

Technical Datasheet

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Product Introduction

1. Overview

The ZX-901H is an industrial-grade Edge RTU designed for remote monitoring, telemetry and control applications requiring reliable field data acquisition, flexible communication and intelligent processing capabilities.

The device integrates:

- Multi-channel sensor acquisition
- Industrial communication interfaces
- 4G LTE connectivity
- Ethernet networking
- LoRa wireless communication
- Video overlay (OSD)
- Local data processing
- Alarm management
- Remote maintenance

into a compact industrial terminal.

The ZX-901H enables distributed monitoring systems to collect, process and transmit field information from remote locations where stable and unattended operation is required.

2. Product Applications

Typical applications include:

Water & Hydrology

- River monitoring
- Reservoir monitoring
- Flood warning systems
- Rainfall monitoring
- Irrigation management

Infrastructure Monitoring

- Dam safety monitoring
- Bridge monitoring
- Tunnel monitoring
- Slope stability monitoring

Environmental Monitoring

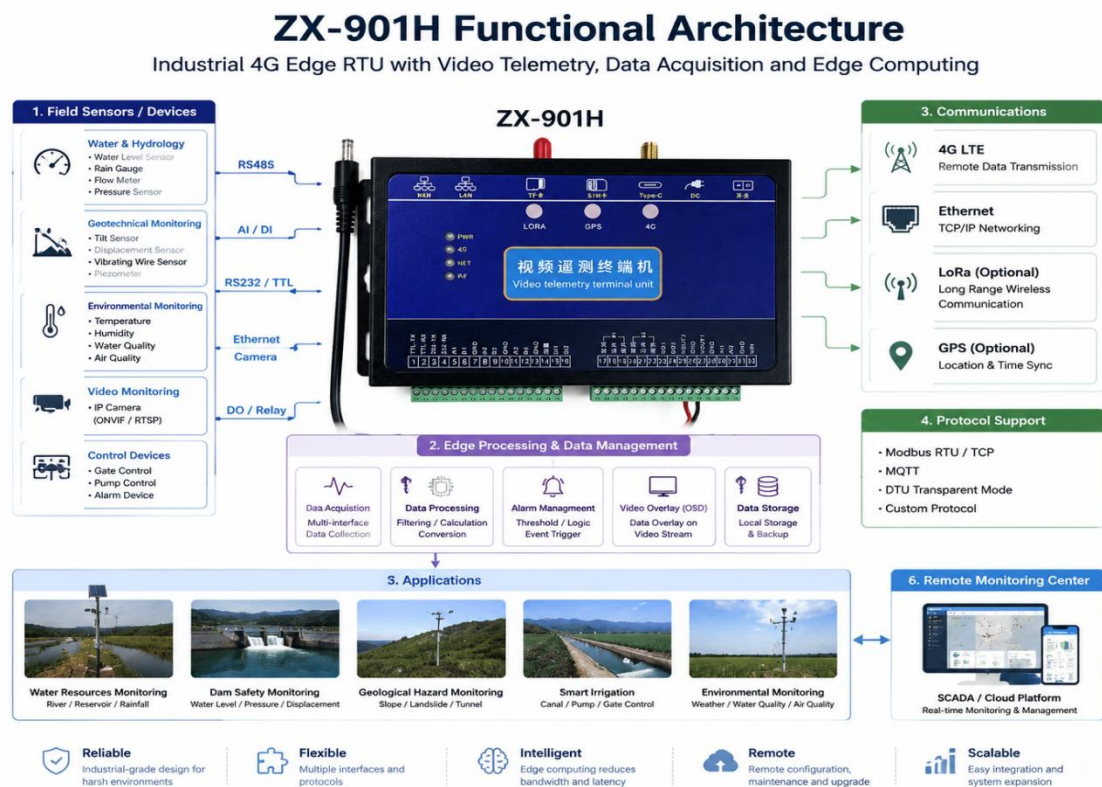
- Water quality monitoring
- Weather monitoring
- Remote environmental stations

Industrial IoT

- Remote equipment monitoring
- Pump station monitoring
- Smart field applications

System Architecture

3. Functional Architecture



4. Main Functional Modules

Module	Function
Data Acquisition	Sensor signal collection
Edge Processing	Local calculation and logic
Communication	Data transmission
Storage	Historical data logging
Video Module	Data overlay and verification
Control Module	Remote output control

Hardware Overview

5. Hardware Design

The ZX-901H adopts an industrial hardware architecture designed for long-term field deployment.

Key design features:

- Industrial-grade MCU
- Wide voltage input
- Industrial communication interfaces
- Protection circuits
- Expandable interface design

6. Interface Overview

Serial Interfaces

Interface	Description
RS485	Industrial sensor communication
RS232	External device connection
TTL	Embedded communication

I/O Interfaces

Interface	Function
AI	Analog signal acquisition
DI	Digital input
DO	Digital output
Relay	Remote switching control

Data Acquisition

7. Sensor Integration Capability

The ZX-901H supports connection with various industrial sensors.

Typical sensors:

- Water level sensors
- Rainfall sensors
- Pressure sensors
- Flow sensors
- Temperature sensors
- Tilt sensors
- Vibrating wire sensors

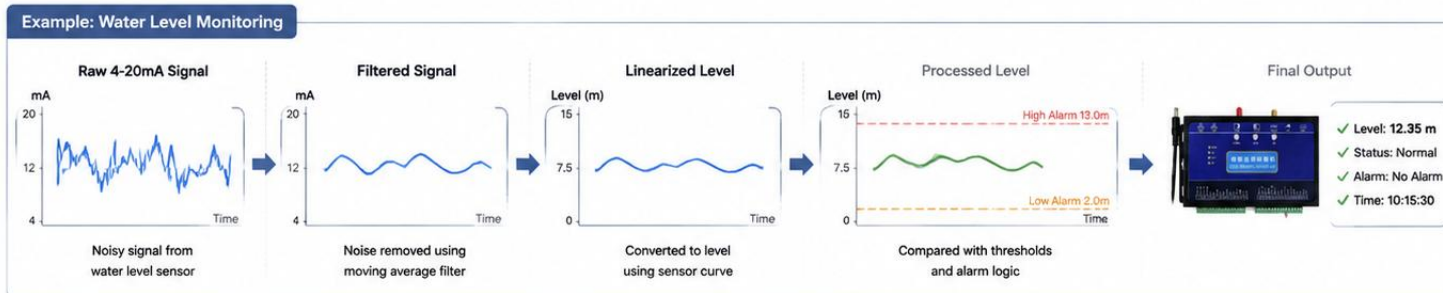
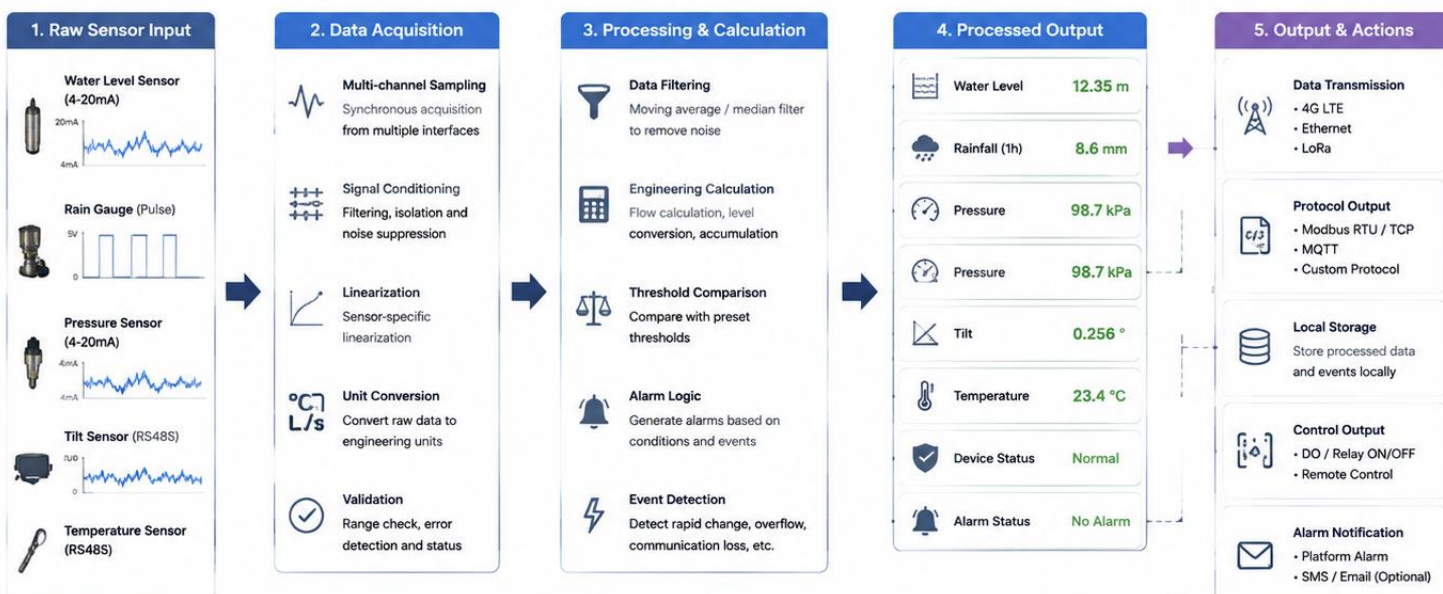
8. Signal Processing

Supported functions:

- Data sampling
- Unit conversion
- Data filtering
- Threshold comparison
- Alarm generation
- Local calculation

8. Signal Processing Example

The ZX-901H performs multi-stage signal processing to convert raw sensor data into valuable information for monitoring and control applications.



Communication System

9. Communication Interfaces

Cellular Communication

Support:

- 4G LTE

Applications:

- Remote monitoring stations
- Unmanned field sites
- Distributed sensor networks

Ethernet Communication

Support:

- 10/100 Mbps Ethernet

Applications:

- SCADA integration
- Industrial networks
- Local communication

LoRa Communication

Optional wireless communication for:

- Low-power sensors
- Large-area monitoring
- Remote field deployment

Protocol Support

10. Industrial Communication Protocols

The ZX-901H supports multiple communication protocols for flexible system integration.

Supported Protocols

Protocol	Application
Modbus RTU	Industrial sensors
Modbus TCP	Ethernet systems
MQTT	IoT cloud platforms

Protocol	Application
DTU Mode	Transparent transmission
Custom Protocol	OEM integration

Platform Integration

Compatible with:

- SCADA systems
- IoT platforms
- Cloud monitoring systems
- Customized software platforms

Video Telemetry Function

11. Video Overlay Technology

The ZX-901H supports integration between sensor data and video streams.

Through On-Screen Display (OSD):

- Measurement values
- Device status
- Alarm information
- Time information

can be displayed directly on video images.

Benefits

Visual Data Verification

Operators can confirm field conditions together with measurement data.

Event Traceability

Synchronizes:

- Sensor records
- Video information
- Event information

Applications:

- Flood monitoring
- Dam monitoring
- Pump station monitoring
- Remote inspection

Edge Computing & Data Management

12. Edge Processing

The ZX-901H provides local intelligence for remote monitoring applications.

Functions:

- Local calculation
- Data filtering
- Alarm decision
- Event triggering
- Data compression

13. Data Storage

Features:

- Local historical logging
- Event recording
- Data backup

14. Store-and-Forward

When communication is interrupted:

1. Data continues to be collected
2. Records are stored locally
3. Data is automatically uploaded after network recovery

Electrical & Environmental Specifications

15. Technical Specifications

Parameter	Specification
Product Type	Industrial Edge RTU
Processor	Industrial-grade MCU
Power Supply	9-32 VDC
Communication	4G LTE / Ethernet / LoRa
Ethernet	10/100 Mbps
Serial Ports	RS485 / RS232 / TTL
Analog Input	4-20mA
Digital Input	DI
Digital Output	DO
Relay Output	Supported
Storage	Flash / Micro SD
Protocol	Modbus RTU/TCP, MQTT, DTU, Custom
Protection	Industrial Protection Design
Operating Temperature	-40° C to +85° C

Installation, Integration & OEM

16. System Integration

The ZX-901H is designed for easy integration into existing monitoring systems.

Integration options:

- SCADA systems
- Cloud platforms
- Industrial networks
- Customized software platforms

17. OEM / ODM Capability

Shenzhen HuEntropy Tech provides customized solutions including:

Hardware Customization

- Interface modification
- Communication module selection
- Mechanical design

Firmware Customization

- Protocol development
- Functional modification
- Application-specific logic

System Integration Support

- Sensor integration
- Platform connection
- Field application support

Company Profile

Shenzhen Hu Entropy Tech Co., Ltd

Shenzhen HuEntropy Tech specializes in industrial IoT devices, remote telemetry terminals and monitoring solutions.

Our engineering capabilities include:

- RTU development
- Data acquisition technology
- Sensor integration
- Industrial communication
- Remote monitoring systems

Contact Information

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Appendix A

Interface Pin Definitions

Pin No.	Interface Name	Description
1	TTL_TX	TTL level serial transmit, connect to RX
2	TTL_RX	TTL level serial receive, connect to TX
3	232_TX	RS232 level serial transmit, connect to RX
4	232_RX	RS232 level serial receive, connect to TX
5	A1	RS485-1 differential signal positive (Data+ / A)
6	B1	RS485-1 differential signal negative (Data- / B)
7	GND	Power ground / signal reference ground
8	A2	RS485-2 differential signal positive (Data+ / A)
9	B2	RS485-2 differential signal negative (Data- / B)
10	GND	Power ground / signal reference ground
11	A3	RS485-3 differential signal positive (Data+ / A)
12	B3	RS485-3 differential signal negative (Data- / B)
13	GND	Power ground / signal reference ground
14	Rain Gauge	Tipping-bucket rain gauge pulse input (passive dry contact)
15	DI1	Digital / switch input (Digital Input)
16	DI2	Digital / switch input (Digital Input)
17	Normally Closed	#1 relay normally closed contact
18	Common	#1 relay common terminal

Pin No.	Interface Name	Description
19	Normally Open	#1 relay normally open contact
20	Normally Closed	#2 relay normally closed contact
21	Common	#2 relay common terminal
22	Normally Open	#2 relay normally open contact
23	DO1	Digital output, default 3.3V level output
24	DO2	Digital output, default 3.3V level output
25	VOUT2	Controllable power output
26	GND	Power ground / signal reference ground
27	VOUT1	Controllable power output
28	GND	Power ground / signal reference ground
29	AI1	Analog input (4~20mA)
30	AI2	Analog input (4~20mA)
31	GND	Power ground / signal reference ground
32	VIN	Power input (9~32V wide voltage input)

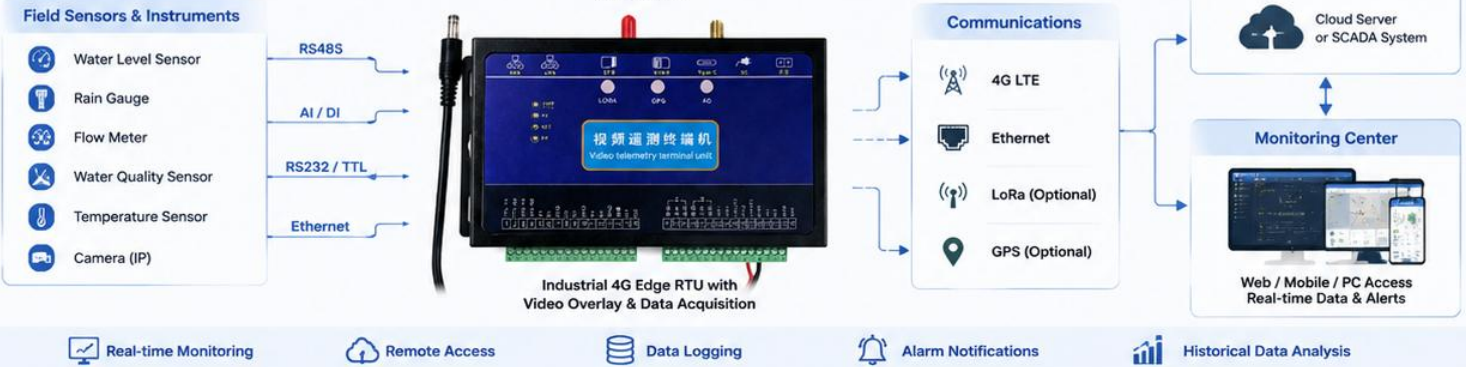
Appendix B

ZX-901H APPLICATION DIAGRAM

Reliable Monitoring Solutions for Water, Dam and Flood Applications

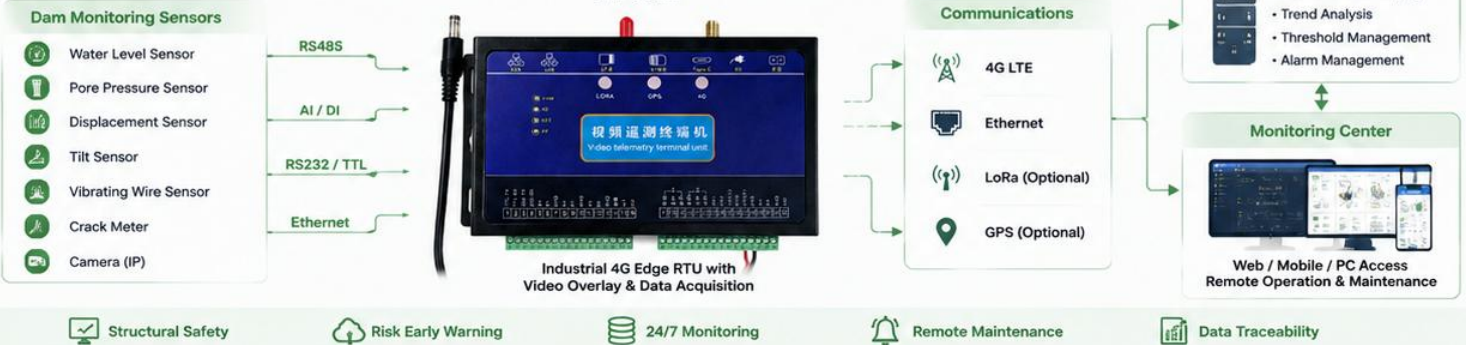
1. WATER MONITORING SOLUTION

Monitor water level, rainfall, flow and quality in rivers, canals, reservoirs and water supply systems.



2. DAM SAFETY SOLUTION

Continuous monitoring of dam structural health and environmental conditions to ensure operational safety.



3. FLOOD WARNING SOLUTION

Early detection of heavy rainfall and rising water levels for river basins, urban areas and flood-prone regions.



Note: The above diagrams are typical application examples. Interfaces and communications can be customized based on project requirements.