

Figure 33 Three-Terminal 3SM Configuration With All Relays as Masters

Three-Terminal Slave Application With a Serial Channel (E87CH = 3SS)

Figure 34 shows a SEL-411L relay set to 3SS, in which the relay uses one serial channel to communicate with one remote peer in a three-terminal application. This relay acts as a slave serving the data to the connected master (relay set to E87CH = 3SM), but it does not receive data from any remote peers and cannot perform differential protection independently. Slave relays trip via the 87DTT (direct transfer trip) bit they receive from the master(s). An operational 87L scheme requires that at least one relay be a master and that a bidirectional communications channel exists between the master and each slave.

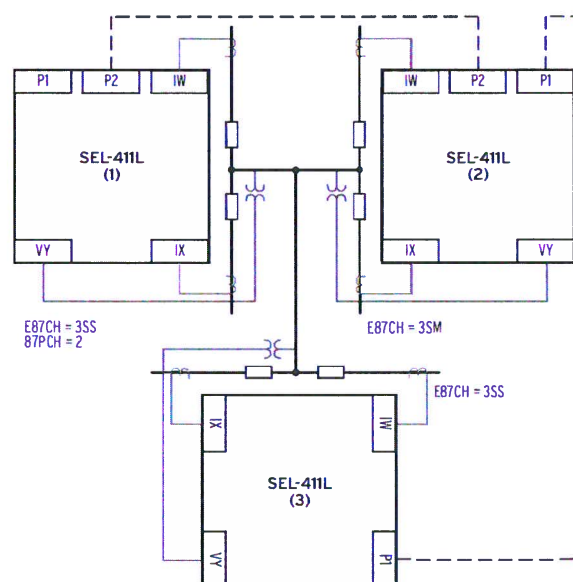


Figure 34 Three-Terminal Application Over Serial Channels With Relay 1 and Relay 3 as Slaves

In-Line Transformers

For lines with transformers, the preferred application is to apply separate relays for the line current differential zone and the transformer differential zone, as shown in Figure 35. This allows application of fault location (transformer vs. line faults, exact location for line faults) and reclosing features. A direct transfer trip from the 87T to the 87L allows fast clearing of transformer zone faults. However, another solution is to use the SEL-411L as a current differential relay for the combined line and transformer zones as shown in Figure 36. This is an economic alternative if neither reclosing nor multiterminal fault locating are necessary.

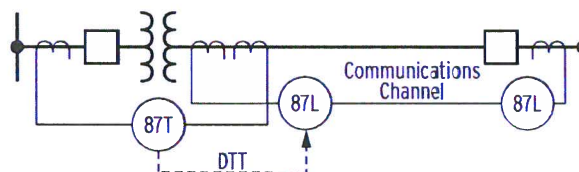


Figure 35 Preferred Application for Lines With Transformer

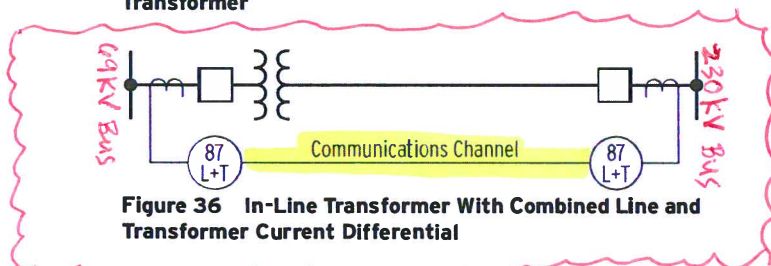


Figure 36 In-Line Transformer With Combined Line and Transformer Current Differential