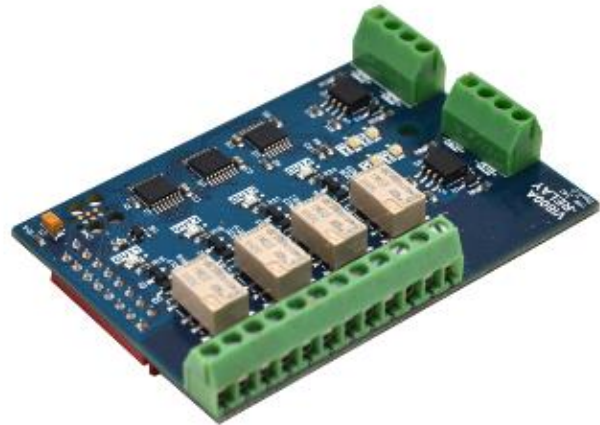


FTDI Chip

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

2 Ordering Information

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

Table 2-1 – Ordering information

Table of Contents

1	Introduction	1
1.1	Features.....	1
2	Ordering Information	2
3	Hardware Description.....	4
3.1	VI800A-RELAY module.....	4
3.2	Physical Descriptions	5
3.2.1	Dimensions.....	5
3.2.2	VI800A-RELAY Connectors.....	6
3.2.3	VI800A-RELAY Components	8
4	Board Schematics	9
5	Hardware Setup Guide.....	10
5.1	Power Configuration	10
5.2	RELAY Interface connection	10
6	Contact Information	11
	Appendix A – References.....	12
	Appendix B - List of Figures and Tables.....	13
	Appendix C – Revision History.....	14

3 Hardware Description

Please refer to section **3.2.2** 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.
- Supports 4 relay outputs.
- Contains 8 LEDs.
- Powered by the VM800P Plus board.

3.2 Physical Descriptions

3.2.1 Dimensions

The VI800A-RELAY module dimension is illustrated in [Figure 3-2](#) and [Figure 3-3](#).

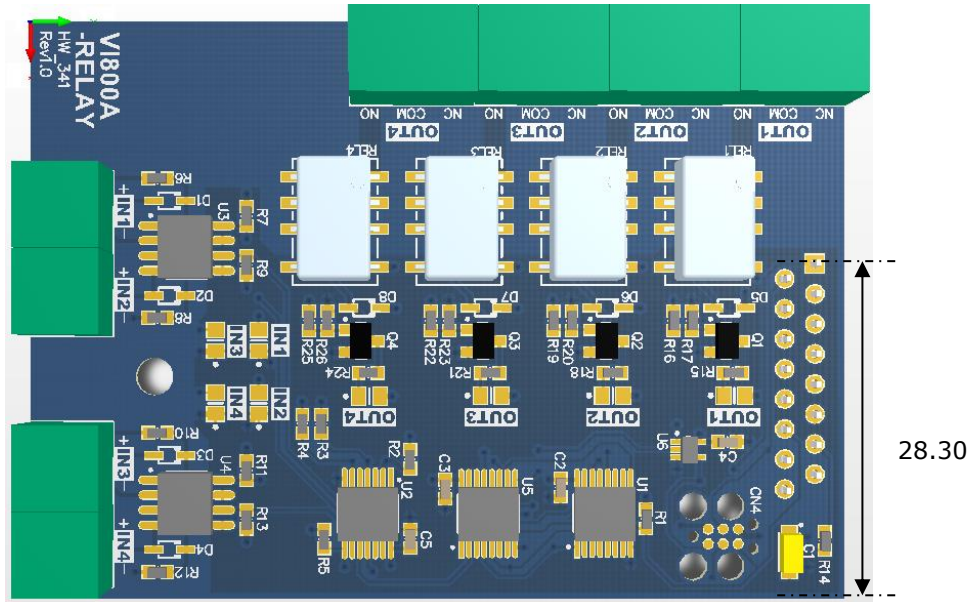


Figure 3-2 - VI800A-RELAY module PCB Top view

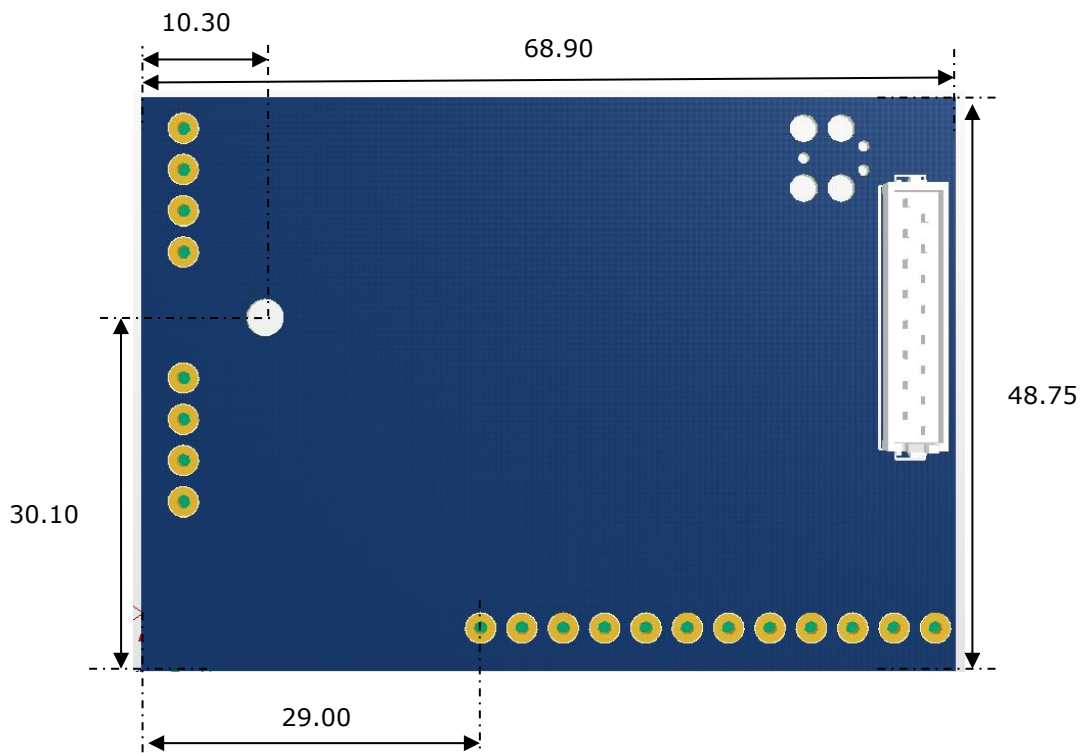


Figure 3-3 - VI800A-RELAY module PCB Bottom view


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

All dimensions are in mm

3.2.2 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

- **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

Pin No.	Name	Type	Description
4	MOSI	I	Master out slave in
5	RST#	I	reset
6	GND	P	Ground

Table 3-4 – CN4 Pinout

3.2.3 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.

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.

6 Contact Information

Head Office – Glasgow, UK

Unit 1, 2 Seaward Place, Centurion Business Park
Glasgow G41 1HH
United Kingdom
Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-mail (Sales) sales1@ftdichip.com
E-mail (Support) support1@ftdichip.com
E-mail (General Enquiries) admin1@ftdichip.com

Branch Office – Tigard, Oregon, USA

7130 SW Fir Loop
Tigard, OR 97223
USA
Tel: +1 (503) 547 0988
Fax: +1 (503) 547 0987

E-Mail (Sales) us.sales@ftdichip.com
E-Mail (Support) us.support@ftdichip.com
E-Mail (General Enquiries) us.admin@ftdichip.com

Branch Office – Taipei, Taiwan

2F, No. 516, Sec. 1, NeiHu Road
Taipei 114
Taiwan, R.O.C.
Tel: +886 (0) 2 8797 1330
Fax: +886 (0) 2 8751 9737

E-mail (Sales) tw.sales1@ftdichip.com
E-mail (Support) tw.support1@ftdichip.com
E-mail (General Enquiries) tw.admin1@ftdichip.com

Branch Office – Shanghai, China

Room 1103, No. 666 West Huaihai Road,
Changning District, Shanghai, 200052
China
Tel: +86 (0)21 6235 1596
Fax: +86 (0)21 6235 1595

E-mail (Sales) cn.sales@ftdichip.com
E-mail (Support) cn.support@ftdichip.com
E-mail (General Enquiries) cn.admin@ftdichip.com

Web Site

<http://www.ftdichip.com/>

Distributor and Sales Representatives

Please visit the Sales Network page of the [FTDI Web site](#) for the contact details of our distributor(s) and sales representative(s) in your country.

System and equipment manufacturers and designers are responsible to ensure that their systems, and any Future Technology Devices International Ltd (FTDI) devices incorporated in their systems, meet all applicable safety, regulatory and system-level performance requirements. All application-related information in this document (including application descriptions, suggested FTDI devices and other materials) is provided for reference only. While FTDI has taken care to assure it is accurate, this information is subject to customer confirmation, and FTDI disclaims all liability for system designs and for any applications assistance provided by FTDI. Use of FTDI devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold harmless FTDI from any and all damages, claims, suits or expense resulting from such use. This document is subject to change without notice. No freedom to use patents or other intellectual property rights is implied by the publication of this document. Neither the whole nor any part of the information contained in, or the product described in this document, may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder. Future Technology Devices International Ltd, Unit 1, 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH, United Kingdom. Scotland Registered Company Number: SC136640

Appendix A – 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](#)

Appendix B - List of Figures and Tables

List of Figures

Figure 3-1 – VI800A-RELAY module	4
Figure 3-2 - VI800A-RELAY module PCB Top view	5
Figure 3-3 - VI800A-RELAY module PCB Bottom view	5
Figure 3-4 - VI800A-RELAY module PCB Side view	6
Figure 4-1 - VI800A-RELAY Schematics	9
Figure 5-1 - VI800A-RELAY module connected to VM800P Plus module	10

List of Tables

Table 2-1 – Ordering information	2
Table 3-1 – CN1 Pinout	6
Table 3-2 – CN2 Pinout	7
Table 3-3 – CN3 Pinout	7
Table 3-4 – CN4 Pinout	7

Appendix C – Revision History

Document Title: DS_VI800A_RELAY
Document Reference No.: FT_000994
Clearance No.: FTDI#410
Product Page: <http://www.ftdichip.com/EVE.htm>
Document Feedback: [Send Feedback](#)

Version 1.0	Initial Datasheet released	14/10/14
Version 1.1	Added height dimensions	20/10/14