

This user guide addresses the features, setup and operation of the Versa In-Circuit Programmer for Flash programming of Ramtron Versa 8051 and Versa Mix 8051 microcontrollers.

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1 Versa In-Circuit Programmer (ICP) Overview

The Versa In-Circuit Programmer (Versa-ICP) is a hardware-based device that enables the programming of Ramtron MCUs via the serial port on a standard PC. The Versa-ICP supports the following Ramtron MCU devices:

- VMX51C1020
- VMX51C1016
- VRS51C1000 *
- VRS51L1050 *
- VRS51C1100 *

* - The ISP firmware option must be present in these parts to use the Versa-ICP. Note that the Versa-ICP communicates with these devices directly via their on-chip serial ports. No RS-232 transceiver/level shifter should be present when using the Versa-ICP with these devices.

2 In-Circuit Programmer Setup

1. Connect the DC power supply (provided) to the Versa-ICP supply input (next to the DB9 connector).
2. Use the DBP serial cable (provided) to connect to the host computer via the Versa-ICP RS-232 port.
3. If the target PCB requires its own DC supply, make sure that it is connected before fixing the Versa-ICP to the PCB. Now, the Versa-ICP "Power" LED should be ON. (If it is not, check the connections between the Versa-ICP and the target PCB.)
4. Run the appropriate Versa Ware software, provided by Ramtron, to begin programming. (See following sections)

Note: When the Versa Ware ISP software starts running, the Versa-ICP goes into reset mode and the "power" Led turns OFF. This occurs because the software uses the Versa-ICP's RS-232 transceiver to communicate directly with the firmware installed on the Versa 8051 MCU.

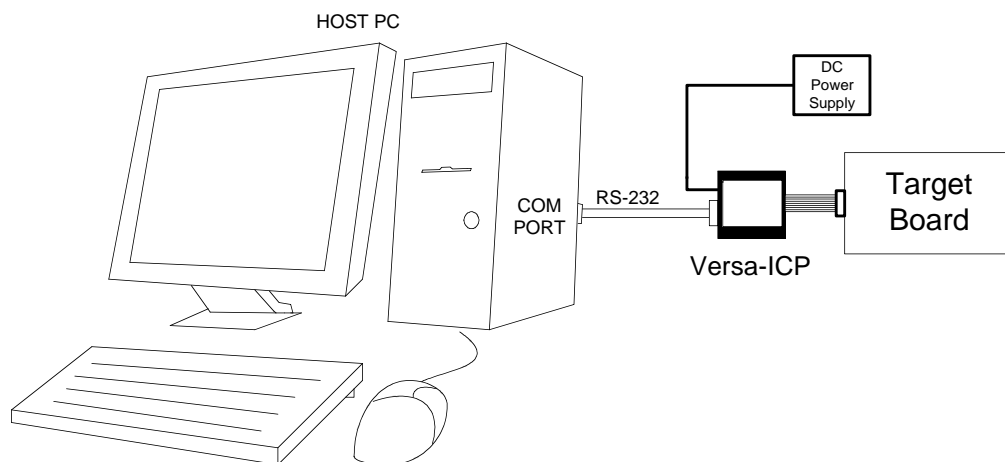


Figure 1: Versa-ICP and target PCB connected to the host computer via the RS-232 port

3 Versa-ICP IDC Connector Pin-out for Versa Mix 8051 (VMX51C1xxx) devices

The following figure provides a description of the IDC connector pin-outs on the Versa-ICP when programming the VMX51C1020 or VMX51C1016:

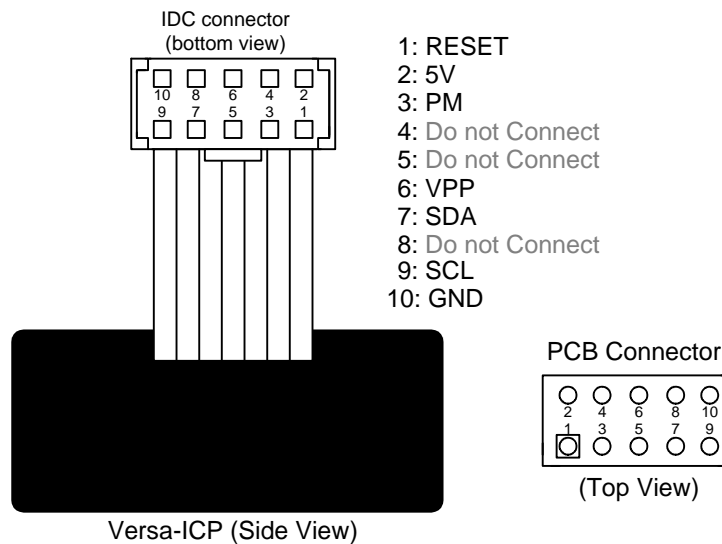


Figure 2: IDC connector pins for Versa Mix 8051 programming

Pin	Name	Description
1	Reset	Reset control line. Must be connected to target Versa-ICP RES pin.
2	5V	5V supply from Versa-ICP to target. Versa-ICP can provide up to a 100mA current supply to power the target board when programming. Make sure target board regulator (if there is one) can withstand 5V when its power is off. If target is to be powered from its own supply (recommended), leave this pin unconnected.
3	PM	Connect to target Versa-ICP PM pin. This pin must have a pull-down resistor to ground.
4	Do not Connect	Do not connect.
5	Do not Connect	Do not connect.
6	VPP	Programming voltage. Connect to target Versa-ICP VPP pin. It is recommended to connect a pull-up resistor ($\geq 100k$) in parallel with a 0.1 μ F ceramic capacitor from the VPP pin to VCC.
7	SDA	Programming data line. Connect to target Versa-ICP SDA pin.
8	Do not Connect	Do not connect.
9	SCL	Programming clock line. Connect to target Versa-ICP SCL pin.
10	GND	Versa-ICP ground. Connect to Versa-ICP device ground.

4 ICP IDC Connector Pin-out for Versa 8051 devices with ISP Firmware (VRS51x1xxx)

The following figure is a pin description of the IDC socket when the Versa-ICP is used to program the VRS51C1000, VRS51L1050 or VRS51C1100:

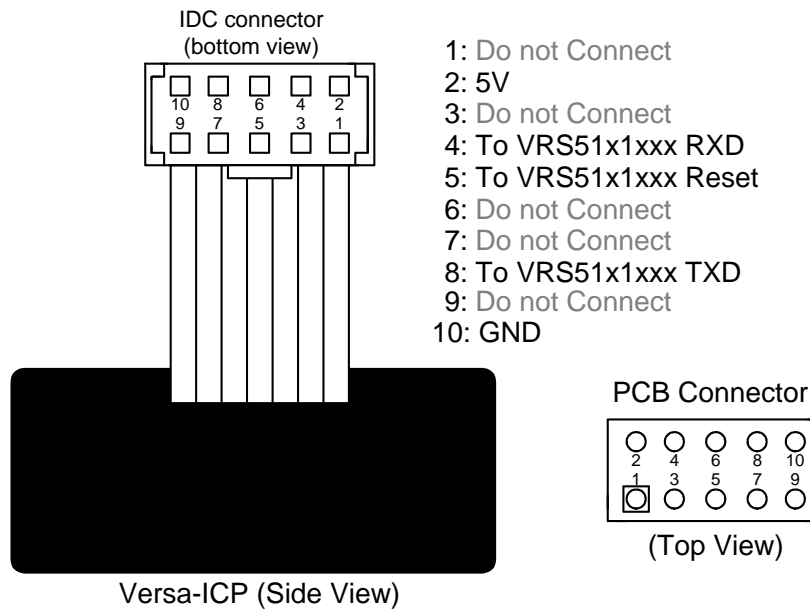


Figure 3: IDC socket pin descriptions

Pin	Name	Description
1	Do not Connect	Do not connect.
2	5V	5V supply from Versa-ICP to target. Versa-ICP can provide up to a 100mA current supply to power the target board when programming. Make sure that target board regulator (if there is one) can withstand 5V when its power is off. If target is to be powered from its own supply (recommended), leave this pin unconnected.
3	Do not Connect	Do not connect.
4	To VRS51xxxxx RXD	Connect to UART RX pin (P3.0).
5	To VRS51xxxxx Reset	Connect to RES pin.
6	Do not Connect	Do not connect.
7	Do not Connect	Do not connect.
8	To VRS51xxxxx TXD	Connect to UART TX pin (P3.1).
9	Do not Connect	Do not connect.
10	GND	Versa-ICP ground. Connect to VRS51x1xxx ground.

5 Versa Ware VMX-ICP and Versa Ware ISP Programming Software

5.1 Minimum System Requirements to Run the Versa Ware Software

Versa Ware ISP software has been developed to run on operating systems such as Windows™ 98/2000/NT/XP. The minimum system requirements to run the software are:

- Intel Pentium III 400 MHz
- 128 MB of RAM
- 2 MB of Hard Drive Space
- A serial port capable of running at 115200 bps

Versa Ware is compatible with universal USB serial adaptors for PCs and laptops that do not include serial ports. (Note that operation may be slower when using an adaptor.)

5.2 Software Installation

There are different versions of Versa Ware programming software for each Versa MCU family. To program the Versa Mix 8051 devices (VMX51C1020/VMX51C1016), use the Versa Ware VMX-ICP software.

To install this, launch “Versa_Ware_VMX_ICP_xx_SETUP.exe” (xx is the revision number) setup file. Instructions on how to use the software are included in the setup file.

To program the Versa 8051 VRS51x1xxx, devices, use the Versa Ware ISP software.

To install this, launch “Versa_Ware_ISP_xx_SETUP.exe” (xx is the revision number). Instructions on how to use the software are included in the setup file.

5.3 Configuring the Serial Communications Interface in Windows™ 98

For users with Windows 98™ or Me™ operating systems, please make sure the serial port is properly configured: Click on the System icon in the Windows™ “control panel (*Start > Settings > Control Panel > System*), enter the System Properties window and click on the COM Port for the ICP.

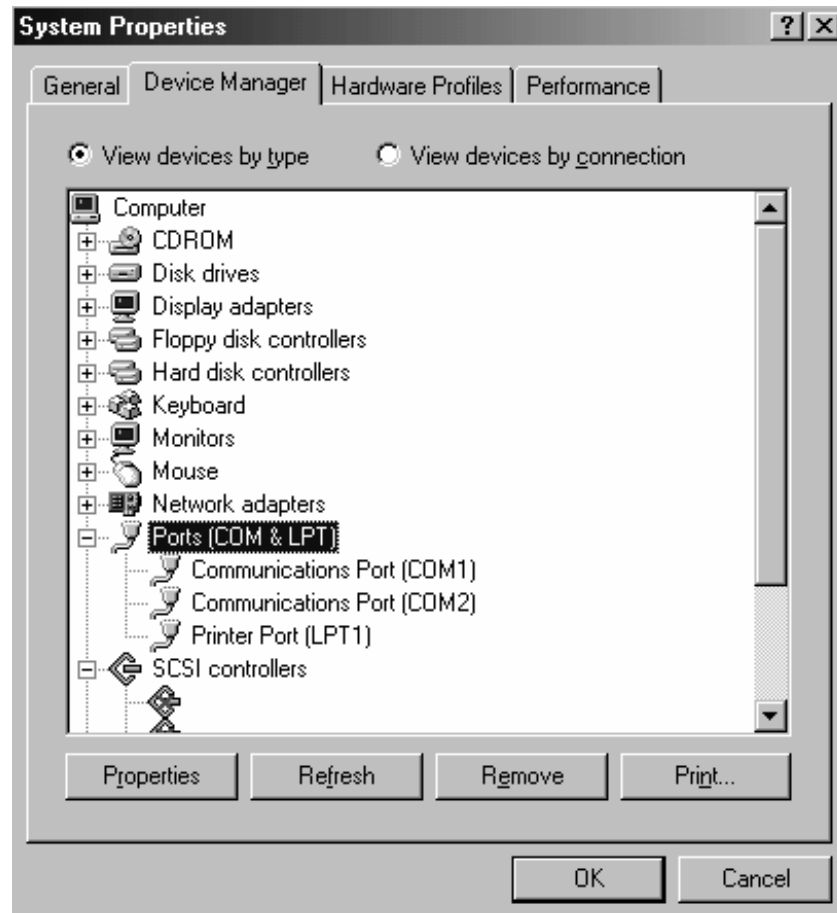


Figure 4: System properties window (Windows™ 98 interface)

In the Communications Port Properties window, configure the serial port connected to the ICP as follows:

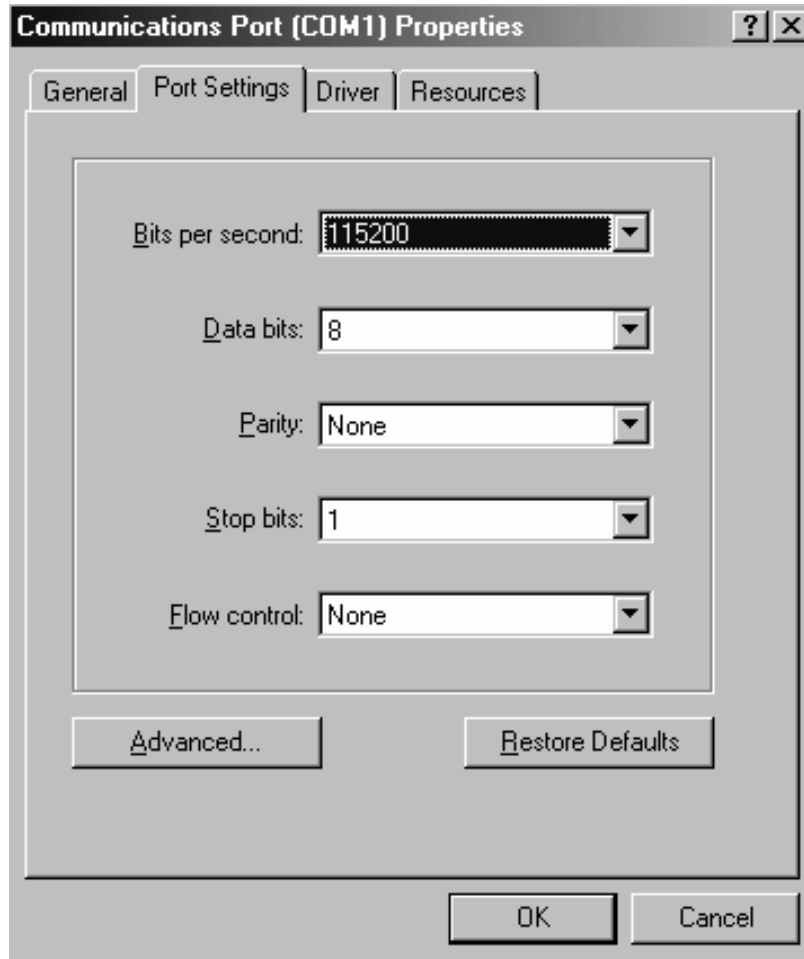


Figure 5: Port settings for the ICP (Windows™ 98 interface)

For users with a Windows™ 98 operating system, it is recommended that the FIFO buffers be enabled: Click the Advanced button in the Communications Port Properties window and check the Use FIFO buffers box in the Advanced Port Settings window. The buffers should be set to their maximum. Restart Windows™ when the COM settings are complete.

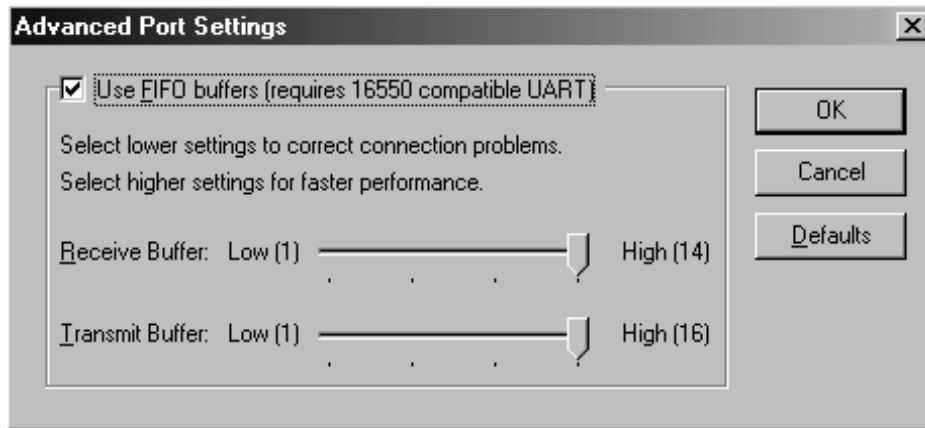


Figure 6: Advanced port settings used with Versa-ICP (Windows™ 98 interface)

5.4 Running the Versa Ware VMX-ICP Software (for VMX51C1020/VMX51C1016)

Launch the Versa Ware VMX-ICP software with "Versa_Ware_VMX_ICP.exe." The following window will appear:

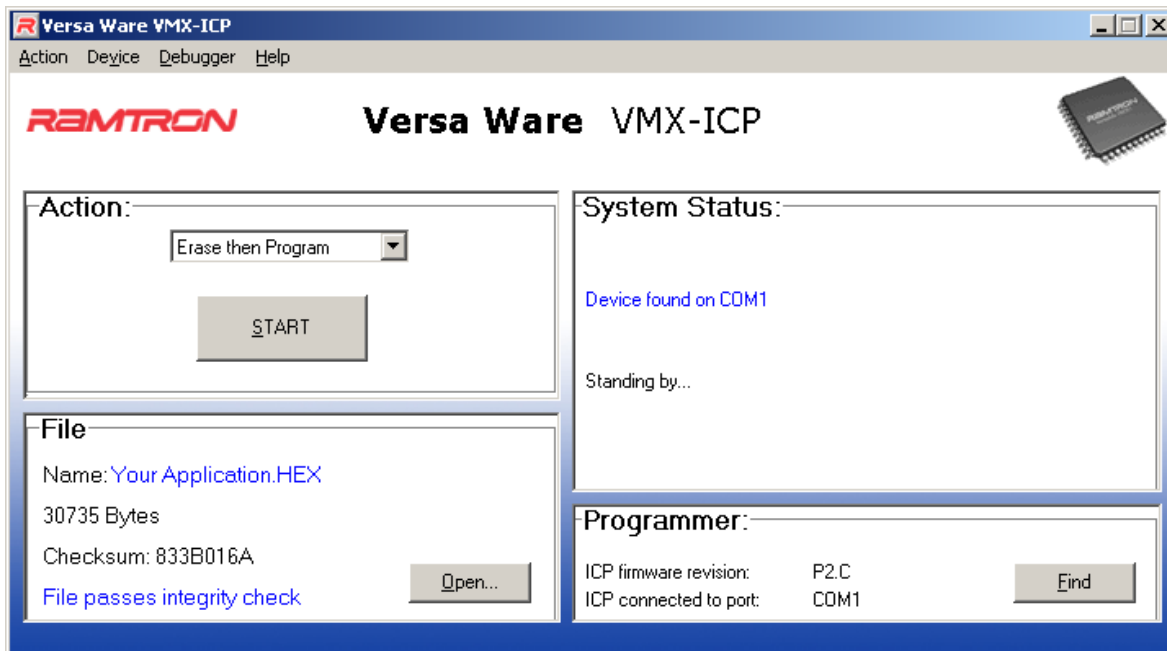


Figure 7: Versa Ware VMX-ICP main interface

If the Versa Ware VMX-ICP does not detect the In-Circuit Programmer on the COM 1 to 8 serial ports, a programmer connection error box will appear. Check the ICP connection and the COM port settings.

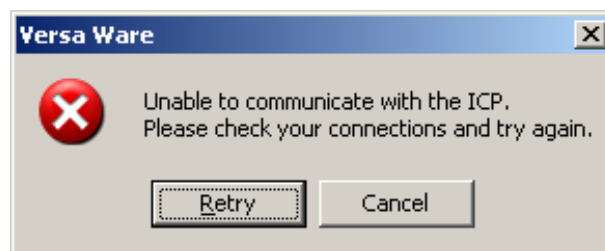


Figure 8: Program connection error box

Rerun the auto-detection function by clicking <Retry> in the communication error box or by first clicking <Cancel> in the communication error box, followed by <Find> in the programmer box on the main interface.

Once the connection with the Versa-ICP is established, select the Hex file to be programmed and click <Start> to begin Flash erase and programming.

For more information on using the Versa Ware VMX-ICP software, please consult the software enclosed user guide.

5.5 Running the Versa Ware ISP Software (for VRS51C1000/VRS51L1050/VRS51C1100)

Launch the "Versa_Ware_ISP.exe" file. The following window will appear:

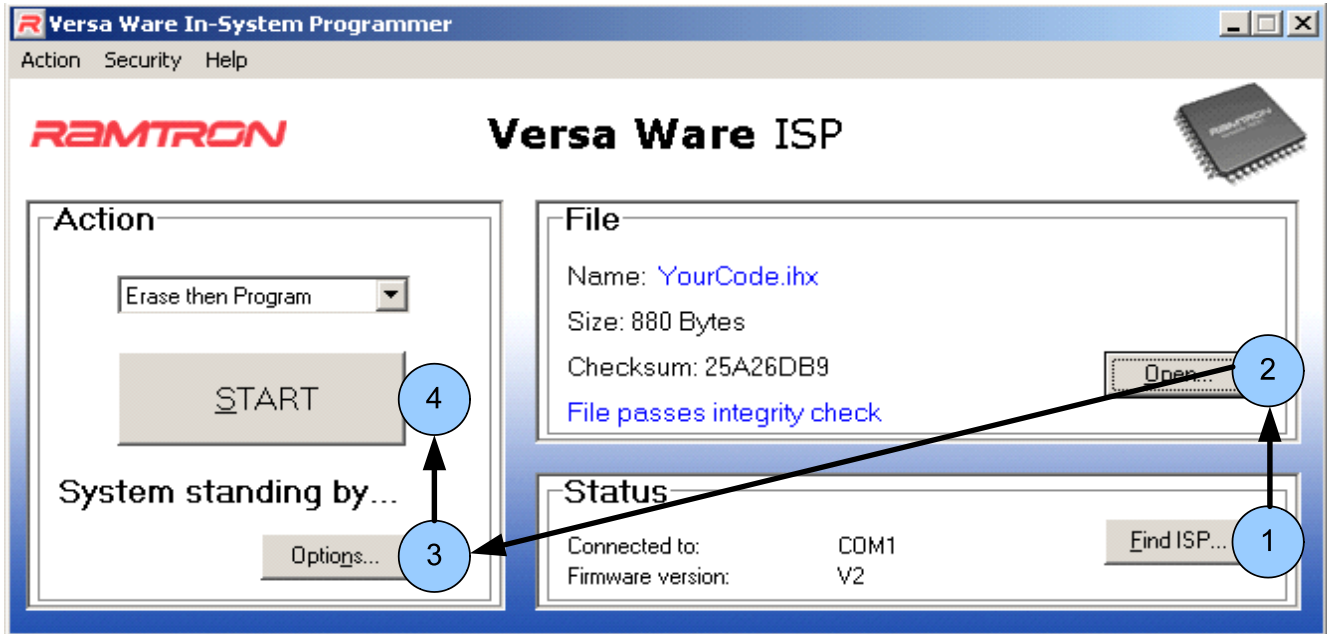


Figure 9: Versa Ware ISP main interface (forISPv2 firmware)

To program the Hex file into the device:

1. When the Versa Ware ISP starts, a connection between the ISP firmware and the MCU will be established automatically. If this connection is not established, check the connections with the ISP interface, the supply, etc.



Figure 10: Search for a VRS51C1000 with the ISP firmware

2. Click on Open and select <Open...> from the Action menu, or press <F2> to select the Hex file to be programmed into the VRS51x1xxx.
3. Select <Options...> once programming is complete.
4. Click on <START> to erase and program the VRS51x1xxx, or press the <F5> key.

Note: Following this process,, fewer steps will be required for additional programming. For instance, for a second file to be loaded, only steps 2 and 4 need to be performed, or if programming another MCU, only steps 1 and 4 must be performed, etc. (Configurations are saved between sessions.)

If the Versa Ware ISP does not detect the ISP firmware on the COM 1 to 8 serial ports, an error message will appear in the Searching for an ISP device... window. The software will now offer the options to either stop the search, retry establishing the connection or close the program.



Figure 11: Connection error message box

The most common causes of a misconnection between the Versa Ware ISP software and the ISP firmware are:

- Use of a crystal frequency that does not allow the supported communication speed
- A power supply or serial port misconnection
- A target device that does not contain the ISP firmware

For more details, please consult the ISP firmware documentation available at www.ramtron.com

6 ICP Specifications

6.1 Power Supply

The Versa In-Circuit Programmer module has the following power supply input requirements:

Voltage	6VDC (Min) to 9VDC(Max)
Current	45mA Standby / 70mA (programming)
Plug Type	2.1mm Female Plug (Center positive)

Please note that many commercially available wall-mount DC power supplies exceed their output voltage rating. Use of such power supplies with the In-Circuit Programmer may cause damage. Please verify the power supply's specifications before using it with the Versa-ICP. It is recommended to use the power supply provided in the Ramtron kit.

6.2 LEDs

- The green (power) and yellow (busy) LEDs serve as mode indicators.

Green	Yellow	In-Circuit Programmer Mode
ON	OFF	ICP power is on and device is ready
ON	ON	ICP power is on and device is programming a Versa Mix 8051 MCU
OFF	OFF	No Versa Ware software is running. If the Versa Ware ISP software is running, the power and busy LEDs are OFF (see setup section, page 1)

6.3 RS-232 Serial Port

- The ICP connects to the host PC via the RS-232 serial port. Please note that a PC with a DB25 connector will require a standard DB25 to DB9 adapter to connect with the ICP.

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