

RTRI Develops Facility Gauge Measuring Equipment

RTRI developed a device to detect trackside facilities protruding into the track clearance (Fig. 1). This device is capable of checking continuously whether any trackside objects interrupt safe train running or not without manual measurement nor using a specialized measuring vehicle.

【Features of the device】

- By mounting this device to an existing track inspection car, the required track clearance can be checked in the regular track inspection without conducting additional inspections using a specialized vehicle.
- Using a laser sensor, this device enables continuous measurement of the clearance between train vehicles and trackside facilities and checking whether required clearance is maintained on the track both in the daylight and night time. The laser sensor measures the distance between vehicles and trackside facilities including signalling equipment and level crossings facilities by laser beam reflection time. Since the device can conduct measurement in 80 km/h running, quick detection is possible.
- Its data management unit (Fig. 2) automatically cross-checks the measured data with the facilities management registry and outputs the results confirming whether track clearance is blocked or not. It is capable of confirming the distance from selected trackside facilities as well.
- With this device, it is possible to confirm the sufficient clearance of 75% of the trackside facilities which have been checked manually by maintenance staff so far.

【Background】

In order to ensure safe train operation, building limits have been set for railway trackside facilities to keep sufficient clearance around a train. Railway operators build and maintain structures and facilities so that they do not block the required clearance.

The distance from a specific structure or facility has been measured manually by maintenance staff or by a specialized measuring vehicle so far. However, manual measurement requires a lot of time and labor, and for vehicle measurement, a specialized vehicle needs to be introduced.

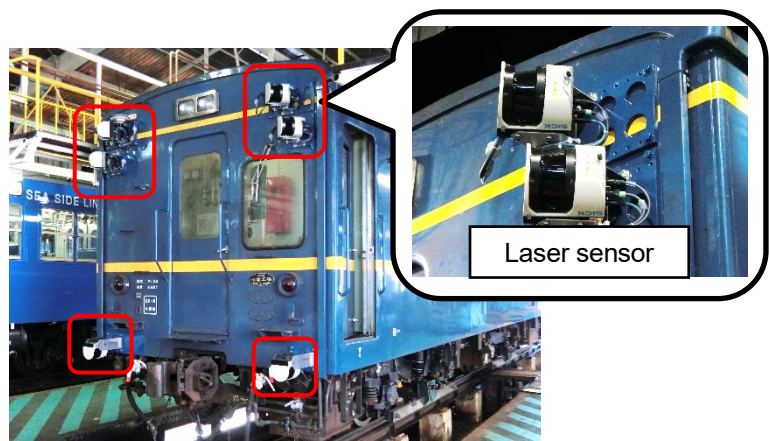
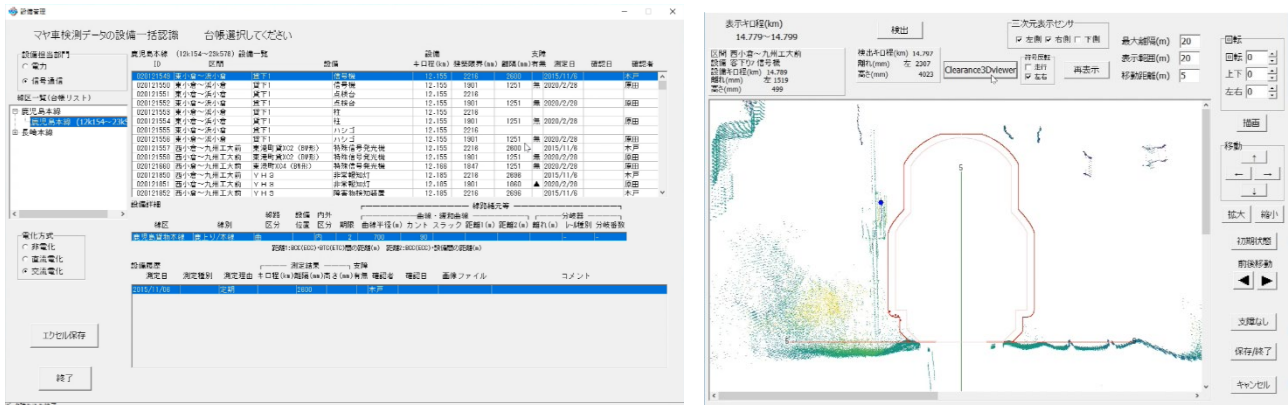


Fig. 1 Facility Gauge Measuring Equipment



(a) List of facilities

(b) Measured result of a facility

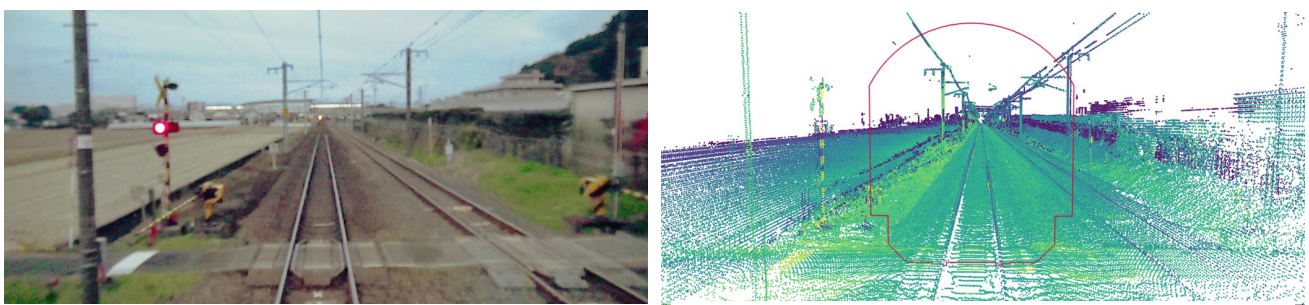
Fig. 2 Screen display of the data management unit

[Introduction to commercial operation]

Since trackside facilities are screened with this device in advance in order to identify those which do not need further measurement, 75% of the facilities do not require on-site manual measurement by maintenance staff.

In April, 2021, Kyushu Railway Company introduced this device to manage about 180 thousand items of ground facilities of conventional lines including signals, signs, tool boxes and power poles.

As the measurement data is 3-dimensional (Fig. 3) and cross-sectional shapes of tracks can be measured, RTRI is considering the possibility of using this system to measure distance between track centers.



(a) Image by ordinary camera

(b) Visualized image of 3-dimensional data measured by the device (Red line shows building limit)

Fig. 3 Example of data measured with this device