
# SET501S series of single-channel AC transmitter

## Description

SET501S series of single-channel AC transmitter is a device that converts the AC voltage or current into a linear analog output by isolation. The mode of analog output is voltage signal (default 0 ~ 5V) or current signal (default 4 ~ 20mA).At the same time, SET501S series of AC transmitter with RS485 communication output, have the ability of long-distance data transmission. They can be widely used in electrical devices, automatic control and scheduling system of electric power, petroleum, coal, metallurgy, electrical installations of railway and other departments.

## Executive standard

GB/T 50063-2008 Code for design of electrical measuring instrument of electric installation
GB/T 13850-1998 Electrical measuring transmitter that AC power is converted to analog or digital signals
DLT 1075-2007 General technical conditions of digital protection and monitoring device

*version number : V1.1(20181012)*

## Naming Rules

| Model | SET501S | -A | 1 | -YA | -S | -II | G | -02 |
|---|---|---|---|---|---|---|---|---|

**Product Series**
SET501S=Single-channel AC transmitter

**Auxiliary power**
A=85~265VAC(47~63Hz) or 88~370VDC;
B=48VDC;C=24VDC

**Shell type**
1=MEMAX

**Measurement type and range**
Measurement type: Y=Voltage;L=Current;F=Frequency
Measuring range: A=100V;B=220V;C=380;D=100V;1=1A;2=5A

**RS485 communication**
S=Own the function of RS485, Blank= Without RS485

**The type and range of analog output**
I=AO1 is 4~20mA;II=AO1 and AO2 both are 4~20mA;U=AO1 is 0~5V;UU=AO1 and AO2 both are 0~5V;IU=AO1 is 4~20mA,AO2 is 0~5V;Blank=Without the function

**Isolation between analog outputs (Only select AO1 and AO2 both)**
G=Isolation between AO1 and AO2;Blank=Without isolation

**Accuracy class**
02=0.2 grade;05=0.5 grade

Note: When the measurement type is frequency, the actual input voltage range is 50% ~ 120% of the rated voltage. If the rated input voltage is 100VAC, the actual measurable input range will be 50VAC ~ 120VAC.

## Parameters

**Auxiliary power**：85~265VAC（47~63Hz）or 88~370VDC、24VDC、48VDC
**Power consumption**：≤5VA
**Power protection**：Anti-surge, over-voltage protection
**Overload capacity**：Voltage 1.2 times sustained, 2 times 1s, current 1.2 times sustained, 10 times 1s
**Accuracy**：0.5 grade（default）or 0.2 grade
**Response time**：≤300mS
**Load impedance**：when output is 0~5V，Load impedance≥10KΩ;when output is 4~20mA，Load impedance≤500Ω
**Insulation resistance**：Input, output and power supply circle ≥20MΩ
On shell≥ 100MΩ
**Withstand voltage**：Power and input or output≥2KVAC, Input and output≥1KVAC
**Working environment**：-40℃~+70℃，≤95%RH without condensation
**Storage environment**：-40℃~+85℃，≤95%RH without condensation
**Altitude**：≤4500m

## RS485 parameter description

| Name | Parameter | Default |
|---|---|---|
| Address | 001~247 | 001 |
| Baud rate | 1200, 2400, 4800, 9600, 19200 | 9600 |
| Check method | E81(Even parity，8-bit data bits, 1-bit stop bit)<br>O81(Odd parity，8-bit data bits, 1-bit stop bit)<br>N82（No check，8-bit data bits, 2-bit stop bit） | N82 |

Note: ①AO1 and AO2 are respectively corresponding to 1 channel analog output. For the relationship between analog output and input, for example:
If AO is analog current output, and the range is 4 ~ 20mA, then 4mA corresponds to zero input, 20mA corresponds to the full scale input. Other output range, such as the current signal is 0 ~ 12mA, 4 ~ 12mA, the voltage signal is 0 ~ 10V, the same goes for -5V ~ 5V.

②AO and RS485 are isolated from each other.

## RS485 Communication protocol

1、Communication data structure

| frame start | address field | function code | data domain | CRC check | Frame end |
|---|---|---|---|---|---|

address field ： Slave address　　data domain：Data to be transmitted

function code：03H is reading data　　CRC check ： 16 bit CRC check

2、Data domain format

Information is transmitted in an asynchronous manner，and in bytes, the communication information is transmitted between the host and the machine is the 11 bit frame format.

| Start bits | Data bits | Parity bits | Stop bits | Type |
|---|---|---|---|---|
| 1 | 8 | Odd | 1 | O81 |
| 1 | 8 | Even | 1 | E81 |
| 1 | 8 | None | 2 | N82 |

3、Information frame format

1）Read register data

Request from host：（Function is 03H）

| Address | Function code | Start address | | Register number | | CRC check | |
|---|---|---|---|---|---|---|---|
| | | High byte | lower byte | High byte | lower byte | lower byte | High byte |
| 01～F7H | 03H | 00H | 10H | 00H | 01H | | |
| 1byte | 1byte | 1byte | 1byte | 1byte | 1byte | 1byte | 1byte |

Answer from the slave computer：

| Address | Function code | Number of data bytes | Data (High byte in front) | CRC check | |
|---|---|---|---|---|---|
| 01～F7H | 03H | 02H | Register content | Lower byte | High byte |
| 1byte | 1byte | 1byte | 2byte | 1byte | 1byte |

Note: the AC transmitter only has read function. because there is one parameters, the starting address is 0010H, and the number of register is 0001H, when the address is 01, the CRC calibration value is 85CF. when the slave computer`s answer data is hexadecimal number, it is, firstly, converted to a decimal number. The different inputs correspond to different ranges.

### *RS485 communication protocol*

Input voltage ： 100V，125，220V，380V，the coefficient is 100
Input current ： 1A measuring product，the coefficient is 10000
5A measuring product，the coefficient is 1000
For example：The production is 100V. The data bit answered by the slave is 16 3D，that the decimal number is 5693. It divides the coefficient 100 is 56.93. So the value of measuring product is 56.63V.

2）Returned error communication information from the slave computer

| Device address | Function code | Error code | Check code | |
|---|---|---|---|---|
| 01～F7H | 83H/86H | 01H/02H/05H | Lower byte | High byte |
| 1byte | 1byte | 1byte | 2bytes | |

A）function code ： Host read error：83H
B）Error code meaning：01H ： Error in function code 02H ： Address or data length error 05H ： Checking data
3）CRC check way: check table method

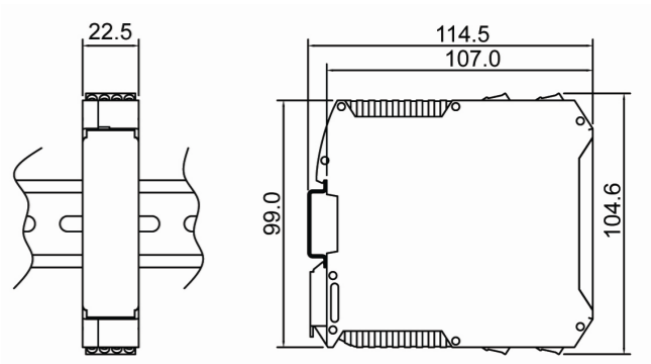
### *Terminal definition diagram*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | L | A | 58 | 4 | UA | AO1+ | 41 |
| | | B | 59 | | | AO1- | 42 |
| | | S | 60 | | | AO2+ | 43 |
| 2 | N | | | 7 | UN | AO2- | 44 |

1,2 for auxiliary power wiring
58,59 for the RS485 communication line, 60 for the RS485 ground wire
4 for the AC signal input, 7 for the AC signal input
41, 42 for the first analog signal output
43,44 for the second analog signal output

Note: RS485 is an optional item. When this function is not used, the corresponding 58, 59, and 60 positions are decorated by empty cover .

### *Installation size chart (unit: mm)*




### *Typical models and ordering instructions*

SET501S-A1-YD-S-IIG-02：
SET501S series single AC transmitter. The auxiliary power has a wide range of input (88 ~ 370VDC or 85 ~ 265VAC). The shell is MEMAX , and it supports rail installation.
The measurement type is AC voltage and the voltage rating is 0 ~ 100VAC.
The output is 1 channel RS485 and 2 channels 4 ~ 20mA, and AO1 and AO2 are isolated from each other. 0.2 accuracy.

### *Ordering instructions*

Please specify when ordering: model, RS485 parameters (address, baud rate, the way of check) and the number and so on. For example:
SET501S-A1-YD-S-IIG-02、RS485 (001~010、9600、N82)，10。