FEBL2110-01

OKI

ML2110P Evaluation Board User's Manual

- Version 1.0 -

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OKI Electric Industry Co.,LTD.

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The ML2110P Evaluation Board enables a user to evaluate the speech data converted from text data that is sent from a host system through a serial interface (RS232C) or a parallel interface (ISA BUS). The board simulates not only the functions and performance of ML2110, but also a work with a user dictionary and the condition of control using the control code.

1. BOARD CONFIGURATION

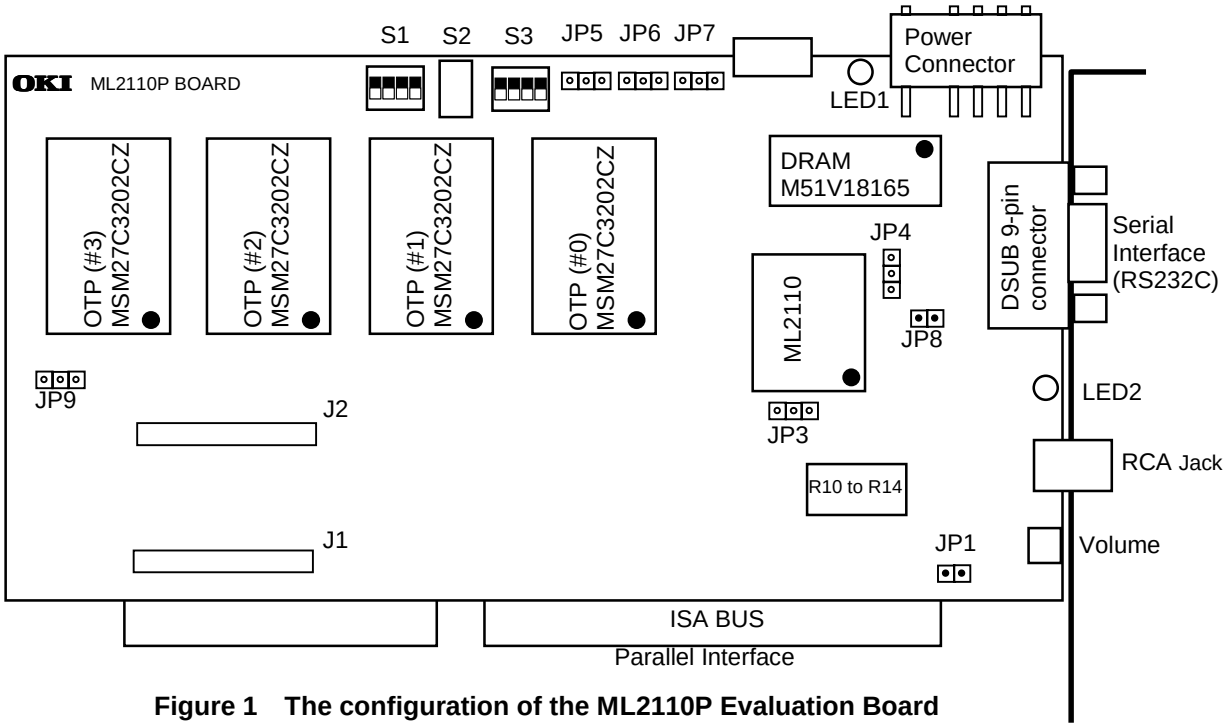


Figure 1 The configuration of the ML2110P Evaluation Board

1.1 S1 (DIP-4)

This DIP switch sets the port address of the board when a parallel interface is used.
PIN 1 to 4 of DIP Switch correspond to SA12 to SA15.
When pins are on "ON" side, the mode of Low (= "0") is set. When they are on "OFF" side, High (= "1") mode is set.

1.2 S2 (Reset)

The reset switch puts ML2110 into its initial condition.
When the board is used with a MCU Interface, the reset signal can be output by PC through ISA bus.
Whenever the configuration register values (JP5 to 7) are changed, be sure to reset ML2110.

1.3 S3 (DIP-4)

This DIP switch selects the program to be activated after reset of ML2110. The switch is valid only when OTP that includes a program selector function is setup on the board and the serial interface with a host system is selected. The pins of DIP switch 1 to 4 correspond to D31 to 28 of the configuration register.
When pins are on "ON" side, Low (= "0") is set. When they are on "OFF"side, High (= "1") mode is activated.

1.4 JP1

This jumper-pin short-circuits the digital-GND and analog-GND on the board.
Note: Normally, this jumper-pin is to be used in the short-circuited condition.

1.5 JP5 to 7

These jumper-pins specify the ML2110's configuration register values.
JP5 to 7 correspond to D26 to 24 of the configuration register. Please refer to Section 3.

1.6 JP8

This jumper-pin puts ML2110 into stand-by mode. When the jumper pin is short-circuited, a stand-by input signal is sent so that ML2110 stops operating.
Note: Please do not use this jumper pin in the short-circuited condition.

1.7 Power Supply Connector

When the board is used in stand-alone mode (serial interface), the power is supplied through the connector. The board operates at 5.0 V. In case a MCU parallel interface is used, the power is supplied through the ISA bus, and this connector is not used.

1.8 RCA Jack

The RCA jack is the line output terminal to output the converted speech data.
The Jack is connected with the speaker with a built-in amplifier

1.9 Volume Controller

The pin controls the output voltage (volume) to the RCA jack.
To avoid amplifying the noise generated by the low-pass filter, turn the volume down to the lowest volume with on-board controller. Next use the external volume controller.

1.10 DSUB 9-Pin Connector

Select the DSUB 9-Pin connector when the RS232C interface is used. The transfer speed can be changed between 2400 bps and 19200 bps using ML2110's configuration register values (JP5 to 7).

1.11 ISA BUS

Select the ISA bus connector when the board is used with the parallel port interface (MCU parallel Interface).

1.12 J1, J2 Connectors

These connect the sub-board for FLASH memory with ML2110P Evaluation Board.

1.13 LED1

LED1 lights up when the power is supplied to the board.

1.14 LED2

When the UPORT signal of ML2110 is asserted, LED2 lights up.

1.15 JP3

This jumper-pin selects a boot-up OTP word size which is 16 bits or 32 bits. When the JP3 1 and 2 are connected, the 16-bit word size is available to boot up ML2110.

1.16 JP4

This jumper-pin selects a clock multiply ratio. When the JP4 1 and 2 are connected, the multiply ratio is 1 (one) and the JP4 2 and 3 are connected, the multiply ratio is 2 (two).

1.17 JP9

This jumper-pin selects either 64M OTP or 32M OTP. When the JP9 1 and 2 are connected, 32M OPTs are available.

2. HOW TO SUPPLY THE POWER

This evaluation board operates at 5 V single power supply. (ML2110 device and some devices on the board operate at 3.3 V. The operation voltage is converted from 5 to 3.3 V on the board.)
Plug the cable into the connector as shown in Figure 2.

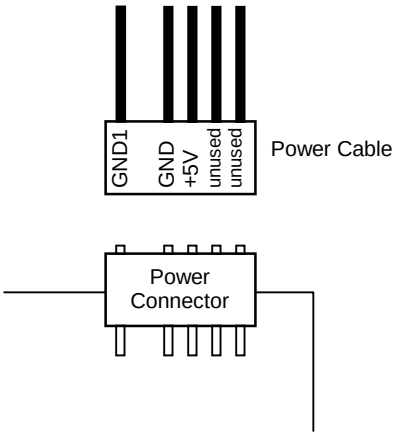


Figure 2 Power Supply Connection to ML2110P Evaluation Board

3. INTERFACE WITH HOST SYSTEM

The board supports two types of interface that are communicated with the host system.

- Serial interface
- Parallel interface

These two interfaces cannot be used simultaneously.
The type of interface is determined depending on the combination of the configuration registers as shown in Figure 3.

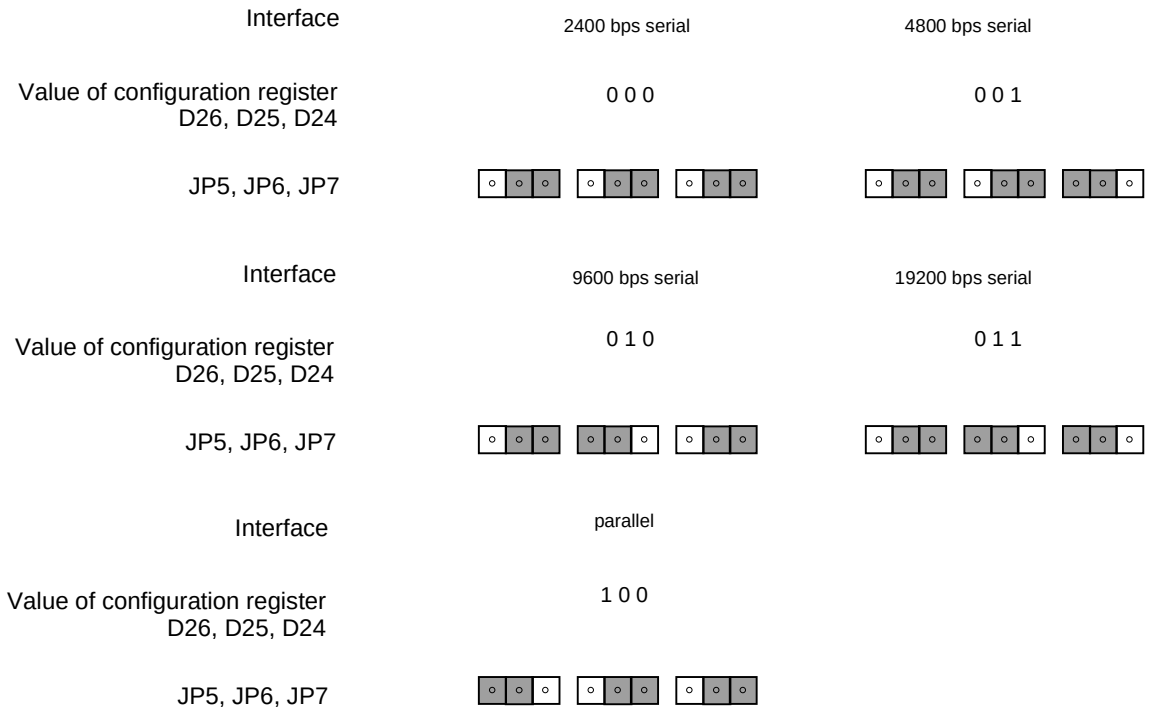


Figure 3 Combination of configuration registers and the type of interface available

3.1 Serial Interface (RS232C interface)

Connect the board with the host system using a DSUB 9-Pin connector.
Then set the configuration register corresponding to the transfer speed as shown in Figure 3.
Connect ML2110 internal SIO with the host system as shown in Figue 4.

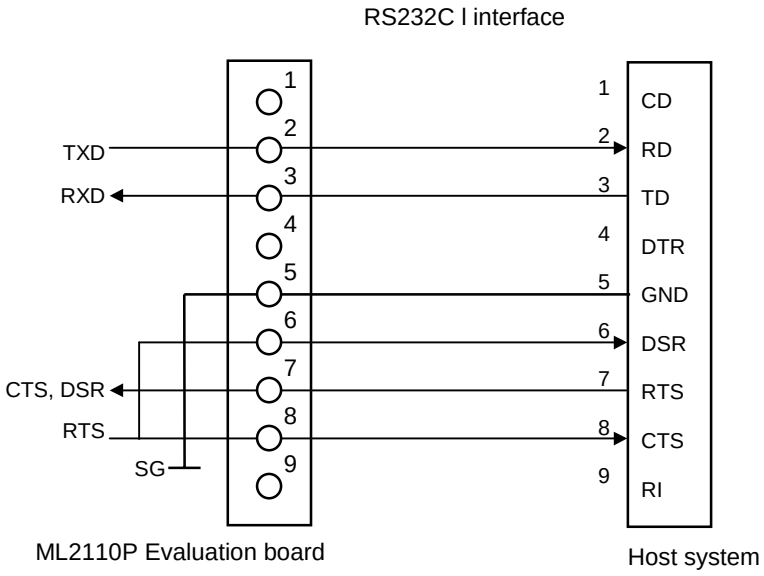
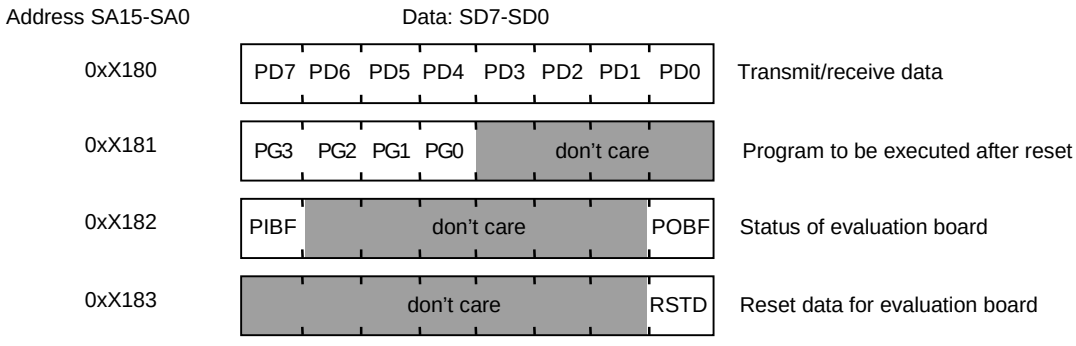


Figure 4 Connection between ML2110 internal SIO and host system

3.2 MCU Parallel Interface

Use a PC/AT compatible computer as the host system, because the ISA bus is used as the parallel interface.
Set the configuration register values (JP5 to 7) as shown in Figure 3, referring to Figure 5 for address location of ISA bus.



Note : "X" (SA15-SA12) of an address is set using S1.

Figure 5 The address location of ISA bus

When the power of the board is turned on, the RESET DRV signal from the host system works internally as a reset signal for ML2110. The reset mode is to be released in the following steps, before the access to the board is started.

Procedure of start up (Reset release operation)

1. Write 0 data (or LSB only) into address 0xX183 (trigger reset)
2. Write 1 data (or LSB only) into address 0xX183 (release reset)

Procedure of data transmission

- Write into the board
  1. Read PIO status from address 0xX182
  2. Confirm that PD7 (bit 7) is "0" (if "1", wait until it gets to "0")
  3. Write transfer data into address 0xX180

-Read from the board

1. Read PIO status from address 0xX182
2. Confirm that PD0 (bit 0) is "0" (if "0", wait until it gets to "1")
3. Read data from address 0xX180

In case OTP with the function of program selector is setup, the working program can be selected after the reset mode.

-Program selector function

1. Write the program number (PG3 to PG0) to address 0xX181 after reset mode.
2. Write 0 data (or LSB only) to address 0xX183 (to trigger reset)
3. Write 1 data (or LSB only) to address 0xX183 (to release reset)

4. OTHERS

4.1 Cut-off Frequency of Low-pass Filter (LPF)

The cut-off frequency of LPF can be changed by using resistors R10 to R14 (see Figure 1).
Table 1 shows TTS sampling frequencies corresponding resistor values of R10 to R14 and cut-off frequencies of LPF.

Table 1 TTS sampling frequencies, LPF resistor values and cut-off frequencies

Sampling frequency	R10 to R14 resistor value	LPF cut-off frequency
16 kHz	100 kΩ	6.4 kHz

4.2 Default Setting of DIP Switches (S1, S3) and Jumper-pin (JP5, JP6, JP7)

- S1 and S3 are all "ON".
- JP5, JP6, JP7: "9600 bps serial interface"