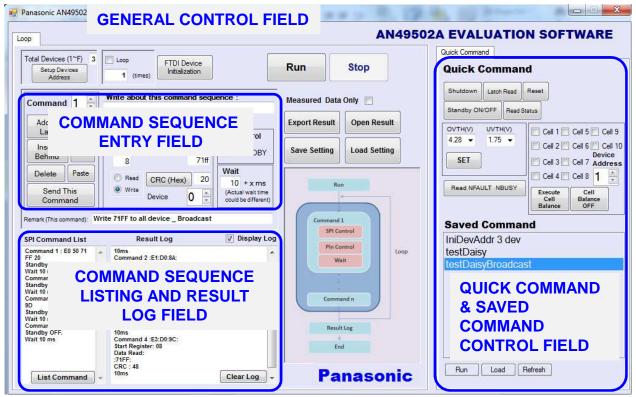
#### 1.1 Features

- Program the SPI command in sequence and execute the sequence repeatedly in loop
  - program a SPI command sequence and execute
  - execute the command sequence repeatedly by loop setting
  - program a wait time between each command
  - Pin control (for Standby ON/OFF) between command
- b. Save and load the programmed command sequence for reusability
  - a programmed sequence can be saved and loaded for reuse
  - remark for each command can be added for quick future reference
- c. Result can be exported for post-processing and reference
  - export result in .csv format for easy access and post-processing
  - data only (converted voltage reading) result can be exported
- d. Quick command for quick access to the IC's function
  - provides quick command with pre-programmed command to IC's function control
- e. Simple command entry with customizable CRC entry
  - user may enter only the register address and data to be written or register address and number of register to be read only, and the software will calculate the CRC code and convert it into AN49502A compatible SPI code
- f. Clear information of command sequence and data read
  - provides clear information of the command sequence to be sent in SPI code so that user understand what is the command exactly sent
  - provide feedback on data read

# **Command Sequence & Loop Concept**



#### 1.2 Software Main Screen



# 1.3 Software Installation and Requirement

#### 1.3.1 Hardware requirement

FTDI MM-FT232H module or equivalent-

This software use FTDI module as conversion device between USB and SPI command to AN49502A

#### 1.3.2 Software installation

#### a. AN49502A Evaluation Software

b. Driver for FTDI MM-FT232H is required.

Plug in the device module and install the driver with the provided driver file or download from

http://www.ftdichip.com/Drivers/D2XX.htm accordingly.

#### 1.4 Connection

- Connect to AN49502A to MM-FT232H module with defined pin configuration
- 2. Connect MM-FT-232H module to PC

# Pin Configuration FTDI MM-FT232H to AN49502A

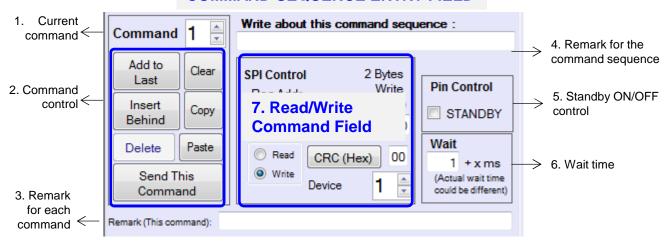
FTDI Port Name	FTDI Function	FTDI MM-FT232H Port	AN49502A
ADBUS0	CLK	TB2-3	CLK
ADBUS1	MOSI	TB2-4	SDI
ADBUS2	MISO	TB2-5	SDO
ADBUS3	CE	TB2-6	SEN
ADBUS4	GPIOL0	TB2-7	STB
ADBUS5	GPIOL1	TB2-8	NFAULT
ADBUS6	GPIOL2	TB2-9	NBUSY
ADBUS7	GPIOL3	TB2-10	-
ACBUS9	GND	TB2-12	GND

.

# 2 Software Function Explanation

#### 2.1 Command Sequence Entry field

# **COMMAND SEQUENCE ENTRY FIELD**



#### **Control Explanation**

- 1. Current command currently editing command
- 2. Command control command control area,
  - Add to Last = add new command after last command
  - Insert Behind = add new command after this command
  - Delete = delete currently editing command
  - Clear = clear currently editing command to default setting
  - Copy = copy currently editing command setting
  - Paste = paste copied setting to currently editing command
  - Send This Command = send only this command to AN49502A
- 3. Remark for each command add remark to each command, (user may add explanation to this command for future reference)
- 4. Remark for command sequence add remark to the command sequence (eg. A title)
- 5. Standby ON/OFF control Set if AN49502A go into standby after current SPI command sent
- 6. Wait time wait time after the SPI command and Standby ON/OFF control in ms

Note: the actual wait time may be different from set value

- 7. Read/Write Command Field
- a. Select checkbox "Write" for write command



Reg Addr(Hex) – register address to write to

2 Bytes Write (Hex) – 2 bytes data to be written

CRC(Hex) button – to calculate CRC code

Device – device number to write to, 0 for broadcast to all

b. Select checkbox "Read" for read command



Reg Addr(Hex) – register address to read from

Read Data < = 128 - number of registers to be read

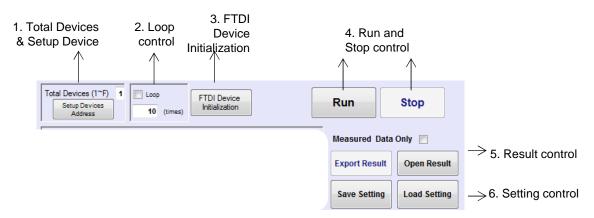
CRC(Hex) button – to calculate CRC code

Device – device number to read from

# 2 Software Function Explanation

#### 2.2 General Control Field

# **GENERAL CONTROL FIELD**



# **Control Explanation**

- Total Devices & Setup Device Total devices number to be input here and click "Setup Devices Address"
- Loop control check the checkbox to enable loop operation and enter the loop repetition times
- FTDI Device Initialization This software use FTDI module between USB and AN49502A, FTDI device will be initialize during start up of this software. However, when FTDI device is reconnected, initialization is required.
- 3. Run and Stop Control Run button start execute the command sequence (with loop set), stop button stop the operation.

# Note; Do not execute other function of this software during run.

5. Result control – Export or open run result (when "Measured Data Only" checkbox checked, only data registers will be exported.)

Note: Do not perform multiple read command in the command sequence if data registers to be output as it may interrupt with the result listing.

6. Setting control – save and load current command sequence (loop data will be saved together with data set in Command Sequence Entry Field)

# 2.3 Command Sequence Listing and Result Log Field

# COMMAND SEQUENCE LISTING AND RESULT LOG FIELD

SPI Command List Field

- By clicking on "List Command" button, the editing command sequence will be listed in\_ this field, it is listed in SPI command.
- During "Run", the list of command sequence will also be listed here.



Result Log Field

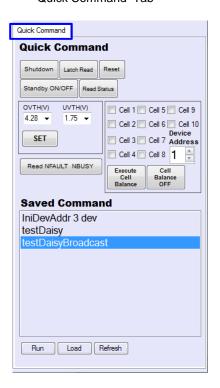
- By clicking on "Display Log" checkbox, the result will be listed in this field after run
- Read data, SPI communication error, CRC error status will be shown, if any.
- By clicking on "Clear Log" button, it clear the Result Log Field
- When the total run command is too many, the "Display Log" will be disabled.

# 2 Software Function Explanation

#### 2.3 Quick Command Control Field

# QUICK COMMAND CONTROL FIELD

Quick Command Tab



#### **QUICK COMMAND Control Explanation**

This software provides some pre-programmed command sequences to control AN49502A which is listed in **Quick Command Control Field**.

For all command except cell balance setting, command will be broadcast to all devices (device address = 0).

Click on any of the quick command, and it will send series of SPI command, and these command will be displayed on the **Result Log Field** so that user can understand the sequence to control AN49502A easily.

The command sequence of quick command will be loaded into **Read/Write Command Field** after button clicked.

Note: In this software, it is trying to provide user with customize control to the IC, it is important for users to take precaution when controlling the IC by themself. For example, two consecutive battery cell shall not be cell balanced at the same time.

Note: These quick command may show only one of the example of control sequence, users are required to modify according to their requirement.

#### SAVED COMMAND CONTROL FIELD

# **SAVED COMMAND Control Explanation**

The settings saved using "Save Setting" button from GENERAL CONTROL FIELD will be listed here.

Button control -

Run - run the selected saved command

Load - load the selected saved command into COMMAND SEQUENCE ENTRY FIELD.

Refresh - rescanned saved command files