NightShade Electronics

Trēo™ Module

Adapter Features

- Adapts Trēo to All Arduino Uno Style Boards
  - Arduino Boards
  - STM32 Nucleo Boards
- Compatible with 5V or 3.3V Boards
- 9 Trēo™ Connectors
  - 6 I2C
  - 3 SPI
  - 3 GPIO
  - 1 UART
- RoHS Compliant

Trēo™ Compatibility

Electrical

Communication	I2C, SPI, UART, GPIO
Supply Current, 3.3V	Max 300mA
Supply Current, 5V	Max 1000mA

Mechanical

Arduino Hat

- 53.3mm x 68.6mm Outline
- Arduino boards can be adapted to the Trēo™ 10mm grid with an Arduino plate adapter.

Description

The Trēo™ Arduino Adapter provides any Arduino-style host board with access to the entire Trēo™ development system, so long as it accepts a Shield-style daughter boards and can be programmed with the Arduino IDE. This module is a part of the NightShade Treo system, patent pending.

Table of Contents

1   What is Trēo™?

NightShade Trēo is a system of electronic modules that have standardized mechanical, electrical, and software interfaces. It provides you with a way to quickly develop electronic systems around microprocessor development boards. The grid attachment system, common connector/cabling, and extensive cross-platform software library allow you more time to focus on your application. Trēo is supported with detailed documentation and CAD models for each device.

Learn more about Trēo here.

2   Electrical Characteristics

	Minimum	Nominal	Maximum
Arduino Board Voltages			
$V_{i/o}$ (SDA, SCL, INT)	-0.3V	-	5.2V
$V_{3.3V}$	3.1V	3.3V	3.5V
V_{5V}	4.8V	5.0V	5.2V
Trēo Connector Voltages			
$V_{i/o}$ (SDA, SCL, INT)	-0.3V	-	3.6V
$V_{3.3V}$	3.1V	3.3V	3.5V
V_{5V}	4.8V	5.0V	5.2V
Operating Temperature	-25°C	-	+85°C

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3 Electrical Connections

3.1 Communications

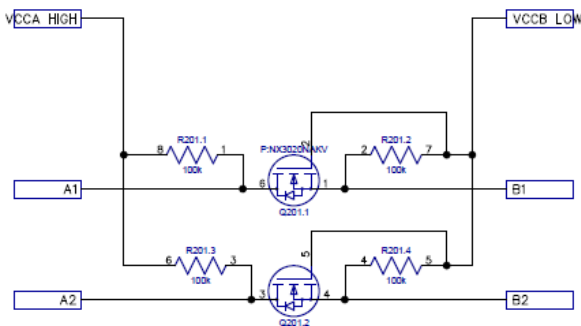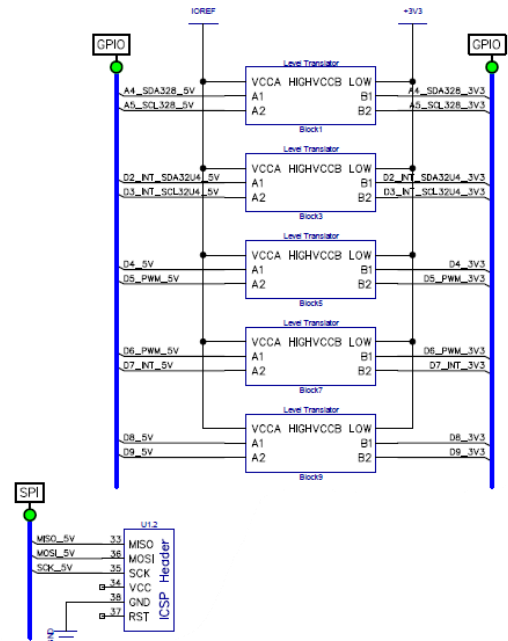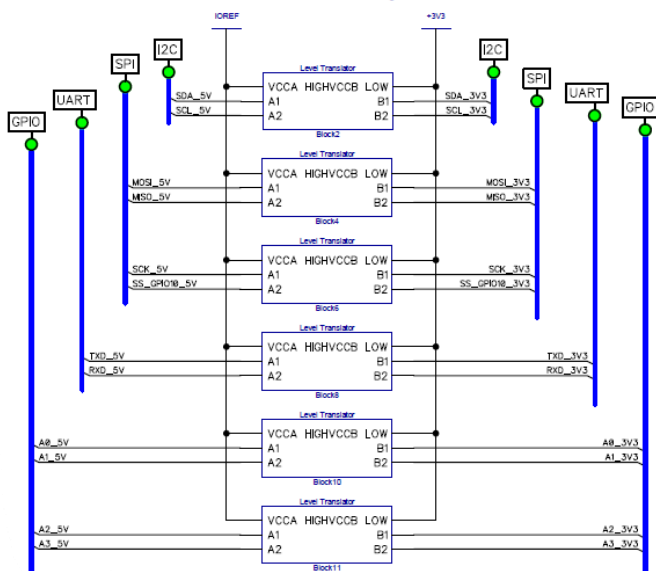| Trēo Connection	Signal	Arduino Pin
I2C	SDA	SDA
I2C	SCL	SCL
SPI	MOSI	D11
SPI	MISO	D12
SPI	SCK	D13
SPI	CS0	D10
SPI	CS1	D9
SPI	CS2	D8
UART	TXD	D1
UART	RXD	D0
GPIO 0	GPIO0	D5
GPIO 0	GPIO1	D4
GPIO 1	GPIO0	D6
GPIO 1	GPIO1	A2
GPIO 2	GPIO0	A0
GPIO 2	GPIO1	A1

3.2 Interrupts

The Arduino Uno (ATmega328P) has hardware interrupt pins on D2 and D3, but these pins correspond with the I2C pins on an Arduino Leonardo (ATmega32U4). To use the hardware interrupts and I2C of both boards, a switch was added to the adapter to change the connections of INT0 and INT1. These connections are show in this table.

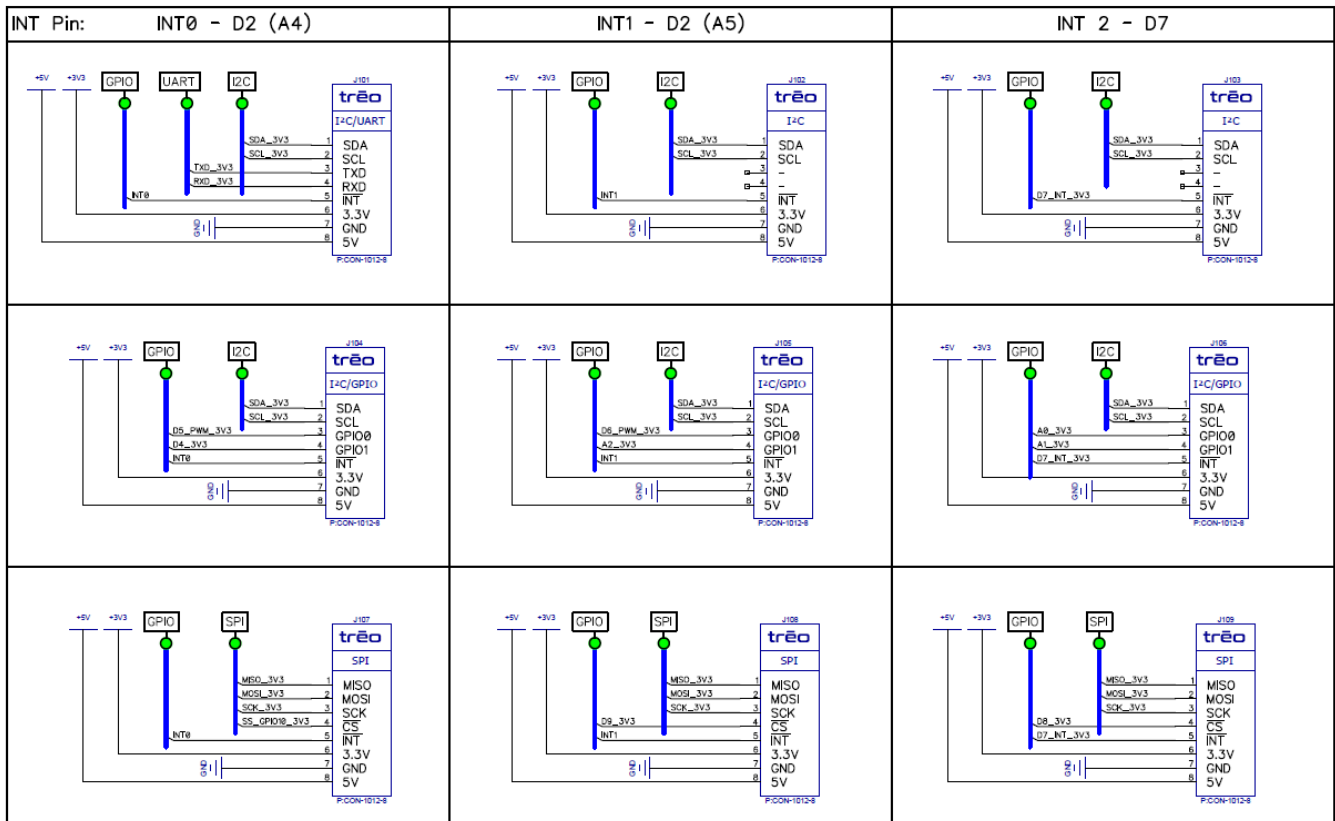| Interrupt	Switch Position A	Switch Position B
INT0	D2	A4
INT1	D3	A5
INT2	D7	D7

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4 Electrical Schematic
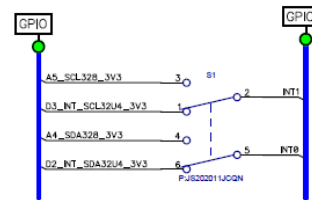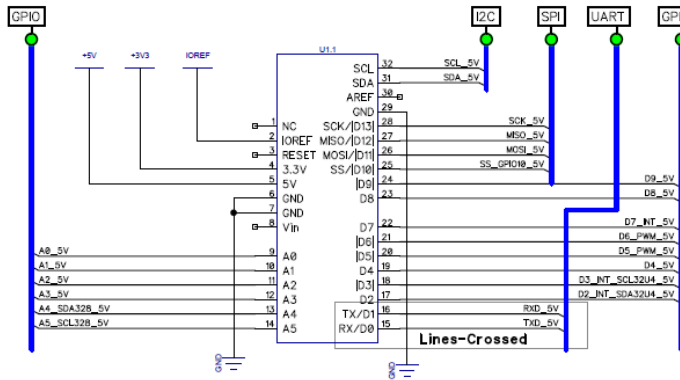
Switches between D2 & D3
(INT0 and INT1 on Uno) and
A4 & A5 for the Leonardo
(D2 & D3 are I2C)

Level Translator Sub-Circuit

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5 Mechanical Outline

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