T10 Vehicle Mount Computer Manual

Version History

Version	Time	Author	Remark
V0.1	2022-3-5	DW	Create
V0.2-V0.6	2022-5-25	DW	Updates
V0.7	2022-06-10	DW	Add 23PIN,14PIN definition

Content

1. Product introduction

1.1 Brief introduction

T10 vehicle mount computer is a sturdy and durable in-vehicle computer, which is suitable for various vehicles to work in complex and harsh environments. It is suitable for commercial vehicles such as agricultural tractors, excavators, loading and transport trucks, engineering tower cranes, self-driving mining trucks, large trucks, buses, and taxi-hailing vehicles. It supports car-grade 64-bit processor, ANDROID operating system, and has an IP65 waterproof and dust proof rating. At the same time, support the optional built-in centi-meter-level positioning module, the T10 can meet the automatic or semi-automatic driving needs of agricultural, engineering and mining vehicles.

Highlights:

1) Car chip 64-bit processor, 4-core Cortex A53@1.5GHZ, passed AEC-Q100 test

2) Support ANDROID 10 or LINUX+QT5 system

3) Support RTK high-precision centi-meter-level positioning function

4) Max to support 4-channel 720P cameras can be previewed at the same time

5) Max to support 2 CAN networks, and the CAN rate can support 500kbps/250kbps

6) Support Ethernet function and external handheld public network intercom function to

meet the needs of fleet networking operations

7) Support 9-36V power input, support ISO7637 vehicle power supply standard,

8) IP65 protection grade to meet the needs of complex and harsh working environment

1.2 Product ID

47.5mm

275.0mm

(USBC
&USBA)

190.0mm

SCREEN

MIC

PowerButton   Screws   Label

heat-dissipating
metal

SIM&
TFCard

SIM | TF

Speaker

23PIN   TNC

14PIN   TNC   SMA

*(*The default connector on the back is 14PIN+23PIN+2*TNC+1*SMA, it can be customized)*

1.3 Port Definition

The PIN definition on the back interface of T10 series, different customers have different

needs. At present, there are mainly four PIN definition combinations of

T10/T10A/T10B/T10C. The following table shows T10, T10A type, T10B type and T10C type.

The internal sequence of 14-PIN, 23-PIN of T10 series is as follows:

14-PIN CONNECTOR   23-PIN CONNECTOR

PIN No	T10 (default) (4*CAMERA+2*CAN+2*RS232+1*100M Ethernet)	T10A (2*CAMERA+1*CAN+1*RS485+1*100M Ethernet +Hand microphone intercom)	T10B (1*CAN+3*RS232)	T10C (4*CAMERA+2*CAN+2*RS232+1*USB)
23PIN function description				
1	CAN1_H_IO	CAN1_H_IO	NA	CAN1_H_IO
2	CAN1_L_IO	CAN1_L_IO	NA	CAN1_L_IO
3	CAN2_H_IO	NA	NA	CAN2_H_IO
4	CAN2_L_IO	NA	NA	CAN2_L_IO
5	B- (Vehicle power input negative)	B- (Vehicle power input negative)	NA	B- (Vehicle power input negative)
6	B- (Vehicle power input negative)	B- (Vehicle power input negative)	NA	B- (Vehicle power input negativ)
7	B+ (Vehicle power input positive)	B+ (Vehicle power input positive)	NA	B+ (Vehicle power input positive)
8	B+ (Vehicle power input positive)	B+ (Vehicle power input positive)	NA	B+ (Vehicle power input positive)
9	AHD1	AHD1	NA	AHD1
10	AHD2	AHD2	NA	AHD2
11	AHD3	NA	NA	AHD3
12	AHD4	NA	NA	AHD4
13	Camera_12V_OUT1	Camera_12V_OUT1	NA	Camera_12V_OUT1

14	Camera_12V_OUT2	Camera_12V_OUT2	NA	Camera_12V_OUT2
15	RS232-TX3	IO_INPUT1	NA	RS232-TX3
16	RS232-RX3	NA	NA	RS232-RX3
17	RS232-RX4	485A_IO	NA	RS232-RX4
18	RS232-TX4	485B_IO	NA	RS232-TX4
19	RJ45_TX+	RJ45_TX+	NA	USB3_DM
20	RJ45_TX-	RJ45_TX-	NA	USB3_DP
21	RJ45_RX+	RJ45_RX+	NA	VCC_5VOUT
22	RJ45_RX-	RJ45_RX-	NA	GND
23	ACC_IN	ACC_IN	NA	ACC_IN
14PIN function description				
1	KB_CAN_H	NA	KB_CAN_H	NA
2	KB_RS232_RX3	NA	KB_RS232_RX3	NA
3	KB_RS232_TX3	NA	KB_RS232_TX3	NA
4	KB_RS232_TX4	NA	KB_RS232_TX4	NA
5	KB_RS232_RX4	NA	KB_RS232_RX4	NA
6	KB_CAN_L	NA	KB_CAN_L	NA
7	GND	NA	GND	NA
8	GND	NA	GND	NA
9	KB_RS232_TX2	NA	KB_RS232_TX2	NA
10	+12V-IN	NA	+12V-IN	NA
11	+12V-IN	NA	+12V-IN	NA
12	KB_VCC_5VOUT	NA	KB_VCC_5VOUT	NA
13	5V-GPIO-OUT1_KB	NA	5V-GPIO-OUT1_KB	NA
14	KB_RS232_RX2		KB_RS232_RX2	NA
		T10A type customer has a M16 type 6PIN aviation interface to connect the hand microphone intercom function, and the location uses the location of the 14PIN connector		

1.4 Specification

Product surface	
IP rating	IP65
Screen and touch	Full lamination process, multi-touch 10.1", 1280*800, brightness>=500 CD/M2 IPS screen, The viewing angle is greater than 170 degrees

Size	275mm*190mm*47.5mm
System	
CPU	Car chip 64-bit processor, 4-core Cortex A53@1.5GHZ
Memory	2GB (*optional 4GB)
Storage	16GB (*optional 256GB)
Operation system	Android 10.0(* optional LINUX+QT)
Wireless communication	
WIFI	2.4G WiFi, IEEE802.11 b/g/n
BT	BT4.0 BLE
GNSS	GPS+BD module (* optional)
4G LTE	Module: Quectel EC200U CAT1 (for European countries) LTE-FDD: B1/B3/B5/B7/B8/B20/B28 LTE-TDD: B38/B40/B41 GSM: B2/B3/B5/B8
High precision positioning	(*optional support RTK module UM482 or UB482)
Port	
Port	Power button *1 USBC port * 1 (for software debugging) USB Host A port *1 TF Card *1 Nano SIMCard *1 TNC antenna port *2 (For external high-precision GNSS positioning antenna) SMA antenna port*1 (For external LTE communication antenna) 14PIN connector*1 (*Function extension interface) 23PIN connector*1 (*Function extension interface)
*Function extension interface (14PIN+23PIN)	Various function combinations are available(Using 14PIN+23PIN to meet the function requirement) Default function: 4*CAMERA+2*CAN+2*RS232+1*100M Ethernet Combo 1 function: 2*CAMERA+1*CAN+1*RS485+1*100M Ethernet +Hand microphone intercom Combo 2 function: 1*CAN+3*RS232 Combo 3 function: 4*CAMERA+2*CAN+2*RS232+1*USB
Environment specification	
Environment specification	Power : ISO7637 Vibration standard（working）: MIL-STD-810 Impact standard（working）: ISO16750 Humidity 95%, non-condensing Working temperature: -20°C ~ +70°C

2. Installation Instructions

T10 by default is installed with RAM MOUNT bracket. There are RAM bracket holes on the back, the installation diagram is as follows

2.1 Bracket type RAM MOUNT installation
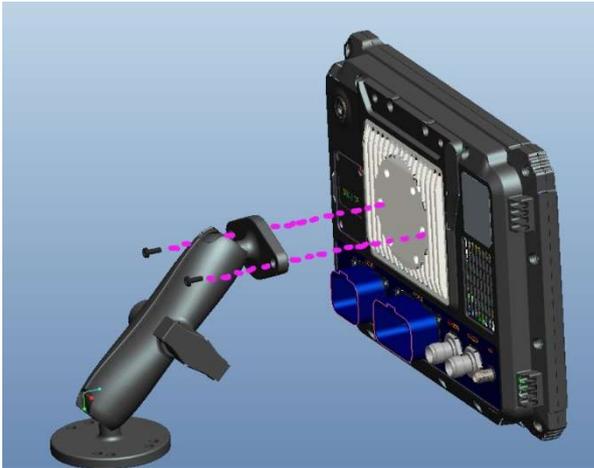
2.2 LOCK TYPE RAM MOUNT INSTALLATION
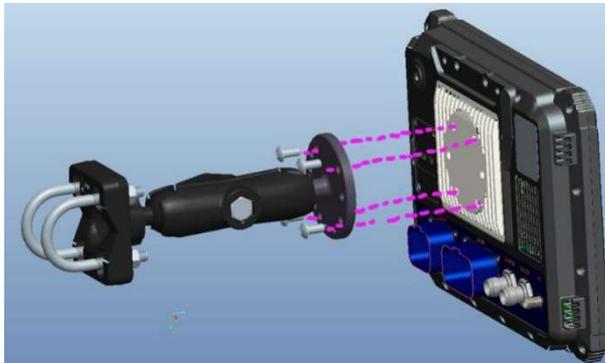
3. Software related instructions

3.1 Switch on and off the machine

The ACC_IN signal of the 23rd PIN of the 23PIN connector of the T10 is connected to the vehicle ACC (Car Ignition signal) signal. When ACC is ON, the device automatically turns on. When ACC is OFF, T10 detects that ACC is OFF, pops up a detected message and then automatically shuts down

When the current T10 is powered by the 14PIN connector, there is no ACC signal in it. At this time, T10 uses the power button, long press 3S to switch the device on/off.

3.2 Description of forced reset

Forcibly press and hold the power button for 6 seconds to force reset the device.

3.3 Software upgrade instruction

1) Copy the upgrade zip package such as "T10A-XX.zip" to a U disk or TF card, and insert the U disk or TF card into the device.

2) Run the build in [icon] "Local upgrade" application, follow the screenshot below to complete the OS upgrade.
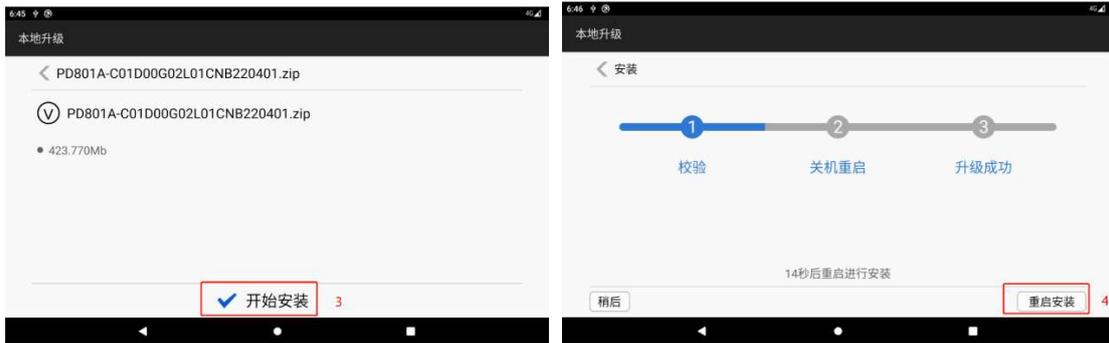
3.4 Software SDK introduction

The secondary development SDK software package of T10 can be used to develop

built-in CAN, UART, RS485, GPIO, MCU and other functions. We provide reference

source code examples as follows:
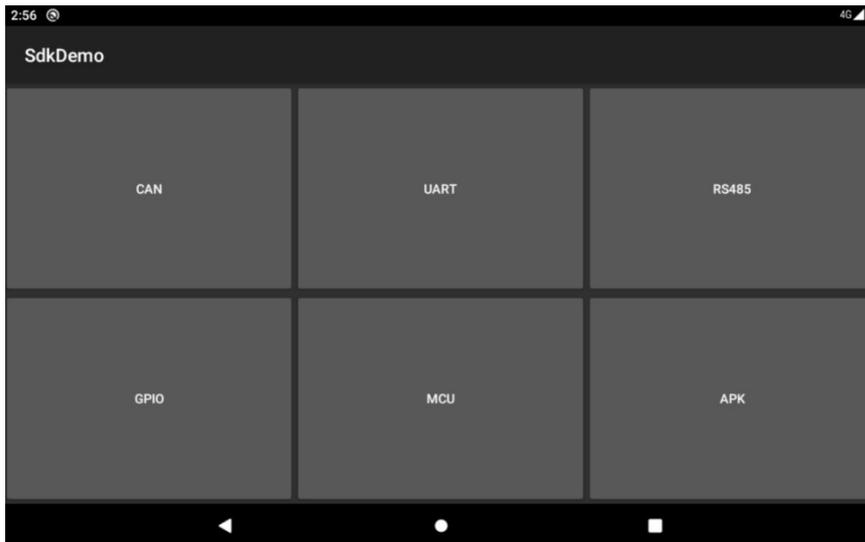
4. Reliability test

T10 part of the reliability test reference is as follows

Code	Testing item	Testing requirement	Judgement standard	Reference documentation
1. Accelerated aging test				
1.1	Thermal shock	(-20°C 30 minutes +70°C 30 minutes, 30 seconds switching time) : 24 times	All functions are normal, no mechanical damage, no surface paint cracks, no deformation of the rubber plug cover, etc.	GB / T 2423.22-2002 Environmental Testing of Electrical and Electronic Products Part 2: Test Methods Test N: Temperature Change
1.2	High temperature and high humidity	60℃, 90%~95%RH 48 hours	All functions are normal, no mechanical damage, no surface paint cracks, no deformation of the rubber plug cover, etc.	GB / T 2423.3-2006 Environmental testing of electrical and electronic products - Part 2: Test methods Test Cab: constant damp heat test
1.3	Drop test	1. 0.7m drop 2. Drop surface: front, left, right, top, bottom, any corner	All functions are normal, no mechanical damage. Minor dents, scratches or peeling paint are allowed.	GB / T 2423.8-1995 Environmental testing of electrical and electronic products - Part 2 Test methods - Test Ed free drop
2. Environmental testing				
2.1	High temperature storage	The T10 was put in 80°C for 48H.	Check after at least 2 hours of normal temperature recovery. The surface of the sample should be free of shrinkage, rupture, expansion, decomposition and other phenomena, and the function is normal.	GB / T 2423.2-2008 Environmental Testing of Electrical and Electronic Products Part 2: Test Methods Test B: High Temperature
2.2	Low temperature storage	T10 was kept at a temperature of -30°C for 48H.	Check after at least 2H recovery at room temperature. The surface of the sample should be free of shrinkage, rupture, expansion, decomposition and other phenomena, and the function is normal.	GB / T 2423.1-2008 Environmental testing of electrical and electronic products - Part 2: Test methods Test A: Low temperature
2.3	High temperature work	T10 was turned on and worked continuously for 24 hours at 70°C	The mechanical and electrical functions of the structure, switch machine, display, touch screen, Mic, etc. are normal.	GB/T 2423.2-2008 Environmental Testing of Electrical and Electronic Products Part 2: Test

				Methods Test B: High Temperature
2.4	Low temperature work	T10 was turned on and worked continuously for 24 hours at -20°C	The mechanical and electrical functions of the structure, switch machine, display, touch screen, Mic, etc. are normal.	GB / T 2423.1-2008 Environmental testing of electrical and electronic products - Part 2: Test methods Test A: Low temperature

3. Structural Durability Testing

3.1	Durable keys testing	Pressing force: 3W times Key cover hardness: Shore hardness 50	The keys and other functions are normal, allowing the feel value to change by 30% before and after	GB/T 14081-2010
3.2	Ball impact	Impact energy: 0.2J, impact point: 5 points (four corners + center point)	The mechanical and electrical performance of the T10 is normal. The touch screen function is normal, no cracks, no irrecoverable abnormal display	SJ/T 11041-1996
3.3	Random vibration	6H Adsorb the test sample with all accessories in the power-on state on the test stand and fix it on the vibration table. The vibration table is set at a frequency of 10Hz~1000Hz, PSD 20~0.14m/s²/Hz, and acceleration root mean square value of 27.8m/s². Each Axial test lasts 6H	The mechanical and electrical functions of the prototype structure, switch machine, charging, display, touch screen, etc. are normal. The T10 has no abnormality such as power failure and restart.	ISO 16750
3.4	Impact test	According to ISO 16750-3 standard, the total number of shocks is 2000 times	The mechanical and electrical functions of the prototype structure, switch machine, charging, display, touch screen, etc. are normal. The T10 has no abnormality such as power failure and restart.	ISO 16750