

# 네트워크 비디오 레코더

## 제품 사양 설명서

XRN-410S/810S  
QRN-410/810  
QRN-410S/810S/1610S

### A급 기기(업무용 방송통신기자재)

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# 네트워크 비디오 레코더

## 제품 사양 설명서

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- 시스템 운용과 관련 없는 프로그램을 실행하여 시스템이 잘못된 동작을 한 경우
- 바이러스에 감염되어 데이터가 손상된 경우
- 시간 경과에 따른 제품의 변화 또는 사용 중 자연적 마모에 의한 이상
- 품질 및 기능에 영향을 미치지 않는 감각적 현상 (예. 발생음)

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❖ 최초 관리자 ID는 "admin"이며, 비밀번호는 최초 로그인 시 설정해야 합니다.


안전하게 개인정보를 보호하고, 개인정보도용 피해를 예방하기 위해 3개월 마다 주기적으로 비밀번호를 변경하세요. 부주의한 비밀번호 관리로 인한 보안 및 기타 문제의 책임은 사용자에게 있으므로 각별히 주의하세요.



## 안전상의 경고 및 주의

사용자의 안전을 보호하고 재산상의 손해 등을 막기 위한 내용입니다.  
반드시 읽고 올바르게 사용해 주세요.

### 경고/주의의 내용

 <b>경고</b>	사람이 사망하거나 중상을 입을 가능성이 있는 내용입니다.	 <b>주의</b>	사람이 부상을 입거나 물적 손해 발생이 예상되는 내용입니다.
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 <b>경고</b>		
설치하기 전에 반드시 본 기기의 전원 코드를 뽑은 상태에서 설치하세요. 또한 전원 플러그를 동시에 여러개 꽂아 사용하지 마세요. 이상 발열 및 화재, 감전의 위험이 있습니다.	제품 위에 물, 커피, 음료수 등과 같은 액체가 담긴 그릇을 올려 놓지 마세요. 액체가 쏟아져 제품 내부로 들어가면 고장 및 화재의 원인이 됩니다.	전원 코드를 무리하게 구부리거나 무거운 물건에 눌러 파손되지 않도록 하세요. 화재의 원인이 됩니다.
본 기기의 내부에 고전압 부위가 있으므로 임의로 뚜껑을 열지 않도록 하고, 절대로 분해, 수리, 개조하지 마세요. 이상 작동으로 인해 화재, 감전, 상해의 위험이 있습니다.	습기, 먼지나 그을음 등이 많은 곳에는 설치하지 마세요. 감전, 화재의 원인이 됩니다.	전원 코드 부분을 무리하게 잡아당겨 빼거나 젖은 손으로 전원 플러그를 꽂거나 빼지 마시고, 전원 플러그 구멍이 헐거울 경우 전원 플러그를 꽂지 마세요. 화재 및 감전의 위험이 있습니다.
제품을 직사광선이 비치지 않는 서늘한 장소에 두고, 적정 온도를 유지해야 하며, 촛불, 난방 기구 등 열이 나는 곳을 피해주시기 바랍니다. 또한 장비나 도구를 사람들이 왕래하는 장소에서 멀리 떨어지게 두세요. 화재의 위험이 있습니다.	습기찬 바닥, 접지되지 않은 전원 확장 케이블, 낡은 전원 코드, 안전 접지의 결여 등 작업 공간에서 있을 수 있는 위험을 주의 깊게 살피고, 문제가 발생할 경우 구입처나 전문가에게 문의하세요. 화재 및 감전의 위험이 있습니다.	전원 코드 등 각종 외부 입출력 포트 등이 기기의 뒷면에 돌출되어 있어서 벽에 너무 가깝게 설치하면 케이블이 무리하게 구부러지거나 눌러 파손되거나 끊어질 수 있으므로, 제품 뒷면을 벽으로부터 15cm 이상, 옆면은 5cm 이상 거리를 유지하세요. 화재, 감전, 상해의 원인이 됩니다.
본 기기의 작동을 위한 입력 전압은 전압 변동 범위가 규정 전압의 10% 이내여야 하며, 전원콘센트는 반드시 접지가 되어 있어야 합니다. 또한, 전원 커넥터를 연결하는 콘센트에는 헤어 드라이기, 다리미, 냉장고 등의 전열 기구를 같이 사용하지 마세요. 이상 발열 및 화재, 감전의 원인이 됩니다.	데이터를 저장하는 HDD가 수명이 다하면 저장하려는 영상 데이터가 손상되어 복구되지 않을 수 있습니다. 녹화 중에 HDD에 저장되어 있는 데이터를 재생할 경우 화면이 깨지면 HDD의 수명이 다한 것이므로 빨리 구입처나 서비스 센터에 의뢰하여 HDD를 교체하시기 바랍니다. 사용자의 부주의로 인해 손상된 데이터에 대해서는 당사가 책임지지 않습니다.	배터리는 제조사가 지정한 동일 형명 또는 동등 품으로만 교환하세요. 그리고 사용한 배터리는 제조사의 지시에 따라 폐기하세요. 방폭의 위험이 있습니다.

 <b>경고</b>		
HDD가 꽉 찼을 때 녹화를 계속할 경우 이전의 저장 데이터가 지워지므로 데이터가 지워져도 좋은지를 한번 더 확인하세요. (부록의 문제 해결에서 녹화에 관련된 증상에 대해 참고하세요.) 사용자의 부주의로 인해 지워진 데이터에 대해서는 당사가 책임지지 않습니다.	시스템 전면의 HDD 상태표시 LED가 지속적으로 깜빡이는 것으로 시스템이 HDD에 정상적으로 접속하고 있다는 것을 알 수 있습니다. HDD 상태 표시 LED가 지속적으로 깜빡이는지 수시로 확인하세요. HDD 이상으로 녹화가 불가할 수 있습니다. 주기적으로 녹화 상태 확인이 필요하며 중요한 데이터는 정기적으로 백업하세요.	최초 관리자 ID는 “admin”이며, 비밀번호는 최초 로그인 시 설정해야 합니다. 안전하게 개인정보를 보호하고, 개인정보도용 피해를 예방하기 위해 3개월 마다 주기적으로 비밀번호를 변경하세요. 부주의한 비밀번호 관리로 인한 보안 및 기타 문제의 책임은 사용자에게 있으므로 각별히 주의하세요.
 <b>주의</b>		
강한 자성이나 전파가 있는 곳, 라디오나 TV 등의 무선 기기에 근접한 곳에는 설치를 피하여 주십시오. 자석류나 전파, 심한 진동이 없는 곳에 설치하세요.	주위 온도와 습도는 적절한 곳이 좋습니다. 온도가 너무 높은 곳(40℃ 이상)이나 낮은 곳(0℃ 이하), 습기가 많은 곳은 피하세요. 습기가 높은 장소에 장시간 보관된 제품은 충분한 (상온 2시간 이상) 건조 후 설치하세요.	제품 위에 무거운 물건을 올려 놓거나 제품내부로 이물질이 들어가지 않도록 하세요. 고장의 원인이 됩니다.
바람이 잘 통하는 곳이 좋고, 직사광선이나 열기구를 피해 설치하세요.	평평하고 안정된 장소에 설치하고, 수직으로 세우거나 비스듬히 놓고 사용하지 마세요. 동작이 제대로 되지 않거나, 기기가 넘어져 떨어질 수 있어 위험합니다.	강한 충격이나 진동은 기기 고장의 원인이 되므로 사용시 주의하도록 합니다. 심한 진동이 없는 곳에 설치하세요.
이상한 소리가 나거나 냄새가 날 때에는 즉시 전원 플러그를 뽑고 구입처나 서비스 센터로 문의하세요. 화재, 감전의 위험이 있습니다.	시스템 운영실의 공기를 적절히 순환시키고, 본체의 덮개를 절대 열지 마세요. 내부 온도상승으로 인해 고장의 원인이 됩니다. 주변 환경 요소에 의한 고장의 원인이 됩니다.	시스템의 성능을 유지하기 위해서는 서비스 센터에 의뢰하여 정기적으로 점검을 받으시기 바랍니다. 사용자의 부주의로 인한 고장에 대해서는 당사가 책임지지 않습니다.
안정된 전원 공급을 위해 AVR (자동 전원 공급기)을 사용하는 것이 좋습니다. 본 기기에 연결하는 커넥터에는 EMI에 영향을 줄 수 있으므로 Core-Ferrite(자기 코어)를 감아서 사용하는 것이 좋습니다. 권장 사항으로 필수 사항은 아닙니다.	반드시 접지가 된 콘센트에 전원코드를 연결하세요. 전기적쇼크(감전) 및 상해를 입을 수 있습니다.	전원플러그는 조작하기 쉬운 곳에 두세요. 제품의 문제가 발생했을 경우 완전한 전원차단을 위해서는 전원플러그를 뽑아야 합니다. 본체의 전원 버튼만으로는 전원이 완전히 차단되지 않습니다.
본 기기를 설치하는 도중이나 설치한 이후에도 기기가 위치하는 장소를 항상 깨끗하게 하여 먼지가 없도록 유지하고, 특히 기기 표면은 깨끗하고 부드러운 마른 헝겊으로 오염 부위를 닦거나 부드러운 마른 헝겊에 물을 적서 물이 흐르지 않도록 꼭 짰 후에 오염 부분을 닦으세요. 알코올, 솔벤트가 함유되거나, 계면활성제가 함유된 세제, 화장품류, 기름 성분등은 기기의 파손 및 변형을 유발할 수 있으니 사용하지 마세요.		

## 사용설명서를 읽기 전에

본 사용설명서는 제품을 사용하는데 필요한 정보를 제공하며 제품에 대한 간략한 소개와 각 부분의 명칭, 기능, 연결방법, 메뉴 설정 등 제품 사용에 필요한 내용을 포함하고 있습니다.  
사용설명서를 읽기 전에 아래의 내용을 꼭 확인하세요.

- 본 사용설명서의 저작권은 제조사에 있습니다.
- 본 사용설명서는 무단으로 복제할 수 없습니다.
- 규격품 외 제품을 사용하거나 사용설명서에 언급된 이외의 사용으로 인한 손상에 대해서는 당사에서 책임지지 않으므로 주의하세요.
- 고장 수리를 위해 제품의 케이스를 열고 내부에 손을 대야 하는 경우에는 반드시 제품 구입처에 문의하여 전문가의 도움을 받으세요.
- 본 제품에 HDD를 추가하거나 기타 외장저장장치(USB 메모리, USB HDD 등)를 연결하기 전에, 먼저 본 제품과 호환이 되는지 여부를 확인하세요. 이를 위한 호환성 리스트는 제품 구입처에 문의하세요.

## 경고

### 배터리

제품 내부의 배터리를 잘못 교체할 경우에는 폭발의 위험이 있으므로 꼭 제품에서 사용하는 동일한 배터리를 사용하세요.

현재 사용 중인 배터리의 사양은 다음과 같습니다.

- 전압 : 3V
- 용량 : 210mAh
- 지속 표준부하 : 0.4mA
- 사용 가능 온도 : -20°C ~ +60°C

직사광선이나 난방기구 등 열이 나는 곳에 배터리를 두지 마세요.

### 시스템 종료

동작 중에 전원을 끄거나 비정상적으로 작동 했을 경우 하드디스크 및 제품에 손상을 줄 수 있습니다.  
사용 중 하드디스크 자체의 문제로 인하여 오류가 발생할 수 있습니다.  
안전한 전원 차단을 위해서 시스템 종료 팝업 창에서 <확인>을 누른 뒤 전원 코드를 분리하세요.  
갑작스런 정전 등으로 인한 제품의 손상을 막기 위해서는 별도의 UPS 시스템을 설치하세요.  
(UPS 관련 문의는 UPS 판매처에 하세요.)

비정상적으로 전원을 차단할 경우 재동작 시 하드디스크 복구를 위해 구동시간이 지연될 수 있습니다.

## 동작온도

본 제품의 동작 가능 온도는 0°C ~ 40°C 입니다.  
동작온도 이하의 저온에서 장시간 방치한 경우에는 사용 시 기기가 동작이 안될 수도 있습니다.  
이런 경우에는 상온에서 일정시간 보관 후 사용하세요.  
특히 내부에 장착된 하드디스크의 동작 가능 온도는 5°C ~ 55°C 이므로 저온 상태에서 동작이 안될 수도 있으므로 제품 보관 온도에 유의하세요.

## 보안관련

최초 관리자 ID는 “**admin**”이며, 비밀번호는 최초 로그인 시 설정해야 합니다.  
안전하게 개인정보를 보호하고, 개인정보도용 피해를 예방하기 위해 3개월 마다 주기적으로 비밀번호를 변경하세요. 부주의한 비밀번호 관리로 인한 보안 및 기타 문제의 책임은 사용자에게 있으므로 각별히 주의하세요.



한화테크윈은 지구환경보전을 위하여 제품과 관련된 전 과정에서 환경을 고려하고 있으며, 고객에게 보다 친환경적인 제품을 제공하기 위하여 다양한 활동을 추진하고 있습니다.  
에코(Eco)마크는 친 환경제품을 만들기 위한 한화테크윈의 의지이며, 유럽의 환경규제(RoHS)에 만족하는 제품임을 의미합니다.

## 기능별 지원하는 NVR 제품

기능	제품 목록
팬	QRN-810, QRN-810S, XRN-410S, QRN-410, QRN-410S
PoE	QRN-1610S, XRN-810S, QRN-810S, XRN-410S, QRN-410S
P2P	QRN-1610S, XRN-810S, QRN-810, QRN-810S, XRN-410S, QRN-410, QRN-410S
리모컨	QRN-1610S, XRN-810S, QRN-810, QRN-810S, XRN-410S, QRN-410, QRN-410S



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3	4	사용설명서를 읽기 전에	14		
	5	목차			
	6	제품의 주요기능			
	7	전면의 명칭 및 기능			
	8	후면의 명칭 및 기능			
설치하기	10	설치환경 점검하기	외관도	20	외관도
10	10	랙(Rack)설치	20		
	10	HDD 장착하기			
다른 기기와 연결	12	외부 장치 연결하기			
12	12	USB 장치 연결하기			
	12	알람 입/출력 연결하기			
	13	네트워크 연결하기			

제품의 주요기능

본 제품은 네트워크 카메라의 영상 및 음성을 하드디스크에 녹화 및 재생을 할 수 있습니다.  
또한 네트워크를 이용하여 영상 및 음성을 원격지에서 PC를 통해 모니터링 할 수 있는 환경을 제공합니다.

- 편리한 UI 제공
- 다양한 4K 카메라 해상도 지원
- HDMI를 이용한 4K 고화질 영상 출력
- 영상 녹화 및 재생
- 음성 녹음 및 재생
- ONVIF Profile S 및 표준 RTP/RTSP 프로토콜 지원
- HDD SMART 기능을 이용한 HDD 정보 및 상태표시
- 하드디스크 덮어쓰기 기능
- USB 2.0, 3.0 메모리 및 외장 하드디스크를 이용한 백업 기능
- 4, 8채널 동시 재생
- 다양한 검색 모드 (시간, 이벤트, 스마트, 텍스트, 백업, ARB)
- ARB 지원 (채널별 저장 기간 설정 기능)
- 다양한 저장 모드 (일반 녹화, 이벤트, 예약녹화)
- 알람 입/출력 기능
- 윈도우 네트워크 뷰어를 이용한 원격지 감시 기능 제공
- 네트워크 카메라 라이브 모니터링 지원
- 설치 마법사 기능 (Easy Setup, 빠른 설정)
- P2P 지원을 통한 스마트폰 원격 모니터링 편의성 지원
- 스마트폰 이벤트 알람 제공 (실시간 이벤트 메시지 전송)

구성품 확인하기


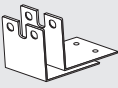

제품 구입 시 먼저 포장을 벗겨낸 후 평평한 바닥이나 설치 장소에 본 기기를 내려 놓으세요.  
다음의 구성품이 모두 포함되어 있는지 확인하세요.

- 액세서리 종류 및 수량은 판매 지역에 따라 다를 수 있습니다.

XRN-410S/QRN-410/QRN-410S

			
NVR	마우스	전원코드	전원 어댑터
			
간단 설명서	터미널 블록 (QRN-410S는 제외)	리모컨 / 리모컨 배터리 (AAA)	HDD 장착용 나사 (HDD가 없는 모델의 경우)
			
SATA 전원 케이블 (HDD가 없는 모델의 경우)			

XRN-810S/QRN-1610S

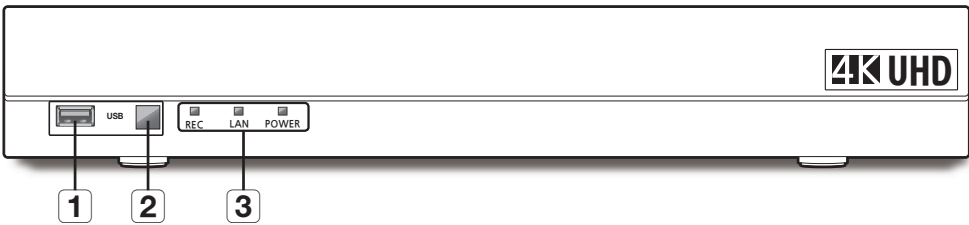
			
NVR	마우스	전원코드	간단 설명서
			
터미널 블록	리모컨 / 리모컨 배터리 (AAA)	브라켓 랙	브라켓 장착용 나사

QRN-810/QRN-810S

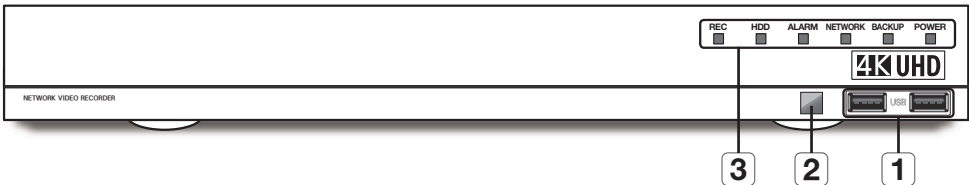
			
NVR	마우스	전원코드	전원 어댑터
			
간단 설명서	터미널 블록 (QRN-810S는 제외)	리모컨 / 리모컨 배터리 (AAA)	HDD 장착용 나사 (HDD가 없는 모델의 경우)
			
SATA 전원 케이블 (HDD가 없는 모델의 경우)			

전면의 명칭 및 기능

XRN-410S/QRN-410/QRN-810/QRN-410S/QRN-810S



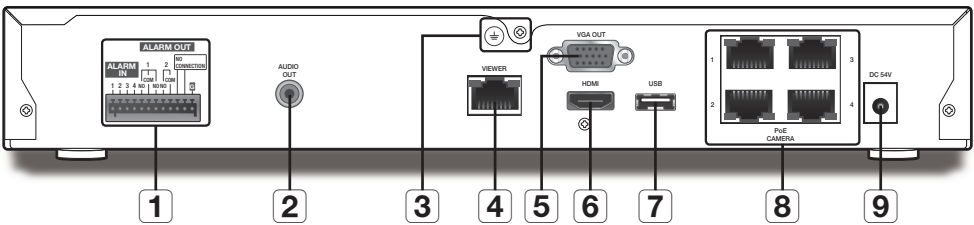
XRN-810S/QRN-1610S



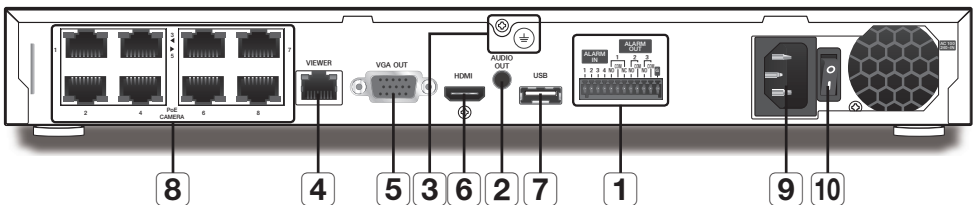
명칭		기능설명
1	USB	USB 타입의 장치를 연결하기 위해 사용합니다. (USB 2.0 지원)
2	리모컨 수신부	리모컨 신호를 수신합니다.
3	LED 램프	<b>REC</b> : 녹화가 진행 중일 때 불이 켜집니다. <b>HDD</b> : 하드디스크를 정상적으로 접속하고 있는지를 표시합니다. 하드디스크 접속 시 LED가 점등합니다. (XRN-810S/QRN-1610S) <b>ALARM</b> : 이벤트 발생 시 불이 켜집니다. (XRN-810S/QRN-1610S) <b>NETWORK (LAN)</b> : 네트워크 접속 상태 및 데이터 전송 상태를 표시합니다. <b>BACKUP</b> : 백업이 동작 중일 때 점등됩니다. (XRN-810S/QRN-1610S) <b>POWER</b> : 전원 ON/OFF 상태를 표시합니다.

후면의 명칭 및 기능

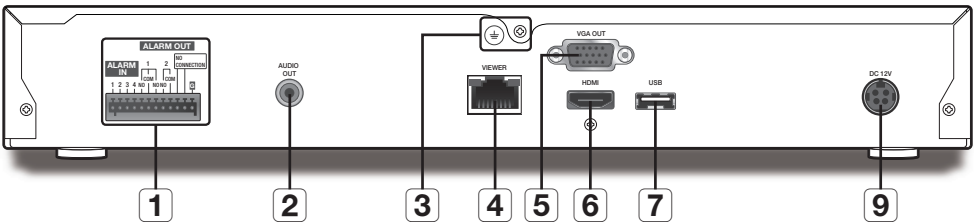
XRN-410S



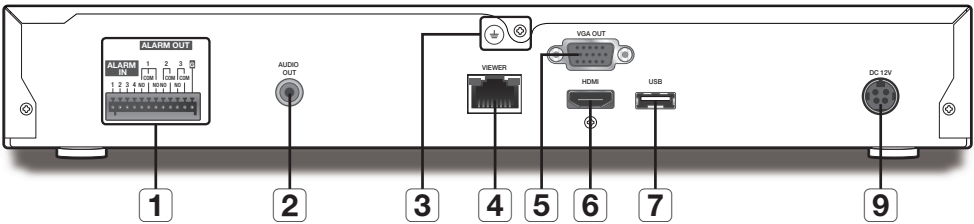
XRN-810S



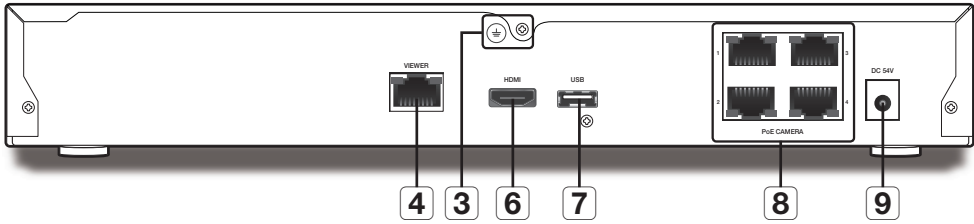
QRN-410



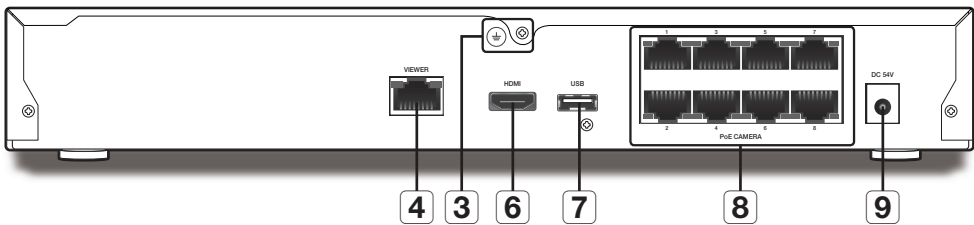
QRN-810



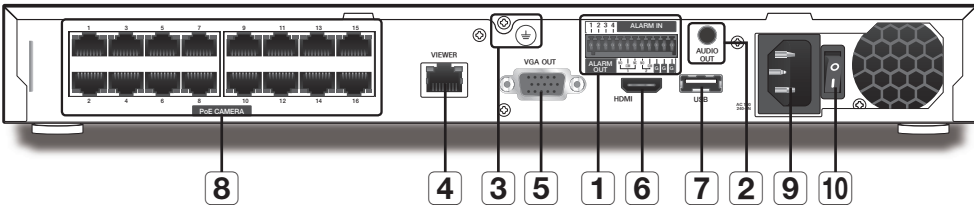
QRN-410S



QRN-810S



QRN-1610S



명칭		기능설명
1	ALARM	<ul style="list-style-type: none"> <li>- ALARM IN : 알람 입력 단자입니다. (1~4 CH)</li> <li>- ALARM OUT : 알람 출력용 단자입니다.</li> <li>XRN-410S/QRN-410/QRN-1610S : 1~2 CH</li> <li>XRN-810S/QRN-810 : 1~3 CH</li> </ul>
2	AUDIO OUT	음성신호 출력 단자(RCA jack)입니다.
3	접지	별도의 접지 케이블을 연결하는 단자입니다. ■ 장치의 안전한 사용을 위해서 접지선을 추가하세요.
4	VIEWER	네트워크/웹뷰어와의 접속/연결을 위해 사용하길 권장하는 포트입니다.
5	VGA OUT	VGA 영상 출력 단자입니다.
6	HDMI	HDMI 영상 출력 단자입니다.
7	USB	USB 타입의 장치를 연결하기 위해 사용합니다. (USB 3.0 지원)
8	PoE CAMERA	카메라와의 연결을 위한 전원 공급 포트입니다.
9	전원	전원을 연결하는 단자입니다.
10	전원 스위치	전원 on/off 스위치 입니다.

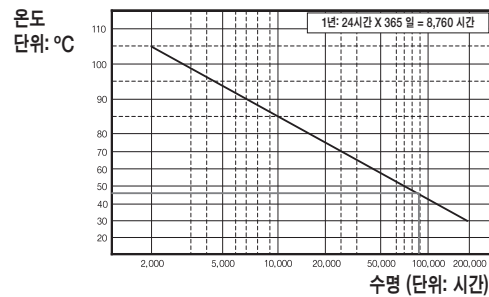
제품을 설치하기 전 다음의 사항들을 주의하여 설치하세요.

- 실내에서만 사용하세요.
- 물이나 액체가 제품의 접속부에 닿지 않게 하세요.
- 무리한 충격이나 힘을 가하지 마세요.
- 전원 코드를 무리하게 잡아 당기지 마세요.
- 임의로 제품을 분해하지 마세요.
- 정격 입출력 범위에서만 사용하세요.
- 승인된 전원 코드만 사용하세요.
- 입력 그라운드가 있는 제품에 대해서는 반드시 그라운드가 있는 전원 플러그와 함께 사용하세요.

## 설치환경 점검하기

본 제품은 첨단 보안 장비로 내부에 고용량 하드디스크와 중요한 회로를 탑재하고 있습니다.

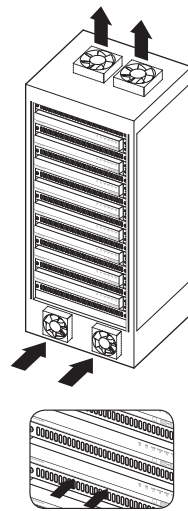
제품 내부 온도가 높을 경우, 수명이 단축되거나 고장이 발생 (우측 그래프를 참고) 할 수 있으므로 설치 전에 아래의 권고 사항들을 참고하세요.



[그림 1]

본 제품을 랙에 설치할 경우 아래의 권고 사항을 준수하세요.

1. 제품이 설치되는 랙 내부를 밀폐 되지 않도록 하세요.
2. 그림에서와 같이 흡기구와 배기구를 통해 공기 순환을 원활하게 해주세요.
3. 그림 2에 보이는 것처럼 제품 또는 기타 랙 설치 제품과 적층 하는 경우 일정한 공간을 확보하거나 공기 순환을 위한 통풍구를 설치하세요.
4. 공기의 자연 대류를 위해서 흡기구는 랙의 하단에 배기구는 상단에 설치하세요.
5. 각 흡기구와 배기구에는 공기 순환을 위한 팬 모터를 설치할 것을 적극 권장합니다. (흡기구의 팬에는 먼지나 이물질질을 거르는 필터를 함께 설치하세요.)
6. 그림 1에 보이는 것처럼 랙 내부나 제품 주변의 온도를 0°C ~ 40°C 로 꼭 유지시켜주세요.

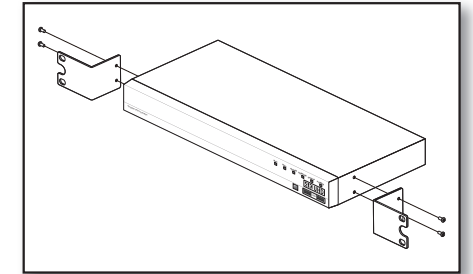


[그림 2]

## 랙(RACK)설치

브라켓 랙을 그림과 같이 장착 후 좌, 우측면 나사를 체결하세요.

- 나사가 진동에도 풀리지 않도록 단단히 체결하세요.



<XRN-810S/QRN-1610S>

## HDD 장착하기

제품 내부에는 감전이나 사고 및 제품의 고장 등을 발생시킬 요소가 많으므로 전원을 뽑은 후 설치하시기 바랍니다.

설치나 설정방법을 적절하게 적용하지 못한 경우 제품이 작동하지 않을 수도 있으니, HDD 추가 작업은 반드시 제품 구입처에 문의하시기 바랍니다.

- 장착 가능한 HDD 개수 : XRN-410S/QRN-410/QRN-810/QRN-410S/QRN-810S : 최대 1개  
XRN-810S/QRN-1610S : 최대 2개
- 작업을 진행하기 전 반드시 전원코드를 콘센트에서 빼주세요.



### 데이터 유실에 관한 주의 사항 (HDD 관리)

HDD의 데이터가 손상되지 않도록 주의하세요.

HDD를 추가할 경우 당사 제품과 호환되는 HDD 제품인지 우선 확인하세요.

HDD는 외부 환경이나 사용 중 충격으로 인하여 불량 발생될 수 있는 민감한 제품으로, 충격을 받아 손상되지 않도록 주의하세요.

사용자의 부주의나 외부 환경으로 인해 HDD가 손상된 경우, 제조업체에서는 유무상의 어떠한 책임도 지지 않습니다.

### HDD와 데이터가 손상 될 수 있는 경우

HDD 손상으로 인한 피해를 최소화하려면 자주 백업(복제)을 해 두세요.

제품을 분리하거나 설치 작업 중 외부 충격이 가해졌을 경우 데이터가 손상 될 수 있습니다.

HDD 동작 중에 정전이나, 전원을 끄는 등 갑자기 제품이 정지될 경우 HDD가 손상 될 수 있습니다.

HDD 동작 중에 본체를 이동하거나 충격을 가하면 파일이 손상되거나 HDD가 손상 될 수 있습니다.

## HDD 장착 작업 시 유의 사항

1. 작업 시 HDD에 무리한 힘을 가하여 장착하지 않도록 주의하세요.
2. 나사 및 부품을 잃어버리지 않도록 주의하세요.
  - 나사 및 부품을 조립하지 않은 경우, 제품에 고장이 발생하거나 제대로 동작하지 않을 수도 있습니다.
3. HDD를 장착하기 전에 지원하는 호환성 리스트의 HDD를 확인하세요.
  - 호환성 리스트는 제품 구입처에 문의하세요.

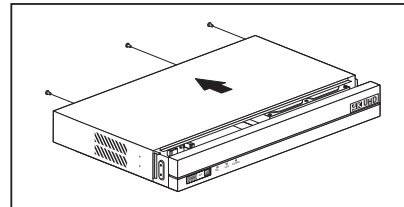
## HDD를 장착하기

- ❗ 초기 설치 외에 새로 추가된 신규 HDD나 다른 제품에서 사용하던 HDD를 본 제품에 장착할 경우 세트에서 수동으로 포맷해서 사용하세요.  
포맷 방법은 Wisenet NVR 설명서에서 "장치 확인 / 포맷 하기"를 참고하세요.

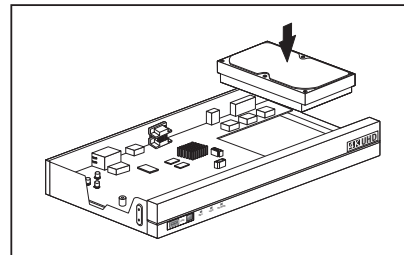
### XRN-410S/QRN-410/QRN-810/QRN-410S/QRN-810S에 HDD를 장착할 경우

- ✍ 다음의 그림들은 XRN-410S 모델 기준입니다.

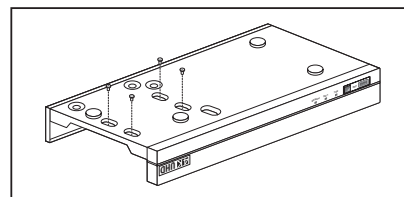
1. 후면의 나사를 풀고 커버를 뒤로 밀면서 벗겨내세요.



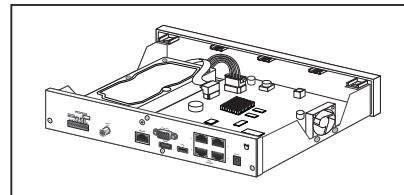
2. HDD의 SATA/전원 케이블을 메인보드의 커넥터에 연결하세요.



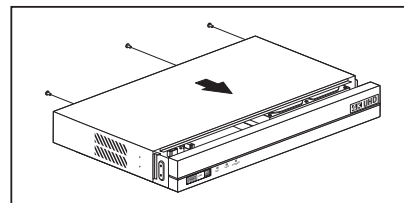
3. 세트 바닥의 나사로 HDD를 고정하세요.



4. 제품 내부의 연결 단자와 배선에 문제가 없는지 확인 후 커버를 닫고 나사를 이용해 고정시키세요.



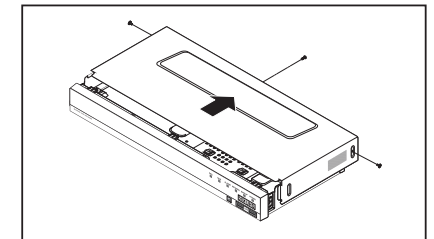
5. 커버를 닫고 후면의 고정 나사를 조이세요.



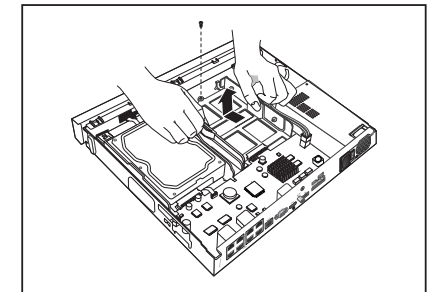
### XRN-810S/QRN-1610S에 HDD를 장착할 경우

- ✍ 다음의 그림들은 XRN-810S 모델 기준입니다.

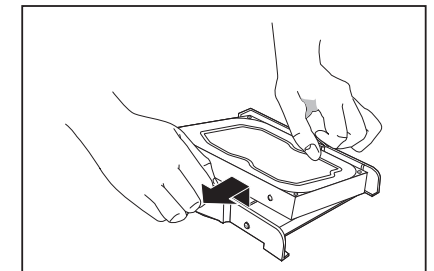
1. 후면의 나사를 풀고 커버를 뒤로 밀면서 벗겨내세요.



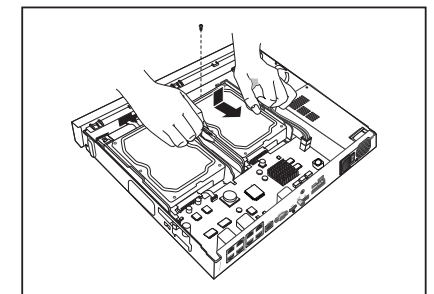
2. 브라켓의 고정 나사를 풀어 보드의 화살표 방향으로 밀어서 분리시키세요.



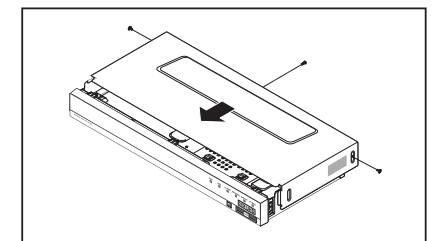
3. HDD 브라켓과 HDD의 한쪽 면을 먼저 맞춰 끼우고 다른 한쪽의 브라켓을 벌려 HDD를 장착하세요.  
■ HDD 브라켓에 장착된 나사와 HDD의 나사 구멍을 맞춰서 넣어주세요.



4. HDD가 장착된 브라켓을 밀어넣고 나사로 고정시키세요.



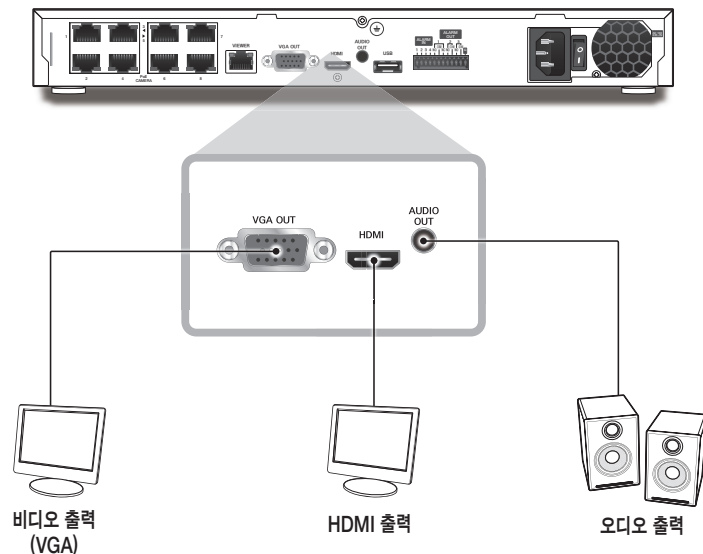
5. 커버를 닫고 나사를 이용해 고정시키세요.





## 외부 장치 연결하기

- 다음의 그림들은 XRN-810S 모델 기준입니다.

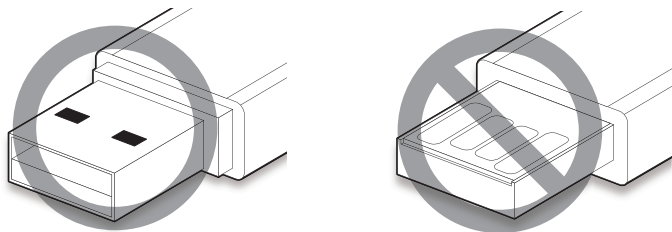


- 부적절한 전원 전압을 연결 시 시스템에 파손을 초래할 수 있으므로, 시스템에 전원을 연결하기 전에 반드시 정격 전압을 확인하세요.

## USB 장치 연결하기

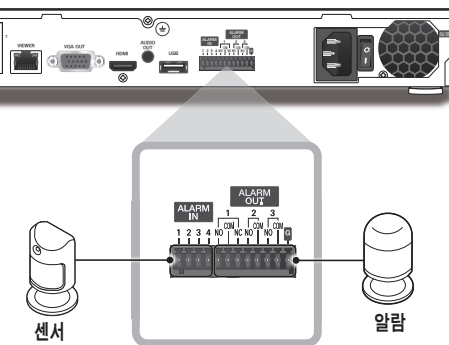
- 제품의 전면에 USB 연결용 포트가 있습니다.
- USB HDD 및 USB 메모리나, 마우스를 USB 포트를 통해 연결할 수 있습니다.
- USB HDD가 시스템에 연결되어 있다면 Wisenet NVR 설명서에서 “메뉴 > 장치 > 저장매체”를 통해 인식과 설정이 가능해집니다.
- 본 제품은 다른 시스템 동작 중에도 USB 장치의 연결과 제거를 지원하는 HOT PLUG 기능을 제공합니다.

- 백업 용도의 USB 장치의 경우 NVR에서 포맷되지 않으면 PC에서 FAT32로 포맷하세요.
- 일부 USB 장치의 경우 호환성 문제로 인해 정상적 동작이 되지 않을 수도 있으니, 사용 전 동작 확인 후 사용하세요.
- 규격품(메탈 커버 타입) USB 저장 장치 외에는 동작을 보증하지 않습니다.
- USB 커넥터 핀 자체 마모로 인하여 USB 신호의 전달이 세트와 원활하지 않을 수 있습니다.

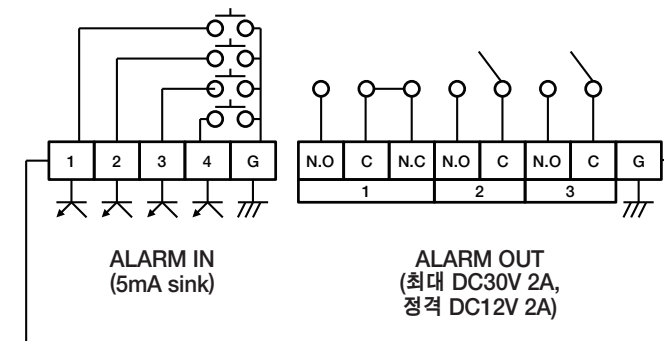


## 알람 입/출력 연결하기

후면의 알람 IN/OUT 포트는 아래와 같이 구성됩니다.



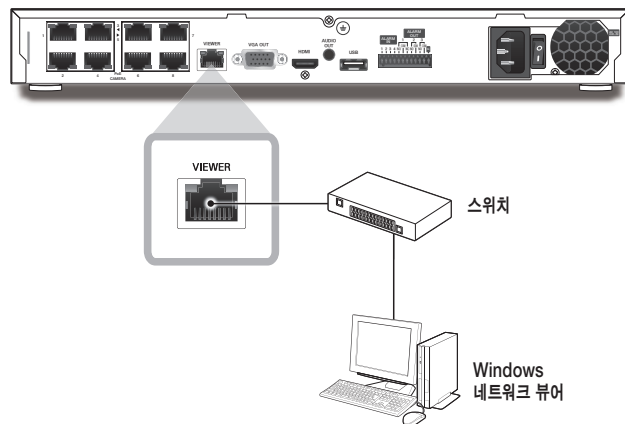
- ALARM IN 1 ~ 4 : 알람 입력 포트
- ALARM OUT 1 ~ 3 : 알람 출력 포트



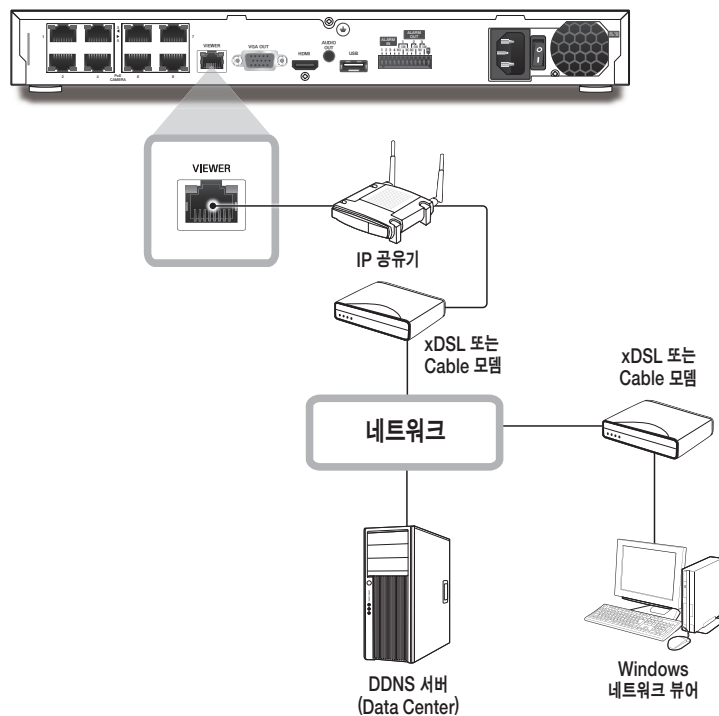
## 네트워크 연결하기

- 네트워크 연결에 관한 자세한 설명은 Wisenet NVR 설명서에서 "네트워크 설정"을 참고하세요.
- 다음의 그림들은 XRN-810S 모델 기준입니다.

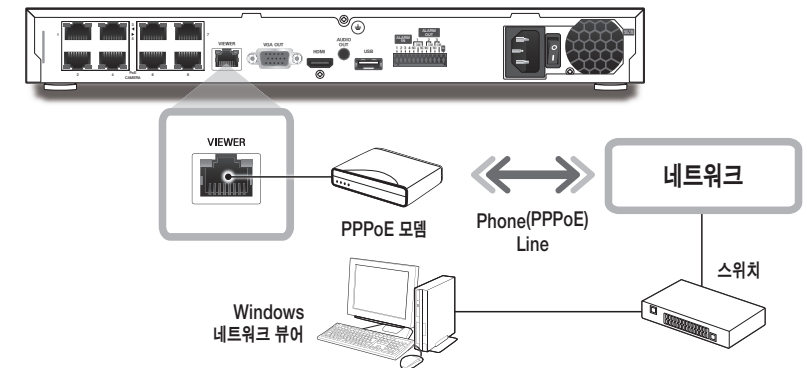
### 이더넷 (10/100/1000BaseT)을 통해 네트워크 연결하기



### 공유기를 통해 네트워크 연결하기

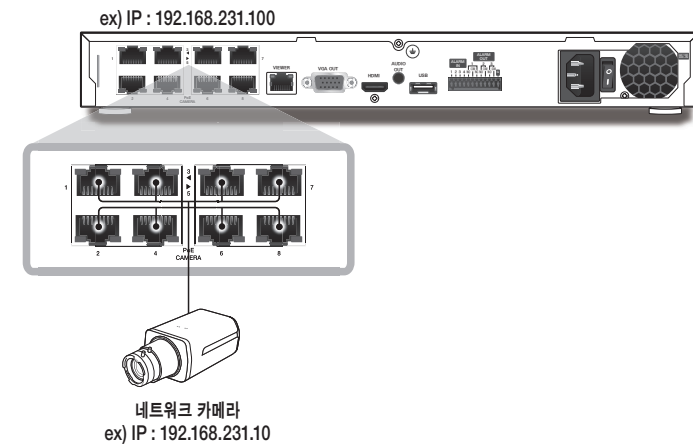


### PPPoE를 통해 네트워크 연결하기

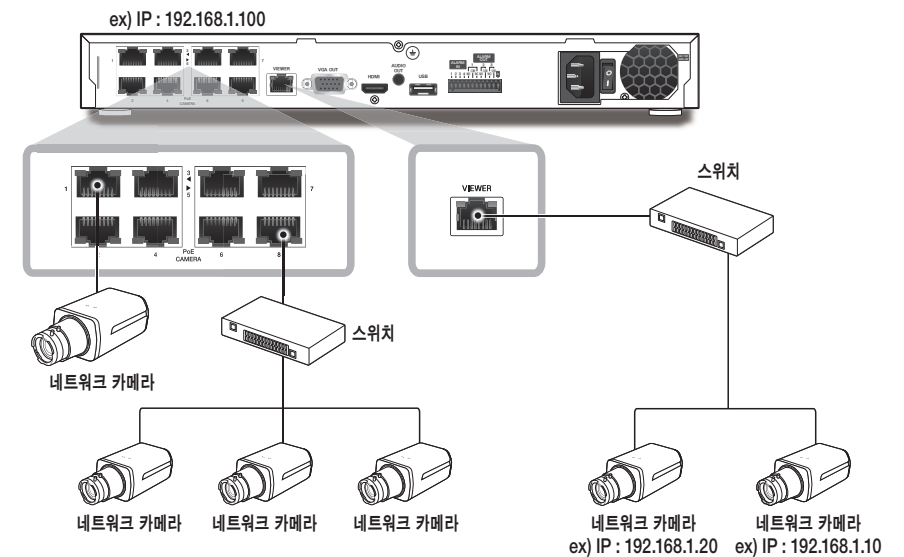


### 네트워크 카메라 연결하기

#### 예시 1)



#### 예시 2)



• XRN-410S/XRN-810S

항목		세부 설명	
		XRN-410S	XRN-810S
디스플레이			
네트워크 카메라	입력	최대 4채널	최대 8채널
	해상도	CIF ~ 8MP	
	프로토콜	Wisenet, ONVIF	
라이브	모니터 출력	1x HDMI(HDMI 1.4) / 1x VGA	
	디스플레이 성능	[모니터] 8MP(60fps) 5MP(90fps), 3MP(120fps), 2MP(240fps), 720p(240fps), D1(240fps) - 단 Mjpeg은 2MP까지만 허용	
성능			
운영 체제	임베디드	리눅스	
녹화	압축방식	H.265, H.264, MJPEG (2M까지 디코딩 가능)	
	대역폭	최대 50Mbps	최대 100Mbps
	해상도	CIF ~ 8MP	
검색/재생	재생 대역폭	32Mbps(4채널 동시재생)	32Mbps(8채널 동시재생)
	성능	최대 3명 (본체 1, 원격 3)	
	동시 재생	최대 4 채널(본체, 원격)	최대 8 채널(본체, 원격)
	해상도	CIF ~ 8MP	
	재생 제어	고속/저속 정/역 배속, 스텝 전/후 재생	
HDD	기본 장착	0TB ~ 6TB (dependent on region) - Seagate : ~ 4TB	0TB ~ 6TB - Seagate : ~ 4TB
	내장	1 (최대 6TB)	2 (최대 12TB)

항목		세부 설명	
		XRN-410S	XRN-810S
백업	파일 포맷	BU/Exe(USB), JPG/AVI(Web, CMS)	
	기능	최대 4CH 동시 재생, 날짜-시간/타이틀 표시	최대 8CH 동시 재생, 날짜-시간/타이틀 표시
센서	입력 / 출력	4/2 (NO 1개, NO/NC 1개)	4/3 (NO 2개, NO/NC 1개)
오디오	입력	4 채널(네트워크)	8 채널(네트워크)
	압축방식	G.711, G.726, AAC(16/48KHz)	
	양방향	지원	
네트워크			
프로토콜		TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)	
DDNS		Hanwha Security DDNS	
전송 속도		64Mbps	128Mbps
최대 원격 사용자		검색 3 / 라이브 유니캐스트 10 / 라이브 멀티캐스트 20	
IP 버전		IPv4/v6	
보안		사용자 접속 로그 기록, IP 주소 필터링, 802.1x 인증방식, 암호화 (ID/PW, 녹화, 전송, 백업)	
언어		한국어	
OS		Windows 7, 8, 10, Mac OS X 10.9. 10.10. 10.11	
웹 브라우저		플러그인 프리 웹뷰어 지원 브라우저: Google Chrome 47, MS Edge 20 플러그인 웹뷰어 지원 브라우저: MS Explore 11 , Apple Safari 9 * Mac OS X 전용	
뷰어 프로그램	종류	SSM, Webviewer, Smart Viewer, Wisenet Mobile	
	지원 방법 (CMS)	SDK/CGI 제공 (SUNAPI)	

항목		세부 설명	
		XRN-410S	XRN-810S
주요 기능			
카메라 제어	PoE	1) PoE의 소비 전력 모니터링 2) 각각의 PoE 카메라 ON / OFF 제어 3) 각 PoE 카메라 원격 리셋	
간편 설정		설치 마법사(날짜 / 시간, 네트워크, 자동 카메라 구성) P2P (QR 코드)	
Redundancy	ARB	지원	
PTZ	제어/프리셋	Via GUI, Webviewer, 300 preset	
스마트폰	지원 OS	I-Phone, Android	
	프로토콜	RTP, RTSP, HTTP, CGI (SUNAPI)	
스마트폰	지원 기능	라이브 4채널 : Multi-Profile Support Playback(1 채널) Event push	라이브 8채널 : Multi-Profile Support Playback(1 채널) Event push
제어		마우스, 리모컨, 웹	
전후면 표시/연결부			
전면	표시부	LED (Status indicator) : 3개 Power Status 1개, LAN 1개, 녹화 1개	LED (Status indicator) : 6개 HDD action 1개, 알람 1개, 전원 1개, 녹화 1개, 백업 1개, 네트워크 1개
후면	VGA	1개	
	HDMI	1개 - 4K 해상도 지원 (3840 x 2160), 30Hz	
	오디오	출력(1개, RCA, Line)	

항목		세부 설명	
		XRN-410S	XRN-810S
후면	이더넷	■ 4개 (PoE/PoE+, 100Mbps) ■ 1개 (WAN, 1Gbps) - WAN : Uplink to CMS	■ 8개 (PoE/PoE+, 100Mbps) ■ 1개 (WAN, 1Gbps) - WAN : Uplink to CMS
	알람	입력(4개, 터미널 블록) 출력(2개, 터미널 블록)	입력(4개, 터미널 블록) 출력(3개, 터미널 블록)
	USB	2개 (전면1, 후면1)	3개 (전면 2, 후면 1)
	저장	-	
	시리얼	-	
	리셋	스위치(1개)	
	전원코드	포함	
시스템			
로그 정보	로그 리스트	최대 20,000 (시스템 로그, 이벤트 로그 각각)	
환경 사양			
동작 온도		+0°C ~ +40°C	
동작 습도		20% ~ 85% RH	
전기적 사양			
전원		54V DC / 1.67A	100 ~ 240 VAC ±10%
소비전력		최대 13W (44BTU, 2TB HDD x 1개)	최대 19W (64BTU, 2TB HDD x 1개)
PoE 용량		최대 50W	최대 100W
외관			
색상 / 재질		검정 / 메탈	
외형치수 (WxHxD)		W300 x H47 x D208.7 mm(1U)	W370 x H44 x D320 mm(1U)
무게		1.694Kg (2T HDD)	3.356kg (2T HDD)

• QRN-410/QRN-810

항목		세부 설명	
		QRN-410	QRN-810
디스플레이			
네트워크 카메라	입력	최대 4채널	최대 8채널
	해상도	CIF ~ 8MP	
	프로토콜	Wisenet, ONVIF	
라이브	모니터 출력	1x HDMI(HDMI 1.4) / 1x VGA	
	디스플레이 성능	[모니터] 8MP(60fps) 5MP(90fps), 3MP(120fps), 2MP(240fps), 720p(240fps), D1(240fps) - 단 Mjpeg은 2MP까지만 허용	
성능			
운영 체제	임베디드	리눅스	
녹화	압축방식	H.265, H.264, MJPEG (2M까지 디코딩 가능)	
	대역폭	최대 50Mbps	최대 100Mbps
	해상도	CIF ~ 8MP	
검색/재생	재생 대역폭	32Mbps(4채널 동시재생)	32Mbps(8채널 동시재생)
	성능	최대 3명 (본체 1, 원격 3)	
	동시 재생	최대 4 채널(본체, 원격)	최대 8 채널(본체, 원격)
	해상도	CIF ~ 8MP	
	재생 제어	고속/저속 정/역 배속, 스텝 전/후 재생	
HDD	기본 장착	0TB ~ 6TB (dependent on region) - Seagate : ~ 4TB	
	내장	1 (최대 6TB)	

항목		세부 설명	
		QRN-410	QRN-810
백업	파일 포맷	BU/Exe(USB), JPG/AVI(Web, CMS)	
	기능	최대 4CH 동시 재생, 날짜-시간/타이틀 표시	최대 8CH 동시 재생, 날짜-시간/타이틀 표시
센서	입력 / 출력	4/2 (NO 1개, NO/NC 1개)	4/3 (NO 2개, NO/NC 1개)
오디오	입력	4 채널(네트워크)	8 채널(네트워크)
	압축방식	G.711, G.726, AAC(16/48KHz)	
	양방향	지원	
네트워크			
프로토콜		TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)	
DDNS		Hanwha Security DDNS	
전송 속도		64Mbps	128Mbps
최대 원격 사용자		검색 3, 라이브 유니캐스트 10, 라이브 멀티캐스트 20	
IP 버전		IPv4/v6	
보안		사용자 접속 로그 기록, IP 주소 필터링, 802.1x 인증방식, 암호화 (ID/PW, 녹화, 전송, 백업)	
언어		한국어	
OS		Windows 7, 8, 10, Mac OS X 10.9. 10.10. 10.11	
웹 브라우저		플러그인 프리 웹뷰어 지원 브라우저: Google Chrome 47, MS Edge 20 플러그인 웹뷰어 지원 브라우저: MS Explore 11, Apple Safari 9 * Mac OS X 전용	
뷰어 프로그램	종류	SSM, Webviewer, Smart Viewer, Wisenet Mobile	
	지원 방법 (CMS)	SDK/CGI 제공 (SUNAPI)	

항목		세부 설명	
		QRN-410	QRN-810
주요 기능			
간편 설정		설치 마법사(날짜 / 시간, 네트워크, 자동 카메라 구성) P2P (QR 코드)	
Redundancy	ARB	지원	
PTZ	제어/프리셋	Via GUI, Webviewer, 300 preset	
스마트폰	지원 OS	I-Phone, Android	
	프로토콜	RTP, RTSP, HTTP, CGI (SUNAPI)	
	지원 기능	라이브 4채널 : Multi-Profile Support Playback(1 채널) Event push	라이브 8채널 : Multi-Profile Support Playback(1 채널) Event push
제어		마우스, 리모컨, 웹	
전후면 표시/연결부			
전면	표시부	Power Status LED 1개 Lan Status LED 1개 Record Status LED 1개	
후면	VGA	1개	
	HDMI	1개 - 4K 해상도 지원 (3840 x 2160), 30hz	
	오디오	출력(1개, RCA, Line)	
	이더넷	1개 (WAN, 1Gbps) - WAN : Uplink to CMS	
	알람	입력(4개, 터미널 블록) 출력(2개, 터미널 블록)	입력(4개, 터미널 블록) 출력(3개, 터미널 블록)
	USB	2개 (전면1, 후면1)	
	저장	-	
	시리얼	-	
	리셋	스위치(1개)	
	전원코드	포함	

항목		세부 설명	
		QRN-410	QRN-810
시스템			
로그 정보	로그 리스트	최대 20,000 (시스템 로그, 이벤트 로그 각각)	
환경 사양			
동작 온도		+0°C ~ +40°C	
동작 습도		20% ~ 85% RH	
전기적 사양			
전원		12V/4A	
소비전력		최대 9W(31BTU, 2TB HDD x 1개)	
외관			
색상 / 재질		검정 / 메탈	
외형치수 (WxHxD)		W300 x H47 x D208.7 mm(1U)	
무게		1.655Kg (2T HDD)	

• QRN-410S/QRN-810S/QRN-1610S

항목		세부 설명		
		QRN-410S	QRN-810S	QRN-1610S
디스플레이				
네트워크 카메라	입력	최대 4채널	최대 8채널	최대 16채널
	해상도	CIF ~ 8MP		
	피쉬아이 디워핑	N/A (process on Web / CMS)		
	프로토콜	Wisenet, ONVIF, RTSP		
라이브	모니터 출력	1x HDMI		1x HDMI / 1x VGA
	디스플레이 성능	[모니터] 8MP(60fps) 5MP(90fps), 3MP(120fps), 2MP(120fps), 720p(120fps), D1(120fps)	[모니터] 8MP(60fps) 5MP(90fps), 3MP(120fps), 2MP(240fps), 720p(240fps), D1(240fps)	[모니터] 8MP(60fps) 5MP(90fps), 3MP(120fps), 2MP(240fps), 720p(480fps), D1(480fps)
성능				
운영 체제	임베디드	리눅스		
녹화	압축방식	H.265, H.264, MJPEG		
	대역폭	최대 40Mbps	최대 80Mbps	최대 128Mbps
	해상도	CIF ~ 8MP		
검색/재생	재생 대역폭	32Mbps(4채널 동시재생)	32Mbps(8채널 동시재생)	
	성능	최대 3명 (본체 1, 원격 3)		
	동시 재생	최대 4 채널(본체, 원격)	최대 8 채널(본체, 원격)	최대 8 채널(본체), 최대 16 채널(원격)
	해상도	CIF ~ 8MP		
	피쉬아이 디워핑	N/A (processed on Web / CMS)		
	재생 제어	고속/저속 정/역 배속, 스텝 전/후 재생		
저장	기본 장착	N/A		
	내장	1 (최대 6TB)		2 (최대 12TB)

항목		세부 설명		
		QRN-410S	QRN-810S	QRN-1610S
백업	파일 포맷	BU/Exe(USB), JPG/AVI(Web, CMS)		
	기능	최대 4CH 동시 재생, 날짜-시간/타이틀 표시	최대 8CH 동시 재생, 날짜-시간/타이틀 표시	
센서	입력 / 출력	N/A		4/2 (NO 1개, NO/NC 1개)
오디오	입력	4 채널(네트워크)	8 채널(네트워크)	16 채널(네트워크)
	압축방식	G.711, G.726, AAC(16/48KHz)		
	양방향	2-Way		
네트워크				
프로토콜		TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)		
DDNS		Hanwha Security DDNS		
전송 속도		50Mbps	80Mbps	128Mbps
최대 원격 사용자		검색 (3) / 라이브 유니캐스트 (10) / 라이브 멀티캐스트 (20)		
IP 버전		IPv4/v6		
보안		사용자 접속 로그 기록, IP 필터링, 802.1x, 암호화		
OS		Windows 7, 8, 10, Mac OS X 10.9. 10.10. 10.11		
웹 브라우저		플러그인 프리 웹뷰어 지원 브라우저: Google Chrome 47, MS Edge 20 플러그인 웹뷰어 지원 브라우저: MS Explore 11 , Apple Safari 9 * Mac OS X 전용		
뷰어 프로그램	종류	SSM, Webviewer, Smart Viewer, Wisenet Mobile		
	지원 방법 (CMS)	SDK/CGI 지원 (SUNAPI)		
주요 기능				
카메라 제어	PoE	1) PoE의 소비 전력 모니터링 2) 각각의 PoE 카메라 ON / OFF 제어 3) 각 PoE 카메라 원격 리셋		

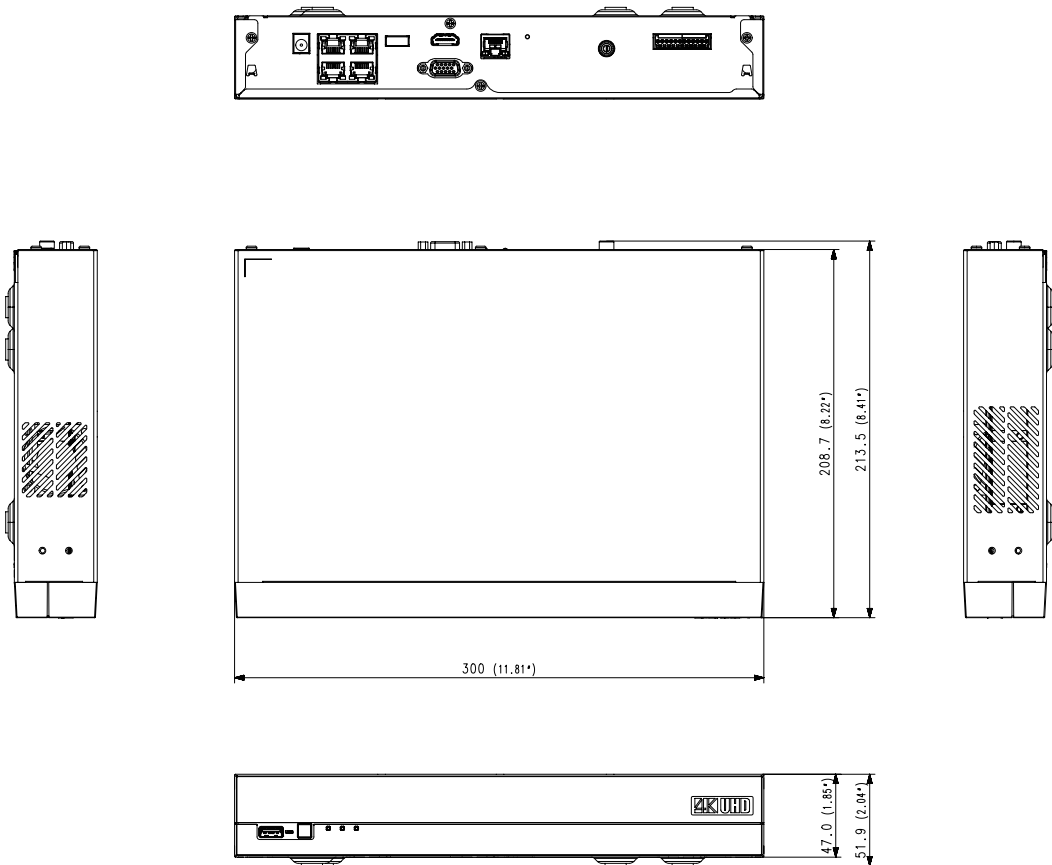


항목		세부 설명		
		QRN-410S	QRN-810S	QRN-1610S
간편 설정		설치 마법사(날짜 / 시간, 네트워크, 자동 카메라 구성) P2P (QR 코드)		
ARB		지원		
PTZ	제어	Via GUI, Webviewer, 300 preset		
스마트폰	지원 OS	I-Phone, Android		
	프로토콜	RTP, RTSP, HTTP, CGI (SUNAPI)		
	지원 기능	라이브 4채널 : Multi-Profile 지원 재생(1 채널) Event push	라이브 8채널 : Multi-Profile 지원 재생(1 채널) Event push	라이브 16채널 : Multi-Profile 지원 재생(1 채널) Event push
	최대 원격 사용자	검색 (3) / 라이브 유니캐스트 (10) / 라이브 멀티캐스트 (20)		
제어		마우스, 웹, IR 리모컨		
전후면 표시/연결부				
전면	표시부	LED (상태 표시) : 3개 전원 1개, LAN 1개, 녹화 1개		LED (상태 표시) : 6개 HDD 동작 1개, 알람 1개, 전원 1개, 녹화 1개, 백업 1개, 네트워크 1개
후면	VGA	N/A		1개(1920x1080, 1280x1024, 1280x720, 1024x768)
	HDMI	1개 (3840 x 2160, 2560x1440, 1920x1080, 1280x1024, 1280x720, 1024x768)		
	오디오	N/A		출력(1개, RCA)
	이더넷	■ 4개 (PoE, 100Mbps) ■ 1개 (WAN, 100Mbps) - WAN : Uplink to CMS	■ 8개 (PoE, 100Mbps) ■ 1개 (WAN, 1Gbps) - WAN : Uplink to CMS	■ 16개 (PoE, 100Mbps) ■ 1개 (WAN, 1Gbps) - WAN : Uplink to CMS

항목		세부 설명		
		QRN-410S	QRN-810S	QRN-1610S
후면	알람	N/A		입력(4개, 터미널 블록) 출력(2개, 터미널 블록)
	USB	전면 1개(USB2.0), 후면 1개(USB3.0)		전면 2개(USB2.0), 후면 1개(USB3.0)
	리셋	스위치(1개)		
	전원코드	포함		
시스템				
로그 정보	로그 리스트	최대 20,000 (시스템 로그, 이벤트 로그 각각)		
환경 사양				
동작 온도		+0°C to +40°C		
동작 습도		20% ~ 85% RH		
전기적 사양				
전원		54V DC / 1.20A	54V DC / 1.67A	100 to 240 VAC
소비전력		최대 47W(1HDD, PoE on) 최대 7.4W(1HDD, PoE off)	최대 76.2W(1HDD, PoE on) 최대 8.1W(1HDD, PoE off)	최대 158.2W(2HDDs, PoE on) 최대 34.6W(2HDDs, PoE off)
PoE 용량		최대 30W	최대 50W	최대 130W
외관				
색상 / 재질		검정 / 메탈		
외형치수 (WxHxD)		W300.0 x H47.1 x D208.4 mm(1U)		W370.0 x H44.0 x D320 mm(1U)
무게		0.99Kg	1.01Kg	2.79Kg

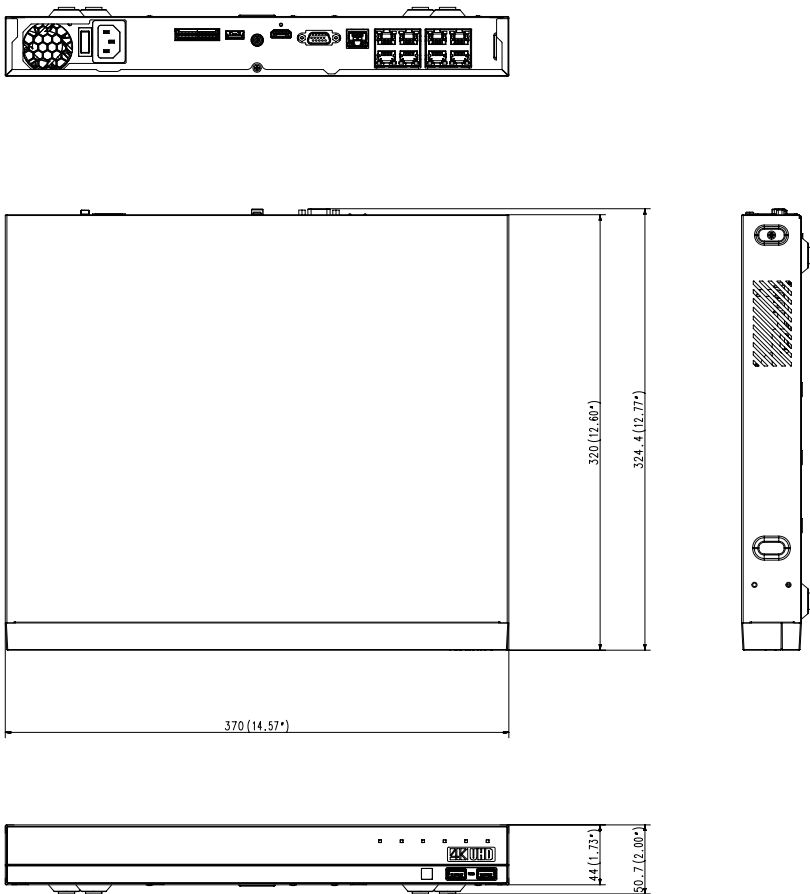
• XRN-410S

단위 : mm (inches)



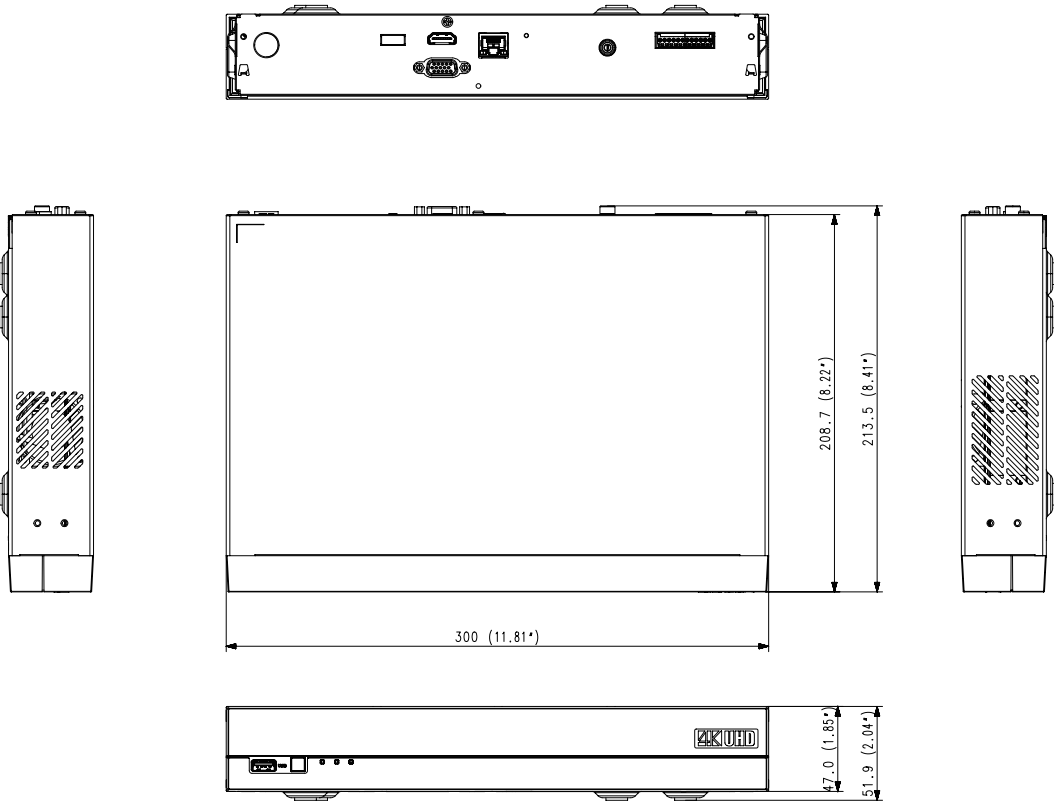
• XRN-810S

단위 : mm (inches)



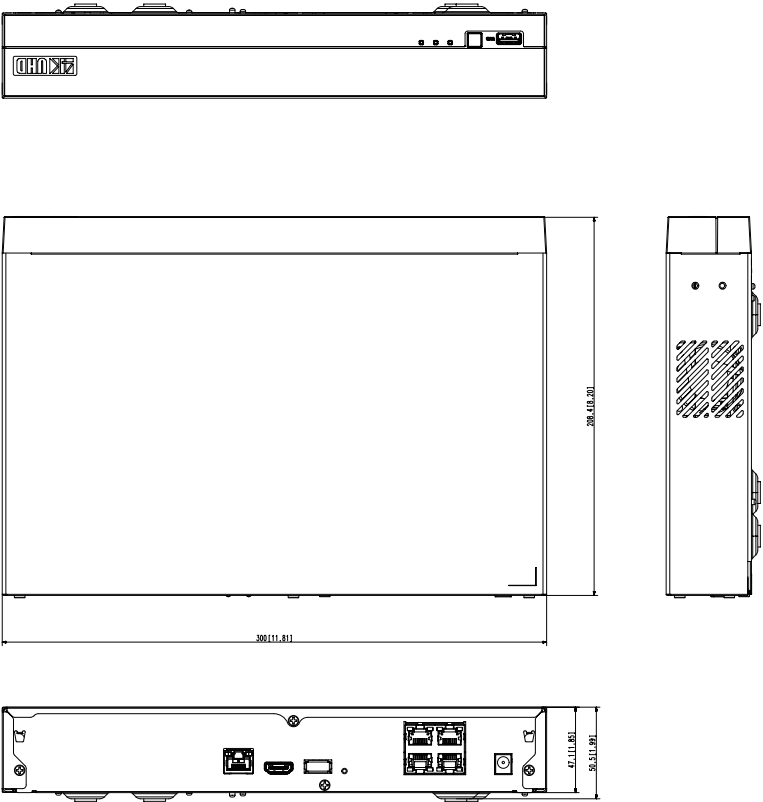
• QRN-410/QRN-810

단위 : mm (inches)



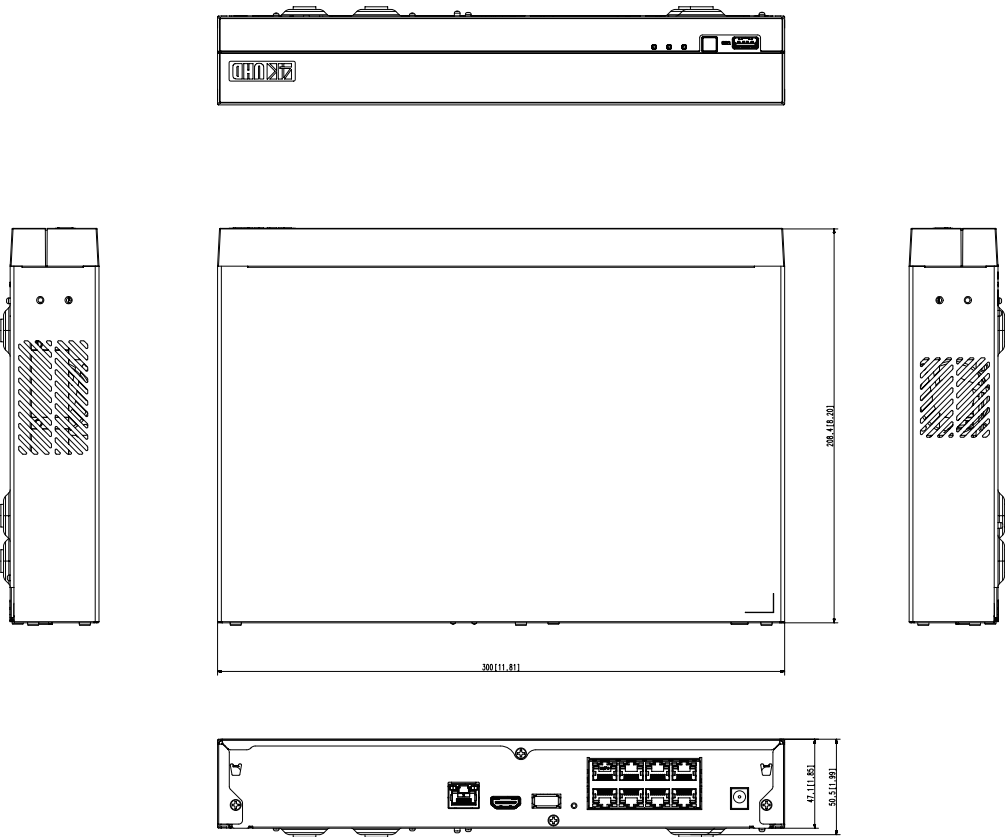
• QRN-410S

단위 : mm (inches)



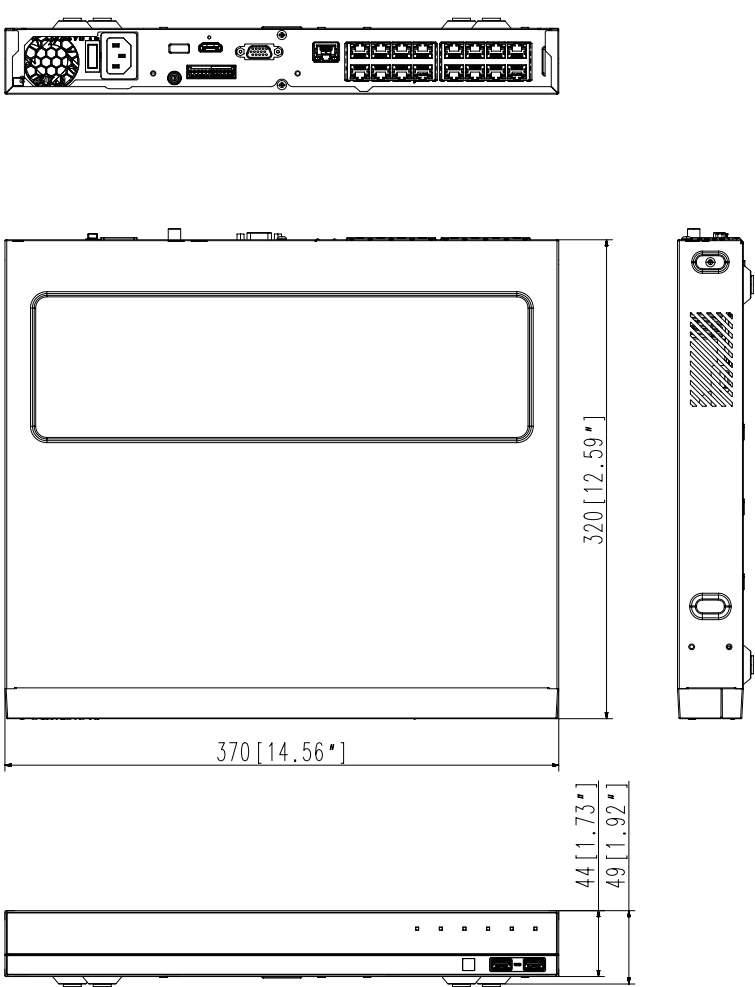
• QRN-810S

단위 : mm (inches)



• QRN-1610S

단위 : mm (inches)



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- **LGPL Software:** avahi-0.6.32, ffmpeg-2.4.3, glib-2.46.2, libdaemon-0.14, libnl-3.2.25, libusb-0.1.12, libusb-0.1.5, qrencode-3.4.4, wvdial-1.61, wstreams-4.6.1, Live555, qtopia4.7.2
- **MPL 1.1:** npapi-sdk
- **BSD 2-Clause License:** FreeBSD
- **BSD 3-Clause License:** minipnp-1.5-ppc, net-snmp v5.6.2.1, ppp-2.4.5, jquery.sha256, jsbn, libjpeg-turbo, lighttpd v1.4.35, msinttypes, requires, spher+++, sprintf 0.7, System-Verilog-Packet-Library, Text OpenGL Extension Wrangler Library 1.7.0
- **MIT License:** aptechcmv2, avropendous, cJSON, cJSON-Dave Gamble, dynatree, javascript-ipv6, jqGrid, JQuery UI, jquery-form, jquery-hashchange, jquery-json, jquery-numeric, jquery-throttle-debounce 1.1, JS-Browser-Driver, moon9, noty, Raphael JavaScript Library, wildflower 1.3.Beta
- **libxml2 License:** libxml2 v2.7.7
- **Apache 2.0 License:** RLLib
- **zlib/libpng Lisence:** cximage, HM NIS Edit, Nullsoft Scriptable Install System 2.46, PNG reference library, tinyxml 2.6.2, zlib v1.2.8
- **Boost Software License:** boost 1.57.0
- **Curl License:** curl v7.49.1
- **Microsoft Public License:** Minima, Text Designer Outline Text Library
- **Code Project Open 1.02 License:** CPPPSQLite - C++ Wrapper for SQLite, A reusable, high performance, socket server class - Part3
- **JPEG License:** libjpeg-8b
- **RSA MD4 or MD5 Message-Digest Algorithm License:** JavaScript MD5 1.1, sipxtapi
- **PHP License 3.01:** HPHP-2.1.0, php v5.6.33
- **OpenSSL Combined License:** openssl v1.0.2n
- **PCRE 5 License:** pcre v8.39
- **NTP License:** ntp v4.2.8p10
- **CodeIgniter License:** CodeIgniter
- **GLUT for Win32 License:** GLUT for Win32
- **ISC License:** dhcp 4.3-2rc2
- **Brian Gladman Alternate License:** AES with the VIA ACE
- **Acknowledgement:** This product includes modified version of ffmpeg, Live555, qtopia4.7.2 and npapi-sdk.

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- [31]Lars H. Mathiesen <[thorinn@diku.dk](mailto:thorinn@diku.dk)> adaptation of foundation code for Version 3 as specified in RFC-1305
- [32]David L. Mills <[mills@udel.edu](mailto:mills@udel.edu)> Version 4 foundation: clock discipline, authentication, precision kernel; clock drivers: Spectracom, Austron, Arbiter, Heath, ATOM, ACTS, KSI/Odetics; audio clock drivers: CHU, WWW/H, IRIG
- [33]Wolfgang Moeller <[moeller@gwdgv1.dnet.gwdg.de](mailto:moeller@gwdgv1.dnet.gwdg.de)> VMS port
- [34]Jeffrey Mogul <[mogul@pa.dec.com](mailto:mogul@pa.dec.com)> ntpttrace utility
- [35]Tom Moore <[tmoore@fievel.daytonoh.ncr.com](mailto:tmoore@fievel.daytonoh.ncr.com)> i386 svr4 port
- [36]Kamal A Mostafa <[kamal@whence.com](mailto:kamal@whence.com)> SCO OpenServer port
- [37]Derek Mulcahy <[derek@toybox.demon.co.uk](mailto:derek@toybox.demon.co.uk)> and [38]Damon Hart-Davis <[d@hd.org](mailto:d@hd.org)> ARCRON MSF clock driver
- [39]Rainer Pruy <[Rainer.Pruy@informatik.uni-erlangen.de](mailto:Rainer.Pruy@informatik.uni-erlangen.de)> monitoring/trap scripts, statistics file handling
- [40]Dirce Richards <[dirce@zk3.dec.com](mailto:dirce@zk3.dec.com)> Digital UNIX V4.0 port
- [41]Wilfredo Sánchez <[wsanchez@apple.com](mailto:wsanchez@apple.com)> added support for NetInfo
- [42]Nick Sayer <[mrapple@quack.kfu.com](mailto:mrapple@quack.kfu.com)> SunOS streams modules
- [43]Jack Sasportas <[jack@innovativeinternet.com](mailto:jack@innovativeinternet.com)> Saved a Lot of space on the stuff in the [html/pic/](#) subdirectory
- [44]Ray Schnitzler <[schnitz@unipress.com](mailto:schnitz@unipress.com)> Unixware1 port
- [45]Michael Shields <[shields@tembel.org](mailto:shields@tembel.org)> USNO clock driver
- [46]Jeff Steinman <[jss@pebbles.jpl.nasa.gov](mailto:jss@pebbles.jpl.nasa.gov)> Datum PTS clock driver
- [47]Harlan Stern <[harlan@pfcs.com](mailto:harlan@pfcs.com)> GNU automake/ autoconfigure makeover, various other bits (see the ChangeLog)
- [48]Kenneth Stone <[ken@sdd.hp.com](mailto:ken@sdd.hp.com)> HP-UX port
- [49]Ajit Thyagarajan <[ajit@ee.udel.edu](mailto:ajit@ee.udel.edu)> IP multicast/anycast support
- [50]Tomoaki TSURUOKA <[tsuruoka@nc.fukuoka-u.ac.jp](mailto:tsuruoka@nc.fukuoka-u.ac.jp)> TRAK clock driver
- [51]Paul A Vixie <[vixie@vix.com](mailto:vixie@vix.com)> TrueTime GPS driver, generic TrueTime clock driver
- [52]Ulrich Windl <[Ulrich.Windl@rz.uni-regensburg.de](mailto:Ulrich.Windl@rz.uni-regensburg.de)> corrected and validated HTML documents according to the HTML DTD
- [53]gif
- [54]David L. Mills <[mills@udel.edu](mailto:mills@udel.edu)>

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