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**Digital Key Telephone System**

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## **INTRODUCTION :**

Congratulation on your smart selection of ARISTEL DV-28 SOHO System. ARISTEL DV-28 is a state-of-the-art communication system that offers you the unique feature, flexibility and superb service in your office or at your home.

ARISTEL DV-28 system's digital technology extends well beyond handling just conventional voice call. Computers, paging systems, fax machines, sensors, modems, door phones and even door latches can be connected and controlled through this system.

This system is designed to suit your requirements today and grow with your business tomorrow. The entry window of Internet has been prepared for you by Aristel DV-28 , through it , you can enjoy the fascinating network world unrestrainedly. The capacity is of 4-8 CO lines, 8-20 station ports, and door phone port, multi function card port, sensor port, paging port, external music port, single line phone port are powerful options for your communication enhancement. So you can upgrade many special functions cost effectively just by adding expansion cards or periphery accessories.

The manual will provide you with the details instructions or procedures for the installation of ARISTEL DV-28 SOHO system so that it can serve you with the communication needs and custom-design services. Please read this entire section before proceeding with the actual installation.

**In case you have any other questions, please contact your nearest dealer for further assistance.**

## 1. System Summary

### 1.1 Hardware Configuration

- System capacity : 408~820
- **System Control** : Stored Program Control (SPC).
  - SMT interface agglutinate technology
  - Stationary trough interface installation, Main systematic and Internal/External Lines independent of each

### 1.2 System Software

- Built-in programming : Store in ROM
- System Operation programming : Store in RAM
- Software Security Element : Watch Dog
- Programming security : Back up by “Li-Battery”
- Key phone operation security : Error operation recovery protection program.
- Extension Error Action Protection : Extension error action protection mode

### 1.3 Safety Conformity

- Internal/External Lines Short Circuit Protection : Electron is short circuit protection
- Power Mingled Dispatch Restraint
- Lightning Protection
- Power Fluid Transformation : AC110~AC240
- KEY PAD Endurance : 1,000,000 Times

## 2. Hardware Configuration

### 2.1 System Specifications

The system use fixed slot design, all expansion card have to connected to designated slot

| DV-28                    | Basic Capacity | Expansion Capacity | MAX. Capacity |
|--------------------------|----------------|--------------------|---------------|
| CO Line                  | 4              | 4                  | 8             |
| Key Telephone            | 8              | 6 / 8 / 12         | 20            |
| Single Line Telephone    | 0              | 1 / 2 / 4 / 8      | 8             |
| Door Phone Connection    | 0              | 1                  | 1             |
| Relay Interface          | 0              | 1                  | 1             |
| Sensor Interface         | 0              | 1                  | 1             |
| Auto Attendant           | 0              | 1 / 2              | 2             |
| Three Parties Conference | 0              | 8 Groups           | 8 Groups      |
| Speed Dial set           | 1000           | 0                  | 1000          |

## 2.2 ELECTRICAL SPECIFICATIONS

|                              |                       |                                                                       |
|------------------------------|-----------------------|-----------------------------------------------------------------------|
| Input AC Voltage             |                       | AC110~240V                                                            |
| Power Consumption            | Key Telephone         | 1~2 W                                                                 |
|                              | Door Phone            | 0.5 W                                                                 |
|                              | Maximum               | 40 W                                                                  |
| System Power Back-Up Battery |                       | 4 Hour (24 V 7AH)                                                     |
| Loop Resistance              | CO Line               | 1.5K $\Omega$ max.                                                    |
|                              | Key Telephone         | 40 $\Omega$ max.                                                      |
|                              | Door Phone            | 40 $\Omega$ max.                                                      |
| Dialing Signal               | Outgoing Dialing      | Tone / Pulse                                                          |
|                              | Intercom Dialing      | Tone / Pulse / Digital                                                |
| Wiring Installation          | CO Line/Key Telephone | 2 wires                                                               |
|                              | Door Phone            | 2 wires                                                               |
|                              | Relay Switch          | 2 wires                                                               |
|                              | External Music/paging | 2 wires                                                               |
| Relay Switch                 | Type                  | SPDT                                                                  |
|                              | Contact Capacity      | 120V $\times$ 7A max.                                                 |
| System Dimension (mm, WxDxH) |                       | 310 $\times$ 205 $\times$ 70 mm                                       |
| Key Telephone Dimension (mm) |                       | 200L $\times$ 180W $\times$ 75H mm                                    |
| Working Temperature          |                       | 0 $^{\circ}$ C ~ 45 $^{\circ}$ C (32 $^{\circ}$ F ~ 113 $^{\circ}$ F) |
| Working Humidity             |                       | 10% ~ 90% relative non-condensing                                     |

## 2.3 System Model Description

| Model No. | Description                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------|
| D5-408K   | <b>MAIN SERVICE UNIT</b> , consisting of (Plastic Cabinet + D5MBUA + D4PWUA + D5EXPA + D1CIDC )                               |
| D4PWUA    | <b>POWER UNIT</b> , Input 110~240VAC Full range, Output 28Vdc/1.8A                                                            |
| D5MBUA    | <b>MOTHER BOARD UNIT</b> , consisting of (4 CO Lines + 8 Digital Key Stations Ports), with quick Connectors                   |
| D5CNFC    | <b>Conference Chip</b> , support up to 8 groups of three party conference call                                                |
| D5EXPA    | <b>Sub-Control Board</b> , for expanding Trunk card D5TKUA, D4TKUB and Station Card D5DLUA, D4DLUB, D4HYUB, D4SLUB, D4SLCC/D. |
| D5TKUA    | <b>CO Trunk CARD</b> , consisting of 4 CO Lines                                                                               |
| D4TKUB    | <b>CO Trunk CARD</b> , consisting of 3 CO Lines                                                                               |
| D4DLUB    | <b>Key Station Card</b> , consisting 8 Digital Key Station Ports.                                                             |
| D5DLUA    | <b>Key Station Card</b> , consisting 12 Digital Key Station Ports.                                                            |
| D4HYUB    | <b>HYBRID STATION UNIT</b> , consisting of 6 Digital Key Station+2 SLT Station port)                                          |
| D4SLCA8   | <b>SLT STATION CARD</b> , consisting of 8 SLT Station Ports                                                                   |
| D4SLCA4   | <b>SLT STATION CARD</b> , consisting of 4 SLT Station Ports                                                                   |
| D4SLCA1   | <b>SLT STATION CARD</b> , consisting of 1 SLT Station Ports                                                                   |
| D4VSCA    | <b>VOICE SERVICE CARD</b> , consisting of 2 Voice Channels (60 seconds)                                                       |
| D4VSCB    | <b>VOICE SERVICE CARD</b> , consisting of 1 Voice Channels (60 seconds)                                                       |
| D4VSCC    | <b>VOICE SERVICE CARD</b> , consisting of 2 Voice Channels (60 seconds) with Fax detection function                           |
| D4MFCA    | <b>MULTI FUNCTION CARD</b> , consisting of (1 Sensor + 1 Relay + 1 Door Phone Port)                                           |
| D4MFCB    | <b>MULTI FUNCTION CARD</b> , consisting of 1 Door Phone Port                                                                  |
| D1CIDC    | <b>FSK/DTMF CLI INTERFACE</b>                                                                                                 |

## 2.4 System Features List

- 2 Pages of DSS Key
- 5 Different Trunk Access Codes
- 9 Different Incoming Ringing Frequencies
- Account Code
- ❖ Auto Attendant
- Auto Accessing Trunk
- Automatic Answer (Intercom)
- ❖ Automatic Call Distribution (ACD)
- Automatic Transfer
- ❖ Baby Listening
- ❖ Caller's Number Identification
- Call Limit Time Duration
- Call Park
- Call Split
- Console Grouping
- Date/Time Setting
- Day/Night Schedule
- Direct Intercom Dialing
- Direct Inward Station Access (DISA)
- ❖ Door Phone Connection
- ❖ Door Switch Control
- ❖ Environment Monitor
- ❖ Fax Call Detection
- Flexible Function Key Assignment
- Forced Account Code
- Headset Function
- Hot Line
- Illegal Outgoing Protection
- Intercom Busy Reminder
- Incoming Hunting
- Incoming Paging
- Intercom Hunting
- Internal/External Music Source
- Internal/External Paging
- Key Station Short Protection
- Lightning Protection
- Manual Line
- Message Waiting
- Name Speed Dialing (Phone Book)
- One Touch Operation
- Power Failure Telephone
- Private Line
- Programming Help List
- ❖ Remote Relay Control
- ❖ Security/Fire Alarm System
- Single Digit Dialing
- ❖ Station Loud Bell
- System Alarm
- Toll Restriction
- Tone/Pulse Dialing
- Trunk Grouping
- ❖ Trunk Loud Bell
- Trunk Queuing

❖ Means the optional function.



**2.5 Station Features List**

- 16×2 Dot-Matrix LCD Display
- 5 Different Numbers Auto Redial
- 9 Different Ringing Frequencies on Key Station
- Adjustable LCD Angle
- Built-In Calculator Function (25 Buttons LCD Phone)
- Call Forward/Call Follow Me
- Call Forward To Individual Speed Dial
- Call Pick Up
- Call Transfer
- Camp On
- Day/Night Service Indication
- Digital Volume Control (8 Levels)
- Do Not Disturb
- Dual-Color/Tri-Status BLF Indication
- ❖ DSS Console
- Handsfree Dialing
- ❖ Handsfree Conversation
- Hold/Exclusive Hold
- Last Outgoing Redial
- Macro Key Setting
- Message Text
- Monitor
- Override
- Page/Be Paged
- Station Lock/Unlock
- Station Name Setting
- Station Operation Help List

❖ means the optional function.



### 3. Equipment Requirement:

#### 3.1 Preparation:

- ♦Survey the capacity of system and telephone.
- ♦Survey the wiring and tool.
- ♦Carefully study and follow this manual before installation.

#### 3.2 Environment Requirement:

- ♦Input Voltage : AC110~240V

System Power Back-up Battery : Connect with DC24V power source to the battery back-up interface to ensure a continue supply of power during power failure.

#### 3.3 Cable Requirement :

CO Line : 2 wires

Key Telephone : 2 wires

SLT : 2 wires

Door Phone : 2 wires

Relay Switch / Sensor : 2 wires

External Paging / External music : 2 wires

#### 3.4 Notice:

The main unit should be installing in a clean, dry, dust-free, and secured location. Place 10cm above the ground to avoid vibration.

Install in an environment of ventilation and prevent from direct sunbeam.

Install main unit in the center position of the extensions to shorten the distance between main unit and extensions.

- ♦The power supply must be independent from the others. And keep away from high frequency source and noise to avoid interference from EMI.
- ♦Use three-aperture outlet. ( Include ground connection )
- ♦Install ground wire of lightning rod to ensure stability of system.
- ♦Use twin wire to avoid noise and interference when the wiring is too long.
- ♦ Keep away from the power cord and interference source. Otherwise, it's necessary to use segregate wire and indeed install ground wire.

## 4. DV-28 PCB AND CABINET LAYOUT

### 4.1 DV-28 SYSTEM DIAGRAM

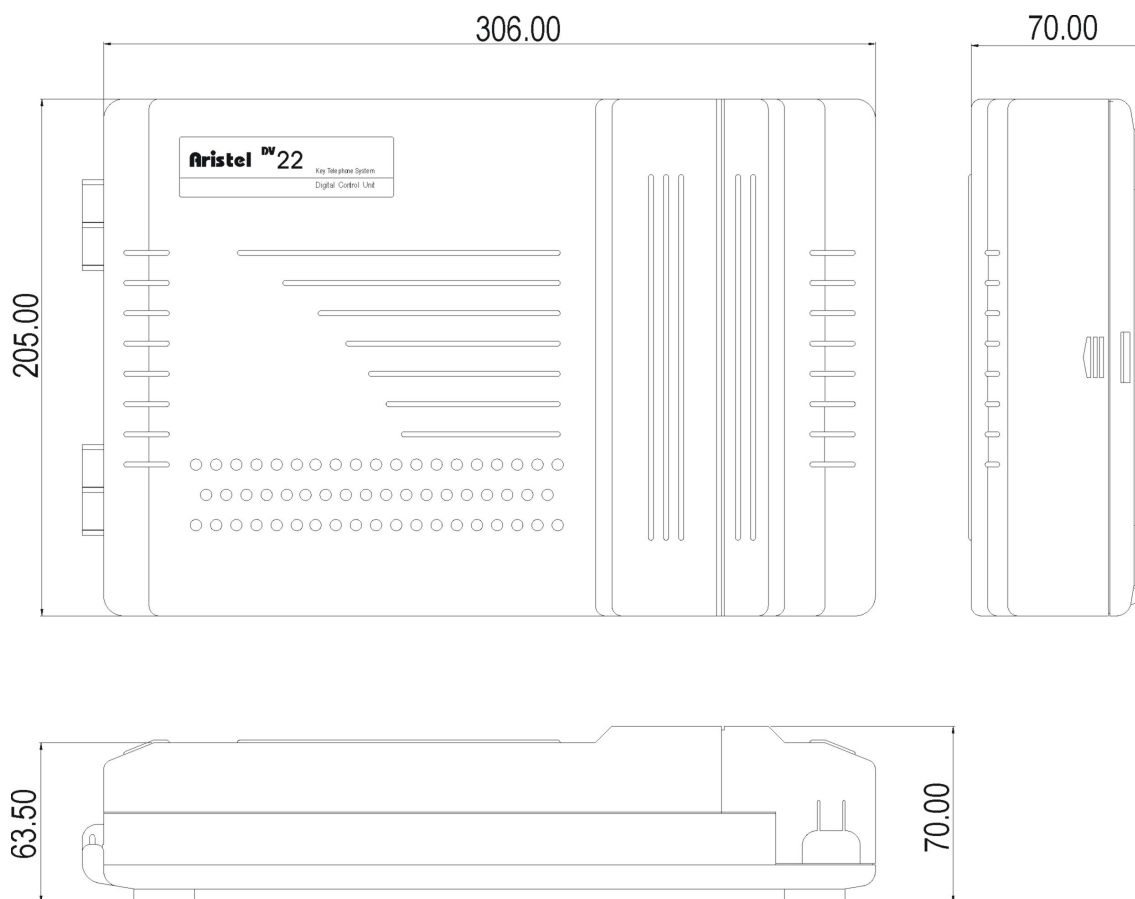


Figure 1: DV-28 Diagram

1. System Dimension : 306 x 205 x 70mm
2. System AC Input : 110~240VAC
3. DC Output for Battery backup: 28VDC

## 4.2 D4PWUA – Full Range Power Adaptor



Figure 2: DV-28 power adaptor D4PWUA front view

1. AC Input : 110~240VAC Full range
2. DC Output : 28VDC/1.8A

### 4.3 D5MBUA (Mother Board Unit)

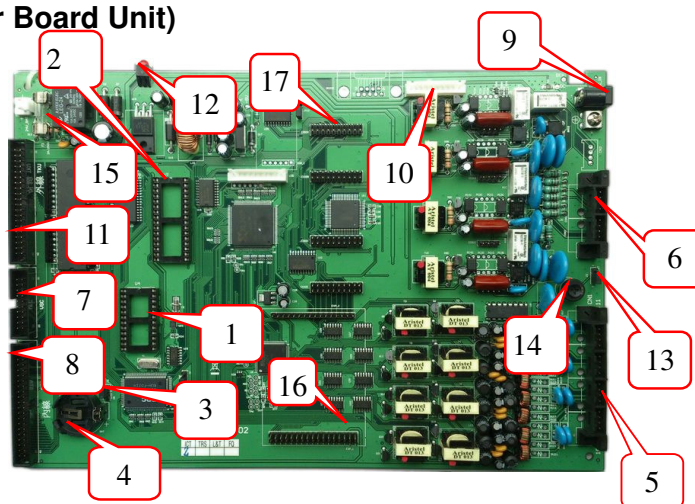


Figure 3: DV-28 Mother board Unit (D5MBUA)

1. U4 - D5CNFC Conference Chip
2. U2 - System Software EEPROM
3. J3 – Jumper selection for system RAM programming backup switch
4. BAT – Li Battery for system programming backup
5. CN1 - Key phone port connector
6. CN2 - Trunk port connector
7. VSC - D4VSCA card connector
8. STA - D4DLU/D5DLUA/D4HYUB/D4SLUB expansion connector
9. D4PWUA power adapter connector
10. MFC - D4MFCA/D4MFCB Multi-function card connector
11. TKU - D4TKUA/D5TKUA trunk expansion connector
12. LED1 - System working Indicator
13. J2 - Music on hold Switch (Internal/ External)
14. VR1 - The volume controller of the Internal Music on hold
15. F1 - Battery Reverse Protect Fuse : 2A/250V
16. EXP\_1 and EXP\_2 - Pin connectors for D5EXPA Sub-Control Board.
17. CID1(A~D) and CID2(A~D) - Pin connectors for D1C1DC board.

#### 4.4 D5TKUA (Trunk Unit)

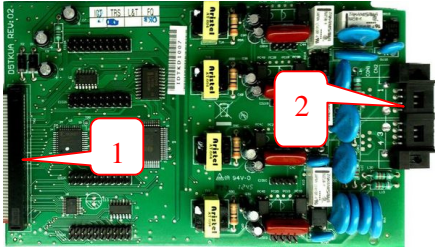


Figure 4: DV-28 CO Trunk Card Unit (D4TKUB)

1. For D5MBUA connection.
2. Terminal-Block Connector for the CO Line Connection

**NOTE : D5TKUA ( CO Trunk CARD ) consisting of ( 4CO Lines )**

#### 4.5 D4TKUB (Trunk Unit)

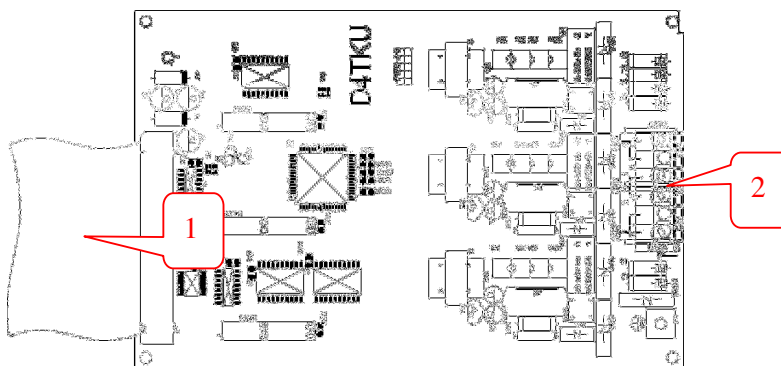


Figure 5: DV-28 CO Trunk Card Unit (D4TKUB)

3. For D5MBUA connection.
4. Terminal-Block Connector for the CO Line Connection

**NOTE : D4TKUB ( CO Trunk CARD ) consisting of ( 3 CO Lines**



#### 4.6 D5DLUA ( Key Station Card )

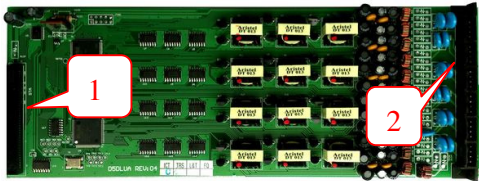


Figure6: DV-28 Key Station Card Unit (D5DLUA)

1. For D5MBUA connection.
2. Quick-Connector Module for **Key phone connection**, ( **Use 2-wire T/R** ) , including 4 sets of 4-wire Male Quick-Connector.

**NOTE : D5DLUA ( Key Station Card ) consisting of ( 12 Digital Key Station Ports )**

#### 4.7 D4DLUB ( Key Station Card )

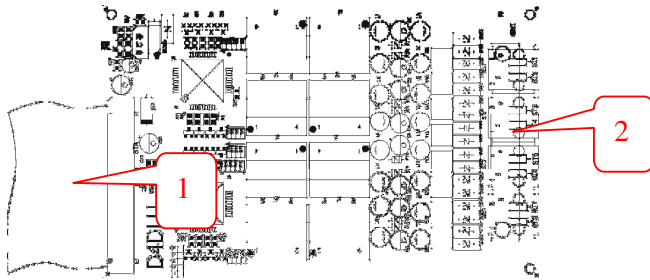


Figure 7: DV-28 Key Station Card Unit (D4DLUB)

3. For D5MBUA connection.
4. Quick-Connector Module for **Key phone connection**, ( **Use 2-wire T/R** ) , including 4 sets of 4-wire Male Quick-Connector.

**NOTE : D4DLUB ( Key Station Card ) consisting of ( 8 Digital Key Station Ports )**

#### 4.8 D4SLCC (SLT Station Card)

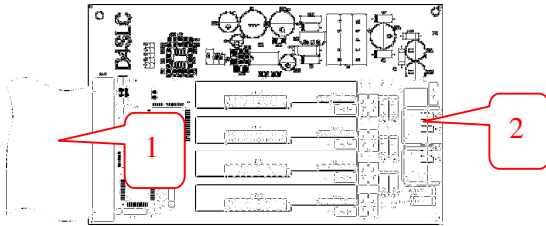


Figure 8: DV-28 SLT Station Card Unit (D4SLCC)

1. For D5MBUA connection.
2. Quick-Connector Module for **Single Line phone connection ( Use 2-wire T/R )** , including 2 sets of 4-wire Male Quick-Connector.

**NOTE : D4SLCC4 (SLT Station Card ) consisting of 4 SLT Station Ports.**

**D4SLCD1 (SLT Station Card ) consisting of 1 SLT Station Port.**

#### 4.9 D4HYUB ( Hybrid Station Unit )

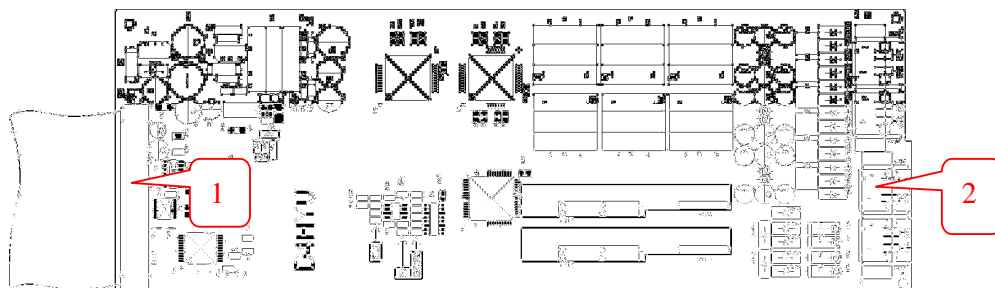


Figure 9 : DV-28 Hybrid Station Unit

1. For D5MBUA connection.
2. Quick-Connector Module for **Key Station Wiring**, or **Single Line Telephone ( Use 2-wire T/R )** , including 2 sets of 4-wire Male Quick-Connector.
3. Terminal-Block Connector for the CO Line Connection

**NOTE : D4HYUB ( Hybrid Station Unit ) consisting of 6 Digital Key Station + 2 SLT Station ports.**

#### 4.10 D4VSCA ( Voice Service Card )

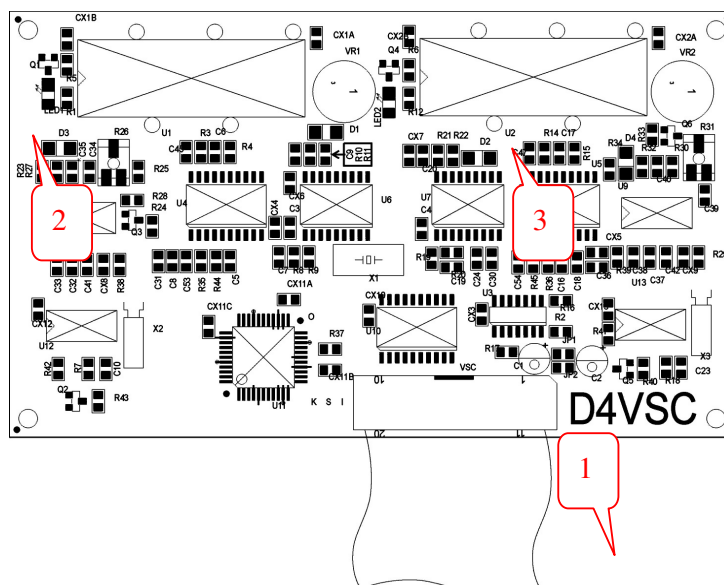


Figure 10: DV-28 Voice Service Card (D4VSCA/B)

1. For **D5MBUA** connection.
2. LED : To indicate the **channel 1** is working when LED is blinking.
3. LED : To indicate the **channel 2** is working when LED is blinking.

**NOTE :** D4VSCA (Voice Service Card) consisting of 2 voice channel (60 seconds per channel)  
 D4VSCB (Voice Service Card) consisting of 1 voice channel (60 seconds per channel)  
 D4VSCC (Voice Service Card) consisting of 2 voice channel (60 seconds per channel)  
 with Fax detection function

#### 4.11 D4MFCA/B (Multi Function Card)

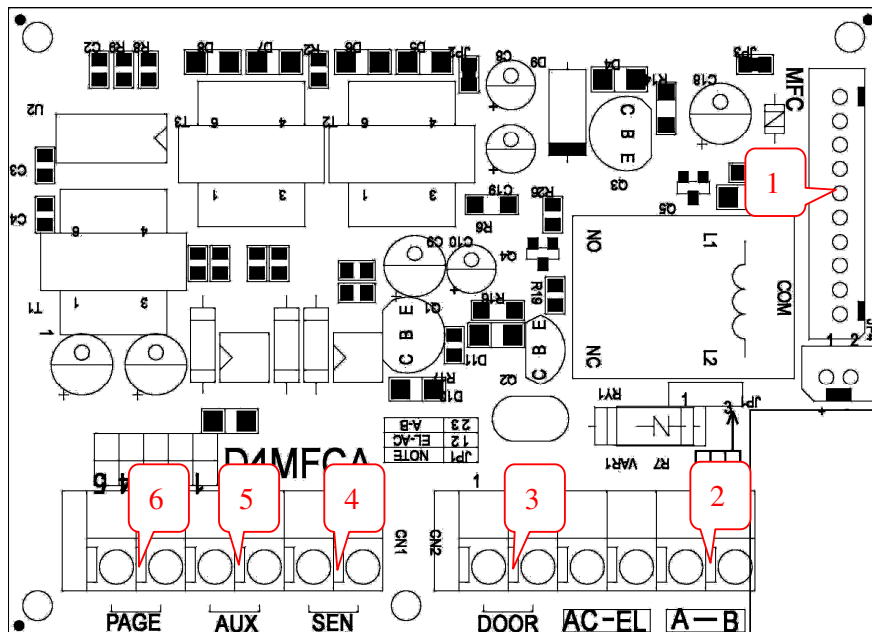


Figure 11 : DV-28 Multi Function Card (D4MFCA/B)

1. For D5MBUA connection.
2. **A-B**: Terminal-Block Connector, for the Relay Connection.
3. **DOOR**: Terminal-Block Connector, for the Door Phone Connection.
4. **SEN**: Terminal-Block Connector, for the Sensor Connection.
5. **AUX**: External music input connector
6. **PAGE**: External page output connector

**NOTE : D4MFCA (MULTI FUNCTION CARD), consisting of (1 Sensor + 1 Relay +1 Door Phone Port).**

**D4MFCB (MULTI FUNCTION CARD), consisting of (1 Door Phone Port).**

## 5、INSTALLATION AND WIRING

### 5.1 D4PWUA POWER UNIT INSTALLATION

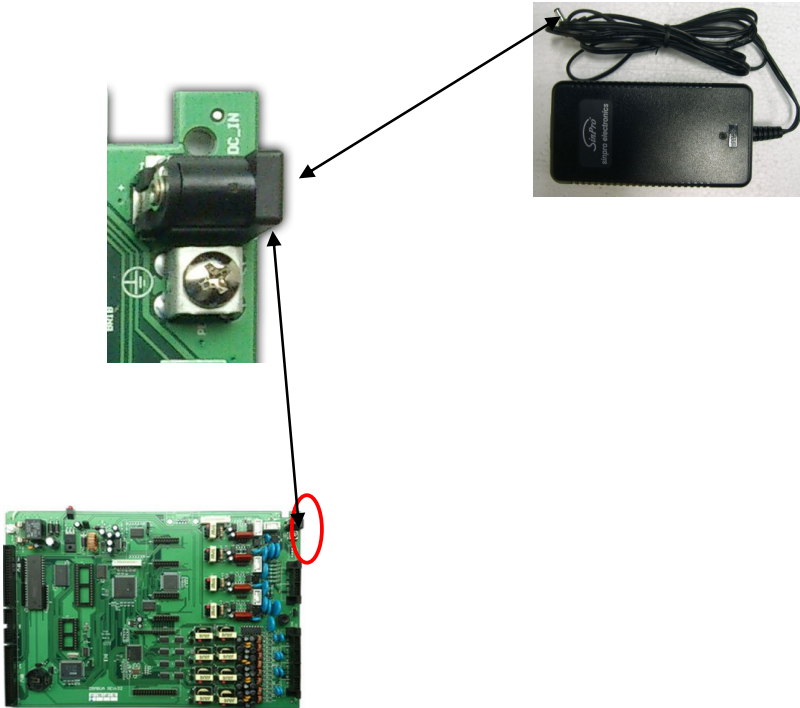


Figure 12 : DV-28 Power Installation

## 5.2 D5MBUA - CO TRUNK AND KEY-PHONE EXTENSION INSTALLATION

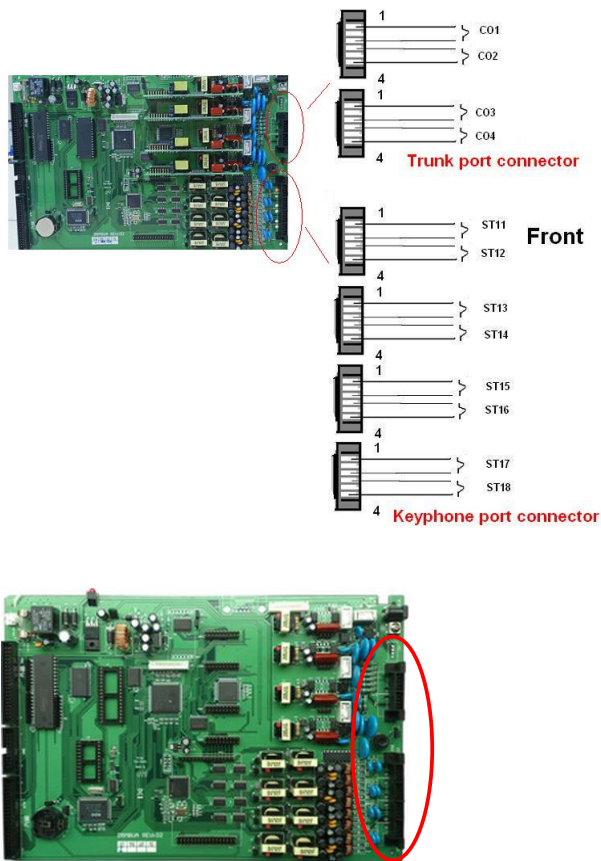


Figure 13: CO line and key-phone Extension installation



### 5.3 D5EXPA Sub-Control BOARD INSTALLATION

Fit the D5IPXA card upon EXP\_1 and EXP\_2 - Pin connectors of D5MBUA Board.



Figure 14: CO line and key-phone Extension installation

## 5.4 D5DLUA STATION CARDS INSTALLATION

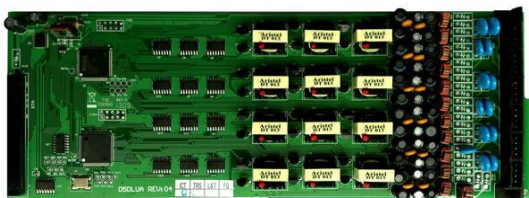
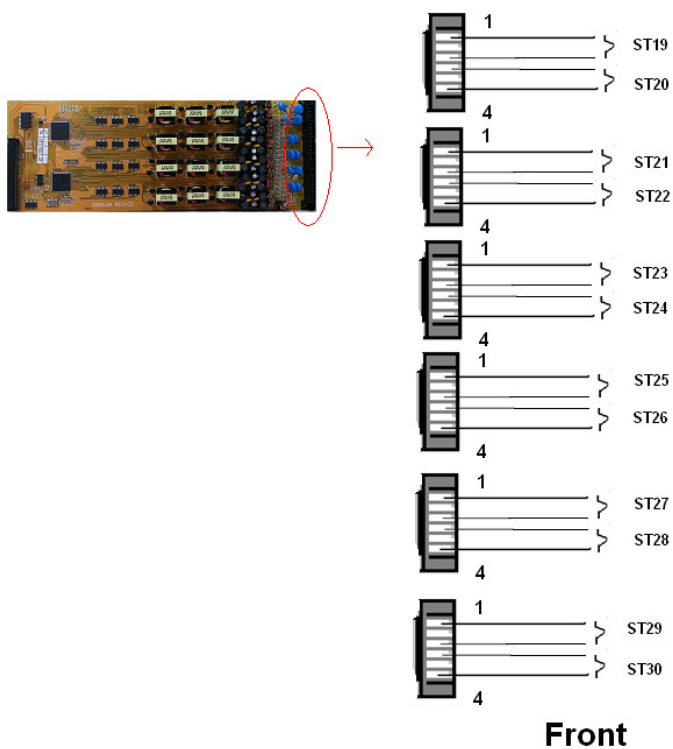


Figure15: DV-28 Key Station Card Unit (D5DLUA)



### 5.5 D5TKUA (Trunk Unit)

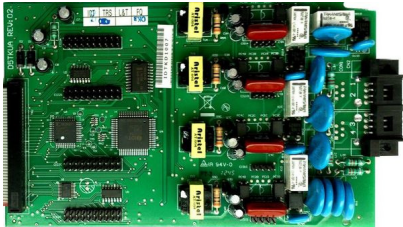
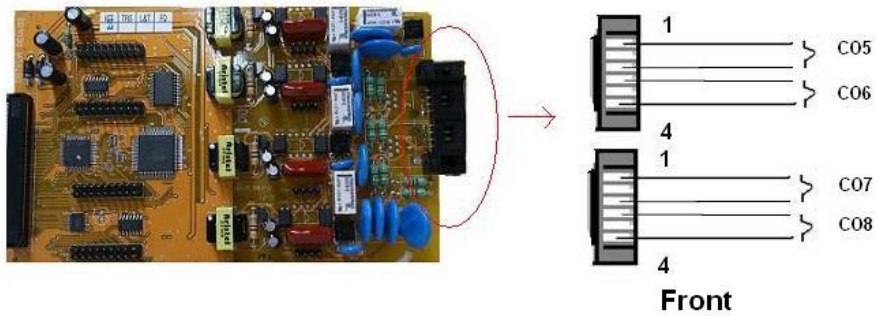


Figure 16: DV-28 Trunk Card Unit (D5TKUA)



## 5.6 Door phone connection

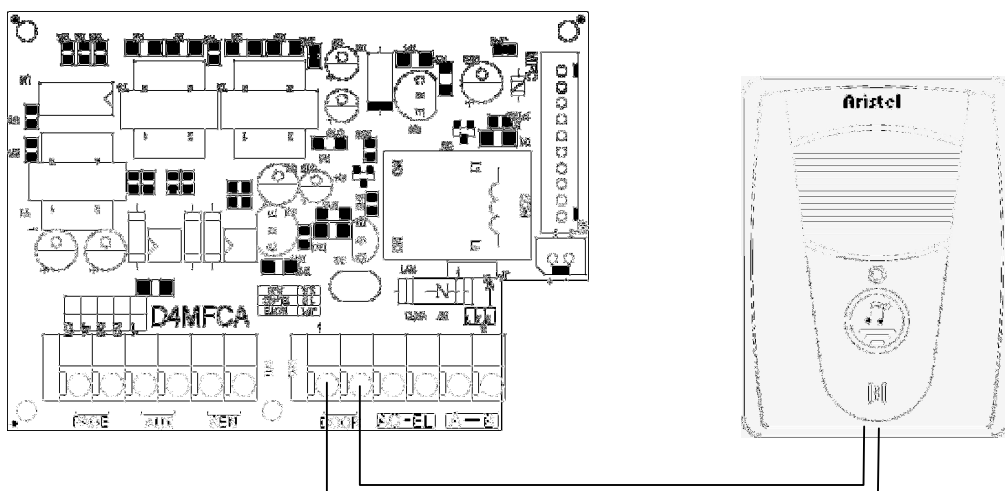


Figure 17: Door phone installation

## 5.7 sensor installation

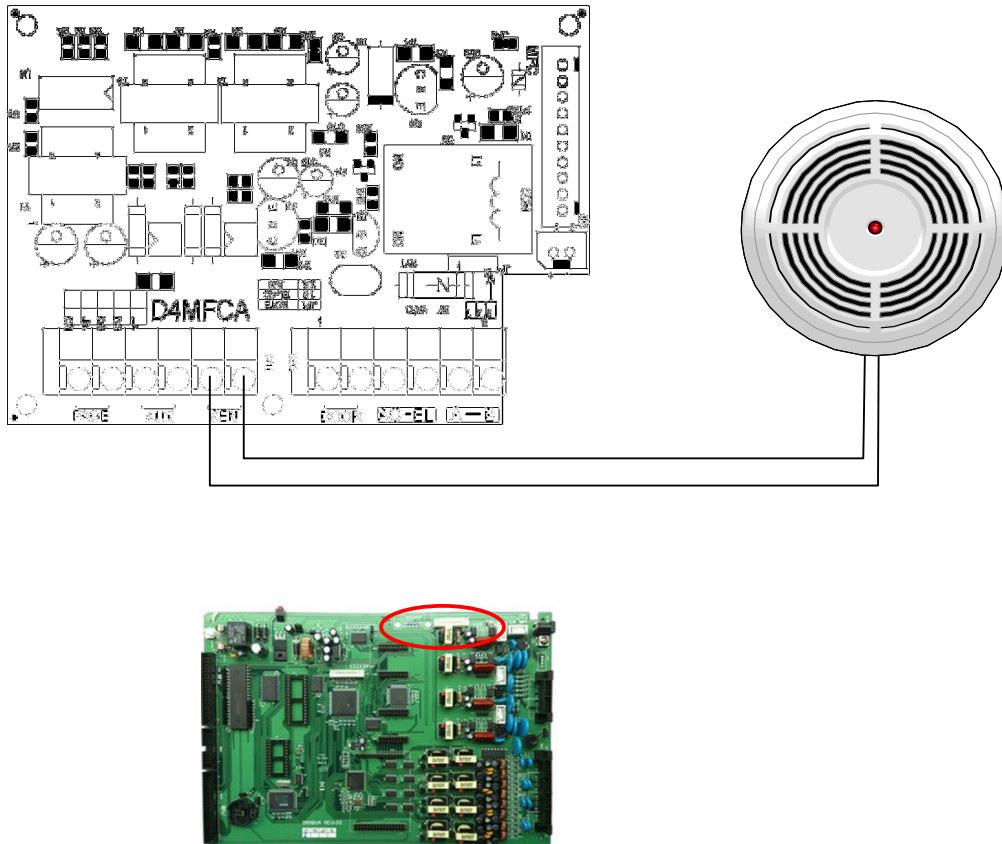


Figure 18: Sensor installation

## 5.8 Door switch installation

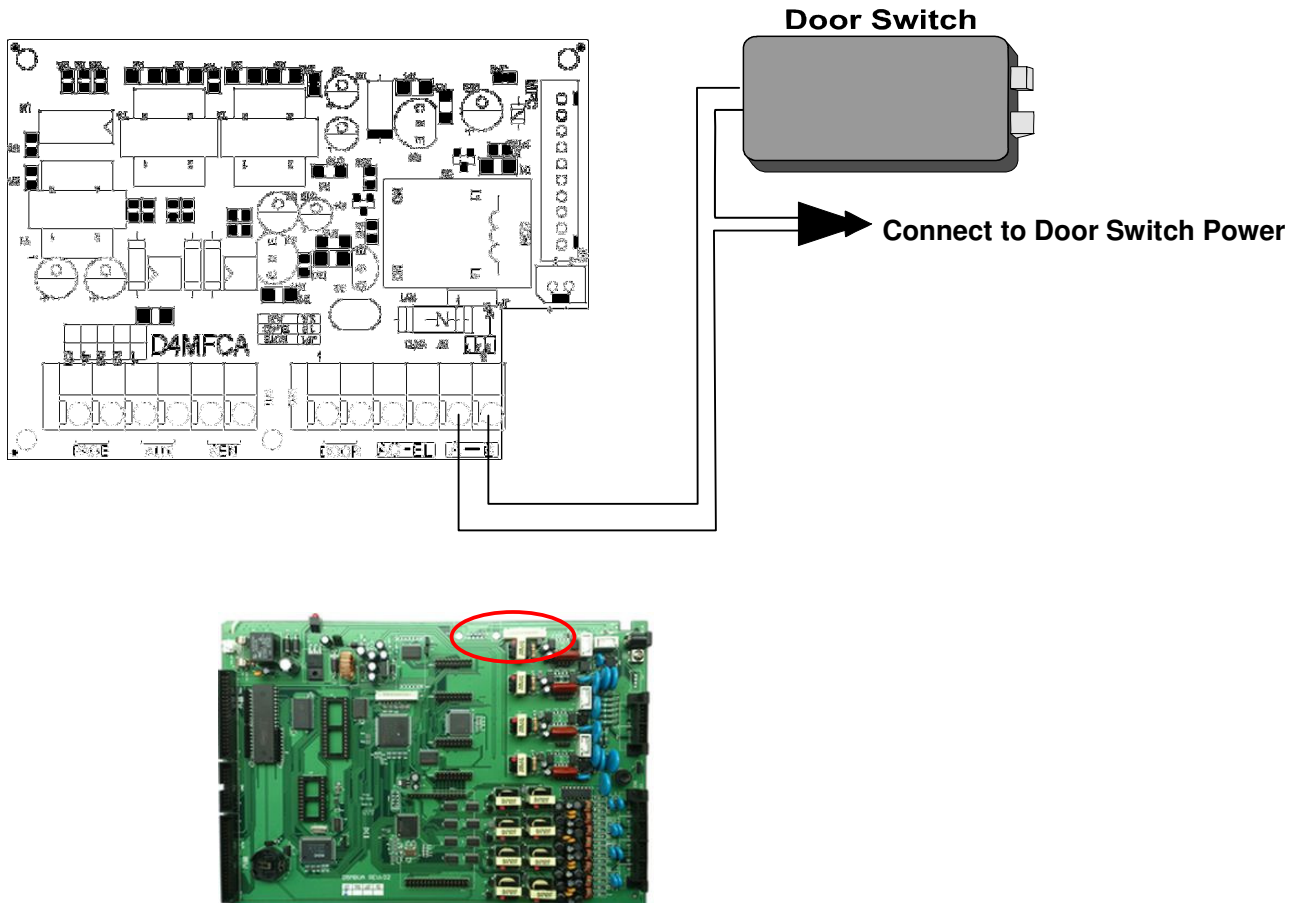


Figure 19: Door switch installation

## 5.9 External music installation

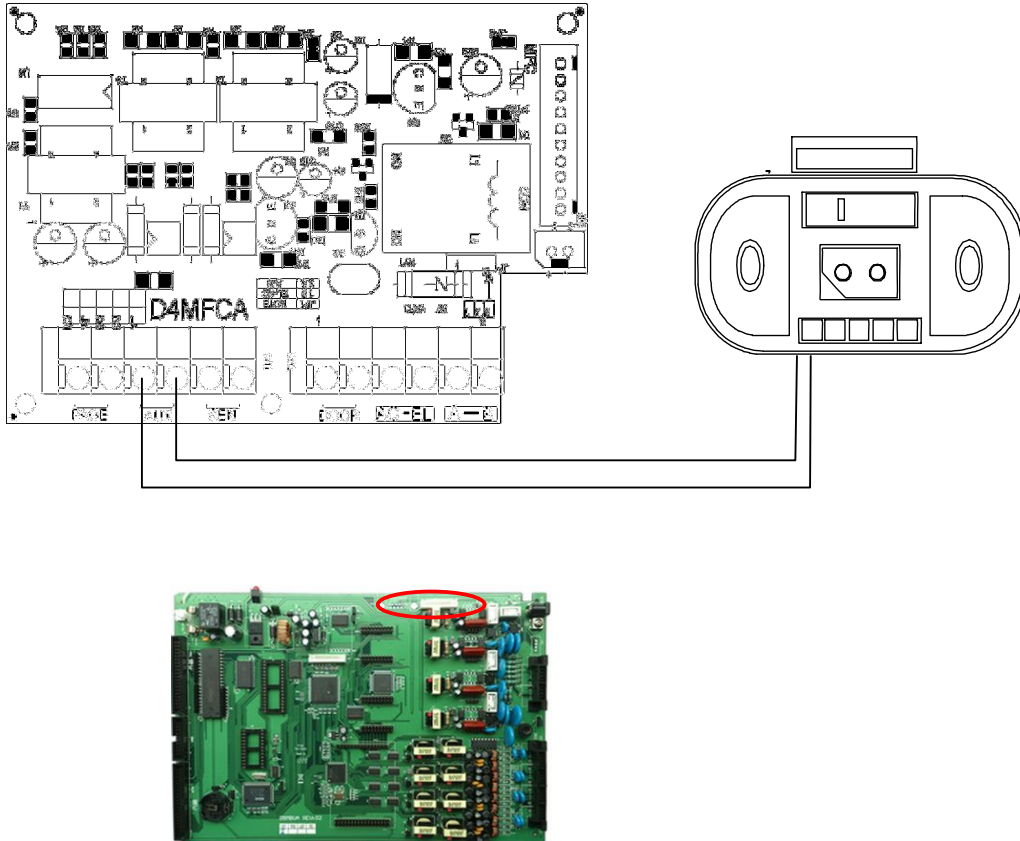


Figure 20: External music installation