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XYGStudy 6455556

XYGStudy AVRISP mkII USB In-System Programmer User Manual

Model: 6455556

1. Introduction

The XYGStudy AVRISP mkII is a professional in-system programmer designed for Atmel AVR microcontrollers. It is fully compatible with the original AT AVRISP mkII and supports all AVR devices with ISP (In-System Programming) or PDI (Program and Debug Interface) interfaces, including XMEGA series microcontrollers. This programmer integrates seamlessly with AVR Studio 4, 5, 6, or higher versions, and can be updated to support future devices.



Figure 1: XYGStudy AVRISP mkII USB In-System Programmer

2. Key Features

- **Compatibility:** Fully compatible with AT AVRISP mkII from Atmel.
- **Device Support:** Programs all AVR devices with ISP or PDI interface, including XMEGA, and certain 51 devices.
- **Programming Capabilities:** Supports programming of both Flash and EEPROM memory, as well as fuses and lock bits.
- **Software Integration:** Compatible with AVR Studio 4/5/6 or higher versions, and WINAVR (GCC). Supports program files generated by IAR, ICCAVR, and CVAVR.
- **Firmware:** Delivered with firmware for AVR Studio 5, upgradeable to support other AVR Studio versions and future devices.
- **Target Voltage Support:** Operates with target voltages ranging from 1.8V to 5.5V.
- **Adjustable Speed:** ISP programming speed is adjustable from 50Hz to 8MHz SCK frequency.
- **Connectivity:** USB 2.0 compliant (full speed, 12Mbps).
- **Power Supply:** Powered directly from the USB bus, eliminating the need for an external power supply for the programmer unit.
- **Protection:** Features target interface protection and short-circuit protection.

3. Package Contents

The following items are included in your package:

- 1 x USB AVRISP XPII Programmer
- 1 x USB Cable (Type A to B)
- 1 x 6-pin Cable (spare)
- 1 x 6-pin to 10-pin ISP Cable
- 1 x 6-wire Multicolour Custom Connector Cable

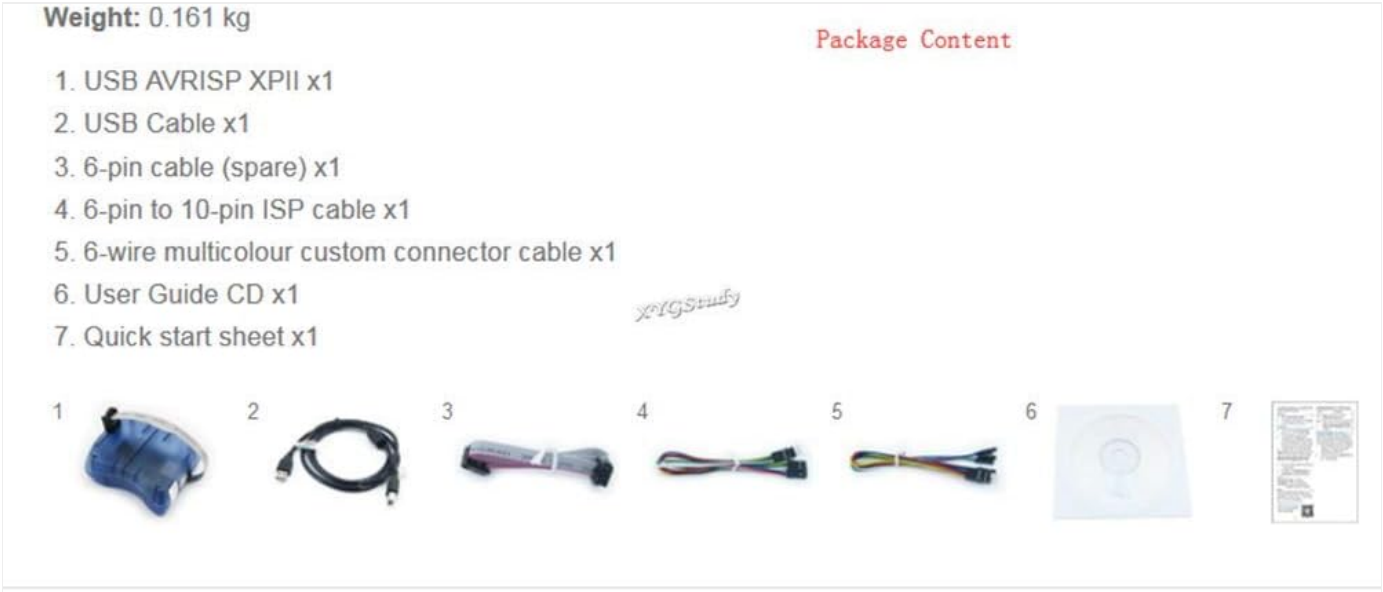


Figure 2: Included accessories and programmer unit

4. Setup Guide

4.1. Software Installation

Before connecting the AVRISP XPII programmer, you must install Atmel Studio (version 4, 5, 6, or higher) on your computer. The necessary drivers are typically included with Atmel Studio. The programmer is compatible with Windows XP/7/8/8.1/10 operating systems.

4.2. Hardware Connection

1. **Connect to PC:** Connect the AVRISP XPII programmer to your computer using the provided USB cable.
2. **Connect to Target Board:** The programmer connects to the target board via one of three optional cables, depending on the target board's connector type:
    - For a standard 6-pin ISP connector, use the 6-pin cable.
    - For a standard 10-pin ISP connector, use the 6-pin to 10-pin ISP cable.
    - For custom connections, use the 6-wire multicolour custom connector cable.
3. **Target Board Power:** The AVRISP XPII programmer is powered by USB and does not supply power to the target board. **The target board must be powered from an external power supply.**Ensure the target board is powered before attempting to program.



Connecting USB AVRISP XPII to the target board

(Click on the image to enlarge)

AT AVRISP mkII compliant
- Compatible with AT AVR ISP, easy to use, stable and reliable

Based on AT AVRISP mkII firmware
- Identified as AVRISP mkII in AVRStudio, high speed programming

Upgradable firmware
- Firmware is upgradable to Support Future Devices
- Automatic Upgrade

Supported software
- AVR Studio 4/5/6 or WINAVR(GCC) is used as front-end software
- Supports the program files generated by IAR, ICCAVR, CVAVR

Device Support
- USB AVRISP XPII supports all AVR devices with ISP and PDI Interface. Support for new devices will be added with new versions of AVR Studio.
- Supports AT86RF401/AT89S51/AT89S52

Figure 3: Connecting the USB AVRISP XPII to a target board

4.3. Firmware Upgrade

Generally, firmware auto-upgrades after connecting the XPII to Atmel Studio (above Studio 6.1). Manual upgrade is only required if the programmer does not function correctly. To manually upgrade firmware:

1. Open the installation directory of your Atmel Studio software, typicallyc:\Program Files (x86)\Atmel\Atmel Studio 6.2\.
2. Copy the firmware file (e.g.,avrispmkii_fw.zip) to the tools folder within the \atbackend\ directory.
3. Open a command prompt, navigate to the\atbackend\ directory (e.g., cd c:\Program Files (x86)\Atmel\Atmel Studio 6.2\atbackend\).
4. Execute the command: run atfw -a avrispmkii_fw.zip -t avrispmkiito upgrade the firmware.

5. Operation

5.1. Programming Microcontrollers

The AVRISP XPII programmer allows you to program Flash and EEPROM memory, as well as configure fuses and lock bits on supported AVR and XMEGA microcontrollers. The programming process is managed through Atmel Studio or other compatible development environments.
The programmer offers high-speed programming, capable of programming a 12K program file with verification in approximately 2.5 seconds (with programming speed set to 1MHz; maximum speed is 8MHz).

5.2. Pinout Diagrams

Understanding the pinouts is crucial for correct connection to your target board. The following diagrams illustrate the

standard 10-pin and 6-pin ISP connectors:

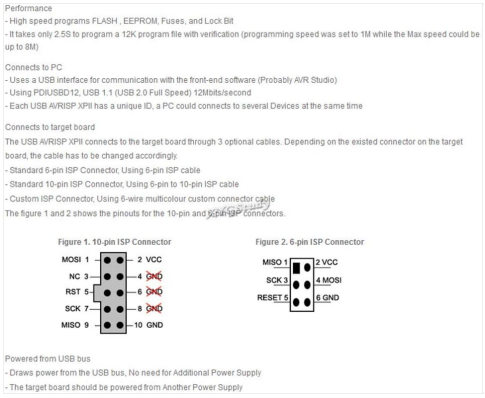


Figure 4: 10-pin ISP Connector Pinout

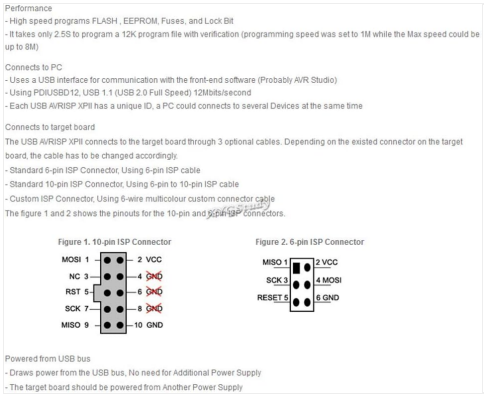


Figure 5: 6-pin ISP Connector Pinout

Note: The target board must be powered independently. Ensure MOSI, MISO, SCK, GND, and RESET lines are correctly connected and free from interference during programming.

6. Supported Devices

The AVRISP XPII programmer supports a wide range of Atmel AVR microcontrollers. Refer to Atmel Studio for the most up-to-date list. Below is a general list of supported AVR Mega, AVR Tiny, and AVR Xmega devices:

6.1. AVR Mega Series

Refer to AVR Studio 6, the following devices are supported:

AVR Mega 1/2

AT90CAN128 AT90CAN32 AT90CAN64 AT90PWM1 AT90PWM161 AT90PWM216 AT90PWM2B AT90PWM316 AT90PWM3B
AT90PWM81 AT90USB1286 AT90USB1287 AT90USB162 AT90USB646 AT90USB647 AT90USB82 ATA5702M322 ATA5782 ATA5790
ATA5790N ATA5795 ATA5831 ATA5832 ATA5833 ATA6285 ATA6286 ATA6612C ATA6613C ATA6614Q ATA6616C ATA6617C
ATA664251 ATmega128 ATmega1280 ATmega1281 ATmega1284 ATmega1284P ATmega1284RFR2 ATmega128A ATmega128RFA1
ATmega128RFR2 ATmega16 ATmega162 ATmega164A ATmega164P ATmega164PA ATmega165A ATmega165P ATmega165PA
ATmega168 ATmega168A ATmega168P ATmega168PA ATmega168PB ATmega169A ATmega169P ATmega169PA ATmega16A
ATmega16HVA ATmega16HVB ATmega16HVBrevB ATmega16M1 ATmega16U2 ATmega16U4 ATmega2560 ATmega2561
ATmega2564RFR2 ATmega256RFR2 ATmega32 ATmega324A ATmega324P ATmega324PA ATmega325 ATmega3250
ATmega3250A ATmega3250P ATmega3250PA ATmega325A ATmega325P ATmega325PA ATmega328 ATmega328P ATmega329
ATmega3290 ATmega3290A ATmega3290P ATmega3290PA ATmega329A ATmega329P ATmega329PA ATmega32A ATmega32C1
ATmega32HVB ATmega32HVBrevB ATmega32M1 ATmega32U2 ATmega32U4 ATmega48 ATmega48A ATmega48P ATmega48PA
ATmega48PB ATmega64 ATmega640 ATmega644 ATmega644A ATmega644P ATmega644PA ATmega644RFR2 ATmega645
ATmega6450 ATmega6450A ATmega6450P ATmega645A ATmega645P ATmega649 ATmega6490 ATmega6490A ATmega6490P
ATmega649A ATmega649P ATmega64A ATmega64C1 ATmega64HVE2 ATmega64M1 ATmega64RFR2 ATmega8 ATmega8515
ATmega8535 ATmega88 ATmega88A ATmega88P ATmega88PA ATmega88PB ATmega8A ATmega8HVA ATmega8U2

Figure 6: Supported AVR Mega Devices (Part 1)

6.2. AVR Tiny and AVR Xmega Series

AVR Tiny 2/2

ATtiny10 ATtiny13 ATtiny13A ATtiny1634 ATtiny167 ATtiny20 ATtiny2313 ATtiny2313A ATtiny24 ATtiny24A ATtiny25 ATtiny26 ATtiny261
ATtiny261A ATtiny4 ATtiny40 ATtiny4313 ATtiny43U ATtiny44 ATtiny441 ATtiny44A ATtiny45 ATtiny461 ATtiny461A ATtiny48 ATtiny5
ATtiny828 ATtiny84 ATtiny841 ATtiny84A ATtiny85 ATtiny861 ATtiny861A ATtiny87 ATtiny88 ATtiny9

AVR Xmega

ATxmega128A1 ATxmega128A1U ATxmega128A3 ATxmega128A3U ATxmega128A4U ATxmega128B1 ATxmega128B3
ATxmega128C3 ATxmega128D3 ATxmega128D4 ATxmega16A4 ATxmega16A4U ATxmega16C4 ATxmega16D4 ATxmega16E5
ATxmega192A3 ATxmega192A3U ATxmega192C3 ATxmega192D3 ATxmega256A3 ATxmega256A3B ATxmega256A3BU
ATxmega256A3U ATxmega256C3 ATxmega256D3 ATxmega32A4 ATxmega32A4U ATxmega32C3 ATxmega32C4 ATxmega32D3
ATxmega32D4 ATxmega32E5 ATxmega384C3 ATxmega384D3 ATxmega64A1 ATxmega64A1U ATxmega64A3 ATxmega64A3U
ATxmega64A4U ATxmega64B1 ATxmega64B3 ATxmega64C3 ATxmega64D3 ATxmega64D4 ATxmega8E5

Supports all the different voltages and speed grade versions of the devices listed in the table above.
Check more supported devices : UC3, Mega, SAM , Tiny, Xmega

Figure 7: Supported AVR Tiny and AVR Xmega Devices (Part 2)

The programmer supports all different voltages and speed grade versions of the devices listed above.

7. TROUBLESHOOTING

7.1. LED Status Indicators

The programmer features LED indicators to provide status information:

LED	Description
Power (Green)	Connect to PC normally

LED	Description
States (Green)	Connect to PC and target board
States (Red)	Connect to PC without target board
States (Red)	Program; Orange flash: Firmware upgrade

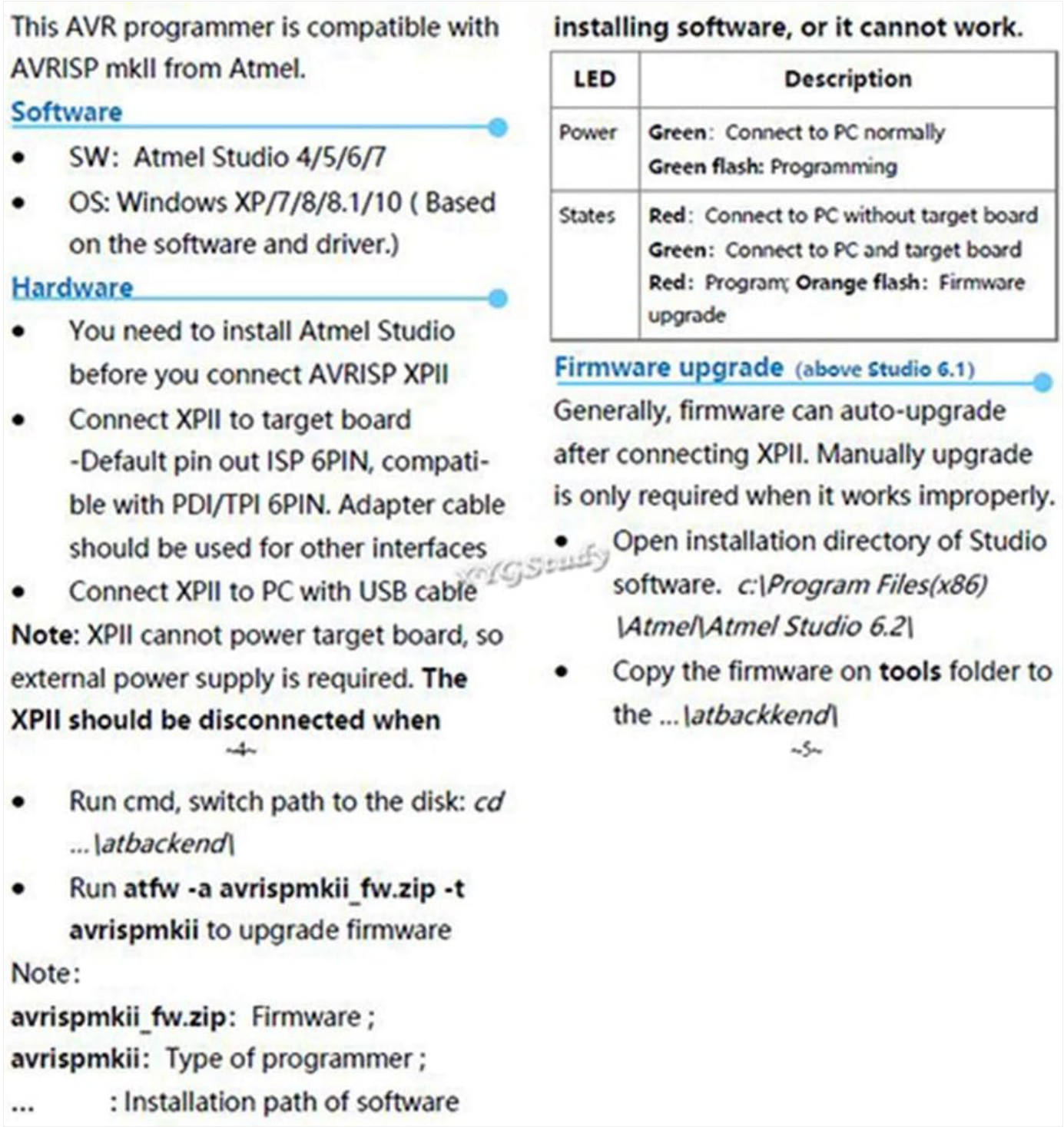


Figure 8: LED Status and Firmware Upgrade Information

7.2. Common Issues and Solutions

- **Programmer not recognized by PC:** Ensure the USB cable is securely connected. Verify that Atmel Studio and the necessary drivers are correctly installed. Try a different USB port.
- **Cannot connect to target board:**

- **Target Power:** Confirm that the target board is independently powered. The programmer does not supply power to the target.
- **Wiring:** Double-check all connections between the programmer and the target board, ensuring correct pinouts (MOSI, MISO, SCK, RESET, GND).
- **Interference:** Disconnect or remove any circuitry in series or across the ISP bus that might interfere with programming signals.
- **Target Voltage:** Ensure the target voltage is within the supported range of 1.8V to 5.5V.

- **Programming errors:** This could be due to incorrect fuse settings, an incompatible device selected in Atmel Studio, or issues with the target board's clock source. Verify all settings and connections.
- **Firmware issues:** If the programmer behaves erratically, consider performing a manual firmware upgrade as described in Section 4.3.

8. Specifications

Feature	Detail
Product Dimensions	7.3 x 5.5 x 1.7 inches
Item Weight	7 ounces
Model Number	6455556
Connectivity Technology	USB
Number of Ports	2 (USB, ISP/PDI)
Compatible Devices	Personal Computer, Laptop, Microcontrollers (AVR, XMEGA, certain 51)
Target Voltage Range	1.8V to 5.5V
ISP Programming Speed	50Hz to 8MHz SCK frequency (adjustable)
USB Compliance	USB 2.0 (full speed, 12Mbps)

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