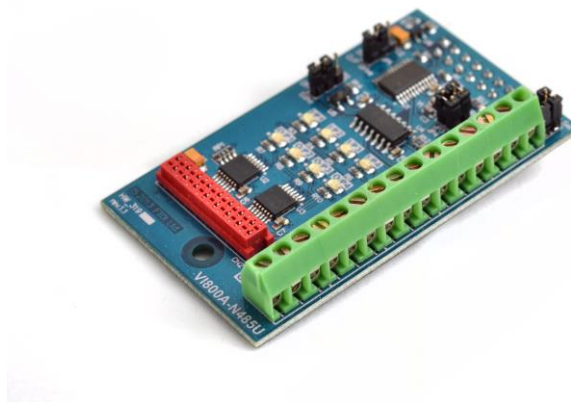


# **FTDI Chip**

## **VI800A-N485U Datasheet**

### **Plug in accessory for VM800P Embedded Video Engine Plus module**



## **1 Introduction**

The VI800A-N485U 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 RS485 bridge on the VM800P Plus module.

### **1.1 Features**

- Connects to the VM800P Plus module using an SPI slave interface
- SPI slave interface is converted to RS485 interface
- 4 GPIO inputs and 4 GPIO outputs
- 8 LEDs to indicate the input and output status
- 3.3 V IO with 5 V tolerant buffers
- Screw connector to connect the RS485 signals, GPIO inputs and GPIO outputs
- IO interface to connect the RS485 signals, GPIO inputs and GPIO outputs
- Powered from the VM800P module

## 2 Ordering Information

| Part No.     | Description                                                    |
|--------------|----------------------------------------------------------------|
| VI800A-N485U | VI800A RS485 module, plug accessory for the VM800P Plus module |

**Table 2-1 – Ordering information**

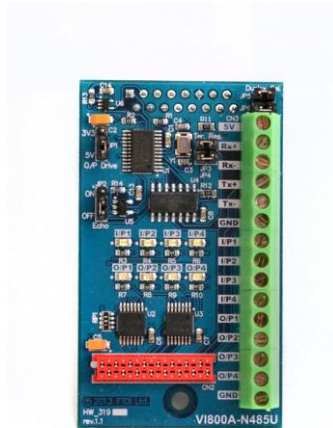
## Table of Contents

|          |                                              |           |
|----------|----------------------------------------------|-----------|
| <b>1</b> | <b>Introduction .....</b>                    | <b>1</b>  |
| 1.1      | Features.....                                | 1         |
| <b>2</b> | <b>Ordering Information .....</b>            | <b>2</b>  |
| <b>3</b> | <b>Hardware Description.....</b>             | <b>4</b>  |
| 3.1      | VI800A-N485U module .....                    | 4         |
| 3.2      | Physical Descriptions .....                  | 5         |
| 3.2.1    | PCB Dimensions .....                         | 5         |
| 3.2.2    | VI800A-N485U Connectors .....                | 7         |
| 3.2.3    | VI800A-N485U Components .....                | 9         |
| <b>4</b> | <b>Board Schematics .....</b>                | <b>11</b> |
| <b>5</b> | <b>Hardware Setup Guide.....</b>             | <b>12</b> |
| 5.1      | Power Configuration .....                    | 12        |
| 5.2      | RS485 Interface connection .....             | 12        |
| <b>6</b> | <b>Contact Information .....</b>             | <b>13</b> |
|          | 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-N485U jumpers must be set to work properly with your system.

#### 3.1 VI800A-N485U module



**Figure 3-1 – VI800A-N485U module**

The VI800A-N485U module is designed to connect directly with the VM800P Plus module.

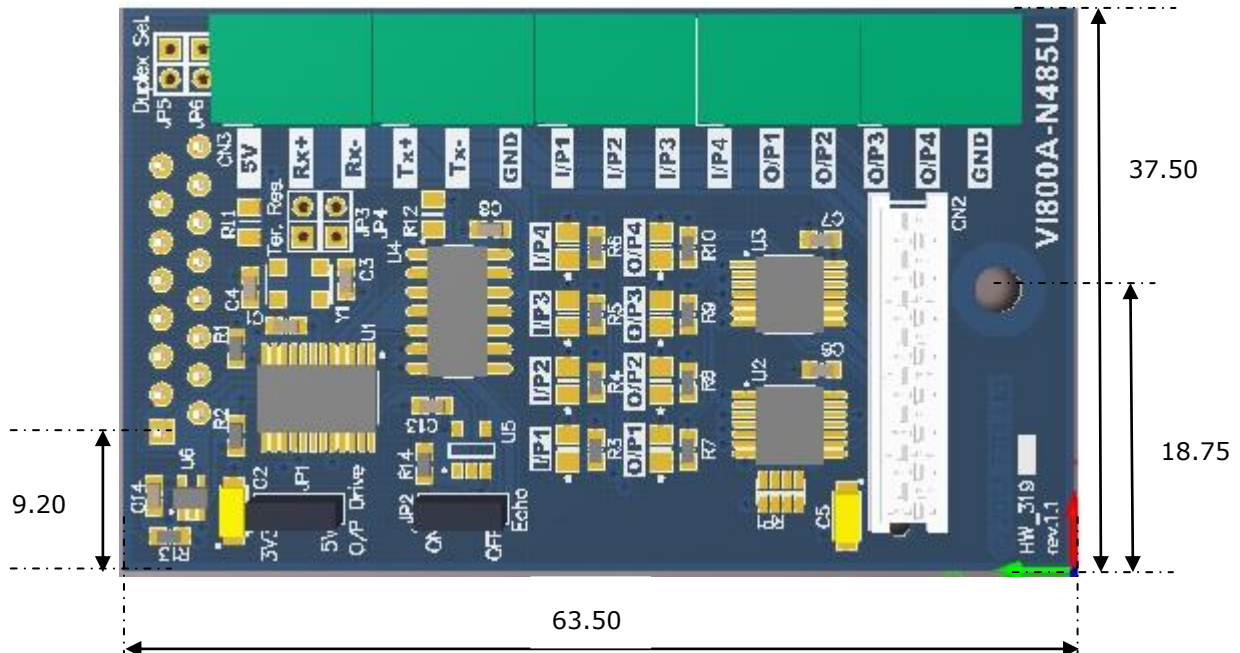
The main functions of the VI800A N485U are as follows:

- Plug in accessory board for the VM800P Plus module.
- Interface to the VM800P Plus board as a SPI slave device.
- Connects with an external RS485 interface.
- Supports 4 GPIO inputs.
- Supports 4 GPIO outputs.
- Contains 8 LEDs.
- Powered by the VM800P Plus board.

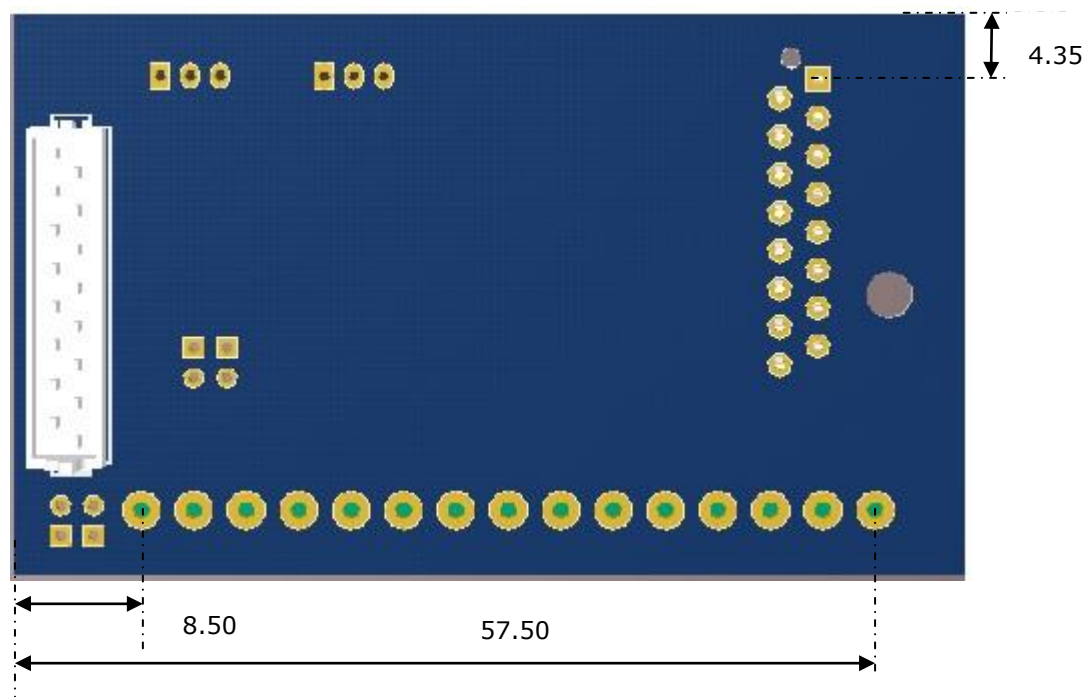
## 3.2 Physical Descriptions

### 3.2.1 PCB Dimensions

The VI800A-N485U module PCB layout is illustrated in [Figure 3-2](#) and [Figure 3-3](#).



**Figure 3-2 - VI800A-N485U module PCB Top view**



**Figure 3-3 - VI800A-N485U module PCB Bottom view**



**Figure 3-4 - VI800A-N485U module PCB side view**

All dimensions are in mm

## 3.2.2 VI800A-N485U Connectors

Connectors and jumpers 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-N485U board to the VM800P Plus board.

**Note:**

**This connector should be connected to J6 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       | SS#  | I    | SPI Chip select, active low, 3.3V (5V tolerant)       |
| 5       | INT0 | O    | Interrupt output active low, 3.3V                     |
| 6       | IO6  | I    | Daughter reset input, active low , 3.3V (5V tolerant) |
| 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      | AD1  | IO   | Address/Data Line 1                                   |
| 14      | NC   | NA   | Not Connected                                         |
| 15      | AD3  | IO   | Address/Data Line 3                                   |
| 16      | AD2  | IO   | Address/Data Line 2                                   |

**Table 3-1 – CN1 Pinout**

- CN2- IO Interface(alternative to CN3)**

This is the interface where the RS485 connections, GPIO input and outputs are connected. There are also power and ground pins on this interface.

| Pin No. | Name | Type | Description       |
|---------|------|------|-------------------|
| 1       | 3V3  | P    | 3.3V power supply |
| 2       | 5V   | P    | 5V power supply   |
| 3       | I/P1 | I    | Input 1           |
| 4       | I/P2 | I    | Input 2           |
| 5       | I/P3 | I    | Input 3           |

| Pin No. | Name | Type | Description                 |
|---------|------|------|-----------------------------|
| 6       | I/P4 | I    | Input 4                     |
| 7       | O/P1 | O    | Output 1                    |
| 8       | O/P2 | O    | Output 2                    |
| 9       | O/P3 | O    | Output 3                    |
| 10      | O/P4 | O    | Output 4                    |
| 11      | GND  | P    | Ground                      |
| 12      | GND  | P    | Ground                      |
| 13      | Rx+  | I    | Receive Data non-inverting  |
| 14      | Rx-  | I    | Receive Data inverting      |
| 15      | Tx+  | O    | Transmit Data non-inverting |
| 16      | Tx-  | O    | Transmit Data inverting     |

**Table 3-2 – CN2 Pinout**

- CN3- External Screw Connector(alternative to CN2)**

This is the interface where the RS485 connections, GPIO input and outputs are connected. There are also power and ground pins on this interface.

| Pin No. | Name | Type | Description                 |
|---------|------|------|-----------------------------|
| 1       | 5V   | P    | 5V power supply             |
| 2       | Rx+  | I    | Receive Data non-inverting  |
| 3       | Rx-  | I    | Receive Data inverting      |
| 4       | Tx+  | O    | Transmit Data non-inverting |
| 5       | Tx-  | O    | Transmit Data inverting     |
| 6       | GND  | P    | Ground                      |
| 7       | I/P1 | I    | Input 1                     |
| 8       | I/P2 | I    | Input 2                     |
| 9       | I/P3 | I    | Input 3                     |
| 10      | I/P4 | I    | Input 4                     |
| 11      | O/P1 | O    | Output 1                    |
| 12      | O/P2 | O    | Output 2                    |
| 13      | O/P3 | O    | Output 3                    |
| 14      | O/P4 | O    | Output 4                    |
| 15      | GND  | P    | Ground                      |

**Table 3-3 – CN3 Pinout**



- **JP1- Output Drive Select**

This jumper provides the option to select the power supply voltage for the inputs and outputs.

| Jumper position | Description           |
|-----------------|-----------------------|
| Short pin 1-2   | 3.3V selected         |
| Short pin 2-3   | 5V selected (default) |

**Table 3-4 – JP1 Pin options**

- **JP2- Duplex/Simplex Enable**

This jumper provides the option to enable simultaneous transmit and receive of data.

| Jumper position | Description                                        |
|-----------------|----------------------------------------------------|
| Short pin 1-2   | Transmit and receive can be done simultaneously    |
| Short pin 2-3   | Transmit and receive cannot be done simultaneously |

**Table 3-5 – JP2 Pin options**

- **JP3- connect Rx+ to Rx-**

Solder connection not fitted by default

- **JP4- connect Tx+ to Tx-**

Solder connection not fitted by default

- **JP5- connect Rx+ to Tx+**

Solder connection not fitted by default

- **JP6- connect Rx- to Tx-**

Solder connection not fitted by default

### **3.2.3 VI800A-N485U Components**

- **U1 – SC16IS760**

This converts the SPI signals from the VM800P Plus board to UART TTL signals.

- **U4 – ZT3073LEEN**

This converts the UART signals from the TTL level to RS485 signal.

- **LED1 – LED4**

Indicates the status of GPIO inputs. Illuminate when the GPIO line is logic 0.

- **LED5 –LED8**

Indicates the status of the GPIO outputs. Illuminate when the GPIO line is logic 0.

## 4 Board Schematics

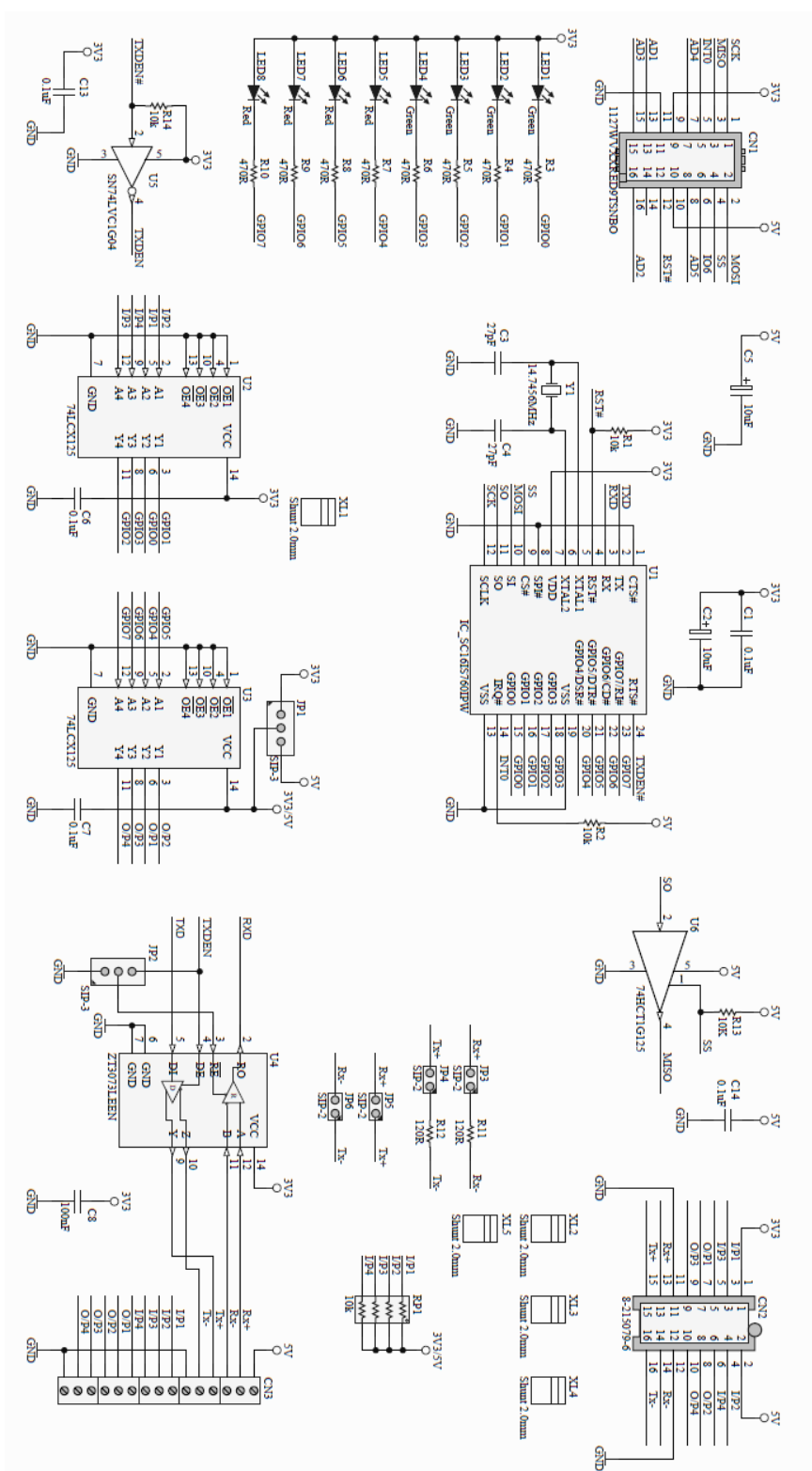
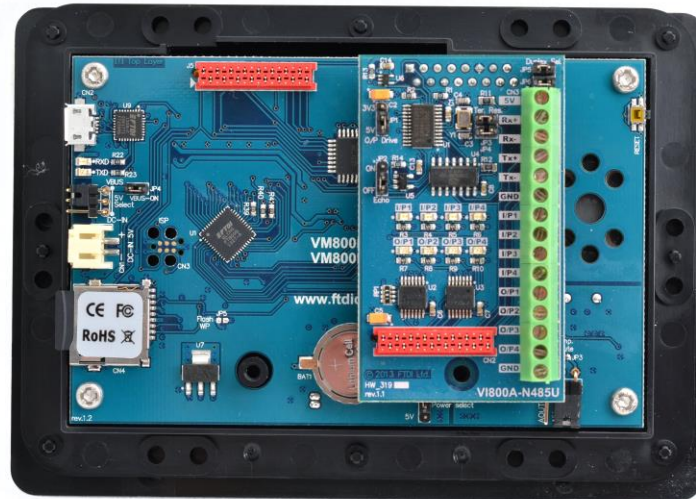


Figure 4-1 - VI800A-N485U Schematics

## 5 Hardware Setup Guide

### 5.1 Power Configuration

The board is powered from the VM800P Plus board. The CN1 connector on the VI800A-N485U board should be connected to the J6 connector of the VM800P Plus board as shown in the Figure 5-1.



**Figure 5-1 - VI800A-N485U module connected to VM800P Plus module**

### 5.2 RS485 Interface connection

When the VI800A-N485U is connected to a RS485 device the following connection is used.

The Tx+ signal on CN3 is connected to the Rx+ signal on the external RS485 device.

The Tx- signal on CN3 is connected to the Rx- signal on the external RS485 device.

The Rx+ signal on CN3 is connected to the Tx+ signal on the external RS485 device.

The Rx- signal on CN3 is connected to the Tx- signal on the external RS485 device.

The GND signal on CN3 is connected to the GND signal on the external RS485 device.

The output from the external device is connected to the inputs I/P1, I/P2, I/P3 and I/P4 on the CN3.

The input from the external device is connected to the outputs O/P1, O/P2, O/P3 and O/P4 on the CN3.

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

This interface is used to interface the VM800P Plus module to the devices having RS485 and GPIO interfaces.

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## **Appendix A – References**

VM800P datasheet: [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\\_330\\_VI800A\\_TTL\\_232U\\_N485U\\_ArduinoLibrary\\_Sample](#)

## **Appendix B - List of Figures and Tables**

### **List of Figures**

|                                                                        |    |
|------------------------------------------------------------------------|----|
| Figure 3-1 – VI800A-N485U module .....                                 | 4  |
| Figure 3-2 - VI800A-N485U module PCB Top view .....                    | 5  |
| Figure 3-3 - VI800A-N485U module PCB Bottom view .....                 | 5  |
| Figure 3-4 - VI800A-N485U module PCB side view .....                   | 6  |
| Figure 4-1 - VI800A-N485U Schematics .....                             | 11 |
| Figure 5-1 - VI800A-N485U module connected to VM800P Plus module ..... | 12 |

### **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 – JP1 Pin options .....      | 8 |
| Table 3-5 – JP2 Pin options .....      | 8 |

## Appendix C – Revision History

Document Title: DS\_VI800A N485U  
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Clearance No.: FTDI#413  
Product Page: <http://www.ftdichip.com/EVE.htm>  
Document Feedback: [Send Feedback](#)

|                    |                            |          |
|--------------------|----------------------------|----------|
| <b>Version 1.0</b> | Initial Datasheet released | 14/10/14 |
| <b>Version 1.1</b> | Added height dimensions    | 20/10/14 |