

TouchPAD

TPD/VPD Series HMI Device User Manual

Version 1.1.0, Jul. 2015



WARRANTY

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Preface

Thank you for buying TPD/VPD Series HMI Devices, TouchPADs, which are made by ICP DAS Co., Ltd. We suggest you read through this user manual before you set up these devices and develop their programs.

SUPPORT

This manual relates to the following modules:

TPD-280, TPD-280U, TDP-283, TPD-283U, TPD-820-H, TPD-283-H, TPD-283U-H, TPD-280-Mx, TPD-283-Mx, TPD-283U-Mx, TPD-430, TPD-430-EU, TPD-433, TPD-433-EU, TPD-432F, TPD-433F, TPD-703, TPD-703-64, VPD-130, VPD-130N, VPD-132, VPD-132N, VPD-133, VPD-133N, VPD-142, VPD-142N, VPD-143, VPD-143N

PURPOSE

This manual shows how to use TouchPADs and develop programs.

This manual mainly contains the following parts:

- Introduction: basic understandings of TouchPADs.
- Hardware: specifications, dimensions, and installations.
- Software: mainly how to build a project and HMIWorks introductions.

PERSONNEL

This manual is fit for following personnel:

- End Users
- Engineers
- Technicians

1. Introduction

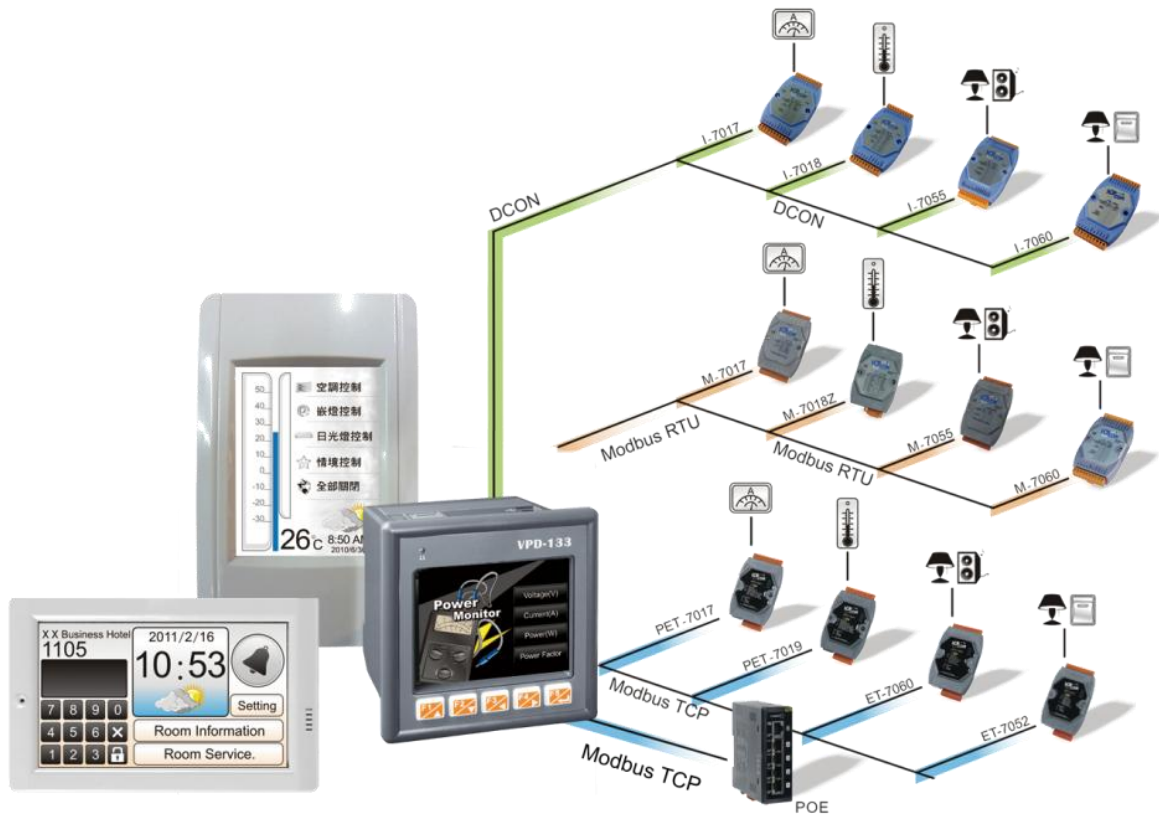


Our solution for HMI (Human Machine Interface) is composed of GUI (Graphical User Interface) based touch screens and an integrated software development package. ICP DAS hears the voices of our customers and is dedicated to providing a series of solutions particularly for intelligent building, equipment monitoring, factory automation and automatic controls. Its development software, HMIWorks, provides plenty of widgets and a variety of templates. Combined with the high resolution color touch screen of the TouchPAD series, a GUI can be realized with your own unique fashion and style. Development is no longer difficult and project accomplishment is within reach.

ICP DAS provides two types of touch HMI devices, the TPD series and the VPD series. The TPD series is designed for home/building automation applications and the VPD series is designed for factory/machine automation applications. Both have many common features, such as a high-resolution touch screen, RTC, and a variety of communication interfaces, including RS-232/RS-485, Ethernet, USB. However, each still has its own specific features for its respective target applications. For the TPD series, you can use an external wall box to help you smoothly blend the TPD series device into your decoration. For the VPD series, the rubber keypad, IP-65 waterproof front panel and DIN-Rail/panel mounting are designed for harsh environment, and are especially suitable for factories.

1.1 Features

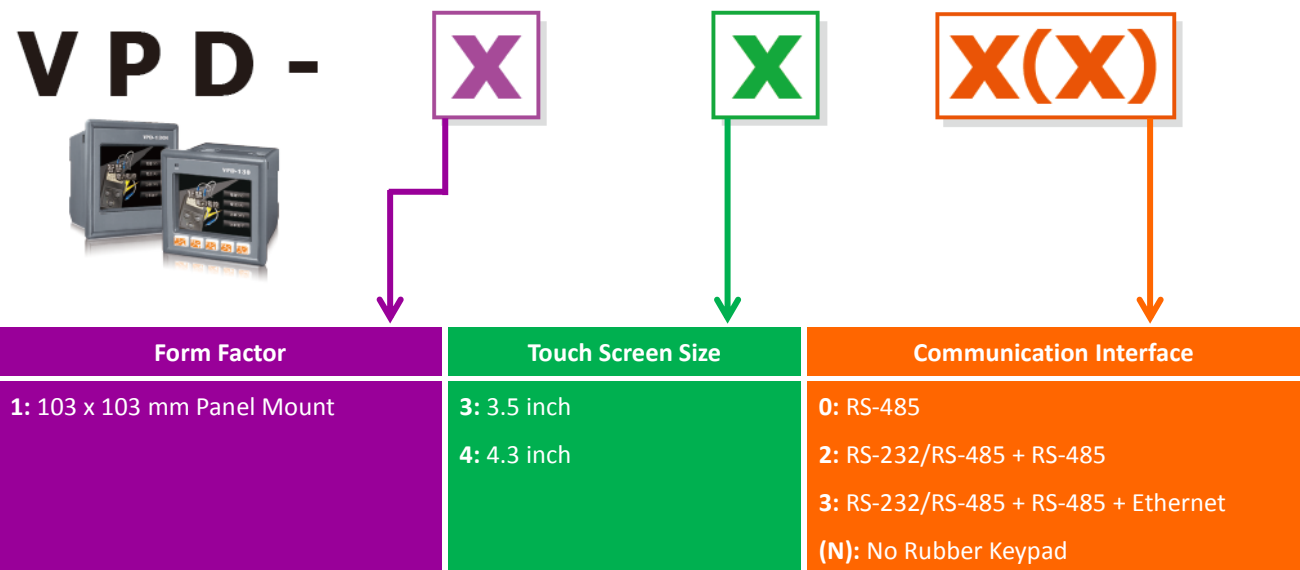
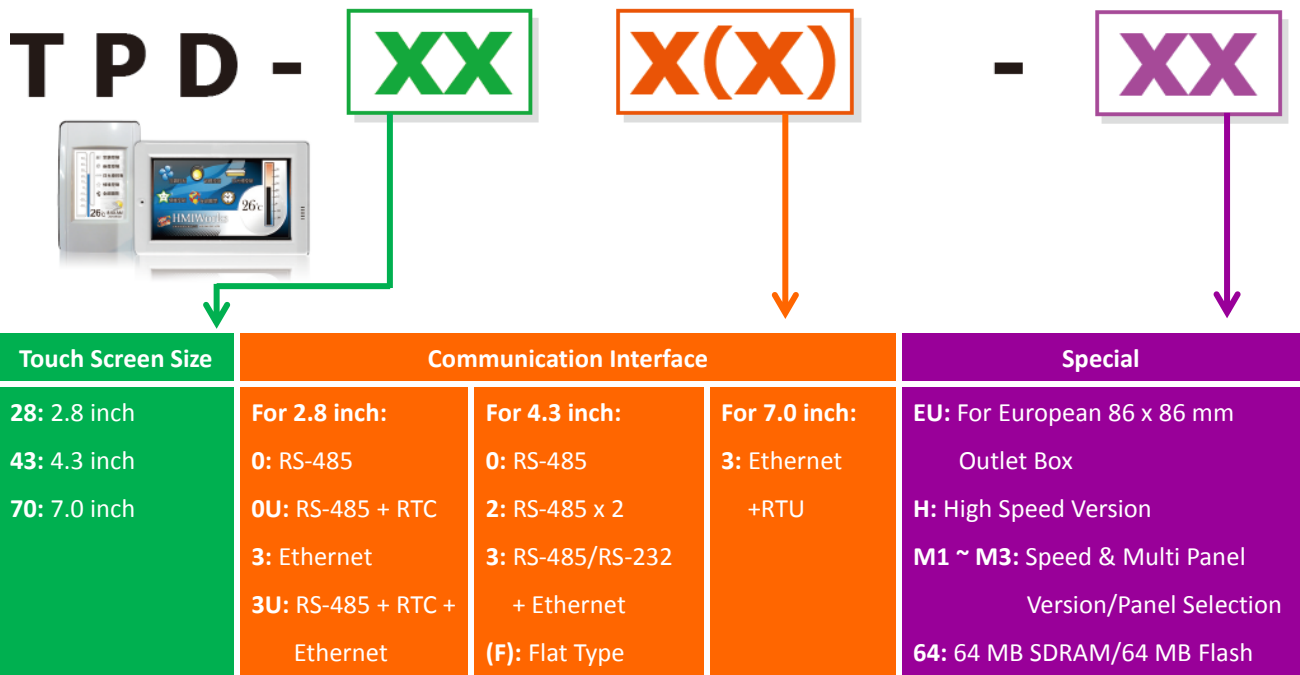
- Excellent C/P ratio (cost/performance)
- High-Color high-resolution resolution touch screen
- PoE, Power over Ethernet (PoE)
- RS-485 network (including SelfTuner)/RS-232 (3 pins)
- RTC (Real Time Clock)
- Buzzer
- Rubber Keypad (Option for VPD Series)
- Graphical user interface designer
- Free development tool: HMIWorks
- Support the C language and Ladder Designer
- Support user-defined third party protocol (C language)
- Modbus Protocol enables remote control of I/O modules and integration with SCADA software
- ESD Protection: 4 kV
- Waterproofed Front Panel (VPD: IP65, TPD: IP40)
- Operating temperature: -20 ~ 50 °C (2.8" TPD: -20 ~ 70 °C)





1.2 Module Naming Convention

There are many different products available, and sometimes it is difficult to remember the specifications for any given product. However, if you take a few minutes to understand the module naming conventions, it may save your time and prevent confusion. The figure below shows how the module naming conventions work for each TPD/VPD series product.





1.3 Selection Guide

1.3.1 TPD Series Models

➤ 2.8" (Resolution: 240 x 320)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Outlet Box	External Wall Box	Power Input
TPD-280	-	1	-	1 x RS-485	-	OB120	EWB-T28	+10 ~ +30 V _{DC}
TPD-283	-	1	Yes	-	PoE			
TPD-280U	8 MB	54	-	1 x RS-485	Yes			+10 ~ +30 V _{DC}
TPD-283U	8 MB	54	Yes	1 x RS-485	Yes			+10 ~ +30 V _{DC} or PoE

➤ 2.8" (Resolution: 240 x 320)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Outlet Box	External Wall Box	Power Input
TPD-280-Mx	-	4	-	1 x RS-485	-	OB120	EWB-T28	+12 ~ +48 V _{DC}
TPD-283-Mx	-	4	Yes	-	PoE			
TPD-283U-Mx	16 MB	108	Yes	1 x RS-485	Yes			+12 ~ +48 V _{DC} or PoE

➤ 4.3" (Resolution: 480 x 272)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Outlet Box	External Wall Box	Power Input
TPD-430	8 MB	32	-	1 x RS-485	Yes	OB120	EWB-T43	+10 ~ +30 V _{DC}
TPD-433			Yes	1 x RS-485	Yes			+10 ~ +30 V _{DC} or PoE
TPD-432F			-	2 x RS-485	Yes	OB140F OB140FP	EWB-T43F	+10 ~ +30 V _{DC}
TPD-433F			Yes	1 x RS-232 1 x RS-485	Yes			+10 ~ +30 V _{DC} or PoE
TPD-430-EU			-	1 x RS-485	Yes	-	-	+10 ~ +30 V _{DC}
TPD-433-EU			Yes	1 x RS-485	Yes			+10 ~ +30 V _{DC} or PoE

➤ 7" (Resolution: 800 x 480)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Outlet Box	External Wall Box	Power Input
TPD-703	16 MB	18	Yes	1 x RS-232	Yes	OB170	EWB-T70	+12 ~ +48 V _{DC} or PoE
TPD-703	64 MB	84		1 x RS-485				

1.3.2 VPD Series Models

➤ 3.5" (Resolution: 320 x 240)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Expansion I/O Boards	Rubber Keypad	Ingress Protection	Power Input		
VPD-130	8 MB	54	-	RS-232/RS-485	Yes	-	Yes	Front Panel: IP65	+12 ~ +48 V _{DC}		
VPD-130N			-			-					
VPD-132			-	Yes		COM1: RS-485 or RS-232 COM2: RS-485	Yes			Yes	+12 ~ +48 V _{DC} or PoE
VPD-132N			-	-							
VPD-133			Yes	Yes							
VPD-133N			Yes	-							

➤ 4.3" (Resolution: 480 x 272)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Expansion I/O Boards	Rubber Keypad	Ingress Protection	Power Input	
VPD-142	8 MB	32	-	COM1: RS-485 or RS-232	Yes	Yes	Yes	Front Panel: IP65	+12 ~ +48 V _{DC}	
VPD-142N			-				-			
VPD-143			Yes	COM2: RS-485 or RS-232			Yes		Yes	+12 ~ +48 V _{DC} or PoE
VPD-143N			Yes				-			

➤ Expansion I/O Boards (Optional XV-boards)

Model	Digital Input (DI)			Digital Output (DO)		
	Channels	Sink/Source	Contact	Channels	Type	Sink/Source
XV107	8	Source	Wet	8	Open Collector	Sink/Source
XV107A	8	Sink	Wet	8	Open Emitter	Source
XV110	16	Sink/Source	Wet + Dry	-	-	-
XV111	0	-	-	16	Open Collector	Sink
XV111A	0	-	-	16	Open Emitter	Source
XV116	5	Sink/Source	Wet	6	Power Relay, Form A	-

Model	AI		AO		DI		DO	
	Channels	Type	Channels	Type	Channels	Type	Channels	Type
XV306	4	Voltage/Current	-	-	4	Wet	4	Relay Form A, 6A
XV307	-	-	2	Voltage/Current	4		4	Sink
XV308	8	Voltage/Current	-	-	DI+DO = 8		DI+DO=8	Sink
XV310	4		2	Voltage/Current	4	Source		4

1.4 Specifications



Note: **Communication interface** that is only for run time supports the following protocols:

1. For the case of **RS-485**, Modbus RTU Master and DCON Protocol Master (for ICP DAS I-7000 series modules) are supported. We provide API functions to open COM Port for sending/receiving strings through RS-485.
2. For the case of **Ethernet**, Modbus TCP Master is supported. We provide API functions to sending/receiving strings through TCP.
3. **USB** is used for firmware update only.

1.4.1 TPD-280/280U/283/283U Series Models

Models	TPD-280	TPD-280U	TPD-283	TPD-283U
CPU Module				
CPU	32-bit RISC CPU			
Memory Expansion	-	16 MB SDRAM / 8 MB Flash	-	16 MB SDRAM / 8 MB Flash
Real Time Clock (RTC)	-	Yes	-	Yes
Buzzer	Yes			
Rotary Switch (0 ~ 9)	Yes			
Communication Interface				
Ethernet	-		RJ-45 x 1, 10/100 Base-TX	
Serial Port	RS-485 (including Self-Tuner)		-	RS-485 (including Self-Tuner)
USB 1.1 Client	-	Firmware updates only	-	Firmware updates only
MMI (Main Machine Interface)				
LCD	2.8 TFT (Resolution 240 x 320 x 16), defective pixels <= 3			
Backlight Life	20,000 hours			
Brightness	160 cd/m ²			
Touch Panel	Yes			
Reset Button	Yes			
Electrical				
Powered from Terminal Block	+10 ~ +30 Vdc		-	+10 ~ +30 Vdc
Powered from PoE	-		IEEE 802.3af, Class1 (48 V)	
Power Consumption	1.2 W			
Mechanical				
Dimensions (W x L x H)	76 mm x 119 mm x 31 mm			
Installation	Wall Mounting			
Ingress Protection	Front Panel: IP40			
Environmental				
Operating Temperature	-20 ~ +70°C			
Storage Temperature	-30 ~ +80°C			
Ambient Relative Humidity	10 ~ 90% RH, non-condensing			

1.4.2 TPD-280-H/280-Mx/283-H/283-Mx/283U-H/283U-Mx Series Models

Models	TPD-280-H TPD-280-Mx	TPD-283-H TPD-283-Mx	TPD-283U-H TPD-283U-Mx
CPU Module			
CPU	32-bit RISC CPU		
Memory Expansion	-		16 MB SDRAM / 16 MB Flash
Real Time Clock (RTC)	-		Yes
Buzzer	Yes		
Rotary Switch (0 ~ 9)	Yes		
Communication Interface			
Ethernet	-	RJ-45 x 1, 10/100 Base-TX	
Serial Port	COM1	RS-485 (including Self-Tuner)	RS-485 (including Self-Tuner)
	COM2	-	
MMI (Main Machine Interface)			
LCD	2.8 TFT (Resolution 240 x 320 x 65535 colors), defective pixels <= 3 for "H" versions 2.8 TFT (Resolution 240 x 320 x 16), defective pixels <= 3 for "Mx" versions		
Backlight Life	20,000 hours		
Brightness	160 cd/m2		
Touch Panel	Resistive Touch		
Reset Button	Yes		
Electrical			
Powered from Terminal Block	+12 ~ +48 VDC	-	+12 ~ +48 VDC
Powered from PoE	-	IEEE 802.3af, Class1 (48 V)	
Power Consumption	1.5 W		
Mechanical			
Dimensions (W x L x H)	127 mm x 92 mm x 21.8 mm	127 mm x 92 mm x 31 mm	
Installation	Wall Mounting		
Ingress Protection	Front Panel: IP40		
Environmental			
Operating Temperature	-20 ~ +70°C		
Storage Temperature	-30 ~ +80°C		
Ambient Relative Humidity	10 ~ 90% RH, non-condensing		



1.4.3 TPD-430/430-EU/433/433-EU Series Models

Models	TPD-430	TPD-430-EU	TPD-433	TPD-433-EU
CPU Module				
CPU	32-bit RISC CPU			
Memory Expansion	16 MB SDRAM /8 MB Flash			
Real Time Clock (RTC)	Yes			
Buzzer	Yes			
Rotary Switch (0 ~ 9)	Yes			
Communication Interface				
Ethernet	-		RJ-45 x 1, 10/100 Base-TX	
Serial Port	RS-485 (including Self-Tuner)			
USB 1.1 Client	Firmware updates only			
MMI (Main Machine Interface)				
LCD	4.3" TFT(Resolution 480 X 272 X 16), defective pixels <= 3			
Backlight Life	20,000 hours			
Brightness	400 cd/m2			
Touch Panel	Yes			
LED Indicator	Yes			
Reset Button	Yes			
Electrical				
Powered from Terminal Block	+10 ~ +30 Vdc			
Powered from PoE	-		IEEE 802.3af, Class1 (48 V)	
Power Consumption	2.5 W			
Mechanical				
Dimensions (W x L x H)	126 mm x 82 mm x 24 mm	126 mm x 92 mm x 29 mm	126 mm x 82 mm x 24 mm	126 mm x 92 mm x 29 mm
Installation	Wall Mount (Suitable for the outlet box in United States)	Wall Mount (Suitable for the European 86mm x 86mm outlet box)	Wall Mount (Suitable for the outlet box in United States)	Wall Mount (Suitable for the European 86mm x 86mm outlet box)
Environmental				
Operating Temperature	-20 ~ +50°C			
Storage Temperature	-30 ~ +80°C			
Ambient Relative Humidity	10 ~ 90% RH, non-condensing			

1.4.4 TPD-432F/433F Series Models

Models	TPD-432F	TPD-433F
CPU Module		
CPU	32-bit RISC CPU	
Memory Expansion	16 MB SDRAM /8 MB Flash	
Real Time Clock (RTC)	Yes	
Buzzer	Yes	
Rotary Switch (0 ~ 9)	Yes	
Communication Interface		
Ethernet	-	RJ-45 x 1, 10/100 Base-TX
COM 1	RS-485 (including Self-Tuner)	RS-485 (including Self-Tuner)
COM 2	RS-485 (including Self-Tuner)	RS-232 (3-pin)
USB 1.1 Client	Firmware updates only	
MMI (Main Machine Interface)		
LCD	4.3" TFT(Resolution 480 X 272 X 16), defective pixels <= 3	
Backlight Life	20,000 hours	
Brightness	400 cd/m2	
Touch Panel	Yes	
LED Indicator	Yes	
Reset Button	Yes	
Electrical		
Powered from Terminal Block	+10 ~ +30 Vdc	
Powered from PoE	-	IEEE 802.3af, Class1 (48 V)
Power Consumption	2.5 W	
Mechanical		
Dimensions (W x L x H)	140 mm x 87 mm x 42 mm	
Installation	Wall Mounting	
Ingress Protection	Front Panel: IP40	
Environmental		
Operating Temperature	-20 ~ +50°C	
Storage Temperature	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH, non-condensing	

1.4.5 TPD-703/703-64 Series Models

Models	TPD-703	TPD-703-64
CPU Module		
CPU	32-bit RISC CPU	
Memory Expansion	16 MB SDRAM /16 MB Flash	64 MB SDRAM /64 MB Flash
Real Time Clock (RTC)	Yes	
Buzzer	Yes	
Rotary Switch (0 ~ 9)	Yes	
Communication Interface		
Ethernet	RJ-45 x 1, 10/100 Base-TX	
COM 1	RS-485 (including Self-Tuner); non-isolation	
COM 2	RS-232 (3-pin); non-isolation	
MMI (Main Machine Interface)		
LCD	7" TFT (Resolution 800 x 480 , 65535 colors), defective pixels <= 3	
Backlight Life	20,000 hours	
Brightness	250 cd/m2	400 cd/m2
Touch Panel	4-wire, analog resistive; Light Transmission: 80%	
Reset Button	Yes	
Electrical		
Powered from Terminal Block	+12 ~ +48 Vdc	
Powered from PoE	IEEE 802.3af, Class1 (48 V)	
Power Consumption	3.6 W	
Mechanical		
Dimensions (W x L x H)	217 mm x 153 mm x 33 mm	
Installation	Wall Mounting	
Ingress Protection	Front Panel: IP40	
Environmental		
Operating Temperature	-20 ~ +60°C	
Storage Temperature	-30 ~ +70°C	
Ambient Relative Humidity	10 ~ 90% RH, non-condensing	

1.4.6 VPD-130/130N/132/132N/133/133N Series Models

Models	VPD-130	VPD-130N	VPD-132	VPD-132N	VPD-133	VPD-133N
CPU Module						
CPU	32-bit RISC CPU					
Memory Expansion	16 MB SDRAM /8 MB Flash					
Real Time Clock (RTC)	Yes					
Buzzer	Yes					
Rotary Switch (0 ~ 9)	Yes					
Communication Interface						
Ethernet	-				RJ-45 x 1, 10/100 Base-TX	
COM1	RS-232/RS-485 (including Self-Tuner)		RS-485 (including Self-Tuner) and RS-232 (3-pin)			
COM2	-		RS-485 (including Self-Tuner)			
USB 1.1 Client	Firmware updates only					
I/O Expansion						
I/O Expansion Bus	-		Yes, One of XV-boards			
MMI (Main Machine Interface)						
LCD	3.5 TFT (Resolution 240 x 320 x 16), defective pixels <= 3					
Backlight Life	20,000 hours					
Brightness	270 cd/m2					
LED Indicator	Yes	-	Yes	-	Yes	-
Touch Panel	Yes					
Reset Button	Yes					
Rubber Keypad	5 keys (Programmable)	-	5 keys (Programmable)	-	5 keys (Programmable)	-
Electrical						
Powered from Terminal Block	+12 ~ +48 Vdc					
Powered from PoE	-				IEEE 802.3af, Class1 (48 V)	
Power Consumption	2 W					
Mechanical						
Dimensions (W x L x H)	103 mm x 103 mm x 53 mm					
Installation	DIN-Rail Mounting and Panel Mounting					
Ingress Protection	Front Panel: IP65					
Environmental						
Operating Temperature	-30 ~ +50°C					
Storage Temperature	-30 ~ +80°C					
Ambient Relative Humidity	10 ~ 90% RH, non-condensing					

1.4.7 VPD-142/142N/143/143N Series Models

Models	VPD-142	VPD-142N	VPD-143	VPD-413N
CPU Module				
CPU	32-bit RISC CPU			
Memory Expansion	16 MB SDRAM /8 MB Flash			
Real Time Clock (RTC)	Yes			
Buzzer	Yes			
Rotary Switch (0 ~ 9)	Yes			
Communication Interface				
Ethernet	-		RJ-45 x 1, 10/100 Base-TX	
COM1	One set of RS-232 (3-pin) / RS-485 (including Self-Tuner)			
COM2	One set of RS-232 (3-pin) / RS-485 (including Self-Tuner)			
USB 1.1 Client	Firmware updates only			
I/O Expansion				
I/O Expansion Bus	Yes, One of XV-boards			
MMI (Main Machine Interface)				
LCD	4.3 TFT (Resolution 480 x 272 x 16), defective pixels <= 3			
Backlight Life	20,000 hours			
Brightness	400 cd/m2			
LED Indicator	Yes	-	Yes	-
Touch Panel	Yes			
Reset Button	Yes			
Rubber Keypad	5 keys (Programmable)	-	5 keys (Programmable)	-
Electrical				
Powered from Terminal Block	+12 ~ +48 Vdc			
Powered from PoE	-		IEEE 802.3af, Class1 (48 V)	
Power Consumption	2.5 W			
Mechanical				
Dimensions (W x L x H)	131 mm x 105 mm x 54 mm			
Installation	DIN-Rail Mounting and Panel Mounting			
Ingress Protection	Front Panel: IP65			
Environmental				
Operating Temperature	-30 ~ +50°C			
Storage Temperature	-30 ~ +80°C			
Ambient Relative Humidity	10 ~ 90% RH, non-condensing			



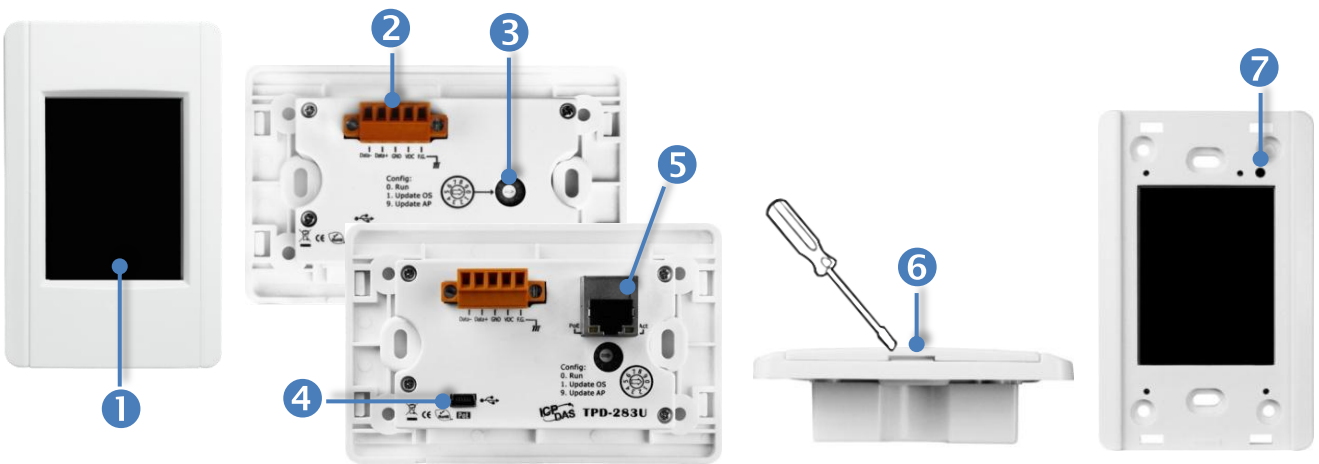
2. Hardware Information

This chapter provides a detailed description of the appearance, dimensions, pin assignments, mount the hardware for the TPD/VPD series product.

2.1 Appearance

2.1.1 TPD-280/283 Series Models

Models supported include TPD-280, TPD-280U, TPD-280-H, TPD-283, TPD-283U, TPD-283-H and TPD-283U-H.



1. 2.8" TFT LCD with Touch Panel

2. Power/GND/RS-485 Connector (for TPD-280/280U/280-H/283U/283U-H only)



The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to [Section 2.2.1 TPD-280/283/430/433 Series Models](#).

3. Rotary Switch (0 ~ 9)



The Rotary Switch is used to set the configuration modes, as follows:

➤ **For TPD-280/280-H:**

0. Run Only: This mode is used for running programs.

1. Update Only: This mode is used for updating programs.



➤ **For TPD-280U/283U:**

0. Run: This mode is used to run the application. (There is only one application on a TouchPAD device.)

1. Update OS: This mode is used to update operating system of TouchPAD device.

9. Update AP: This mode is used to download an application to TouchPAD device. (There is only one application on a TouchPAD device.)

➤ **For TPD-283/283-H/283U-H:**

0. Run & Update: This is a special run mode which is used in the development stage. The TouchPAD device can be updated by a PC from the remote side through Ethernet.

1. Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device.

2. Run Only: Simply run, a TouchPAD device cannot be updated in this mode.

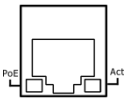
4. USB Port (for TPD-280U/283U only)



The USB Port is used to downloading application programs.



5. PoE and Ethernet RJ-45 Jack (for TPD-TPD-283/283U/283-H/283U-H only)



The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Orange)** indicator will be illuminated.

6. Cover Removal Slit

Use a flat-head screwdriver in this slit to remove the top cover on the TouchPAD device.

7. Reset Button

Use a flat-head screwdriver to press this button to reset the TouchPAD device. *Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading programs.*

2.1.2 TPD-280-Mx/283-Mx/283U-Mx Series Models

Models supported include TPD-280-M1, TPD-280-M2, TPD-280-M3, TPD-283-M1, TPD-283-M2, TPD-283-M3, TPD-283U-M1, TPD-283U-M2 and TPD-283U-M3.



1. 2.8" TFT LCD with Touch Panel

2. Power/GND/RS-485 Connector *(The TPD-283-Mx does not support this connector)*



The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to [Section 2.2.1 TPD-280/283/430/433 Series Models](#).

3. Rotary Switch (0 ~ 9)



The Rotary Switch is used to set the configuration modes, as follows:

➤ For TPD-280-M1/M2/M3:

0. Run Only: This mode is used for running programs.

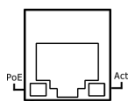
1. Update Only: This mode is used for updating programs.

➤ For TPD-283-M1/M2/M3 and TPD-283U-M1/M2/M3:

0. Run & Update: This is a special run mode which is used in the development stage. The TouchPAD device can be updated by a PC from the remote side through Ethernet.

1. Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device.

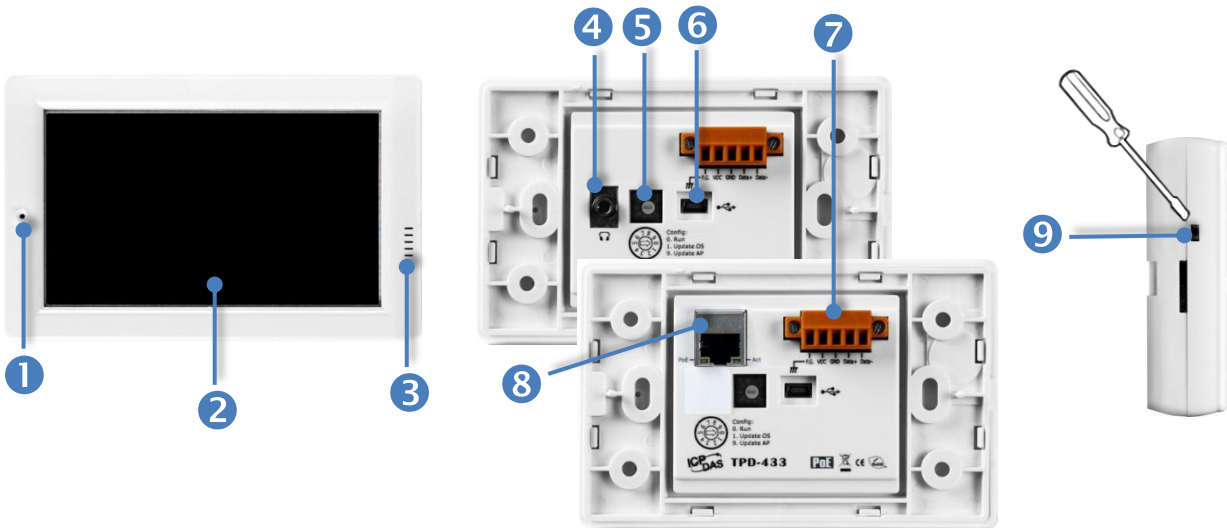
2. Run Only: Simply run, a TouchPAD device cannot be updated in this mode.

4. PoE and Ethernet RJ-45 Jack *(The TPD-280-Mx does not support this jack)*

The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Orange)** indicator will be illuminated.

2.1.3 TPD-430/433 Series Models

Models supported include TPD-430, TPD-430-EU, TPD-433 and TPD-433-EU.



1.	Programmable LED Indicator
2.	4.3" TFT LCD with Touch Panel
3.	Speaker for TPD-430/430-EU only; Buzzer for TPD-433/433-EU only
4.	Headphone Jack (for TPD-430/430-EU only)
5.	Rotary Switch (0 ~ 9)



The Rotary Switch is used to set the configuration modes, as follows:

0. Run: This mode is used to run the application. (There is only one application on a TouchPAD device.)

1. Update OS: This mode is used to update operating system of TouchPAD device.

9. Update AP: This mode is used to download an application to TouchPAD device. (There is only one application on a TouchPAD device.)

6.	USB Port
----	-----------------



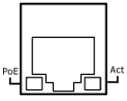
The USB Port is used to downloading application programs.

7.	Power/GND/RS-485 Connector
----	-----------------------------------



The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to [Section 2.2.1 TPD-280/283/430/433 Series Models](#).

8. PoE and Ethernet RJ-45 Jack (for TPD-433/433-EU only)

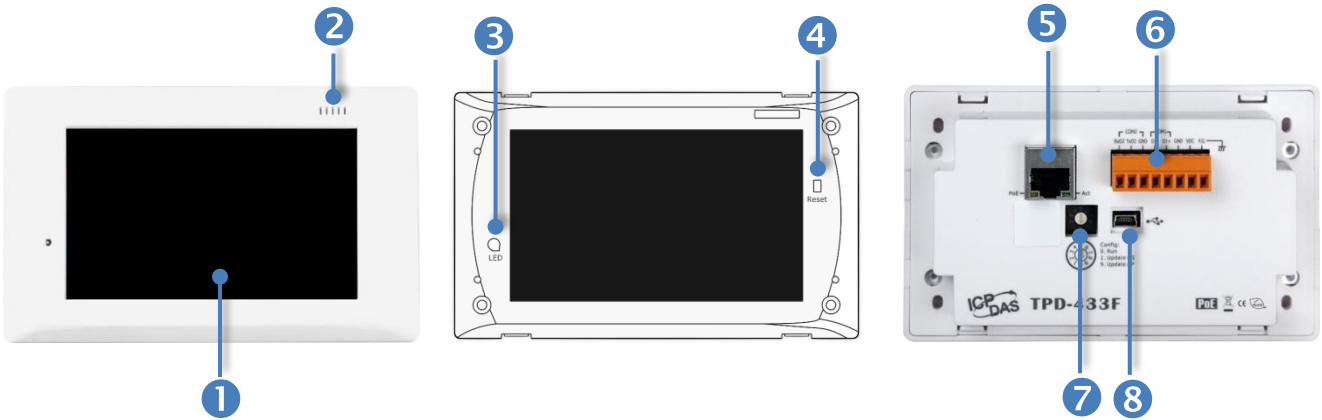


The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Orange)** indicator will be illuminated.

9. Reset Button (Left had Side)

Use a flat-head screwdriver to press this button to reset the TouchPAD device. *Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading programs.*

2.1.4 TPD-432F/433F Series Models



1. 4.3" TFT LCD with Touch Panel

2. Buzzer

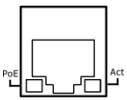
3. Programmable LED Indicator

The Programmable LED is placed under the front cover of the TouchPAD device.

4. Reset Button

The reset button is placed under the front cover of the TouchPAD device, please remove this cover and use a flat-head screwdriver to press this button to reset the TouchPAD device. *Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading programs.*

5. PoE and Ethernet RJ-45 Jack (for TPD-433F only)



The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Orange)** indicator will be illuminated.

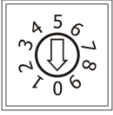
6. Power/GND/RS-485/RS-232 Connector



The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to [Section 2.2.2 TPD-432F/433F Series Models](#).

7. Rotary Switch (0 ~ 9)

The Rotary Switch is used to set the configuration modes, as follows:



0. Run: This mode is used to run the application. (There is only one application on a TouchPAD device.)

1. Update OS: This mode is used to update operating system of TouchPAD device.

9. Update AP: This mode is used to download an application to TouchPAD device. (There is only one application on a TouchPAD device.)

8. USB Port



The USB Port is used to downloading application programs.

2.1.5 TPD-703/703-64 Series Models



1. 7" TFT LCD with Touch Panel

2. Buzzer

3. System LED Indicator

4. Programmable LED Indicator

The System LED and Programmable LED is placed under the front cover of the TouchPAD device.

5. Reset Button

The reset button is placed under the front cover of the TouchPAD device, please remove this cover and use a flat-head screwdriver to press this button to reset the TouchPAD device. *Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading programs.*

6. Rotary Switch (0 ~ 9)



The rotary switch is placed under the front cover of the TouchPAD device, please remove this cover and use a flat-head screwdriver to set the configuration modes, as follows:

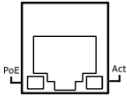
0. Run & Update: This is a special run mode which is used in the development stage. The TouchPAD device can be updated by a PC from the remote side through Ethernet.

1. Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device.

2. Run Only: Simply run, a TouchPAD device cannot be updated in this mode.



7. PoE and Ethernet RJ-45 Jack



The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Orange)** indicator will be illuminated.

8. Power/GND/RS-232/RS-485 Connector

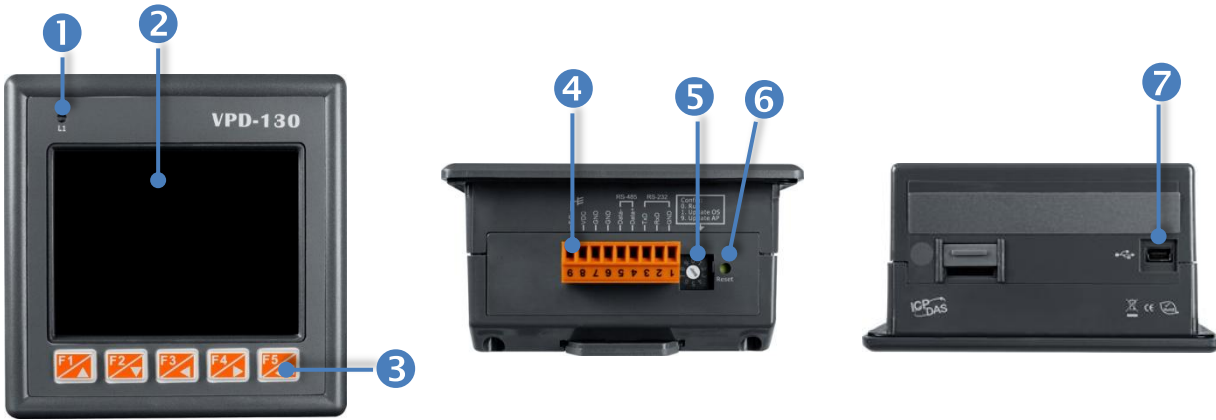


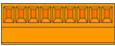


The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to [Section 2.2.3 TPD-703/703-64 Series Models](#).



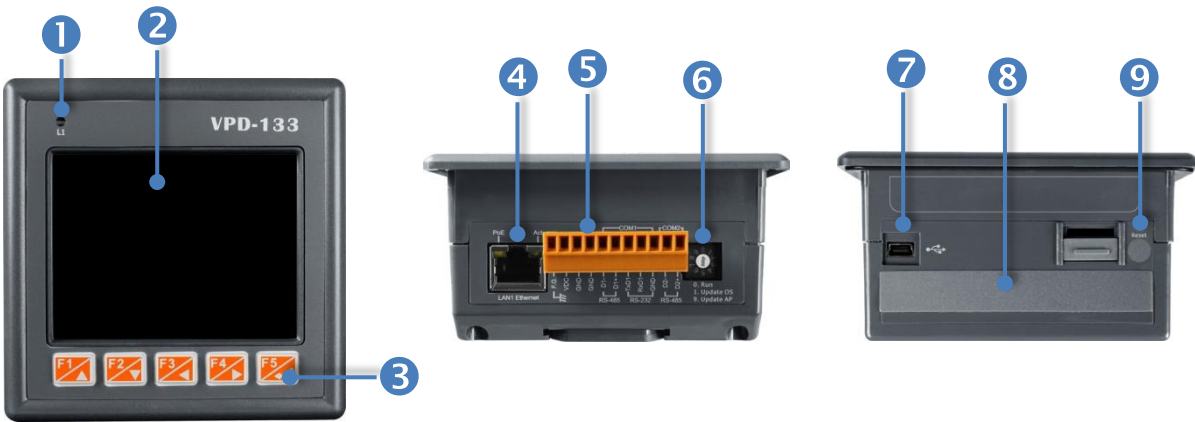


2.1.6 VPD-130/130N Series Models

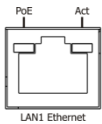


1.	LED Indicator
2.	3.5" TFT LCD with Touch Panel
3.	Rubber Keypad (for VPD-130 only)
4.	Power/GND/RS-232/RS-485 Connector
	 <p>The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to Section 2.2.4 VPD-130/130N Series Models.</p>
5.	Rotary Switch (0 ~ 9)
	 <p>The Rotary Switch is used to set the configuration modes, as follows:</p> <p>0. Run: This mode is used to run the application. (There is only one application on a TouchPAD device.)</p> <p>1. Update OS: This mode is used to update operating system of TouchPAD device.</p> <p>9. Update AP: This mode is used to download an application to TouchPAD device. (There is only one application on a TouchPAD device.)</p>
6.	Reset Button
	<p>Use a flat-head screwdriver to press this button to reset the TouchPAD device. <i>Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading programs.</i></p>
7.	USB Port
	 <p>The USB Port is used to downloading application programs.</p>

2.1.7 VPD-132/132N/133/133N Series Models



- | | |
|----|--|
| 1. | LED Indicator |
| 2. | 3.5" TFT LCD with Touch Panel |
| 3. | Rubber Keypad (for VPD-132/133 only) |
| 4. | PoE and Ethernet RJ-45 Jack (for VPD-133/133N only) |



The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Orange)** indicator will be illuminated.

- | | |
|----|--|
| 5. | Power/GND/RS-232/RS-485 Connector |
|----|--|



The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to [Section 2.2.5 VPD-132/133 Series Models](#).

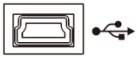
- | | |
|----|------------------------------|
| 6. | Rotary Switch (0 ~ 9) |
|----|------------------------------|



The Rotary Switch is used to set the configuration modes, as follows:

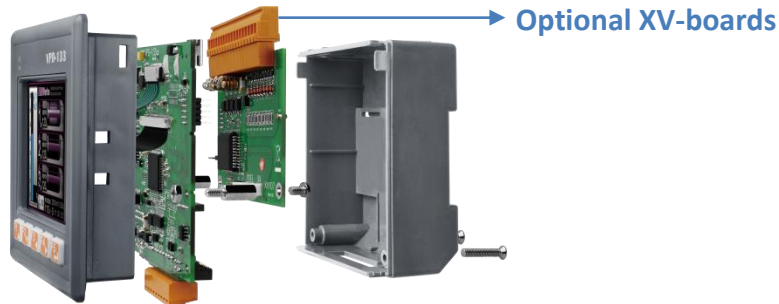
- 0. Run:** This mode is used to run the application. (There is only one application on a TouchPAD device.)
- 1. Update OS:** This mode is used to update operating system of TouchPAD device.
- 9. Update AP:** This mode is used to download an application to TouchPAD device. (There is only one application on a TouchPAD device.)

7. USB Port



The USB Port is used to downloading application programs.

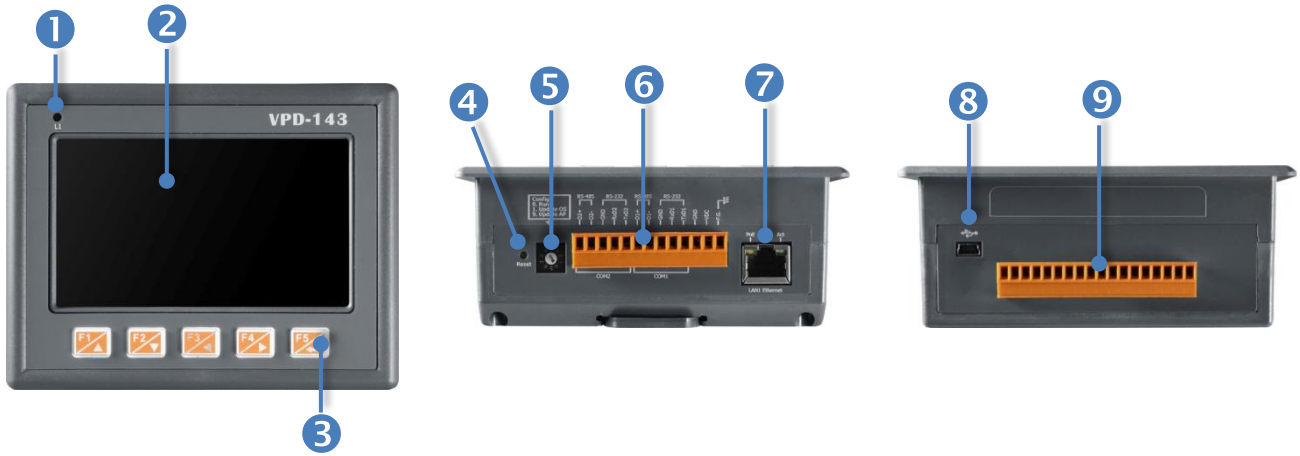
8. I/O Expansion Boards (Optional XV-boards)



9. Reset Button

Use a flat-head screwdriver to press this button to reset the TouchPAD device. *Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading programs.*

2.1.8 VPD-142/142N/143/143N Series Models



1.	LED Indicator
2.	4.3" TFT LCD with Touch Panel
3.	Rubber Keypad (for VPD-142/143 only)
4.	Reset Button

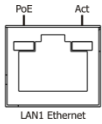
Use a flat-head screwdriver to press this button to reset the TouchPAD device. *Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading programs.*

5.	Rotary Switch (0 ~ 9)
	The Rotary Switch is used to set the configuration modes, as follows:
	0. Run: This mode is used to run the application. (There is only one application on a TouchPAD device.)
	1. Update OS: This mode is used to update operating system of TouchPAD device.
	9. Update AP: This mode is used to download an application to TouchPAD device. (There is only one application on a TouchPAD device.)



6.	Power/GND/RS-232/RS-485 Connector
	The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to Section 2.2.6 VPD-142/143 Series Models .

7. PoE and Ethernet RJ-45 Jack (for VPD-433/433N only)



The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Orange)** indicator will be illuminated.

8. USB Port



The USB Port is used to downloading application programs.

9. I/O Expansion Boards (Optional XV-boards)



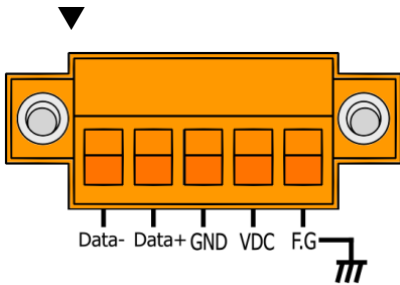


2.2 Pin Assignments

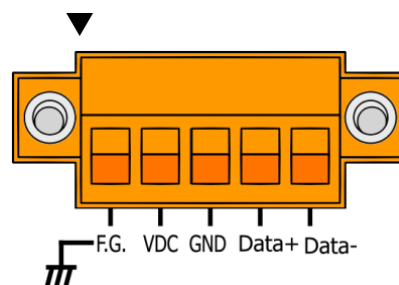
2.2.1 TPD-280/283/430/433 Series Models

Models supported include TPD-280, TPD-280U, TPD-280-H, TPD-280-Mx, TPD-283, TPD-283U, TPD-283U-H, TPD-283U-Mx, TPD-430, TPD-430-EU, TPD-433 and TPD-433-EU.

TPD-280/280U/280-H/TPD-280-Mx
 TPD-283U/283U-H/TPD-283U-Mx

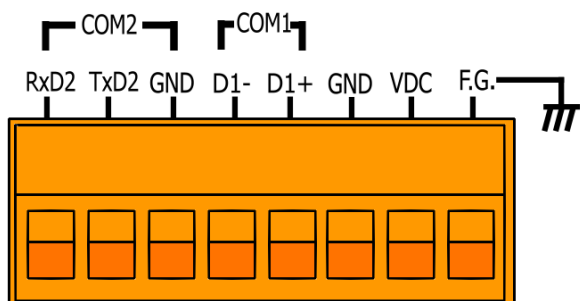


TPD-430/430-EU
 TPD-433/433-EU



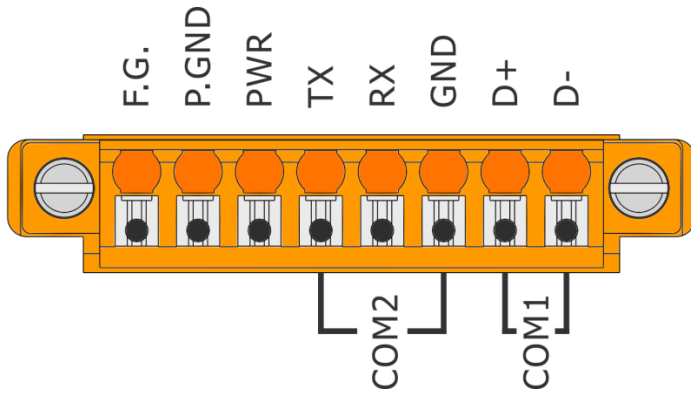
Pin	Name	Function Description
Data-	2-wire RS-485 Serial Port	
Data+		
GND	Ground Connection	
VDC	DC Power Input	The use as the power supply applies to TPD-280/283/430/433 Series models. ➤ For TPD-280/280U/283U/430/430-EU/433/433-EU: The valid power voltage range is from +10 to +30 V_{DC} . ➤ For TPD-280-H/283U-H/283U-Mx: The valid power voltage range is from +12 to +48 V_{DC} .
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.

2.2.2 TPD-432F/433F Series Models



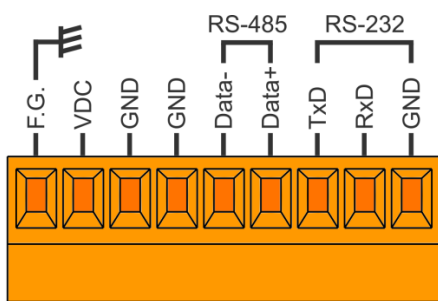
Pin	Name	Function Description
RxD2	3-wire RS-232	For COM2 Serial Port
TxD2		
GND		
D1-	2-wire RS-485	For COM 1 Serial Port
D1+		
GND	Ground Connection	
VDC	DC Power Input	The use as the power supply applies to TPD-432F/433F Series models. The valid power voltage range is from +10 to +30 V_{DC} .
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.

2.2.3 TPD-703/703-64 Series Models



Pin	Name	Function Description
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.
P.GND	Ground Connection	
PWR	DC Power Input	The use as the power supply applies to TPD-703/703-64 Series models. The valid power voltage range is from +12 to +48 V_{DC} .
Tx	3-wire RS-232	For COM2 Serial Port
Rx		
GND		
D+	2-wire RS-485	For COM 1 Serial Port
D-		

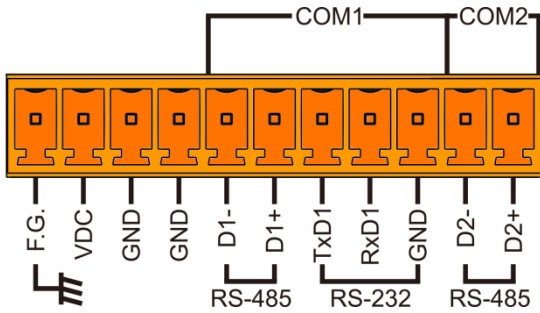
2.2.4 VPD-130/130N Series Models



Pin	Name	Function Description
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.
VDC	DC Power Input	The use as the power supply applies to VPD-130/130N Series models. The valid power voltage range is from +12 to +48 V_{DC} .
GND	Ground Connection	
GND	Ground Connection	
Data-	2-wire RS-485	For COM1 Serial Port
Data+		
TxD	3-wire RS-232	
RxD		
GND		

2.2.5 VPD-132/133 Series Models

Models supported include VPD-132, VPD-132N, VPD-133 and VPD-133N.

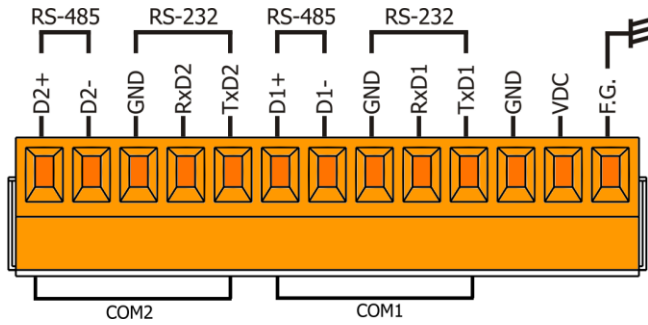


Pin	Name	Function Description	
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.	
VDC	DC Power Input	The use as the power supply applies to VPD-132/133 Series models. The valid power voltage range is from +12 to +48 V_{DC} .	
GND	Ground Connection		
GND	Ground Connection		
D1- D1+	2-wire RS-485	For COM1 Serial Port	
TxD1 RxD1 GND	3-wire RS-232		
D2- D2+	2-wire RS-485		For COM2 Serial Port



2.2.6 VPD-142/143 Series Models

Models supported include VPD-142, VPD-142N, VPD-143 and VPD-143N.



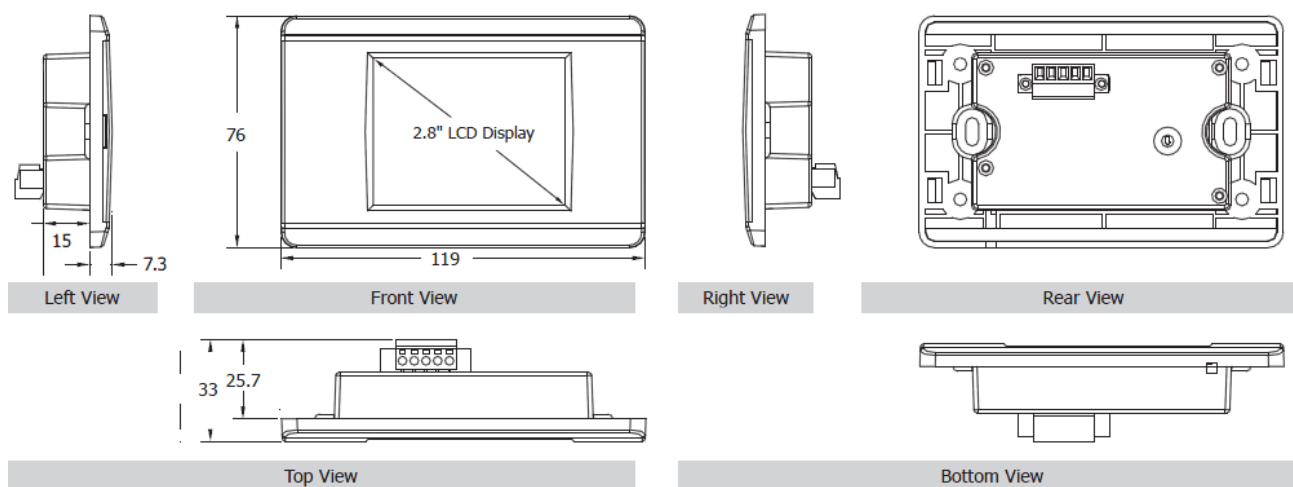
Pin	Name	Function Description
D2+	2-wire RS-485	For COM2 Serial Port
D2-		
GND	3-wire RS-232	
RxD2		
TxD2		
D1+	2-wire RS-485	For COM1 Serial Port
D1-		
GND	3-wire RS-232	
RxD1		
TxD1		
GND	Ground Connection	
VDC	DC Power Input	The use as the power supply applies to VPD-142/143 Series models. The valid power voltage range is from +12 to +48 V_{DC} .
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.



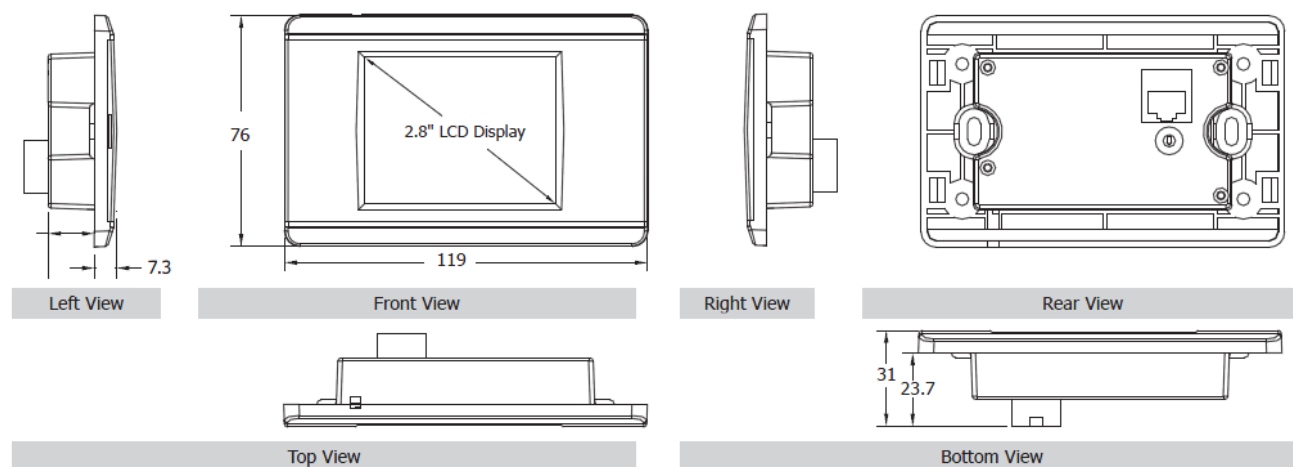
2.3 Dimensions

2.3.1 TPD-280/283 Series Models

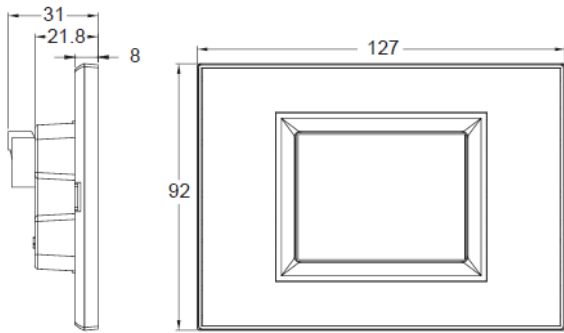
➤ **TPD-280/280U/280-H (Units: mm)**



➤ **TPD-283/283U/283-H/283U-H (Units: mm)**

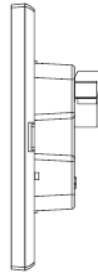


➤ TPD-280-Mx/283-Mx/283U-Mx (Units: mm)

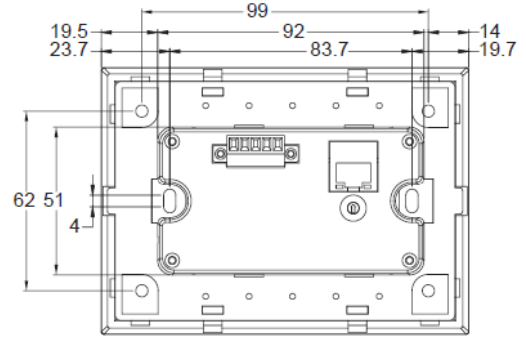


Left View

Front View



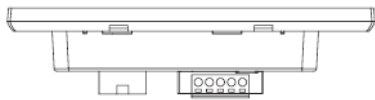
Right View



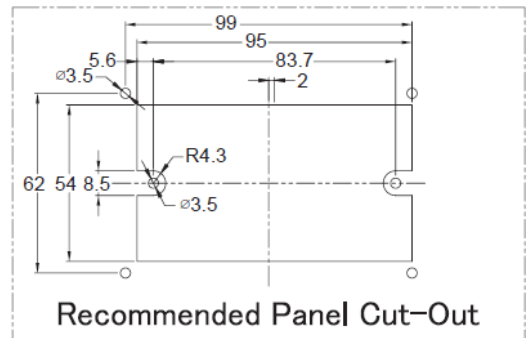
Rear View



Top View



Bottom View

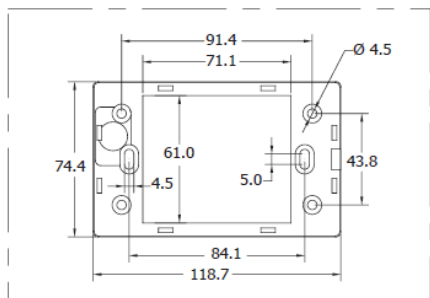
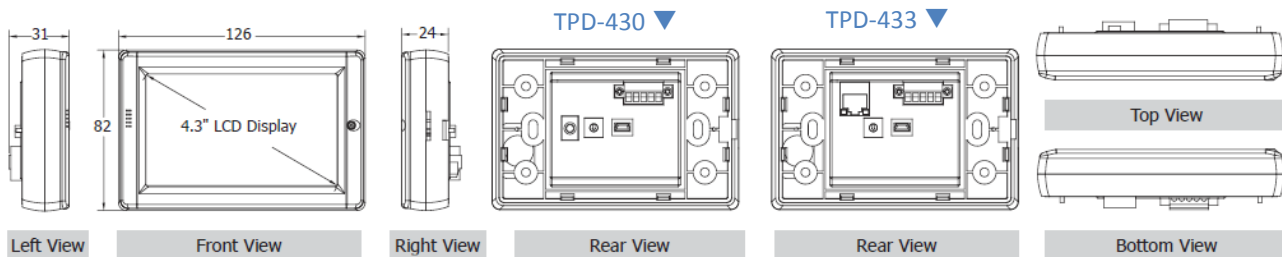


Recommended Panel Cut-Out

Wall Mounting

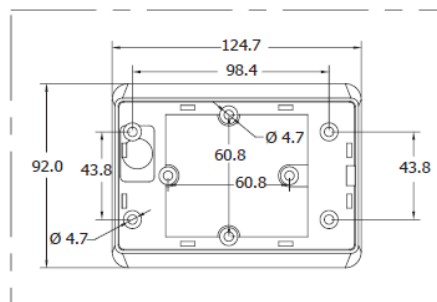
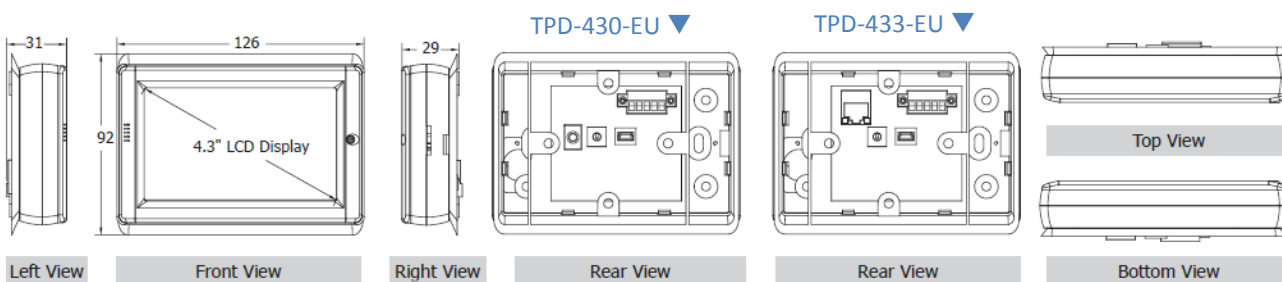
2.3.2 TPD-430/432/433/703 Series Models

TPD-430/433 (Units: mm)



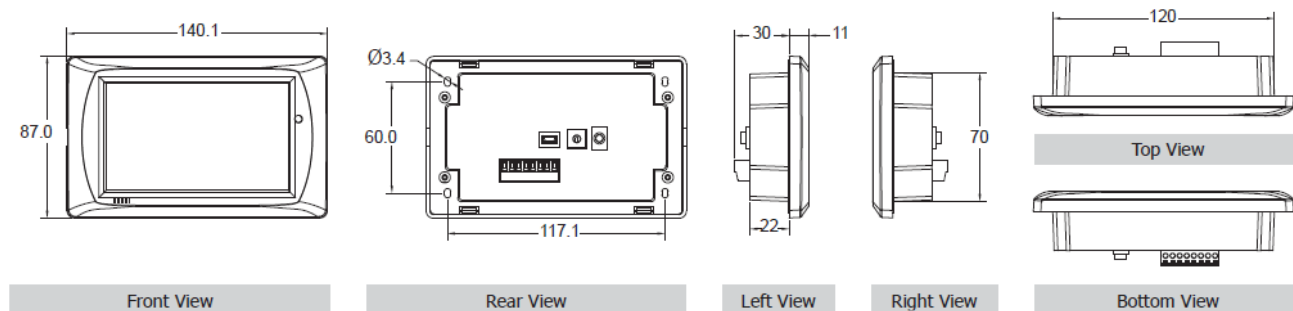
Wall Mounting

TPD-430-EU/433-EU (Units: mm)

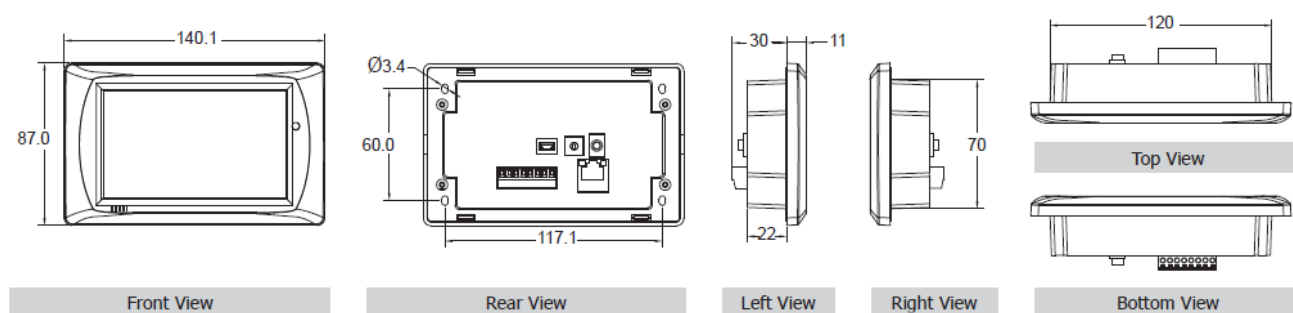


Wall Mounting

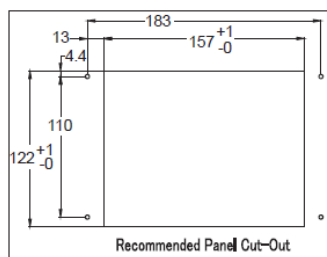
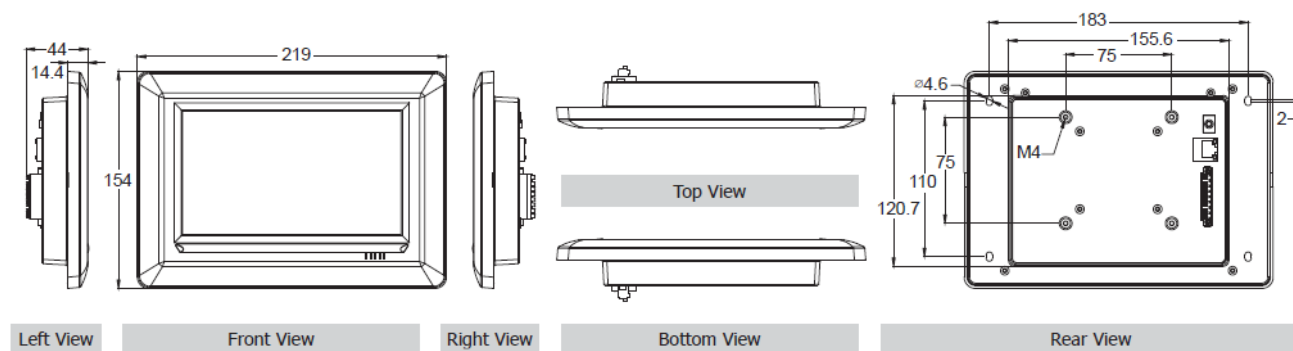
➤ **TPD-432 (Units: mm)**



➤ **TPD-433 (Units: mm)**



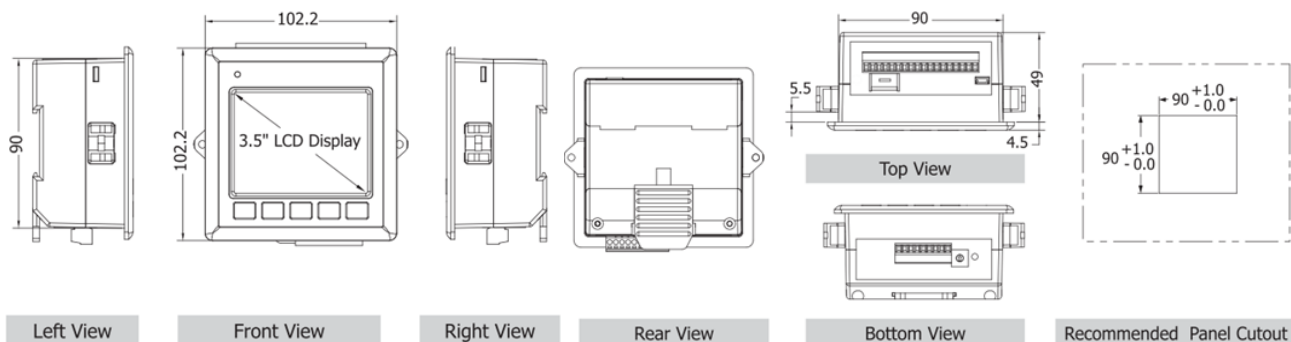
➤ **TPD-703/703-64 (Units: mm)**



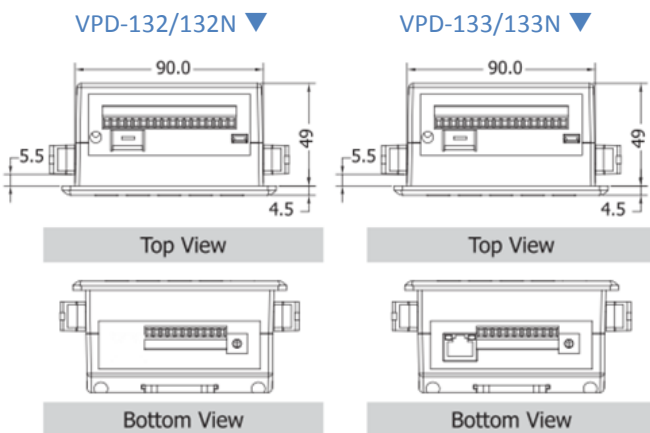
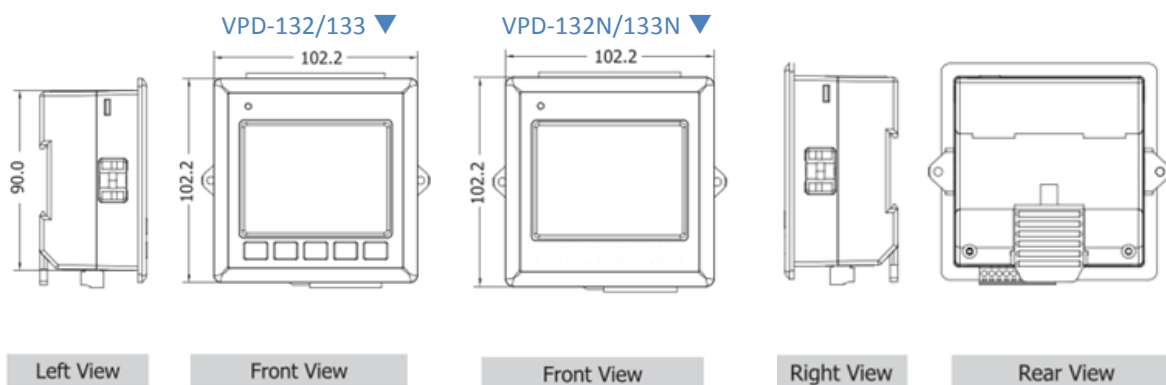
Wall Mounting

2.3.3 VPD-130/132/133 Series Models

VPD-130/130N (Units: mm)

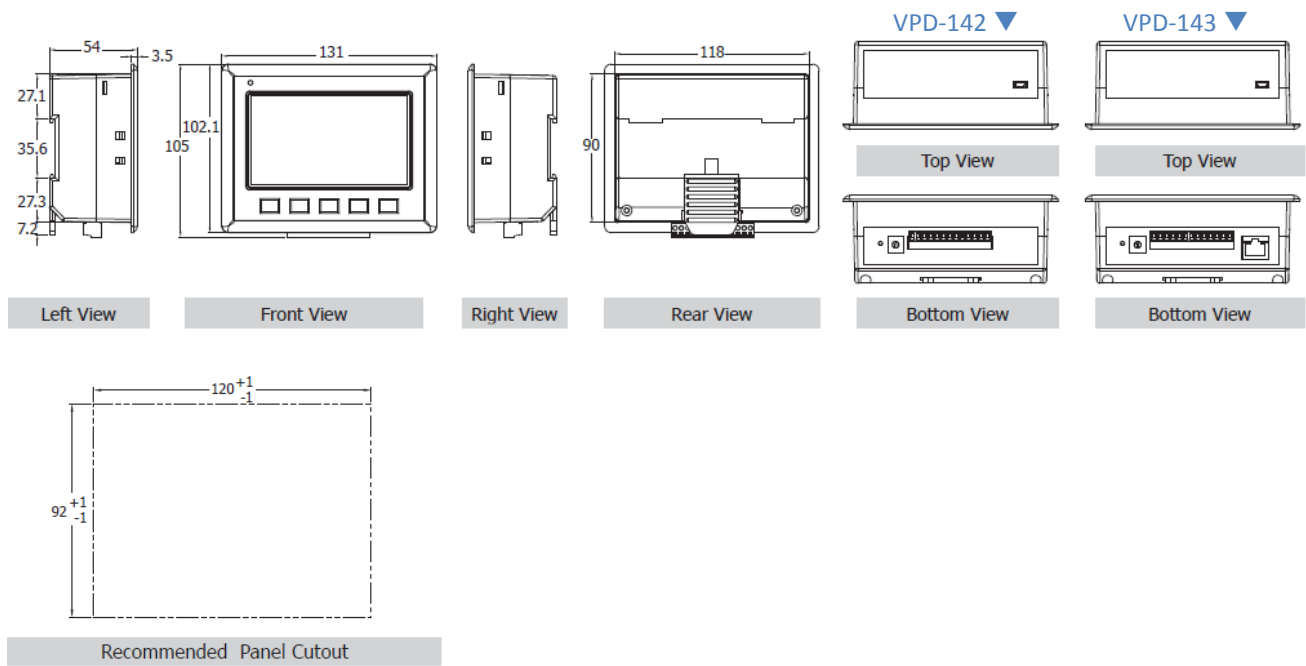


VPD-132/132N/133/133N (Units: mm)

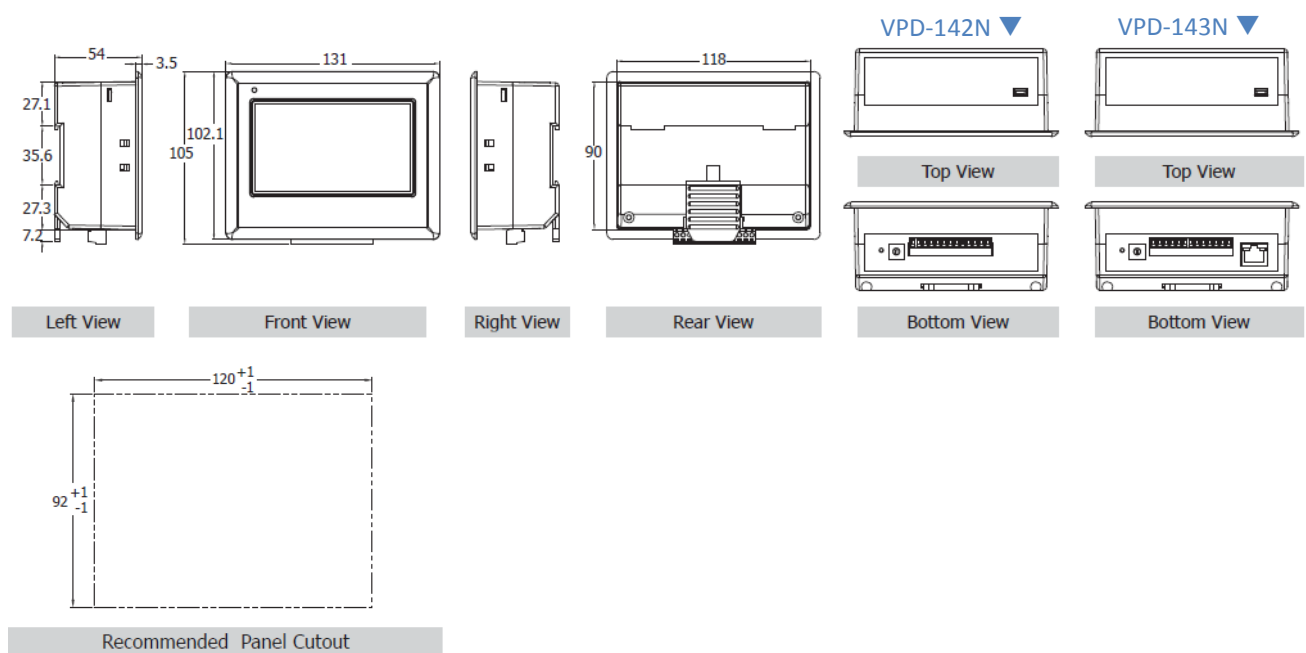


2.3.4 VPD-142/143 Series Models

➤ VPD-142/143 (Units: mm)



➤ VPD-142N/143N (Units: mm)

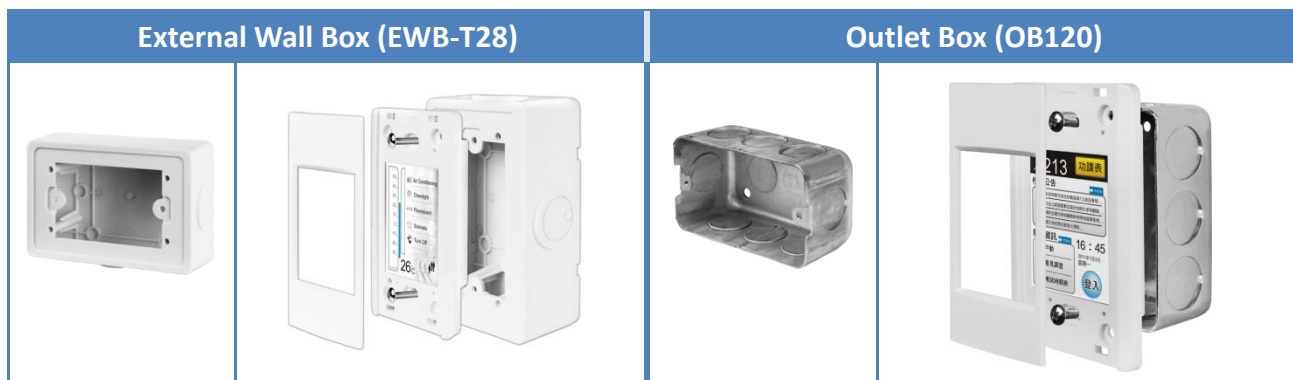




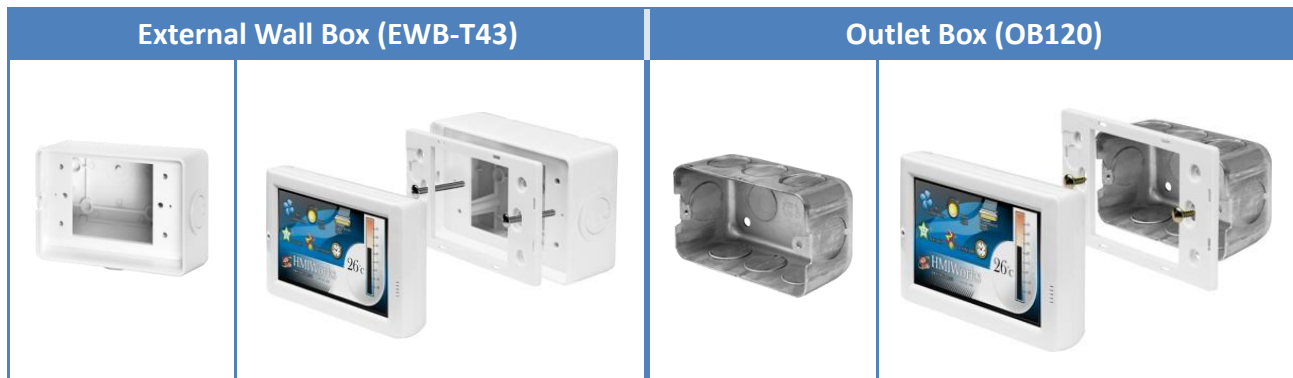
2.4 Mounting the Hardware

2.4.1 Wall Mounting

- For TPD-280/280U/280-H/283/TPD-283U/283-H/283U-H (2.8")



- For TPD-430/433 (4.3")



- For TPD-430-EU/433-EU (4.3")





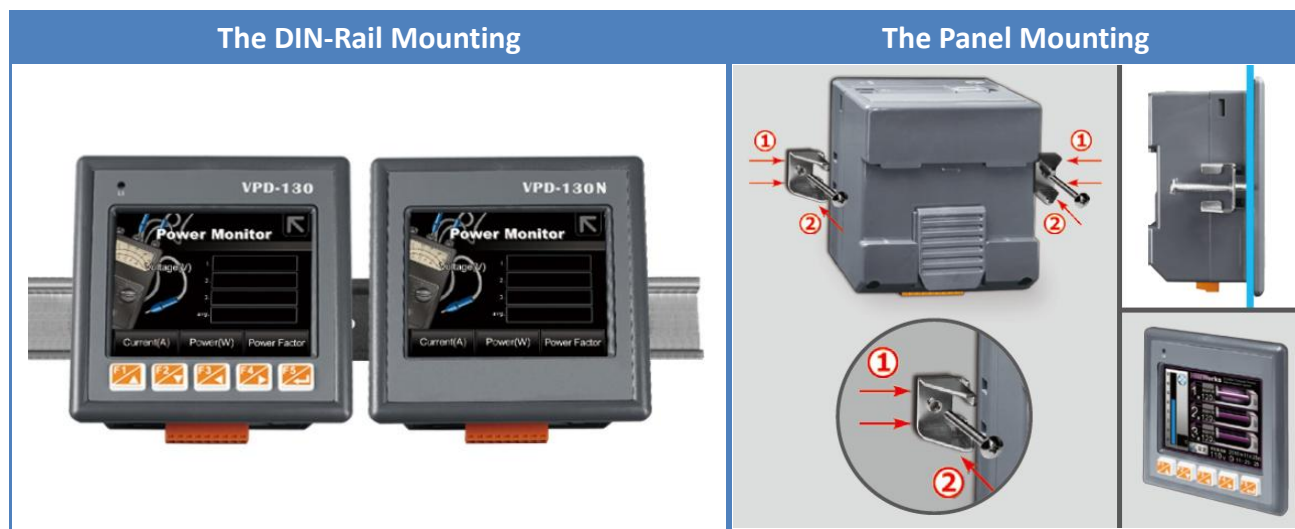
➤ For TPD-432F/433F (4.3")



➤ For TPD-703/703-64 (7")



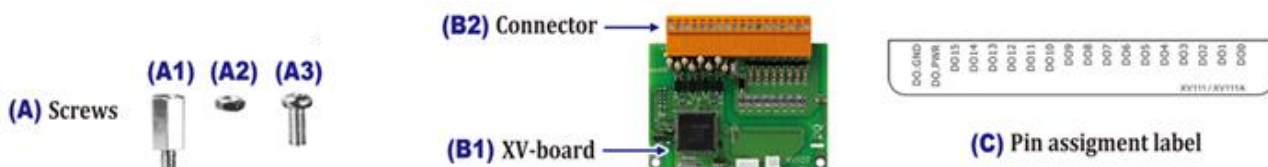
➤ For VPD-130/130N/132/132N/133/133N/142/142N/143/143N



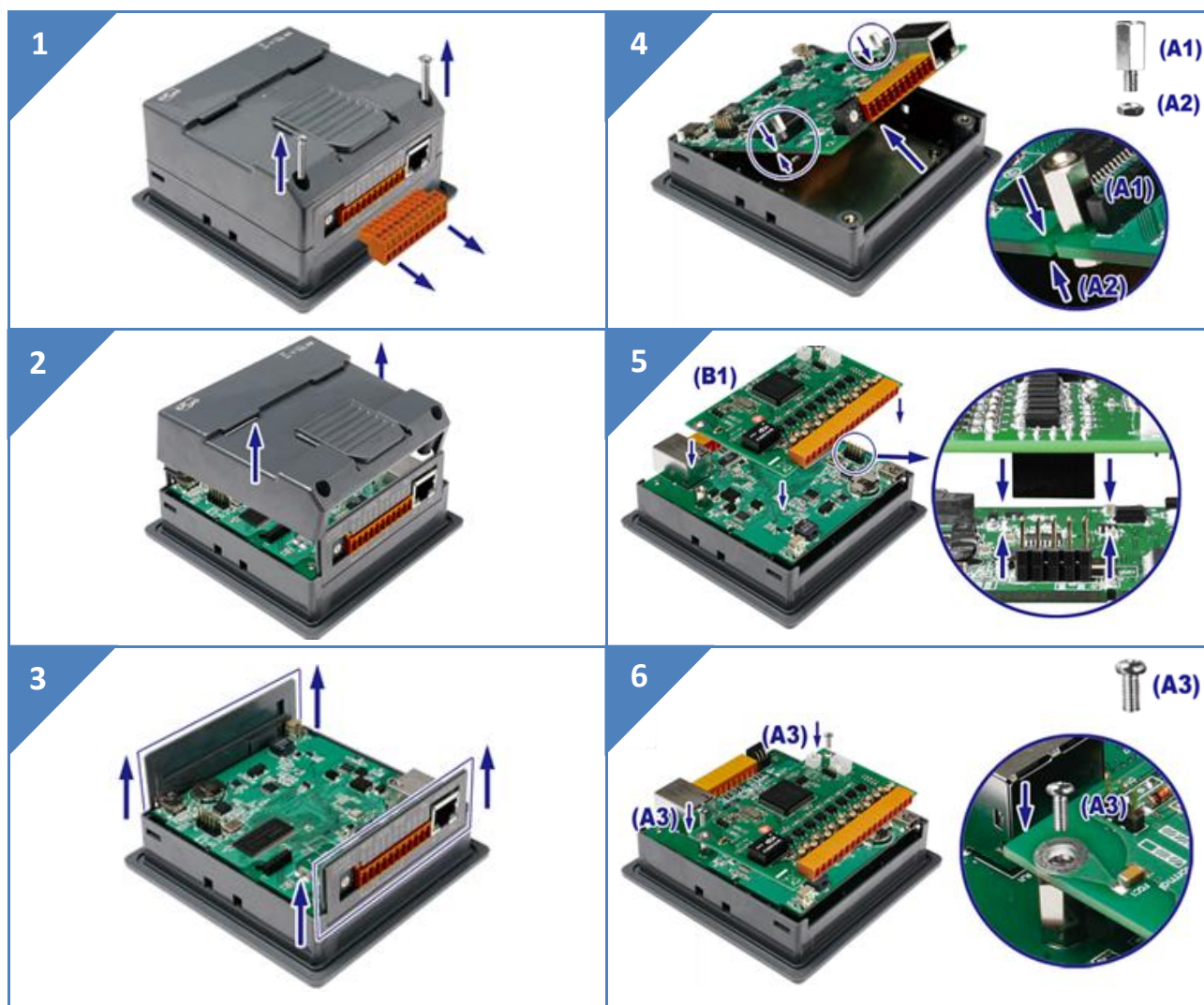


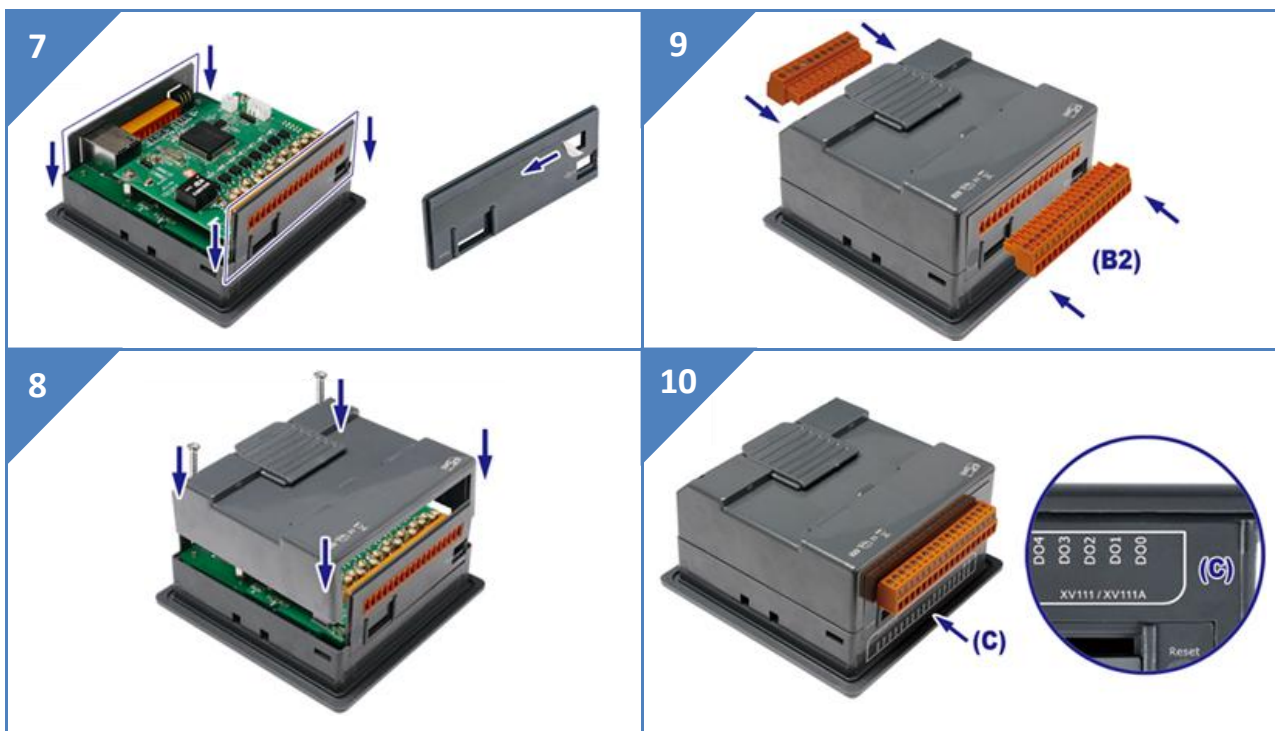
2.4.2 XV-boards Assembly on the VPD Series Models

➤ What's in the package?



➤ Follow the procedure described below:







3. Getting Started

This chapter provides a basic overview of how to install, configure and operate TouchPAD device.

3.1 Obtaining/Installing the HMIWorks Software

First of all, you should **install the HMIWorks development software on your PC**. HMIWorks is the development tools for the TouchPAD devices.

The **HMIWorks** can be obtained from either the companion CD-ROM, the ICP DAS FTP site, or the ICP DAS web site. The location of the install files on the CD and the download addresses are shown below:

	CD:\NAPDOS\TouchPAD\Setup\
	http://ftp.icpdas.com/pub/cd/touchpad/setup/



1. Double-click the **“HMIWorks_STD_vxxx_setup.exe”** file icon to execute the driver installation program.



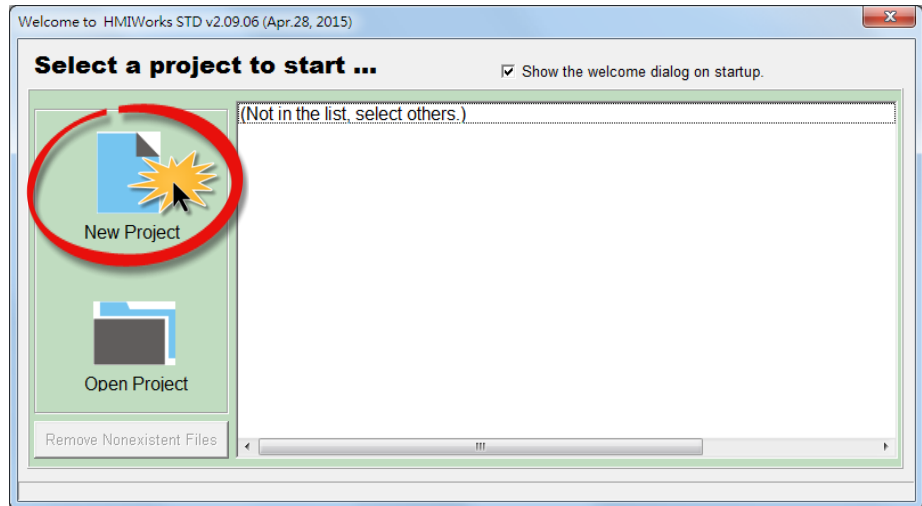
2. Once the driver installation is complete, double-click the **“HMIWorks_STD_vxxx_Update_xx.exe”** file icon to execute the driver installation update program.

Follow the steps as suggested by the HMIWorks setup wizard to finish the installation. For more detailed information related to the driver installation, refer to [HMIWorks Software user manual](#).

3.2 Create a New Project in the HMIWorks

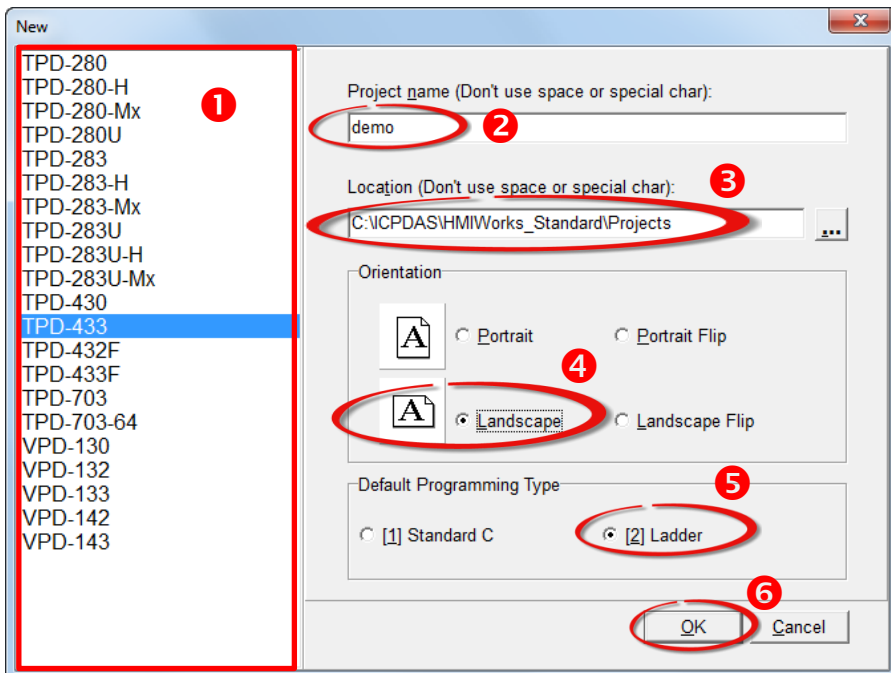
Step 1: Double click the HMIWorks shortcut on desktop to open the HMIWorks software.

Step 2: Click the “New Project” icon to create a new project.



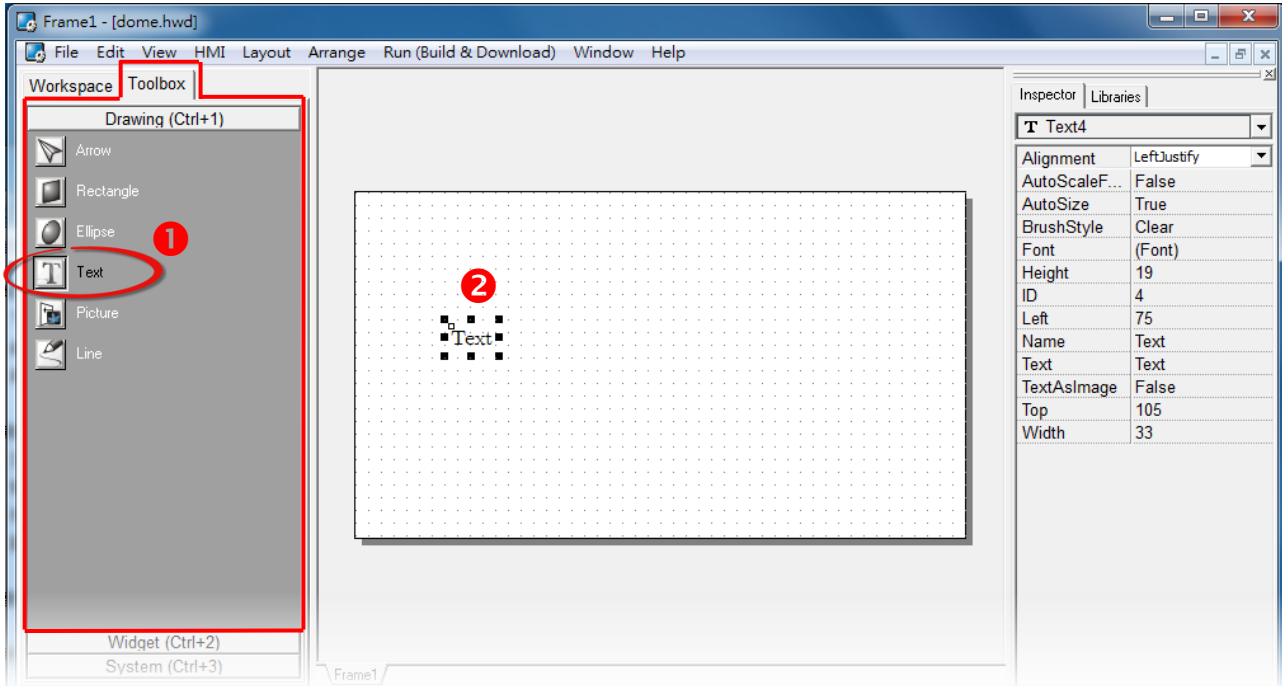
Step 3: In the “New” dialog box, configure the parameters for the new project as follows:

1. Click the name of the TouchPAD model to select it (e.g., TPD-433).
2. Enter a name for the project (e.g., dome).
3. Select the location where the project should be saved (Use the default path).
4. Select the orientation for the display (e.g., Landscape).
5. Select the Default Programming Type (e.g., Ladder).
6. Click the “OK” button to save the configuration and close the dialog box.

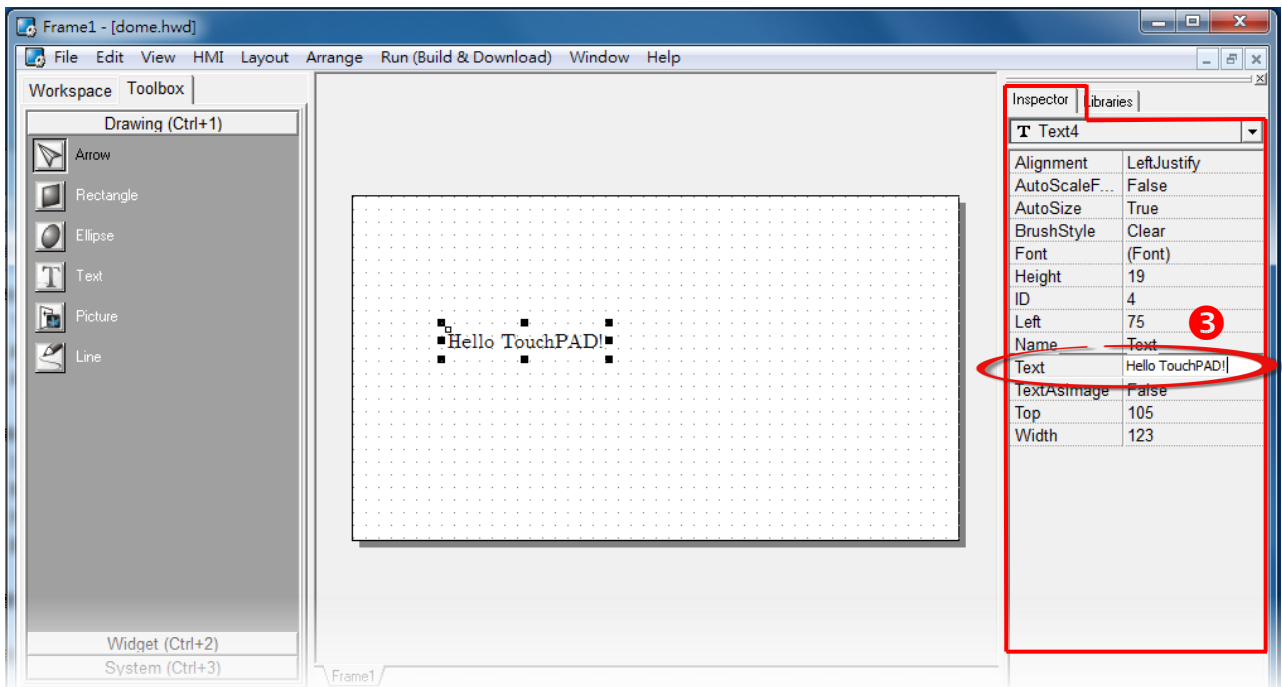


Step 4: The following example creates a simple procedure that displays the string **“Hello TouchPAD!”** on the screen of the TouchPAD device.

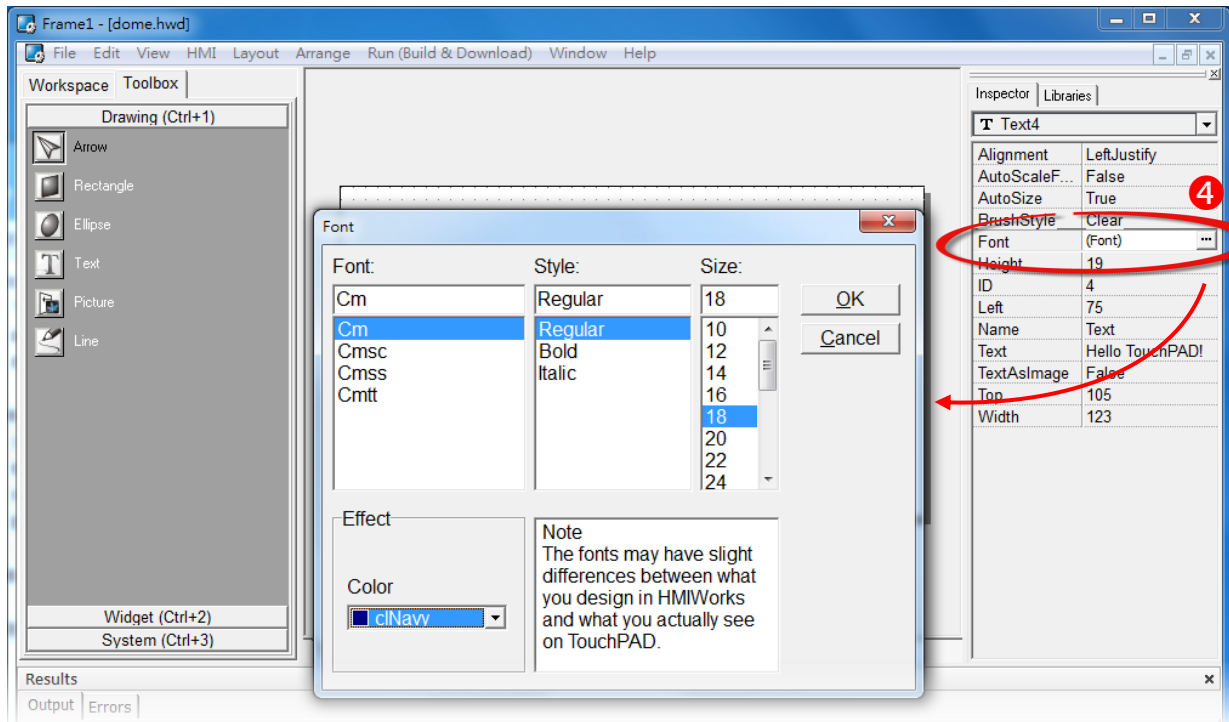
1. Click the **“Text”** icon from the **“Toolbox”** pane.
2. Drag and click the **“Text”** tag to the desired position on the design frame.



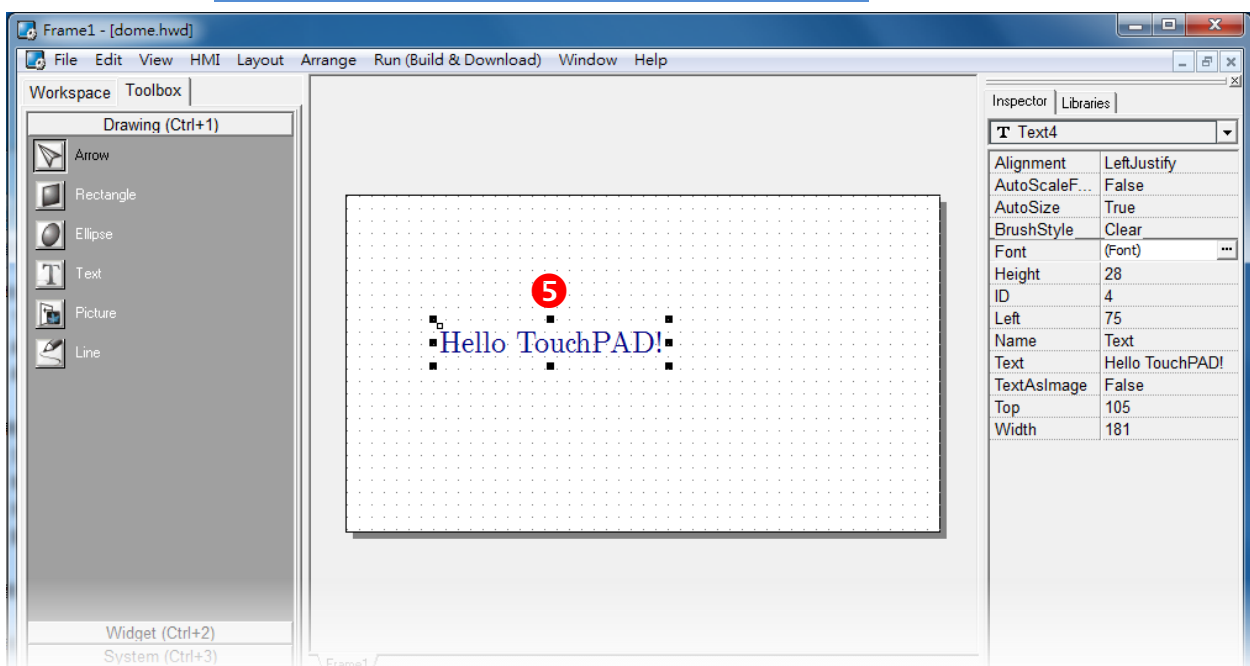
3. Enter the **“Hello TouchPAD!”** in the **“Text”** field from the **“Inspector”** pane and press **“Enter”** key.



- Click the “...” icon in the “Font” field from the “Inspector” pane to setting the text size, style, color, etc.



- The creation of the string “Hello TouchPAD!” sample is now complete, it can be uploaded to the TouchPAD device, refer to [Section 3.3 “Supply Power to the TouchPAD”](#) and [Section 3.4 “Downloading Methods for TouchPAD”](#) for more details.



3.3 Supply Power to the TouchPAD

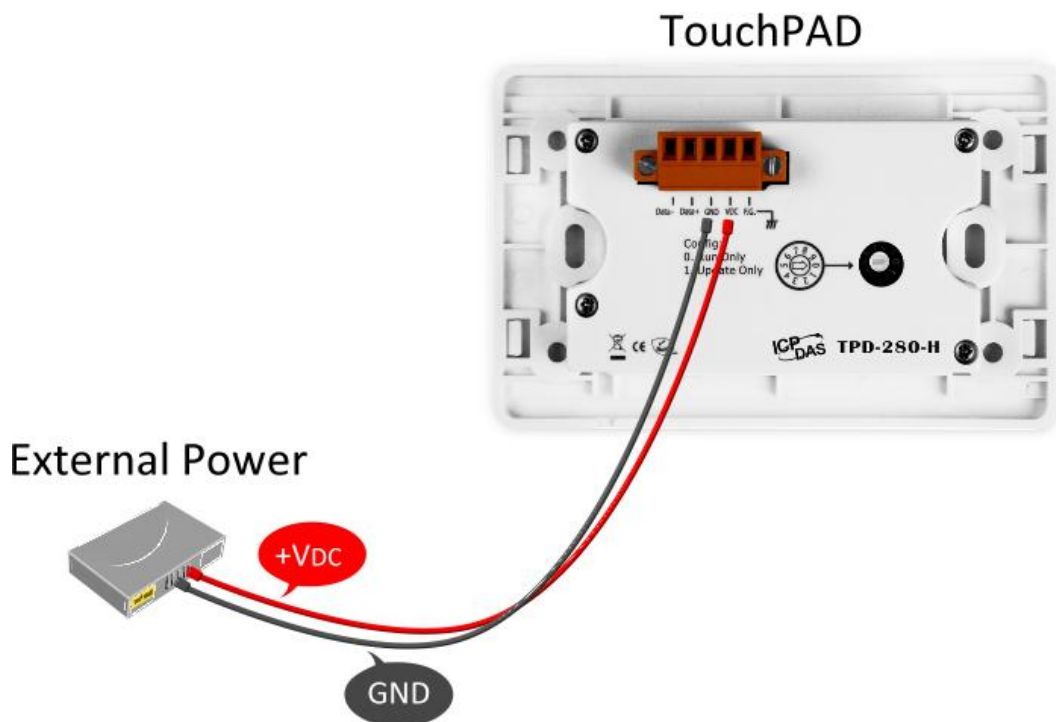
The power supply is divided into two kinds, namely Ethernet power supply (PoE) and DC power supply. The detailed wiring information is as follows:

3.3.1 DC Power Supply

Step 1: Connect the **External Power Supply (+24 V)** to the **VDC pin** on the TouchPAD device.

- TPD-280-H/283U-H/280-Mx/283U-Mx/703/703-64 and VPD-13x/14x Series models power supply can range from **+12 to +48 V_{DC}**.
- TPD-280/280U/283U/430/430-EU/433/433-EU/432F/433F Series models power supply can range from **+10 to +30 V_{DC}**.

Step 2: Connect the **External Power Supply GND** to the **GND pin** on the TouchPAD device.



3.3.2 PoE Power Supply

When using PoE devices such as the TPD-283/283-H/283U/283-Mx/283U-Mx/283U-H/433/433-EU/433F/703/703-64 and VPD-133/133N/143/143N, you can incorporate the ICP DAS “PoE” switch, the “NS-205PSE”, as the power source. The NS-205PSE automatically detects any connected devices, whether they are PoE devices or not. This mechanism ensures that the NS-205PSE will function simultaneously with both PoE and non-PoE devices.

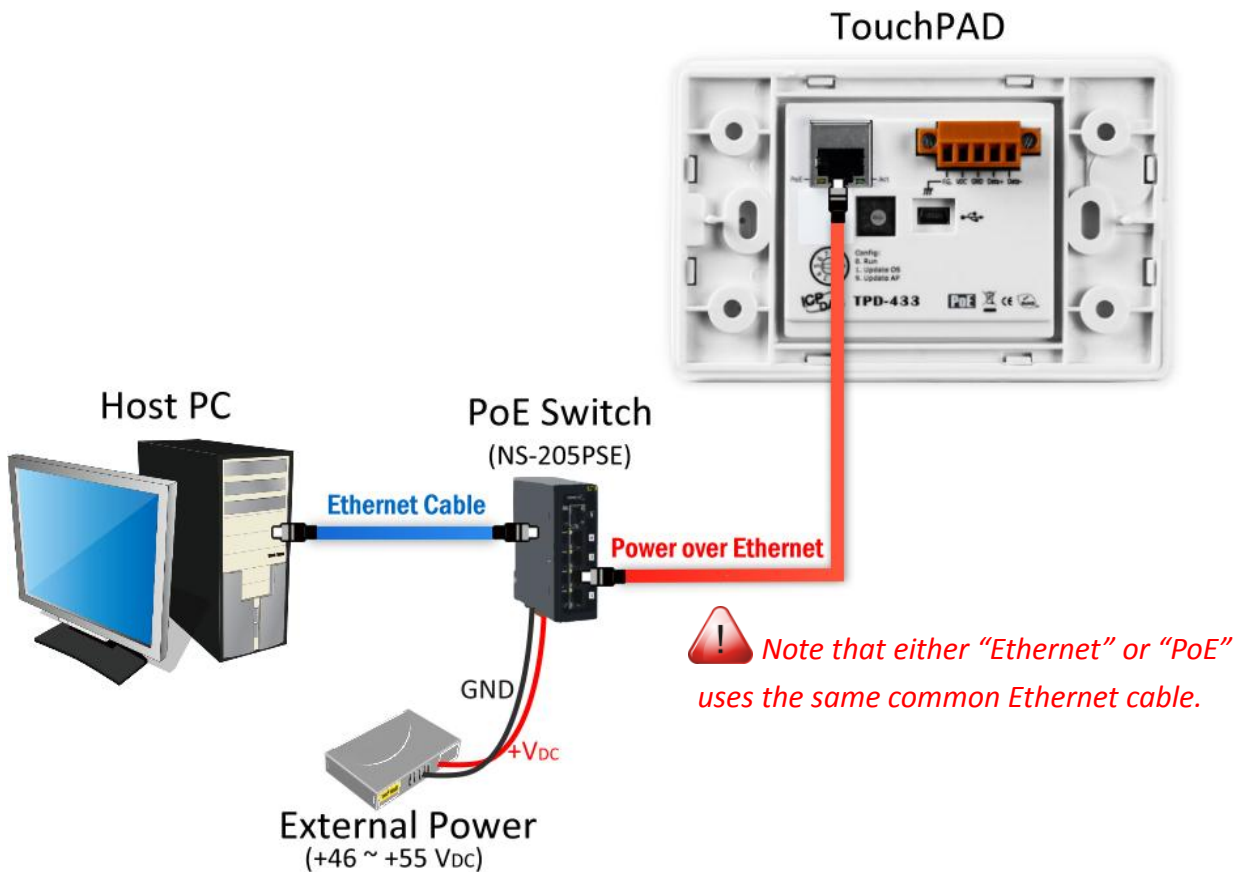


Note:

1. *When acting as a power source for a PoE device, the NS-205PSE requires a power input ranging from +46 V_{DC} to +55 V_{DC}.*
2. *PoE (Power over Ethernet) means that the Ethernet cable conveys not only data but also power.*



Step 1: Connect both the TouchPAD device and the Host PC to the same sub network or use a Power over Ethernet Switch (e.g., an NS-205PSE) and supply power to the TouchPAD device via the PoE Switch.



3.4 Downloading Methods for TouchPAD

The downloading applications program to the TouchPAD device is divided into three methods, RS-485, Ethernet and USB. The detailed wiring and configuration information is as follows:

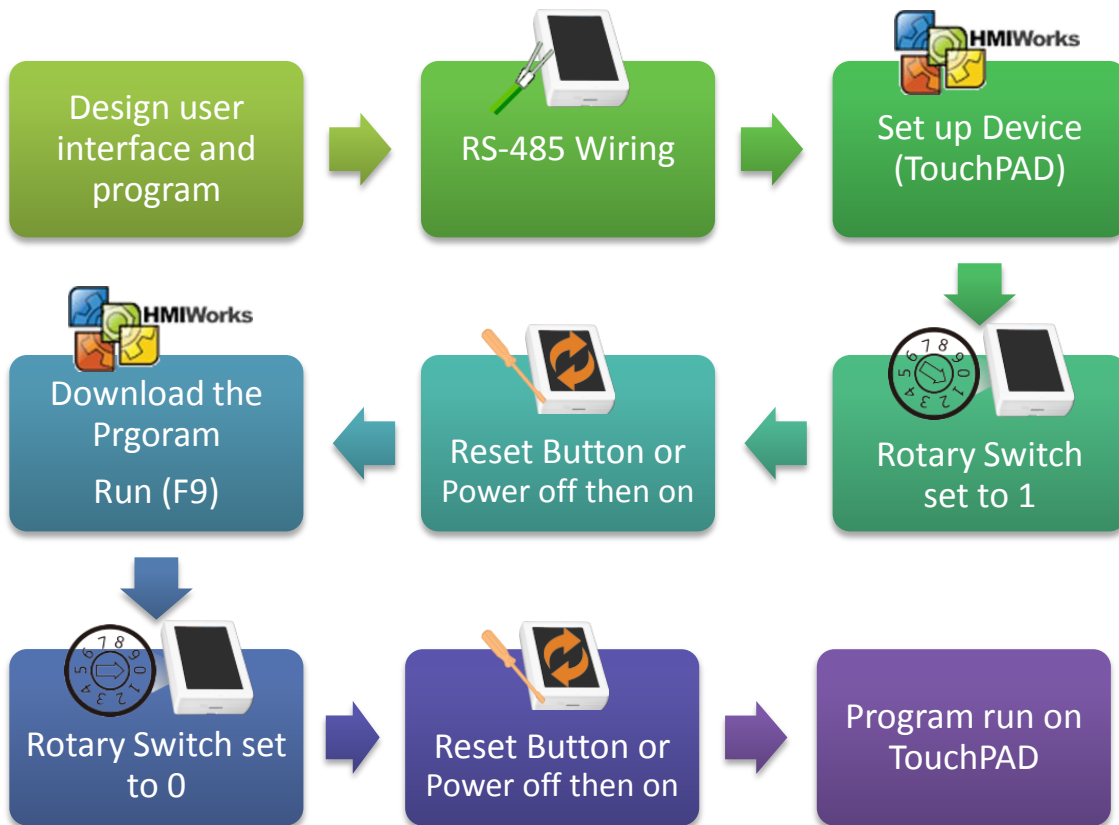
3.4.1 Setup RS-485-downloaded Devices

The TouchPAD Series models listed below use RS-485 to download the HMIWorks-built applications into TouchPAD:

-
- | | |
|---|--|
| <input checked="" type="checkbox"/> TPD-280 | <input checked="" type="checkbox"/> TPD-280-M1/M2/M3 |
| <input checked="" type="checkbox"/> TPD-280-H | |
-

3.4.1.1 Applications are downloaded through RS-485

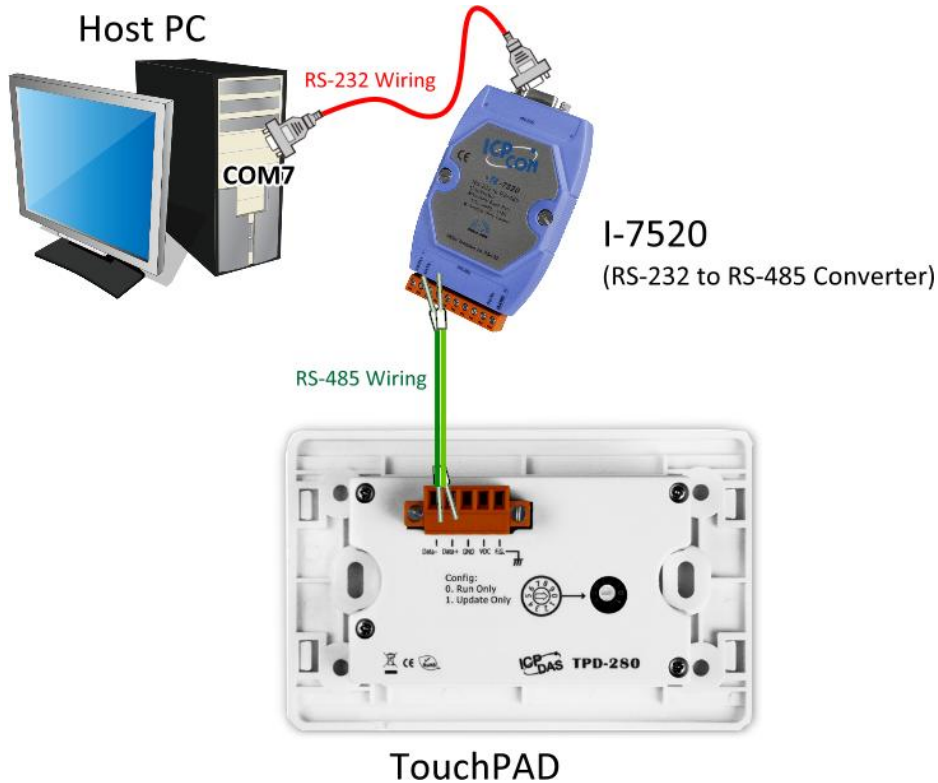
➤ The following flow chart describes the RS-485-downloaded devices.



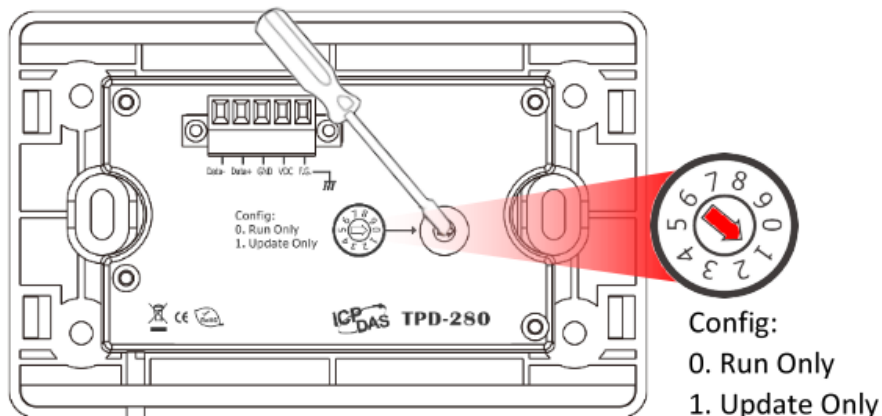
➤ Follow the procedure described below:

Step 1: Attach a power supply to the TouchPAD device. Refer to [Section 3.3 “Supply Power to the TouchPAD”](#) for more details.

Step 2: Connect the TouchPAD device to the **Host PC** using an **I-7520 module** (Option).



Step 3: Use a flat-head screwdriver to set the **Rotary Switch** on the TouchPAD device to **“Update Only”** mode (position 1). **Reboot the TouchPAD device** and then setting is complete. *Note that the default configuration is “Run Only” mode (position 0).*

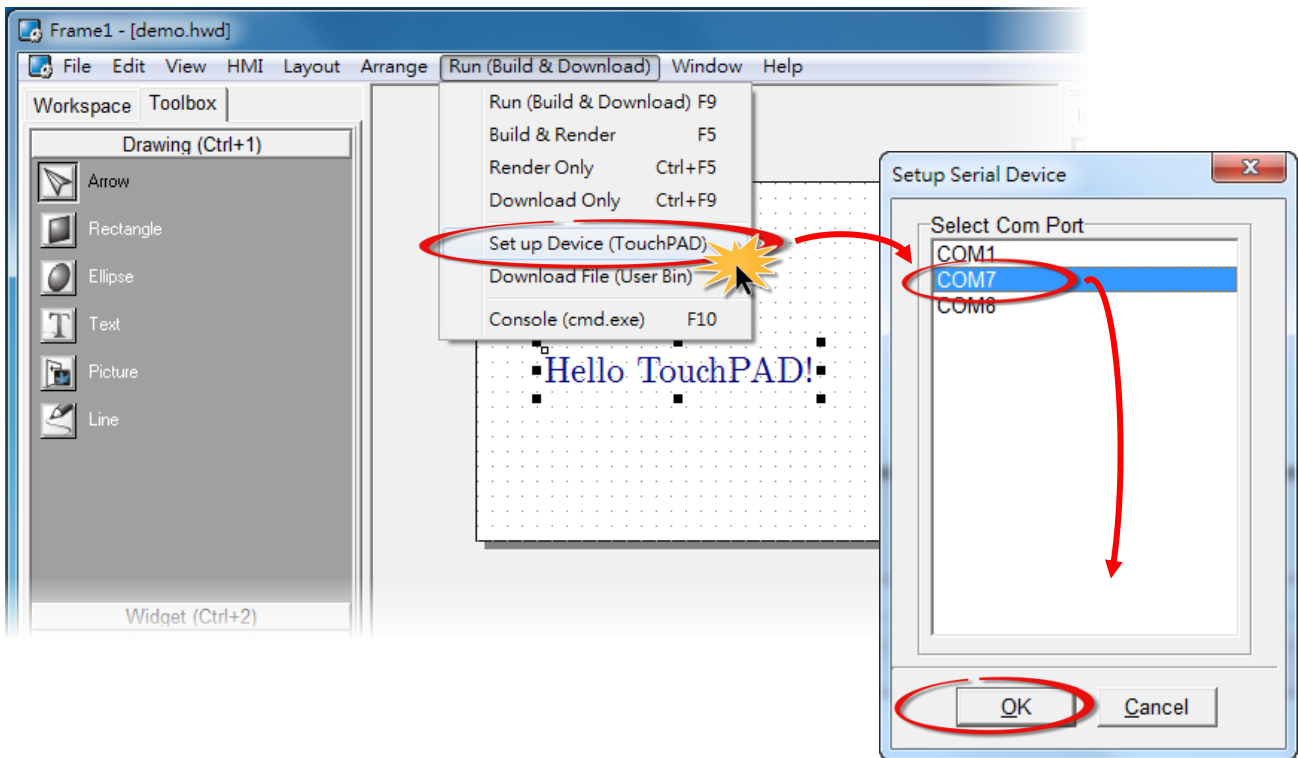




Note: Before downloading programs to the TouchPAD device, be sure to **set up the TouchPAD device to connect to it first.**

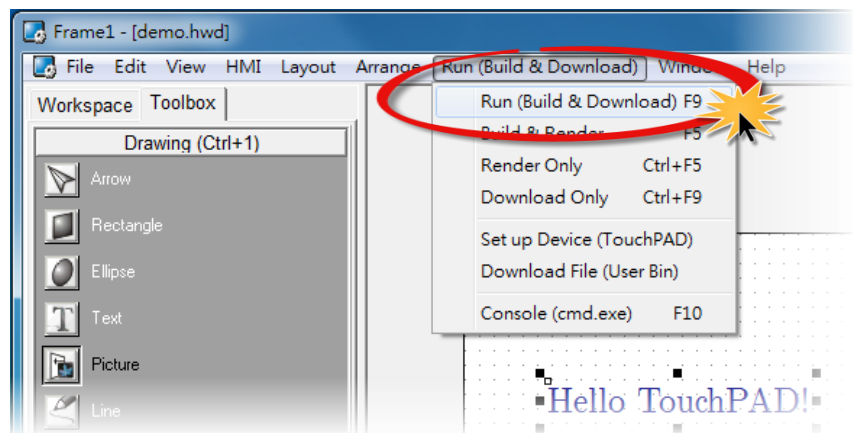
Step 4: In the HMIWorks software, click the **“Set up Device (TouchPAD)”** item from the **“Run (Build & Download)”** menu to open **“Select Com Port”** dialog box.

Step 5: In the **“Select Com Port”** dialog box, **Select the COM Port** (e.g., COM7) depend on your PC COM Port that connect to TouchPAD device and click the **“OK”** button.

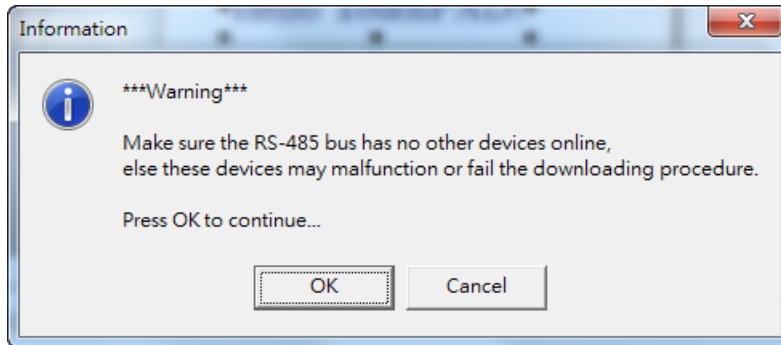


Note: Verify that the new project has been created (see [Section 3.2 “Create a New Project in the HMIWorks”](#)).

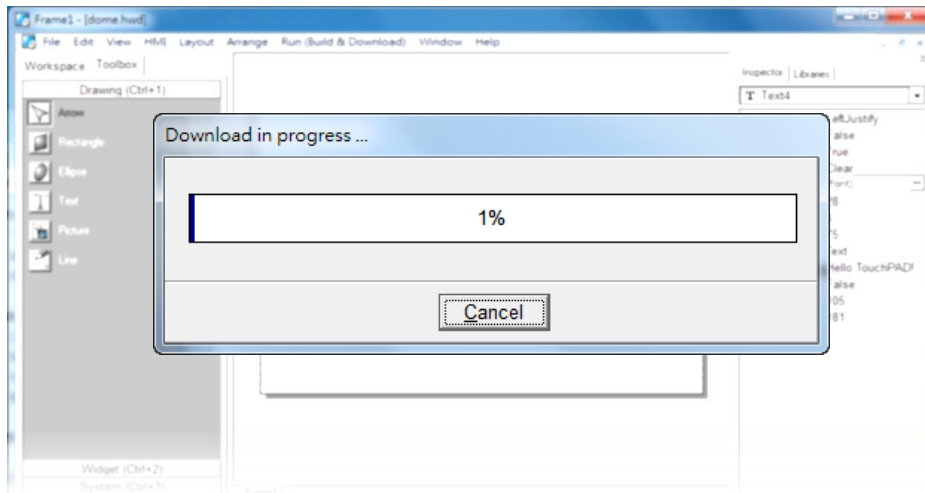
Step 6: Click the **“Run (Build & Download) F9”** item from the **“Run (Build & Download)”** menu, or press **F9**.



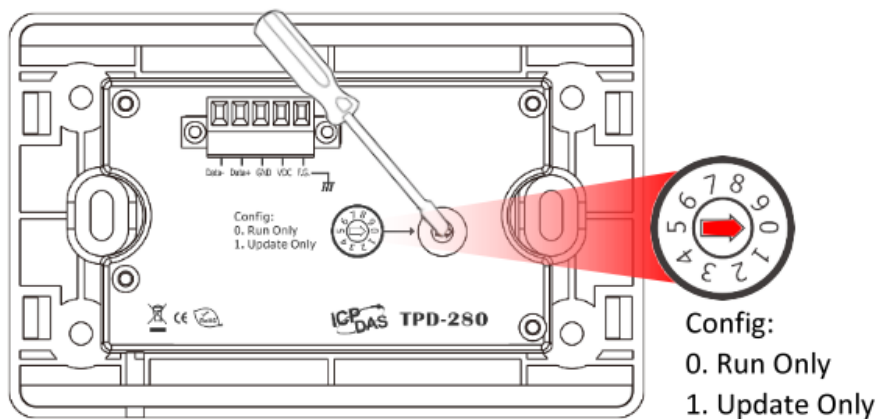
Step 7: A “*** Warning***” dialog box will be displayed and click the “OK” button to continue.



Step 8: The “Download in progress...” dialog box will be displayed showing the progress of the update.



Step 9: Once the upload is complete (i.e., when the progress indicator reaches 100%), **power off the TouchPAD device** and set the **Rotary Switch to “Run Only” mode (position 0)**.

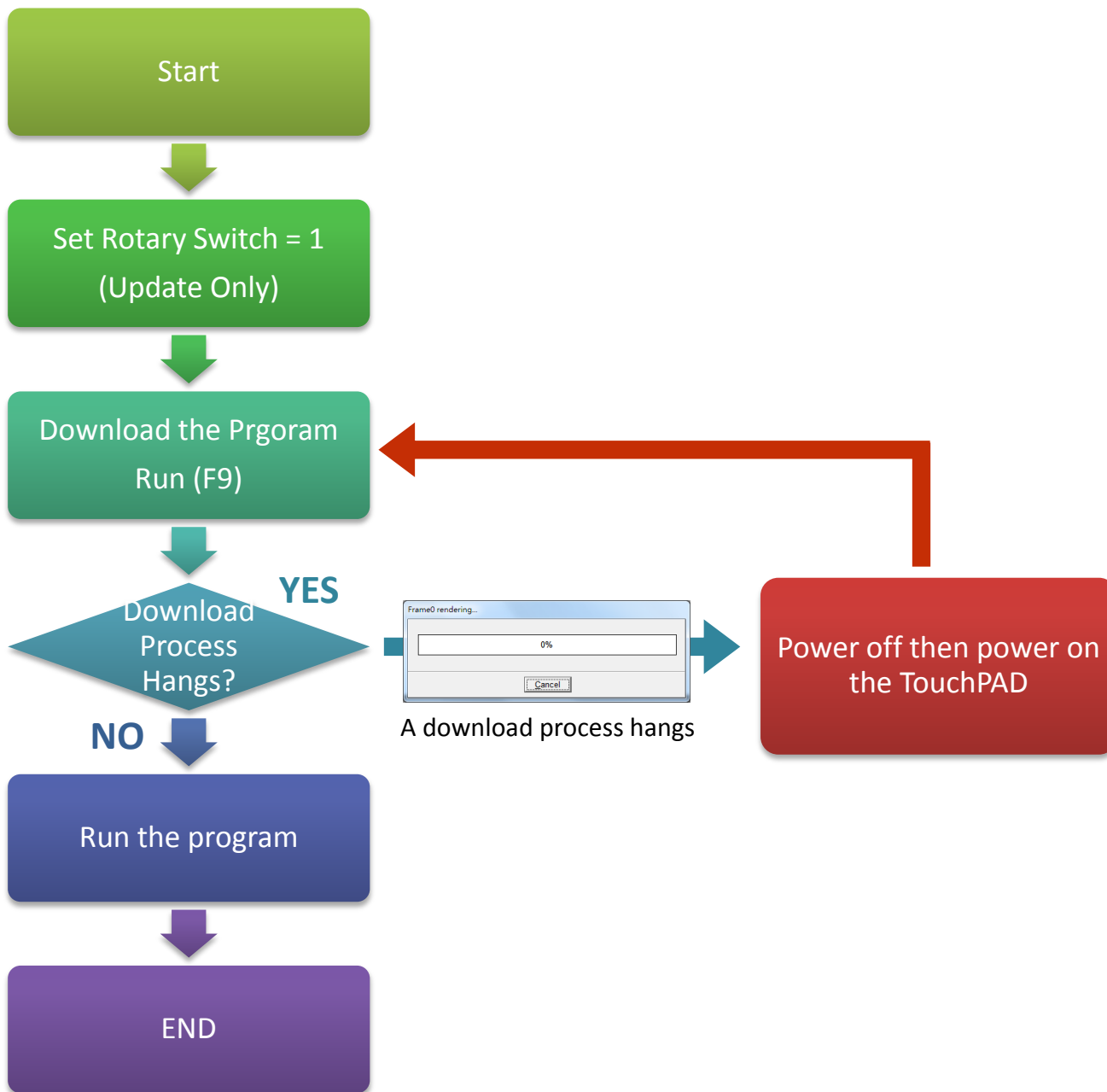


Step 10: Power-on and reboot TouchPAD device so that the module is operating in **“Run Only” mode**. The TouchPAD device will then execute the string **“Hello TouchPAD!”** sample.



3.4.1.2 What to do if the download process hangs?

Anytime download process hangs, users can follow the flow below to complete the download process.



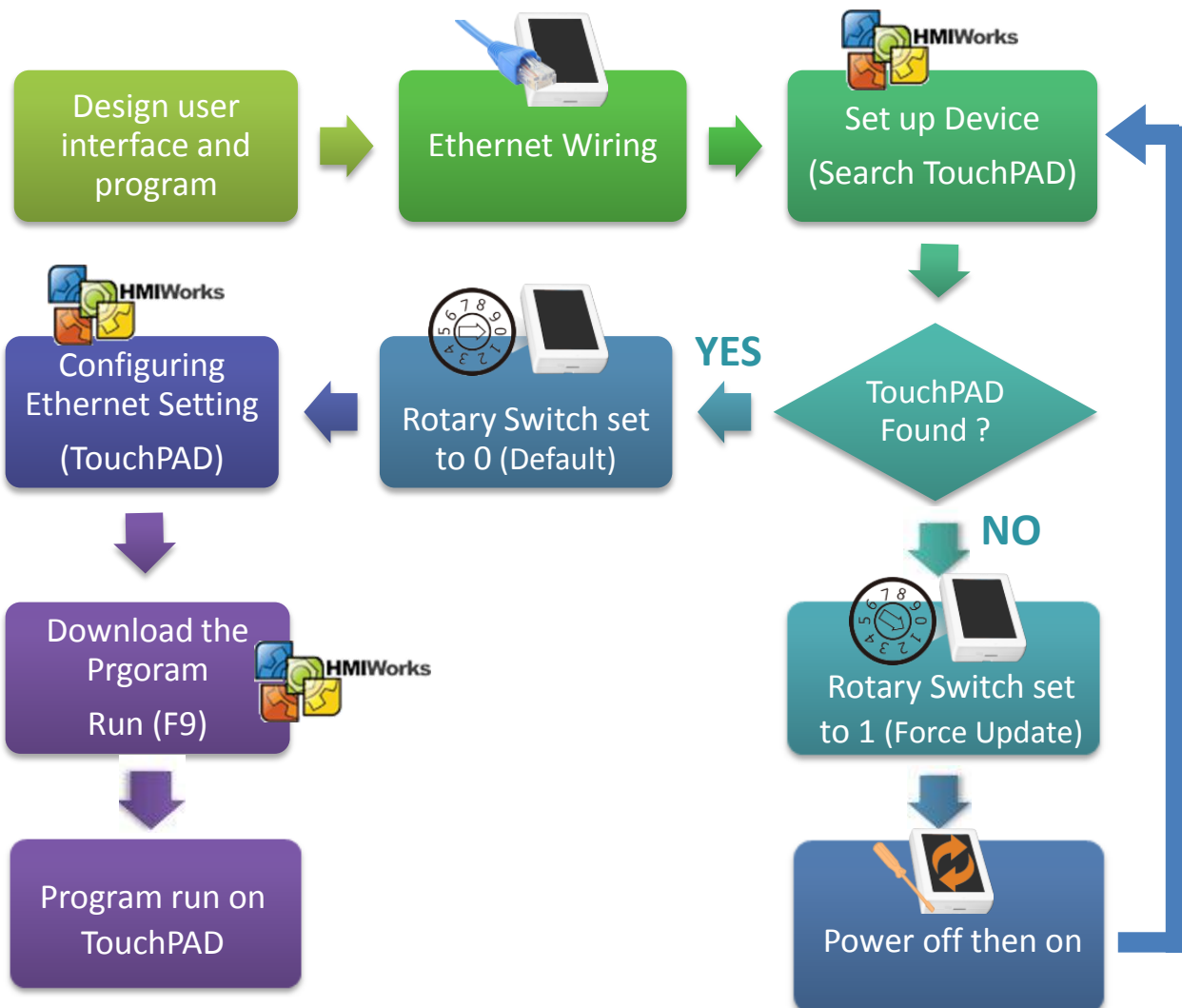
3.4.2 Setup Ethernet-downloaded Devices

The TouchPAD Series models listed below use Ethernet to download the HMIWorks-built applications into TouchPAD:

- | | |
|--|---|
| <input checked="" type="checkbox"/> TPD-283 | <input checked="" type="checkbox"/> TPD-283-M1/M2/M3 |
| <input checked="" type="checkbox"/> TPD-283-H | <input checked="" type="checkbox"/> TPD-283U-M1/M2/M3 |
| <input checked="" type="checkbox"/> TPD-283U-H | <input checked="" type="checkbox"/> TPD-703/703-64 |

3.4.2.1 Applications are downloaded through Ethernet

➤ The following flow chart describes the Ethernet-downloaded devices.

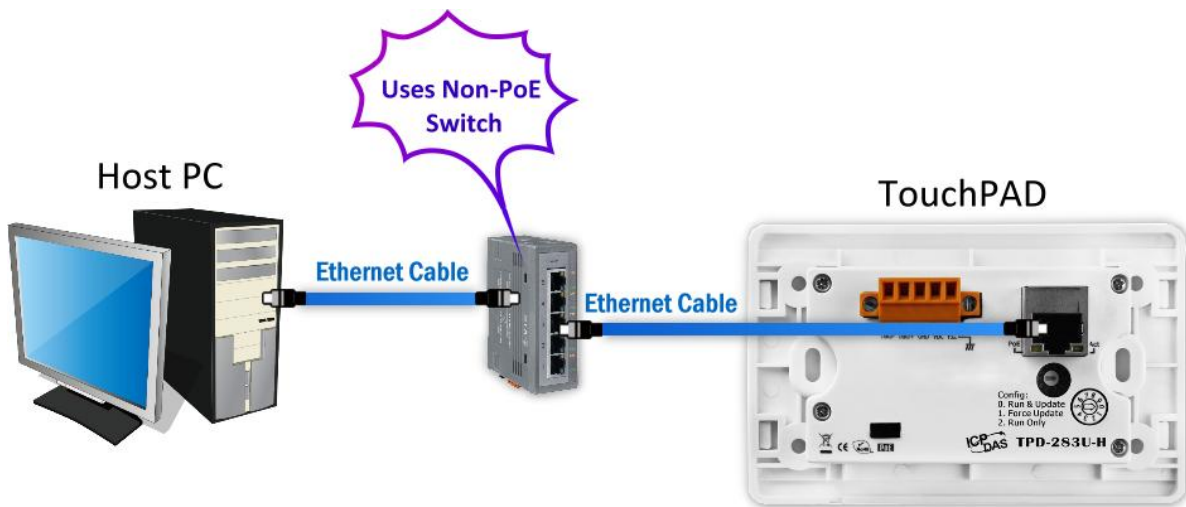




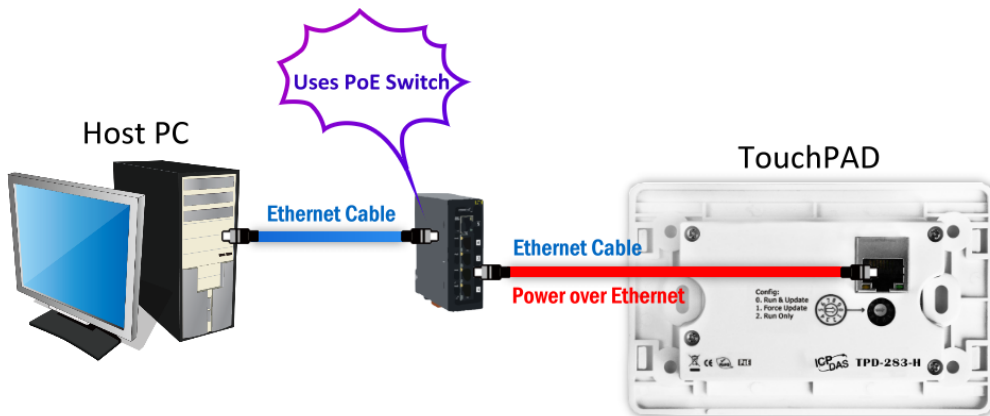
➤ Follow the procedure described below:

Step 1: Attach a power supply to the TouchPAD device. Refer to [Section 3.3 “Supply Power to the TouchPAD”](#) for more details.

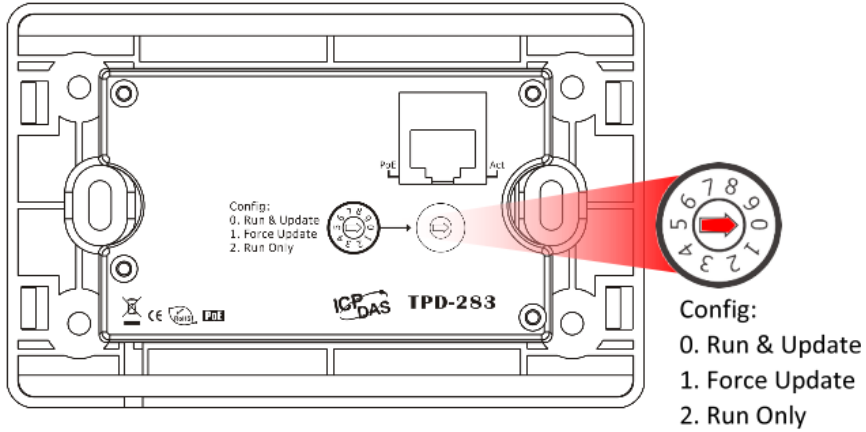
Step 2: Connect the TouchPAD device to the same hub or the same sub-network as the Host PC using an **Ethernet cable**.



! *Note that if you use PoE power supply to TouchPAD device, please keep the original network wiring.*

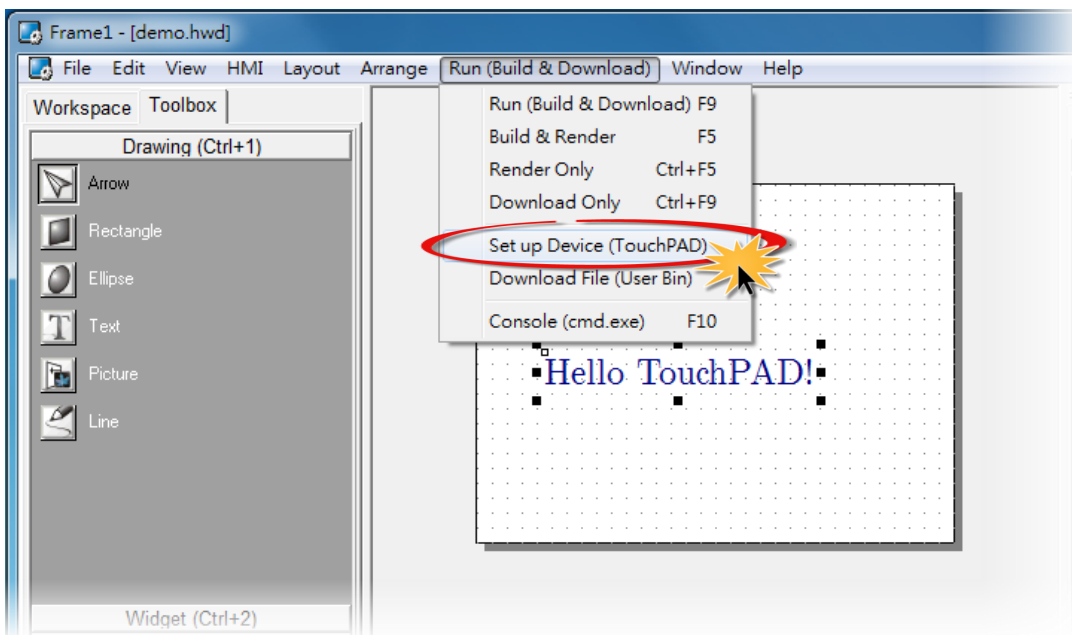


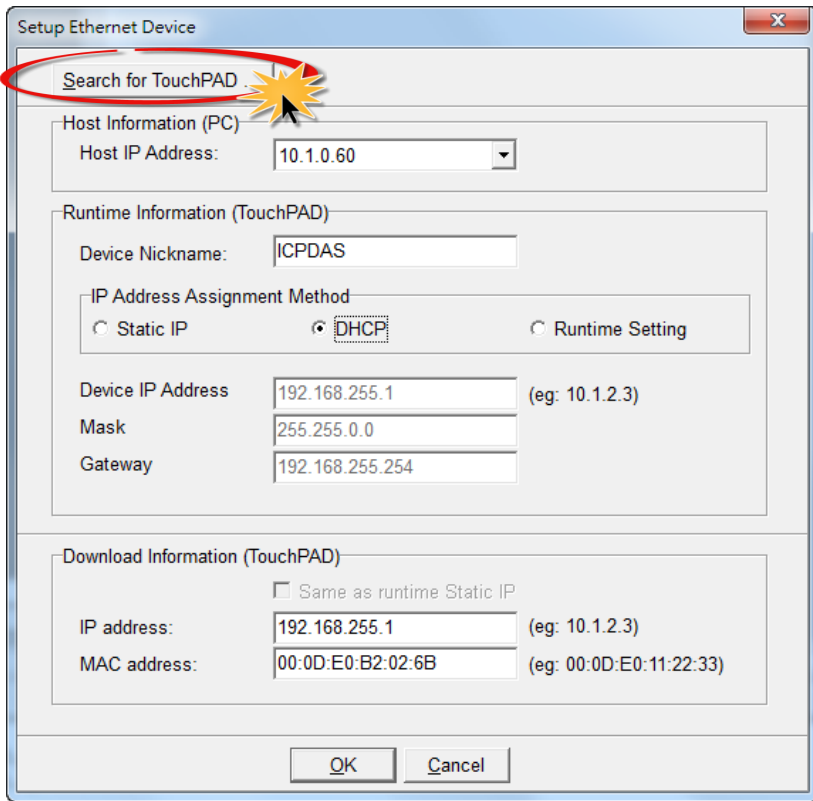
Step 3: Check that the **Rotary Switch** on the TouchPAD device is **“Run & Update”** mode (position 0).
Note that the default configuration is “Run & Update” mode (position 0).



Note: Before downloading programs to the TouchPAD device, be sure to **set up the TouchPAD device to connect to it first.**

Step 4: In the HMIWorks software, click the **“Set up Device (TouchPAD)”** item from the **“Run (Build & Download)”** menu to open **“Setup Ethernet Device”** dialog box.






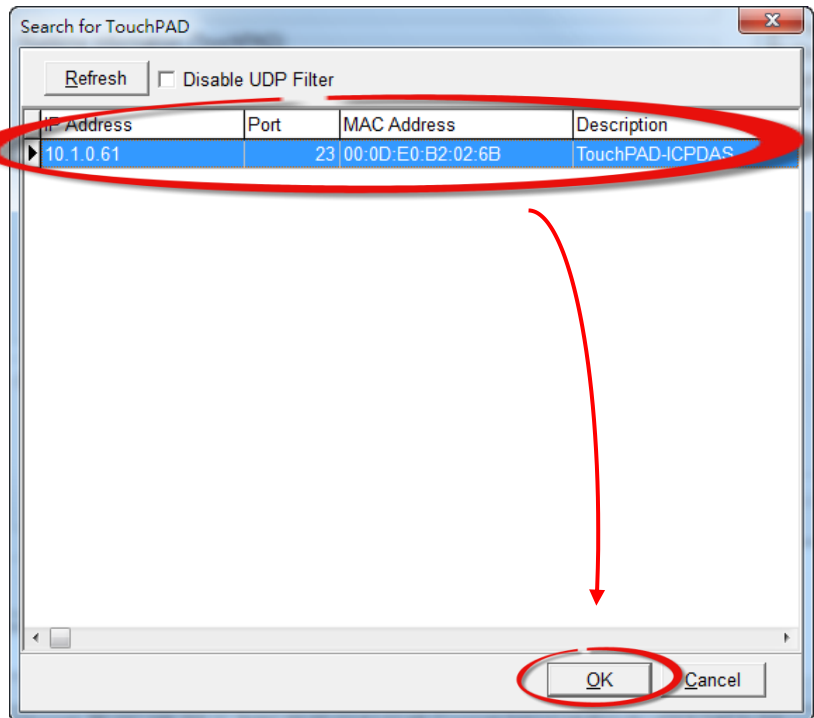
Step 5: In the “Setup Ethernet Device” dialog box, click the “Search for TouchPAD...” button to open “Search for TouchPAD” dialog box.

The following is factory default settings of the TouchPAD device:

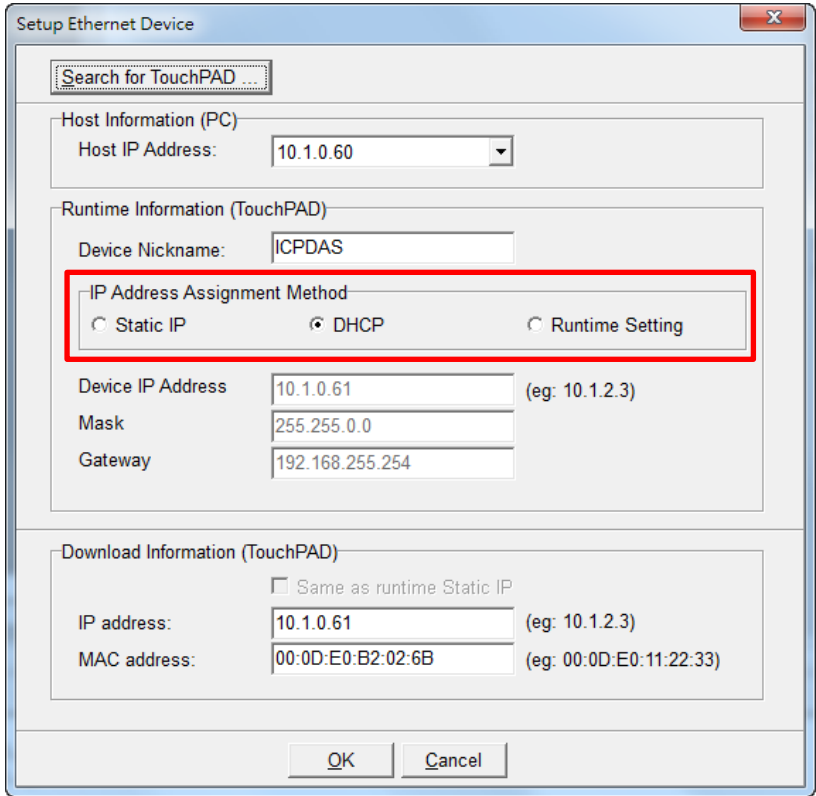
Item	Value
IP Address	192.168.255.1
Type	Static IP
Mask	255.255.0.0
Gateway	192.168.255.254

Step 6: If the TouchPAD device is found and displayed in the list on the “Search for TouchPAD” dialog box, **select the TouchPAD item depend on MAC Address of your TouchPAD device** and click the “OK” button to bring the information back to the “Setup Ethernet Device” dialog box.

 **Note:** You can find the MAC address on the back of the TouchPAD.



Step 7: In the “Setup Ethernet Device” dialog box, select the “DHCP”, “Static IP” or “Runtime Setting” (e.g., DHCP) in the “IP Address Assignment Method” field.

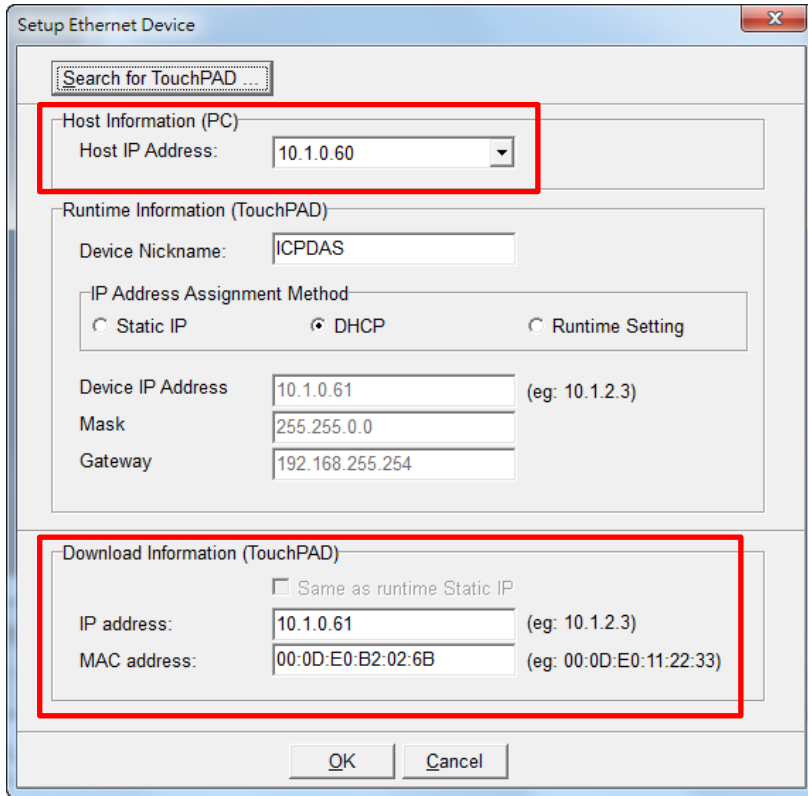



Notes:

1. When using “Static IP” or “DHCP”, the IP settings are stored as a part of the program image, and only successful downloading can update the IP settings.
2. When using “Runtime Setting”, the program image has no information about the IP settings, and TouchPAD loads the IP information from the flash at the runtime. Before IP settings are used, be sure to set the IP settings into the flash by the related API functions. We have demo to do this as well.

Step 8: Verify that “Host IP Address” and “TouchPAD IP Address” in the same subnet.

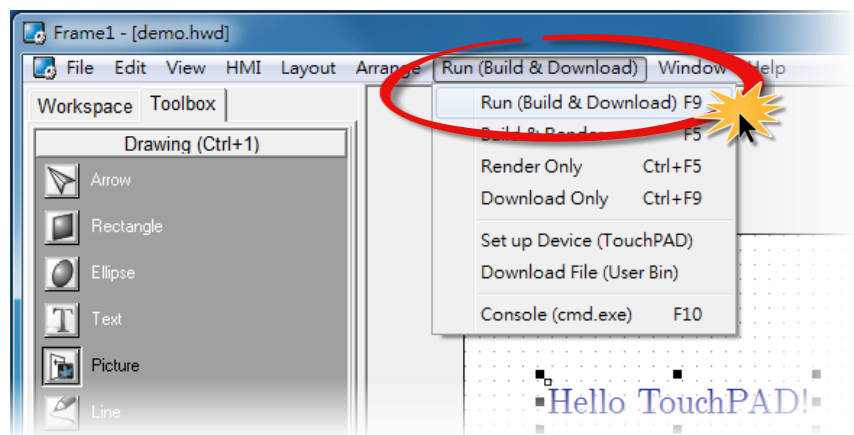
Step 9: Verify that “TouchPAD MAC Address” must match the MAC Address of your TouchPAD device, and click the “OK” button.



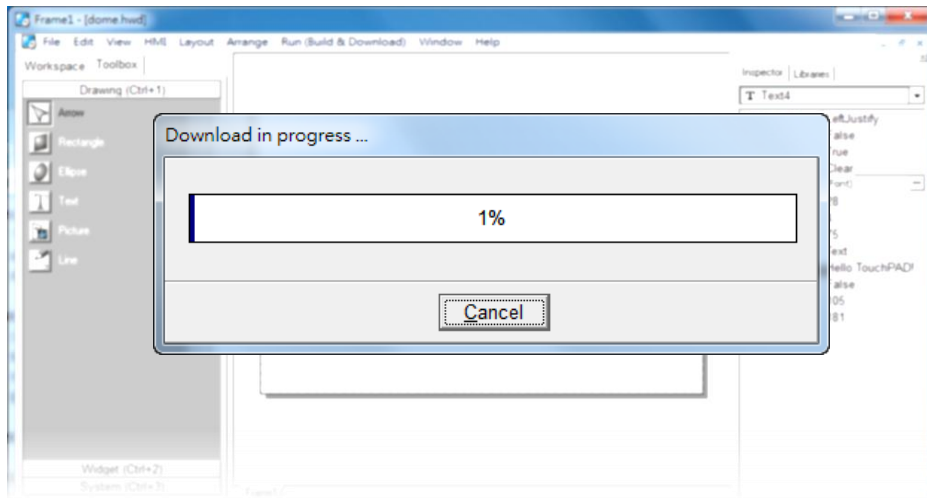
 **Note:** You can find the MAC address on the back of the TouchPAD

 **Note:** Verify that the new project has been created (see [Section 3.2 “Create a New Project in the HMIWorks”](#)).

Step 10: Click the “Run (Build & Download) F9” item from the “Run (Build & Download)” menu, or press F9.



Step 11: The “Download in progress...” dialog box will be displayed showing the progress of the update.

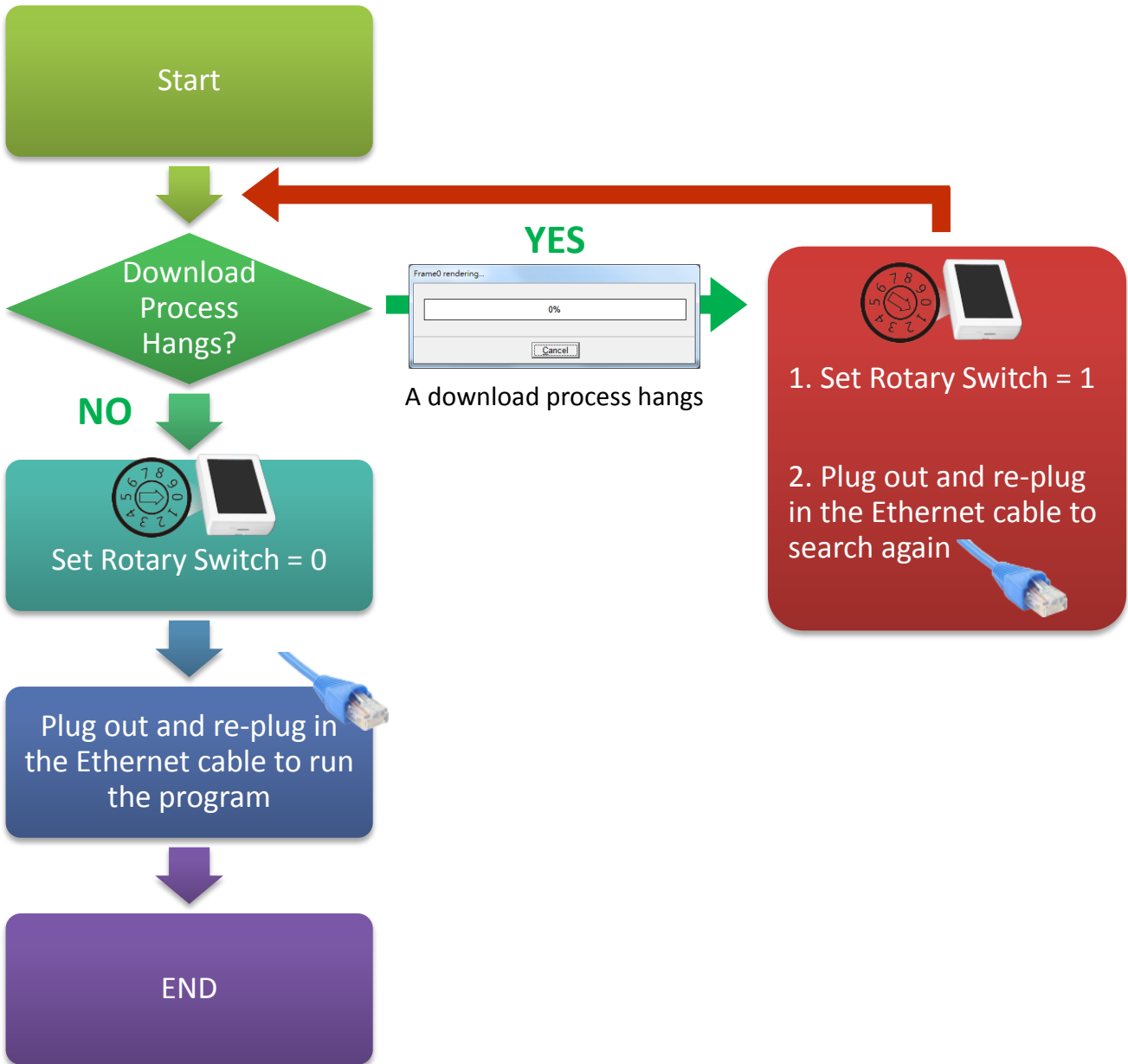


Step 12: The TouchPAD device will then execute the string “Hello TouchPAD!” sample.



3.4.2.2 What to do if the download process hangs?

Anytime download process hangs, users can follow the flow below to complete the download process. (Note that below is not just for the case after setup device.)



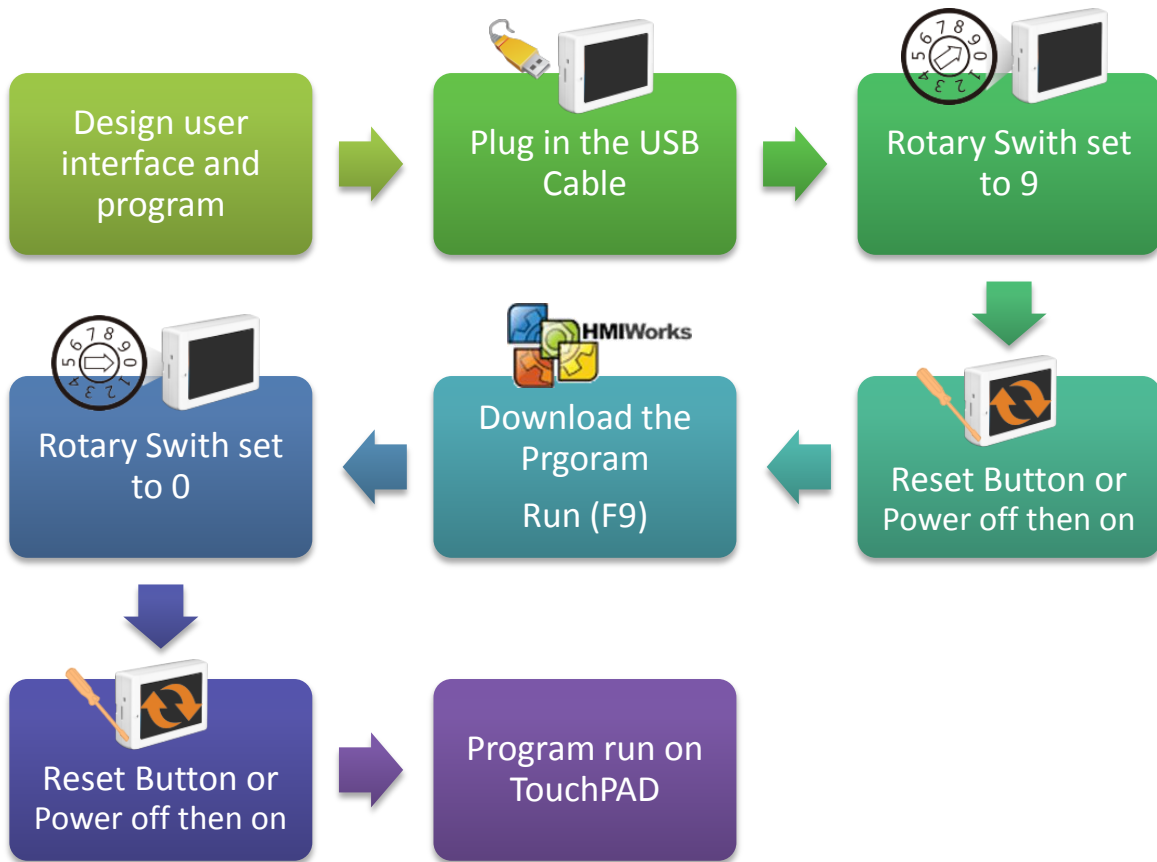
3.4.3 Setup USB-downloaded Devices

The TouchPAD Series models listed below use USB Port to download the HMIWorks-built applications into TouchPAD:

<input checked="" type="checkbox"/> TPD-280U	<input checked="" type="checkbox"/> VPD-130/130N
<input checked="" type="checkbox"/> TPD-283U	<input checked="" type="checkbox"/> VPD-132/132N
<input checked="" type="checkbox"/> TPD-430/430-EU	<input checked="" type="checkbox"/> VPD-133/133N
<input checked="" type="checkbox"/> TPD-433/433-EU	<input checked="" type="checkbox"/> VPD-142/142N
<input checked="" type="checkbox"/> TPD-432F/433F	<input checked="" type="checkbox"/> VPD-143/143N

3.4.3.1 Applications are downloaded through USB Port

➤ The following flow chart describes the USB-downloaded devices.



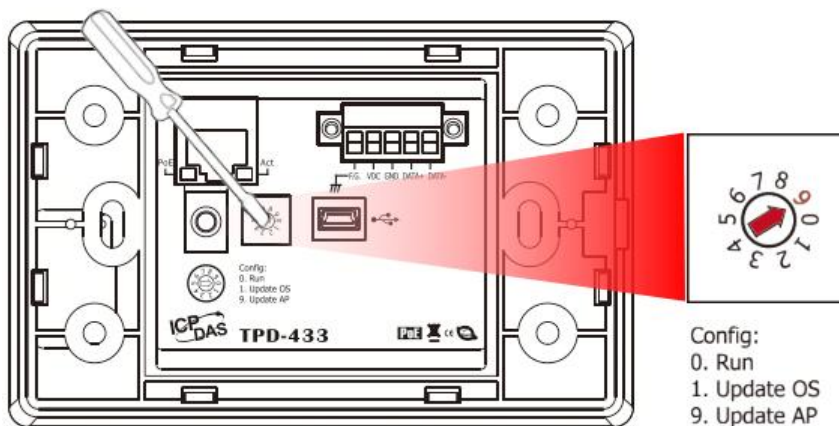
➤ Follow the procedure described below:

Step 1: Attach a power supply to the TouchPAD device. Refer to [Section 3.3 “Supply Power to the TouchPAD”](#) for more details.

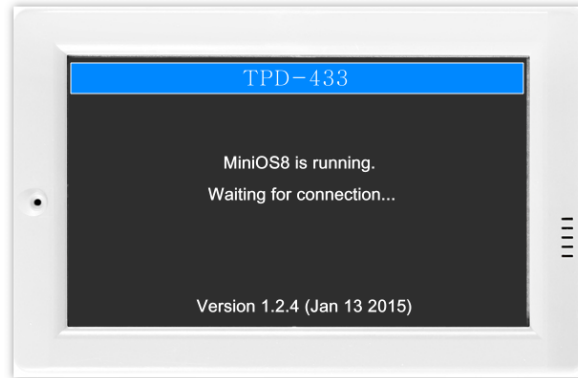
Step 2: Connect the TouchPAD device to the **Host PC** using a **CA-USB10** cable.



Step 3: Power off the TouchPAD device and use a flat-head screwdriver to set the **Rotary Switch** on the TouchPAD device to **“Update AP” mode (position 9)**. *Note that the default configuration is “Run” mode (position 0).*

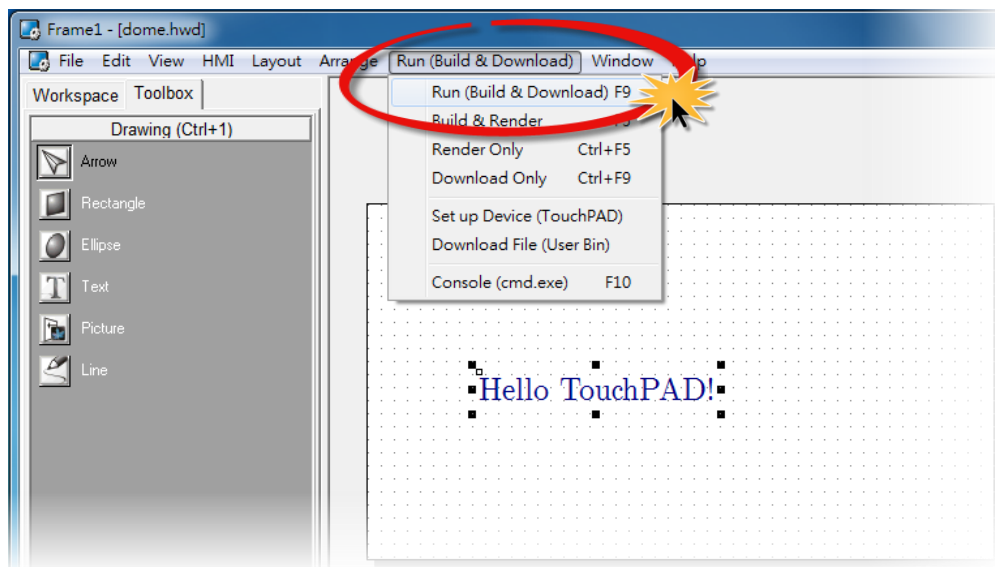


Step 4: Power-on and reboot the TouchPAD device, the message: “MiniOS8 is running. Waiting for connection...” will be displayed on TouchPAD device.

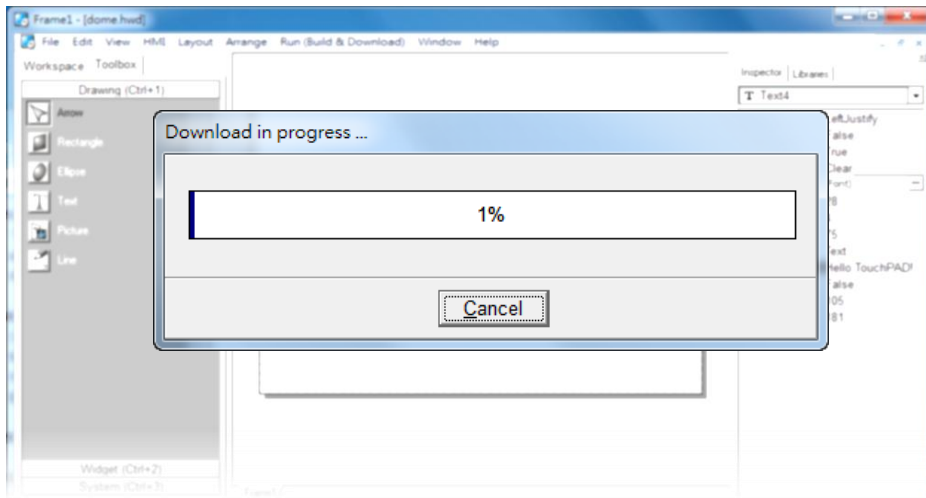


Note: Verify that the new project has been created (see [Section 3.2 “Create a New Project in the HMIWorks”](#)).

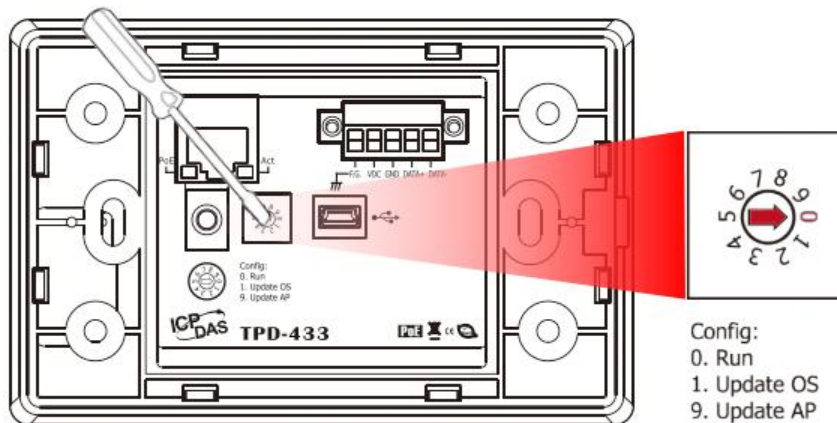
Step 5: In the HMIWorks software, click the “Run (Build & Download) F9” item from the “Run (Build & Download)” menu, or press F9.



Step 6: The “Download in progress...” dialog box will be displayed showing the progress of the update.



Step 7: Once the upload is complete (i.e., when the progress indicator reaches 100%), **power off the TouchPAD device** and set the **Rotary Switch to “Run” mode (position 0)**.



Step 8: Power-on and reboot TouchPAD device so that the module is operating in “Run” mode. The TouchPAD device will then execute the string “Hello TouchPAD!” sample.



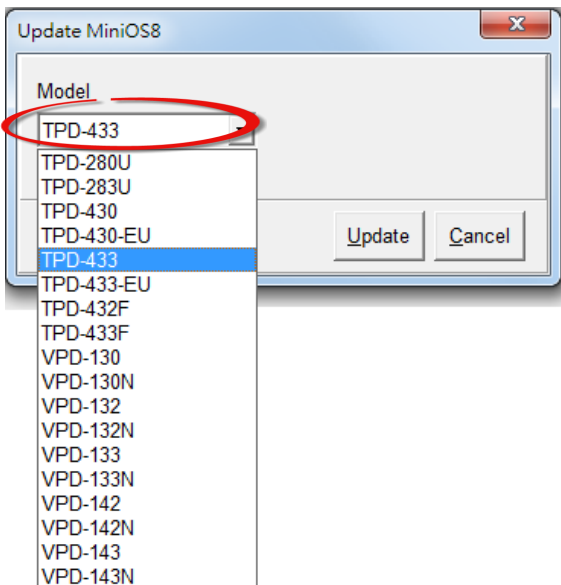
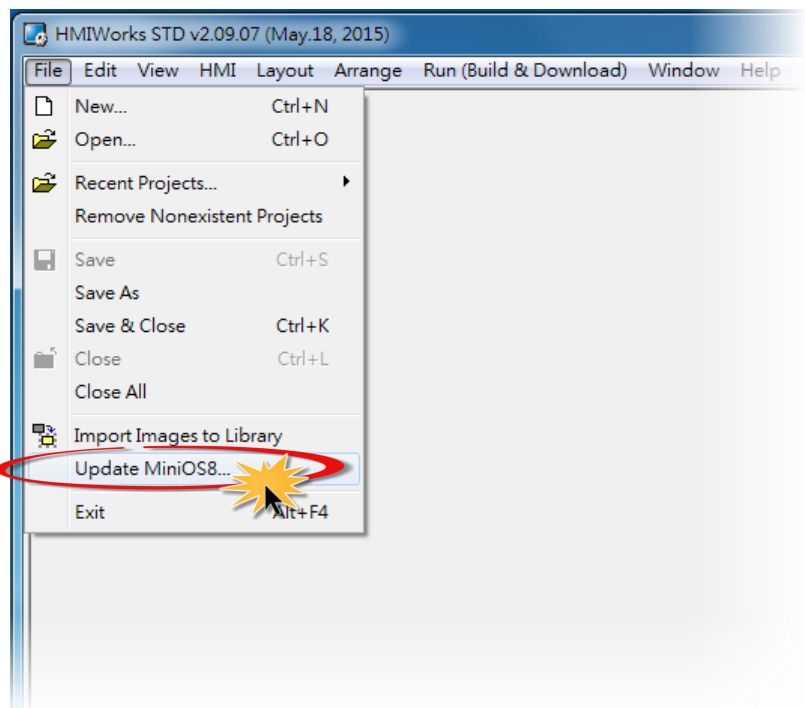


3.4.3.2 Updating MiniOS through USB Port

Some devices (e.g., TPD-280) in the TouchPAD series do not have MiniOS8 on them, but still some do have. Each version of HMIWorks corresponds to a version of MiniOS8. Though we try to achieve backward compability, we still suggest update MiniOS8 every time HMIWorks is updated.

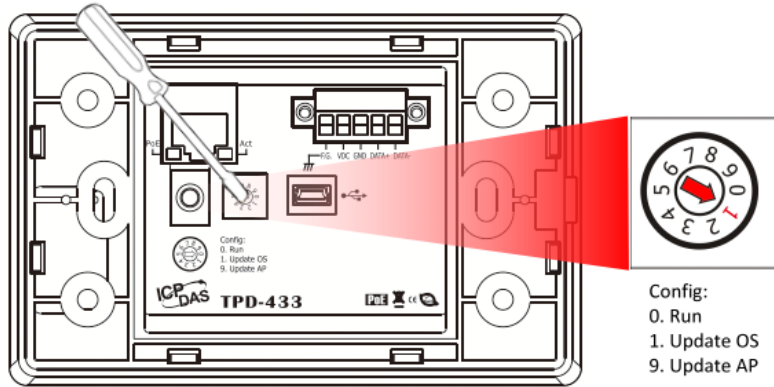
Follow the procedure described below to update the MiniOS8 for TouchPAD device:

Step 1: In the HMIWorks software, click the **“Update MiniOS8...”** item from the **“File”** menu to open **“Update MiniOS8”** dialog box.

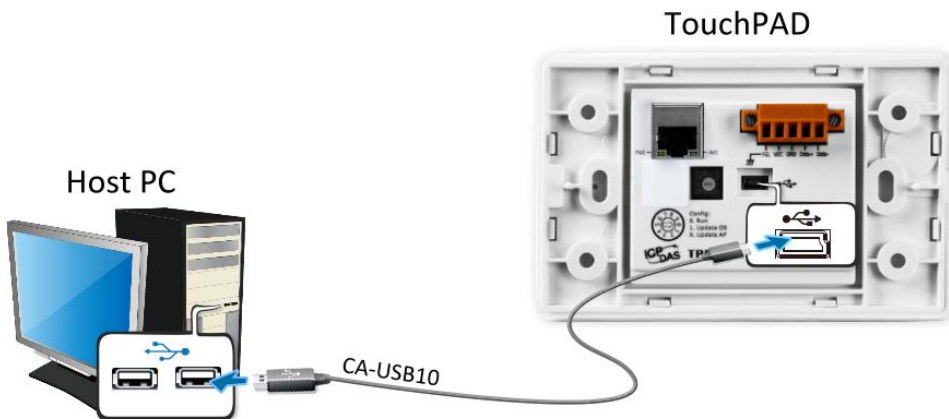


Step 2: The Model drop down list shows the models in the TouchPAD series that have MiniOS8. Select the model of the TouchPAD to update.

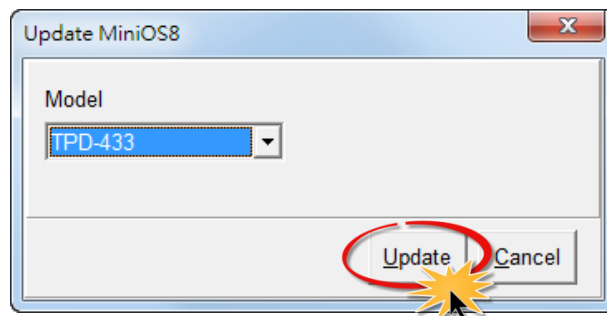
Step 3: Use a flat-head screwdriver to set the **Rotary Switch** on the TouchPAD device to **“Update OS” mode (position 1)** and power off then power on the TouchPAD. *Note that the default configuration is “Run” mode (position 0).*



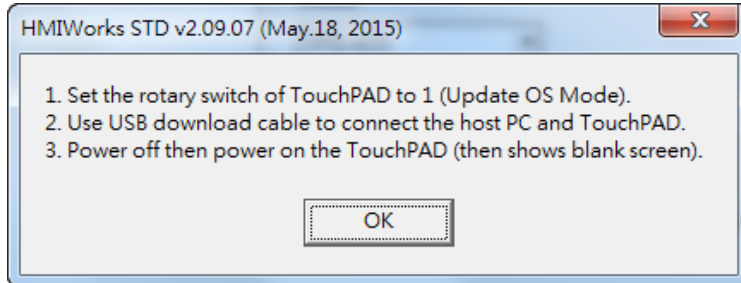
Step 4: Connect the TouchPAD device to the **Host PC** using a **CA-USB10** cable.



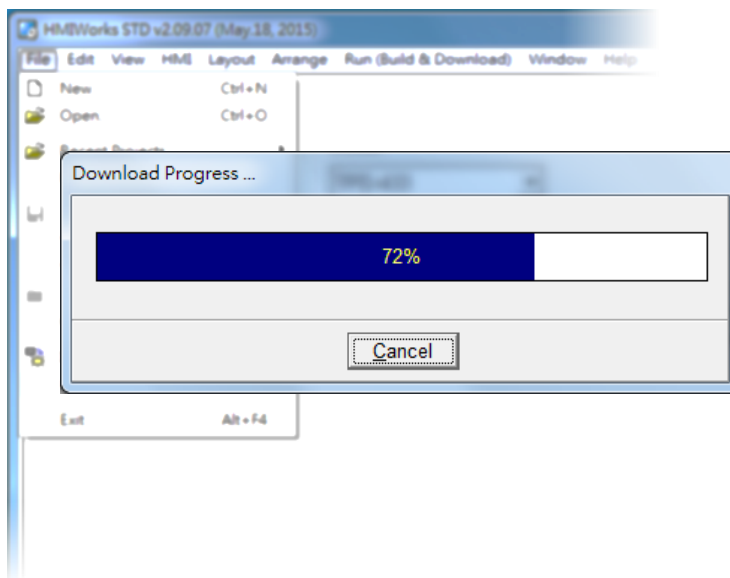
Step 5: In the “Update MiniOS8” dialog box, click the **“Update”** button to start update.



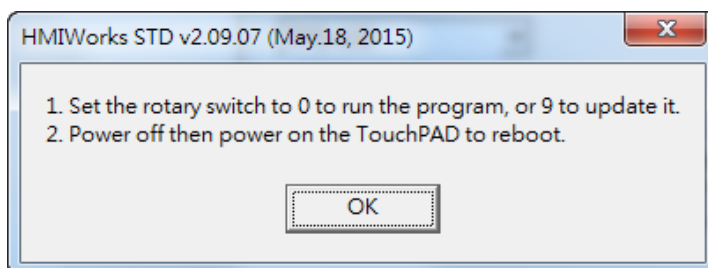
Step 6: Verify that steps 1 to 3 has been set in the configuration dialog box and click the **“OK”** button to continue.



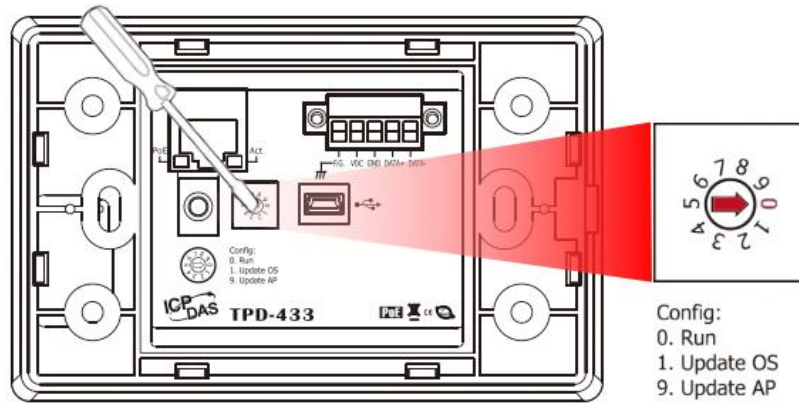
Step 7: The **“Download in progress...”** dialog box will be displayed showing the progress of the update.



Step 8: Once the upload is complete (i.e., when the progress indicator reaches 100%), a configuration dialog box will be displayed and click the **“OK”** button.

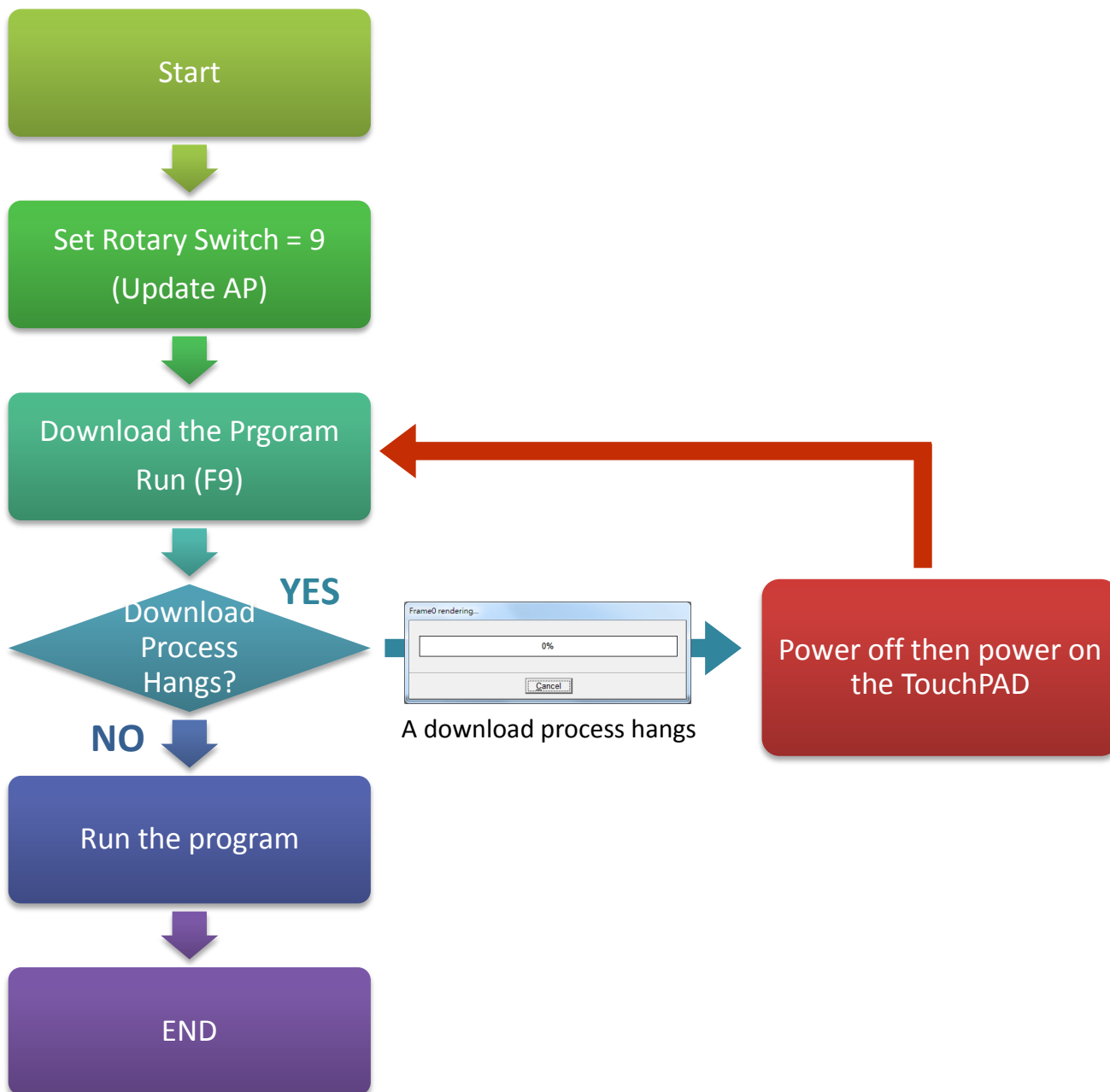


Step 9: Use a flat-head screwdriver to set the **Rotary Switch** on the TouchPAD device to **“Run” mode (position 0)** and power off then power on the TouchPAD.



3.4.3.3 What to do if the download process hangs?

Anytime download process hangs, users can follow the flow below to complete the download process.

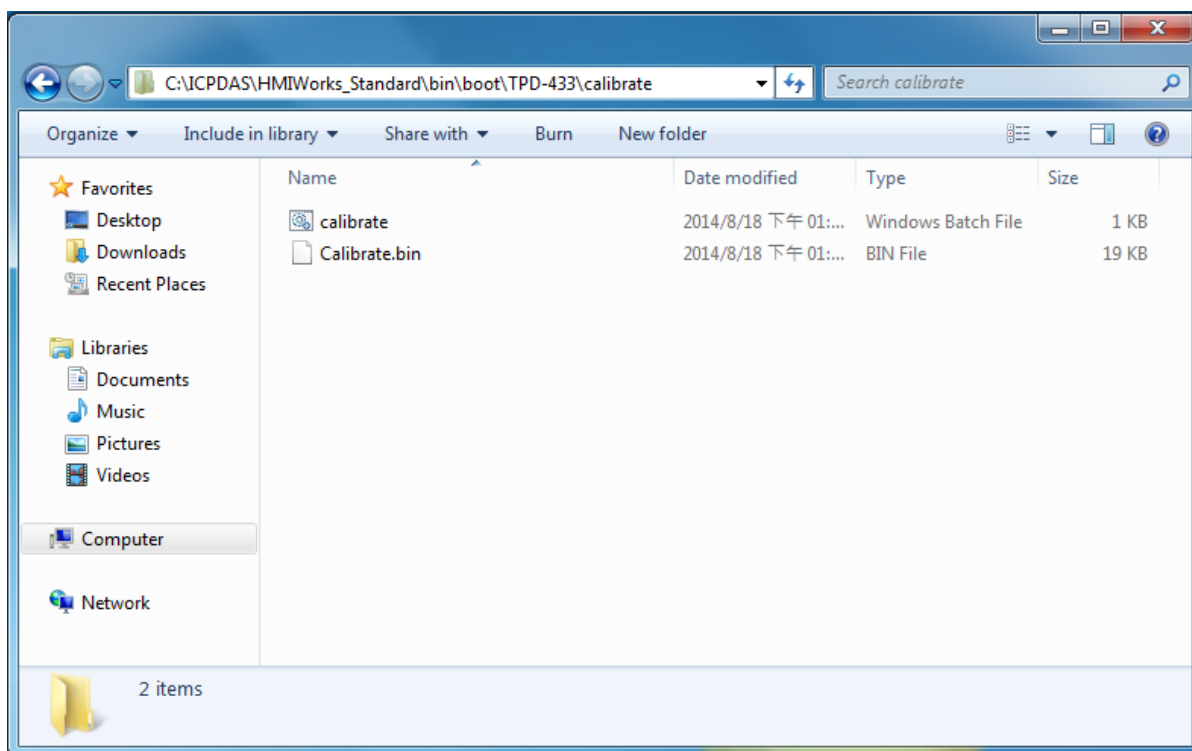


4. Calibrations

Usually users need not to calibrate the touch screen because we calibrate the TouchPAD devices before shipping. However, in cases users may need to calibrate the touch screens, we introduce the flow below.

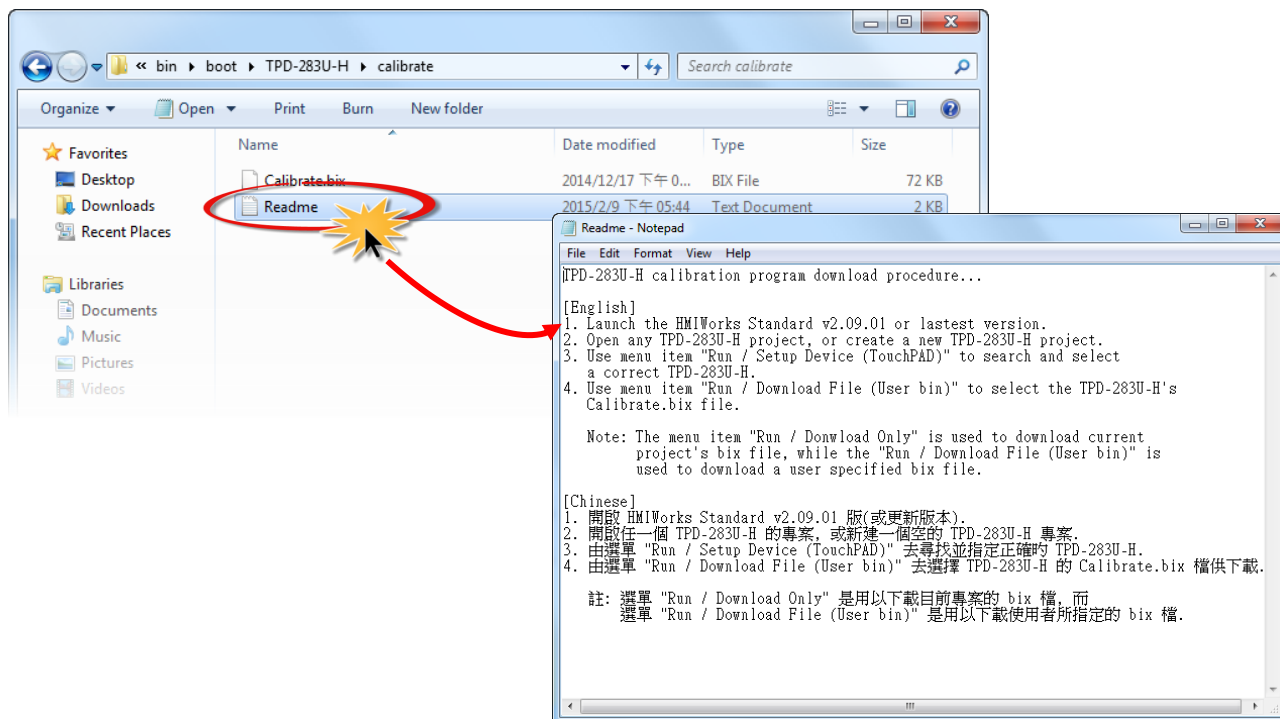
You can find that the calibration programs are in the following directory:

“[HMIWorks_Install_Path]\bin\boot\[Device_Name]\calibrate”.

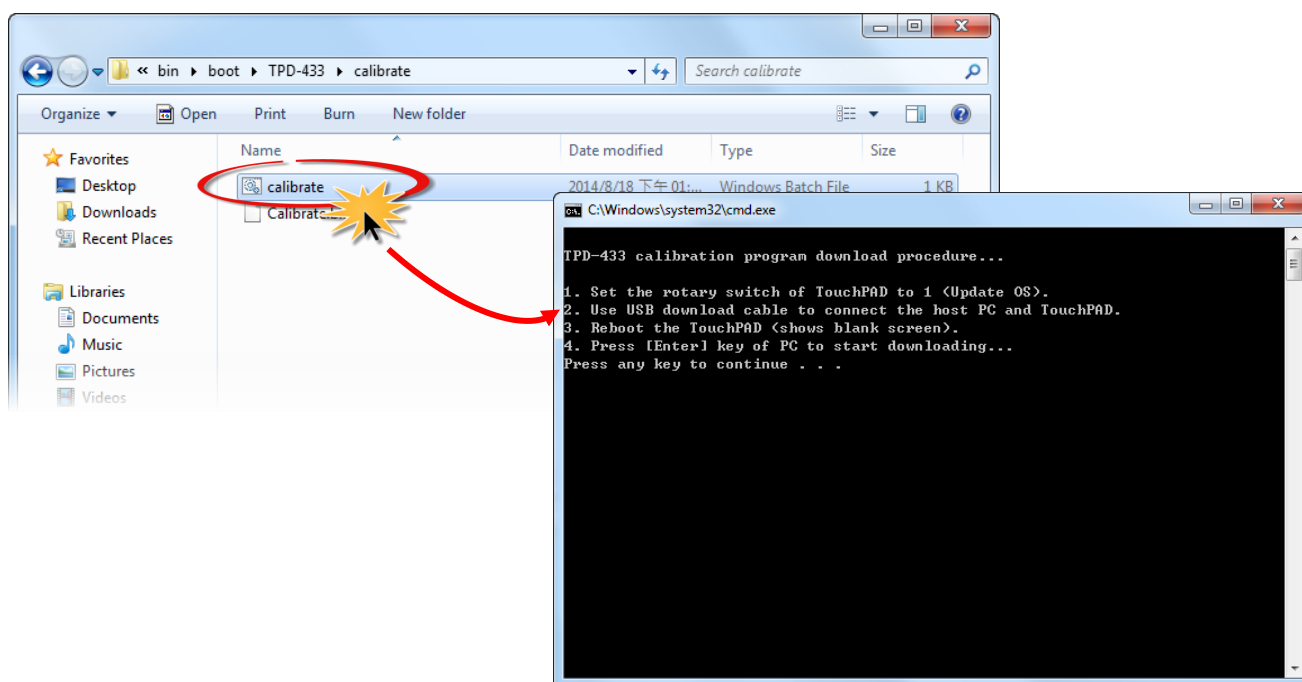


For example, there are two calibration programs can be found at **“C:\ICPDAS\HMIWorks_Standard\bin\boot\TPD-433\calibrate”** if trying to calibrate TPD-433. And in the same directory of the calibrate file, there’s a batch file which is used to download the calibrate programs to the TouchPAD device and it is called **“calibrate.bat”**.

- Refer **“Readme.txt”** to execute calibration when contains a **Readme.txt** file in the calibrate folder.



- Double click **“calibrate.bat”** file to execute calibration when contains a **calibrate.bat** in the calibrate folder.





5. Connecting to I/O Devices

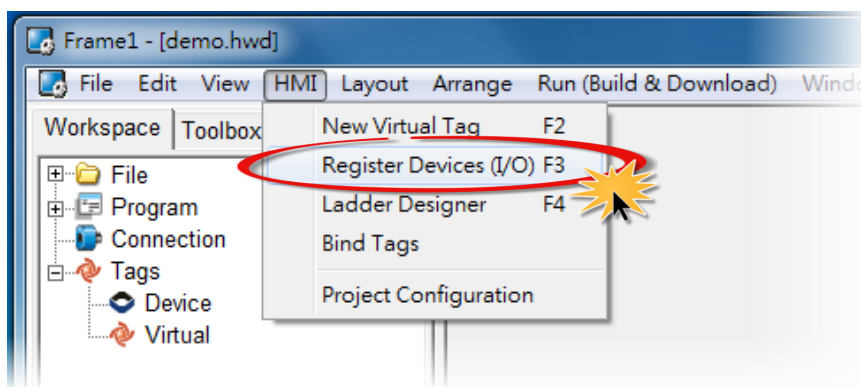
We provide connection methods for three series of I/O modules, the PET-7000, the I-7000, and the M-7000 series and a general approaches for the Modbus TCP Master I/O modules, Modbus RTU Master/Slave I/O modules.

5.1 Access a Modbus TCP Slave Device

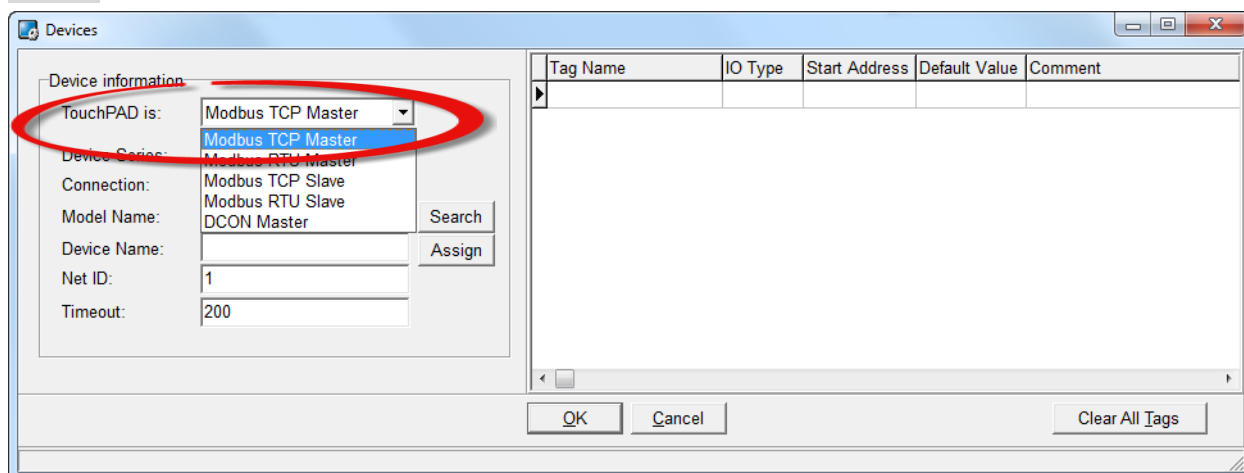
Using a PET-7060 module (Ethernet I/O Module with 6-channel Relay output, 6-channel Digital Input) as an example, ensure that the network settings for both the Modbus TCP slave device and the Host computer are correctly configured, otherwise the TouchPAD may not be able to correctly access the Modbus TCP slave device via the Ethernet network.

The following will access to connect to Modbus TCP slave device through HMIWorks configuration:

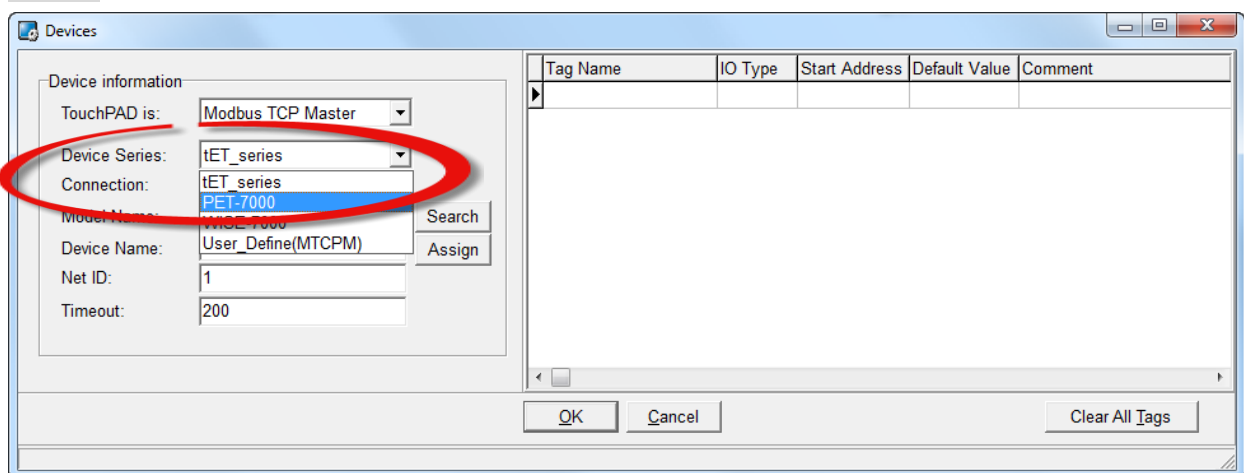
Step 1: In the HMIWorks software, click the **“Register Devices (I/O)”** option from the **“HMI”** menu to open the **“Devices”** dialog box, or press **F3**.



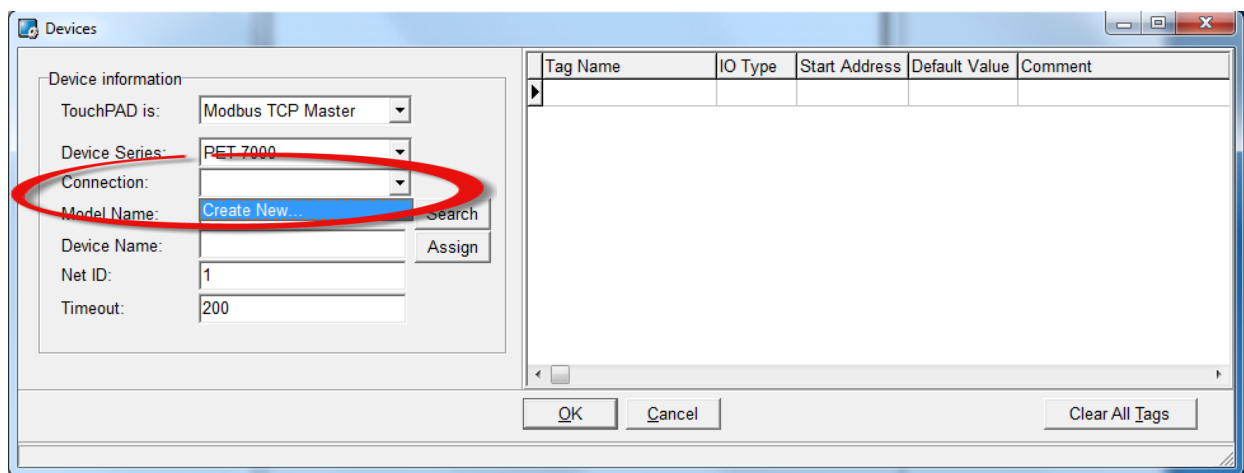
Step 2: Select “Modbus TCP Master” from the “TouchPAD is” drop down menu.



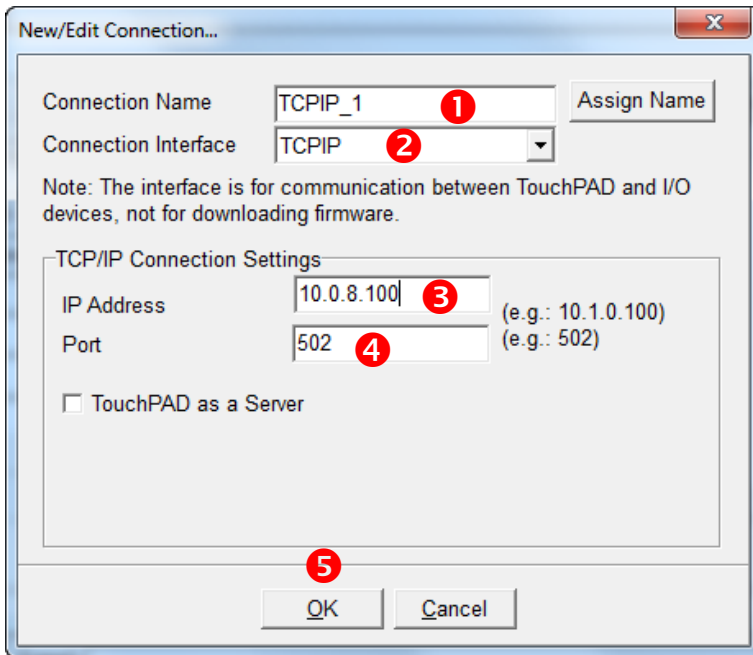
Step 3: Select “PET-7000” from the “Device Series” drop down menu.



Step 4: Select “Create New...” from the “Connection” drop down menu to open the “New/Edit Connection...” dialog box.



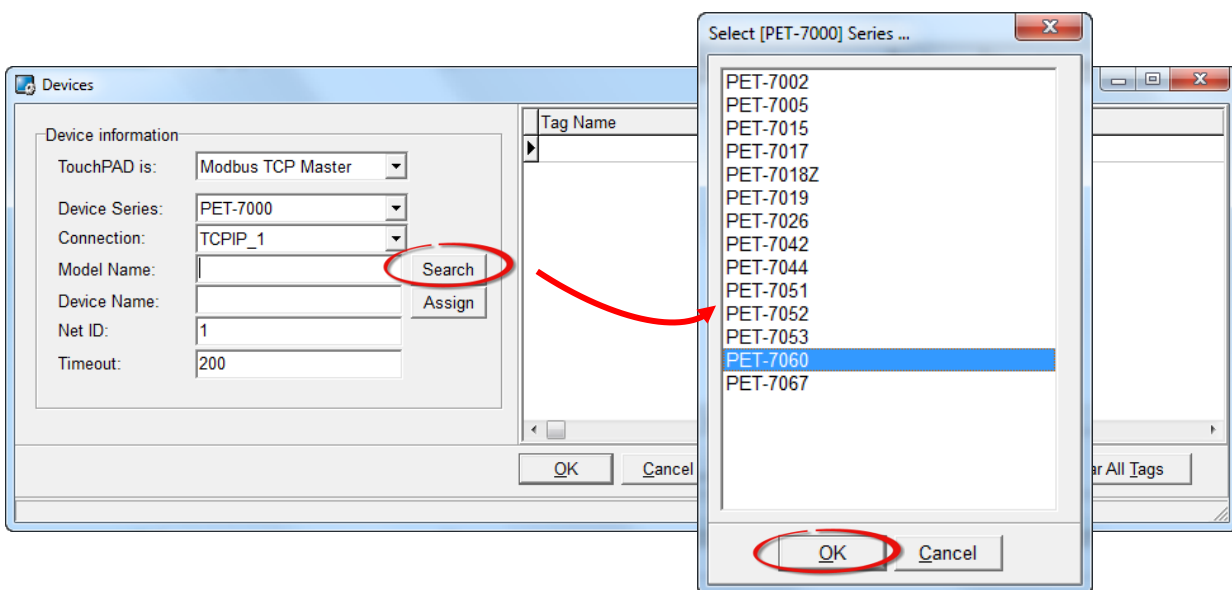
Step 5: In the “**New/Edit Connection...**” dialog box, configure the connection information of the PET-7060 module as follows:



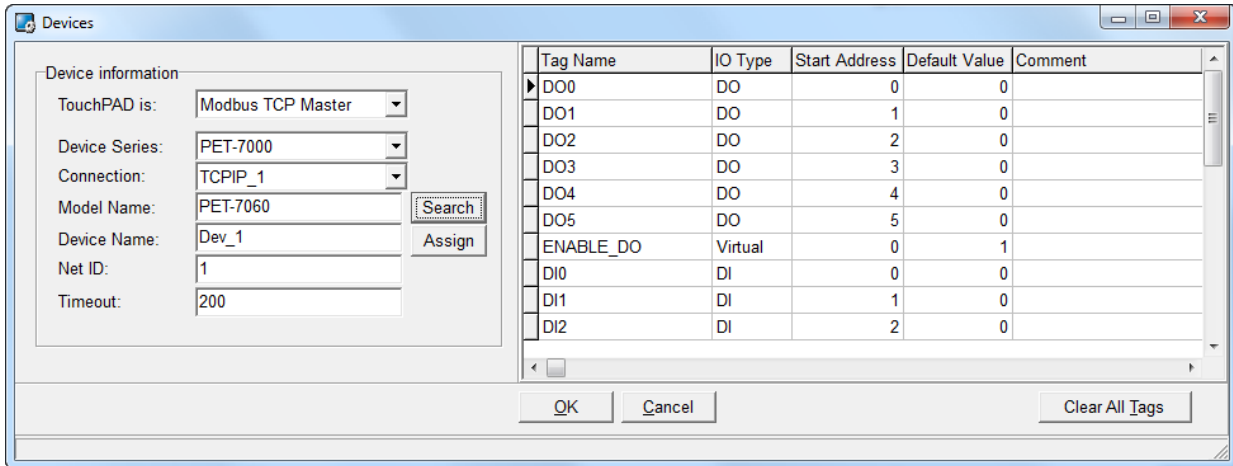
1. Enter a name for the connection (e.g., TCP_1) in the “Connection Name” field.
2. Select “**TCPIP**” from the “Connection Interface” drop down menu.
3. Enter the **IP Address of the PET-7060** module in the “IP Address” field.
4. Enter the **TCP Port of the PET-7060** module in the “Port” field.
5. Click the “**OK**” button to save the configuration.

Step 6: Click the “**Search**” button to open the “**Select [PET-7000] Series...**” dialog box.

Step 7: In the “**Select [PET-7000] Series...**” dialog box, select the model name (e.g., PET-7060) and then click the “**OK**” button.



Step 8: Verify that the **information for PET-7060 module is correct** (e.g., the Device Name, Net ID, Tag Name, IO Type, Start Address and Default Value, etc.) and then click the **“OK”** button to save the configuration and close the **“Devices”** dialog box.



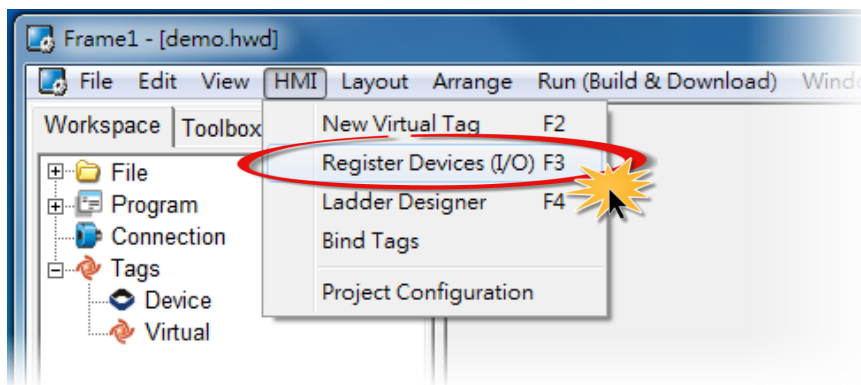
- For more detailed information regarding the Self-test process, which is used to confirm that the PET-7060 and TouchPAD are operating correctly, refer to [FAQ: How can the PET-7060 be accessed using a TouchPAD.](#)
- If you use a third-party Modbus TCP Slave device, refer to [FAQ: How do I access a third-party Modbus TCP slave device using a TouchPAD](#) for more detailed information.

5.2 Access a Modbus RTU Slave Device

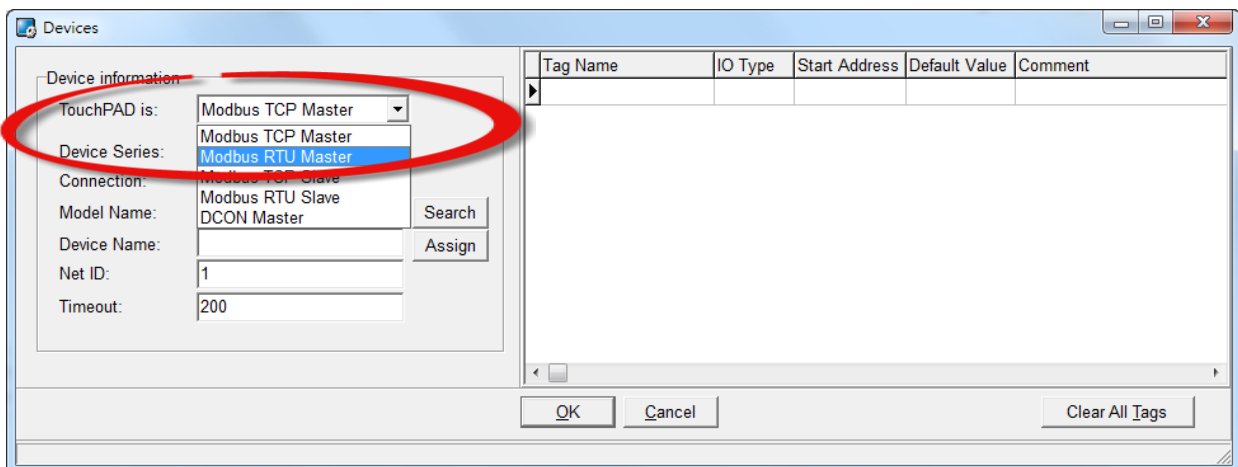
Using an M-7060 module (I/O Module with 4-channel Relay output, 4-channel Digital Input) as an example, connect the Modbus RTU slave device to the TouchPAD model on RS-485 COM Port and apply power to the Modbus RTU slave device and TouchPAD model.

The following will access to connect to Modbus RTU slave device through HMIWorks configuration:

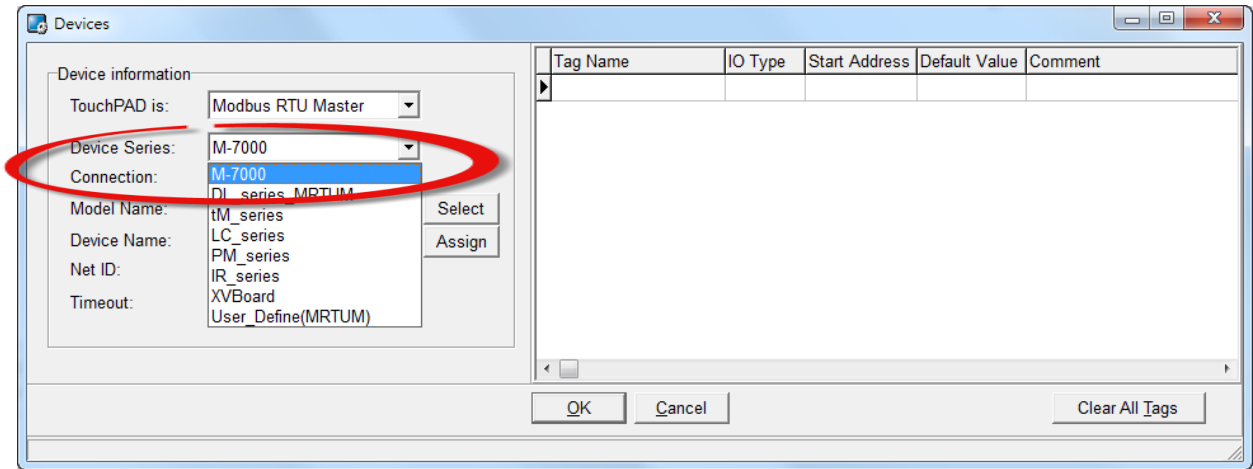
Step 1: In the HMIWorks software, click the **“Register Devices (I/O)”** option from the **“HMI”** menu to open the **“Devices”** dialog box, or press **F3**.



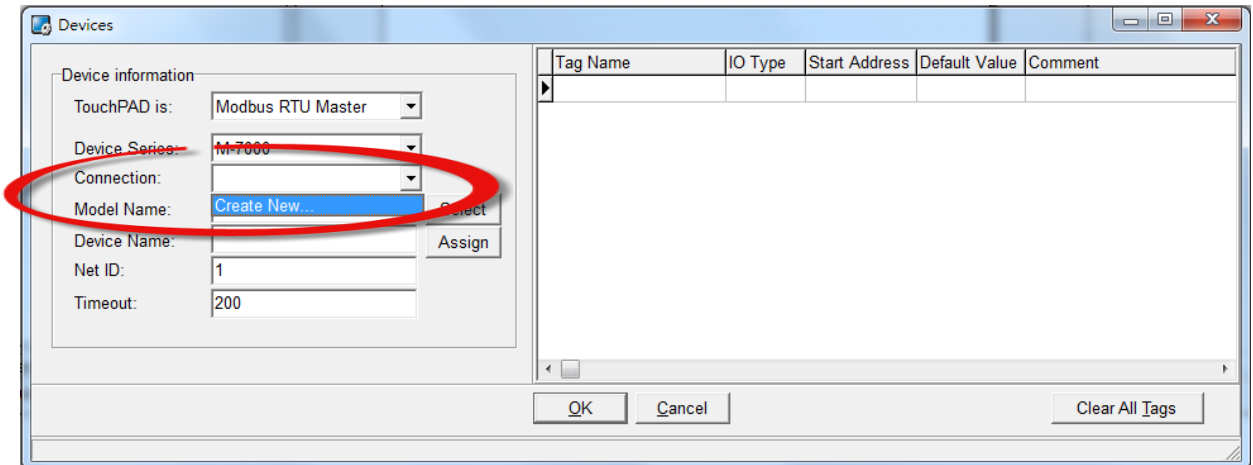
Step 2: Select **“Modbus RTU Master”** from the **“TouchPAD is”** drop down menu.



Step 3: Select “M-7000” from the “Device Series” drop down menu.

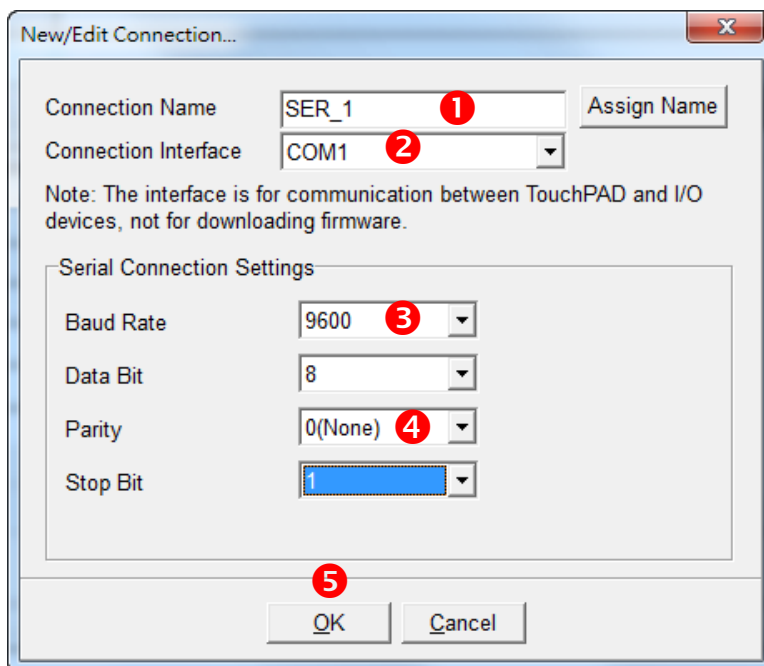


Step 4: Select “Create New...” from the “Connection” drop down menu to open the “New/Edit Connection...” dialog box.



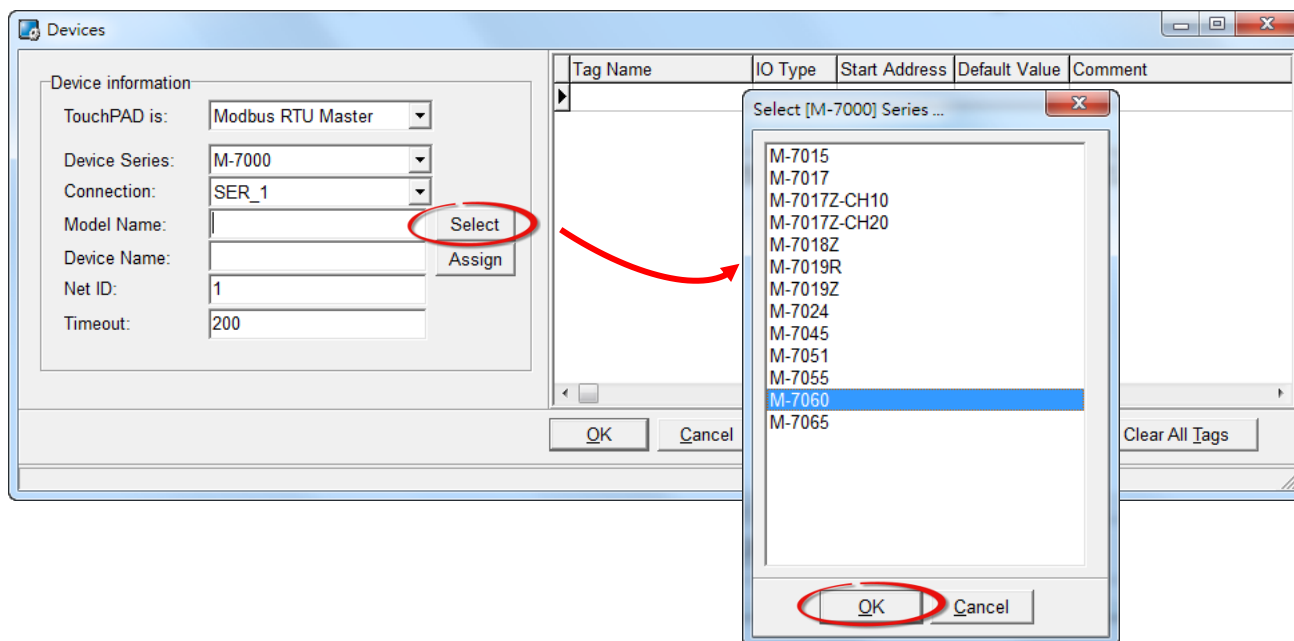
Step 5: In the “New/Edit Connection...” dialog box, configure the connection information of the M-7060 module in the following manner:

1. Enter a name for the connection (e.g., SER_1) in the “Connection Name” field.
2. Select “COM1” from the “Connection Interface” drop down menu.
3. Select the **Baud Rate of the M-7060** module (e.g., 9600) in the “Baud Rate” drop down menu.
4. Select the **Data Format of the M-7060** module (e.g., 8, None, 1) in the “Data Bit”, “Parity” and “Stop Bit” drop down menu.
5. Click the “OK” button to save the configuration and close the dialog box.

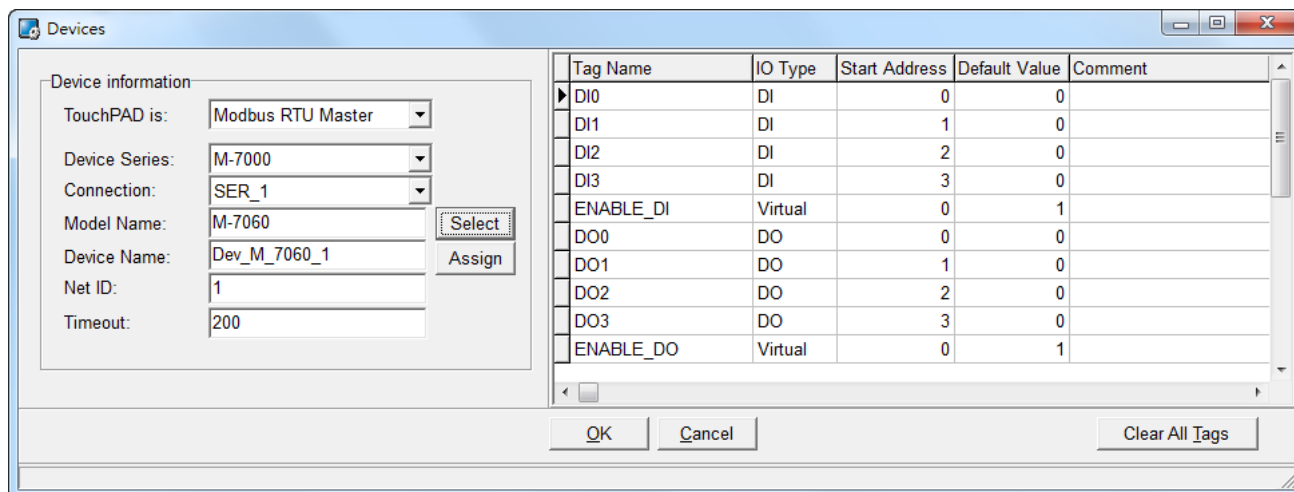


Step 6: Click the “Select” button to open the “Select [M-7000] Series...” dialog box.

Step 7: In the “Select [M-7000] Series...” dialog box, select the M-7060 module and then click the “OK” button.

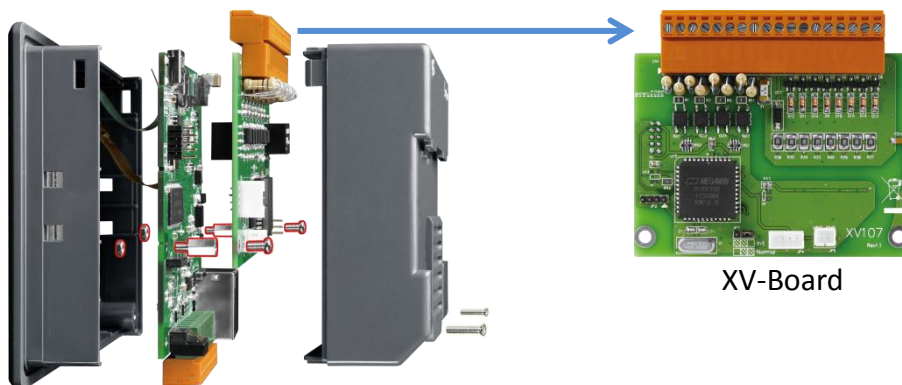


Step 8: Verify that the **information for M-7060 module is correct** (e.g., the Device Name, Net ID, Tag Name, IO Type, Start Address and Default Value, etc.) and then click the **“OK”** button to save the configuration and close the **“Devices”** dialog box.



- For more detailed information regarding the Self-test process, which is used to confirm that the M-7060 and TouchPAD are operating correctly, refer to [FAQ: How can the M-7060 be accessed using a TouchPAD.](#)
- If you use a third-party Modbus RTU Slave device, refer to [FAQ: How do I access a third-party Modbus RTU slave device using a TouchPAD](#) for more detailed information.

5.3 Connecting to I/O Expansion Boards (XV-Board)



➤ Default Value

Net ID	1
Baud Rate	115200
Comport	XVBus
Communication Interface	Modbus RTU (XV-Board as slave)

➤ Using C Programming Language to Control XV-Board

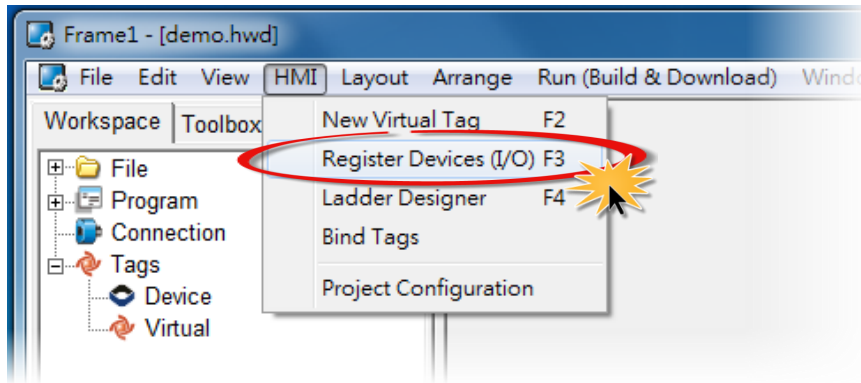
```

HANDLE h;
int NetID = 1;
int addr = 1;
int ch_count = 8;
char DO_value[1];

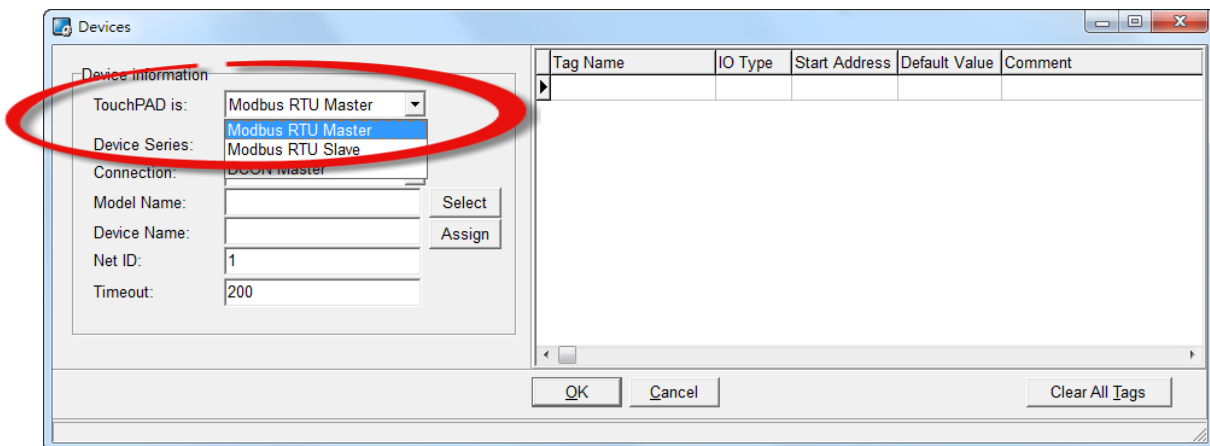
DO_value[0] = 3; //that is, turn on the ch 0 and ch1.
h = uart_Open("XVBus,115200,N,8,1");
mrm_WriteDO (h, NetID, addr, ch_count, DO_value);
uart_Close(h);
    
```


➤ Using Ladder Designer

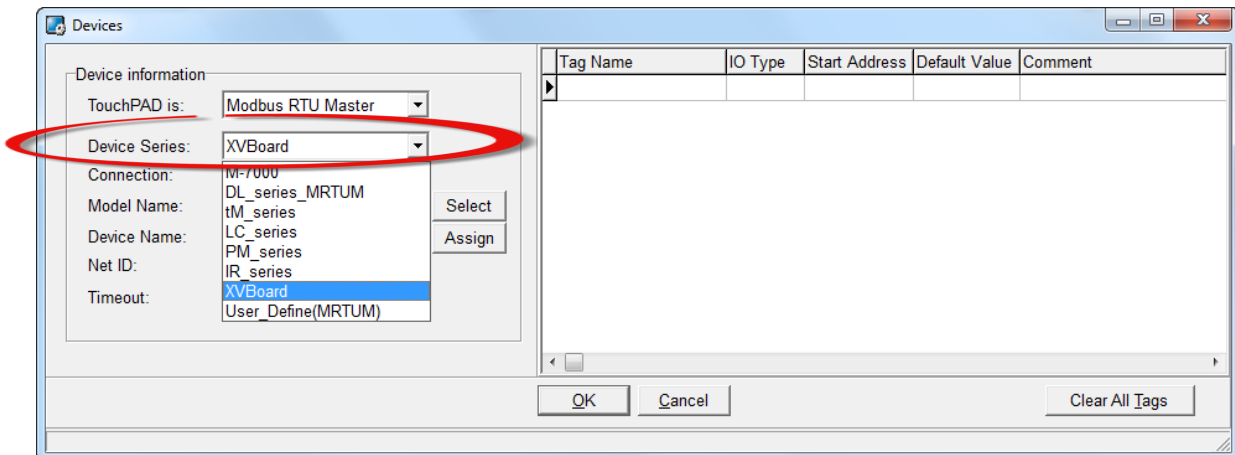
Step 1: In the HMIWorks software, click the **“Register Devices (I/O)”** option from the **“HMI”** menu to open the **“Devices”** dialog box, or press **F3**.



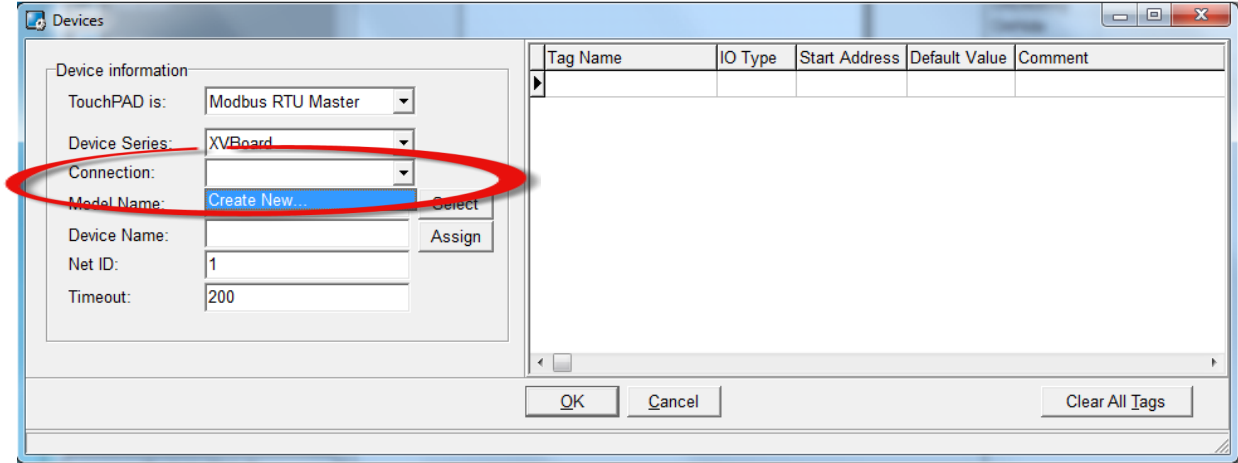
Step 2: Select **“Modbus RTU Master”** from the **“TouchPAD is”** drop down menu.



Step 3: Select **“XVBoard”** from the **“Device Series”** drop down menu.

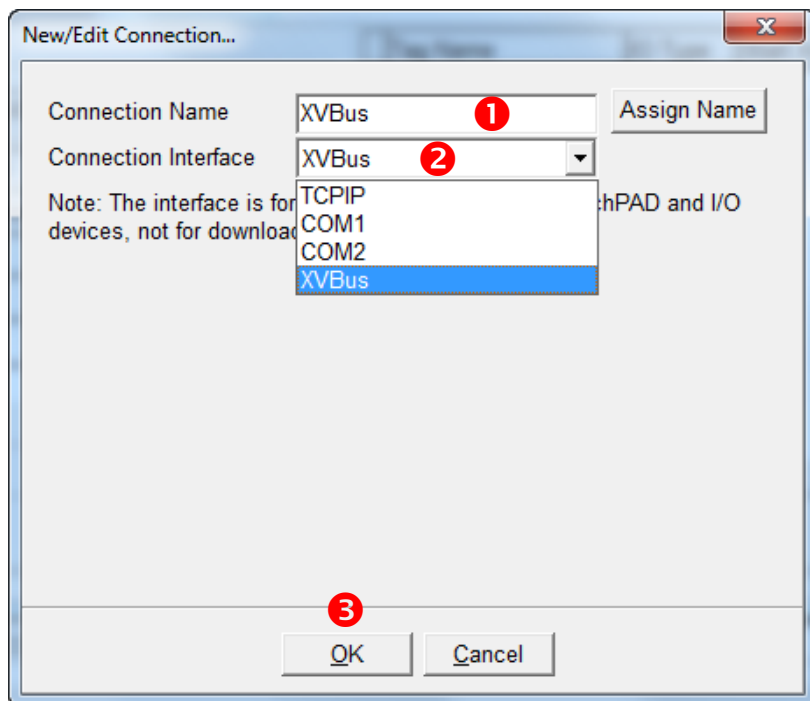


Step 4: Select **“Create New...”** from the **“Connection”** drop down menu to open the **“New/Edit Connection...”** dialog box.



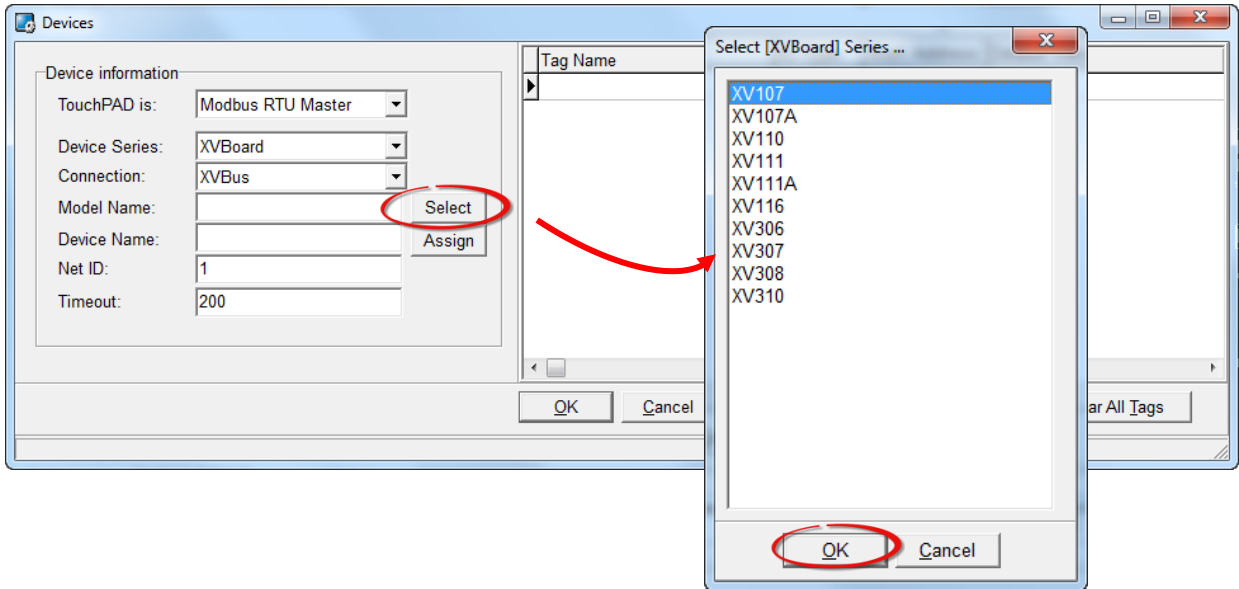
Step 5: In the **“New/Edit Connection...”** dialog box, configure the connection information of the XVBoard in the following manner:

1. Enter a name for the connection (e.g., XVBus) in the **“Connection Name”** field.
2. Select **“XVBus”** from the **“Connection Interface”** drop down menu.
3. Click the **“OK”** button to save the configuration and close the dialog box.



Step 6: Click the “**Select**” button to open the “Select [XVBoard] Series...” dialog box.

Step 7: In the “Select [XVBoard] Series...” dialog box, select the model and then click the “**OK**” button.



Step 8: Verify that the **information for XV-Board is correct** (e.g., the Device Name, Net ID, Tag Name, IO Type, Start Address and Default Value, etc.) and then click the “**OK**” button to save the configuration and close the “Devices” dialog box.

