

Teach Pendant TP-100-1

User's Manual



V1.0

06/24, 2020



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Revision History

Rev.	Description
0.8	Draft released.
1.0	First Version release





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1.0 Product Description

The TP-100-1 teach pendant provides the freedom and convenience by allowing users to move away from the host computer and control the robot locally. It incorporated the Multi-Touch projected capacitive (PCAP) touchscreen technology to reduce the number of buttons and consequently streamlined the operation of the industrial robots.



1.1. Overview of TP-100-1

The TP-100-1 is a handheld device that controls robot movements, teaches locations, and runs robot programs. It features an ergonomic housing with safety elements, a 10.1" WXGA resolution panel, and the Multi-Touch PCAP touchscreen technology. The control unit is comfortable to use and has an optional shoulder strap.



Front

Back

1.2. Handling of TP-100-1

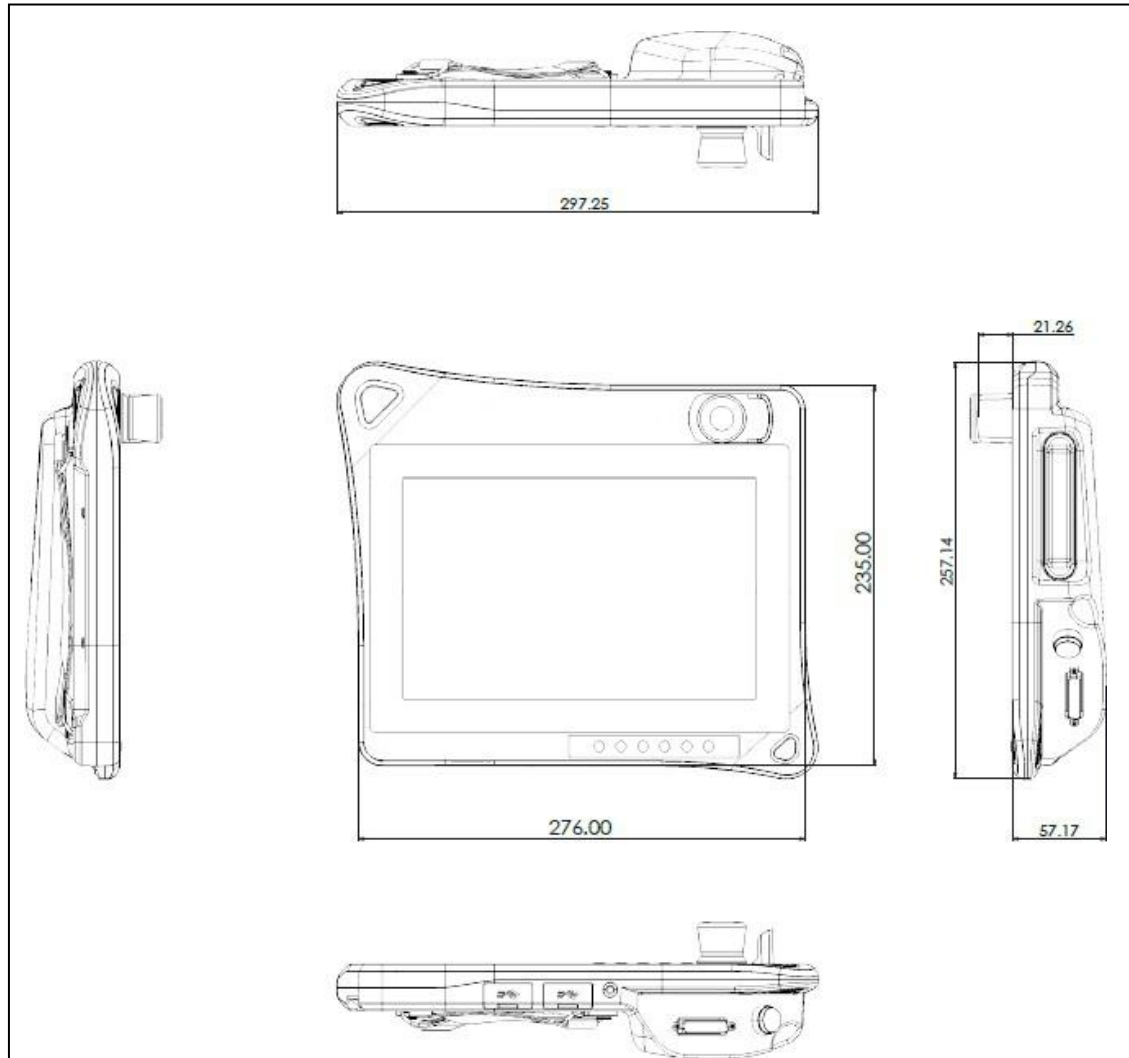


The TP-100-1 teach pendant is designed to operate in a horizontal/landscape format. When operating the device, make sure to connect all necessary cables from the teach pendant to the host computer.

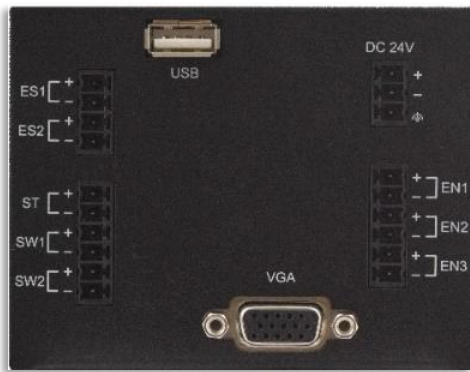
2.0 Technical Data

2.1. Dimensions

TP-100-1



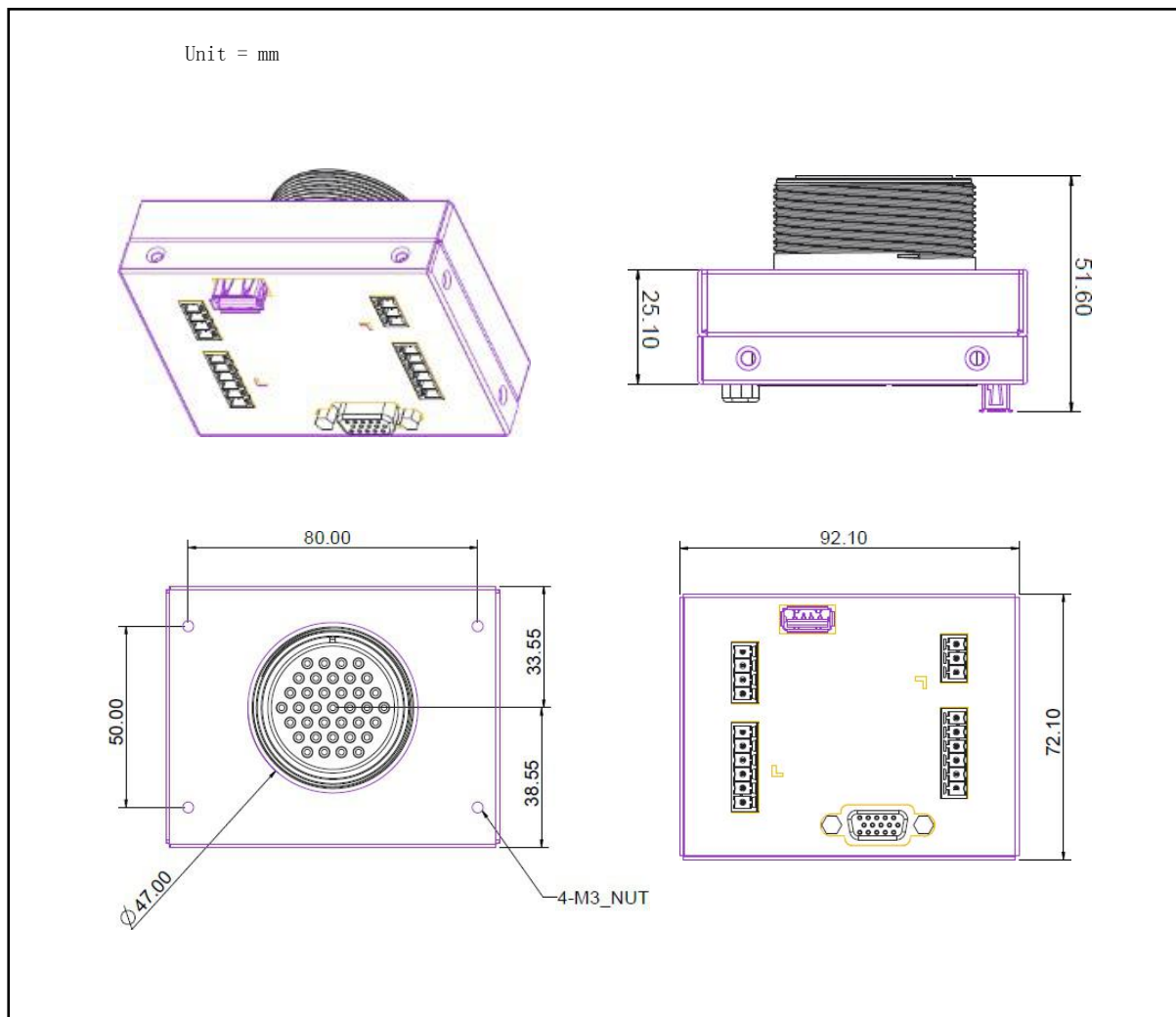
TP-100-VGA-JB



Front



Back

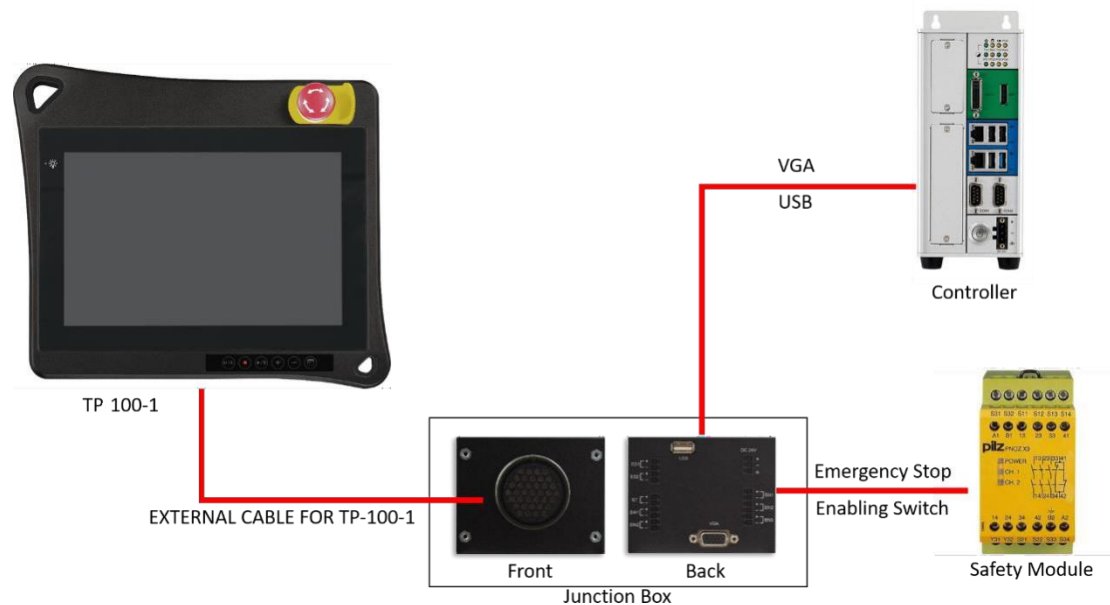


2.2. Specification


Technical Data	TP-100-1	Technical Data	TP-100-1
Panel	<ul style="list-style-type: none"> - 10.1", 16:10, WXGA, 1280 x 800 - Luminance: 500 cd/m2 - Contrast ratio: 800:1 - LCD color: 16.7M - Viewing angle: 85 (U), 85 (D), 85 (L), 85 (R) - Backlight: LED 	Interface	<ul style="list-style-type: none"> - Data back-up: 2 x USB 2.0 - Control connector: HDB-44 female Removable HDB-44 control cable, including power signal, E-stop button signal, Enabling switch signal, Switch button signal, STOP signal, USB 2.0 and VGA signals
Touch	<ul style="list-style-type: none"> - Touch: 5 points P-Cap - Touch light transmission: 87% - Touch interface: USB - Anti-scratch surface: 7H hardness 	Ratings	<ul style="list-style-type: none"> - Power supply voltage: 24 Vdc (19.2 to 28.8 Vdc) - Current consumption: <ul style="list-style-type: none"> > TP-100-VGA 0.625A at 24Vdc (max.)
Safety Elements	<ul style="list-style-type: none"> - Emergency stop button (2 NC channels, B10d=130,000) <ul style="list-style-type: none"> > Contact function: latching > Reset: by rotating - 3-position Deadman switch (3 channels 2 NO & 1 NC, B10d=100,000) 	Mechanical	<ul style="list-style-type: none"> - Dimension: 297.3 x 257.2 x 57.2 mm (78.5mm including E-stop button) - Weight (without external control cable): <ul style="list-style-type: none"> > TP-100-11.5Kg - TP-100-1 IP protection class: Full IP65 - Junction Box module and "install on TM control box" IP protection class: Full IP 32 - Teach Pendant cable length: 3m
Operating Elements	<ul style="list-style-type: none"> Switch button switch (1 NO, 1 NC) 6 membrane key 	Environment	<ul style="list-style-type: none"> - Operating temperature: 0°C to 50°C - Storage temperature: -20°C to 75°C - Operating humidity: 5%~90% relative humidity, non-condensing - Vibration resistance/shock-proof/free-fall according to EN 61131-2
System	<ul style="list-style-type: none"> - TP-100-1: VGAinput - USB 2.0 upstream 	Certifications	<ul style="list-style-type: none"> - CE (Emission EN61000-6-4; Immunity EN61000-6-2 for installation in industrial environments) - FCC Class A

3.0 Connection and Wiring

3.1. Connection



3.2. Pin define of Junction Box

Function	Pin	Description
DC24V	+	DC power input (24V, 0V, Shielding)
	-	
		
VGA	VGA	VGA signal for display
USB	USB	USB 2.0 of TP-100-1
Enabling Switch	EN1 +	An enabling switch is a 3-position (OFF-ON-OFF) switch to allow a machine operation only when the switch is lightly pressed and held in the middle position.
	EN1 -	
	EN2 +	
	EN2 -	
	EN3 +	
	EN3 -	
Emergency Stop Button	ES1 +	Emergency stop button are switches that quickly and reliably provide two-channel signal
	ES1 -	

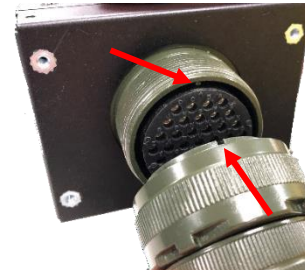


	ES2 +	for switching machines and systems to a safe state in an emergency.
	ES2 -	
Switch Button	SW1 +	A general-purpose button which provide two-channel signal and can be used as power switch of system.
	SW1 -	
	SW2 +	
	SW2 -	
Membrane Stop Key	ST +	The stop key on membrane provides a hard-wired signal can be used as program stop function.
	ST -	

3.3. Connecting extension cable to the Junction Box

Circular connectors that meet military specifications are used to connect with the junction box. The connector consists of a plug (male, pin) and a receptacle (female, socket). Follow the steps below to connect the junction box with the teach pendant.

- (1) Align the notch of the plug with the latch of the receptacle.



- (2) Turn the “first green ring” on the plug clockwise until you cannot turn it anymore.



- (3) Push the “second green ring” toward the junction box and repeat steps 1 and 2 until the junction box and plug are tightly connected.



Note 1: DO NOT twist the “black ring” to tighten the connection.

Note 2: Generally, after the connection is secured, there are about three threads visible.



For disconnecting the Junction Box

- (1) Turn the “first green ring” on the plug counterclockwise to disconnect the junction box.
- (2) Pull the “second green ring” opposite from the junction box once and repeat steps 1 and 2 until the junction box and plug are disconnected.



Note: DO NOT twist the “black ring” to disengage the connection.



Connect extension wire to TP-100-1



CAUTION:

DO NOT power on the system before finishing wiring. DO NOT remove the wiring during power on, which may result in damage to the system.

4.0 Operation Behaviors



4.1. Membrane Keys



The TP-100-1's membrane keys are located at the lower-right of the teach pendant. Review the key definitions below:

Key Definition	Defined Keyboard Mapping
M/A	[Ctrl] + [Shift] + [m]
Stop	[Ctrl] + [Shift] + [s]
Play/Pause	[Ctrl] + [Shift] + [p]
+	[Ctrl] + [Shift] + []]
-	[Ctrl] + [Shift] + [[]
Error Log	[Ctrl] + [Shift] + [e]

The stop key on membrane provides a hard-wired signal and connects to ST+ and ST- at the back of junction box. When the stop button is pressed, the ST+ and ST- status will then change from Normal Open (NO) to Normal Close (NC).



4.2. Emergency Stop Button

The Emergency Stop button locates at the upper-right corner of the TP-100-1 and connects to ES1 and ES2 at the back of the junction box. When an emergency occurs, the Emergency Stop button is pressed to stop all activities, the ES1 and ES2's status will then change from Normal Close (NC) to Normal Open (NO). To reset the button, turn it clockwise or counterclockwise to raise the button.



4.3. Enabling Switch



The Enabling switch checks the two-channel mechanical switching elements and filter out any asynchronous output signals. It ensures the approval control (circuit 1 and circuit 2) and both outputs of the teach pendant are synchronized at all time.

		6.0 Travel (mm)			
		3.0			
		0			
		Position	Position 1	Position 2	Position 3
When pressing the switch	Pin				
	EN1 +	Open	Close	Open	
	EN1 -				
	EN2 +	Open	Close	Open	
	EN2 -				
	EN3 +	Close	Close	Open	
	EN3 -				
When releasing the switch	EN1 +	Open	Open	Open	
	EN1 -				
	EN2 +	Open	Open	Open	
	EN2 -				
	EN3 +	Close	Close	Open	
	EN3 -				

4.4. Switch Button



The switch button connects to SW1 and SW2 at the back of the junction box. When the switch button is pressed, the SW1 status will change from Normal Close (NC) to Normal Open (NO), and SW2 status will change from Normal Open (NO) to Normal Close (NC).

	Pin	Contact
When pressing the switch	SW1 +	Open
	SW1 -	
	SW2 +	Close
	SW2 -	
When releasing the switch	SW1 +	Close
	SW1 -	
	SW2 +	Open
	SW2 -	