



<b>MPN</b>	410-341
<b>Description</b>	Pmod MTDS



The Digilent Pmod MTDS (Revision A) is a gorgeous 2.8" touchscreen display with a powerful on-board microcontroller that performs graphics processing tasks. The display is a capacitive touchscreen with QVGA resolution (320x240) and 2 finger multi-touch support.

The most compelling aspect of the Pmod MTDS is the programming experience provided by its Multi-Touch Display System (MTDS) Firmware and the associated libraries. These allow you to design sleek, stylish user interfaces very quickly and with very little code. The timing dependent tasks are handled by the firmware, so integrating the display into existing projects is also a snap. Some of the key functionality provided by the libraries include the ability to draw basic shapes and text, draw images stored on

microSD with binary transparency, draw buttons and easily check if they have been pressed, and check the status and location of the user's two fingers. The libraries are supported in Arduino IDE and Xilinx SDK, and have been tested with Arduino, chipKIT and Arty host boards.

## Features

- 2.8" Display with QVGA resolution (320×240)
- 2 Finger Capacitive touch panel
- Powerful PIC32MZ Microcontroller
- Multi-Touch Display System (MTDS) Firmware
- Design a beautiful UI with only a few lines of code using libraries for Arduino IDE and Xilinx SDK
- Easily draw images with binary transparency from files stored on microSD
- Drop stylish buttons and check their status at will using intuitive function calls
- For use with Arduino, chipKIT and Arty platforms
- 6-pin Pmod port with SPI interface

## Display Specifications

<b>Size</b>	2.8 inches
<b>Resolution</b>	QVGA (320×240)
<b>Touchscreen</b>	2-Finger Multi-Touch

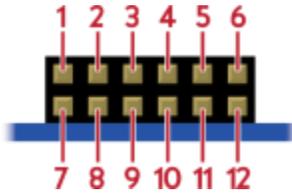
## Electrical

<b>Bus</b>	SPI
<b>Logic Level</b>	3.3V

## Physical

<b>Width</b>	3.45 in (8.76 cm)
<b>Length</b>	2.00 in (5.08 cm)

## J1 Pinout



<b>Pin 1</b>	~CS
<b>Pin 2</b>	MOSI
<b>Pin 3</b>	MISO
<b>Pin 4</b>	SCLK
<b>Pin 5</b>	GND
<b>Pin 6</b>	VCC
<b>Pin 7</b>	NC
<b>Pin 8</b>	RESET
<b>Pin 9</b>	NC
<b>Pin 10</b>	NC
<b>Pin 11</b>	GND
<b>Pin 12</b>	VCC

### Pinout Table Diagram

Header J1						Header J2 (External Backlight Power)		
Pin	Signal	Description	Pin	Signal	Description	Pin	Signal	Description
1	<u>CS</u>	Chip Select	7	<u>NC</u>	Not Connected	1	<u>VEXT</u>	External Power Supply Positive Connection
2	<u>MOSI</u>	Master Out Slave In	8	<u>RESET</u>	Active-Low Reset	2	<u>GND</u>	Power Supply Ground
3	<u>MISO</u>	Master In Slave Out	9	<u>NC*</u>	Not Connected	<b>Jumpers</b>		
4	<u>SCLK</u>	Serial Clock	10	<u>NC*</u>	Not Connected	<u>Name</u>	<u>State</u>	<u>Description</u>
5	<u>GND</u>	Power Supply Ground	11	<u>GND</u>	Power Supply Ground	JP1	EXT	Use External power supply attached to J2 to power Backlight
6	<u>VCC</u>	Power Supply (3.3V/5V)	12	<u>VCC</u>	Power Supply (3.3V/5V)	JP1	<u>VCC</u>	Use <u>VCC</u> from Pmod connector to power Backlight

Table 2. Pmod MTDS Pinout

\* Pins 9 and 10 of J1 are attached to the PIC32, but are not used by the firmware and should be treated as if they are not connected.

## Functional Description

The Pmod MTDS has an on-board PIC32MZ microcontroller that is running the MTDS firmware. To communicate with the device, you must use the MTDS and MyDisp libraries available and documented on the [MTDS resource center](#). Arduino and chipKIT host boards should use the Arduino IDE libraries, and Xilinx FPGA or Zynq based host boards should use the Pmod MTDS IP core and the libraries included with it. After exporting to Xilinx SDK, follow the README.txt guide included in the examples folder.

JP1 is used to select how to power the display's backlight. A single jumper should be loaded across 2 of the three pins in order to select the power source. When the jumper is loaded across the bottom 2 pins the backlight is powered by VCC on the Pmod connector, and when it is loaded across the top two pins the backlight is powered by an external power supply attached to J2. This external power supply must meet the minimum and maximum voltage requirements outlined in the Specifications table above.

The microSD connector allows the MTDS firmware to draw and save images to an attached microSD card. In order to work properly, the microSD card must be formatted as FAT32. Image files should be saved as Windows Bitmap files (.bmp).

## Serial Communication

The Pmod MTDS communicates with the host board via the SPI protocol.