
On-Board Writing Tool for ML22Q54/Q58 User's Manual

Spt 22, 2006

INTRODUCTION

Thank you for purchasing the On-Board Writing Tool for ML22Q54/Q58 (referred to as Writing Tool). The Writing Tool is for writing binary data for the ML22Q54/Q58 created with the ML2250 Control Kit (or the AR207) into the ML22Q54/Q58 that has been installed in a customer-developed board. Please read this manual carefully to make the best use of the Writing Tool.

CAUTIONS

The hardware, software, and manual that comprise this product may not be replicated in part or whole without prior permission.

We have made the utmost effort to ensure the integrity of this product's contents, but if you have any enquiries, please contact the retailer from where the product was purchased.

We cannot accept any responsibility for the consequences of the operation of this product for any reason.

Also, please note that the product names stated in this manual are registered trademarks of their respective companies.

SYSTEM CONFIGURATION

Operating system

Windows 2000 or XP

CPU

Intel Pentium II 233 MHz or higher

Memory

256 Mbytes or more

Disc drive

- CD-ROM drive for installation
- HDD

PROGRAM INSTALLATION METHOD

Insert the CD-ROM into the drive, and use the Windows “Explorer” etc to display the disc contents.

Start installation by double-clicking “Install.exe”.

Thereafter, follow the installer instructions.

DRIVER INSTALLATION METHOD

The explanation of the driver installation method has been omitted here.

Since users of the Writing Tool are assumed to be owners of the ML2250 Control Kit or the AR207, refer to the driver installation method described in the user’s manual of them.

HOW TO START UP THE PROGRAM

Select [ML22Q54/Q58 On-Board] – [Wrt22Q58] from the start menu. This will open the “ML22Q58 On Board Writing” window.

WRITING TOOL SPECIFICATION

Board size:	120 mm long x 110 mm wide x 30 mm thick
Operating environment:	Operating temperature range: 10°C to 40°C; Humidity: Up to 85%, non-condensing
Current consumption:	250 mA (Max.) per unit (*1)
Supply current:	3.3 V / 150 mA per unit (*1)
Data transfer rate:	ML22Q54: Approx. 80 sec. ML22Q58: Approx. 150 sec.
Writing time:	ML22Q54: Approx. 20 sec. ML22Q58: Approx. 40 sec. (Including the erase/verify time)

*1: The attached AC adapter can supply up to 2 A. If the total of board’s self current consumption and the supply current required exceeds 2 A, prepare a power supply separately and make it supplied to the customer’s board.

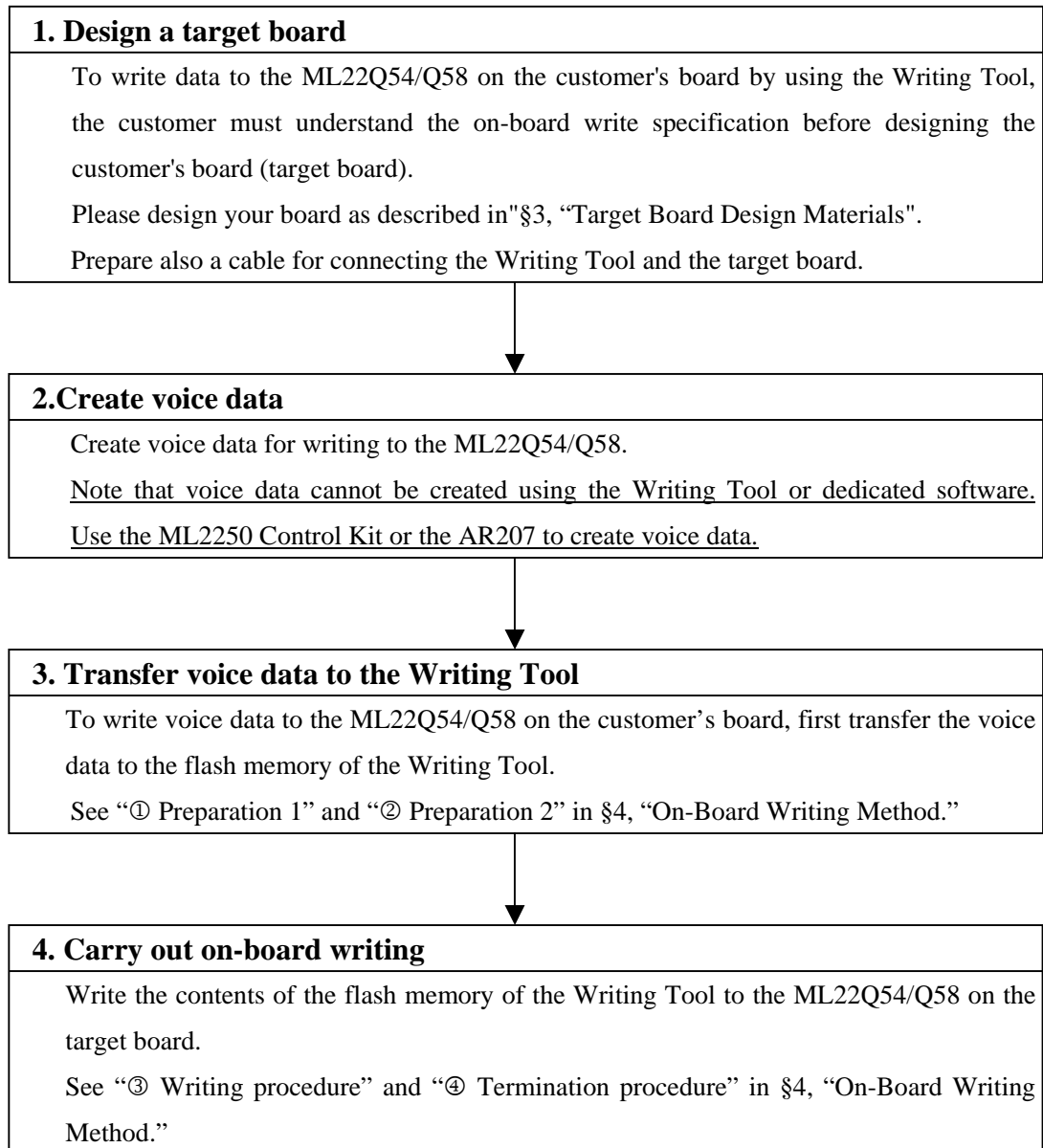
PREREQUISITE FOR USING THE WRITING TOOL

In order to achieve on-board writing using the Writing Tool, it is necessary to design the customer’s board by tailoring it to the Writing Tool. For the design conditions, see §3, “Target Board Design Materials.”

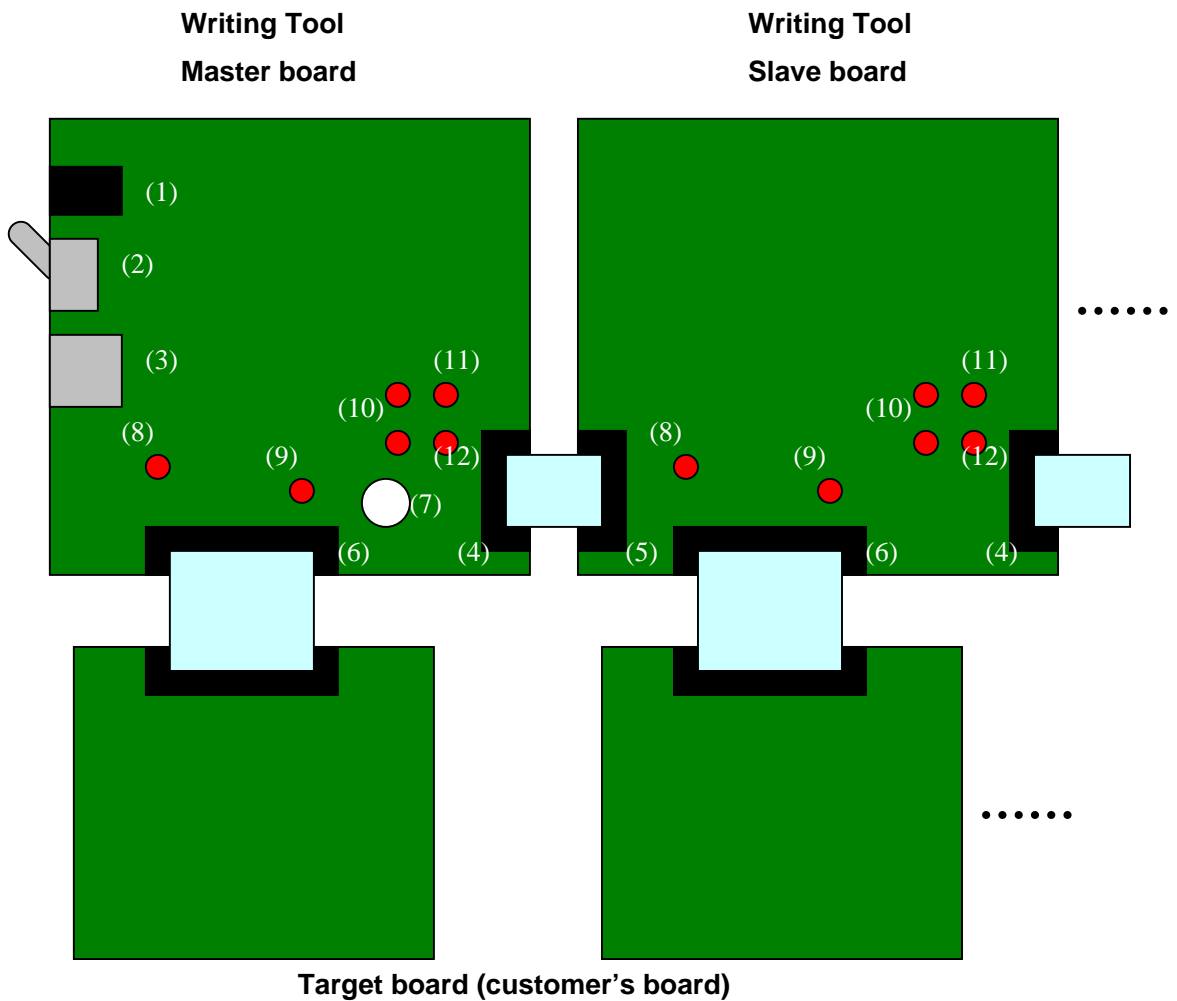
Users of the Writing Tool must also have a full understanding of the ML22Q54/ML22Q58. So they are strongly encouraged to refer to the data sheet of the ML22Q54/ML22Q58. (For the data sheet, please contact your nearest Oki distributor.)

§1. OPERATION FLOW USING THE WRITING TOOL

The main operational flow of writing to the ML22Q54/Q58 on the customer's board using the Writing Tool is shown below.



§2. CONNECTED VIEW OF BOARDS



- (1) AC adapter connector (Silk-screened as J2)
- (2) Power supply switch (S1)
- (3) USB connector (J1)
- (4) Connector 1 for slave board connection (CN3)
- (5) Connector 2 for slave board connection (CN2)
- (6) Connector for target board connection (CN1)
- (7) Write start switch (PROGRAM)
- (8) Link /Power LED (LNK/PWR)
- (9) Target LED (TARGET)
- (10) Data size LEDs (DT1, DT2)(two LEDs per board)
- (11) Erase LED (ERASE)
- (12) Verify LED (VERIFY)

§3. TARGET BOARD DESIGN MATERIALS

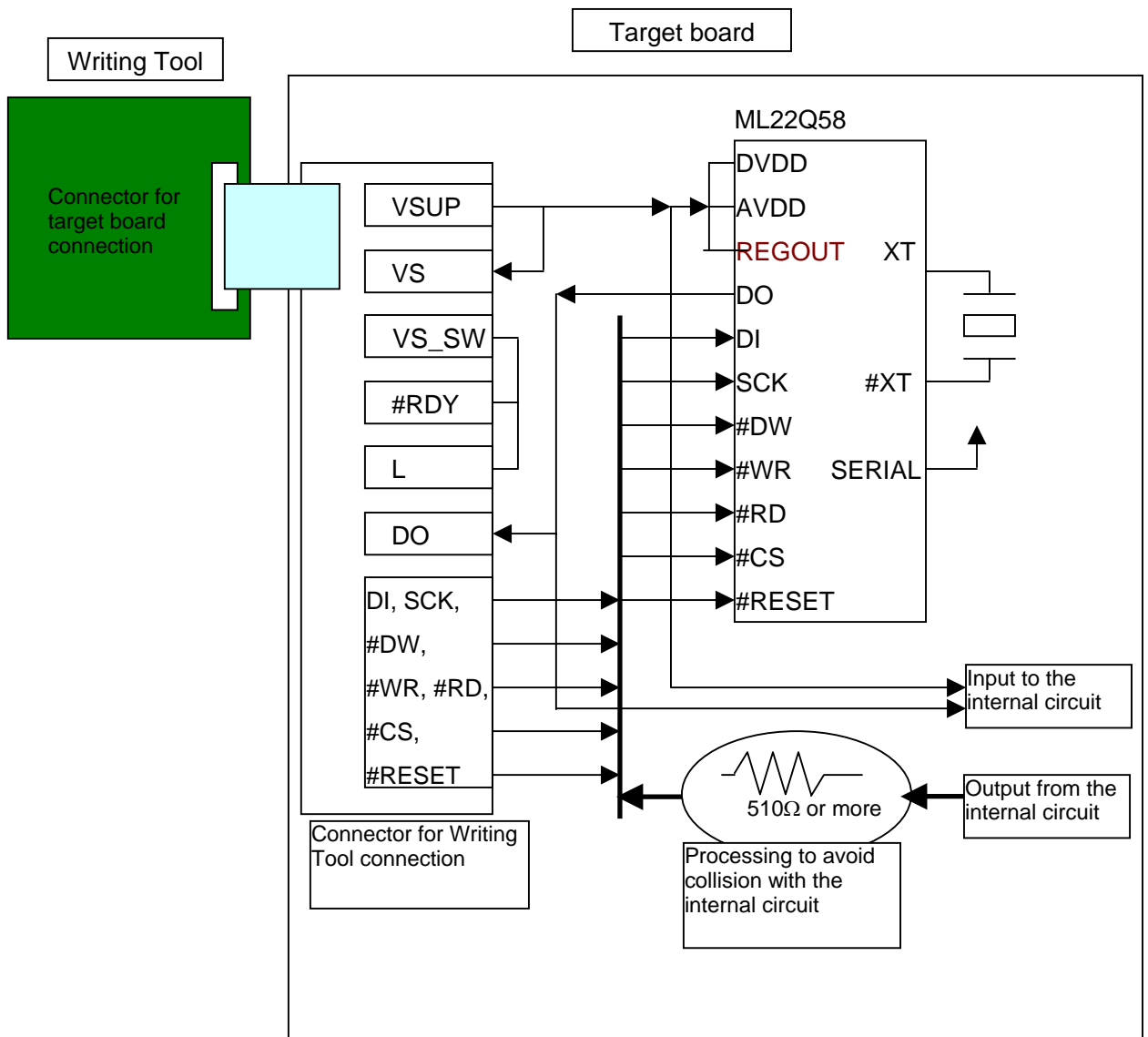
To write data to the ML22Q54/Q58 on the customer's board (target board) by using the Writing Tool, it is necessary to design the target board by tailoring it to the characteristics of the Writing Tool.

Refer to the following materials to design the target board.

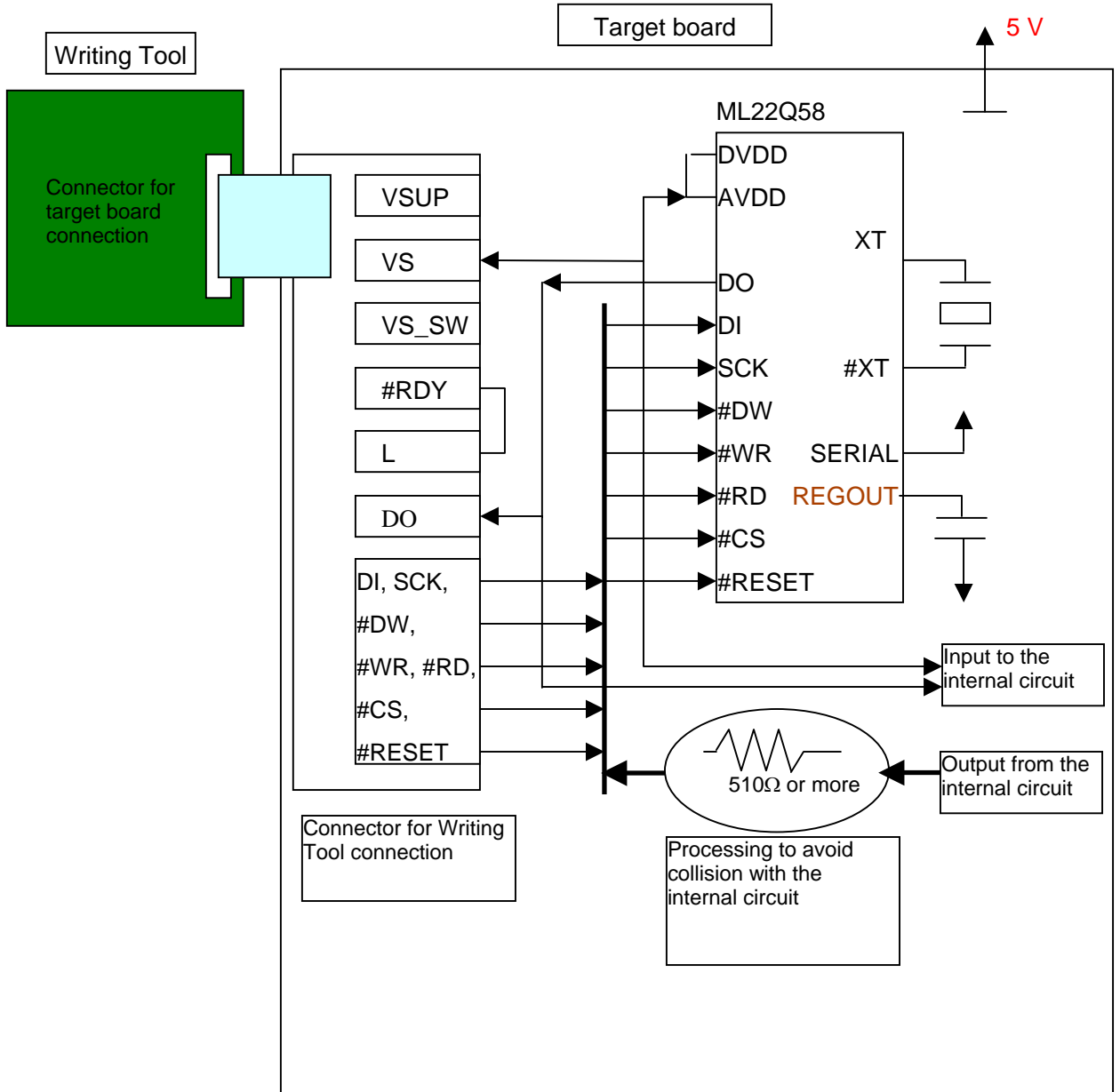
① Outline of connection

The figures below are shown by rotating the ones shown in the previous section as a connected view 90 degrees counterclockwise, for convenience of explanation.

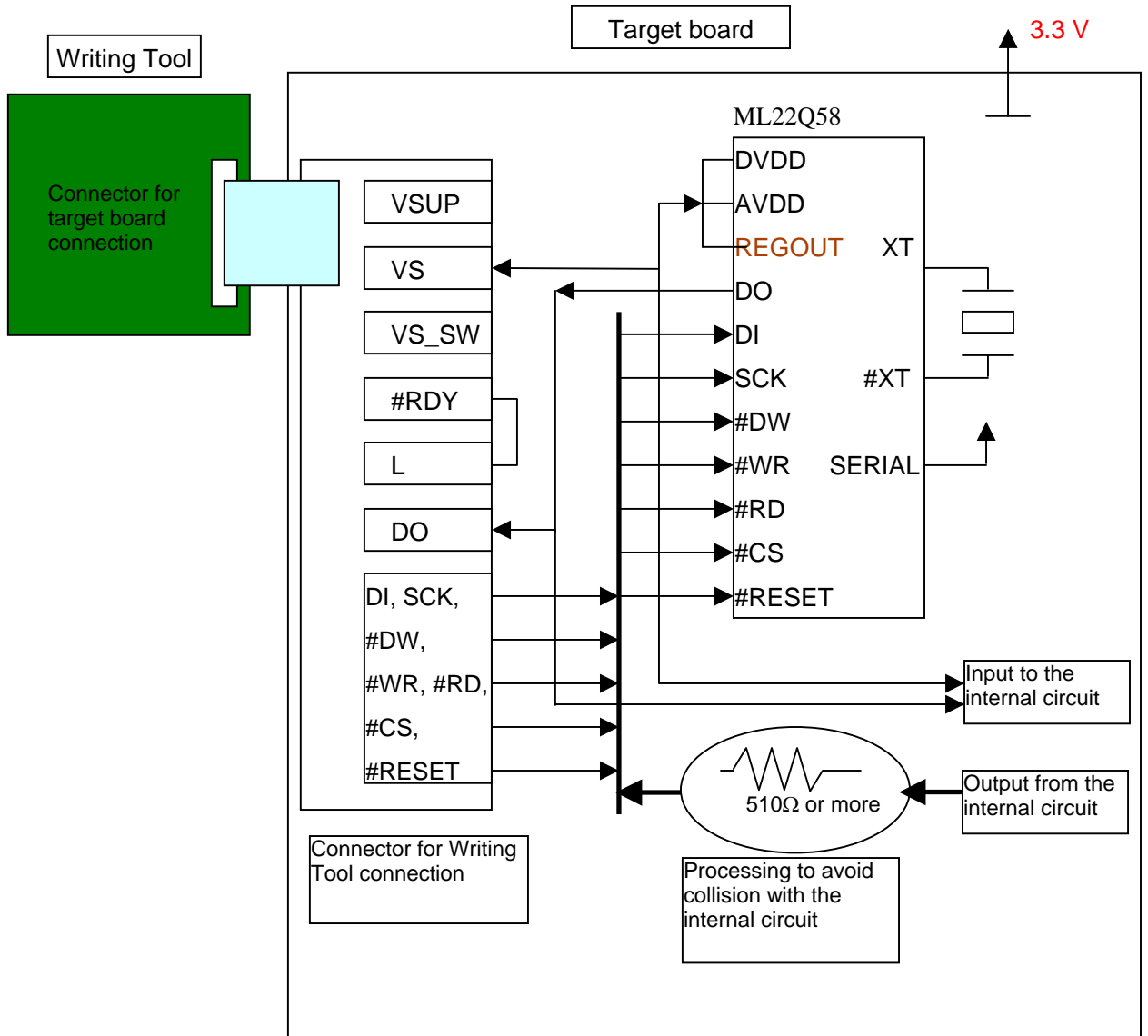
«When power is supplied from the Writing Tool»



«When a 5 V power supply is prepared on the target board side»



«When a 3.3 V power supply is prepared on the target board side»



② Pin descriptions of the connector for the target board connection

Pin No.	Signal name	Pin No.	Signal name
1	DO	2	L
3	DI	4	GND
5	SCK	6	GND
7	#DW	8	GND
9	#WR	10	GND
11	#RD	12	GND
13	#CS	14	GND
15	#RESET	16	VS_SW
17	VS	18	VSUP
19	#RDY	20	VSUP

Note: Signal names beginning with # indicate that they are of the negative logic.

Connector used: 20-pin 1.27 mm pitch flat-cable connector

Manufacturer: HIROSE ELECTRIC Model No.: HIF3FC-20PA-2.54DSA

③ Connection between the connector and the ML22Q58 on the target board

Connector Pin No. (Signal name) Writing Tool's function	Pin name in ML22Q58	Example of connection inside the target board
1 (DO) Logic input	DO	Connects to the controller input.
3 (DI) Logic output	DI	Connects to the controller output via a 510Ω resistor.
5 (SCK) Logic output	SCK	Connects to the controller output via a 510Ω resistor.
7 (#DW) Logic output	#DW	Connects to the controller output via a 510Ω resistor.
9 (#WR) Logic output	#WR	Connects to the controller output via a 510Ω resistor.
11 (#RD) Logic output	#RD	Connects to the controller output via a 510Ω resistor.
13 (#CS) Logic output	#CS	Connects to the controller output via a 510Ω resistor.
15 (#RESET) Logic output	#RESET	Connects to the controller output via a 510Ω resistor.
17 (VS) Power supply sense input (used as the logic output reference voltage)	_____	Connects to DVDD.
19 (#RDY) Pulled up on the target board. Detects the completion of the connection with the target board at a Low level.	_____	Connects to the Low level pins (such as GND)
16 (VS_SW) When a Low level is detected, power is supplied to pins 18 and 20 upon writing.	_____	<ul style="list-style-type: none"> • If power is supplied from the Writing Tool: Connects to the Low level pins. • If power is not supplied from the Writing Tool: Open

18, 20 (VSUP) Supplies power at write when a Low level is detected at pin 16. (3.3 V / 150 mA Max.)		<ul style="list-style-type: none"> • If power is supplied from the Writing Tool: These pin connect to DVDD and AVDD of the ML22Q58. For the ML22Q58, these pins also connect to REGOUT. • If power is not supplied from the Writing Tool: Open
2 (L) Connected to GND. Notifies that the Writing Tool has been connected to the target board.		Pull this pin up. When the Writing Tool is connected, this pin is set to a Low level.
4, 6, 8, 10, 12, 14 (GND) Connected to GND.	GND	GND

As can be seen from the above, the connection method depends on whether power is supplied from the Writing Tool or whether it is prepared on the target board.

④ Connection of other pins on the ML22Q58 on the target board

ML22Q58 pins	Handling
SERIAL	Tie this pin to a High level or pull it up.
D [4:0]	Leave this pin open or tie it to a Low.
TEST	Leave this pin open or tie it to a Low.
XT	Supply a 4.096 MHz clock to this pin or connect an oscillator with it.
OPTANA, TESTO1, TESTO2 DAO, AOUT BUSY2, BUSY1, NCR1, NCR2, VBG	Connection of these pins does not affect writing. Follow the instruction given in the data sheet.

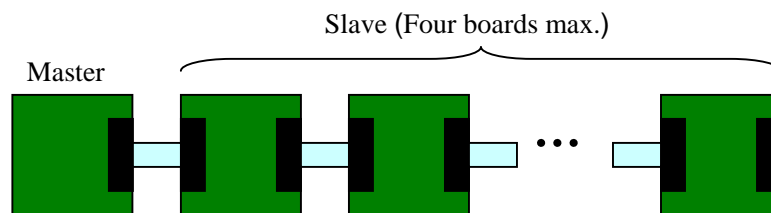
§4. ON-BOARD WRITING METHOD

① Preparation 1

- (1) Create voice data (ROM data) (file extension: .bin) for the ML22Q54/Q58 in advance using the ML2250 Control Kit or the AR207.
- (2) Connect the master board and slave boards with the dedicated connection cable.

With the method of connecting one slave to another, a maximum of one master board and a maximum of four slave boards, that is, up to a total of five boards can be connected.

If only one master board will do, no slave boards needs to be connected.



- (3) Connect the AC adapter to the AC adapter connector on the master board.
- (4) Turn on the power supply switch on the master board.
- (5) Links between the boards are automatically detected.

During detection, the Link/Power LEDs (LINK/PWR) of all the boards blink.

After a while, the blinking stops and the Link/Power LEDs are lit.

If blinking continues even after a while, remove and re-insert the cable or turn off and then on the power supply. **Always turn off the power supply before removing and re-inserting the cable.**

- (6) Each LED on a board indicates the settings of the board, as follows:

Data size LEDs (DT1, DT2)

These LEDs indicate whether voice data has been written in the flash memory on the board:

- No voice data has been written.
-
- Voice data for ML22Q54 has been written.
-
- Voice data for ML22Q58 has been written.
-

Erase LED (ERASE)

Indicates whether to erase data before writing to the ML22Q54/Q58.

If this LED is lit, data will be erased.

If this LED is off, data will not be erased.

Verify LED (VERIFY)

Indicates whether to verify data after writing to the ML22Q54/Q58.

If this LED is lit, data will be verified.

If this LED is off, data will not be verified.

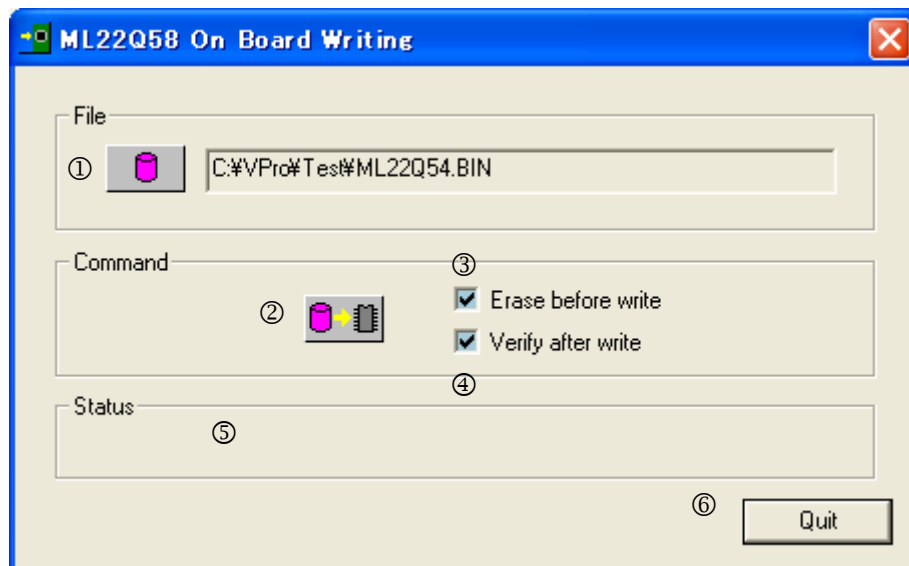
The above settings can be configured by the dedicated application (described later).

Providing that, with the above preparation completed, all the required voice data have been written to the flash memory and no change to the current board settings is required, skip the next step “② Preparation 2” to proceed to ③ Writing procedure.

② Preparation 2

- (1) Connect the USB port of the PC and the master board using the attached USB cable.
- (2) Activate the dedicated application “Wrt22Q58”.

The following dialog box will appear:



The items that are displayed in the dialog are described below.

① File selection button

Press this button to select the voice data file (extension: .bin) for the ML22Q54/Q58 used for on-board writing.

The path name of the selected file is displayed on the right-hand side of the button.

② Data transfer button

Press this button to transfer the voice data that was selected in "①File selection button" to the Writing Tool.

In this case, the contents that were set in ③ and ④ are also transferred.

③ Erase execution check box

Specify whether the existing data is to be erased before writing data.

If the check box is checked, data is erased.

This setting is sent to the Writing Tool at the time voice data is transferred by the "②Data transfer button."

If this box is not checked, the time required for write processing is reduced since erase operation is omitted. However, if the ML22Q54/Q58 contains some data, an erase check error occurs at write processing. Therefore, it is recommended to turn off this check box only when it is clear that the board concerned has never been written to.

④ Verify execution check box

Specify whether data verification is to be performed after data is written.

If this check box is checked, data will be verified.

This setting is sent to the Writing Tool at the time voice data is transferred by the "②Data transfer button."

If this box is not checked, the time required for write processing is reduced since verification is omitted. It is therefore recommended to turn off this check box only when the result of on-board writing is inspected in another process.

⑤ Status display

Contents of operation that is currently being performed are displayed.

⑥ Quit button

This button ends the program and closes the dialog box.

(3) Click on the "File selection button" and select the voice data file (extension: bin) for the ML22Q54/Q58.

(4) Configure the settings for the "Erase execution check box" and "Verify execution check box," and then click on the "Data transfer button."

(5) Wait until transfer is completed.

During transfer, DT1 of the Data size LED blinks.

At completion of transfer, a dialog box telling the message "Success to send" will open.

By the preparation described above, voice data and settings required for on-board writing are set in the Writing Tool.

After this, the Writing Tool can be disconnected from the PC according to the "④Termination

procedure" or it can remain connected to the PC.

Since the contents of voice data and the settings for on-board writing are stored in the flash memory of the Writing Tool, they are retained even if the power supply for the board is turned off.

③ Writing procedure

- (1) Connect one target board to the master board and one to each of the slave boards.

In this case, the power supply of the Writing Tool can be kept ON.

When a power supply is provided on the target board side, the power supply must be kept OFF when connecting the Writing Tool (master board or slave board).

- (2) When a power supply is provided on the target board side, turn on the power supply.
- (3) When the Writing Tool is connected with the target board and the #RDY signal is set to a Low level, the Target LED (TARGET) blinks.

If the LED does not blink, there is a connection abnormality or the #RDY signal may not be set to the Low level. Check the connection. (When a power supply is provided on the target board side, turn off the power supply and reconnect it.)

Check that the target LEDs of all the Writing Tools are blinking.

- (4) Press the Write start switch (PROGRAM) on the master board.

The write processing of all the target boards starts and the Target LEDs change from blinking to being lit.

Wait until the write processing of all the target boards is completed.

At completion of write processing, Target LED goes off.

If an abnormality occurs during write, the LED of the Writing Tool at which the error is occurring blinks.

The contents of the abnormality can be known by checking which LED is blinking.

Erase LED	Verify LED	Target LED	Error contents
Blinking	/	/	Erase check error. (Data is already written to the ML22Q54/Q58. This error occurs only when the erase execution check box is not checked.)
/	Blinking	/	Verification error. (Data was not written to the ML22Q54/Q58 correctly.)
Blinking	Blinking	Blinking	Target board operation error.

If the flash memory of the Writing Tool does not contain any voice data (none of the data size LEDs are lit), nothing will take place even if the Write Start switch is pressed. Perform "©Preparation" again.

- (5) Disconnect all the target boards from the Writing Tools.

When a power supply is prepared on a target board side, turn off that power supply before disconnecting the board.

- (6) Return to step (1) to repeat write processing.

④ Termination procedure

- (1) Disconnect all the target boards from the Writing Tools.

When a power supply is prepared on a target board side, turn off that power supply before disconnecting the board.

- (2) If the dedicated application (Wrt22Q58) on the PC is being executed, terminate it.
- (3) Click on the icon indicating "Save to remove hardware" to terminate the driver.
- (4) Turn off the power supply switch of the master board.
- (5) Disconnect the USB cable and the AC adapter.
- (6) Disconnect the cable between the master board and the slave boards.

§5. LIST OF ERROR MESSAGES DISPLAYED BY THE DEDICATED APPLICATION WRT22Q58

Error message	Error reason / Handling method
Binary File is NOT selected.	File that needs to be transferred has not been selected. Select the file that needs to be transferred with the "File selection button," and then click on the "Data transfer button."
Binary File open error.	An attempt was made to open the voice data file that needed to be transferred, but failed. Check whether the file exists or whether the file/disk is damaged.
Binary File read error.	An attempt was made to read the voice data file that needed to be transferred, but failed. Check whether the file/disk is damaged.