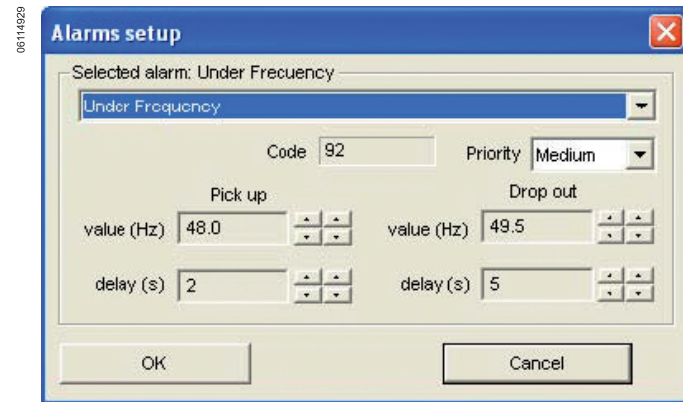


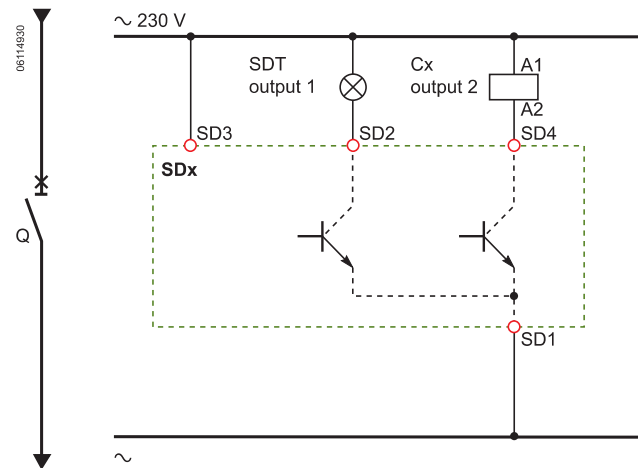
Example 3: Load-shedding based on frequency threshold (f).

The detection of a network frequency low threshold overrun in the event of the installation being operated by a diesel generator indicates an imbalance between the demand and the capacity of the generator. Load shedding makes it possible to redress the balance and therefore to improve availability.



The load-shedding order is given as soon as the frequency falls below 48 Hz for more than 2 s. This order will be maintained as long as the frequency does not rise above 49.5 Hz for more than 5 s.

Diagram



Test

Test whether the reflex load-shedding solution has been implemented by using the LSU (Local Simulation Utility) software. This software, which is available from schneider-electric.com, can be used to simulate the electrical variables (I, V, f, THD, phase shift angle phi). The USB port is connected using the maintenance module.

Connection using the USB port



- 1 Standard USB cable connecting the maintenance module to the PC
- 2 Maintenance module power supply unit
- 3 Micrologic cable connecting the maintenance module to the trip unit test socket

From the LSU software, a current is simulated on phase 1 ($I_1=83$ A for example) and at the end of the activation time delay (20 s), it is noted that output 2 on the SDx module changes to 1 and therefore supplies the coil of the load shedding contactor (Cx) that will cut off the non-priority feeders. To change the SDx module output back to 0, a current of less than 30 A must be simulated on phase 1 for at least 10 s.

The same procedure can be followed for load-shedding solutions based on the power or frequency threshold.

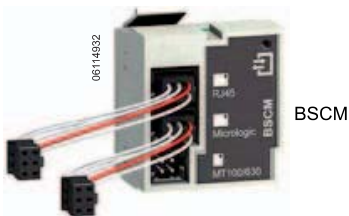
2. Centralized Load Shedding

Description

The centralized load-shedding order is generated remotely by the controller (PC or PLC).

The controller is used to generate load-shedding orders based on monitoring the electrical variables of the entire electrical installation, taking the time bands, operating constraints or even process-related information into consideration.

The centralized load-shedding order is sent to the BSCM installed in the PowerPact H-, J-, or L-frame circuit breaker through the Modbus™ communication network. The BSCM is connected to the communicating motor operator. The communicating motor operator is the actuator that opens or closes the circuit breaker.



The FDM121 front display module can be added as an optional extra. In addition to displaying measurements, alarms and operating information, the FDM121 can be used to give a local order to open/close the PowerPact H-, J-, or L-frame circuit breaker.

In remote mode, only orders from the controller are taken into account. In local mode, only orders from the display unit are taken into account.

This ensures, for example, that no unwanted circuit breaker opening orders are received and that the closed position is maintained during a critical operation (backup, transfer of sensitive data, etc.).

Products used

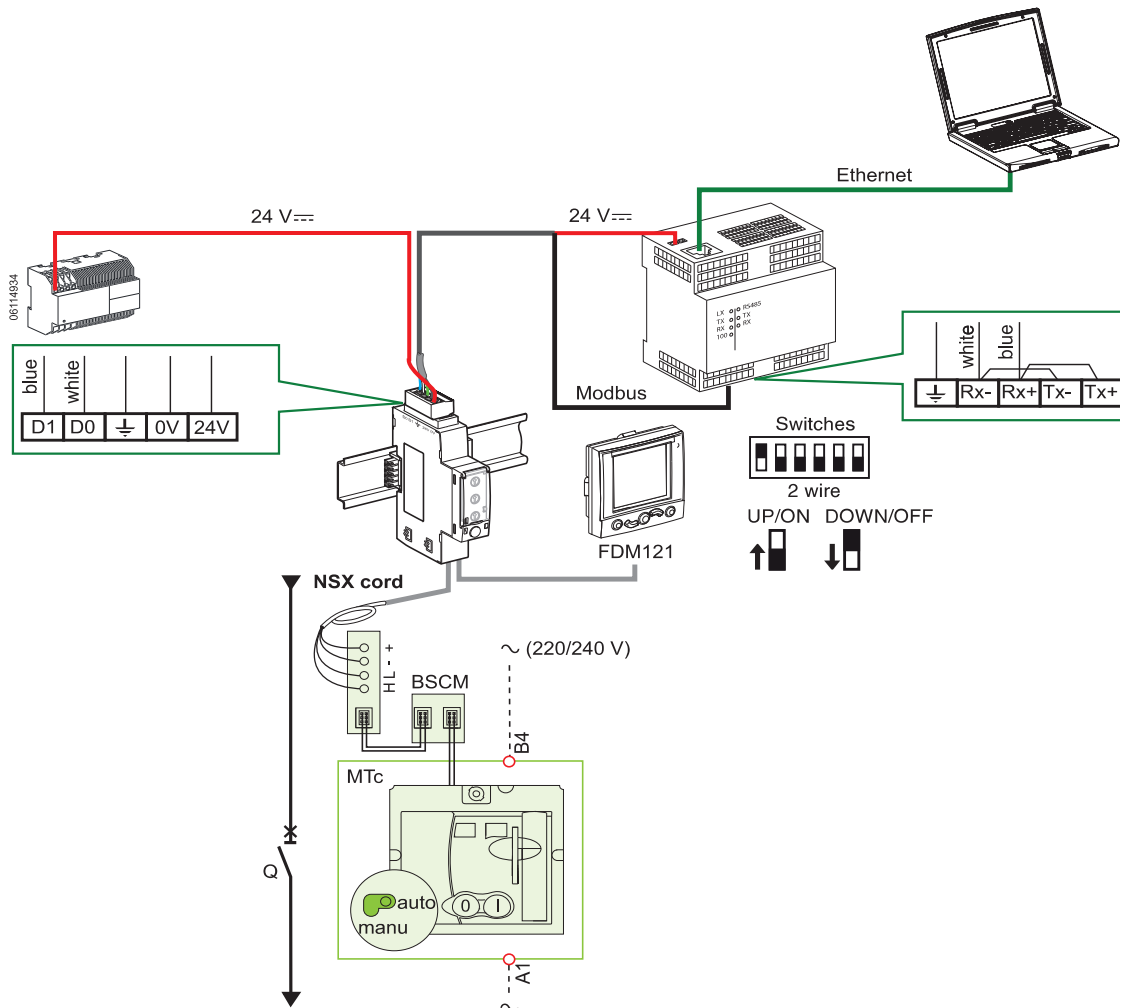
Products needed are shown below. For catalog numbers, see the PowerPact H-, J-, and L-Frame catalog, 0611CT1001.

Table 2: Products Required for Ethernet Connection

Product	Description
Circuit Breaker	PowerPact™ H-, J-, or L-Frame Circuit Breaker with Micrologic Electronic trip unit
MTc	Communicating motor operator
BSCM	Breaker Status Control Module
NSX Cord	Wire length L= 1.3 m
IFM	Modbus interface module
FDM121	Front display module
EGX100	Modbus/Ethernet communication gateway

Configuration

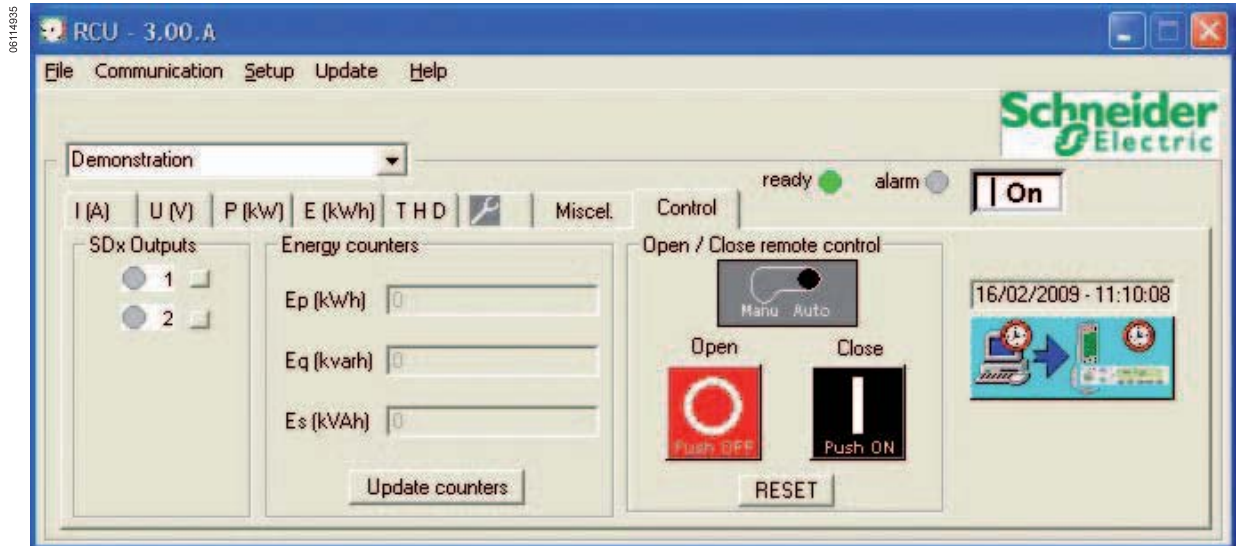
No special configuration is required for the Micrologic trip unit. The load-shedding order (circuit breaker opening/closing) is sent by the controller to the BSCM module through the Modbus network. The configuration of the BSCM module Modbus circuit breaker opening/closing orders is specified in the Modbus Communication—User Guide (48940-328-01).



Test

Test whether the centralized load-shedding solution has been implemented by using the RCU (Remote Control Utility) software. This software, which is available from schneider-electric.com, can be used to open/close the PowerPact H-, J-, or L-frame circuit breaker using the communicating motor operator. Connection to the PC Ethernet port is through the Modbus/Ethernet EGX communication gateway.

In the main set-up menu, go to the User profile submenu and choose "control". The control tab is now available and can be used to check that the communicating motor operator is operating correctly over the Modbus network.



Conclusion

The reflex load-shedding solution using a local order with PowerPact H-, J-, or L-frame breaker provides:

- a reduction in capital expenditure, as its purchase price is lower than that of a traditional solution: the cost of a PowerPact H-, J-, or L-frame circuit breaker with a Micrologic E trip unit (energy measurement) + SDx module is similar to the cost of a PowerPact H-, J-, or L-frame circuit breaker without the measurement function + Power Meter + I/O + CT. The difference is the cost of installing/wiring/testing the CTs, which is included in the PowerPact H-, J-, or L-frame circuit breaker.
- a reduction in operational expenditure, due to optimized energy costs and to the improved availability provided by the load-shedding function.

NOTE: As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

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