

<b>Document Title</b>	MDVR Hardware User Manual
<b>Version</b>	1.06
<b>Date</b>	2016-3-7
<b>Status</b>	Release
<b>Document Control ID</b>	

## Contents

1. Revision History .....	3
2. Introduction.....	4
2.1. Reference.....	4
2.2. Terms and Abbreviations.....	4
3. Product Overview .....	5
3.1. Check Part List.....	5
3.2. Parts List.....	5
3.3. MDVR Front Panel.....	6
3.4. MDVR Rear Panel .....	7
3.5. Power and ignition Port .....	7
3.6. 20 PIN Port User Port.....	7
3.7. Video interface .....	9
4. User guide .....	10
4.1. Pull out hard-disk box .....	10
4.2. Open the SIM plate.....	10
4.3. Install SIM card .....	
4.4. Install SD CARD.....	11
4.5. Install hard disk .....	12
4.6. Hard disk box install.....	12
4.7. Install antenna.....	12
4.8. Power and ignition connection .....	13
4.9. Connection ignition signal .....	14
4.10. Video out connection .....	14
4.11. Digital Input connection .....	14
4.12. Digital Output connection .....	15
4.13. Extended IRDA connection .....	17
4.14. RS232 Uart Connection.....	17
4.15. RS485.....	17

## Table Index

Table 1 MDVR Protocol Reference .....	4
Table 2 Terms and Abbreviations .....	4
Table 3 Part List .....	5
Table 4 MDVR 20IN Definition Table .....	
Table 5 Electric Characteristic of Ignition.....	14
Table 6 IN1-IN3 Electrical Characteristic .....	14
Table 7 IN4-IN6 Electrical Characteristic .....	14
Table 8 Digital output Electrical Characteristic .....	16

## Figure Index

Figure 1 MDVR Appearance .....	5
Figure 2 MDVR Front Panel .....	6
Figure 3 MDVR Rear Panel.....	7
Figure 4 Power and Ignition port definition .....	7
Figure 5 MDVR 20IN Definition.....	8
Figure 6 Video/Audio Out Definition.....	9
Figure 7 Remove hard disk box .....	10
Figure 8 SIM card plate.....	11
Figure 9 SIM Card Installation.....	
Figure 10 SD Installation.....	11
Figure 11 Open the hard disk case .....	12
Figure 12 Place the hard disk .....	
Figure 13 Fix the hard disk .....	
Figure 14 Connect Hard disk.....	
Figure 15 Antenna instillation .....	13
Figure 16 Typical ignition connection .....	14
Figure 17 Positive Trigger Typical Connection .....	15
Figure 18 Digital Output Internal Circuit.....	16
Figure 19 Relay Typical Connection .....	16
Figure 20 LED Typical Connection.....	16
Figure 21 IRDA Typical Connection .....	17

## 1. Revision History

Revision	Date	Author	Description of change
1.00	2015-9-23	owen.feng	Initial version
1.01	2015-9-26	zhao.jing	Change some picture
1.02	2015-9-29	zhao.jing	Change some picture
1.03	2015-10-10	owen.feng	Change the note of company
1.04	2015-10-28	owen.feng	Change the 20pin notes
1.05	2016-3-3	Owen.feng	Change the back-end picture
1.06	2016-3-6	Owen.feng	Change the error to pin def

## 2. Introduction

MDVR is a specially designed analog HD DVR monitor for in-car AHD720P. MDVR built high-performance image processing chip, combined with H.264 video codec technology, the analog HD video recording, storage and playback. Built- MDVR 3G / 4G / WIFI module, with pass legislation feature-rich control protocol to achieve the remote monitoring of vehicle information, remote analysis and processing. MR9704 supports intelligent power management, automatic identification of supply categories, low power automatically shut down, turn off the system after a low power consumption.

### 2.1. Reference

Table 1 MDVR Protocol Reference

SN	Document name	Remark
[1]	MDVR @Track Air Interface Protocol	The air protocol interface between MDVR and backend server.

### 2.2. Terms and Abbreviations

Table 2 Terms and Abbreviations

Abbreviation	Description
AHD	Analog high definition
PAL	Phase Alternating Line
NTSC	the National Television System Committee
GPIO	General purpose Input Output
AGND	Analog Ground
AIN	Analog Input
DIN	Digital Input
DOUT	Digital Output
GND	Ground
MIC	Microphone
RXD	Receive Data
TXD	Transmit Data
SPKN	Speaker Negative
SPKP	Speaker Positive

### 3. Product Overview

#### 3.1. Check Part List


Before starting, check all the following items have been included with your MDVR. If anything is missing, please contact your supplier.





Figure 1 MDVR Appearance

#### 3.2. Parts List

Table 3 Part List

Name	Picture
MDVR	

Power Line	
20PIN User Cable	
Camera Cable	
Remoter	

### 3.3. MDVR Front Panel

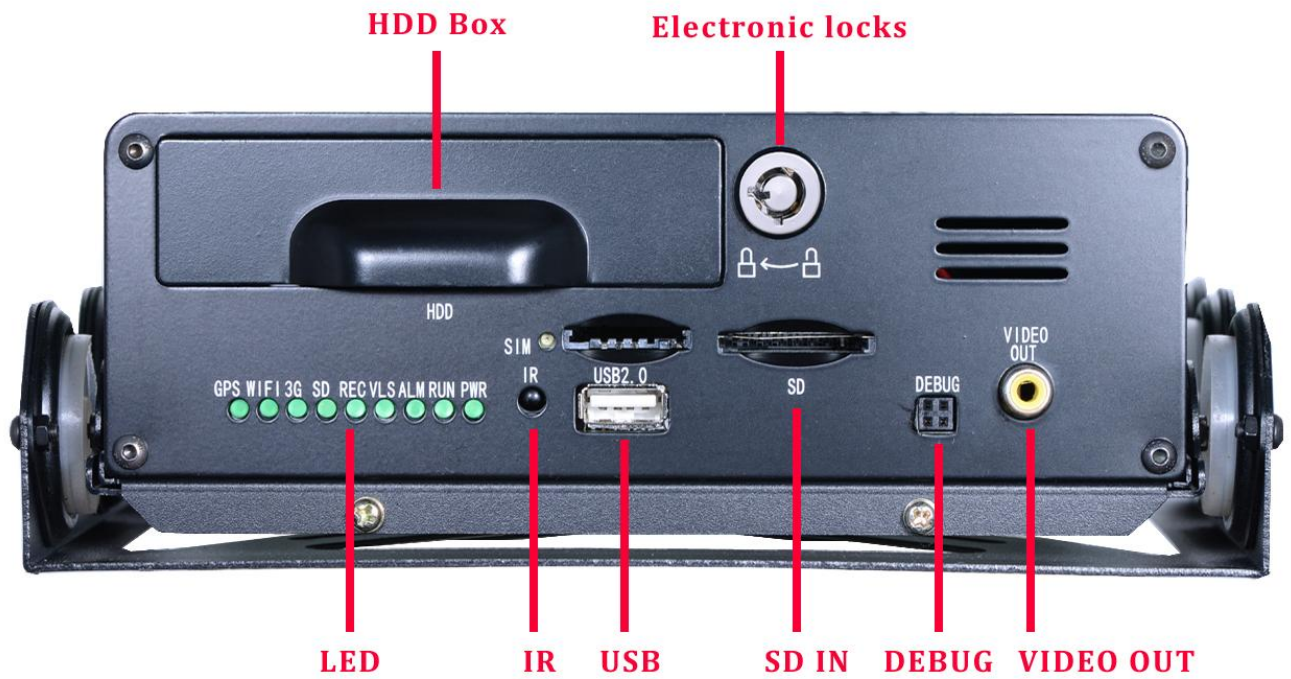
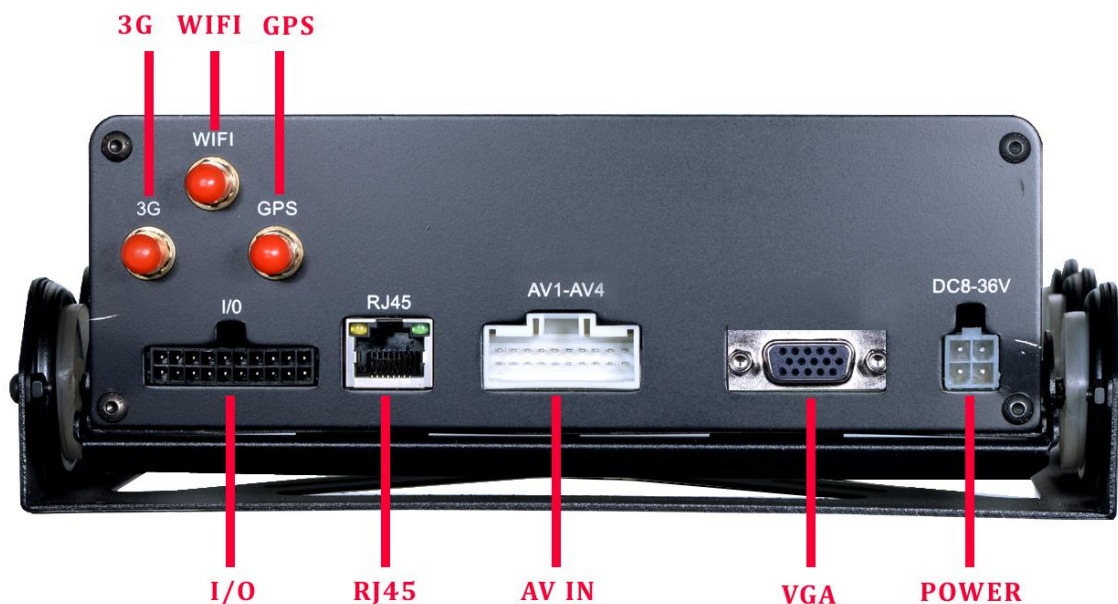


Figure 2 MDVR Front Panel

### 3.4. MDVR Rear Panel



**Figure 3 MDVR Rear Panel**

### 3.5. Power and ignition Port

MDVR has a six-pin power port at the rear panel. The six-pin is defined as following.

(8~36V)	(8~36V)	Ignition
GND	GND	GND

**Figure 4 Power and Ignition port definition**

### 3.6. 20 PIN Port User Port

MDVR has a 20-pin user port, it power output/GPIO/RS232/RS485/1WIRE and IRDA. The 20-pin port is defined as following.



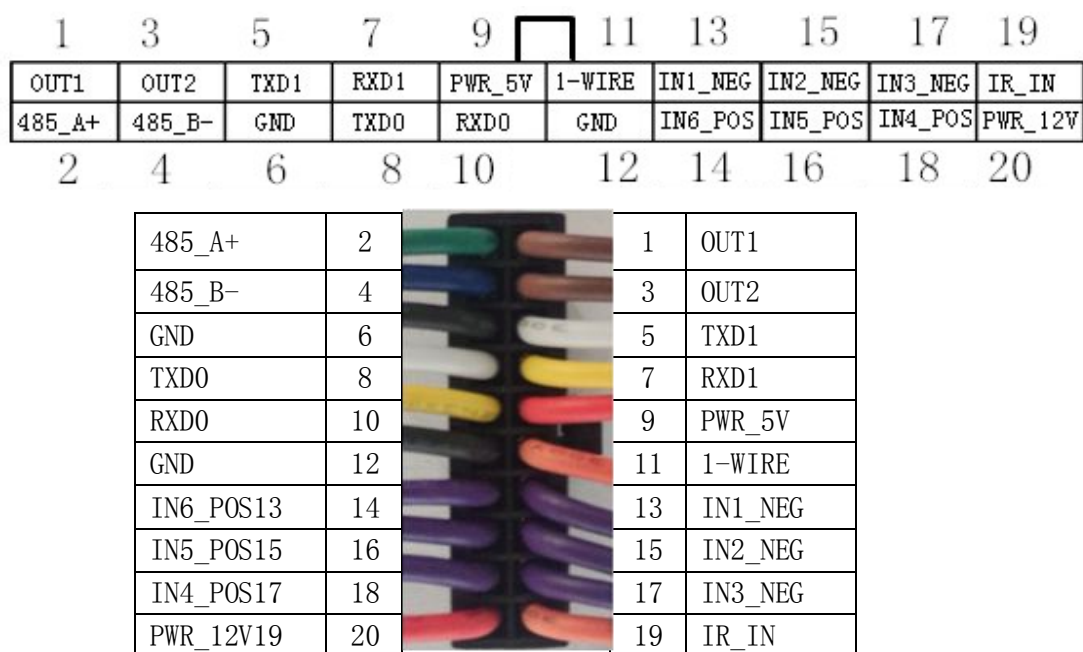


Figure 5 MDVR 20IN Definition

No	Name	Description	Note
2	485_A+	RS485 A+	RS485
4	485_B-	RS485 B-	RS485
6	GND	Ground	Power ground
8	TXD0	RS232 TXD0	RS232 output
10	RXD0	RS232 RXD0	RS232 input
12	GND	Ground	Power ground
14	IN6_POS	Positive Trigger Input(NO 6)	Over voltage protection internally
16	IN5_POS	Positive Trigger Input(NO 5)	Over voltage protection internally
18	IN4_POS	Positive Trigger Input(NO 4)	Over voltage protection internally
20	PWR_12V	Power output,12V,300mA	Over current protection PTC
No	Name	Description	Note
1	OUT1	Output,open drain,150mA	With internal latch circuit Over current protection
3	OUT2	Output,open drain,150mA	Over current protection
5	TXD1	RS232 TXD1	RS232 output
7	RXD1	RS232 RXD1	RS232 input
9	PWR_5V	Power output,5V,300mA	Over current protection PTC
11	1-WIRE	1-WIRTE temperature sensor	Over voltage protection internally
13	IN1_NEG	Negative Trigger Input(NO 1)	Over voltage protection internally
15	IN2_NEG	Negative Trigger Input(NO 2)	Over voltage protection internally
17	IN3_NEG	Negative Trigger Input(NO 3)	Over voltage protection internally
19	IR_IN	IRDA	Over voltage protection internally

### 3.7. Video interface

MDVR has a 20 PINS video interface. MDVR support four channels analog camera inputs. On the video line that is labeled as AV\_IN1, AV\_IN2, AV\_IN3, AV\_IN4 and AV\_OUT. The following picture is the definition of the cable.



图 1. Video/Audio IN Definition



**Figure 6 Video/Audio Out Definition**

## 4. User guide

### 4.1. Pull out hard-disk box

Inserted in the key to the annex of the keyhole in the front of panel, rotate 90 degrees clockwise. Anti clockwise the two spring disk box fixing screws, then pull out the hard-disk box by the hard disk box handle.



**Figure 7 Remove hard disk box**

### 4.2. Open the SIM plate



**Figure 8 SIM card plate**

#### 4.3. Install SD CARD

Orient the SD card so that the printed side faces down and the teeny triangle on the card points toward the open slot. Use your fingernail to gently shove the card all the way into the slot. The card makes a faint clicking sound when it is fully inserted.



**Figure 9 SD Installation**

#### 4.4. Install hard disk

Loosing the two fixing screws on the side and remove the case of hard disk box as the following figure.



**Figure 10**      **Open the hard disk case**

With the hard disk label side up,placing it on the frame, and the connection socket in the right side.Then fixed the hard disk by the four side screw.And last connect the cable with the hard disk.

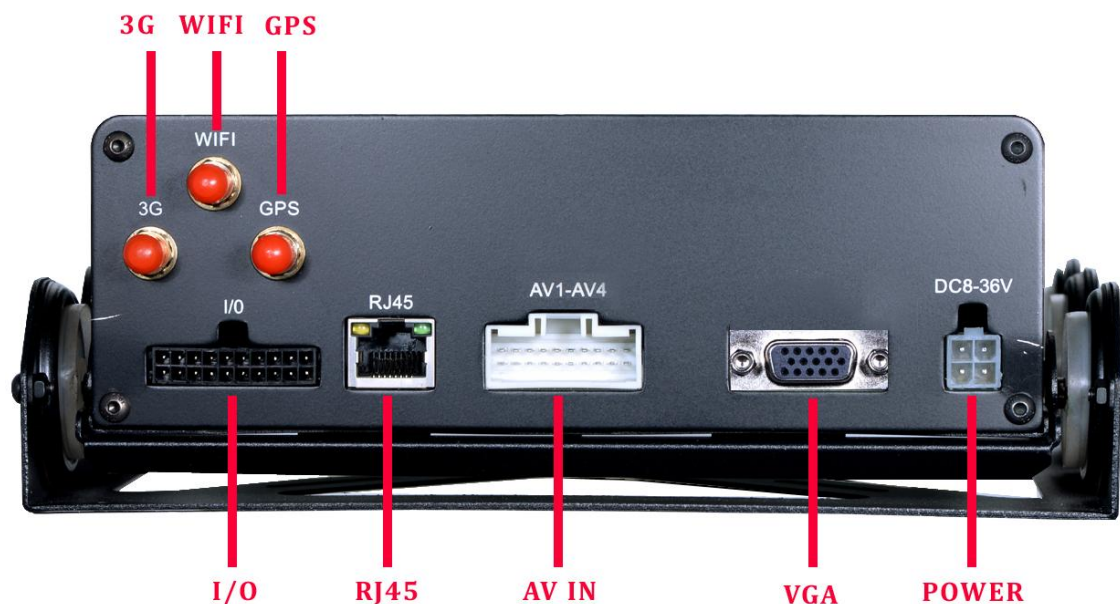
#### 4.5. Hard disk box install

After the hard disk has been installed, please make a careful examination. Then close the case and fix it.Last pull back the box and fix it and lock the box.

#### 4.6. Install antenna

There are three kinds of antenna for MR9704,such as 3G/4G wireless antenna GPS antenna and WIFI antenna the three antennas.Please refer to the silkscreen of the front

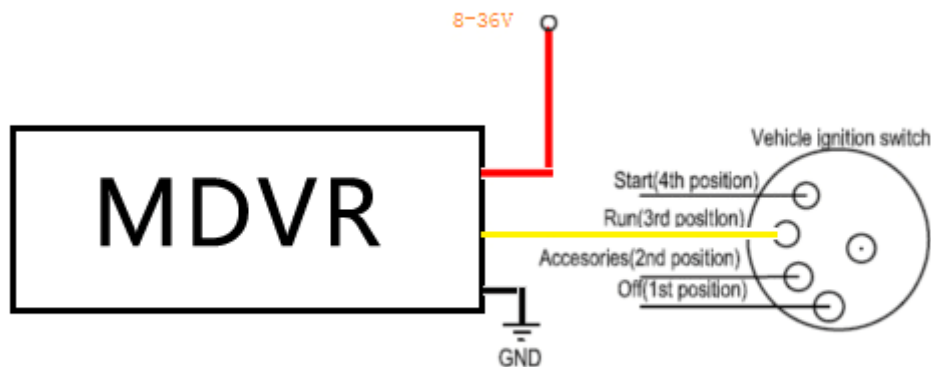
panel, connect the antenna properly.



**Figure 11 Antenna installation**

#### 4.7. Power and ignition connection

PWR (PIN12) / GND (PIN6) is the power input pin. Input voltage range of 8V to 36V. MDVR can be directly connected to 12V / 24V vehicle battery, no any external transformer is needed.



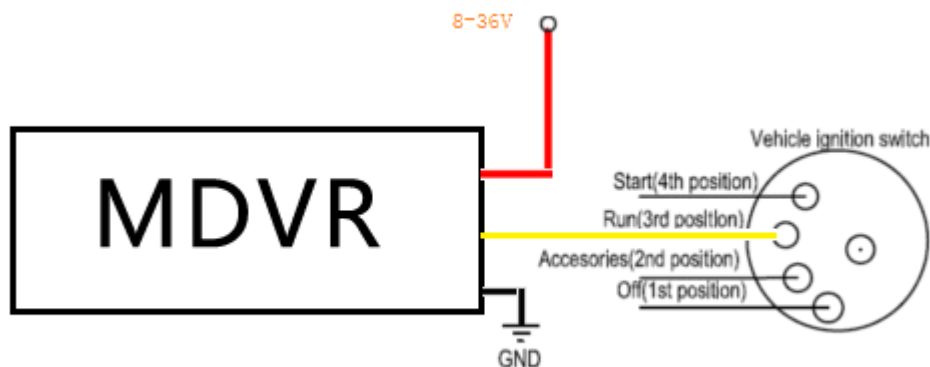
**图 2. Typical Power and ignition connection**

Note:

- 1- MDVR power off current consumption 3mA.
- 2- MDVR low voltage protection, when the voltage falls below a certain value, it will automatically shut down.
  - 12V system power voltage 7.5V voltage shutdown
  - 24V system power voltage 16.5V voltage shutdown
- 3- To protect the battery and system, battery voltage protection has a priority than ignition signal.

#### 4.8. Connection ignition signal

IGN (PIN3) pin is used to detect the ignition input. It is strongly recommended that this pin is connected to the ignition key "RUN" position terminals. Typical connection diagram below.



**Figure 12** Typical ignition connection  
Table 4 Electric Characteristic of Ignition

Logical	Electric Characteristic
Trigger	5.0V to 36V
Not Trigger	0V to 3V

Another method is: looking at vehicle's connecting box, try to find some signal such as FM radio's power which will be on when the vehicle is started, connect ignition with this signal. The time between ignition off and machine power off time can be configured.

#### 4.9. Video out connection

MDVR has two video VGA and CVBS output modes. Users according to their needs, the output switches to their needs mode via remote control or mouse.

#### 4.10. Digital Input connection

MDVR has six digital inputs, IN1-IN3 is negative trigger, IN4-IN6 is positive trigger. All the digital IO port has internal over voltage protection.

Table 5 IN1-IN3 Electrical Characteristic

Logical	Electrical Characteristic
Trigger	0V to 0.8V
Not Trigger	Float or 0.8V-36V

Table 6 IN4-IN6 Electrical Characteristic

Logical	Electrical Characteristic
---------	---------------------------

Trigger	5-36V
Not Trigger	Float or 0-5V

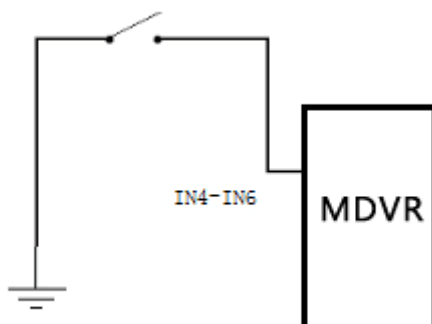


图 3. Negative Trigger Typical connection

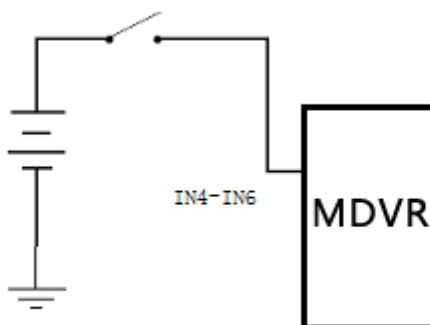
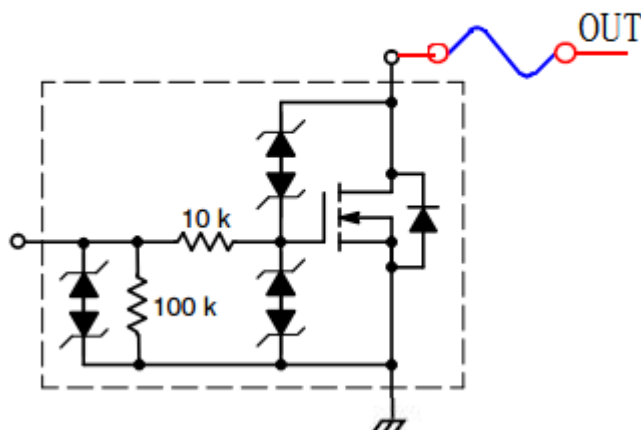


Figure 13 Positive Trigger Typical Connection

#### 4.11. Digital Output connection

There are two digital open drain outputs, maximum drive current 150mA, with internal over current fuse.



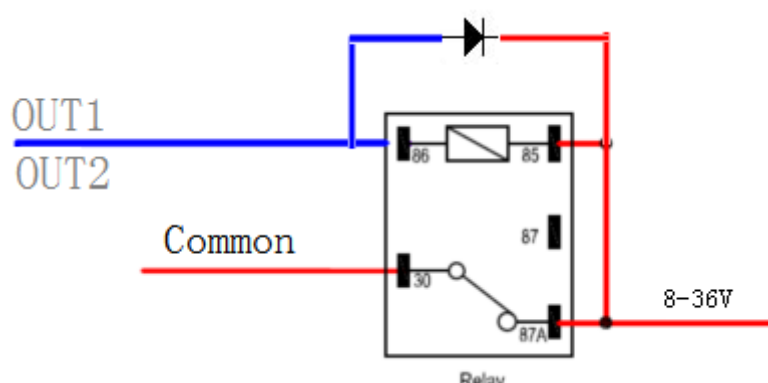


**Figure 14 Digital Output Internal Circuit**

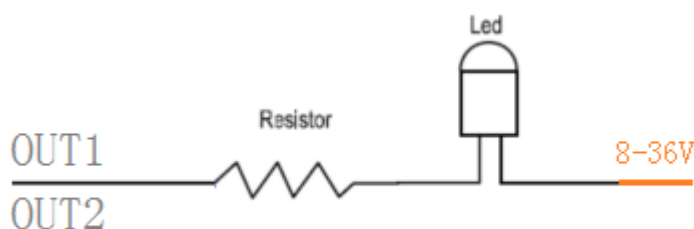
Table 7 Digital output Electrical Characteristic

Logic	Electrical Characteristic
Enable	<1.5V @150mA
Disable	Open drain

The following figure is the typical connection for relay, please connect a diode parallel to the relay's driver coil.



**Figure 15 Relay Typical Connection**



**Figure 16 LED Typical Connection**

Note:

1 - OUT1 internal latch circuit. On the system power-up/reset, output can remain unchanged.

#### 4.12. Extended IRDA connection

MDVR has an IRDA pin in the 20pin user port that can be connected to an external IRDA. It is very useful in some case the set is placed in a hidden place. The following is the typical connection. And the power 5V is also in the 20pin user port. Please confirm the IDRA part can suffer 5V power.



**Figure 17 IRDA Typical Connection**

#### 4.13. RS232 Uart Connection

MDVR has two two-wire RS232 port.

#### 4.14. RS485

MDVR has a standard RS485 interface, it can be used to connect standard 485 PTZ and other equipment.