

Wireless Temperature Measurement System (WTMS)

2015.05.14



Contents

1. Overview
2. Product Description
3. Installation
4. Maintenance

1. Overview

Development Background

- Temperature measurement relies entirely on manpower.
- System Monitoring is not possible for enclosed & inaccessible equipment such as IPB, Switchgear, GCB, Main TR, AUX. TR, Power cable tunnel, Cable Tray.
- Spend a lot of time, manpower to find out cause and recovery in case of breakdown of machine.
- Impossible to get early warning of failure, breakdown.
- Imperfect database management on condition & history of equipment.

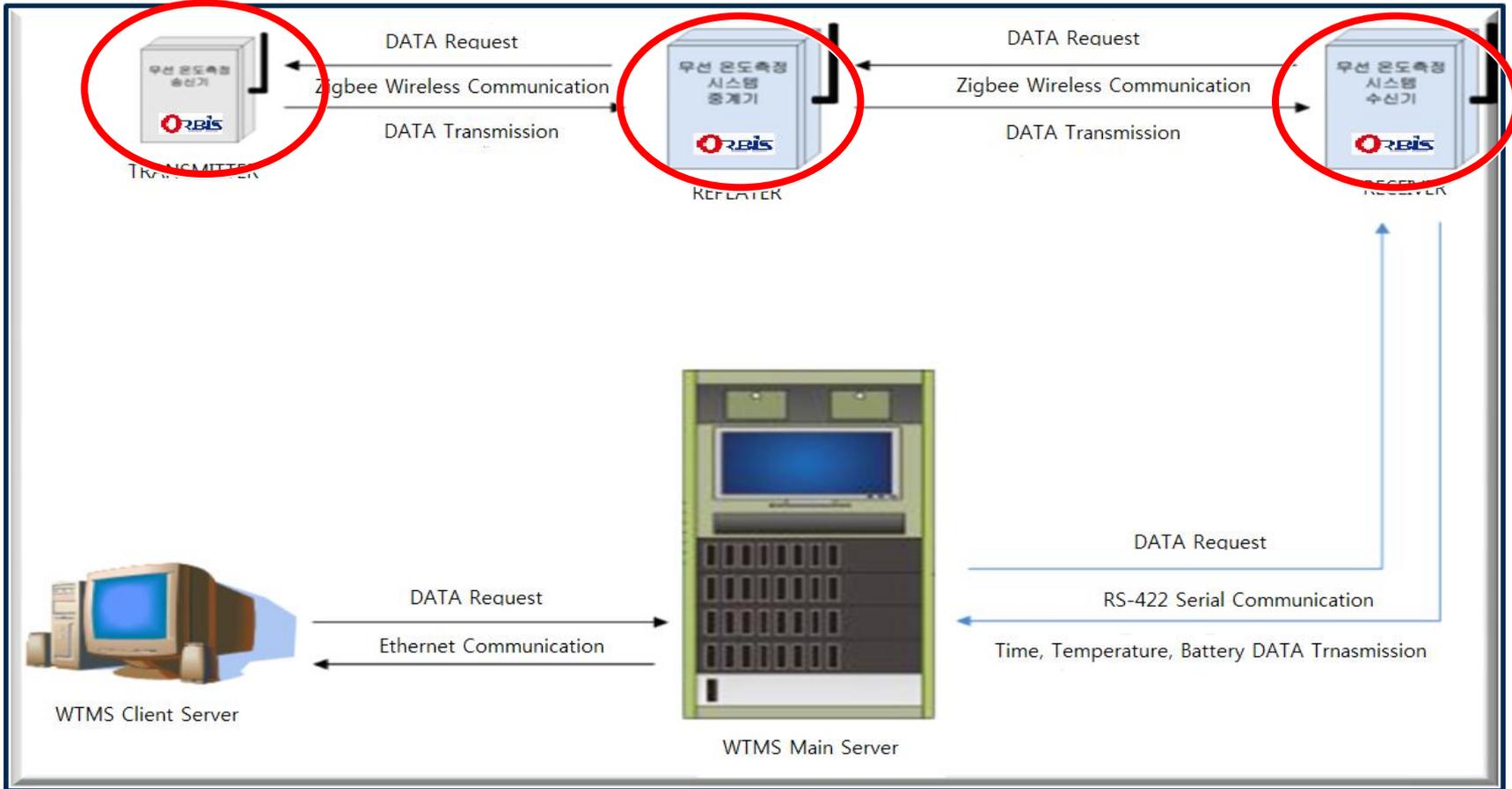
1. Overview

What is WTMS.

- WTMS measures temperature of electrical connection & voltage of battery for inaccessible equipment. After measurement, data is sent to server system for saving by wireless transmitter module at regular intervals.
- Each transmitter can be done history management and set the different temperature and alert alarm rings for prevent of accident, if temperature rises abnormally.
- Each transmitter can be managed in detail information such as “Trend” and save as history by WTMS operating program.
- The transmitter can be used two years without changing batteries(built-in battery).

1. Overview

System Configuration



2. Product Description

Sensor & Transmitter

Transmitter is activated on every half an hour for measure the temperature and transmission data. Rest of the activation, keep the Power Save Mode that minimize the power consumption.

- Temperature measurement range of Non-contact sensor :
-20℃ ~ 120 ℃, -20℃ ~ 250 ℃
- Temperature measurement range of contact sensor(PT-100) :
-30℃ ~ 120 ℃
- Measurement method :
Platinum resistance temperature detector,
Non-contact infrared light
- Transmission distance : In the lower 100m
- Transmission frequency : 2.4GHz
- Temperature measurement cycle : Every half hour
- Low electricity consumption H/W
- Each channel can be connected number of 120 transmitters



2. Product Description

Receiver

The data is requested by specified order and save the received data. If Receiver requests the data, transmitter send latest data.

- Transmission distance : In the lower 100m
- Transmission frequency : 2.4GHz
- Used power : 100~240VAC/60Hz
- Server communication : RS-422



Repeater

Each repeater relays the data selectively from the transmitters to the receiver.

- Same as Receiver
- Classified according to correspondence & receiver module

2. Product Description

Receiver module

Call the data from Receiver and connect to server PC

- Used power : 100~240VAC/60Hz
- Server communication : RS-422
- Number of channel is settled by number of module
(Available up to 9)



2. Product Description

WTMS 3.0

- Temperature & Battery Monitoring
- Temperature warning, alarm signal output
- Battery power warning, alarm signal output
- Temperature trend monitoring and report printing
- Event data recoding and management
- Sensor location display for each group
- OPC, Modbus and various communication links function

2. Product Description

WTMS 3.0

Main Overview Screen

번호	호기명	그룹명	센서명	측정시간	온도(°C)	Battery(V)
1	1호기	#1 보조변압기	#1 AUX TR-A	2014-03-18 16:25:46	35.6	3.8
2	1호기	#1 보조변압기	#1 AUX TR-B	2014-03-18 16:26:01	37.3	3.8
3	1호기	#1 보조변압기	#1 AUX TR-C	2014-03-18 16:26:16	36.9	3.9
4	1호기	#1 보조변압기	#1 AUX TR-X-U	2014-03-18 16:26:31	34.3	3.8
5	1호기	#1 보조변압기	#1 AUX TR-X-V	2014-03-18 16:26:46	37.5	3.9
6	1호기	#1 보조변압기	#1 AUX TR-X-W	2014-03-18 16:27:01	32.4	3.8
7	1호기	#1 보조변압기	#1 AUX TR-Y-U	2014-03-18 16:27:16	41.4	3.8
8	1호기	#1 보조변압기	#1 AUX TR-Y-V	2014-03-18 16:27:31	39.4	3.8
9	1호기	#1 보조변압기	#1 AUX TR-Y-W	2014-03-18 16:27:46	31.1	3.8
10	1호기	#1 보조변압기	#1 AUX TR-Z-U	2014-03-18 16:28:01	25.0	3.9
11	1호기	#1 보조변압기	#1 AUX TR-Z-V	2014-03-18 16:28:16	25.8	3.8
12	1호기	#1 보조변압기	#1 AUX TR-Z-W	2014-03-18 16:28:31	26.6	3.9
13	1호기	#1 보조변압기	#1 AUX TR-Z-X	2014-03-18 16:28:46	64.7	3.8
14	1호기	#1 보조변압기	#1 AUX TR-Z-Y	2014-03-18 16:29:01	74.4	3.8
15	1호기	#1 보조변압기	#1 AUX TR-Z-Z	2014-03-18 16:29:16	56.4	3.9
16	1호기	#1 보조변압기	#1 AUX TR-A	2014-03-18 16:15:30	29.6	3.9
17	1호기	#1 보조변압기	#1 AUX TR-B	2014-03-18 16:15:45	28.1	3.8
18	1호기	#1 보조변압기	#1 AUX TR-C	2014-03-18 16:16:00	29.6	3.8
19	1호기	#1 보조변압기	#1 AUX TR-X-U	2014-03-18 16:16:15	28.4	3.9
20	1호기	#1 보조변압기	#1 AUX TR-X-V	2014-03-18 16:16:30	30.2	3.8
21	1호기	#1 PT BOX	#1 PT BOX REGULATING-C	2014-03-18 16:16:45	27.7	3.8
22	1호기	#1 발전기하부	#1 GEN 하부 PHASE-A	2014-03-18 16:17:00	74.9	3.8
23	1호기	#1 발전기하부	#1 GEN 하부 PHASE-B	2014-03-18 16:17:15	80.5	3.8
24	1호기	#1 발전기하부	#1 GEN 하부 PHASE-C	2014-03-18 16:17:30	76.5	3.8
25	1호기	#1 발전기하부	#1 GEN 하부 NUTRAL-A	2014-03-18 16:17:45	58.0	3.9
26	1호기	#1 발전기하부	#1 GEN 하부 NUTRAL-B	2014-03-18 16:18:00	63.2	3.8
27	1호기	#1 발전기하부	#1 GEN 하부 NUTRAL-C	2014-03-18 16:18:15	59.0	3.8
28	1호기	#1 중성점	#1 중성점	2014-03-18 16:18:30	40.6	3.8
29	1호기	#1 SWGR	1SW01-01B-A	2014-03-18 16:28:18	35.7	3.8
30	1호기	#1 SWGR	1SW01-01B-B	2014-03-18 16:28:33	38.4	3.9
31	1호기	#1 SWGR	1SW01-01B-C	2014-03-18 16:28:48	38.0	3.8

- Index

- Data(Time, Temp, Battery)

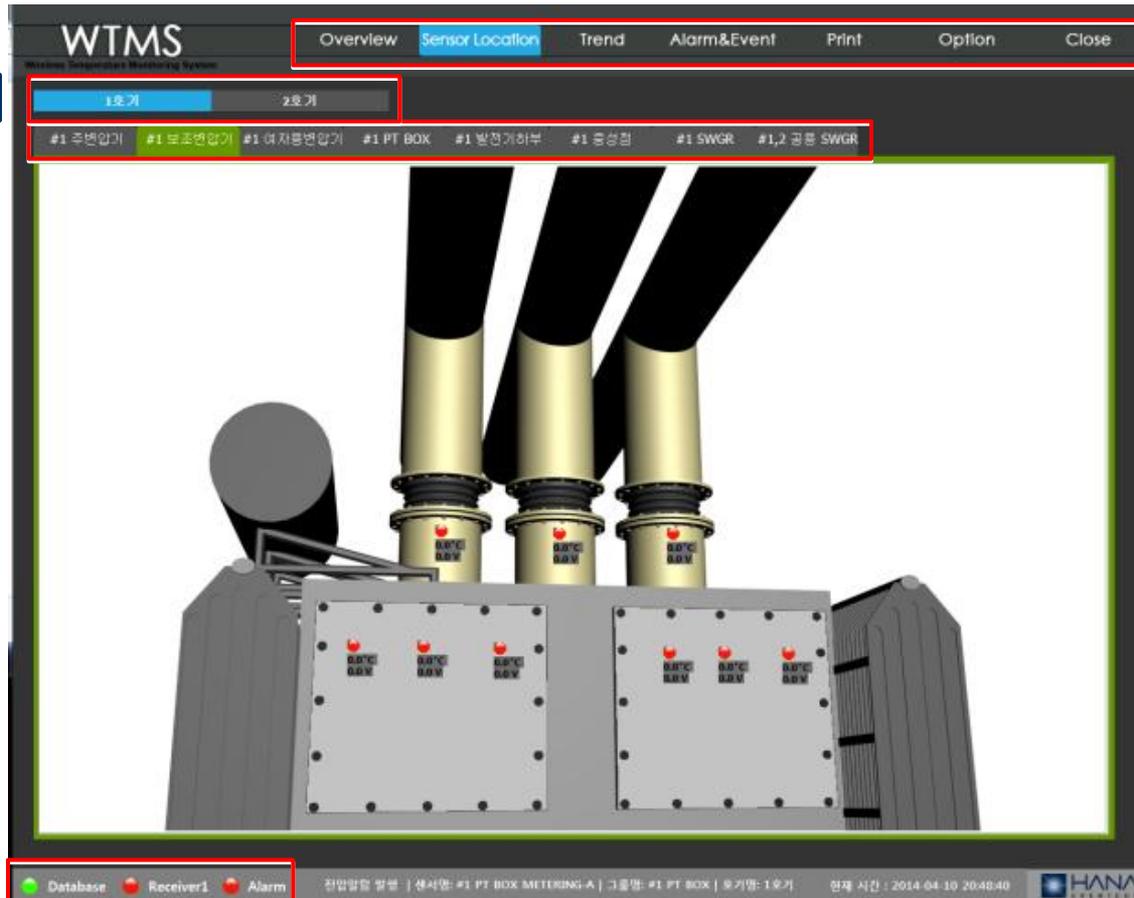
- Unit & Group list

- Database state
 - Receiver state
 - Alarm signal

2. Product Description

WTMS 3.0

Sensor Location Display Screen



- index

- Unit classification

- Group classification

- Database state
- Receiver state
- Alarm signal

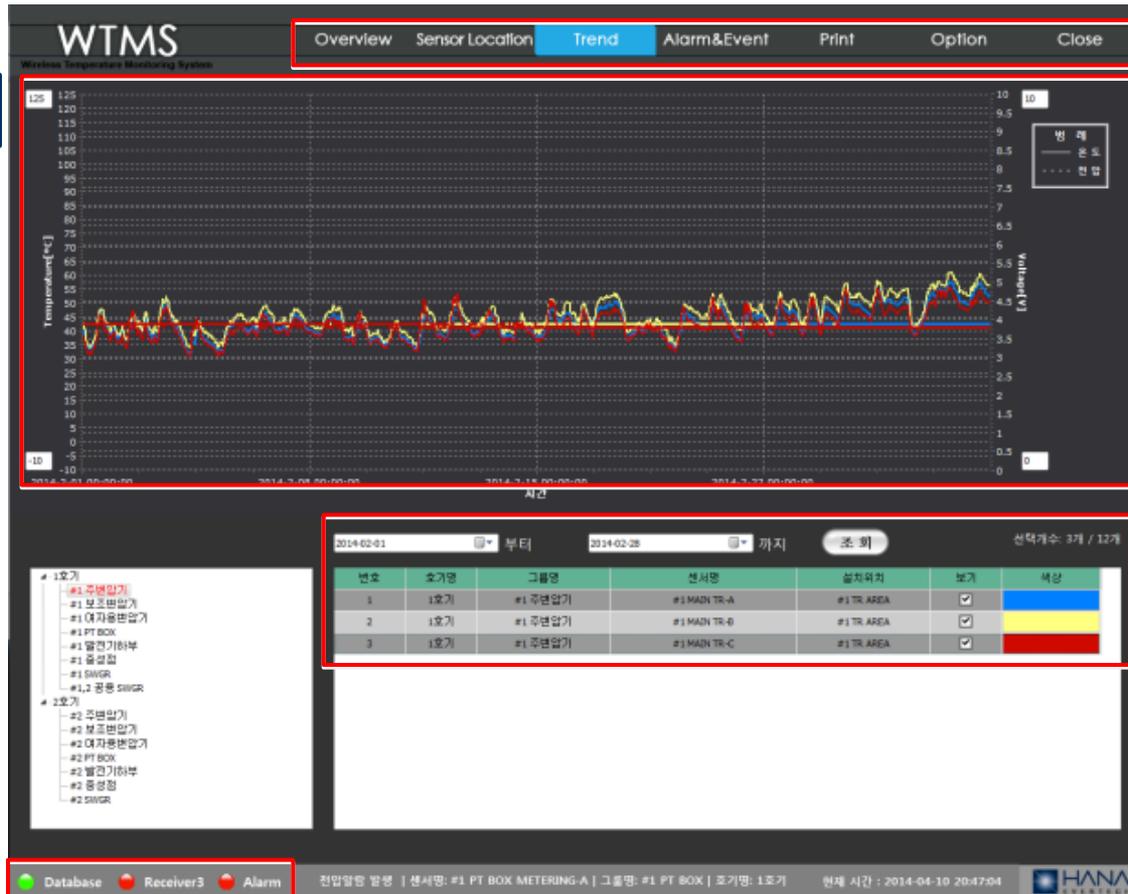
2. Product Description

WTMS 3.0

Trend Screen

- Temperature level : Left
- Battery Voltage : Right

- Database state
- Receiver state
- Alarm signal



- Index

- Data query by period
- Can compare up to 12 sensors simultaneously

2. Product Description

Advantage

- Wireless measurement available for preventing accidents.
- Manage a operating condition of equipment & preventing a random failure from real-time monitoring for **point of overheating**.
- Measurement of a high-voltage connection where is difficult to monitoring at all times.
- Measure the temperature of concerned area at regular time.
- Forecast of maintenance period & operating condition.
- Improving working condition for the person in charge.

3. Installation

TR area



▲ Main TR



◀ Main TR Manhole

▼ Aux TR Secondary Bus



3. Installation

Generator area



▲ PT BOX



◀ Generator bus bar

▼ Exciter slip ring



3. Installation

Other areas



▲ SWGR 차단기



◀ GCB



▲ GCB 하부

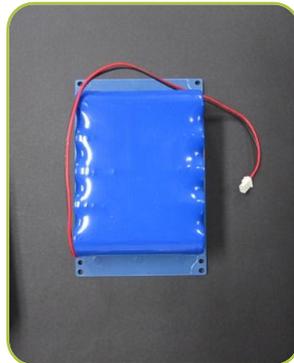


◀ 복합 화력 GT 발전기

4. Maintenance

Transmitter

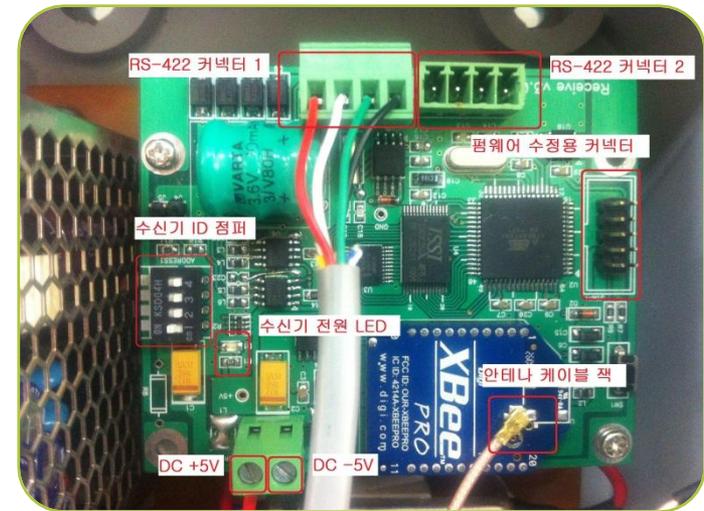
- Part of the sensor
 - A sensor cap must be sealed properly.
- Part of wireless communication
 - Antenna must be kept proper direction & connection
- Part of inside a transmitter
 - Prolonged exposure to moisture can adversely affect the proper functioning of this unit.



4. Maintenance

Receiver

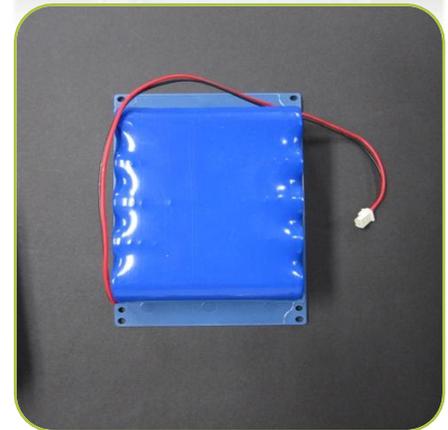
- Part of receiver
 - Check the inner operating ramp
- Part of wireless communication
 - Antenna must be kept proper direction & connection
- Condition of data communication
 - Check condition of receiver module & WTMS S/W on display



4. Maintenance

Replace a Battery

- Replace Period : 2 Years(Design life : 3 Years)
- Description of Battery Replacement
 - a) Loosen the bolt of transmitter from Base machine
 - b) Disassemble a back side cover of transmitter
 - c) Take off a battery connecter from transmitter board
 - d) Replace a fully charged battery.
 - e) Press on a Reset button to reset a board
 - f) Assembly is following in reverse order of disassemble.



Thank you