THERMOMETRICS
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AN AMPHENOL COMPANY

LET-Elite

Alarm module (Locating)
Leak and Breakage Detection Module



The **Thermometrics LET-Elite Alarm Module** uses the standard MODBUS-RTU protocol with a 2-wire RS485 port. The host computer reading interval shall be ≥500 ms (recommended 1 s). Its default address is 01, configurable via PC commands or LEAK-Talk software. It supports BACnet IP and Modbus RTU/TCP.

Features

- Typical applications include leak detection for data centers, communication rooms, air conditioning and refrigeration units, liquid storage tanks, pipelines, valves, pumps, and other equipment where liquid leakage monitoring is required.
- LET-Elite Alarm module can detect the leakage of water, acid-base, oil and other liquids. It can also connect the sense cable up to 1500 meters When a liquid leakage is detected, the leakage position is displayed through the LCD screen and the relay alarm signal is output.
- The LET-Elite Alarm Module can operate as a standalone detection and alarm unit or as part of a network with other LET-Elite Alarm Modules. Using a standard communication protocol, the module can communicate with a monitoring system or host computer to provide remote alarm notification, status monitoring, and remote equipment control.
- The output of alarm relay can select multiple linkage modes, and normal power on or normal power off operation modes LED displays the power supply, leakage, cable fault and communication status; LCD displays the Location of leakage.
- There are three power supply models: 12-24VDC, 24VAC and 220 VAC.
- Serial RS-485 communication up to 1200 meters, can be centralized monitoring network.
- The Alarm module has a special address assigned by the software.
- Convenient installation of DIN 35mm guide rail.
- LET-Elite Alarm module can be configured with PC based on Microsoft Windows. The Alarm module comes with independent configuration software.

Technical Descriptions

Part	Description
Detection Cable	Compatible with all four core detection cables
Detection Cable Length	Maximum cable length is 1500 meters
Work Environment	Temperature -10~+80°C. Humidity 90%, white ABS / IP65 waterproof can be installed outdoors
Weight and Size	Weight 250g; Size L120mm x H85mm x W55mm
Detection Sensitivity	The detection sensitivity is stepless, and the response time is less than 1 second (when the sensitivity is the highest)
Power Input	12 - 30 VDC, 12 - 24 VAC power supply
Relay Output	3 SPDT normally open normally closed output rated power is 220VAC / 2A
RS485 Output	MODBUS-RTU communication protocol, device address 1 - 255

LET-Elite Sensor Specifications

CAUTION

Please carefully confirm the power supply voltage before powering on, and ensure that the power cable is connected to the correct port, otherwise the Alarm module may FAIL.

RS485 Communications Interface
RS485 interface, 1-2/3-4 two groups of parallel inter-working, can connect a group. SHL is shield ground and can not be connected

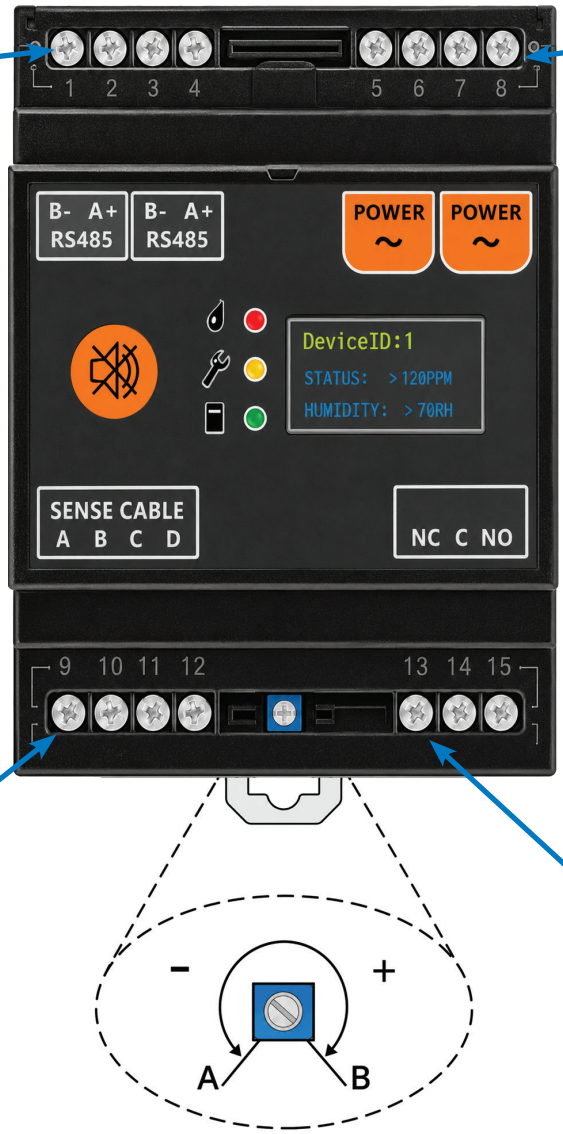
Service
The yellow light will be on when the maintenance indicator light, the cable connection circuit is interrupted, or the cable status is abnormal

Reset Button
Mute reset button,manually eliminate alarm sound and reset alarm status

Power
Power indicator Always on green when working

Leak Sense Cable (locating)
Connect the sense cable:
9-A red
10-B green
11-C yellow
12-D black

In the order of the color of the sense cable



Power Output
Alarm module three types of power supply voltage: 12VDC, 24 VAC or 220 VAC. Two groups of 5 - 6 / 7 - 8 are interconnected in parallel, and one group can be connected without line sequence,

Leak Indicator
When the cable meets water alarm and reaches the alarm sensitivity value, the red light will be on.

LCD Display
Display the equipment address code, display the current status of the equipment, display the cable when alarm, and the leakage position meter

Alarm Output
Relay dry contact signal output:
13- NC (normally closed)
14- COM (public terminal)
15- NO (normally open)
Rated power 220 VAC / 2A

Sensitivity Modulation
Increase sensitivity clockwise and decrease sensitivity counterclockwise

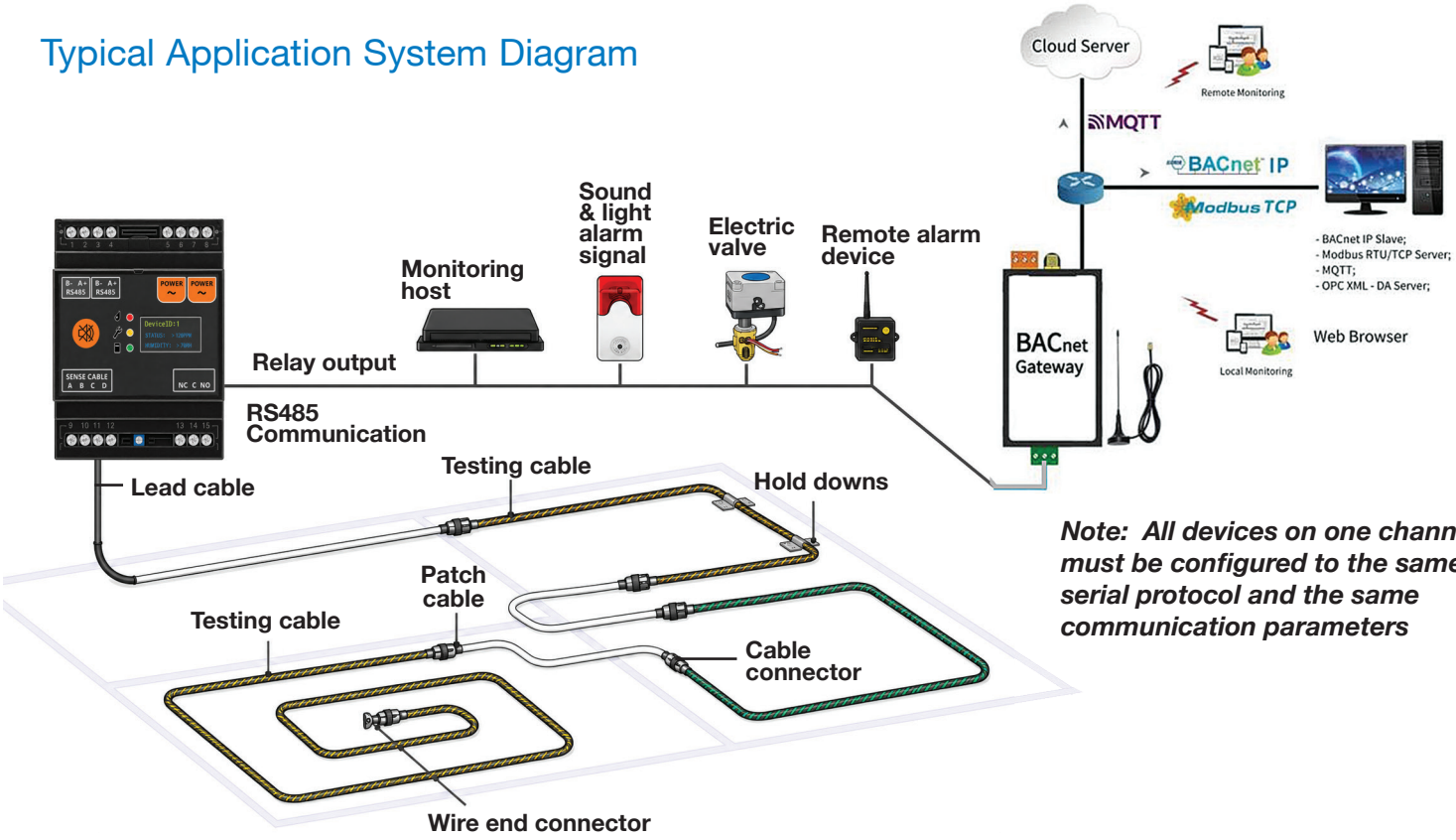
Position a needs more water to trigger the alarm B position water drop can trigger alarm

Notes:

1. The maximum length of the Alarm module (Locating) can be connected to the Sense cable (Locating) is 1500 meters (excluding Leader cable and Jumper cable).
2. The leakage alarm display position is calculated according to the starting sequence of the Sense cable (Locating), that is, the length of the Alarm module is calculated in the direction of the cable end.
3. The factory setting of detection sensitivity is normal, and the equipment address is 01 by default.
4. The Alarm module (Locating) is waterproof design.

LET-Elite Sensor Specifications

Typical Application System Diagram

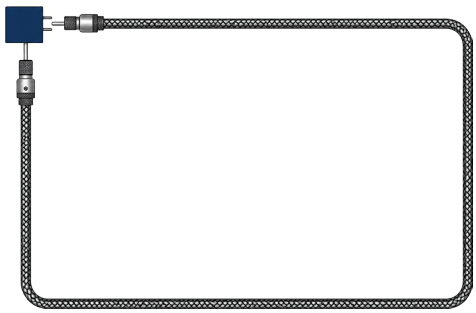


Note: All devices on one channel must be configured to the same serial protocol and the same communication parameters

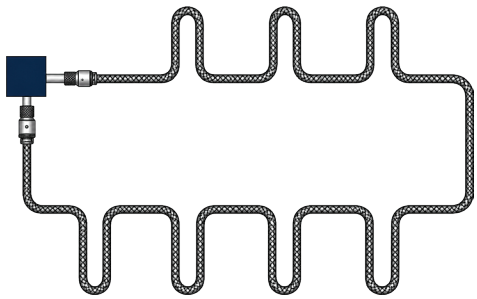
Sense Cable Layout



Cover the whole area
Comprehensive protection
for critical areas



Cover the edge area
Prevent leaks from immersing in
or spreading out



Covering air - conditioned areas
Key protection against major leakage
sources such as air conditioners

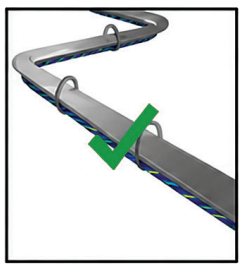
Sense Cable Installation and Fixing



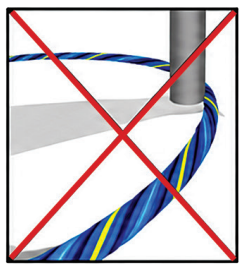
Dedicated line card installation



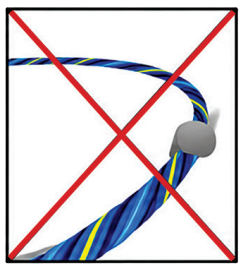
Hoisting along the pipeline



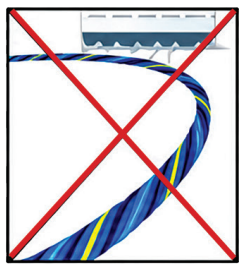
Fixed with metal boundless



Facing air conditioner



Glue fixed



Cable harness fixed

The Leak Sensing Cable should be installed away from high-temperature sources, open flames, strong magnetic fields, and wet or dusty environments. Avoid exposing the cable to sharp objects that could scratch, cut, or damage the cable sheath.

LET-Elite Sensor Specifications

Communication Parameters

Data transfer rate:	Baud rate 9600 BPS
Data transmission format:	N (parity check), 8 (data bit), 1 (stop bit)
Device default address:	01
RS485 wiring port:	Standard two-wire asynchronous communication, 8RS+, 9 RS-

LET-Elite Communications Protocol

(1) Send the Command:

Address	Function Code	Data start bit (high + low)		Number of Data (high + low)		CRC16 Check
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	2 byte

(2) Equipment Return Information:

Address	Function Code	Byte Length	Data Value (high + low)		CRC16 Check
1 byte	1 byte	1 byte	1 byte	1 byte	2 byte

(3) Protocol Data:

Function Code	Register Bit	Data Address	Number of Data	Data Value Definition
04H	30001	0000H	1	Device address code: 01-255
	30002	0001H	1	Equipment status: 00 normal, 01 disconnection, 02 leakage, 03 disconnection + leakage
	30003	0002H	1	Leakage location value: Divide the value by the cable's unit resistance to obtain the leakage position in meters. Value FF means no leakage
	30004	0003H	1	The cable resistance is measured in meters
	30005	0004H	1	Relay alarm mode: 00 no action, 01 disconnection action, 02 leakage action, 03 leakage and disconnection action
	30006	0005H	1	The value is divided by 10 after decimal conversion, that is, the unit resistance of the cable is detected, and the default value is 13.0 Ω / m
06H	40001	0000H	1	Modify the device address: 01-255
	40005	0004H	1	Set relay mode: 00 no action, 01 disconnection action, 02 leakage action,03 leakage and disconnection action
	40006	0005H	1	Set the unit resistance value of the detection cable,which can be adjusted according to the detection error, generally between 12.5~13.5

Example

Content	Dispatch Orders	Return Information	Explain
Read device address	010400010001600A	0104020000 B930	Leakage alarm status
Read device status	010400020001900A	010402002638 EA	Test the cable leakage resistance of 38 ohm (except 13.3)
Read relay status	0106000000 C7C858	0106000000 C7C858	The device address 01 is changed to 199
Modify device address	010600040003880A	010600040003880A	In case of leakage and is connection, the relay will alarm
Read relay status	0106000500855868	0106000500855868	Set the unit resistance of the cable to 13.3 ohm / m

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LET-Elite Sensor Optional Gateway with Wifi

Functional Description

The gateway (with 1 Ethernet port, 1 RS485 serial port, dynamically supporting 256 points) supports the collection of Modbus RTU/TCP and more than 500 protocols, simultaneously forwarding it to BACnet IP and Modbus RTU/TCP servers. It also features WeChat alarms, MQTT server and the ability to upload projects to the cloud. The gateway is configured using X2View software. Users can configure it based on the existing equipment's point list, convert it to standard BACnet IP or Modbus RTU/TCP, and upload it to the hardware gateway. BACnet/Modbus clients can then access the data of on-site equipment through the gateway.

Note: For the data collection side of this gateway, Modbus registers start from decimal address 1 (Base1), while hexadecimal addresses start from 0 (Base0); for the forwarding side, Modbus register base addresses all start from 1 (Base1).

Operating Environment

The X2View configuration software supports multiple operating systems, including Win 7, Win 8, Win 10, Win 11, Win Server 2008, Win Server 2016, and more. The hardware gateway comes with a built-in WEB server, which supports remote access to the configuration screens within the gateway using browsers such as Google Chrome, Microsoft Edge, Apple's Safari, Firefox, Opera, and 360 Speed Mode.

Supported Register Types and Quantities

Note: The number of register points is dynamically supported, with a total limit of up to 256 points. The BACnet/Modbus register types and maximum number of points supported are shown in the table below.

BACnet Register Types	BACnet Register Points
AI (Read-only)	256
AO (Read and Write)	256
AV (Read and Write)	256
BI (Read-only)	256
BO (Read and Write)	256
BV (Read and Write)	256
MI (Read-only)	256
MO (Read and Write)	256
MV (Read and Write)	256

Modbus Register Types	Modbus Register Points
0X (Coil Status) Read and Write	256
1X (Input Status) Read-only	256
4X (Holding Register) Read and Write	256
3X (Input Register) Read-only	256

Notes:

4X and 3X register address = transfer register address *2+1

0X and 1X register address = transfer register address +1

Hardware Parameters

OS	Linux	Power supply	AC/DC 12~24V
CPU	1 Core 750MHz	Dimensions (L×W×H):	119mm x 55mm x 33mm
RAM	64M	Weight:	200g Not including antenna
Flash	32M	Material:	Galvanized Steel
Power	6W	Installation:	DIN-Rail/Wall-mounted
Ethernet Ports:	1x 10M/100M NIC	Temperature:	-20 ~ +70°C (working) -40 ~ +85°C (storage and transportation)
Serial Ports:	1x RS485 (Electromagnetic isolation)	Humidity:	Operating: 20-90% RH (non-condensing) Storage and Transportation: 15-95%RH (non-condensing) 15 95 no condensation (storage and transportation)

WiFi Connection: Support WiFi 5

LET-Elite Sensor Specifications

Type	Product	Specification	Description
LET-Elite	Leak Controller	Dimensions/Weight	L70*W86*H58mm; 200g
		Plastic Casing	Black fire-resistant ABS material, with IP55 protection level
		Detection Sensitivity	0 - 50K adjustable range, flexible selection of sensitivity, wide detection range
		Power Requirement	12-24VDC or 220VAC AC power supply, with a working current less than 1A
		Relay Output	1SPDT, rated power 220VAC/2A (normally open and normally closed)
		RS485 Output	RS485 serial interface, MODBUS-RTU protocol
	Positioning Detection Cable	Weight	38g/m
		Cable Diameter	6mm
		Cable Length	15m supplied with kit. Custom lengths are avaialble up to 500m
		Maximum Exposure Temperature	85°C
	Module	Patch Cable	Optional
		Lead Cable	Length 3m
		Cable Connector	Standard component
		Hold Downs	Standard component

The LET-Elite System includes:

- Controller
- Power Extension Wire
- Lead Cable - 3 meters (~10ft)
- Testing Cable - 15 m (~50ft)
- Wire End Connector

LET-Elite Ordering Number: RLDS-E-L15

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