

## GPS radio wave retransmission system

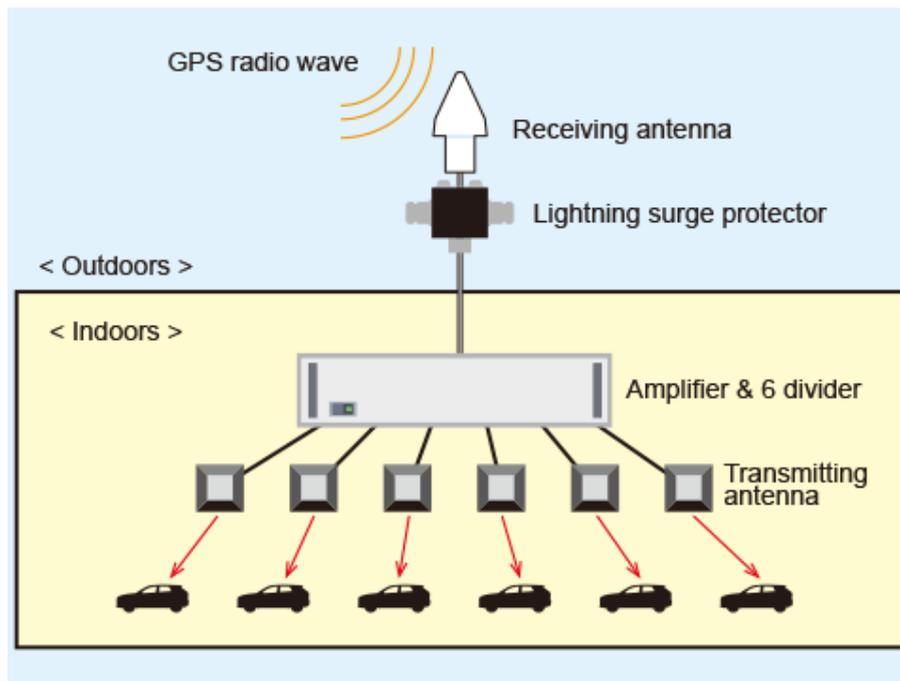
◇GPS signal can be received even in buildings where GPS radio wave doesn't reach.

### [~\*Application\*~]

GPS radio wave retransmission system is effective when setting on-board equipment such as car navigation system and drive recorder using GPS signal indoors.

### [~\*Solution\*~]

The MN1600 is a retransmission system that receives GPS radio wave with a receiving antenna installed outdoors, amplifies it and then radiates again with an indoor transmitting antenna. GPS radio waves can be emitted from up to 6 transmit antennas with the MN1600.



In the MN1600, it is designed so as not to cause problems concerning the following points.

(1) In order not to violate the Radio Law, it is necessary to control the strength of the radio waves to be retransmitted.

GPS radio waves from satellites are about  $-130$  dBm in intensity on the ground. After receiving this radio wave, the MN1600 amplifies it and radiates it again with indoor transmit antenna, but in order not to be in violation of Japanese Radio Law, the electric field intensity of it at the distance of 3 m from the transmitting antenna shall be reduced to  $35 \mu\text{V} / \text{m}$  (about  $-110$  dBm). Therefore, attenuation of GPS radio waves is assumed by checking the length of the coaxial cable used between the receiving antenna and the transmitting antenna and the distance from the transmitting antenna to the GPS signal receiver such as a car at the installation site of this system, after that, we set the amplifier gain of the MN1600.

(2) The radio waves to be retransmitted must be amplified after narrowing the frequency band sufficiently.

In the air, there are many radio waves of various radio devices such as mobile phones, radio and television. Since these radio waves are stronger than the GPS radio waves, if they are simultaneously amplified and re-radiated, the GPS signal receiver will saturate and not receive correctly, it will also be a violation of Japanese Radio Law. Therefore, in the MN1600, before amplifying radio waves with the amplifier, the frequency band is sufficiently narrowed with a narrow bandpass filter so that only GPS radio waves are amplified.

### [~\*System constitution\*~]

- GPS radio wave retransmission system MN1600      × 1

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2018/8