KSZ8895MQX/RQX
Evaluation Board User's Guide

KSZ8895 Family Integrated 5-port 10/100 Ethernet Managed Switch

Rev 1.0 May 2014

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Revision History

Revision	Date	Change
1.0	05/01/14	Initial release

1.0 Introduction

The KSZ8895 family is Micrel Operations' new generation integrated 5-port switch. The KSZ8895MQX is one of KSZ8895 family. KSZ8895MQX contains two MII interfaces for MAC 5 and PHY 5 of the port 5. KSZ8895RQX is one of KSZ8895 family. KSZ8895RQX contains two RMII interfaces for MAC 5 and PHY 5 of port 5. The device had been designed with cost sensitive systems in mind but still offers a multitude of features such as switch management; port and tag based VLAN; QoS priority; CPU control SPI interfaces and CPU control MDC/MDIO for MIIM/SMI interfaces. The KSZ8895 family is an excellent choice in broadband gateway applications, integrated broadband router applications, managed media converter, industrial automatic, automotive, etc. fields and as a standalone 5-port switch. The KSZ8895 evaluation board is designed to allow the user to experience first-hand the rich feature set of this exciting new product. The evaluation board is highly configurable and easy to use.

2.0 Features

- Micrel KSZ8895 Integrated 5-port 10/100 Managed Ethernet Switch
- 5 RJ-45 Jacks for Ethernet LAN and WAN Interfaces with Corresponding Isolation Magnetics.
- Auto MDI/MDIX on All Ports.
- 1 PHY mode and 1 MAC mode MII Connector are for the port 5 MAC 5 SW5-MII/RMII Interface
- 1 PHY mode is for the port 5 PHY 5 P5-MII/RMII interface
- 1 USB Port Interface Configurable to Emulate an I2C or SPI or MDC/MDIO Interface for EEPROM, all control registers and all MIIM registers access.
- On Board EEPROM
- 3 LEDs Per Port to Indicate the Status and Activity
- 5VDC, 2.5A Universal Power Supply (Not included), the Powered can be used by USB port.

3.0 Evaluation Kit Contents

The KSZ8895 Evaluation kit includes the following:

- KSZ8895 Evaluation Board Rev. 1.x
- KSZ8895 Evaluation Board User's Guide Rev 1.x
- Micrel EEPROM/SPI/SMI/MIIM Configuration Software tools
- KSZ8895 Evaluation Board Schematics and BOM
- The software, schematics and other design information will be found in the Design Kit (Design Package) of the KSZ8895 Ethernet switch products on Micrel website.
  (Contact your Micrel FAE for the latest schematic).
- The USB cable is not included.

4.0 Hardware Description

The KSZ8895 evaluation board is in a compact form factor and can sit on a bench near a computer with USB connector. There are four options for configuration: strap in mode; EEPROM mode, SMI mode and SPI mode. Strap in mode configuration is easily done with on board jumper options. EEPROM mode, SMI mode and SPI mode are accomplished through a built in USB port interface. Using Micrel EEPROM software and your PC, you can program the EEPROM on board by the USB port. Using Micrel SPI software and your PC, you can access the KSZ8895's full feature set registers by the USB to SPI interface. Or using Micrel MDC/MDIO software and SMI software with your PC, you can access the KSZ8895's MIIM PHY registers by generic MDC/MDIO interface and full feature set registers by the SMI mode of MDC/MDIO interface. The board also features the MII connectors for the Switch MII/RMII interface. These are to facilitate connections from the switch to an external MAC or PHY. There is also an additional MII connector for the PHY5 MII/RMII interface to an external MAC. This is used to recover use of the fifth PHY unit in broadband gateway applications or others.

The KSZ8895 evaluation board is easy to use. There are programmable LED indicators for link and activity on all ports and a power LED. A manual reset button allows the user to reset the board without removing the power plug. A standard 5VDC power supply can be used by the power jack so that the user can supply power from any 110-240 Volt AC wall or bench socket, and the power also can be provided by USB port when close pin 2-3 of the JP47 jumper.

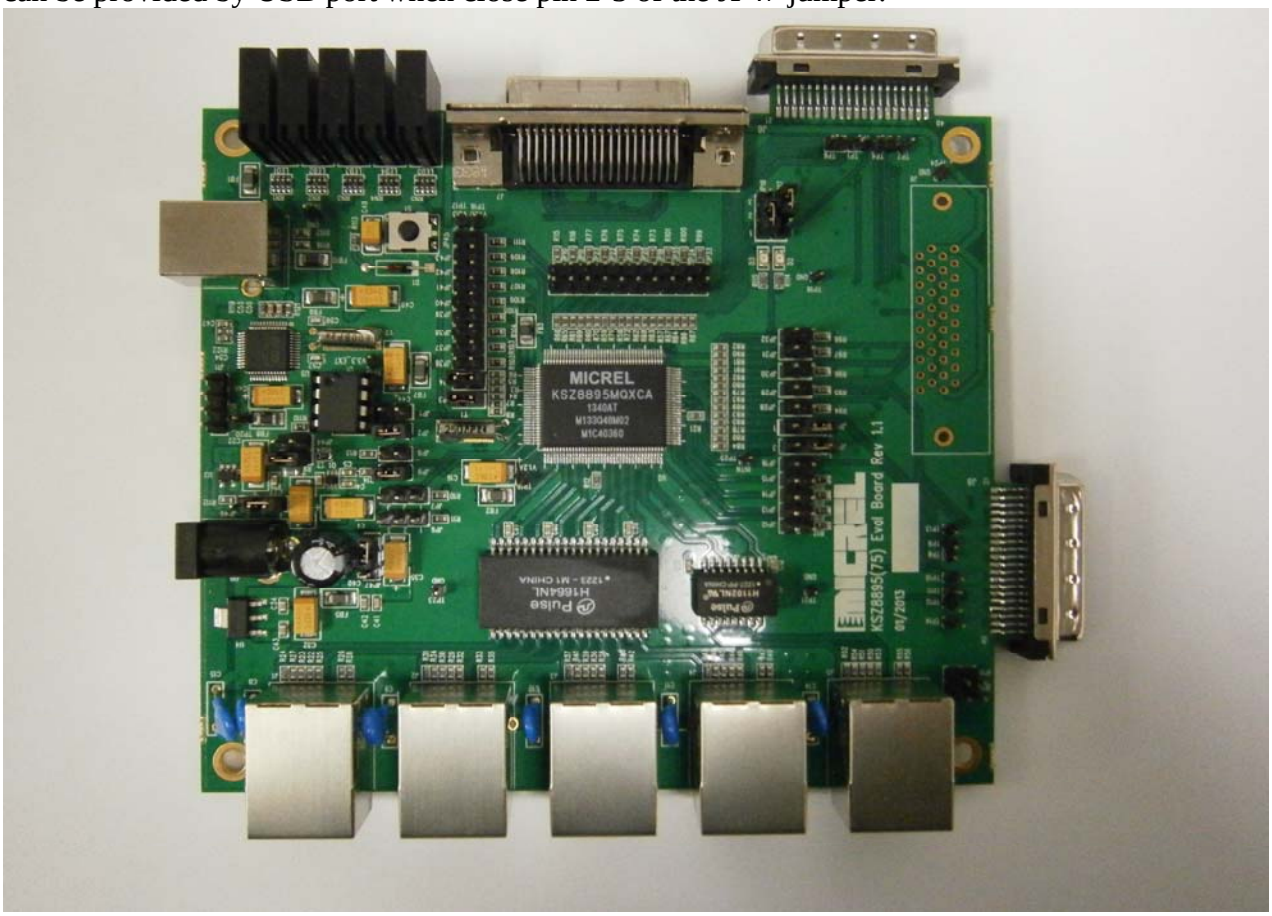


Figure 1 KSZ8895 Evaluation Board

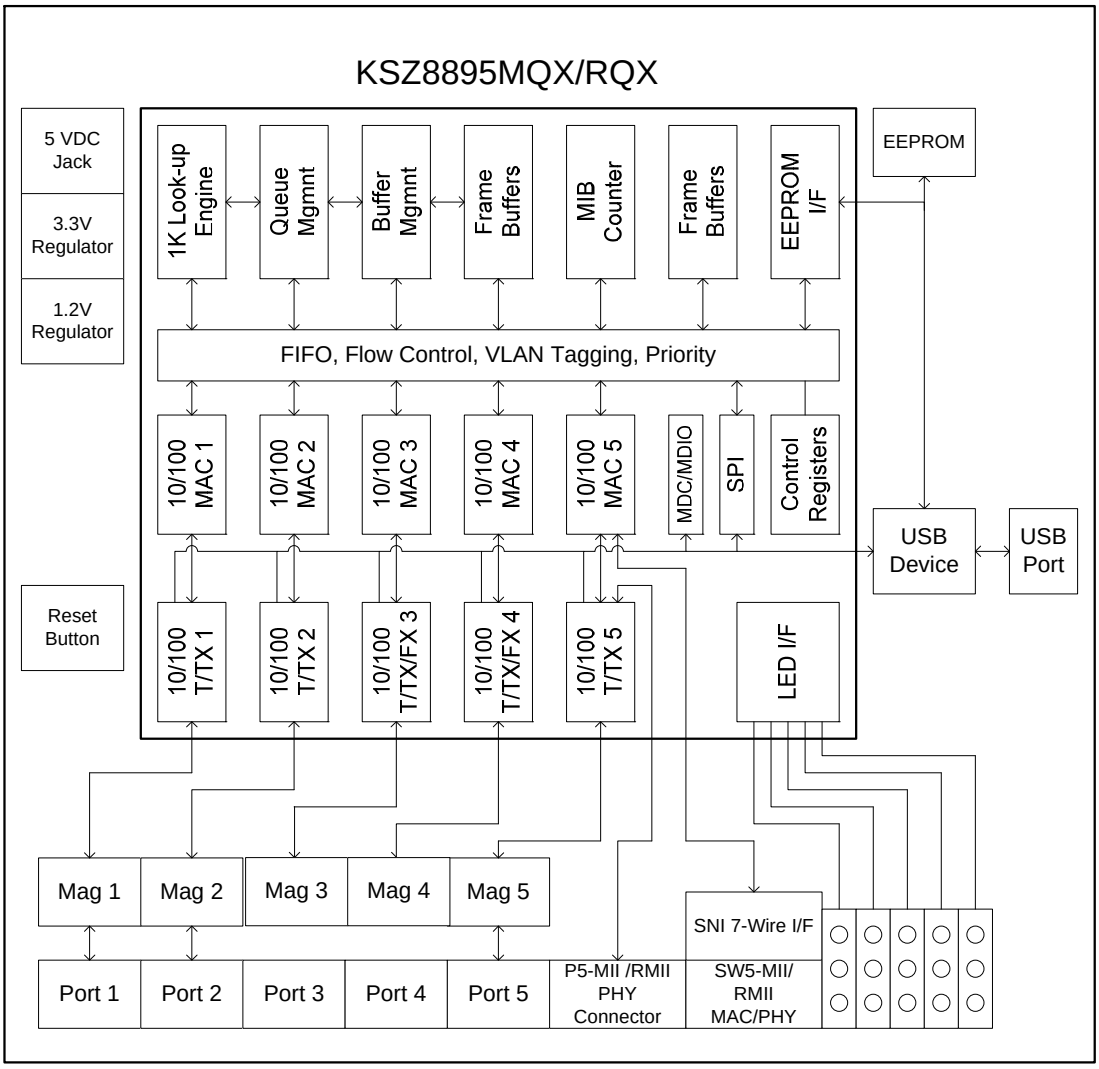


Figure 2 KSZ8895 Evaluation Board Block Diagram

4.1 Strap in Mode

Strap in configuration mode is the quickest and easiest way to get started. In this mode, the KSZ8895 acts as a stand-alone 5 port switch. The user has to simply set the board's configuration jumpers to the desired settings and apply power to the board. The user can also change jumper settings while power is applied to the board and press the convenient manual reset button for the new settings to take effect. Note that even if there is no external strap in values are set, internal pull up and pull down resistors will set the KSZ8895 default configuration. Section 4.1.1 covers each jumper on the board and describes its function.

To start in strap in configuration mode, make sure that JP1 and JP2 are closed and JP3, JP4, JP8 and JP9 are open. In this mode, pins (PS1,PS0)=(0,0), the chip will start automatically, after trying to

read the external EEPROM, if EEPROM does not exist, the chip will use the default values and the strap option setting for all internal registers.

4.1.1 Feature Setting Jumpers

The evaluation board provides jumpers to allow the user to easily set strap in configurations for the KSZ8895. Table 1 describes the jumpers and their function in the open or closed state.

Table 1 Feature Setting Jumpers

Jumper	KSZ8895 Signal	2-pin Jumper Open 3-pin Jumper 1-2 Closed	2-pin Jumper Closed 3-pin Jumper 2-3 Closed
JP1	SCL	SPI and MIIM/SMI	EEPROM
JP2	SPIQ	SPI	EEPROM and MIIM/SMI
JP3	MDC	SPI and EEPROM	MIIM/SMI
JP4	MDIO	SPI and EEPROM	MIIM/SMI
JP5	IN_PWR_SEL	Use external 1.2V LDO	Use internal 1.2V LDO controller (default on board)
JP46 3-pin	Set it consistency with JP5	1-2 Close and JP5 Close: use internal 1.2V LDO controller	2-3 Close and JP5 Open: use external 1.2V LDO
JP6 3-pin	MDIXDIS	1-2 Close: disable Auto – MDI/MDIX mode	2-3 Close or all Open: enable Auto – MDI/MDIX (default)
JP8	PS0	EEPROM/SPI/SMI Setting. See Section 4.2 and 4.3	
JP9	PS1	EEPROM/SPI/SMI Setting. See Section 4.2 and 4.3	
JP10	SCONF0	MII Setting See Section 4.6	
JP11	SCONF1	MII Setting See Section 4.6	
JP12 to JP15	FXSD1-4 Reserved	Normal operation for copper (internal pull-down)	Normal operation for copper (stronger external pull-down)
JP16	PWRDN-N	Normal Operation	Hardware Power down KSZ8895
JP17 3-pin	Default 2-3 close is for SW5- MII/ TMII RXC clock	1-2 Close: SW5-RMII provides 50MHz clock	2-3 Close: SW5-MII or SW5-RMII receive 50MHz clock from opposite
JP18 3-pin	Default 1-2 close is for SW5- MII/ TMII TXC clock	1-2 Close: SW5-MII mode. Detail see schematics	2-3 Close: RMII interface without clock provided
JP20	SMRXD3	Disable SW5-MII and RMII Flow Control	Enable SW5- MII and RMII Flow Control
JP21	SMRXD2	SW5-MII and RMII Half Duplex Mode	SW5-MII and RMII Full Duplex Mode
JP22	SMRXD1	SW5-MII/RMII 100BT mode and SW5-TMII 200BT mode	SW-MII/RMII 10BT mode

JP23	SMRXD0	LED Mode 0: LEDx_2 = Link/Act LEDx_1 = Full Duplex/Col LEDx_0 = Speed	LED Mode 1: LEDx_2 = 100Link/Act LEDx_1 = 10Link/Act LEDx_0 = Full Duplex
JP25	MDIO	Don't access external PHY	Access PHY MIIM registers
JP26	MDC	Don't access external a single PHY	Provide MDC clock to access a single PHY MIIM registers
JP24 3-pin	Default 2-3 close is for P5- MII RXC clock	1-2 Close: P5-RMII provides 50MHz clock	2-3 Close: P5-MII mode or SW5-RMII receive 50MHz clock from opposite
JP27 3-pin	Default 1-2 close is for P5- MII TXC clock	1-2 Close: P5-MII mode. Detail see schematics	2-3 Close: RMII interface without clock provided
JP28	PMRXDV	Reserved	
JP29	PMRXD3	Enable flow control	Disable flow control
JP30	PMRXD2	Disable Back Pressure	Enable Back Pressure
JP31	PMRXD1	Drop excessive collision packets	Do not drop excessive collision packets
JP32	PMRXD0	Aggressive back off disable	Aggressive back off enable
JP33	PMRXER	Max Packet Size up to 1522/1518 bytes	Max Packet Size up to 1536 bytes
JP34	PCRS	Force Half Duplex on port 4 if AN is disabled or failed	Force Full duplex on port 4 if AN is disabled or failed
JP35	PCOL	No Force Flow Control on port 4	Force Flow Control on port 4
JP36	LED1_0	Force Half Duplex on port 3 if AN is disabled or failed	Force Full duplex on port 3 if AN is disabled or failed
JP37	LED1_1	No Force Flow Control on port 3	Force Flow Control on port 3
JP40	LED2_1	Enable Auto-negotiation on port 3	Disable Auto-negotiation on port 3
JP41	LED2_2	SW5-RMII clock mode, the chip clock source is from 25MHz crystal (default)	SW5-RMII normal mode, the chip clock source is from RMII 50MHz SMTXC.
JP42	LED3_0	8mA for I/O pin drive current	12mA for I/O pin drive current
JP43	LED5_0	Enable Auto-negotiation on port 4	Disable Auto-negotiation on port 4
JP44	LED5_1	Enable port 5 P5-MII/RMII	Tristate port 5 P5-MII/RMII
JP45	LED5_2	Enable Aging	Disable Aging
JP47 3-pin	DC from 5V Jack	1-2 Close: 5V DC from the power jack of AC adapter	2-3 Close: 5V DC from the USB connector.

Table 2 Reserved Jumpers and recommendation

Jumper Number	Description	Recommended Settings
JP7	Test 2	Open
JP19	SMRXDV	Open
JP28	PMRXDV	Open
JP38	LED1_0	Open
JP39	LED1_1	Open
JP44	LED5_1	Open

4.2 EEPROM Mode

The evaluation board has an EEPROM to allow the user to explore more extensive capabilities of the KSZ8895. The user can conveniently program the EEPROM on board using the USB port from any computer with a WIN 2000/XP environment and the Micrel provided software. This makes it easy for the user to evaluate features like "broadcast storm protection" and "rate control".

To prepare the KSZ8895 evaluation board for EEPROM configuration follow these steps:

1. Copy the Micrel provided EEPROM software to your computer.
2. Set JP3, JP4, JP5 and JP9 as specified in Table 3 for EEPROM mode configuration. Make sure that the EEPROM is installed on the board.

Table 3 EEPROM Mode Settings

Jumper	Description	Setting
JP1	EEPROM	Closed
JP2	EEPROM	Closed
JP3	MDC	Open
JP4	MDIO	Open
JP4	Serial Bus Config. (PS0)	Open
JP5	Serial Bus Config. (PS1)	Open

3. Connect the computer's USB port to the KSZ8895 board with a USB port cable.
4. There are two way to power up the evaluation board:
   a). Connect the 5 VDC power supply to the KSZ8895 when JP47 pin1-2 is closed.
   b). 5 VDC power source from the USB port when JP47 pin 2-3 is closed.
5. The KSZ8895 will power up in its default configuration if there is no information in the EEPROM.
6. Program the desired settings into the EEPROM using the Micrel software. See the software description section 5.1 for details.
7. Press the manual reset button. The KSZ8895 will reset and read the new configuration in the EEPROM. After reset, the KSZ8895 is ready for the operation with EEPROM configuration.

4.3 SPI Mode

From SPI interface to the KSZ8895, use a USB to SPI converter that allows accessing all of the KSZ8895 features and registers. The user can easily access the SPI interface using a computer connected to the evaluation board's USB port interface. Micrel provides a Windows 2000/XP based program for the user to evaluate the KSZ8895's full feature set. In addition to all the control registers available via EEPROM programming, a host CPU connected to the KSZ8895's SPI interface will be able to access all static MAC table, the VLAN table, dynamic MAC address table and the MIB counters.

To prepare the KSZ8895 evaluation board for SPI mode configuration follow these steps:

1. Copy the Micrel provided SPI interface software on your computer.
2. Set JP9 as specified in Table 4 for SPI mode configuration.

Table 4 SPI Mode Settings

Jumper	Description	Setting
JP1	EEPROM	Open
JP2	EEPROM	Open
JP3	MDC	Open
JP4	MDIO	Open
JP8	Serial Bus Config. (PS0)	Open
JP9	Serial Bus Config. (PS1)	Closed

3. Connect the computer's USB port to the KSZ8895 board with a USB port cable.
4. There are two ways to power up the evaluation board:
   a). Connect the 5 VDC power supply to the KSZ8895 when JP47 pin1-2 is closed (default).
   b). 5 VDC power source from the USB port when JP47 pin 2-3 is closed.
5. The KSZ8895 will power up initial default configuration with the start switch in register 1 bit 0 = '0' which means the switch is "off". You can set the bit 0 ='1' to start switch.
6. Open the Windows and navigate to the directory where the Window SPI file is stored. Click its icon to invoke the software.
7. Program the desired settings using the Micrel SPI interface software. See the software operation description section 5.2 for details.

4.4 10/100 Ethernet Ports

There are five 10/100 Ethernet ports on the KSZ8895 evaluation board. The ports J1, J2, J3, J4 and J5 are the standard RJ45 connectors and using CAT-5 cables. Each port can be used as either an uplink or downlink. All ports support auto MDI/MDIX so there is no need for cross over cables.

J1 = RJ45 connector for port 1
J2 = RJ45 connector for port 2
J3 = RJ45 connector for port 3
J4 = RJ45 connector for port 4
J5 = RJ45 connector for port 5

4.5 LED indicators

Ethernet Port LEDs

There are five columns of LED indicators on the board, one column for each of the five ports. The LED indicators are programmable to two different modes. You can program the LED mode through a strap in option on JP23 or in register 11, bit 1. The mode definitions are shown in Table 5. There are three LEDs per port. The naming convention is "LEDx_y", where "x" is the port number, and "y" is the number of the LED for that port.

Table 5 LED Modes

Mode 0	Mode1
LEDx_2 = Link/Act	LEDx_2 = 100Link/Act
LEDx_1 = Full Duplex/Col	LEDx_1 = 10Link/Act
LEDx_0 = Speed	LEDx_0 = Full Duplex

LED1_y are assigned to Port1.

LED2_y are assigned to Port2.

LED3_y are assigned to Port3.

LED4_y are assigned to Port4.

LED5_y are assigned to Port5.

Power LED

The board also has a power LED D3 for the 3.3V power supply. D3 LED indicates 3.3V Power on and off.

Interrupt LED

The board also has an Interrupt LED D2 for the Link status change when set the interrupt mask register 125. D2 LED is turn on to indicate the interrupt to be asserted.

4.6 MII/RMII Ports Configuration

There are two MII/RMII ports on the KSZ8895. One port connects to the fifth MAC in the KSZ8895, and we refer to it as the port 5 Switch SW5-MII/RMII port. The second MII port connects to the fifth PHY in the KSZ8895. We refer to this as the PHY5 P5-MII/RMII port. Both the Switch MII/RMII port and the PHY5 MII/RMII port configuration are set on the board by using the MII Enable bit (register 2, bit 3) in conjunction with JP10 and JP11 as shown in Table 6.

The Switch MII/RMII port can be set to PHY mode, MAC mode or SNI mode. In PHY mode, the Switch MII/RMII port will transmit and receive signals on J6 of the board's male MII connector. This mode is usually used to connect the KSZ8895 to a CPU with MAC. In MAC mode, the Switch MII/RMII port will transmit and receive signals on J7 of the board's female MII connector. This

interface is normally used to connect the KS8895 to an external PHY. We also have provisions on the board to support the SNI 7 wire interface. In SNI mode, the Switch MII port will transmit and receive signals on header pins. The connections between the header pins and the SNI signals are shown in the Table 7.

The PHY5 MII/RMII port is used to connect to an external MAC or CPU. This port is only in PHY mode.

Table 6 MII Mode Settings

MII Enable Bit (reg. 2, bit 3) Pin 91	JP11 Pin 86	JP10 Pin 87	Switch SW5-MII/RMII	PHY[5] P5-MII/RMII
0	Open	Open	Disable, Outputs Tri-stated	Disable, Outputs Tri-stated
0	Open	Close	PHY mode MII or RMII	Disable, Outputs Tri-stated
0	Close	Open	MAC mode MII or RMII	Disable, Outputs Tri-stated
0	Closed	Close	PHY mode SNI	Disable, Outputs Tri-stated
1	Open	Open	Disabled	Disabled
1	Open	Close	PHY mode MII or RMII	PHY mode MII or RMII
1	Close	Open	MAC mode MII or RMII	PHY mode MII or RMII
1	Close	Close	PHY mode SNI	PHY mode MII or RMII

Table 7 SNI Header Pin Definitions

Header Pin	SNI Signal	KSZ8895 Signals
TP1	RXC	SMRXC
TP2	CRS	SMRXDV
TP3	TXC	SMTXC
TP4	TXEN	SMTXEN
TP5	TXD	SMTXD0
TP6	RXD	SMRXD0
TP7	COL	SCOL

4.6.1 Port 5 SW5-MII Jumper Configuration for KSZ8895MQX

Modes	JP10	JP11	JP17	JP18
SW5-MII MAC Mode with J7 used	Open	Close	Pin 2-3 Close	Pin 1-2 Close
SW5-MII PHY Mode with J6 used	Close	Open	Pin 2-3 Close	Pin 1-2 Close

Table 8 Configure for SW5-MII

4.6.2 Port 5 P5-MII Jumper Configuration for KSZ8895MQX

Modes	JP10 and JP11	JP24	JP27
Port 5 PHY P5-MII with J8 used	Closed either JP10 or JP11	Pin 2-3 Close	Pin 1-2 Close

Table 9 Configure for P5-MII

4.6.3 Port 5 SW5-RMII Jumper Configuration for KSZ8895RQX

Modes	JP10 and JP11	JP41	JP17	JP18
SW5-RMII MAC to MAC mode with J6 used	Closed either JP10 or JP11	Open is clock mode (Device's clock source comes from X1 pin 25MHz and SMRXC pin provide 50MHz clock to both RMII)	Pin 1-2 Close	Pin 1-2-3 Open
SW5-RMII MAC to PHY mode with J7 used	Closed either JP10 or JP11	Open is clock mode (Device's clock source comes from X1 pin 25MHz and SMRXC pin provide 50MHz clock to both RMII)	Pin 1-2 Close	Pin 1-2-3 Open
SW5-RMII MAC to MAC mode with J6 used	Closed either JP10 or JP11	Close is normal mode (Device's clock source comes from SMTXC pin 50MHz external reference clock)	Pin 1-2-3 Open	Pin 2-3 Close
SW5-RMII MAC to PHY mode with J7 used	Closed either JP10 or JP11	Close is normal mode (Device's clock source comes from SMTXC pin 50MHz external reference clock)	Pin 2-3 Close	Pin 1-2-3 Open

Table 10 Configure for SW5-RMII

4.6.4 Port 5 P5-RMII Jumper Configuration for KSZ8895RQX

Modes	JP10 and JP11	JP41	JP24	JP27
P5-RMII PHY to MAC mode with J8 used	Closed either JP10 or JP11	Either Open (clock mode) or Close (normal mode). Note: In both modes, the 50MHz reference clock can be provided from PMRXC pin to PMTXC pin and opposite RMII.	Pin 1-2 Close	JP27 1-2-3 Open

Table 11 Configure for P5-RMII

4.7 MDC/MDIO Interface for MIIM Registers and SMI mode

From MDC/MDIO interface to the KSZ8895, use a USB to MDC/MDIO converter that allows accessing all of PHY related registers and all of the KSZ8895 registers. The user can easily access the MDC/MDIO interface using a computer connected to the evaluation board's USB port interface. Micrel provides Windows based programs for the user to evaluate for both MIIM and SMI. For the MIIM software to be used all of PHY related registers, please use the software tool in the folder of MDC_MDIO MIIM of the software directory. For the SMI software to be used all of registers, please use the software tool in the folder of MDC_MDIO SMI of the software directory.

To prepare the KSZ8895 evaluation board for MDC/MDIO configuration, please follow these steps:

1. Copy the Micrel provided software on your computer.
2. Set JP2, JP3 and JP4 as specified in Table 8 for MDC/MDIO configuration.

Table 12 MDC/MDIO Settings for MIIM and SMI

Jumper	Description	Setting
JP1	EEPROM	Open
JP2	EEPROM/MIIM/SMI	Close
JP3	MDC for MIIM/SMI	Close
JP4	MDIO for MIIM/SMI	Close
JP8	Serial Bus Config. (PS0)	Open (Close for SMI)
JP9	Serial Bus Config. (PS1)	Open

8. Connect the computer's USB port to the KSZ8895 board with a USB port cable.
9. There are two ways to power up the evaluation board:
   a). Connect the 5 VDC power supply to the KSZ8895 when JP47 pin1-2 is closed.
   b). 5 VDC power source from the USB port when JP47 pin 2-3 is closed.
10. The KSZ8895 will power up initial default configuration with the start switch in register 1 bit 0 = '0' which means the switch is "off". You can set the bit 0 ='1' to start switch in SMI mode.
11. Open the Windows and navigate to the directory where the Window MDC/MDIO files are stored. Click its icon to invoke the software.
12. Program the desired settings using the Micrel MDC/MDIO software. See the software operation description section for details.

5.0 Software Description

5.1 Introducing Application Software Tools

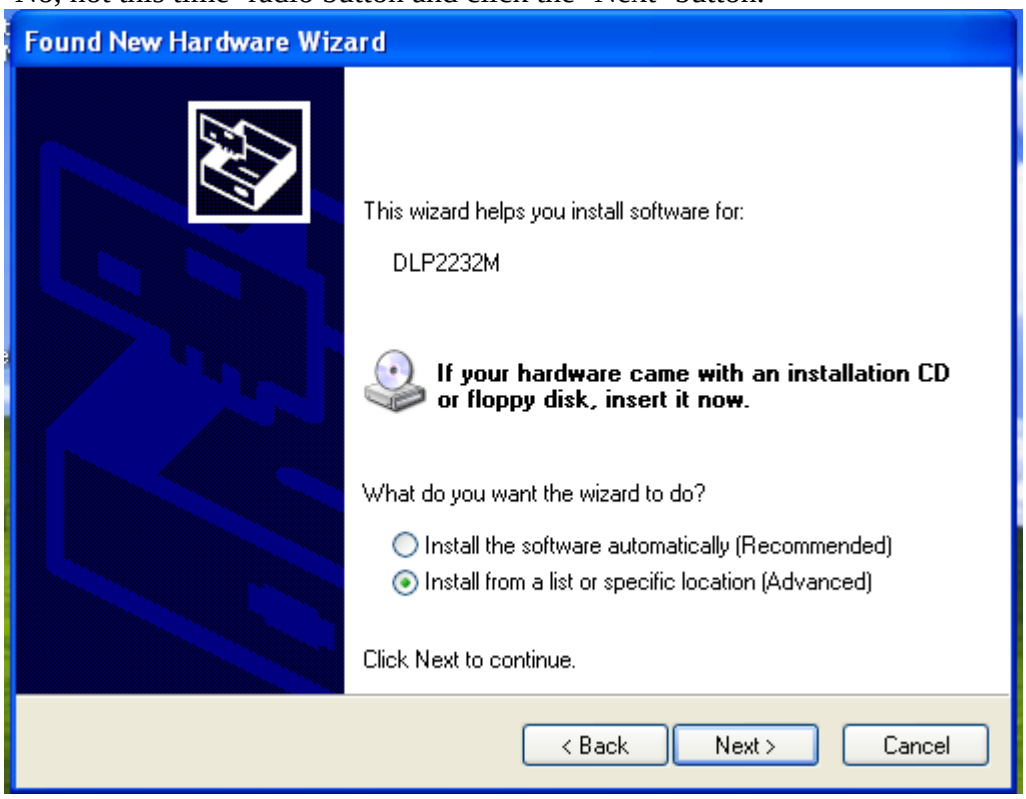
The Design Kit provides some software tools to support SPI interface, EEPROM (I2C) and MDC/MDIO access for MIIM registers and SMI interface. They are located folders in the software tool directory as follows:

1. In folder of DOS SPI Tool, there is an 8895SPI_DOS.exe file which can be executed directly. The tool is used to access all registers by SPI in a DOS Window.
2. In folder of MDC_MDIO SMI, there is a MicrelSMIIfApp.exe file which can be executed directly by clicking its icon. The software tool is used to access all registers by MDC/MDIO interface with SMI mode.
3. In folder of Window SPI_I2C_MIIM Tools, there is a MicrelSwitchPhyTools_1.xx.msi file which is clicked to create two application files in the default folder of Micrel (or you selected folder) and two icons on desktop, they need window drivers supported first, see 5.2 section for detail. One software tool is used to access all registers by SPI interface or is used to read/write all control register on I2C EEPROM mapping. Another software tool is used to access all MIIM registers for all PHYs.

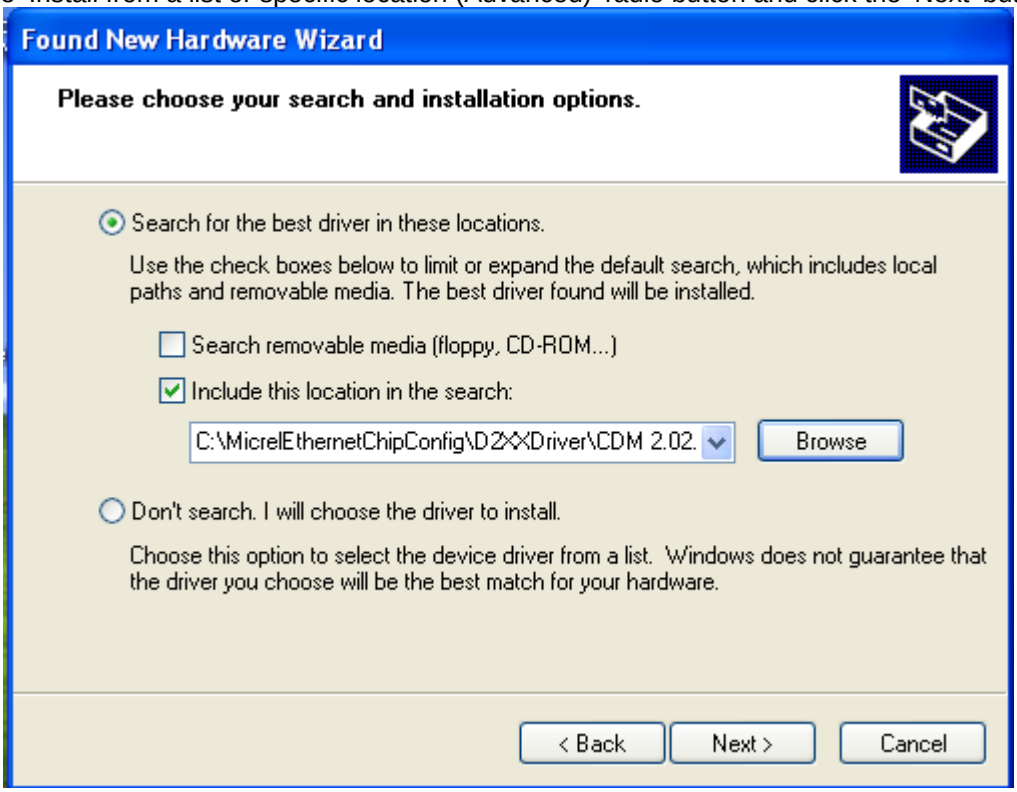
5.2 Install Window Driver First

Before use the Window based application software tool, the support drivers need to be installed to PC/Laptop first and this installation is just one times only. When connect one standard USB cable with type A and type B connectors between the evaluation board and PC computer first time, the Found New Hardware Wizard window will pop-up and then follow the instructions step by step as below.

. Choose 'No, not this time' radio button and click the 'Next' button.



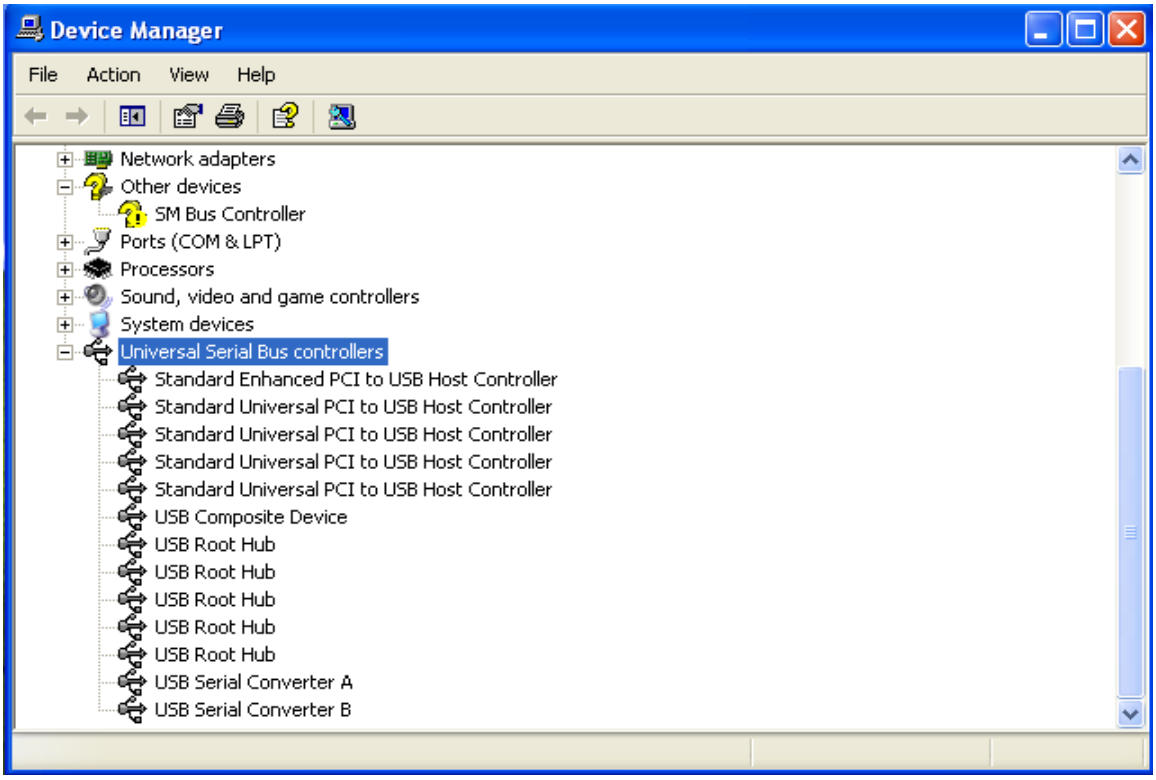
Choose the 'Install from a list or specific location (Advanced)' radio button and click the 'Next' button.



Click the 'Include this location in the search' check box, and use 'Browse' button to select the

'C:\MicrelEthernetChipConfig\D2XXDriver\CDM 2.02.04 WHQL Certified' directory and click the 'Next' button. The window will install the drivers from this location.

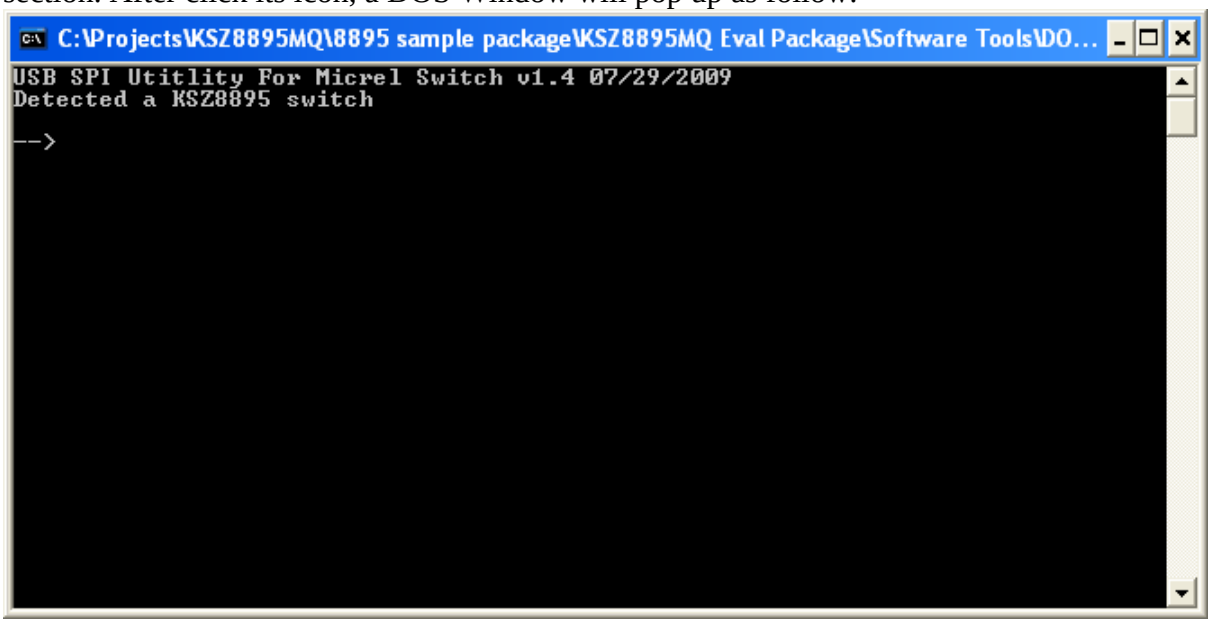
Click 'Finish' button. The Window will install another driver called 'USB Serial Converter B'. After the drivers installed, Window Device Manager will show 'USB Serial Converter A' and 'USB Serial Converter B' as below figure. That means the installation successful.



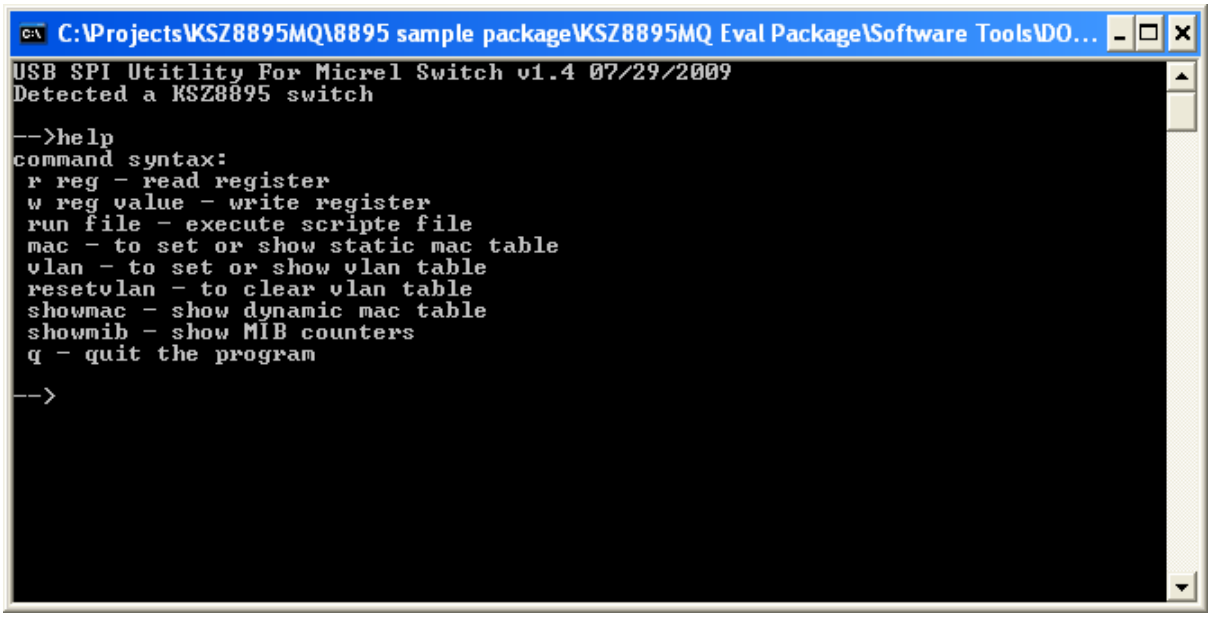
5.3 DOS SPI Tool

This is a simple and powerful tool to access all register. The tool located in the folder of DOS SPI Tool in the Software tools folder. There is an USBSPI.exe file which can be executed directly by clicking its icon.

Before run the software tool, the JP9 should be closed, please check the SPI setting in 4.3 SPI mode section. After click its icon, a DOS Window will pop up as follow:



Type a 'help' and press Enter, all commands will display as follows,



For Read or Write registers, reg is the offset address of the register, value is Hex number.

The 'run file' command can execute multiple commands by a script file, the script file is a .txt file which can be created by any edit tools.

→ run xxxx.txt //will run the .txt script file.

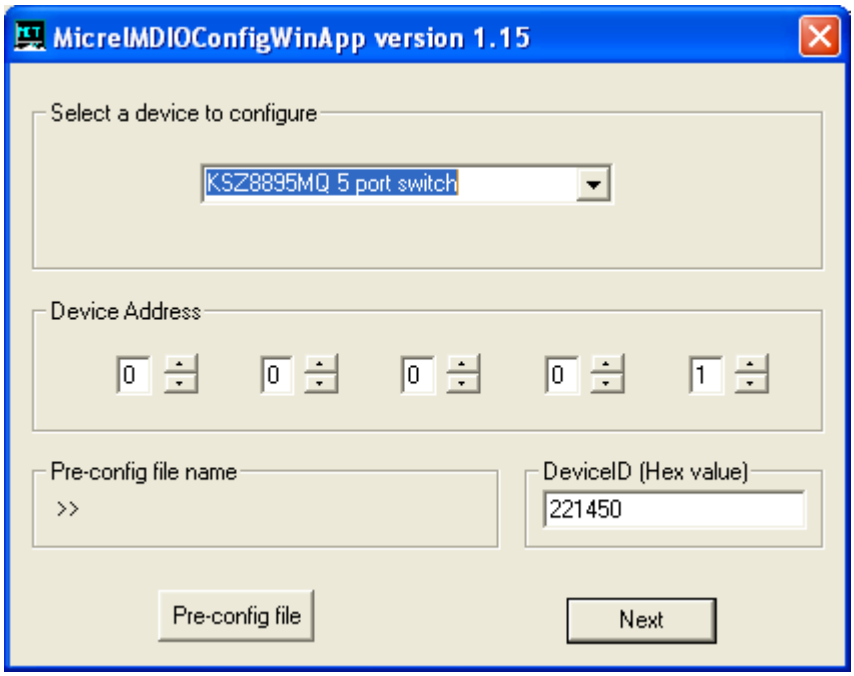
5.4 MDC/MDIO MIIM Software Tool

5.4.1 MDC/MDIO MIIM software installation

The software tool can be used to access all MIIM registers for PHY based.
This install file of the software tool locates in folder of Window SPI_I2C_MIIM Tools in the software tools folder of the Design Kit, there is MicrelSwitchPhyTools_1.xx.msi file which is clicked to install application file and add two application icons on the desktop, this installation just do one times only, the application file will be copied into the folder of Micrel\MicrelSwitchPhyTools (default) or other assigned folder in the installation.
The MDC/MDIO MIIM Software Tool can be executed directly by clicking its application file or icon with name of MicrelMDIOConfigWinApp on the desktop.

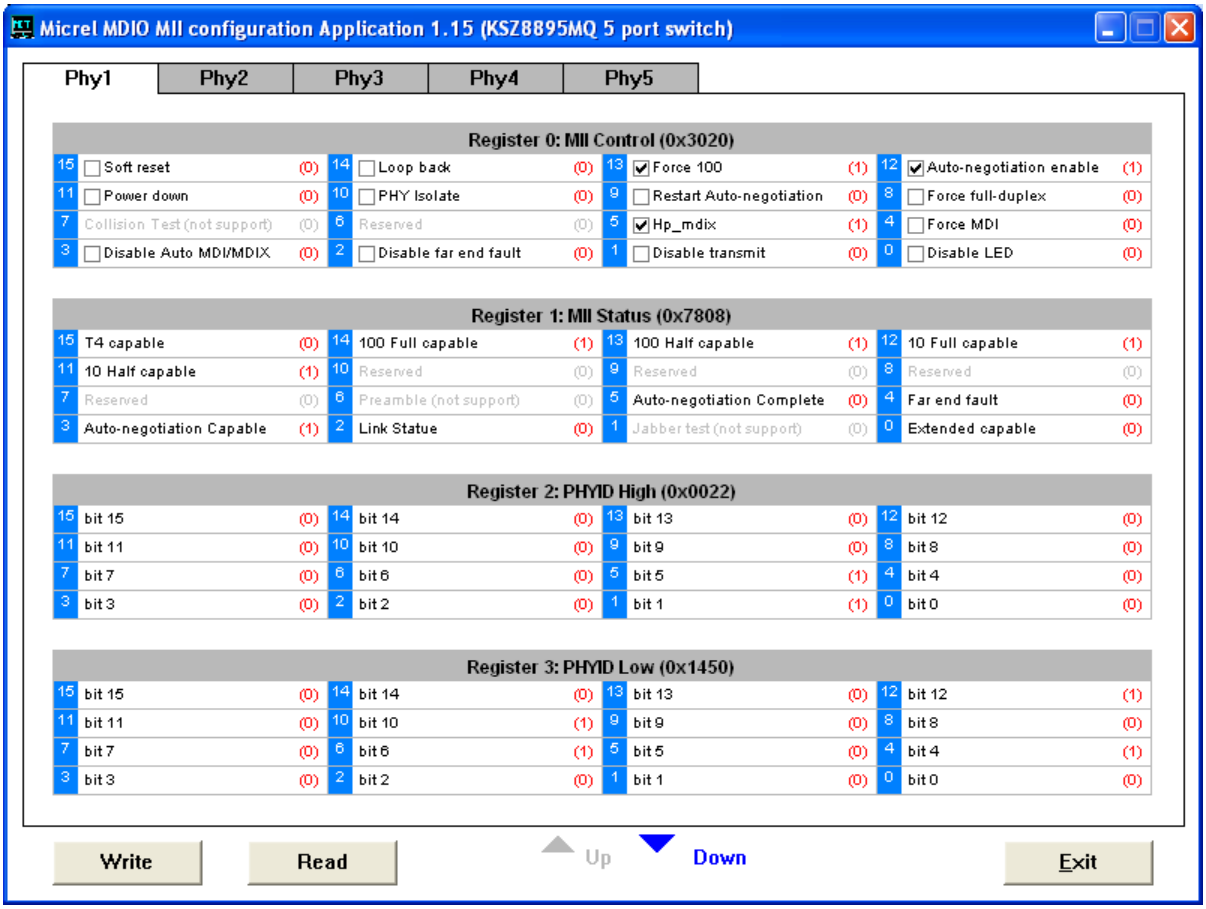
5.4.2 On board jumper setting and Software Application

Before run the software tool, the JP2, JP3 and JP4 should be closed, please check the MDC/MDIO setting in section of 4.7 MIIM SMI mode section. After click its icon, a Window will pop up as follow:



Select 'KSZ8895MQX 5 port switch' and click Next button, Pop up a MDIO MIIM Configuration window as follows:

By this window, all of MIIM registers on 5 PHYs can be read and written directly. Click the button of Down or Up, all MII registers will display for current configuration. Check any writable bits of registers and click Write button, the value of registers will be changed.



5.5 MDC/MDIO SMI Software Tool

5.5.1 MDC/MDIO SMI software

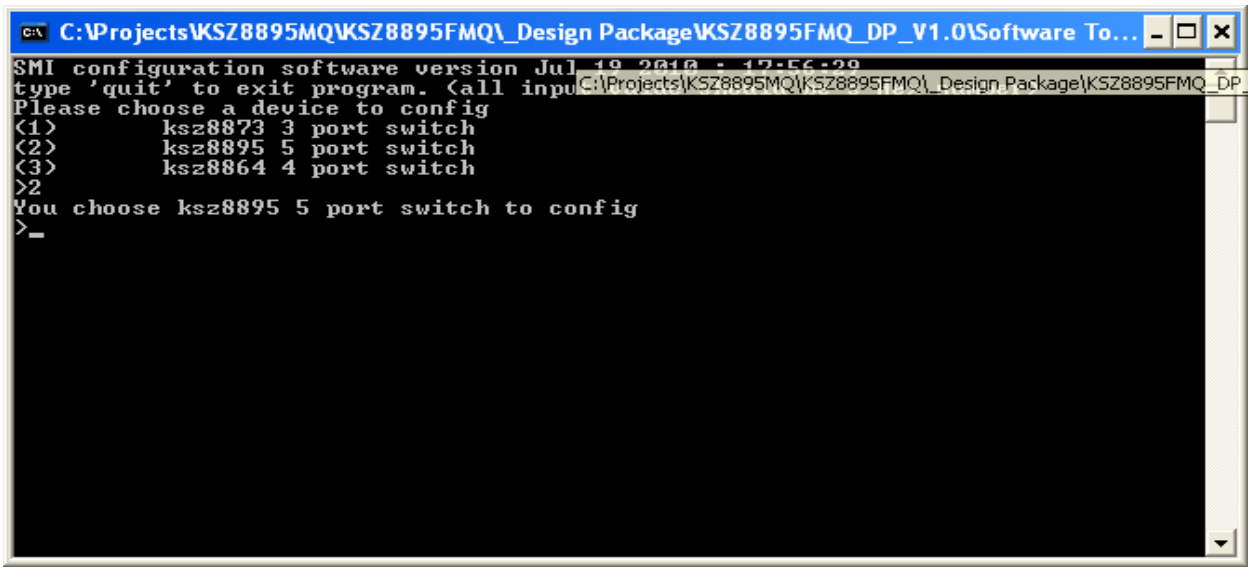
The software tool can be used to access all registers of KSZ8895 by MDC/MDIO interface
This tool locate in folder of MDC_MDIO SMI in the Design Kit, there is MicrelSMIIfApp.exe file which can be executed directly by clicking its icon.

5.5.2 On board jumper setting and Software Application

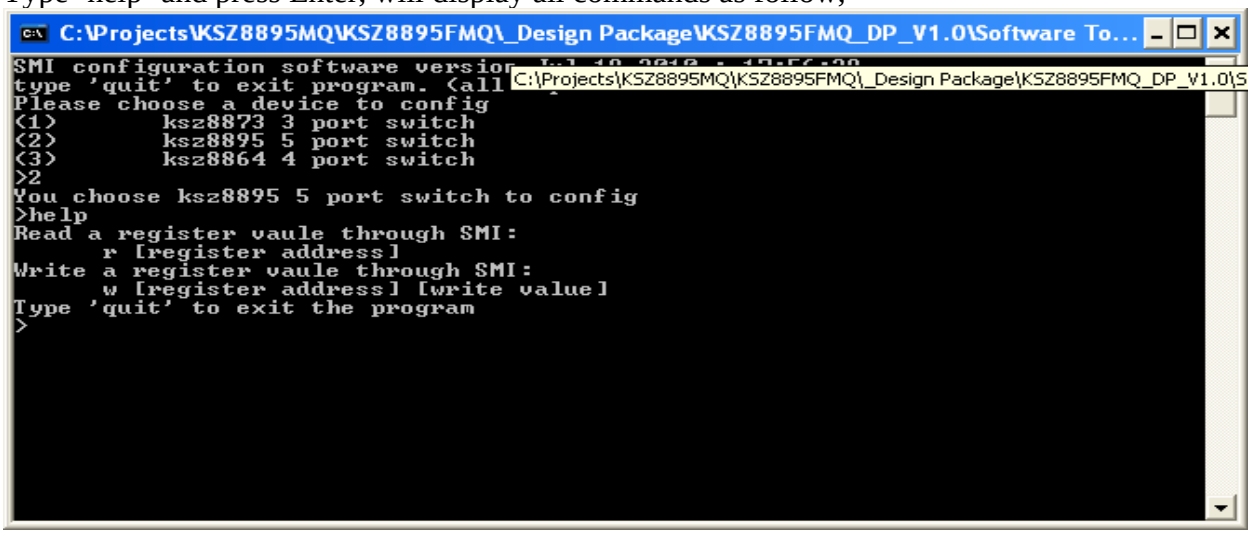
Before run the software tool, the JP2, JP3 and JP4 should be closed, please check the MDC/MDIO setting in section of 4.7 MIIM SMI mode and pins PS[1:0]=01, JP8 should be closed also. After click its application file of MicrelSMIIfApp, a Window will pop up as follow:
There are three options:

(1) KSZ8873 3 port switch
(2) KSZ8895 5 port switch
(3) KSZ8864 4 port switch

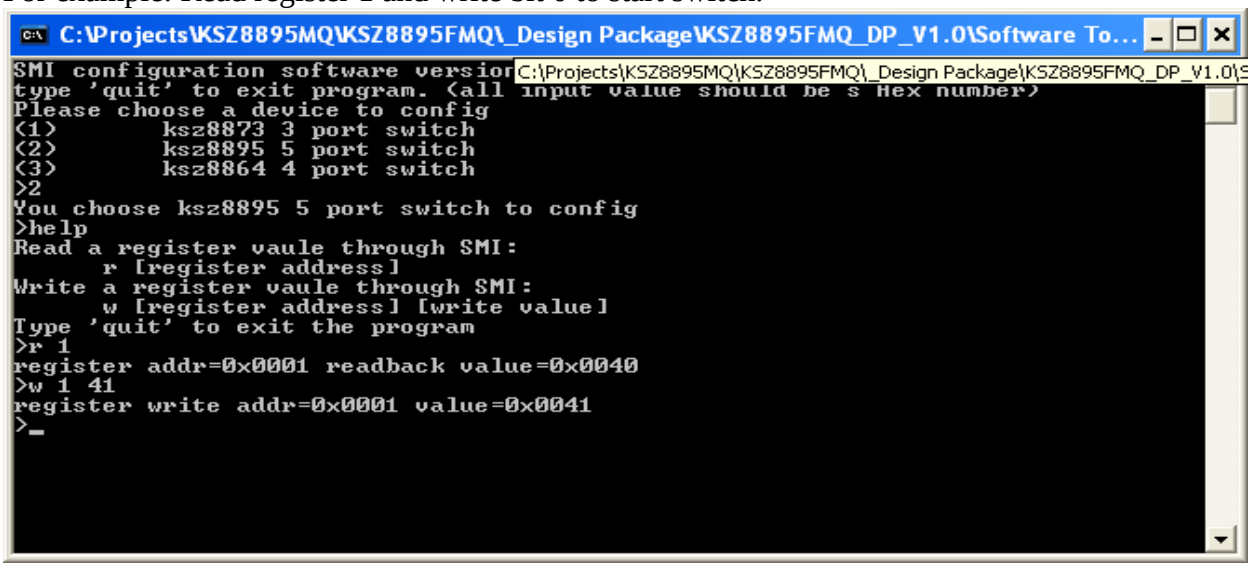
Please select (2) to support KSZ8895 configuration by SMI mode



Type 'help' and press Enter, will display all commands as follow,



For example: Read register 1 and write bit 0 to start switch.



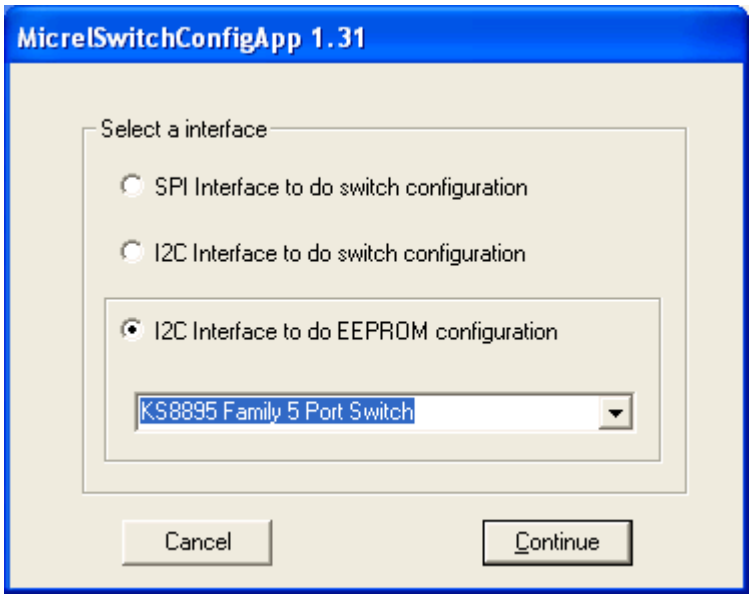
5.6 EEPROM Software Tool

5.6.1 EEPROM software installation

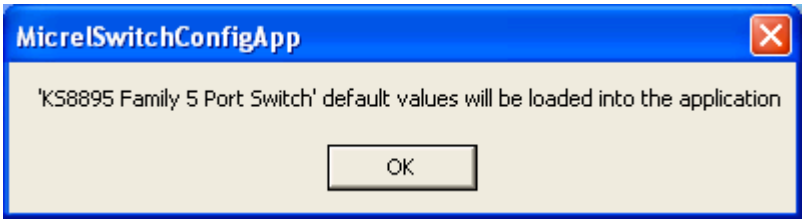
Micrel provides EEPROM software tool can use a PC/Laptop via the on board USB port to program the KSZ8895 evaluation board's EEPROM without the added expense of an external EEPROM programmer.
The software tool can be used to read/write all control registers of the KSZ8895.
The installation file of the tool is located in folder of Window SPI_I2C_MIIM Tools in the software tools folder of the Design Kit, there is MicrelSwitchPhyTools_1.xx.msi file which is clicked to install application file and add two application icons on the desktop, this installation just do one times only, the application file will be copied into the folder of Micrel\MicrelSwitchPhyTools (default) or other assigned folder in the installation.
The MDC/MDIO EEPROM Software Tool can be executed directly by clicking its application file or icon with name of MicrelSwitchConfigApp on the desktop.

5.6.2 On board jumper setting and Software Application

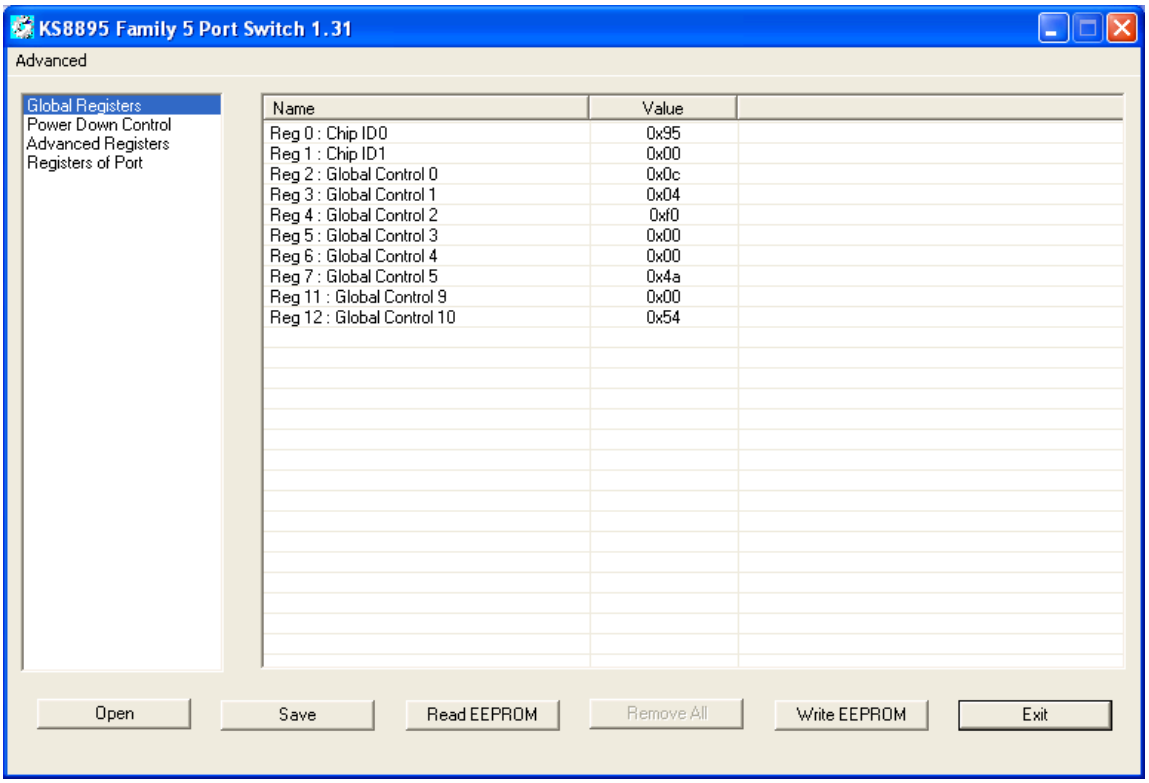
Before run the software tool, the JP1 and JP2 should be closed, please check the EEPROM setting in section of 4.2 EEPROM mode. After click its icon, a Window will pop up as follow:



Select the radio of I2C interface to do EEPROM configuration and press Continue button, pop up a window as follow.

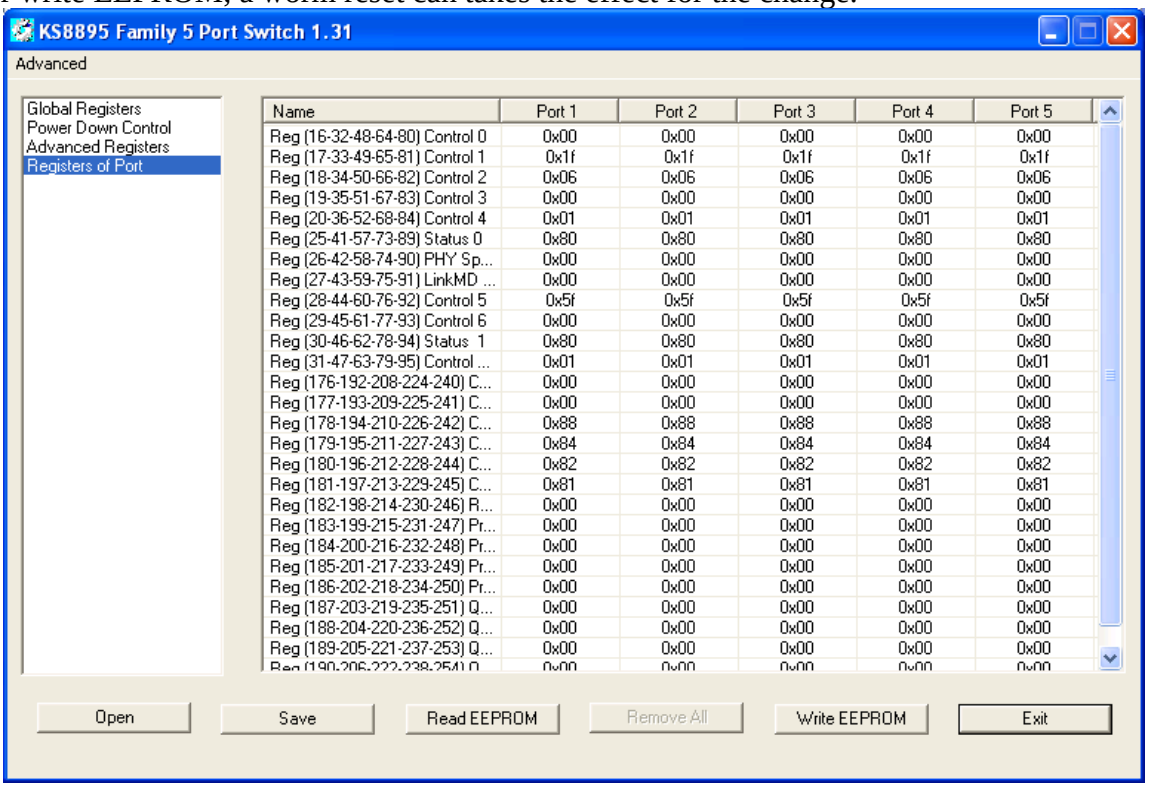


Click OK button, one of read/write EEPROM window will display as follow:



Note: Chip ID1 in the register 1 has to set to 0x00 for EEPROM contents to be downloaded to all registers in current device revision.

The software tool can read/write all advanced and port control registers into EEPROM as follow. After write EEPROM, a worm reset can takes the effect for the change.



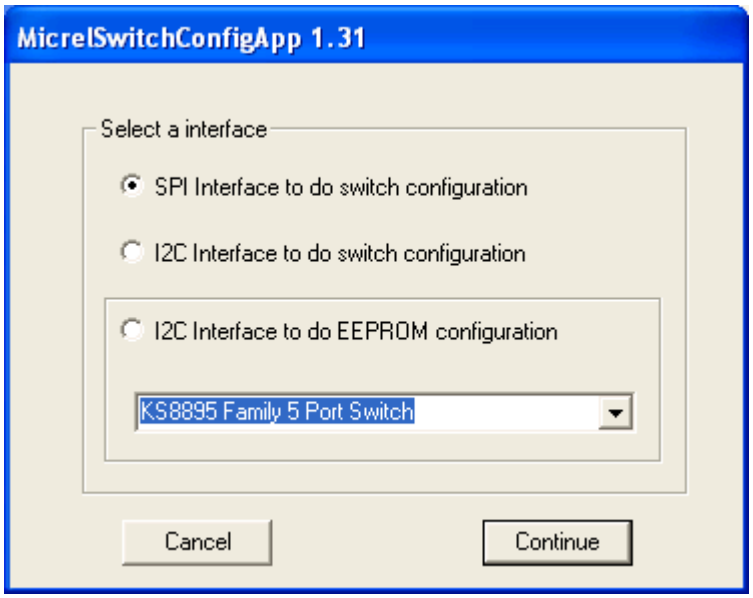
5.7 Window SPI Software Tool

5.7.1 Window SPI software installation

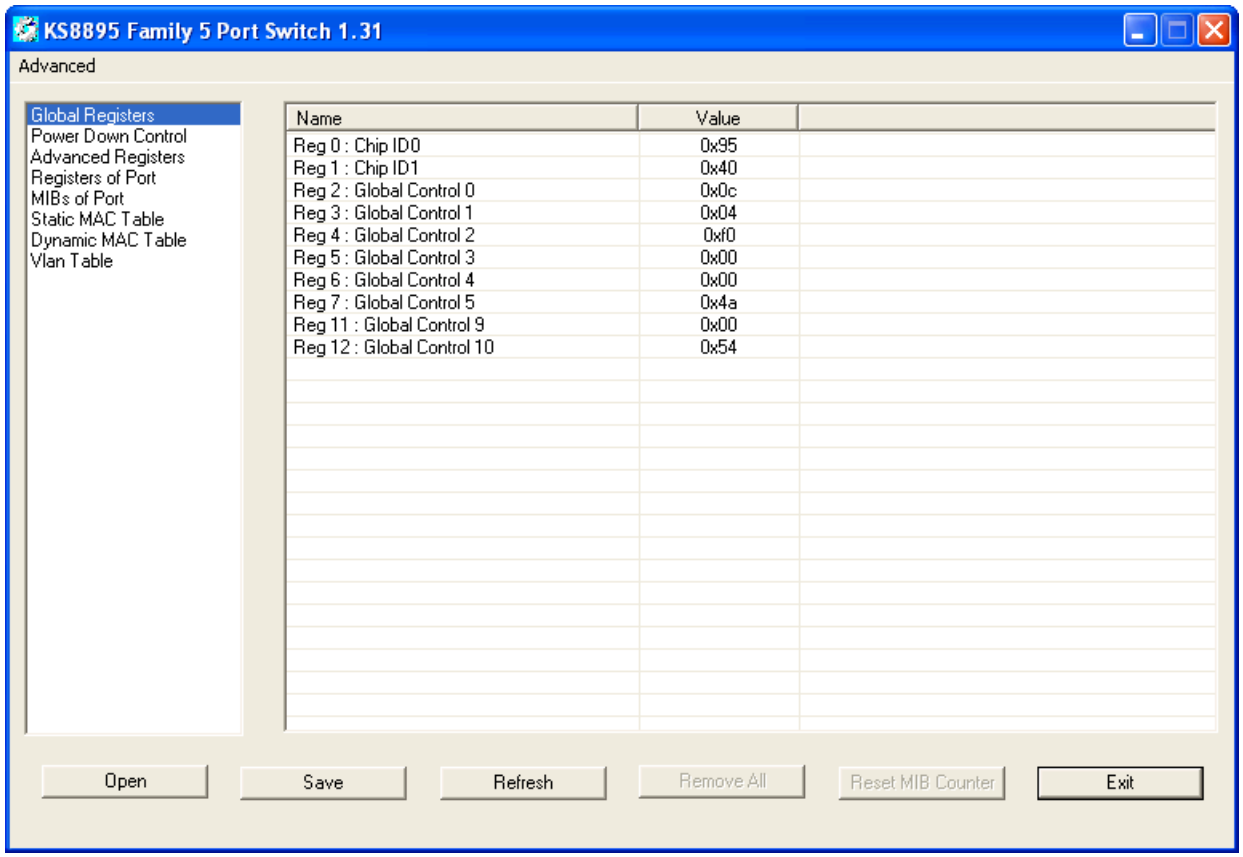
The software tool can be used to read/write all of registers of the KSZ8895.
The installation file of the tool is located in folder of Window SPI_I2C_MIIM Tools in the software tools folder of the Design Kit, there is MicrelSwitchPhyTools_1.xx.msi file which is clicked to install application file and add two application icons on the desktop, this installation just do one times only, the application file will be copied into the folder of Micrel\MicrelSwitchPhyTools (default) or other assigned folder in the installation.
The MDC/MDIO SPI Software Tool can be executed directly by clicking its application file or icon with name of MicrelSwitchConfigApp on the desktop.

5.7.2 On board jumper setting and Software Application

Before run the software tool, the JP9 should be closed, please check the SPI setting in section of 4.3 SPI mode. After click its icon, a control Window will be pop up as follow:



The default is SPI interface to do switch configuration. From the device selection window to select any KS8895 devices and press Continue button. A control window will be pop up as follow.
All register can be read/ written in the window.



The control Window includes all registers, static MAC table, VLAN table, dynamic table and MIB counters that are supported by SPI. The software can save and open the configuration file as a back-up.