

# Flexible MiniPCI Express to 2x PCI Express Splitter

## Hardware Manual

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May 25, 2012  
Revision 1.3

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# 1 About this Document

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## 1.1 Purpose

This document describes Hardware installation, features, specification and operation for AMFELTEC Flexible MiniPCI Express to 2x PCI Express Splitter.

## 1.2 Feedback

AMFELTEC Corp. makes every effort to ensure that the information contained in this document is accurate and complete at time of release. Please contact AMFELTEC Corp. if you find any errors, inconsistency or have trouble understanding any part of this document.

To provide your feedback, please send an email to [support@amfeltec.com](mailto:support@amfeltec.com)

Your comments or corrections are greatly valued in our effort for excellence and continued improvement.

## 1.3 Revision History

Rev. No.	Description	Rev. Date
1.0	Initial Release.	December 10, 2009
1.1	Update hardware installation instructions	June 01, 2011
1.2	Correction in Table 1	May 20, 2012
1.3	Added Gen2 support	May 25, 2012

## 2 General Description

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### 2.1 Introduction

Flexible MiniPCI Express to 2x PCI Express Splitter (Splitter) is designed to support expansion of modern motherboards with limited numbers of PCI Express Connectors. Splitter converts the standard MiniPCI Express motherboard slot into 2 independent x1 PCI Express slots.



Figure 1: Flexible MiniPCIe to 2x PCIe Splitter

It includes one MiniPCI Express Host card (

Figure 2) and two x1 PCI Express adapter boards (Figure 4 or Figure 5). The MiniPCI Express Host card has to be plugged into an upstream MiniPCI Express motherboard connector. Each PCI Express adapter board connects to the main MiniPCI Express Host card via 12" Flex PCI Express cable. The expansion PCI Express add-in board has to be plugged into the standard x1 PCI Express connector on the x1 PCI Express adapter board.

Because of the flexible nature of the connection (unlike traditional rigid risers), expansion PCI Express add-in boards can be positioned away from the Splitter, including around any obstacles inside a computer chassis. Each x1 PCI Express Adapter has two mounting holes allowing them to be securely fixed inside a computer chassis. In addition, each x1 PCI Express Adapter has two support tabs for mechanical stabilization expansion add-in boards (US Patent 7,255,570).



Figure 2: MiniPCI Express Host Board

The Splitter functions right out of the box, no additional software needs to be installed. The Mini PCI Express Host card has LEDs for displaying upstream and downstream PCI Express ports activities as well as expansion PCI Express add-in boards “PRESENT” status.



Figure 3: x1 PCI Express adapter board (powered from host card (3.3V only))

## General Description



Figure 4: x1 PCI Express adapter board (powered from ATX power supply) (12V, 5V)



Figure 5: x1 PCI Express adapter board (powered from external 12V power supply)



## 3 Requirements/Features

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### 3.1 Power Source

The power for the expansion PCI Express add-in board can be supplied from two different sources:

- From standard ATX power supply (“floppy disk” connector) (12 and 5 volts) via x1 PCI Express Adapter board
- From external power supply 12V and 3.3V via x1 PCI Express Adapter board
- From external 12 volt power supply via x1 PCI Express Adapter board

### 3.2 Software

There is no software required for normal operation.

## 4 Hardware Description

### 4.1 Board Layout

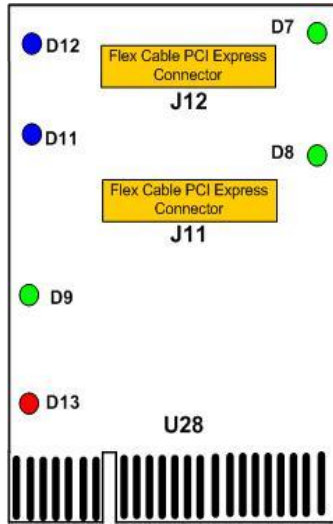


Figure 6: MiniPCI Express Host board layout

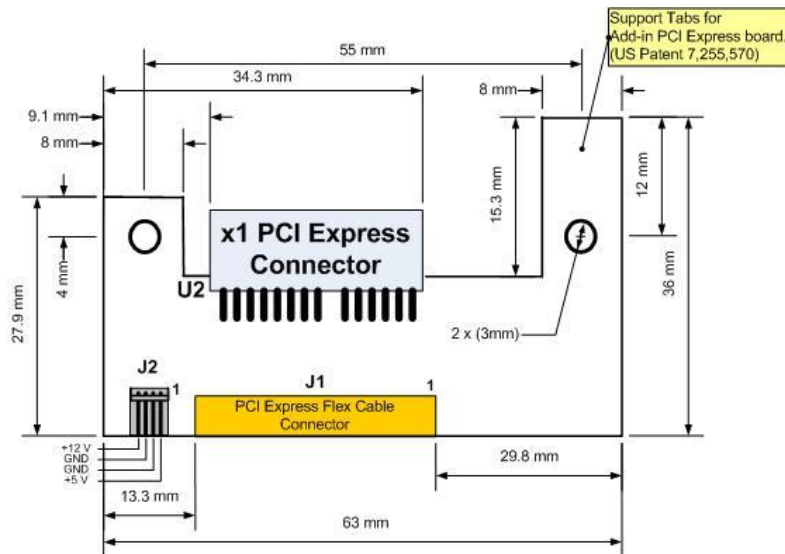


Figure 7: x1 PCI Express adapter board layout

## 4.2 LEDs

RESET	D13	Red	Global PCIe “RESET” signal
ACTIVE	D9	Green	Upstream port link status. ( <b>Solid Off</b> - Lane is disabled, <b>Solid On</b> –Lane is enabled, 5GT/s, <b>0.5 seconds On, 0.5 seconds Off</b> – Lane is enabled, 2.5 GT/s)
ACTIVE1	D8	Green	Downstream port 1 link status. ( <b>Solid Off</b> - Lane is disabled, <b>0.5 seconds On, 0.5 seconds Off</b> – Lane is enabled, 2.5 GT/s)
PRSNT 1	D11	Blue	First downstream link “PRSNT” signal
ACTIVE2	D7	Green	Downstream port 2 link status. ( <b>Solid Off</b> - Lane is disabled, <b>0.5 seconds On, 0.5 seconds Off</b> – Lane is enabled, 2.5 GT/s)
PRSNT 2	D12	Blue	Second downstream link “PRSNT” signal

Table 1: MiniPCI Express Host board LEDs

## 4.3 Connectors

RefDes	Type	Usage
U28	Upstream x1 PCI Express male connector	Connection to the upstream PCI Express bus on motherboard. (bandwidth up to 5Gbit/sec.)
J11,J12	PCI Express Flex Cable connector	Connection via Flex PCI Express Cable to the x1 PCI Express adapter boards. (bandwidth 2.5 Gbit/sec)

Table 2: MiniPCI Express Host board connectors

RefDes	Type	Usage
J1	PCI Express Flex Cable connector	Connector via Flex PCI Express Cable to the x4 PCI Express Host card.
J2	“Floppy disk” male power connectors	Incoming power for the expansion PCI Express add-in boards
U2	Downstream 1x PCI Express female connector	Connection to the expansion PCI Express add-in board.

Table 3: x1 PCI Express adapter board connectors

## 5 Installation

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### 5.1 PCI Express Flex Cable Connection

Locate PCI Express Flex Cable with blue label to the top.

### 5.2 Hardware Installation

Following steps provide the exact sequence need to be followed in order to properly install the Flexible MiniPCI Express to 2x PCI Express Splitter from AMFELTEC Corp.:

**Warning:** Before touching anything inside the computer or any components, be sure to discharge your body's static electricity by touching a grounded surface.

- Turn OFF host computer and unplug it from the wall outlet.
- Remove the chassis cover or side panel from host computer. Refer to the computer manual for instructions if you need them.
- If the unit is a tower unit, turn it over on its side to make access easier.
- Ground yourself to the PC case. Attach a grounding wrist strap (if available) to the computer's metal chassis and your wrist. **CAUTION:** If you choose not to use the grounding wrist strap, be sure to take adequate precautions to discharge static electricity from your body before touching any components.
- Insert PCI Express Flex Cable into the connectors on the MiniPCI Express Host card and on the PCI Express Adapter.
- Install the host card the motherboard MiniPCI Express slot.
- Place and retain PCI Express Adapters inside the chassis.
- Connect power for the PCI Express Adapters.
- Holding your add-in card by its edges and the mounting bracket, position the card with the contacts downward over the PCI Express slot and insert the card into the slot. Do not let it touch any of the components on the motherboard or PCI Express Adapter.
- Now, you can close computer cover and power-up the host computer.



BE SURE THAT BLUE LEDS ARE ON where there is expansion PCI Express add-in board! (Expansion PCI Express board is present)

## 6 Operation Modes

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Multiple x1 PCI Express adapter boards can be attached together with spacers as shown in a photo below.

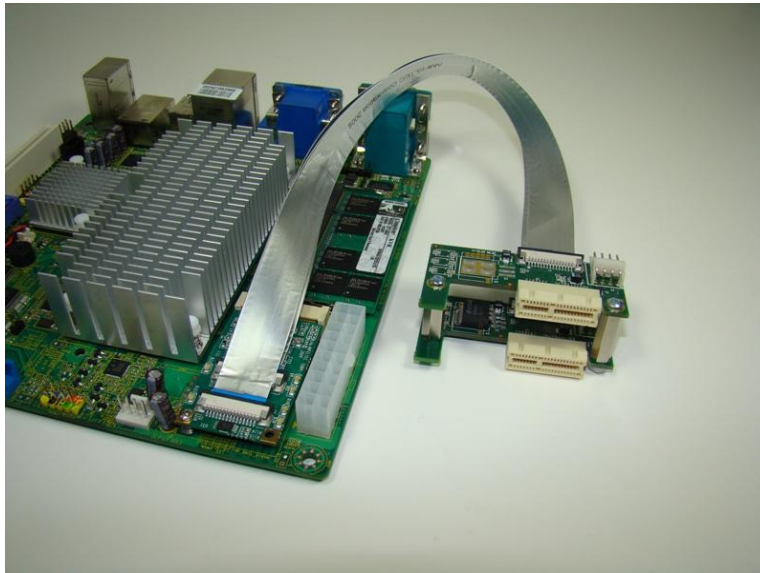


Figure 8: MiniPCI Express to 2x PCI Express Splitter

## **7            Ordering Information**

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### **7.1        Standard package**

Standard package include the following components:

- MiniPCI Express Host card
- Two x1 PCI Express adapter board with Flex PCI Express cable

## **8 Appendix A: Limited warranty**

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