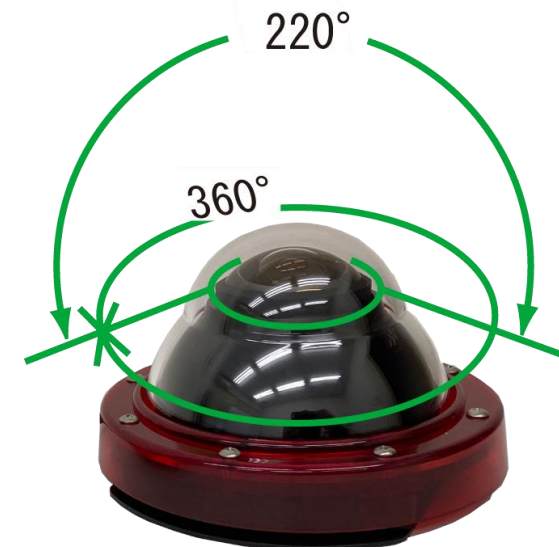


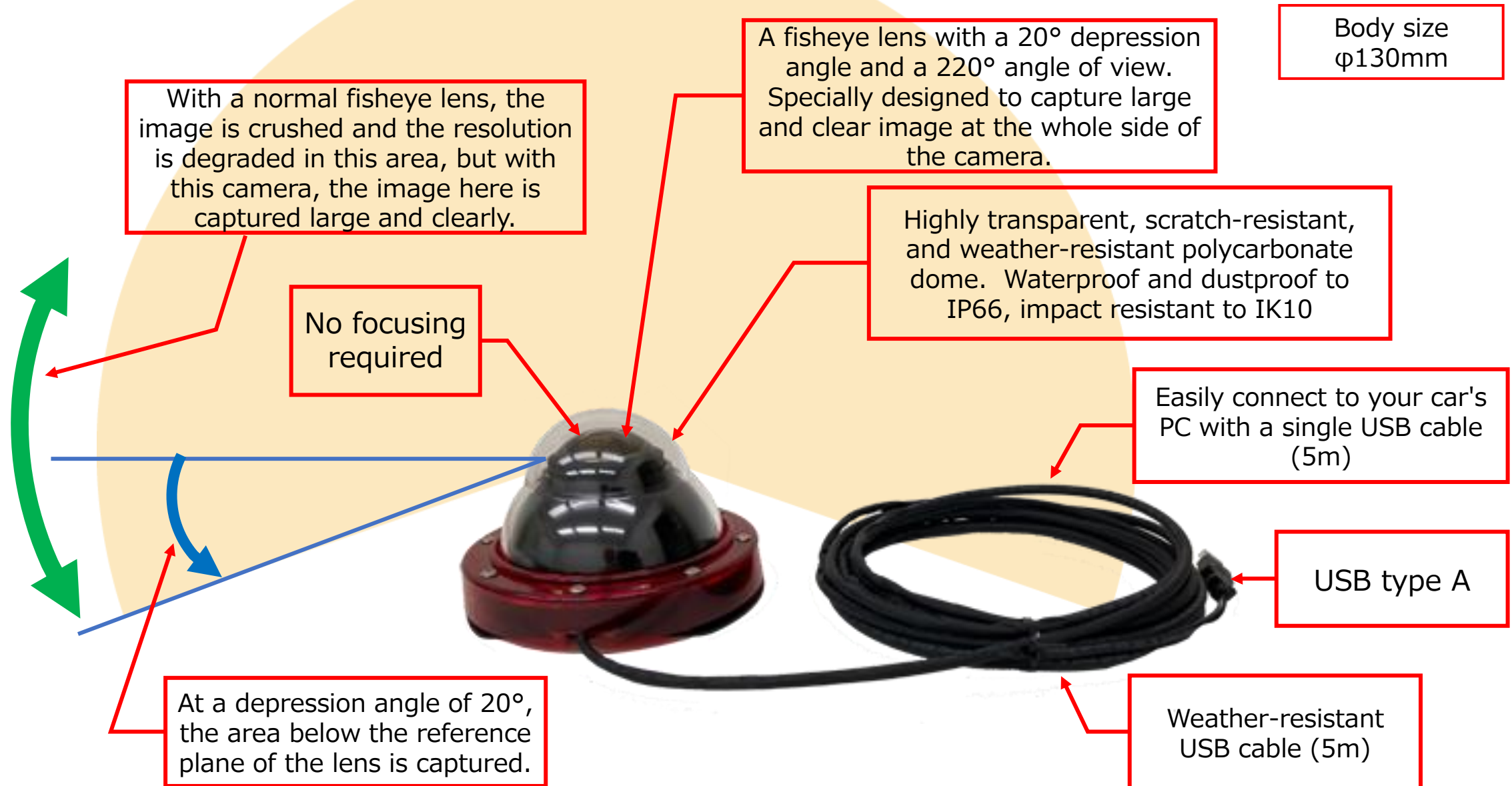
Structure and feature of Rooftop type 360° camera PLC220-12M

* Overview of the 360° Rooftop Camera

- With a specially designed fisheye lens, the camera installed on the roof can shoot the **360° hemisphere view of the vehicle**.
- With the depression angle (the angle below the lens reference plane) of 20° of the lens, **the road surface is in a view**.
- You can shoot in all directions with one camera. Since it is not a composition of images from multiple cameras, **a seamless view** is available. Image dewarping is very easy and smooth.
- Since it is a fisheye lens, there is **no need for a focusing mechanism or alignment work**. No PTZ mechanism assures **12 times higher durability**.
- The use of a glass lens provides **high reliability and high image quality**.
- Digital output of clear images from USB. Connect directly to a computer for operation and video confirmation. Even during image transmission, there is no image deterioration.
- **Easy connection** between the camera and a PC in a car with a single USB cable.
- Easy and simple installation with a strong adhesive tape or magnet.
- Water & dust proof **IP66**, anti-shock **IK10** dome housing

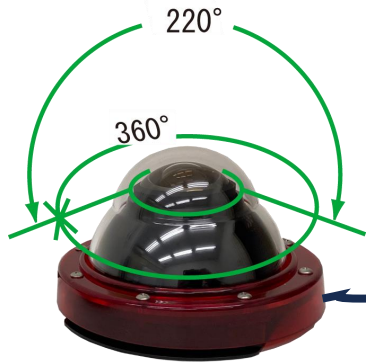


Structure of PLC220-12M



Basic feature of PLC220-12M

Rooftop type 360°camera
PLC220-12M



USB cable

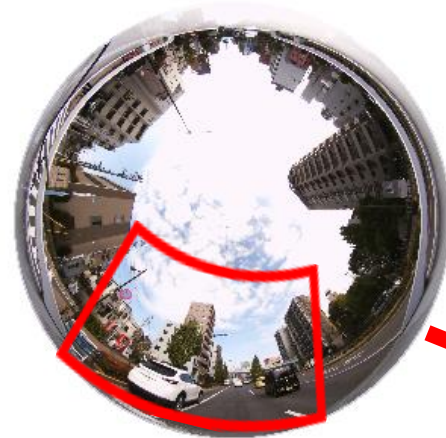
Windows PC
in a car



The dedicated free app PLCViewer allows you to **live view, record, play, dewarp and partially decode of video.**



180° panorama x2



12.3 Mega Pixel
High Resolution Fisheye image



Partial dewarping



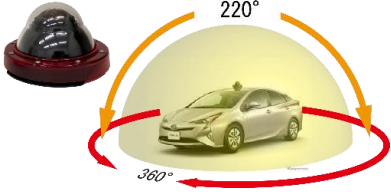



Partial zoom-in

Comparison of On-vehicle camera

Blue: advantages

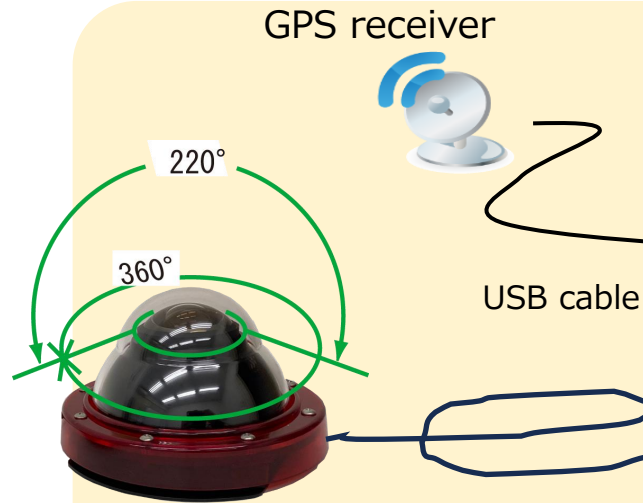
Red: disadvantages

Green: concerns

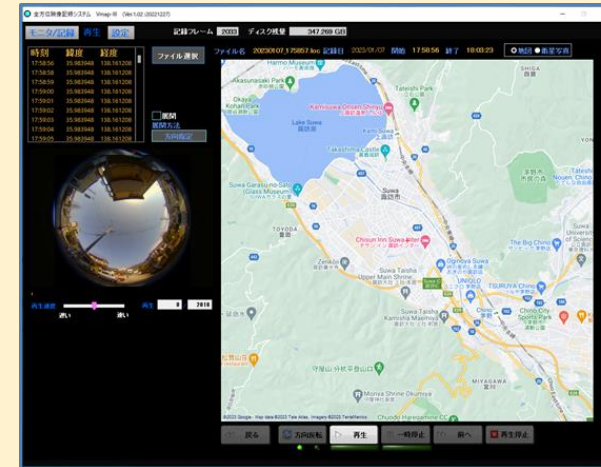
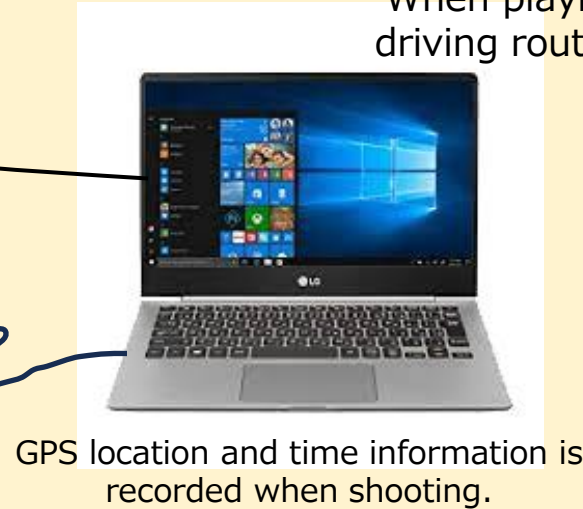
	On-vehicle installation	In-vehicle Dashcam	On-vehicle camera with different solution	
Supplier/Model	OPT Corporation : PLC220-12M	from many suppliers, Dashcam	Fujitsu General, HITACHI	Ricoh/Theta Z1/Z251, Insta 360
Appearance/ View angle				
Basic Structure	Fisheye lens with depression angle Installed on Vehicle. 360 degree all side of the camera is in view.	1~3 cameras in a car for front and rear view. 1~3 separate screens.	Two wide-angle cameras are installed back to back, and wide-angle (apprx. 170°) images are displayed on two screens.	Action camera: Images from two fisheye cameras (180°) are combined to create a global image.
Housing : would like to be less than H=130mm	small as φ=130mm, H=89mm	Small and unobtrusive inside a car	Difficult to miniaturize, cable is thick Current product: φ180mm, H=70mm or more	Impossible to make smaller in height. H=160mm or more
Viewing range	220° x 360°: Captures images from above down to the road surface. Large, clear side views	View is limited to the front and rear. Separate video management = dual-screen display. Blind spots due to interior structures. Side blind spots.	Front and rear wide-angle images. Separate image management = dual-screen display. Blind spots on the sides	Even if you can take a global shot, it will be useless because the roof of the car will block it.
Movie resolution (Mega Pixel)	12.3	0.5~2 (enough for minimum size screen)	3	7.4
Vide format	AVI/M-JPEG	MP4	INSV	MP4 or INSV
Required Power	Powered by USB of your car's PC 5V, 2A Single cable connection required	Cigarette lighter 12V	Cigarette lighter 12V	Internal rechargeable battery
Recording and video transfer function	Long-term recording is possible using an in-car PC. Transfer to IP via the police system.	Transfer only via SD card. Self-contained recording. Due to the recording capacity of the SD card, not suitable for long-term recording	Record and save in the PC in a car, and transferred to headquarters via the PC's communication function.	SD card recording. Wi-Fi transfer or USB Type-C. Not suitable for long-term recording.
価格	US\$2,400 includes the dewarping software.	Cheap (US\$100-800) For personal users.	US\$800 excluding application software.	The camera alone costs about US\$250, but this is unrealistic for use in a car.

※ In addition to the above, there is a system used by Google View that synthesizes images from eight cameras (US\$113,000 per unit), and Facebook is considering a system using 17 composite cameras (US\$11,500).

Advanced feature ~ Video Mapping ~



Record using the separately sold video mapping software.
When playing back, a map is displayed showing the driving route, latitude and longitude, time, and video.



Zoom-in, 180x2 panoramas

E-mail transfer of still images

Recorded video from Vmap can also be played and dewarped by PLCViewer



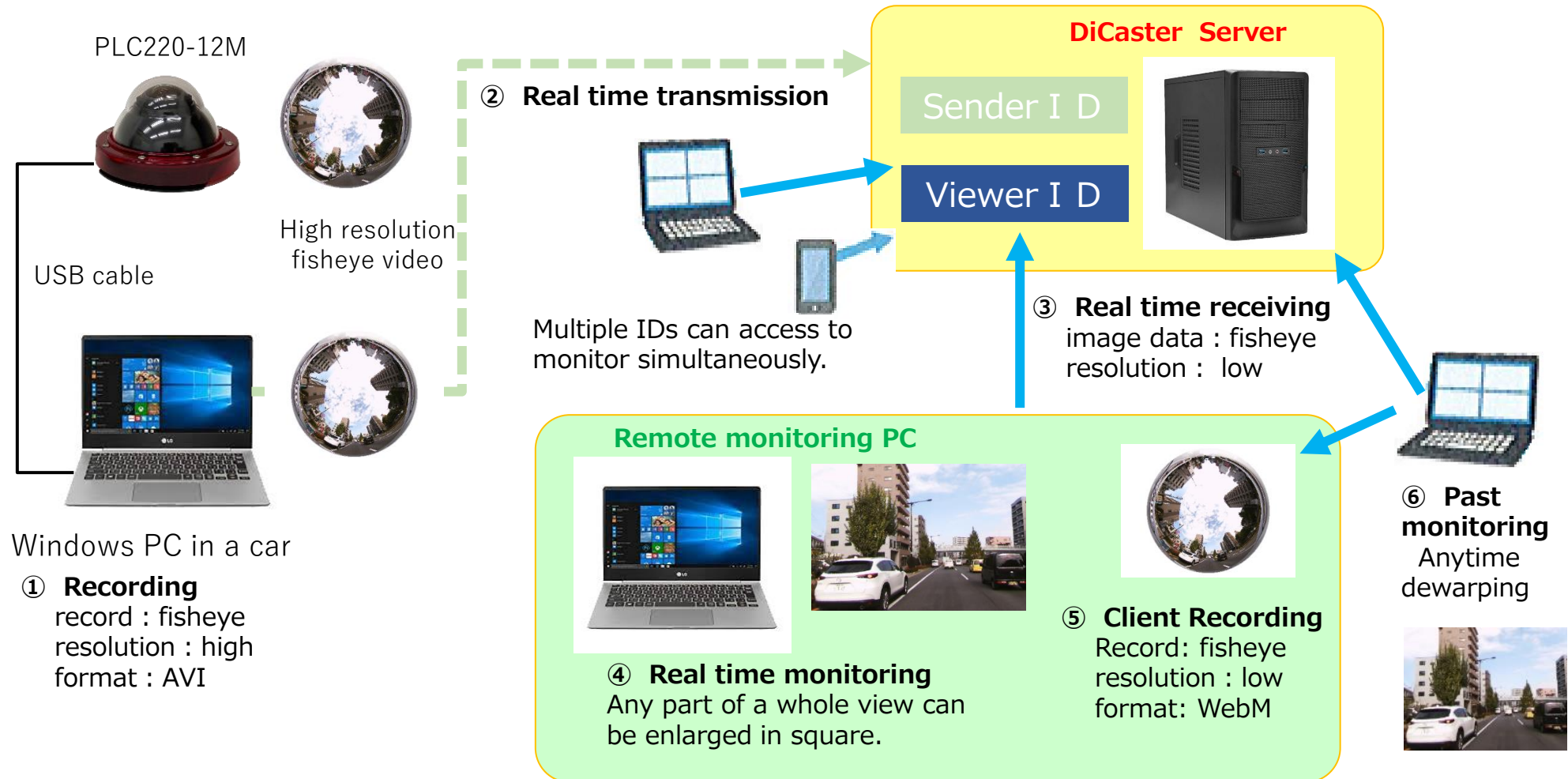
12.3 Mega Pixel
High Resolution Fisheye image

【very convenient with GPS information】

- ◆ The recording date and time, as well as latitude and longitude information, are recorded along with the video.
- ◆ You can overlay free online map information to see your exact location.
- ◆ You can get the latest footage of your own drive, rather than old footage from the internet.
- ◆ You can even record live footage of accident scenes.

Advanced feature ~ Live video data transmission system ~

- DiCaster® is the video transmission system provided by ENWA Co.Ltd (Oosaka) to fire departments across the country.



Reference price by configuration

	Basic Set	Mapping Set	Remote monitoring Set
	PC and Camera only. Shooting, recording and playback.	Records GPS location info and video together, and displays the driving trajectory on the map.	Real-time transmission of video from the PC in the car. ASP service.
Installation	Simply attach the camera to the car with a magnet only when necessary, and bring a PC in the car.	Permanent install camera and GPS receiver in a dedicated vehicle, bring a PC in.	Camera and PC are permanently equipped in a dedicated vehicle. Transmission to cloud server.data management.
Equipment	<ul style="list-style-type: none"> •PLC220-12M •Laptop PC (Recording and playback software, pre-installed) 	<ul style="list-style-type: none"> •PLC220-12M •Laptop PC (Mapping software and viewer, pre-installed) •GPS receiver •Inverter •USB hub etc... 	<ul style="list-style-type: none"> •PLC220-12M •In-car PC (dedicated app pre-installed) •GPS receiver •Inverter etc...
Construction	unnecessary	Need	Need
Price Ref.	US\$4,500	US\$5,900 Construction cost included	US\$11,000 Construction cost included. Communication cost: US\$180/Month Exclude Monitoring PCs.

※ Discount is available depending on the equipment configuration and the number of sets/lot.