MM8118G01RFE Eval Board

MM8118G01 Eval Board is an evaluation board for the purpose of remaining capacity evaluation for Li-ion battery. A current sense resistor and a thermistor is mounted on this board. By using Interface Box and “EvaTool” software for MM8118G01 at the evaluation of Li-ion battery, the user can get Log such as voltage, current and remaining capacity etc., and write the battery parameter and set the other general settings.

Contents

1. Feature

・Intelligent Gauge5 (=Remaining capacity estimation algorithm) installed Eval Board
・Eval Board is able to check and record Remaining capacity easily by the software

1.1 Eval Board Information

Table 1. Supported Battery

Name	Configuration	Battery type	Battery Capacity
MM8118G01 Eval Board	1 Cell	Li-ion	16000mAh or less

1.2 Eval Board Specification

Table 2. Eval Board Specification

Parameter	MIN.	TYP.	MAX.
Input voltage B+ to B- and P+ to P-	2.5V	-	5.5V
Input voltage range of I/O pin (SDA/SCL/HDQ)	-0.3V	-	VDD+0.3V
Charge / Discharge current P+ to P-	0.0A	1.0A	3.0A
Current sense resistor	-	5mΩ	-

2. Eval Board Connections

2.1 Connection example to Eval Board

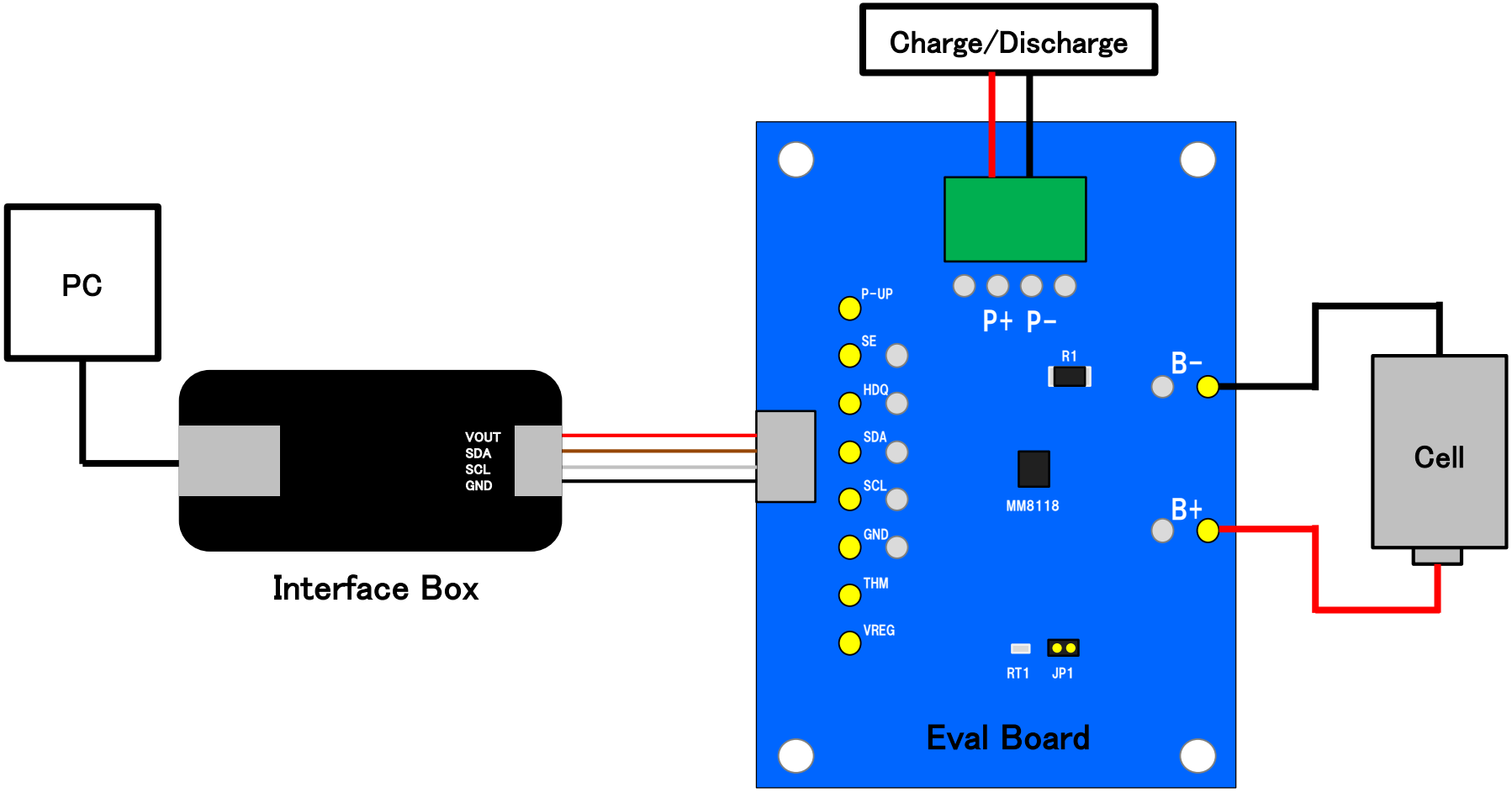

Figure 1. Eval Board Connection

2.2 Pin Descriptions

Table 3. Eval Board Pin

Name	Description
B+	Cell+ terminal
B-	Cell− terminal
P+	Pack+ terminal
P-	Pack− terminal
VREG	Regulator output terminal
THM	Thermistor input terminal
SDA	I2C data input/output terminal
SCL	I2C clock input/output terminal
HDQ	General purpose output terminal
SE	General purpose output terminal
P-UP	External power input terminal for pull−up ※If you use External power for Pull−up, please mount 1KΩ resistor on R13 (HDQ) or R14 (SE).

Please refer to MM8118G01RFE specification for each terminal ratings.

3. Eval Board Layout

3.1 Layout and Bill of Materials

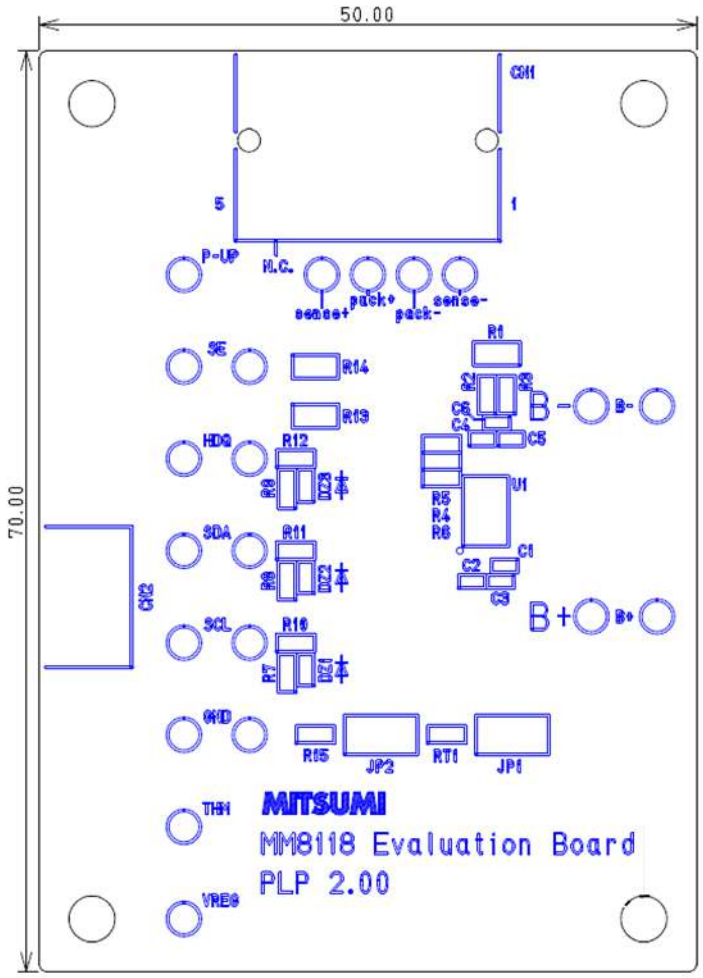

Figure 2. Eval Board Layout

Table 4. Bill of Materials

Symbol	Value
C1	0.47µF
C2	1.0µF
C3,C4,C5,C6	0.1µF
R1	5mΩ
R2,R3,R4,R5,R6 R10,R11,R12,	100Ω
R7,R8,R9	1MΩ
RT1	10kΩ
DZ1,DZ2,DZ3	Breakdown voltage Min. 5.8V

3.2 Eval Board Schematic

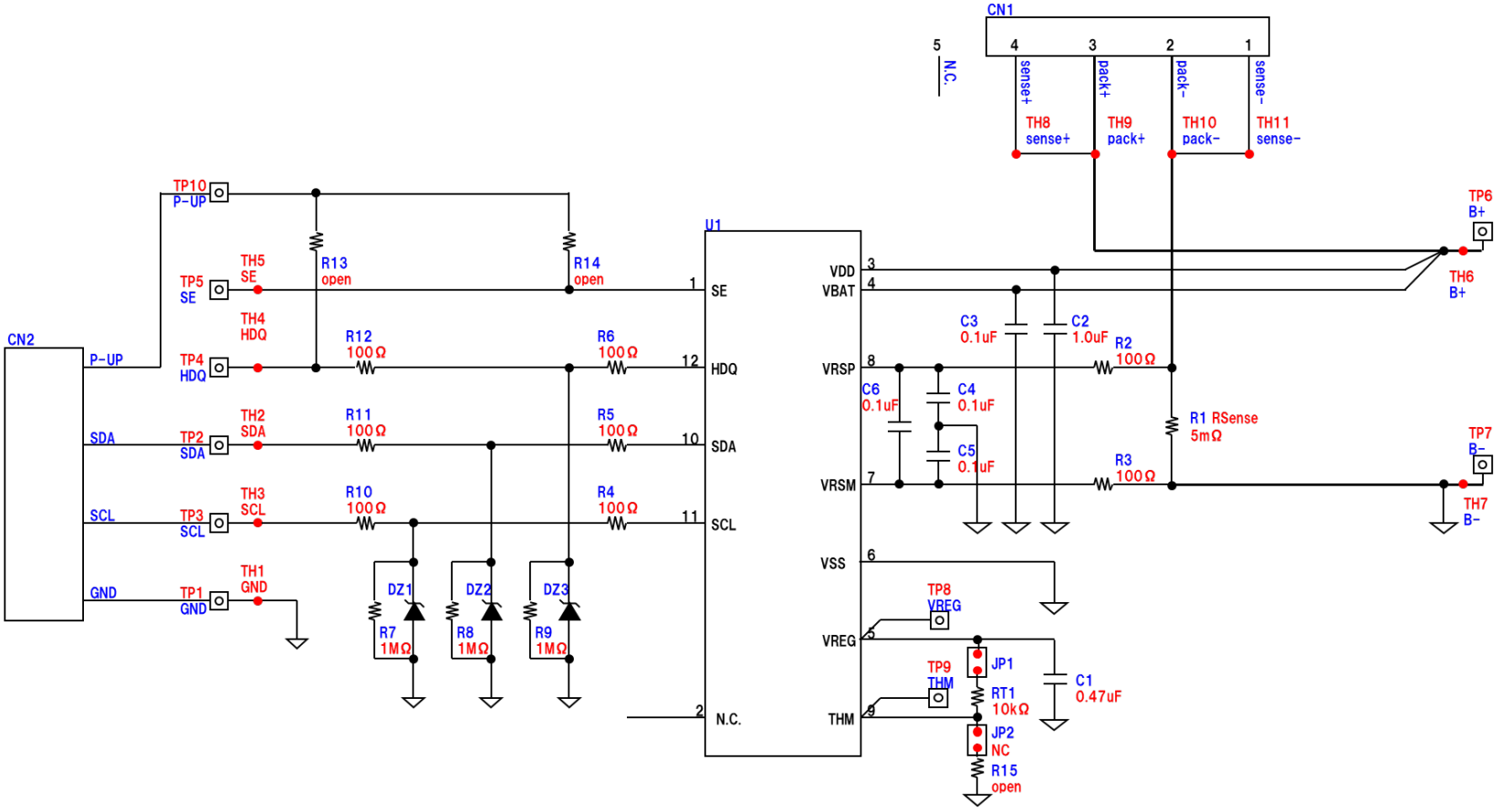

Figure 3. Eval Board Schematic

4. Software

4.1 EvaTool

The user can evaluate easily by using the software (EvaTool) which controls MM8118G01 to check the voltage/current/remaining capacity/etc. of MM8118G01 and to store Log data and to execute each sensor Calibration.
Please contact us to obtain EvaTool.

4.2 Ready to use EvaTool

1. Download VCP driver of FTDI Chip, and install it to the PC.
2. Connect the USB cable to the Interface Box and the PC.
3. Run EvaTool.
4. Select「MM8118G01_EvaTool」in「Target Selection Wizard」window. (Figure 4)
5. The main screen of EvaTool appears. (Figure 5)

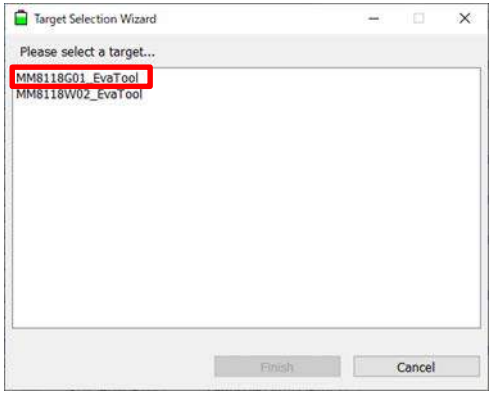

Figure 4. Target Selection Wizard

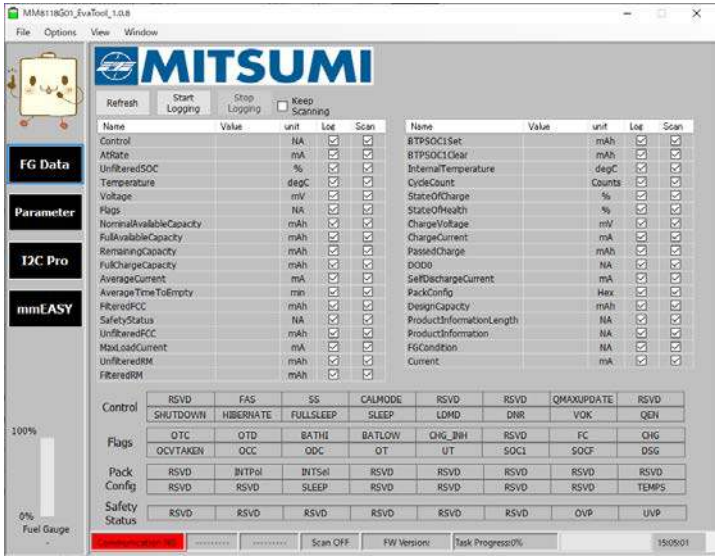

Figure 5. EvaTool main screen

4. Software

4.3 Communication to Eval Board

1. Connect Interface Box and Eval Board. (refer to P.4)
2. Click「I2C Pro」=>「Port Scan」in order and select the COM number, then click「Connect」. (Figure 6)
3. Click「FG Data」=>「Refresh」in order.
4. When the communication is successful, the current data is displayed in Value. (Figure 7)

※Refer to the document below for more detail.
「MM8118_AN030_StandardEvaluationKit_QuickStartGuide_rev1.●.pdf」

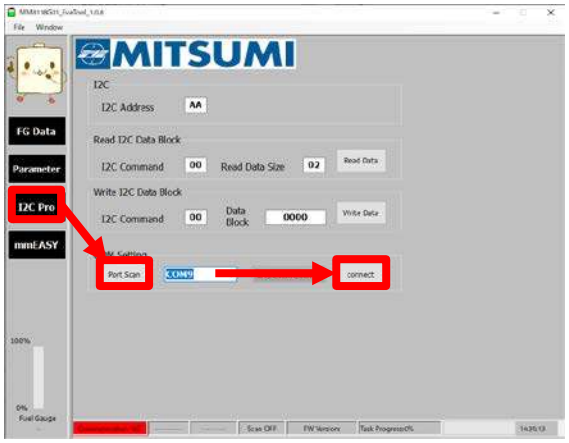

Figure 6. I2C Pro screen

4.4 EvaTool Basic Operation

Refresh : update data once
Start Logging : start to save Log continuously with any interval
Stop Logging : stop to save Log
Keep Scanning : update data continuously with any interval
「Option」=>「Set Scan And Logging Interval」 : set the interval of data update 「0ms～600000ms」

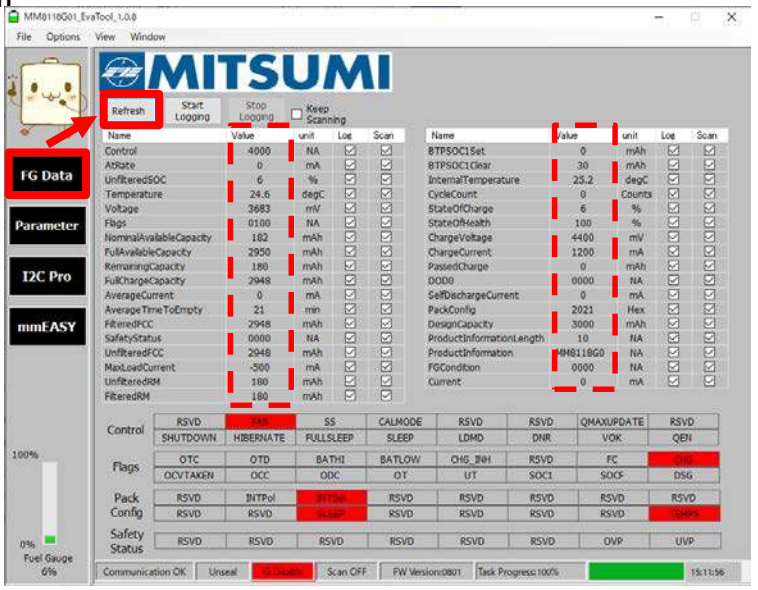

Figure 7. FG Data screen

4.5 Check Battery Parameter Data

1. Click「Parameter」=>「Read All」in order
2. Battery Parameter data which is written in MM8118G01 is displayed in Value column.

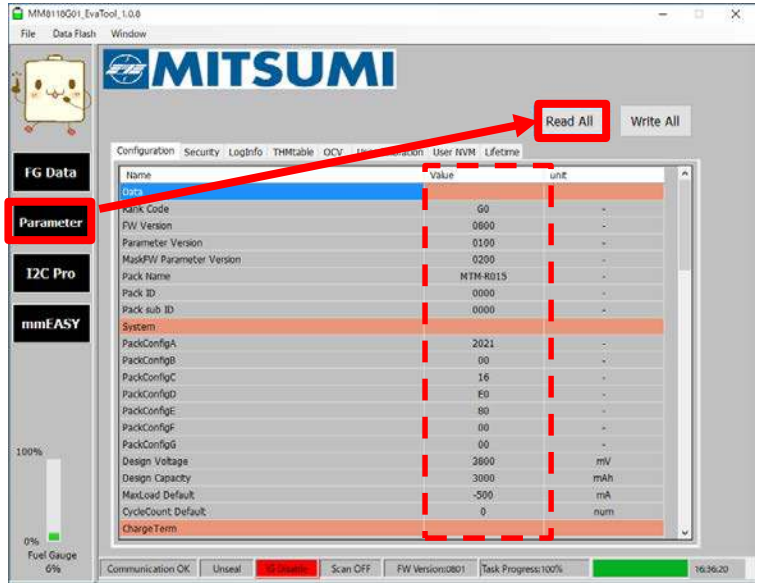

Figure 8. Battery Parameter data check

4.6 Make Battery Parameter

If the actual use battery and battery parameter condition is different in MM8118G01, the accuracy of remaining capacity gets worse.

The user can make battery parameter easily by using the software「ParameterEditor」from the basic data of the use battery.

The accuracy of remaining capacity improves by writing the made battery parameter to MM8118G01 using EvaTool.

Please contact us to obtain「ParameterEditor」and please refer the document below for「ParameterEditor」usage.
「MM8118_AN031_ParameterEditorToolGuide_rev1.●.pdf」.

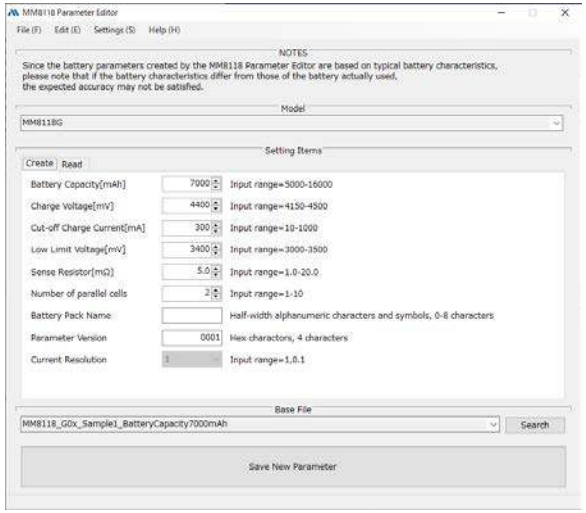

Figure 9. ParameterEditor screen

4.7 Write Battery Parameter

To write battery parameter, follow the steps below. (Figure 10)

1. Click「mmEASY」
2. Drag and drop the battery parameter file made by「ParameterEditor」in「Step 1」area, or click「Browse」and select it.
3. If you want to start the evaluation right after the battery parameter write finished, check「IG_Enable set」.
4. Click「Write」.

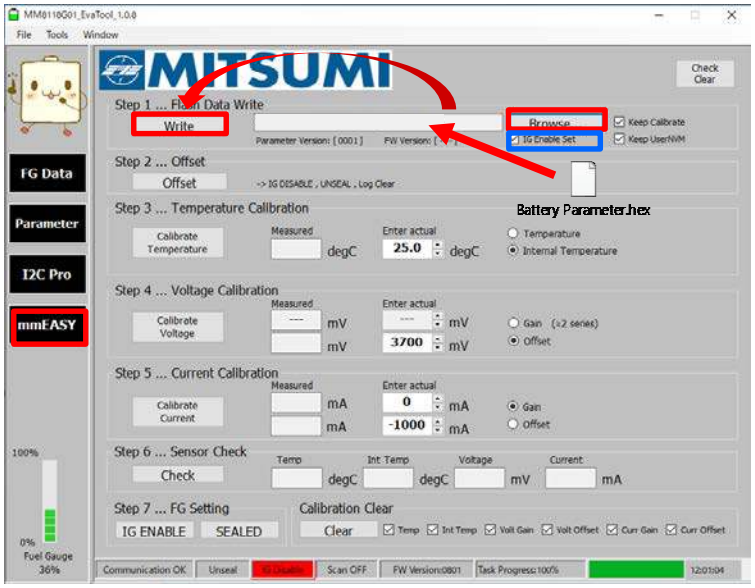

Figure 10. Battery Parameter Write

4.8 Each Sensors Calibration

MM8118G01 has voltage sensor, current sensor, IC temperature sensor and thermistor, and needs Calibration (adjustment) for these sensors.

Please refer the document below for the calibration procedure.
「MM8118_AN030_StandardEvaluationKit_QuickStartGuide_rev1.●.pdf」

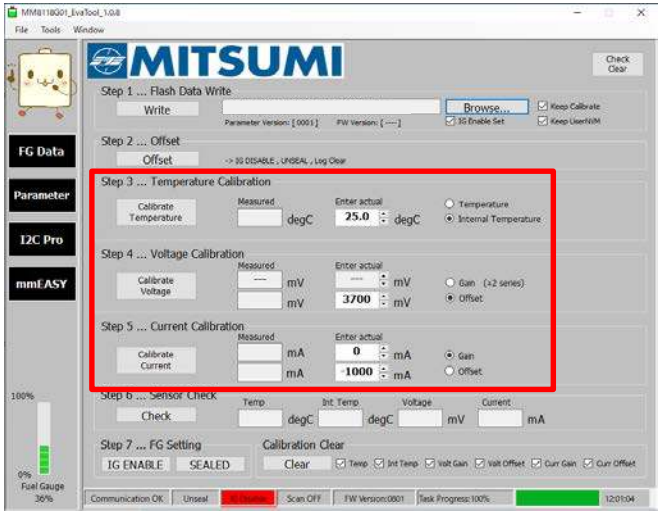

Figure 11. Calibration

5. NOTES

【Safety Precautions】

・Though Mitsumi Electric Co., Ltd. (hereinafter referred to as "Mitsumi") works continually to improve our product's quality and reliability, semiconductor products may generally malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of this product could cause loss of human life, bodily injury, or damage to property, including data loss or corruption. Before customers use this product, create designs including this product, or incorporate this product into their own applications, customers must also refer to and comply with (a) the latest versions or all of our relevant information, including without limitation, product specifications, data sheets and application notes for this product and (b) the user's manual, handling instructions or all relevant information for any products which is to be used, or combined with this products. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications. Mitsumi assumes no liability for customers' product design or applications.

・This product is intended for applying to computers, OA units, communication units, instrumentation units, machine tools, industrial robots, AV units, household electrical appliances, and other general electronic units.

【Precautions for Product Liability Act】

・No responsibility is assumed by us for any consequence resulting from any wrong or improper use or operation, etc. of this product.

【ATTENTION】

・This product is designed and manufactured with the intention of normal use in general electronics. No special circumstance as described below is considered for the use of it when it is designed. With this reason, any use and storage under the circumstances below may affect the performance of this product. Prior confirmation of performance and reliability is requested to customers.

Environment with strong static electricity or electromagnetic wave
Environment with high temperature or high humidity where dew condensation may occur

・This product is not designed to withstand radioactivity, and must avoid using in a radioactive environment.

・This specification is written in Japanese and English. The English text is faithfully translated into the Japanese. However, if any question arises, Japanese text shall prevail.