PCS-924

Stub Differential Relay

In one-and-a-half breaker and ring breaker arrangements, the T-zone exists between two breakers and line/transformer feeders. The PCS-924 is designed to provide current differential protection, phase overcurrent protection and feeder end fault protection for the T-zone. It provides three groups of CT input for direct connections to three terminal CTs. The disconnector is always installed in the feeder to facilitate the maintenance. The relay considers the different operating scenarios for the feeder with the disconnector. 3-terminal and 2-terminal current differential protections are automatically enabled/ disabled to meet different scenarios with closed or opened disconnector. The feeder end fault protection is enabled whenthe disconnector is opened. It is used to clear faults between CT and disconnector while keeping continuous operation of local breakers. The phase overcurrent protection employs the calculated sum current of two CTs. It can be applied for feeder energization and feeder backup protection.

The PCS-924 is compatible with IEC 61850 station bus and process bus applications. It supports IEC 61850-8-1 MMS and GOOSE . The front panel RJ-45 port is provided for testing and setting, allowing for easier commissioning and maintenance.

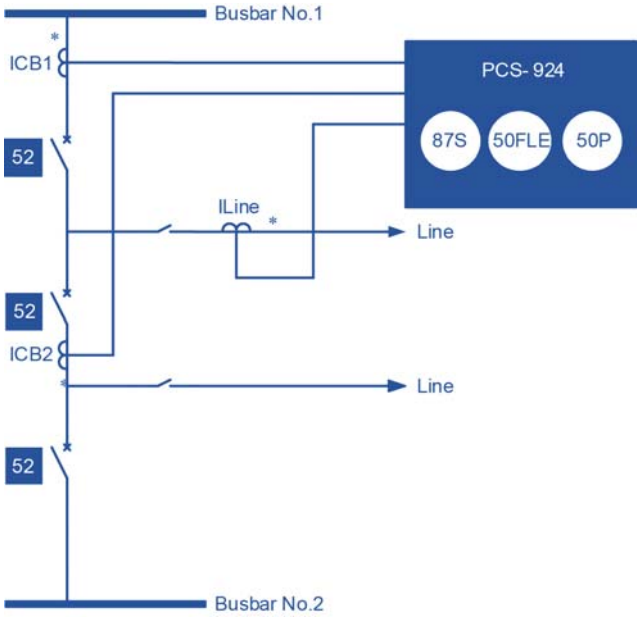

Figure 1 PCS-924 Functional Block Diagram

Functions

Protection and Control

- Current differential protection (87S)
  The switchover of 3-terminal and 2-terminal current differential protection can be automatically implemented according to the open/close state of feeder disconnector.
- Two stage feeder end fault protection (50FLE)
  This protection is only valid when the feeder disconnector is opened. It is used to clear the faults between CT and the opened disconnector. It will send a transfer trip command to remote end and keep the local breakers in service.
- Phase overcurrent protection (50P)
  Phase overcurrent protection is based on the summed current of two CTs. It can be used as the energizing protection or feeder backup protection.
- Current drift auto adjustment
  The relay continually and automatically traces the current drifts and adjusts the zero point to acquire accurate measurements

Monitoring and Measurement

- CT circuit supervision
- Self-diagnostic
- Event recorder including 1024 change-of-binary-input events, 1024 supervision events and 1024 device logs
- Disturbance recorder including 32 disturbance records with waveforms (The format of disturbance recorder is compatible with COMTRADE.)
- Clock synchronization using IRIG-B, SNTP, PPS (Pulse-Per-Second) and PPM (Pulse-Per-Minute)

Communication

- Up to four 10Base-T/100Base-TX copper Ethernet ports using IEC 61850, DNP3.0 or IEC 60870-5-103 oaver TCP/IP
- Up to two 100Base-FX optical Ethernet ports using IEC 61850, DNP3.0 or IEC 60870-5-103 over TCP/IP (Sharing two copper Ethernet ports)
- Two RS-485 serial ports using IEC 60870-5-103
- One RS-485 serial port for clock synchronization
- Optional Sampling value and GOOSE communication module with six/eight optical Ethernet ports using IEC 61850-9-2 and IEC 61850-8-1 GOOSE.

User Interface

- HMI interface with large-size LCD and 9-button keypad on the front panel
- Support setup up to 40 users and allow each user to own different password and access authority
- Provide some function shortcuts key, which can be configured by PCS-Explorer and be fulfilled by combination key of devices' keypad, to execute some operation quickly.
- One front RJ-45 port for testing and setting
- One RS-232 or RS-485 rear port for printer
- Language selection – English + selected language
- Assistant software - PCS-Explorer

Features

- A unique two-out-two logic is adopted in hardware design to improve security. Coordinating with the redundant scheme, this solution improves both security and dependability of protection system. The two independent data acquisition paths are provided to prevent mal-operation caused by component failure. One works as a fault detector and the other is designed for protection logic. Tripping outputs are supervised by both data acquisition paths.
- Comprehensive flexibility is achieved via modular hardware design, scalable function library, programmable logics, configurable I/Os and definable LEDs. It allows users to create customized schemes for specific projects. 2 fixed LEDs and 18 definable 3-color LEDs (Green/Yellow/Red) are provided.
- The relay is fully compatible with IEC 61850, including station bus communication and process bus communication. It provides up to 6 Ethernet ports for process bus with IEC 61850-8-1 GOOSE, as well as up to 4 Ethernet ports for station bus with IEC 61850- 8-1 MMS.