PCS-996R

Disturbance Fault Recorder

The PCS-996R disturbance & fault recorder (DFR) is a multifunctional data acquisition system designed to address the data recording requirements of substations. It captures the curves of monitored quantities and aligns the values of different supervised objects to build disturbance records. The PCS-996R helps users simplify disturbance analysis by combining the discrete records in different protective relays.

The disturbance & fault recording system architecture can be centralized or distributed based upon customers' requests.DFRs can also be applied to a substation independently with a local computer and HMI software. The protocol for the communication network can be IEC 61850, FTP and IEC 60870- 5-103 based on LAN. GOOSE function is integrated to receive information from the process bus.

Standard format

PCS-996R DFRs are equipped with 48 analog channels and 60 binary channels in one unit. Furthermore, it can be synchronized via an external time source.

Recording

- Triggered recording @ 9600Hz, for short-term transient process.
- Continuous recording @1200Hz, for mid-term dynamic process
- Slow recording @1 ~ 50Hz , for long-term power quality monitoring
- Extract recording @ 9600Hz, isolate fault channels automatically for information efficiency.

Functions

Recording Functions

- Initiating recording by AC voltage
  - Phase voltage over upper limit
  - Phase voltage under lower limit
  - Sudden increase/decrease of phase voltage over limit
  - Negative sequence voltage over upper limit
  - Zero sequence voltage over upper limit
  - Sudden change of zero-sequence over limit
  - Frequency over upper limit
  - Frequency under lower limit
  - Absolute value of df/dt over limit
- Initiating recording based on AC current out-of-limit
  - Phase current over upper limit
  - Sudden change of phase current over limit
  - Negative sequence over upper limit
  - Zero sequence over upper limit
  - Sudden change of zero sequence over limit
  - Power swing
- Initiating recording based on binary input
- Continuous recording (24hours of uninterrupted recording)

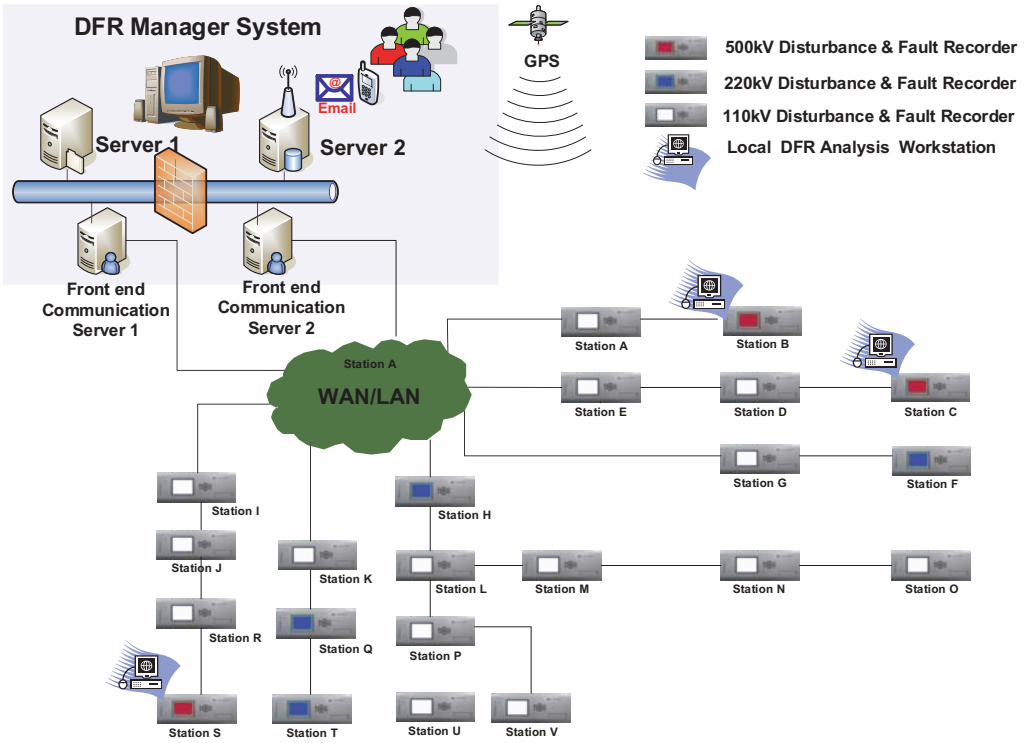

Figure 1 Typical application of the PCS-996R in a wide-area DFR system

Auxiliary Function

- Self diagnostic test
- Loss of DC power supply alarm
- Hardware circuit online detection
- Support IRIG-B time synchronization

Communications

- 1 RJ45 Ethernet port complies with IEC60870-5-103 and IEC61850 protocol
- 1 RS-485 serial port used for GPS time synchronization
- 1 RS-232 serial port used to test and configure device
- 1 Ethernet interface used for FTP service for continuous recording and real-time waveform display
- Two fiber Ethernet ports which support IEC60870-5-103 and IEC61850 protocol (available for PCS-996R)

Features

- The robust hardware platform adopted for DFR is the same as NR Electric's protection and control system, which has been well proven in field.
- This device adopts a fully-closed chassis with a well designed structure, providing separate spaces for low and high voltage systems. The traditionally integrated circuit board mode is abandoned. Furthermore, anti-interference measures are integrated into the software, thus enhancing anti-interference capabilities.
- This device makes use of an advanced hardware platform, which includes 16 bits parallel A/D converter, 320*240 graphic dot matrix LCD, and real-time multi-task operating system. The advanced hardware platform can achieve the high-capacity, high-precision, high-speed, and real-time data processing. The high-precision parallel A/D converter can sample all the AC signals simultaneously in order to ensure the accuracy of these measurements.