PoC (Power over Coaxial)

White Paper

User Manual

About this Manual

This Manual is applicable to PoC products.

The Manual includes instructions for using and managing the product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version in the company website (http://overseas.hikvision.com/en/).

Please use this user manual under the guidance of professionals.

Trademarks Acknowledgement

HIKVISION and other Hikvision’s trademarks and logos are the properties of Hikvision in various jurisdictions. Other trademarks and logos mentioned below are the properties of their respective owners.

Legal Disclaimer

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THE PRODUCT DESCRIBED, WITH ITS HARDWARE, SOFTWARE AND FIRMWARE, IS PROVIDED “AS IS”, WITH ALL FAULTS AND ERRORS, AND HIKVISION MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF THIRD PARTY. IN NO EVENT WILL HIKVISION, ITS DIRECTORS, OFFICERS, EMPLOYEES, OR AGENTS BE LIABLE TO YOU FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR INDIRECT DAMAGES, INCLUDING, AMONG OTHERS, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, OR LOSS OF DATA OR DOCUMENTATION, IN CONNECTION WITH THE USE OF THIS PRODUCT, EVEN IF HIKVISION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

REGARDING TO THE PRODUCT WITH INTERNET ACCESS, THE USE OF PRODUCT SHALL BE WHOLLY AT YOUR OWN RISKS. HIKVISION SHALL NOT TAKE ANY RESPONSIBILITIES FOR ABNORMAL OPERATION, PRIVACY LEAKAGE OR OTHER DAMAGES RESULTING FROM CYBER ATTACK, HACKER ATTACK, VIRUS INSPECTION, OR OTHER INTERNET SECURITY RISKS; HOWEVER, HIKVISION WILL PROVIDE TIMELY TECHNICAL SUPPORT IF REQUIRED.

SURVEILLANCE LAWS VARY BY JURISDICTION. PLEASE CHECK ALL RELEVANT LAWS IN YOUR JURISDICTION BEFORE USING THIS PRODUCT IN ORDER TO ENSURE THAT YOUR USE CONFORMS THE APPLICABLE LAW. HIKVISION SHALL NOT BE LIABLE IN THE EVENT THAT THIS PRODUCT IS USED WITH ILLEGITIMATE PURPOSES.

IN THE EVENT OF ANY CONFLICTS BETWEEN THIS MANUAL AND THE APPLICABLE LAW, THE LATER PREVAILS.

Contents

Chapter 1 Overview

From 2017, Hikvision released Turbo 4.0 DVR products. It is a big technical improvement from previous ones and the function of PoC (Power Over Coaxial) is a highlight. In this white paper, the theory of PoC, as well as its application and possible exceptions, will be explained.

Chapter 2 PoC and Analog Surveillance Wiring

PoC is a coaxial cable-based transmission technology of video, coaxitron and power supply. A PoC DVR has a built-in PoC power module and operates by power supply of 48 VDC and 52 VDC with DC current-based video signals. The technical barrier of PoC module is how to overlap DC current and video signals without causing interference to video signals. The patented technology of Hikvision effectively separates AC and DC current so that electricity and video signals are transmitted harmoniously together on coaxial cables.

With the PoC technology, the wiring of analog surveillance becomes much easier and more efficient while the cost is lower.

Below is a comparison of different wiring methods:

Traditional wiring: Both separate and centralized power supply require power and coaxial cable connection to the cameras.

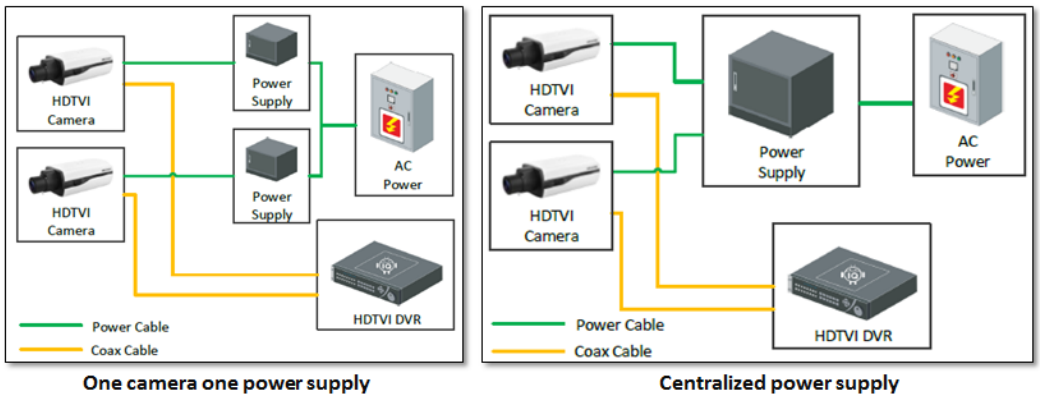

Figure 2-1 Traditional Wiring

PoC 1.0 wiring: The PoC unit is powered through power cables and is connected to cameras through coaxial cables that transmit power and video signals. Then the video signals are transmitted from the PoC unit to DVR through coaxial cables.

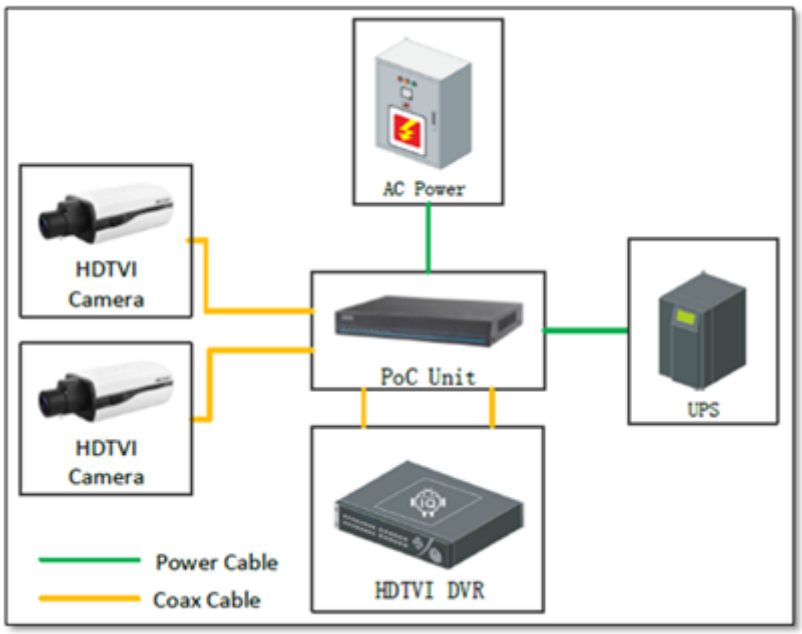

Figure 2-2 PoC 1.0 Wiring

PoC 2.0 wiring: The cameras are connected to DVR through a coaxial cable that transmits video signals, control signals and power supply.

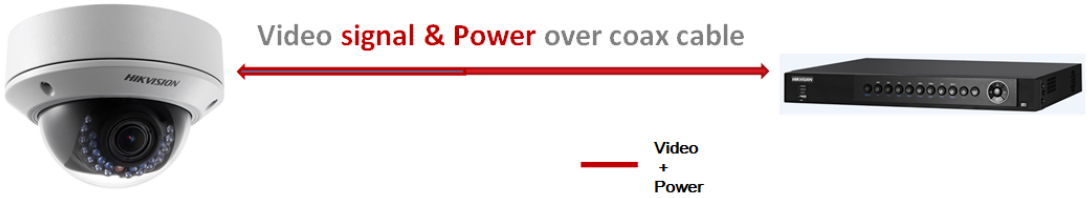

Figure 2-3 PoC 2.0 Wiring

Chapter 3 The Basics of PoC

3.1 Camera Connection

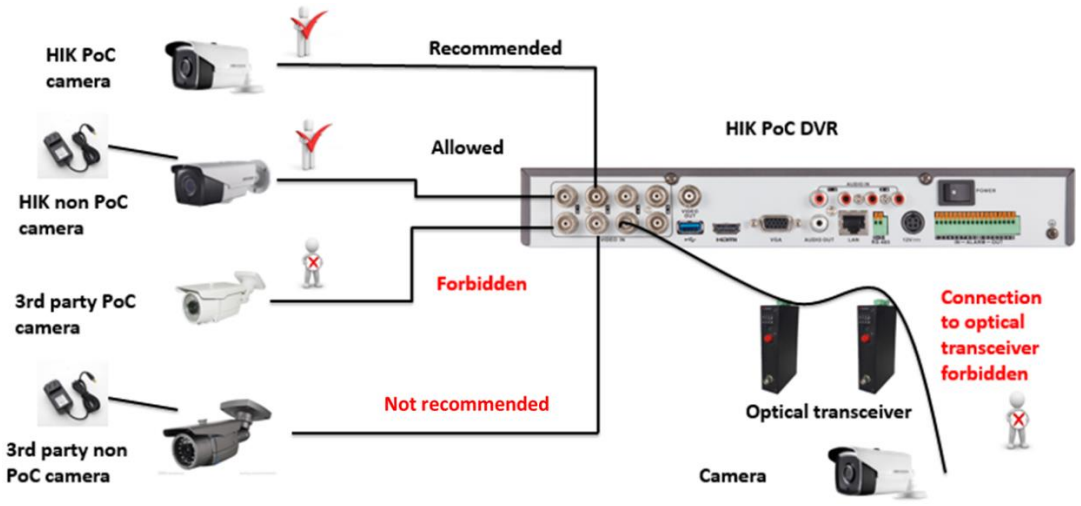

Figure 3-1 Camera Connection

- Only Hikvision PoC camera can be connected to a PoC DVR. A self-powered PoC camera can be connected to a non-PoC DVR.
- Turn off the PoC power supply function of the DVR before connecting to a non-PoC camera. The image can be displayed if the non-PoC camera uses DC (direct current) coupling. If the non-PoC camera use AC (alternating current) coupling, it cannot display image.

WARNING

Do not connect optical transceiver or third-party PoC camera to the DVR.
Please turn off the PoC function if the camera does not support PoC, or the camera is not produced by Hikvision. Otherwise, it may result in damage to the camera or DVR

3.2 Camera Power Supply Scenarios

- First connect the camera to 12 VDC power supply, then to a DVR. The DVR detects that the camera is connected to power and will not supply power to the camera.
- First connect the camera to DVR, then add 12 VDC power supply. The power supply will not be changed.
- When powered by 12 VDC, if the power supply is stopped, the camera will shut down and stop outputting video signals. The DVR then detects the PoC camera and provides power supply, and the camera will restart.

- When powered by PoC and connected to 12 VDC, if PoC is disconnected, the camera will turn to 12 VDC power supply and will not restart.

3.3 Dual-power Supply

For a PoC camera, dual-power supply (self-supplied power and PoC DVR power) ensures that the camera can be accessed during power exceptions. When the self-supplied 12 VDC power failed, the camera will switch to PoC power supply (video signal may stop for a period of time); when PoC power supply failed, the camera will switch to 12 VDC power.

3.4 AT/AF Mode

With reference to PoE standards, Hikvision has introduced AT and AF mode for PoC to distinguish the power level of PoC cameras: the max. operating power of AT and AF are 10 W and 6 W respectively. These two modes are not related to IEEE 802.3 IP standard.

3.5 PoC Access Capability

PoC Device	**Allowed AT/AF Camera Access**
4-ch PoC device	4 AT cameras
8-ch PoC device	8 AT cameras
16-ch PoC device	8 AT cameras + 8 AF cameras Or up to 12 AT cameras

16-ch PoC device is connected to 8 AT cameras through 8 random channels rather than fixed ones. The access scenarios of a 16-ch PoC device are listed in the table below:

AT camera access	12	11	10	9	8	N (0 to 7)
AF camera access	0	2	4	6	8	16-N

3.6 Insufficient PoC Power

If the power of a DVR channel is not enough to support a PoC camera, the prompt of "Insufficient Power For PoC" will be displayed in the live view window.

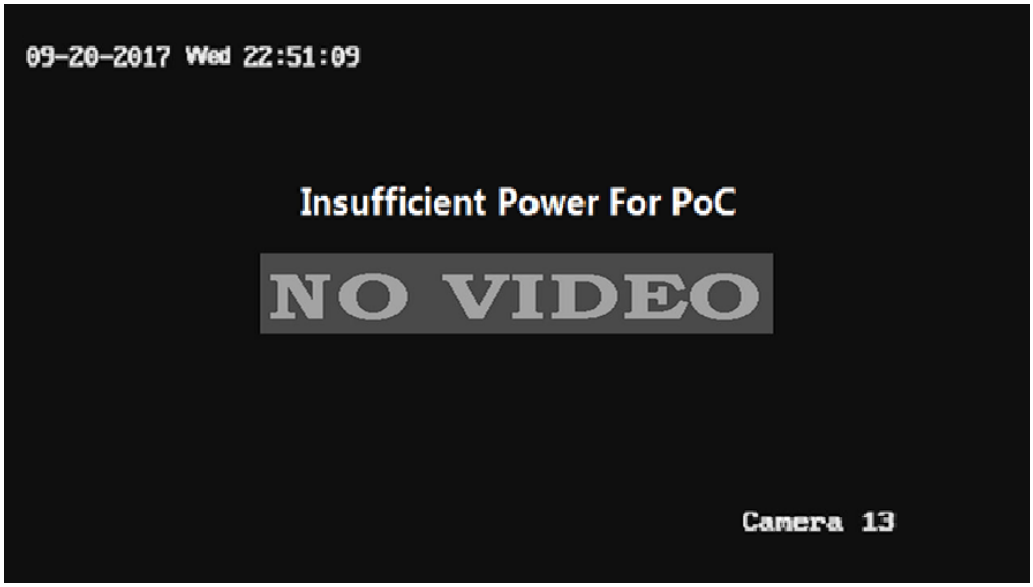

Figure 3-2 Insufficient Power For PoC

3.7 Camera Access Time

Time to access single channel PoC camera: approx. 30 sec

Time to access multiple channel PoC camera: within 1 min

Chapter 4 PoC Connection and Transmission Distance

4.1 Connection Method

- Use BNC cable

4.2 Transmission Distance

Transmission distance is related to cable material and power of the connected PoC camera. Details are listed below.

	PoC AF Camera (2 MP)	PoC AT Camera (2 MP)	PoC AF Camera (4 MP)	PoC AT Camera (4 MP)
RG6(75-5)	200m	200m	150m	150m
RG59(75-4)	200m	100m	150m	100m

NOTE

- Better cable material (less resistance), longer transmission distance.

4.3 Extend Transmission Distance

A PoC unit can be used to extend the transmission distance between a DVR and a PoC camera. In the case below, the DVR can be a non-PoC DVR. The released PoC unit models are: DS-1TP04I/AT, DS-1TP08I/AT, etc.

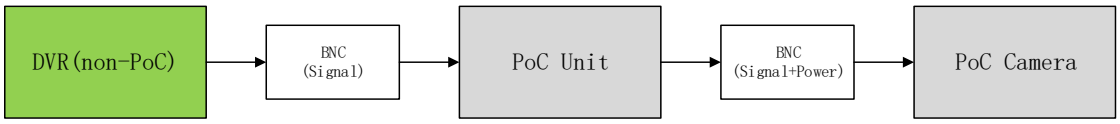

Figure 4-1 Extended Transmission Distance

Chapter 5 PoC Device Model

5.1.1 DVR

- Models for access of 2 MP PoC cameras: DS-7204HQHI-K1/P, DS-7208HQHI-K2/P, DS-7216HQHI-K2/P.
- Models for access of 4 MP PoC cameras: DS-7204HUHI-K1/P, DS-7208HUHI-K2/P, DS-7216HUHI-K2/P.

5.1.2 Camera

- 2 MP PoC models: D0T, D8T, D9T models with "E".
- 4 MP PoC models: H0T, H1T, H5T models with "E".

5.1.3 PTZ Dome

Considering high power consumption of the PTZ dome, currently there is no schedule for the release of PoC-compatible PTZ domes.

Chapter 6 GUI, Exception and Log of PoC DVR

6.1 PoC Information

To check PoC connection status, go to **Camera Management** -> **Camera** -> **PoC Information**.

- You can click the channels in **Poc Channel** to turn on/off the PoC power supply. Turn on the PoC power supply only when the DVR connects to Hikvision PoC camera, otherwise please turn off the PoC power supply.
- You can see the type of currently connected cameras. The icon of the channel that is connected to an AT/AF cameras will be lit and display AT or AF accordingly.
- You can see the number of currently connected and connectable AT/AF cameras under channel information.

NOTE

In PoC information, the power consumption of currently connected cameras and remaining available power is displayed.

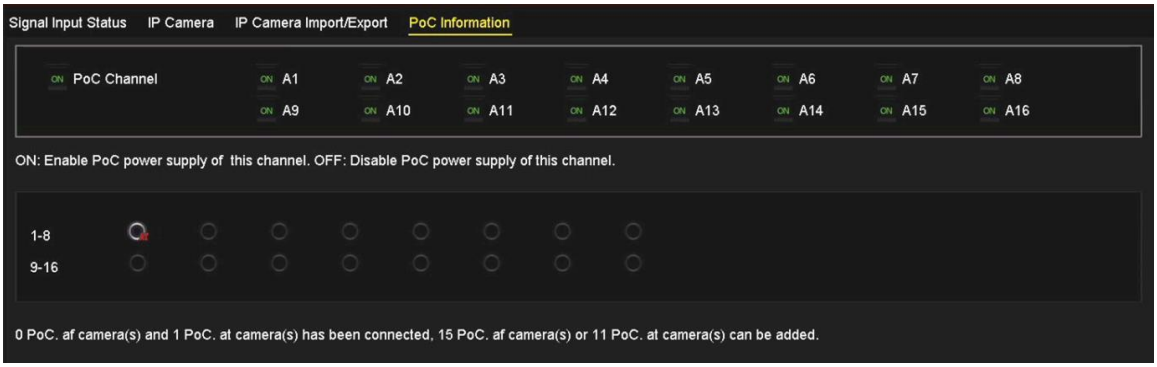

Figure 6-1 PoC Information

6.2 PoC Module Exception

PoC Module Exception can be selected under **Exception Type**, and the DVR will detect PoC exceptions such as PoC module exception, PoC and motherboard communication exception, and PoC camera exception.

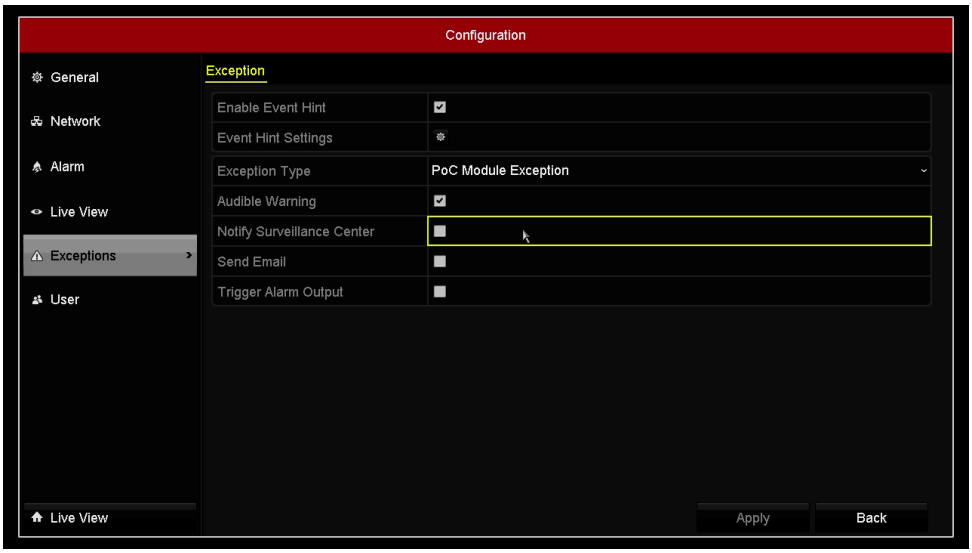

Figure 6-2 Exception Configuration

You can also configure different linked actions for PoC exception.

6.3 Log

Three types of exceptions will be recorded in the logs:

- PoC module communication exception

Possible cause: Communication exception between PoC module and motherboard.

- PoC module does not exist

Possible cause: PoC board is not tightly connected or has been removed, or the PoC module is not detected by motherboard.

- PoC module short circuit exception

Possible cause: PoC camera exception.

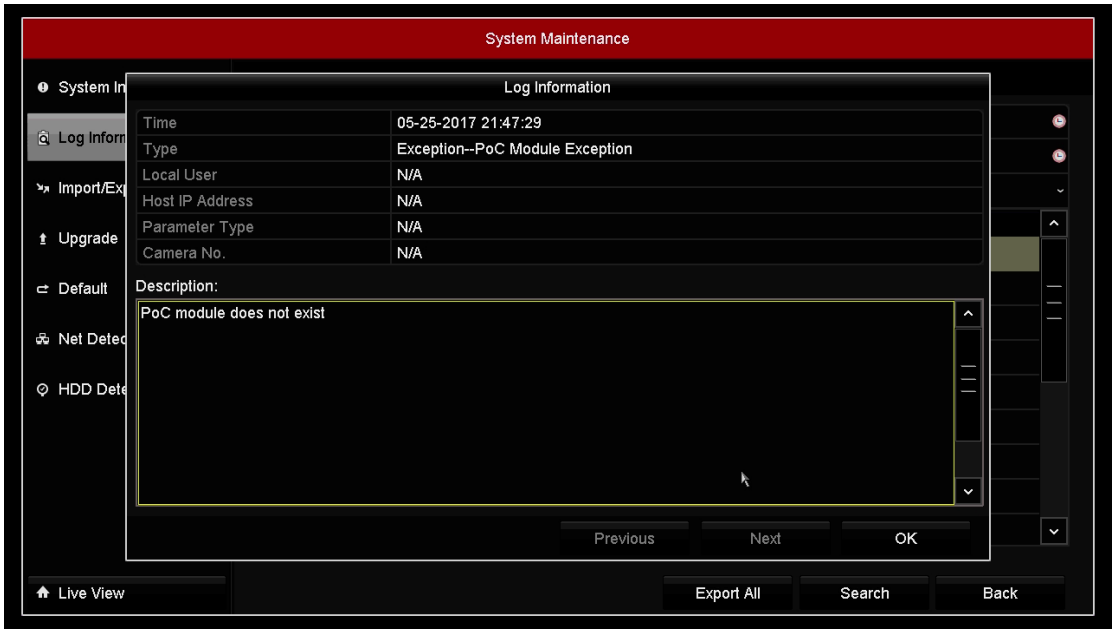

Figure 6-3 Log Information

Chapter 7 PoC Safety Features

The safety features of PoC include:

1. Overcurrent protection. The PoC system monitors the output current in real-time and will cut off power output to protect the system in case of overcurrent.
2. Undervoltage protection. When a PoC camera or the cables short-circuited, the PoC module will actively cut off its power supply while power supply of other channels is not affected.
3. Auto-adaptive. When a camera is connected, the PoC device will detect whether it is an AT or AF model so that the camera will not be damaged as a result of mismatched power supply.


See Far, Go Further