INDUSTRUINO CODE REFERENCE

IDE SET UP

1. Download and install the Arduino IDE from Arduino.cc (minimum version 1.6.12)

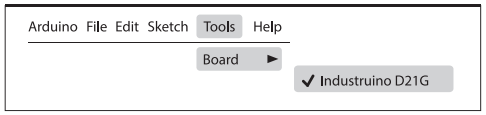
2. In the boards manager (Tools->Boards Manager) search for “Industruino” and install the “Industruino SAMD Boards” package.

3. In the library manager (Sketch->Include library->Manage libraries) search and install the following libraries
   - UC1701 (LCD functions)

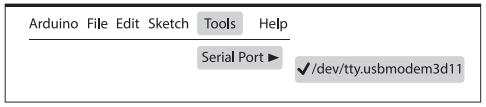
4. For Windows users: before connecting the Industruino download and install the USB driver from: *https://static.industruino.com/downloads/drivers/drivers-industruino-windows-0.0.1.zip*

5. Connect the Industruino to your computer via the USB-micro port.

6. Select "Industruino D21G" from Tools->Board



7. Select your serial port from Tools->Port



8. Upload your first sketch. Each library installed in step #3 has example sketches which can function as the starting point of your application (ex. File->Examples->UC1701).

For more detailed documentation please visit our tech support page:
industruino.com/support

I/O OPERATIONS

Analog Setup() routines

Syntax
analogReference(type)
analogReadResolution(bit);
analogWriteResolution(bit);

Parameters
type: AR_DEFAULT (3.3V), AR_INTERNAL (1V), AR_EXTERNAL (ext. AREF)
bit: 8, 10, 12

Example
analogReference(AR_INTERNAL); //Set analog reference to internal 1V reference
analogReadResolution(12); //Set ADC resolution to 12bits
analogWriteResolution(12); //Set PWM resolution to 12bits

1 Read analog input

Syntax
analogRead(pin);

Parameters
pin: The pin you want to read from

Example
int x = analogRead(A12); //Read the value of input A12 (D12) to variable x

2 Write analog output (PWM)

Syntax
analogWrite(pin, value);

Parameters
pin: The pin you want to write to
value: PWM duty cycle

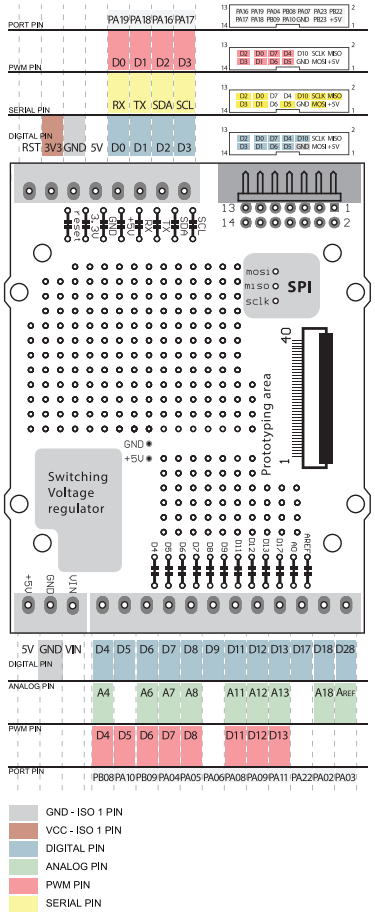
Example
analogWrite(11, 2048); // Set output pin D11 to 50% duty cycle

3 Hardware Serial Setup

Syntax
Serial*.begin(baud);

Parameters
baud: Baud speed of serial comms

Example
Serial.begin(9600); //Enable UART on D0/D1 at 9600 baud
Serial1.begin(9600); //Enable UART on D10/D5 at 9600 baud
SerialUSB.begin(9600); //Enable USB serial terminal



GND - ISO 1 PIN
VCC - ISO 1 PIN
DIGITAL PIN
ANALOG PIN
PWM PIN
SERIAL PIN

14P IDC Expansion Port

+5V	MOSI/D16	GND	D5/TX1	D6/A6	D1/TX	D3/SCL
MISO/D14	SCLK/D15	D10/RX1	D4/A4	D7/A7	D0/RX	D2/SDA

Internal functions

Arduino pin	Peripheral function	Internal dependencies
D19	GPIO	LCD CS
D20	MOSI - SPI1	LCD MOSI
D21	SCLK - SPI1	LCD SCLK
D22	GPIO	LCD D/C
D23	GPIO	Button UP
D24	GPIO	Button ENTER
D25	GPIO	Button DOWN
D26	GPIO	LCD Backlight
D27	GPIO	RTC interrupt

Digital Setup() routines

Syntax
digitalMode(pin, mode);

Parameters
pin: Channel that you want to configure
mode: INPUT, OUTPUT, INPUT_PULLUP

Example
digitalMode(11,INPUT); // Set pin D11 as an input

4 Read digital input

Syntax
digitalRead(pin); // Read pin

Parameters
pin: Input pin to read

Example
int x = digitalRead(11); // Read pin D11 to integer x

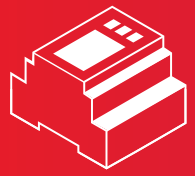
5 Write digital output

Syntax
digitalWrite(pin, value); // Read pin

Parameters
pin: Output pin to write to
value: HIGH, LOW

Example
digitalWrite(11,HIGH); // Set pin D11 high.

GUIDE BOOK: PROTO D21G



INDUSTRUINO

INDUSTRUINO®

Operation instructions

Before using Industruino PROTO please read the manual carefully, and pay full attention to safety to handle the product correctly.
For the full manual and instructions regarding installation, usage and operation of the Industruino kit please visit:
www.industruino.com/support

Before using Industruino PROTO please refer to our conditions of use:
www.industruino.com/conditions-of-use

Safety instructions

WARNING:

- Do not connect any part of the device to voltages higher than 28V.
- Always switch off power before you connect or disconnect an external device or accessory.
- Avoid circuit or wire exposure. Do not touch exposed connections or components when the device is powered on or when devices connected to it are powered on.
- Use only with cables and accessories that are approved or recommended by Industruino.
- Do not operate with suspected failures. If suspected damage occurs with the device, have it inspected by qualified service personnel before further operations.
- Do not operate in an explosive atmosphere.
- Do not use in wet/damp conditions.
- Keep device surfaces clean and dry.
- Use only for applications described in the catalog and the manual, and only with third party devices or components if they have been approved or recommended by Industruino.
- The device can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.
- The device must be installed and wired by a trained technician following the applicable local safety standards and regulations.

Conditions of use

(1) Industruino PROTO programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
ES GEAR LTD. OR ITS DISTRIBUTORS SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN ES GEAR LTD. OR ITS DISTRIBUTORS' USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;

Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.

Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.

Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions ES Gear Ltd. may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by ES Gear Ltd. and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact an ES Gear Ltd. representative.

REGULATORY

CE COMPLIANCE

This product meets the essential requirements of applicable European Directives as follows:

2004/108/EC; Electromagnetic Compatibility Directive (EMC).
2011/65/EU; Restriction of Hazardous Substances Directive (RoHS).

FCC COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

All Industruino products that are subject to the WEEE directive shipped from September 1, 2014 are compliant with the WEEE marking requirement. Such products are marked with the "crossed-out wheelie bin" WEEE symbol (shown, above) in accordance with European Standard EN50419.

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Importer in EU: BTL cvba
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Product: Industruino PROTO D21G