



REMOTE TERMINAL UNIT DT-20RN

Monitoring and Control Program

NU-14004

Application

Increased consumer demands on energy availability have emphasized the demand for rapid fault detection, fault insulation and reconfigure the feeder supply to healthy distribution line in overhead MV networks. Remote Terminal Unit DT-20RN represents a part in the selection range of IEL's remote terminal units custom designed for monitoring and control switch disconnectors in overhead MV networks. Depending on network grounding (grounded or insulated) Remote Terminal Unit besides primary monitoring and control functions can also using fault indicators detect fault (short circuit, earth fault), and perform local and remote fault indication. Monitoring functions can be extended to measuring of electric quantities, automatic fault detection, insulation of faulty feeder sections, reconfiguring feeder supply and registration. Switch disconnector is controlled by motor operated device integrated directly on the disconnector axle. The control can be performed locally or remotely (radio link

or optical line) from the control center via SCADA system. Remote Terminal Unit DT-20RN is programmable microprocessor system, that uses standard peripheral input/output circuitry and communication protocols and thus it can be connected to all standard SCADA systems and switch disconnectors.

Application of remote terminal unit DT-20RN for switch disconnectors and DT-10TS for substations 10(20)/0,4kV ensures automation of MV network. Modular approach used in Remote terminals (selection of functions, measurement, indication, automation and registration) enables step by step implementation of network remote monitoring and control system according to network demands. Network automation realized with remote terminal unit DT-20RN ensures rapid fault detection and repair, minimizes energy black outs and lowers maintenance costs.

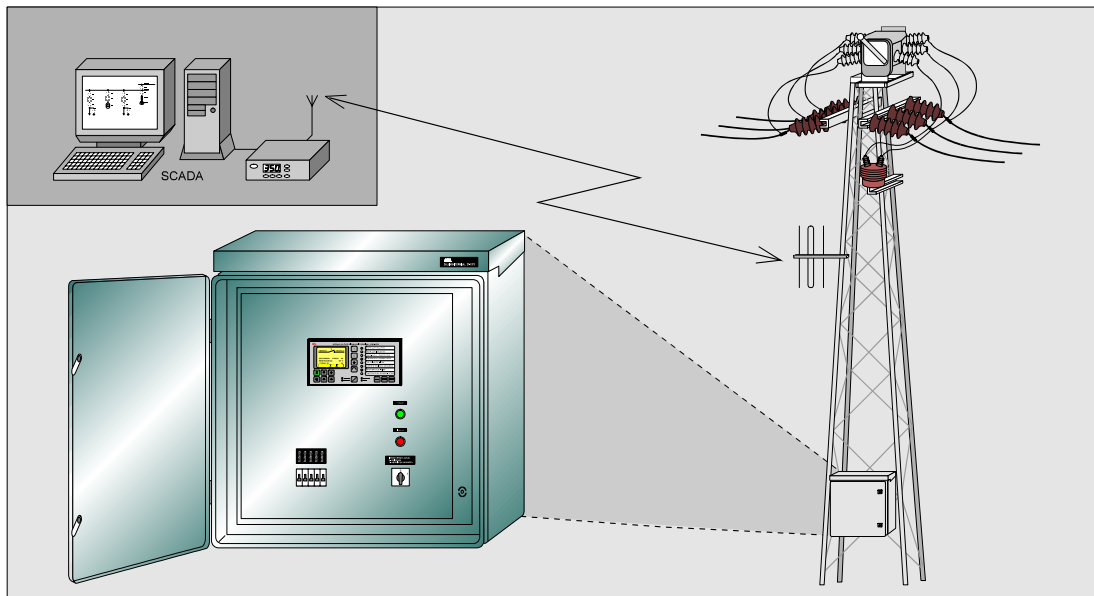


Fig. 1. Remote Terminal Unit DT-20RN in the remote monitoring, control system of switch disconnector

Main features

- monitoring and control of up to two switch disconnectors (more switch disconnectors can be controlled on request)
- besides remote monitoring and control functions DT-20RN can implement additional functions: fault indication, network automation and measurement (I,U,P,Q,S, EQ, EP, f).
- depending on network grounding DT-20RN can include various fault indicators, current and voltage sensors
- all monitoring and control elements are built in control cabinet for outdoor mounting on concrete or steel pole
- switch disconnector is controlled by motor operated device integrated directly on the disconnector axle
- communication between the control center (SCADA system) and Remote Terminal Unit via different media (radio link, optical line)
- power supply for remote terminal unit from voltage transformer and integrated UPS
- communication protocol MODBUS or IEC 60870-5-101

Functional Description

Remote monitoring and control system in overhead MV network (fig. 2.) consists of: switch disconnector with integrated motor, short circuit and earth fault indicator, current sensors (option) and Terminal Unit DT-20RN. Basic elements of remote terminal unit are: Monitoring and control terminal UST-10G, Radio modem, Radio and power supply unit. Monitoring and control terminal UST-10G is the most important part of remote terminal unit. Optically insulated digital inputs are used for acquisition of digital signals, and analog inputs for analog signal acquisition (battery voltage, cabinet temperature). Using sensor conditioning modul SM-21 intended for acquisition of sensor input signals UST-10G can measure electric quantities and detect short circuit and earth fault. Digital outputs of UST-10G are used for controlling motor device on switch disconnector. Switch disconnector can be controlled locally or remotely using motor drive or manually by insulated hook-stick. Depending on network type and technical demands UST-10G provides possibility for connecting various fault indication devices (IK-10, IK-20)

or sensor conditioning modul SM-21, which can detect short circuit fault, earth fault and fault direction. Communication with remote control center is realized with radio modem RM-20 and radio GM340. Power supply unit provides an uninterruptible power supply for all devices built in Remote Terminal Unit, and also 24VDC supply for motor drive of switch disconnector.

Following system informations are displayed on the graphic LCD display with backlight: dynamical indication of switch disconnector status, fault indication, cabinet temperature, battery voltage etc. Additional informations can be obtained by selecting appropriate menu. Device parametrization is also performed via LCD display, and no additional devices are needed.

Control cabinet is intended for outdoor mounting on concrete or steel pole (IP54 protection, temperature regulation, ventilation fan). Antenne for radio communication with control center is also mounted on the pole.

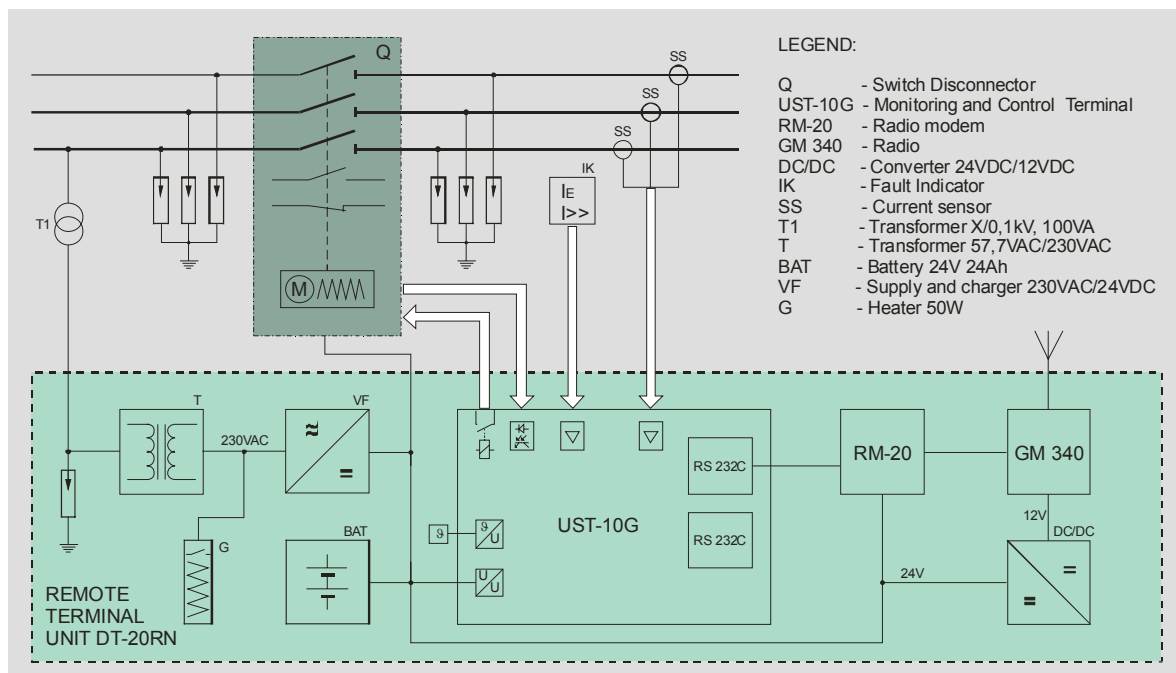


Fig. 2. Remote measuring, signalling and switch disconnector control in overhead medium voltage networks

Technical specifications

Basic elements used in system of Remote monitoring and control

Switch disconnector:.....switch disconnector with motor device, voltage transformer 10(20)/0,1kV, 100VA, unconventional combi sensors, remote terminal unit DT-20RN, antenna

Basic elements of

Remote terminal unit DT-20RN:.....Monitoring and control terminal UST-10G, Sensor module, Radio modem RM-20, Radio Motorola GM340, and power supply unit

Monitoring and Control Terminal UST-10G 20 digital inputs, 4 relay outputs, 16 sensor inputs, graphic LCD

Radio modem RM-20..... RS232 link with UST-10G and GM340

Radio station GM-340 Motorola (other on request)

Power supply unit uninterruptible 24VDC power supply for DT-20RN, and motor drive, battery charger

DT-20RN cabinet:cabinet for outdoor mounting with built in heater and temperature regulation, IP54 protection, with ventilating fan, dimensions 760x760x300 stainless steel

Communication with control center: ..radio link (other on request)

communication protocols:.....MODBUS or IEC 870-5-101

power supply:.....from voltage transformer 10(20)/0,1kV

operation temperature:..... -40°C...+55°C

Detailed technical specifications can be found in the leaflets of separate devices.

