» VX3905 «

VX3905 Ethernet Switch
Firmware User Manual

SD.DT.G22-0e - January 2013

Revision History

Publication Title:	VX3905 Firmware User Manual	
Doc. ID:	SD.DT.G22-0e	
Rev.	Brief Description of Changes	Date of Issue
0e	Initial Version	01-2013

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Environmental Protection Statement

This product has been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled.

Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

Environmental protection is a high priority with Kontron.

Kontron follows the DEEE/WEEE directive.

You are encouraged to return our products for proper disposal.

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- reduce waste arising from electrical and electronic equipment (EEE)
- make producers of EEE responsible for the environmental impact of their products, especially when they become waste
- encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
- improve the environmental performance of all those involved during the lifecycle of EEE

Conventions

This guide uses several types of notice: Note, Caution, ESD.

Note: this notice calls attention to important features or instructions.


Caution: this notice alert you to system damage, loss of data, or risk of personal injury.


ESD: This banner indicates an Electrostatic Sensitive Device.

All numbers are expressed in decimal, except addresses and memory or register data, which are expressed in hexadecimal. The prefix `0x' shows a hexadecimal number, following the `C' programming language convention.

The multipliers `k', `M' and `G' have their conventional scientific and engineering meanings of $*10^3$, $*10^6$ and $*10^9$ respectively. The only exception to this is in the description of the size of memory areas, when `K', `M' and `G' mean $*2^{10}$, $*2^{20}$ and $*2^{30}$ respectively.

When describing transfer rates, `k' `M' and `G' mean $*10^3$, $*10^6$ and $*10^9$ *not $*2^{10}$ $*2^{20}$ and $*2^{30}$.*

In PowerPC terminology, multiple bit fields are numbered from 0 to n, where 0 is the MSB and n is the LSB. PCI and CompactPCI terminology follows the more familiar convention that bit 0 is the LSB and n is the MSB.

Signal names ending with an asterisk (*) or a hash (#) denote active low signals; all other signals are active high.

Signal names follow the PICMG 2.0 R3.0 CompactPCI Specification and the PCI Local Bus 2.3 Specification.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions


Warning!
All operations on this device must be carried out by sufficiently skilled personnel only.


Caution, Electric Shock!
Before installing a not hot-swappable Kontron product into a system always ensure that your mains power is switched off. This applies also to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair and maintenance operations with this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing work.

Special Handling and Unpacking Instructions

ESD Sensitive Device!
Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the board is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the board.

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the device, which are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

This device should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This applies also to the operational temperature range of the specific board version, which must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, please follow only the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board, please re-pack it as nearly as possible in the manner in which it was delivered.

Special care is necessary when handling or unpacking the product. Please consult the special handling and unpacking instruction on the previous page of this manual.

Table Of Contents

Chapter 1 - Introduction

1.1 Scope

This document describes VX3905's firmware features.

1.2 Glossary

Acronym	Definition
TUI	Text User Interface
µC, PIC	Synomyms of VX3905 microcontroller

1.3 Kontron Documents

Type	Title	Reference
[DOC_INT_1]	VX3905 - 3U VPX PCI Express and Ethernet Switch User's Guide	CA.DT.A89

1.4 Miscellaneous Documents

Type	Title	Reference
[DOC_EXT_1]	PIC16(L)F1825/1829 14/20-Pin Flash MCUs with XLP Technology	41440C

Chapter 2 - Microcontroller Overview

A custom Microchip PIC16LF1825 microcontroller (µC) offers additional functionalities to the VX3905 COTS product. The µC becomes active when the 5V backplane is supplied. The µC is accessed via the connector EIA-232 RJ-11 located on the front panel or optionally through a RTM board when the connector RJ-11 on the front is not available.

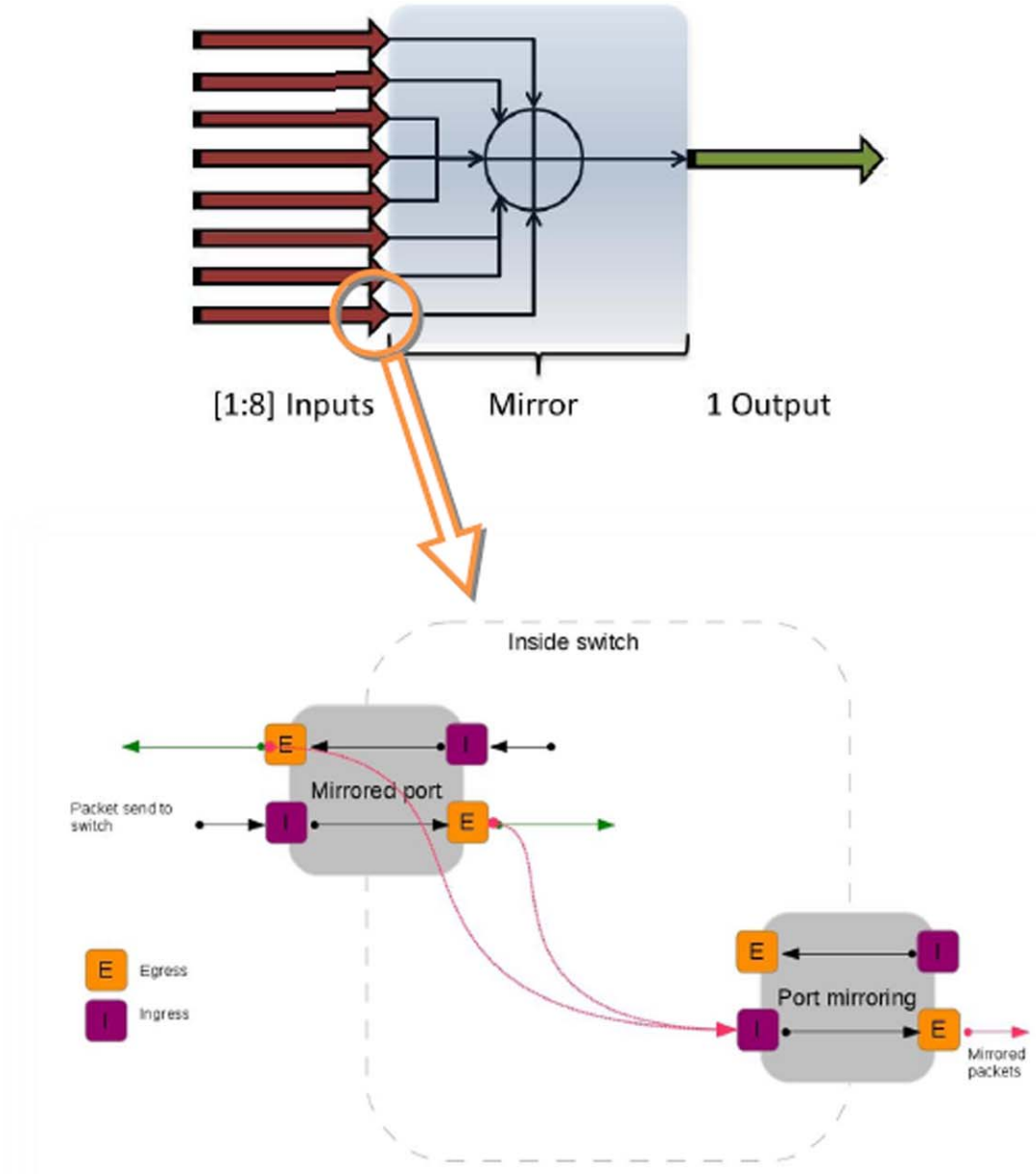
Pin	Signal
1	NC
2	Shell
3	TXD
4	RXD
5	GND
6	NC

Serial interface characteristics are:

- 115200 bauds
- 8 bits
- No parity
- 1 stop bit
- No flow control

Chapter 3 - Ethernet Switch Configuration

Marvell Ethernet switch chip of VX3905 offers the capability to configure the behavior of each port.



Port Number	Location	Interface	Type
0	Front Panel	ETHB	1000BASE-T
1	Backplane	SRDS0	1000BASE-BX
2	Backplane	SRDS1	1000BASE-BX
3	Front Panel	ETHA	1000BASE-T
4	Backplane	SRDS2	1000BASE-BX
5	Backplane	SRDS3	1000BASE-BX
6	Front Panel	ETH2	1000BASE-T
7	Backplane	SRDS4	1000BASE-BX
8	Front Panel	SRDS5	1000BASE-BX
9	Backplane	SRDS6	1000BASE-BX

Chapter 4 - Command Line Interface

A command line interface is reachable through “HyperTerminal” or VT100 emulation software. Three commands are implemented as described below.

4.1 Set MDIO

`"setmd"` writes a 4-byte value at a register address (2 bytes) of a device address (2 bytes).

Command SET requires 3 arguments: `SET [DEV ADDR] [REG ADDR] [VALUE]`

4.2 Get MDIO

`"getmd"` reads a 4-byte value from a register address (2 bytes) of a device address (2 bytes).

Command GET requires 2 arguments: `GET [DEV ADDR] [REG ADDR]`

`"setmd"` and `"getmd"` use mdio protocol to communicate with the Ethernet switch. Please refer to switch datasheet for more information.

`"setmd"` and `"getmd"` use mdio protocol to communicate with the Ethernet switch. They are reserved and should be used with caution.

4.3 Toggle Menu

`"tglm"` switch from command line interface (CLI) to text user interface (TUI).

For example:

```
VX3905_PIC_CMD> tglm
```

Chapter 5 - Text User Interface (TUI)

The HMI is reachable through HyperTerminal or VT100 software emulation.

```
MAIN:
(1) SW       (ETHERNET switch configuration)     -> menu (a)
(2) PCIe     (N/A)
(3) ADV      (Advanced menu)                     -> menu (e)
```

```
SWITCH:
(1) Mirror   (ETHERNET port mirroring configuration)   -> menu (b)
(2) LBacks   (ETHERNET port loopback configuration)    -> menu (f)
Return       (return to "Main" menu)
```

```
XGRESS:
(1) IN       (configure ingress port (s) for mirroring) -> menu (c)
(2) OUT      (Configure egress port (s) for mirroring)   -> menu (d)
Return       (return to "Main" menu)
```

5.1 Port Mirroring Configuration

None or all inputs can be selected at the same time. All tagged inputs are redirected to the selected outputs. The output is exclusive and only one can be selected. At least one input must be selected to choose one mirrored output.

Select (or unselect) is done by de-selecting the corresponding option number.

The selected output cannot be selected as input.

```
Set INGRESS: -> menu (c)
(0) INGRESS Port [ ]
(1) INGRESS Port [x]
(2) INGRESS Port [ ]
(3) INGRESS Port [x]
(4) INGRESS Port [ ]
(5) INGRESS Port [ ]
(6) INGRESS Port [x]
(7) INGRESS Port [ ]
(8) INGRESS Port [x]
(9) INGRESS Port [ ]

Return       (return to "Main" menu)
```

```
Set EGRESS:      -> menu (d)
(0) EGRESS Port [ ]
(1) EGRESS Port [ ]
(2) EGRESS Port [ ]
(3) EGRESS Port [ ]
(4) EGRESS Port [ ]
(5) EGRESS Port [ ]
(6) EGRESS Port [ ]
(7) EGRESS Port [ ]
(8) EGRESS Port [ ]
(9) EGRESS Port [x]

(R)Return    (return to "Main" menu)
```

5.2 VPD Configuration

VPD: All Vital Product Data are stored into the microcontroller EEPROM and can be read / written through the serial line.

```
ADV:          (Advanced menu)  menu (b)
(1) SVPD      (Set VPD)                -> menu (g)
(2) GVPD      (Get VPD)                -> menu (h)
(3) TOGL      (Toggle to command line menu)

(R)Return     (return to "Main" menu)
```

```
Set VPD:          -> menu (g)
> BType : (Board Type)
> ECL ..:
> SN ...:
> Var ..: (Variant)
> PN ...:
> uVer .: (Microcontroller version)

(R)Return     (return to "Main" menu)
```

```
Get VPD:          -> menu (h)
> BType :     (Board Type)
> ECL ..:
> SN ...:
> Var ..:     (Variant)
> PN ...:
> uVer .:     (Microcontroller version)

(R)Return     (return to "Main" menu)
```

5.3 Ethernet Loopback Configuration

The Ethernet switch loopbacks are configurable through the serial link for test purpose.

```
Set EGRESS:                -> menu (f)
(0) Set LOOPBACK Port [ ]
(1) Set LOOPBACK Port [x]
(2) Set LOOPBACK Port [ ]
(3) Set LOOPBACK Port [x]
(4) Set LOOPBACK Port [ ]
(5) Set LOOPBACK Port [ ]
(6) Set LOOPBACK Port [x]
(7) Set LOOPBACK Port [ ]
(8) Set LOOPBACK Port [x]
(9) Set LOOPBACK Port [ ]

(R)Return
```

MAILING ADDRESS
Kontron Modular Computers S.A.S.
150 rue Marcelin Berthelot - BP 244
ZI TOULON EST
83078 TOULON CEDEX - France

TELEPHONE AND E-MAIL
+33 (0) 4 98 16 34 00
sales@kontron.com
support-kom-sa@kontron.com

For further information about other Kontron products, please visit our Internet web site: www.kontron.com.