

**XGate6-lite
Intelligent Gateway
Installation & Operation Manual
V2.4.4**



Danger and warning!

This device can be installed only by professionals.

The manufacturer shall not be held responsible for any accident caused by the failure to comply with the instructions in this manual.



Risks of electric shocks, burning, or explosion

- This device can be installed and maintained only by qualified people.
- Before operating the device, isolate the voltage input and power supply and short-circuit the secondary windings of all current transformers.
- Use appropriate voltage tester to make sure the voltage has been cut-off.
- Put all mechanical parts, doors, or covers in their original positions before energizing the device.
- Always supply the device with the correct working voltage during its operation.

Failure to take these preventive measures could cause damage to equipment or injuries to people.

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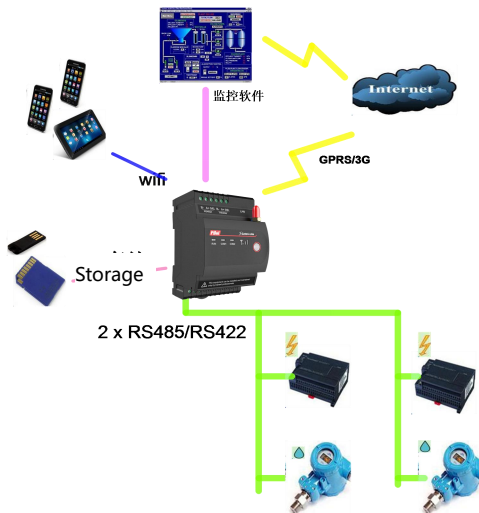
Chapter 1 Introduction

XGate6 intelligent gateway be widely used for different smart device data collection and analysis, to fulfill automated management and maintenance. To monitor each device real time running status and provide alarm notice on the problems which caused in the process of usage, greatly reducing the manpower, material and other maintenance costs.

Product Features

1. Stable and Reliable. All the interface of device use isolated protection design, equipped with wide temperature working ability, suit for working in different on-site hazard environment.
2. Easy operation. There is no special technical knowledge requirement for engineering staff, we provide configuration software to do easy operation which can fulfill data collection, analysis and storage.
3. Strong function. Provide different interface, built-in real time data base and history data base, **which can acquire, process, analyze and storage large amounts of data.**
4. Ring network topology structure, make sure the communication stability.
5. Distributed Deployment and Ethernet Network Management, adapt to any scene environment.
6. Detailed historical data recording, Sound alarm event management, provide data support on failure analysis, report generation.
7. A variety of alarm linkage makes emergencies visible.

1.1 System Structure



XGate6 intelligent gateway monitoring platform consist of 4 parts, they are Gateway module, Smart Device (intelligent power meter, smart power supply, etc.), Temperature and humidity sensor and Data Center (cloud), each part with following functions:

Module Name	Description
Gateway Module	With the function of data collection, control, upload and event alarm record function Gateway module can be divided to 1-2 logic group, the maximum smart device connected is 64 . The maximum number of access data points are: 1000
Smart Device	Intelligent power meter, smart power supply and etc. Support Modbus-RTU, modbusTCP, DLT645, IEC103, CJT188
Data Center	Provide data analysis and presentation
Cloud	Provide data analysis and presentation, and fulfill Remote Monitoring Service

1.2 Function Illustration

Item	Yes / No	Note
Modbus-RTU Protocol data collection	•	
Modbus-TCP Protocol data collection	•	
DLT645-1997 Protocol data collection	•	
DLT645-2007 Protocol data collection	•	
IEC103 Protocol data collection	•	
CJT188 Protocol data collection	•	
Modbus-TCP Protocol data transmission	•	
IEC104 Protocol data transmission	•	
SMS alarm	•	
Restful cloud data upload	•	
DGJ 08-2068-2012 energy monitoring protocol for public buildings (Shanghai) Alarm	•	
GPRS /LTE transmission	•	Model choose
Record		
Maximum storage 12 month history data	•	
Maximum storage 12 month alarm record	•	
Logging	•	

Chapter 2 Order Information

Model: XGate6-Lite-□-□ ① ②	
①: Module (Only one communication module can be selected for a meter)	
2CG	2*RS485 1*GPRS
2CL	2*RS485 1*2G/3G/4G
②: Extended Function	
P5	This model is for Xgate6-IR infrared use 5V DC output, load capacity < 0.3W 2*RS485(include IR) 1*GPRS

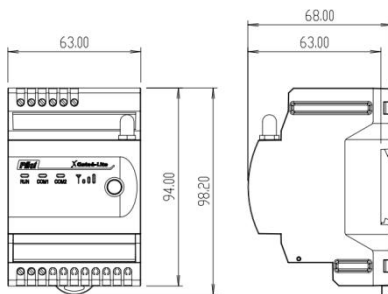
Noted: Standard configuration 1*TF (8Gb), 1*10M/100M NIC.

Chapter 3 Installation and Wiring

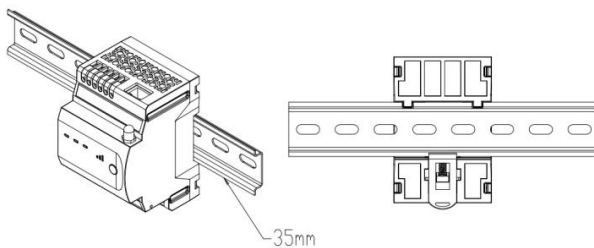
3.1 Installation

The gateway module is mounted by rail type and is fixed on the rail by two fixed blocks. The dimensions of the mounting rails must be strictly in accordance with the dimensions shown in the figure below to ensure proper installation of the device.

(1) Dimension



(2) Installation



3.2 Terminals

3.2.1 XGate6-lite-2CG/2CL:

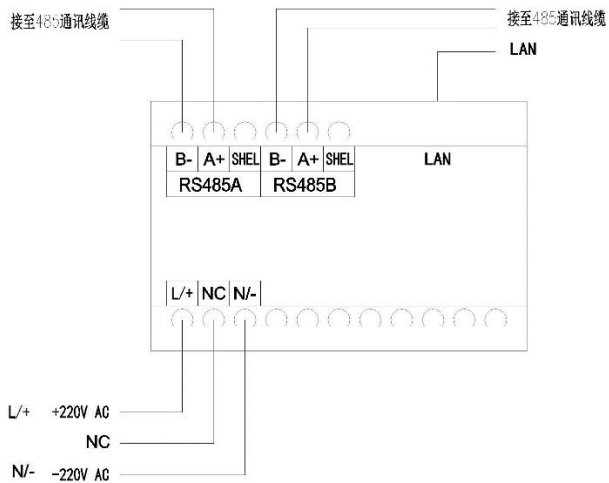
Terminal NO.	Code	Definition
1	L/+	220V Power Supply
2	NC	Null
3	N/-	220V Power Supply
4	RS485A B-	RS485A-
5	RS485A A+	RS485A+
6	RS485A SHEL	RS485A Shield
7	RS485B B-	RS485B-
8	RS485B A+	RS485B+
9	RS485B SHEL	RS485B Shield
	LAN	Ethernet port (10M/100M)
	USB(flip)	Debug TTL (not USB)
	SIM(flip)	SIM(can extend GPRS/ LTE)
	TF(built-in)	TF card (standard)

3.2.2 XGate6-lite-2CG/2CL:

Terminal NO.	Code	Definition
1	L/+	220V Power Supply
2	NC	Null
3	N/-	220V Power Supply
4	RS485A B-	RS485A-
5	RS485A A+	RS485A+

6	VCC	5V+ (for IR)
7	SENSOR B	RS485B-
8	SENSOR A	RS485B+
9	GND	5V- (for IR)
	LAN	Ethernet port (10M/100M)
	USB(flip)	Debug TTL (not USB)
	SIM(flip)	SIM(can extend GPRS/ LTE)
	TF(built-in)	TF card (standard)

3.3 Example of Wiring Diagram




Chapter 4 Display and Operation

4.1 Button

There is a button on the panel of XGate6-Lite. Long press it for more than 10 seconds to restart the XGate6-Lite.

4.2 LED Display

Symbol		Light	Definition
Run	Green	Rules:	
		Work	Every 1000ms, flash twice quickly
		Loading or upgrading	100ms On, 100ms Off
		Lack of files, cannot work, need to re-write	2000ms Off, 100ms On
COM1	Green	RS485A Receive/ Transport light	
COM2	Green	RS485B Receive/ Transport light	
	Green	SIM light:	
		No card inserted	[Lv1:lv3] 1000ms On, 1000ms Off
		Always bright	[Lv1:lv3]: 001 => Weak signal 011 => Medium intensity signal 111 => Strong signal
LAN	LINK	Green	10M: Off, 100M: Always bright

	ACT	Yellow	Flashing when the network is connected and there is data transmission (10M/100M)
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Chapter 5 Software Configuration

Please refer to *XGate6 Software Configuration Manual.doc*.

Chapter 6 Data Acquisition Function

6.1 Instruction

XGate6-lite gateway module has up to 2-way RS485 connection to intelligent devices (smart meters, smart power, etc.), acquisition of intelligent device data, and with control linkage alarm function.

6.2 Acquisition Functions

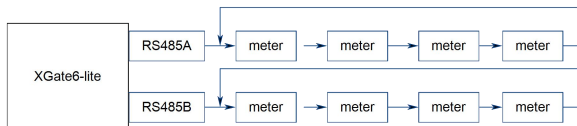
- (1) Each gateway has up to 2 RS485 ports.
- (2) Each channel RS485 can connect up to 32 intelligent devices.
- (3) The slave address of the device with the same RS485 connection must be unique.
- (4) The serial number of the same RS485 channel must be consistent.

6.3 Acquisition Process Description

The time interval of current and the next acquisition of all the device nodes by default is 0 seconds, that is, after collecting all the equipment data of a single channel, **next poll will be processed immediately**. In order to improve the acquisition rate, 2-way acquisition channel are sampling at the same time, **and no need waiting for the previous acquisition is over**.

The acquisition process is as follows:

- (1) 2 Channel data acquisition at the same time in parallel



- (2) **The default time of polling interval is 0 second, when a device fails to acquire, it will re-request 3 times (Repeat). After 3 times (Break) fails, the device will be temporarily removed from the polling line to stop polling. The device will rejoin the**

polling line in an hour (Repoll), and other devices will be polled normally.

[Repoll interval], [Repeat times], [Break times] and [Repoll time] parameters can be configured according to the user's requirements.

Parameter	Illustration
【Repoll Inv】 = 0	Repoll interval is 0, no need wait and continue the next time repoll
【Repeat times】 = 0	If repoll fails, no request again
【Break times】 = 0	No break judge, the overtime request device in this time poll, will request again in next repoll!
【Repoll time】 = 0	Break repoll time is 0, if device break, will request again in next time repoll

6.4 Description of Logical Operation

The 194 acquisition channel of XGate6-Lite is a logical calculation channel. A virtual device can be created, and virtual logical measuring points can be added in the device. The virtual logical measuring point is mainly to process the actual measuring points that have been acquired. The processing method can be arithmetic, logical judgment, sine cosine and etc. Details please refer to *XGate6 software configuration.doc*

Chapter 7 Data Forwarding and Cloud Upload

7.1 Summary

XGate6-lite XGate6 support both data forward and cloud upload functions. The data center software can read all real-time data of the meter through modbusTCP for monitoring. The data center can also set up a web server, and XGate6-Lite will upload the configured data to the server by network.

This gateway supports multi-host modbusTCP connections. Theoretically, there is no limit to the number of connections, but in actual use, it is recommended that the maximum number of connections to less than 10. This gateway also supports the upload of the IEC104 protocol. Each IEC104 channel supports one IEC104 client connection. It is recommended that the maximum number of IEC104 connections is less than 5.

This gateway cloud currently supports Http (Restful) general upload, Shanghai public building energy monitoring protocol upload, PILOT cloud platform upload, and other customized local platform protocol uploads. For the configuration software configuration corresponding to the above method, please refer to *XGate6-Lite Configuration Software Manual.doc*.

7.2 modbusTCP Data Forwarding Function

7.2.1 modbusTCP Forwarding Configuration Table

The user configure the forwarding table according to the required measuring points. Please refer to *XGate6 Intelligent Gateway Configuration Software.doc*. After configuration, the register-based devices are shown as follow:

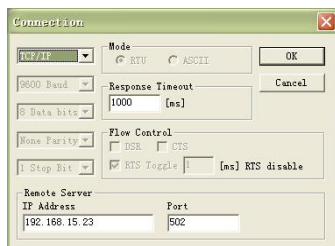
序号	点名称	描述	访问方式	系数运算	基数	系数值	功能码	寄存器地址	数据类型	数据库ID	五通类型
0	进线A相电压	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	0	浮点32位ABCD	01010000	AI
1	进线B相电压	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	2	浮点32位ABCD	01010001	AI
2	进线C相电压	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	4	浮点32位ABCD	01010002	AI
3	进线A相电流	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	6	浮点32位ABCD	01010003	AI
4	进线B相电流	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	8	浮点32位ABCD	01010004	AI
5	进线C相电流	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	10	浮点32位ABCD	01010005	AI
6	进线零线电流	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	12	浮点32位ABCD	01010006	AI
7	进线电流不平衡率	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	14	浮点32位ABCD	01010007	AI
8	进线A相最大电流	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	16	浮点32位ABCD	01010008	AI
9	进线B相最大电流	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	18	浮点32位ABCD	01010009	AI
10	进线C相最大电流	C1_D1_20IH_进线...	只读	否	0	1	读写保持寄存器03/06	20	浮点32位ABCD	0101000A	AI

7.2.2 modbusTCP Data Forwarding

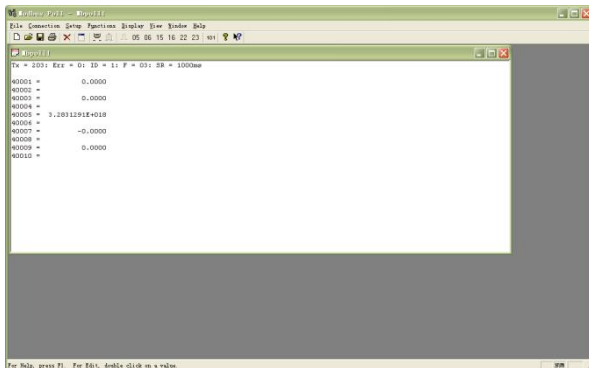
Configure the forwarding table base on Chapter 7.2.1, the user can read the real time data by the software which connect with gateway through modbus TCP.

We are using modbus Poll as example:

1. Choose TCP/IP connection mode, input IP address (here is 192.168.15.3), port number 502



2. Set up new modbus query. Click [Setup] -> [read/write definition], set the slave register starting address is 0 and reading register number is 10
3. Set the read register starting address and display format [display] -> [float inverse]



4. The real-time data of smart device can be read sequentially after above configuration. One message can read maximum 512 measuring points. When a larger number of measuring points need to get real-time data, it can read in several sections.
5. If there are several data centers need to read the data from gateway at the same time, all of them can connect to port 502 on the gateway. It is recommended that the maximum number of connections does not exceed 10.

7.3 IEC104 Data Forwarding

7.3.1 IEC104 Protocol

The full name of IEC104 Protocol is IEC60870-5-104 Protocol, which is the International Electro Technical Commission and National Electric Power Industry Standard. It is used to adapt and guide the development of electric power system dispatch automation, and regulate the technical performance of dispatching automation and remote control equipment.

7.3.2 IEC104 Forwarding Configuration Table

The IEC104 configuration needs to pay attention to the port and remote IP, as shown in the following figure:

IEC104端口号	2404
远程主IP	192.168.15.252
远程备IP	192.168.1.253
归一化遥测数据首地址(0x)	0

The default port number is 2404, which is the service port of IEC104. The IEC104 client needs to connect the IP of XGate6-Lite and this port. For the security, the remote IP restricts the client IP that can connect to the IEC104 port service. If the connected IP is not in the main and backup IP, XGate6-Lite will prohibit the connection. The main IP and the backup IP are used when the IEC104 client of the other party has a main and backup. When the main IP client is abnormal, the backup IP client can be used to connect and acquire data. One IEC104 port only allows one main and backup IP connection. When the new main IP is connected, XGate-Lite will disconnect the previous one.

As for other configuration, such as the first data address and specific measuring points, users can configure the forwarding table according to their needs.

For specific configuration, please refer to *XGate6 Intelligent Gateway Configuration Software.doc*

7.3.3 IEC104 Data Forwarding

The user can use the client software which support IEC104 Protocol to connect the gateway to acquire data, the specific types are as follows:

Data Classification	Data Type
Telemetry	Normalized Telemetry
	Standardized Telemetry
	Float Telemetry
Telesignaling	Single Telesignaling
	Two Point Telesignaling

Cumulants	Cumulants
Teleaction	Single Teleaction
	Two Point Teleaction
Tleregulation	Position Setting
	Normalized Setting
	Standardized Setting
	Floated Setting

7.4 Http (Restful) Upload Function

Http (Restful) universal upload, is a protocol customized by PILOT, which is convenient for the manufacturers with development capabilities to access the system. The protocol adapts Restful based on Http, and support json and xml. In order to save web traffic, it also support standard deflate compression. It will upload timely according to the setting of configured collection table. The specific communication protocol can refer to the document *XGate6 cloud platform interface document. Doc*, the relevant server configuration can refer to the document *XGate6 cloud demo platform documentation.doc*.

7.5 Upload Function of Shanghai Public Building Energy Monitoring Protocol

Upload of Shanghai public building energy monitoring protocol, supporting *DGJ 08-2068-2012 Public Building Energy Monitoring System Engineering Technical Specifications (Shanghai)*. The standard is mainly applied on government energy consumption platforms in Shanghai and Zhuhai, for meter data upload and classified data upload. The upload ports are generally 8500 and 9000, 8500 is the default TCP port, and 9000 is the standard Web Service port. The default Web Service address, such as <http://58.40.19.116:9000/DataTransmissionService?WSDL>, where the IP and port are filled

in according to the actual situation. Specific standards and communication protocols can refer to the document *DGJ 08-2068-2012 Public Building Energy Monitoring System Engineering Technical Specification (Shanghai) .pdf*.

7.6 Upload of PILOT Cloud Platform

PILOT Cloud Platform Upload, is the method used by PILOT cloud platform and power distribution management systems, and can be used with PILOT's cloud system (smart cloud, fire cloud, etc). Data can be showed by web and mobile apps and statistic. For specific configuration, please refer to the document *XGate6-Lite Configuration Software Manual.doc*.

Chapter 8 Record Function

8.1 Summary

To facilitate the user to analyze various parameters and errors in the monitoring system, XGate6-Lite provides 12-month history and alarm records, and at most 10,000 log records.

The record is saved in TF card of gateway XGate6-lite. Please check whether the TF card is inserted before using.

The record can save 12-month data, and the earliest month's data will be automatically deleted if the data exceeds 12 months.

8.2 History and Event Logging

XGate6-Lite has the function of recording time storage records of all measuring points configured by the user. There are 2 ways to store:

A: Store by time. Such as: hh:mm:ss

B: Store by time interval. Such as: save each xx minutes

XGate6-lite records alarm records of all measuring point configured by the user. Alarm event recording will be triggered by setting limits (Upper and lower limit).

8.3 Cloud log

The cloud log can be viewed the current cloud upload protocol type, you can view data upload status with a certain period of time and cloud upload log, to facilitate the engineering staff to debug and on-site maintenance. For the viewing method, please refer to the network management debugging function of *XGate-Lite Configuration Software Manual.doc*.

Chapter 9 Alarm System

9.1 Summary

XGate6 with customized alarm system, can monitor all smart device parameters and set the linkage, support all the measuring point over limit alarm (Upper Limit alarm and lower limit alarm).

Notice: Alarm parameter setting please reference *XGate6 configuration software manual.doc*

9.2 Alarm Analysis

9.2.1 Alarm judge type

There are two types: Upper Limit and Lower Limit, the value can be free setting.

9.2.2 Alarm object type

Analogue setting system can monitor all electrical parameter, as following listed normal parameters:

Over Limit Type	Parameter Type
Upper Limit	Voltage
	Current
	Active Power
	Reactive Power
	Frequency
	Power Factor
	Other parameters
Lower Limit	Voltage
	Current

	Active Power
	Reactive Power
	Frequency
	Power Factor
	Other parameters

9.2.3 Alarm action condition

After define monitoring parameters, need to set the trigger condition.

For example: define A phase voltage's upper limit action

Set the item number, set event type as upper limit, limit value is 265.0 V, trigger action is [Event Record]. The Hysteresis value, hold time, recovery time is 0

If the voltage over than 265.0 V, there will be one event record information

9.2.4 Alarm holding time

When the alarm object meets threshold condition, it still need to meet the time requirement before it can be activated. During the entire delay time, if the alarm object returns back to the limit value, the alarm will not be activated. The unit for action delay is second, and the value range is 0-65535. If the value is set as 0, it means that once the monitoring object exceeds the limit, the alarm will be activated immediately. Because the repoll time interval of smart device is long, it is suggested that this value be set to 0 in actual application.

9.2.5 Alarm hysteresis value

When the alarm object meets the threshold condition and generates an alarm, the real-time value of the object needs to be restored to the range specified by the hysteresis value, after that the alarm can be cancelled. This value prevents the object's real-time value from fluctuating frequently and causing repeated alarm output. The range is set according to the actual object.

For example: set the upper limit of A phase voltage alarm to 265.0 V, and hysteresis value to 245.0 V, when smart device reaches >265.0 V, the alarm will be generated, when the meter at 250.0 V, the alarm will not be cancelled. When it returns back to 265.0 V, the alarm will not generate repeatedly. The alarm will not be cancelled until the voltage back to <245.0 V.

Hysteresis value is set according to the trait of measuring point and on-site environment, if setting value is 0, it means that at the moment the real time value is not within the limit range, and [Alarm return time] is 0, [Revert] is yes, the alarm will be cancelled immediately. Because the repoll time interval of smart device is long, it is suggested that this value be set to 0 in actual application.

9.2.6 Alarm recovery time

When alarm object meets the threshold condition and return back not meet the condition, the alarm is not eliminated immediately, but to wait the alarm recovery value continue to [Alarm holding time]. This value prevents the object from suddenly failing to meet the threshold condition due to interruption, misjudging as a false alarm. Setting to 0 means that once the detected object does not meet the threshold condition, and the [hysteresis value] is 0, and [reset] is a reset, the alarm will be cleared immediately. Because the repoll time interval of smart device is long, it is suggested that this value be set to 0 in actual application.

9.2.7 Alarm trigger activation

When the alarm object generates an alarm, the corresponding action can be set to remind the maintenance personnel. Trigger action including:

Trigger Action	Illustration
Event Record	record alarm and alarm cancel
SMS alarm	SMS alarm

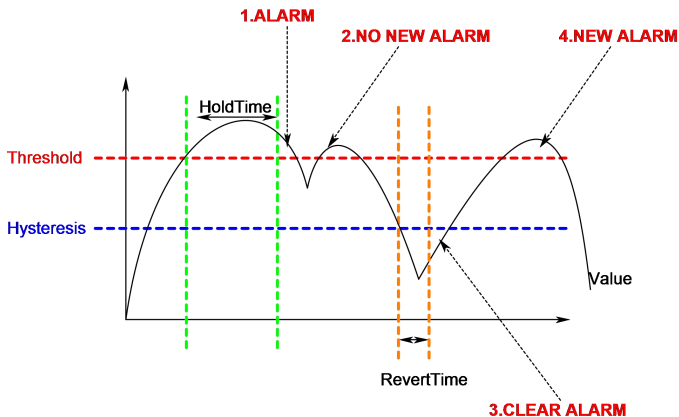
9.2.8 SMS alarm

When the SMS alarm occurs, it will be set in accordance with the SMS number, send SMS notification. SMS content configuration as follows:

报警事件	报警类型	门限值/报警间隔	报警值	事件持续时间	报警持续时间	报警动作	属性	ID	报警等级	短信报警点描述	短信报警发送地址	短信报警内容描述
CL_D1_PMACCEL...	轴上报警	15	0.000	0	0	写记录	是	0.000000	报警			
CL_D1_PMACCEL...	轴上报警	500	0.000	0	0	写记录	是	0.000000	报警			
CL_D1_PMACCEL...	轴上报警	220	0.000	0	0	写记录	是	0.000000	报警			
CL_D1_PMACCEL...	轴上报警	300	0.000	0	0	写记录	是	0.000001	报警			
CL_D1_PMACCEL...	轴上报警	20000	0.000	0	0	报警清除	是	0.000001	报警			
CL_D1_PMACCEL...	轴上报警	10000	0.000	0	0	写记录	是	0.000001	报警			
CL_D1_PMACCEL...	轴上报警	1000	0.000	0	0	写记录	是	0.000004	报警			
CL_D1_PMACCEL...	轴上报警	0.9	0.000	0	0	写记录	是	0.000001	报警	主轴数字科轴报警/主轴数字科轴报警	发生报警故障	恢复料池
CL_D1_PMACCEL...	轴上报警	12	0.000	0	0	写记录	是	0.000000	报警			

Among them, the SMS alarm point is described as the reported point, the SMS alarm is described as sending information when it occurs, and the SMS alarm reset is described as the message sent at reset.

9.2.9 Description of alarm parameters (use over the upper limit as an example)



Attention: the form uses over the upper limit as an example (below the lower limit is similar to it)

Name	illustration
Threshold	<p>Threshold value.</p> <p>Threshold upper limit value.</p>
Hysteresis	<p>Hysteresis. Turn on this feature to filter some alarms that are subject to minor fluctuations nearby Threshold.</p> <p>When the alarm is generated , real-value $V < \text{Threshold}$ and $V > \text{Hysteresis}$, When the limit is exceeded again, no alarms are generated.</p> <p>When the alarm is generated , real-value $V < \text{Threshold}$ and $V < \text{Hysteresis}$, When the limit is over again, alarms are generated.</p> <p>Set to 0, to close this function.</p>
Hold Time	<p>Over limit hold time. When the limit exceeds the Hold time milliseconds, an over limit alarm event is generated. Otherwise no alarm is generated. This function filters some false alarms caused by some instantaneous interference.</p> <p>Set to 0, to close this function.</p>
Revert Time	<p>Over limit recovery time. When the actual value $V < \text{threshold}$, and continue to $> \text{Revert Time}$ milliseconds, it is considered as alarm cancellation.</p> <p>Set to 9, to close this function.</p>

Chapter 10 Auxiliary Function

10.1 Communication

XGate6-Lite with maxim 2 x RS485 port, 2 of them independent from each other.

Please note that in the actual application, In order to prevent signal reflection, normally need to add on parallel an approximately120-ohm resistor by the end of network

XGate6-Lite with 1 port RJ45, support IEEE-802.3 Ethernet standard

10BaseT/100BaseTX

10.1.1 Communication Media

Communication use standard 22# shielded Twisted Pair, **Up to 60 smart devices can be set in the same network (the default baud rate is 9600, and the number of accesses decreases with the increase of the communication rate).** If there is no repeater, total length no more than 1200 meter long.

10.1.2 Communication Protocol

Standard MODBUS-RTU、DLT645-2007、DLT645-1997、IEC103、CJT188 communication protocol.

10.1.3 Communication Parameter

Communication Parameter including:

1. Meter address ID: It is the network identification of a meter. Each smart device has a unique ID, which can be changed by the user.
2. Baud rate: 1200, 2400, 4800, 9600, 19200, 38400, 57200, 115200.

10.1.4 Communication port against strong electrical function

The RS485 with anti-strong electrical function, that is, it will not burn out when strong electricity (220V AC) power on in a short time (within 5 minutes), the communication will recovery after the removal of strong electricity.

10.2 Clock

During the operation of the smart gateway, the accuracy of the built-in real-time clock needs to be ensured. Therefore, an NTP server is built in and the NTP time service is configured, the clock will be synchronized when the system runs to the NTP synchronization time.

Chapter 11 Technical Index

Hardware Index		
CPU	Mipsel 580MHz	
Storage	DDR 128MB	
flash	Nor flash 32MB	
Ethernet	One 10/100M Ethernet port	
Number of Acquisition Interface	XGate6-lite-2CG/2CL XGate6-lite-2CG/2CL-P5	•Two RS485 Interface
Wireless Communication Interface	XGate6-lite-2CG XGate6-lite-2CG-P5	•Four-frequency 850/900/1800/1900MHz •Standard SIM Card (15mm×25mm)
	XGate6-lite-2CL XGate6-lite-2CL-P5	•LTE FDD Band 1,3,5,8 •LTE TDD Band 34,38,39,40 •WCDMA Band 1,8 •GSM 900/1800MHZ •Standard SIM Card (15mm×25mm)
TF Interface	Standard 8G, Support 32GB Micro-SD TF.	
RS485 Baud Rate	1200bps-115200bps(optional)	
RS485 Data Transport	Half-duplex (host mode).	
Performance Index		
单串口可接 IED 数	≤32 pcs	
MTBF	>=50,000 hours	
Working Environment		
Power Supply	AC85-265V or DC80-300V	
Power Consumption	<5W	

Environmental Temperature	Operating Temperature -15°C ~ +55°C, Storage Temperature -25°C ~ +70°C.
Humidity	5-95%(non-condensing)

Measurement		
L*W*H	98.2mm*63mm*68mm	
Anti-Interference Index		
Oscillatory Wave Immunity	GB/T17626.12-1998 (IEC61000-4-12:1995)	III
Electrostatic Discharge Immunity	GB/T17626.2-2006 (IEC61000-4-2:2001)	III
Radiated Radio-frequency Electromagnetic Field Immunity	GB/T17626.3-2006 (IEC61000-4-3:1998)	IV
Electric Fast Transients Immunity	GB/T17626.4-2008 (IEC61000-4-4:1998)	III
Surge Immunity	GB/T17626.5-2008 (IEC61000-4-5:2005)	III
Radio-Frequency Conducted Immunity	GB/T17626.6-2008 (IEC61000-4-6:1998)	III
Power Frequency Magnetic Field Immunity	GB/T17626.8-2008 (IEC61000-4-6:2001)	III
Electromagnetic Emission Limit	GB/T14598.16-2002 (IEC60255-25:2000)	Accord
Power Frequency Immunity	GB/T17626.8-2008 (IEC61000-4-8:2001)	A

Chapter 12 Maintenance and Trouble

Problems	Causes	Solutions
No display after power on	Power supply failure	Check L/+ & N/- terminal and make sure with correct power supply Check the fuse of power supply whether be burned
Measuring value wrong or incompatible with target	voltage measurement wrong	Check the connection Check whether measurement voltage compatible with device rated parameter
	Current measurement wrong	Check whether measurement current compatible with device rated parameter Check Hall sensor setting
Cannot communication with devices	Wrong communication address	Check device address
	Incorrect baud rate	Check device baud rate
	The communication link is not connected to the terminating resistor	Check whether the 120 ohm resistor is added
	The communication link is disturbed	Check whether the communication shield is well grounded

	Communication line is interrupted	Check whether the communication cable is disconnected
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Notice:

- PILOT reserves the right to modify this manual without prior notice in view of continued improvement.
- PILOT reserves the right of final explanation for the above information.

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