

CAB60851 USB Board Manual

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Okidata Electric Industry Co., Ltd.

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1 Introduction

1-1. Checking the product and accessories

Thank you for purchasing CAB60851 USB Board.

The CAB60851 USB Board serves to enable you to easily evaluate the USB device controller ML60851C (or ML60851D). The board installs peripheral circuits that include USB device controller ML60851C (or ML60851D) and a USB connector (other than a control microcomputer). A 50-pin onboard connector is comprised of all lines required for controlling the ML60851C/D. Therefore, draw an MCU bus and several control ports from your computer and connect them to an evaluation board and an emulator. Accordingly, by porting the sample firmware into your computer, it is possible to implement the features of the USB device and make a reasonable evaluation.

When you receive the CAB60851 USB Board package, please confirm that all the components shown in Table 1 are in the package. This device was carefully inspected before shipment; therefore it should have no defects and all the correct components should be in the package. However, if any of the components are damaged or missing, please contact us or your distributor.

Table 1 Component list

CAB60851	1
CD-ROM	1
Manual	1

- Contents of the CD-ROM package

Programs

- USB firmware sample program
- Oki's original C compiler package

Documents

- CAB60851 USB board manual (this manual)
- ML60851C/ML60851D datasheets
- Documents related to ML60851/ML60852
- User's manual for MSM66573
- User's manual for CC665S C compiler package

1-2. Hardware requirements

You need the following hardware to activate the CAB60851 starter kit.

- A PC with a USB interface running Windows 98
- A USB cable
- Program development environment including a C-compiler, a control microcomputer evaluation board, an emulator, etc.

2 Related documents and software

2-1. USB specifications

For a brief outline of the USB specifications, refer to Chapter 4 of “JOB60851 Starter Kit Manual” included in Document\JOB60851 on the CD-ROM.

2-2. USB device controller specifications

For a brief outline of the ML60851C (or ML60851D) USB device controller specifications, refer to “4-3 Various information related to USB” in “JOB60851 Starter Kit Manual” included in Document\JOB60851 on the CD-ROM. For more details, refer to the datasheets contained in Document\ML60851 on the CD-ROM.

2-3. Circuit diagrams of CAB60851

Section 3 of this manual illustrates circuit diagrams of the CAB60851 USB Board. Refer to the diagrams together with the above-mentioned datasheets before connecting the board with a microcomputer (or its evaluation board). A pdf file (CIR_C851.pdf) is contained in Document\CAB60851 on the CD-ROM.

2-4. USB sample firmware

Control sample firmware for ML60851C (or ML60851D) is contained in Package\USB_Firm. For the contents of the firmware, refer to “4-2 USB sample firmware” in the “JOB60851 Starter Kit Manual” included in Document\JOB60851 on the CD-ROM.

Read the instructions described in “4-2 USB sample firmware” before porting the sample firmware into your computer. Descriptions of tools to verify operations are also included in the document.

2-5. USB sample host software

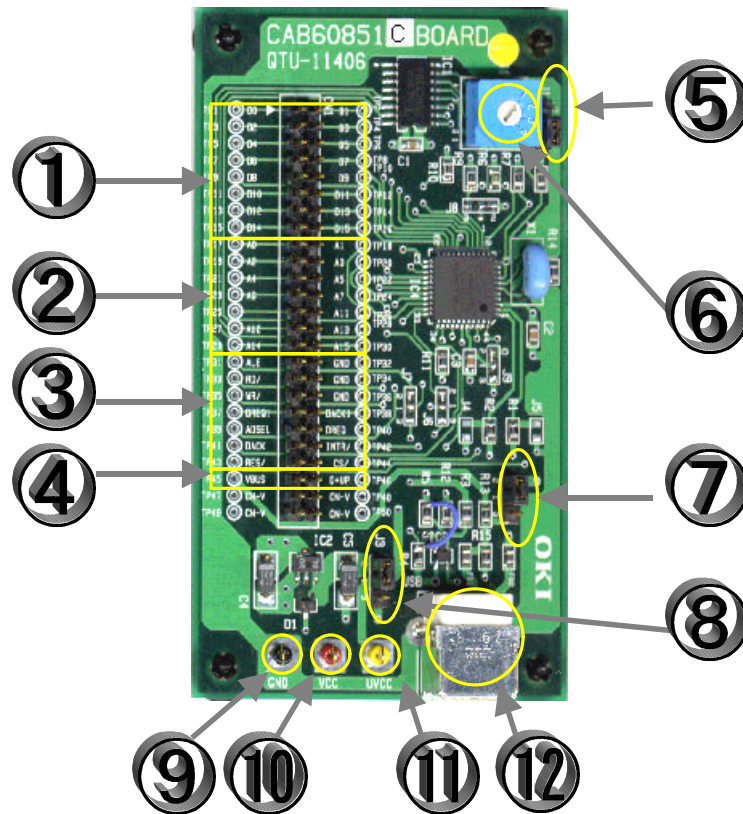
Regarding the sample host software provided in binary to evaluate bulk transfer, refer to “4-2-3 USB sample host software” in the “JOB60851 Starter Kit Manual”.

2-6. Evaluation board with a microcomputer

A microcomputer for controlling the USB device controller is not installed in CAB60851. We have other evaluation boards with a microcomputer (JOB60851 Starter Kit, etc.) available. Information about other evaluation boards is included on the CD-ROM.

3 Hardware settings

The following is the upper surface of the board.



- (1) DATA lines
Connect the data lines to your computer's data lines.
- (2) ADDRESS lines
Connect the address lines to your computer's address lines.
- (3) Control lines
(ALE•RD•WR•ADSEL•DREQ•DACK•INTR•RES•CS/)
Connect these lines to your computer's bus strobe and other control lines for controlling signals from a DMA controller, an interrupt line, and select signals.
- (4) USB BUS control lines (VBUS•D+UP)
VBUS is used for detecting the correct connection with an effective host PC or a HUB. Make your computer ports or A/D available for detection.
D+UP is a pull-up control pin for D+line of a USB bus. Use this pin to connect devices to the USB for control by your computer.

- (5) Jumper J1
Select CS/Input into ML60851C.
- 1-2 Short [CS by Address]
Create CS by decoding with an onboard address decoder.
 - 1-3 Short [CS by CS signal (default)]
Directly input from an external terminal.
- (6) Rotary switch
Specifies an address range in the case of 1-2 Short [CS by Address] at Jumper J1.
- 1: 30xxH-37xxH
 - 2: 70xxH-77xxH
 - 3: B0xxH-B7xxH
 - 4: F0xxH-F7xxH
- (7) Jumper J2
Select power supply for ML60851.
- 1-2 Short [Self-power (default)]
 - 1-3 Short [Supplies Vbus power for the board (bus powered)]
- NOTE:
The bus powered device configured by ML60851 does not conform to USB specifications.
- (8) Jumper J3
ML60851 system Vcc voltage
- 1-2 Short Vcc
 - 1-3 Short UVcc
- For 5 V microcomputers, after 1-2 short at J3, supply 5 volts to Vcc.
For 3.3 V microcomputers, after 1-3 short at J3, supply 3.3 volts to UVcc.
- (9) GND
- (10) Vcc
Supply 5 volts to a 5 V microcomputer.
- (11) UVcc
Supply 3.3 volts to a 3.3 V MCU.
With a 5-volt power supply, it is possible to monitor 3.3 volts created by a regulator in the board.
- (12) USB type B socket

3-1. Processing unconnected pins

Refer to “Processing unused pins” in the datasheet of ML60851C (or ML60851D) before handling pins. Some pins can be processed on the board by pulling down or pulling up. Refer to the circuit diagrams for processing pins on the CAB60851 USB Board.

4 Circuit diagrams

