

WatchfulEye

Watchful Eye Solutions, Inc.

WTH-CS/F-E Series Lightning Counter & Monitoring



WTH-CS/F-E Lightning Counter with Surge Protection and Monitoring

Type & Ordering Code	2
Dimension	2
Fixation and installation	2
Main function	2
Concection and description	3
Knowing the device panel	3
Functions and settings of panel bottoms	3
Setting methods	3
Debugging and using	3
System architecture diagram	4
Using 485 connector to connect with computers	5
The definition of the register	6
Other application technique	6
Modbus command format	7

WTH-CS/F-E Lightning Counter with Surge Protection and Monitoring



Type: WTH-CS/F-E220 220VAC 50Hz Ordering Code: US121086
 Type: WTH-CS/F-E110 110VAC 50Hz Ordering Code: US121087

Dimension:

WxHxD: 52mmx90mmx66mm

Fixation and installation

35mm DIN rail mounted fixation method, convenient to install in distribution boxes, cabinets and panels.

Main function

1. Built-in Class III surge protection, protection level can reach $6kV(1.2/50\mu s)+3kA(8/20\mu s)$, providing fine surge protection for the terminals of computer rooms.
2. Lightning counting with 0-9999 times records, no data loss caused by power outages
3. Two modes of failure monitoring of SPDs, either normally open alarm or normally closed alarm is available
4. 485 network connection, realizing computer remote monitoring, providing free-version software for downloading
5. Standard Modbus protocol, convenient for the secondary development of system integration; with 485 address, single network can be connected to 247 devices
6. Customized Modbus command format, using device number mode for networking, the total number of devices connected by one single network can reach 65535 units
7. Coordinating with RS485-TCP/IP networking equipment makes it easy to extend to cloud service

Concection and description:

- 1-2: Power supply, WTH-CS/F-E220, apply to 220V AC power grid system
- 3-4: Remote input of "Channel 1 NO/NC", the remote connector of the first SPD set needs monitoring, connecting with the SPD's connectors of COM-NO or COM-NC.
- 5-6: Remote input of "Channel 2 NO/NC", the remote connector of the first SPD set needs monitoring, connecting with the SPD's connectors of COM-NO or COM-NC.
- 7: Grounding platoon of surge protection in computer room.
- 8: Grounding line for shielding enclosure of cabinet; if conditions permit, it can form a whole equipotential bonding by connecting the grounding line for shielding enclosure of cabinet with the grounding platoon of surge protection in computer room.
- 9-10: Induction coil of lightning counter, covering the grounding line of surge protection device.
- RS485: Connecting line +/- with the corresponding connection terminal of RS485 networking device.

Knowing the device panel

In standby mode, the displays of 4 normally on digital tube: re-power on or press self-checking key; version No. display first, and verification code display; after three alarming sound, self-checking finished; then lightning count displays.

Two indicator lights:

- 1.Green light of "Power" is on, which means normal power supply and operation.
- 2.Red light of "Alarm" is on, which means there is lightning count but the states of the surge protection device is abnormal.

Functions and settings of panel bottons:

Set: Set

Check: Self-check (show "up" function key in setting states); when an alarm is given, troubleshoot then press "Check" key to do self-check again.

Reset: Reset (show "down" function key in setting states) (Long press, initialize to factory defaults

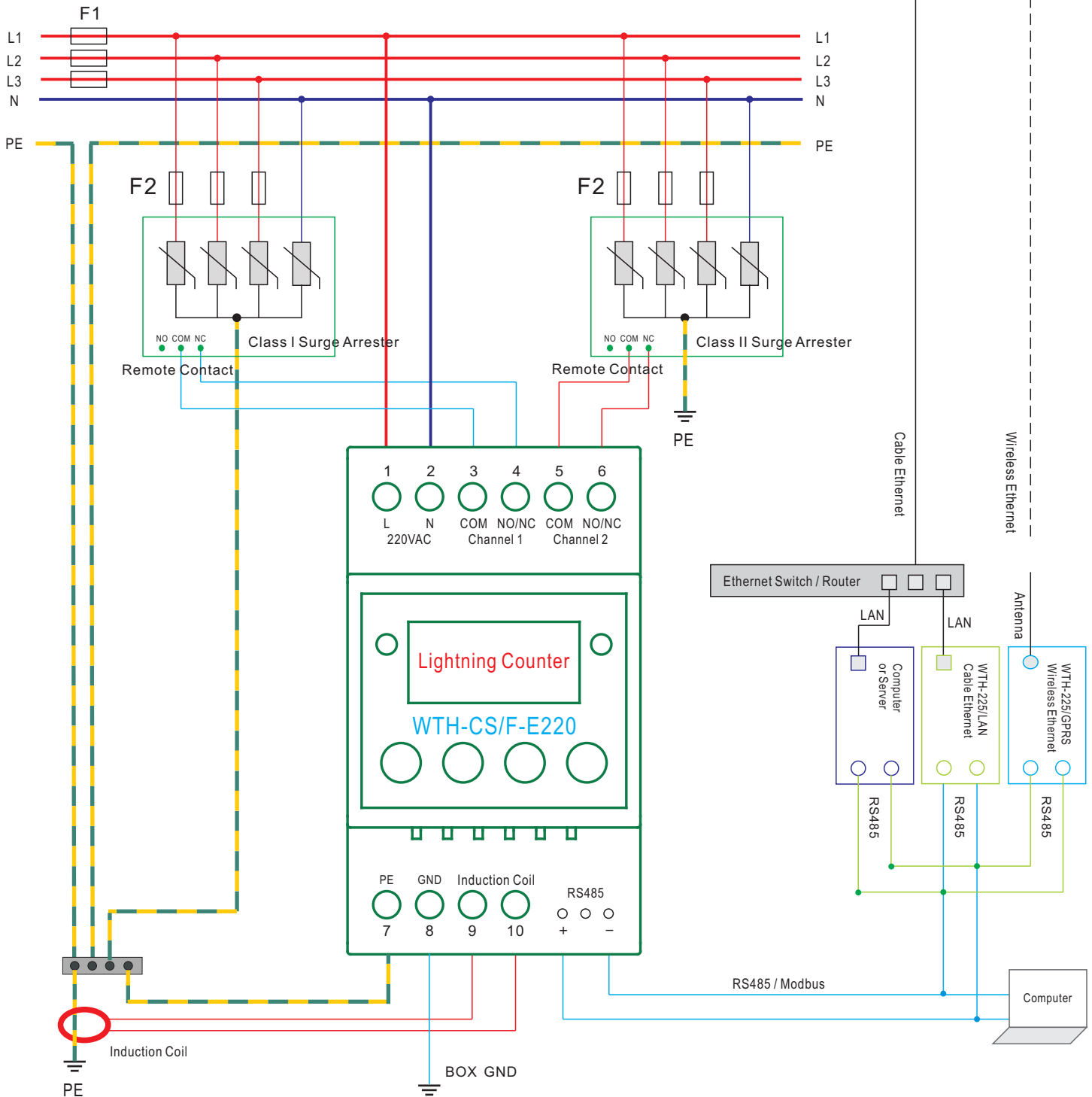
Mute: mute (show "enter" key in setting states)

Setting methods:

- 1. Press "Set" to set menu, menu code display, for example: [01]; press "up/down" to choose menu code between [01]-[07] and press "enter" to confirm the setting choice of this function code; press "up/down" again to set value and press "enter" to confirm the value then exit setting menu, or waiting for 30 second to save and return.
- 2. Function code menu:
 - [01]Channel 1 connecting method: 0=normally open contact (COM-NO), 1=normally close contact (COM-NC) (menu[01]set, default=0)
 - [02]Channel 2 connecting method: 0= normally open contact (COM-NO), 1= normally close contact (COM-NC) (menu[01]set, default=0)
 - [03]Lightning count (Long press "down" function key, lightning count is removed to be 0.)
 - [04]Alarm mode: 0=standard alarm mode, 1=enforced mode--never alarm, 2=enforced mode--open alarm.
 - [05]485 address (Long press, increasing rapidly) (Default 1)
 - [06]0=Modbus mode, 1=send initiatively (for extension of could service)
 - [07]Time interval of initiatively sending, 0s, 60s, 120s, 300s (Default 60s)

Debugging and using

- 1. Hook up power, connect the line1-2 in the single phase 220V grid system, line 1-2 is on the behind side of Class I and ClassII surge protection device.
- 2. Power the device.
- 3. Power LED normally open, LCD gradually displays the version No., device verification code, lightning count, and enters standby states.
- 4. If alarming, press "Mute" button to mute the device, then checking whether the settings of function code menu are correct (see to Article "Functions and settings of panel button")
- 5. Disconnect and connect the remote terminal at particular intervals to test the alarm function.
- 6. When alarming, "Alarm" light is on and make a sound to alarm.
- 7. Redo the line connection of remote connector to make the device connection return a normal state.
- 8. Press "Mute" to make device mute, the alarm LED is still normally on.
- 9. Press "Check" to set re-check, the alarm LED is off, which means device is normal and enter standby states. (When the alarm LED is on, must press "check" to go back to normal).



Using 485 connector to connect with computers

1. Does your computer have 485 connectors? If not, please buy USB-RS485 connecting line by your own side.
2. If using the free version software, the computer needs Windows operation system.
3. All devices should be connected with computers by 485 connectors.
4. Download software: there are free version software for downloading
5. Uncompress the downloaded software, run Monitoring.exe (Green version without any installation, document of readme.txt is a software guide)
6. Open serial ports.
7. Run and read, the data of remote monitoring device will display on the software's monitoring windows.

1. Cloud service extension (see to “cloud service” page)

A. Cable connection

1. Buy transparent transmission networking equipment for RS485 transferring RJ45, eg: WTH-225/LAN (cable connection)



2. Connecting the +/- of RS485 line with the corresponding 485 connector of WTH-225/LAN
3. Use reticle to connect RJ45 connector of WTH-225/LAN and the networking port of Broad brand router (using computer to test networking firstly)
4. Turn on power

B. Wireless connection

1. Buy transparent transmission networking equipment for RS485 transferring TCP/IP wireless GPRS, or: WTH-225/GPRS (wireless connection)
2. Go to mobile company to buy SIM card of phone (Open the GPRS function, one month subscription is suggested: 50M traffic each month, and 20 CNY each month)
3. Connecting the +/- of RS485 line with the corresponding 485 connector of WTH-225/GPRS
4. Turn on power

C. Free version computer software

1. Connect the 485 connector and windows computer.
2. Open cloud service in software interface.

D. More methods for networking

1. Microwave networking,
2. Networking by power relay
3. Satellite networking,
4. Fiber optic networking,

For more networking method, please refer to the suppliers of networking equipments.

E. Log in the cloud service (for free)

1. Log in the cloud service in computer, the website: www.spdworld.com
2. Full in email address, register your user name of cloud service
3. After log in the cloud service, input device number and verification code, related to monitoring device.
4. Any computer able to network can log in cloud service to check 5 latest data constantly.

F. VIP extension of Cloud service (For charge)

1. Set alarm threshold value
2. Set alarm message of email
3. When alarming, cloud service will send alarm message to your email address.
4. Set the longitude and latitude of the device site
5. Any computer able to network can log in cloud service to check the data of near half year; then it can be used as black box.

The definition of the register (for secondary development programmer's use)

- [0] Empty
- [1] Device ID (system fixed data, unchangeable)
- [2] 485 ID (menu [05] setting, default=1)
- [3] Empty
- [4] Lightning count (menu [03]empty, default=0)
- [5] Channel 1 input state: 0=normally close (NC), 65535(FFFF)=normally open(NO)
- [6] Channel 2 input state: 0=normally close (NC), 65535(FFFF)=normally open(NO)
- [7] Channel 1 connection method: 0=normally open contact (COM-NO), 1=normally close contact (COM-NC) (menu [01] setting, default=0)
- [8] Channel 2 connection method: 0=normally open contact (COM-NO), 1=normally close contact (COM-NC) (menu [02] setting, default=0)
- [9] Alarm mode: 0=standard alarm mode, 1=enforced mode--never alarm, 2=enforced mode--open alarm. (menu[04]setting, default=0)
- [10] Empty
- [11] Empty
- [12] Empty
- [13] Empty
- [14] 0=Modbus mode, 1= send initiatively (for extension of could service) (menu [06] setting, default=0)
- [15] Interval time of 485 data sending (menu [07] setting, default=60s)
- [16] Verification code (system fixed data, unchangeable)
- [17] Empty
- [18] Empty
- [19] Empty

Other application technique

1. The remote terminal of surge protection device is suggested to connect with the connector of COM-NC, because when there is no connection with surge protection device, the default of COM-NO connector shows that the device is normal.
2. NO and NC connector can extend to apply to the alarm device with switching value signal input, eg: door control, glass break, waterlogging alarm, temperature control, humidity control, smoke detect, etc..
3. COM-NO connector: if there is more switching value alarm devices connection, connect the devices with COM-NO connector in parallel. Then any device alarms, there will be COM-NC signal.
4. The method of sending data initiatively: use device No. address to communicate, and the maximum number of a single networking connecting devices can reaches 65535 units.
5. When the cloud service networking, it saves cost because of many devices enjoying one networking device. Several WTH-CS/F-B devices network together, and use one of them as host. When the data transmission is finished, it will initiatively sending a command request to the next device to realize the time synchronization of 485, then realize many 485 devices to enjoy one networking device. Notice: if there is any trouble in any networking device, the command request can't cycle normally.

Modbus Command Format (the secondary development of program)

Provide Modbus command format, convenient to integrate the secondary development to your own system

1. Standard modbus protocol, use 485 address for communication, the maximum number of connected devices with a single network is 247 units.
2. If you want to integrate your own system for the secondary development, please contact us to download Modbus command format at: www.watchfuleyesolutions.com

1. Read Equipment's Registers

Modbus Request		
Function Code	1 BYTE	0x03
Start Address	2 BYTE	0x0000-0x0013
Data	2 BYTE	
Modbus Response		
Function Code	1 BYTE	0x03
Byte Count	1 BYTE	N*2
Input Status	N*2 BYTE	

2. Modification of Equipment Registers

Modbus Requests		
Function Code	1 BYTE	0x06
Register Address	2 BYTE	0x0000-0x0013
Data	2 BYTE	
Modbus Response		
Function Code	1 BYTE	0x06
Register Address	2 BYTE	0x0000-0x0013
Data	2 BYTE	

Watchfuleye is specialized in a complete range of lightning and surge protective devices, with wide applications in low voltage DC & AC power supply system, data and control system, intelligent monitoring system and new energy industry like solar and wind power system, etc. Our company also offers reliable custom technical solutions in lightning & surge protection for global customers.

Headquartered in New York, watchful Eye has a network of sales to serve our customers world wide. with high quality products and optimal service, Watchful Eye can meet your strict technical standards and unique requirements.

Watchful Eye

The Guardian that Protects Your System against Surge and Lightning

 **Watchful Eye Solutions, Inc.**



www.watchfuleyesolutions.com

