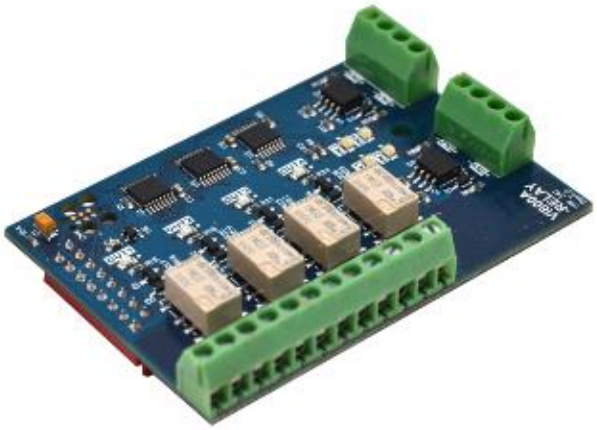
FTDI Chip

VI800A-RELAY Datasheet

Plug in accessory for VM800P Embedded Video Engine

Plus module



1 Introduction

The VI800A-RELAY is a plug in accessory for the VM800P Plus module, which is used to develop and demonstrate the functionality of the FT800 Embedded Video Engine, EVE.

This module behaves as an SPI to relay bridge for the VM800P Plus module.

1.1 Features

- Connects to the VM800P Plus module using SPI slave interface
- SPI slave interface is converted to relay interface
- 4 Opto-isolated Inputs and 4 Relay outputs
- 8 LEDs to indicate the input and output status
- Screw connector to connect the relay inputs and relay outputs

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2 Ordering Information

Part No.	Description
VI800A-RELAY	VI800A RELAY module, plug in accessory for the VM800P Plus module

Table 2-1 – Ordering information

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3 Hardware Description

Please refer to section **3.3.2** for connector settings. Some VI800A-RELAY jumpers must be set to work properly with your system.

3.1 VI800A-RELAY module

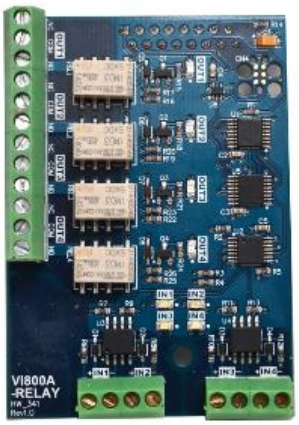

Figure 3-1 – VI800A-RELAY module

The VI800A-RELAY module is intended for the plug in board to the VM800P Plus module.

The main functions of the VM800P are as follows:

- Plug in board for the VM800P plus board.
- Connect to the VM800P plus board as a SPI slave device.
- Connects to the RELAY inputs and outputs.
- Supports 4 Opto-isolated inputs (5V maximum input)
- Supports 4 relay outputs (switching 12V maximum)
- Contains 8 LEDs.
- Powered by the VM800P Plus board.

3.2 Safety Considerations

The VI800A-RELAY board is designed for 12V maximum to be switched by the relays and 5V maximum for the logic inputs. Due to the exposed electrical components and traces, and the proximity to the other circuitry of the VM800P board, the VI800A-RELAY must never carry voltages which could present a danger to users.

If the module is to be used for controlling voltages above 12V, the relays on the VI800A-RELAY may be used to switch an external circuit (e.g. a 5V or 12V coil of an external relay circuit) which has been specifically designed for safe operation at mains voltages.

The user is responsible for the safe design of any circuit connected to the VI800A-RELAY and for ensuring that this module is not exposed to any voltages outwit the ratings specified above.

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3.3 Physical Descriptions

3.3.1 Dimensions

The VI800A-RELAY module dimension is illustrated in Figure 3-2 and Figure 3-3.

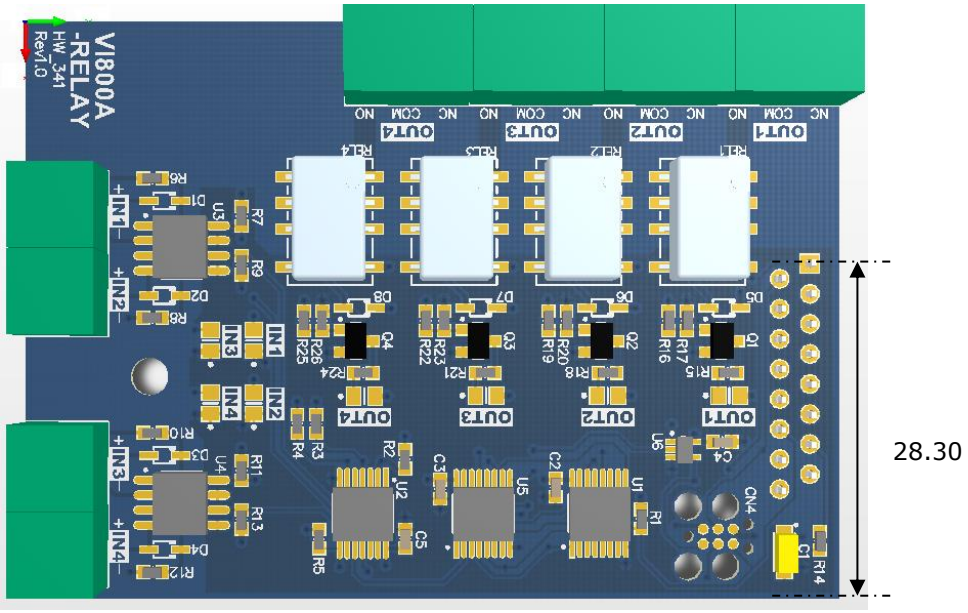

Figure 3-2 - VI800A-RELAY module PCB Top view

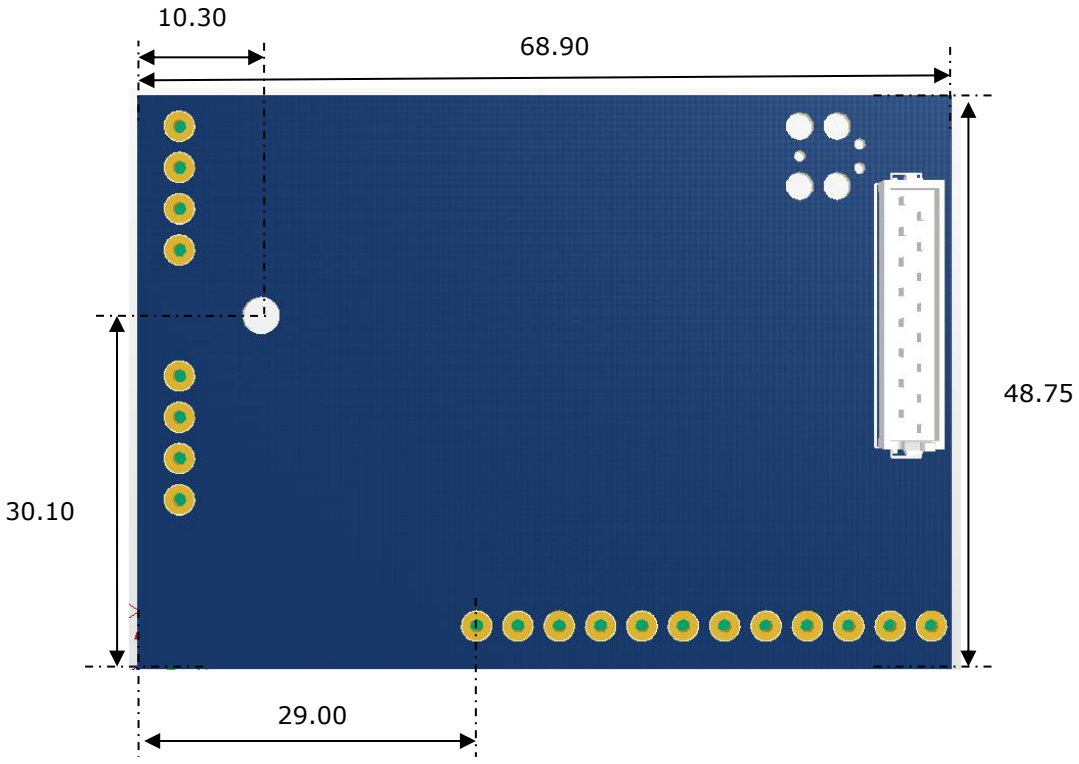

Figure 3-3 - VI800A-RELAY module PCB Bottom view

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Figure 3-4 - VI800A-RELAY module PCB Side view

All dimensions are in mm

3.3.2 VI800A-RELAY Connectors

Connectors are described in the following sections.

- **CN1- SPI Interface**

  This is the interface where the SPI control and data signals are routed. There are also power and ground pins on this interface. This interface is used to connect the VI800A-RELAY board to the VM800P Plus board.

  Note:

  This connector should be connected to J5 of the VM800P plus board.

Pin No.	Name	Type	Description
1	SCK	I	SPI Clock input, 3.3V (5V tolerant)
2	MOSI	I	Master Out Slave in, 3.3V (5V tolerant)
3	MISO	O	Master In Slave out, 5V
4	IO7	IO	Input/Output Line 7
5	INT0	O	Interrupt output active low, 3.3V
6	NC	NA	Not Connected
7	AD4	IO	Address/Data Line 4
8	AD5	IO	Address/Data Line 5
9	3V3	P	3.3V power supply
10	5V	P	5V power supply
11	GND	P	Ground
12	RST#	I	Reset, active low
13	IO5	IO	Input/Output Line 5
14	AD0	IO	Address/Data Line 0
15	NC	NA	Not Connected
16	NC	NA	Not Connected

Table 3-1 – CN1 Pinout

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- **CN2- Input Screw Connector**

  This is the interface where the RELAY input connections are connected.

Pin No.	Name	Type	Description
1	IN1+	I	Input 1 positive
2	IN1-	I	Input 1 negative
3	IN2+	I	Input 2 positive
4	IN2-	I	Input 2 negative
5	IN3+	I	Input 3 positive
6	IN3-	I	Input 3 negative
7	IN4+	I	Input 4 positive
8	IN4-	I	Input 4 negative

Table 3-2 – CN2 Pinout

- **CN3- Output Screw Connector**

  This is the interface where the RELAY output connections are connected.

Pin No.	Name	Type	Description
1	O1-NC	O	Output 1 Normally Closed
2	O1-COM	P	Connect to 5V
3	O1-NO	O	Output 1 Normally Open
4	O2-NC	O	Output 2 Normally Closed
5	O2-COM	P	Connect to 5V
6	O2-NO	O	Output 2 Normally Open
7	O3-NC	O	Output 3 Normally Closed
8	O3-COM	P	Connect to 5V
9	O3-NO	O	Output 3 Normally Open
10	O4-NC	O	Output 4 Normally Closed
11	O4-COM	P	Connect to 5V
12	O4-NO	O	Output 4 Normally Open

Table 3-3 – CN3 Pinout

- **CN4- ISP Connector**

  This is the interface where the ISP cable is connected.

Pin No.	Name	Type	Description
1	MISO	O	Master in slave out
2	5V	P	5V power supply
3	SCK	I	SPI clock
4	MOSI	I	Master out slave in

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Pin No.	Name	Type	Description
5	RST#	I	reset
6	GND	P	Ground

Table 3-4 – CN4 Pinout

3.3.3 VI800A-RELAY Components

- **U1 – SN74AHCT595**

  This converts the MOSI signals from the VM800P Plus board to parallel output signals.

- **U2 – 74ACT14MTCX**

  This inverts the Input signals.

- **U3 and U4 – ACPL-227-500E**

  This converts the differential inputs to single ended input signals.

- **U5 – SN74HC165**

  This converts the parallel inputs to MISO signal.

- **REL1 to REL4 – IM03GR**

  This converts the parallel output to relay output signal.

- **LED1 – LED4**

  Indicates the status of the inputs.

- **LED5 –LED8**

  Indicates the status of the outputs.

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4 Board Schematics

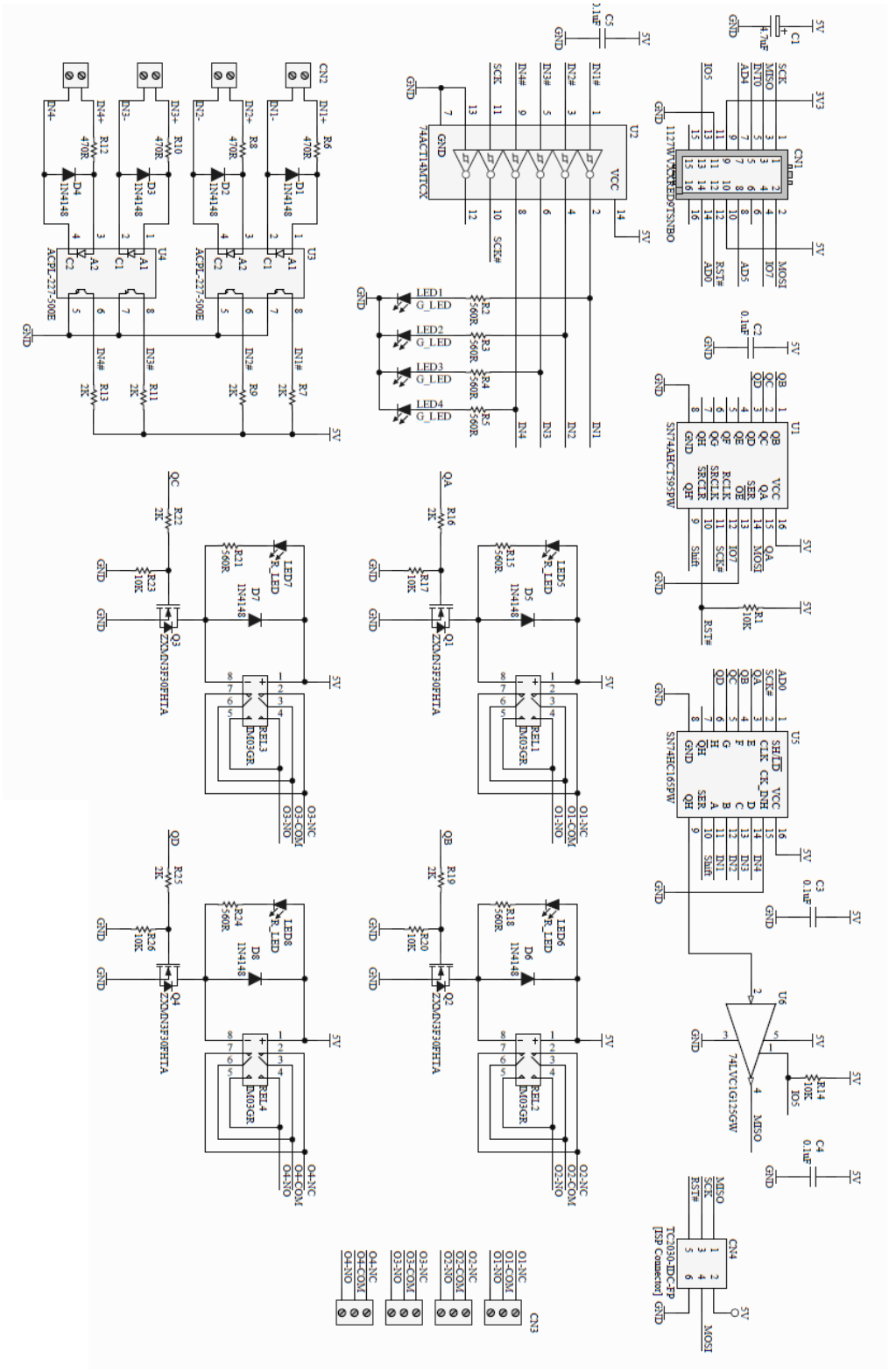

Figure 4-1 - VI800A-RELAY Schematics

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5 Hardware Setup Guide

5.1 Power Configuration

The board is powered from the VM800P Plus board. The CN1 connector on the VI800A-RELAY board should be connected to the J5 connector of the VM800P plus board as shown in Figure 5-1.

Figure 5-1 - VI800A-RELAY module connected to VM800P Plus module

5.2 RELAY Interface connection

The relay inputs are connected to the connector CN2.

The relay outputs are connected from the connector CN3

The LEDs LED1 to LED8 are used to display the status of the inputs and outputs.

This interface is used to add relay support to the VM800P Plus module.

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Appendix A – References

Document References

VM800P Plus board

FT800 datasheet: FT800_Embedded_Video_Engine

FT800 software programming guide: FT800_Programmer_Guide

FT800 sample application notes:

AN_246_VM800CB_SampleAPP_Arduino_Introduction

AN_275_FT800_Example_with_Arduino.pdf

AN_318 Arduino Library for FT800 Series

AN_331 VI800A_Relay_SampleApp

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Appendix B - List of Figures and Tables

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Appendix C – Revision History

Document Title: VI800A_RELAY Datasheet
Document Reference No.: BRT_000008
Clearance No.: BRT #012
Product Page: http://brtchip.com/product
Document Feedback: Send Feedback

Revision	Changes	Date
Version 1.0	Initial Release	2014-10-14
Version 1.1	Added height dimensions	2014-10-20
Version 1.2	Added max voltage recommendation for relays	2015-04-15
Version 1.3	Dual branding to reflect the migration of the product to the Bridgetek name – logo changed, copyright changed, contact information changed	2016-09-13

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