

# **4-Wire Video Intercom System**

# **Technical manual**

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## 1. General

### 1.1 System Features

The DP intercom system is a 4-wire intercom system designed for villa or single family residences. It's main features are:

- 4 wire connection from Outdoor Station and Monitor.
- Electronic Lock connect to Door Station directly.
- Two Outdoor Station supported by default(for 7 inch Monitors).
- Extending 4 Outdoor Station or CCTV With MDS(Multi Door station Switch) unit.
- Direct connect up to 5 Monitors in one house.
- Direct TV connection.
- Monitor remote control function.
- Stair Light control or additional lock control by RLC unit.
- Telephone or mobile phone control by TCI unit.
- Internet connection with IPM unit.
- Long distance wiring and achieve Star Topology with BDU unit.
- Any Outdoor Station can match any Monitor of DP series product.

### 1.2 Monitor features

3.5 / 4 / 5 / 5.6 / 7 inch color LCD screen or 4 inch CRT monitor

- Touch screen (optional)
- Full screen digital calendar
- Picture Memory (optional)
- SD card (optional) including video record, MP3 music play back and photo play back (digital photoframe) function
- Multiple chord ring tones

### 1.3 Door station features

CMOS / CCD camera Door station

- 12V DC output for direct electronic lock connection
- Light LED or infrared LED for night-view
- Back light call button
- Back light name plate (for specific model only)
- Access control ID card function (for specific model only)
- Rain cover (optional)
- Camera angle adjustable (for specific model only)

### 1.4 Basic Structure · Without Addition Parts

#### 1.4.1 1 to 1 structure

This is the most common way to use the DP system, it includes a Outdoor Station, a Monitor and a adapter.  $AC \sim$ 



#### 1.4.2 2 to 1 structure

Use the built in two way connector to extend 2 Outdoor Stations.



Figure 1.2

#### 1.4.3 1 to N structure

Extend Multi Monitors directly(Max.5 Monitors).



#### 1.4.4 2 to N structure

Use the built-in two way connector to extend 2 Outdoor Stations and connect Multi Monitors directly(Max.5 Monitors).



#### 1.4.5 CCTV camera connection

Use the built in two way connector to extend a CCTV camera directly.



#### **1.4.6 Television connection**

Connect television to the Monitor directly, video can be shifted and display on the television.



### 1.5 Advanced Structure · With Additional Parts

#### 1.5.1 MDS unit connection

Using the MDS (Multi Doorstation Switch) unit to extend 4 Door stations or CCTV cameras.



#### 1.5.2 RLC unit connection

Using the RLC (Lamp/Lock control) unit to control a lamp or an additional electronic lock.





#### 1.5.3 BDU unit connection

Using the BDU (Signal Repeater) unit to extend the distance between Door station and Monitor, or to carry out a star structure connection.





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### 2.1 Basic 1 to 1 kit connection

The most common way to use the DP system in villa house is one Doorstation connect with one Monitor. 4 wires (with color Red, White, Yellow and Black) will be used to connect the Doorstation and Monitor, the definition of these wires are:

- **1R** (Red): Power positive. +12V present when Door Station calling or being monitored.
- **2W** (White): Power negative (Ground).
- **3Y** (Yellow): Image signal (Video signal).
- 4B (Black): Talk and control signal (Audio signal).

It's recommended to use RVVP 4x0.5 mm<sup>2</sup> Shielded Cable. And when distance is over 30m, we suggest to use additional co-axle cable SYV- 75-3 (RG-59) connect 3Y and 2W pin.



Figure 2.1

**[1]** Power supply for the lock. This adapter is not included in our product, please purchase the appropriate adapter authorized by the electronic lock.

[2] Relay Contact for lock control. 3 · Normally Opened Terminal, 2 · Common Terminal, 1 - Normally Closed Terminal.

[3] Electronic Lock. See section ??? for detail lock connection information.

- [4] Please connect the wire firmly, iro n welding is recommended.
- [5] RVVP cable. See section ??? for detail information
- [6] Shielded layer of the RVVP Cable.

[7] JP\_VD jumper. To adjust the video impedance; keep the jumper on the last Monitor and remove all on other Monitors.

When only one Monitor installed, keep the jumper (as in this case). Jumper on the position by default.

**[8]** JP\_LK jumper for lock power control. Keep the jumper when using an outer power supply for the lock(as it is in this case), remove the jumper when using the power from the Doorstation. Jumper on the position by default.

[9] JS\_OS1: Connect to first Doorstation.

 $\ensuremath{\left[10\right]}$  JS\_OS2: Connect to second Doorstation / CCTV camera.

[11] JS\_AP: Connect to Audio Phone (if only)

 $\left[ 12\right]$  Connect to the Slave Monitor when multi Monitors installed.

**[13]** Adapter: Power supply for the Monitor and Doorstation. 16V DC, 800mA output.

### 2.2 **Dual Doorstation Connection**

All most all the Monitors of DP system have been equipped with a built -in Dual Doorstation connect port, which allows user to connect 2 Doorstation(or one Doorstation plus one CCTV camera) directly. When Monitor execute unlock operation, only the lock which is connect to the calling / monitoring Doorstation will be unlocked.



[1] The first Doorstation connect to the JS\_OS1 port.

[2] The second Doorstation connect to the JS\_OS2 port.

[3] The electronic lock used for each Doorstation must be of the same safety type (there are 2 different safety types: Power-on-to-Unlock or Power-off-to Unlock).

[4] JP\_VD jumper. To adjust the video impedance; keep the jumper on the last Monitor and remove all on other Monitors. When only one Monitor installed, keep the jumper (as in this case). Jumper on the position by default.

**[5]** JP\_LK jumper for lock power control. Keep the jumper when using an outer power supply for the lock(as it is in this case), remove the jumper when using the power from the Doorstation. Jumper on the position by default.

**[6]** Monitor settings: To enable 2 Doorst ation, the <u>1/2 Camera</u> item should be set to 2 on the Monitor. On the Monitor, go to <u>Setup</u>  $\cdots$  <u>Advanced Set...</u>  $\cdots$  <u>1/2 Camera</u> and change the value to <u>2</u>. To monitor both Doorstation, press the MONITOR Button in standby to watch the view of 1# Doorstation, press again to switch to 2# Doorstation.

### 2.3 Extend CCTV Camera

A CCTV camera can be connected to one of the built-in 2 way port of the Monitor. Video can be switched between Doorstation and CCTV camera on the Monitor just as switching video from 2 Doorstations.



CCTV Video Cable

Figure 2.3

**[1]** The power supply for the CCTV camera is not included in the DP system, please use appropriate power supply which is authorized by the CCTV camera.

[2] Please connect the wire firmly, iron welding is recommended.

[3] Connect the Doorstation to the JS\_OS1 port.

[4] Connect the CCTV camera to the JS\_OS2 port.

**[5]** Monitor settings: To enable 2 Doorst ation, the <u>1/2 Camera</u> item should be set to 2 on the Monitor. On the Monitor, go to <u>Setup</u>  $\cdots$  <u>Advanced Set...</u>  $\cdots$  <u>1/2 Camera</u> and change the value to <u>2</u>.

### 2.4 Extend Audio Phone

Audio Phones can be connected to the Monitor directly. The Audio Phone can answer the calling from Doorstation and unlock the door. When visitors call from the Doorstation, Monitor(s) and Audio Phone(s) will ring at the same time, and any of them answer the call, the other will stop ringing.



**[1]** The power supply for the CCTV camera is not included in the DP system, please use appropriate power supply which is authorized by the CCTV camera.

[2] Please connect the wire firmly, iron welding is recommended.

- [3] Connect the Doorstation to the JS\_OS1 port.
- [4] RVV 3 X 0.5 mm2 Cable, less than 50 meters.
- [5] Audio Phone, no additional power supply needed.

### 2.5 Extend One Monitor

Extended Monitors can be connected to the Monitor directly. When visitors call from the Doorstation, all Monitors will ring at the same time, and any of them answer the call, the other will stop ringing.



Figure 2.5

[1] No special setting needed when extending Monitors.
[2] Remove the JP\_VD jumper on 1# Monitor, keep the JP\_VD jumper on 2# Monitor, as the 2# Monitor is the last one.

[3] All Monitors should have the same setting of JP\_LK jumper.

[4] MUST connect the JS\_VP to the JS\_OS1 port of the 2 # Monitor, DO NOT connect to JS\_OS2.

### 2.6 Extend Multiple Monitors

Extended Monitors (Maximum 5 Monitors plus one Audio Phone) can be connected to the Monitor directly. When visitors call from the Doorstation, all Monitors and Audio Phone will ring at the same time, and any of them answer the call, the other will stop ringing.

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[1] For all the extended Monitors(not include the 1# Monitor), the <u>1/2 Camera</u> item should be set to <u>1</u> (despite single or Multiple Doorstations are installed). On the Monitor, go to <u>Setup</u> --> <u>Advanced Set...</u> --> <u>1/2</u> <u>Camera</u> and change the value to <u>2</u>..

[2] Remove the JP\_VD jamer on all Monitors except the last one.

 $\circlet{[3]}$  All Monitors should have the same setting of JP\_LK jumper.

[4] All the extended Monitors MUST be connected to the JS\_VP of the 1# Monitor in parallel. DO NOT connect extended Monitor to the JS\_VP port of any other Monitor except the 1# Monitor.

[5] Use JS\_OS1 of all each extended Monitor to connect to the JS\_VP of 1# Monitor, DO NOT use JS\_OS2.

### 2.7 TV and Remote

Television can be connect to the Monitor directly; when the visitor calls from the Doorstation, press the AV Button on the TV remote to switch the video from the Doorstation. A Remote can be added to the Monitor, and be used to control the Monitor, such as unlock the door.



Figure 2.7

[1] Remote Button definition: [A] Button - In standby, to turn on screen and monitor the Doorstation, the same as MONITOR Button on Monitor. [B] Button - For color memory function, use this button to start playback operation, and to view next image in playback state. [C] Button - For color memory function, to record an image when Monitor screen is turned on. However, in playback state, use this button to view last image. [D] Button - Use this button to open the door when Monitor screen is turned on in calling or monitoring. However, in playback state, use this button to delete.

[2] By default, the Monitor is not equipped with the remote function, this function should be customized in the purchasing order. Settings need to be made on the Monitor

to enable the remote control function: On the Monitor, go to <u>Setup</u>  $\cdots$  <u>Advanced Set...</u>  $\rightarrow$  <u>Other Device Set...</u>, to add the Remote, touch the <u>Add</u> <u>Remote</u> item, then press any of the [A]/[B]/[C]/[D] Button on the Remote. A 'Di~' sound will be heared if the Remote is added successfully.

[3] Connect the video cable core to 3Y and the shielded layer to 2W.

[4] The Television can be connect to any of Monitor if multiple Monitors are installed.

[5] Connect the video cable to the VIDEO terminal of the Televison.

**[6]** Press the AV Button on the TV remote to switch the picture from TV to Doorstation.

## 3. Accesories and expansions

### 3.1 DP-MDS Multi Doorstation Swith

The DP-MDS unit is used to extended multiple Doorstations or CCTV cameras (4 input maximum, and at least one Doorstation must be installed).



[1] Doorstation or CCTV Camera can be connected to any of the DS1 / DS2 / DS3 / DS4 port. At least one Doorstation should be connected.

[2] There is only one DP·MDS unit can be installed in a system, DO NOT connect multiple DP -MDS in one system.

[3] SET switch, for Doorstation or CCTV total number selection; if connect 2 Doorstations(and / or Cameras), set to left position; set to middle position for 3 Doorstations(and / or Camras); set to right position for 4 Doorstations( and / or Cameras)

Figure 3.1

[4] The JW\_VP must connect to the 1# Monitor(if multiple Monitors installed), refer to <u>"2.6 Extend Multiple Monitors"</u> section for connection detail).

**[5]** When using DP-MDS in the system, the JS\_OS2 port become invalid, so DO NOT connect any Doorstation or CCTV camera to JS\_OS2 port.

**[6]** When using a DP-MDS unit, the <u>1/2 Camera</u> item should be set to <u>1</u> on all the Monitors(include 1# Monitor). On the Monitor, go to <u>Setup</u>  $\cdots$  <u>Advanced Set...</u>  $\cdots$  <u>1/2 Camera</u> and change the value to <u>1</u>.

### 3.2 DPA-RLC Lock/Lamp Control Unit

The DPA-RLC unit can be used to control lamp (for example, the staircase light) or to control a additional electronic lock(for example, garage door lock).

When control a lamp, there are 2 different control modes can be used, Automatic mode and Manual mode.

- Automatic Mode: The lamp will be automatically turned on when visitors press Call button • on the Doorstation, and it will be turned off automatically after a give time(called Light -on time, can be set by the DIP switches for 1, 3, 5 or 10 minutes)
- Manual Mode: The lamp will be turned on and off manually on the screen of the Monitor or by the external button.

#### 3.2.1 DPA-RLC Terminal descriptions





Figure 3.2

[1] DIP switches for lamp control or unlock time settings(see detail information later this section).

[2] Relay contact terminal, connect to lock or lamp. NO - Normally open terminal; NC - Normally closed terminal; COM · Common terminal.

[3] External control button port.

[4] Monitor connection port, connect to the JS\_AP port of Monitor. 4B · data transmition line, connect to 4B pin of Monitor; **GND** - power ground, connect to 2W pin of Monitor; 12V - DC 12V power, connect to +12V of Monitor.

[5] LED indicator, lights in red when power is on, blink in red when the unit is acting.





Figure 3.3

DIN nail mounting



## 3.2.2 Use DPA-RLC to control lamps



**[1]** Only the Monitors with a touch screen can support DPA-RLC unit, and settings need to be made to enable the RLC function.

[2] Connecting RLC unit will not afffect the jumper settings.

[3] Connect the RLC unit to the JS\_AP port of Monitor. Note that Audio Phone can not be supported when using RLC.

[4] DIP switches for Lock/Lamp control settings.

**[5]** Connect the lamp to **NO** and **COM** terminal, this lamp can be any type of AC light(the power rating must less then 700 w), such as a light tube.

#### **DIP settings**

- Bit-1: Lamp / Lock select. set to OFF for lamp control; set to ON for lock control.
- Bit-2: Control mode select. set to **ON** to select Manual Mode, set to **OFF** to select automatic Mode.
- Bit-3 and Bit-4: Light-on time select, see **Table3-1** on the right.

DIP state	Function descriptions
ON	Automatic Mode;
	Light-on time=10 min;
1 2 3 4	Default setting
ON	Automatic Mode;
1 2 3 4	Light-on time=3 min;
ON	Automatic Mode;
1 2 3 4	Light-on time=5 min;
ON     1 2 3 4	Automatic Mode; Light-on time=1 min;
ON	Manual Mode;
1 2 3 4	Lamp manually control by button or Monitor

Table 3-1

[6] The button connection is Non-polarity.

[7] Both button or switch can be connect to the BT port. Note that if using a switch, the Light -on timing will only work when the switch is turned off, when the switch is turn on, the lamp will always be on.

#### Monitor settings and operations

When the monitor is in standby, enter <u>Main</u>--> <u>setup</u>--> <u>Advanced Set</u>--> input password('2008') --> <u>Other Device Set</u>, to open RLC setting page:



[1] <u>RLC Lock</u>: If RLC unit is used to control lock, this item must be set to ON, otherwise the second lock icon on the screen will not show up.

[2] <u>RLC Lamp</u>: If RLC unit is used to control lamp, this item must be set to on, to show the lamp icon in the Main page.

[3] <u>RLC Lamp Call Control</u>: There are 3 different settings for this item: **OFF** · Disable the Call Control function. **ON(always)** · Enable the Call Control function, the lamp will be turned on whenever the call button is pressed on the outdoor station. **ON(night)** · Enable the Call Control function, the lamp will be turned on only when call button is pressed at night time(from 6 P.M to 6 A.M next day).



## 3.2.3 Use DPA-RLC to control Lock



**[1]** Only the Monitors with a touch screen can support DPA-RLC unit, and settings need to be made to enable the RLC function.

[2] Connecting RLC unit will not affect the jumper settings.

[3] Connect the RLC unit to the JS\_AP port of Monitor. Note that Audio Phone can not be supported when using RLC.

[4] DIP switches for Lock/Lamp control settings.

#### **DIP settings**

- Bit-1: Lamp / Lock select. set to OFF for lamp control; set to ON for lock control.
- Bit-2: Function reserved.
- Bit-3 and Bit-4: Light-on time select, see **Table 3-2** on the right.



Table 3.2

[5] The button connection is Non-polarity.

**[6]** External button can be connect to the BT port. DO NOT connect a switch to the BT port.

[7] When connecting a lock with the safety type of Poweroff-to-Unlock, connect to the **NC** and **COM** port.

[8] When connecting a lock with the safety type of Poweron to Unlock, connect to the **NO** and **COM** port.

#### Monitor settings and operations

When the monitor is in standby, enter <u>Main</u>--> <u>setup</u>--> <u>Advanced Set</u>--> input password('2008') --> <u>Other Device Set</u>, to open RLC setting page:



must be set to ON, otherwise the second lock icon on the screen will not show up.



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### 3.3 DPA-BDU Branch Distributor Unit

The BDU unit is design for DP video door phone system, for the purpose of video repeat and video signal impedance matching. There are two models of BDU, the BDU and the BDU -S. The BDU-S is a simplified version of BDU witch have no 1R power recover function.

- Distribute the video signal in star topology.
- Multiple BDUs can be used when multiple distributor nodes need to be applied.
- Work as a signal repeater in a long wiring distance system(up to 100 meters).
- Work as a power recover in a long wiring distance system. **1R power recover**: when the distance from door station to the monitor is over 100 meters, the power voltage will become lower than the necessary working voltage, in this case, the 1R power recover can be used. An external power supply is needed to applied this function.

### 3.3.1 DPA-BDU terminal descriptions



- CN101: DC power input; input 15~18V DC only when the 1R power recover function is needed, no need to input power in other usages.
- SET -3Y: Video impedance setting; 1 When multiple BDU units are installed in the system, all the BDU units must be set to HI except the last one(which is installed at the end of the line). 2 For the last BDU unit(when there is only one BDU installed, the settings are the same as the last unit), it should be set to 75R or 100R according the follow conditions: when the distance from the door station to the BDU is over 50 meters, set to 100R, other wise set to 75R.
- SET-1R: 1R power recover setting; 1 when use the 1R power recover function, set to EXT , and external power must be input into the CN101 port. 2 When the 1R power recover function is not used, set to INT.
- JW/OS: Input port; Connect to the door station (when the 1R power recover function is not used, otherwise, connect the door station to the JW/OS(PS) port)
- **JW/OS(PS):** Input port; Connect this port to the door station **only** when the 1R power recover function is used.
- JW/VP1/2/3: Output port; connect to indoor monitors or next BDU unit.

#### 3.3.2 Use DPA-BDU to extend distance

There are 2 different ways to use the DPA-BDU unit to extend wiring distance from Doorstation to Monitor.

- Direct Extend: Connect the DPA-BDU directly between Doorstation and Monitor(s). Maximum distance 100 meters.
- 1R Power Recover: Extend distance over 100 meters, up to 200 meter from Doorstation to Monitor.(Not available for DPA-BDU-S).



[1] RVVP-75-3(RG-59) video cable, connect the video core to 3Y and connect the shielded layer to 2W.

[2] Connect the Doorstation to the JW/OS port when using Direct Extend, DO NOT connect to JW/OS(PS).

[3] DO NOT connect any power supply to the CN101 port.

 $\cite{[4]}$  Set the SET-3Y to 75R position (middle position) when using Direct Extend.

 $\ensuremath{\left[ 5\right] }$  Set the SET-1R to INT position (left position) when using Direct Extend.

[6] Connect the JW/VP 1/2/3 to the 1#/2#/3# Monitor.

[7] No special settings needed on Monitors suing BDU unit.

**[8]** Multiple Monitors can be supported when using the BDU unit, refer to <u>2.6 Extend Multiple Monitors</u> section for connection detail).

[9] The JS\_OS2 can be connect to the second Doorstation, refer to <u>2.2 Dual Doorstation Connection</u> section for connection detail).

[10] External power supply, 16V 800mA.

**[11]** Set the SET-3Y to 100R position(right position) when using 1R Power Recover(over 50 meters).

**[12]** Set the SET-1R to EXT position(middle position)

#### 3.3.3 Use DPA-BDU to apply star connection topology

Star topology can be applied using one DPA-BDU unit or multiple DPA-BDU units, to meet the needs of different house structures. Maximum 4 DPA-BDU units can be used in one system.



[1] When the distance between two connect port is less than 30 meters, use RVVP  $4*0.5 \text{ mm}^2$  shielded cable, when the distance is over 30 meters, use RVVP -75-3(RG-59) video cable plus a RVVP  $3*0.5\text{mm}^2$ .

[2] Connect the Doorstation to the JW/OS port.

[3]DO NOT connect any power supply to all 1/2/3/4# BDUs.

[4] Set the SET-3Y to HI except the last DPA-BDU.(4# BDU in this case).

**[5]** The SET-1R switch of all the DPA-BDU units must be set to INT (left position).

[6] Each JW/VP port can be connected either Monitor or next DPA-BDU unit.

[7] The JP\_LK setting should according to ???. Keep the JP\_VD jumper on all the Monitors;

**[8]** Multiple Monitors can be connected, and the distance from the farest Monitor to the connected DPA-BDU should be less than 50 meters. (refer to <u>2.6 Extend Multiple Monitors</u> section for connection detail).

[9] Audio phones can be extended, (refer to <u>2.4 Extend</u> <u>Audio Phone</u> section for connection detail)

**[10]** Doorstation can be connected to the JS\_OS2 port of each the 1~9# Monitors, (refer to <u>2.2 Dual Doorstation</u> <u>Connection</u> section for connection detail).

[11] The SET -3Y of the last DPA-BDU must be set to 75R.

### 3.4 Power Supply Units

There are many kinds of power supply can be used in DP system to meet different needs.

- AC adapter, for 1 Doorstation 1 Monitor kit usage.(default product with kits)
- PS4, for 1 Doorstation 1 Monitor kit usage.
- PS5, support up to 5 Monitors.
- PS6, support???who knows.

#### 3.4.1 AC Adapter



- Switching Power Supply for villa kits
- Input: 100~240V 50~60Hz 0.5A
- Output: 16V-800mA 12.8VA
- Dimensions:
- Weight:

#### 3.4.2 PS4 Power Supply



Figure 3.10



- Switching Power Supply
- Input: 100~240V 50~60Hz 0.5A
- Output: 16V-1.2A
- Dimensions:
  - Weight:

#### 3.4.3 PS5 Power Supply



- Switching Power Supply, Support up to 4 Monitors
- Input: 85~260V 50~60Hz
- Output: 21.5~26.5V DC 3.2A
- L(AC), N(AC): AC input
- ●● 上 : Earth Ground
- V-, V+: DC output
- VADJ: Voltage Adjustment
- Dimensions: 159 \* 153 \* 38 mm
- Weight:

## 4. Cable Usage

### 4.1 Distances and Cables

Distance can be different when using different find of cable or connection method. Please use the cables recommended here to insure the system work correctly.





Figure 4.1



#### Table 4.1

### 4.2 Cable Connection

Connect the cable to the 4 or 3 pin connector, the joint should be weldded with an iron.

1. Connect RVVP 4 cable



2. Connect RVV 3 + SYV cable



3. Connect RVV 3 cable



- [1] Connect the shielded layer of the cable to the 2W wire.
- [2] All the jointers should be welded with an iron.

# 5. Trouble Shooting

### 5.1 Trouble Shooting

Problem description	Solution
No Power	A-Check the 2 pin power connection B-Check power supply voltage, this should be 16V DC
No Picture	Check the cable connections
Picture too dark or too bright	Check the brightness adjustment
Image is not clear	<ul> <li>A -Check that all the plastics have been removed from door station camera lens.</li> <li>B - Check that all the plastics have been removed from monitor.</li> <li>C -Check for loose connectors.</li> <li>D -Make sure all wiring joints are soldered and taped up.</li> </ul>
No Sound	Check the sound volume adjustment
Volume too low	Adjust the volume
Picture not stable and moves along	Check the wiring inputs and outputs
Can't see the installed 2nd camera	Check the number of cameras in the setup is correct
Cannot see outdoor through the door station	Make sure 3Y port is connected