

DYX-FF

Remote Cable Line Fault Indicator

For MV Power Distribution Network

Datasheet

Version 1.0



1. Description

The DYX-FF Remote Cable Line fault indicator is used in 6~35KV Cable line distribution networks, usually installed in Ring Main Unit, Cable Distribution Box, Switch Cabinet, enable the electricity distribution network engineers to quickly identify the faulty section of network and restore power supplies to customers on healthy sections in the shortest time possible.

2. Main technical parameters

- Short circuit sensor mounted cable diameter: outside diameter $\leq\Phi$ 40mm (other specifications shall be customized)
- Earth fault sensor mounted cable diameter: outside diameter $\leq\Phi$ 120mm (other specifications shall be customized)
- Working Ambient Temperature: -40°C-75°C
- Relative Humidity: \leq 95%RH
- Working Power Supply: CT power supply when the flowing current above 10A, when the current under 10A, will be powered by the backup Lithium battery
- Remote Signal Communication Capacity: AC220V/1A
- Remote Signal Communication Reset Method: Manual reset / Auto reset
- Automatic Reset Time: 1-48H Selectable (accuracy: \pm 1%); Customer could select before production; Default Settings:12H
- Suitable for medium voltage below 35KV rating system.

3. System Composition

The system is composed of 3 pcs short circuit sensor, 1 pcs earth fault sensor, and 1 pcs data concentration, and the monitoring central station.

3.1. Cable Line Installed part include:

3.1.1 sensor : 4pcs/SET, include 3 pcs short circuit sensors and 1 pcs earth fault sensor. 3 pcs short circuit sensors respectively installed in A,B,C three phase Cable Line, 1 pcs earth fault sensor installed on the bifurcation unshielded part of three-phase cable.

3.1.2 Data Concentrator Unit: Installed inside or outside the Ring Main Unit(or Cable Distribution Box, Switch Cabinet). One data concentrator unit can receive fault signal sent by sensors through 433MHz or fiber optic and send to central station through GPRS/3G/4G LTE cellular network. The data concentrator Unit is mainly composed of industrial modem.

3.2. Monitoring central station include:

One set data server with software system. Monitoring central station usually setup in power utility office, power substation, etc. When receiving the fault message from the data concentrator unit, combined with GIS system, the maintenance crew man could quickly locate the fault site and trouble-shoot.

The software system could be SCADA or other software platform, usually power utility companies have their own software system. Four-faith also have our own-developed software system.



Note: If customers use their own software system, then should offer Four-faith the software data communication protocol format, so that the FOURFAITH data concentrator could be able to communicate with the software system.

4. Operation worked example

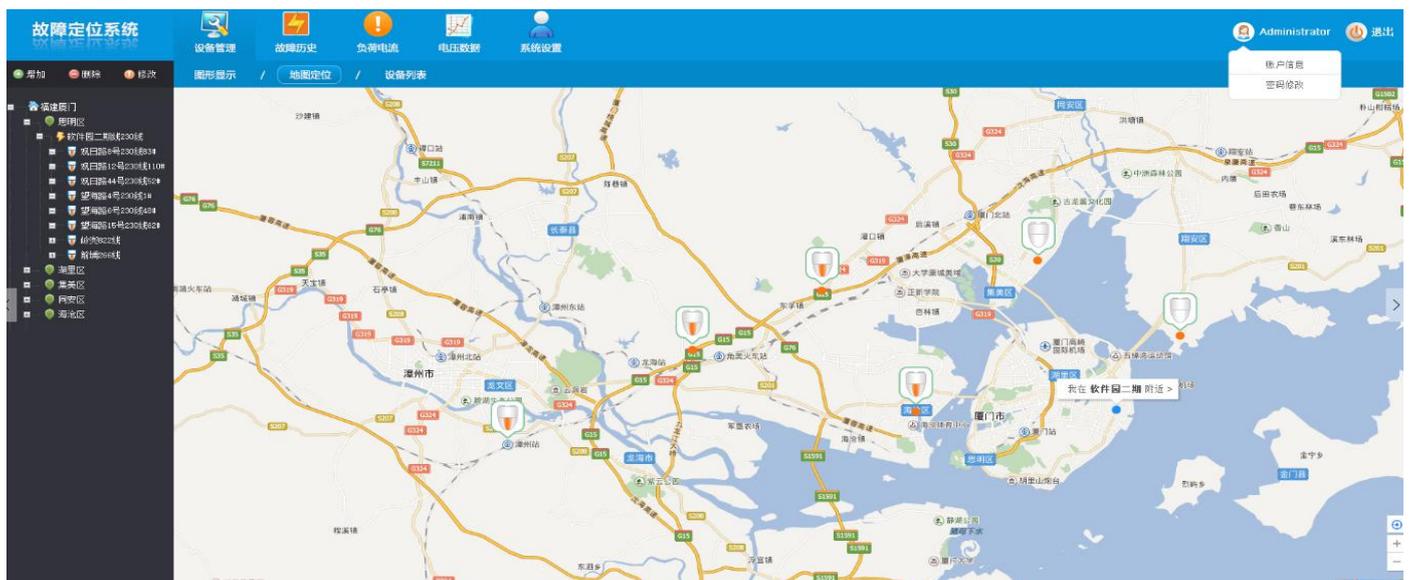
With the remote monitoring central station, the maintenance crew man could be able to accurately locate the fault section via the GIS in the software system, thus save a lot of time for troubleshooting.

4.1 Short circuit indication

On detection of flowing current value exceed the fault sensitivity threshold, the short circuit sensor will send fault signal through 433MHz or fiber optic to the data concentrator, the data concentrator will send the fault signal through GPRS/3G/4G LTE cellular network to the remote central station, the crew man then could quickly identify and locate the fault section and go for troubleshooting at the pointed site.

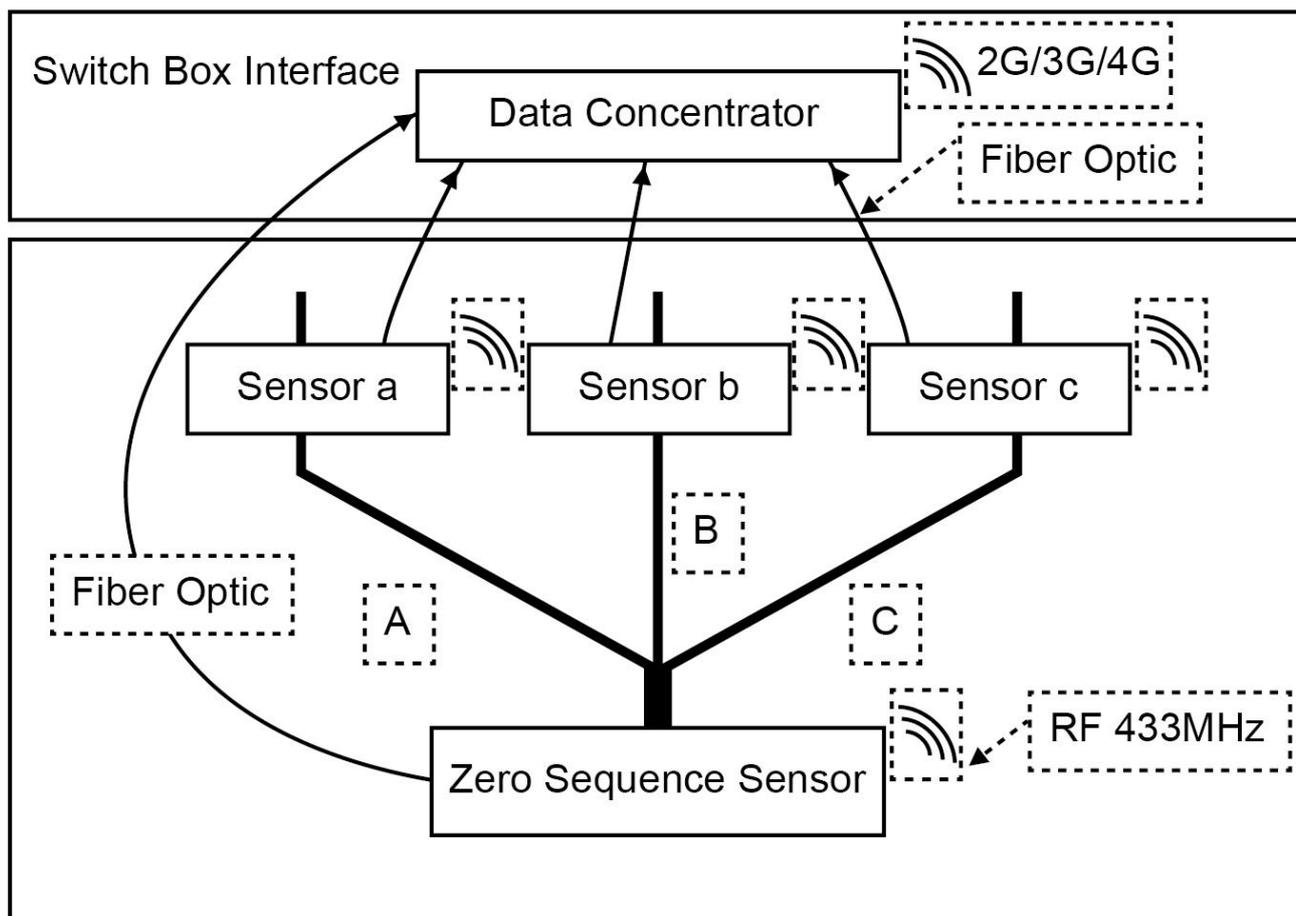
4.2 Earth fault indication

On detection of the zero sequence current value exceed fault sensitivity threshold, the earth fault sensor will send fault signal through 433MHz or fiber optic to the data concentrator, the data concentrator will send the fault signal through GPRS/3G/4G LTE cellular network to the remote central station, the crew man then could quickly identify and locate the fault section and go for troubleshooting at the pointed site.



Locate the fault section in the FOURFAITH software which embedded with Google map

5. Installation



6. Specification

6.1 General

6.1.1 DYX-FF-C (sensor)

Applicable voltage range	6~35KV (should confirm before production)
Applicable current range	0~630A (should confirm before production)
Applicable power frequency range	45~60Hz (should confirm before production)
MTBF	more than 70000H
Impulse current withstand	31.5kA for 2s
Degree of protection	IP67
Weight	less than 500g
Outline dimension	Φ75mm * 115mm

6.1.2 DYX-FF-HX (data concentrator)

Short circuit fault upload	Receiving and upload fault information and fault current
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Ground fault upload	Receiving and upload fault information and fault current
Load current	Upload load current value, Timing or out-of-limit upload
Low battery alarm	Receiving and upload Low battery alarm function
Heartbeat function	Timing upload heartbeat information
Fault indicator Status measurement	Active measurement switch status and load current
Remote management	Remote management fault indicator, such as parameters, reset etc
Local and remote maintenance	Have local and remote upgrade function
Stability mechanism	WDT design, to ensure the stability of system
Identification of fault current duration	20ms~40ms
IEC support	Support IEC60870-5-101
Shell	304 stainless steel+ RAL7305
Protection class	IP67
Outline dimension	Φ 355*293*255mm
Weight	5Kg

6.2 EMC

Electrostatic discharge	Can withstand the GB/T 17626.2 of the IV level of electrostatic discharge interference test Communication discharge: + 8KV Air discharge: + 15KV
EFT/B immunity test	Can withstand the GB/T 17626.12 of the IV class fast pulse group interference test Voltage peak value: 2KV Frequency: 5KHz & 100KHz
Radiated susceptibility	Can withstand the GB/T 17626.3 of the IV level RF electromagnetic field immunity Field strength: 30V/m
Surge immunity	Can withstand the GB/T 17626.5 of the IV level surge (impact) interference test Common mode voltage: 4KV ± 10% Differential mode voltage: 2KV ± 10%
Power frequency magnetic field immunity	Can withstand the GB/T 17626.8 of the V level power frequency magnetic field immunity interference test Magnetic field intensity: 100A/m
Damped oscillatory magnetic field immunity	Can withstand the GB/T 17626.10 of the V level damping oscillation magnetic field immunity test Damped oscillatory magnetic field intensity peak value: 100A/m

6.3 Environmental

Environment temperature	Operation temperature : $-35^{\circ}\text{C}\sim 80^{\circ}\text{C}$ ($-31\sim +176^{\circ}\text{F}$) Storage temperature : $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$ ($-40\sim +185^{\circ}\text{F}$)
Relative humidity	5~95%(No condensing)
Altitude	$\leq 4000\text{m}$