TouchPAD

TPD/VPD Series HMI Device User Manual

Version 1.4, Apr. 2018

WARRANTY

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

WARNING

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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 Series Models	TPD-280, TPD-280U, TPD-283, TPD-283U, TPD-430, TPD-430-EU, TPD-433, TPD-433-EU, TPD-432F, TPD-433F
TPD High Speed Series Models	TPD-280-H, TPD-280U-H, TPD-283-H, TPD-280-M1, TPD-280-M2, TPD-280-M3, TPD-283-M1, TPD-283-M2, TPD-283-M3, TPD-283U-M1, TPD-283U-M2, TPD-283U-M3, TPD-430-H, TPD-433-H, TPD-433F-H, TPD-432F-H, TPD-433-M2, TPD-703, TPD-703-64
VPD Series Models	VPD-130, VPD-130N, VPD-132, VPD-132N, VPD-133, VPD-133N, VPD-142, VPD-142N, VPD-143, VPD-143N
VPD High Speed Series Models	VPD-130-H, VPD-130N-H, VPD-132-H, VPD-132N-H, VPD-133-H, VPD-133N-H, VPD-142-H, VPD-142N-H, VPD-143-H, VPD-143N-H VPD-173N , VPD-173N-64, VPD-173X , VPD-173X-64

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

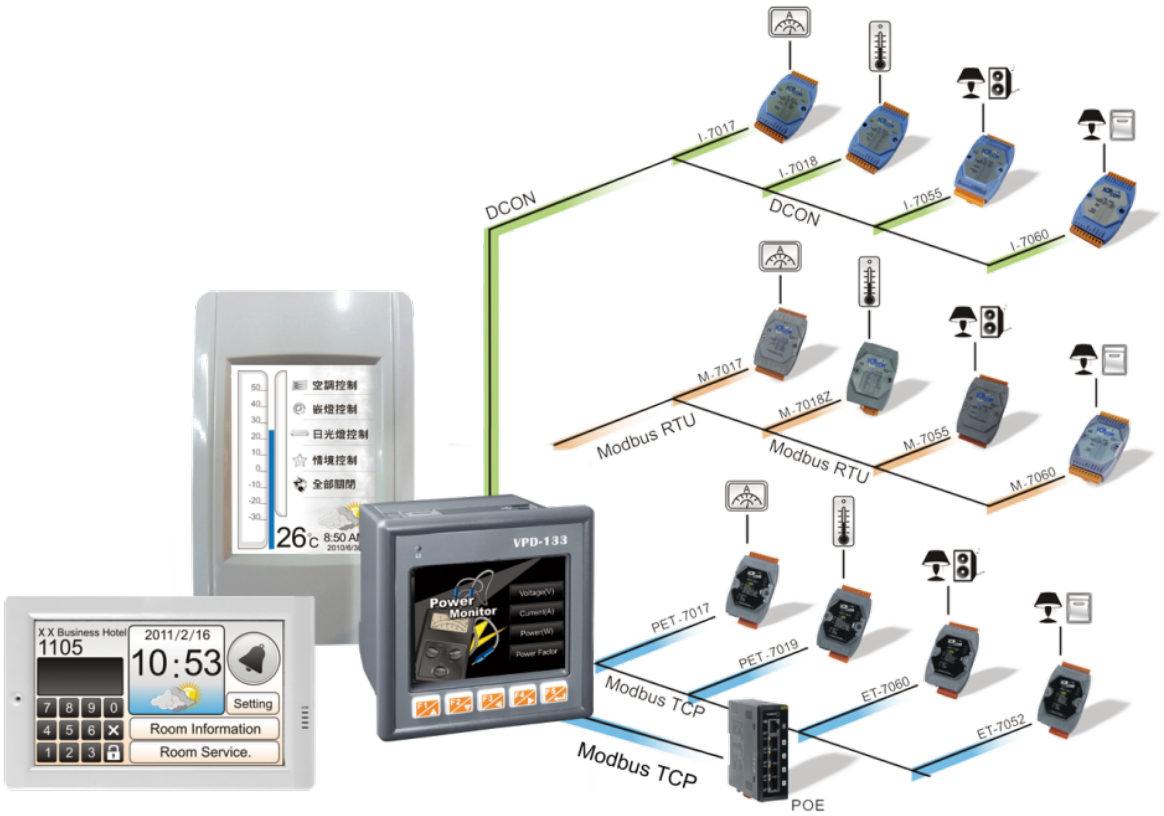
1. Introduction

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.

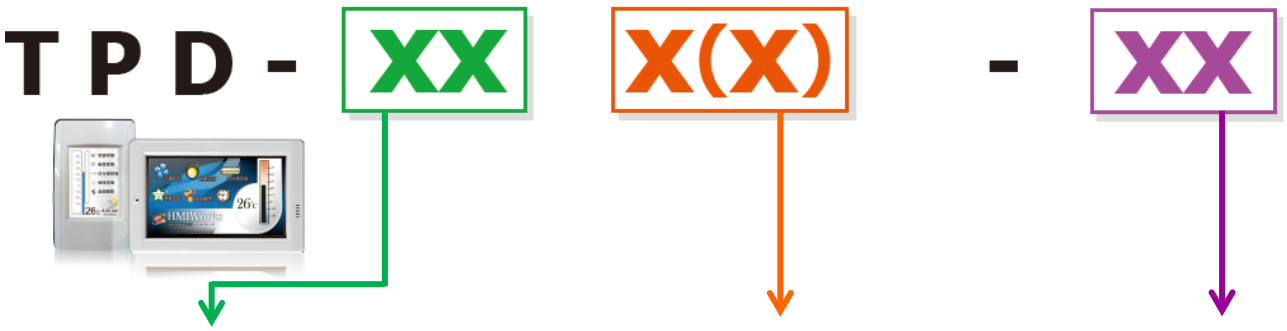
1.1 Features

- Excellent C/P ratio (cost/performance)
- High-Color high-resolution resolution touch screen
- PoE, Power over Ethernet (PoE)
- RS-485 network (including Self-Tuner)/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”: -20 ~ 70 °C, 7”: -10 ~ 60 °C)

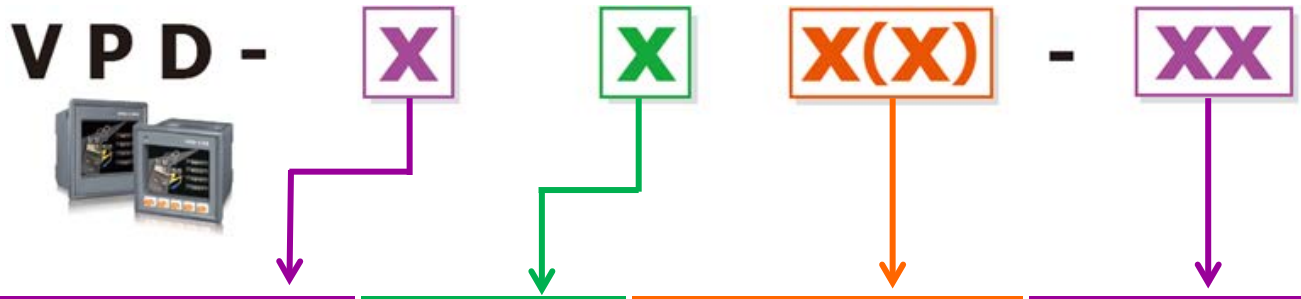


1.2 Module Naming Convention

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.



Touch Screen Size	Communication Interface			Special
28: 2.8 inch 43: 4.3 inch 70: 7.0 inch	For 2.8 inch: 0: RS-485 0U: RS-485 + RTC 3: Ethernet 3U: RS-485 + RTC + Ethernet	For 4.3 inch: 0: RS-485 2: RS-485 x 2 3: RS-485/RS-232 + Ethernet (F): Flat Type	For 7.0 inch: 3: Ethernet +RTU	EU: For European 86 x 86 mm Outlet Box H: High Speed Version M1 ~ M3: Stylish Panel 64: 64 MB SDRAM/64 MB Flash



Form Factor	Touch Screen Size	Communication Interface	Special
1: 103 x 103 mm Panel Mount	3: 3.5 inch 4: 4.3 inch 7: 7 inch	0: RS-485 2: RS-232/RS-485 + RS-485 3: RS-232/RS-485 + RS-485 + Ethernet (N): No Rubber Keypad	H: High Speed Version 64: 64 MB SDRAM/64 MB Flash

1.3 Selection Guide

1.3.1 TPD Series Models

- Phased-out models:
  TPD 2.8": TPD-280, TPD-280U, TPD-283, TPD-283U
  TPD 4.3": TPD-430, TPD-430-EU, TPD-433, TPD-433-EU, TPD-432F, TPD-433F

- 2.8" (Resolution: 240 x 320)

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

- 4.3" (Resolution: 480 x 272)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Outlet Box	External Wall Box	Power Input	Multi Panel
TPD-430-H	16 MB	32	-	1 x RS-485	Yes	OB140F OB140FP	EWB-T43F	+12 ~ +48V_{DC}	-
TPD-433-H	16 MB	32	Yes	1 x RS-485	Yes			+12 ~ +48 V_{DC} or PoE	-
TPD-432F-H	16 MB	64	-	2 x RS-485	Yes			+12 ~ +48 V_{DC}	-
TPD-433F-H	16 MB	64	Yes	1 x RS-232 1 x RS-485	Yes			+12 ~ +48 V_{DC} or PoE	-
TPD-433-M2									Yes

- 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 1 x RS-485	Yes	OB170	EWB-T70	+12 ~ +48 V_{DC} or PoE
TPD-703-64	64 MB	84						

1.3.2 VPD Series Models

- Phased-out models:
  VPD 3.5": VPD-130, VPD-130N, VPD-132, VPD-132N, VPD-133, VPD-133N
  VPD 4.3": VPD-142, VPD-142N, VPD-143, VPD-143N

- 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-H	16 MB	108	-	RS-232/RS-485	Yes	Yes	Yes	Front Panel: IP65	+12 ~ +48 V_{DC}
VPD-130N-H			-				-		
VPD-132-H			-	COM1: RS-485 or RS-232 COM2: RS-485			Yes		
VPD-132N-H			-				-		
VPD-133-H			Yes				Yes		+12 ~ +48 V_{DC} or PoE
VPD-133N-H			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-H	16 MB	64	-	COM1: RS-485 or RS-232 COM2: RS-485 or RS-232	Yes	Yes	Yes	Front Panel: IP65	+12 ~ +48 V_{DC}
VPD-142N-H			-				-		
VPD-143-H			Yes				Yes		+12 ~ +48 V_{DC} or PoE
VPD-143N-H			Yes				-		

- 7" (Resolution: 800 x 480)

Model	Extra Flash	Image Storage Capacity	Ethernet	COM Port	RTC	Expansion I/O Boards	Rubber Keypad	Ingress Protection	Power Input
VPD-703N	16 MB	18	Yes	COM1: RS-485 or RS-232 COM2: RS-485 or RS-232	Yes	-	-	Front Panel: IP65	+12 ~ +48 V_{DC} or PoE
VPD-703N-64	64 MB	84							
VPD-703X	16 MB	18				Yes			
VPD-703X-64	64 MB	84							

➢ 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	Dry, Source	DI+DO=8	Sink
XV310	4		2	Voltage/Current	4		4	Source

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

Models	TPD-280 (Phased-out)	TPD-280U (Phased-out)	TPD-283 (Phased-out)	TPD-283U (Phased-out)
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 update only	-	Firmware update only
MMI (Main Machine Interface)				
LCD	2.8 TFT (Resolution 240 x 320, 65535 colors), defective pixels <= 3			
Backlight Life	20,000 hours			
Brightness	160 cd/m2			
Touch Panel	Yes			
Reset Button	Yes			
Electrical				
Powered from Terminal Block	+10 ~ +30 V_{DC}		-	+10 ~ +30 V_{DC}
Powered from PoE	-		IEEE 802.3af, Class1 (48 V)	
Power Consumption	1.2 W			
Mechanical				
Dimensions (W x L x H) (Unit: mm)	119 x 76 x 33		119 x 76 x 32	119 x 76 x 33
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/280U-H/280-Mx/283-H/283-Mx/283U-H/283U-Mx

Models		TPD-280-H TPD-280-Mx	TPD-280U-H	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	-	16 MB SDRAM / 16 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 update only	-	Firmware update only
MMI (Main Machine Interface)					
LCD		2.8 TFT (Resolution 240 x 320, 65535 colors), defective pixels <= 3			
Backlight Life		20,000 hours			
Brightness		160 cd/m2			
Touch Panel		Resistive Touch			
Reset Button		Yes			
Electrical					
Powered from Terminal Block		+12 ~ +48 V_{DC}		-	+12 ~ +48 V_{DC}
Powered from PoE		-		IEEE 802.3af, Class1 (48 V)	
Power Consumption		1.5 W			
Mechanical					
Dimensions (W x L x H) (Unit: mm)	"H" Version	119 x 76 x 33		119 x 76 x 32	119 x 76 x 33
	"Mx" Version	127 x 92 x 31		127 x 92 x 30	127 x 92 x 31
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

Models	TPD-430 (Phased-out)	TPD-430-EU (Phased-out)	TPD-433 (Phased-out)	TPD-433-EU (Phased-out)
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 update only			
MMI (Main Machine Interface)				
LCD	4.3” TFT (Resolution 480 X 272, 65535 colors), 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 V_{DC}			
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-430-H/430-H-EU/433-H/433-H-EU

Models	TPD-430-H	TPD-430-H-EU	TPD-433-H	TPD-433-H-EU
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	RS-485 (including Self-Tuner)			
USB 1.1 Client	Firmware update only			
MMI (Main Machine Interface)				
LCD	4.3” TFT(Resolution 480 X 272, 65535 colors), 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	+12 ~ +48 V_{DC}			
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			

1.4.5 TPD-432F/432F-H/433F/433F-H/433-M2

Models	TPD-432F (Phased-out)	TPD-432F-H	TPD-433F (Phased-out)	TPD-433F-H	TPD-433-M2
CPU Module					
CPU	32-bit RISC CPU				
Memory Expansion	16 MB SDRAM/ 8 MB Flash	16 MB SDRAM/ 16 MB Flash	16 MB SDRAM/ 8 MB Flash	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		
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 update only				
MMI (Main Machine Interface)					
LCD	4.3” TFT(Resolution 480 X 272, 65535 colors), 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 V_{DC}	+12 ~ +48 V_{DC}	+10 ~ +30 V_{DC}	+12 ~ +48 V_{DC}	
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				

1.4.6 TPD-703/703-64

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 V_{DC}	
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	

1.4.7 VPD-130/130N/132/132N/133/133N

Models	VPD-130 (Phased-out)	VPD-130N (Phased-out)	VPD-132 (Phased-out)	VPD-132N (Phased-out)	VPD-133 (Phased-out)	VPD-133N (Phased-out)
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 update 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, 65535 colors), 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 V_{DC}					
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	-20 ~ +50°C					
Storage Temperature	-30 ~ +80°C					
Ambient Relative Humidity	10 ~ 90% RH, non-condensing					

1.4.8 VPD-130-H/130N-H/132-H/132N-H/133-H/133N-H

Models	VPD-130-H	VPD-130N-H	VPD-132-H	VPD-132N-H	VPD-133-H	VPD-133N-H
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	
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 update 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, 65535 colors), 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 V_{DC}					
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	-20 ~ +50°C					
Storage Temperature	-30 ~ +80°C					
Ambient Relative Humidity	10 ~ 90% RH, non-condensing					

1.4.9 VPD-142/142N/143/143N

Models	VPD-142 (Phased-out)	VPD-142N (Phased-out)	VPD-143 (Phased-out)	VPD-413N (Phased-out)
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 update 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, 65535 colors), 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 V_{DC}			
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	-20 ~ +50°C			
Storage Temperature	-30 ~ +80°C			
Ambient Relative Humidity	10 ~ 90% RH, non-condensing			

1.4.10 VPD-173N/173N-64/173X/173X-64

Models		VPD-173N	VPD-173N-64	VPD-173X	VPD-173X-64
CPU Module					
CPU		32-bit RISC CPU			
Memory Expansion		64 MB SDRAM/ 64 MB Flash	64 MB SDRAM/ 64 MB Flash	64 MB SDRAM/ 64 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			
Serial Port	COM1	RS-232 (3-pin) or RS-485 (including Self-Tuner); 2500 V_{DC} isolated			
	COM2				
I/O Expansion					
I/O Expansion Bus		-		Yes	
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			
Touch Panel		4-wire, analog resistive; Light Transmission: 80%			
Reset Button		Yes			
Electrical					
Powered from Terminal Block		+12 ~ +48 V_{DC}			
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: NEMA 4/IP65			
Environmental					
Operating Temperature		-10 ~ +60°C			
Storage Temperature		-20 ~ +70°C			
Ambient Relative Humidity		10 ~ 90% RH, non-condensing			

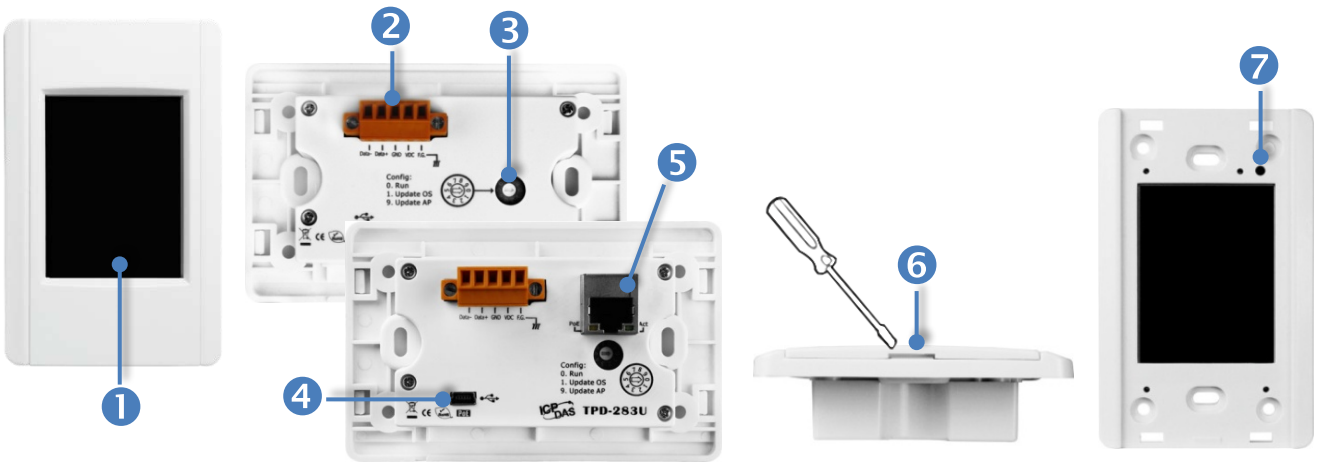
2. Hardware Information

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-280U-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/280U-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. (Only one application on a TouchPAD)

1. Update OS: Update operating system of TouchPAD.

2. Update AP: Download an application to TouchPAD.

➢ **For TPD-280U-H:**

0. Run Only: Run the program.

9. USB Force Update: Update a new application to the TouchPAD device through USB.

➢ **For TPD-283/283-H:**

0. Run & Update: Run or update the program. This mode is used in the development phase.

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 through Ethernet.

2. Run Only: Run the program.

➢ **For TPD-283U-H:**

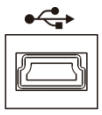
0. Run & Update (Ethernet): This is a special run mode which is used in the development stage. The TouchPAD device can be updated by a PC from the remote side through Ethernet.

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

2. Run Only: Run the program.

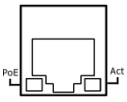
9. USB Force Update: Update a new application to the TouchPAD device through USB.

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



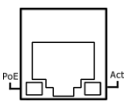
The TouchPAD device is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities. When an Ethernet link is detected and an Ethernet packet is received, the **Act LED (Green)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), 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.	**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.
4.	**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:**

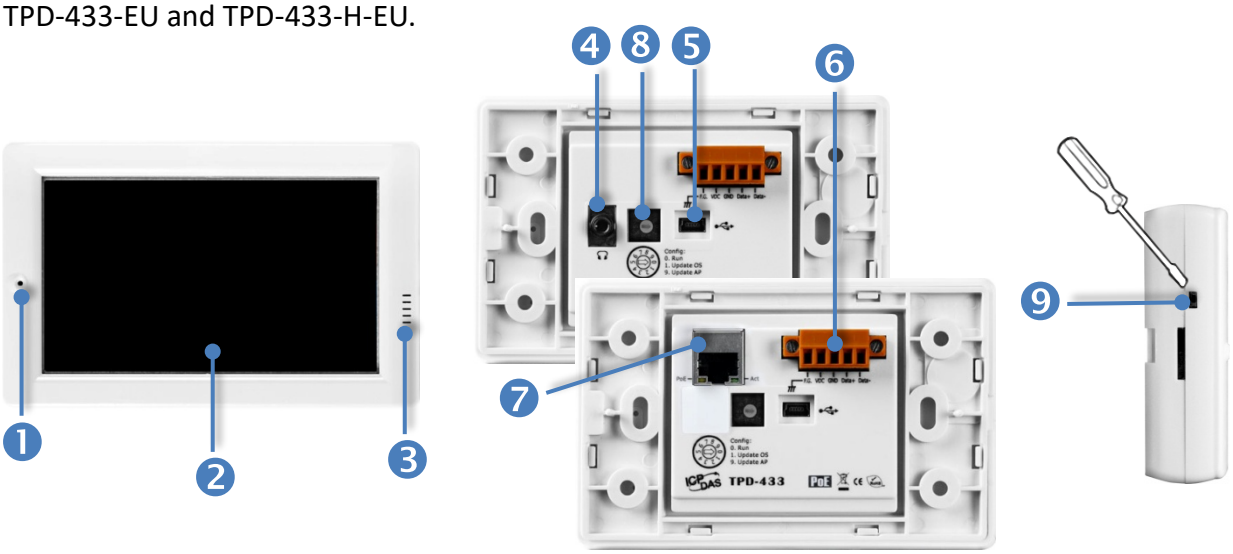
0. Run & Update: Run or update the program. This mode is used in the development phase.

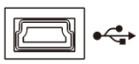
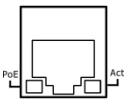
1. Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device through Ethernet.

2. Run Only: Run the program.

2.1.3 TPD-430/433 Series Models

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



1.	**Programmable LED Indicator**
2.	**4.3” TFT LCD with Touch Panel**
3.	**Buzzer**
4.	**Headphone Jack** *(for TPD-430/430-EU only)*
5.	**USB Port**
	The USB Port is used to downloading application programs.
6.	**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.
7.	**PoE and Ethernet RJ-45 Jack** *(for TPD-433/433-EU/433-H/433-H-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.

8. Rotary Switch (0 ~ 9)

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

➢ **For TPD-430/430-EU/433/433-EU:**

0. Run: This mode is used to run the application. (Only one application on a TouchPAD)
1. Update OS: Update operating system of TouchPAD.
9. Update AP: Download an application to TouchPAD.

➢ **For TPD-430-H/430-H-EU:**

0. Run Only: Run the program.
9. USB Force Update: Update a new application to the TouchPAD device through USB.

➢ **For TPD-433-H/433-H-EU:**

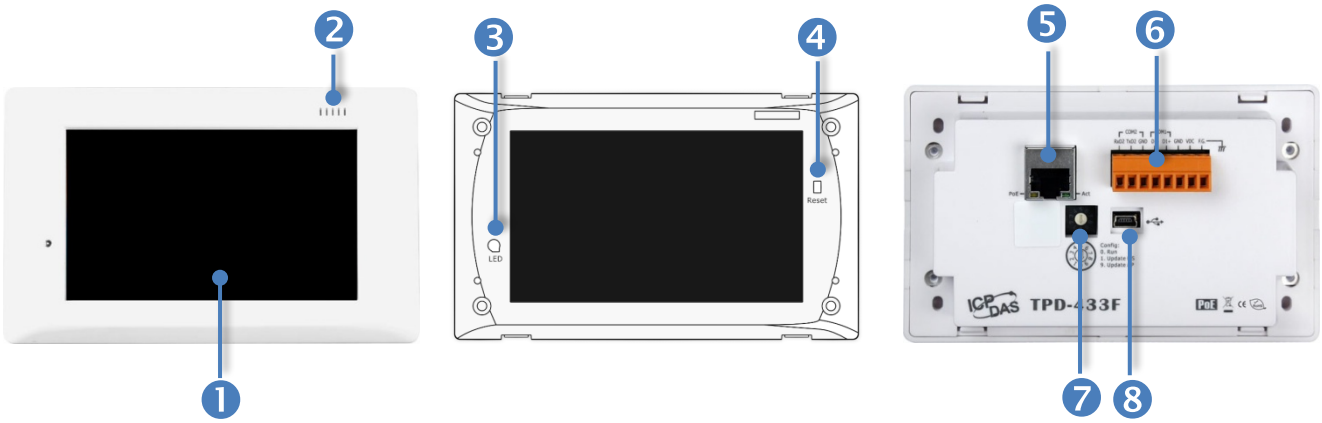
0. Run & Update (Ethernet): This is a special run mode which is used in the development stage. The TouchPAD device can be updated by a PC from the remote side through Ethernet.
1. Ethernet Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device through Ethernet.
2. Run Only: Run the program.
9. USB Force Update: Update a new application to the TouchPAD device through USB.

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

Models supported include TPD-432F, TPD-432F-H, TPD-433F, TPD-433F-H and TPD-433-M2.



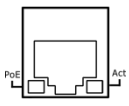
1.	**4.3” TFT LCD with Touch Panel**
2.	**Buzzer**
3.	**Programmable LED Indicator**

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/433F-H/433-M2 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 Series Models and Section 2.2.3 TPD-433F Series Models.

7. Rotary Switch (0 ~ 9)

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

➢ **For TPD-432F/433F:**

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

1. Update OS: Update operating system of TouchPAD.

9. Update AP: Download an application to TouchPAD.

➢ **For TPD-433F-H/433-M2:**

0. Run & Update (Ethernet): 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. Ethernet Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device through Ethernet.

2. Run Only: Run the program.

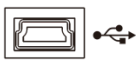
9. USB Force Update: Update a new application to the TouchPAD device through USB.

➢ **For TPD-432F-H:**

0. Run Only: Run the program.

9. USB Force Update: Update a new application to the TouchPAD device through USB.

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.*

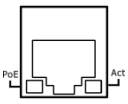
6.	**Rotary Switch (0 ~ 9)**

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: Run or update the program. This mode is used in the development phase.

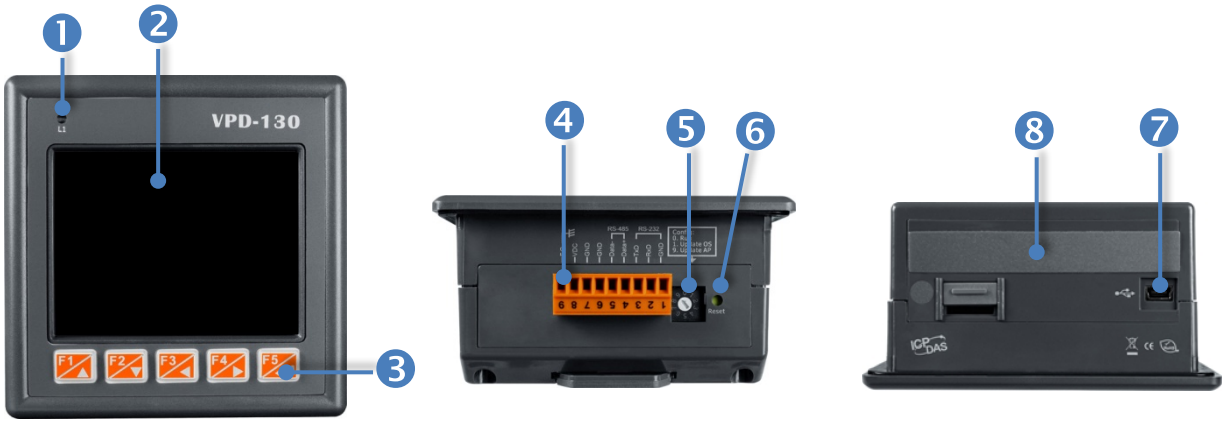
1. Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device through Ethernet.

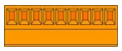
2. Run Only: Run the program.

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 2.2.4 TPD-703 Series Models.

2.1.6 VPD-130/130N Series Models

Models supported include VP-130, VPD-130N, VPD-130-H and VPD-130N-H.

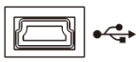


1.	**LED Indicator**
2.	**3.5” TFT LCD with Touch Panel**
3.	**Rubber Keypad** *(for VPD-130/130-H only)*
4.	**Power/GND/RS-232/RS-485 Connector**
	The TouchPAD device is equipped with a removable terminal block connector is designed for easy and robust wiring. For more detailed information regarding the pin assignments, refer to Section 2.2.5 VPD-130 Series Models.
5.	**Rotary Switch (0 ~ 9)**
	The Rotary Switch is used to set the configuration modes, as follows: ➢ **For VPD-130/130N:** **0. Run:** This mode is used to run the application. (Only one application on a TouchPAD) **1. Update OS:** Update operating system of TouchPAD. **9. Update AP:** Download an application to TouchPAD. ➢ **For VPD-130-H/130N-H:** **0. Run Only:** Run the program. **9. USB Force Update:** Update a new application to the TouchPAD device through USB.

6. Reset Button

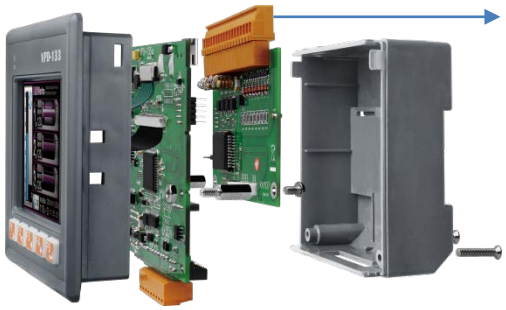
Use a flat-head screwdriver to press this button to reset the TouchPAD device. *Note: The reset button does not behave as a reboot to the whole system, only resets the microcontroller and this is not enough to make the program downloading successful. Always cut the power then turn it on before downloading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

7. USB Port



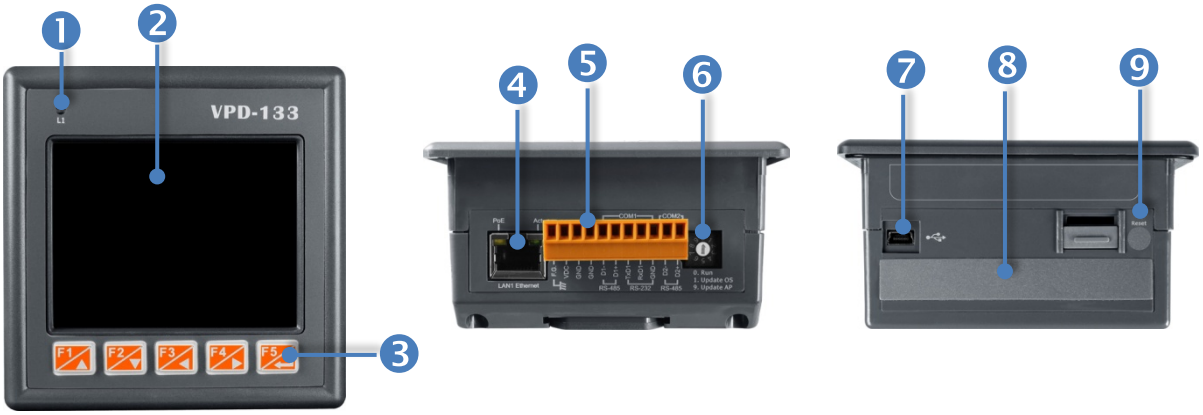
The USB Port is used to downloading application programs.

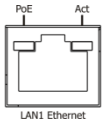
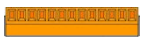
8. I/O Expansion Boards (Optional XV-board) *(for VPD-130-H/130N-H only)*



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

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



1.	**LED Indicator**
2.	**3.5” TFT LCD with Touch Panel**
3.	**Rubber Keypad** *(for VPD-132/133/132-H/133-H only)*
4.	**PoE and Ethernet RJ-45 Jack** *(for VPD-133/133N/133-H/133N-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.
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 2.2.6 VPD-132/133 Series Models.
6.	**Rotary Switch (0 ~ 9)**
	The Rotary Switch is used to set the configuration modes, as follows: ➢ **For VPD-132/132N/133/133N:** **0. Run:** This mode is used to run the application. (Only one application on a TouchPAD) **1. Update OS:** Update operating system of TouchPAD. **9. Update AP:** Download an application to TouchPAD.

➢ **For VPD-132-H/132N-H:**

0. Run Only: Run the program.

9. USB Force Update: Update a new application to the TouchPAD device through USB.

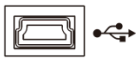
➢ **For VPD-133-H/133N-H:**

0. Run & Update (Ethernet): 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.

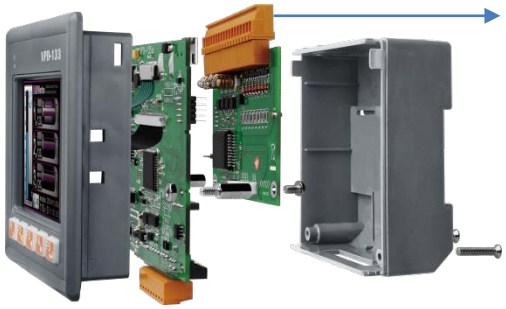
1. Ethernet Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device through Ethernet.

2. Run Only: Run the program.

9. USB Force Update: Update a new application to the TouchPAD device through USB.

7.	USB Port
	The USB Port is used to downloading application programs.

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

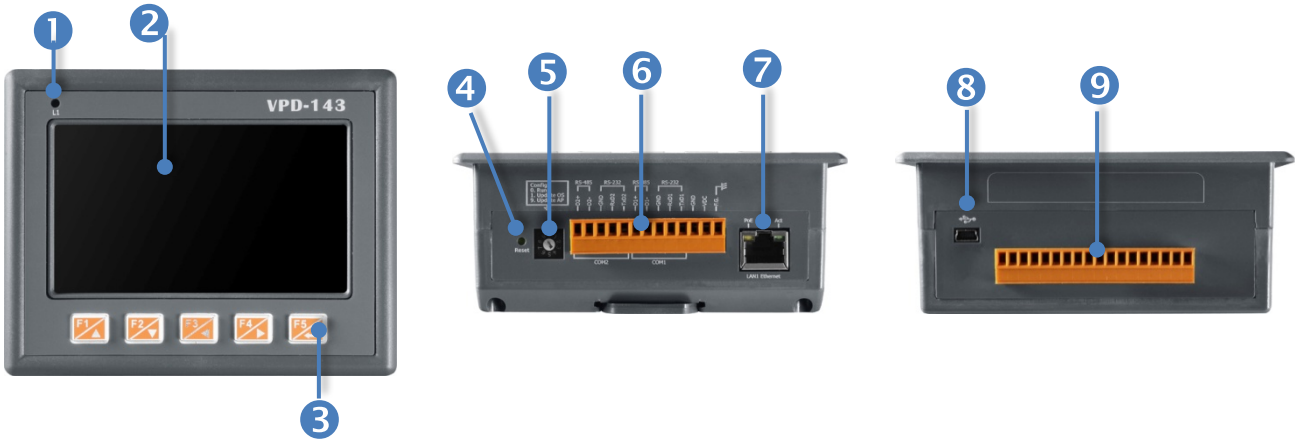


9.	Reset Button

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

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



1.	**LED Indicator**
2.	**4.3” TFT LCD with Touch Panel**
3.	**Rubber Keypad** *(for VPD-142/143/142-H/143-H 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:

➢ **For VPD-142/142N/143/143N:**

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

1. Update OS: Update operating system of TouchPAD.

9. Update AP: Download an application to TouchPAD.

➢ **For VPD-142-H/142N-H:**

0. Run Only: Run the program.

9. USB Force Update: Update a new application to the TouchPAD device through USB.

➢ **For VPD-143-H/143N-H:**

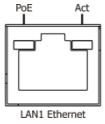
0. Run & Update (Ethernet): This is a special run mode which is used in the development stage. The TouchPAD device can be updated by a PC from the remote side through Ethernet.

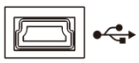
1. Ethernet Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device through Ethernet.

2. Run Only: Run the program.

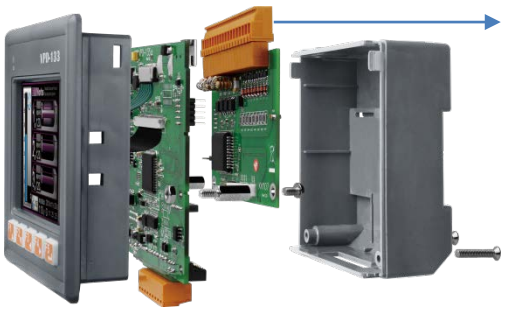
9. USB Force Update: Update a new application to the TouchPAD device through USB.

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 2.2.7 VPD-142/143 Series Models.

7.	**PoE and Ethernet RJ-45 Jack** *(for VPD-143/143N/143-H/143N-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.

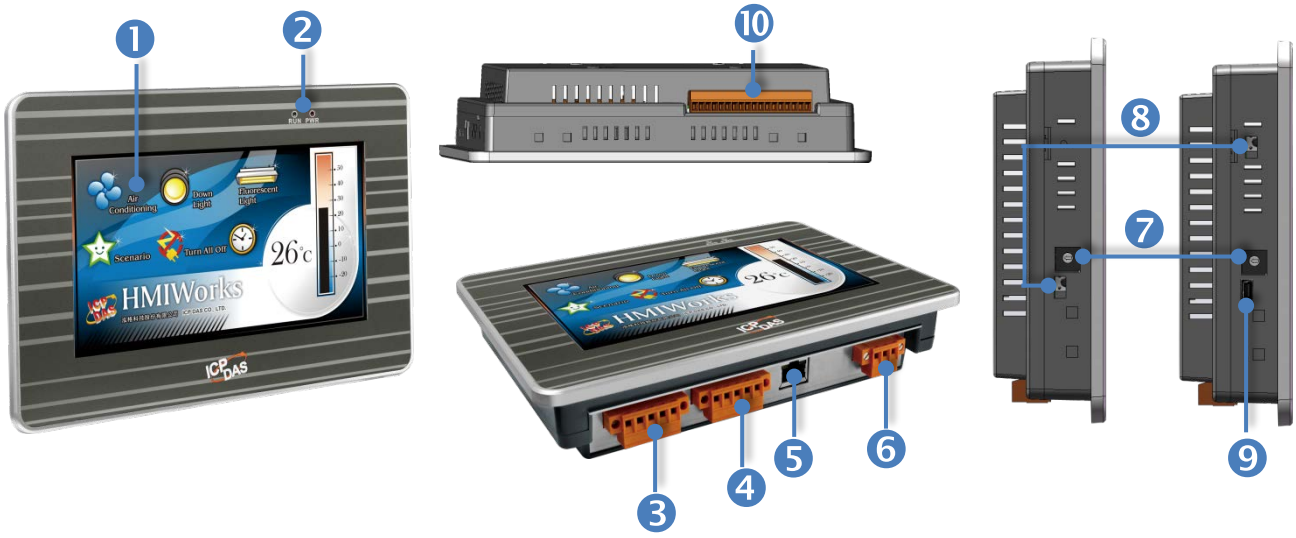
8.	**USB Port**
	The USB Port is used to downloading application programs.

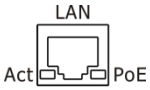
9.	**I/O Expansion Boards (Optional XV-board)**



2.1.9 VPD-173N/173X Series Models

Models supported include VP-173N, VPD-173N-64, VPD-173X and VPD-173X-64.



1.	**7” TFT LCD with Touch Panel**
2.	**L1 (LAN) and PWR (Power) LED Indicator**
3.	**COM2 (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 2.2.8 VPD-173N/173X Series Models.
4.	**COM1 (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 2.2.8 VPD-173N/173X Series Models.
5.	**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.

6. Power/GND Connector

The use as the power supply applies to VPD-173N/173X series models. The valid power voltage range is from **+12 to +48 V_{DC}**. For more detailed information regarding the pin assignments, refer to Section 2.2.8 VPD-173N/173X Series Models.

7. 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:

➢ **For VPD-173N/173N-64:**

0. Run & Update: Run or update the program. This mode is used in the development phase.

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 through Ethernet.

2. Run Only: Run the program.

➢ **For VPD-173X/173X-64:**

0. Run & Update (Ethernet): 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. Ethernet Force Update: While the application run on the TouchPAD device seriously crashes, use this mode to update a new application to the TouchPAD device through Ethernet.

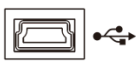
2. Run Only: Run the program.

9. USB Force Update: Update a new application to the TouchPAD device through USB.

8. 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.*

9. USB Port *(for VPD-173X/173X-64 only)*



The USB Port is used to downloading application programs.

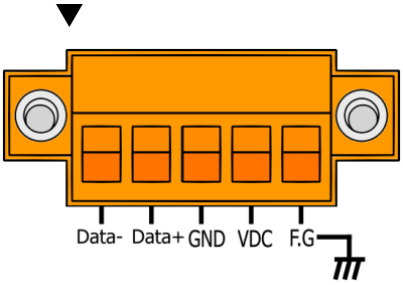
10. I/O Expansion Boards (Optional XV-board) *(for VPD-173X/173X-64 only)*

2.2 Pin Assignments

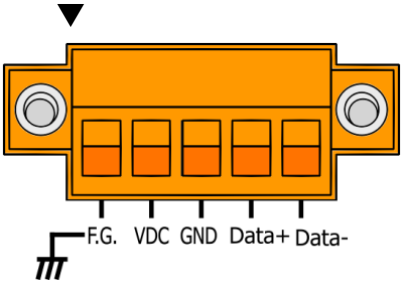
2.2.1 TPD-280/283/430/433 Series Models

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

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



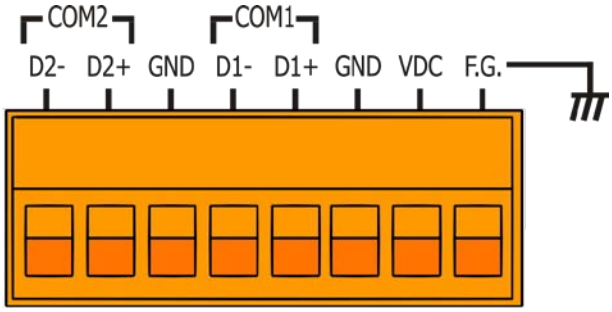
TPD-430/430-H/430-EU/430-H-EU
TPD-433/433-H/433-EU/433-H-EU



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/280U-H/283U-H/280-Mx/283U-Mx/ 430-H/430-H-EU/433-H/433-H-EU:** 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 Series Models

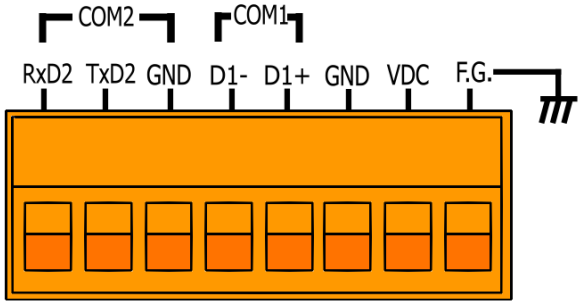
Models supported include TPD-432F and TPD-432F-H.



Pin	Name	Function Description
D2-	2-wire RS-485	For COM2 Serial Port
D2+		
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**. The valid power voltage range is from **+10 to +30 V_{DC}**. The use as the power supply applies to **TPD-432F-H**. 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.

2.2.3 TPD-433F Series Models

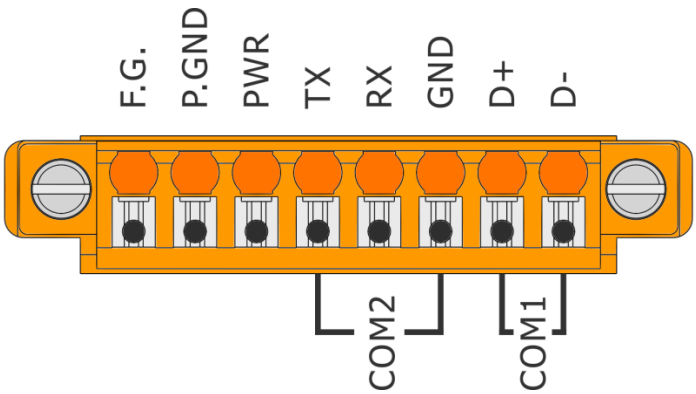
Models supported include TPD-433F, TPD-433F-H and TPD-433-M2.



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-433F**. The valid power voltage range is from **+10 to +30 V_{DC}**. The use as the power supply applies to **TPD-433F-H/433-M2**. 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.

2.2.4 TPD-703 Series Models

Models supported include TPD-703 and TPD-703-64.

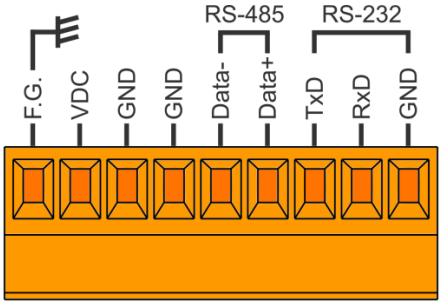


Pin	Name	Function Description
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.
P.GND	Ground Connection	
PWR	DC Power Input	The use as the power supply applies to TPD-703/703-64 Series models. The valid power voltage 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-		

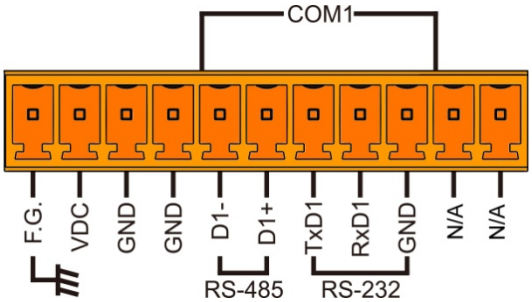
2.2.5 VPD-130 Series Models

Models supported include VPD-130, VPD-130N, VPD-130-H and VPD-130N-H.

▼ VPD-130/130N



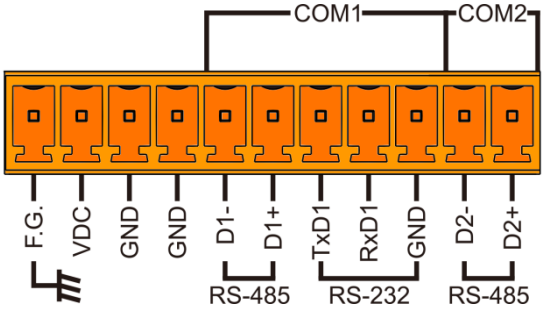
▼ VPD-130-H/130N-H



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(N)/130(N)-H Series models. The valid power voltage range is from **+12 to +48 V_{DC}**.
GND		Ground Connection	
GND		Ground Connection	
Data-	**D1-**	2-wire RS-485	For COM1 Serial Port
Data+	**D1+**		
TxD		3-wire RS-232	
RxD			
GND			

2.2.6 VPD-132/133 Series Models

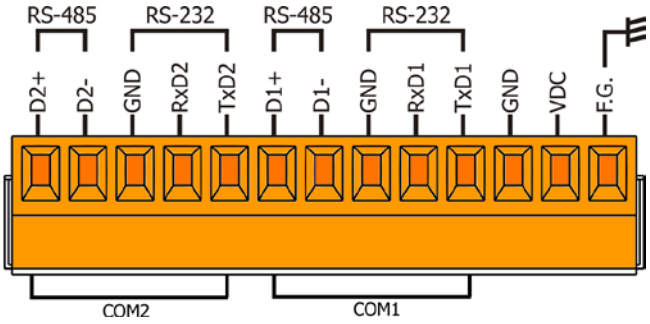
Models supported include VPD-132, VPD-132N, VPD-132-H, VPD-132N-H, VPD-133, VPD-133N, VPD-133-H and VPD-133N-H.



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(N)/133(N)/ 132(N)-H/133(N)-H Series models. The valid power voltage range is from **+12 to +48 V_{DC}**.
GND	Ground Connection	
GND	Ground Connection	
D1-	2-wire RS-485	For COM1 Serial Port
D1+		
TxD1	3-wire RS-232	
RxD1		
GND		
D2-	2-wire RS-485	For COM2 Serial Port
D2+		

2.2.7 VPD-142/143 Series Models

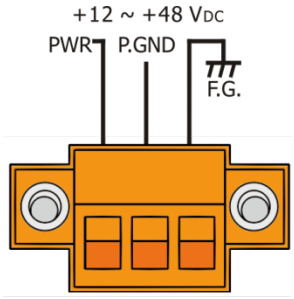
Models supported include VPD-142, VPD-142N, VPD-143, VPD-143N, VPD-142-H, VPD-142N-H, VPD-143-H and VPD-143N-H.

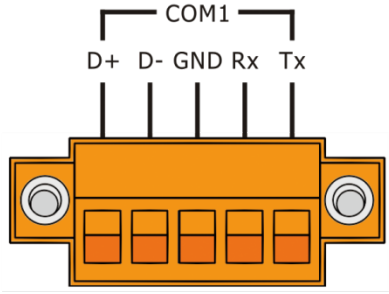


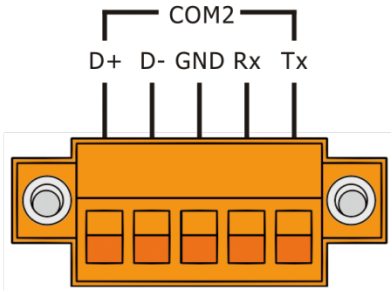
Pin	Name	Function Description
D2+	2-wire RS-485	For COM2 Serial Port
D2-		
GND	3-wire RS-232	
RxD2		
TxD2		
D1+	2-wire RS-485	For COM1 Serial Port
D1-		
GND	3-wire RS-232	
RxD1		
TxD1		
GND	Ground Connection	
VDC	DC Power Input	The use as the power supply applies to VPD-142(N)/143(N)/142(N)-H/143(N)-H 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.

2.2.8 VPD-173N/173X Series Models

Models supported include VPD-173N, VPD-173N-64, VPD-173X and VPD-173X-64.





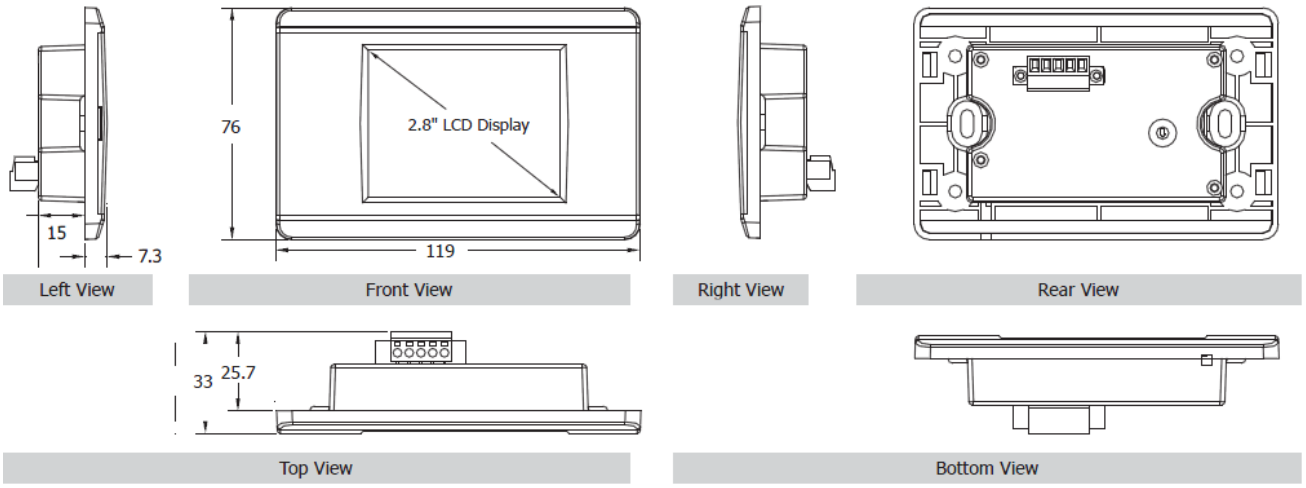


Pin	Name	Function Description
PWR	DC Power Input	The use as the power supply applies to VPD-173N/173N-64/173X/173X-64. The valid power voltage range is from **+12 to +48 V_{DC}.**
P.GND	Power Ground Connection	
F.G.	Frame Ground	Frame Ground is connected to the inside EMI or ESD suppression circuits. Make sure that F.G. is connected to the Earth.
D+	2-wire RS-485 or 3-wire RS-232	For COM1 Serial Port
D-		
GND		
Rx		
Tx		
D+	2-wire RS-485 or 3-wire RS-232	For COM 2 Serial Port
D-		
GND		
Rx		
Tx		

2.3 Dimensions

2.3.1 TPD-280/283 Series Models

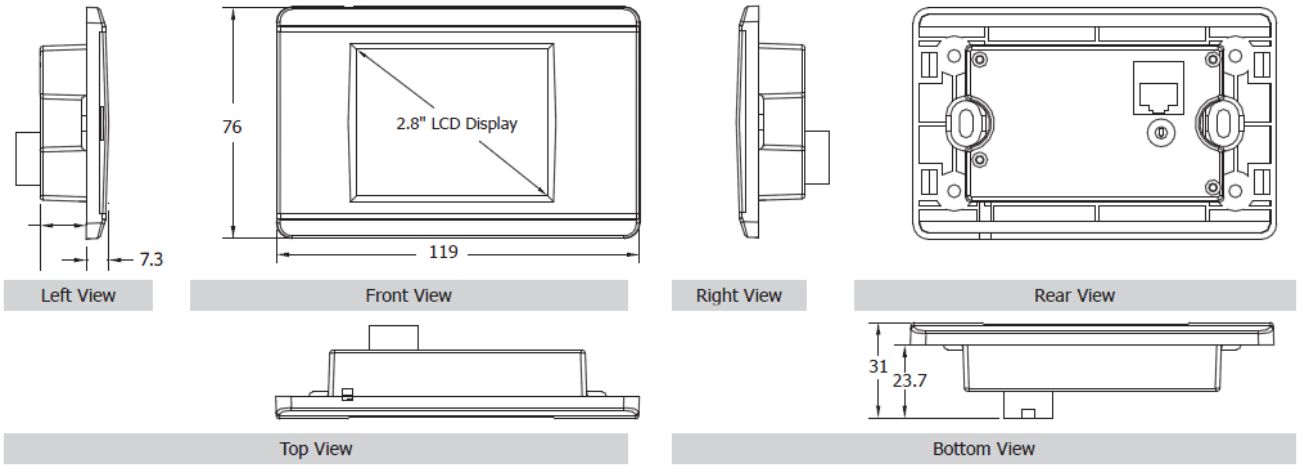
➢ TPD-280/280U/280-H/280U-H (Units: mm)



Left View | Front View | Right View | Rear View

Top View | Bottom View

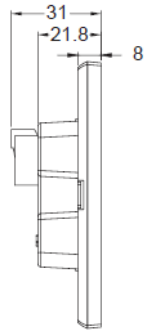
➢ TPD-283/283U/283-H/283U-H (Units: mm)



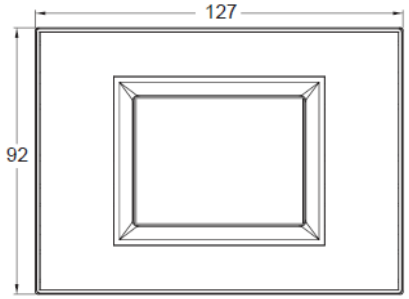
Left View | Front View | Right View | Rear View

Top View | Bottom View

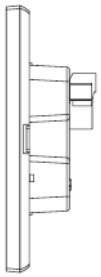
➢ TPD-280-Mx/283-Mx/283U-Mx (Units: mm)



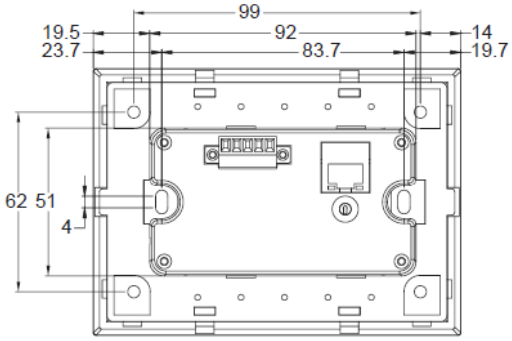
Left View



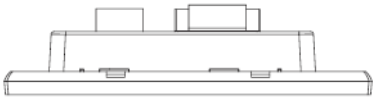
Front View



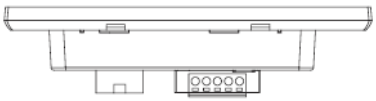
Right View



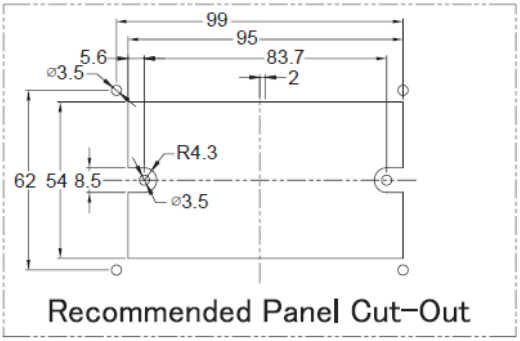
Rear View



Top View



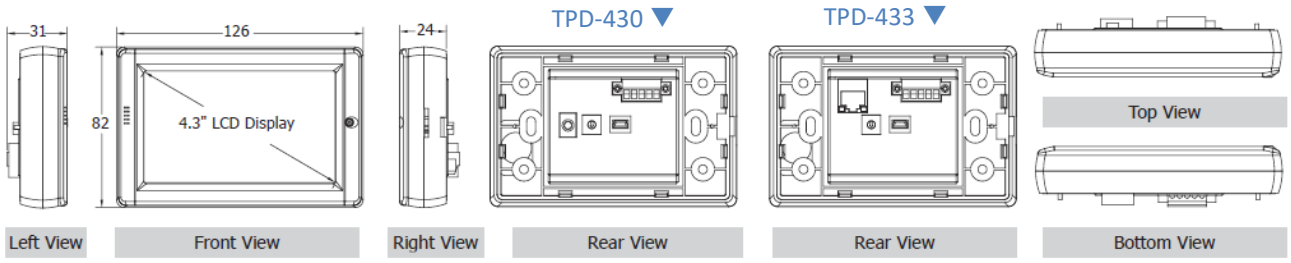
Bottom View

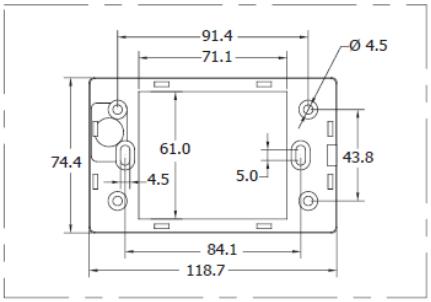


Wall Mounting

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

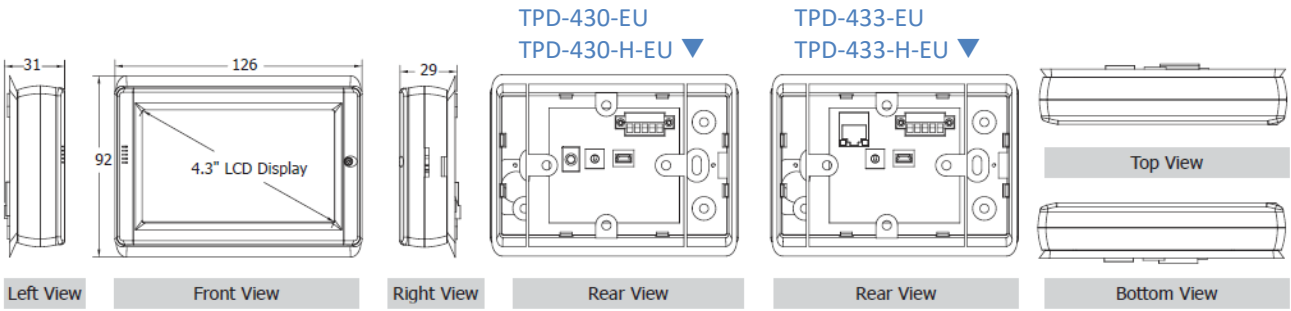
➢ TPD-430/433/430-H/433-H (Units: mm)

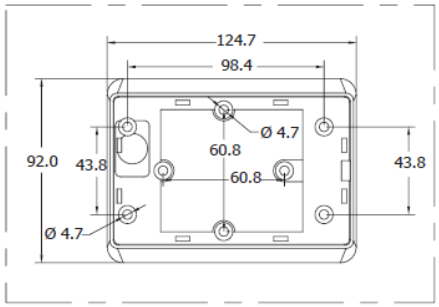




Wall Mounting

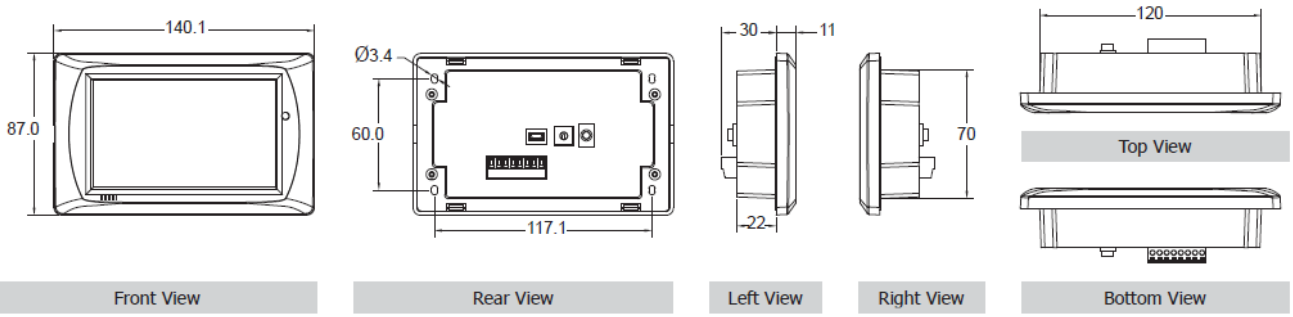
➢ TPD-430-EU/433-EU/430-H-EU/433-H-EU (Units: mm)



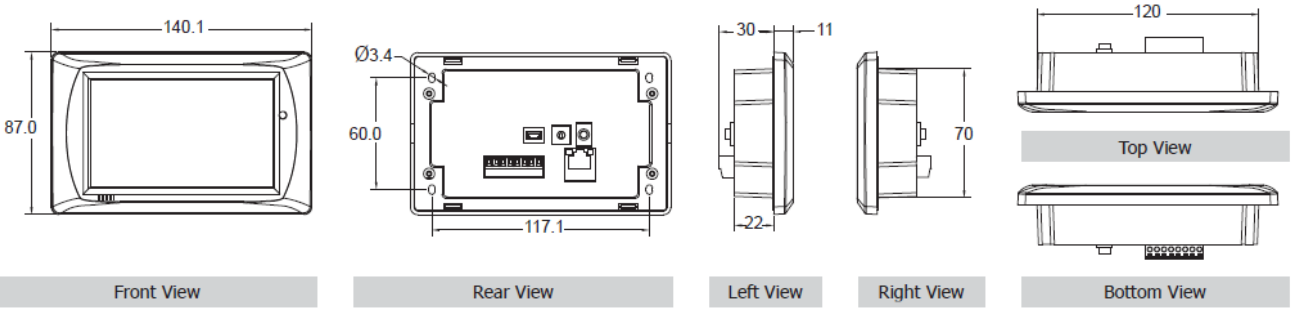


Wall Mounting

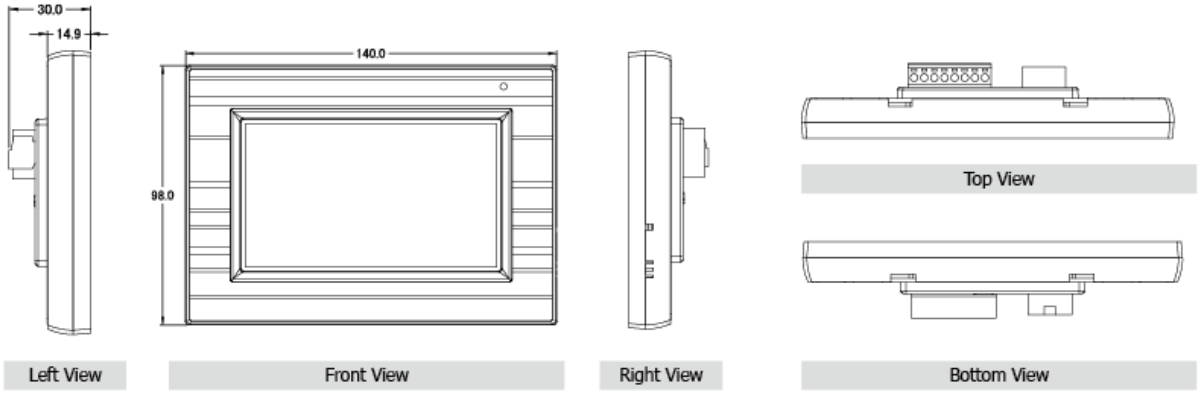
➢ TPD-432F/432F-H (Units: mm)

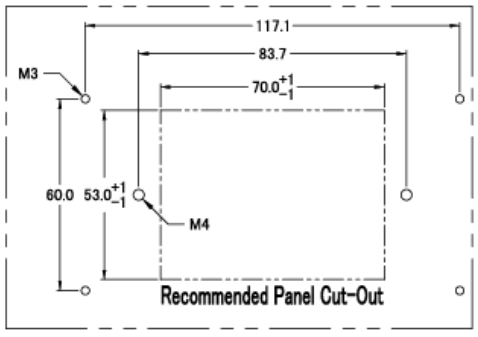


➢ TPD-433F/433F-H (Units: mm)



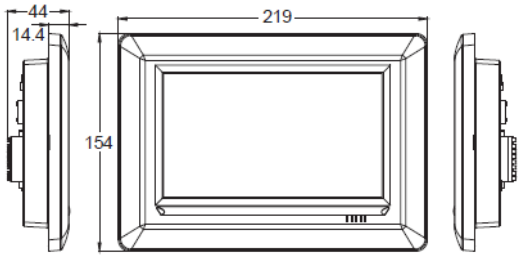
➢ TPD-433-M2 (Units: mm)



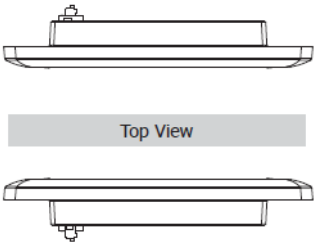


Wall Mounting

➢ TPD-703/703-64 (Units: mm)

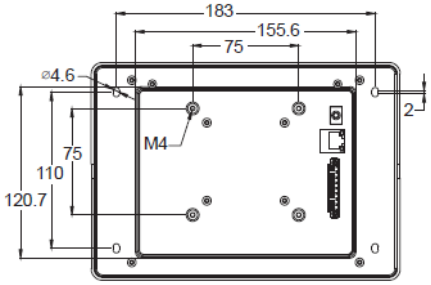


Left View | Front View | Right View

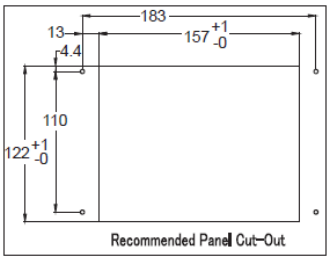


Top View

Bottom View



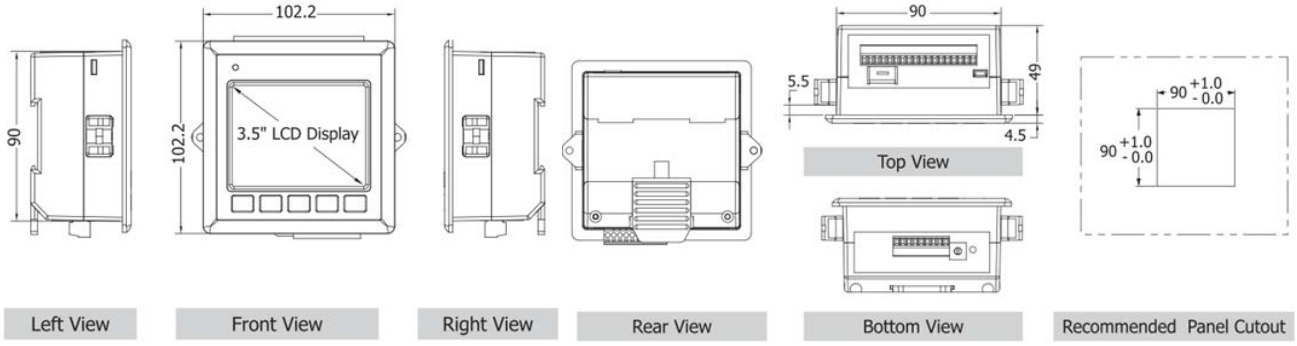
Rear View



Wall Mounting

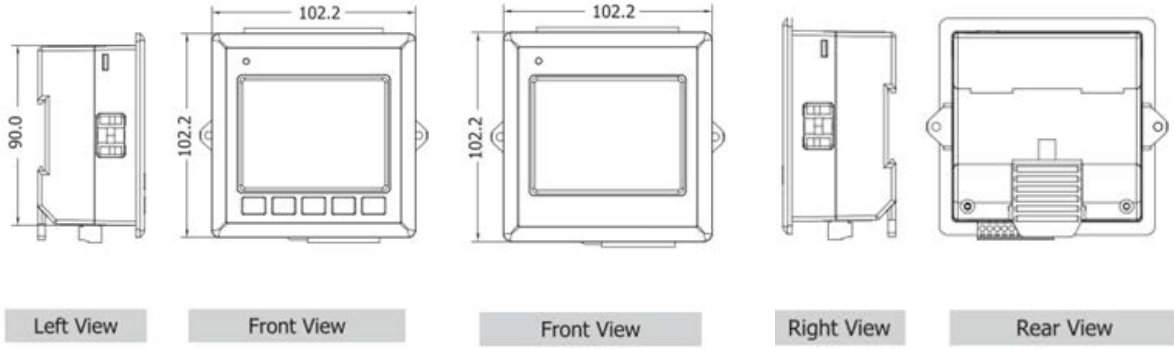
2.3.3 VPD-130/132/133 Series Models

➢ VPD-130/130N/130-H/130N-H (Units: mm)

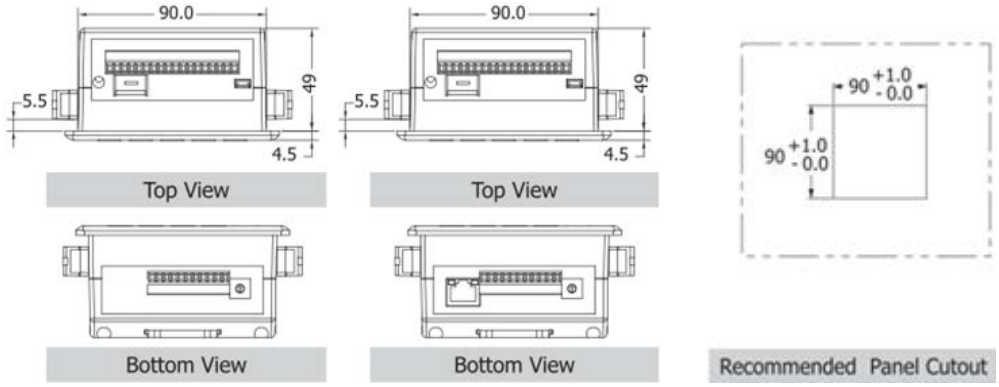


➢ VPD-132/132N/132-H/132N-H/133/133N/133-H/133N-H (Units: mm)

VPD-132(-H)/133(-H) ▼ VPD-132N(-H)/133N(-H) ▼

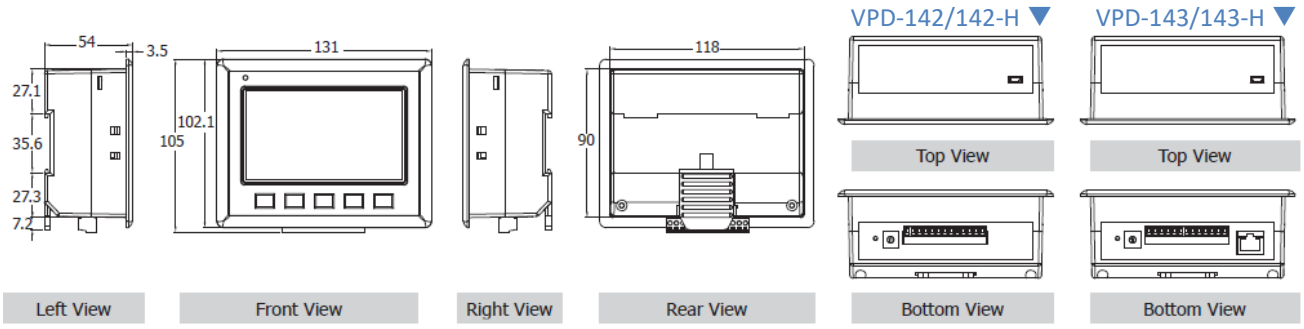


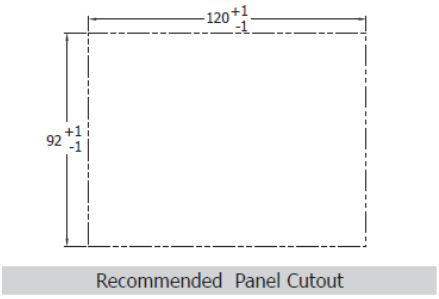
VPD-132(-H)/132N(-H)▼ VPD-133(-H)/133N(-H) ▼



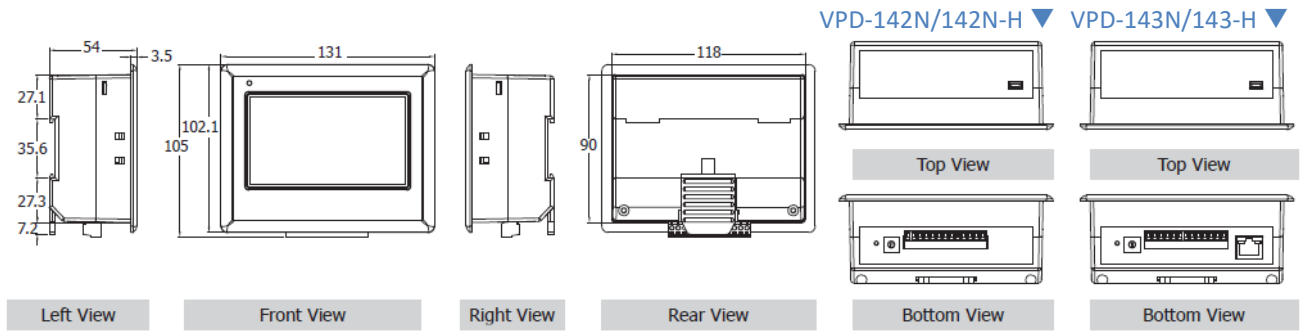
2.3.4 VPD-142/143/173N/173X Series Models

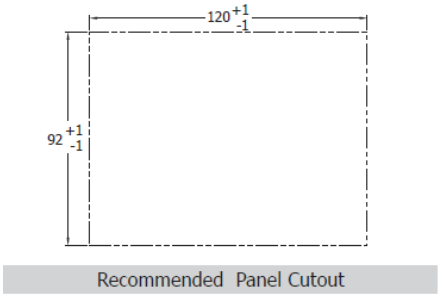
➢ VPD-142/143/142-H/143-H (Units: mm)



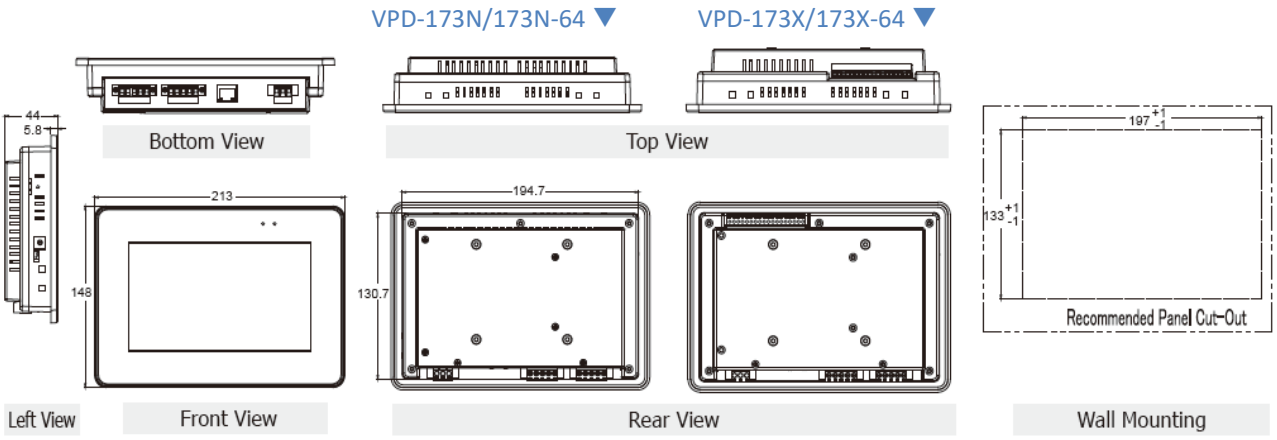


➢ VPD-142N/143N/142N-H/143N-H (Units: mm)





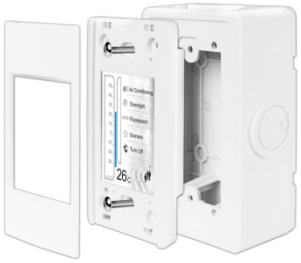
➢ VPD-173N/173N-64/173X/173X-64 (Units: mm)



2.4 Mounting the Hardware

2.4.1 Wall Mounting

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

(EWB-T28-BK)	(EWB-T28)	External Wall Box
		

Outlet Box (OB120)	
	

➢ **For TPD-430-EU/433-EU/430-H-EU/433-H-EU (4.3")**

European 86 x 86 mm Outlet Box


➢ **For TPD-430/433/430-H/433-H (4.3")**

(EWB-T43-BK)	(EWB-T43)	External Wall Box
		

Outlet Box (OB120)	
	

➢ **For TPD-432F/433F/432F-H/433F-H (4.3")**

External Wall Box (EWB-T43F)		Outlet Box (OB140F)	
			

Outlet Box (OB-140FP)	
	

➢ For TPD-703/703-64 (7”)

External Wall Box (EWB-T70)		Outlet Box (OB170)	
			

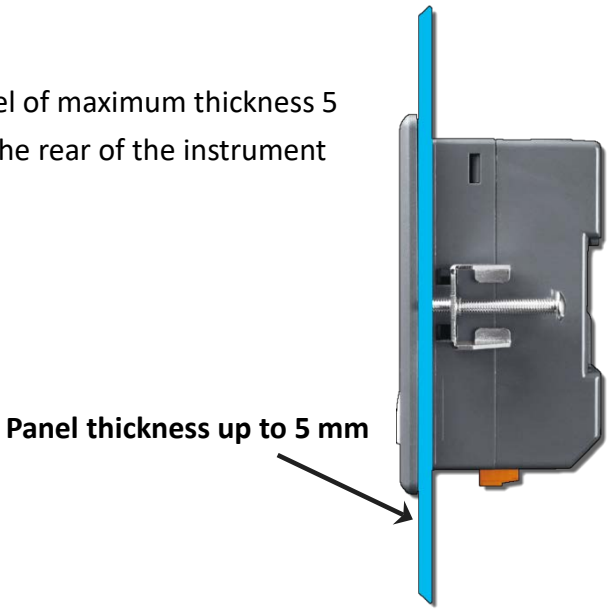
2.4.2 DIN-Rail Mounting

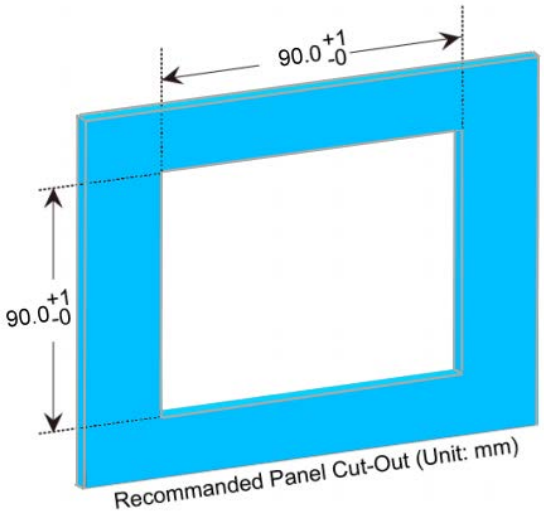
The VPD Series device can be mounted by attaching the bottom of the chassis to a DIN-Rail or the wall. The DIN-Rail mounts are available in three size, and enable a variety of ICP DAS devices to be mounted.

Part Number	Maximum Number of Modules	Dimensions
DRS-125	2	125 mm x 35 mm
DRS-240	3	240 mm x 35 mm
DRS-360	5	360 mm x 35 mm

2.4.3 Panel Mounting

The VPD Series device can be mounted on a panel of maximum thickness 5 mm. Adequate access space can be available at the rear of the instrument panel for wiring and servicing purposes.

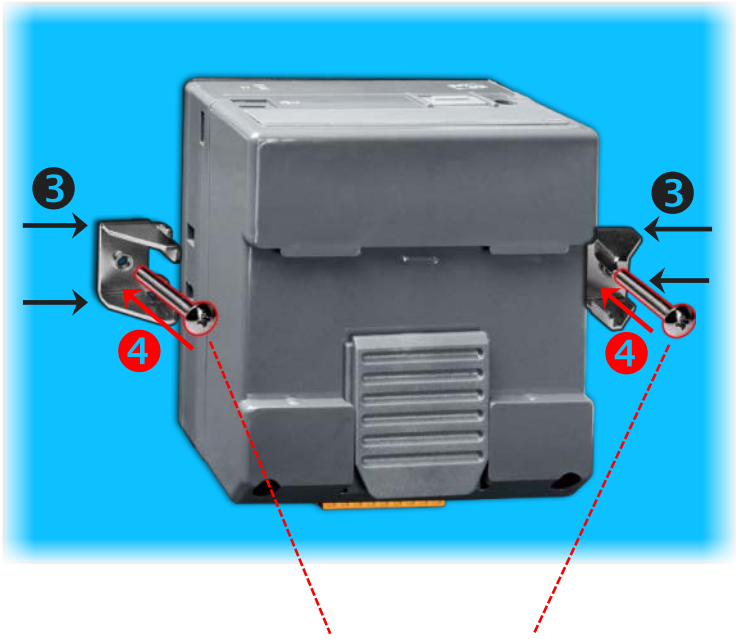




1. Prepare the panel and cut the hole to the specified size. The detailed about panel cut-out size depends on the type of VPD Series, please refer to Section 2.3 Dimensions.

2. Attach the View PAC to the cut-out hole.

3. Insert the panel mounting clips into the upper and lower ventilation holes.
4. Screw the panel mounting clips to the panel.

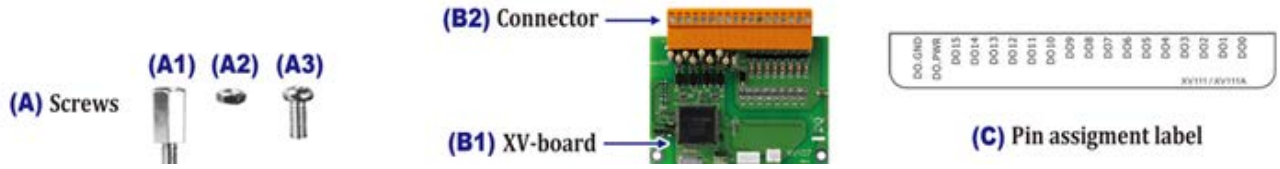


Mounting Screw: M4 x 30L

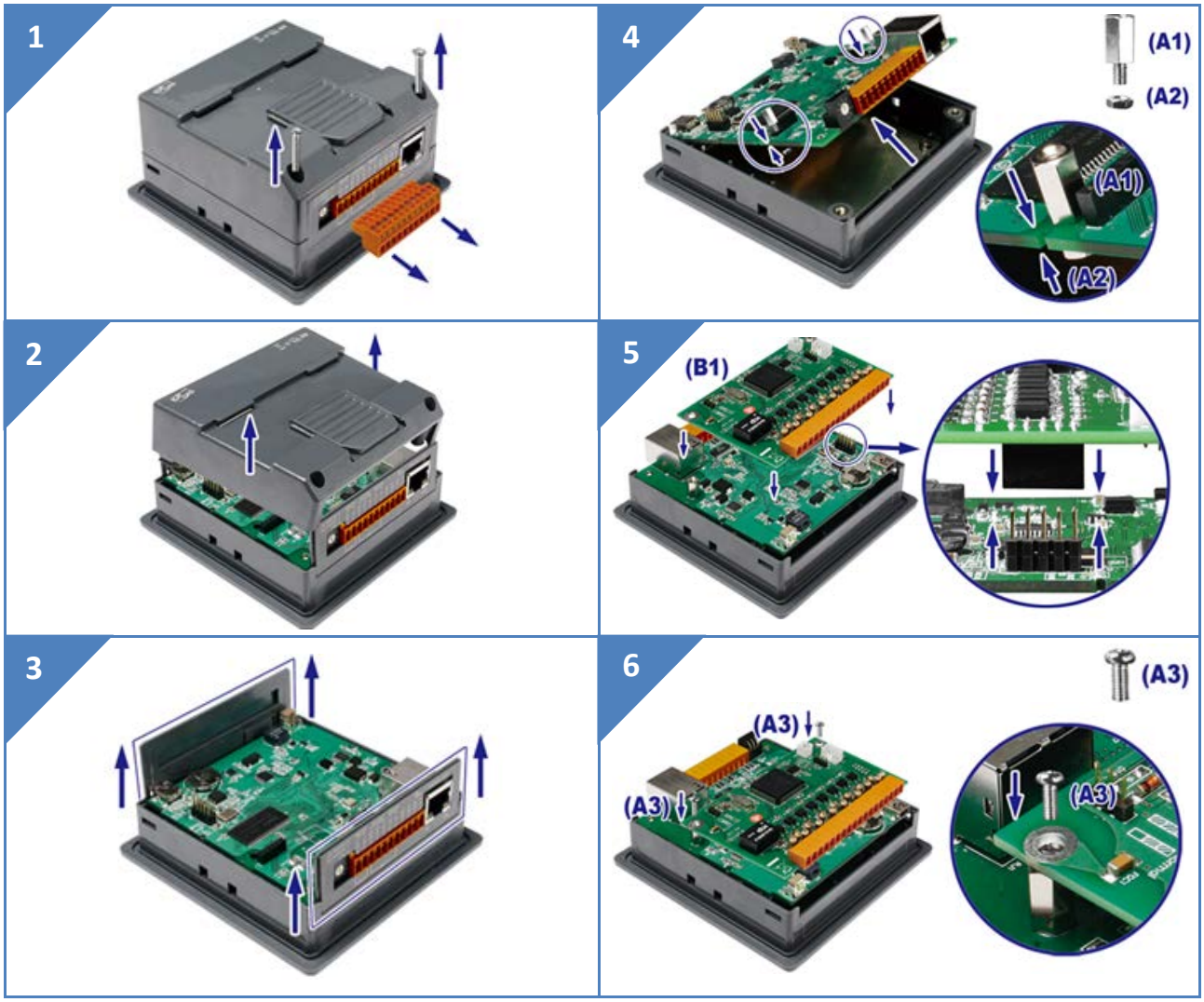
Note: Recommended Screw Torque: 3.4 ~ 4.5 kgf-cm.

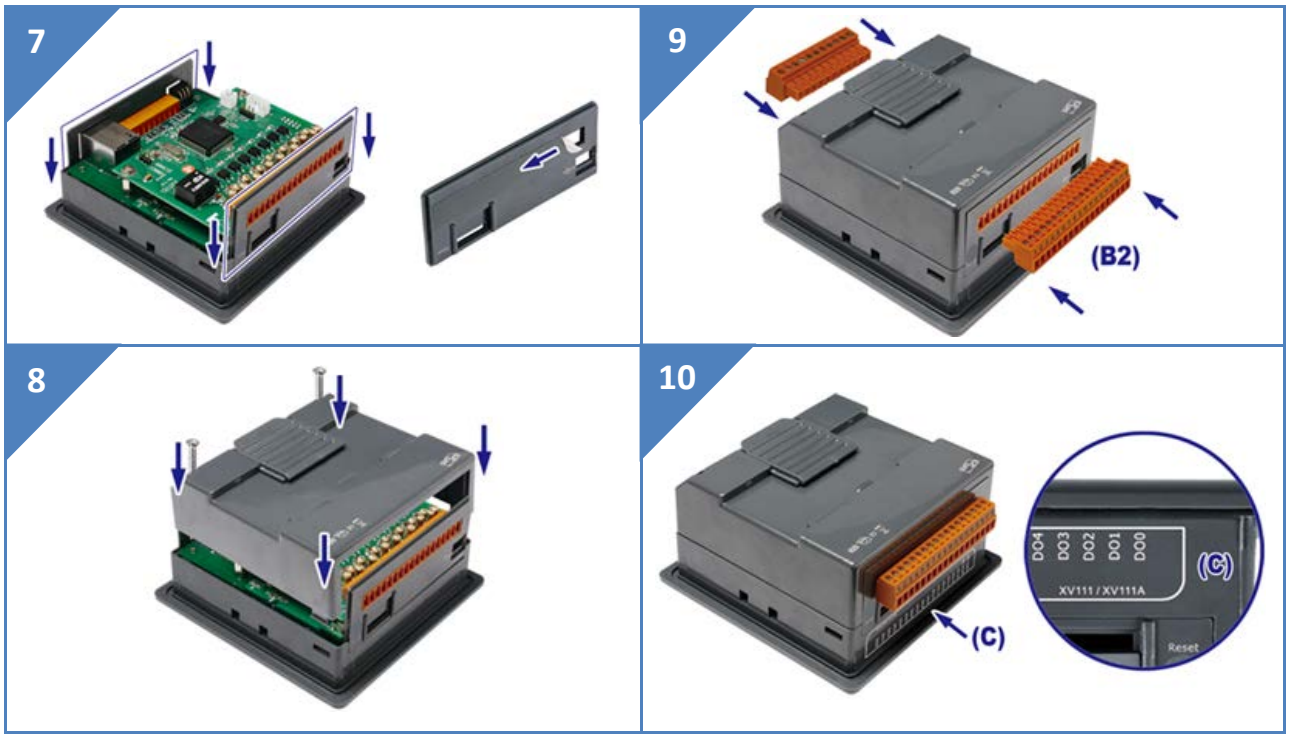
2.4.4 XV-boards Assembly on the VPD Series

➢ What's in the package?



➢ Follow the procedure described below:





3. Getting Started

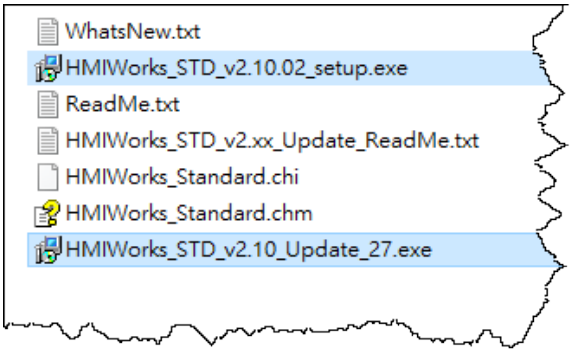
This chapter provides a basic overview of how to install, configure and operate TouchPAD device.

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/



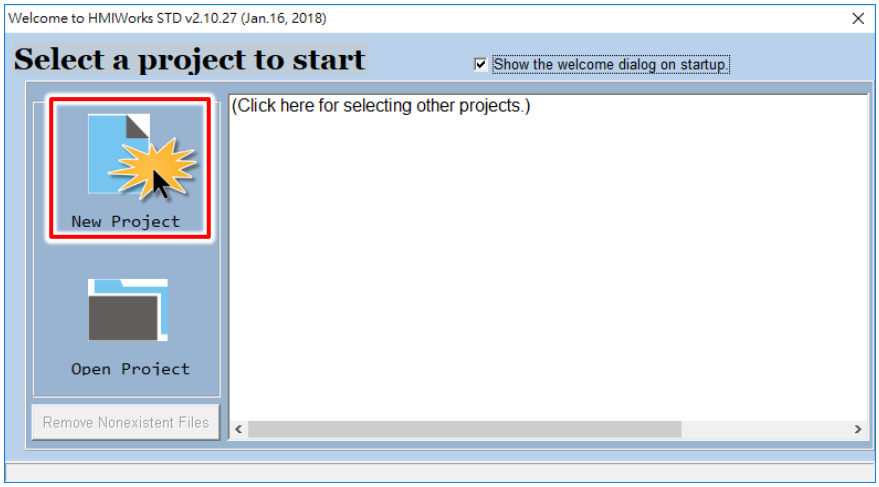
1. Double-click the **"HMIWorks_STD_vxxx_setup.exe"** file icon to execute the driver installation program.
2. Once the driver installation is complete, double-click the **"HMIWorks_STD_vxxx_Update_xx.exe"** file icon to execute the driver installation update program.

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

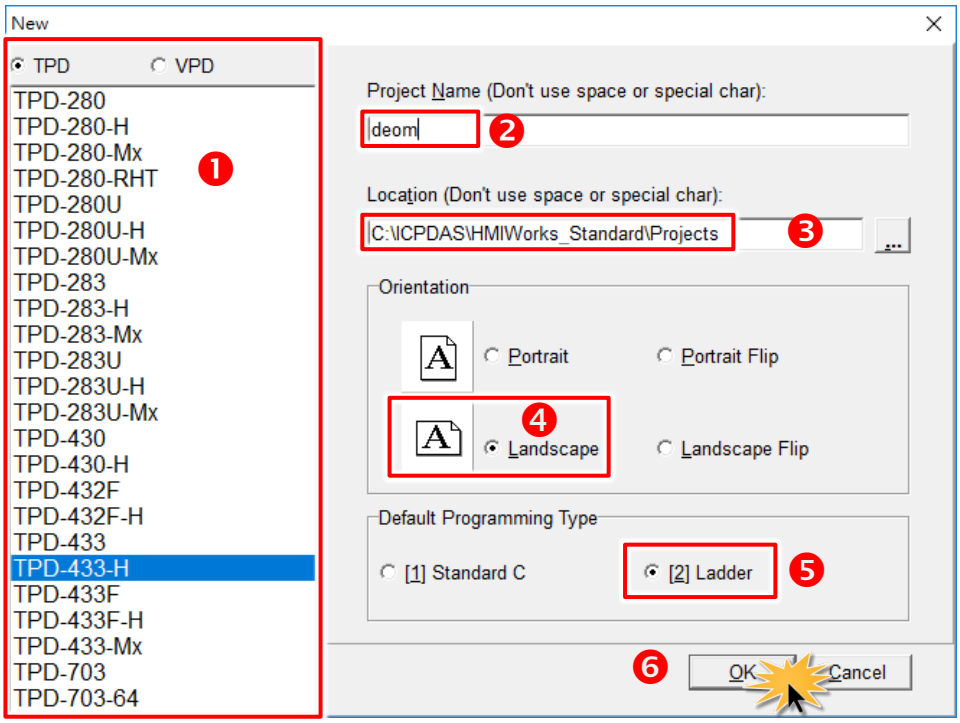
Step 1: Double click the HMIWorks shortcut on desktop to open the HMIWorks software.

Step 2: Click the **"New Project"** icon to create a new project.



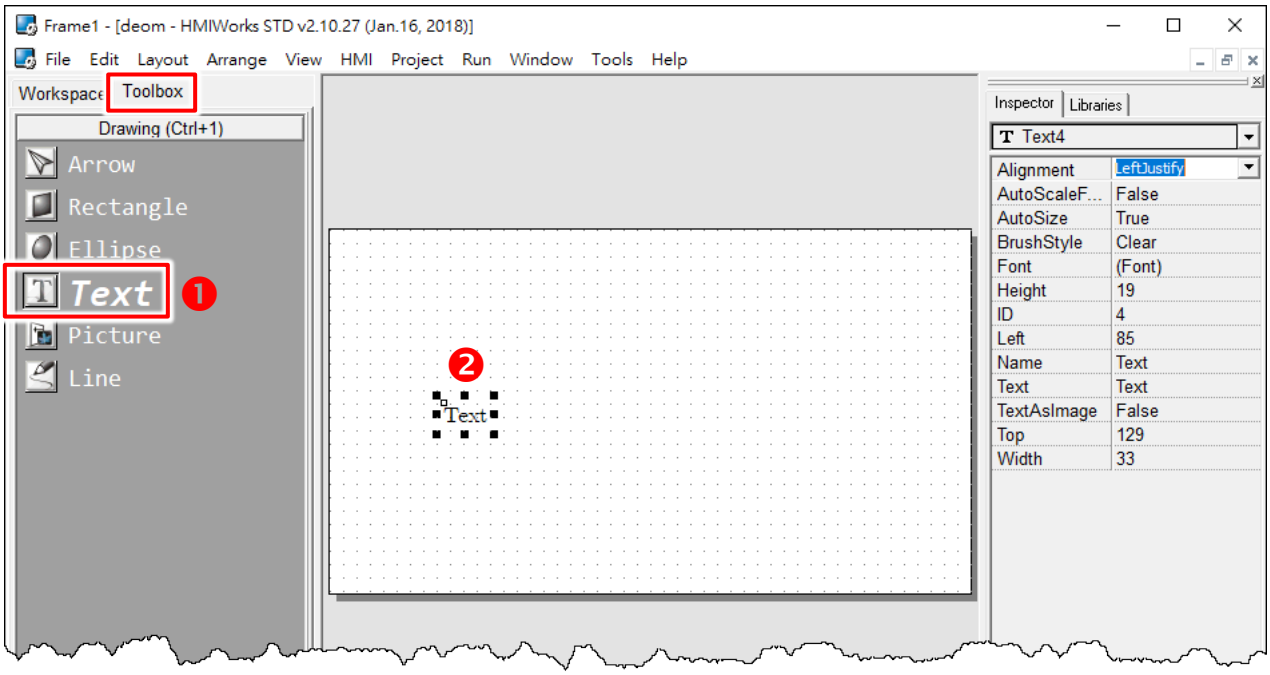
Step 3: In the **"New"** dialog box, configure the parameters for the new project as follows:

1. Click the name of the TouchPAD model to select it (e.g., TPD-433-H).
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.

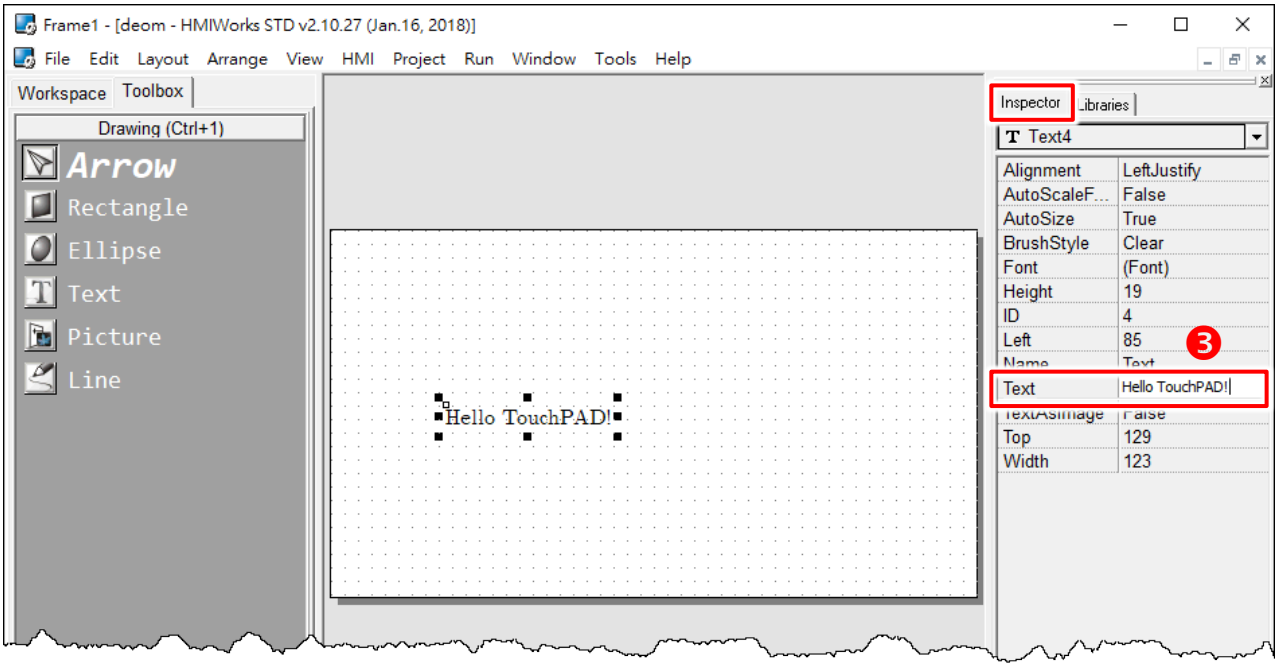


Step 4: The following example creates a simple procedure that displays the string **“Hello TouchPAD!”** on the screen of the TouchPAD device.

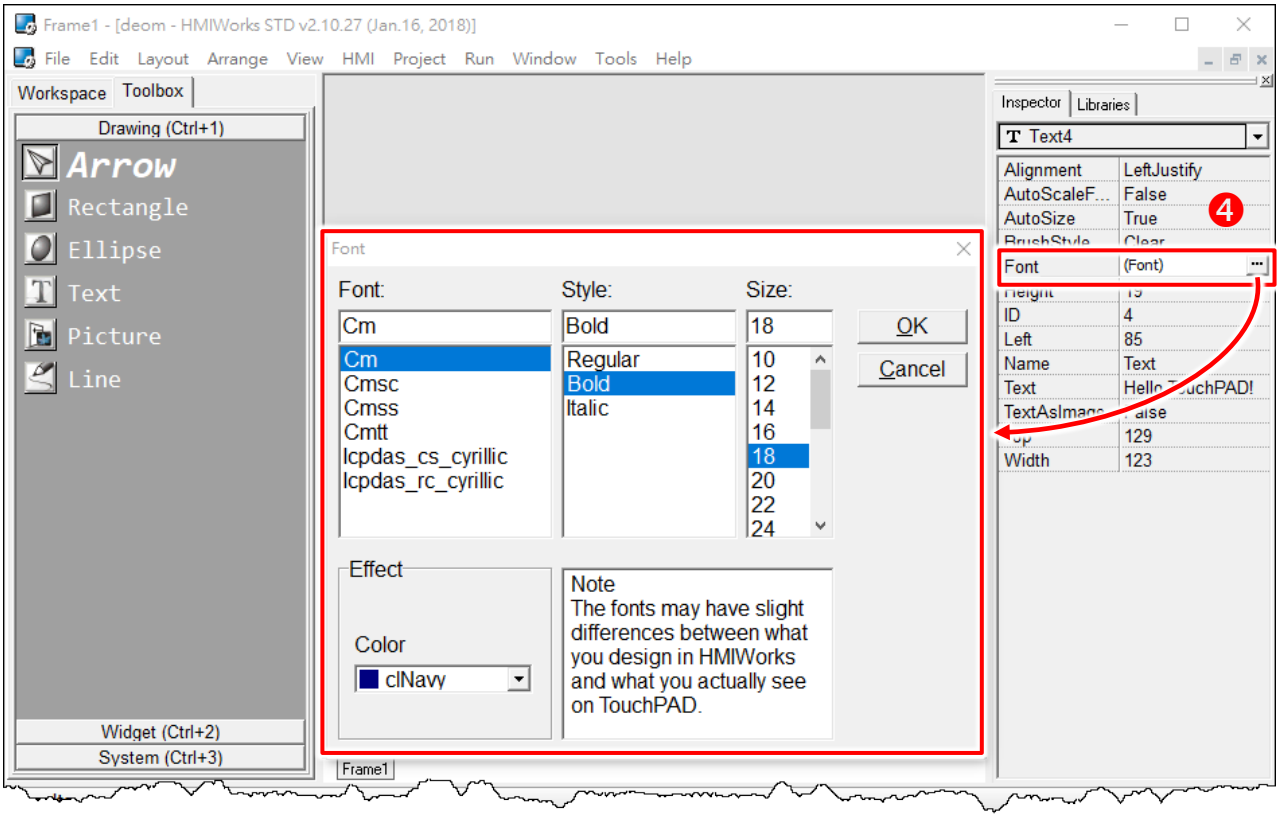
1. Click the **“Text”** icon from the **“Toolbox”** pane.
2. Drag and click the **"Text"** tag to the desired position on the design frame.



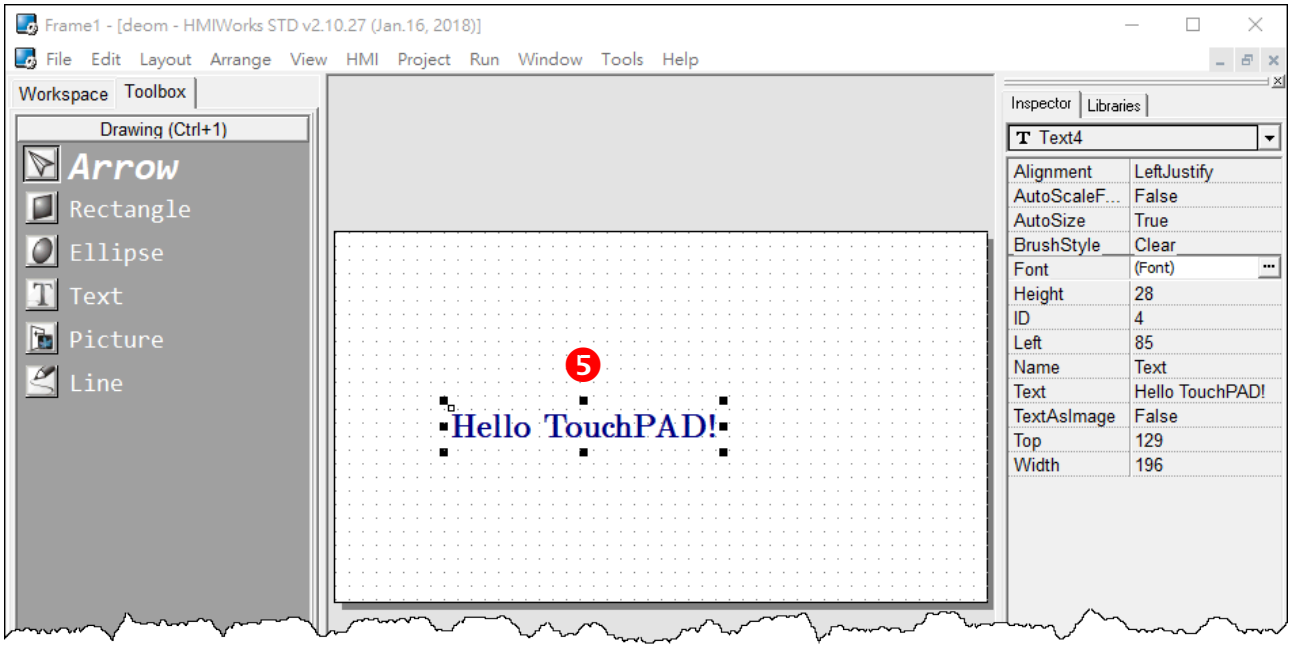
3. Enter the **“Hello TouchPAD!”** in the **“Text”** field from the **“Inspector”** pane and press **<Enter>**.



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



5. 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:

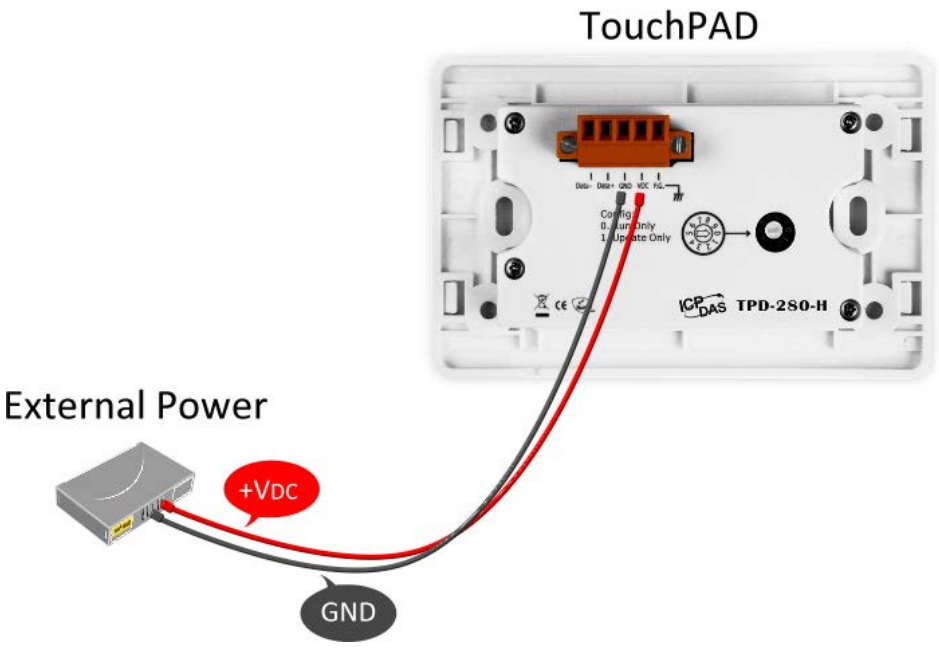
3.3.1 DC Power Supply

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

The valid power voltage range depends on the type of TPD/VPD Series device. Please refer to the table below:

Model	**TPD**	TPD-280/280U/283U TPD-430/430-EU TPD-433/433-EU TPD-432F/433F	TPD-280-H/208U-H/283U-H/280-Mx/283U-Mx TPD-430-H/433-H/430-H-EU/433-H-EU TPD-432F-H/433F-H/433-M2 TPD-703/703-64
	VDP	--	VPD-130(N)/130(N)-H VPD-132(N)/132(N)-H VPD-133(N)/133(N)-H VPD-142(N) /143(N)-H VPD-173N/173N-64/173X/173X-64
Power Input		**+10 ~ 30 VDC**	**+12 ~ +48 VDC**

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

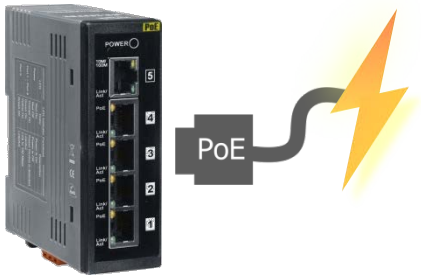


3.3.2 PoE Power Supply

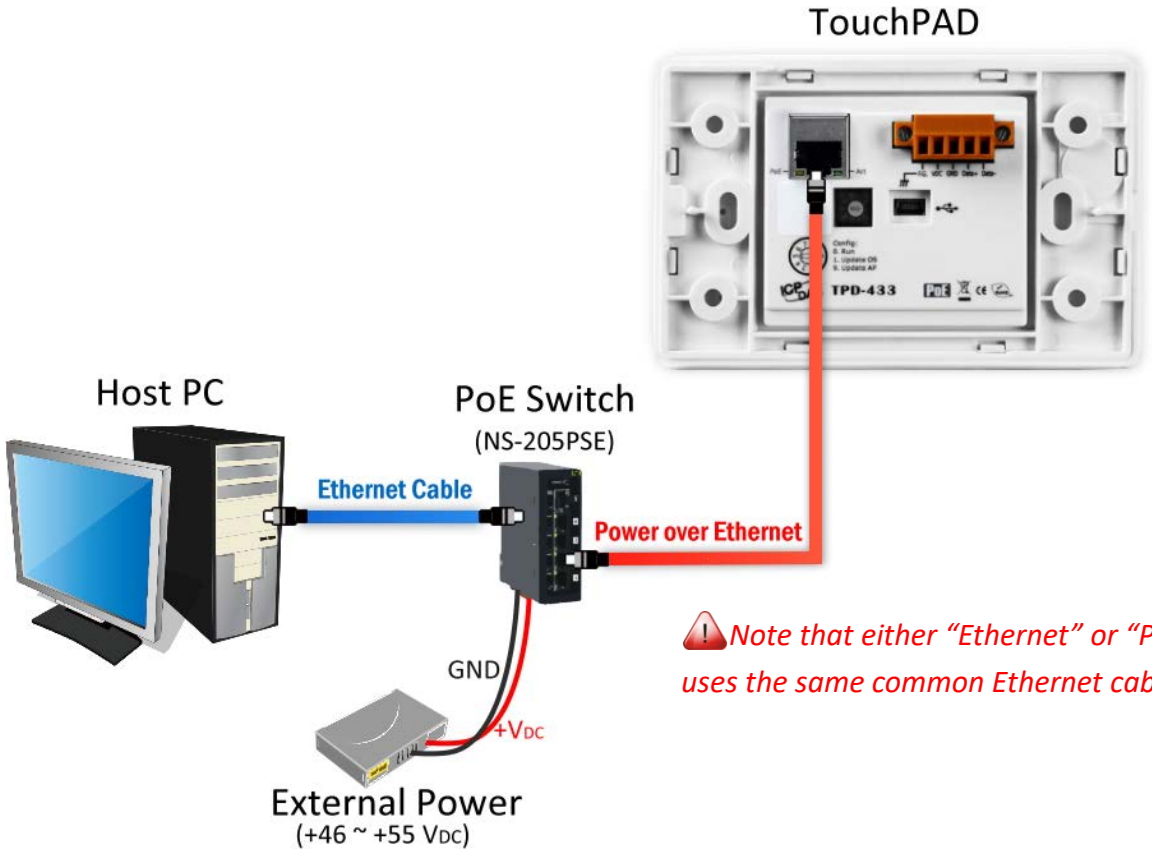
When using PoE devices such as the TPD-283(-H)/283U(-H)/283(U)-Mx, TPD-433(-H)/433(-H)-EU/433F(-H)/433-M2/703(-64) and VPD-133(N)(-H)/143(N)(-H)/173N(-64)/173X(-64), you can incorporate the ICP DAS **"PoE"** switch, the **"NS-205PSE"**, as the power source. The NS-205PSE automatically detects any connected 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.



Note that either "Ethernet" or "PoE" uses the same common Ethernet cable.

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:

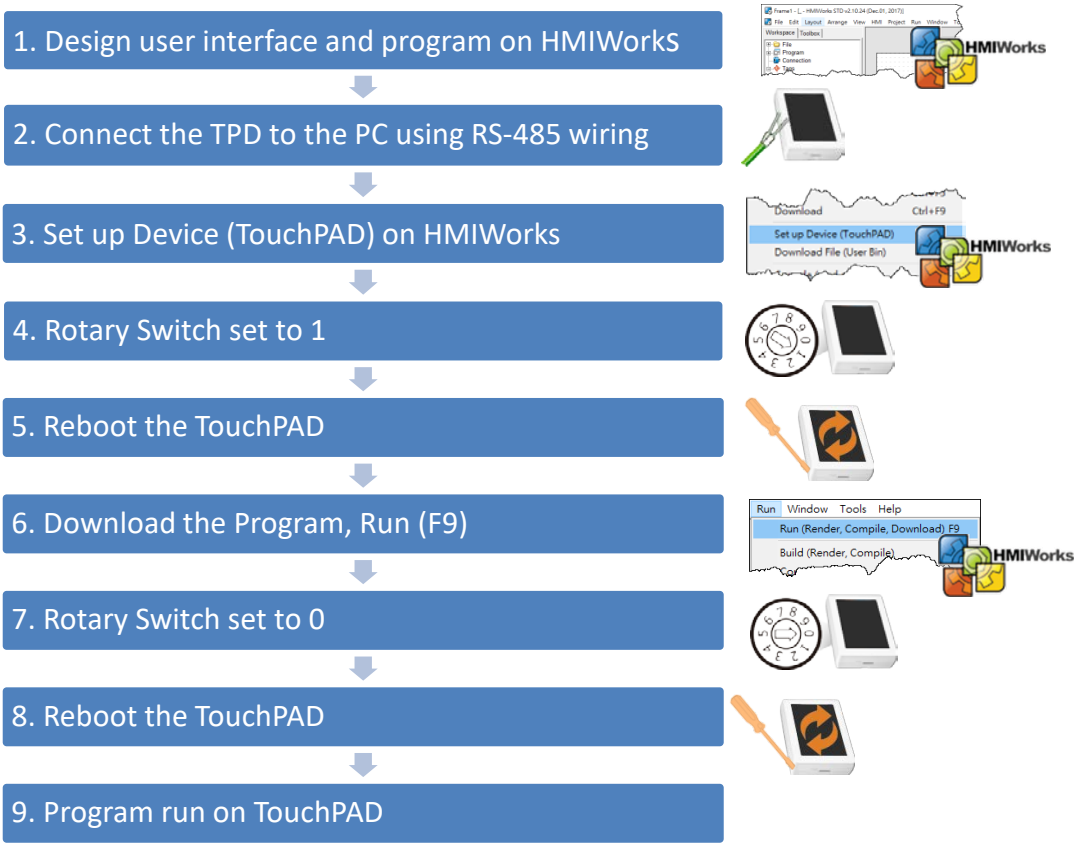
3.4.1 Setup RS-485-downloaded Devices

The following models use RS-485 to download the HMIWorks-built applications:

☑ TPD-280	☑ TPD-280-M1/M2/M3
☑ TPD-280-H	

3.4.1.1 Applications are downloaded through RS-485

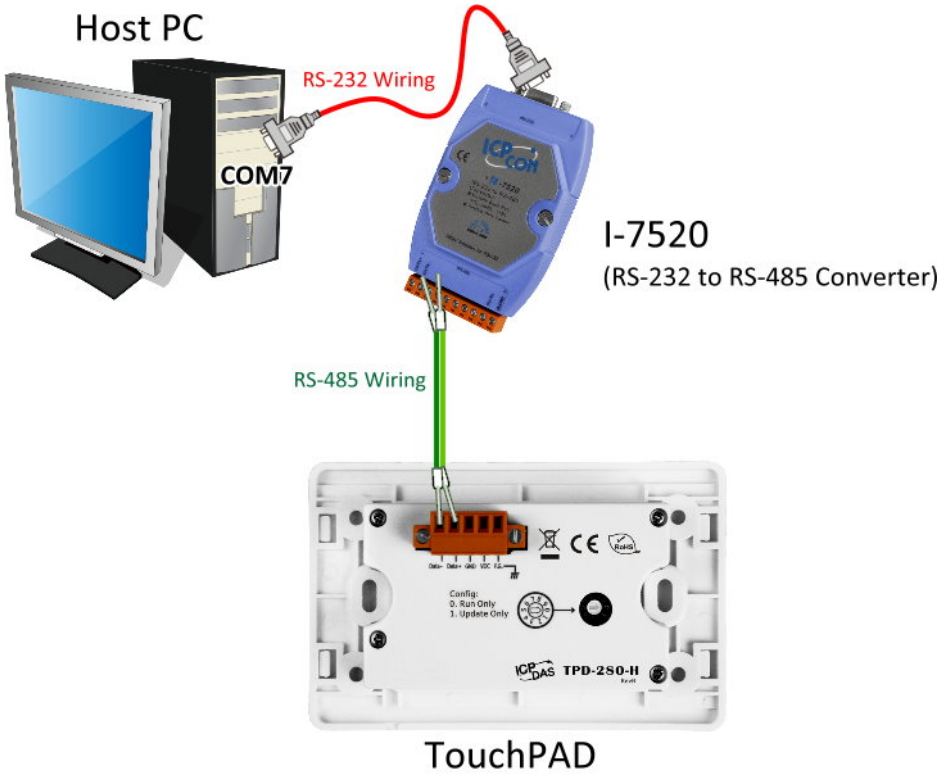
The following flow chart describes the RS-485 downloading procedures.



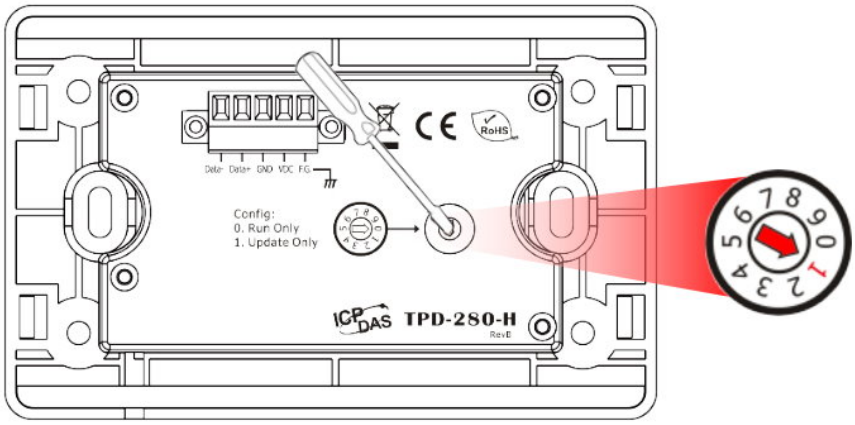
➢ Follow the procedure described below:

Step 1: Connect 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** through a RS-485 converter. For example: I-7520 (RS-232 to RS-485 converter), or I-7561 (USB to RS-485 converter).



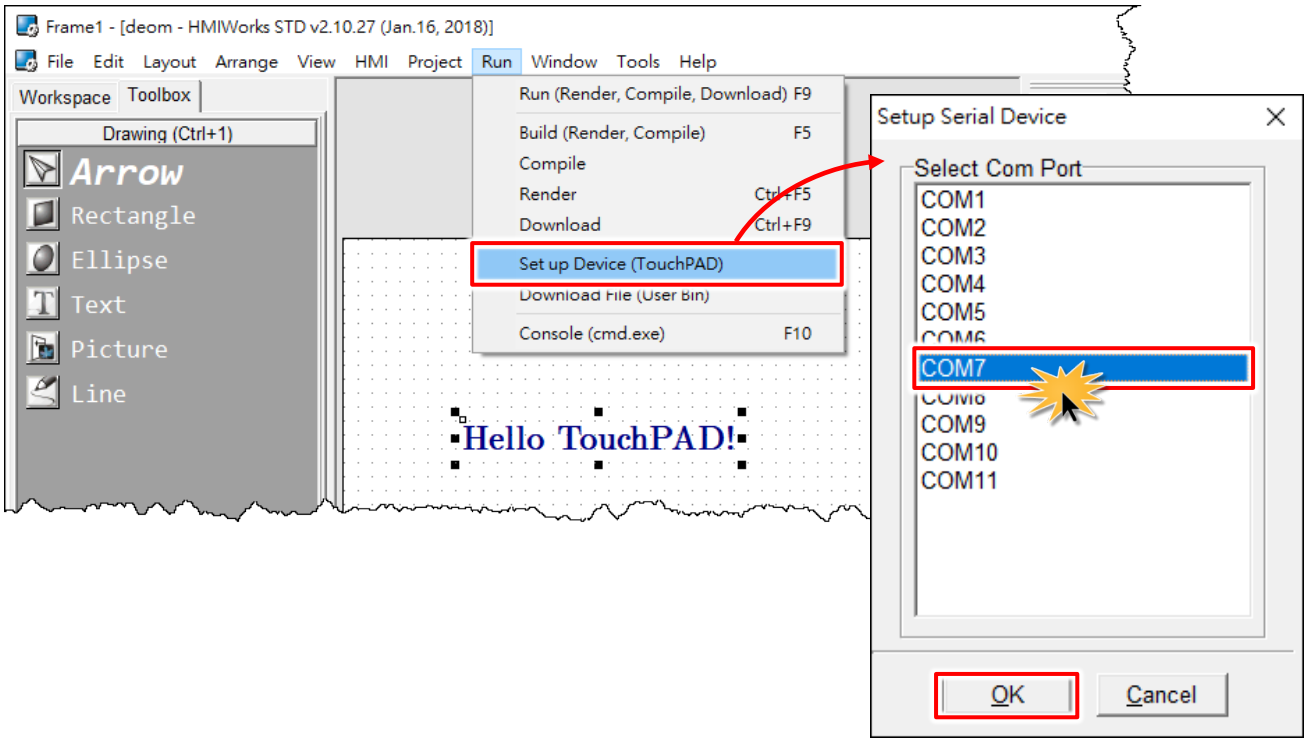
Step 3: Use a flat-head screwdriver to set the **Rotary Switch** on the TouchPAD device to **position 1 (Update mode)**. **Reboot the TouchPAD device** and then setting is complete. *Note that the default configuration is position 0.*



Note: Before downloading programs to the TouchPAD device, be sure to select correct COM port first.

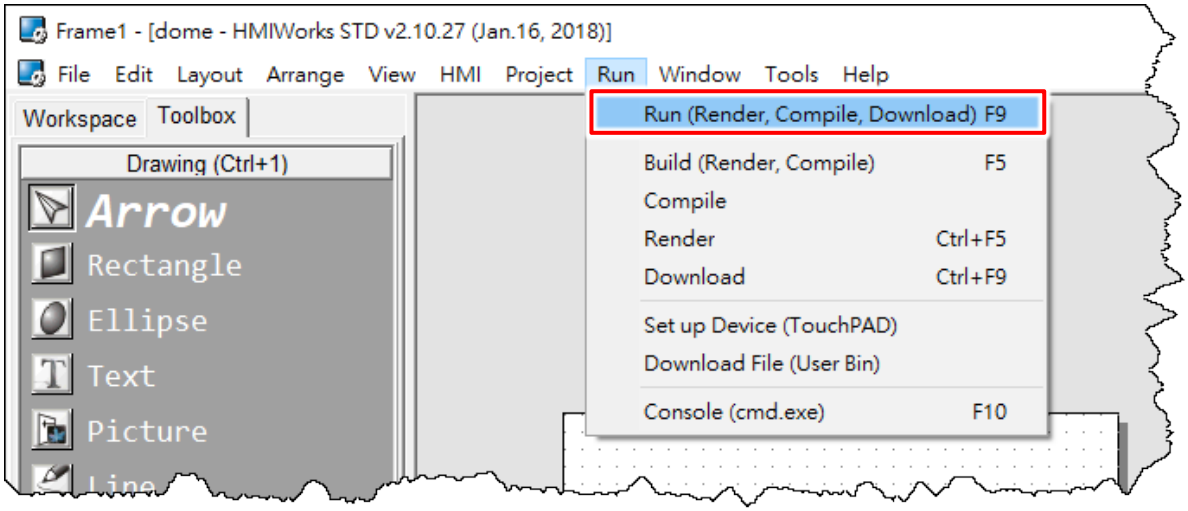
Step 4: In the HMIWorks software, click the **"Set up Device (TouchPAD)"** item from the **"Run"** menu to open "Setup Serial Device" dialog box.

Step 5: In the "Setup Serial Device" dialog box, **select the COM Port** (e.g., COM7) depending on your PC COM Port that connect to TouchPAD device and click the **"OK"** button.

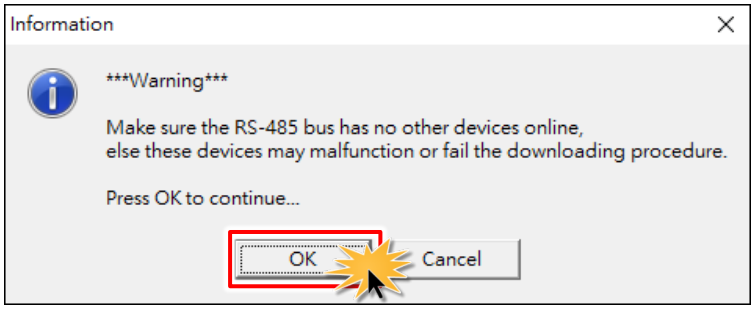


Note: Verify that the new project has been created (see Section 3.2 "Create a New Project in the HMIWorks").

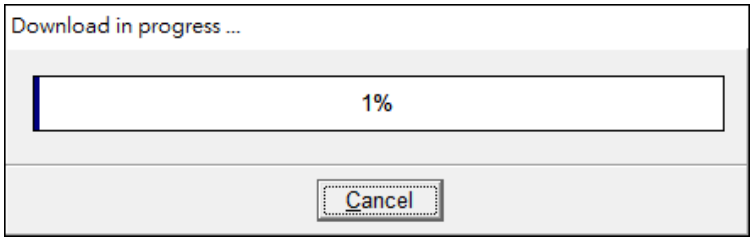
Step 6: Click the **"Run (Render, Compile, Download) F9"** item from the **"Run"** menu, or press **<F9>**.



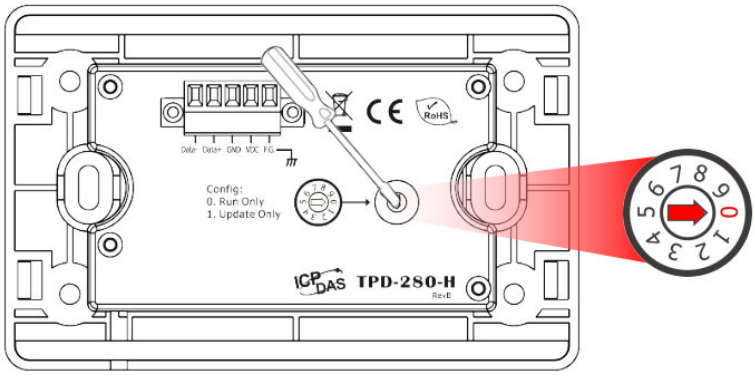
Step 7: A "*** Warning***" dialog box will be displayed.
Ensure there is no other device on the same RS-485 bus that may cause update failure.
Click the **"OK"** button to continue.



Step 8: The **"Download in progress…"** dialog box will be displayed showing the progress of the update.



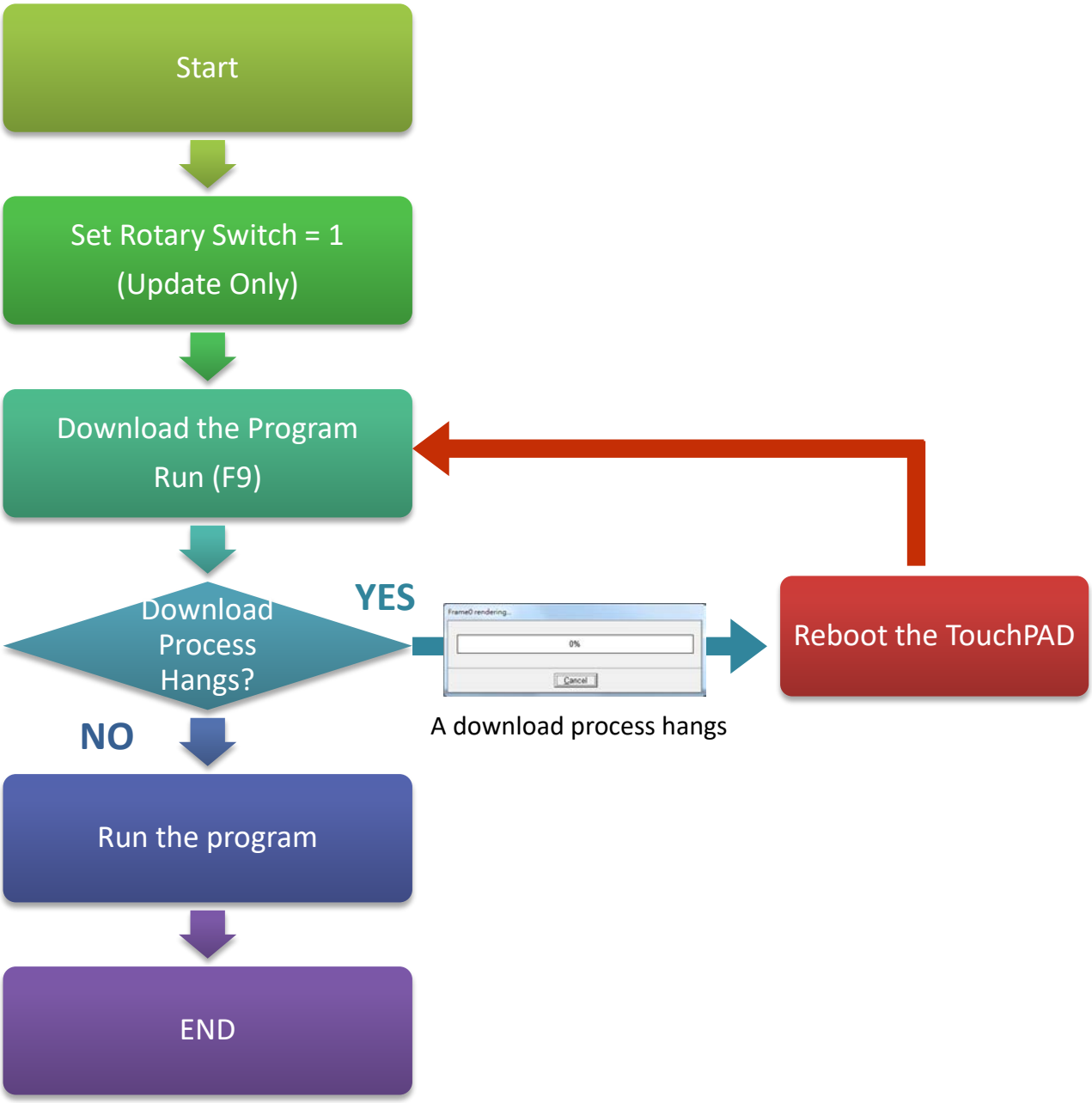
Step 9: Once the upload is complete (i.e., when the progress indicator reaches 100%), **power off the TouchPAD device** and set the **Rotary Switch to position 0 (Run mode)**.



Step 10: 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.

3.4.1.2 What to do if the download process hangs?

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



A download process hangs

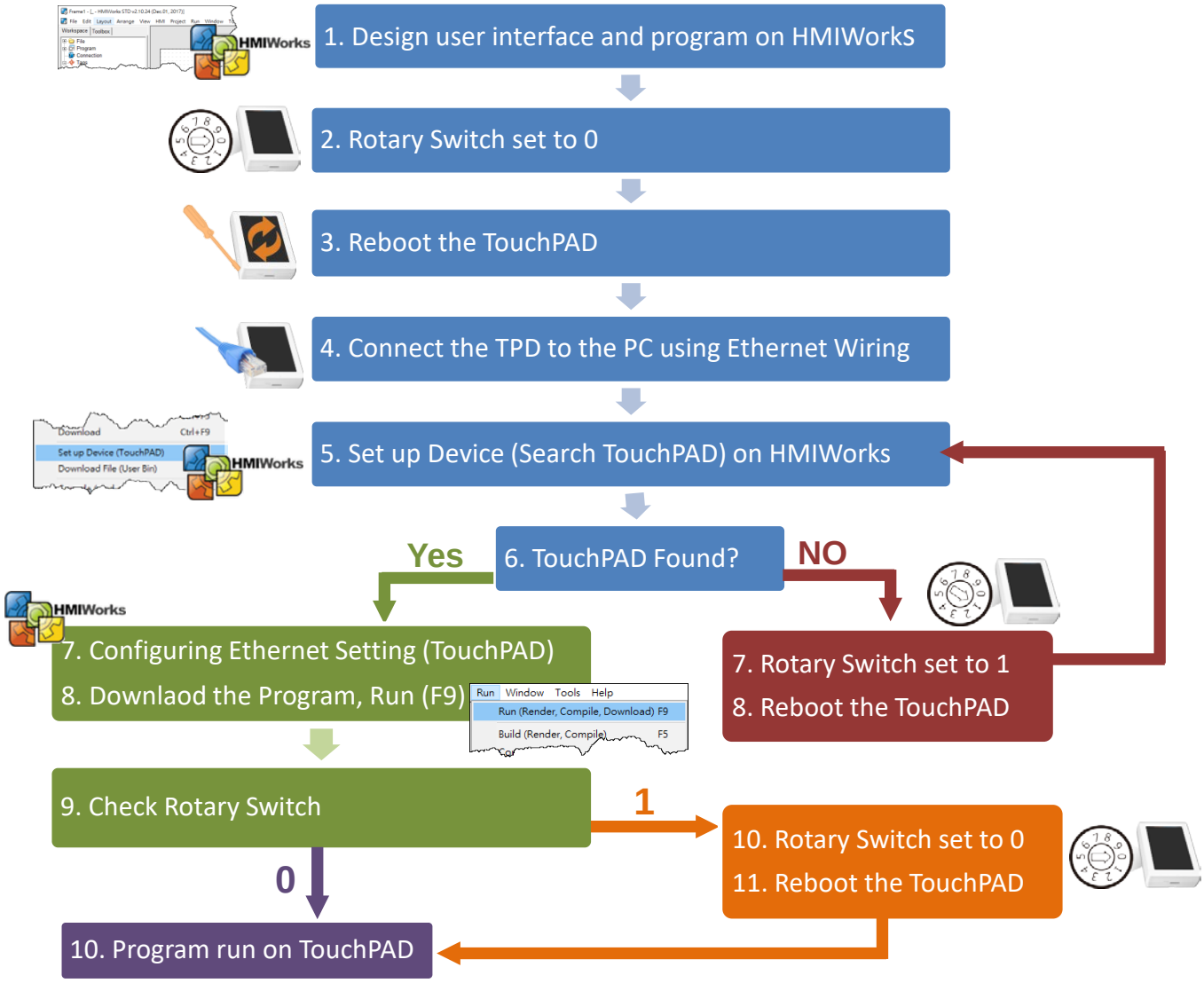
3.4.2 Setup Ethernet-downloaded Devices

The below modules support Ethernet download applications:

☑ TPD-283/283-H,TPD-283-M1/M2/M3	☑ TPD-703/703-64
☑ TPD-283U-H, TPD-283U-M1/M2/M3	☑ VPD-133-H/133N-H/143-H/143N-H
☑ TPD-433-H/433F-H/433-M2/433-H-EU	☑ VPD-173N/173N-64/173X/173X-64

3.4.2.1 Applications are downloaded through Ethernet

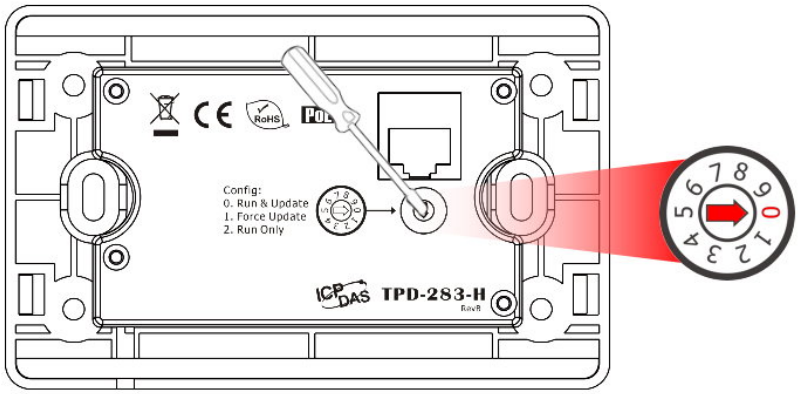
➢ The following flow chart describes the Ethernet downloading procedures.



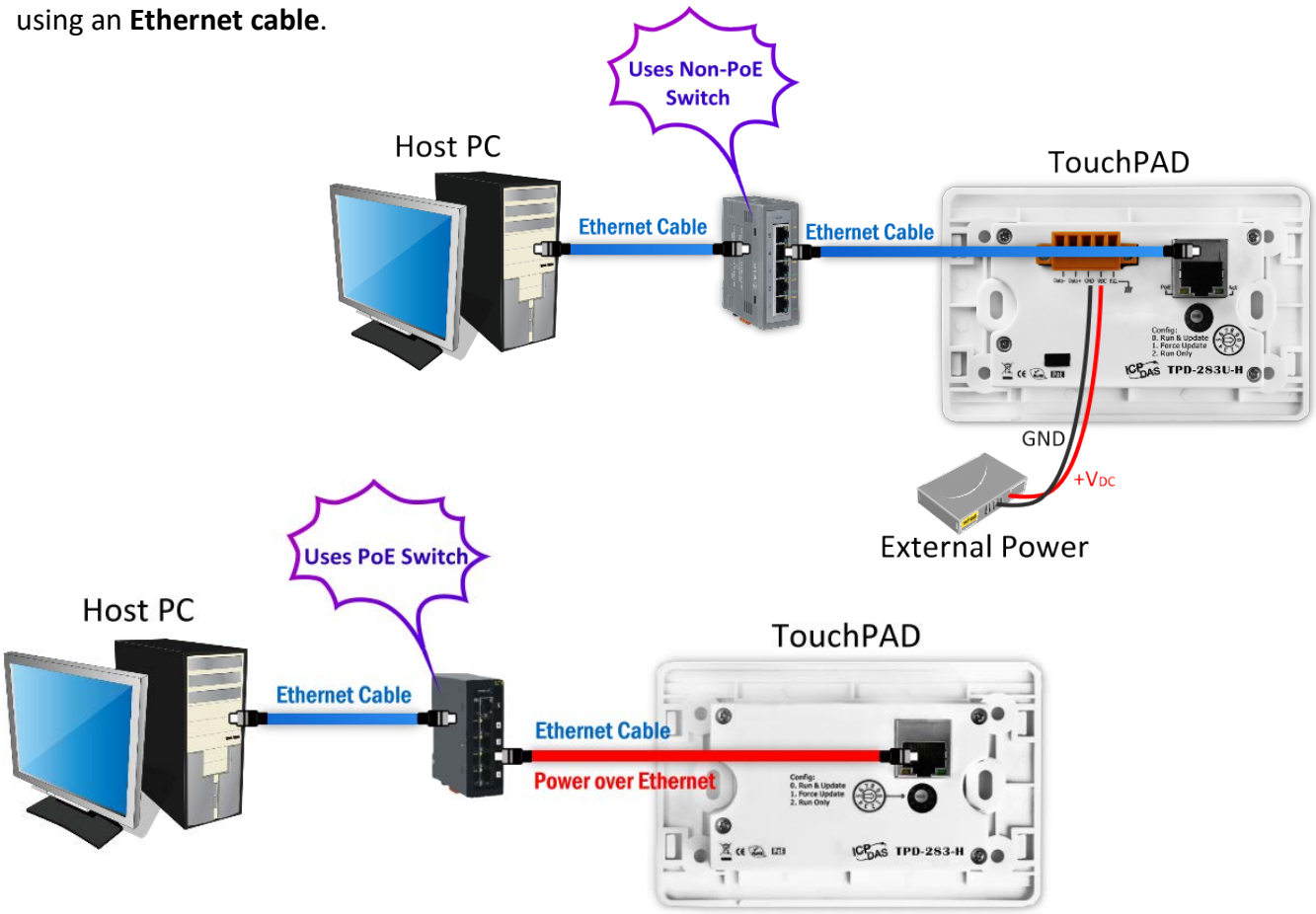
➢ Follow the procedure described below:

Note: Ensure that your Anti-Virus and Windows firewall are disabled or well configured first, else the download program may not work. (Please contact with your system Administrator)

Step 1: Use a flat-head screwdriver to set the **Rotary Switch** on the TouchPAD device to **position 0 (Run & Update mode)** and **power reboot the TouchPAD device**.



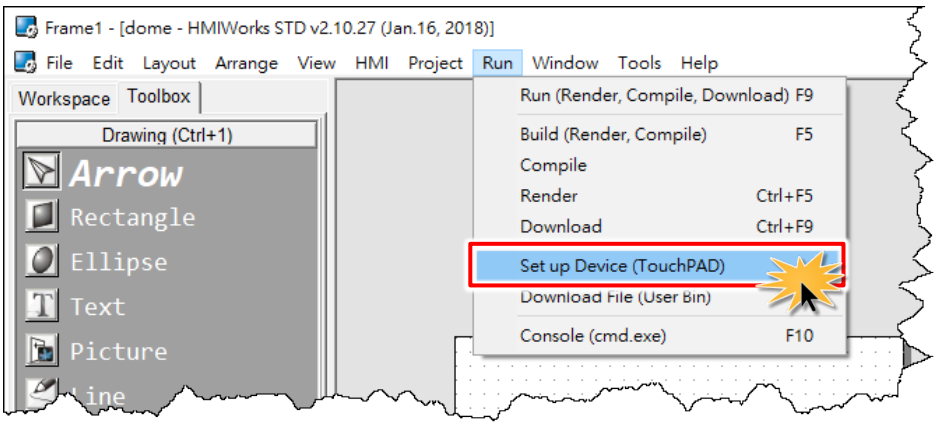
Step 2: Connect the TouchPAD device to the same hub or the same sub-network as the Host PC using an **Ethernet cable**.



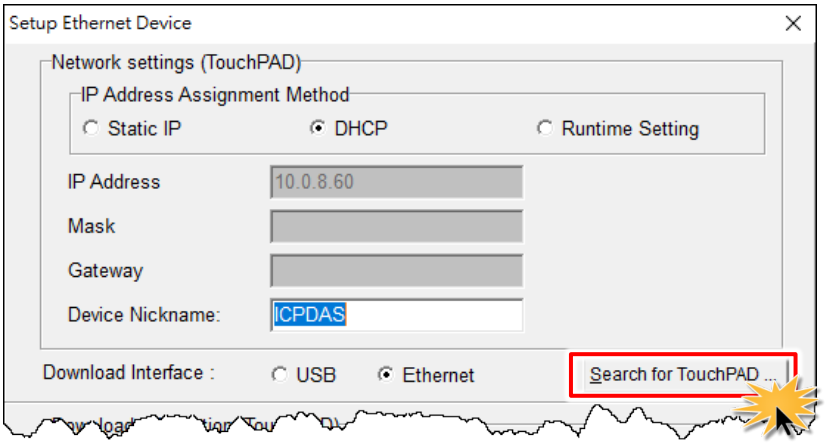
Note that if you use PoE power supply to TouchPAD device, please keep the original network wiring.

Note: Before downloading programs to the TouchPAD device, be sure to assign correct runtime IP address and download information first.

Step 3: In the HMIWorks software, click the **"Set up Device (TouchPAD)"** item from the **"Run"** menu to open "Setup Ethernet Device" dialog box.



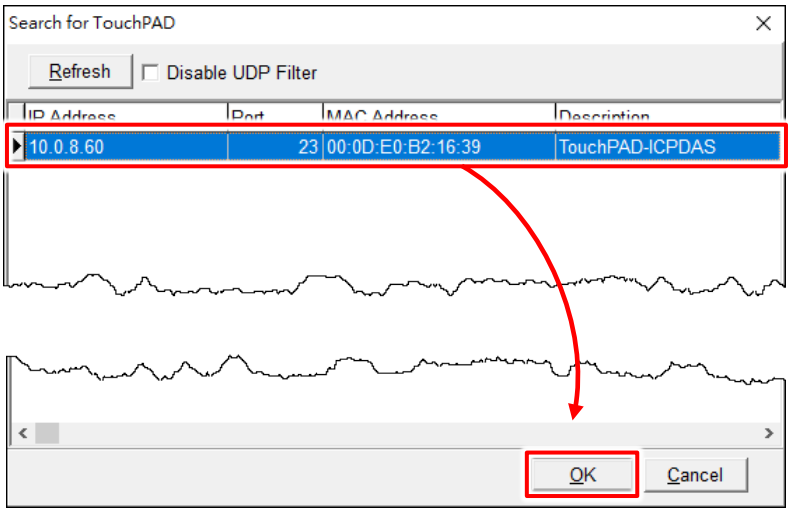
Step 4: In the "Setup Ethernet Device" dialog box, click the **"Search for TouchPAD…"** button to open "Search for TouchPAD" dialog box.



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 5: If the TouchPAD device is found and displayed in the list on the "Search for TouchPAD" dialog box, **select the TouchPAD item depending 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 also find the MAC address on the back of the TouchPAD.

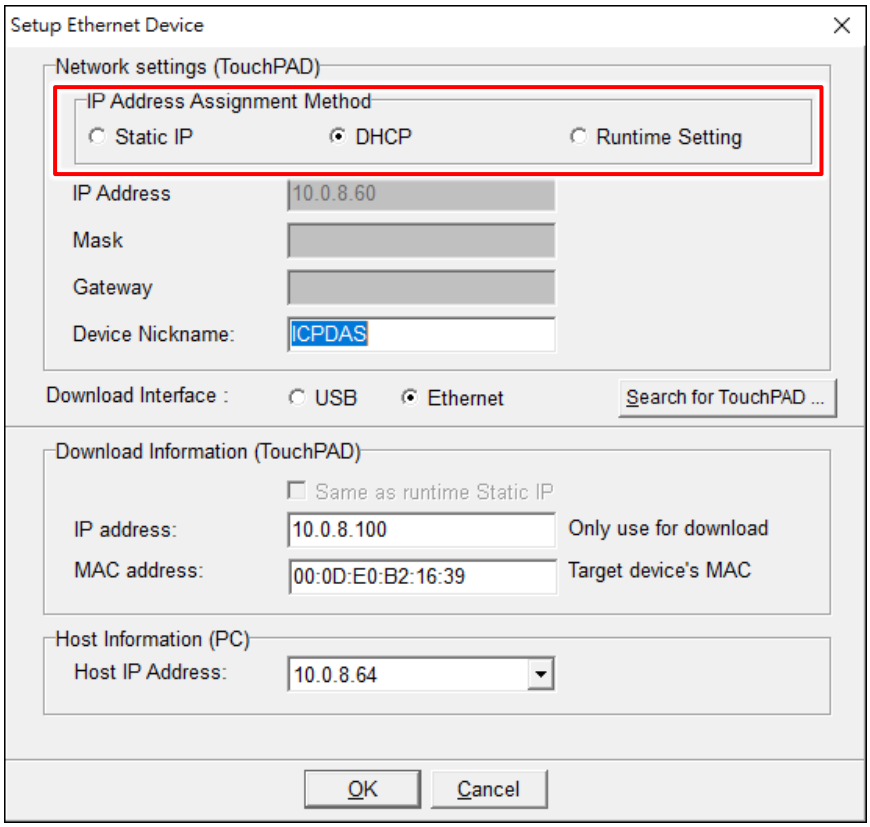
Step 6: In the “Setup Ethernet Device” dialog box, select the **“DHCP”, “Static IP” or “Runtime Setting”** (e.g., DHCP) in the “IP Address Assignment Method” field. This setting is used for TouchPAD runtime.

Note:
Static IP: The IP address of the TouchPAD is configured in HMIWorks, and it is stored as a part of the program image.

DHCP: The IP address of the TouchPAD is dynamically allocated from a DHCP server. Please ensure that there is a DHCP server in the environment.

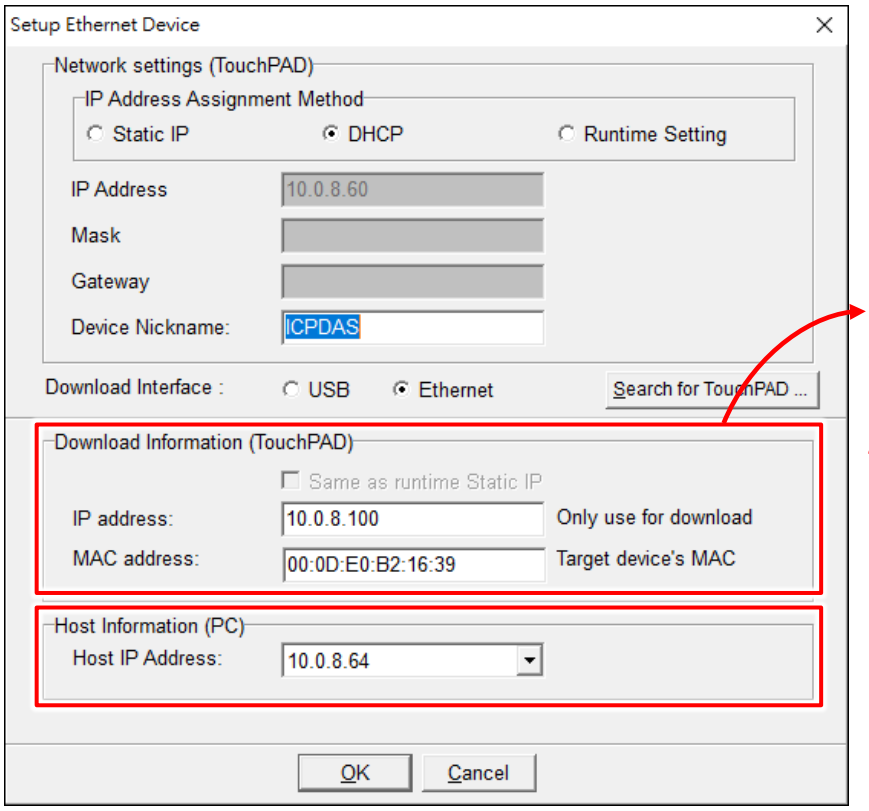
Runtime Setting: TouchPAD loads the IP information from the flash at the runtime. Before IP settings are used, be sure to set the IP settings into the flash by the related API functions. We have demo to do this as well.

Downloading new program image into TouchPAD is required for changing the operation mode between Static IP, DHCP and Runtime Setting, or changing the IP address of the Static IP settings.



Step 7: Verify that the **"IP Address"** of the download information is in the same subnet of the **"Host IP Address"**. This setting is used for downloading application only.

Step 8: Verify that **"TouchPAD MAC Address"** must match the MAC Address of your TouchPAD device, and click the **"OK"** button.



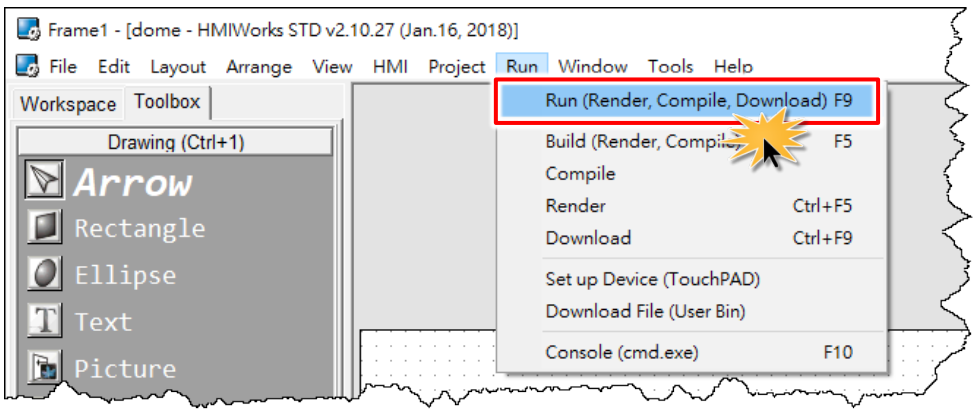
Notes:

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

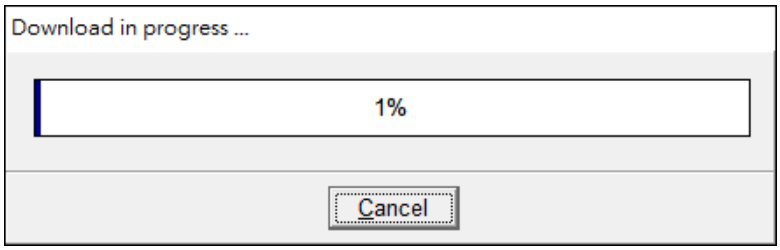
2. *It's normal that the searched IP address of the TouchPAD is 0.0.0.0 when force update. You just need to assign a valid IP address in the Download Information, and the TouchPAD can then be updated via the new specified IP address.*

Note: Verify that the new project has been created (see Section 3.2 "Create a New Project in the HMIWorks").

Step 9: Click the **"Run (Render, Compile, Download) F9"** item from the **"Run"** menu, or press **<F9>**.



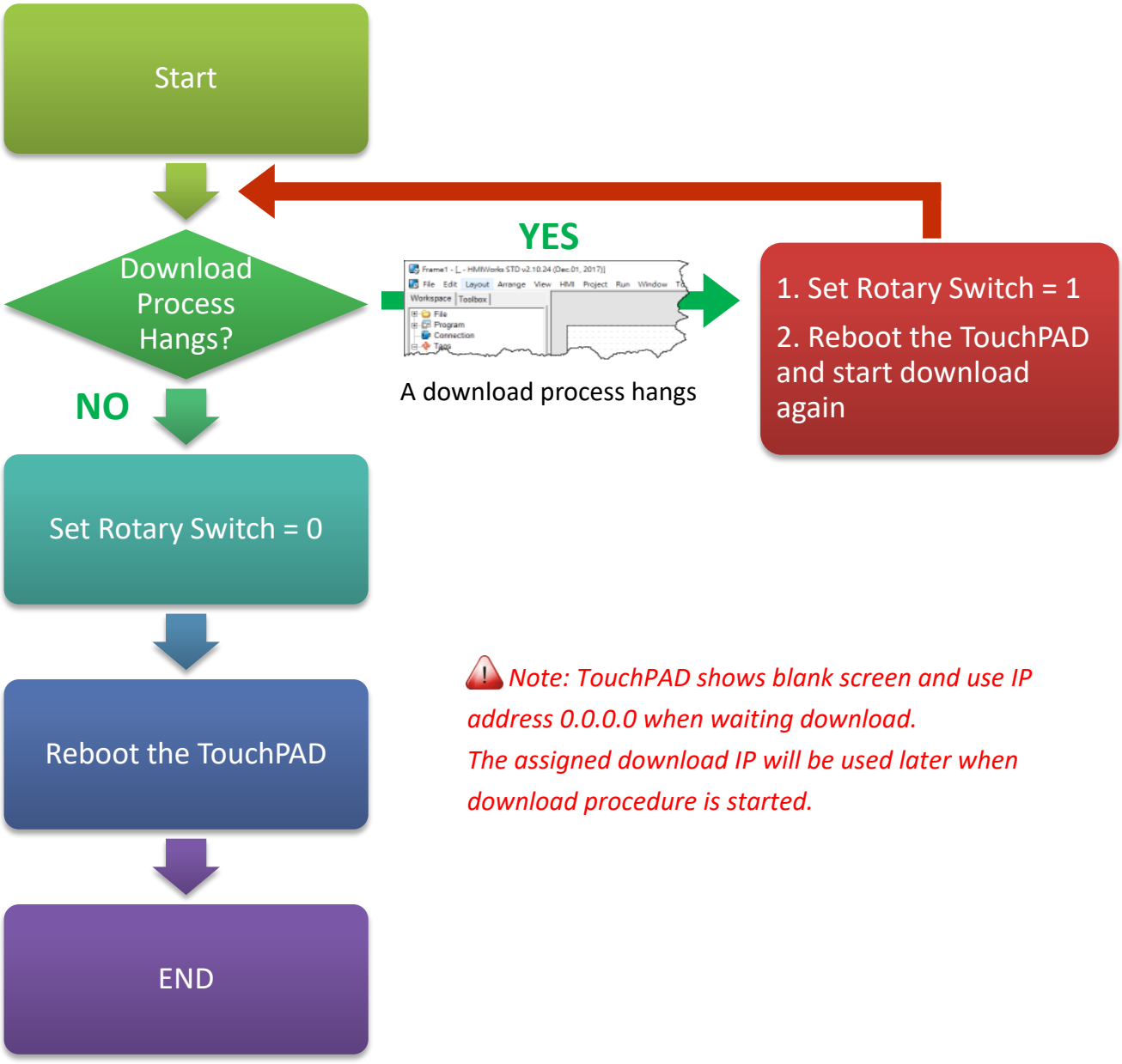
Step 10: The **“Download in progress…”** dialog box will be displayed showing the progress of the update.



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: TouchPAD shows blank screen and use IP address 0.0.0.0 when waiting download.
The assigned download IP will be used later when download procedure is started.

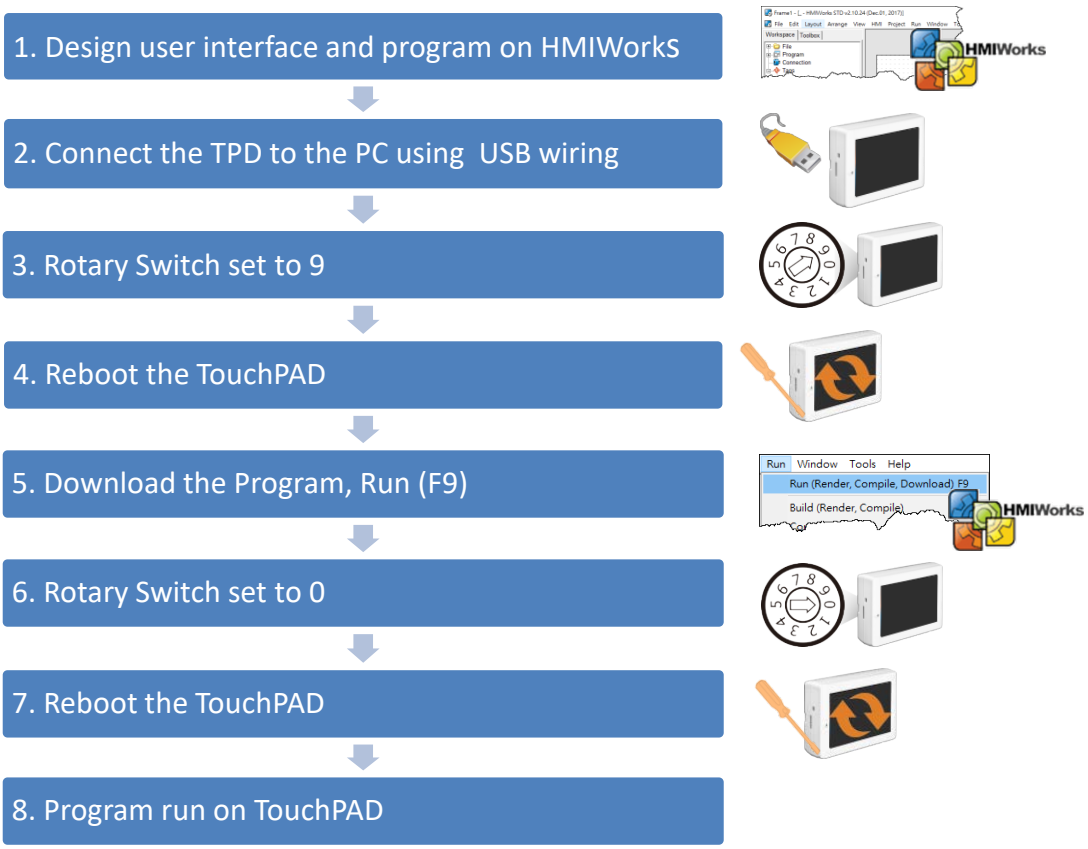
3.4.3 Setup USB-downloaded Devices

The following models use USB Port to download the HMIWorks-built applications:

☑ TPD-280U/280U-H	☑ VPD-130/130N/130-H/130N-H
☑ TPD-283U/283U-H/283U-M1/M2/M3	☑ VPD-132/132N/132-H/132N-H
☑ TPD-430/430-EU/430-H/430-H-EU	☑ VPD-133/133N/133-H/133N-H
☑ TPD-433/433-EU/433-H/433-H-EU	☑ VPD-142/142N/142-H/142N-H
☑ TPD-432F/432F-H	☑ VPD-143/143N/143-H/143N-H
☑ TPD-433F/433F-H/433-M2	☑ VPD-173X/173X-64

3.4.3.1 Applications are downloaded through USB Port

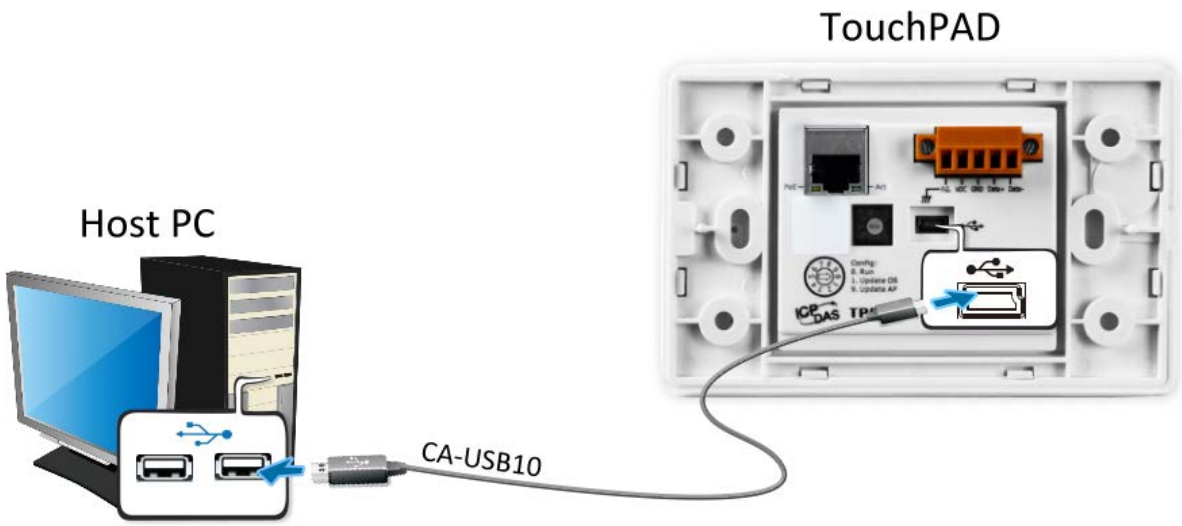
The following flow chart describes the USB downloading procedures.



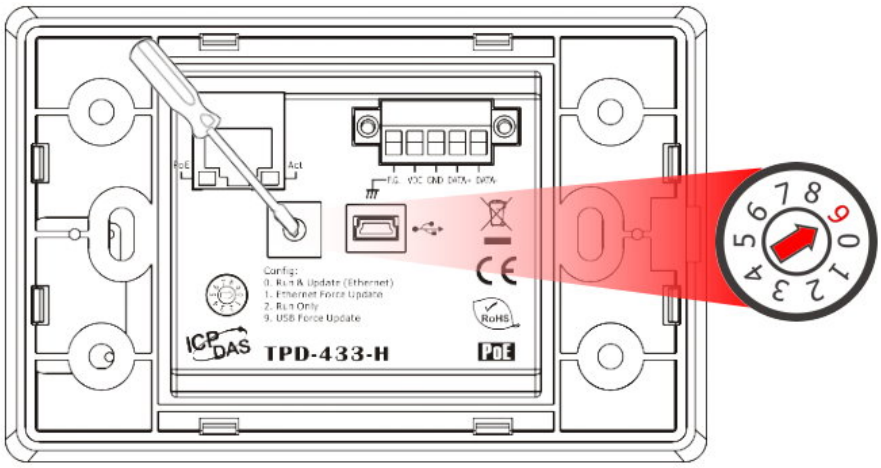
➢ Follow the procedure described below:

Step 1: Connect 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 **position 9 (USB update mode)**. ⚠ *Note that the default configuration is position 0.*



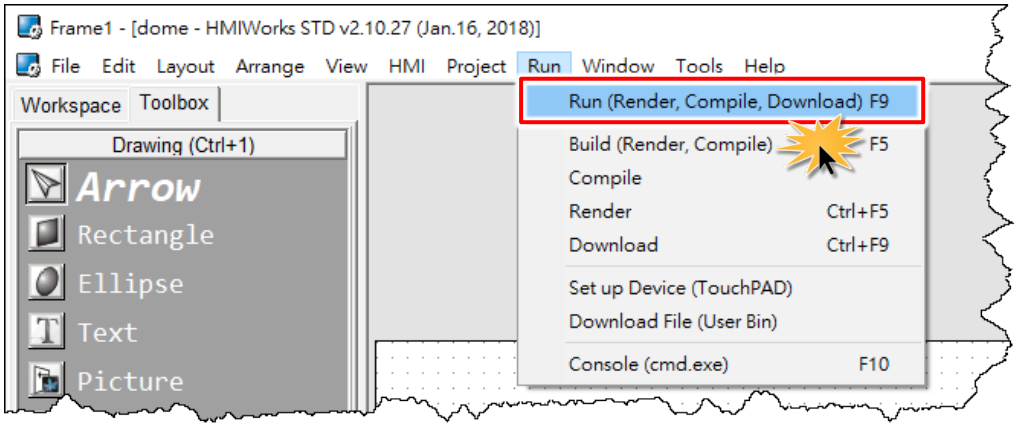
Step 4: Power-on and reboot the TouchPAD device for waiting update.

Non-H version TouchPAD shows MiniOS8 screen. ▼

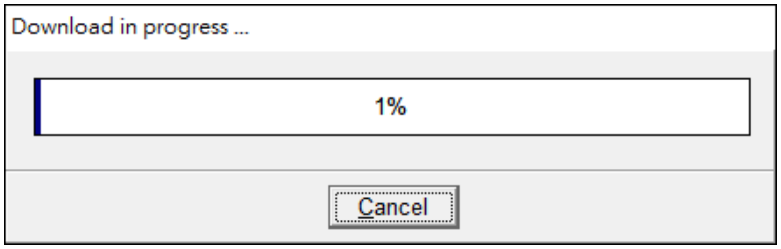
H-version TouchPAD shows blank screen. ▼

⚠ *Note: Verify that the new project has been created (see Section 3.2 "Create a New Project in the HMIWorks").*

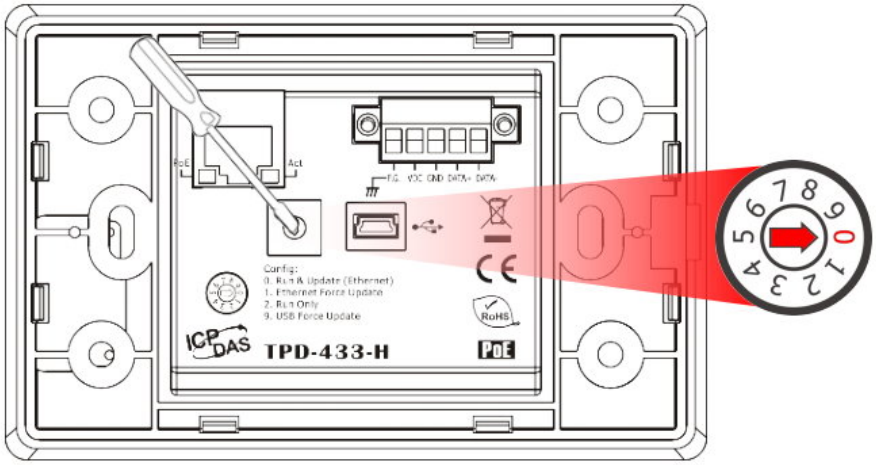
Step 5: In the HMIWorks software, click the **"Run (Render, Compile, Download) F9"** item from the **"Run"** menu, or press **<F9>**.



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 position 0 (Run mode)**.



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

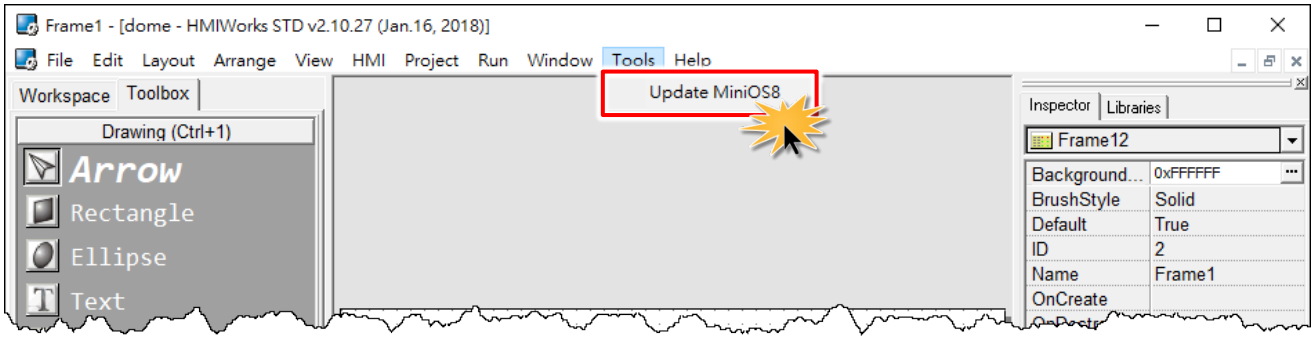
The following models are support MiniOS8:

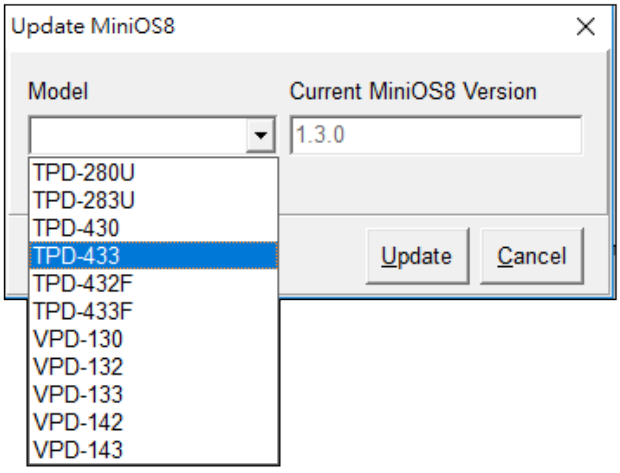
☑ TPD-280U/283U	☑ VPD-130/130N/132/132N/133/133N
☑ TPD-430/433/432F/433F	☑ VPD-142/142N/143/143N

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 compatibility, we still suggest update MiniOS8 every time HMIWorks is updated.

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

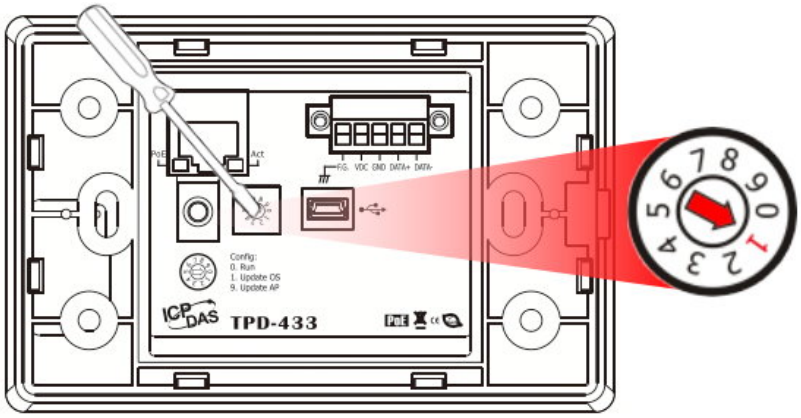
Step 1: In the HMIWorks software, click the **"Update MiniOS8"** item from the **"Tools"** menu to open "Update MiniOS8" dialog box.





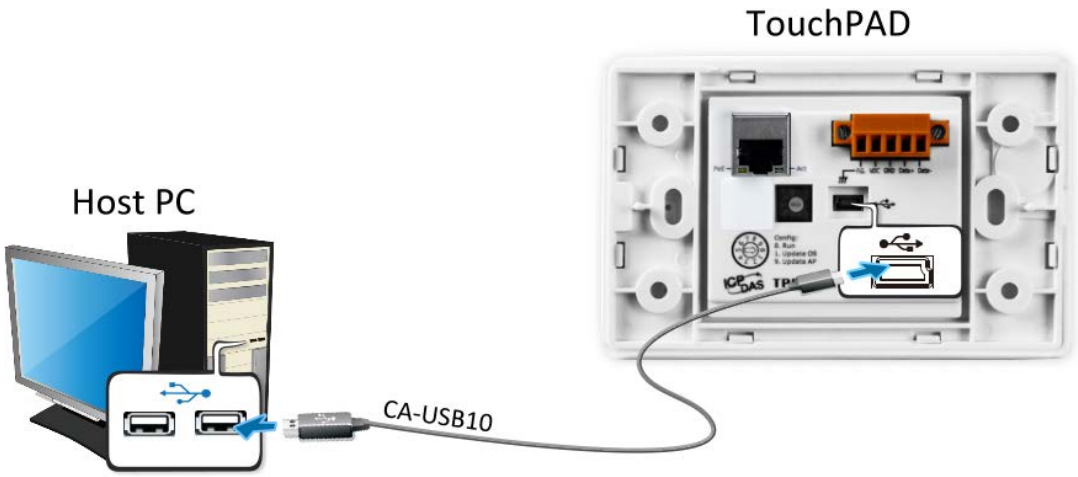
Step 2: The Model drop down list shows the models in the TouchPAD series that have MiniOS8. Select the model of the TouchPAD to update.

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

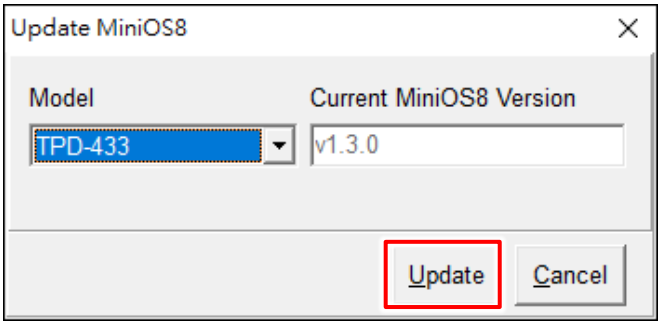


Note: TouchPAD shows blank screen when waiting update MiniOS8.

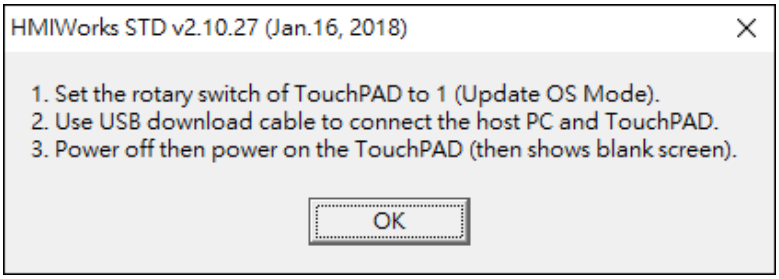
Step 4: Connect the TouchPAD device to the **Host PC** using a **CA-USB10 cable**.



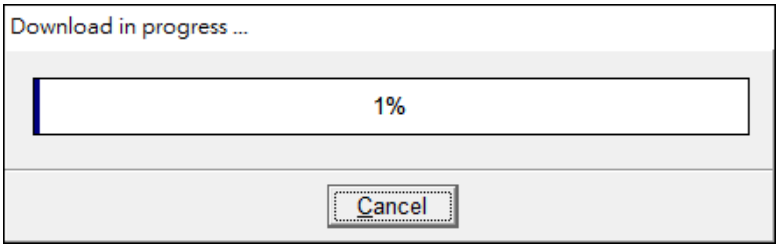
Step 5: In the "Update MiniOS8" dialog box, click the **"Update"** button to start update.



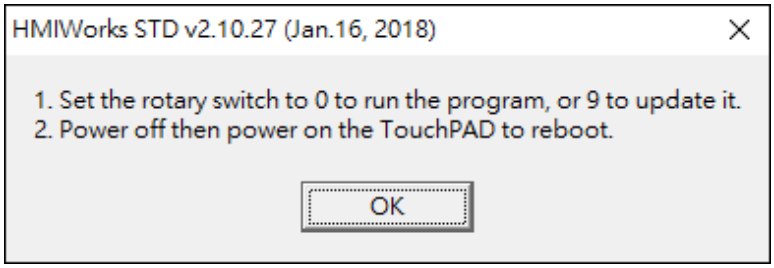
Step 6: Verify that steps 1 to 3 has been set in the configuration dialog box and click the **"OK"** button to continue.



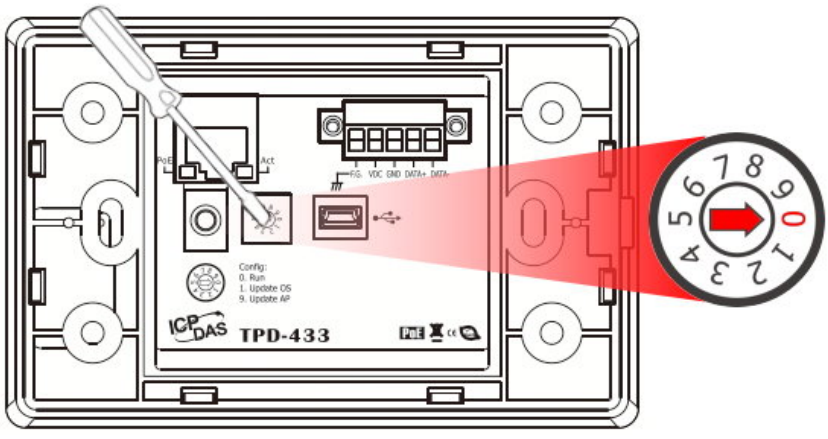
Step 7: The **"Download in progress…"** dialog box will be displayed showing the progress of the update.



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.

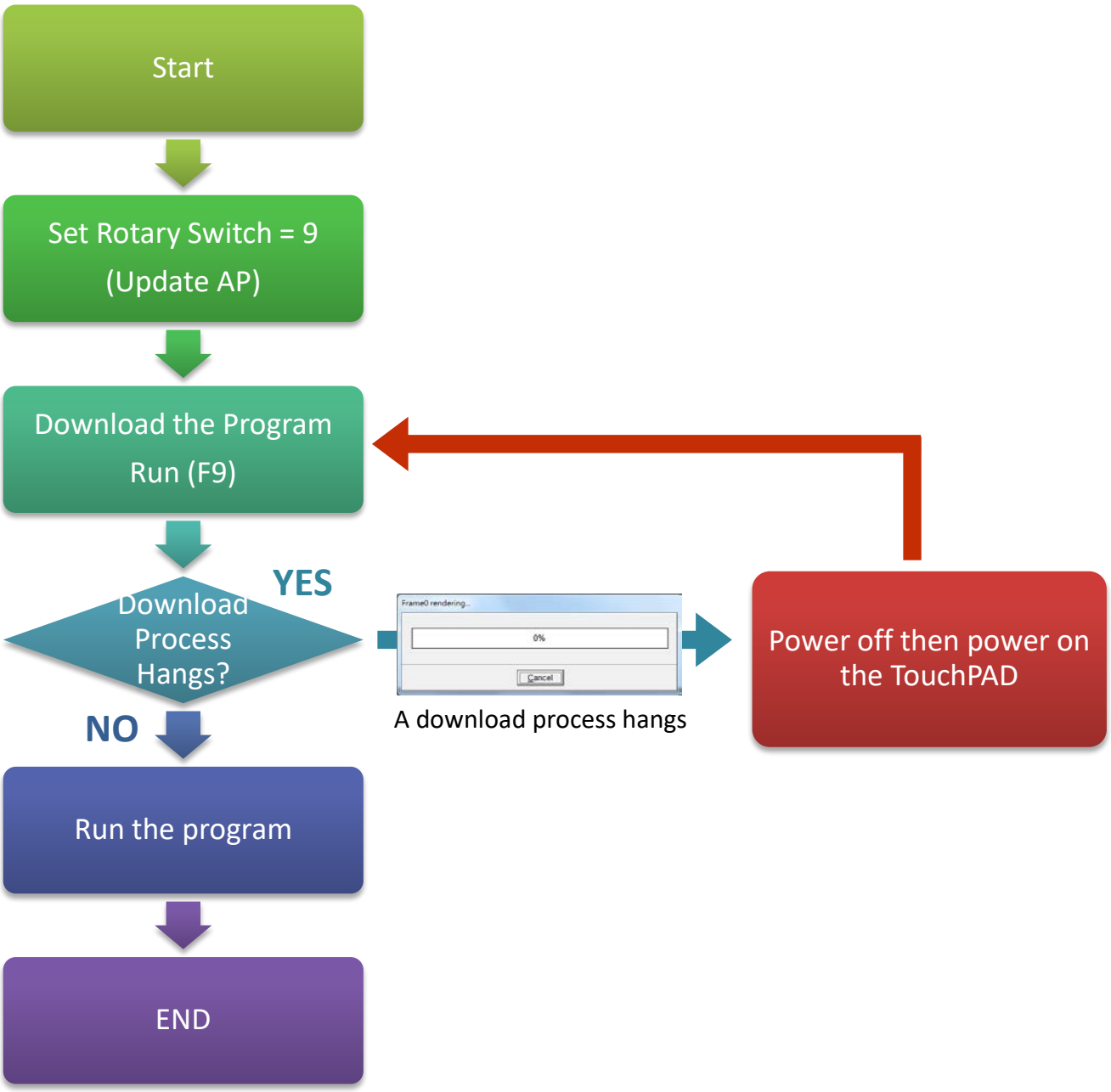


Step 9: Use a flat-head screwdriver to set the **Rotary Switch** on the TouchPAD device to **position 0 (Run mode) and power off then power on the TouchPAD**.



3.4.3.3 What to do if the download process hangs?

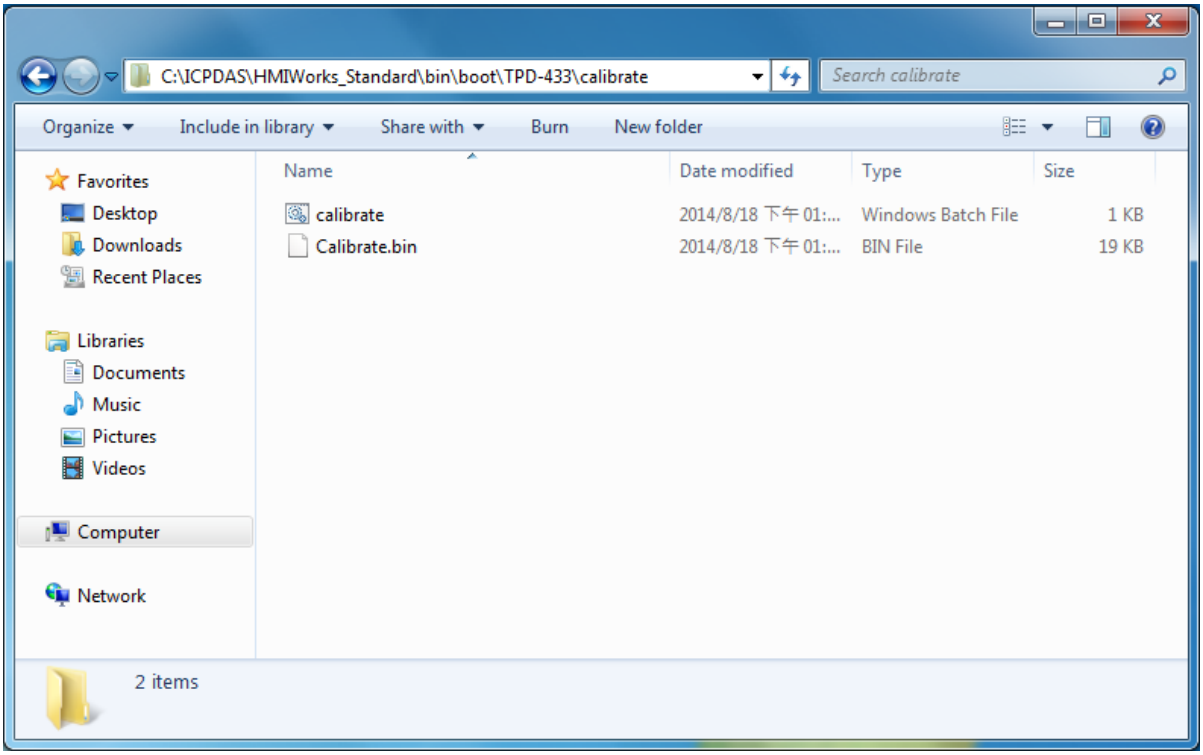
Anytime download process hangs, users can follow the flow below to complete the download process.



4. Calibrations

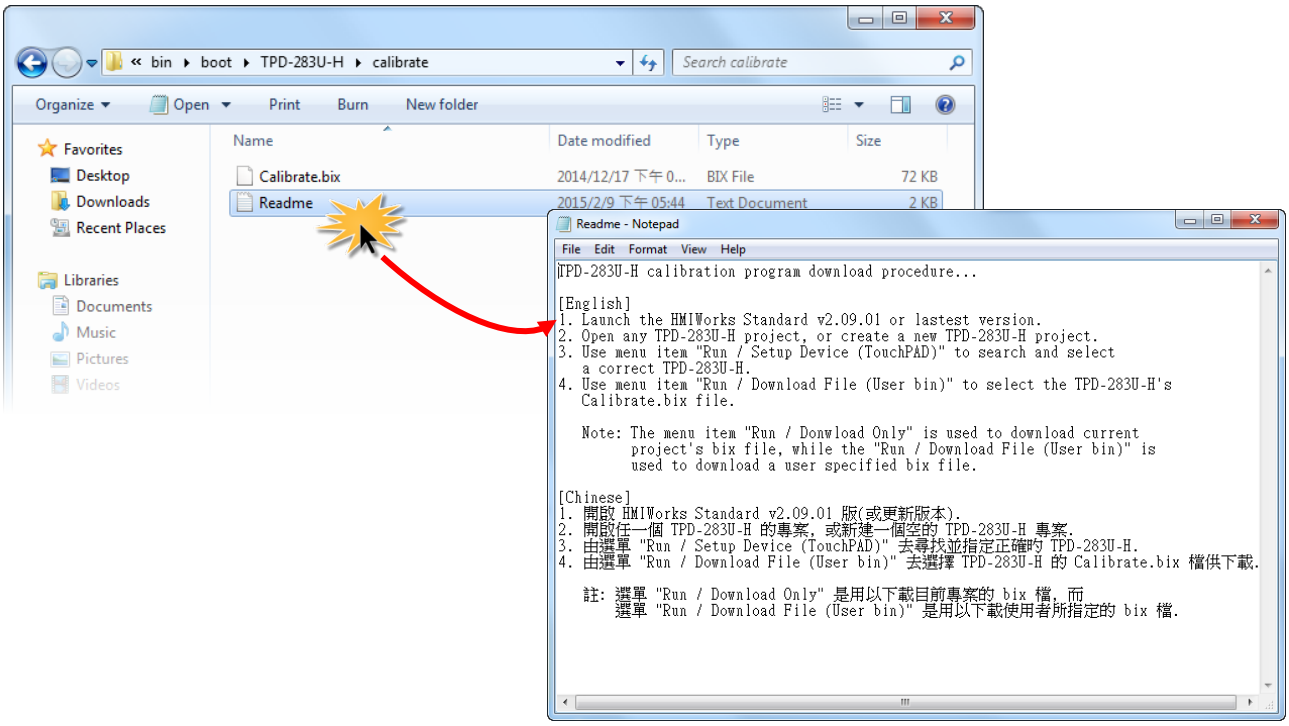
Usually users need not to calibrate the touch screen because we calibrate the TouchPAD devices before shipping. However, in cases users may need to calibrate the touch screens, we introduce the flow below.

You can find that the calibration programs are in the following directory:
"[HMIWorks_Install_Path]\bin\boot\[Device_Name]\calibrate".

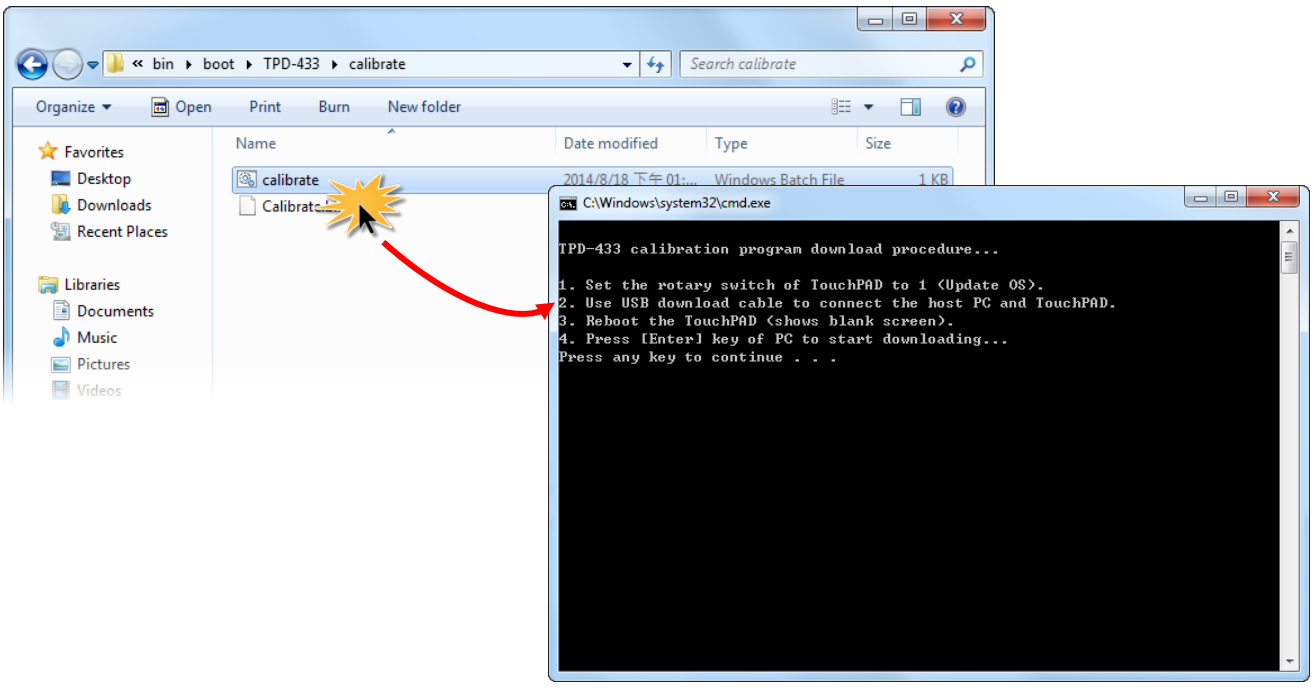


For example, there are two calibration programs can be found at **"C:\ICPDAS\HMIWorks_Standard\bin\boot\TPD-433\calibrate"** if trying to calibrate TPD-433. And in the same directory of the calibrate file, there's a batch file which is used to download the calibrate programs to the TouchPAD device and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

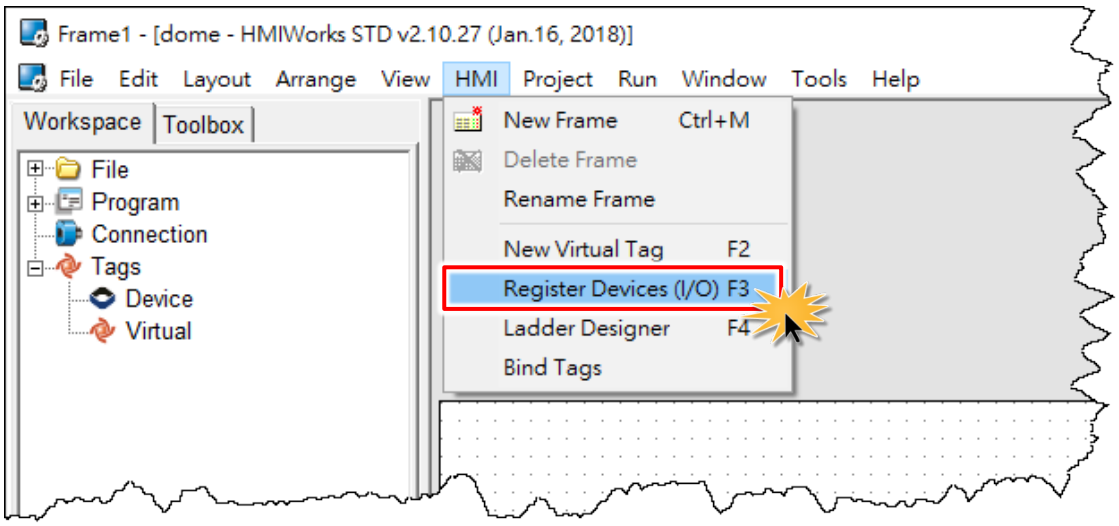
We provide connection methods for three series of I/O modules, the PET-7000, the I-7000, and the M-7000 series and a general approaches for the Modbus TCP Master I/O modules, Modbus RTU Master/Slave I/O modules.

5.1 Access a Modbus TCP Slave Device

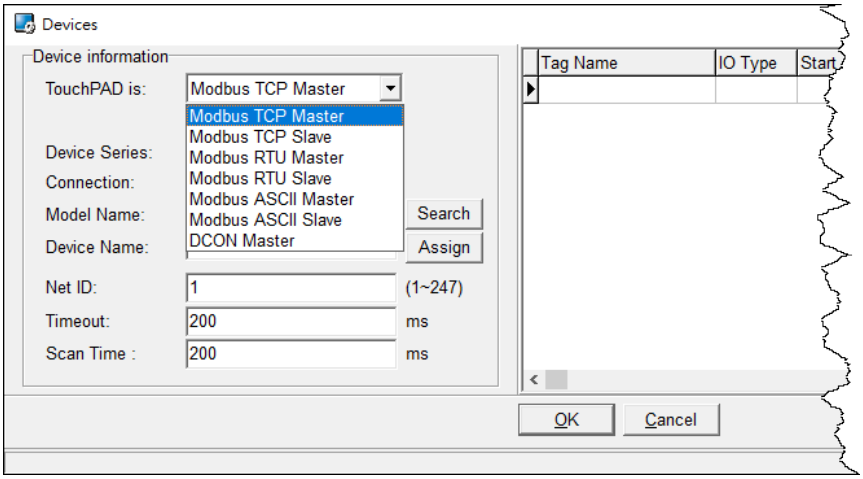
Using a PET-7060 module (Ethernet I/O Module with 6-channel Relay output, 6-channel Digital Input) as an example, ensure that the network settings for both the Modbus TCP slave device and the Host computer are correctly configured, otherwise the TouchPAD may not be able to correctly access the Modbus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

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

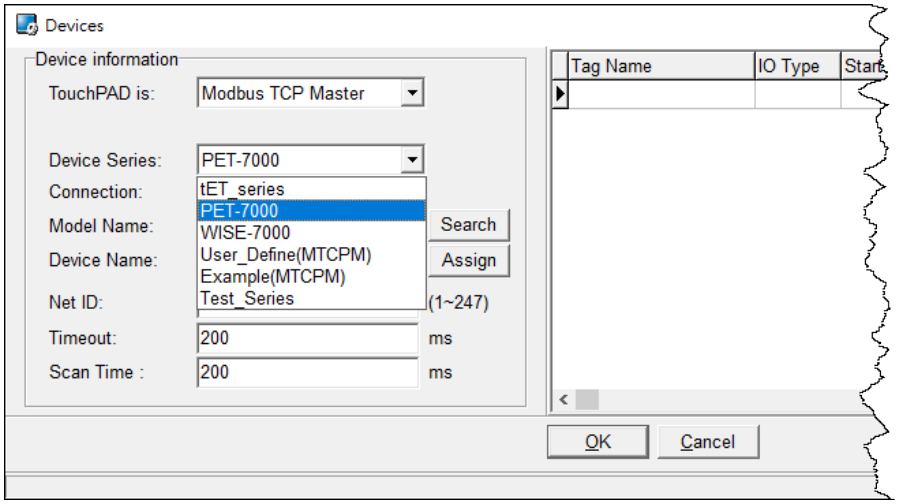
Step 1: In the HMIWorks software, click the **"Register Devices (I/O)"** option from the **"HMI"** menu to open the **"Devices"** dialog box, or press **<F3>**.



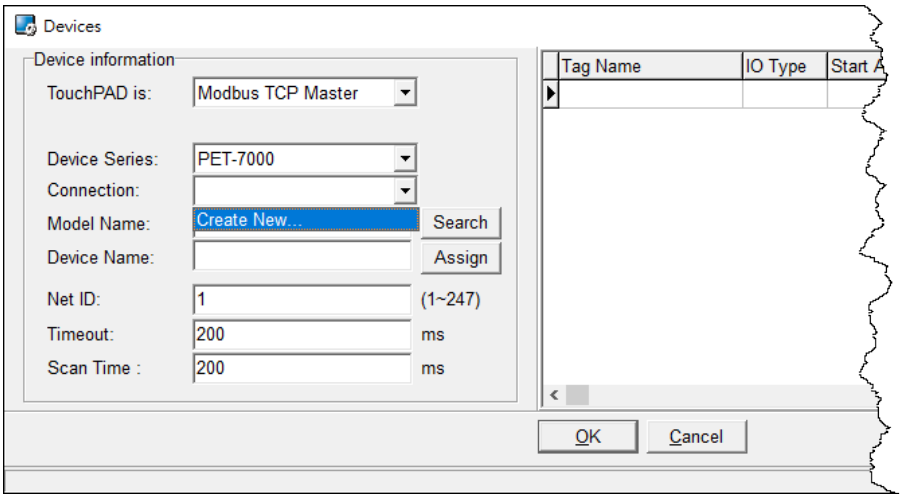
Step 2: Select **"Modbus TCP Master"** from the "TouchPAD is" drop down menu.



Step 3: Select **"PET-7000"** from the "Device Series" drop down menu.

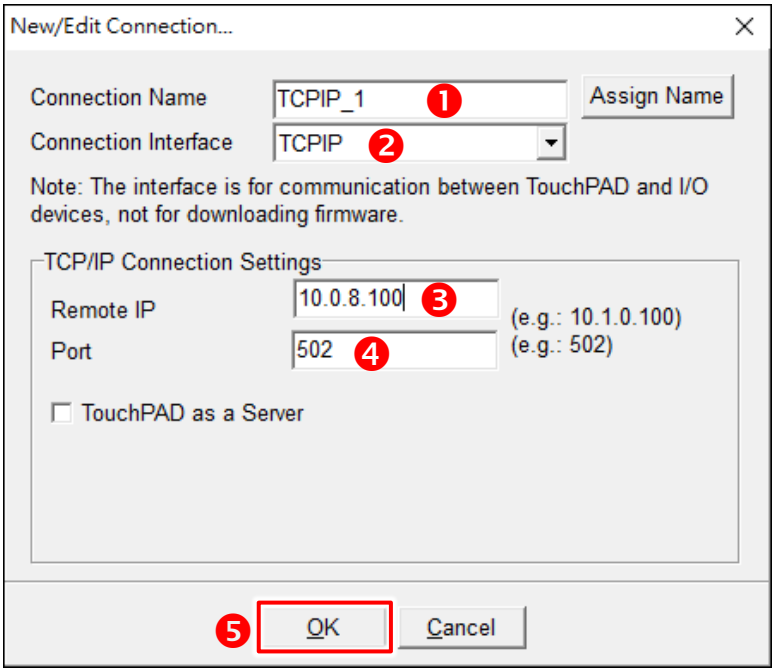


Step 4: Select **"Create New…"** from the "Connection" drop down menu to open the **"New/Edit Connection…"** dialog box.



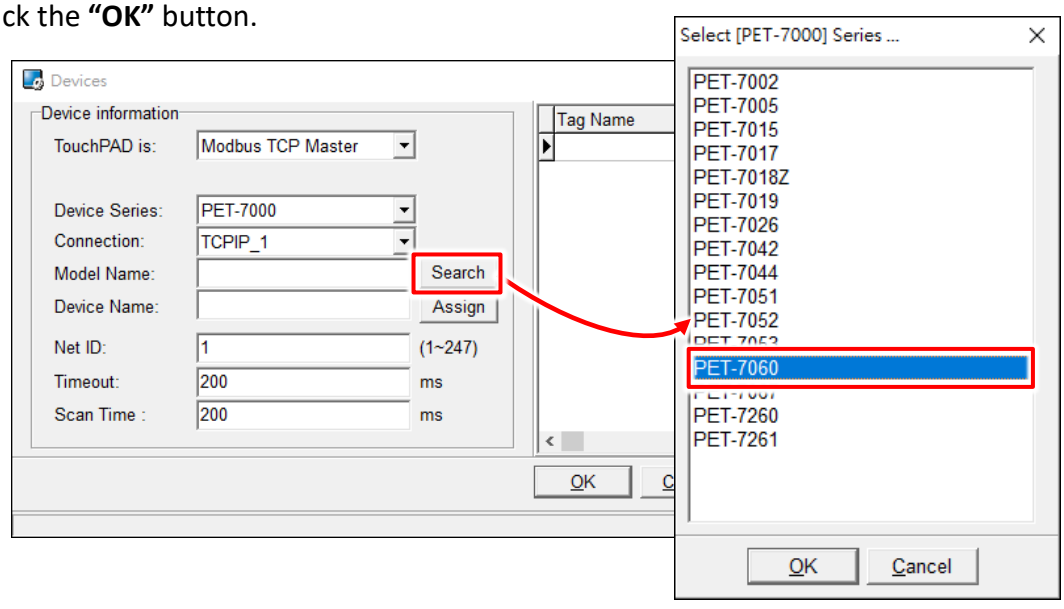
Step 5: In the "**New/Edit Connection…**" dialog box, configure the connection information of the PET-7060 module as follows:

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.

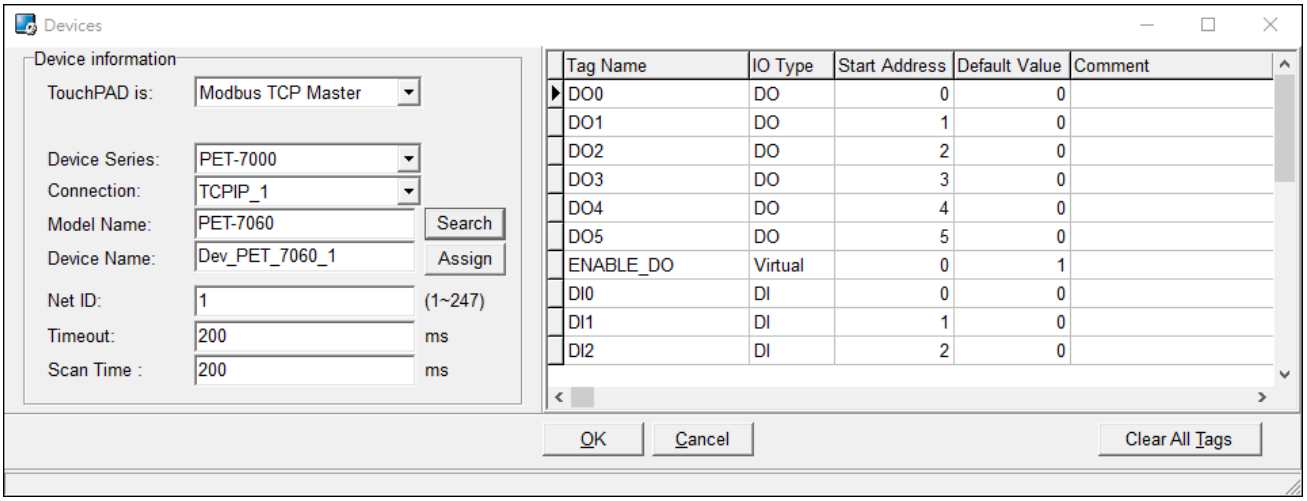


Step 6: Click the **"Search"** button to open the **"Select [PET-7000] Series…"** dialog box.

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.

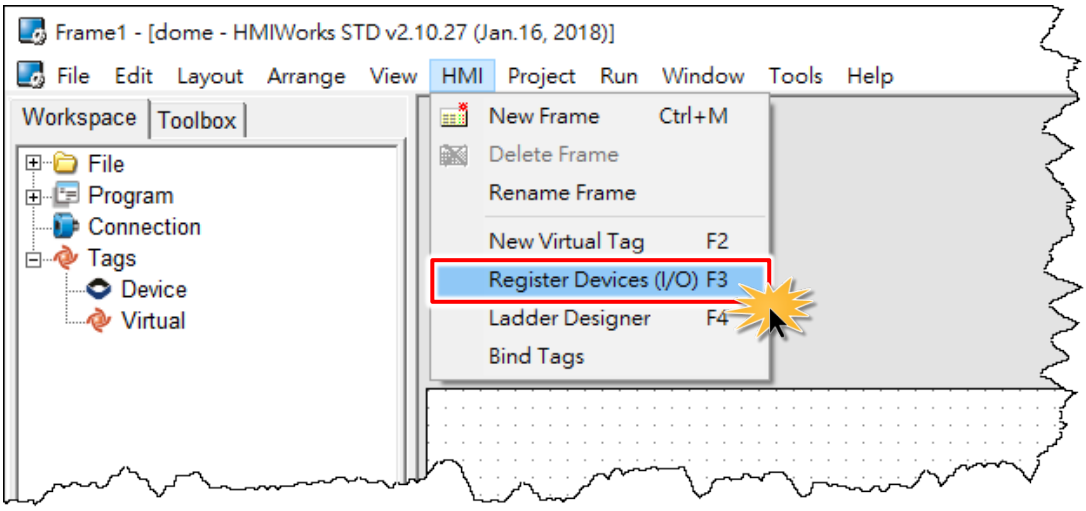
- If you use a third-party Modbus TCP Slave device, refer to FAQ: How do I access a third-party Modbus TCP slave device using a TouchPAD for more detailed information.

5.2 Access a Modbus RTU Slave Device

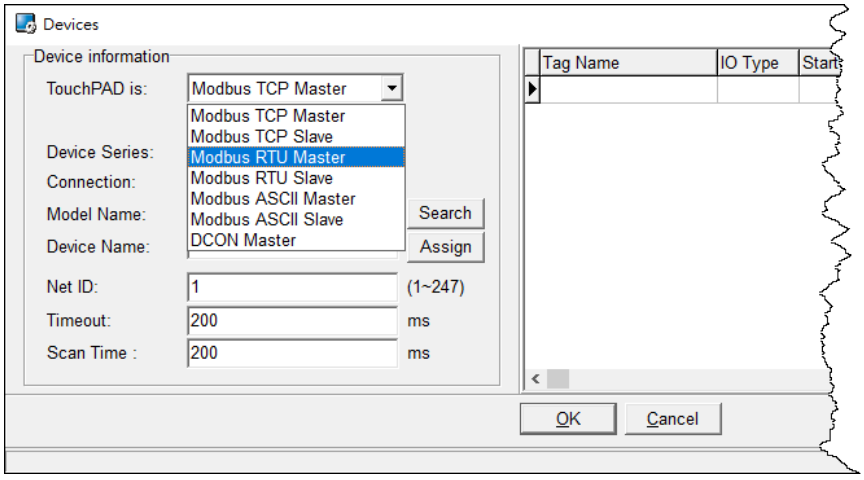
Using an M-7060 module (I/O Module with 4-channel Relay output, 4-channel Digital Input) as an example, connect the Modbus RTU slave device to the TouchPAD model on RS-485 COM Port and apply power to the Modbus RTU slave device and TouchPAD model.

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

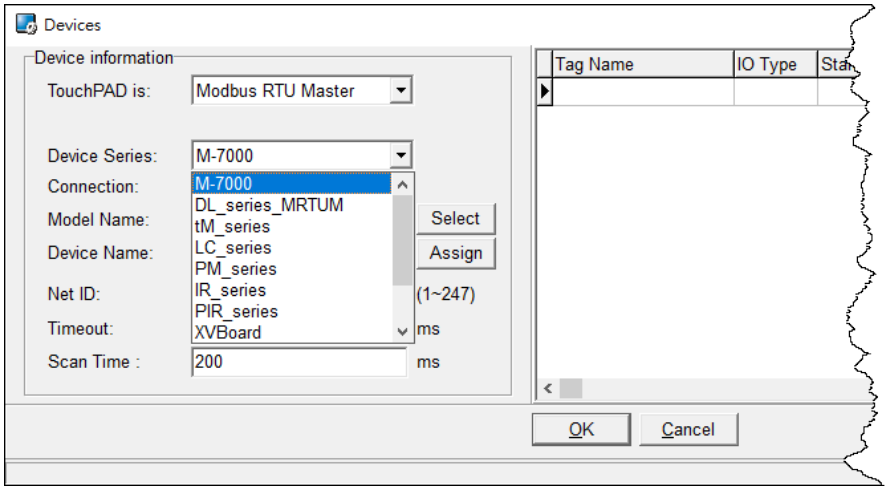
Step 1: In the HMIWorks software, click the **"Register Devices (I/O)"** option from the **"HMI"** menu to open the **"Devices"** dialog box, or press **F3**.



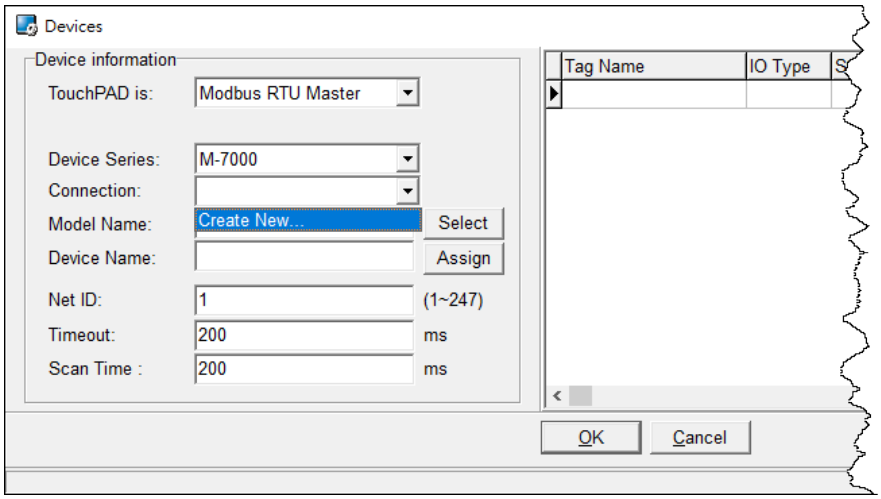
Step 2: Select **"Modbus RTU Master"** from the "TouchPAD is" drop down menu.



Step 3: Select **"M-7000"** from the "Device Series" drop down menu.

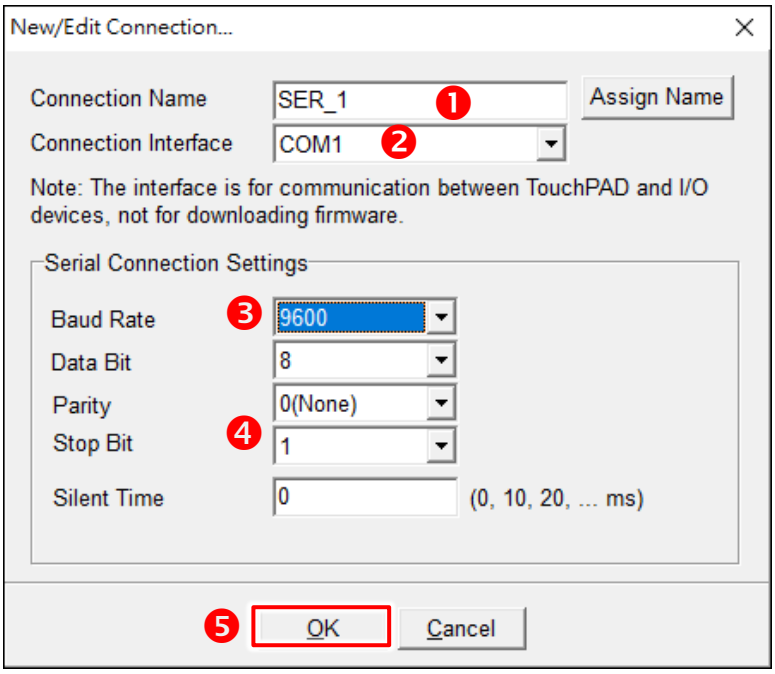


Step 4: Select **"Create New…"** from the "Connection" drop down menu to open the "New/Edit Connection…" dialog box.



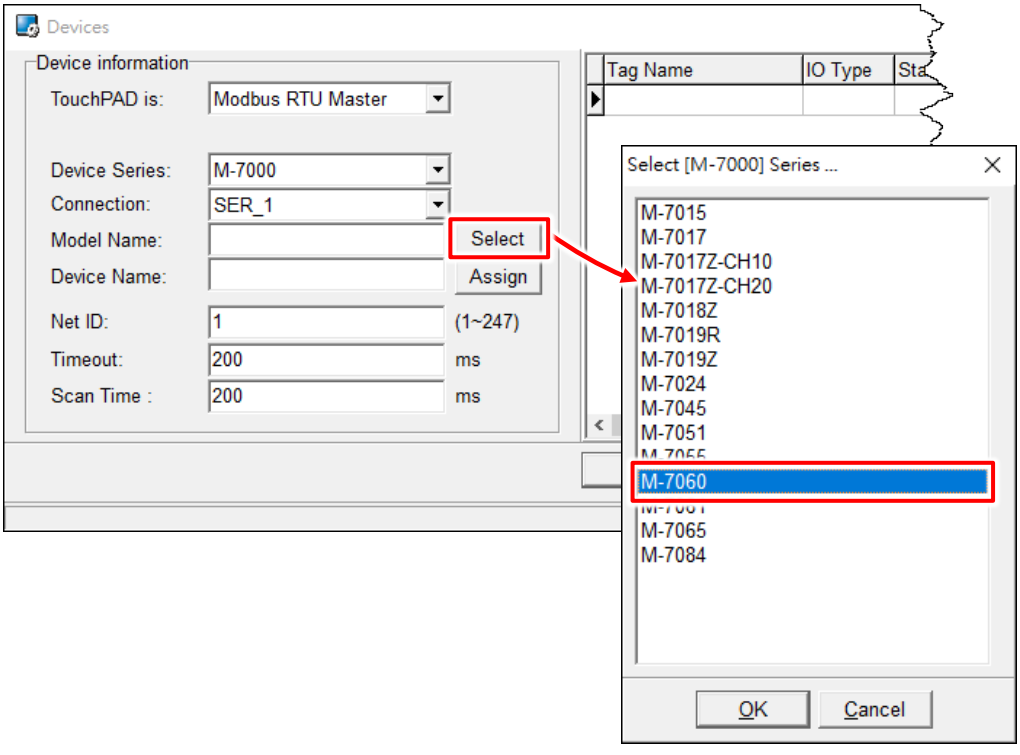
Step 5: In the "**New/Edit Connection…"** dialog box, configure the connection information of the M-7060 module in the following manner:

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.

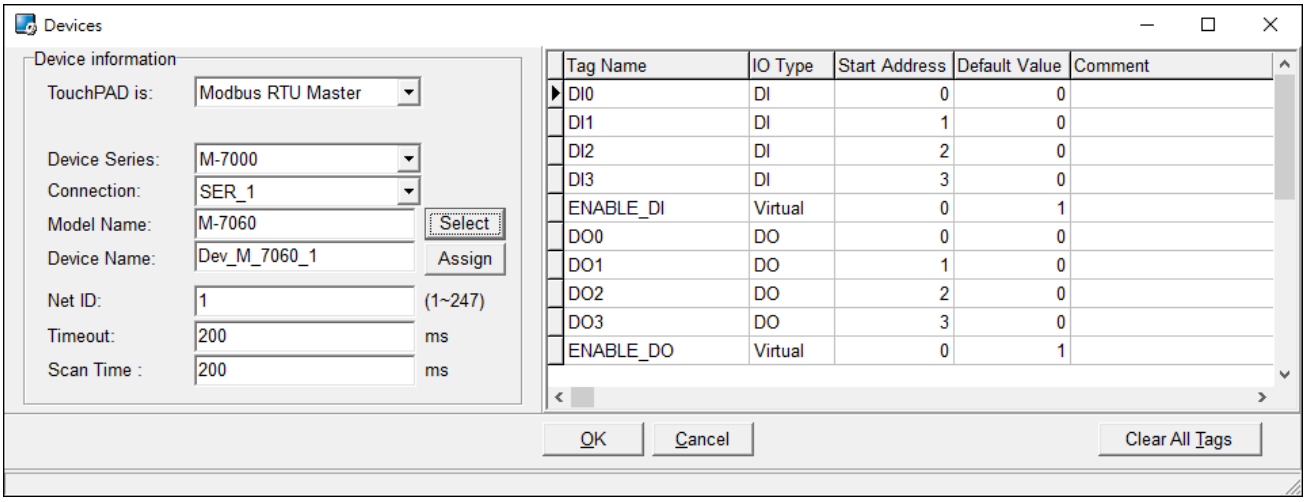


Step 6: Click the **"Select"** button to open the "Select [M-7000] Series…" dialog box.

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



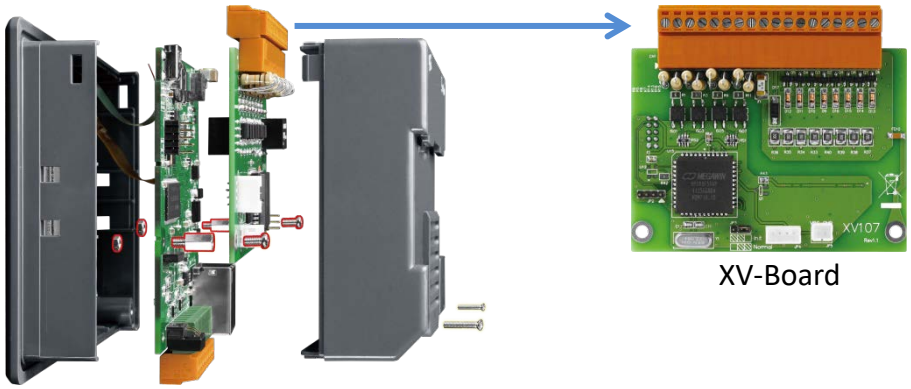
Step 8: Verify that the **information for M-7060 module is correct** (e.g., the Device Name, Net ID, Tag Name, IO Type, Start Address and Default Value, etc.) and then click the **"OK"** button to save the configuration and close the "Devices" dialog box.



- 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)



XV-Board

➢ Default Value

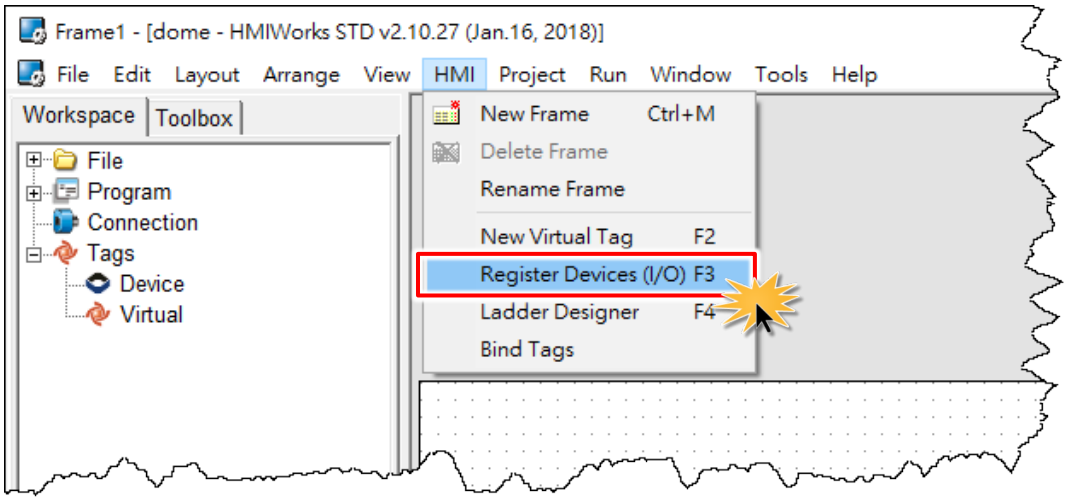
Net ID	1
Baud Rate	115200
Comport	XVBus
Communication Interface	Modbus RTU (XV-Board as slave)

➢ Using C Programming Language to Control XV-Board

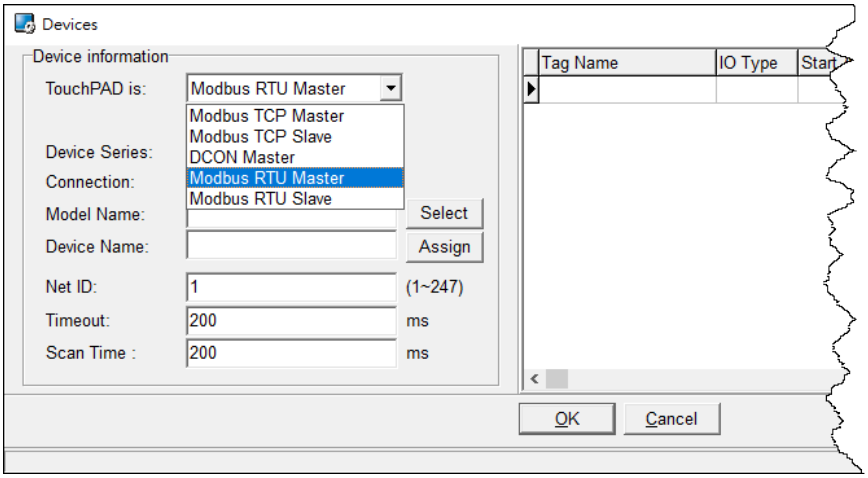
```
HANDLE h;
int NetID = 1;
int addr = 1;
int ch_count = 8;
char DO_value[1];

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

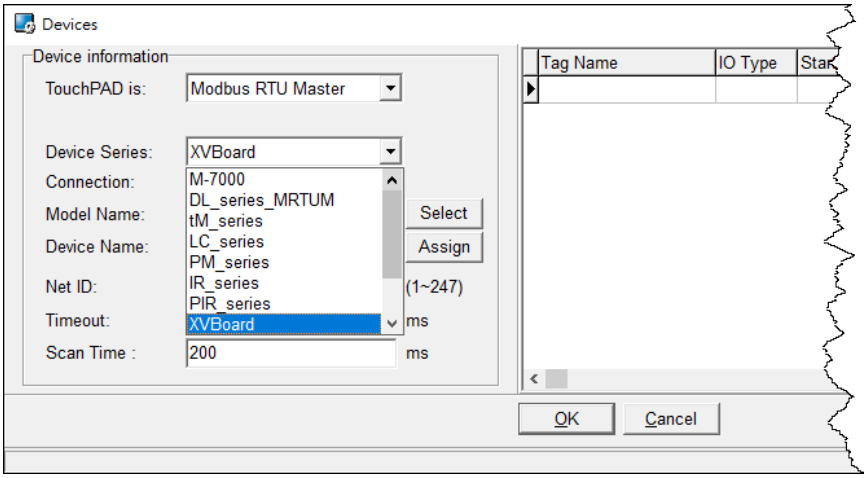
Step 1: In the HMIWorks software, click the **"Register Devices (I/O)"** option from the **"HMI"** menu to open the **"Devices"** dialog box, or press **<F3>**.



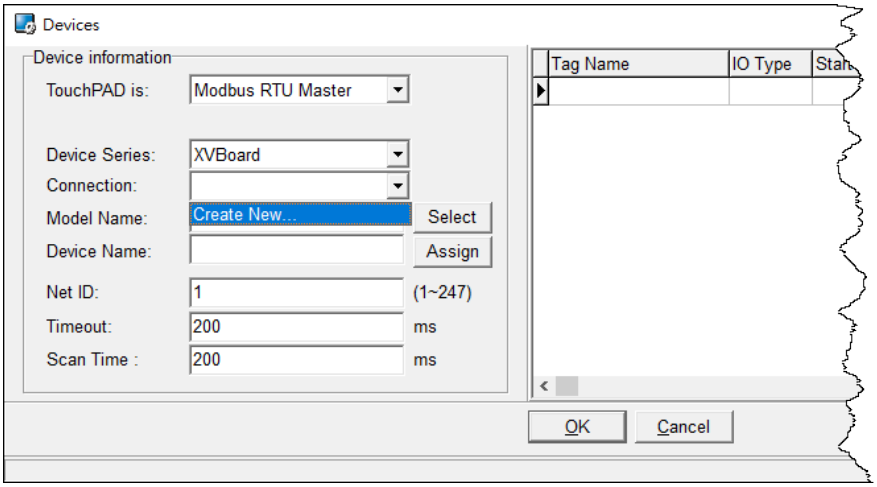
Step 2: Select **"Modbus RTU Master"** from the "TouchPAD is" drop down menu.



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

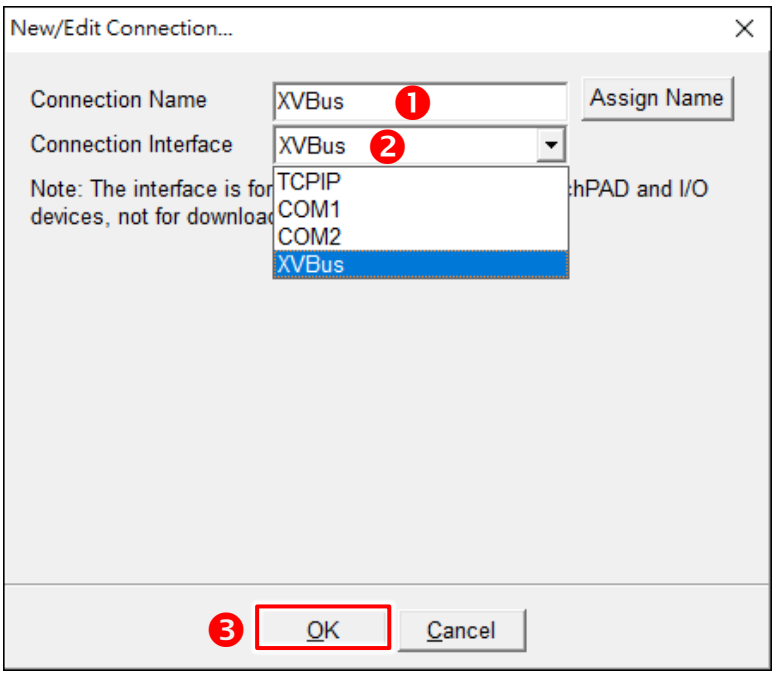


Step 4: Select **"Create New…"** from the "Connection" drop down menu to open the "New/Edit Connection…" dialog box.



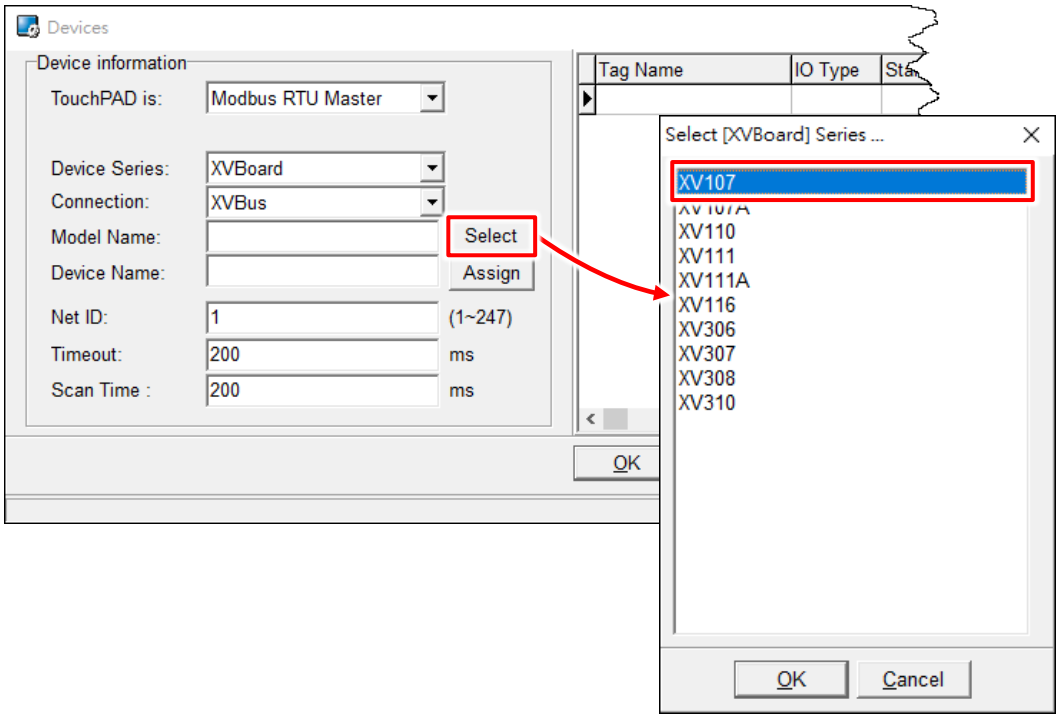
Step 5: In the "**New/Edit Connection…"** dialog box, configure the connection information of the XVBoard in the following manner:

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.

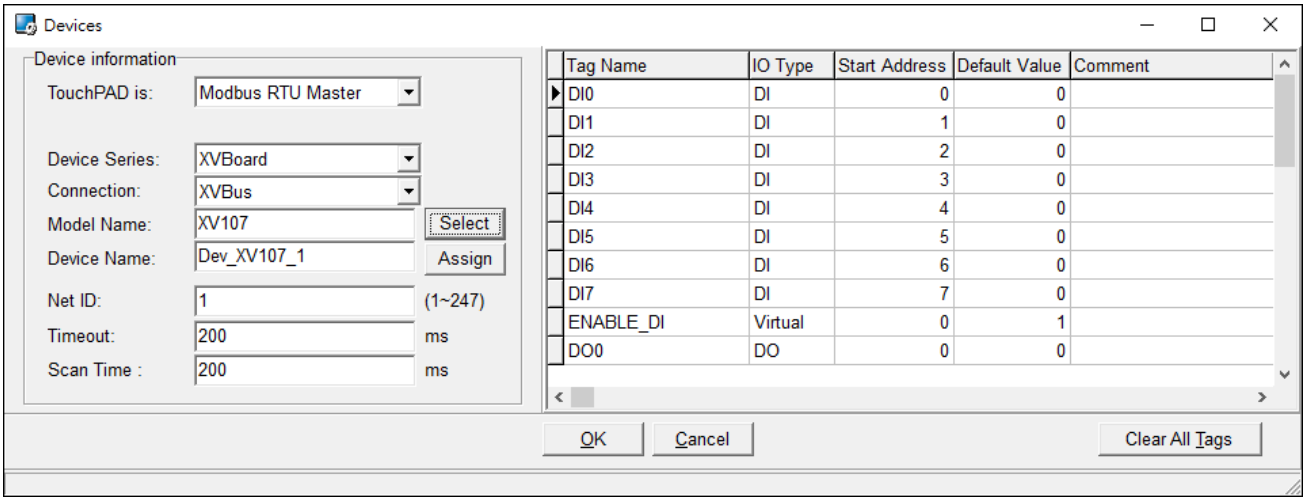


Step 6: Click the **"Select"** button to open the "Select [XVBoard] Series…" dialog box.

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.



Appendix: Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Description
1.0.25	April 2015	Initial issue
1.1.0	July 2015	1. Added the information about the TPD-703/703-64 specification in Section 1.4 Specifications. 2. Added the information about the TPD-703/703-64 appearance in Section 2.1 Appearance. 3. Added the information about the TPD-703/703-64 pin assignments in Section 2.2 Pin Assignments. 4. Added the information about the TPD-703/703-64 dimensions in Section 2.3 Dimensions.
1.2.0	December 2016	1. Added the information about the VPD-173N/173N-64 and TPD-433F-H specification in Section 1.4 Specifications. 2. Added the information about the VPD-173N/173N-64 and TPD-433F-H appearance in Section 2.1 Appearance. 3. Added the information about the VPD-173N/173N-64 and TPD-433F-H pin assignments in Section 2.2 Pin Assignments. 4. Added the information about the VPD-173N/173N-64 and TPD-433F-H dimensions in Section 2.3 Dimensions.
1.3.0	May 2017	1. Added the information about the specification in Section 1.4 Specifications. 2. Added the information about the VPD-130(N)-H/ 132(N)-H/133(N)-H/142(N)-H/143(N)-H/173X/173X-64, TPD-280U-H and TPD-430-H/430-H-EU/433-H/433-H-EU/433-M2 appearance in Section 2.1 Appearance. 3. Added the information about the VPD-130(N)-H/ 132(N)-H/133(N)-H/142(N)-H/143(N)-H/173X/173X-64, TPD-280U-H and TPD-430-H/430-H-EU/433-H/433-H-EU/ 433-M2 pin assignments in Section 2.2 Pin Assignments.

		4. Added the information about the VPD-130(N)-H/ 132(N)-H/133(N)-H/142(N)-H/143(N)-H/173X/173X-64, TPD-280U-H and TPD-430-H/430-H-EU/433-H/433-H-EU/ 433-M2 dimensions in Section 2.3 Dimensions. 5. Added the information about the VPD series DIN-Rail mounting in Section 2.4.2 DIN-Rail Mounting. 6. Added the information about the VPD series panel mounting in Section 2.4.3 Panel Mounting.
1.3.1	Aug. 2017	1. Added the TPD-433-H/433F-H/433-M2 and VPD-133-H/143-H models in the Section 3.4.2 Setup Ethernet-downloaded Devices. 2. Added the TPD 283U-H/283U-Mx in the Section 3.4.3 Setup USB-downloaded Devices.
1.4	Apr. 2018	1. Added the Phase out the models: TPD 2.8”: TPD-280, TPD-280U, TPD-283, TPD-283U TPD 4.3”: TPD-430, TPD-430-EU, TPD-433, TPD-433-EU, TPD-432F, TPD-433F 2. Added the information about the specification, pin assignments, dimensions and appearance, etc. for TPD-432F-H. 3. Update HMIWork (v2.10.27) operation picture.