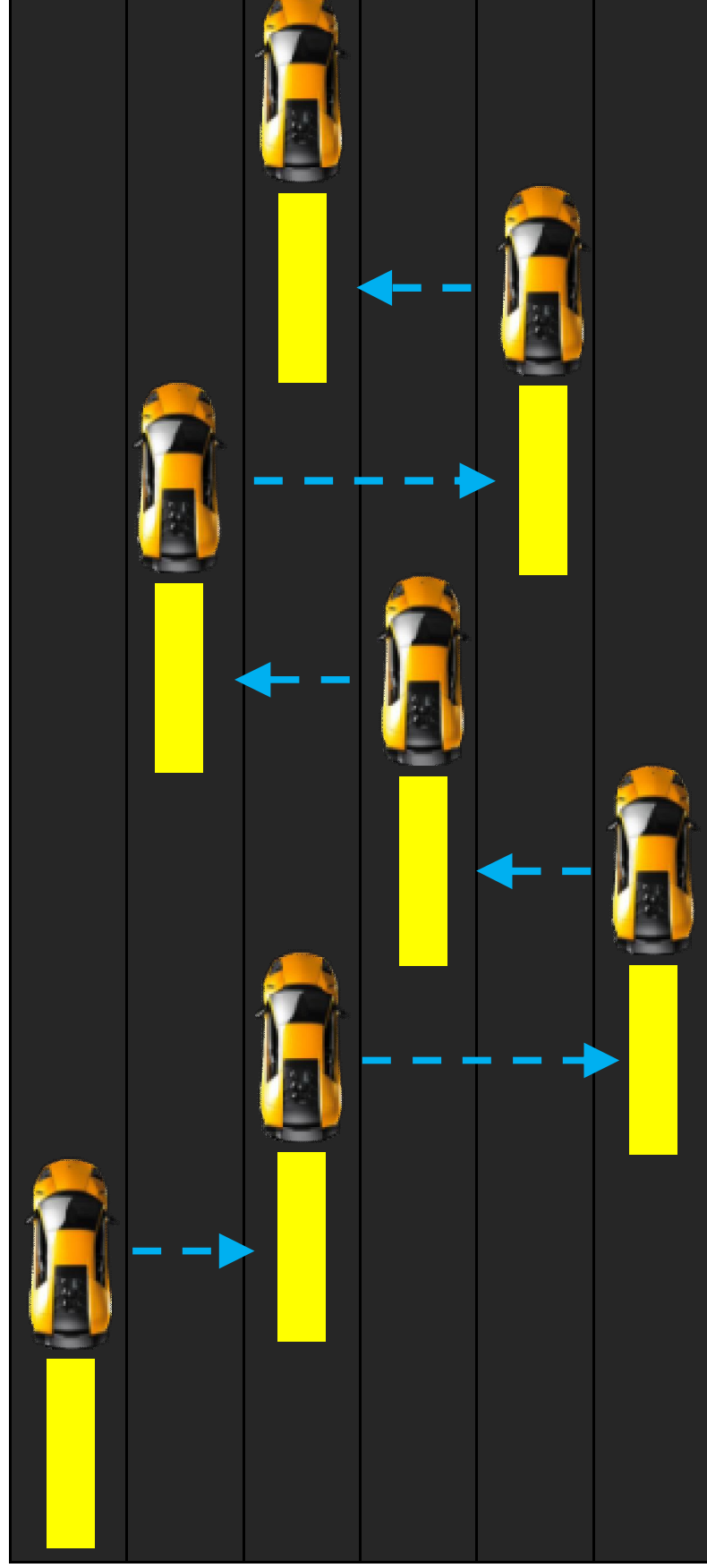
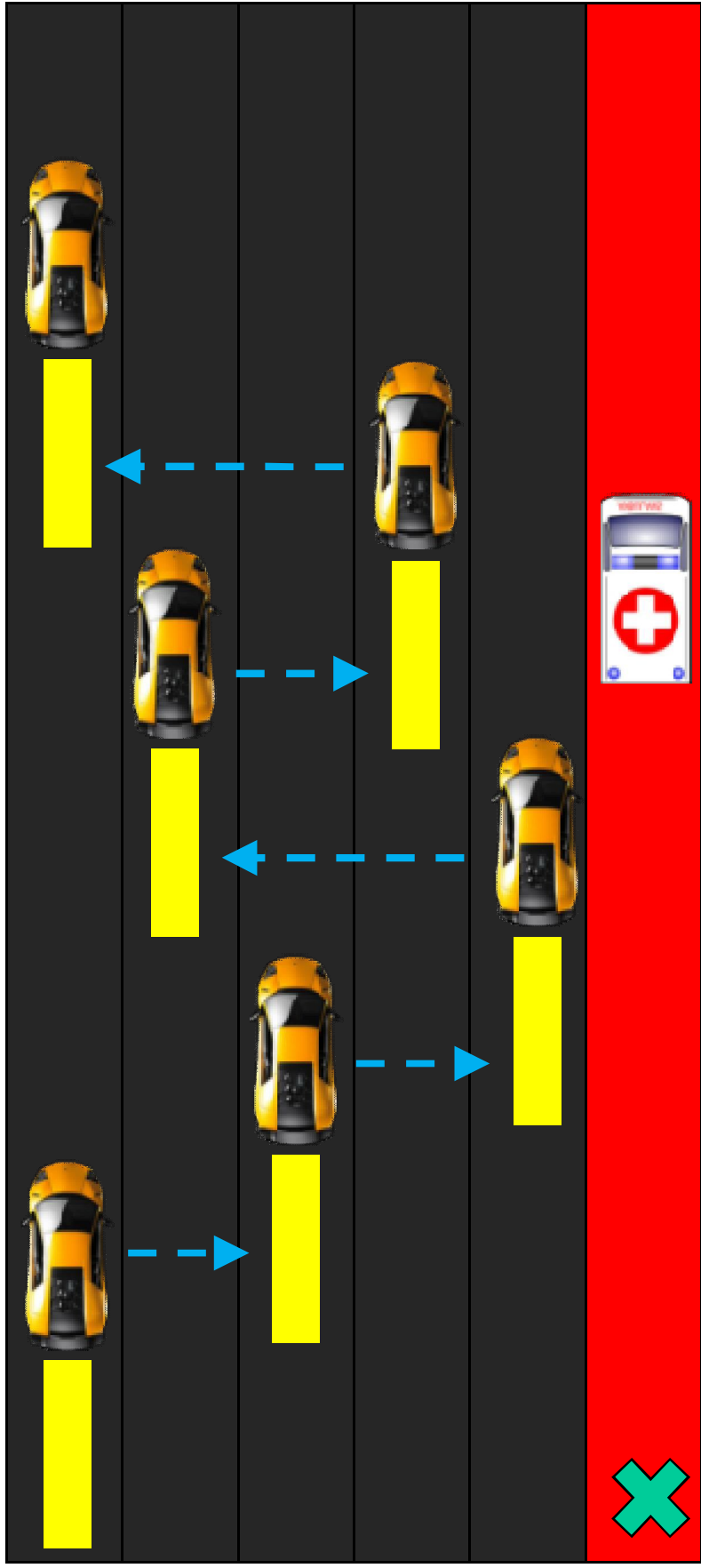


Channel Hopping

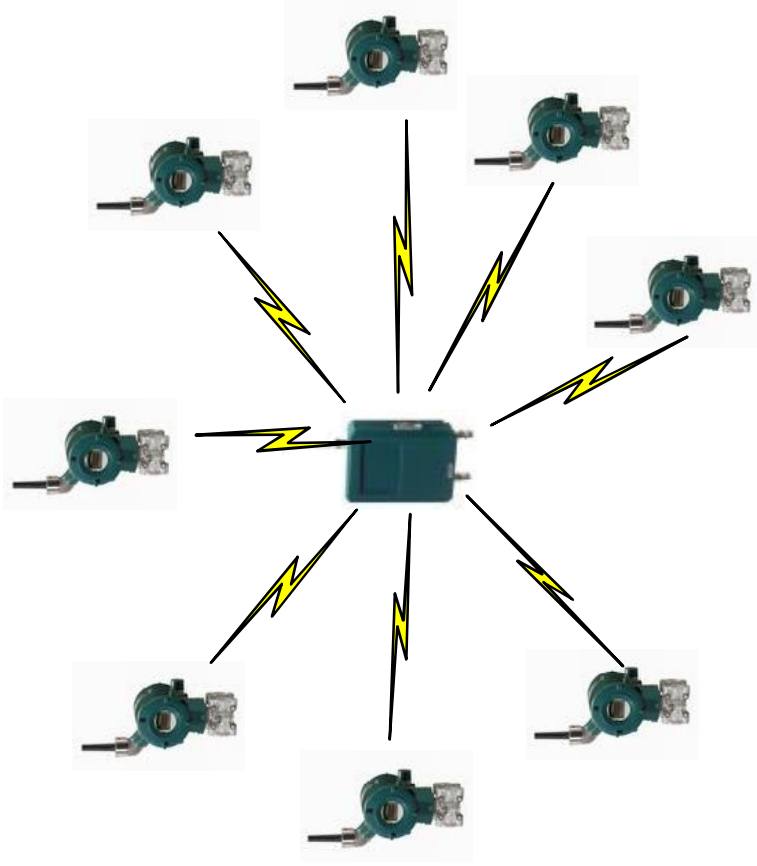


Channel Black Listing



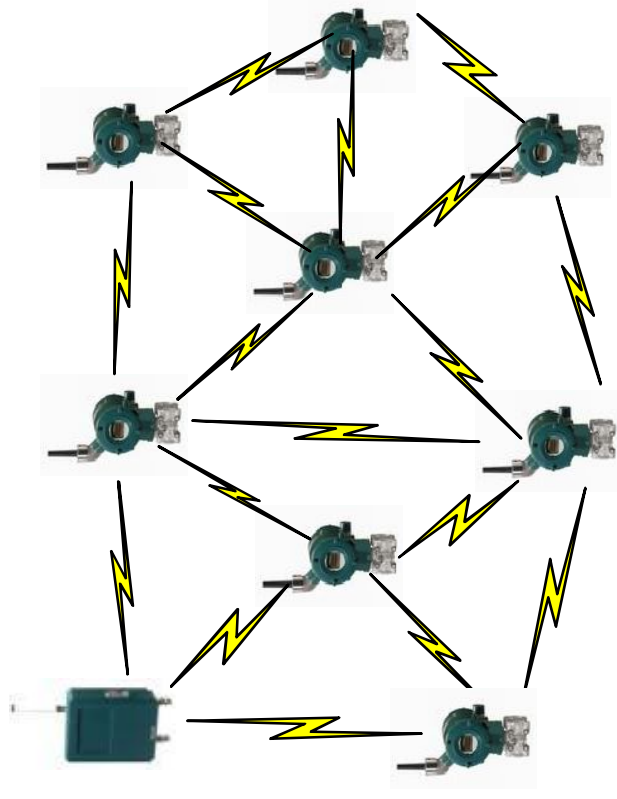


STAR topology

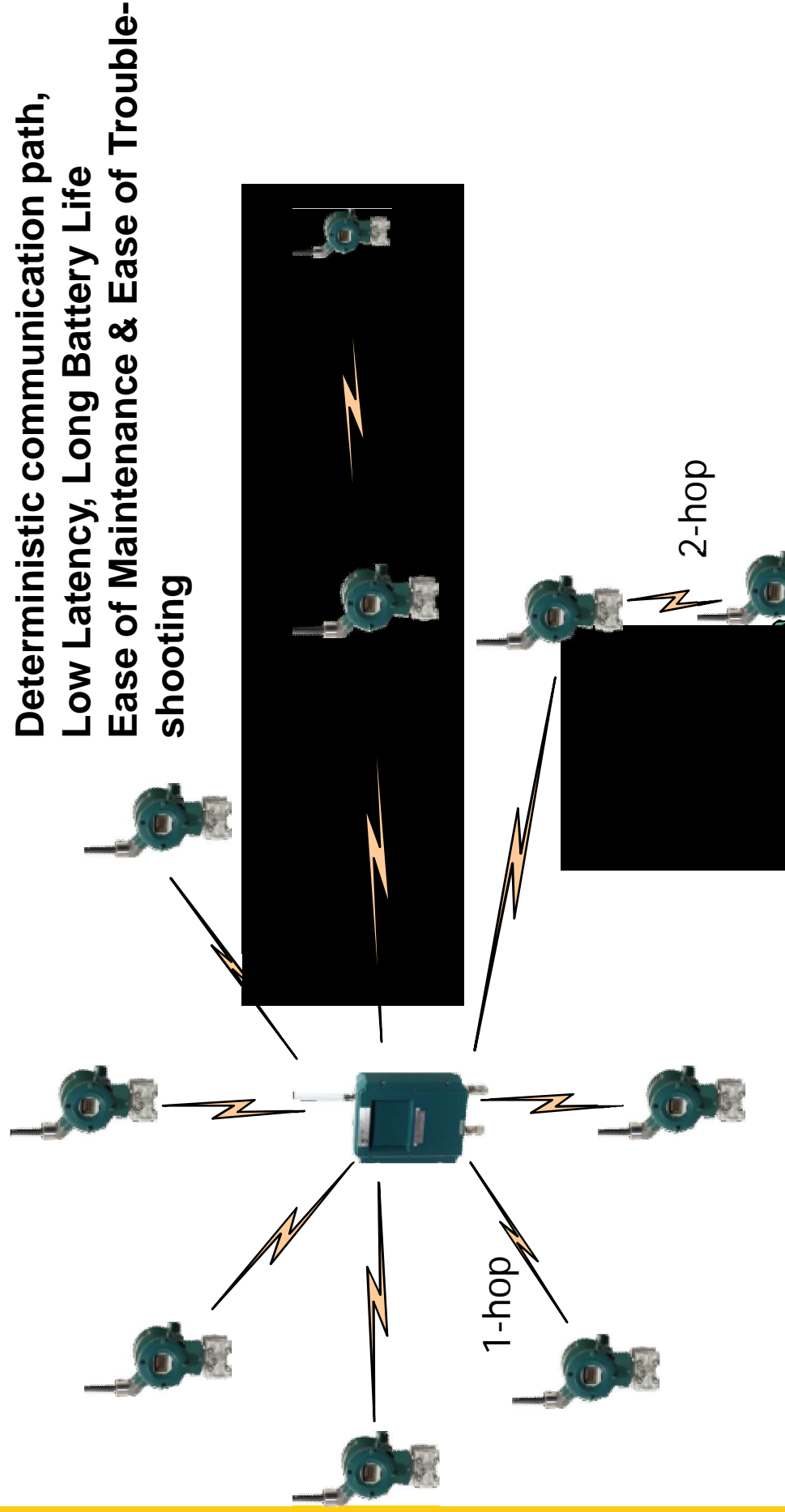


- Advantage:** Low power consumption
: Fast update time
: Deterministic
- Disadvantage:** No redundancy

MESH topology



- Advantage:** Redundant network
- Disadvantage:** High power consumption
: Delay time
: Non deterministic

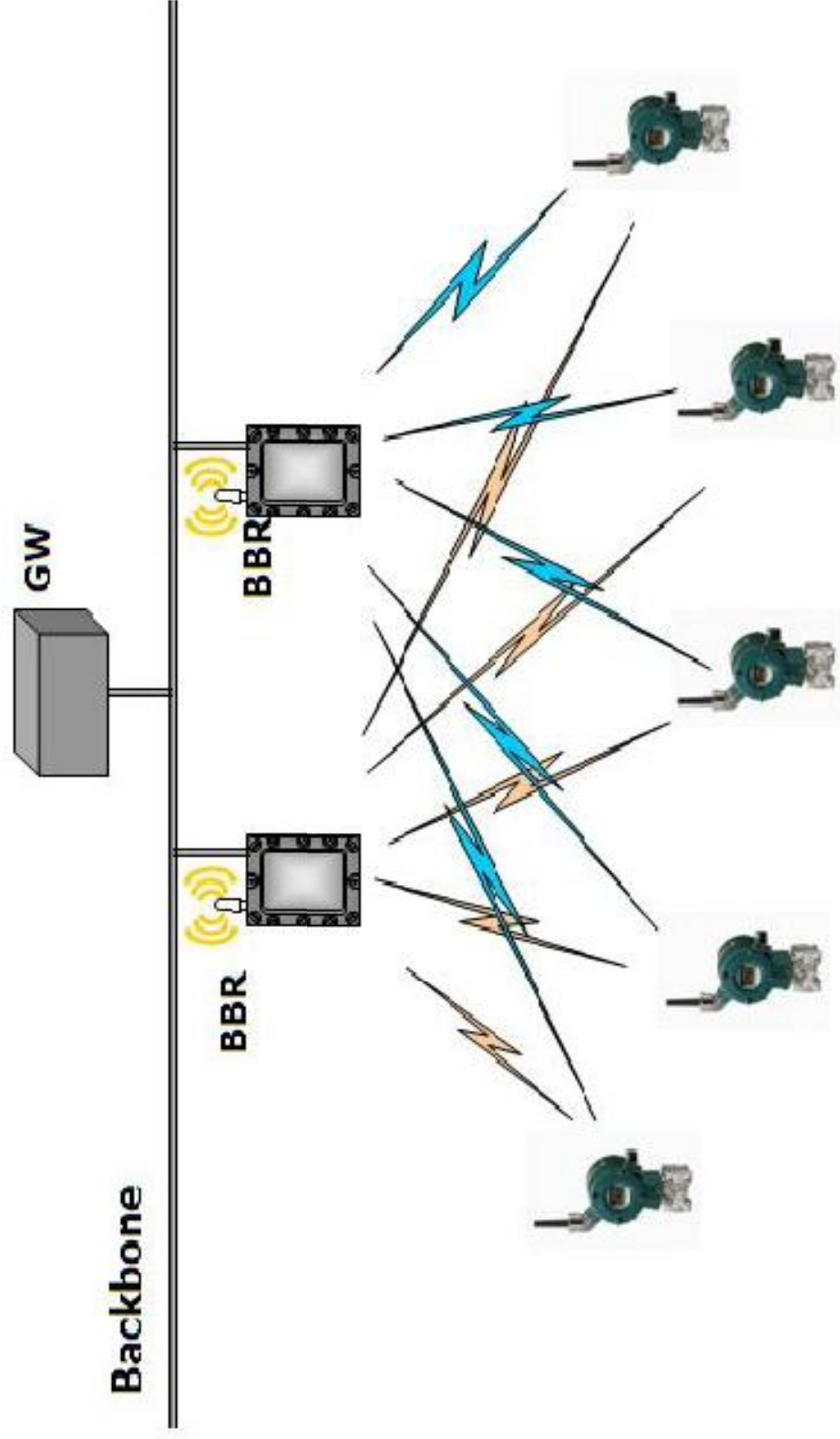


Field configurable by user...



Redundancy on star topology

vigilantplant.®





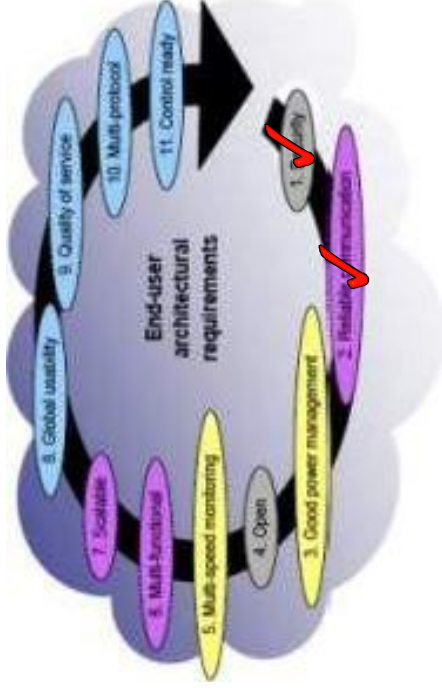
Reliable Communication

Channel Hopping

Channel Black Listing

Duo Cast

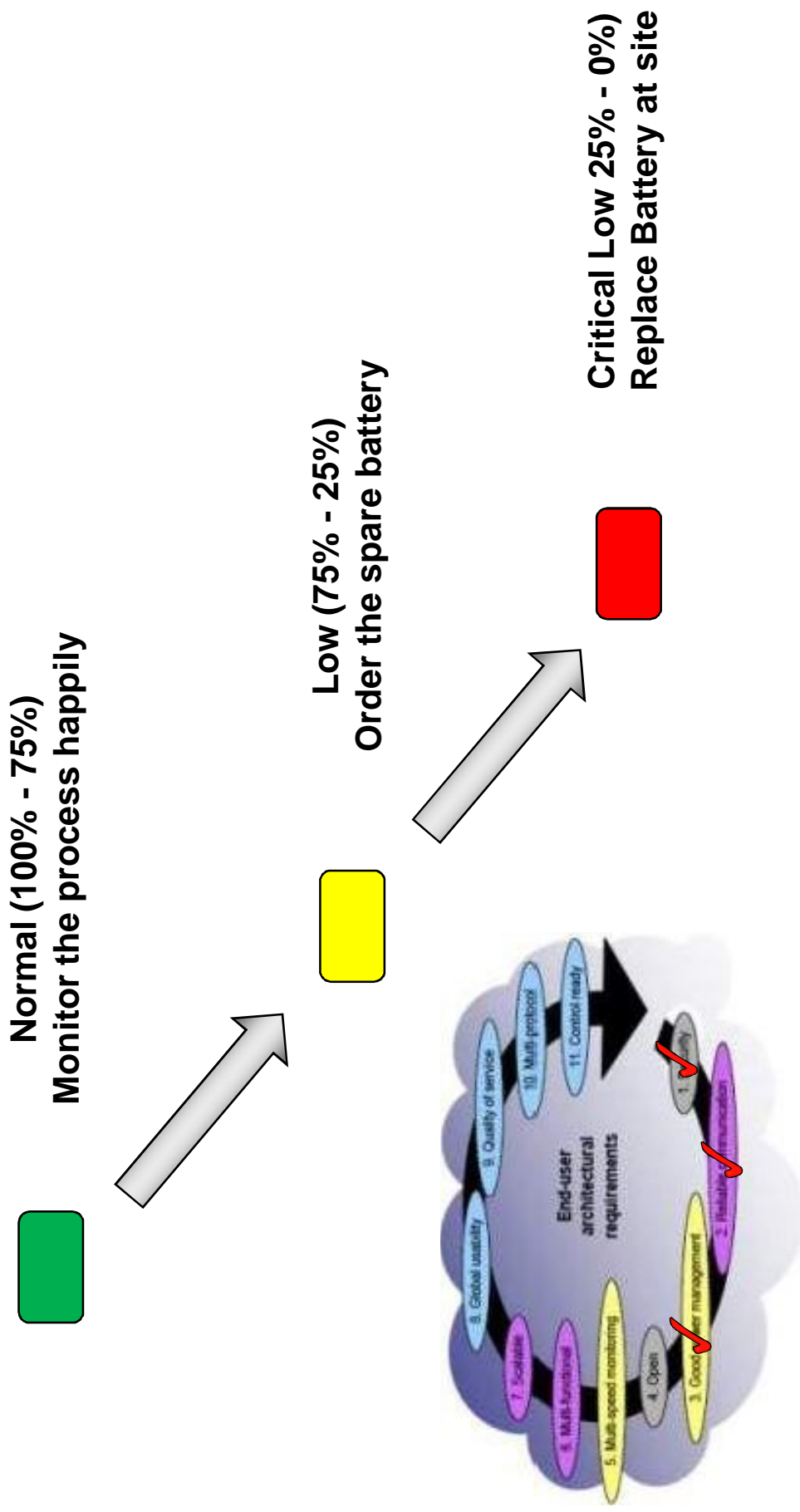
Mesh Network Redundant





Power Management Diagnostics

vigilantplant®

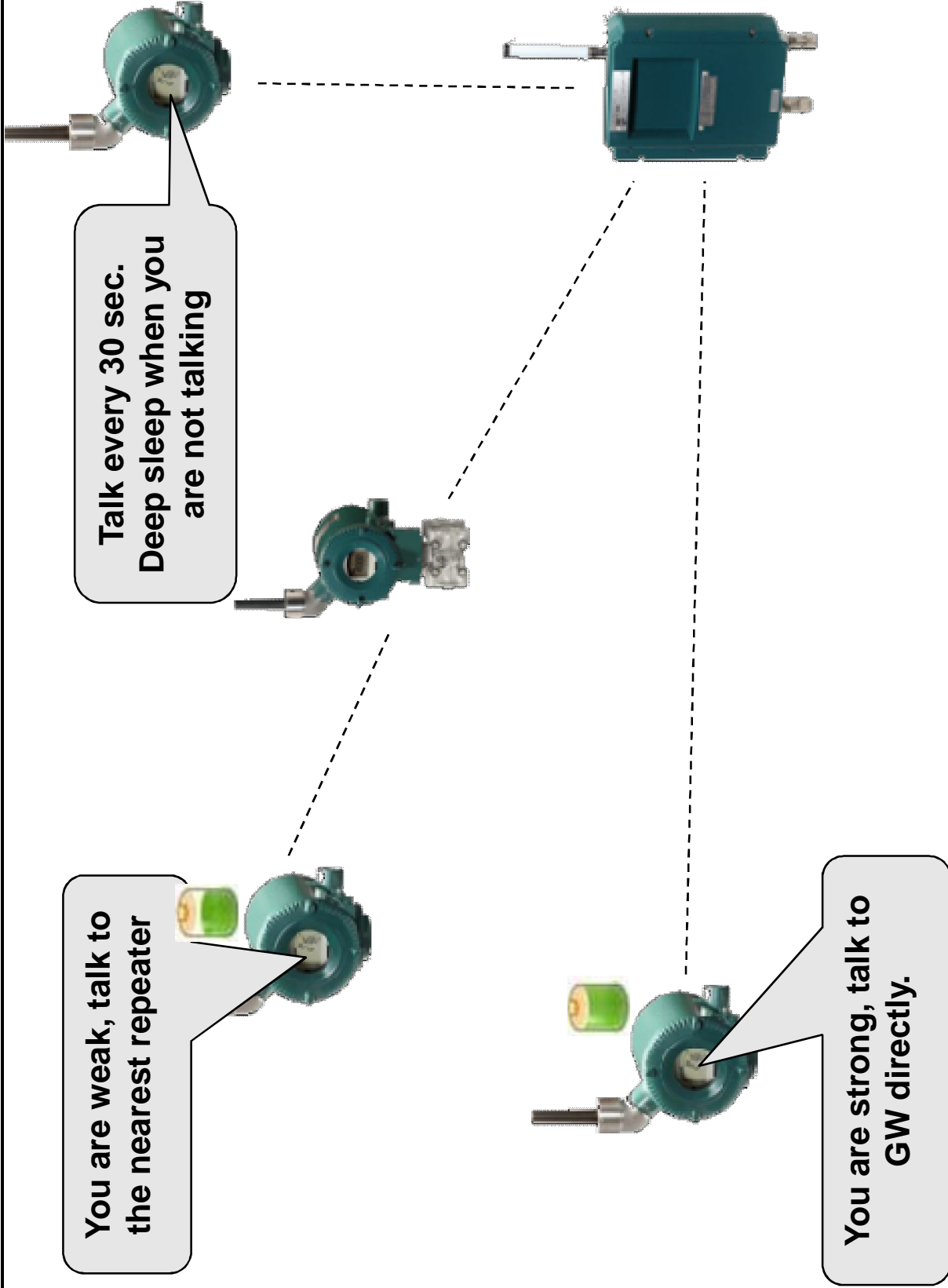


Three Tier diagnostic for user...



Good Power Management

vigilantplant®

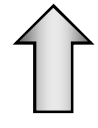




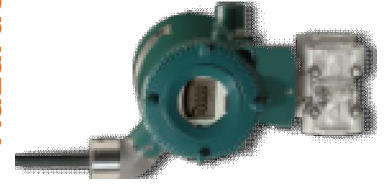
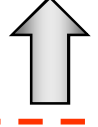
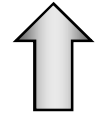
Easy Battery Maintenance

vigilantplant®

Widely available
Low cost batteries



Battery pack, designed for
Ex-Environments



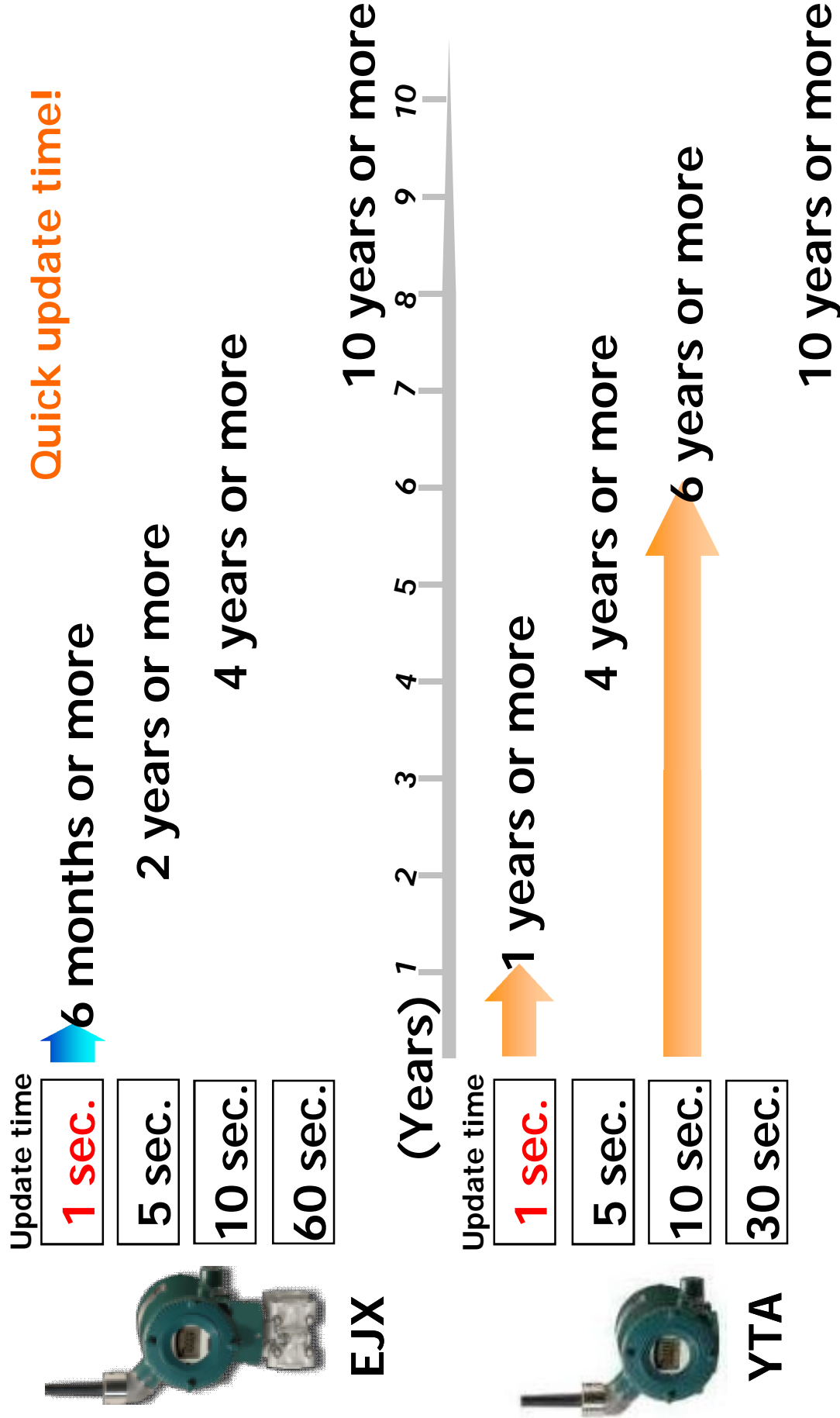
Hazardous Area

Replace batteries in safe area

Convenient battery
replaceable in the field



Non Proprietary Batteries ...

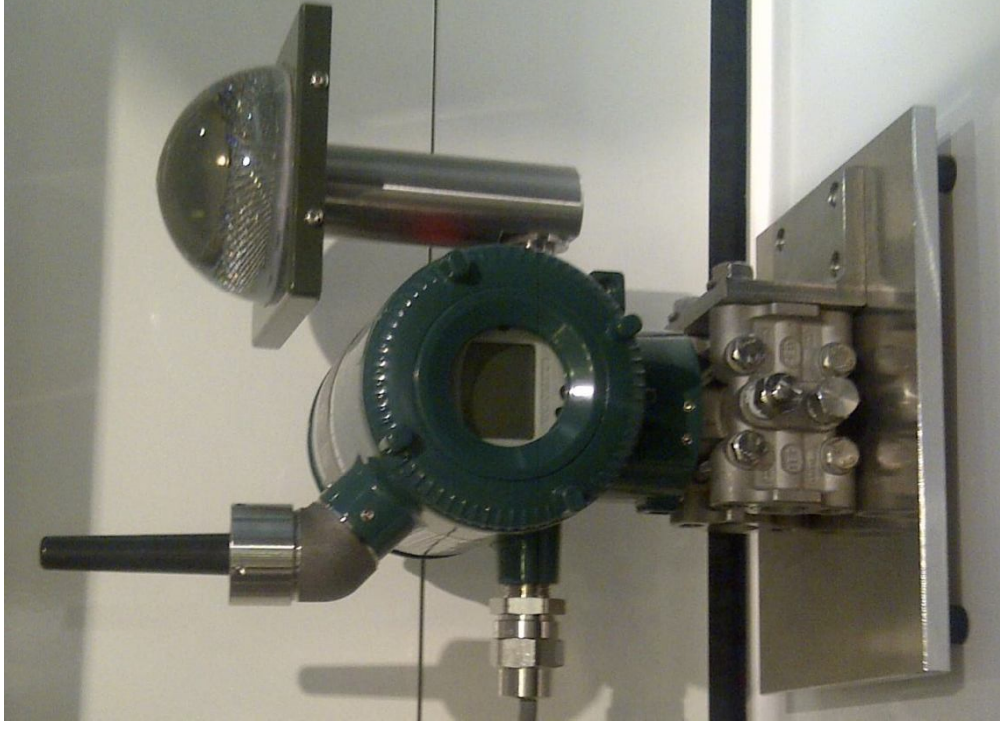


Conditions at 23 deg.C/73 deg.F

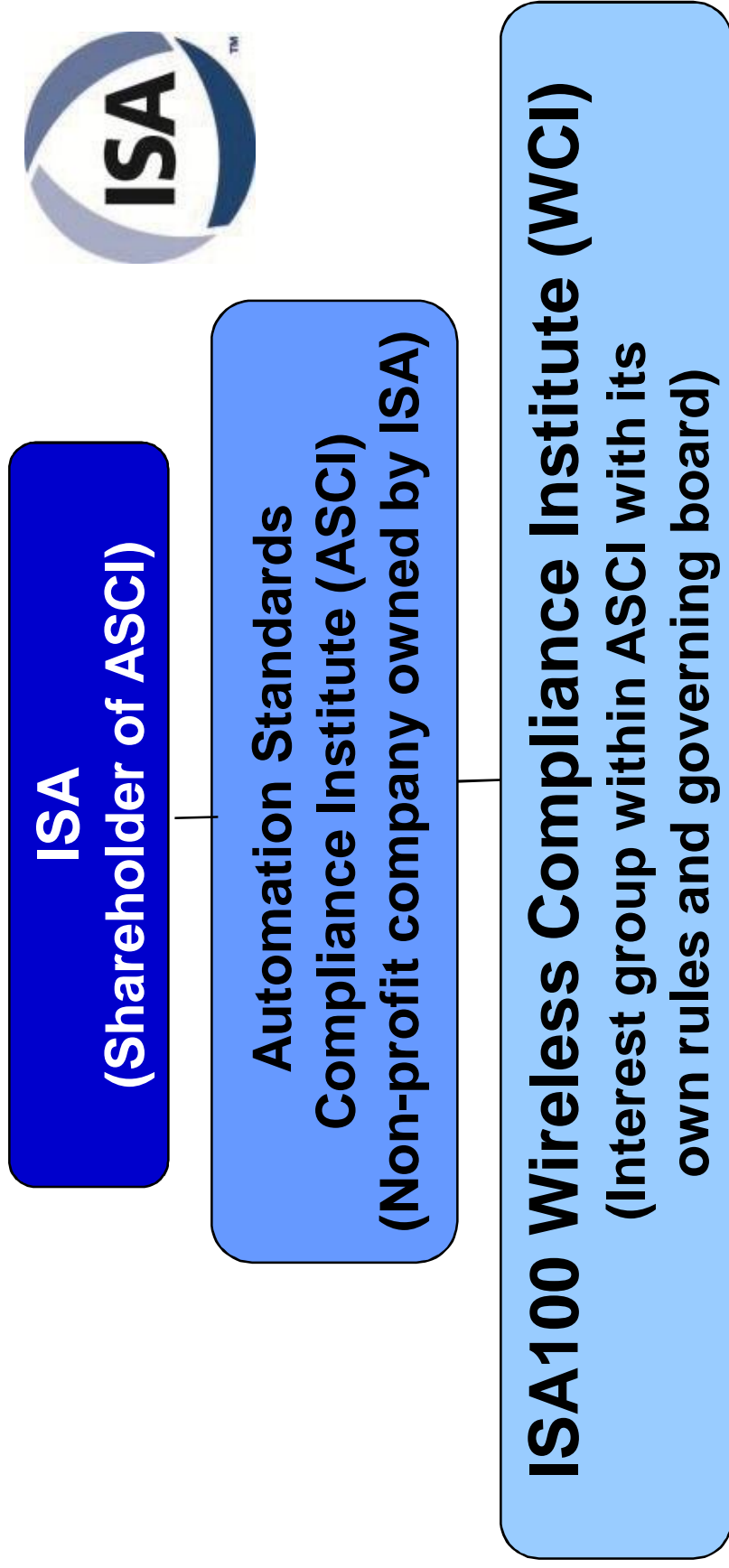


Solar powered devices

vigilantplant.®



Alternate Power resources



*The WCI is Operated as an ASCI Interest Group to Lead
the Wireless Compliance Initiatives*

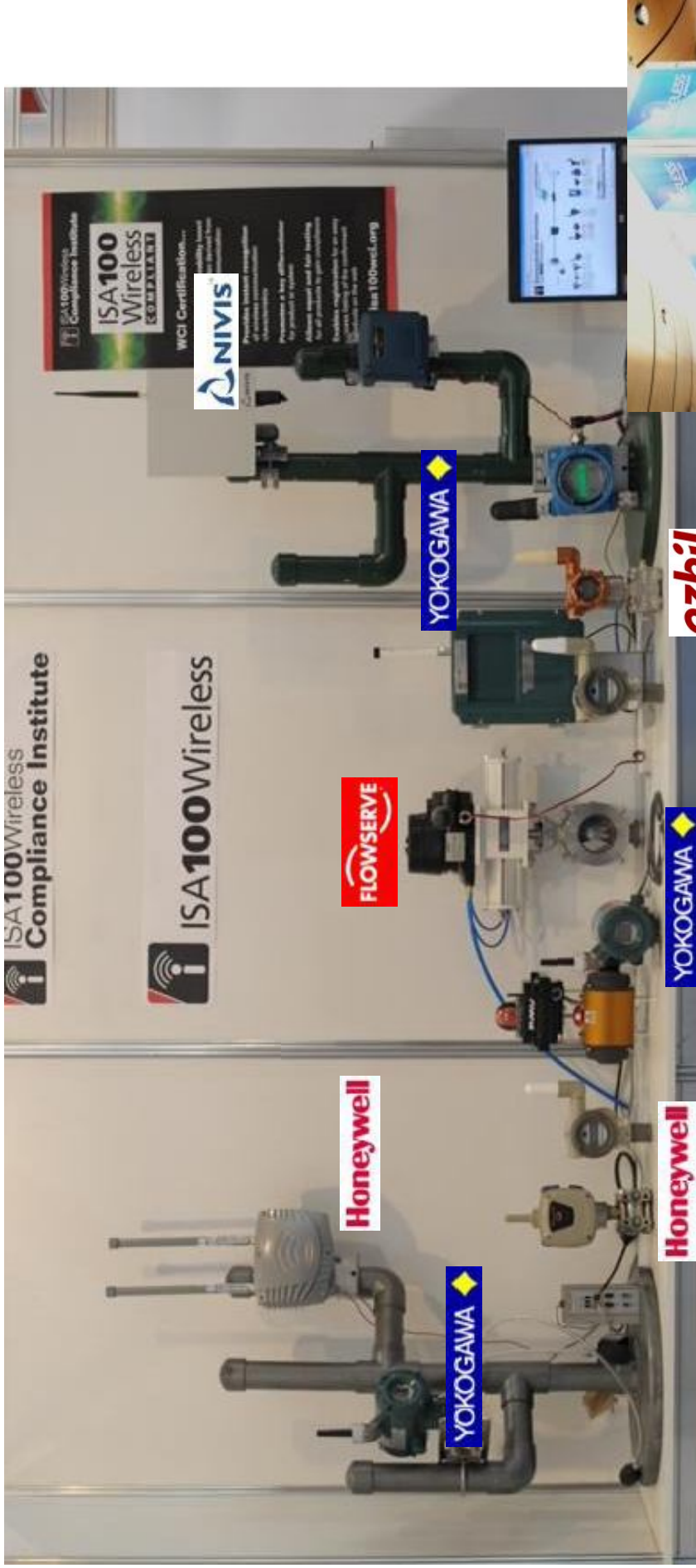
Mission

Decrease the time, costs, and risks of developing and deploying standards-based industrial wireless devices and systems.

Provides

- Interoperability
 - Compliance
 - Tools
 - Technical Support
 - Education
 - Market Awareness
- ... For the ISA100 Family of Industrial Wireless Standards





Interoperability testing and demonstrations...

Multi-vendor field test at Arkema



Arkema plant in Crosby, Texas



Yokogawa: Pressure transmitter



Gastronics: SO2 Gas sensor



er

Interoperability site testing ...



How WCI Achieves Its Mission

vigilantplant.®

ISA100. Here. Now. Certified.

As the only wireless standard developed for, and by, end-users, the ISA100.11a standard reflects end-user requirements for *interoperability*, *scalability*, and *sustainability* in an industrial wireless system purpose-built for industrial performance.

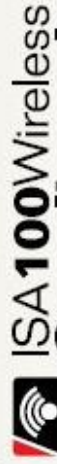
ISA100.11a is the first industrial wireless standard driven by end-users and approved by a standards organization in an open, balanced, ANSI-accredited consensus process. It is also the first industrial wireless standard to certify devices in an independent ISO/IEC17025 test lab.

Industry leading suppliers have made strong commitments to develop ISA100.11a products including Honeywell, Nvis, and Yokogawa who recently announced products certified to the ISA100.11a standard.

For vendors developing ISA100.11a certified products, test kits to prepare for certification and certification services are available now.

To learn more about how to build and certify ISA100.11a based devices and see who else is committed to the technology, visit the ISA Wireless Compliance Institute website.

Make ISA100.11a your choice for better performance and to future-proof your industrial wireless systems. www.isa100wci.org.



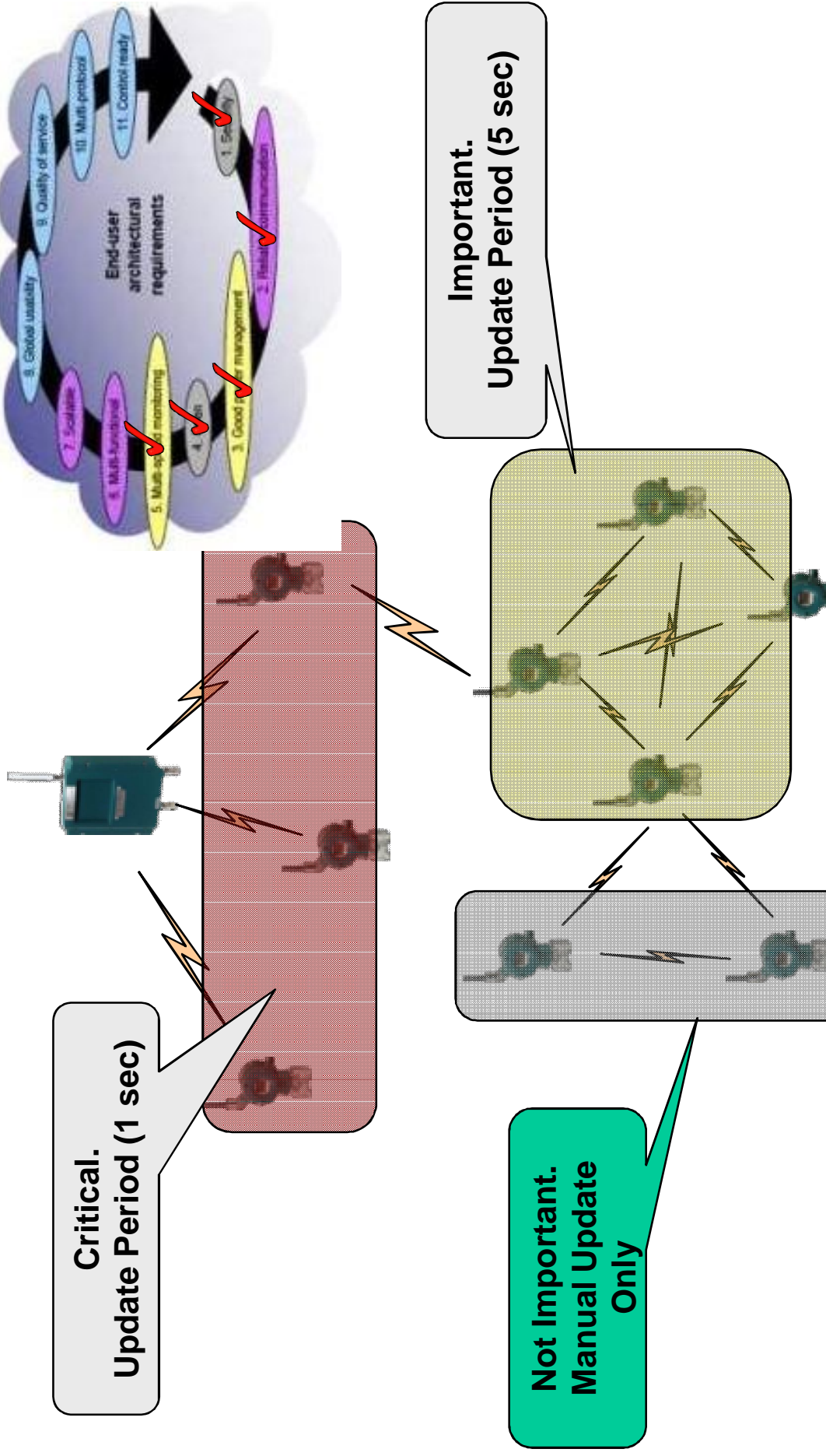
67 Alexander Drive
Research Triangle Park, NC 27709

Product certification...

<http://www.isa100wci.org/>

Supplier	Device	Models	Version	Registered
Nelis, LLC	ISA100 T1a Protocol Stack	N/A	4.2.1	Yes
Honeywell	XYYR 6000 Pressure Transmitters (Logic, Absolute and Differential Pressure)	STWAD4EL STLWWS263009174, STGVW94404L W7-4-87LJ00L	N/A	Yes
Honeywell	XYYR 6000 Universal IO Transmitter	STLWV7006/708	N/A	Yes
Honeywell	XYYR 6000 Temperature Transmitter with Digital Input Transmitter	STLW401	N/A	Yes
Honeywell	XYYR 6000 Temperature Transmitter	STTN400	N/A	Yes
Honeywell	XYYR 6000 Multiple Digital Input Transmitter	STWWS00	N/A	Yes
Honeywell	STTW401 Temperature/Discrete Input Transmitter	STTW401	200	Yes
Honeywell	XYYR 6000 Wireless Universal IO Transmitter	STLW70X	200	Yes
Honeywell	XYYR6000 Position Sensor	WCSK1 or WCSK	200	Yes

Verification listing...



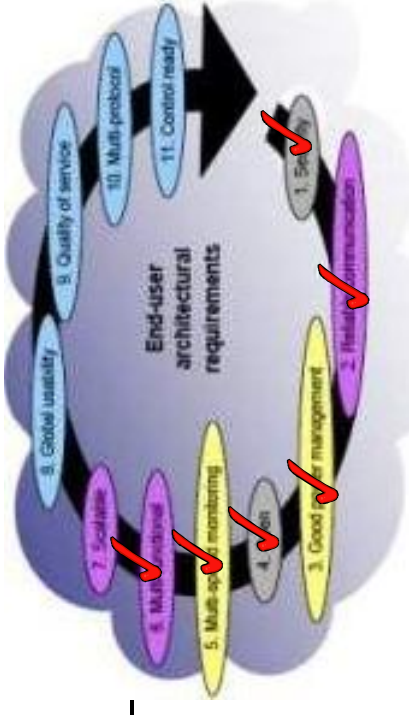
**Critical.
Update Period (1 sec)**

**Not Important.
Manual Update
Only**

**Important.
Update Period (5 sec)**

Field Configurable update time to "One Second" ...

Multi-Functional



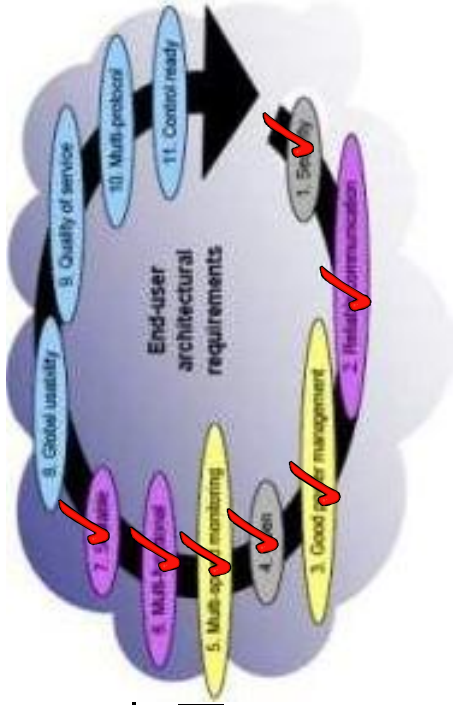
❖ **Measuring device / Routing device**

❖ **Selectable update rate**

❖ **Monitoring / Control**

Scalable

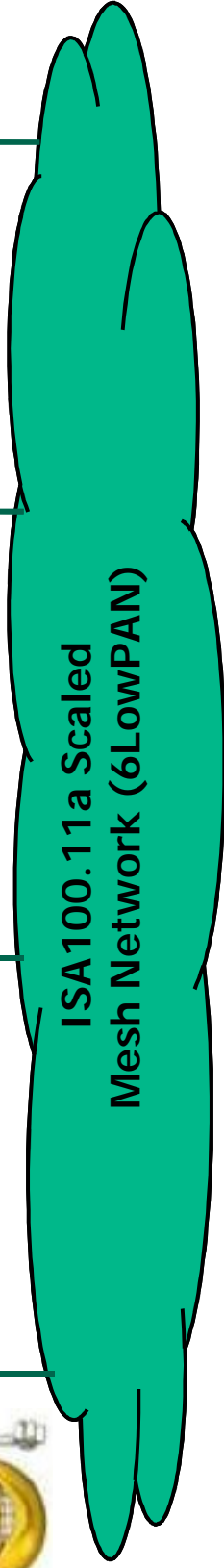
- ISA100.11a network architecture Scal



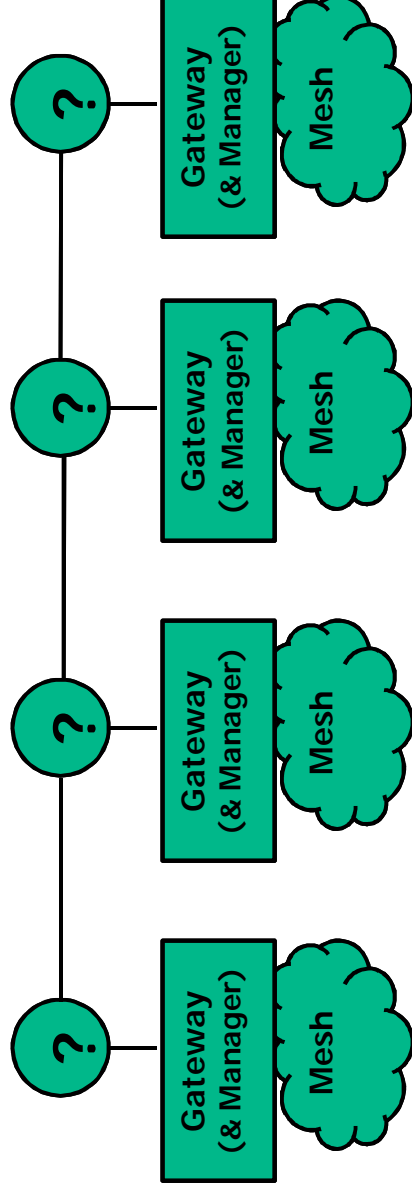
IP Backbone to Mesh

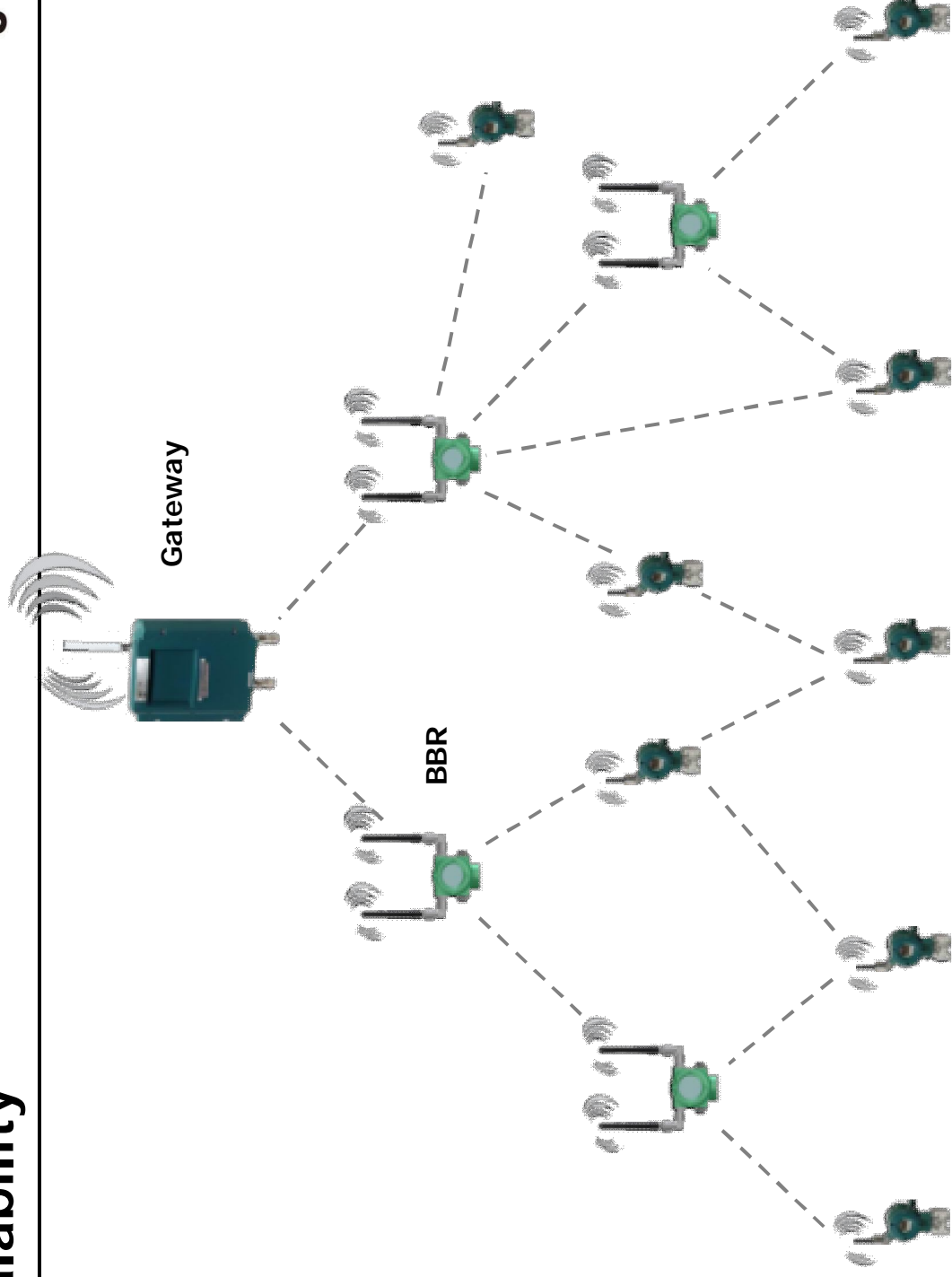


IP Backbone



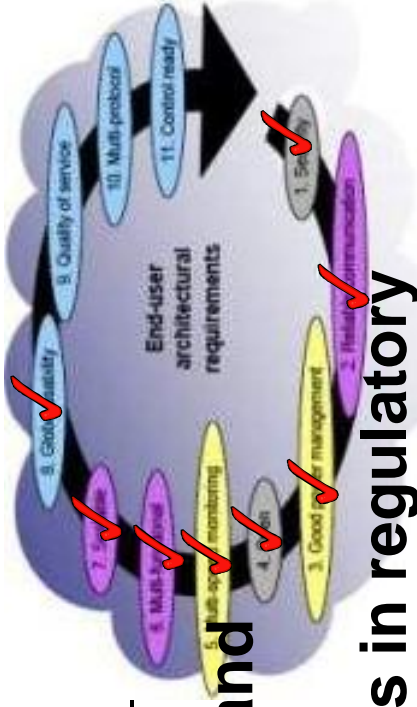
Mesh to Gateway



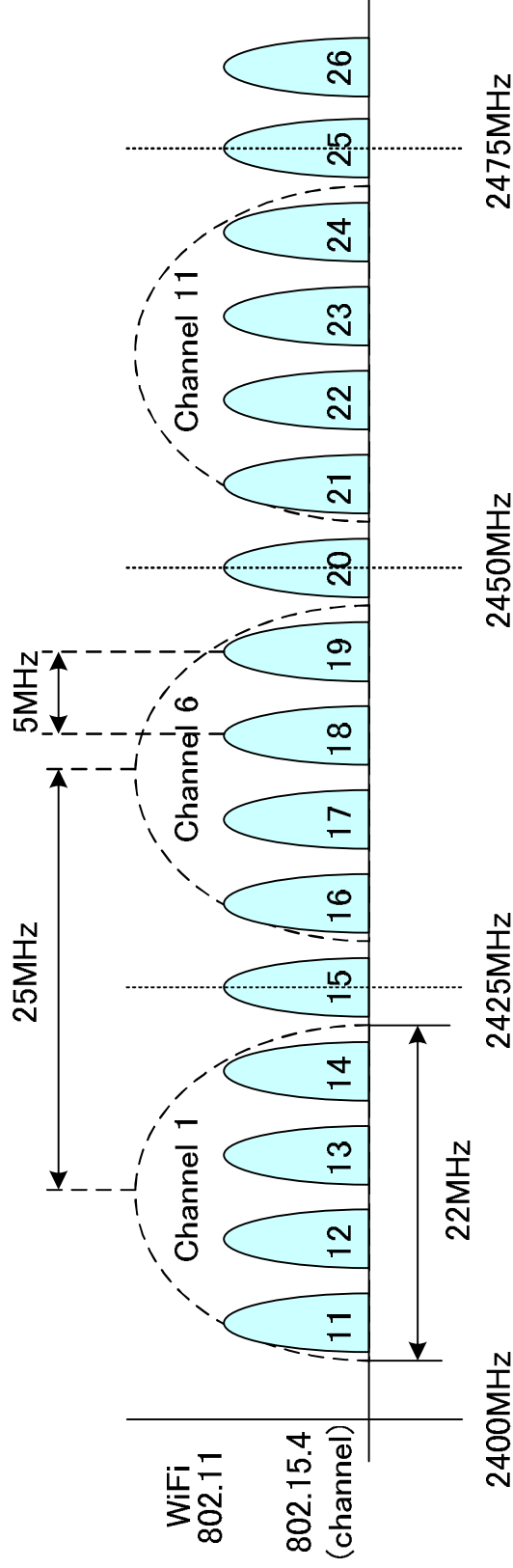


IPv6 for addressing expandable network...

Global Usability



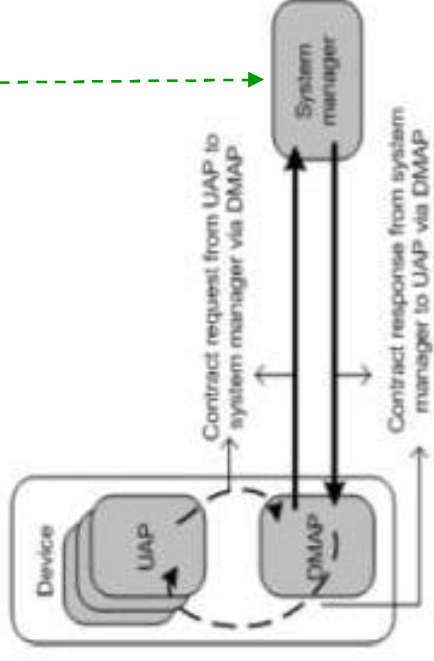
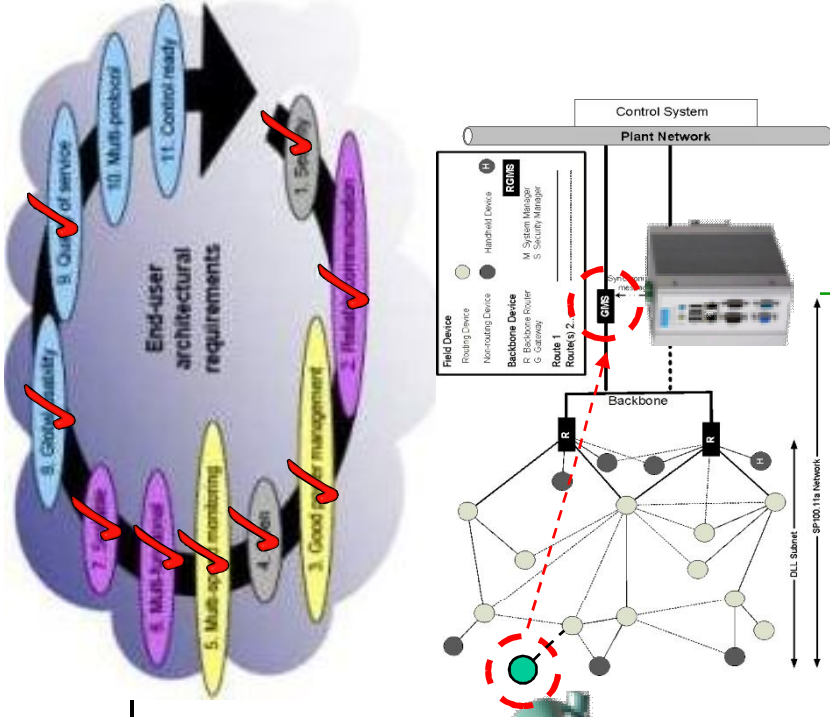
- IEEE 802.15.4 Radio: 2.4GHz ISM Band
- Country code : ISA100.11a leverages the differences in regulatory requirements of different countries, by not limiting the maximum output power of the device.

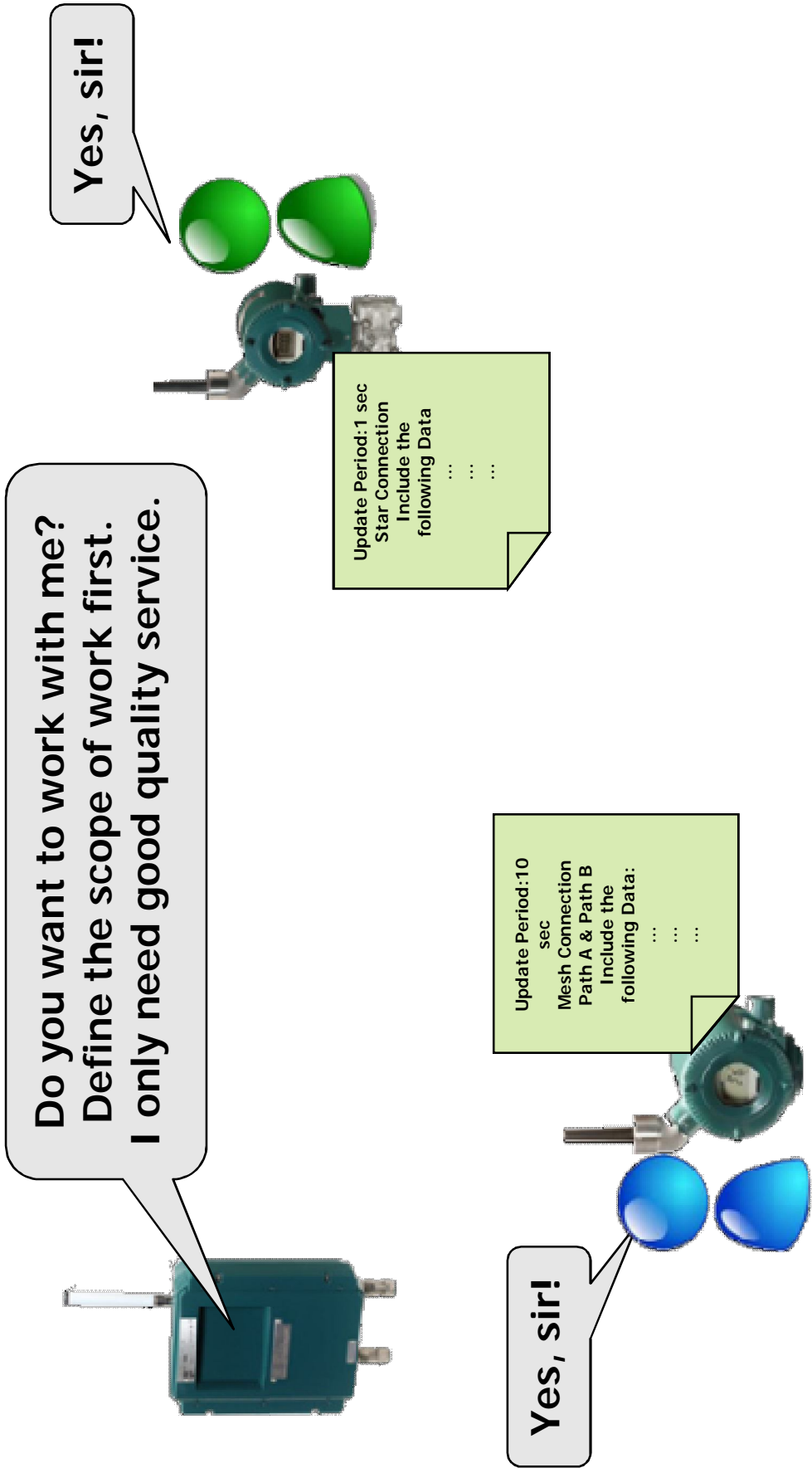


2.4GHz ISM Band (industrial, scientific and medical)

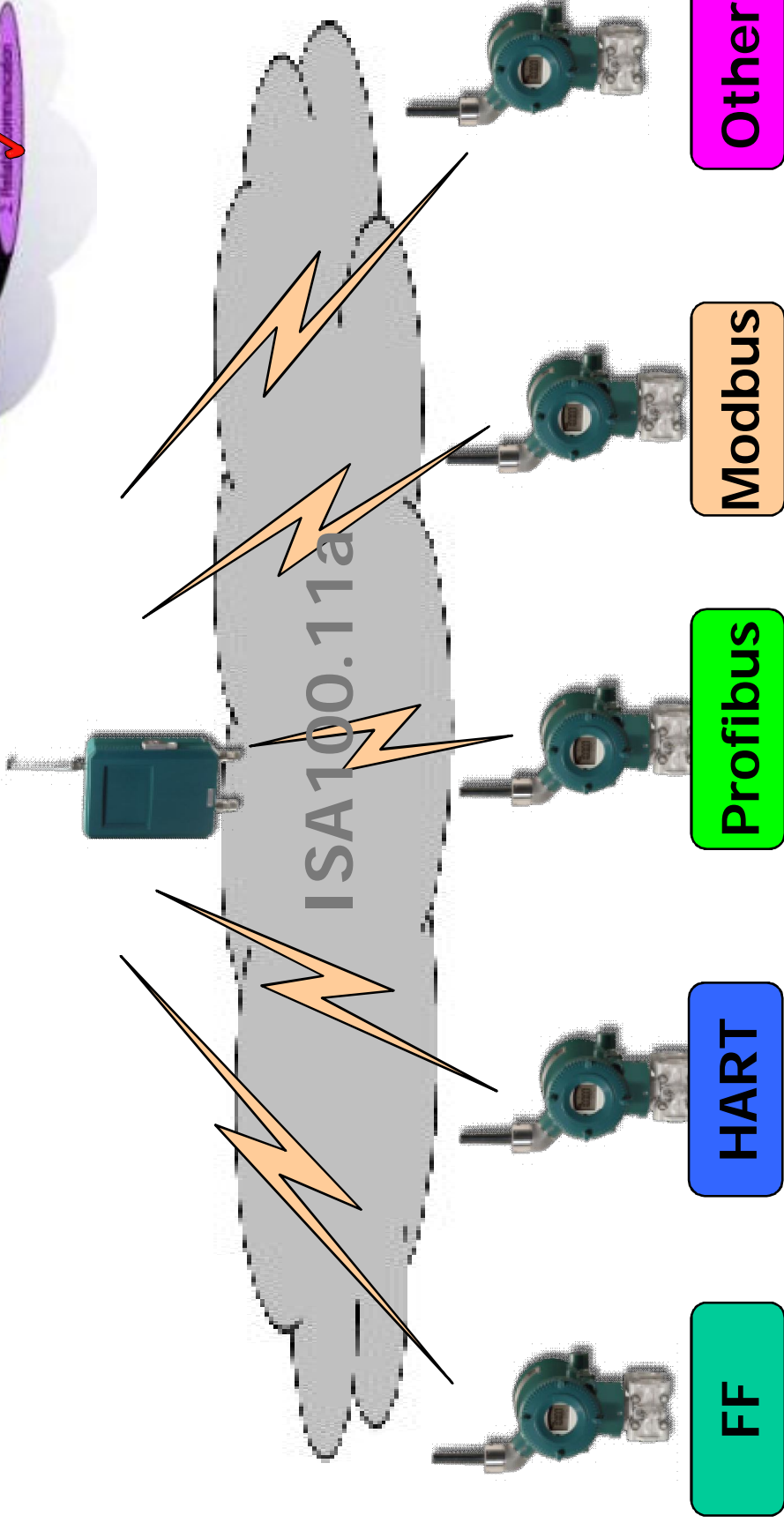
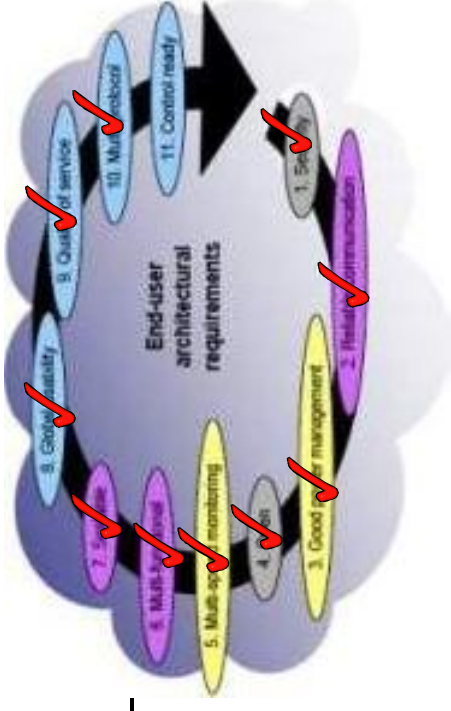
Quality of Service

Agreement between the system manager and a device in the network involving the allocation of network resources by the system manager to support a particular communication need of that device



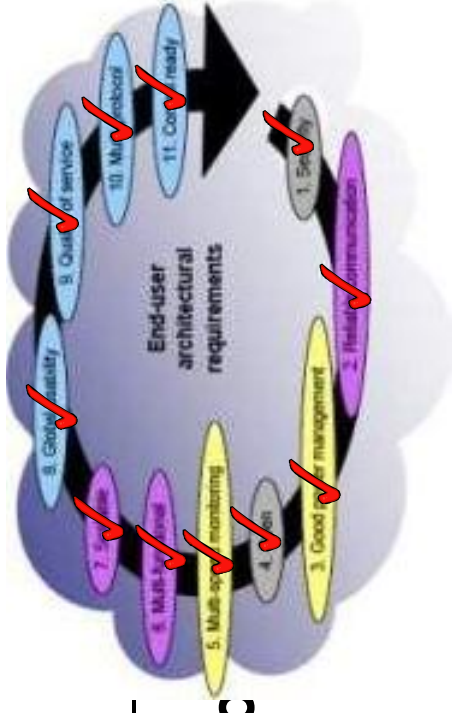


Multi-protocol by tunneling



Control Ready

- ISA100 regulates the response time of communication up to Class 1
- Critical and extremely time sensitive in scope



Safety	Class 0: Emergency action (Always critical)
Control	Class 1: Closed loop regulatory control (often critical)
	Class 2: Closed loop supervisory control (usually non-critical)
	Class 3: Open loop control (human in the loop)
Monitoring	Class 4: Flagging Short-term operational consequence (e.g., event-based maintenance)
	Class 5: Logging & downloading/uploading No immediate operational consequence (e.g., history collection, SOE, preventive maintenance)

Importance of message timeliness increases







ISA100





Reliable signal over a distance

vigilantplant®

<p>Open spaces</p> 	<p>Tank Farm</p> 	<p>Many pipes on the ground</p> 
<p>> 600m expected</p>	<p>> 200m expected</p>	<p>50- 100m expected</p>
<p>Space near by Plant building</p> 	<p>Complex pipes on the ground</p> 	<p>Inside the Plant</p> 
<p>> 50m expected</p>	<p>> 50m expected</p>	<p>10- 40m, depending on Obstacles</p>

Longer distance solution under implementation...

- Elevated Assets
 - Enables uneconomical measurements on flare stack and vacuum columns
- Distributed Assets
 - Loading Piers and Tank Farms are ideal areas to deploy wireless networks, enhancing asset management while minimizing infrastructure
- Isolated Assets
 - Robust measurement solutions for difficult to reach areas; Well heads, production platforms and pipelines

Wireless Enables Asset Management



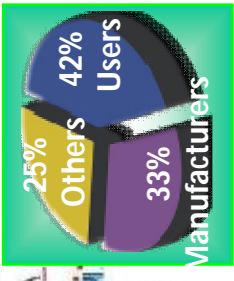
- ⇨ Rotating & Modular Equipment
 - Wireless free these assets from the complexity of traditional high maintenance cabled solutions
 - No moving parts - slip rings, complex connectors required and difficult cable looms needed

- ⇨ Temporary Measurements
 - Such as those required to diagnose a problem with a production asset are simple and convenient to implement wirelessly

Wireless Enables Greater Process Insights

Why Yokogawa choose ISA100.11a?

- End-user driven standard
 - Focus on field to control room integration
 - Co-existence with other wireless system
 - High security

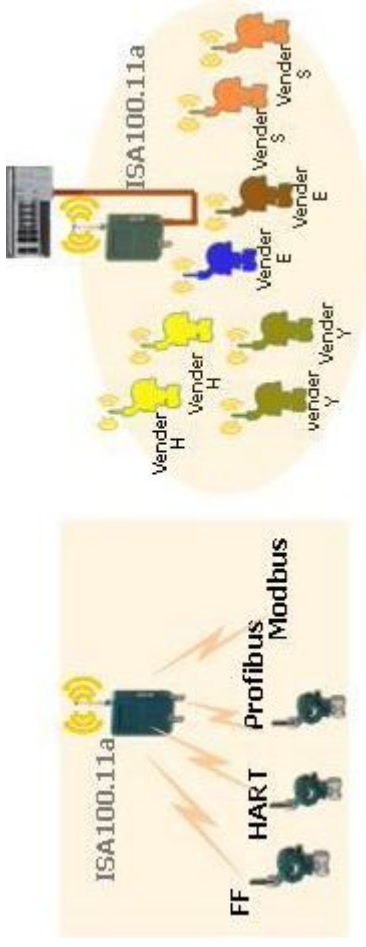


- Not limited to monitoring only
 - Allows other types of network than just a mesh
 - Covers Class 1 usage classification of response time

	Safety	Class 0	Emergency action
Control		Class 1	Closed loop regulatory control
		Class 2	Closed loop supervisory control
		Class 3	Open loop control
Monitoring		Class 4	Alarm/Warning notification
		Class 5	Data logging

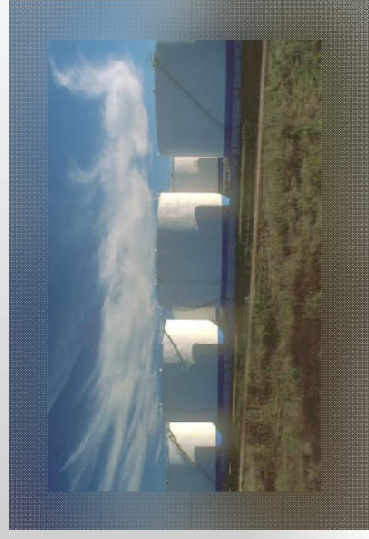
ISA100

- Plant wide scalability & integrity
 - Multi-protocol management
 - Multi-vendor device interoperability





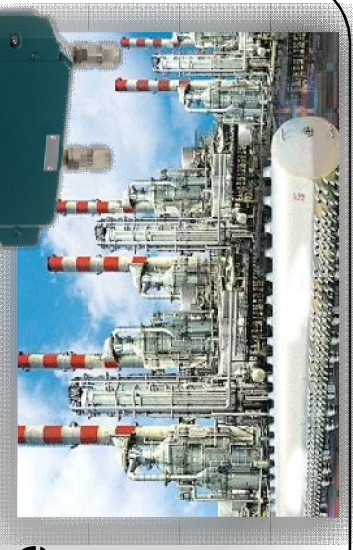
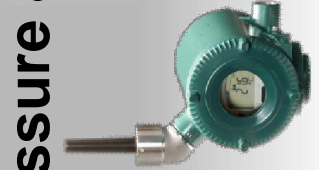
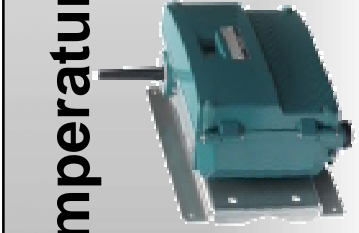
Level



Flow



Pressure & Temperature



- ❖ EJX Series Wireless Pressure Transmitter
 - Gauge, absolute and differential pressure (multi-sensing)
 - Manifold or direct mount
 - Battery life 5-15 year typically; battery health diagnostics
 - ATEX certified intrinsically safe

- ❖ YTA Series Wireless Temperature Transmitter
 - RTD (2-, 3- or 4-wire), t/c, mV or Ω - signals (single sensor)
 - Battery life 5-15 year typically; battery health diagnostics
 - ATEX certified intrinsically safe

ISA100
WIRELESS



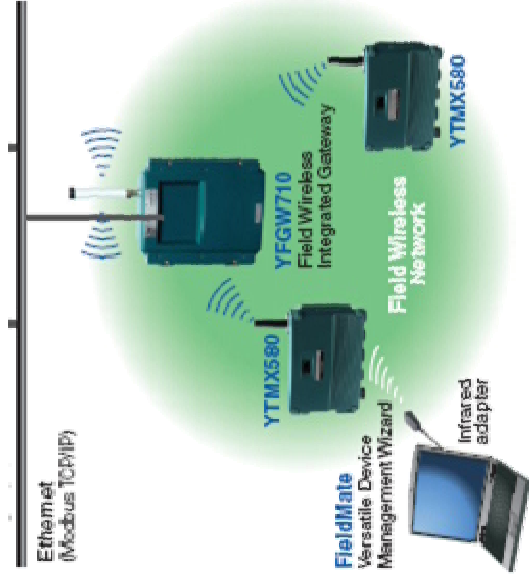
ISA100.11a Realizes Real Lifecycle Benefits



❖ YTMX Series Wireless Multi Input Transmitter

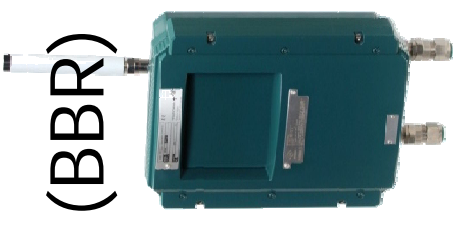
- Eight Inputs
- RTD (2-, 3- or 4-wire), t/c, mV or Ω - signals, 4 to 20mA (through shunt resistor)
- Field configurable update time to 1 sec
- Battery life 5-15 year typically; battery health diagnostics
- ATEX certified intrinsically safe (under process)

ISA100
WIRELESS



❖ Gateway with integrated Backbone Router (BBR)

- ATEX certified type N for Zone 2
- Security and system management



❖ Field Wireless Tools

- FieldMate integrated Universal Provisioning Tool
- Network Management Tool
- Field Wireless Configurator



FieldMate

Universal Provisioning Tool

❖ DCS and SCADA integration

- Measurement and device status visualisation
- Asset management and DTM based device management

ISA100
WIRELESS

- ❖ Application – Utilities Management
 - Oil Consumption and inventory management
 - Present method is using dip rod / manual measurement
 - Level measurement of Oil storage tank
 - five location
 - Flow measurement to storage tank
 - three points
 - Pressure measurement
 - two points