

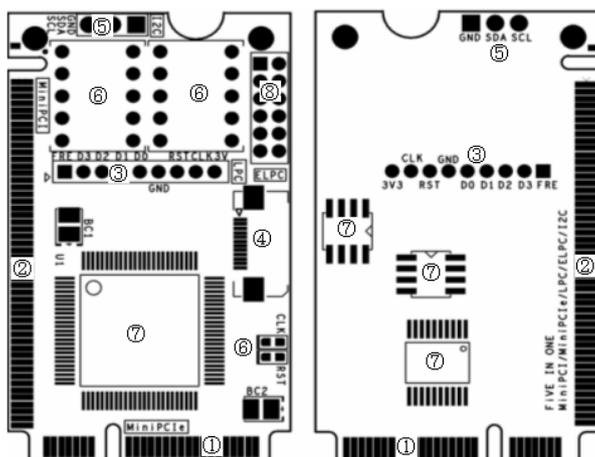
5IN1 MINI PCIE Notebook Debug Card User Guide

CHAPTER 1: FIVE-IN-ONE Notebook Debug Card User Guide

This Five-In-One notebook debug card is the upgraded version of Combo-Debug-Card (VIP). It supports five interfaces: MINI PCI, Mini PCI-E, LPC, ELPC and I2C (Notebook Battery Interface). This product is easy to use, and is designed with good stability. It is your ideal tool for notebook repair.

1. Debug Card structure and usage
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1. Debug Card structure and usage



- ① Mini-PCle interface:
- ② Mini-PCI interface:
- ③ LPC interface:
- ④ ELPC interface: (Dedicated for ASUS notebook)
- ⑤ I2C interface (Dedicated for IBM notebook battery interface)
- ⑥ Two 7-segment LEDs and LED indicators
- ⑦ ASIC:
- ⑧ Test port: This port is reserved, and end-user should not use this port.

2. The Mini-PCle interface

Mini-PCle is used as a trend in the new notebooks. Comparing to Mini-PCI, Mini-PCle occupies less space. This Five-In-One Debug-Card uses the below pins: PIN-8, PIN-10, PIN-12, PIN-14, PIN-16, PIN-17, and PIN-19. Those pins definitions are optional in Mini-PCle spec, and not all notebook vendors use those pin definition, so that not all notebooks can work with this Mini PCIe interface. But Our test shows more and more notebook manufacturers are beginning to use this, such as IBM, HP, Fujitsu, Toshiba, Hasee, TCL, Acer and etc... For the notebook, which doesn't meet the above Mini-PCle pin definition, this interface will not work and user needs to use the other interface in this Five-In-One debug card.

Note: Please be aware that Mini-PCle interface is supported with limitation, and some notebooks will not work with this interface.

As reference, below is part of the notebook type list, which can work with this mini-PCle interface.

HP: V6000 series, including CT6 ...; V9000 series, including AT8, AT9...

IBM/Lenovo: CW3, CW4, LE4, LE5 ...

Hasee: 310, 320 ...

Fujitsu: PROLAND 10 series

Acer: most of the new type

...

With more and more notebook manufacturers begin to support this Mini-PCle debug card interface, just part of notebook part numbers are listed as above. And user can expand this list by their experience.

3. The Mini-PCI interface

Mini PCI is a general interface, which is used in notebook. It includes 124 pins. This Five-In-One Debug-Card doesn't fully use those pins, and only 101 pins are used. This interface will work with all notebooks, which are with Mini PCI slot.

4. The LPC interface

For the user, whose notebooks don't support the Mini-PCI interface and the Mini-PCle interface, you can use the third port: LPC interface. LPC interface exists in all notebook main-boards. In the Five-In-One Debug-Card, from left to right, the LPC definition is: PIN1-LFRAME#, PIN2-LAD3, PIN3-LAD2, PIN4-LAD1, PIN5-LAD0, PIN6-GND, PIN7-LRESET#, PIN8-LCLK, PIN9-3.3V

Most of IBM/Lenovo ThinkPad series notebooks reserve the LPC interface in the motherboard.

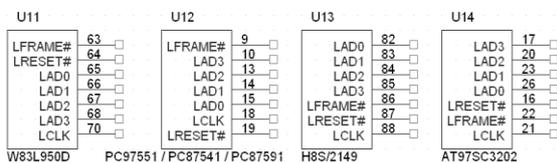
For IBM X 60 notebooks, the LPC interfaces are located in the U39 slot of the main-board. The Pin definitions are as below:

A2->LRESET# A3->LFRAME# A5->LCLK
 A9->LAD3 A10->LAD2 A11->LAD1 A12->LAD0

For IBM T6 R6 notebooks, the LPC interfaces are located in the J26 slot of the main-board. The Pin definitions are as below:

A1->LCLK, A3->LFRAME# B2->LRESET#
 B7->LAD3 A7->LAD2 B6->LAD1 A6->LAD0

But, usually, the notebook boards haven't LPC connectors or slots. And the users will need to connect this LPC port to the notebook by using wires. This requires that users have very good soldering skill. Below are some LPC interface chips pins definitions and user can connect the Five-In-One Debug-Card to the corresponding chip pins. For more information, please refer those chips' datasheets.

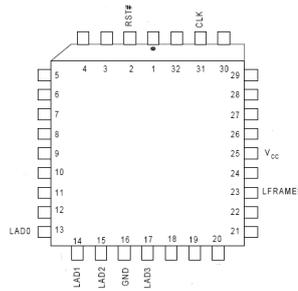


Note: This Debug-Card uses 3.3V as power supply, and you can use any 3V3 and GND signals in your notebook main-board. Please be aware that connecting the Debug-Card to a non-3.3V power may damage the Debug-Card.

If your notebooks use LPC VBIOS, you can also connect the Five-In-One Debug-Card LPC interface to your notebook's BIOS pin as below.

LPC BIOS Pin definition:

PIN2-RST# PIN13-LAD0
 PIN14-LAD1 PIN15-LAD2
 PIN16-GND PIN17-LAD3
 PIN23-LFRAME#
 PIN25-VCC PIN31-CLK



5. The ELPC interface

Five-In-One debug card's ELPC is designed for ASUS notebook to use. This interface uses a cable to connect debug card to ASUS notebook motherboard directly without using fly wires. It is very easy to use, and most of ASUS notebook motherboard supports this, such as ASUS A8S, F8S, EPC and etc...

Usually, Asus has a connector, which is named as DEBUG_CON, in the motherboard. Users just need to use the cable to connect Five-In-One debug card to this port.

6. The I2C interface

Five-In-One debug card's I2C is designed for IBM/Lenovo notebook to use. And it uses 3 wires only: SDA, SCL and GND. Because notebook battery interface uses I2C interface, user just needs to connect this interface to notebook's battery connector to show debug code.

Five-In-One debug card has an I2C connector. When using this connector, user needs to plug-in this debug card to motherboard's Mini-PCIe slot to provide power to the debug card. If user doesn't want to use motherboard's Mini-PCIe slot to power up the debug card, LPC interface's PIN9 (3V3) and PIN16 (GND) can also be used. Then user needs to use a 3-wire cable to connect debug card to notebook's battery connector. Because different notebooks use different battery connectors, user needs to purchase the dedicated 3-wire cable when using this I2C interface. Also, user can easy make this 3-wire cable himself.

For the user, who makes the 3-wire cable himself, he needs to understand notebook's battery connector pin definition so that he can correctly connect the I2C signals (SDA/SCL/GND) to the corresponding pins in the debug card. Currently, the supported IBM notebooks include: T400/T500/X61/TR61 and etc...

7. The LED-Display and LED Indicators

The Display includes Error-Code display and "CLK","RST" signal status display.

- 1) Error-Code display: It is composed with two 7-segment LEDs.
- 2) "CLK","RST" signal status display: When the notebook is in RESET status, the "RST" indicator will be lighted on, and the "CLK" indicator will be off. When the notebook is in running status, the "RST" indicator will be off, and the "CLK" indicator will be lighted on.

8. Debug Card Product Series Number

Every debug card includes unique series number. Before power up the debug card, using a jumper to connect SDA and GND, then the debug card will enter "Show Series Number" mode. When needing to work at normal mode, please disconnect the SDA and GND, or debug card will stay in "Show Series Number" mode.

9. Debug Card error information

When power-up the debug card, it will have self-diagnoses. If it can't pass the self-diagnoses test, it will show the corresponding error information as below:

- E0: Fail in self-test
- E1: product series number is incorrect
- E2: product isn't authorized.

10. Q/A

Question: Both of "RST" and "CLK" indicators are off

Answer:

This symptom shows there is no CLK signal for debug card so that the "CLK" indicator isn't lighted on. Usually, it may mean the motherboard can NOT support this Mini-PCIe interface. Please use the other interfaces to test it.