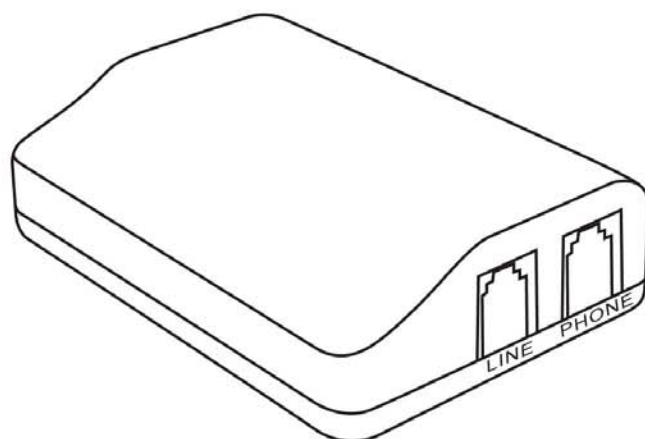


# Caller ID USB interface AD101 Tech Handbook



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## SUMMARIZATION

### Brief Introduction

The most trouble for software programmer is they know very little about hardware structuring, once the customer's requirements can not be meet by just implementing program based on one PC, then works with some external device is a must for the combination, such as record caller ID numbers, start and end call time & date, record dialed numbers, control line operating status, detect phone connection, judge inbound ringer and ringer times, detect phone using status, check line polarity reversal for phone billing, etc. Under such circumstance, it's really difficult for them to design application software independently, so if they don't know how the hardware works, it's really hard for them to get started the application designing. For this purpose, ARTECH is dedicating provide a complete CTI computer telephony interface solution, and fully open SDK & source code for the second development, we're looking for to cooperating with the software integrators.

### General Description

Although the communicative system is progressing constantly, telephone is still the simplest and convenient way. In particular it comes to business field which integrated with computer, many transactions are verified by telephone, in order to avoid forgetting, misunderstanding or dishonest, the recording equipment for call detailed records is a must for some trades. Combining computer & telephony integration, ARTECH is launching CTI series product now. We provide hardware, SDK/API, VC/VB/DELPHI source code, DEMO program for application second development.

### Key Features

- Record incoming/outgoing call number, time & date
- Conversation duration counting
- Compatible ETSI/Bellcore FSK & DTMF Caller ID
- Live line operating status indication
- Flexible system parameter programming
- HID USB data transmission without USB driver
- Multiple LED status for system control
- Provide multi-condition for startup talking
- Equips with 4 units expand up to 4 lines under 1 PC
- Start talking interval & missed call time setting
- No external power required, powered by USB
- Line busy/standby status control
- Line polarity reversal detection
- Fully open SDK for application development

### Target User

- Telephone Shopping Transactions
- Real Estate Liaison
- Customer Service Center
- Banking & Financial Transactions
- Private Enterprise
- Credit Reference Agency
- SOHO Family Studio
- Security Employee Direct Line
- Call Center Solution
- Call Shop Billing
- Family User for Harassment Collection
- Commercial Transactions

## Installation

### Operating Condition

#### 1. System Requirement:

Pentium 400 MHz CPU or above  
 Windows98se/XP/2000/NT OS  
 10MB HD space or above  
 128 MB RAM  
 CD-ROM  
 Standard USB port  
 Standard RJ11 port

#### 2. Environment Requirement:

Operating Temp: 0°C - 50°C (32°F - 122°F)  
 Storage Temp: -30°C - 65°C (-22°F - 149°F)  
 Operating Humidity: 10% - 90% without congealment

#### 3. USB Audio Function:

Supports USB2.0 full speed  
 Supports USB audio device class specification 1.0  
 Supports Microsoft Windows98se/ ME / 2000/ XP

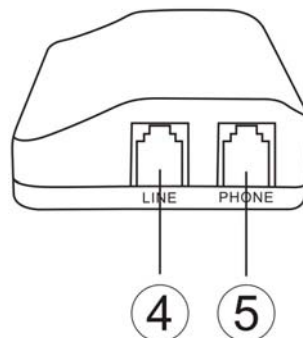
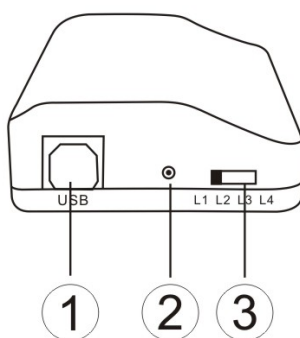
#### 4. Product Spec:

Name: Caller ID USB Interface  
 Model: AD101  
 Dimension: 138(L) × 106(W) × 25(H) (mm)  
 USB Cable: 1.5 meter  
 Weight: 187g  
 Packing Contents: AD101 Hardware · SDK Driver CD · USB Cable · RJ11 Cord · User's Manual

### Hardware Structure

#### 1. Product Overview

Please have a good look for each part of AD101 device before operating.



- ① USB Jack
- ② Indicator
- ③ Device Switch
- ④ RJ-11 Line Jack
- ⑤ RJ-11 Phone Jack

## 2. Packing Contents

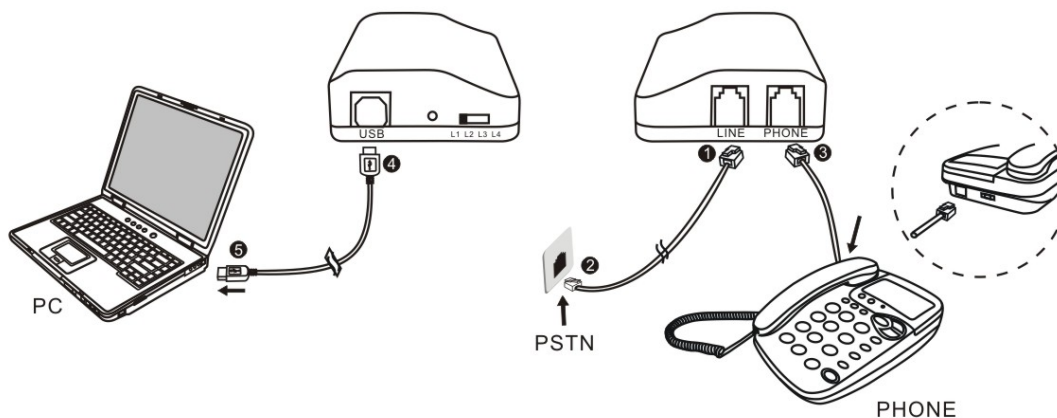
1. AD101 Hardware
2. SDK Driver CD
3. USB Cable
4. RJ11 Cord
5. User's Manual

## 3. Installation

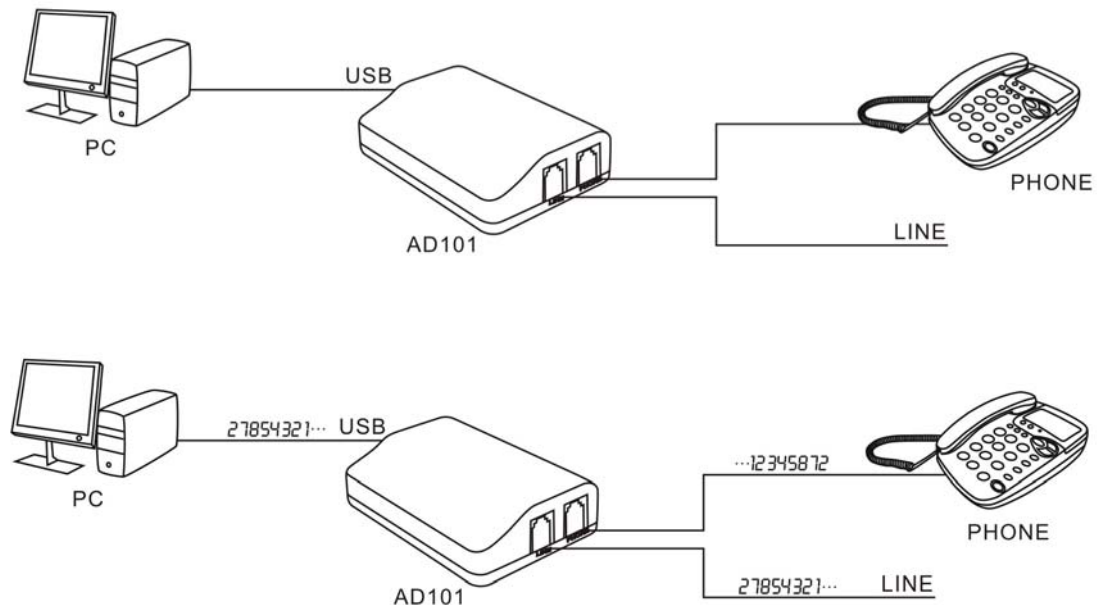
1. One USB interface connects to PC
2. One RJ11 Line port connects to PSTN/C.O. line from telecom station
3. One RJ11 Phone port connects to normal analog telephone set

## 4. Installing Procedures

1. Plug one side of RJ-11 Jack to Line terminal of AD101
2. Plug another side of RJ-11 Jack to PSTN/C.O. Line Jack
3. Plug one side of RJ-11 Jack to PHONE terminal of AD101, another side to analog phone
4. Plug one side of USB Jack to USB Jack of AD101
5. Plug another side of USB Jack to USB Jack of PC



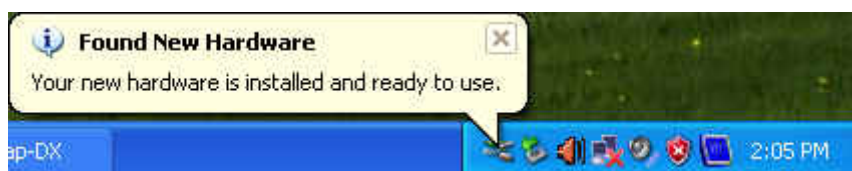
## 5. Connection Diagram:



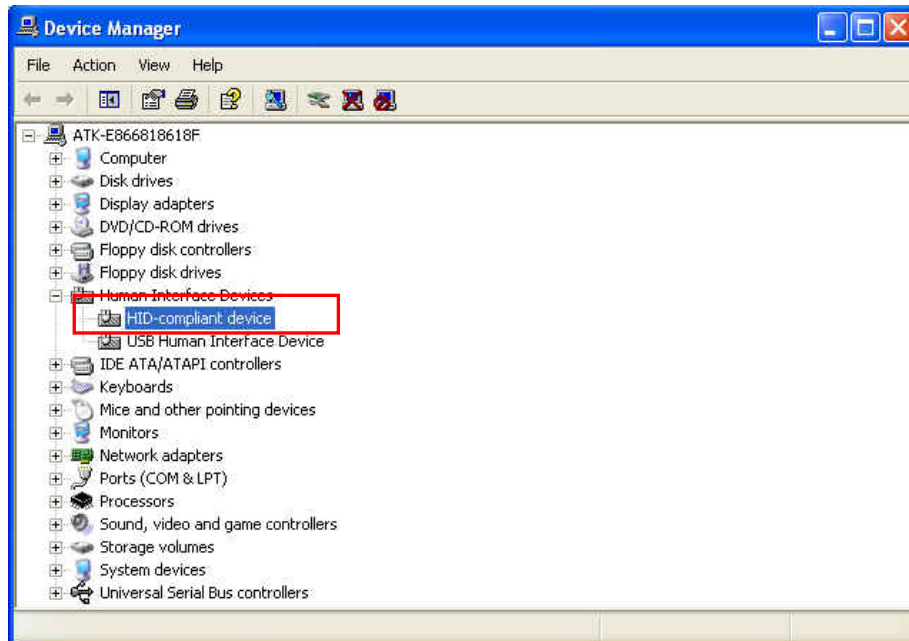
AD101 powered and transmitted data via standard USB protocol, all detailed call information can be logged to PC, such as inbound and outbound call number, time & date, line control status, live phone operating status, inbound ringer & ringer times detection, line polarity reversal detection, system LED indicator control, etc. On the expandable feature, it can expand up to 4 units for 4 lines simultaneously.

## Hardware Installation & DEMO Program Introduction

If it is the first time for you to operate AD101, when you plug it into PC via USB, then the windows will find new USB HID hardware and will automatically install driver, after done will indicate new hardware is installed and ready to use as shown in below picture.

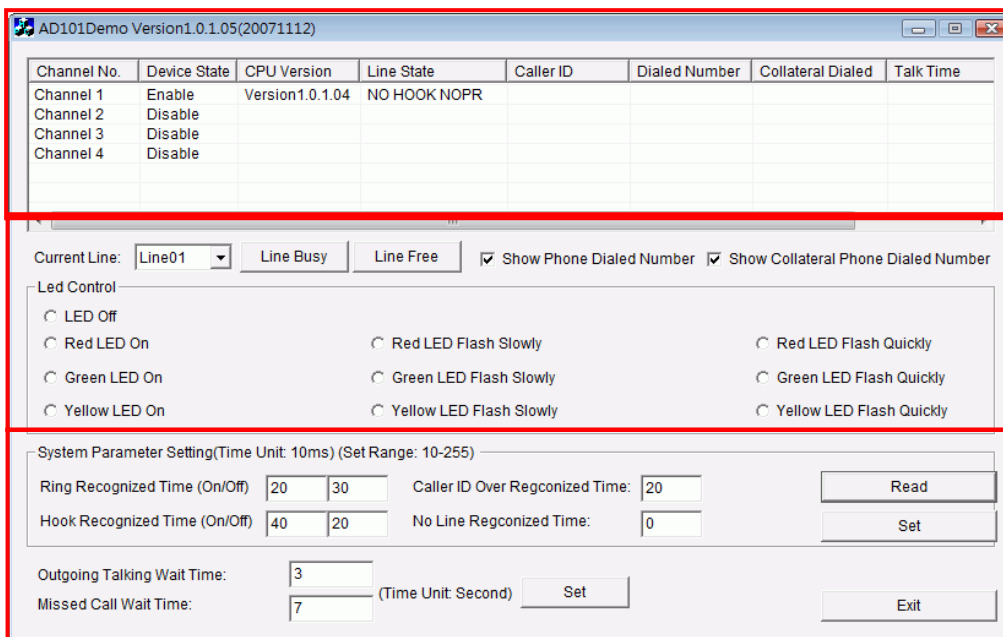


Then you can check the new-added device on Device Manager window, you'll see two items for USB HID device announcement, those are HID-compliant device and USB Human Interface Device as shown in below window:



**Demo Program Introduction**

1. Complete the hardware installation as per the indication
2. Run DEMO program: AD101 Demo\AD101 Demo.exe
3. Then will show below DEMO program friendly interface



**A**

**B**

**C**

- A area stands live Line status display
- B area stands system LED indication and Line control status
- D area stands system parameter data programming

## 1. A area for current Line status display

**Channel No.:** Stands expand up to 4 units of AD101 device, totally include 4 channels

**Device State:** Stands device connecting status, [Enable] stands connecting success, [Disable] stands connecting failed

**CPU Version:** Stands device firmware CPU version

**Line State:** Stands system live Line operating status, all status as shown in below table:

Line Status	Introduction
HOOK ON PR+	(Hang up phone with positive Line polarity)
HOOK ON PR-	(Hang up phone with negative Line polarity)
HOOK ON NOPR	(Hang up phone without Line polarity)
HOOK OFF PR+	(Pick up phone with positive Line polarity)
HOOK OFF PR-	(Pick up phone with negative Line polarity)
No Line	(No Line plugged)
Ring On	(Inbound ringer on)
Ring Off	(Inbound ringer off)
NO HOOK PR+	(No any operations with positive Line polarity)
NO HOOK PR-	(No any operations with negative Line polarity )
NO HOOK NOPR	(No Line plugged, no Line polarity, no any operations)
Missed Call	(Missed inbound call)

**Caller ID:** Show the inbound call number

**Dialed Number:** Show the dialed outbound call number

**Collateral Dialed:** Show the outbound call number which is dialed from the parallel line terminal

**Talk Time:** Show the talking time while talking, when pick up to dial out, after waiting for 3 sec will count talking time, this time can be set by [Outgoing Talking Wait Time] on C area

**Show Phone Dialed Number:** When you select it will show outbound call number which is dialed from Phone terminal

**Show Collateral Phone Dialed Number:** When you select it will show outbound call number which is dialed from parallel Line terminal

## 2. B area for system LED indicator control

**Current Line:** Current valid operated Line ID

**Line Busy:** Control Line to be online as BUSY status

**Line Free:** Control Line to free as standby status

**LED Control:** System LED control status table:

LED off	LED off	Note: Totally have 10 types			
RedLED on	LED lights in RED	RedLED Flash Slowly	LED slowly flashes in RED	RedLED Flash Quickly	LED quickly flashes in RED
GreenLED on	LED lights in GREEN	GreenLED Flash Slowly	LED slowly flashes in GREEN	GreenLED Flash Quickly	LED quickly flashes in GREEN
YellowLED on	LED lights in YELLOW	YellowLED Flash Slowly	LED slowly flashes in YELLOW	YellowLED Flash Quickly	LED quickly flashes in YELLOW

### 3. C area for system parameter programming

System Parameter Setting(Time Unit:10ms)(Set Range:10-255)

This area is used for flexible system parameter data programming, time unit is 10ms, set range is: 10-255

**Ring Recognized Time(On/Off):** Ringer on/off recognized time, factory default is (20/30: 200ms/300ms)

**Hook Recognized Time(On/Off):** Hang up/pick up phone recognized time, factory default is (40/20: 400ms/200ms)

**Caller ID Over Regconized Time:** Inbound caller ID over recognized time, factory default is (20: 200ms)

**No Line Regconized Time:** No Line plugged recognized time, factory default is (20: 200ms)

**Outgoing Talking Wait Time:** Auto count talking time after waiting this interval when you dial out (time unit is second)

**Missed Call Wait Time:** Missed call wait time when inbound call coming (time unit is second)

**Read:** Read out system parameter data value from device

**Set:** Set programmed parameter data to device

## Relevant Knowledge

### USB Interface

USB is the abbreviation of Universal Serial Bus. USB is created and constituted by Compaq, DEC, Intel, Microsoft, NEC and Northern Telecom corporations, it is the perfect replacement for the serial and parallel bus communication currently, due to its convenient with easy-of-use interface and high-performance speed for data transmission, it has been becoming the main human friendly interface, almost all computers including laptops featured with USB function. The USB interface has below main features.

#### 1. Easy-of-use Operation

USB interface can connect serverl different devices, support plug in and out immediately, on software programming side, the USB driver program and application can auto startup without any user interference. Otherwise, USB device also will not involve in IRQ conflict problem, it has independent reserve interrupt resources, so it does not occupy the PC recources with other devices, it ultimately eliminates your doubles and annoyances while researching. The key for USB is able to freely work as an instant PIPO device.

#### 2. Hi-Speed Data Transmission

USB high speed data transmission is one of the main features, the hightes USB transmission interface can reach up to 12Mb/s, it is much quicker with 100 times against COM port, and much quicker with 10 times against parallel port, nowadays the speed for USB transmission is up to 100Mb/s or above.

### 3. Flexible Connection

USB supports several different devices connection, theoretically one USB port can connect 127 units of USB devices. The connecting way is very flexible, you can either use serial connecting, or you can use USB hub to gather with many devices, then connect to USB port of PC. Under USB connection, all device equipped the USB Jack in the outlook of device, no need open casing. The USB supports PIPO feature, so no need turn off power to plug in/out USB device. Likewise, USB provide serial connection way, each USB jack can be connected together with another one. In this way, one USB controller can reach 127 USB devices simultaneously, each device distance can be up to 5 meters, it can also wisely recognize which USB device is plugged in and out under the serial connection.

### 4. Direct USB Powered

Normally the serial and parallel connection device need external power, but USB device has no external power adapter required, powered by the build-in power inside USB interface, USB power can provide DC 5V power for device powering, so no AC power support, and the R&D cost is economized accordingly.

### CID - Calling Identity Delivery

The worldwide caller ID(Calling Identity Delivery - simplified to CID) format provide 2 ways, DTMF and FSK, those caller ID data are transmitted out before picking up phone. The caller ID in DTMF format is sent out before the first ringing, and FSK caller ID is sent out between the first ringer and second ringer. The DTMF caller ID signal is DTMF tone, shortcoming is by its slow speed and no checksum features, FSK caller ID has the contrary feature with quick speed transmission and have checksum, but if you pick up phone immediately after first ringer, there'll not show caller ID data. In some cities, the caller ID service is charged by telecom station, if your telephone can not show caller ID, please check whether you subscribe caller ID service or not. Please note in general DTMF caller ID data only includes call number, but FSK caller ID includes date, time, caller name and call numbers together.

## FAQ

#### A. Why startup failed or device can not be found by Windows?

The problem may be caused by:

1. Firstly please make sure the USB connection is correct, if the connection is ok, then please check the BIOS setting to enable USB device.
2. Then reboot your PC for entering BIOS setting to enable USB interface.
3. Please check the USB driver is successfully installed on your OS, please refer to above details for installation.
4. As for NT4.0 OS, due to the USB inability of NT OS, so it can not support USB device.

#### B. Why caller ID data can not be received?

The problem may be caused by:

1. Pick up phone on the first ringer while coming caller ID in FSK format.
2. Your caller ID service is not subscribed in telecom station yet.
3. No caller ID data transmitted on this call.
4. Connect to some ext. line of PBX, some PBXs can not send caller ID data before talking.
5. On Win98 OS, if caused by user other program, please reconnect device by more times.

**C. What should we care if plug in/out device while using?**

When you plug device to use, you'd better not plug out it immediately, especially don't repeat plug in/out so frequently, as the OS needs some responding time, the best interval should be at least 5 seconds or above.

**D. How many AD101 device can be used based on one PC?**

One PC can work with 4 units of AD101 devices, can reach to 4 lines simultaneously, each unit has one USB interface, so if you can expand the USB port by USB HUB will only need one USB port interface on your PC.

**Appendix****Technical Parameters**

USB Interface: USB1.1 standards

Input Indepence: > 50 K ohm

Signal Noise Ratio: Typical 50 dB

Frequency Response: 300-3400 Hz

Modulation Method: PCM, 64KBPS, 8Kb/sec

Channel Current: < 50mA

Power Consumption: < 250mW

ARTECH CTI Series Product Spec Comparison Table

	AD101	AD120	AD410	AD409
Line Amount	1	1	4	4
Expandable Line Amount	4	4	64	64
Device Power	Powered by USB	Powered by USB	Power Adapter	Power Adapter
Data Transmission	USB	USB	USB	RS232
LED Indicator	●	●	●	●
Polarity Reversal Detection	●	●	●	●
Line Online Control	●	●	●	●
Caller ID Format	DTMF	DTMF	DTMF	DTMF
	Bellcord FSK	Bellcord FSK	Bellcord FSK	Bellcord FSK
	ETSI FSK	ETSI FSK	ETSI FSK	ETSI FSK
Line Recording		USB Transmitting Recording		
Record Dialed No.	●	●	●	●
Record Inbound No.	●	●	●	●
Phone Status Detection	●	●	●	●
Line Status Detection	●	●	●	●
Talking Start & End Time	●	●	●	●
Play on Line		USB Transmitting Voice Playback	Audio Transmitting Voice Playback	Audio Transmitting Voice Playback
Busy Tone Dection		Detected by PC	Detected by Hardware	Detected by Hardware
Ringer Detection	●	●	●	●
Phone Status after Power Off	Can Dial Line	Can Dial Line	Can Dial Line	Can Dial Line
Device Dialing		Send DTMF Tone by PC		
DEMO Program Source Code	●	●	●	●
DEMO Program	●	●	●	●
API Source Code	●	●	●	●
Operating Voltage	USB DC5V	USB DC5V	DC24V Adapter	DC18V Adapter
Operating Current	70~80mA	400~450mA	150~200mA	150~200mA
Max Power	0.4W	2.25W	4.8W	4.3W
Dimension(mm)	95 x 66 x 26	140 x 105 x 26	224 x 160 x45	182 x 147 x42
Net Weight(g)	74	208	540	400
Packing Dimension(mm)	95 x 60 x 115	114 x 55 x 155	255 x 230 x 60	255 x 230 x 60
Weight(g)	186	361	982	868

● Stands featured this function.