Case Introduction (SF6 Sensor)

1. Function Implementation

Collect data from a relatively complex RS485 interface SF6 sensor (Sulfur Hexafluoride), and report to the 61850 master station.

> This SF6 sensor device contains two types of data points: telemetry type (integer or floating point) and telesignaling type (status bit 0/1), so we need two device models: YC_RM telemetry and YX_RS telesignaling. However, this device has a special characteristic where its status bit information is also stored in holding registers (16-bit length), occupying specific bits. For details, please refer to the Modbus data point table below.

2. Device RS485 Communication Parameters

SF6 Sensor Device No.1: 9600 baud, no parity, 1 stop bit

3. Device Modbus Data Point Table

The following data points use Modbus 03 Read Holding Registers function code

Data Point Address	Name	Modbus Data Type	Additional Notes	61850 Data Type
0000H	Probe 1 Oxygen Value	U_AB (16-bit unsigned integer)	Integer divided by 10, unit: 0.1PPM	YC_RM Telemetry-Float
0001H	Probe 2 Oxygen Value	U_AB (16-bit unsigned integer)	Integer divided by 10, unit: 0.1PPM	YC_RM Telemetry-Float
0002H	Probe 3 Oxygen Value	U_AB (16-bit unsigned integer)	Integer divided by 10, unit: 0.1PPM	YC_RM Telemetry-Float
0003H	Probe 4 Oxygen Value	U_AB (16-bit unsigned integer)	Integer divided by 10, unit: 0.1PPM	YC_RM Telemetry-Float
003CH	Probe 1 SF6 Status	Bool	Occupies bit 0 of 0x003C register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
003CH	Probe 2 SF6 Status	Bool	Occupies bit 1 of 0x003C register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
003CH	Probe 3 SF6 Status	Bool	Occupies bit 2 of 0x003C register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
003CH	Probe 4 SF6 Status	Bool	Occupies bit 3 of 0x003C register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
0042H	Probe 1 O2 Status	Bool	Occupies bit 0 of 0x0042 register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
0042H	Probe 2 O2 Status	Bool	Occupies bit 1 of 0x0042 register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
0042H	Probe 3 O2 Status	Bool	Occupies bit 2 of 0x0042 register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
0042H	Probe 4 O2 Status	Bool	Occupies bit 3 of 0x0042 register, 0-Normal 1-Alarm	YX_RS Telesignaling-Switch
0050H	Temperature	U_AB (16-bit unsigned integer)	Integer divided by 10, unit: 0.1℃	YC_RM Telemetry-Float
0051H	Humidity	U_AB (16-bit unsigned integer)	Integer divided by 10, unit: 0.1%	YC_RM Telemetry-Float

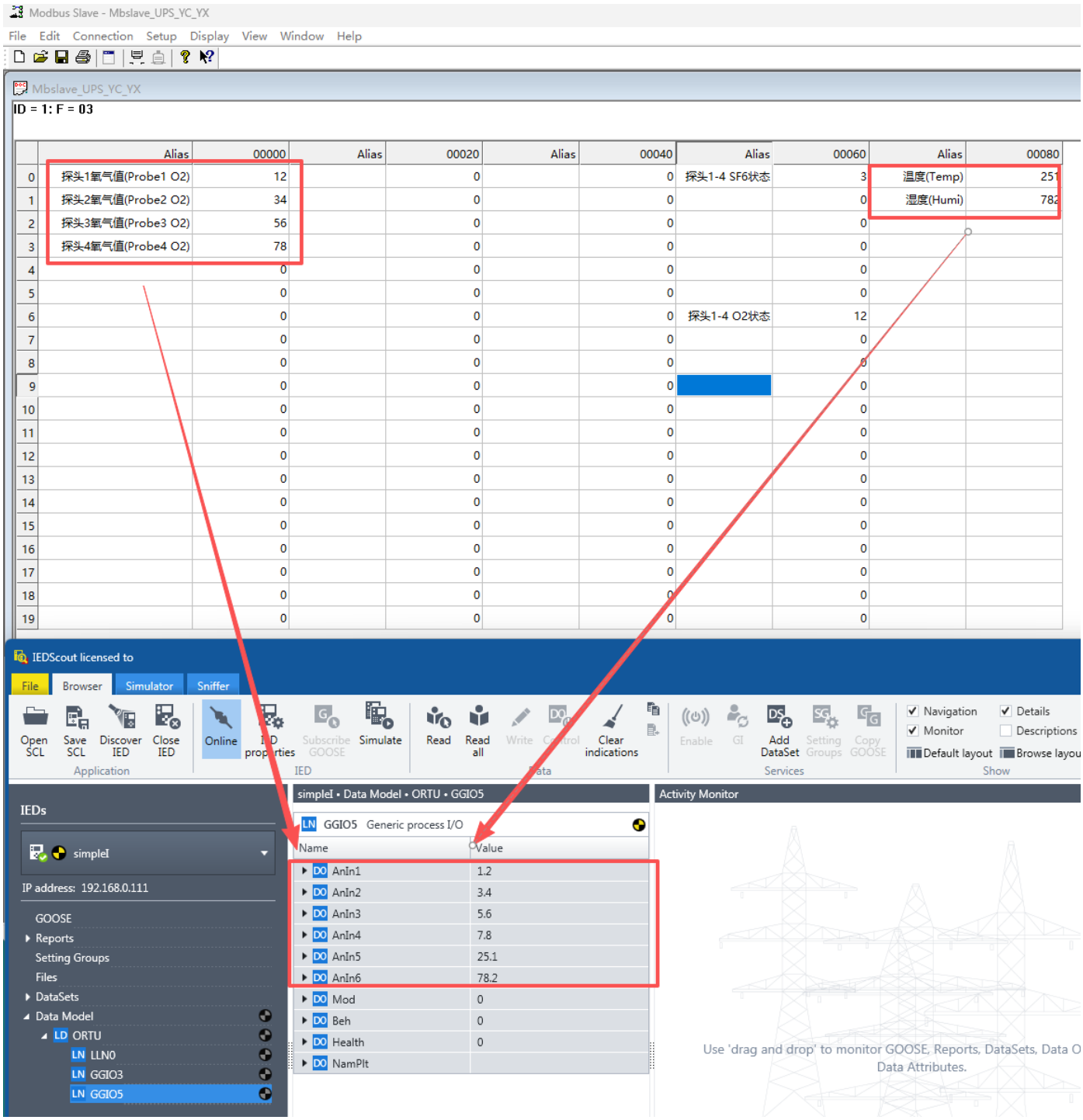
4. How to Use This Case

- Copy the init folder in this case to completely overwrite the init folder in the FLEXLUA_61850 software directory, then click Generate in Step 4 of the software to generate the required 3 files (main.lua, model.cfg, rtu.cid).
- The main.lua and model.cfg files need to be placed into the protocol converter through the USB-C port. The rtu.cid file can be provided to 61850 master station developers for device import.

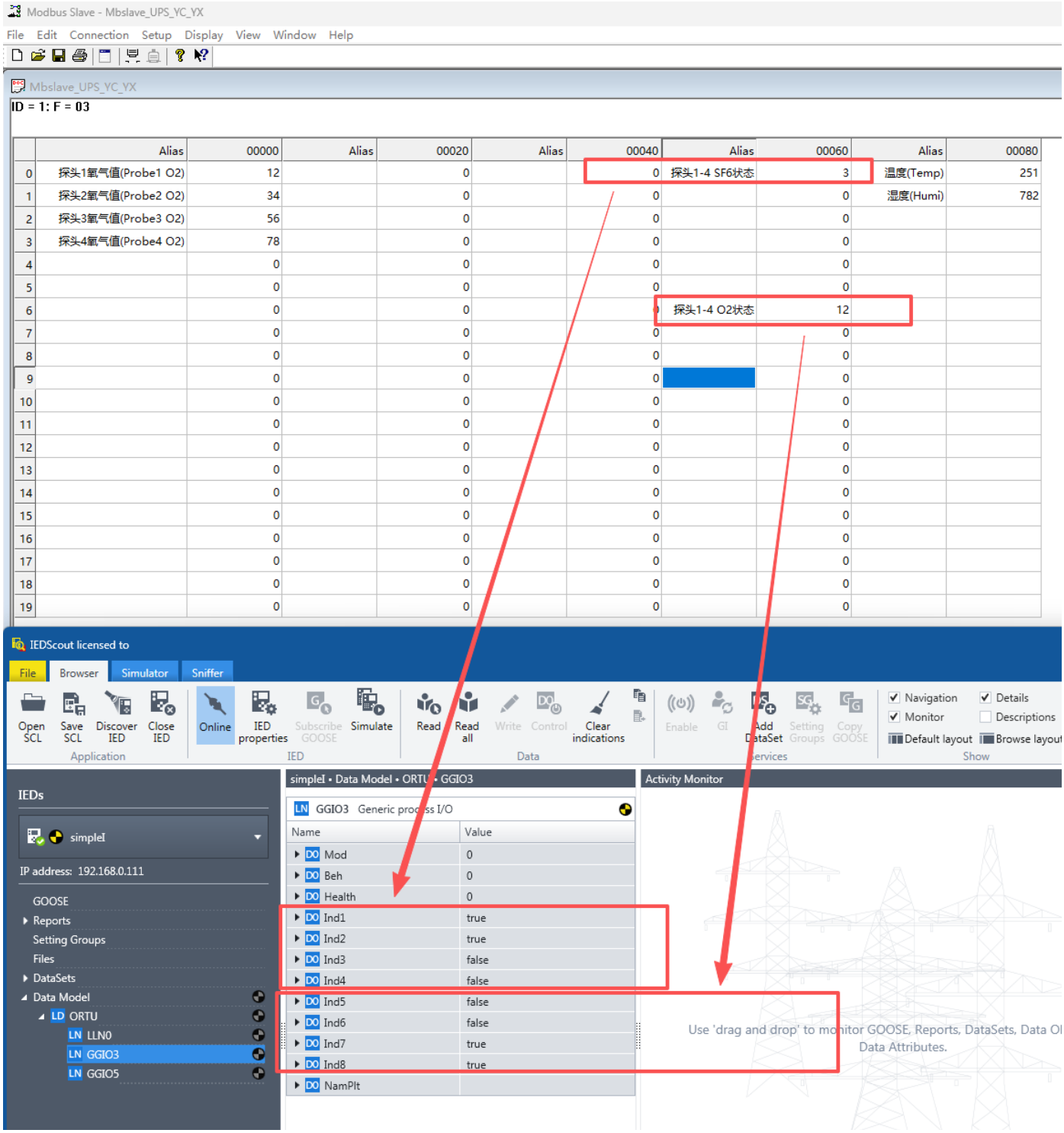
5. Testing

In the test folder of this case, there are modbus slave device simulation files. If you have modbus slave and IEDScout testing tool software installed on your computer, they can be used to simulate modbus slave devices and 61850 master station software respectively to complete testing.

Read Registers (Telemetry) Test Results



Read Coils (Telesignaling) Test Results


Modbus Slave - Mbslave_UPS_YC_YX
File Edit Connection Setup Display View Window Help
Mbslave_UPS_YC_YX
ID = 1: F = 03
Alias 00000 Alias 00020 Alias 00040 Alias 00060 Alias 00080
0 探头1氧气值(Probe1 O2) 12 0 0 探头1-4 SF6状态 3 温度(Temp) 251
1 探头2氧气值(Probe2 O2) 34 0 0 0 湿度(Humi) 782
2 探头3氧气值(Probe3 O2) 56 0 0 0
3 探头4氧气值(Probe4 O2) 78 0 0 0
4 0 0 0 0
5 0 0 0 0
6 0 0 探头1-4 O2状态 12
7 0 0 0 0
8 0 0 0 0
9 0 0 0 0
10 0 0 0 0
11 0 0 0 0
12 0 0 0 0
13 0 0 0 0
14 0 0 0 0
15 0 0 0 0
16 0 0 0 0
17 0 0 0 0
18 0 0 0 0
19 0 0 0 0
IEDScout licensed to
File Browser Simulator Sniffer
Open SCL
Save SCL
Discover IED
Close IED
Online
IED properties
Subscribe GOOSE
Simulate
Read
Read all
Write
Control
Clear indications
Enable
GI
Add DataSet
Setting Groups
Copy GOOSE
Navigation
Details
Monitor
Descriptions
Default layout
Browse layout
Application
IED
Data
Services
Show
IEDs
simpleI
IP address: 192.168.0.111
GOOSE
Reports
Setting Groups
Files
DataSets
Data Model
LD ORTU
LN LLN0
LN GGIO3
LN GGIO5
simpleI • Data Model • ORTU • GGIO3
LN GGIO3 Generic process I/O
Name Value
DO Mod 0
DO Beh 0
DO Health 0
DO Ind1 true
DO Ind2 true
DO Ind3 false
DO Ind4 false
DO Ind5 false
DO Ind6 false
DO Ind7 true
DO Ind8 true
DO NamPlt
Activity Monitor
Use 'drag and drop' to monitor GOOSE, Reports, DataSets, Data
Data Attributes.