

**CYG**

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AUTOMATION  
CATALOGUE**

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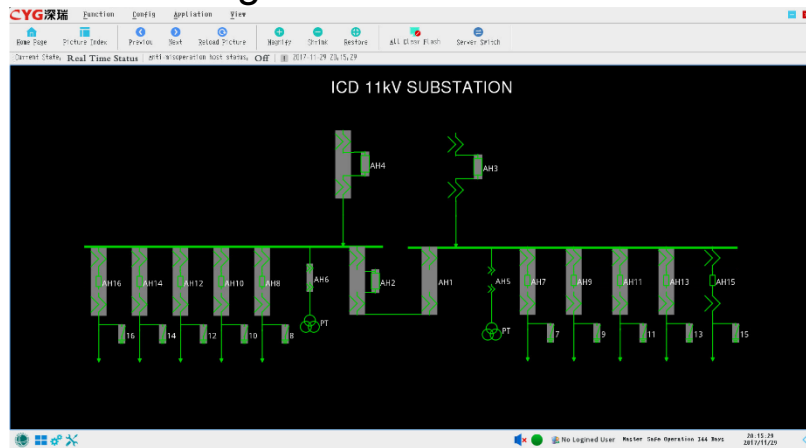


# PRRS-7000

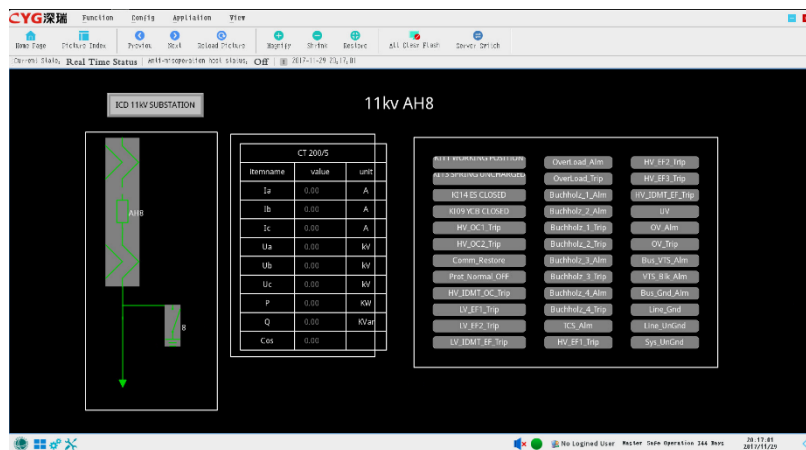


## General Application

PRRS-7000 integrated monitoring system is an integration of the advanced distributed-type network technology, object-oriented database technology and cross-platform visualization technology, which is fully complied with multiple international standards (IEC60870-5-103, IEC-61850 ED1/ED2 etc.). PRRS-7000 is fully adhere to the basic requirements for station information digitalization, communication platform networking and information sharing standardization.



❖ Main Diagram



❖ Bay Diagram

## Feature

Item	Parameter
Platform	Crossing the Unix/Linux/Windows operating system platform
Database	On-line adding, deleting and modifying various data
Module	Includes data configuration (modeling) tool, database system supporting dynamic model, communication unit configuration tool, graphic configuration, communication protocol processing module, data bus module, system function redundant control module, statistical calculation, SCADA module, etc.
Graphic	The graphic system supports some standard graphic formats (SVG, CIM/G, etc.), with good interaction
Analog	Support the protocol IEC60870-5-103, IEC61850 and GOOSE, constantly measures and calculates voltage, current, power and frequency.
Anti-maloperation	Selects measuring points from automation data and edits anti-maloperation attributes, including close/open rule, operational terms, etc.

## Technical Specifications

### System Capacity Index

No.	Item	Unit	System Capacity
1	Capacity of real-time database	Analog quantity	Sample point ≥50000
		Status value	Sample point ≥100000
		Remote control	Sample point ≥10000
		Calculated quantity	Sample point ≥2000
2	Storage capacity of historical database	Historical curve sampling interval	min 1~30 (Adjustable)
		Historical trend curve, storage duration of daily report, monthly report and annual report	year ≥2
		Number of historical trend curves	PCS. ≥300
3	Synchronous vector storage	Continuous recording time	day ≥14

## Technical Specifications

### System Response Index

No.	Item	Unit	System Capacity	
1	Event sequence record resolution (SOE)	Station layer	ms	≤2
		bay layer measuring and control unit	ms	≤1
2	Over deadband transmission time of analog quantity (to station layer)	s	≤2	
3	Status value change transmission time(to station layer)	s	≤1	
4	Response time of analog information (from I/O input terminal to remote communication device output)	s	≤3	
5	Status quantity change response time (from I/O input end to remote communication device outlet)	s	≤2	
6	Time from generating to outputting of control execution command	s	≤1	
7	Picture response	s	≤1	
8	Image refreshing period	s	≤1	
9	Scada master-slave switching time	S	≤10	

### System Reliability Index

No.	Item	Unit	System Capacity	
1	Measuring error of current, voltage	%	≤0.2	
2	Measuring error of active power and reactive power	%	≤0.5	
3	Measuring error of grid frequency	Hz	≤0.01	
4	Over deadband transmission setting value of analog quantity	%	<0.1 rated value, each point can be adjusted	
5	Availability ratio of dual-host system	%	≥99.9	
6	Response ratio of remote signal	%	100	
7	Accuracy of control operation	%	100	
8	Mean time between failures (MTBF) in station layer	h	≥30000	
9	Mean time between failures of bay level measure and control unit	h	≥30000	
10	Mean load rate of CPU in each workstation	Under normal condition (within 30min )	%	≤30
11		Power system breakdown (within 10s)	%	≤50
12	Mean load rate of network	Under normal condition (within 30min)	%	≤20
13		Power system breakdown (within 10s)	%	≤40

## Technical Specifications

No.	Item	Unit	System Capacity	
14	Time from automatic switching to functional recovery of dual host	s	≤15	
15	Accuracy of synchronous phase	Amplitude	%	≤0.2
16		Phase angle	°	≤0.2
17		Time synchronization	μs	≤1
18	Storage of synchronous phase	Continuous recording time	day	≥14

### System Load Rate Index

No.	Item	Unit	System Capacity	
1	CPU mean load rate of each workstation	Under normal condition (within 30min )	%	≤30
2		Power system breakdown (within 10s)	%	≤50
3	network average load factor	Under normal condition (within 30min )	%	≤20
4		Power system breakdown (within 10s)	%	≤40

### System Working Environment and Power Supply Index

No.	Item	Unit	System Capacity
1	AC voltage	V	176V~264V AC
2	Cycle	HZ	48Hz~52Hz
3	Ground resistance	Ω	<0.5Ω
4	Temperature	°C	≤40°C
5	Related humidity	%	5%~95%
6	Ambient environment	None	No explosion hazards, no corrosive gas, no conducting dust, no violent vibration and impulse source



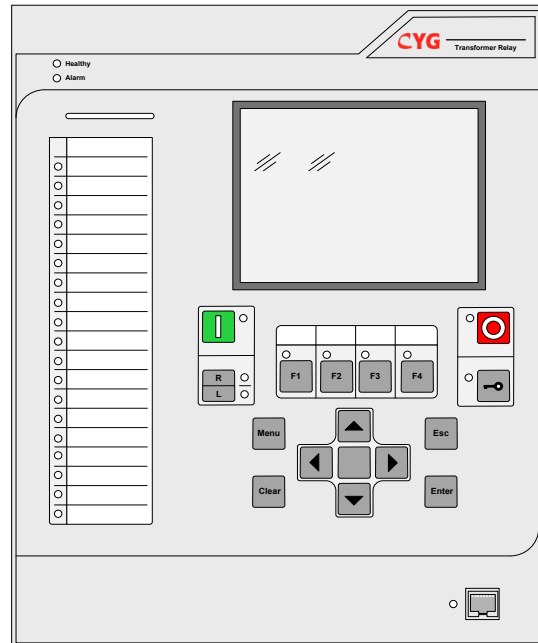
# PRRS-7741



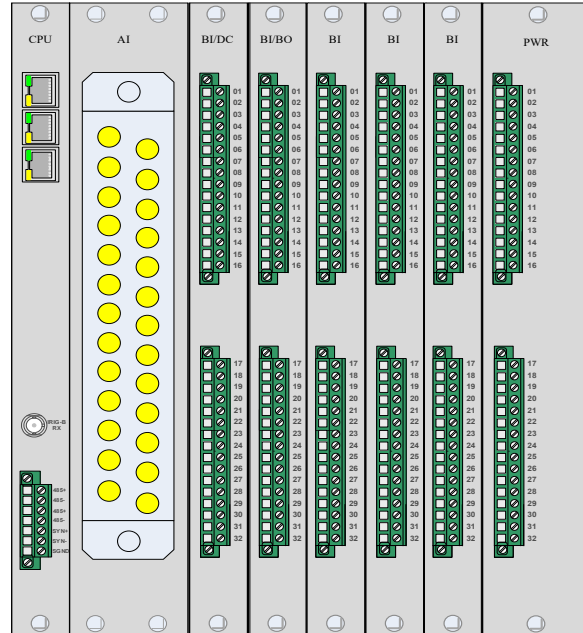
## General Application

The PRRS-7741 relay is a microprocessor based Bay Control Unit (abbreviated as BCU) which is used for bay level controlling and monitoring in power grid. It is suitable for application in Substation Automation System (abbreviated as SAS) with distributed control IEDs.

PRRS-7741 is designed for controlling and monitoring switchgears such as circuit breaker, disconnecter, and earthing switch. Additionally, it supports tap changer control for transformer and shunt reactor.



❖ Front Panel



❖ Rear Panel

## Feature

Item	Parameter
Performance	32-bit high performance dual-core processor, internal high speed bus and intelligent I/O ports
Hardware	Modularized hardware design, flexibly configurable, easy extension
Interface	The human machine interface (HMI) with a small control module (a 320×240-dot LCD, a 16-key keypad and 30 LED indicators)
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
Analog	Support the protocol IEC60044-8, IEC61850-9-2 and GOOSE, constantly measures and calculates voltage, current, power and frequency.
Recording	Fault and disturbance waves, operation reports, supervision, control operation records and time tagged sequence of event.

## Functions

Item	Parameter
Measurement	Conventional CT/VT sampling method with AC AI module in using electrical cable (24 samples per cycle) Transducer input in DC for temperature, humidity, etc.
Configurable	Programmable binary input Programmable binary input Programmable software & hardware interlocking logic output Programmable LED indicators
Supervision	Fuse Failure supervision Current circuit supervision Self-diagnostic Device power supply supervision
Even Recorder	Including 512 latest protection operation reports, 512 IO event, 512 supervision events, 128 control logs and 512 device logs
Synchronization	Supporting PPS, IRIG-B, PPM, SNTP, etc.

## Specifications

### Measurement Range and Accuracy

Metering Item	Range	Accuracy
Phase range	0° ~ 360°	≤ 0.5% or ±1°
Frequency	35.00Hz ~ 70.00Hz	≤ 0.01Hz
Current (three phase 3lp)	0.2In<I<2In 0.1 Un<U<1.5Un	±0.2%In, I≤In; ±0.2%I, I>In
Voltage (Phase 3Up, Phase-to-Phase 3Upp)	0.2In<I<4In 0.1 Un<U<1.5Un	±1%Un, U≤Un; ±1%U, U>Un
P, Q, S, power factor cos	0.2In<I<4In 0.1 Un<U<1.5Un	±1% for power (S, P and Q) ±0.02 for power factor

### Auxiliary Power Supply

Reference	IEC 60255-1, IEC 60255-26
Rated voltage	24VDC~250VDC, 48V~250VAC
Variation	80% ~ 120%
Frequency	50/60Hz, ± 5Hz
Maximum interruption time in the auxiliary DC voltage without resetting the IED	0%Un,100ms; 40%Un,200ms; 70%Un,500ms At the Un=DC220V
Gradual shut down / Start up	Class C (60s shut down ramp, 5 min power off, 60s start up ramp)
Ripple in the DC auxiliary voltage	Class A (15% of rated @200Hz, 220VDC)
Maximum load of auxiliary voltage suppl	< 10W @ Quiescent condition; < 15W @ Operating condition
Reference	IEC 60255-1, IEC 60255-26
Rated voltage	24VDC~250VDC, 48V~250VAC

### Binary input

Reference	IEC 60255-1, Clause:6.10.5
Binary input number	Up to 124
Rated voltage	24VDC~250VDC, 64VAC~250VAC
Pickup voltage	55% ~ 70% rated voltage

## Specifications

"ON" value voltage	70% ~ 120% rated voltage
"OFF" value voltage	< 55% rated voltage
Maximum permitted voltage	120% rated voltage
Resolution of binary input signal	≤ 1ms
Resolution of SOE	≤ 1ms

### Binary output

Item	Tripping output	Signal output
Binary output number	Up to 12	Up to 16
Output model	Potential-free contact	Potential-free contact
Max system voltage	380Vac, 250Vdc	380Vac, 250Vdc
Voltage across open contact	1000V RMS for 1min	1000V RMS for 1min
Continuous carry	2000VA, 240W	2000VA, 150W
Short duration current	6A for 3000ms; 15A for 500ms	6A for 3000ms; 15A for 500ms
Breaking capacity	1.00A @ 48Vdc, L/R=40ms 0.30A @ 110Vdc, L/R=40ms 0.20A @ 220Vdc, L/R=40ms	0.60A @ 48Vdc, L/R=40ms 0.10A @ 110Vdc, L/R=40ms 0.05A @ 220Vdc, L/R=40ms
Pickup time	< 8ms	< 10ms
Dropout time	< 5ms	< 8ms
Bounce time	1ms	1ms
Durability	loaded contact	10,000 operations minimum
	unloaded contact	20,000 operations minimum

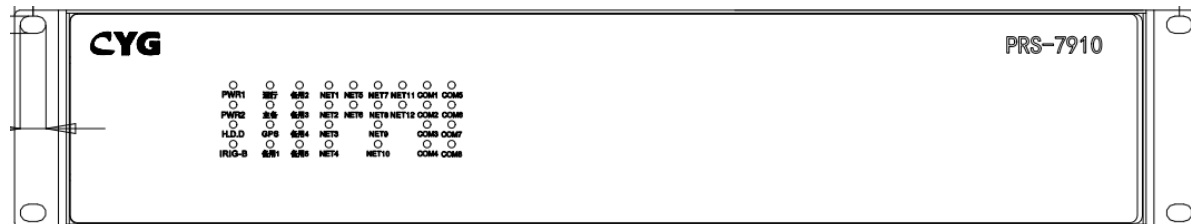


# PRRS-7910

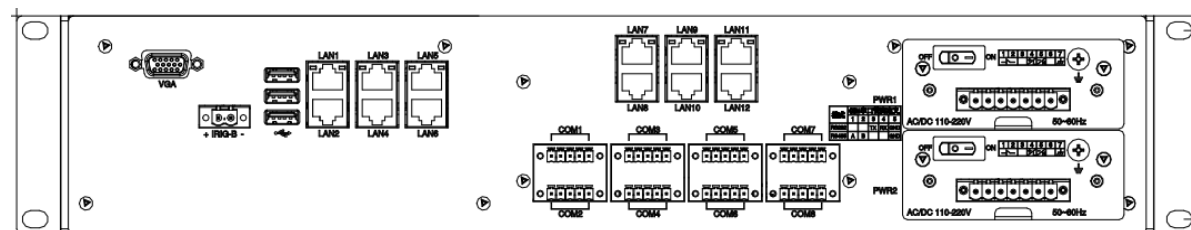


## General Application

The PRRS-7910G Station Manager is designed for the highest standards of performance, safety and reliability to meet requirements of a complex substation automation system (SAS). As a part of the SAS, it works as a station communication manager or protection management system, which collects, stores and maps signals and protection information of relays, measurement units, control units and other IEDs in the substation to transmit to the higher-level systems such as control center (CC) and distributed control system (DCS).



❖ Front Panel



❖ Rear Panel

## Feature

Item	Parameter
Performance	Capable for data management and communication of the SAS for whole substation or power plant
Hardware	Dual 1.60 GHz CPUs, 2GB RAM, optional 128 ~480 GB SLC SATA SSD storage memory for historical data
Interface	Supports up to 08 Ethernet ports and 08 serial ports
Communication	Supporting several protocols, such as IEC 61850, IEC 60870-5-101/104, IEC 60870-5-103, Modbus and DNP3.0, etc.
System scale	Up to 1024 IEDs Up to 32 control centers Database > 200,000 signals
Incident Records	Provides a complete record for auxiliary analysis of the conditions at the time of normal operation and system failure.

## Functions

Subsystem	Description
Real Time Database	For data acquisition (client) and transmission (server) Control/Regulation command from server will be stored inside.
History Database	Embedded history database Optional capacity: 128 ~480 GB SLC SATA Multiple data storage types including historical SOE records, operation reports, wave files, etc.
Server Protocol	For communication to remote control center, distribution center, etc. Response to interrogation & Transmission of control command
Client Protocol	For communication to IED within the local substation Data acquisition from IED Processing of control command
Configuration & Debugging	Configuration offline & Debugging online with the help of PRRS-7000 Configuration Software
HMI Interaction	For local manipulation, LCD display, LED indicators, to realize the supervision of running status, communication messages, parameters & settings, project configuration, etc.
Binary input & output	For acquisition of binary input and programmable output contact

## Functions

Subsystem	Description
Time synchronization	For timing signal reception, decode and transmission
Signal Synthesis	For edition and analysis of synthesized signal
Redundancy Switchover Strategy	For device redundancy mode
Advanced Functions	For further advanced customized functions

## Specifications

### Power Supply

Rated voltage	110/220VDC
Allowable deviation	-20% ~ +15%

### Communication rate

Ethernet	Transmission rate	10/100Mbps
Serial ports	Type	RS232, RS485 and RS422
	Baud rate	300 ~ 38400bps
	Validation	1 start bit, 8 data bits, no verification and 1 stop bit
CAN network interface	Baud rate	5K ~ 1Mbps(One of them: 5K, 10K, 20K, 40K, 80K, 100K, 200K, 400K, 800K and 1M)

### Related technical conditions

Operating temperature range	-10° C ~ +60° C
Permissible humidity	5% ~ 90%
Atmospheric pressure	70kPa ~ 106kPa
Transport and storage temperature range	-20° C ~ +70° C
Anti high frequency electrical interference performance	GB6162
Anti radiation electromagnetic interference performance	GB/T14598, Class III

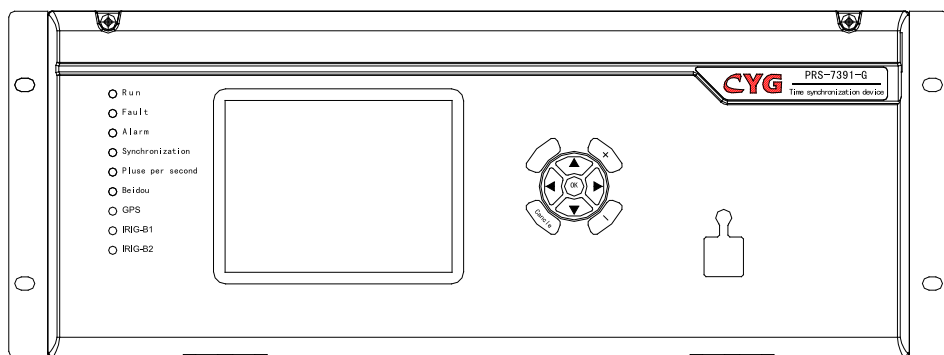
## Specifications

Anti fast transient disturbance performance	GB/T14598, Class III
Electrostatic discharge tests	IEC-255-22-2, Class III
Insulation and voltage resistance	GB7261-87
Heat and humidity resistance	GB7261-87
Vibration resistance	GB7261-87
Shock resistance	GB7261-87
Collision resistance	GB7261-87

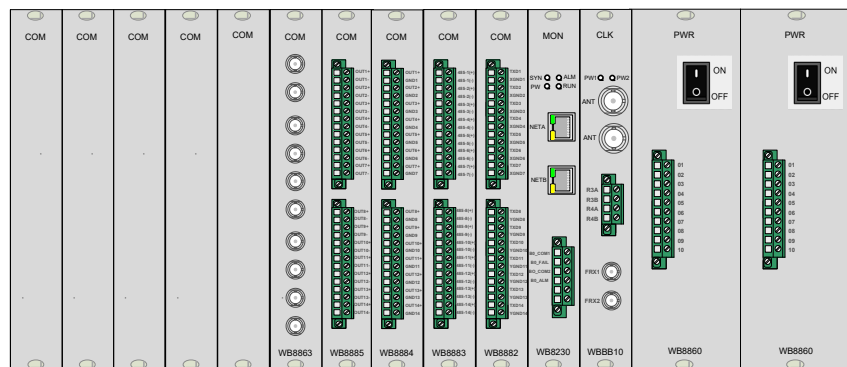


## General Application

PRS-7391 time synchronization device applies to substations and power plants with the voltage grade ranking at or above 10KV, which provides time and synchronization source for various secondary equipment in the plants and stations, such as dispatch automation system, microcomputer relay protection device, fault recorder, event sequence recording device, tele-control device (RTU), computer data exchanging network, intelligent electronic device (IED), etc.



❖ Front Panel



❖ Rear Panel

## Feature

Item	Parameter
Running supervision	This device supports local SCADA and remote control center communication in using of protocols such as IEC 61850 to realize the device running status supervision.
Time service	This device supports GPS (Global Positioning System) and BDS (BeiDou Navigation Satellite System). In addition, it supports antenna transmission time delay compensation.
Signal reception	Provides 2 reception channels for IRIG-B signal via its optical port or RS-485/422 port. In addition, it supports link-based reception time delay compensation.
Standards	IEEE 1588V2 protocol (BC mode and OC mode), SNTP/NTP protocol.
Synchronization	Supporting PPS (Pulse Per Second), PPM (Pulse Per Minute), PPH (Pulse Per Hour), IRIG-B signal, timing message (serial), SNTP/NTP timing message (network), IEEE 1588 signal, etc.
HMI	Provides 5.7" LCD and navigation keypad for the display of real time, satellite tracking status, IRIG-B inputting status, current clock source, etc.

## Specifications

### PPS/PPM/PPH

Item	RS-485/422	TTL	Contact	Optical
Rising edge (Max.)	50ns	50ns	200ns	50ns
Accuracy (Max.)	200ns	200ns	1μs	200ns
Pulse width	10~200ms	10~200ms	10~200ms	10~200ms

### PPS/PPM/PPH

Item	RS-485/422	TTL	Contact	Optical
Rising edge (Max.)	50ns	50ns	200ns	50ns
Accuracy (Max.)	200ns	200ns	1μs	200ns
Format	For IRIG-B code, 1 frame per second, 100 code elements per frame and 10ms per code element; Code element information of IRIG-B code includes: time zone information, time quality information, leap second identification information, SBS information.			

## Specifications

### Serial Port Timing Message

Baud rate	1200bps, 2400bps, 4800bps, 9600bps, 19200bps, 38400bps, 57600bps, 115200bps	
Data format	Data bits	8
	Stop bit	1
	Parity	Odd or Even
Message format	Motorola binary format	
Transmission period	1s	
Accuracy	Max.1ms	

### Network

SNTP/NTP	Max.100μs
IEEE1588	Max.1μs

### GPS Receiver

Frequency	1575.42MHz	
Sensitivity (max.)	Tracking -163dBm Acquisition -160dBm	
Satellites quantity	Max.12	
Acquisition time (max.)	TTFH-hot	30s (with current almanac, position, time and ephemeris)
	TTFH-cold	10min (no stored information)
	Reacquisition	1s
Accuracy	Max.100ns	

### Internal Clock

Inaccuracy	Max.3×10 <sup>-10</sup> (1μs/h)
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## Specifications

### BDS Receiver

Frequency	1575.42MHz	
Sensitivity (max.)	Tracking -163dBm Acquisition -160dBm	
Satellites quantity	Max.12	
Acquisition time(max.)	TTFH-hot	30s (with current almanac, position, time and ephemeris)
	TTFH-cold	10min(no stored information)
	Reacquisition	1s
Accuracy	Max.100ns	

### Optical-coupled Contact

Operating voltage	Max.220Vdc
Operating current	Max.50mA
Transmission distance	Max.300m
Safety level	Isolation to ELV level

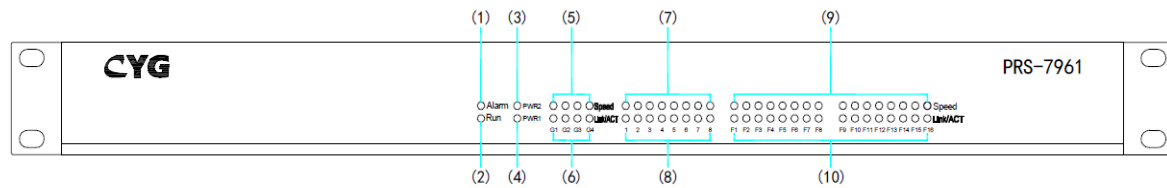


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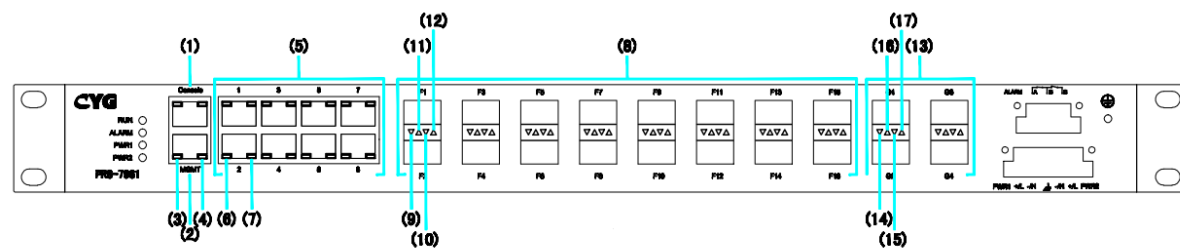


## General Application

PRS-7961 Industrial Ethernet Switch, designed for communications networking devices and installed in electric power substations and harsh industrial environment, is widely used in smart grid, new energy, industrial control, transportation, water conservancy and other fields.



❖ Front Panel



❖ Rear Panel

## Feature

Item	Parameter
Performance	reliable transmission of information in power system, Isolated redundant power inputs, Supports RSTP and SR-Ring, SNTP
Hardware	19 inch standard rack, -40° to 85° C operating temperature range, IP40, grounding screw
Interface	10/100Base-T(X) Ethernet interface, 100Base-FX SFP interface, 1000Base-X, 10/100/1000Base-T(X)SFP Interface, front panel console interface
Standards	IEC 61850-3 and IEEE 1613 (power substations) compliant, IEC 61850-90-4 switch modeling for power SCADA, SNMPv1/v2c/v3
Configuration	Simply configuration maintenance, support WEB, Console, Telnet.

## Functions

Item	Description
Ethernet Switching	Adopts standard RJ45 connector, with self-adaption function, and support MDI/MDI-X self-identification function of cable, support hot-swappable
Flow Management	Forwarding rate limit for broadcast packets can be set to suppress storm. Supports IEEE 802.1p-based packet priority control. Port mirror can monitor specified port. Packet forwarding rate limit for each port can be set
VLAN	Supports port-based VLAN. Supports IEEE 802.1Q-based VLAN. Supports VLAN TRUNK. Supports inserting, modifying or deleting the VLAN tag of the packet.
Redundancy Protocol	Supports STP(802.1D) and RSTP(802.1w) Supports CYG Fast Ring Protection Protocol SR_RING Quickly switch to the backup link when other link is interrupted
Synchronization	Supports SNTP Clock Synchronization.
Management	Supports Console, Telnet, and Web management methods. Supports SNMPv1/v2c/v3

## Specifications

### Standard and Protocol

Standard	IEEE 802.3i, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z, IEEE802.3x, IEEE 802.1p, IEEE 802.1Q, IEEE 802.1s, 802.1x
Protocol	SR-Ring, VLAN, STP/RSTP, IGMP snooping, GMRP, SSH, HTTP, HTTPS, SNMPv1/v2c/v3, RMON, QoS, Port Aggregation, Port Mirror, 802.1X, SNTP Client/Server, RTC, SSL, ACL, FTP

### Switch features

Priority queues	4
VLAN entries	512
VLAN ID	1~4094
Multicast entries	512
MAC addresses	8K
Packet buffer and control memory	4Mbit
Packet forwarding rate	9.5Mpps
Latency	<5μs

### Interface

1000M optical interfaces	1000Base-X SFP
100M optical interfaces	100Base-FX SFP
Electrical interfaces	10/100Base-T(X) self-adaptive RJ45 connector
Console	RJ45
Management port	10/100Base-T(X) self-adaptive RJ45 connector
Alarm terminal	3-core 5.08mm-spacing pluggable terminal block, 250VAC/220VDC Max, 2A Max, 60W Max

## Specifications

### Indicator lights

Indicator lights of front panel	Running indicator light :Run
	Alarm indicator light: Alarm
	Indicator light of power supply: PWR1, PWR2
	Interface indicator light: Link/ACT, Speed
Indicator lights of back panel	Interface link state indicator light (green light): Link/ACT
	Interface speed indicator light (yellow light): Speed

### Transmission distance

Twisted pair	100m(adopt Cable which satisfy CAT5 or CAT5e)
Multimode fiber	1310nm, 2km(100M)
	850nm, 550m(1000M)
Single mode fiber	1310nm, 40km/60km(100M)
	1550nm, 60km/80km(100M)
	1310nm, 10km/40km(1000M)
	1550nm, 60km/80km(1000M)

### Power

Input rated voltage range	220V AC/DC(85-264V AC/77-300V DC)
Connecting terminal	5-core 5.08mm-spacing pluggable terminal block
Rated power	<35W
Overload protection	Support
Wrong polarity protection	Support
Redundancy protection	Support

# Specifications

## Mechanical structure

Case	Cooling surface design of aluminum case, without fan
Ingress protection	IP40
Installation method	19-inch 1U rack mounting

## Environment

Working temperature	-40°C~+85°C
Storage temperature	-40°C~+85°C
Relative humidity	5~95%,without condensation

## International standard

EMI	FCC CFR47 Part 15, EN55022/CISPR22, Class A
EMS	IEC61000-4-2(Electrostatic discharge immunity test) ±8kV(contact), ±15kV(air)
	IEC61000-4-3(Radiated, radio-frequency electromagnetic field immunity test) 10V/m(80MHz~2GHz)
	IEC61000-4-4(Electrical fast transient/burst immunity test) Power Port:±4kV; Data Port:±2kV
	IEC61000-4-5(Surge immunity test) Power Port:±2kV/DM, ±4kV/CM; Data Port:±2kV
	IEC61000-4-6(Immunity to conducted disturbances, induced by radio-frequency fields) 3V(10kHz~150kHz); 10V(150kHz~80MHz)
	IEC61000-4-8(Power frequency magnetic field immunity test) 100A/m(cont.), 1000A/m(1s~3s)
	IEC61000-4-9(Impulse magnetic field immunity test) 1000A/m
	IEC61000-4-10(Damped oscillatory magnetic field immunity test) 100A/m
	IEC61000-4-12(Oscillatory waves immunity test) 2.5kV/CM, 1kV/DM
	IEC61000-4-16(Test for immunity to conducted, common mode disturbances in frequency range 0 Hz to 150 kHz) 30V(cont.), 300V(1s)
Mechanics	IEC60068-2-6(Vibration) IEC60068-2-27(Shock) IEC60068-2-32(Free fall)
Industry	IEC61000-6-2
Electricity	IEC61850-3, IEEE1613