

# Teach Pendant TP-100-C

## User's Manual



**V0.3**

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## Revision History

Rev.	Description
0.1	Draft released.
0.2	Modify the photo of TP-100-C
0.3	Modify the VGA Of Terminal Block Connector Pin define of Junction Cable (page4-page 5)





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## 1.0 Product Description

The TP-100-C 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-C

The TP-100-C 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.



## 1.2. Handling of TP-100-C

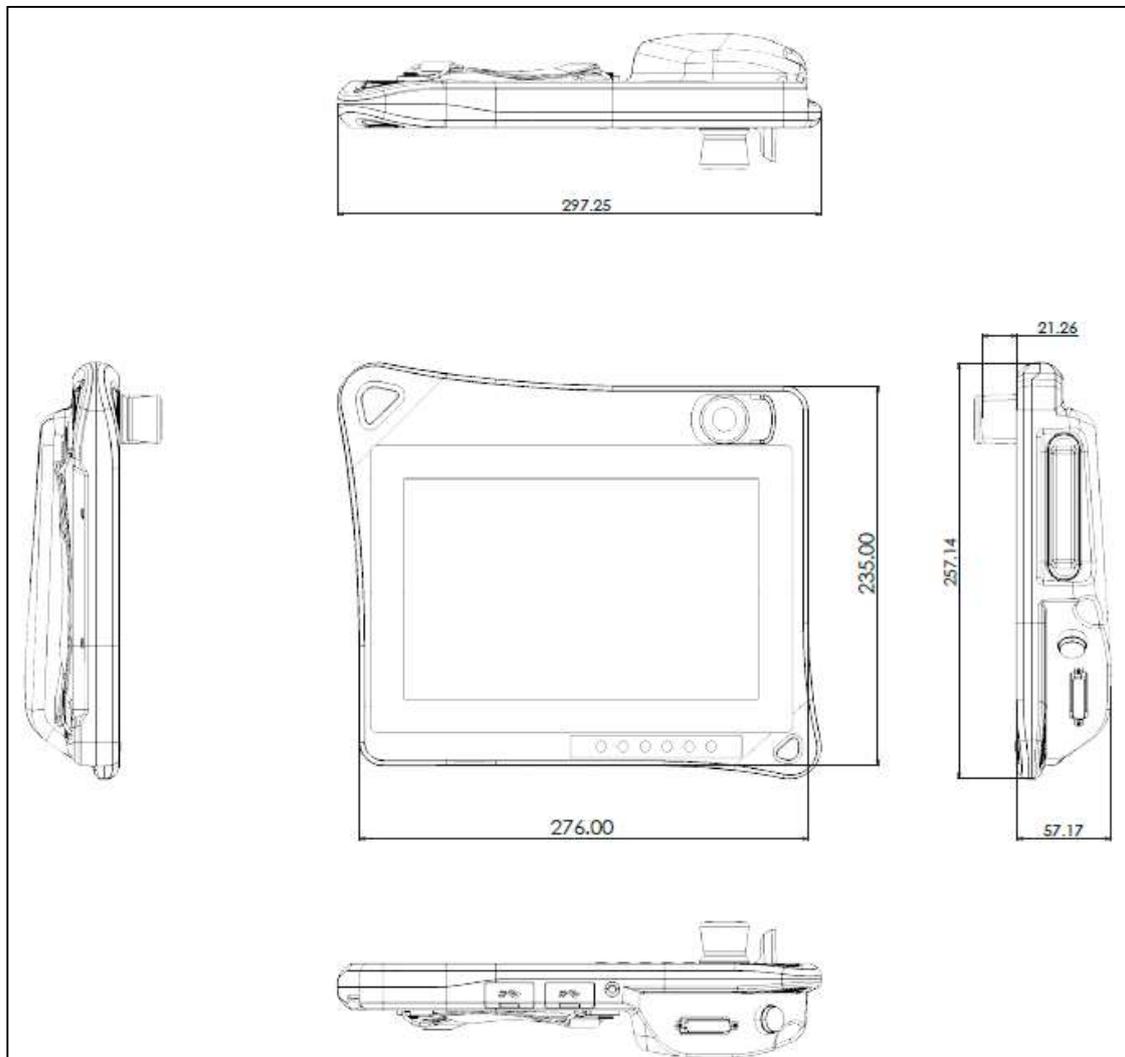


The TP-100-C teach pendant is designed to operate in a horizontal / landscape format. When operating the device, make sure to connect all necessary cables from the teach pendant to the host computer.

## 2.0 Technical Data

### 2.1. Dimensions

TP-100-C



## Terminal Block Connector Pin define of Junction Cable

PIN Definition of Junction Cable			
Terminal Block connector			
Function	Junction Cable Side	Wire Color / Pin	Description
Switch Button	b	Red / SW1+	A general-purpose button which provide two-channel signal and can be used as power switch of system.
	h	White / SW1-	
	g	Black / SW2+	
	n	Blue / SW2-	
Emergency Stop Button	L	Orange / ES1+	Emergency stop button are switches that quickly and reliably provide two-channel signal for switching machines and systems to a safe state in an emergency.
	U	Gray / ES1-	
	K	Purple / ES2+	
	T	Green / ES2-	
Enabling Switch	G	Red / 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.
	H	White / EN1-	
	Z	Black / EN2+	
	N	Blue / EN2-	
	X	Yellow / EN3+	
	W	Brown / EN3-	
DC 24V	C	Orange / 24V+	DC power input (24V, 0V, Shielding)
	J	Gray / 24V-	
GND	R	Yellow + Green / CHASSIS_GND1	
USB	A	P_USB-	USB 2.0
	E	P_USB+	
	B	USB_5V	
	F	GND	
VGA	e	VGA_RED_GND	
	d	VGA_GREEN_GND	
	C	VGA_BLUE_GND	



	r	VGA_VSYNC	
	m	VGA_RND	
	K	VGA_GRN	
	j	VGA_BLUE	
	S	VGA_HSYNC	
	f	VGA_GND	
	p	VGA_5V	
	M	DDC_SDA	
	V	DDC_SCL	
	R	Chassis_GND1	

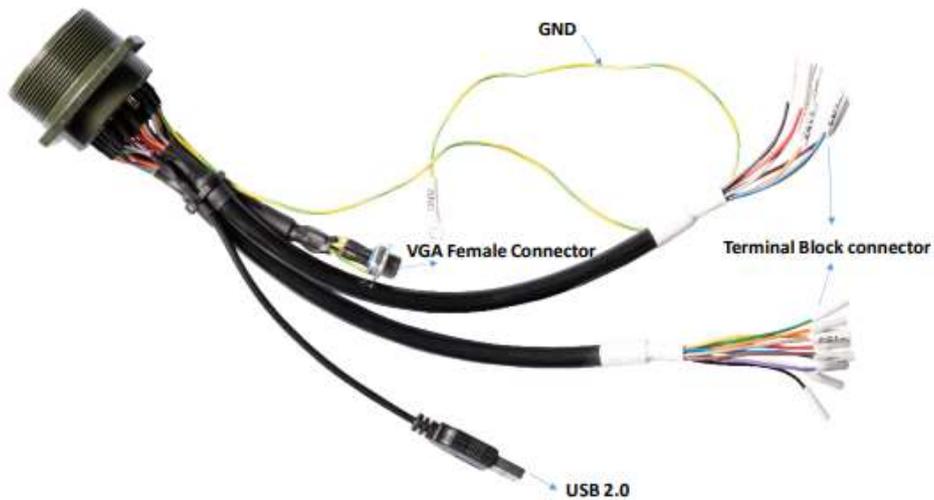
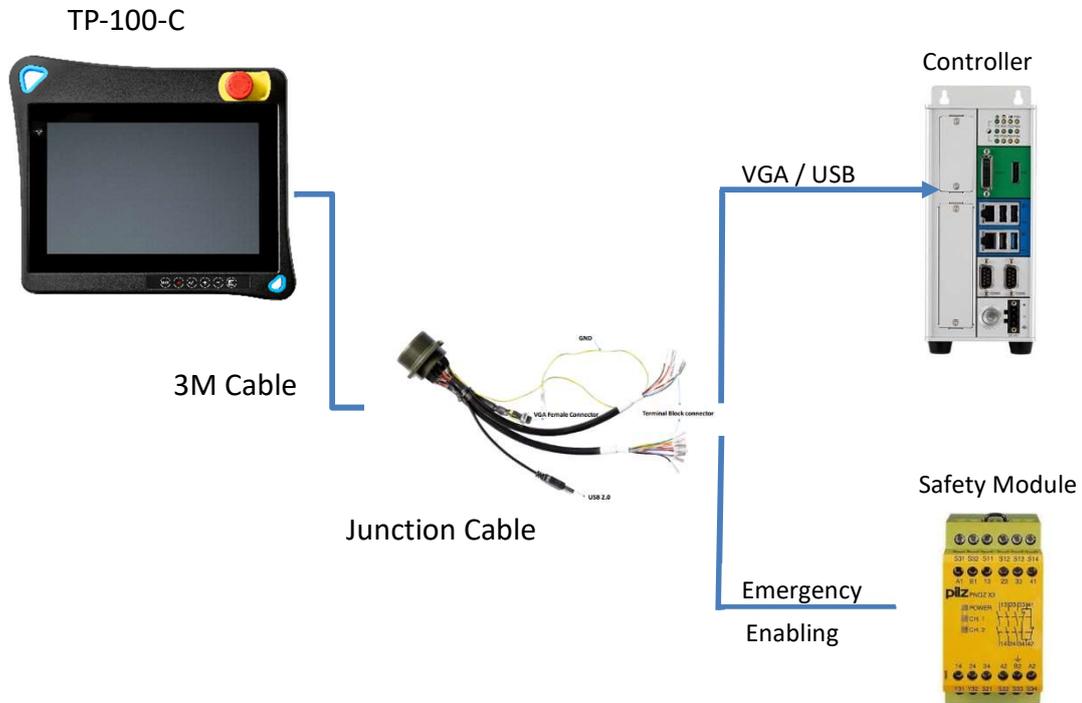


## 2.2. Specification

Technical Data	TP-100-C	Technical Data	TP-100-C
Panel	<ul style="list-style-type: none"> <li>- 10.1", 16:10, WXGA, 1280 x 800</li> <li>- Luminance: 500 cd/m<sup>2</sup></li> <li>- Contrast ratio: 800:1</li> <li>- LCD color: 16.7M</li> <li>- Viewing angle: 85 (U), 85 (D), 85 (L), 85 (R)</li> <li>- Backlight: LED</li> </ul>	Interface	<ul style="list-style-type: none"> <li>- Data back-up: 2 x USB 2.0</li> <li>- Control connector: HDB-44 female</li> <li>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</li> </ul>
Touch	<ul style="list-style-type: none"> <li>- Touch: 5 points P-Cap</li> <li>- Touch light transmission: 87%</li> <li>- Touch interface: USB</li> <li>- Anti-scratch surface: 7H hardness</li> </ul>	Ratings	<ul style="list-style-type: none"> <li>- Power supply voltage: 24 Vdc (19.2 to 28.8 Vdc)</li> <li>- Current consumption: <ul style="list-style-type: none"> <li>&gt; TP-100-C 0.625A at 24Vdc (max.)</li> </ul> </li> </ul>
Safety Elements	<ul style="list-style-type: none"> <li>- Emergency stop button (2 NC channels, B10d=100,000) <ul style="list-style-type: none"> <li>&gt; Contact function: latching</li> <li>&gt; Reset: by rotating</li> </ul> </li> <li>- 3-position Deadman switch (3 channels 2 NO &amp; 1 NC, B10d=100,000)</li> </ul>	Mechanical	<ul style="list-style-type: none"> <li>- Dimension: 297.3 x 257.2 x 57.2 mm (78.5mm including E-stop button)</li> <li>- Weight (without external control cable): <ul style="list-style-type: none"> <li>&gt; TP-100-C 1.5Kg</li> </ul> </li> <li>- TP-100-C IP protection class: Full IP40</li> <li>- Teach Pendant cable length: 3m</li> </ul>
Operating Elements	<ul style="list-style-type: none"> <li>Switch button switch (1 NO, 1 NC)</li> <li>6 membrane key</li> </ul>	Environment	<ul style="list-style-type: none"> <li>- Operating temperature: 0°C to 50°C</li> <li>- Storage temperature: -20°C to 75°C</li> <li>- Operating humidity: 5%~90% relative humidity, non-condensing</li> <li>- Vibration resistance/shock-proof/free-fall</li> </ul>
System	<ul style="list-style-type: none"> <li>- TP-100-C: VGA input</li> <li>- USB 2.0 upstream</li> </ul>	Certifications	<ul style="list-style-type: none"> <li>- CE (Emission EN61000-6-4; Immunity EN61000-6-2 for installation in industrial environments)</li> <li>- FCC Class A</li> </ul>

## 4.0 Connection and Wiring

### 4.1. Connection



## 4.2. Connecting extension cable to the Junction Cable

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

- (1) First install the Junction cable on the controller and 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 cable and repeat steps 1 and 2 until the junction cable 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 Cable

(1) Turn the “first green ring” on the plug counterclockwise to disconnect the junction cable.

(2) Pull the “second green ring” opposite from the junction cable once and repeat steps 1 and 2

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



Connect extension wire to TP-100-C



**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.

## 5.0 Operation Behaviors



### 5.1. Membrane Keys

The TP-100-C'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 ]

## 5.2. Emergency Stop Button

The Emergency Stop button locates at the upper-right corner of the TP-100-C and connects to ES1 and ES2 at the the junction cable. 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.

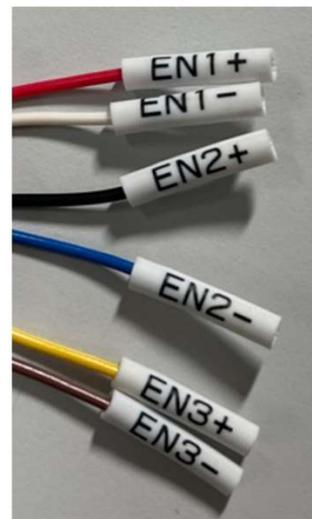
**Note:** ES1- is Gray wire; ES1+ is Orange wire; ES2- is Green wire; ES2+ is Purple wire



## 5.3. 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.

**Note:** EN1+ is Red wire; EN1- is White wire; EN2+ is Black wire; EN2- is Blue wire; EN3+ is Yellow wire; EN3- is Brown wire





		Travel (mm)			
		6			
		3.0			
		0			
		Position	Position 1	Position 2	Position 3
		Pin	1	2	3
When <b>pressing</b> the switch	EN1 +	Open	Close	Open	
	EN1 -	Open	Close	Open	
	EN2 +	Open	Close	Open	
	EN2 -	Open	Close	Open	
	EN3 +	Close	Close	Open	
	EN3 -	Close	Close	Open	
When <b>releasing</b> the switch	EN1 +	Open	Open	Open	
	EN1 -	Open	Open	Open	
	EN2 +	Open	Open	Open	
	EN2 -	Open	Open	Open	
	EN3 +	Close	Close	Open	
	EN3 -	Close	Close	Open	

### 5.4. Switch Button

The switch button connects to SW1 and SW2 at the junction cable. 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).

**Note:** SW1- is Red wire; SW1+ is White wire; SW2- is Blue wire; SW2+ is Black wire;





	Pin	Contact
When <b>pressing</b> the switch	SW1 +	Open
	SW1 -	
	SW2 +	Close
	SW2 -	
When <b>releasing</b> the switch	SW1 +	Close
	SW1 -	
	SW2 +	Open
	SW2 -	