VPort P16-1MP-M12-IR Series Quick Installation Guide

Moxa IP Camera

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Overview

The rugged VPort P16-1MP-M12-IR cameras provide an HD (720P, 1280 x 720) video image, and feature an H.264/MJPEG IP dome, giving them the versatility and ruggedness to excel in many different installations and environments for mobile IP video surveillance applications. In addition, the cameras feature EN 50155 compliance, vandal-proofing (EN 62262 IK10), a -25 to 55°C or -40 to 70°C (TX models) operating temperature, rugged M12 Ethernet port, built-in microphone, digital input, PoE power input, IP66 rain and dust protection, and an IR illuminator for day & night image capability.

Package Checklist

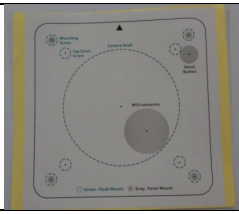
Moxa's VPort P16-1MP-M12-IR is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- 1 VPort P16-1MP-M12-IR (lens included)

Model	Lens	Temperature		Conformal coating
		-25 to 55°C	-40 to 70°C	
VPort P16-1MP-M12-IR-CAM36	3.6 mm	✓		
VPort P16-1MP-M12-IR-CAM80	8.0 mm	✓		
VPort P16-1MP-M12-IR-CAM36-T	3.6 mm		✓	
VPort P16-1MP-M12-IR-CAM80-T	8.0 mm		✓	
VPort P16-1MP-M12-IR-CAM36-CT	3.6 mm	✓		✓
VPort P16-1MP-M12-IR-CAM80-CT	8.0 mm	✓		✓
VPort P16-1MP-M12-IR-CAM36-CT-T	3.6 mm		✓	✓
VPort P16-1MP-M12-IR-CAM80-CT-T	8.0 mm		✓	✓

- Screw handle accessory package

Torx screw driver for attaching/detaching the upper case	4 sets of nut, gasket, and spring washer for mounting the camera	4 Nylock screws (10 mm) for mounting the top cover on the ceiling in a flush mount installation
		

Sticker for camera mounting positions


- Quick Installation Guide (printed)
- Documentation and software CD (includes User's Manual, Quick Installation Guide, and Utility)
- Warranty card

NOTE Check the model name on the VPort's side label to determine if the model name is correct for your order.

NOTE This product must be installed in compliance with your local laws and regulations.

Features

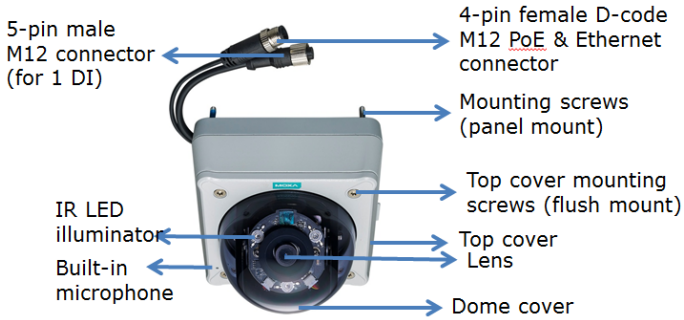
- 1/2.7" HD progressive CMOS image sensor
- High image quality with WDR (wide dynamic range) and DNR (Digital Noise Reduction) supported
- Minimum illumination is up to 0.2 lux (color)
- Built-in IR (infra-red) illuminator and ICR (IR-cut removable) for day & night environments
- Supports MJPEG and H.264 Dual Codecs
- Supports ONVIF Profile S for multiple video stream profiles
- Video stream up to 30 frames/sec at WXGA (1280 x 800) resolution
- Supports video quality configuration with fixed bit rate (CBR) and fixed quality (VBR)
- Video latency under 200 ms
- DynaStream™ for network efficiency with dynamic frame rate change
- WXGA/720P/SVGA/ Full D1/ 4CIF/ VGA/ CIF resolution
- TCP, UDP, and HTTP network transmission modes
- Supports DHCP OPT66/67 for automatic configuration from TFTP server, making it easy to batch configure several units
- Supports RTSP streaming
- Support multicast (IGMP) video streaming
- Supports SNMP (V1/V2C/V3) for network system integration and management
- Supports QoS (ToS) for transmission priority
- Built-in web server for easy configuration
- Accessible IP filtering
- UPnP supported
- Compliant with EN 50121-3-2 and relevant sections of EN 50155 (compliant with IEC 60571)
- 1 10/100BaseT(X) port with M12 D-code connector
- IP66 rain and dust protection, with dehumidifying membrane
- PoE (Power-over-Ethernet, IEEE 802.3af) supported

- EN 62262 IK10 level vandal resistance
- -25 to 55°C (EN 50155, Class T1), or -40 to 70°C (EN 50155. Class TX) operating temperature for rolling stock environments
- CE, FCC, UL 60950-1
- Built-in tamper alarm and Video Motion Detection (VMD)
- Pre, Trigger, and post snapshot images supported
- Sequential snapshot images supported
- Supports SMTP and FTP for alarm message transmission
- Supports HTTP event server
- 5-year warranty

NOTE The VPort P16-1MP-M12 is designed for onboard environments, and should be used inside the car or train.

Product Description of the VPort P16-1MP-M12-IR

Appearance



- **Mounting screw (panel mount):** 4 nylock M4 screws (40 mm) are required to mount the VPort P16 on the wall or ceiling; the external length is about 20 mm after installation. The 4 mounting screws can work with the 4 sets of nut, gasket, and spring washer, or can be screwed directly into the screw holes.

NOTE If the length of the mounting screws is insufficient for your installation environment, you may use longer M4 screws (not provided with the product), or contact your Moxa sales representative for customization service.

- **Top cover mounting screws:** 4 Nylock screws (10 mm) are included with the accessory for flush mounting the top cover on the ceiling.
- **Top cover:** The top cover can be removed for tuning the camera lens position.
- **Lens:** The VPort P16-1MP-M12-IR can be used with 2 different lenses with different focal lengths: 3.6 mm and 8 mm (Complete model names include "-CAMxxxxxxx". See page 2 for details).
- **Dome cover:** The VPort P16-1MP-M12-IR comes with a vandal-proof PC dome cover, which complies with EN 62262 (IEC 62262) class IK10.

- **IR LED illuminator:** VPort P16-1MP-M12-IR is equipped with 3 IR (infra-red) LED illuminators for low light environments. These IR LED illuminators will turn on or off according to the light sensor configuration in the product's web-based manager.
- **4-pin female D-code Ethernet & PoE connector:** A 4-pin M12 D-code connecter for both PoE power supply (Mode A) and Auto MDI/MDI-X Ethernet connection.

PIN	TX
1	TD+
2	RD+
3	TD−
4	RD−

NOTE To connect the VPort 16-M12 series to the network, use an Ethernet cable with a D-code M12 connector and an M12 PoE switch or RJ45 PoE switch.

M12 D-code to M12 D-code cable 	M12 PoE Switch (e.g., TN-5508-4PoE) 
M12 D-code and RJ45 cable 	RJ45 PoE switch (e.g., EDS-P510) 

- **5-pin male M12 connector:** The VPort P06HC-1MP-M12-IR supports one digital input with 5-pin M12 male connector. This DI is used for connecting with external devices for triggering an event or alarm.

  Digital input: Max. 8 mA,
  Low: -30 V to +3 V; High: +13 V to +30 V

Pin	Signal
1	DI+
2	Not used
3	DI-
4	Not used
5	Not used

Configuration:5 pins
System:Connector (M)
Mating Cable:Socket (F)
Code:A-polarization

- **Built-in microphone:** The VPort P16-1MP-M12-IR is equipped with a built-in microphone to receive external sounds. The sound will be digitized and compressed as an audio stream for network transmission with the video stream.

NOTE The color of the dome cover can be customized based on your installation environment. Contact your Moxa sales representative for information about this customization service. However, keep in mind that the dome cover will decrease the amount of light that can be transmitted into the lens. The darker the dome cover, the greater the decrease of light transmittance.

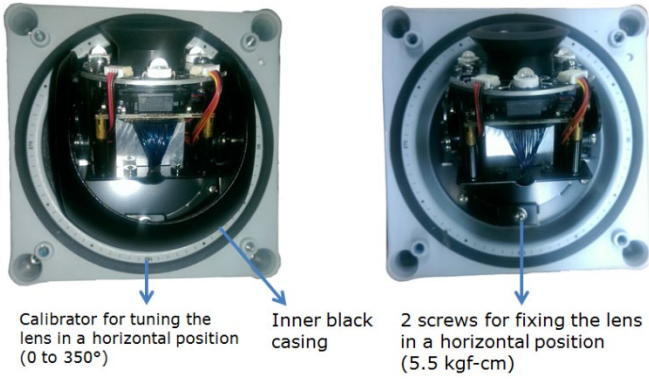
NOTE The power input rating of the VPort P16-1MP-M12-IR is 48V/0.6A, and the maximum power consumption is about 8 W.

NOTE The equipment is designed for installation inside a building, and is not intended to be exposed to the outdoors.

Bottom View

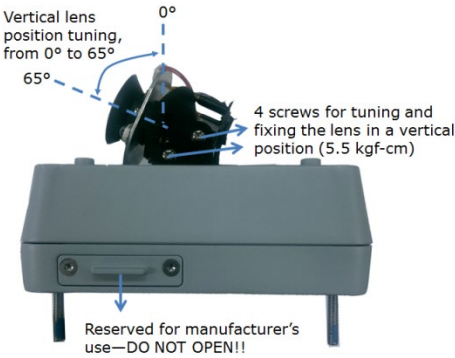
- **Reset button:** Loosen the screw and use a pointed stick, such as a toothpick, to push in the reset button to reboot to factory defaults.
  - Reboot: press the button once and then release.
  - Factory default: press and hold the button for at least 90 seconds.

Top View without top cover and dome cover



- **Calibration for tuning the horizontal lens position (0 to 350°):** After tuning the horizontal lens position, mark the position with this calibration for future replacement or mass installations.
- **2 screws for fixing the horizontal lens position:** There are 2 screws for fixing the horizontal lens position. A 5.5 kgf-cm torque is required for onboard environments.

Side view without top cover and dome cover

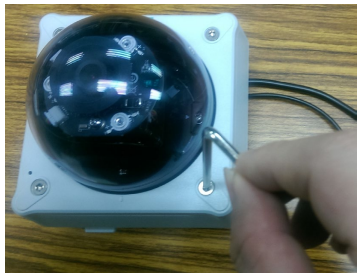


- **4 screws for tuning and fixing the vertical lens position:** There are 4 screws for tuning and fixing the vertical lens position. The vertical lens position can be tuned from 0° to 65°. A 5.5 kgf-cm torque is required for onboard environments.

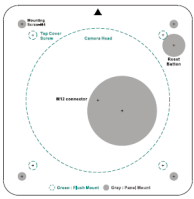
Hardware Installation

Step 1: Open and remove the upper case.

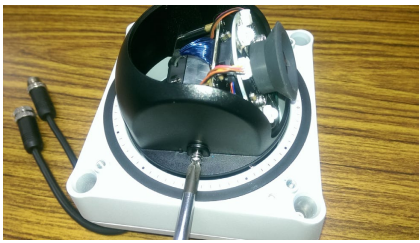
Use the security Torx to loosen the screws on the top of the camera casing.



Step 2: Use the installation sticker for drilling the holes (gray color for panel mounting, green color for flush mounting).



Step 3: Remove the inner black casing.



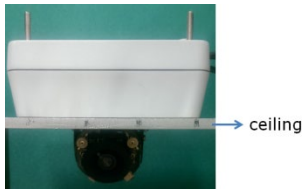
Step 4: Place the VPort P16 over the holes

Panel Mount

Screw the hex nuts, gaskets, and washers to fix the camera, and then connect the M12 cables.

Flush Mount

Position the camera lens over the hole, and hide the VPort P16's body above the ceiling.



Step 5: Loosen the screws that fix the horizontal and vertical lens positions. Next, tune the camera lens position, and connect to the VPort P16's web console to view the video image. After the lens position is correct, fix the screws (5.5 kgf-cm torque is required).

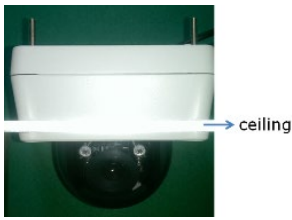
Step 6: Fix the inner black case and top cover to complete the installation.

Panel Mount

Re-screw the 4 top cover screws.

Flush Mount

Screw the 4 flush mount top screws (provided with the accessory) on the top cover.



NOTE Because of the anti-vibration design, for onboard environments 8 kgf-cm torque is required for all mounting screws.

NOTE The Nylock screws are designed to be used 2 or 3 times only. We recommend using new Nylock screws if the existing screws have been loosened and retightened 2 times.

NOTE The 4 flush mount top cover screws can fix the VPort P16's top cover to ceilings that are 5 mm or less thick. You can provide the M4 screws yourself, or contact Moxa for special support if you require longer top screws.

Software Installation

Step 1: Configure the VPort P16's IP address

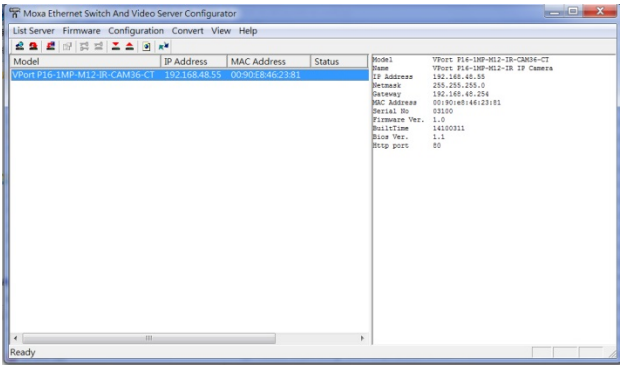
When the VPort P16 is first powered on, the POST (Power On Self Test) will run for a few moments (about 40 seconds). The network environment determines how the IP address is assigned.

Network Environment with DHCP Server

For this network environment, the unit's IP address will be assigned by the network's DHCP server. Refer to the DHCP server's IP address table to determine the unit's assigned IP address. You may also use the Moxa VPort and EtherDevice Configurator Utility (edscfgui.exe), as described below:

Using the Moxa VPort and EtherDevice Configurator Utility (edscfgui.exe)

1. Run the **edscfgui.exe** program to search for the VPort. After the utility's window opens, you may also click on the **Search** button  to initiate a search.
2. When the search has concluded, the Model Name, MAC address, IP address, serial port, and HTTP port of the VPort will be listed in the utility's window.



3. Double click the selected VPort, or use the IE web browser to access the VPort's web-based manager (web server).

Non DHCP Server Network Environments

If your VPort P16 is connected to a network that does not have a DHCP server, then you will need to configure the IP address manually. The default IP address of the VPort 16-M12 is 192.168.127.100 and the default subnet mask is 255.255.255.0. Note that you may need to change your computer's IP address and subnet mask so that the computer is on the same subnet as the VPort.

To change the IP address of the VPort manually, access the VPort's web server, and then navigate to the **System Configuration → Network → General** page to configure the IP address and other network settings. Check the **Use fixed IP address** to ensure that the IP address you assign is not deleted each time the VPort is restarted.

Step 2: Accessing the VPort P16's web-based manager

Type the IP address in the web browser's address input box and then press enter.

Step 3: Install the ActiveX Control Plug-in

A security warning message will appear the first time you access the VPort's web-based manager. The message is related to installing the VPort AcitveX Control component on your PC or notebook. Click Yes to install this plug-in to enable the IE web browser for viewing video images.

NOTE For Windows XP SP2 or above operating systems, the ActiveX Control component will be blocked for system security reasons. In this case, the VPort's security warning message window may not appear. Users should unlock the ActiveX control blocked function or disable the security configuration to enable the installation of the VPort's ActiveX Control component.

Step 4: Access the homepage of VPort P16's web-based manager.

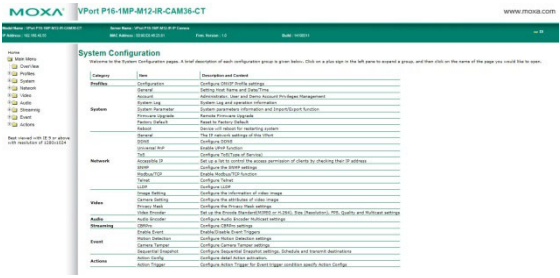
After installing the ActiveX Control component, the homepage of the VPort 16's web-based manager will appear. Check the following items to make sure the system was installed properly:

1. Video Images
2. Video Information

Step 5: Access the VPort's system configuration.

Click on **System Configuration** to access the overview of the system configuration to change the configuration. **Model Name**, **Server Name**, **IP Address**, **MAC Address** and **Firmware Version** appear in the green bar near the top of the page. Use this information to check the system information and installation.

For details of each configuration, check the User's Manual on the software CD.



Wiring Requirements

ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your Moxa VPort P16-1MP-M12-IR.

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

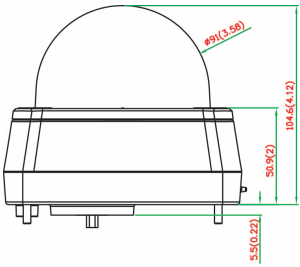
If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

You should also pay attention to the following:

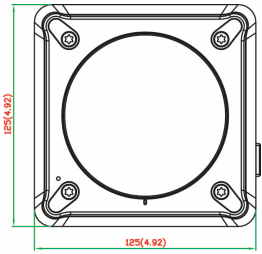
- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring to all devices in the system when necessary.

Dimensions (unit = mm (inch))

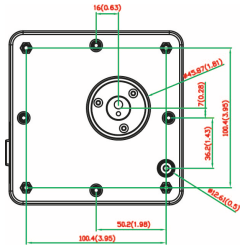
Front View



Top View



Bottom View



Specifications

Camera	
Sensor	1/2.7" Progressive CMOS
Lens	3.6 and 8 mm fixed focal length
Angle of view	3.6 mm, F1.6: Diagonal 120°, Horizontal 96°, Vertical 56° 8.0 mm, F1.8: Diagonal 48°, Horizontal 38°, Vertical 24°
Camera lens angle	PAN 350°, TILT 0 to 65° (controlled manually)
Illumination (low light sensitivity):	Color: 0.2Lux@F1.2, B/W:0.05Lux@F1.2,
ICR Control (day & night)	Auto
IR Illumination	3 IR LED illuminators; On/Off controlled manually (night mode) or by the light sensor
Synchronization	Internal
White Balance	ATW/ AWC (range: 3200 to 10000°K)
Auto Electronic Shutter	1/30 to 1/25000 sec
S/N Ratio	50 dB (Gamma, Aperture, AGC, OFF; DNR ON)
DNR	Built-in
WDR	Level 1-8
AGC Control	2X, 4X, 8X, 16X, 32X, 64X
Flickerless Control	Automatic/50 Hz/60 Hz
Black Level Control	High/Medium/Low
Auto Exposure	Level ±5
Image Rotation	Flip, Mirror, and 180° rotation
Image Setting	Manual tuning with saturation, sharpness, and contrast

Video	
Video Compression	H.264 (ISO/IEC 14496-10) or MJPEG
Video Output	Via Ethernet port
Video Streams	3
Video Resolution and FPS (Frame per second):	

	NTSC		PAL	
	Size	**Max. FPS**	**Size**	**Max. FPS**
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25

Video Viewing	• CBR Pro™ for good image quality in limited bandwidth transmissions • DynaStream™ supported for automatic frame rate adjustment • 3 configurable privacy mask areas • Adjustable image size and quality • Timestamp and text overlay • OSD (On screen Display) position adjustable • Maximum of 5 simultaneous unicast connections
Audio	
Audio Input	1, built-in microphone
Audio Format	Mono, PCM (G.711)
Network	
Protocols	TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS, IGMPv3, SNMPv1/v2c/v3, DDNS, TFTP, ARP, DHCP, OPT66/67
Ethernet	1 10/100BaseT(X) isolated Ethernet port, 4-pin M12 Dcode female connector
GPIO	
Digital Inputs	1, 5-pin M12 male connector • High: +13 V to +30 V • Low: -30 V to +3 V
Power Requirements	
Input	Power-over-Ethernet (IEEE 802.3af)
Consumption	Maximum 8 W
Physical Characteristics	
Housing	Metal, PC dome cover, IP66-rated
Dimensions	125 x 125 x 120.7 mm (5.6 x 5.6 x 4.8 in)
Weight	870 g
Installation	Surface (ceiling) or flush (recessed) mounting

Environmental Limits	
Operating Temperature	Standard Models: -25 to 55°C (-13 to 131°F) Wide Temp. Models: -40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Altitude	2000 m
Regulatory Approvals	
Safety	UL 60950-1
EMI	FCC Part 15, CISPR (EN 55022) Class A
EMS	EN 61000-4-2 (ESD), Level 3 EN 61000-4-3 (RS), Level 3 EN 61000-4-4 (EFT), Level 3 EN 61000-4-5 (Surge), Level 3 EN 61000-4-6 (CS), Level 3 EN 61000-4-8 EN 61000-4-11
Rolling Stock	EN 50155:2007 compliance (shock, vibration, temperature, EMC)
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373
Vandal resistance	IEC 62262, Class IK10
MTBF (Mean-time between failure)	Ground Benign: 1,052,184 hours Ground Mobile: 114,812 hours Database: Telcordia Bellcore, 25°C
Warranty	5 years

Alarm Features

- Intelligent Video: Camera tamper
- Video Motion Detection: 3 independently configurable areas
- Scheduling: Daily repeat timing schedule
- Imaging: JPEG snapshots for pre/trigger/post alarm images
- Custom Alarms: HTTP event servers for setting customized alarm actions
- Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
- Pre-alarm Buffer: 12 MB video buffer for JPEG snapshot images

Security

- Password: User level password protection
- Filtering: By IP address
- Encryption: HTTPS, SSH

Minimum Viewing System Requirements

- CPU: Pentium 4, 2.4 GHz
- Memory: 512 MB of memory
- OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
- Browser: Internet Explorer 9.x or above
- Multimedia: DirectX 9.0c or above

Software Development Kit	
VPort SDK PLUS	Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developer
Standard	ONVIF Profile S