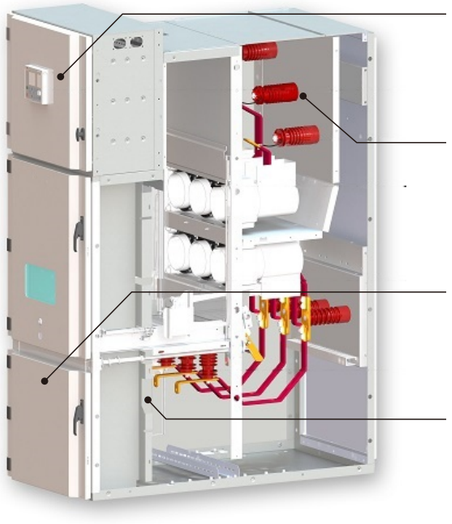
Introduction

Blue Jay focus on medium voltage switchgear and its key component, the circuit breaker safty. Have solution to provide 7*24 hours switchgear monitor device.

Multiple styles of remote sensors node can deal with different electrical contacts, cables insulation failure and set alarm threshold of risk. Panel mount HMI unit have acousto-optic alarm and DO port, user can free to build various automatic alarm / control system. Equipped RS485 port can connect existing SCADA system for remote sensering control.

It can protects your electrical assets from costly outages; while increasing safety via remotely monitoring equipment. This also increases asset integrity, and minimizes downtime.



Integrated CB control panel (CBM3000)
- CB switch status indicate
- CB switching operation
- Integrate PMD and other functions

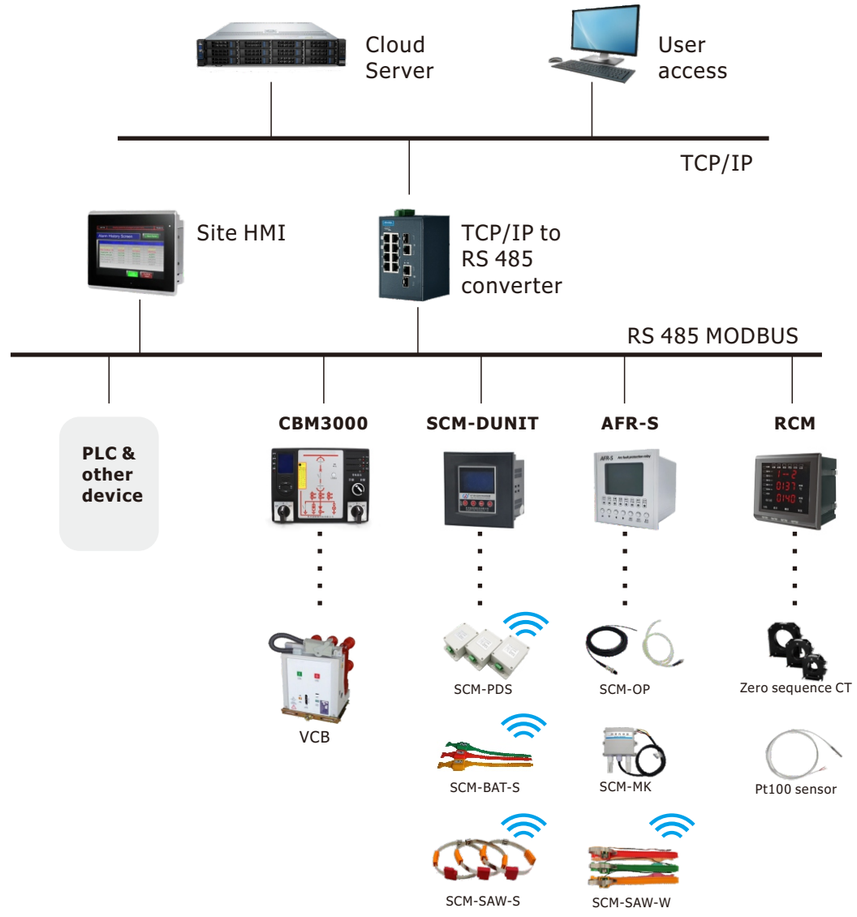
Thermal Monitoring (W3000)
- Surface touch or infrared sensor
- Cable terminations
- CB contact fingers
- Busbar joints

Partial Discharge Monitoring (PD 3000)
- TEV and ultrasonic sensor
- PD detection
- PD localization

Arc Flash Protective (AFR)
- High precision fiber probe
- Arc detection
- Arc localization
- Fault protection

Switchgear Condition Monitoring
BLUE JAY®
Technology of Electrical Automatic

Typical system overall



Optional configuration of device

Connected sensor	CBM3000	W3000	PD3000	AFR	RCM
SCM-D120	-	●	●	-	-
SCM-D96	-	○	○	-	-
SCM-BAT-S	○	●	○	○	-
SCM-SAW-S	○	○	○	○	-
SCM-SAW-S	○	○	○	○	-
SCM-PDS	-	-	●	○	-
PT100	-	-	-	-	○
Zero sequence CT	-	-	-	-	●
SCM-MK	○	-	-	●	-
SCM-OPUV	-	-	-	○	-
SCM-OPVL	-	-	-	○	-

Notes:

1. According to different application scenarios, the product has independent function series, please refer to the details page below for details.
2. Wireless sensors of some products can be used interchangeably, for example, W3000 and PD3000 can be integrated together.
3. Blue Jay can provide HMI, TCP/IP converter and cloud solutions, please contact sales team for more details.

Partial Discharge Monitor

SCM-PD3000 provide continuously monitors of partial discharge (PD) in equipment such as transformers, cables in switchgear and rotating machines etc.

It analyzes RF emissions in the HF, VHF and lower UHF ranges by sensors outside the cabinet. HMI unit provides site display of TEV amplitude, ultrasonic amplitude, DO port can drive local alarms, Multi-level alarm notice site engineer. SCM-PD3000 also can communicate data and notifications across standard RS485 modbus interface to networked supervisory systems.

Features

- Rugged, compact design sensor detect TEV and audible ultrasonic.
- Non-intrusive and wall-mounted unit design, magnetic adsorption easy installation.
- Panel mount HMI unit provide automatic PD data acquisition and analysis.
- HMI support max 96pcs sensor, optional wireless and wired(RS485) connection.
- Multiple configurable alarms, provide 2*DO NC & NO contact for external alarm trig.
- RS 485 MODBUS-RTU easy integration into existing SCADA systems.

Applications

- HV / MV switchgear
- Transformer Bushings
- Breaker Bushings
- condensing / capacitive type bushings

Technical characteristics

HMI electrical parameters	
Auxiliary Power	85-265Vac/dc 20-60Vdc Optional
Power consumption	<6W
Communication	RS-485, MODBUS-RTU
Digital output	2* NC & NO, passive node
Enviorment temperature	-10 ~ +60℃
Enviorment humidity	RH 20% ~ 95% (No condensation)
Dimensions (L × W × H)	144*144*100mm
Open install hole	138*138mm
Remote sensor common	
Power supply	12Vdc or 2000mAh build in battery*
Wireless band*	433Mhz ~2.4Ghz optional
Signal transmission distance	Up to 80m (260 feet)
Static power consumption	<10mW
Installation method	4* strong magnet, wall mount
TEV sensor	
Detect range	0~60 dBmV
HF Frequency Response	3~100MHz
Resolution / Accuracy	1dBmV / ±1dBmV
Ultrasound sensor	
Detect range	-7dBμV ~ 68dBμV
Resolution / Accuracy	1dB / ±1dB
Sensitivity	-65 dB (0 dB=1 volt/μbar rms SPL)
Sensor Center Frequency	40 kHz

Notes: wireless sensor node is optional, use LoRA
Standard sensor is 12Vdc, RS-485 Daisy chain connect to HMI unit.

SCM-PDS TEV detect sensor
- As specifications list

Switchgear Thermal Monitor

SCM-W3000 wireless temperature monitor can help medium-low voltage switchgear operators and maintenance engineers, to reduce safety risks from sudden temperature increases in switchgear components. It provide 7*24 / 365 Days switchgear monitor for critical busbar joints.

Multiple styles of remote sensors node can deal with different electrical contacts, SCM-W3000 support max 32 monitoring node for single switchgear. Panel mount HMI unit have two-level alarm acousto-optic alarm and DO port, user can free to build various automatic alarm / control system. Equipped RS485 port can connect existing SCADA system for remote sensering control.

It can protects your electrical assets from costly outages; while increasing safety via remotely monitoring equipment. This also increases asset integrity, and minimizes downtime.

Install positions

Hot spots can arise in busbars, circuit breaker contacts, cables, or anywhere where a joint or connection point exists. Critical monitoring points may include:

- Line and load side of Air Circuit Breakers (ACB)
- Bus bar joints
- Inside the lower and upper contacts of VCB connected to main bus bar and feeder bus bar circuits
- Stabs / disconnect switches
- Connections on Current Transformers (CT)
- Incoming cable / feeder joints
- Joints on the main bus bar
- Voltage Transformer (VT) electrical joints

Technical characteristics

HMI electrical parameters	
Auxiliary Power	85-265Vac/dc 20-60Vdc Optional
Power consumption	<6W
Communication	RS-485, MODBUS-RTU
Digital output	2* NC & NO, passive node
Enviorment temperature	-10 ~ +60℃
Enviorment humidity	RH 20% ~ 95% (No condensation)
Dimensions (L × W × H)	96*96*85mm or 144*144*100mm
Open install hole	91*91mm or 138*138mm
Remote sensor node	
Wireless band	433Mhz ~2.4Ghz optional
Signal transmission distance	Up to 80m (260 feet)
Static power consumption	<10mW
Temperature monitor range	-20~250C
Measurement accuracy	±2%
Body withstand temperature	70℃
Installation method	Silicone strap self binding, Metal ring band fixing

SCM-SAW-S Remote wireless node
- 0-65C, accuracy 0.5C
- Maintenance free during life cycle
- Suitable for flat surfaces or VCB contacts

SCM-SAW-W Remote wireless node
- Surface acoustic wave (SAW)
- Maintenance free during life cycle
- External wiring probe for irregular surface

SCM-BAT-S Remote wireless node
- Battery powered, 2000mAh for 2~4 years*
- Green/Yellow/Red color for three phase
- Suitable for flat surfaces or VCB contacts

*test under 2min data transmit interval

Circuit Breaker Manager

CBM3000 Series circuit breaker manager is an integrated control relay, designed for 3KV to 35KV indoor switchgear, used for replace multiple components in LV compartment, can reduce LV panel space occupation.

On it's panel it provide primary circuit simulation diagram, switch indicator, VCB status & control switch, environment control, high voltage indicator etc. Special sound prompt function can remind staff to operate the switchgear safely.

It can be used in various types of switchgear such as GZS (Centrally Installed Switchgear), Handcart Cabinet, Fixed Cabinets, Ring Main Unit, etc.

Functions

Indicative

- High voltage indicator
- VCB trip-closed indicator
- Spring storage indicator
- Grounding switch status indicator
- VCB contact position indicator

Control Switch

- Manual / Automatic spring storage select switch
- VCB trip/ closed operation switch
- Remote / Local operation switch

Other

- Compartment environment indication & control
- Three-phase power measurement (PMD) *
- Human proximity sensor*
- Voice prompts for prevent faulty operation*
- Busbar joints thermal monitor*

Notes:
Functions marked * is optional function, details please contact sales team

Technical characteristics

Basic parameters	
Auxiliary Power	85~265Vac/dc
Power consumption	15VA
Display screen	LCD with 4 button operation key
Communication	RS-485, MODBUS-RTU
Enviorment temperature	-10 ~ +60°C
Enviorment humidity	RH 20% ~ 95% (No condensation)
Altitude	<3000m
Withstand voltage	AC2000V/1min
Dielectric strength	100Mohm
Electromagnetic compatibility	Comply with IEC255-22
Dimensions	250x190x68mm (WxHxD)
Install hole open	226x165mm
Tempearture protection relay	
Temperature set range	-20C ~80C
Resolution	0.1C
Humidity set range	0% ~ 100%
Resolution	0.1%RH
Integrate power metering	
Network	1P2W, 3P3W, 3P4W
Rated voltage	AC100V, 220V, 380V depends on VT
Burden	<0.1VA (Per phase)
Rated current	AC1A, 5A depends on CT
Burden	<0.4VA (Per phase)
Accuracy level	full scale 0.5%, RMS
Frequency range	40~65Hz, accuracy: ±0.02Hz
Power	KW and Kvar, accuracy: 0.5%
Energy	Kwh 0.5S class, Kvarh 2.0 class
Other protection functions	
High voltage indicator sensitive	[Rated voltage] x 0.15~0.65
Door lock relay act voltage	>[Rated voltage] x 0.65

Notes:
1. If site have high-voltage sensor, the output short-circuit current must > 220uA±10%,
2. high-voltage sensor capacitance reference is as follows:
   6kV switchgear: 130-160pF;
   10kV switchgear: 90-140pF;
   35kV switchgear: 35-55pF.

Residual-current monitor

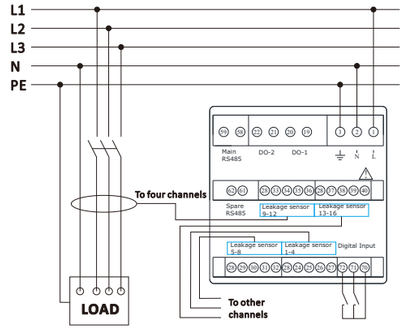
RCM series are combined monitoring device for earthed power supply systems (TN-C-S, TN-S and TT) residual current. It provide max 16 monitor channels, 96x96 size panel mounting design suit for any electrical cabinet. LED screen display various parameters, easy for site engineer diagnosis and Insulation test

It can optionally be carried out by selected current transformer or temperature sensor for each channel detect parameter and alarm or trip threshold. Multiple RCM can combination with circuit breaker for build MRCD applications, RS485 port can easy submit data to SCADA systems.

Features

- Continuous monitoring of residual currents
- Max 16 measuring channels for residual current or temperature input
- History memory with date and time stamp for 100 event data records
- Backlit graphical display (7-segment display) and indicate LEDs
- Two alarm relays, free to set alarm or trip logic
- Built-in buzzer provide sound notice when alarm trigged
- Password protection for device setting

Typical wiring



Technical characteristics

Electrical Characteristics	
Power supply	85~265Vac/dc
Consumption	<5VA
Residual current accuracy	1%
Temperature accuracy	±2°C
Data refresh rate	1sec
Binary inputs	Passive node, isolation voltage 2000VAC
Relay output	AC 250V/5A or DC 30V/5A, 2500V optocoupler isolation
Comm port	RS485 Modbus-RTU protocol, baud rate up to 19200bps
Others	
Physical dimension	96*96*75mm (L*W*H)
Protection class	IP20
Weight	0.55kg
Working enviorment	-10~55°C
Measurement category	CAT-III, polution grade 2
Insulation capacity	> AC 2kV signal - power - output
Reference standard	IEC 61000-4-2, class III IEC 61000-4-3, class III IEC 61000-4-4, class IV IEC 61000-4-5, class IV IEC 61000-4-6, class III IEC 61000-4-8, class III IEC 61000-4-11, class III

Ordering selection

RCM-16IN	16 Residual Current sensor
RCM-8IN8T	8 Residual Current sensor, 8 Temperature sensor
RCM-8IN	8 Residual Current sensor, 8 Temperature sensor
RCM-4IN4T	4 Residual Current sensor, 4 Temperature sensor

Arc Flash Protective Relay

AFR arc flash protective relay is a cost-effective solution that reduces arc-fault damage by detecting the light from an arc flash and rapidly tripping in low-voltage (LV) and medium-voltage (MV) electrical networks. three remote light sensors can be connected to one relay.

It used to limits damages to equipment, improve safety, avoid and protect personnel injuries. It's also can be used as a stand-alone arc protection relay or applied in more complex switchgear layouts.

Features

- Panel mounting design.
- 3-phase current and earth-fault current measurement.
- Informative display on LCD screen.
- Less than 10 ms operation time (including the output relay).
- Multiple passive DI point, indicate CB status.
- Multiple trip contacts, free to configuration NC / NO status.
- Programmable CB protect trip logic.
- Optional extra monitor functions by RS-485 connection, user can customized.
- Support OEM and add customized program for VCB control and protection logic.

Accessories

SCM-MK

Wireless temperature sensor

SCM-OPUV

fibre optic point sensor (UV light detection)

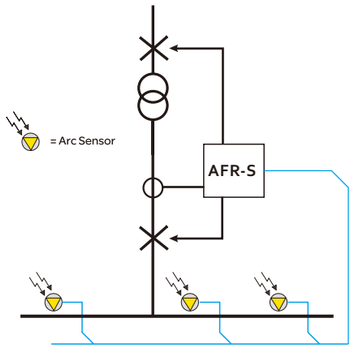
SCM-MK

Smoke sensor

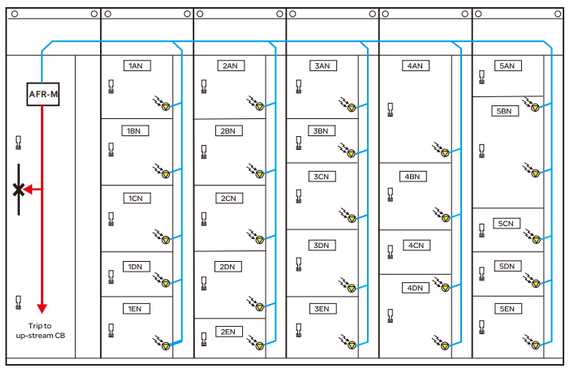
SCM-OPVL

fibre optic loop sensor (Visible light detection)

Wiring Schematic



AFR-S Single switchgear protection



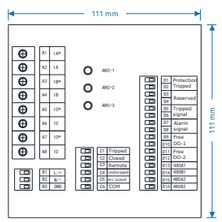
AFR-M Multiple switchgear protection

Technical characteristics

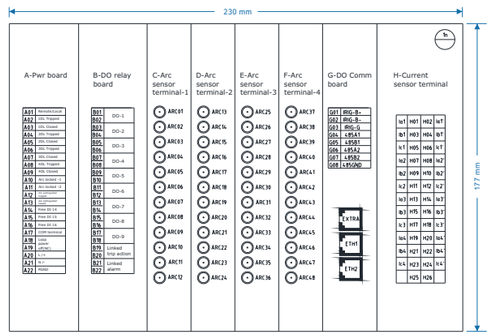
	AFR-S	AFR-M12	AFR-M24	AFR-M36	AFR-M48
Basic parameter					
Power supply	85~265Vac/dc, optional 48Vdc				
Consumption	Monitoring stanby <5W DO trigged <10W		Monitoring stanby <8W DO trigged <10W		
Rated current (In)	5A or 1A				
Protection range	0~20 In				
Burden	0.5VA				
Protect current accuracy	<2%				
Protect frequence accuracy	0.1Hz				
Arc signal & control					
Sensor type	lenspoint fiber optic sensors(1) or bare fiber optic sensors(2)				
Arc sensor access channels	3	12	24	36	48
DO relay channels	6	4	4	9	9
Trip coil contact	AC250V/8A fast relay, passive node				
Trip operation time	<10ms @ only arc protection <20ms @ overcurrent + arc protection				
Safty isolation	2500V isolation capacitry				
Binary inputs	5	12	12	16	16
Others					
Comm prot	RS485 MODBUS-RTU	1* RS485 MODBUS-RTU 1* 10/100M Adaptive Default 192.168.12.2/192.168.13.2 IEC-60870-5-103			
SOE record	512	512	512	512	512
Waveform capture	/	8	8	8	8
Optional modules	Wireless joints temperature monitor Smoke detector				

Notes: wireless sensor node is optional, use LoRA
Standard sensor is 12Vdc, RS-485 Daisy chain connect to HMI unit.

Install dimension and terminal definition



AFR-S



AFR-M