OVERVIEW

The Kimat Arduino ISP shield enables programming via the ICSP/ISP port of AVR based microcontroller boards such as Arduino and our Saleng Uno, Mini and Tiny family. This shield, together with an Arduino Uno, is used to build an Arduino IDE-supported ISP programmer.

This programmer maybe used to upload the bootloader of an Arduino or any AVR-based board. It may also be used to upload sketches without using the bootloader and serial port. Layad Circuits. Saleng Tiny and Saleng Mini boards may also be programmed using this programmer.

Figure 1: Kimat Arduino ISP Shield

FEATURES

- Arduino IDE supported ISP programmer
- Support for 3.3V or 5V microcontrollers
- Complete Arduino ISP LEDs: Heartbeat, Error, and Mode LEDs
- DIP-8 socket for onboard programming of ATTINY85 and similar chips
- On board test LED for DIP-8 chips
- Low Power, <50mA with all LEDs on

BUILDING THE PROGRAMMER

To complete the programmer, you will need an Arduino Uno and its USB cable. Follow the recommended steps below:

1. Insert the shield into the Arduino Uno. The shield is a half-shield and does not include pins 0-6 and A0-A5. See diagram below.

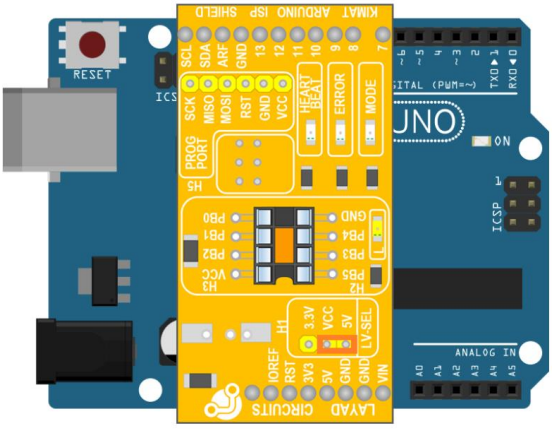

Figure 2: Installing the Kimat Arduino ISP Shield

2. Connect the Arduino Uno to the computer using the USB cable
3. Launch the Arduino IDE
4. Go to File>Examples>11.ArduinoISP>ArduinoISP

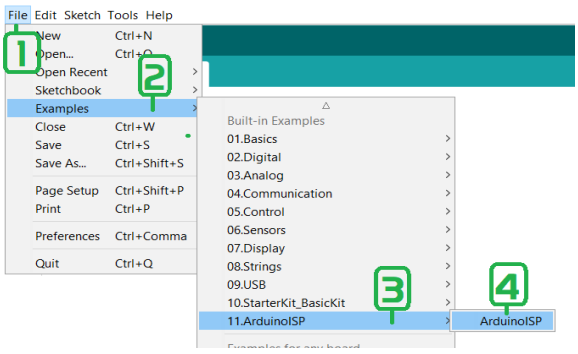

Figure 3: Launching the ArduinoISP sketch

Copyright 2019 © Layad Circuits All Rights Reserved
Layad Circuits Electronics Engineering Supplies & Services, B314 Lopez Bldg., Session Rd. cor. Assumption Rd., Baguio City, Philippines
General inquiries: info@layadcircuits.com Sales: sales@layadcircuits.com FB: facebook.com/layadcircuits Mobile: +639164428565
An IMPORTANT NOTICE: at the end of this guide addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers.

5. Upload the sketch that opens into the Arduino Uno.
6. Once uploaded, the heartbeat LED will glow on and off. The programmer is ready for use at this point. The "complete ISP programmer" consists of the Kimat Arduino ISP Shield, the Arduino Uno programmed with the ISP sketch and the USB cable of the Arduino Uno.

UPLOADING BOOTLOADER

Follow the recommended steps below. The "target board" containing the chip to be programmed should already be in the list under Tools>Boards. Otherwise, install it using the Board Manager of the Arduino IDE.

1. Connect the target board to the completed ISP programmer using the header labeled "PROG PORT". See the PIN FUNCTIONS section for detailed connection. ATtiny85 and pin-compatible chips in 8pin DIP package can use the onboard IC socket for convenient programming.
2. Tools>Port and make sure the COM port of the **Arduino Uno** is selected
3. Tools>Board and then select the name of the **target board**.
4. Tools>Burn Bootloader then wait until programming is done

UPLOADING REGULAR ARDUINO SKETCHES

Follow the recommended steps below to upload a sketch created in the Arduino IDE without using the bootloader and serial port of the target board. Do note that such operation may erase the pre-programmed bootloader of the target.

1. Connect the target board to the completed ISP programmer using the header labeled "PROG PORT". See the PIN FUNCTIONS section for detailed connection. ATtiny85 and pin-compatible chips in 8pin DIP package can use the onboard IC socket for convenient programming.
2. Tools>Port and make sure the COM port of the **Arduino Uno** is selected
3. Tools>Board and then select the name of the **target board**.
4. Sketch>Upload Using Programmer then wait until programming is done

PIN FUNCTIONS

PROG PORT PIN FUNCTIONS	
Pins	**Function**
GND	Ground
VCC	Either 5V or 3.3V depending on H1 microjumper. Taken from 5V or 3.3V of the Arduino Uno board.
RST	Connect to the reset pin of the target
MOSI	Connect to the MOSI pin of the target
MISO	Connect to the MISO pin of the target
SCK	Connect to the SCK pin of the target

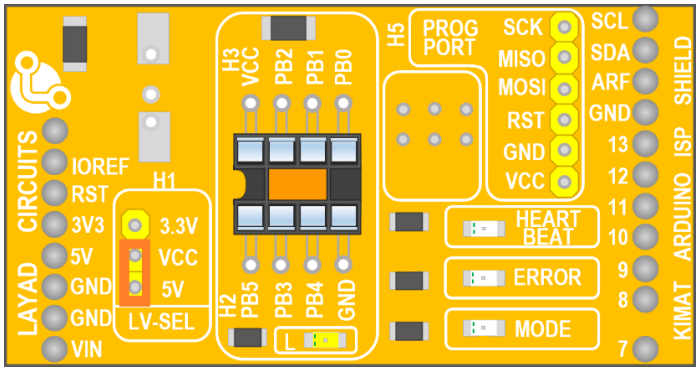

Figure 4: Top view

Copyright 2019 © Layad Circuits All Rights Reserved
Layad Circuits Electronics Engineering Supplies & Services, B314 Lopez Bldg., Session Rd. cor. Assumption Rd., Baguio City, Philippines
General inquiries: info@layadcircuits.com Sales: sales@layadcircuits.com FB: facebook.com/layadcircuits Mobile: +639164428565
An IMPORTANT NOTICE: at the end of this guide addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers.

WIRING DIAGRAM

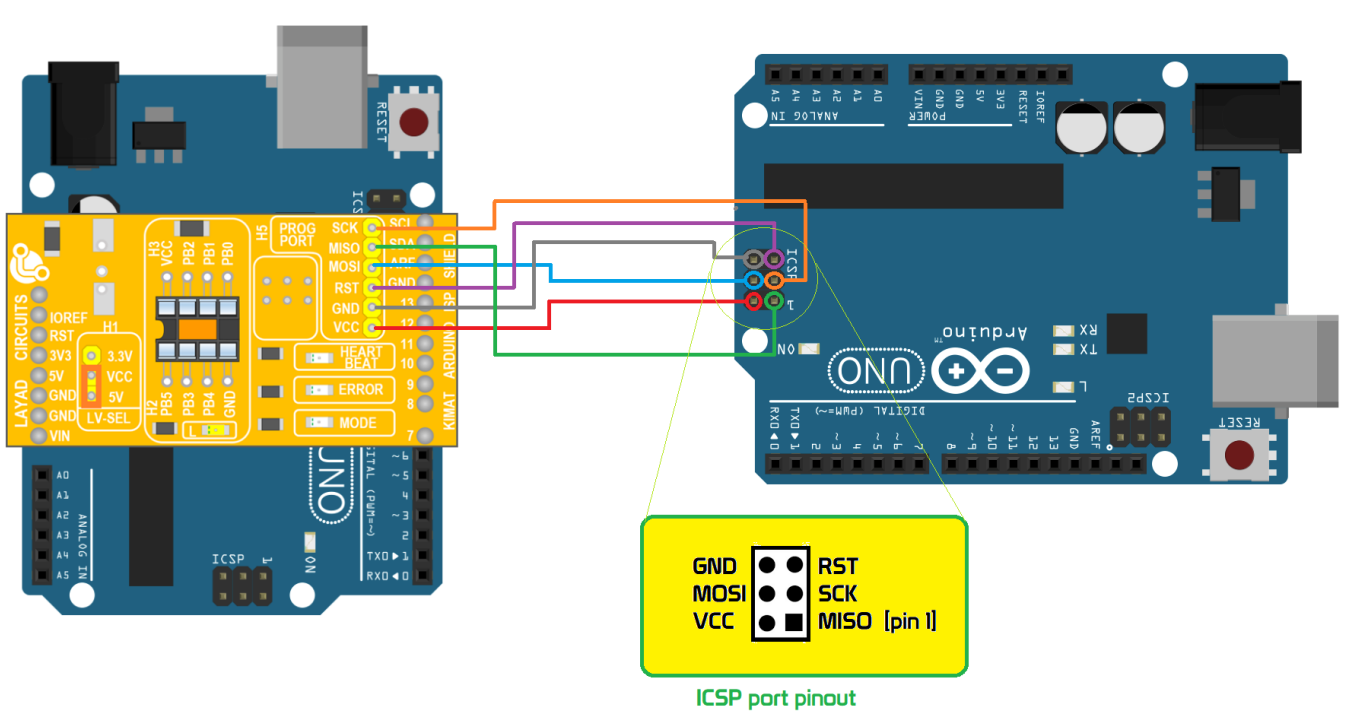

Figure 5: Wiring example for an Arduino Uno as target

DOCUMENT REVISION HISTORY

Revision:

v1.0.0/02 April 2020 C.D.MALECDAN

Copyright 2019 © Layad Circuits All Rights Reserved
Layad Circuits Electronics Engineering Supplies & Services, B314 Lopez Bldg., Session Rd. cor. Assumption Rd., Baguio City, Philippines
General inquiries: info@layadcircuits.com Sales: sales@layadcircuits.com FB: facebook.com/layadcircuits Mobile: +639164428565
An IMPORTANT NOTICE: at the end of this guide addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers.

IMPORTANT NOTICE

Layad Circuits Electronics Engineering Supplies & Services (Layad Circuits) reserves the right to make corrections, enhancements, improvements and other changes to its products, services and documentations, and to discontinue any product or service. Buyers or clients should obtain the latest relevant information before placing orders and should verify that such information is current and complete. Additional terms may apply to the use or sale of Layad Circuits products and services.

Reproduction of significant portions of Layad Circuits information in Layad Circuits datasheets or user guides is permissible only if reproduction is without alteration, displays the Layad Circuits logo and is accompanied by all associated warranties, conditions, limitations, and notices. Layad Circuits is not responsible or liable for such reproduced documentation. Information of third parties may be subject to additional restrictions. Resale of Layad Circuits products or services with statements different from or beyond the parameters stated by Layad Circuits for that product or service voids all express and any implied warranties for the associated Layad Circuits product or service. Layad Circuits is not responsible or liable for any such statements.

Buyers and others who are developing systems that incorporate Layad Circuits products (collectively, “Designers”) understand and agree that Designers remain responsible for using their independent analysis, evaluation and judgment in designing their applications and that Designers have full and exclusive responsibility to assure the safety of Designers' applications and compliance of their applications (and of all Layad Circuits products used in or for Designers’ applications) with all applicable regulations, laws and other applicable requirements. Designer represents that, with respect to their applications, Designer has all the necessary expertise to create and implement safeguards that (1) anticipate dangerous consequences of failures, (2) monitor failures and their consequences, and (3) lessen the likelihood of failures that might cause harm and take appropriate actions. Designer agrees that prior to using or distributing any applications that include Layad Circuits products, Designer will thoroughly test such applications and the functionality of such Layad Circuits products as used in such applications. Layad Circuits’ provision of technical, application or other design advice, quality characterization, reliability data or other services or information, including, but not limited to, reference designs and materials relating to evaluation modules, (collectively, “Layad Circuits Resources”) are intended to assist designers who are developing applications that incorporate Layad Circuits products; by downloading, accessing or using Layad Circuits Resources in any way, Designer (individually or, if Designer is acting on behalf of a company, Designer’s company) agrees to use any particular Layad Circuits Resource solely for this purpose and subject to the terms of this Notice.

Layad Circuits' provision of Layad Circuits Resources does not expand or otherwise alter Layad Circuits’ applicable published warranties or warranty disclaimers for Layad Circuits products, and no additional obligations or liabilities arise from Layad Circuits providing such Layad Circuits Resources.

Layad Circuits reserves the right to make corrections, enhancements, improvements and other changes to its Layad Circuits Resources. Layad Circuits has not conducted any testing other than that specifically described in the published documentation for a particular Layad Circuits Resource.

NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE TO ANY OTHER LAYAD CIRCUITS INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT OF LAYAD CIRCUITS OR ANY THIRD PARTY IS GRANTED HEREIN, including but not limited to any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which Layad Circuits products or services are used. Information regarding or referencing third-party products or services does not constitute a license to use such products or services, or a warranty or endorsement thereof. Use of Layad Circuits Resources may require a license from a third party under the patents or other intellectual property of the third party, or a license from Layad Circuits under the patents or other intellectual property of Layad Circuits. Layad Circuits RESOURCES ARE PROVIDED “AS IS” AND WITH ALL FAULTS. LAYAD CIRCUITS DISCLAIMS ALL OTHER WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, REGARDING RESOURCES OR USE THEREOF, INCLUDING BUT NOT LIMITED TO ACCURACY OR COMPLETENESS, TITLE, ANY EPIDEMIC FAILURE WARRANTY AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS. LAYAD CIRCUITS SHALL NOT BE LIABLE FOR AND SHALL NOT DEFEND OR INDEMNIFY DESIGNER AGAINST ANY CLAIM, INCLUDING BUT NOT LIMITED TO ANY INFRINGEMENT CLAIM THAT RELATES TO OR IS BASED ON ANY COMBINATION OF PRODUCTS EVEN IF DESCRIBED IN LAYAD CIRCUITS RESOURCES OR OTHERWISE. IN NO EVENT SHALL LAYAD CIRCUITS BE LIABLE FOR ANY ACTUAL, DIRECT, SPECIAL, COLLATERAL, INDIRECT, PUNITIVE, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES IN CONNECTION WITH OR ARISING OUT OF LAYAD CIRCUITS RESOURCES OR USE THEREOF, AND REGARDLESS OF WHETHER LAYAD CIRCUITS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Unless Layad Circuits has explicitly designated an individual product as meeting the requirements of a particular industry standard, Layad Circuits is not responsible for any failure to meet such industry standard requirements. Where Layad Circuits specifically promotes products as facilitating functional safety or as compliant with industry functional safety standards, such products are intended to help enable customers to design and create their own applications that meet applicable functional safety standards and requirements. Using products in an application does not by itself establish any safety features in the application. Designers must ensure compliance with safety-related requirements and standards applicable to their applications. Designer may NOT use any Layad Circuits products in life-critical applications. Life-critical medical equipment is medical equipment where failure of such equipment would cause serious bodily injury or death (e.g., life support, pacemakers, defibrillators, heart pumps, neurostimulators, and implantables). Designers agree that it has the necessary expertise to select the product with the appropriate qualification designation for their applications and that proper product selection is at Designers’ own risk. Designers are solely responsible for compliance with all legal and regulatory requirements in connection with such selection. Designer will fully indemnify Layad Circuits and its representatives against any damages, costs, losses, and/or liabilities arising out of Designer’s noncompliance with the terms and provisions of this Notice.

Copyright 2019 © Layad Circuits All Rights Reserved
Layad Circuits Electronics Engineering Supplies & Services, B314 Lopez Bldg., Session Rd. cor. Assumption Rd., Baguio City, Philippines
General inquiries: info@layadcircuits.com Sales: sales@layadcircuits.com FB: facebook.com/layadcircuits Mobile: +639164428565
An IMPORTANT NOTICE: at the end of this guide addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers.

Copyright 2019 © Layad Circuits All Rights Reserved
Layad Circuits Electronics Engineering Supplies & Services, B314 Lopez Bldg., Session Rd. cor. Assumption Rd., Baguio City, Philippines
General inquiries: info@layadcircuits.com Sales: sales@layadcircuits.com FB: facebook.com/layadcircuits Mobile: +639164428565
An IMPORTANT NOTICE: at the end of this guide addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers.