

AF-GSM300/400
DTU 数据转换模块
DTU Data Conversion Module

安装使用说明书 V1.3
Installation Manual V1.3

安科瑞电气股份有限公司

Acrel Electric Co., Ltd.

申 明

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一、概述

I. Overview

AF-GSM 是安科瑞电气推出的新型的 4G 远程无线数据采集设备，采用嵌入式设计，内嵌 TCP/IP 协议栈，同时采用了功能强大的微处理芯片，配合内置看门狗，性能可靠稳定。

AF-GSM is a new 4G remote wireless data acquisition device launched by Acrel Electric. By adopting embedded design, it is embedded TCP/IP protocol stack, as well as powerful microprocessor chip and built-in watchdog, therefore, it has reliable and stable performance.

本产品提供标准 RS485 数据接口，可以方便的连接 RTU、PLC、工控机等设备，仅需一次性完成初始化配置，就可以完成对 MODBUS 设备的数据采集，并且与安科瑞服务器进行通讯，设备外形如图 1 所示。

In this product, the standard RS485 data interface is provided, which can be easily connected to RTU, PLC, industrial computer and other equipment. It only needs to complete the initial configuration at one time and then it can complete the data acquisition of MODBUS device, and communicates with Acrel server. The outline of the device is shown in Figure 1.



图 1 AF-GSM300/400

Figure 1 AF-GSM300/400

可应用于：

It can be applied to:

工业遥控、遥感、遥测及公共事业；

Industrial remote control, remote sensing, telemetry and public utilities;

气象数据采集；

Meteorological data collection;

三防与水文监测；

Three-proofings (water-proof, oil-proof and stain-proof) and hydrological monitoring;

金融、车载等行业。

Finance, automotive and other industries.

典型应用连接如图 2 连接示意所示，将现场的 485 设备与 AF-GSM300/400 相连接，GSM300/400 会根据自身的配置主动采集 485 设备的数据，然后与安科瑞服务器通讯。

The typical application connection is shown in Figure 1 Connection Diagram. It connects the on-site 485 device to the AF-GSM300/400, and GSM300/400 will actively collect the data of 485 device according to its own configuration, and then communicates with the Acrel server.



图 2 连接示意

Figure 2 Connection Diagram

二、功能特点

II. Functional Characteristics

1、支持串口 MODBUS RTU 协议的数据采集，并通过安科瑞平台协议与安科瑞服务器通讯。

It supports data acquisition of the serial port MODBUS RTU protocol and communicates with the Acrel server through the Acrel platform protocol.

2、支持最多 30 个 MODBUS RTU 设备的数据采集。

It supports for data acquisition of up to 30 MODBUS RTU devices.

3、支持对每个 MODBUS 设备 5 个寄存器地址域的采集，每个寄存器地址范围不超过 64 个。

It supports the acquisition of 5 register address fields for each MODBUS device, with each register address range not exceeding 64.

4、支持对每个 MODBUS 地址范围预设报警地址以及报警值触发报警。每个地址域报警地址目前最多 14 个。

It supports triggering alarms by presetting alarm addresses and alarm values for each MODBUS address range. There are currently up to 14 alarm addresses for each address field.

5、支持服务器 MODBUS 或者 LORA 透传通讯。

It supports server MODBUS or LORA unvarnished transmission communication.

6、支持固定 IP 和动态域名解析方式连接数据中心。

It supports to connect the data center by fixed IP and dynamic domain name resolution.

三、技术参数

III. Technical Parameters

参数名称 Parameter name	AF-GSM300-4G	AF-GSM400-4G	AF-GSM400-NB AF-GSM400-2G
工作频段 Working frequency band	LTE-FDD B1 B3 B5 B8 LTE-TDD B34 B38 B39 B40 B41 CDMA B1 B5 B8 GSM 900/1800M LORA 470~510MHz	LTE-FDD B1 B3 B5 B8 LTE-TDD B34 B38 B39 B40 B41 CDMA B1 B5 B8 GSM 900/1800M	LTE-FDD B1 B2 B3 B4 B5 B7 B8 B12 B13 B18 B19 B20 B25 B26 B28 LTE-TDD B38 B39 B40 B41 UMTS B1 B2 B4 B5 B6 B8 B19 GSM B2 B3 B5 B8 LORA 860~935MHz (国外 4G 传输速率与国内不同) (The transmission rate of 4G in foreign countries is different from that in china)
传输速率 Transmission rate	LTE-FDD 下行速率最大 150Mbps 上行速率最大 50Mbps LTE-FDD maximum download rate is 150Mbps, maximum upload rate is 50Mbps LTE-TDD 下行速率最大 130Mbps 上行速率最大 35Mbps LTE-TDD maximum download rate is 130Mbps, maximum upload rate is 35Mbps CDMA 下行速率最大 3.1Mbps 上行速率最大 1.8Mbps CDMA maximum download rate is 3.1Mbps, maximum upload rate is 1.8Mbps GSM 下行速率最大 107Kbps 上行速率最大 85.6Kbps GSM maximum download rate is 107Kbps, maximum upload rate is 85.6Kbps		
下行 Download	LORA 通讯 LORA communication	RS485 通讯 RS485 communication	RS485 通讯 RS485 communication
上行 Upload	4G 通讯 4G communication	4G 通讯 4G communication	4G 通讯 4G communication
SIM 卡电压 SIM card voltage	3V, 1.8V		
天线接口 Antenna interface	50Ω/SMA (母头) 50Ω/SMA (female)		
串口类型 Serial port type	RS-485		
波特率 Baud rate	115200bps		
工作电压	DC12V		

Operating voltage	
工作电流 Operating current	350~400mA@12V (拨号时为 400mA) 350 ~ 400mA @ 12V (400mA when dialing)
工作温度 Operating temperature	-40°C~85°C
储存温度 Storage temperature	-40°C~90°C
湿度范围 Humidity range	0~95% 非冷凝 0 ~ 95% non-condensing
安装方式 Installation method	底板安装, 35mm 标准导轨安装 (导轨安装下单时请注明) Base plate installation, 35mm standard rail mounting (please specify when installing the guide rail)
产品尺寸 Product size	9.6cm×6.7cm×2.4cm

参数名称 Parameter name	AF-GSM300-CE	AF-GSM400-CE	AF-GSM400-NB	AF-GSM400-2G
工作频段 Working frequency band	LORA:470~510MHz	/	H-FDD B1 B3 B8 B5 B20	GSM 850 EGSM 900 DCS 1800 PCS 1900
传输速率 Transmission rate	以太网 支持 10M-100M 的传输速率 Ethernet support 10M-100M transmission rate		下行速率最大 25.2Kbps 上行速率最大 15.62Kbps maximum download rate is 25.2Kbps, maximum upload rate is 15.62Kbps	GPRS 下行速率最大 85.6kbps 上行速率最大 85.6kbps GPRS maximum download rate is 85.6Kbps, maximum upload rate is 85.6Kbps
下行 Download	LORA 通讯 LORA communication	RS485 通讯 RS485 communication	RS485 通讯 RS485 communication	RS485 通讯 RS485 communication
上行 Upload	以太网 Ethernet	以太网 Ethernet	NB-IOT 通讯 NB-IOT communication	RS485 通讯 2G communication
SIM 卡电压	3V, 1.8V			

SIM card voltage	
天线接口 Antenna interface	50 Ω /SMA (母头) 50 Ω /SMA (female)
串口类型 Serial port type	RS-485
波特率 Baud rate	115200bps
工作电压 Operating voltage	DC12V
工作电流 Operating current	350~400mA@12V (拨号时为 400mA) 350 ~ 400mA @ 12V (400mA when dialing)
工作温度 Operating temperature	-40℃~85℃
储存温度 Storage temperature	-40℃~90℃
湿度范围 Humidity range	0~95% 非冷凝 0 ~ 95% non-condensing
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产品尺寸 Product size	9.6cm×6.7cm×2.4cm

四、硬件说明

IV. Hardware Description

AF-GSM300/400 DTU 的正视图如图 1 所示。

The front view of the AF-GSM300/400 DTU is shown in Figure 1.

安装说明：

Installation instructions:

天线安装，本设备的天线接口采用 50 Ω /SMA (母头)，外接天线必须使用适合 4G 工作波段额天线，如

果采用其他不匹配的天线，可能会影响甚至损坏 DTU。

For antenna installation, the antenna interface of this device adopts 50Ω/SMA (female). The external antenna must use the antenna suitable for 4G working frequency band. If other mismatched antennas are used, it may affect or even damage the DTU.

SIM 卡安装，安装 SIM 卡时应确保设备未上电，本设备采用的是抽屉式的 SIM 卡座，打开时，需要将黄色按钮向里推，然后抽出卡套，安装好 SIM 卡后，将卡套推入。

For SIM card installation, when installing the SIM card, make sure that the device is not powered. This device uses a drawer type SIM card holder. When opening, it needs to push the yellow button inward, then pull out the card holder. After installing the SIM card, push the card sleeve in.

面板灯：

Panel light:

1、状态：两秒闪烁正在初始化无线模块；一秒闪烁正在连接服务器；常亮已经连接服务器。

Status: two seconds of flashing indicates it is initializing the wireless module; One second of flashing indicates it is connecting the server; Normally on indicates it has been connected to the server.

2、信号：1 秒闪烁信号值小于 50%；0.5 秒闪烁信号值大于 50%；常亮信号值大于 80%。

Signal: 1 second of flashing signal indicates the value is less than 50%; 0.5 second of flashing signal indicates the value is greater than 50%; Normally on signal indicates the value is greater than 80%.

3、通讯：与下行设备有一包数据交互闪烁一次。

Communication: it flashes once when there is a pack of data interacting with the download device.

4、网络：网络数据传输闪烁。

Network: it flashes when there is network data transmission.

AF-GSM300/400 一侧接口如图 3 接口所示：

The interface on one side of AF-GSM300/400 is shown in Figure 3:

1、电源输入，端子方式：DC9~30V。

Power input, terminal mode: DC9 ~ 30V.

2、RS485 信号输入。

RS485 signal input.



图 3 AF-GSM300/400 接口
Figure 3 AF-GSM300/400 Interface

五、用户配置

V. Use Configuration

使用上位机进行配置：

The host computer is used for configuration:

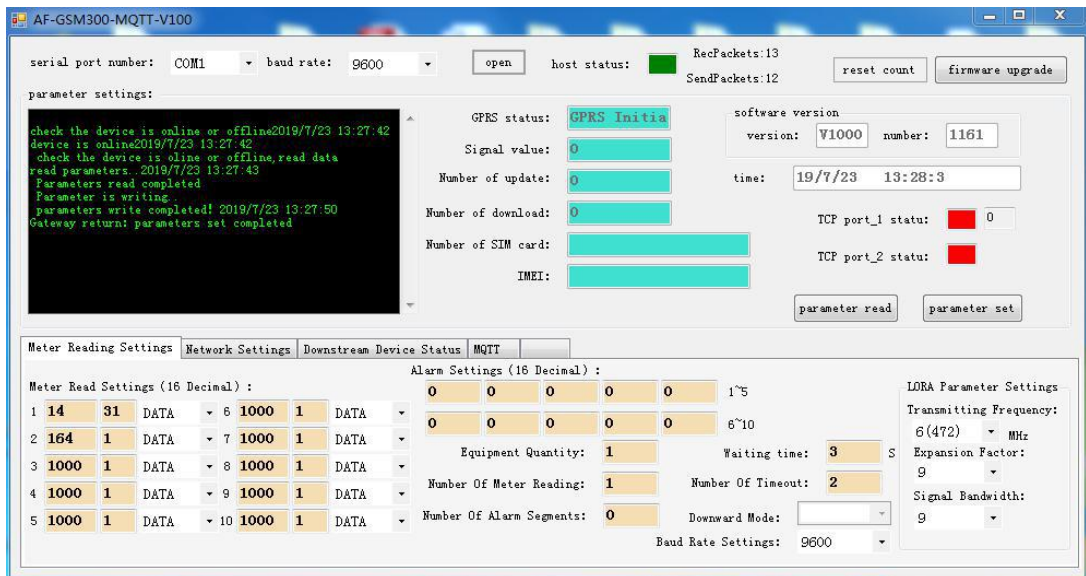


图 4
Figure 4

如图 4 所示，设备成功连接上位机后（主机状态框变绿），可以读取到相关的状态值和参数值，也可以根据需求配置相关参数。写入正确的参数后，点击“参数设置”，将参数写入设备并保存。

As shown in Figure 4, after the device is successfully connected to the host computer (the host status box turns green), the relevant status values and parameter values can be read, or configure relevant parameters according to the needs. After writing the correct parameters, click on "Parameter Settings" to write and save the parameters to the device.

六、使用方法 VI. Methods of Use

设置好参数后，确认下行设备运行正常且网关可以与其正常通讯。等待与服务器建立连接，并且将设备号发送给服务器用于区分设备。同时设备会根据设定好的查询地址范围以及查询寄存器地址域，对下行设备进行轮询来查询在线的下行设备，并将轮询到的数据发送给服务器进行上报。

After setting the parameters, confirm that the download device in running normally and can be normally communicated with the gateway. Wait for establishing a connection with the server, and send the device number to the server to distinguish the device. In addition, the device will poll the download device to query the on-line download device according to the set query address range and query register address field, and report the rolled date to the server.

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