

**Test Report**

**Vol.1**

Long Range Communication  
Stable in Pipe Jungle  
Robustness in Wi-Fi Co-existence

**vigilantplant.**<sup>®</sup>

The clear path to operational excellence

SEE  
CLEARLY

KNOW  
IN ADVANCE

ACT  
WITH AGILITY

**Yokogawa performed Field Wireless System site tests compliant with ISA 100.11a, a standard with superior capabilities**

**Key Features of the Field Wireless System**

- Long Range Communication
- Stable in Pipe Jungle
- Robustness in Wi-Fi Co-existence

**Classification of Wireless Environment**

**Purpose:**

Classify the wireless environment, which enables us to estimate the basic transmission range for the planning of deployment in the actual site.

**Category:**

- Open air (Type A) Transmission Range: 500m max. at 10mW (included dipole antenna)
  - With obstacles (Type B) Transmission Range: 200m max. at 10mW (included dipole antenna)
  - Dense obstacles (Type C) Transmission Range: 50m max. at 10mW (included dipole antenna)
- \* These categories are indicated in the test reports.

**1. Open Air: Estimated Maximum Transmission Range is 500m**

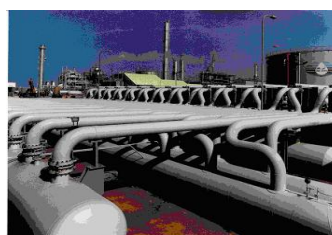
The area such as tank yard, pipe line, and so on where obstacles for wireless scarcely exist.



Site Images

**2. With Obstacles: Estimated Maximum Transmission Range is 200m**

There are some obstacles which interfere with the wireless communication by reflection and absorption.



Site Images

Continue

**3. Dense Obstacles: Estimated Maximum Transmission Range is 50m**

There are many obstacles such as metal machines, metal facilities, pipes, and so on around wireless equipments. (We call this environment “Pipe Jungle”. Wireless equipments are installed in the inside of this environment. )

Wireless equipments often can not see each other (no line of sight).



Site Images

**How to make the best use of the long range communication feature**

- The long range wireless communication feature is one of the advantage of ISA100.11a. wireless system.
- In ideal open air, the communication range reaches 600m without repeater (router). And it is estimated at maximum 500m in the actual plant.
- In the following field image, the communication between the gateway and the repeater is set at upper area without obstacles.
- The repeater is installed on the top of a tower in the target area. And it also communicates with the wireless transmitters installed in the lower direction without obstacles.
- For instance, if the distance between the control room (where the gateway is installed) and a target area (where the repeater and wireless transmitters are installed) is 500m, both areas can communicate directly.
- This solution is the best use of the long range communication feature of ISA100.11a. wireless system.
- In the case of our former wireless system, it is necessary to deploy more repeaters between the gateway and the repeater, and also between the repeater and wireless transmitters.

Field Image

