GIGABIT ETHERNET FOR MINI PCI EXPRESS
PRELIMINARY HARDWARE MANUAL

CHAPTER 1: QUICK START

It is recommended that you install the software package before installing the PCI Express Mini Card (mPCIe) in your computer. You can install the software[1] using either a stand-alone installer downloaded from the website or an optional Software Master CD.

Run the installer you downloaded (or autorun.exe on the Software Master CD) and follow the prompts to install the software for your device.

Please note: during the installation you may be prompted regarding the installation of non-WHQL-certified drivers; please carefully confirm the digitally signed source of the drivers and accept the installation.

After the Software package has finished installing the Intel I210 driver installation program will run.

Once the software and driver has been installed, shut down your system and carefully install the mPCIe card.

Caution: Do not connect an Ethernet cable at this time.

Re-start your system. Once the computer finishes booting your new Ethernet port should already be installed and ready for use; you can confirm this by launching Device Manager and looking under the "Network Adapters" section.

[1] *In Linux or OSX please refer to the instructions in those directories.*

CHAPTER 2: INTRODUCTION

PCI Express Mini Card (mPCIe), a low-profile small-footprint bus standard originally intended for adding peripherals to notebook computers, has become the de-facto standard for high-performance, small form-factor devices in many applications.

- 10/100/1000 BASE-T interface on mPCIe
- Powered by +3.3V from PCI Express Mini Card Connector
- PCI Express v2.1 (2.5GT/s) interface
- Rugged design includes overvoltage protection and buffering on all signals
- RoHS and Industrial temperature standard
- Optional low-PPM XTAL to support IEEE 1488 precision timing protocol

CHAPTER 3: HARDWARE

This manual applies to the following models:
mPCIe-LAN-GbE   1 port 10/100/1000 Ethernet mPCIe Card

These models are full-length "F1" mPCIe devices (30 × 50.95 mm). All units are RoHS compliant and support Industrial temperature environments (-40°C to 85°C operating, -65°C to 150°C storage.)

INCLUDED IN YOUR PACKAGE

One-port mPCIe-LAN card

Available accessories include:	
CAB-mPCIe-LAN	9 inch panel-mount RJ45 cable
mPCIe-HDW-KIT2	Mounting hardware for 2mm
mPCIe-HDW-KIT2.5	Mounting hardware for 2.5mm

Contact the factory for information regarding additional accessories, options, and specials that may be available to best fit your specific application requirements.

CHAPTER 4: CONFIGURATION SETTINGS

Before integrating each mPCIe-LAN-GbE device into your LAN you must assign each port a unique MAC address.

After installing the software package and hardware, before you connect an Ethernet cable to the mPCIe-LAN-GbE you must follow the following procedure:

1. Create a DOS boot USB stick or other storage device.
2. Copy the contents of the SetMAC folder to your device.
3. Boot your computer to DOS using this device.
4. Run the SetMAC.exe program by typing "SetMac"

   The program will list all compatible Ethernet devices detected in your system. Make a note of the "NIC" number shown for your new mPCIe-LAN-GbE card.

5. Run the SetMac program again, including the NIC number and desired MAC address to program as command line parameters, as shown here …

   `SetMac /nic=`n `/mac=`*abcdabcdabcd*

   … where n is the NIC number and *abcdabcdabcd* is a valid MAC address that you wish to program into the port.

6. Reboot; we recommend powering off, unplugging the power from the computer, waiting a half a minute or so, then powering back up as normal … but ctrl-alt-delete generally works.

7. Your new Ethernet port will reflect the newly assigned MAC address and is ready for use. You can now connect the Ethernet Cable at any time.

CHAPTER 5: PC INTERFACE

This product interfaces with a PC using a PCI Express Mini Card (mPCIe) connection; a small-form-factor, high-performance, rugged peripheral interconnect technology first introduced for use in laptops and other portable computers.

mPCIe's small size and powerful performance, combined with perfect software compatibility with PCI and PCIe peripheral designs, have led to its recent adoption as a go-to standard for embedded Data Acquisition and Control, and many other applications.

Although mPCIe is a broadly-adopted industry standard, the actual connection to the computer shares a specification with mSATA: both mSATA and mPCIe use the same edge-connector. In fact, well-designed PCs can automatically detect and configure their onboard connectors to work with either mPCIe or mSATA devices – and, according to the standards for mPCIe and mSATA they are *supposed* to do so! However, some PC manufacturers ship computers that *only* support mSATA devices. Please confirm in your PC documentation that your edge-connector is *actually* PCI Express Mini Card compliant before installing this, or any, mPCIe card. Damage might occur if you install an mPCIe device into a computer that only supports mSATA.

mPCIe defines mounting holes for securing the otherwise loose end of the card, so it is impossible for these cards to wiggle or flap

themselves loose (which was a recurring problem with the older PCI Mini devices). Eliminating this concern for PCI Express Mini Cards is a major reason this standard has seen rapid adoption by the Data Acquisition and Control industry.

The mPCIe standard, like its PCI Mini Card predecessor, was designed assuming use primarily in Laptop or Notebook and similar devices, where physical dimension is often the paramount design constraint. In Data Acquisition and Control applications low-weight combined with vibration tolerance tend to be of more concern.

CHAPTER 6: I/O INTERFACE

The card incorporates a 12-pin right-angle latching connector suitable for deep-embedded integration. When used with the CAB-mPCIe-LAN optional cable accessory this 12-pin embeddable connector is broken out to a standard RJ45 panel-mount connector.

CHAPTER 7: SOFTWARE INTERFACE

CHAPTER 8: SPECIFICATIONS

This card provides a standard 10/100/1000 Ethernet Interface using the Intel I210 PCI Express to Ethernet Bridge chip, and operates seamlessly using your operating systems' native Ethernet utilities and driver stack. Configure and operate the Ethernet port as you would any other; refer to your operating system manual for specific information, if needed.

The latest information can always be found on the product page on the website. Here are some useful links:

Links to useful downloads	
Main web site	http://acces.io
Product web page	acces.io/mPCIe-LAN-GbE
This manual	acces.io/MANUALS/mPCIe-LAN-GbE.pdf
Windows Software	acces.io/files/packages/ mPCIe-LAN-GbE
Install Package	Install.exe
Intel I210 Driver	https://downloadcenter.intel.com/product/64399/Intel-Ethernet-Controller-I210-Series

PC Interface

PCI Express Mini Card	Type F1 "Full Length"

Communications Interface

I/O connector	Amphenol FCI 98417-G61-12ULF
I/O Mating connector	pending

Environmental

Temperature		
	Operating	-40° to 85°C
	Storage	tbd
Humidity		5% to 95%, non-condensing

Power required	3.3VDC at 176mA (1000Mbps)
	3.3VDC at 109mA (100Mbps)
	3.3VDC at 86mA (idle, no link)
ESD Protection	tbd

Physical

Size		
	Length	50.95mm (2.006")
	Width	30.00mm (1.181")
Weight		tbd

CHAPTER 9: CERTIFICATIONS

CE & FCC

These devices are designed to meet all applicable EM interference and emission standards. However, as they are intended for use installed on motherboards, and inside the chassis of industrial PCs, important care in the selection of PC and chassis is important to achieve compliance for the computer as a whole.

UL & TUV

No DC voltages above 5V, and no AC voltages of any kind, are consumed or produced during normal operation of this device. This product is therefore exempt from any related safety standards. Use it with confidence!

ROHS / LEAD-FREE STATEMENT

All models are produced in compliance with RoHS and various other lead-free initiatives.

WARNING

A SINGLE STATIC DISCHARGE CAN DAMAGE YOUR CARD AND CAUSE PREMATURE FAILURE! PLEASE FOLLOW ALL REASONABLE PRECAUTIONS TO PREVENT A STATIC DISCHARGE SUCH AS GROUNDING YOURSELF BY TOUCHING ANY GROUNDED SURFACE PRIOR TO TOUCHING THE CARD.

ALWAYS CONNECT AND DISCONNECT YOUR FIELD CABLING WITH THE COMPUTER POWER OFF. ALWAYS TURN COMPUTER POWER OFF BEFORE INSTALLING A CARD. CONNECTING AND DISCONNECTING CABLES, OR INSTALLING CARDS, INTO A SYSTEM WITH THE COMPUTER OR FIELD POWER ON MAY CAUSE DAMAGE TO THE I/O CARD AND WILL VOID ALL WARRANTIES, IMPLIED OR EXPRESSED.

WARRANTY

Prior to shipment, ACCES equipment is thoroughly inspected and tested to applicable specifications. However, should equipment failure occur, ACCES assures its customers that prompt service and support will be available. All equipment originally

manufactured by ACCES which is found to be defective will be repaired or replaced subject to the following considerations:

GENERAL

Under this Warranty, liability of ACCES is limited to replacing, repairing or issuing credit (at ACCES discretion) for any products which are proved to be defective during the warranty period. In no case is ACCES liable for consequential or special damage arriving from use or misuse of our product. The customer is responsible for all charges caused by modifications or additions to ACCES equipment not approved in writing by ACCES or, if in ACCES opinion the equipment has been subjected to abnormal use. "Abnormal use" for purposes of this warranty is defined as any use to which the equipment is exposed other than that use specified or intended as evidenced by purchase or sales representation. Other than the above, no other warranty, expressed or implied, shall apply to any and all such equipment furnished or sold by ACCES.

TERMS AND CONDITIONS

If a unit is suspected of failure, contact ACCES' Customer Service department. Be prepared to give the unit model number, serial number, and a description of the failure symptom(s). We may suggest some simple tests to confirm the failure. We will assign a Return Material Authorization (RMA) number which must appear on the outer label of the return package. All units/components should be properly packed for handling and returned with freight prepaid to the ACCES designated Service Center, and will be returned to the customer's/user's site freight prepaid and invoiced.

COVERAGE

FIRST THREE YEARS: Returned unit/part will be repaired and/or replaced at ACCES option with no charge for labor or parts not excluded by warranty. Warranty commences with equipment shipment.

FOLLOWING YEARS: Throughout your equipment's lifetime, ACCES stands ready to provide on-site or in-plant service at reasonable rates similar to those of other manufacturers in the industry.

EQUIPMENT NOT MANUFACTURED BY ACCES

Equipment provided but not manufactured by ACCES is warranted and will be repaired according to the terms and conditions of the respective equipment manufacturer's warranty.

DISCLAIMER

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PCI EXPRESS MINI CARD STANDARD NOTICE

The mPCI-LAN-GbE is fully compliant with PCI Express Mini Card v1.2.