LoRaWAN Industrial IoT Solution

Fandesensor

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Comprehensive LoRaWAN Ecosystem

Full-stack solution from sensor to cloud

End to end architecture

Provides a full stack solution from sensor data collection to cloud applications, including network application servers (NAS), gateways, and data collection terminals, to achieve seamless transmission and processing of industrial IoT data.

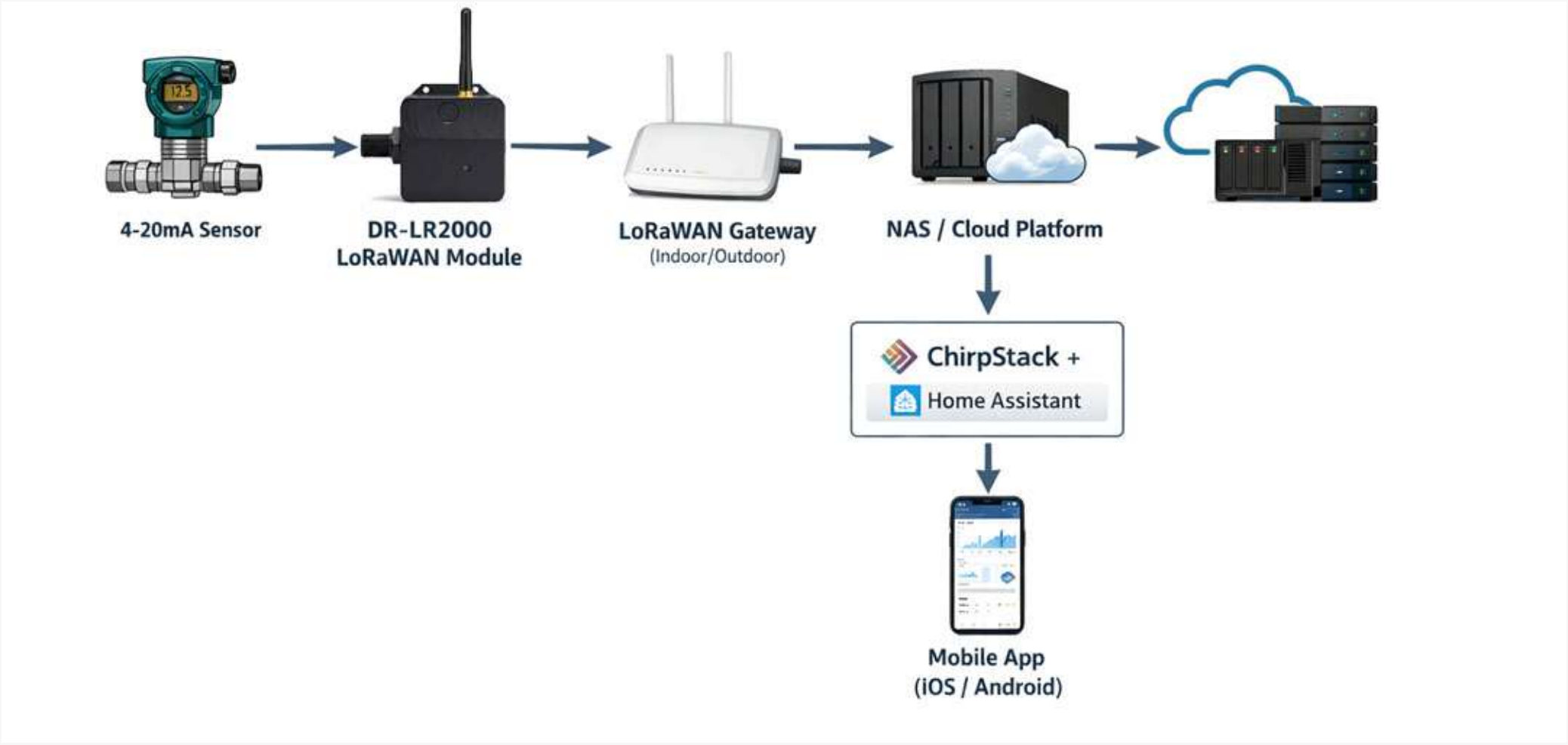
Platform compatibility

Supports deep integration with ChirpStack and Home Assistant platforms, allowing users to access test data in real-time through mobile applications, improving monitoring efficiency and convenience.

Modular design

Adopting a modular architecture design, it is easy to flexibly expand functional modules according to customer needs and meet customized requirements for different industrial scenarios.

Full-stack solution from sensor to cloud



Universal gateway support options

1

Diversified deployment

Provide two gateway versions, indoor and outdoor, to meet the deployment needs of different environments. The outdoor gateway has an IP65 protection level and can operate stably in harsh industrial environments.

2

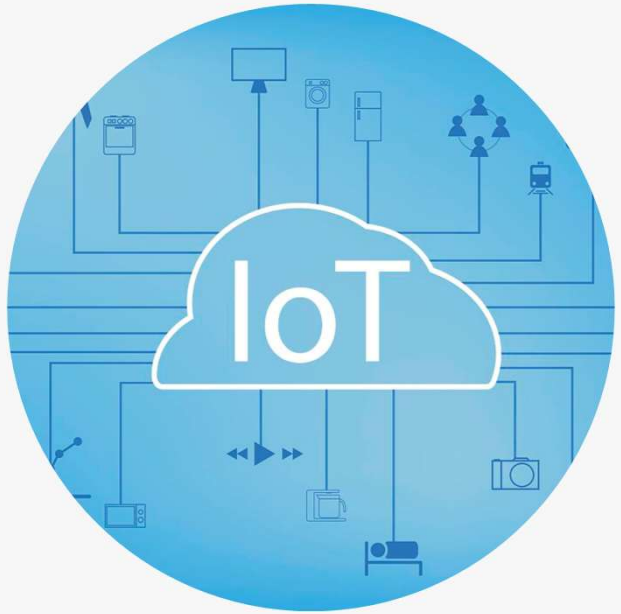
Flexible networking

Supports multiple network topologies, including star, mesh, and hybrid networking modes, to meet the network coverage requirements in complex industrial scenarios.

3

Remote management

The gateway is equipped with remote configuration and firmware upgrade functions, and operation and maintenance personnel can achieve real-time monitoring of device status and fault diagnosis through the cloud platform.



Global frequency band compatibility

01

Multi band support

Full coverage of global mainstream LoRaWAN frequency bands such as KR920, US915, EU868, AS923, AU915, and IN865, ensuring compliant deployment of devices worldwide.

02

Adaptive adjustment

Using intelligent frequency band selection technology, the device can automatically switch to compliant frequency bands according to the deployment area, avoiding signal interference and optimizing network performance.

03

Certification support

All frequency bands are certified by local radio regulatory agencies, including FCC, CE and other international certifications, to ensure customers' rapid landing in the global market.

02

DR-LR2000 Product Specifications

Specifications

Parameter	Specification
Product Model	DR-LR2000
Supported Bands	KR920, US915, EU868, AS923, AU915, IN865
LoRaWAN Version	1.0.3 Class A
Activation Method	OTAA (default)
Sensitivity	-138 dBm
LOS Transmission Range	Up to 10 km (depends on environment)
Input Signal	1 x 4-20mA analog input
Sampling Accuracy	<0.01mA, resolution 0.001mA, overall accuracy ⩽0.01mA (room temperature)

Sampling Rate	Configurable from 1s to 3600s per sample via network server
Data Rate Strategy	ADR (Adaptive Data Rate) enabled by default
Power Supply Options	Option 1: ER34615 (19Ah lithium battery) Option 2: 2×18650 (7Ah total) + 6V 200mA solar panel
Deep Sleep Current	⩽ 10 μA
Operating Temperature	-45°C to +85°C (battery dependent)
Protection Features	Reverse polarity protection, open-circuit detection, surge/lightning protection (TVS + current limiting)
Dimensions	Customizable
Interfaces	4-20mA input terminal, magnetic switch control, LED indicator

Competitive Advantage

Feature	Typical Competitor	DR-LR2000	Advantage
Accuracy	0.1 mA	**<0.01 mA**	**10x better**
Resolution	0.01 mA	**0.001 mA**	**10x finer**
Battery Life (ER34615)	1-2 years	**≥3 years** (hourly reporting)	**50-100% longer**
Solar Charging Solution	Not available	**2×18650 + 6V 200mA solar panel**	**Infinite runtime in sunny regions** – No battery replacement ever
Sleep Current	50-100 µA	**≤10 µA**	**5-10x lower**
Operating Temperature	-20°C to +60°C	**-45°C to +85°C**	**Wider by 50°C**
Communication Distance (LOS)	3-5 km	**Up to 10 km**	2-3x farther – Fewer gateways needed, lower infrastructure cost
Sensor Power Feed	None	**12V output**	Eliminates external power supply
Remote Configuration	Partial	**Full remote** (intervals, thresholds)	No site visits required
ADR	Manual only	**Auto + default ON**	Set-and-forget optimization

03

Power Efficiency & Field Operation

Extended battery life options

Primary battery solution

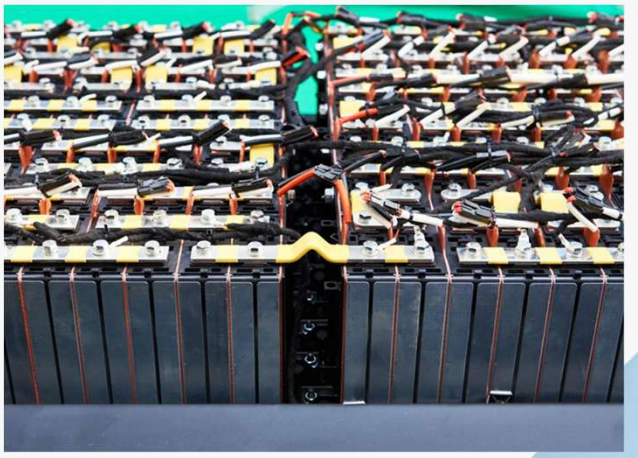
ER34615 (19Ah) lithium-thionyl chloride battery delivers ⩾3 years of operation with hourly reporting intervals, validated through IEC 60086-4 industrial testing standards.

Field-replaceable design

Modular battery compartment allows quick replacement without tools, minimizing downtime in remote installations.

Low-temperature optimization

Specially formulated electrolyte maintains stable discharge current down to -40 °C, ensuring reliability in arctic environments.



Solar power sustainability

The solution combines rechargeable batteries with solar harvesting for perpetual operation in sun-exposed deployments.

Hybrid power system: 2 × 18650 lithium-ion batteries (7.4V 3400mAh) paired with 6V 200mA monocrystalline solar panel achieve 99.7% energy autonomy in daylight conditions.

MPPT charging: Integrated maximum power point tracking algorithm optimizes solar energy conversion efficiency up to 97%, even under partial shading.

Battery protection: Dual-stage charge controller prevents overcharge (cutoff at 4.2V ±0.05V) and deep discharge (protection at 2.5V±0.1V).

Contactless magnetic control

Non-intrusive operation

- Waterproof magnetic switch: IP68-rated Hall effect sensor enables configuration through 3mm stainless steel enclosures without physical penetrations.
- Programmable trigger actions: Magnet proximity duration determines function (⩾3s for manual report, ⩾8s for power cycle) with haptic feedback via LED patterns.

Maintenance optimization

- Zero-power standby: Magnetic activation eliminates need for physical buttons, reducing corrosion risk in humid environments.
- Field diagnostics: Triple-pulse magnet interaction (within 5s) triggers diagnostic mode with LED status code output for troubleshooting.

04

Industry Applications & Use Cases

Industrial tank level monitoring

01

Advantages of wireless collection

Using LoRaWAN technology to achieve wireless monitoring of industrial tank liquid levels can save up to 45 kilometers of wiring costs and solve problems such as complex construction and difficult maintenance in traditional wired solutions.

02

Real time alarm function

Receive tank overflow or empty tank warning signals through the mobile app, support custom alarm thresholds, ensure production safety and reduce manual inspection frequency (reducing labor costs by 80%).

03

Environmental adaptability

The device operates stably at extreme temperatures ranging from -45 ° C to+85 ° C, with built-in TVS lightning protection and reverse connection protection circuits, suitable for harsh industrial scenarios such as chemical and petroleum industries.

Smart water environment solutions

01

Multi parameter monitoring capability

compatible with pressure transmitters, level gauges, and temperature sensors, capable of synchronously collecting water pressure, water level, and temperature data, suitable for municipal water supply, sewage treatment, and other scenarios.

02

Solar power supply design

Supports parallel power supply of 6V/200mA solar panels and dual 18650 batteries, solving the problem of power supply in outdoor environments and achieving maintenance free operation for more than three years.

03

Intelligent alarm optimization

using "anti jitter" and "rate limiting" algorithms to filter instantaneous fluctuation interference, avoid false alarms, and ensure the accuracy and timeliness of abnormal event recognition.

Flexible sensor compatibility

Wide voltage adaptation

The terminal provides a 12V feed output, which can simultaneously drive active (4-20mA) and passive sensors to meet the power supply needs of different industrial sensors.

High precision conversion

Equipped with a low-temperature drift ADC chip, it achieves 0.001mA resolution signal conversion, ensuring monitoring accuracy error of pH value, turbidity and other water quality parameters is less than 0.01mA.

Protocol openness feature

Supports ChirpStack and Home Assistant platform integration, and users can achieve integration with existing SCADA/MES systems through API secondary development.

05

Why Choose Our Solution

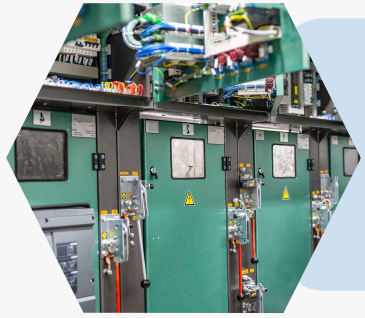
Proven reliability in harsh conditions

Extreme Environment Adaptation

The DR-LR2000 series operates stably within a wide temperature range of -45 ° C to+85 ° C, suitable for extremely cold or high temperature industrial scenarios, ensuring uninterrupted data collection.

Industrial grade protection design

Built in TVS surge protection and current limiting function, effectively resisting lightning strikes and voltage fluctuations, ensuring the safety of equipment in harsh power environments.



Long term stability verification

Through industrial environment tests such as salt spray and vibration, the equipment has been continuously operated for over 20000 hours without failure in high-risk areas such as chemical and mining.

Significant cost efficiency benefits

Labor cost savings

Automated monitoring replaces manual inspections, reducing labor input by 80% in typical application scenarios and lowering annual operation and maintenance costs by approximately 45%.

Wiring cost optimization

Wireless solutions eliminate the need for traditional wired deployment, saving an average of 300000 to 500000 yuan in cable costs per project (such as 45km cabling scenarios).

Energy efficiency management advantages

With a deep sleep current of ⩽ 10 μ A and solar power supply, the energy cost of the equipment lifecycle is reduced to 1/5 of traditional solutions.

Easy deployment and scalability

Plug and play configuration

default OTAA air activation mode, supporting device network access within 15 minutes without the need for professional technicians to debug on site.

Hybrid networking capability

Supports dual platform access of ChirpStack and Home Assistant, meeting both industrial grade NAS requirements and compatible with smart home system expansion.

Elastic scaling solution

A single gateway can manage 200+terminal nodes, and by increasing the number of gateways, the system capacity can be linearly increased, adapting to deployment from a single point to a park level.

THANKS

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