Remote Indicator System with radio and GSM communication.

LineTroll 110μr RIS
LineTroll R110C

LineTroll R110C is specially designed for monitoring phase mounted fault passage indicator (LineTroll 110E μr) in the
MV/HV distribution network.

LineTroll R110C uses a 2.4GHZ, ISM band radio to communicate with up to 9 fault indicators in the range of up to 40m.

The alarm messages from the fault indicators are transported to the SCADA system using SMS.
Versions with GPRS/DNP3 modem is also available as well as one version with a relay interface for connection to any 3rd party RTU.

The unit is powered by three long-life Lithium batteries for long and maintenance-free operation.

LineTroll 110Eμr Fault Indicator detects earth- and short circuit-faults and indicates for both permanent and transient faults. In addition to a bright strobe flash for local indication the LineTroll 110Eμr is equipped with a short range radio that can communicate with **LineTroll R110C** Indicator Communication Unit (Collector) in order to transfer alarms back to the SCADA system.

Features include:

· Remotely programmable operating parameters.
· Integrated addressable short-range radio.
· High visibility for local indication.
· Usable on all Medium Voltage distribution networks 6-132KV.
· Usable on multi circuit systems.
· Voltage or current as start criteria (programmable) and inrush blocking.
· Dual indications (permanent and transient faults).
· Resistant to tough weather conditions.
· Battery capacity monitoring.

All programming and setup of both the LineTroll R110C and LineTroll 110Eμr can be executed from the NetTroll program through the GSM network. Devices can be programmed and setup from a hand-held field device programming unit called FDP-20 or a PC program (NetTroll FDP Configuration Utility).
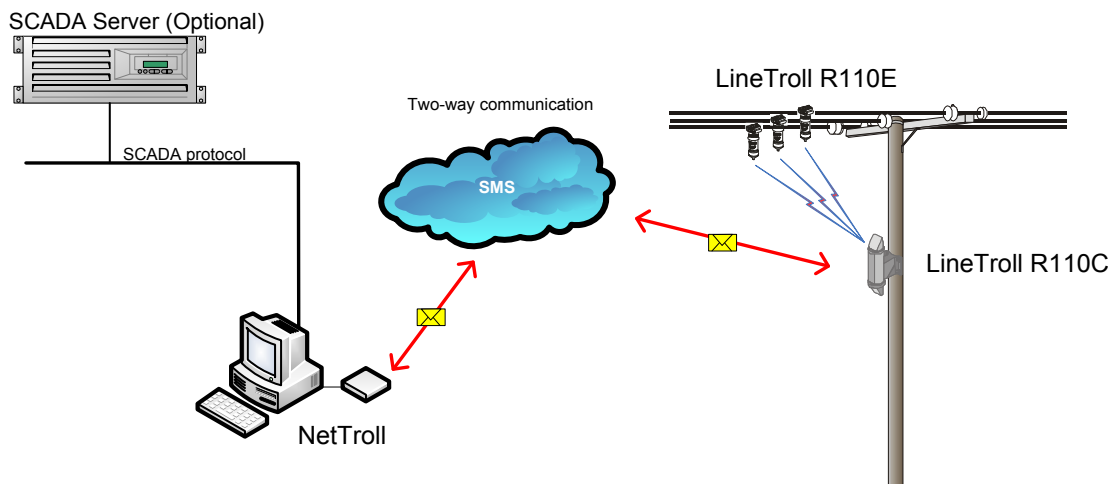
The **LineTroll R110C** can be addressed to up to 9 fault indicators.
It is also possible to mount more than one LineTroll R110C in the same location.

In several network configurations it is not possible to use pole mounted indicators. Where the ground wire runs below the phases, parallel feeders, LV and multiple feeders on the same pole, a pole mounted indicator will not work due to the influence of the adjacent feeders.
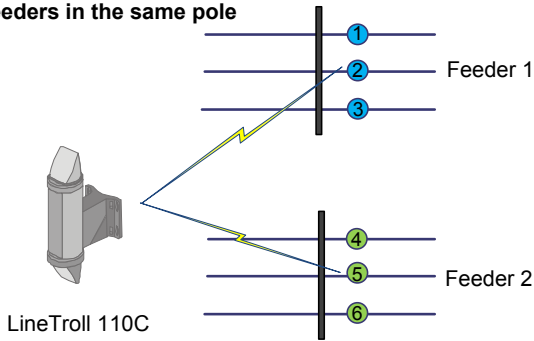In such configurations, phase mounted indicators are the only choice.

The LineTroll R110C sends alarms and events to the NetTroll micro SCADA system through SMS to accommodate very low power consumption and to give problem-free operation even in areas where the GSM signal is very weak.
The LineTroll R110C can also communicate with any SCADA-system using IEC-870-5-101/104 through the NetTroll SCADA Gateway.
Built-in modem for GPRS/DNP3 is also available.

The LineTroll R110C communicates with each individual Fault Indicator (Point-to-point Mode) so that the operator receives information about which phase(s) the fault is on.

SCADA Server (Optional)

Two-way communication

LineTroll R110E

SCADA protocol

SMS

LineTroll R110C

NetTroll

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Parallel feeders or multiple feeders in the same pole


Feeder 1

Feeder 2

LineTroll 110C

The maximum operating distance between the LineTroll R110C and the indicators is 40m line-of-sight.
If two parallel feeders are closer than 40m, one LineTroll R110C can be used to communicate with fault indicators mounted on both feeders.

The alarms from the different indicators on the different feeders/ T-offs will be displayed separately in the NetTroll program.

The point-to-multipoint (PtM) allows for a maximum of 9 LineTroll 110Eμr indicators to communicate with one LineTroll R110C.

This makes the most cost effective set-up of this system as long as phase information is not required.

T-offs and branch points

Branch 1

Backbone / Branch 2

Branch 3
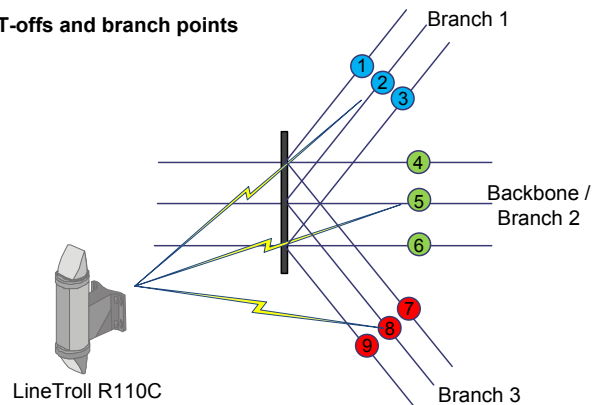
LineTroll R110C

FDP-20

FDP-20 is a hand-held programming device for the LineTroll R110C and LineTroll 110Eμr. This means programming can be done after installation and from the ground. The FDP-20 can also be used to test and reset indicators after installation.

The FDP-20 communicates with the LineTroll R110C with the same 2,4GHz radio used in the indicators.

FDP-20 can be connected to a computer for downloading and uploading of configuration settings for both the fault indicators and the R110C communication device.

FDP-20 can store up to 8 different sets of configuration settings in the memory. In addition, up to 8 sets of configuration settings can be downloaded from installed indicators in the field.



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NetTroll Configuration Utility

The NetTroll configuration Utility is a software specially designed for configuration of different types of Nortroll devices. The program can download sets of configuration properties to FDP-20 or directly the fault indicators through a serial cable or by radio link dependant upon the type of device. The FDP-20 can be used on-site to program fault indicators, collectors and several other devices such as RTU's etc.

It can also be used to upload configuration properties from the field devices to confirm correct settings.
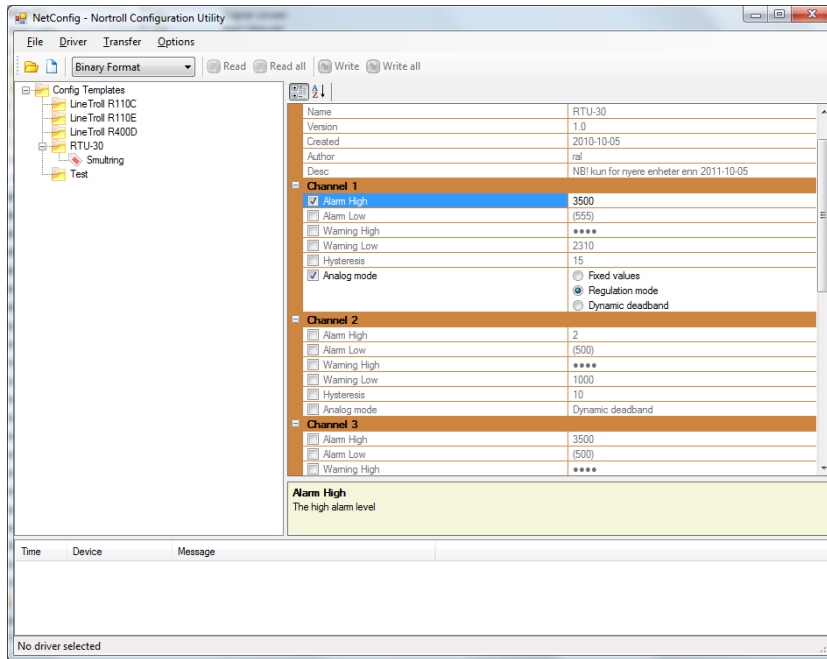
LineTroll *RIS*

04-1200-26	LineTroll 110Eµr	Phase mounted fault passage Indicator (For 6-132kV)
04-1200-10	LineTroll R110C	Pole-mounted communication Collector for up to 9 Fault Passage Indicators for connection tp GPRS/DNP3 modem
04-0110-11	LineTroll R110C	Pole-mounted communication Collector for up to 9 Fault Passage Indicators with relay outputs.
04-0110-00	LineTroll R110C	Pole-mounted communication Collector for up to 9 Fault Passage Indicators with internal SMS modem
17-0001-01	FDP-20	Field Device Programming unit for phase mounted and pole mounted fault indicators.
15-0020-00	NetTroll FDP Configuration Utility	NetTroll Configuration Utility for fault indicators, RTU's and FDP-20.

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Remote Indicator System 'RIS'

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