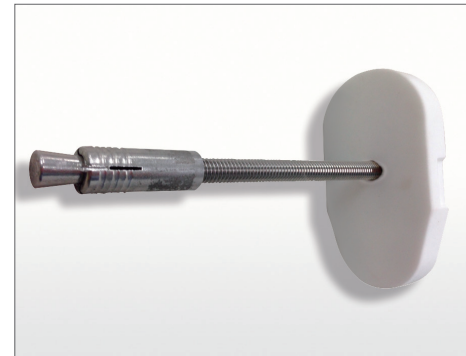


## Installation and measurement

### How to install the corrosion environment sensor

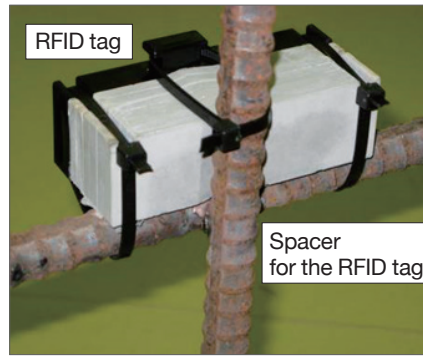


Install to a rebar by using a jig suitable for the rebar diameter.

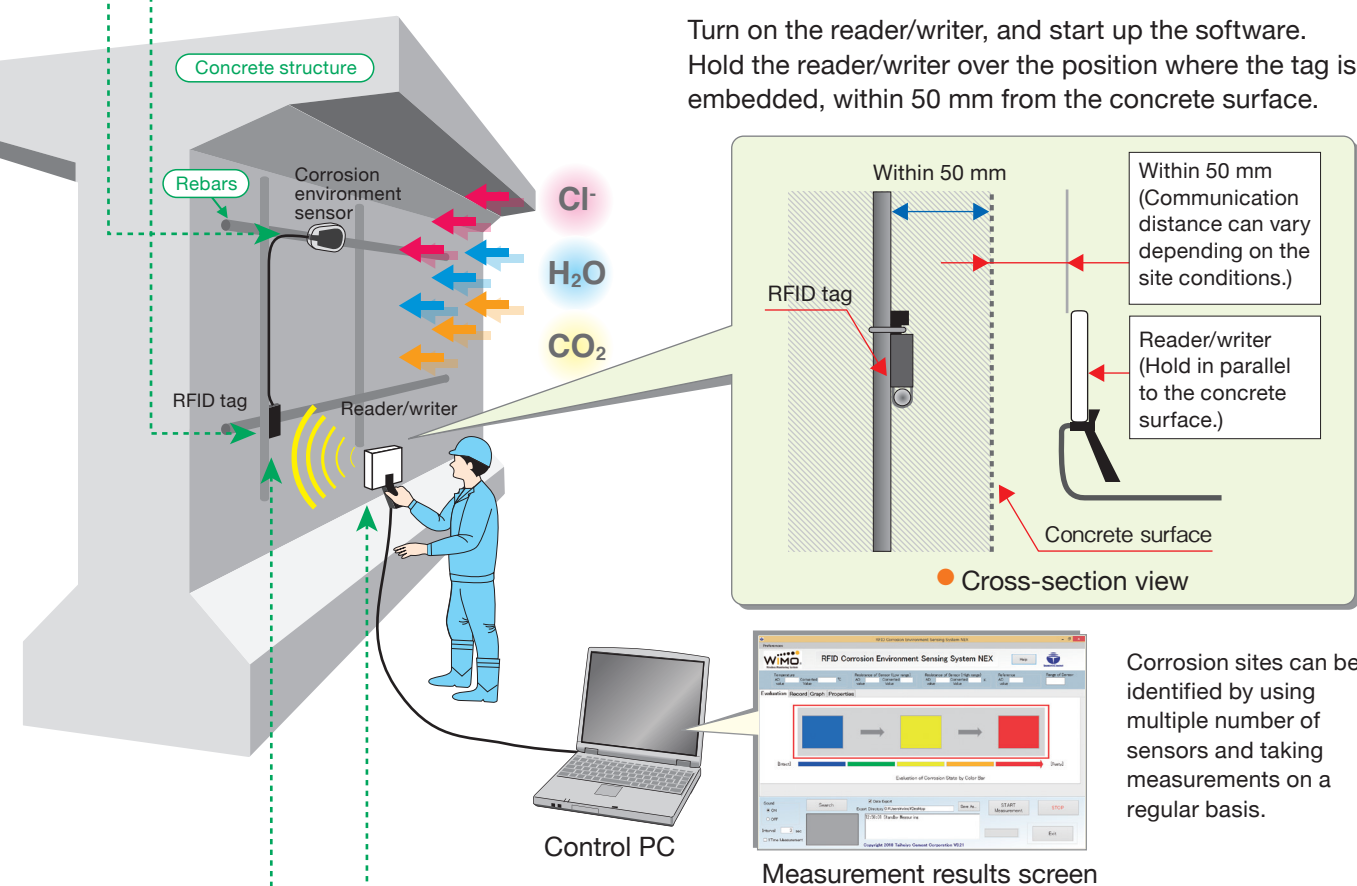


Install to a measurement object by using an anchor bolt.

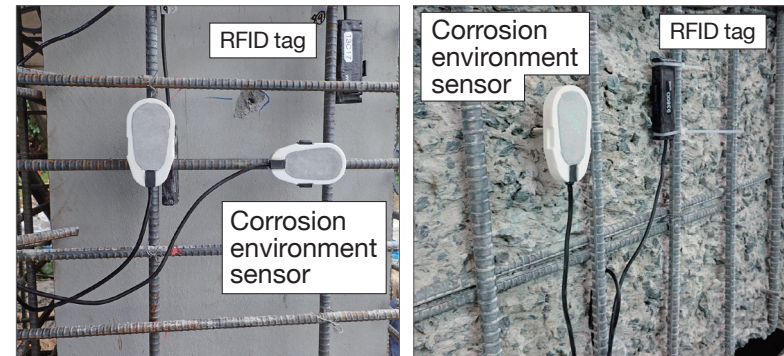
### How to install the RFID tag



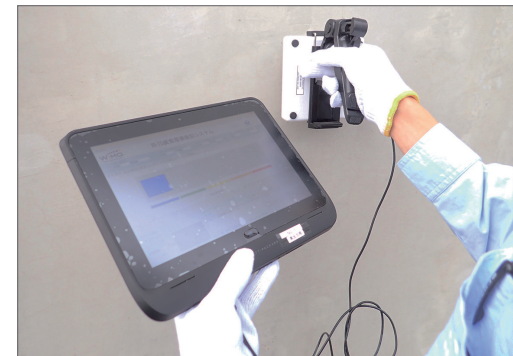
Install to a rebar by using the spacer for the RFID tag.



### Corrosion environment sensors installed



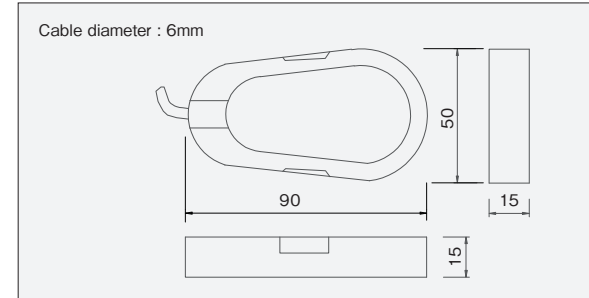
### Measurement using the reader/writer



## Product specifications

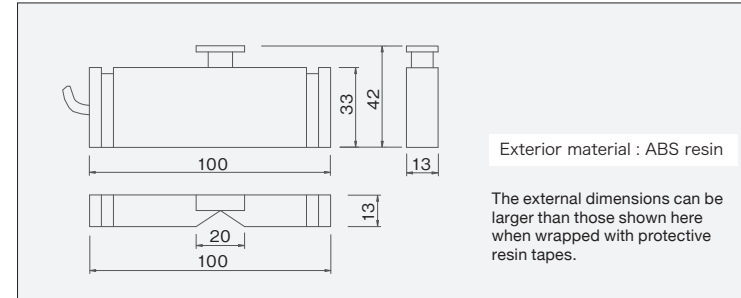
### External dimensions and specifications

#### Corrosion environment sensor



Model number	CES
External size	90×50×15mm
Weight	175g (excluding the RFID tag)
Compressive strength	400N/mm <sup>2</sup> or above (The sensor frame is made of ceramics.)
Cable length	0.5m *

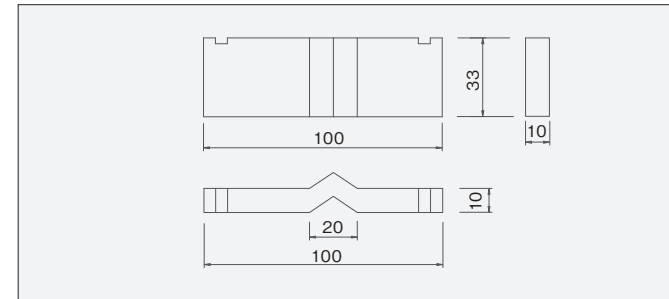
#### RFID tag



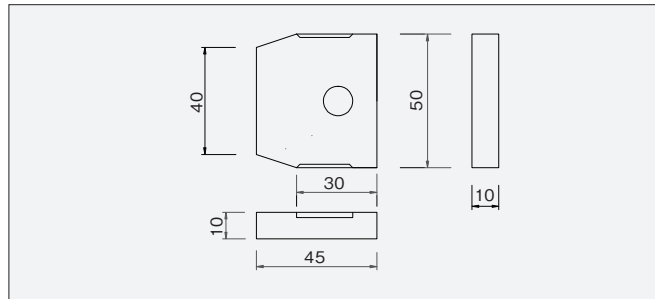
RFID frequency band	13.56MHz (HF band)
Communication distance	100mm or above (in air)
Memory capacity	All measurement values (6 inspection events)
Power	Wireless supply from the reader/writer (No batteries required)
Cable length	0.5m *

\* The total cable length is 1m. Use extension cables as required.

#### Spacer for the RFID tag



#### Spacer for the Sensor



<https://www.taiheiyo-cement.co.jp/rd/rfid/>

WIMO is a registered trademark of Taiheiyo Cement Corporation in Japan.

#### 《Precautions》

- Taiheiyo Cement Corporation assumes no responsibility whatsoever for any secondary damage resulting from the use of this product.
- Do not allow any person other than the manufacturer's repair technician to disassemble, repair or alter this product.
- Do not drop or subject this product to impact or vibration.
- Avoid condensation.
- When the corrosion environment sensor is stored for an extended period of time, wrap it in anticorrosive paper specified by the manufacturer.
- If the reader/writer is not used for an extended period of time, remove the battery or unplug the power cable.
- This product is a consumable. Its durability performance is tested, but no guarantee is provided after the delivery.
- The communicable range of the RFID-tag and the reader/writer antenna can vary depending on the rebar arrangement, materials, water content of concrete or local conditions.

#### 《Precautions related to the Radio Act》

- This product (reader/writer) complies with the Radio Act of Japan, and Technical Regulations Conformity Certification has been acquired.  
This product may require separate or further compliance certifications or further approvals under local laws or regulations for use in other countries.  
Be sure to observe the following instructions:
- Do not disassemble or alter this product. Such actions are prohibited by law.
  - Do not remove the label of Technical Regulations Conformity Certification.

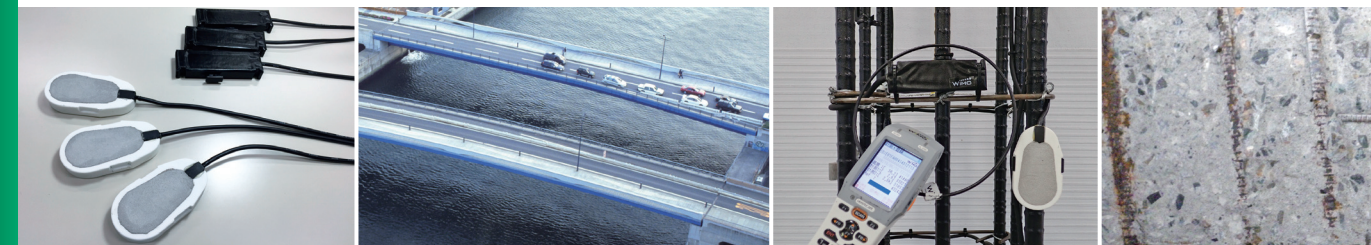
Manufactured and distributed by :

**TAIHEIYO CEMENT CORP.**  
Central Research Laboratory  
2-4-2 Osaku, Sakura City, Chiba Prefecture  
285-8655 JAPAN  
Phone: +81-43-498-3811 Fax: +81-43-498-3819

Product specifications are subject to change without notice.  
202006

## Easy wireless corrosion detection

# RFID Corrosion Environment Sensing System



**WiMo**  
Wireless Monitoring System

Wireless sensing

Wireless power supply  
—no batteries required


Easy information management by unique IDs

**TAIHEIYO CEMENT**



What is the RFID Corrosion Environment Sensing System?

The system measures and evaluates corrosive conditions around steel reinforcement in reinforced concrete structures by using radio signals at the structure surface.



Wireless Monitoring System

**Making structural diagnosis easier and more handy.**

WIMO is the technology for evaluating the structural integrity developed under the concept that anyone can easily perform non-destructive quantitative testing.



Features

Preventive maintenance

Early detection of corrosive conditions around steel reinforcement contributes to preventive maintenance.

Wireless communication

The embedded passive RFID tag obtains sensor outputs wirelessly.

Non-destructive

The RFID tag combined with the sensor enables non-destructive measurement of corrosive conditions in structures.

Long-term inspection

The system requires no external wiring or power supply (batteries) and is good for long-term maintenance and inspection.

History storage

Measurement results and histories of up to six inspection events can be stored in the RFID memory.

Easy to install

Easy installation of the sensor requires no adjustment.

Easy to use

Simple operation using the dedicated reader/writer and software allows anyone to perform measurement.

Detection of corrosion sites

Sites of corrosion can be effectively identified by using multiple number of sensors.

Options

Extension cable

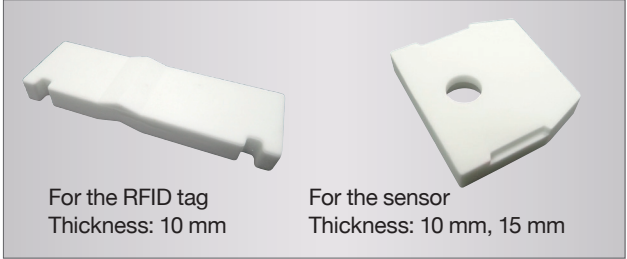
Cable diameter : 6mm



Length	Model number
1 m	CC-E0100
2 m	CC-E0200
4 m	CC-E0400
6 m	CC-E0600
9 m	CC-E0900
14 m	CC-E1400

Spacers

(ceramic)



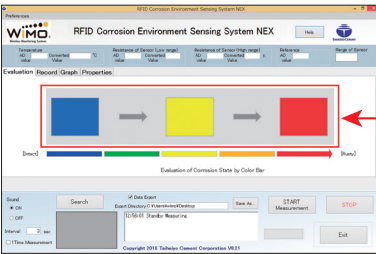
Reader/writer and software

Compatible OSs: Windows Vista/7/8/8.1/10



\*See the separate manual for the details of the software.  
\*Screen layouts are subject to change without notice.

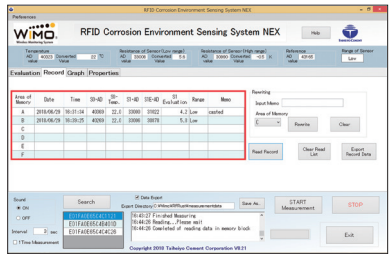
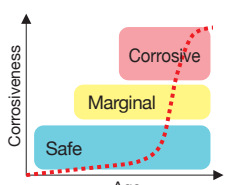
RFID frequency band	13.56MHz
Category by the Japanese Radio Act	Inductive reading and writing radio communication equipment
External size	125 (D) x 125 (W) x 30 (H) mm
Weight	220g
Power	USB (5 V DC, 15 mA max.)



Measurement results screen

Color-coded for quick judgement of corrosive conditions!

The zoning is based on the previous experimental results.



Inspection history check screen

Examples of measurement data

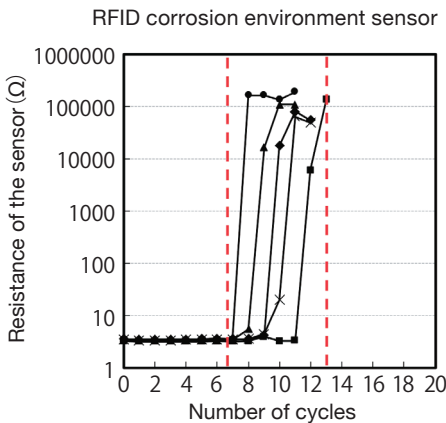
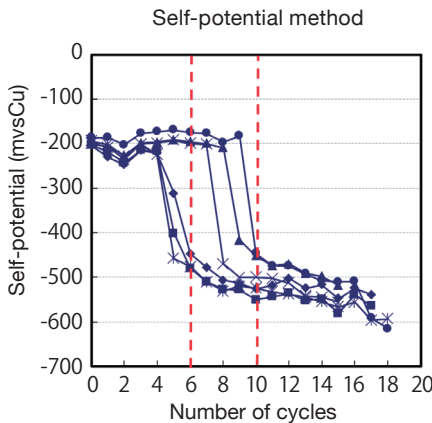
Detection performance evaluation by accelerated test

RFID corrosion environment sensor vs. self-potential method

<Specimens>  
Concrete mix: W/C = 65%, Gmax = 13 mm  
Size: 100\*100\*200 mm  
Install the sensors and rebars at a depth of 20 mm from the surface.

<Corrosion acceleration conditions>  
Cyclic exposure to 2-day immersion in 3% NaCl aqueous solution in a 40°C constant temperature bath and 4.5-day drying

<Test results>  
The REID corrosion environment sensor detected corrosion almost at the same time with the self-potential method.



Corrosion Environment Sensor and its sensing mechanism

Install the corrosion environment sensor which simulates steel reinforcement.

Corrosive substances penetrate the structure.

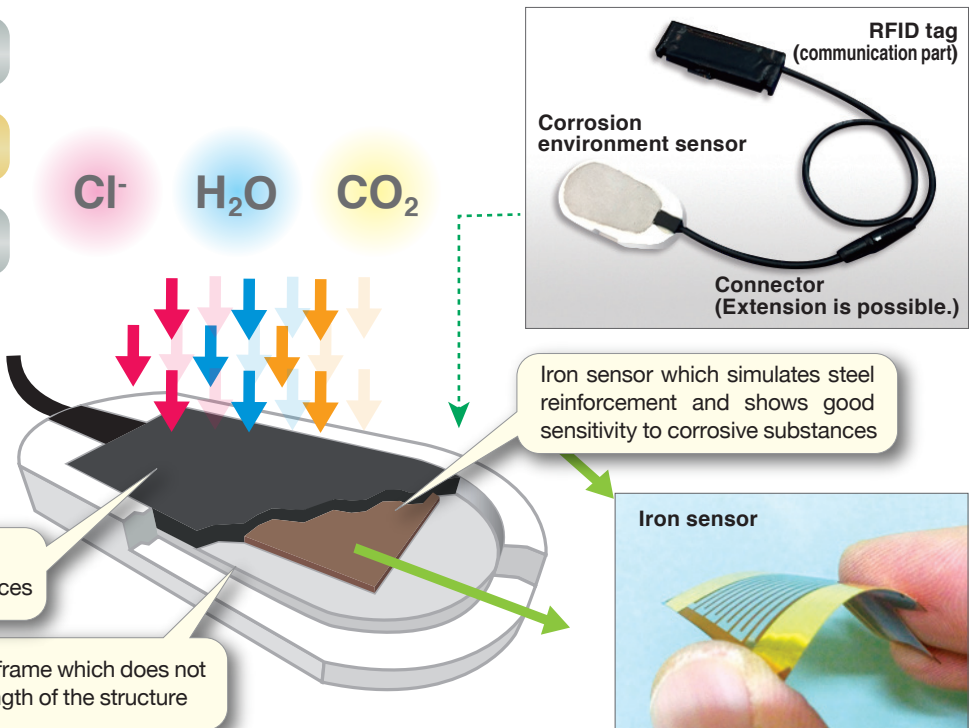
Electrical resistance of the sensor changes with the progress of corrosion.

Carry out wireless measurement.

Evaluate the corrosive conditions by using the dedicated software.

Covering mortar which allows penetration of corrosive substances

High-strength frame which does not affect the strength of the structure



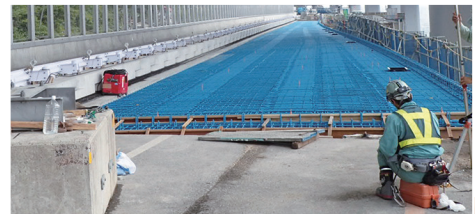
A variety of applications

With this system, you can detect corrosive conditions and their changes before steel corrosion actually starts.

- Management of corrosive conditions of piers, superstructure and substructure of bridges.
- Management of corrosive conditions of marine and port structures.
- Evaluation of the effect of patch repair.
- Management of corrosive conditions related to the use of anti-freezing agents.
- Soundness check on contaminated soil storage containers in which corrosive substances are included.
- Other soundness check and management of various structures.

Examples of construction

Maintenance and management of floor slabs and parapets



- Monitoring of corrosive conditions due to anti-freezing agents.
- Monitoring of corrosion deterioration induced by salt damage.

Maintenance and management of substructure of bridges



- Repair effect evaluation and soundness check.
- Monitoring of corrosion deterioration induced by salt damage.

Maintenance and management of lighthouses



- Monitoring of corrosive conditions due to airborne salt.
- Monitoring of corrosion deterioration induced by salt damage.

Evaluation of the repair effect on river revetments



- Repair effect evaluation and soundness check.
- Monitoring of corrosion deterioration induced by salt damage.