Kappa3710Ard

IS3710 Evaluation Board for Arduino/Nucleo

Presentation

The **IS3710** is an **evaluation board** for the **IS3710** I2C DMX Receiver chip. It enables engineers to easily evaluate the IS3710 without the need for soldering or developing their own prototype—offering a **ready-to-use solution**.

The board features two **DMX connectors** (XLR-3) in a daisy chain, a DMX **activity LED**, an I2C **voltage selector** jumper, an I2C **speed selector** jumper, an **RGB LED** connected to the shield pins (which can be used to display received DMX data), and an LED power indicator.

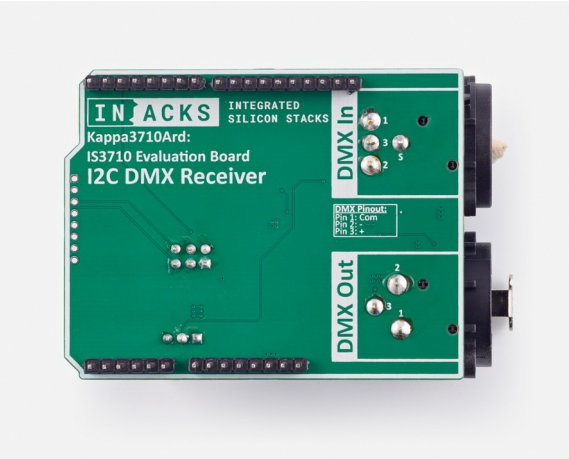
Designed as a shield with the **Arduino UNO form factor**, the **Kappa3710Ard** benefits from its widespread popularity, ensuring compatibility with various microcontroller boards like the Nucleo from ST.

The IS3710 is an ideal solution for **meeting DMX protocol timing constraints** while reducing overhead on timers, interrupts, and RAM. It eliminates the need for a dedicated pin and can receive a full DMX universe (**512-channels**).

Characteristics

IS3710 Characteristics	
Protocol:	DMX512A
Received DMX Channels:	Full DMX Universe (512-channels)
Filter to reject non-DMX data:	Yes — RDM data is rejected, preventing glitches
I2C compatible speed:	100 kHz, 400 kHz, 1 MHz
I2C compatible voltages:	3.3 V, 5 V
Transceiver compatible voltages:	3.3 V, 5 V

Shield Characteristics	
Form Factor:	Arduino Uno and STM32 Nucleo Compatible
Available Jumpers:	I2C voltage jumper (3.3V, 5V or floating) I2C speed (100 kHz, 400 kHz or 1 MHz)
LEDs:	DMX Activity LED Power LED User-available RGB LED (connected to the shield PWM lines)

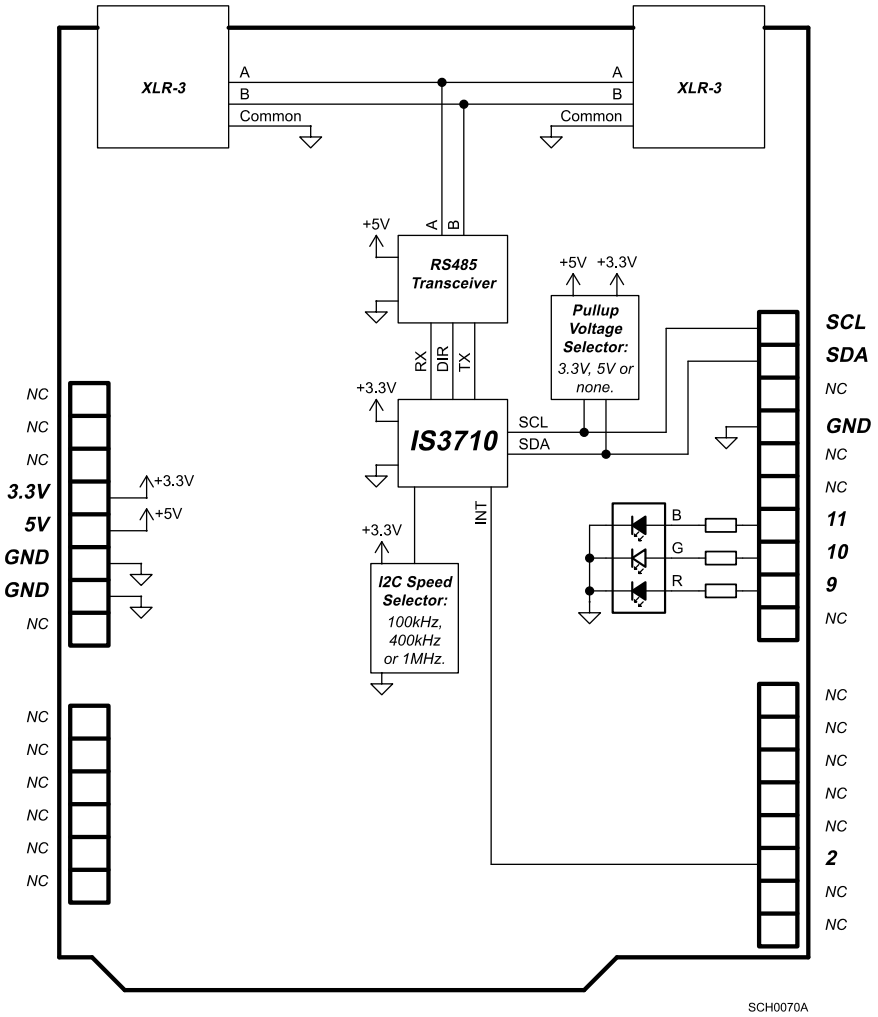


Product Selection Guide

	Part Number		Form Factor	Stack	Description
Only Stack	IS3710-S8		SO8N	DMX512A Receiver	DMX Receiver Chip with I2C [Vist Product Page]
Evaluation Boards	Kappa3710Ard		Arduino Compatible		Evaluation board for the IS3710 with Arduino form factor. It features the IS3710 mounted on a PCB compatible with Arduino and other commercial microcontroller boards, such as the STM32 Nucleo. The board includes two daisy chain XLR-3 connectors, allowing you to easily test the IS3710 without any need for soldering. [Visit Product Page]
	Kappa3710Rasp		Raspberry Pi Compatible		Evaluation board for the IS3710 with Raspberry Pi form factor. It features the IS3710 mounted on a PCB compatible with Raspberry Pi and other commercial embedded computer boards. The board includes two daisy chain XLR-3 connectors, allowing you to easily test the IS3710 without any need for soldering. [Visit Product Page]

1. Description

1.1. General Description



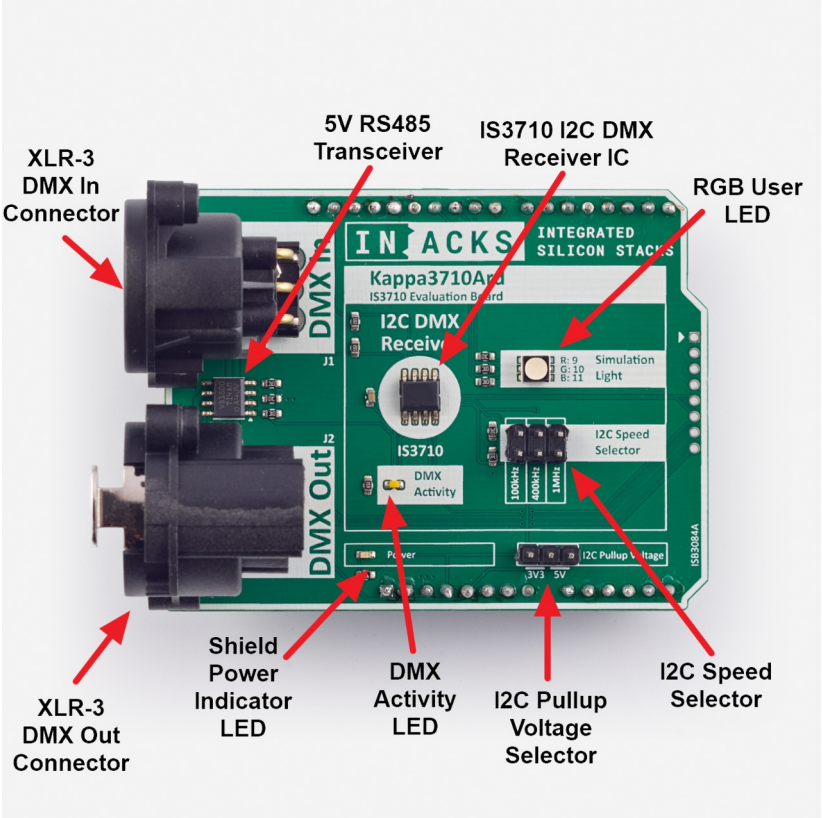
The main component of the Kappa3710Ard is the IS3710 I2C DMX Receiver chip. This chip is connected to the DMX bus through an RS485 transceiver. A 5V transceiver is used because it provides better noise immunity and can achieve longer signal distances. Since the IS3710 is 5V-tolerant, it is perfectly fine to use a 5V transceiver. A 3.3V transceiver can also be used, although 5V is recommended for the benefits mentioned above.

The shield also provides connections to the SCL and SDA pins for I2C communication. In the middle of the board, there is an I2C voltage selector jumper that allows you to adjust the bus to 3.3V, 5V, or leave it floating in case the pull-up resistors are located elsewhere in your circuit. IS3710's SDA and SCL pins are 5V-tolerant.

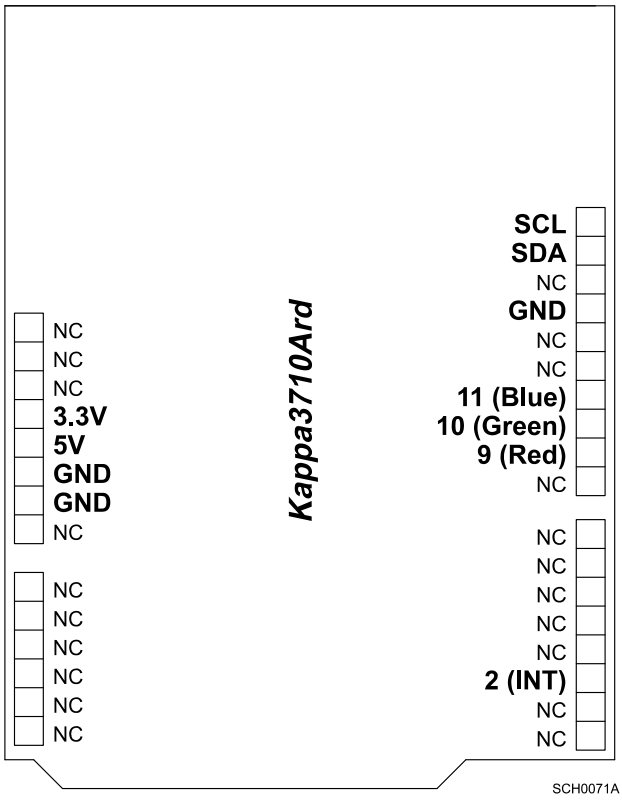
Additionally, there is a jumper to select the I2C speed.

The interruption pin of the IS3710 is also connected to pin 2 of the shield.

The shield features an RGB LED connected to pins 9, 10, and 11 of the shield, which are PWM-capable pins on the Arduino. This LED allows you to map three DMX channels directly to it, eliminating the need for any external components when evaluating the IS3710.

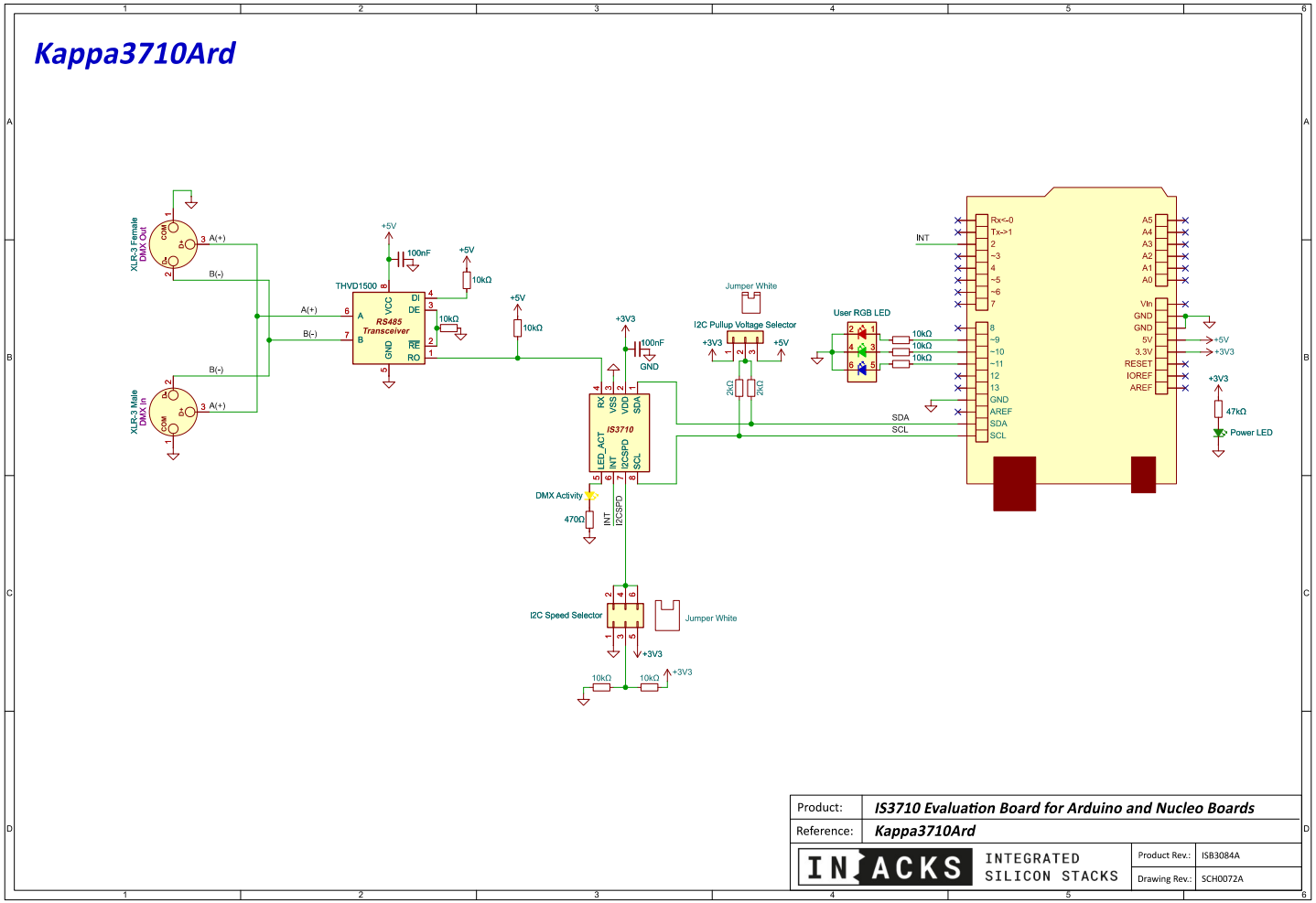

XLR-3
DMX In
Connector
5V RS485
Transceiver
IS3710 I2C DMX
Receiver IC
RGB User
LED
XLR-3
DMX Out
Connector
Shield
Power
Indicator
LED
DMX
Activity
LED
I2C Pullup
Voltage
Selector
I2C Speed
Selector
DMX In
DMX Out
J1
J2
IS3710
DMX
Activity
Simulation
Light
I2C Speed
Selector
100kHz
400kHz
1MHz
3V3
5V

1.2. Module Pinout



Name	Type	Description
NC	Not Connected	These pins have no electrical connection on the shield. They can be used by other shields or by your own proposal.
3.3V	3.3V Power In	The shield needs 3.3V and 5V to operate.
5V	5V Power In	
GND	Ground	Ground reference.
2 (INT)	Push-Pull	This shield pin is connected to the IS3710 pin 6 (INT). This pin goes high for 500µs to indicate a new DMX data packet has been received. The use of this pin is optional.
9 (Red)	LED Anode	These pins are connected to the shield's RGB LED. Arduino pins 9, 10, and 11 support PWM, allowing you to map three DMX channels to this LED to easily test your code.
10 (Green)		
11 (Blue)		
SCL and SDA	Open Drain 5V Tolerant	SCL and SDA pin of the IS3710 I2C-Serial Interface pins. Ensure the proper jumper pull-up configuration on the shield:  • Placing the jumper on 3V3 sets the SCL and SDA pull-up voltage to 3.3V. • Placing the jumper on 5V sets the SCL and SDA pull-up voltage to 5V. • Leaving the jumper off leaves SCL and SDA floating. This option is useful when pull-up resistors are located elsewhere in the circuit.

1.3. Schematic



2. Firmware Examples

2.1. Arduino Example

This example (ISXMPL3710ex1) demonstrates how to use the IS3710 I2C DMX Receiver chip with an Arduino.

Find the complete example and buy the Kappa3710Ard at: https://inacks.com/kappa3710ard

```
#include <Wire.h>

// ------------------------------------------------------------------------
// This example is intended to be used with the Kappa3710 DMX shield.
// It demonstrates how to read DMX Channel 1, Channel 2, and Channel 3
// from the IS3710 chip via I2C, and map these DMX values to an RGB LED
// using the Arduino PWM outputs.
// ------------------------------------------------------------------------

// IS3710 Memory Map Registers:
// DMX channels are mapped sequentially from address 1 to 512.
#define DMX_CH1   1
#define DMX_CH2   2
#define DMX_CH3   3
// ...
#define DMX_CH512 512

// IS3710 ID Register:
#define CHIP_ID   513

// ------------------------------------------------------------------------
// Constants
// ------------------------------------------------------------------------

// I2C address of the IS3710
#define I2C_DEVICE_ADDRESS  16

// Expected value of the CHIP_ID register
#define CHIP_ID_VALUE       16

// ------------------------------------------------------------------------
// Read one byte from a given IS3710 holding register
// The IS3710 uses a 16-bit register address over I2C.
// ------------------------------------------------------------------------
uint8_t readIS3710Register(uint16_t holdingRegisterAddress) {
uint8_t result; // Variable to store the read data.

// Start I2C transmission to the IS3710 device
Wire.beginTransmission(I2C_DEVICE_ADDRESS);

// Send the 16-bit register address (MSB first, then LSB)
Wire.write((holdingRegisterAddress >> 8) & 0xFF);
Wire.write(holdingRegisterAddress & 0xFF);

// End transmission but keep the bus active (repeated START)
Wire.endTransmission(false);

// Request one byte from the specified register
Wire.requestFrom(I2C_DEVICE_ADDRESS, 1);

// Read the received byte
result = Wire.read();

return result;
}

void setup() {
uint16_t chipID;

// Initialize the I2C interface
Wire.begin();

// Initialize the serial port for debug messages
Serial.begin(9600);

// ------------------------------------------------------------------------
// Detect the IS3710 chip by reading its CHIP_ID register
```

```
// ---------------------------------------------------------------------------
chipID = readIS3710Register(CHIP_ID);
if (chipID == CHIP_ID_VALUE) {
 Serial.println("IS3710 Chip detected on I2C!");
 Serial.print("Chip ID: ");
 Serial.println(chipID);
}
else {
 Serial.print("\nERROR: IS3710 Chip NOT detected on I2C!");
 // Halt execution if the chip is not detected
 while(1);
}
}
void loop() {
uint8_t DMX_Channel_1, DMX_Channel_2, DMX_Channel_3;
// Read DMX values from channels 1, 2, and 3
DMX_Channel_1 = readIS3710Register(1);
DMX_Channel_2 = readIS3710Register(2);
DMX_Channel_3 = readIS3710Register(3);
// Print DMX channel values to the serial monitor
Serial.print("\n\nDMX_Channel_1: ");
Serial.println(DMX_Channel_1);
Serial.print("DMX_Channel_2: ");
Serial.println(DMX_Channel_2);
Serial.print("DMX_Channel_3: ");
Serial.println(DMX_Channel_3);
// Map DMX channel values to PWM outputs
analogWrite(9, DMX_Channel_1);
analogWrite(10, DMX_Channel_2);
analogWrite(11, DMX_Channel_3);
delay(100);
}
```

Content

Appendix

Revision History

Document Revision

Date	Revision Code	Description
January 2026	ISDOC147**A**	- Initial Release

Shield Revision

Date	Revision Code	Description
August 2025	ISB3084**A**	- Initial Release

Documentation Feedback

Feedback and error reporting on this document are very much appreciated.

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