# *KIT-VR7701-TP*

**User's Manual(Rev.1.00)**

***RealTimeEvaluator***

## Software Version Up

* The latest RTE for Win32 (Rte4win32) can be down-loaded from following URL.

**http://www.midas.co.jp/products/download/english/program/rte4win_32.htm**

## Notice



## Trademarks

Revision History

| | | |
|---|---|---|
| Rev.1.00 | Nov. 15, 2002 | Official 1st edition |

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# 1. OVERVIEW

**KIT-VR7701-TP** is the software that performs in-circuit emulation for systems that have NEC RISC micro processor VR7701 for debugging purposes. The hardware that can be used is RTE-1000-TP and RTE-2000-TP.

This manual describes how to use the KIT-VR7701-TP. Thus on using the product, please refer to the **RTE-XXXX-TP Hardware User's Manual** also, that is main part of whole debugging system.

This product comes with the following components. First check that none of the components are missing.

- RTE for Win32 (Rte4win32) Setup Disk
- User's manual (This manual)
- License sheet

## 2. HARDWARE SPECIFICATIONS

**Emulation**

| | | | | |
|---|---|---|---|---|
| Target device | | | VR7701 | |
| RTE-TP format to be used | | | RTE-1000-TP | RTE-2000-TP |
| JTAG-IF cable | | | Standard cable | RTE-NEC/MICTOR38 |
| Emulation functions | | | | |
| | CPU operating frequency | | Unlimited | |
| | Interface | | JTAG/N-Wire | |
| | Operation voltage | | 1.8 - 5 V (*2) | |
| | JTAG clk | | 100 kHz - 25 MHz | |
| Break functions | | | | |
| | H/W break points(*5) | | 1 | |
| | Breaks that can be set using access event(*6) | | 1 | |
| | S/W break points | | 100 | |
| | Step breaks | | Supported | |
| | Manual breaks | | Supported | |
| Trace functions(*7) | | | | |
| | Trace data bus | | 4 bits | |
| | Trace memory | | 4 bits × 128k words | 4 bits × 256k words |
| | Trigger setting | | Supported | |
| | | Trigger that can be set using an execution address(*5) | 1 | |
| | | Trigger setting by access event(*6) | 1 | |
| | | Trigger setting by external input | 1 | |
| | Trace delay | | 0 - 1FFFFh | 0 - 3FFFF |
| | Trace clock | | 77 MHz (max.) | 133 MHz (max.) |
| | Time tag | | 100 ns - 30 h | |
| | Disassembled trace data display function | | Provided | |
| ROM emulation functions (*4) | | | | |
| | Map function in block (USER/EMEM) | | None | 64k words |
| | Used as RAM | | Not supported | Supported |
| | Memory capacity | | 8M - 32M bytes | 8M - 128M bytes |
| | Access time (():burst cycle) | | 40 ns (35 ns) (*1) | 35 ns (30 ns) (*1) |
| | Operation voltage | | 1.8 - 5 V (*2) | |
| | Electrical condition | | LV-TTL, 5-V tolerant (*3) | |
| | Number of ROMs that can be emulated | | | |
| | | DIP-32pin-ROM (8-bit ROM) | 4 (max.) | |
| | | DIP-40/42pin-ROM (16-bit ROM) | 2 (max.) | 4 (max.) |
| | | Extend STD-16BIT-ROM connector | 2 (max.) | 4 (max.) |
| | Sizes of ROMs that can be emulated (bits) | | | |
| | | DIP-32-ROM (8-bit bus) | 1M, 2M, 4M, 8M (27C010/020/040/080) | |
| | | DIP-40-ROM (16-bit bus) | 1M, 2M, 4M (27C1024/2048/4096) | |
| | | DIP-42-ROM (16-bit bus) | 8M, 16M (27C8000/16000) | |
| | | Extend STD-16BIT-ROM (16-bit bus) | 1M, 2M, 4M, 8M, 16M, 32M, 64M, 128M, 256M (32M bytes) | |
| | Bus width specification (bits) | | 8/16/32 | 8/16/32 |
| Pin mask functions | | | NMI, INT | |

*1, 2, 3: Values when RTE-1000-TP + CBL-STD16-32M or RTE-2000-TP + CBL-STD16-2K is used.

*2: Note that the DC characteristics of each cable may not electrically match when the supply voltage is 2.3 V or less.

*4: Up to four E.MEM boards can be mounted to RTE-2000-TP, and the maximum capacity is 128M bytes. Two E.MEM boards are necessary for the 32-bit width, and four are necessary for the 64-bit width. One board is necessary per ROM with an 8-bit bus width.

*5. The execution address event for a break and triggers is combination.

*6. The access event for a break and triggers is combination.

*7. Execution speed falls during trace.

# 3. RTE FOR WIN32

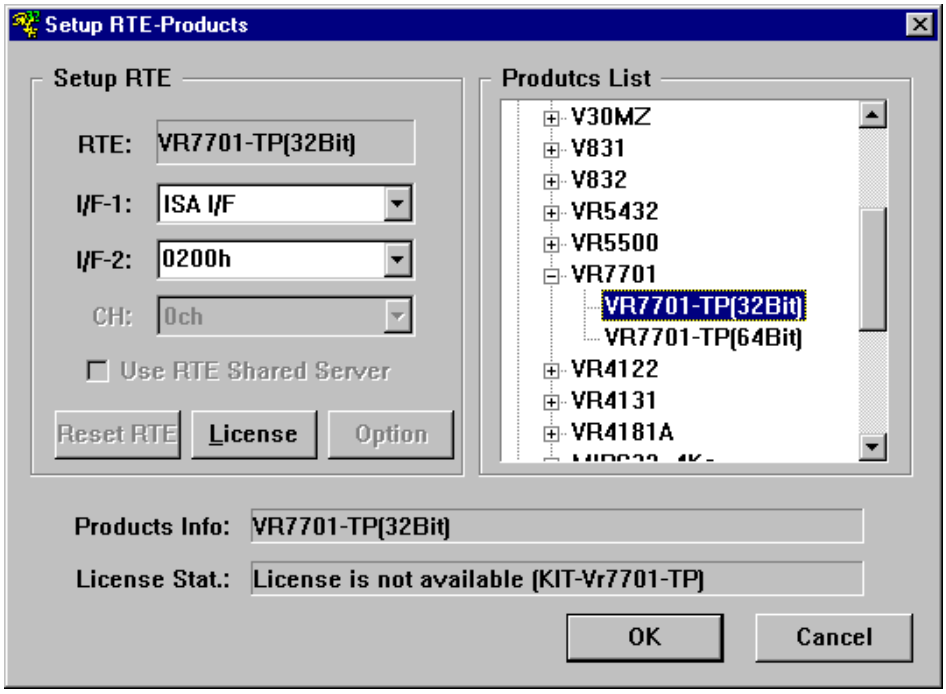
This chapter describes the setting of RTE for WIN32, with the focus on the aspects specific to KIT-VR7701-TP.

**Invoking ChkRTE2.exe**

After finishing to connect and apply the power supply for all equipments, invoke ChkRTE2.exe to setup the configuration of "RTEforWIN32".

Please setup the "RTEforWIN32" configuration at least one time for newly installed hardware.

<Setup RTE-Products>




<Selecting RTE>

From Product List, select the VR7701-TP(xxx) located beneath the TP tree.

VR7701-TP(32Bit) : Usually, please specify this.

VR7701-TP(64Bit) : Please specify to do a register display by 64-Bit width by MULTI.

<Selecting I/F-1, I/F-2>

Select and specify the host interface that suitable for your system from pull-down menu. (The display in example shows that ISA Card is assigned )

<License>

Click the button to setup license checking with the license setup sheet attached to the KIT package. For detail, please refer to the document of "RTE for WIN32".

<Function test>

If RTE for WIN32 is properly connected to the user system and capable of debugging, the following dialog box appears upon the normal completion of the function test. In this state, control from the debugger is possible.


If an error occurs during the test, the N-Wire cable is not properly connected. Check its connection.

**Perform the ChkRTE2.exe function test after the RTE-xxxx-TP has been connected to the user system and the power to all the devices has been turned on.**

# 4. INITIALIZATION COMMANDS

Before debugging can be started, system initialization is required.
The following commands are available for system initialization, be sure to setup correctly before start to use the system.

**To use Multi**

Use following commands in Target window.

ENV command
* Setup port mask
* Specify JTAG clock
* Others

ROM command
* Specify ROM emulation condition

NC/NCD command
* Specify data cache area for debugger software

NSPB/NSPBD command
* Specify forbid software break area

NROM/NROMD command
* Specify forced user area in rom emulation mapping area by ROM commad

**To use PARTNER**

Use following dialog.

Set CPU Environ dialog
* Setup port mask
* Specify JTAG clock
* Others

Set Emulation ROM dialog
* Specify ROM emulation condition

NC/NCD command
* Specify data cache area for debugger software

NSPB/NSPBD command
* Specify forbid software break area

NROM/NROMD command
* Specify forced user area in rom emulation mapping area by ROM commad

# 5. . INTERFACE SPECIFICATIONS: CONVENTIONAL TYPE (KEL)

The signal connections of the conventional type (KEL) JTAG/N-Wire interface are listed below.

**Use of the high-speed interface explained in the next chapter is recommended for new designing.**

**Pin arrangement table**

| Pin number | Signal name | Input/output (user side) | Treatment (user side) |
|---|---|---|---|
| A1 | CLKOUT | Output | 22 - 33 Ω series resistor (recommended) |
| A2 | TRCDATA0 | Output | 22 - 33 Ω series resistor (recommended) |
| A3 | TRCDATA1 | Output | 22 - 33 Ω series resistor (recommended) |
| A4 | TRCDATA2 | Output | 22 - 33 Ω series resistor (recommended) |
| A5 | TRCDATA3 | Output | 22 - 33 Ω series resistor (recommended) |
| A6 | TRCEND | Output | 22 - 33 Ω series resistor (recommended) |
| A7 | DDI | Input | 4.7k - 10 kΩ pullup |
| A8 | DCK | Input | 4.7k - 10 kΩ pullup |
| A9 | DMS | Input | 4.7k - 10 kΩ pullup |
| A10 | DDO | Output | 22 - 33 Ω series resistor (recommended) |
| A11 | DRST- | Input | 4.7k - 50 kΩ pulldown |
| A12 | Rmode*/ BkTGIO* | Input/Output | 4.7k - 10 kΩ pullup |
| A13 | NC. | ------ | Open |

| Pin number | Signal name | Input/output (user side) | Treatment (user side) |
|---|---|---|---|
| B1-B10 | GND | ------ | Connection to the power GND |
| B11 | NC. | ------ | Open |
| B12 | NC. | ------ | Open |
| B13 | +3.3V | ------ | Connection to the power |

I/O (user side) indicates the input/output direction at the user board side.

B13: Directly connect a power supply for I/O of the device that is to interface with the corresponding signal.

**For details of the connectors and wiring, refer to the manual of RTE-XXXX-TP.**

# 6. INTERFACE SPECIFICATIONS: HIGH-SPEED TYPE (MICTOR)

The signal connections of the high-speed (MICTOR) JTAG/N-Wire interface are listed below.

**This interface is supported by RTE-2000-TP only.**

**Signal connection list**

| Pin number | Connected signal name | Input/output (user side) | Treatment (user side) |
|---|---|---|---|
| 1 | GND | | Connection to the GND |
| 3(A8) | DCK | Input | 4.7 k - 10 kΩ pullup |
| 5(A9) | DMS | Input | 4.7 k - 10 kΩ pullup |
| 7(A7) | DDI | Input | 4.7 k - 10 kΩ pullup |
| 9(A10) | DDO | Output | 22 - 33 Ω series resistor (recommended) |
| 11 | --- | --- | Open |
| 13 | --- | --- | Open |
| 15 | --- | --- | Open |
| 17(A1) | TRCCLK | Output | 22 - 33 Ω series resistor (recommended) |
| 19(A6) | TRCEND | Output | 22 - 33 Ω series resistor (recommended) |
| 21(A2) | TRCDATA0 | Output | 22 - 33 Ω series resistor (recommended) |
| 23(A3) | TRCDATA1 | Output | 22 - 33 Ω series resistor (recommended) |
| 25(A4) | TRCDATA2 | Output | 22 - 33 Ω series resistor (recommended) |
| 27(A5) | TRCDATA3 | Output | 22 - 33 Ω series resistor (recommended) |
| 29 | --- | --- | Open or Connection to the GND |
| 31 | --- | --- | Open or Connection to the GND |
| 33 | --- | --- | Open or Connection to the GND |
| 35 | --- | --- | Open or Connection to the GND |
| 37 | GND | | Connection to the GND |

| Pin number | Connected signal name | Input/output (user side) | Treatment (user side) |
|---|---|---|---|
| 2 | GND | | Connection to the GND |
| 4(B13) | VCCIO | --- | Connection to the I/O power supply of CPU (for power monitoring) |
| 6(A11) | DRST- | Input | 4.7 k - 50 kΩ pulldown |
| 8(A12) | BKTGIO- | Input | 4.7 k - 10 kΩ pullup |
| 10(A13) | --- | --- | Open |
| 12 | --- | --- | Open |
| 14(B11) | --- | --- | Open |
| 16(B12) | --- | --- | Open |
| 18 | --- | --- | Open |
| 20 | --- | --- | Open |
| 22 | --- | --- | Open or Connection to the GND |
| 24 | --- | --- | Open or Connection to the GND |
| 26 | --- | --- | Open or Connection to the GND |
| 28 | --- | --- | Open or Connection to the GND |
| 30 | --- | --- | Open or Connection to the GND |
| 32 | --- | --- | Open or Connection to the GND |
| 34 | --- | --- | Open or Connection to the GND |
| 36 | --- | --- | Open or Connection to the GND |
| 38 | GND | --- | Connection to the GND |

**Remark**: ( ) indicates an equivalent pin of the KEL type connector.

I/O (user side) indicates the input/output direction at the user board side.

4-pin: Directly connect a power supply for I/O of the device that is to interface with the corresponding signal.

# 7. PRECAUTIONS

This chapter provides precautionary information on the use of KIT-VR7701-TP.

**Precautions related to operation**

1) Do not turn on the power to the user system while the power to KIT-VR7701-TP is off. Doing so can cause a malfunction.
2) KIT-VR7701-TP externally controls the debugging control circuit built into the CPU Consequently, KIT-VR7701-TP does not operate correctly unless the following conditions are satisfied:
   * KIT-VR7701-TP is properly connected to the user system using the N-Wire cable.
   * The power to the user system is on so that the CPU can run correctly.

**Precautions related to functions**

1) This KIT corresponds to a 32-bit address space and the physical address of legacy mode (512M-byte). It does not correspond to a 64-bit address space and the physical address of normal mode (64G-Byte) .
2) A virtual address corresponds, only when TLB is in the state of always hitting statically.
3) It is related with real-time trace.
   * The disassemble display of real-time trace is performed by reading the contents of a memory on the basis of the branch information from CPU. Therefore, when the contents of a memory are changed after execution, the right execution history cannot be displayed. Moreover, when an error is in branch information, an analysis display cannot be done correctly.
   * When it runs from a break point and using hardware break point one instruction of an execution start address does not write into trace.
   * Trace is automatically ended on condition that the following.
     - When the trigger point was passed and a break is taken.
     - When a break is taken in the state of the delay mode.
4) Don't LOCK cache. When it LOCKs, neither break in the area, nor step execution and rewriting of a memory can be performed normally.
5) For further information, be sure to refer to the Release Note of the KIT.
6) The limitations in the case of doing ICE of the VR7701 ES.
   - Please ask NEC Electoronics Corporation.