DARVEEN

www.darveen.com

VT-876

User's Manual

2024/6/25 Ver: 1.0

Table of Contents

Chapter 1. About this Manual

1.1 Introduction

This is a user manual about VT-876, which mainly includes introduction,application environment of the product, description of appearance, product characteristics,technical parameters, setting of common functions, machine installation, matters needing attention and after-sales common problem diagnosis.This manual is designed to help users solve problems encountered in the process of use, please be sure to read this manual in detail, so as to better use the VT-876.

1.2 User and Product Safety

● Never use strong pressure onto the screen or subject it to severe impact, as the LCD panel could become cracked and possibility cause personal injury. If the LCD panel is broken, never touch the liquid inside because the liquid irritates the skin.

● Although the VT has passed the test of IP66 standard for water and dust resistance, avoid prolonged exposure to rain or other concentrated moisture. Such condition exceeds the IP66 standard, and could result in water or other contaminants entering into the VT.

● Use only the original approved AC/DC Adapter with the VT. Use of an unapproved AC/DC Adapter could result in electrical problems, or even cause a fire or electrical shock to the user.

● Do not disassemble the VT. Servicing should be done by supplier only. If the VT or accessories gets damaged due to wrong handling or unauthorized repair, warranty is void. In case the warranty seals are broken, warranty is void too.

● Make regularly back-up of all important data.

● Under no circumstance will supplier be liable for any direct, indirect, consequential or incidental damages baring out of the use or inability to use the hardware and software and/or any data loss, even if supplier has been informed about the possibility of such damages.

1.3 Recycling & disposal instructions

Do not throw this product in the home waste bin.

1.4 Regulatory information

For CE, FCC, RoHS and other Document of Conformities, consult the Contact Window of Darveen Computer.

1.5 Product application scenario

VT-876 is the latest generation of rugged vehicle mounted computer that comes with Intel Celeron J6412 platform processor and Windows 11 operating system,It is designed for warehouse forklift ,Port and Container Yards, Manufacturing Logistics,Heavy Duty Vehicle and Fleet Management.

Chapter 2. Description of Product

2.1 Overview

VT-876 is the latest generation of rugged vehicle mounted computer that comes with Intel Celeron J6412 platform processor and Windows 11 operating system. The VT-876 harnesses full Microsoft® Windows® computing power in a mobile environment, optimizing application and network management compatibility, while remaining flexible enough to run multiple advanced applications.VT-876 assembly 12.1-inch industrial resistive/capacitive touch screen, built-in WiFi6E, Bluetooth5.3, 4G LTE / 5G, GPS/GNSS/Beidou, 8~36V wide-range DC input adapt it to the warehousing forklift, logistics, container trucks and so on. Meet the STD-MIL-810H of anti-shock and vibration, IP66 dust and water proof standard make it operaing freely in the most demanding environment.These features as:

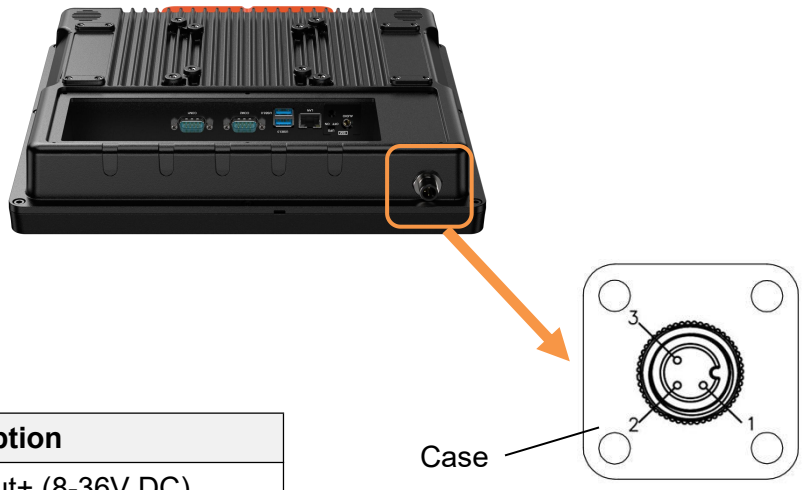
- 12.1" TFT-LCD with resistive touch/projective capacitive touch screen
- Front panel intergrated numeric and function keys control
- Rugged aluminum enclosure and fanless design
- IP66 protection against water and dust
- MIL-STD-810H vibration testing standards compliant
- Wide range 8-36VDC power input with ignition control
- Flexible expansion capability for Wi-Fi 6E, Bluetooth 5.3, LTE, 5G,GNSS, CAN2.0B

2.2 General View of the VT-876

2.2.1 I/O Interfaces

2.3 Power Supply Connector

VT-876 internal power supply can accept DC input voltages in the range of 8 to 36V DC.



Pin	Signal	Description
1	V In+	DC Input+ (8-36V DC)
2	Ignition	ACC Delay Ignition Switch
3	V In-	DC Input-
Case		Chassis ground

2.4 System Specifications

The VT-876 detailed specifications as follows. Unless otherwise noted, all the specifications are subject to change without prior notification.

VT-876	
Processor	- Intel® Celeron J6412, quad core (2.0GHz)
Memory	- 4GB DDR4-2666 SO-DIMM (up to 32GB)
Storage	- 128GB M.2 SSD (up to 2TB)
Operating System	- Windows 11 IoT Enterprise LTSC - Windows 10 IoT Enterprise LTSC - Windows 10 Pro
Display	- 12.1 inch (4:3) TFT LCD - 1000 cd/m² Brightness - SVGA 1024 x 768 Resolution
Touch Panel	- Projected capacitive multi touch,5-wire resistive touch (Optional, by request)
Input / Output Ports	- 1x RS-232/422/485 (COM1 supports 5V/12V, DB9) - 1x RS-232 (COM2 supports 5V, DB9) - 2 x USB3.0(Type A) - 1 x GbE LAN (RJ45) - 1x SIM Socket - 2 to 8x TNC connector for external antenna (Wi-Fi, Bluetooth, WWAN, GPS)
Audio	- 3.5mm Audio Jack (Mic-in/Line-out)
Speaker	- 8Ω/2W, dual studio speakers
Wi-Fi	- Wi-Fi 6E: 802.11a/b/g/n/ac/ax, 2.4G/5G/6(Optional)
Cellular	- 4G LTE (Optional) - 5G NSA/SA (Optional)

Bluetooth	- Bluetooth 5.3 (Optional)
GNSS	- GPS, GLONASS, Galileo, BeiDou (Optional, Ublox NEO M8N)
Keyboard	- Power ON/OFF - Brightness and Volume Adjustment - Power LED Indicator - 0-9 Numeric Keys - F1-F6 User-defined Function Keys - Enter and Backspace
Power System	- DC Input: 8~36V DC - Power Consumption: 18W Typ. - Mode:ATX (default), AT
Battery	- 7.2V 3350mAh (optional)
Dimensions and Weight	- Dimensions (W x D x H):300 x 260 x 58 mm (11.8 x 10.24 x 2.28 inches) - Weight(N.W.) : 3.8 kg (8.4 lbs)
Material	- Die-casting Aluminum with Heavy Duty Metal
Certification	- EMC：CE, FCC

2.4 Environment Standard

Operating Temperature	-20 to 60°C (-4 to 140°F)
Storage Temperature	-40 to 70°C (-40 to 158°F)
Mounting Mode	VESA 75 and 100
RelaAve Humidity	95% @ 70°C (158°F), non-condensing
Shock	MIL-STD-810H Method 514.8 Procedure I
Vibration	MIL-STD-810H Method 516.8 Procedure I
Water & Dust proof	IP66 compliant (I/O interface must be closed)

Chapter3. Function Using

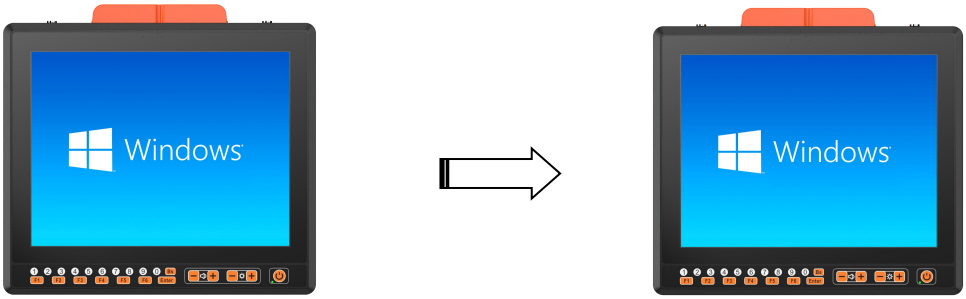
3.1 Key Operation

3.1.1 Turn on the VT-876

Press the power button to turn on the VT-876. If the VT-876 does not power on, check the power supply has been connected normally and you should try again.

Power Button

When the VT-876 is powered on, it's operating system starts up. A splash screen of Darveen logo appears for a short period of time followed by the Windows 10 desktop window.

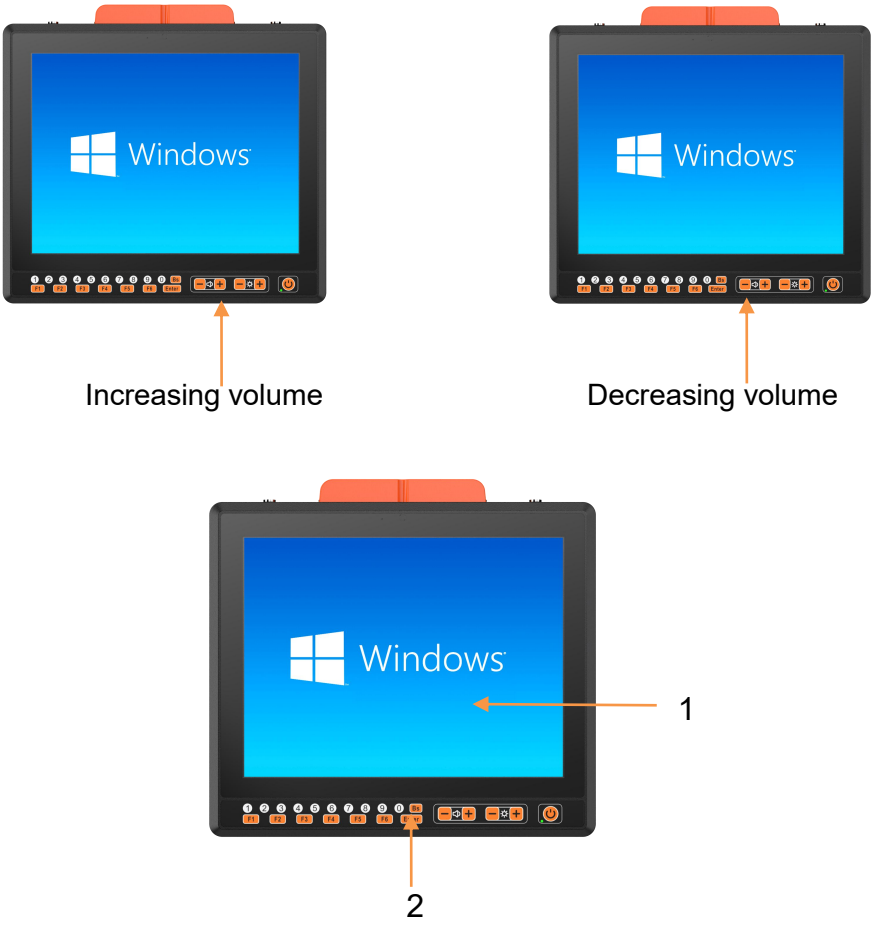


3.1.2 Adjust brightness and volume

When the VT-876 is powered on and login Windows system, you can adjust screen brightness and volume manually by pressing the button on the front of VT-876.

Increasing brightness

Decreasing brightness

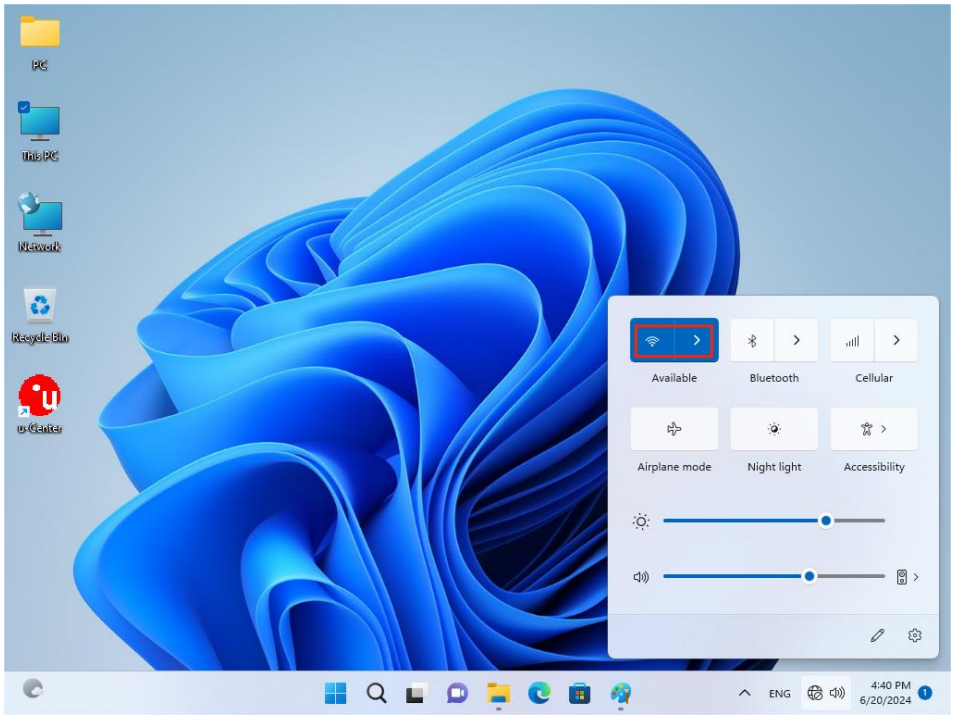


Label nr.	Description
1	LCD panel
2	Keypad for power on/off, brightness and volume control buttons，F1-F6 User-defined Function Keys，Numeric key

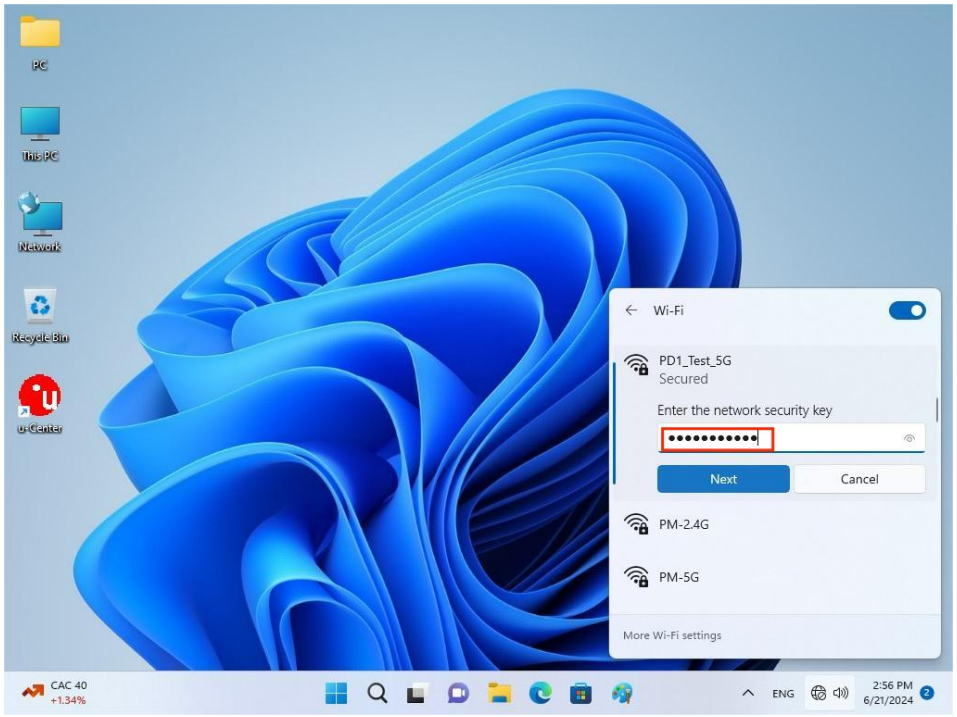
Function Keys	Definition
F1	Help
F2	Rename Files/Folders
F3	Search file window
F4	Expands a drop-down list of Windows or browser addresses
F5	Refresh, refresh the web page or refresh the desktop
F6	Quickly locate the address bar in Resource Manager or Internet Explorer

3.2 WiFi

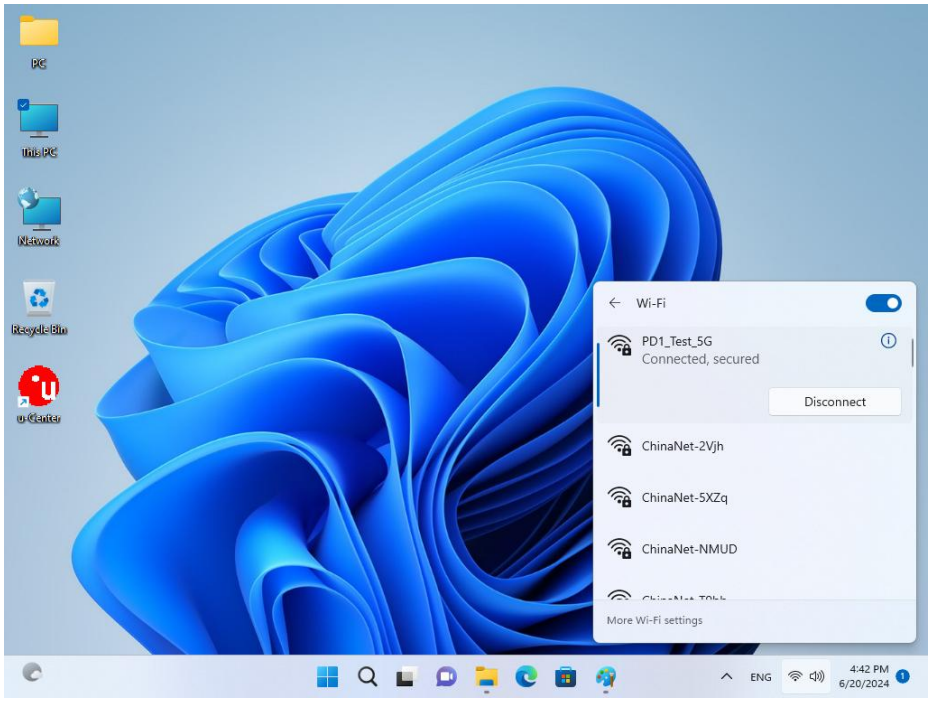
1.Click the network signal icon in the lower right corner of the desktop, select the Expand button and view the list of wireless signals.



2.Select the WiFi signal you want to connect to and enter the correct password.



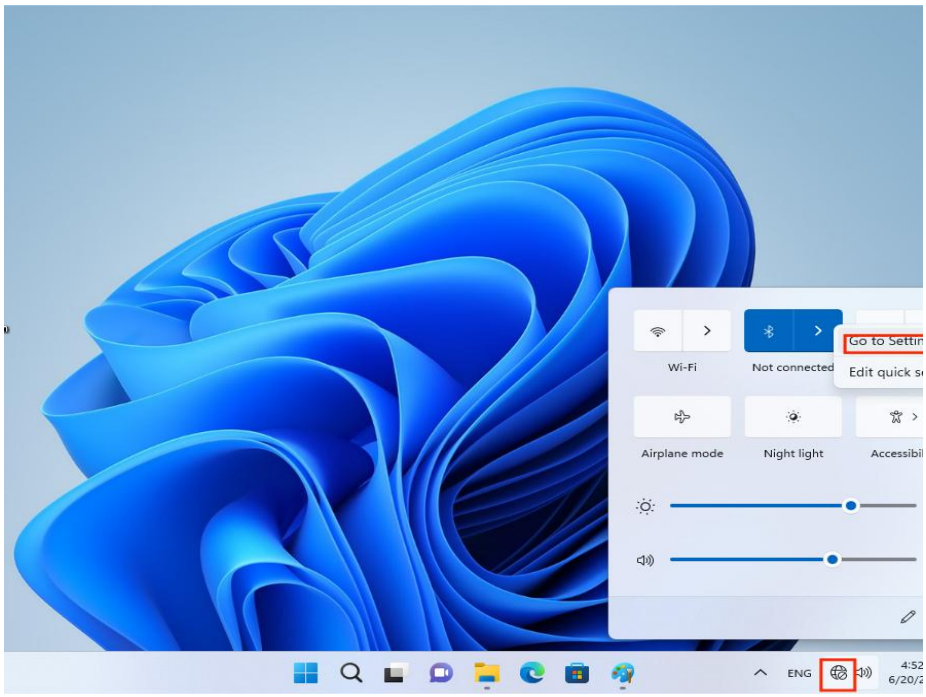
3.The wireless network is properly connected and you can use the wireless network to surf the Internet.



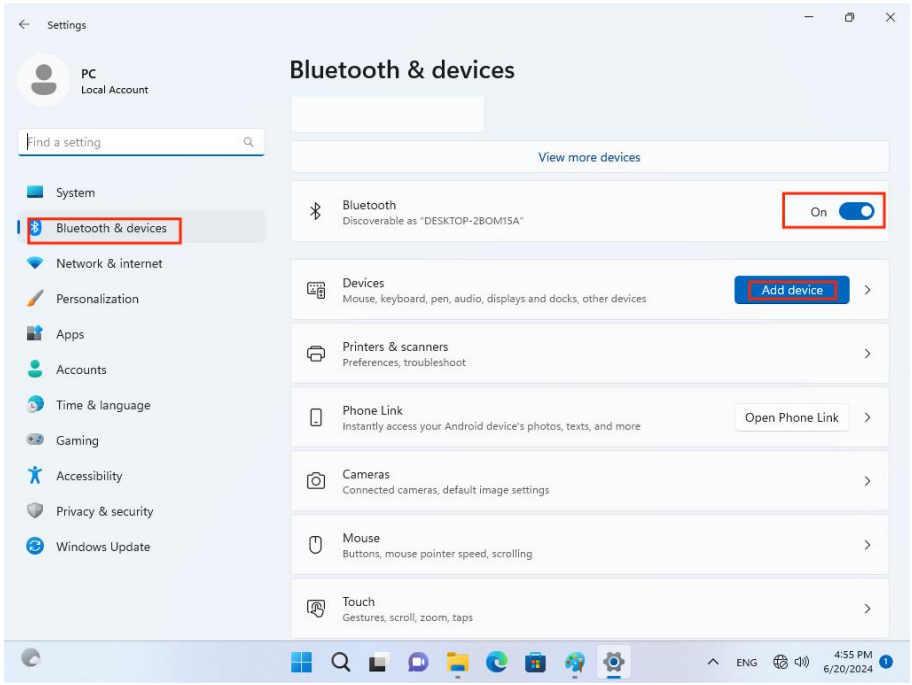
3.3 Bluetooth

3.3.1 Turn on the Bluetooth

1.Tap the network signal icon in the lower right corner of the screen,Click the right mouse button on the Bluetooth icon to enter the Bluetooth setting interface.

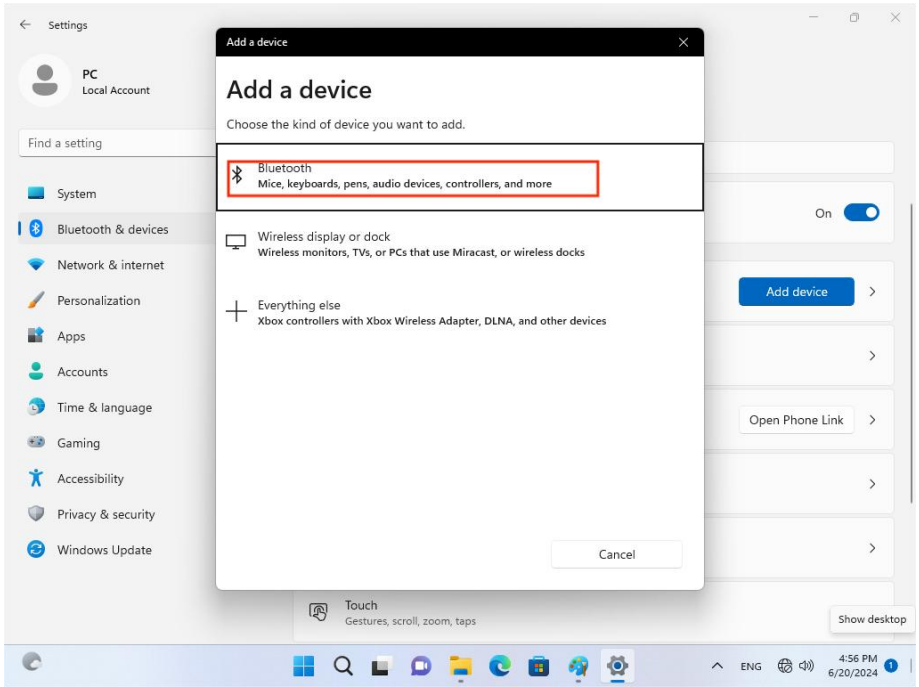


2.In the "**Bluetooth & devices**" ,Turn on the"**Bluetooth**".

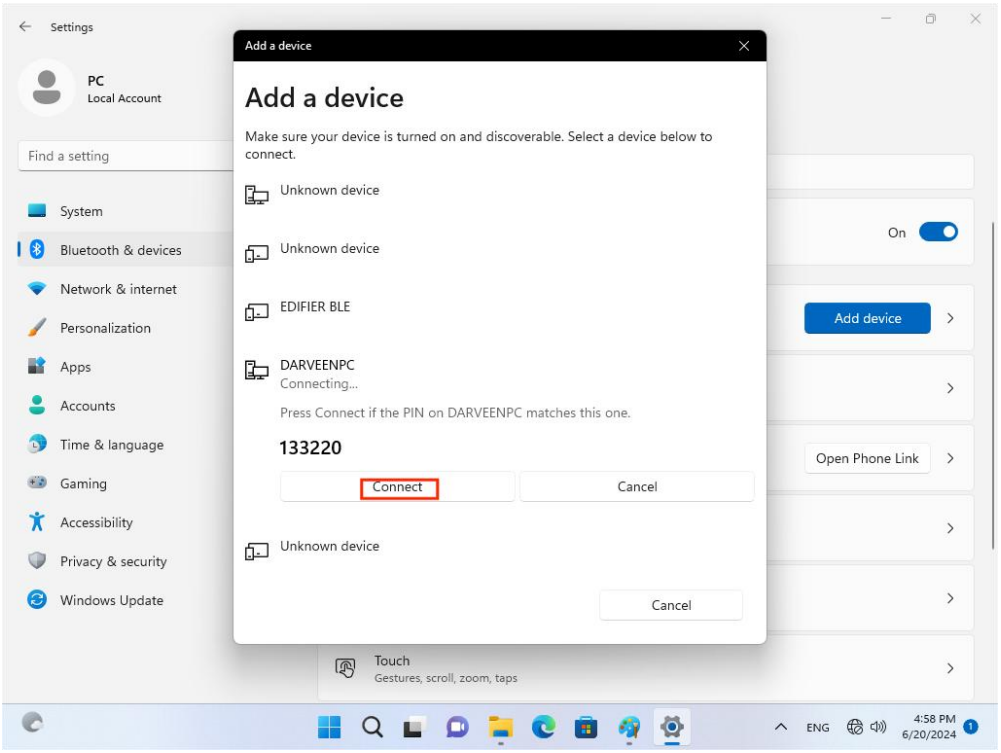


3.3.2 Connect to the Bluetooth

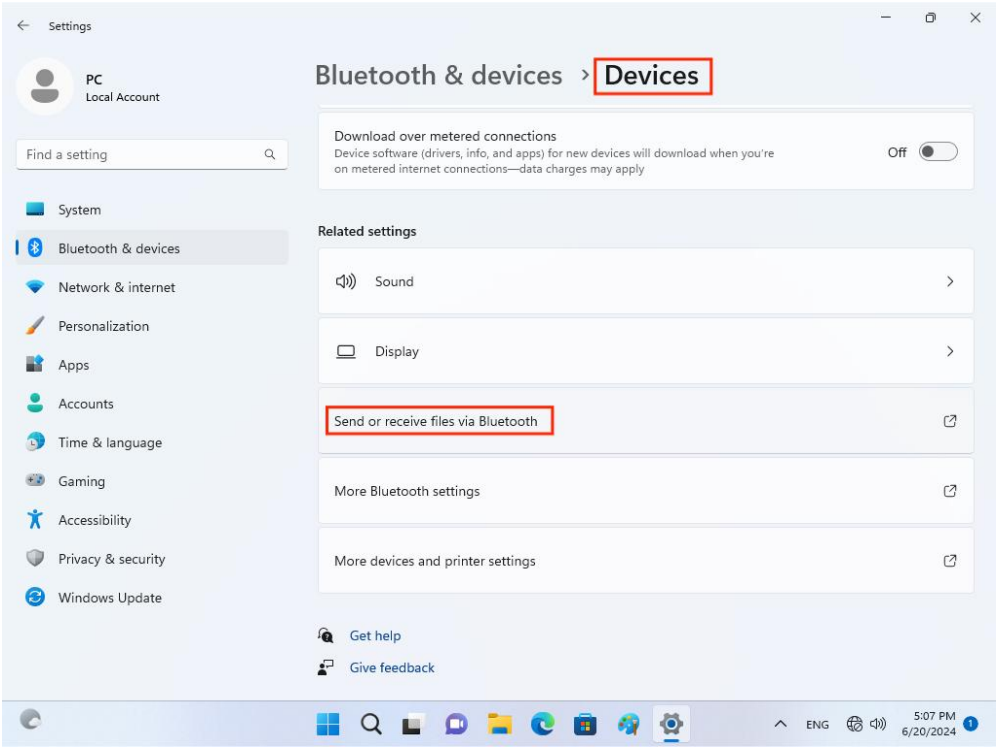
1. Click "**Add device**" and select the type of the Bluetooth device to be added.



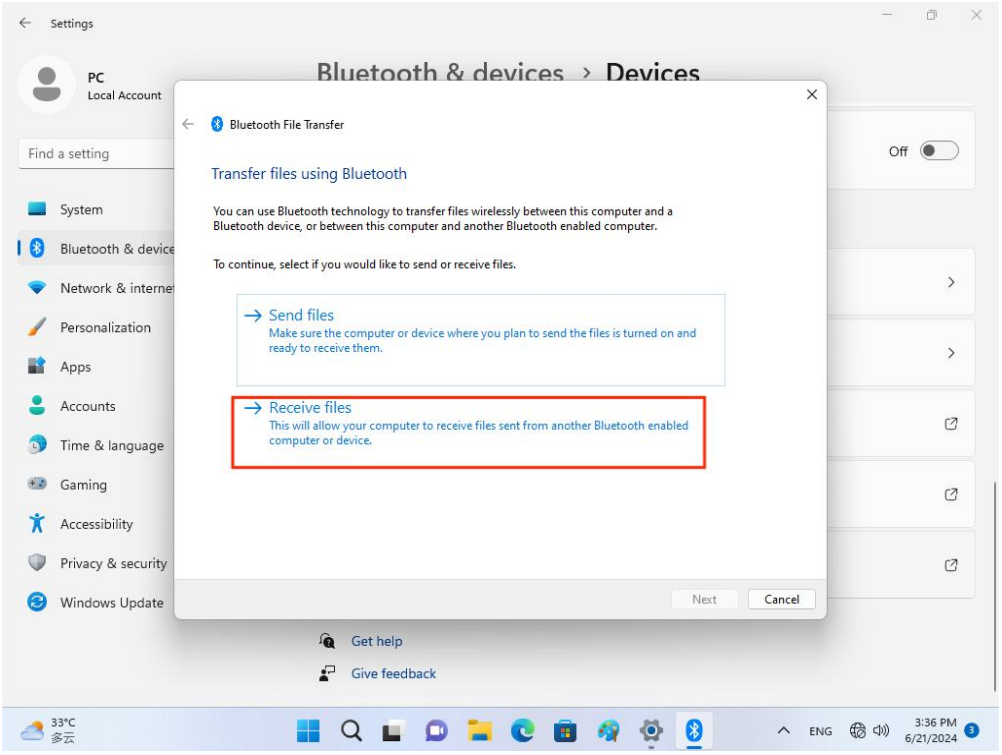
2.Click the Bluetooth device to be connected, and you will see a matching PIN pop up. After confirming that VT-876 is the same as the matching PIN on the device to be connected, click "**Connect**" to match successfully, and then you can start to use Bluetooth to send and receive files.

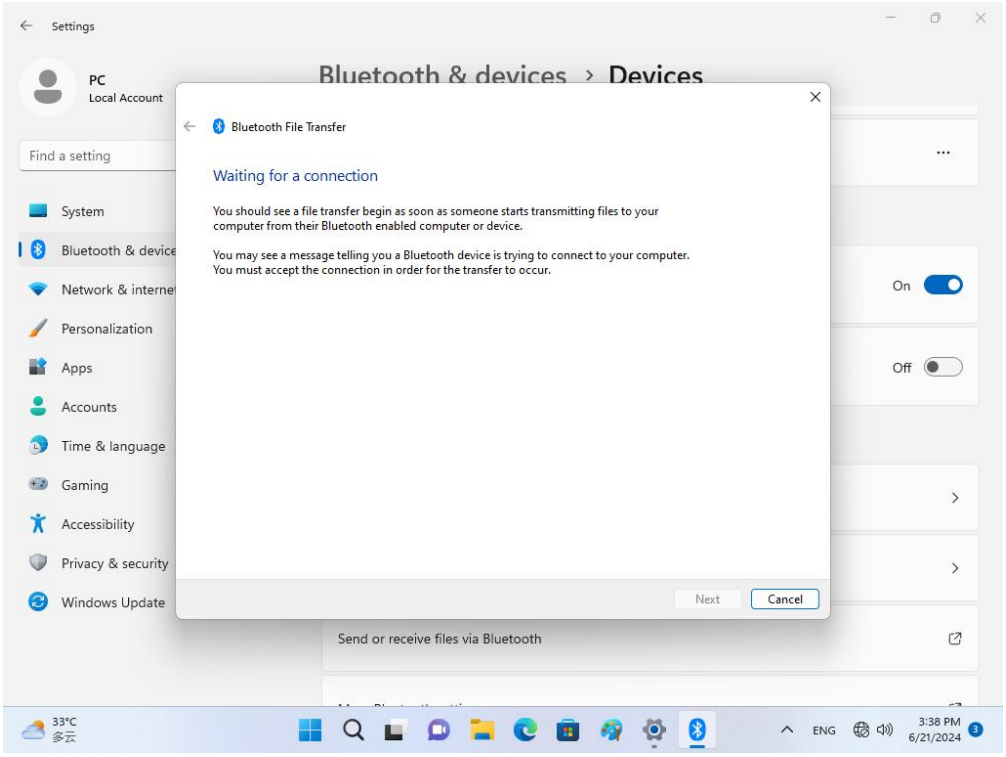


3.In the "**Bluetooth & devices**" interface, click "**Send or receive files via Bluetooth**" to open the Bluetooth file transfer interface.

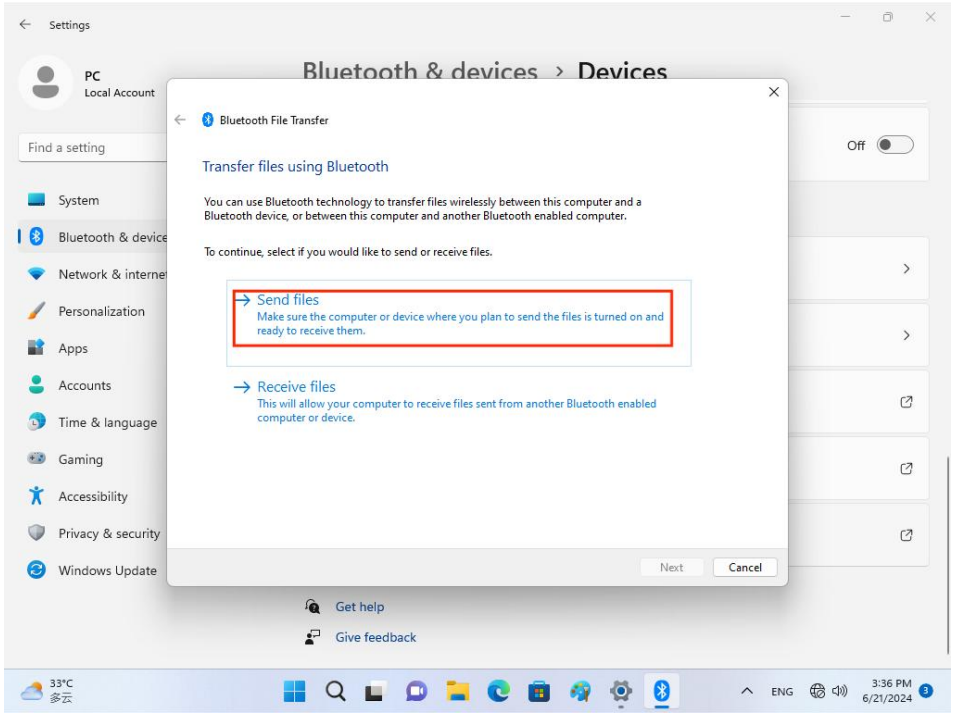


4.Receive the files. Before other devices send files to VT-876, click "**Receive File**" below to wait for the files to be received.

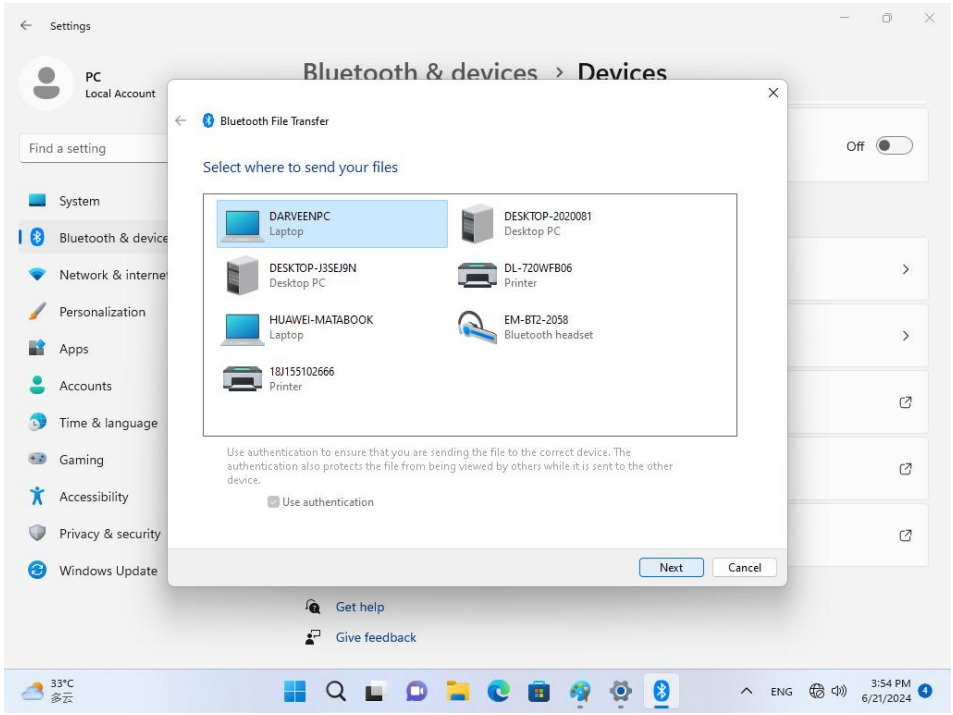




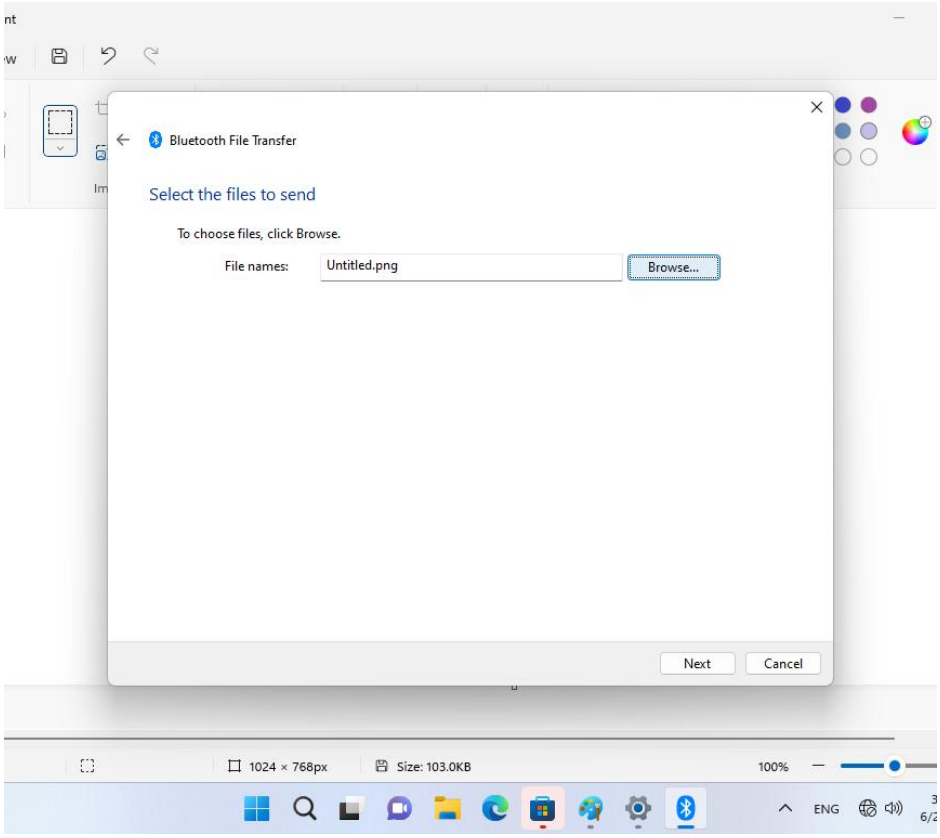
5. Send files. Before sending the file of VT-876 to other devices, please click "**Send File**" .

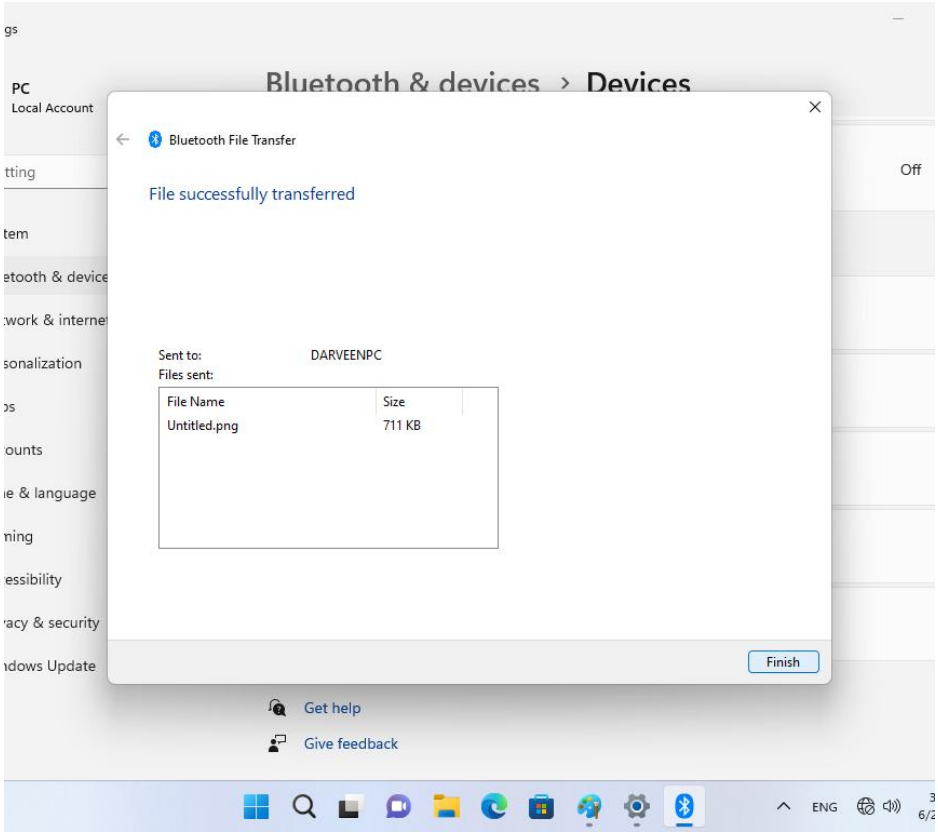


6.Select the device you want to send to and click "**Next**".



7. Click "**Browse**" and select the file to be sent, and wait for the file to be sent.





3.4 4G/5G

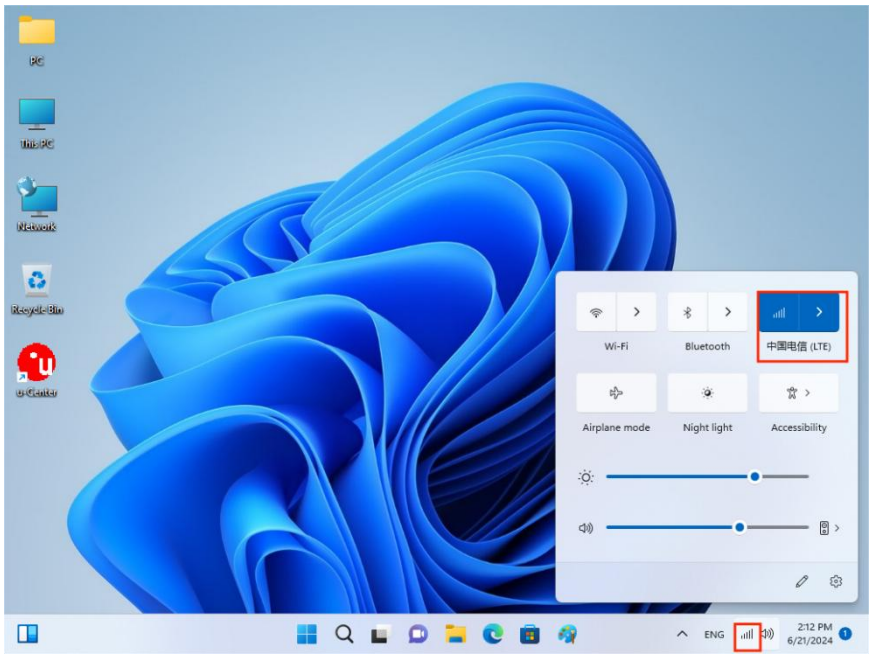
3.4.1 Installation of SIM Card

1.Insert the SIM card into the VT-876. The SIM card slot is push-pull. The SIM card slot position is as follows.

SIM Slot

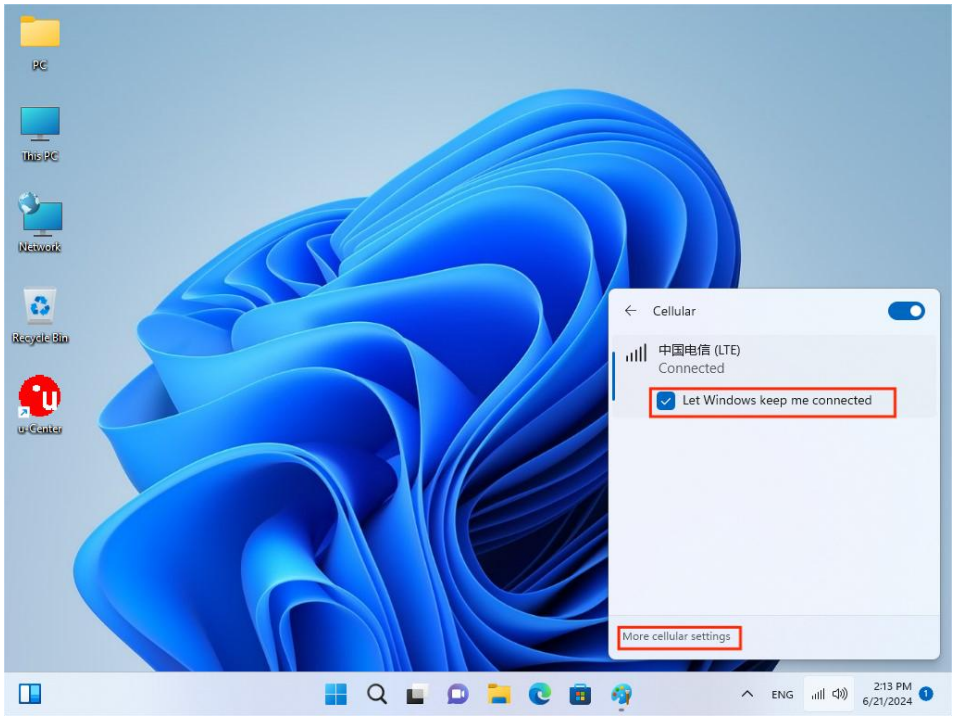
Note: Please ensure that the machine is completely powered off before inserting and removing the SIM card.

2. Click the network icon in the lower right corner of the desktop, and left click the mobile network icon to enable the mobile network connection function.

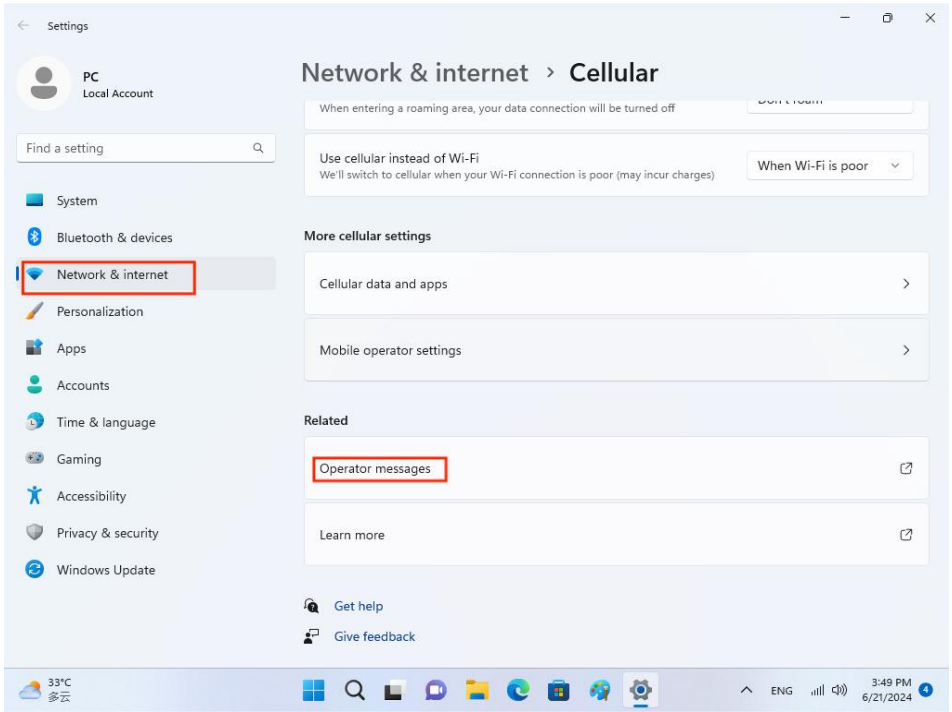


3.4.2 4G/5G setting

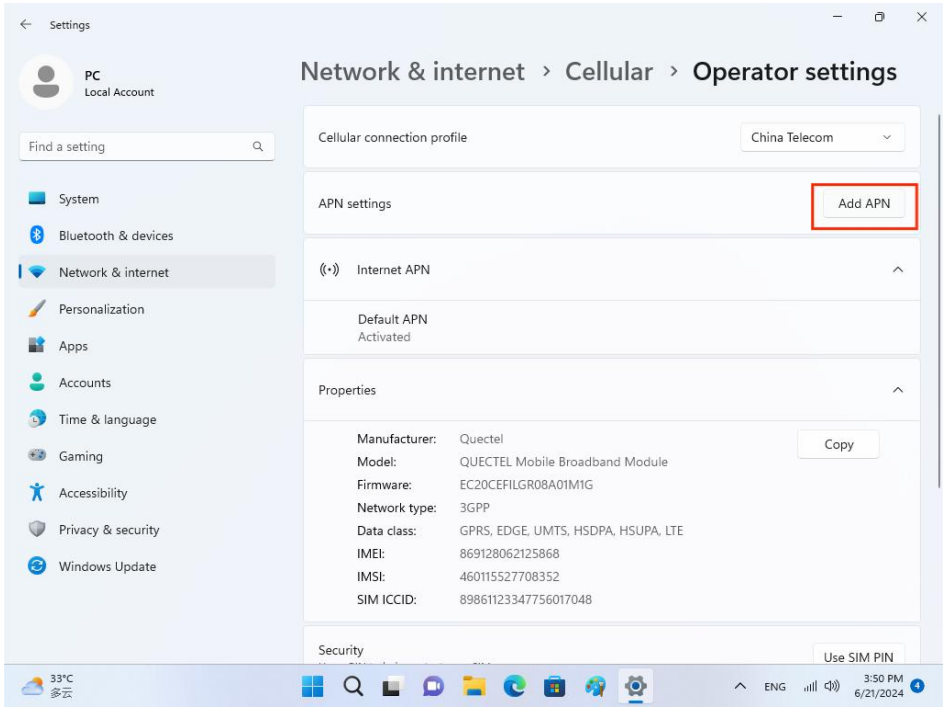
1.If the network connection is normal after the SIM card is installed, select “**Allow Windows to keep me connected**” to complete the connection.

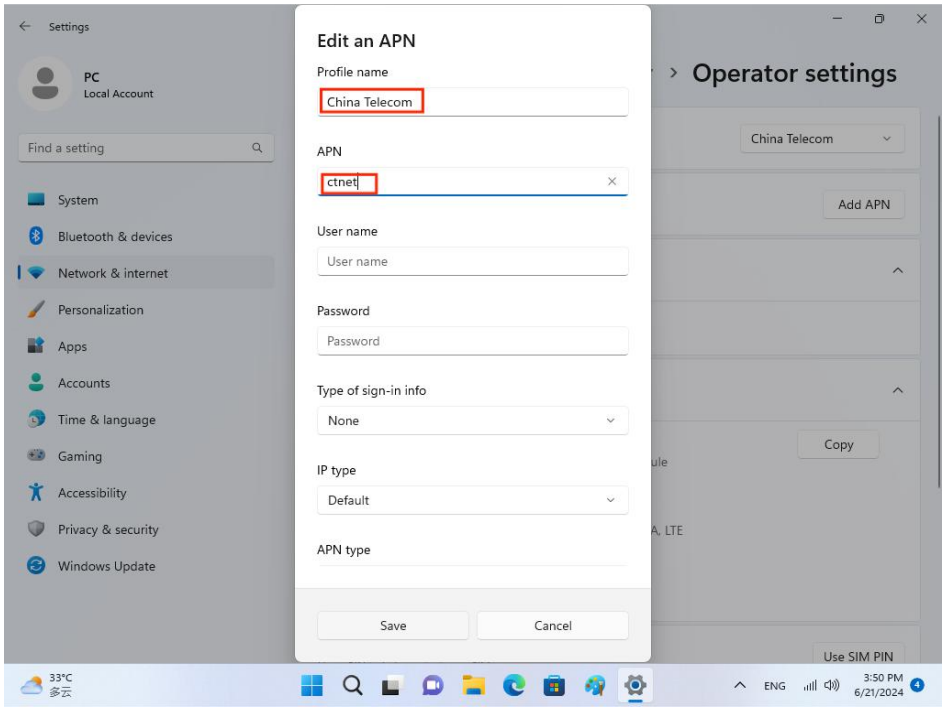


2.If the connection is not successful, click "**More operator settings**" in the figure below to enter the "**Network &Internet**" .

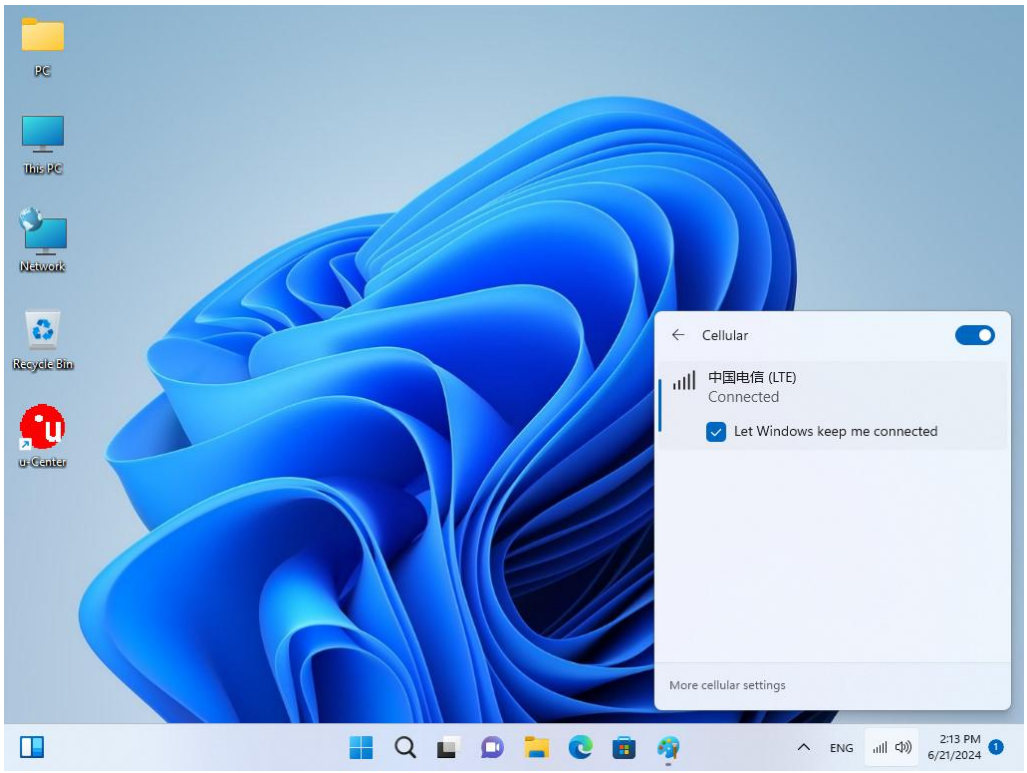


3.Select "**Add APN**", enter the APN corresponding to the SIM card of each operator in the interface of editing access point, and save the APN of each operator is different. The APN of China Mobile is generally "**cmnet**", China Unicom is "**3gnet**", and China Telecom is "**ctnet**". After the APN is set, the power off and restart, You can connect to your mobile network and surf the Internet normally.





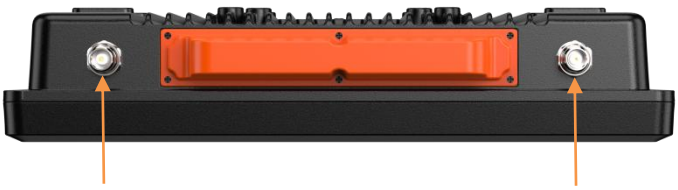
4. If the connection is successful, the following information is displayed.



3.5 GPS

3.5.1 Guidelines for the Use of GPS

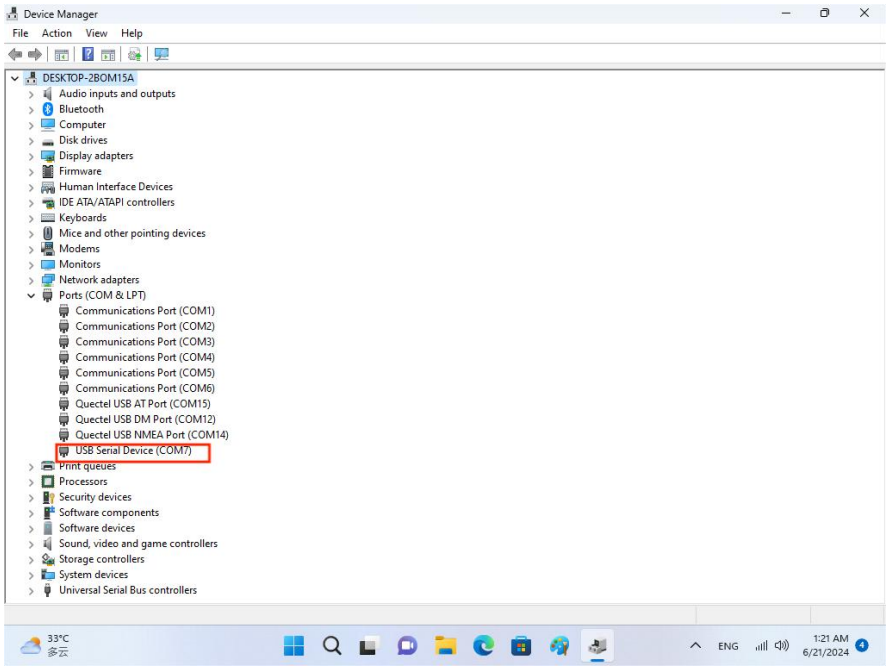
1.Install GPS antenna on TNC antenna interface (**marked GPS**) of VT-876. You can buy antennas with better signals. Install those on the TNC antenna interface.



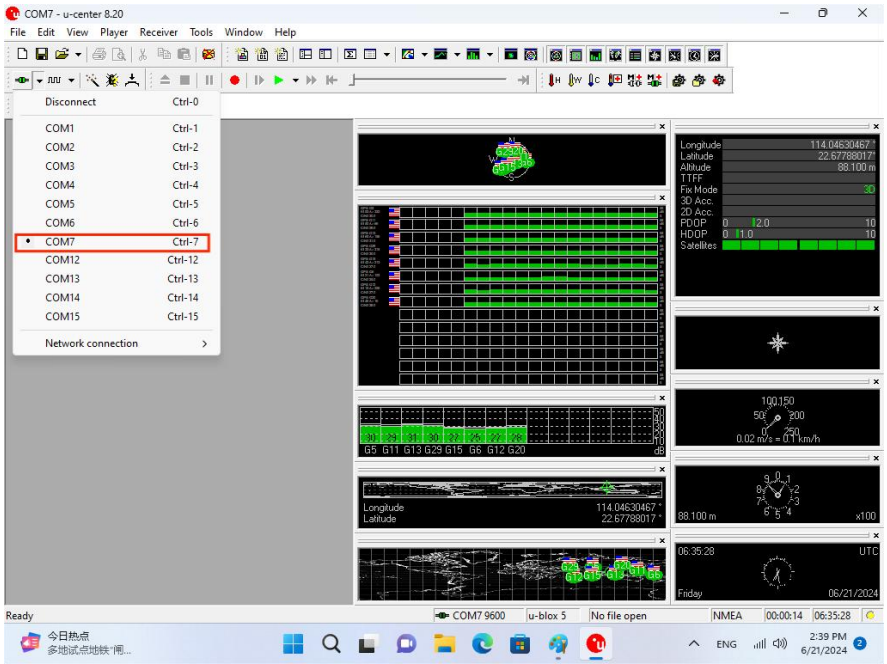
Antenna Interface Antenna Interface

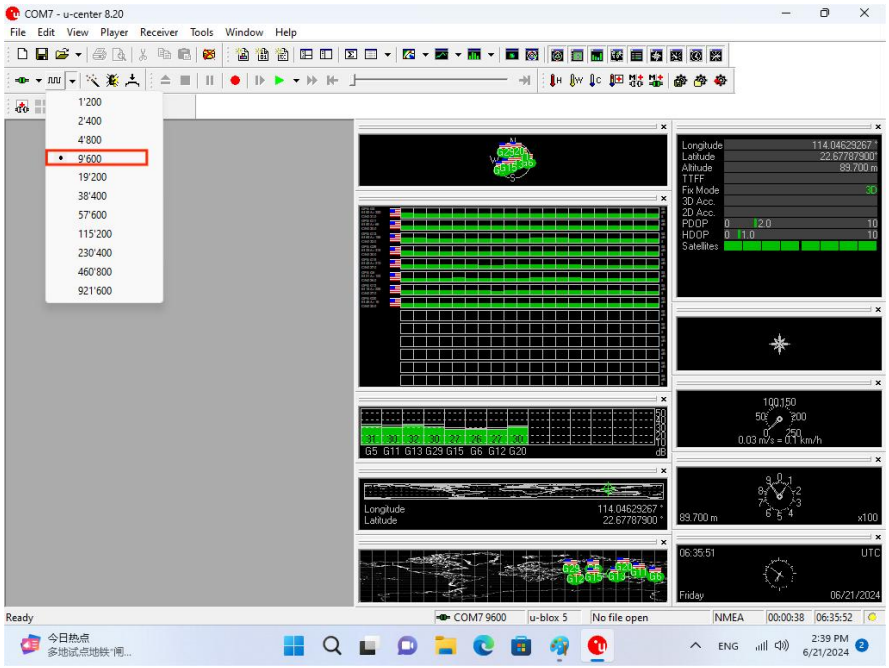
3.5.2 GPS Connection

1.You can get GPS information by this serial port.Select the COM, which you can view the virtual COM number of the GPS module in the “**Device Manager**”.

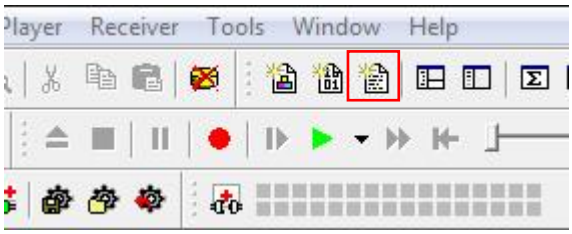


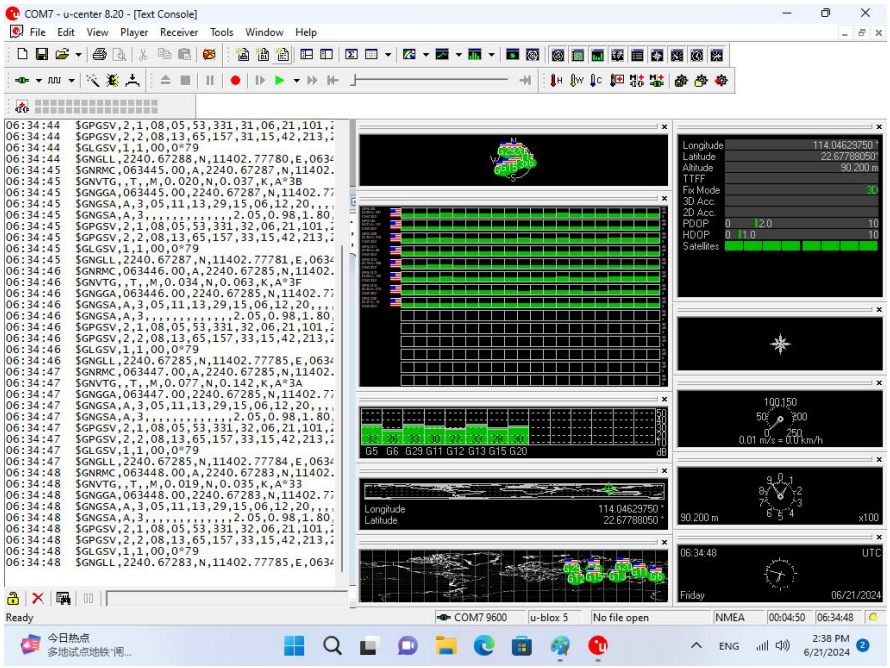
2.The GPS module receives the signal and transmits it to the windows systerm by COM port. The baud rate is **9600bps**.





3.If the device is working correctly, the display will show information about the satellite constellation, signal to noise ratio, time.





Chapter4. Accessories and Power connection

4.1 Check the package

Open the package and check all the parts are inside without shortage and damage.

A. VT-876 (Main Unit)

Standard package is including a VT-876 main unit and a power cable.

1	**Main unit**	VT-876	
2	**Power cable**	PC-03M-20-ACC	

B. Accessories (Optional)

According to the use of different environment, you can choose some different parts, the list is as below:

1	**Power Adapter**	**PWR220A12-M12** * AC-DC Adapter * 100~240V AC Input, 12V/5A DC Output	
2		**PWR836D512-M12** * DC-DC Adapter * 8~36V DC Input, 12V/3A and 5V/2A Output	
3		**PWR1872D512-M12** * DC-DC Adapter * 18~72V DC Input, 12V/3A and 5V/2A Output	
4	**Mounting Kits**	**RAM-MOUNT-02** * Universal Adjustable * Marine Grade Aluminum * VESA Standard (75x75mm and 100x100mm)	
5		**DV-MOUNT-1002** * Forklift Roof Mounting Kits * Universal Adjustable * Marine Grade Aluminum * VESA Standard (75x75mm and 100x100mm)	

6		**DV-MOUNT-2002** * Forklift U-shaped Mounting Kits * Universal Adjustable * Marine Grade Aluminum * VESA Standard (75x75mm and 100x100mm)	
7		**DV-MOUNT-60** * Lifting Mounting Kits * Stainless Steel Material * Lifting Height Adjustable Range 50~100cm * VESA Standard Holes(75x75mm & 100x100mm)	
8	**Power cable**	**PC-03M-20-ACC**	
9		**PC-23MM-20**	
10		**PC-23MM-20-ACC**	
11	**Antenna**	***Rubber Duck Antenna*** **ANT-R3S** SMA(Female), 3dB, Universal	
12		***Rubber Duck Antenna*** **ANT-R3T** TNC(Female), 3dB, Universal	
13		***Rubber Duck Antenna*** **ANT-R4T** TNC(Female), 2~4dB, Cisco	

14		***Magnetic Mount Antenna*** **ANT-S7S** SMA(Female), 7dB, 5meters long	
15		***Magnetic Mount Antenna*** **ANT-S7T** TNC(Female), 7dB, 5meters long	
16		***Fiberglass Antenna*** **ANT-G5N** N(Female), 5dB, 0.3meters long	
17		***GPS Antenna*** **ANT-GPSS** SMA(Female), 3meters cable, GPS	
18		***GPS Antenna*** **ANT-GPST** TNC(Female), 3meters cable, GPS	
19		***GPS Antenna*** **ANT-GNSSS** SMA(Female), 3meters cable, GPS&GNSS	
20		***GPS Antenna*** **ANT-GNSST** TNC(Female), 3meters cable, GPS&GNSS	
21	**Industrial Keyboard**	**DKB-70** * 70 Keys QWERTY Full-function Keyboard * LED Backlight, Independent Swich Control * F1-F20 Function Keys, 0-9 Numeric and A-Z Alpha Keys * IP66 Waterproof * Support Windows and Andriod Operating System	

22		***Keyboard Mounting Bracket*** **BK-VT1**	

4.2 Power Connection

4.2.1 Power Options

Before using the VT-876, choose different power adapters for different vehicle power.

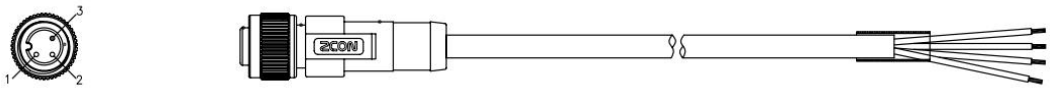
Power Options including:

- 12 VDC Vehicles (8-36VDC Direct Connection) – Direct connection to vehicle power.
- 24 VDC Vehicles (8-36VDC Direct Connection) – Direct connection to vehicle power.
- 48 VDC Vehicles – Requires the use of a DC-DC power supply.
- 80 VDC Vehicles – Requires the use of a DC-DC power supply.
- External AC/DC Power Supply – For use when DC power supply is not available to power the VT-876, such as in an office environment.

4.2.2 Power Cable Identification

PC-03M-20-ACC

Power cable with straight connector and 4 wires, 2 meters long:

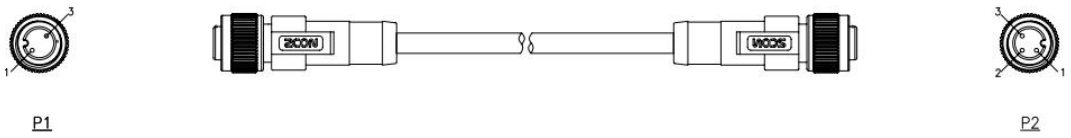


M12 Connector	Wire Color	Connection
P1	Red	DC+ (8-36 VDC)
P2	Yellow Green	Ignition Input (Optional)
P3	Black	DC-
Case	Black	Ground

Note: PC-03M-20-ACC cable is use for direct connection from vehicle power to VT-876 or DC-DC power input.

PC-23MM-20

Power cable with straight connector, 2 meters long:

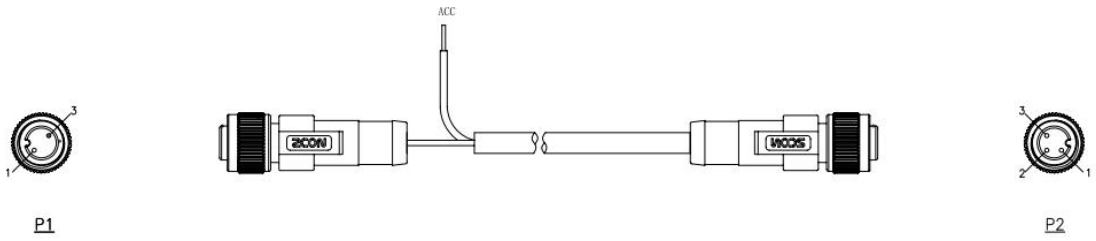


M12 Connector(P1)	M12 Connector(P2)	Connection
P1	P1	DC+ (8-36 VDC)
(NC)	P2	Ignition Input (Optional)
P3	P3	DC-
Case	Case	Ground

Note: PC-23MM-20 cable is use for connection from VT-876 to DC-DC power output, just without power ignition function.

PC-23MM-20-ACC

Power cable with straight connector and 1 wire, 2 meters long:



M12 Connector(P1)	M12 Connector(P2)	Connection
P1	P1	DC+ (8-36V DC)
(Yellow)	P2	Ignition Input (Optional)
P3	P3	DC-
Case	Case	Ground

Note: PC-23MM-20 cable is use for connection from VT-876 to DC-DC power output, also with power ignition function.

4.2.3 External Power Adapter Options

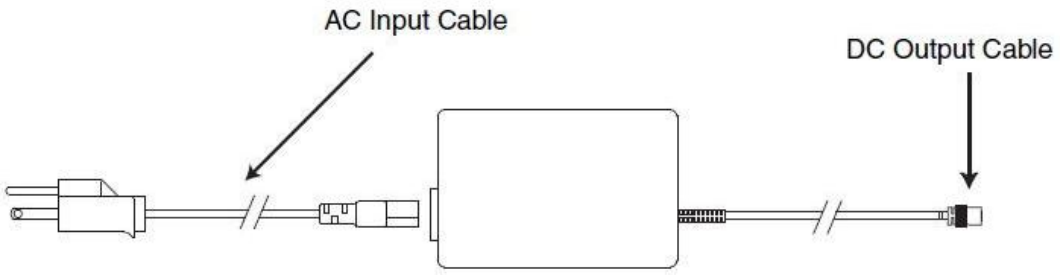
1. External AC-DC Power Supply

PWR220A12-M12

The optional external AC/DC power supply is for use in environments, such as an office, where DC power is not available.

PWR220A12-M12 is support 100V-240V ac input, provide 12V DC and 5A power output, the power connector is an M12 male type which can meet IP66 dust and water proof.

Note: The Darveen-approved AC/DC Power Supply and Adapter Cable are only intended for use in a 25ºC (77ºF) maximum ambient temperature environment.



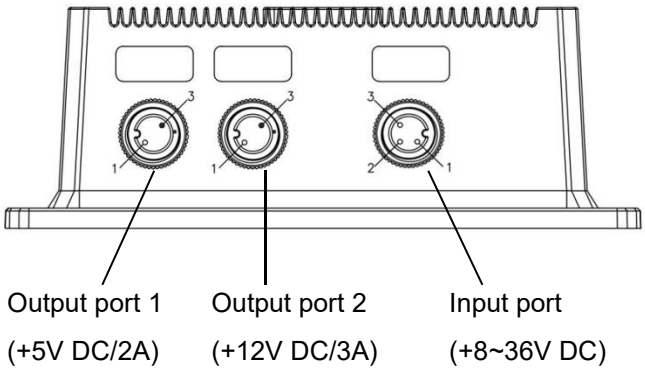
Connect External AC/DC Power Supply

1. Connect the provided detachable cord set (all others must order cable separately) to the external power supply.
2. Plug cord set into appropriate, grounded, electrical supply receptacle (AC mains).
3. Connect the watertight connector end of the Adapter Cable to the VT-876 Power Connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
4. Press the Power Button on the front of the VT-876 to turn on the VT-876.

2. External DC-DC Power Supply

PWR836D512-M12

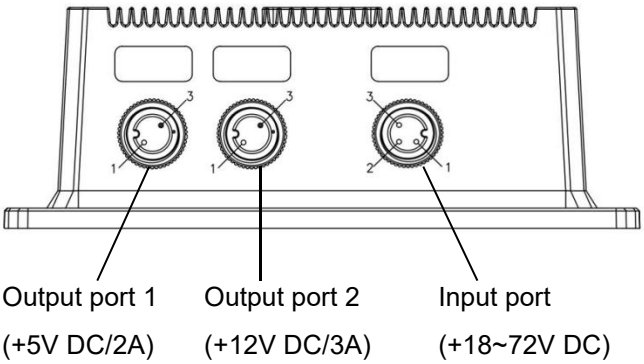
PWR836D512-M12 is an optional external DC/DC power supply, that is for use in vehicles provided 12V DC or 24V DC power. The power input and output connectors are M12 male type which can meet IP66 dust and water proof.



Input Port		Output Port 1		Output Port 2	
Pin	Signal	Pin	Signal	Pin	Signal
1	DC In+ (8-36 VDC)	1	DC Out+ (+5V/2A)	1	DC Out+ (+12V/3A)
2	NC	3	DC Out-	3	DC Out-
3	DC In-				

PWR1872D512-M12

PWR1872D512-M12 is an optional external DC/DC power supply, that is electronic isolation for use in the vehicles provided 48V DC power. The power input and output connectors are M12 male type which can meet IP66 dust and water proof.



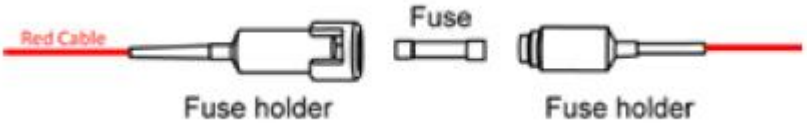
Input Port		Output Port 1		Output Port 2	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	DC In+ (18-72 VDC)	1	DC Out+ (+5V/2A)	1	DC Out+ (+12V/3A)
2	NC	3	DC Out-	3	DC Out-
3	DC In-				

4.2.4 12-24 VDC Vehicles (8-36VDC Direct Connection)

Fuse Requirements:

WARNING *- For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.*

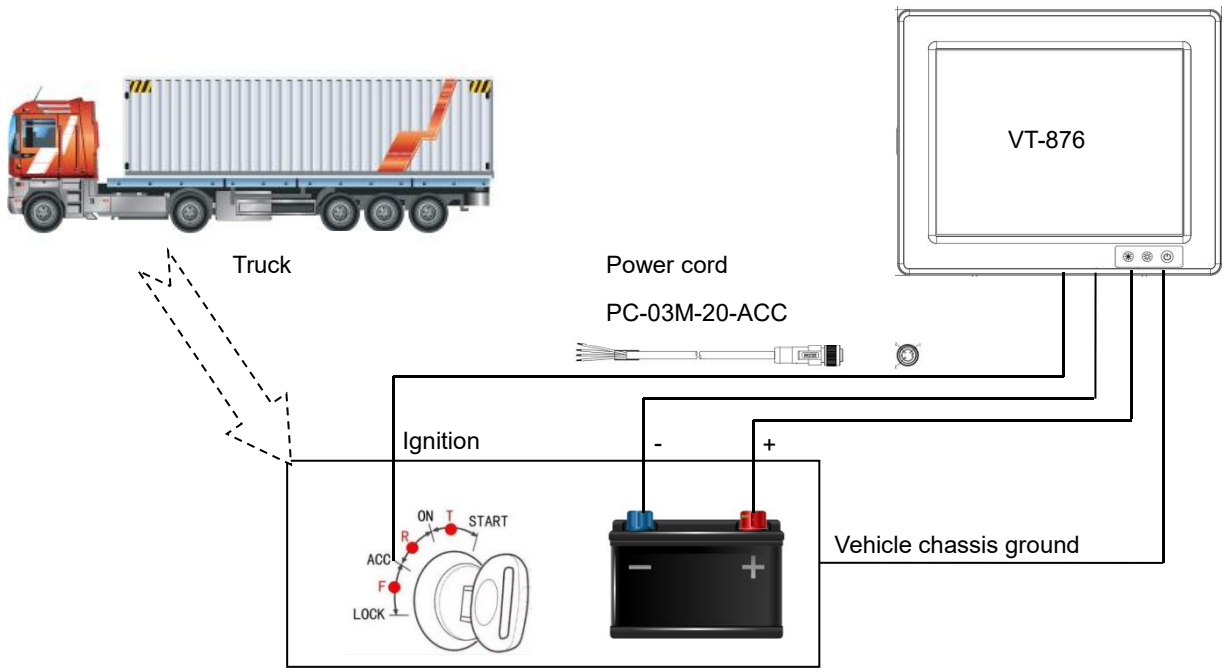
- For **12V DC** input, use a 10A slow blow fuse that has a DC voltage rating greater than 12VDC.
- For **24V DC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 24VDC.



1. Connected vehicle directly.

(1) Use the ignition ON/OFF function.

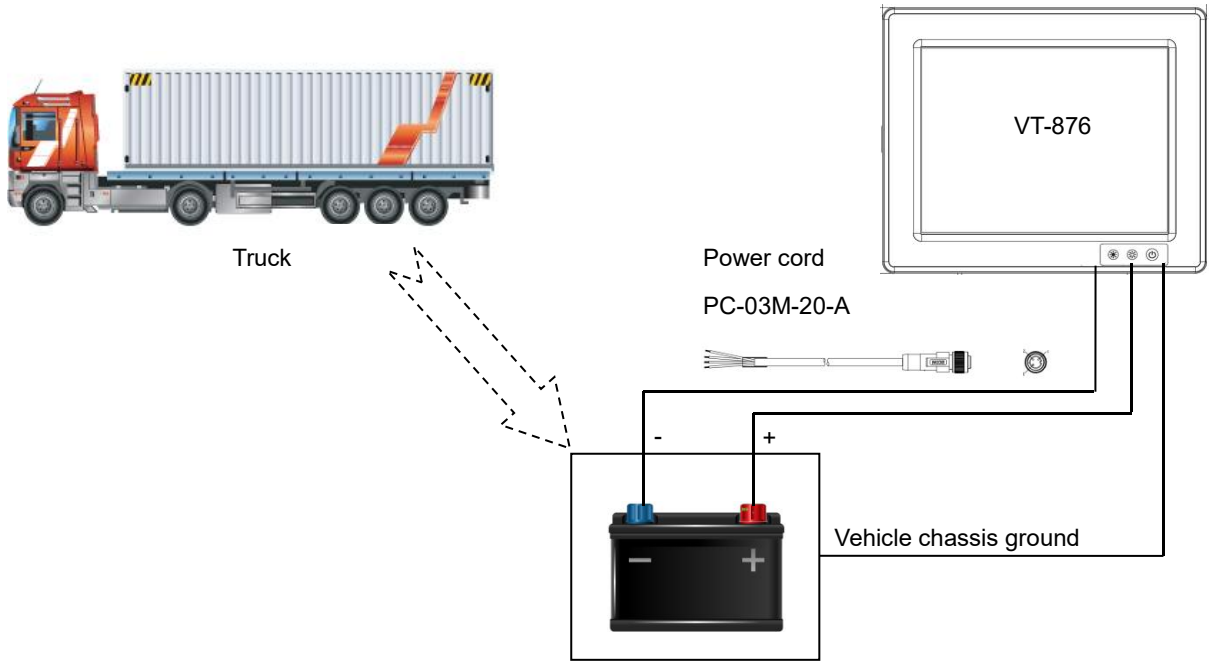
Connect the watertight connector end of the power cable to the VT-876 power connector by aligning the connector pins to the power connector, push down on the watertight connector and twist it to fasten securely.



(2) Without the ignition ON/OFF function.

a. Cut off the yellow wire (Ignition wire) on the power cord (PN: PC-03M-20-ACC);

b. Connect the watertight connector end of the power cable to the VT-876 power connector by aligning the connector pins to the power connector, push down on the watertight connector and twist it to fasten securely.

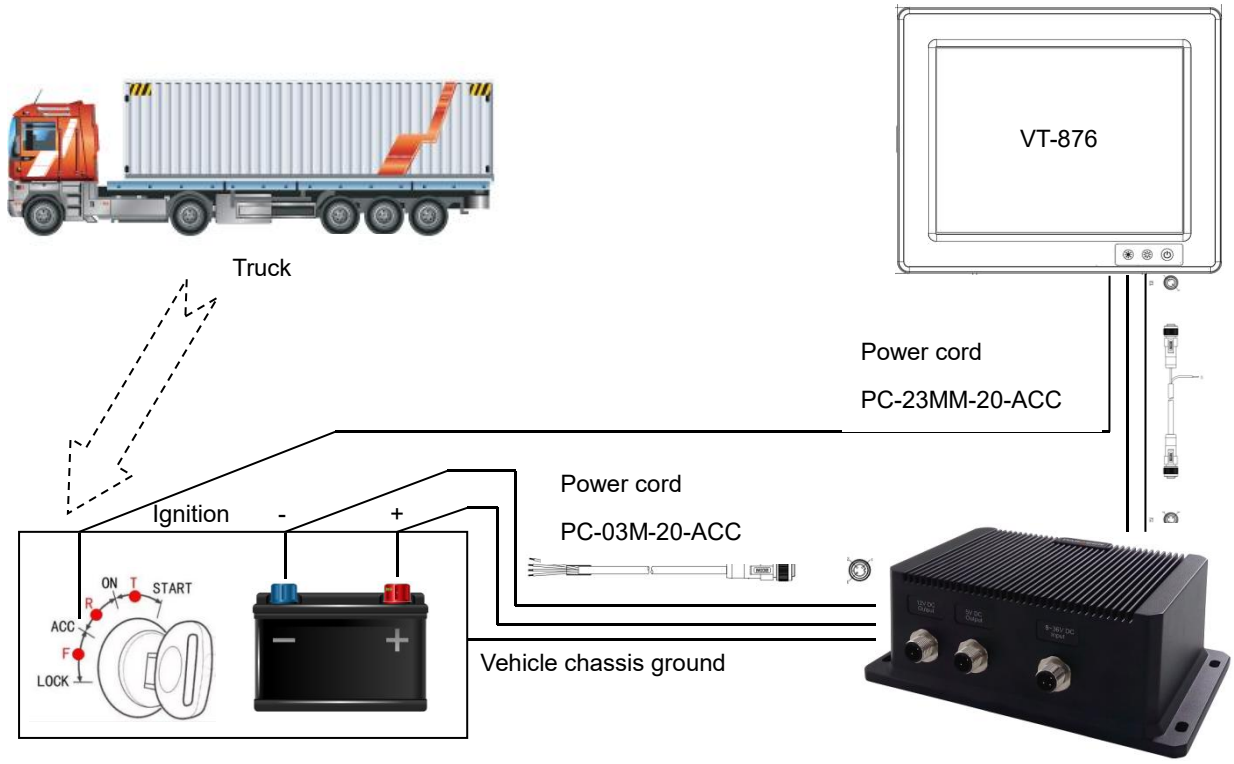


2. Connected vehicle via DC-DC power adapter.

(1) Use the ignition ON/OFF function.

a. Connect the watertight connector end of the power cable (PC-03M-20-ACC) to the PWR836D512-M12 power connector by aligning the connector pins to the power connector, push down on the watertight connector and twist it to fasten securely.

b. Connect the watertight connector end of the power cable (PC-23MM-20-ACC) to VT-876 and PWR836D512-M12, then connect the yellow wire (ignition wire) to the vehicle ignition signal pin.

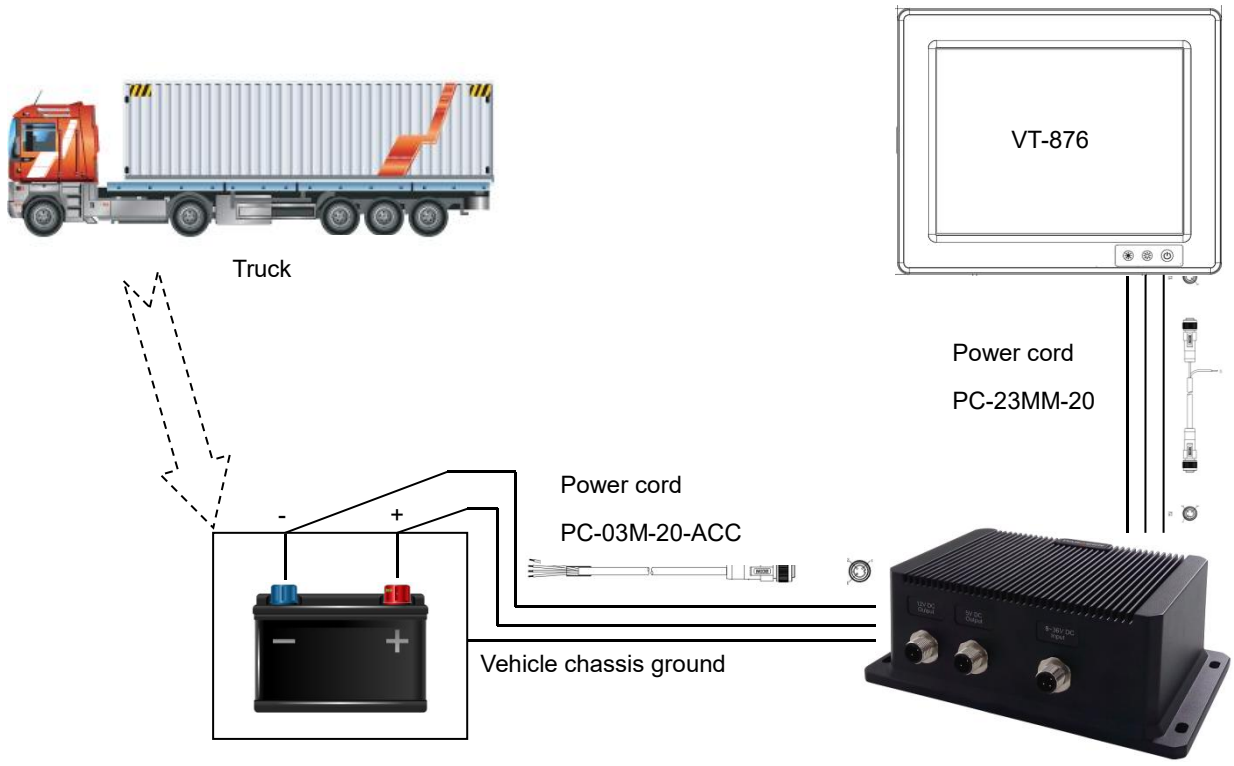


(2) Without the ignition ON/OFF function.

a. Cut off the yellow wire (Ignition wire) on the power cord (PN: PC-03M-20-ACC);

b. Connect the watertight connector end of the power cable (PC-03M-20-ACC) to the PWR836D512-M12 power connector by aligning the connector pins to the power connector, push down on the watertight connector and twist it to fasten securely.

c. Connect the watertight connector end of the power cable (PC-23MM-20) to VT-876 and PWR836D512-M12.

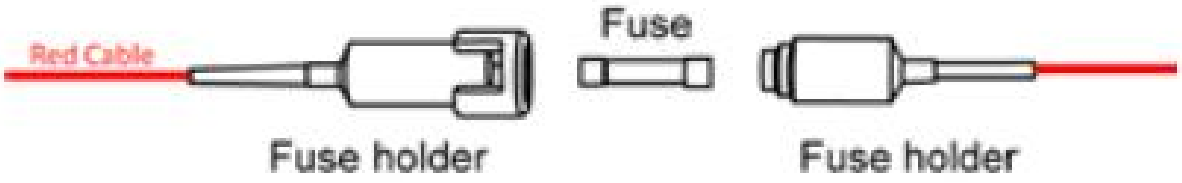


4.2.5 48 VDC Vehicles (Connected via DC/DC power)

Fuse Requirements:

WARNING *- For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.*

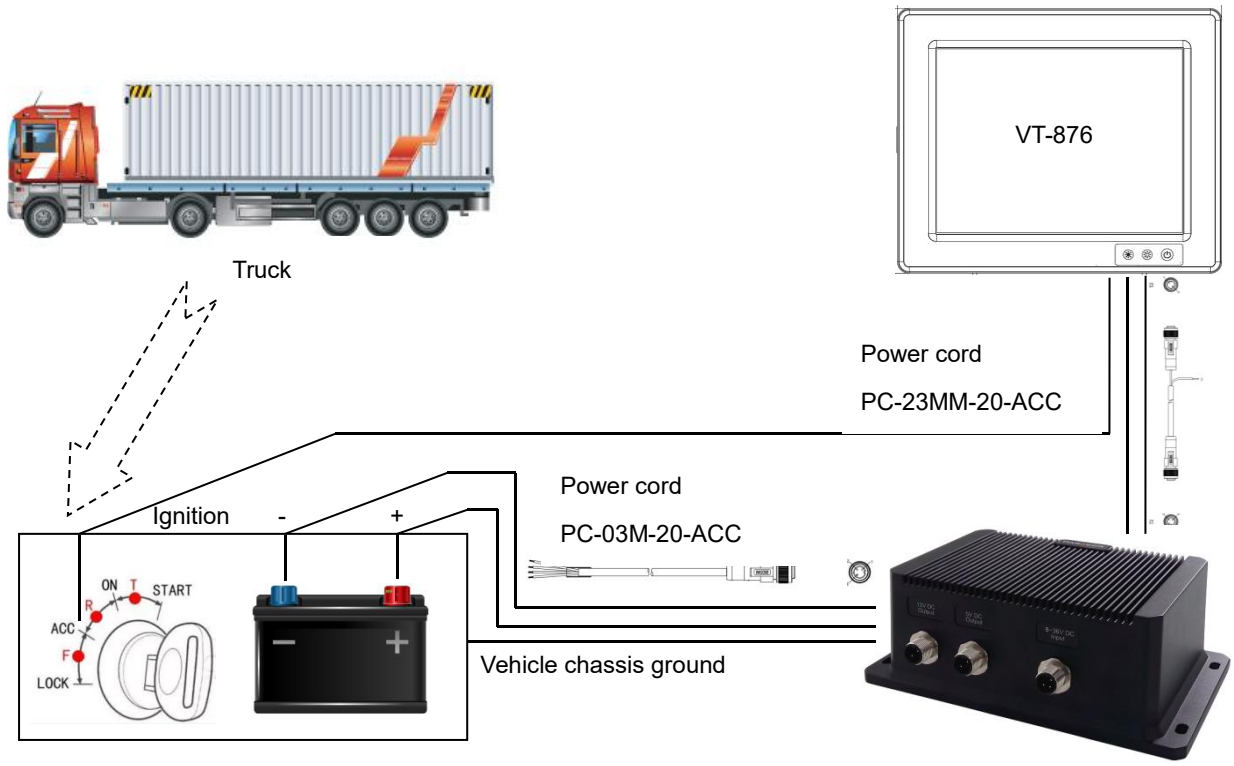
- For **48VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 48VDC.



(1) Use the ignition ON/OFF function.

c. Connect the watertight connector end of the power cable (PC-03M-20-ACC) to the PWR1872D512-M12 power connector by aligning the connector pins to the power connector, push down on the watertight connector and twist it to fasten securely.

d. Connect the watertight connector end of the power cable (PC-23MM-20-ACC) to VT-876 and PWR1872D512-M12, then connect the yellow wire (ignition wire) to the vehicle ignition signal pin.

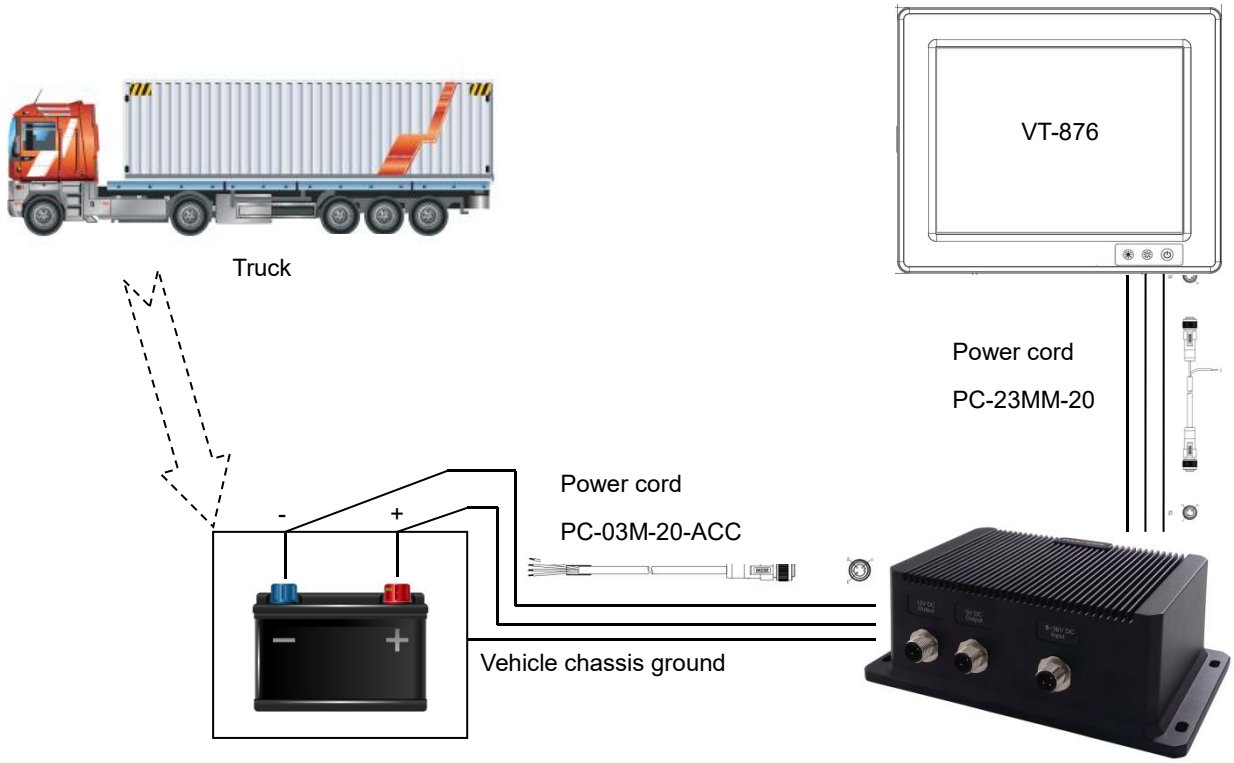


(2) Without the ignition ON/OFF function.

d. Cut off the yellow wire (Ignition wire) on the power cord (PN: PC-03M-20-ACC);

e. Connect the watertight connector end of the power cable (PC-03M-20-ACC) to the PWR1872D512-M12 power connector by aligning the connector pins to the power connector, push down on the watertight connector and twist it to fasten securely.

f. Connect the watertight connector end of the power cable (PC-23MM-20) to VT-876 and PWR1872D512-M12.



Chapter5. Installation and FAQ

5.1 Installation

VT-876 is mainly used in the warehousing forklift, logistics, container trucks and so on. In order to adapt to its operating environment, there are a variety of mounting methods, including boom mounting, VESA mounting, wall mounting, etc.

5.2 FAQ

Q1:Does the on-board terminal support ACC ignition signal delay switch?

A:VT-876 car terminal optional ACC ignition signal intelligent switch machine functions. Under the function of the ACC mode, when the on-board computer off, if the detected signal when the ACC will automatic startup latency for 10 seconds, and car terminal in the boot state, if detected the ACC will delay 10/30/120 seconds after the automatic shutdown, without artificial operation in the process of the on-board computer;When ACC is selected, the power interface of the on-board terminal will be changed to 3Pin, positive pole, negative pole, ACC detection pole. Generally, positive and negative pole are connected to vehicle batteries, and ACC detection pole is connected to ignition signal.

Q2:Why is it necessary to add a DC-DC power adapter for the installation of forklifts, trailers, front cranes and stacker?

A:The car always has a peak value at startup. In order to avoid burning out the equipment power board, the power adapter of DC-DC is needed to stabilize the voltage. The current equipment installed power board supports the voltage of 8-36V

Description:

For these battery models, there are three voltage output specifications, as follows:

1, trailer battery output voltage: 12V

2. Battery output voltage of front lifting and stacking machine: 24V

3. Forklift battery output voltage: 48V

Q3:What advantages does TNC have over SMA antenna interface?

A：TNC interface and feeder connection stability is better, not easy to loose and damage, TNC joint damage rate is low.

TNC interface SMA interface

Q4:How to ensure the normal use of the VT-876 under the impact of high strength vibration?

A:1.VT-876 shell is made of strong aluminum alloy.

2.The VT-876's built-in electronic modules offer excellent shock resistance, such as a gauge LCD screen and a shock-resistant solid-state drive (SSD), enabling the VT-876 to withstand harsh vibration.

5.3 Warranty and after service

Should this VT be malfunctioned, please contact your original retailer providing information about the product name, the serial number, and the details about the problem.

Darveen Co., Ltd.
Email: sales@darveen.com
www.darveen.com