

Using the External RT Address Option with Alta 1553 Boards (Rich Wade – 28 MAR 11)

Some applications require a 1553 device to power-up as a specific RT Address very quickly – these applications are usually implementing MIL-STD-1760 RT behavior. Some of the Alta 1553 products support this option – this is supported on the following products:

PCI-1553, PMC-1553, PC104P-1553, PMC-MA4, PCIE4L-1553, PCIE1L-1553
PCIC-1553, PCIEC4L-1553, CPCIC3-1553, ENET-1553

This is NOT supported on these products:

PCCD-1553, ECD54-1553, MPCIE-1553

Contact Alta if you need to use this feature on a product not listed here. **REFER TO THE HARDWARE MANUAL FOR YOUR SPECIFIC BOARD TYPE – the Hardware Manual provides the specific jumpers, connectors, and pin-outs for the signals discussed here.**

Enabling the External RT Address Option

The External RT Address Option must be enabled with a hardware setting. The \sim RTADDR_EN signal must be connected to **GND**.

On the PCI-1553, this can be done using the DB50 AUX connector on the cable assembly. Refer to the PCI-1553 Hardware Manual – the \sim RTADDR_EN signal is on pin 15 of the DB50 AUX connector. Pin 16 on this connector is **GND**. Connecting pin 15 to pin 16 enables the External RT Address option for the PCI-1553 board.

On the PC104P-1553, the External RT Address option is enabled by installing a jumper on J11.

Setting the Desired RT Address

Six signals are used to set the External RT Address – five bits for the address plus a parity bit. These signals are called **RTADDR1_0**, **RTADDR1_1**, **RTADDR1_2**, **RTADDR1_3**, **RTADDR1_4**, and **RTADDR1_P**. All of these signals are internally pulled up on the Alta board. If you want the bit to be ZERO you must connect the signal to **GND**. If you want the bit to be ONE the signal can be left **OPEN**. The parity bit is used to set ODD PARITY. The Alta board will use the External RT Address if the address is valid and has the correct parity. The following table shows the correct settings by RT Address.

RT Address	RTADDR1_P	RTADDR1_4	RTADDR1_3	RTADDR1_2	RTADDR1_1	RTADDR1_0
0	OPEN (1)	GND (0)				
1	GND (0)	OPEN (1)				
2	GND (0)	GND (0)	GND (0)	GND (0)	OPEN (1)	GND (0)
3	OPEN (1)	GND (0)	GND (0)	GND (0)	OPEN (1)	OPEN (1)
4	GND (0)	GND (0)	GND (0)	OPEN (1)	GND (0)	GND (0)
5	OPEN (1)	GND (0)	GND (0)	OPEN (1)	GND (0)	OPEN (1)
6	OPEN (1)	GND (0)	GND (0)	OPEN (1)	OPEN (1)	GND (0)
7	GND (0)	GND (0)	GND (0)	OPEN (1)	OPEN (1)	OPEN (1)
8	OPEN (1)	GND (0)	OPEN (1)	GND (0)	GND (0)	GND (0)

9	OPEN (1)	GND (0)	OPEN (1)	GND (0)	GND (0)	OPEN (1)
10	OPEN (1)	GND (0)	OPEN (1)	GND (0)	OPEN (1)	GND (0)
11	GND (0)	GND (0)	OPEN (1)	GND (0)	OPEN (1)	OPEN (1)
12	OPEN (1)	GND (0)	OPEN (1)	OPEN (1)	GND (0)	GND (0)
13	GND (0)	GND (0)	OPEN (1)	OPEN (1)	GND (0)	OPEN (1)
14	GND (0)	GND (0)	OPEN (1)	OPEN (1)	OPEN (1)	GND (0)
15	OPEN (1)	GND (0)	OPEN (1)	OPEN (1)	OPEN (1)	OPEN (1)
16	GND (0)	OPEN (1)	GND (0)	GND (0)	GND (0)	GND (0)
17	OPEN (1)	OPEN (1)	GND (0)	GND (0)	GND (0)	OPEN (1)
18	OPEN (1)	OPEN (1)	GND (0)	GND (0)	OPEN (1)	GND (0)
19	GND (0)	OPEN (1)	GND (0)	GND (0)	OPEN (1)	OPEN (1)
20	OPEN (1)	OPEN (1)	GND (0)	OPEN (1)	GND (0)	GND (0)
21	GND (0)	OPEN (1)	GND (0)	OPEN (1)	GND (0)	OPEN (1)
22	GND (0)	OPEN (1)	GND (0)	OPEN (1)	OPEN (1)	GND (0)
23	OPEN (1)	OPEN (1)	GND (0)	OPEN (1)	OPEN (1)	OPEN (1)
24	OPEN (1)	OPEN (1)	OPEN (1)	GND (0)	GND (0)	GND (0)
25	GND (0)	OPEN (1)	OPEN (1)	GND (0)	GND (0)	OPEN (1)
26	GND (0)	OPEN (1)	OPEN (1)	GND (0)	OPEN (1)	GND (0)
27	OPEN (1)	OPEN (1)	OPEN (1)	GND (0)	OPEN (1)	OPEN (1)
28	GND (0)	OPEN (1)	OPEN (1)	OPEN (1)	GND (0)	GND (0)
29	OPEN (1)	OPEN (1)	OPEN (1)	OPEN (1)	GND (0)	OPEN (1)
30	OPEN (1)	GND (0)				

If the External RT Address option is enabled and a valid External RT Address (with correct parity) is selected, then when the board powers up the first 1553 channel will be enabled to respond at the selected RT Address. The RT will initially respond with the BUSY bit set until the user application can take over.

The example program `ADT_L1_1553_ex_rt10_1760extAdd.c` demonstrates how to use the Alta API to transition from the power-up state (where the RT responds with the BUSY bit) to the active state for the RT. Please refer to this example program and the **AltaAPI Users Manual** for more information.

External RT Address Power-Up Timing

The Alta board will be ready to respond (with the BUSY bit set) within **75 milliseconds** from the time the board gets a **good power supply voltage** and the **PCI bus is out of RESET (RST# must be high)**.

MIL-STD-1760 requires the RT to be ready to respond with the BUSY bit set within 150 milliseconds from power-up, and ready to respond and operate normally (with the BUSY bit clear and ready to transmit valid data for a Store Description message) within 500 milliseconds from power-up.

Note that the time that the system holds the PCI RESET signal low on power-up can vary widely from one system to another and this can cause your system to exceed the 150ms MIL-STD-1760 BUSY response time. Likewise, system boot-up times vary widely and can cause your system to exceed the 500ms MIL-STD-1760 operational response time. The system designer must ensure that these factors are taken into account in order to meet the MIL-STD-1760 power-up response time requirements.