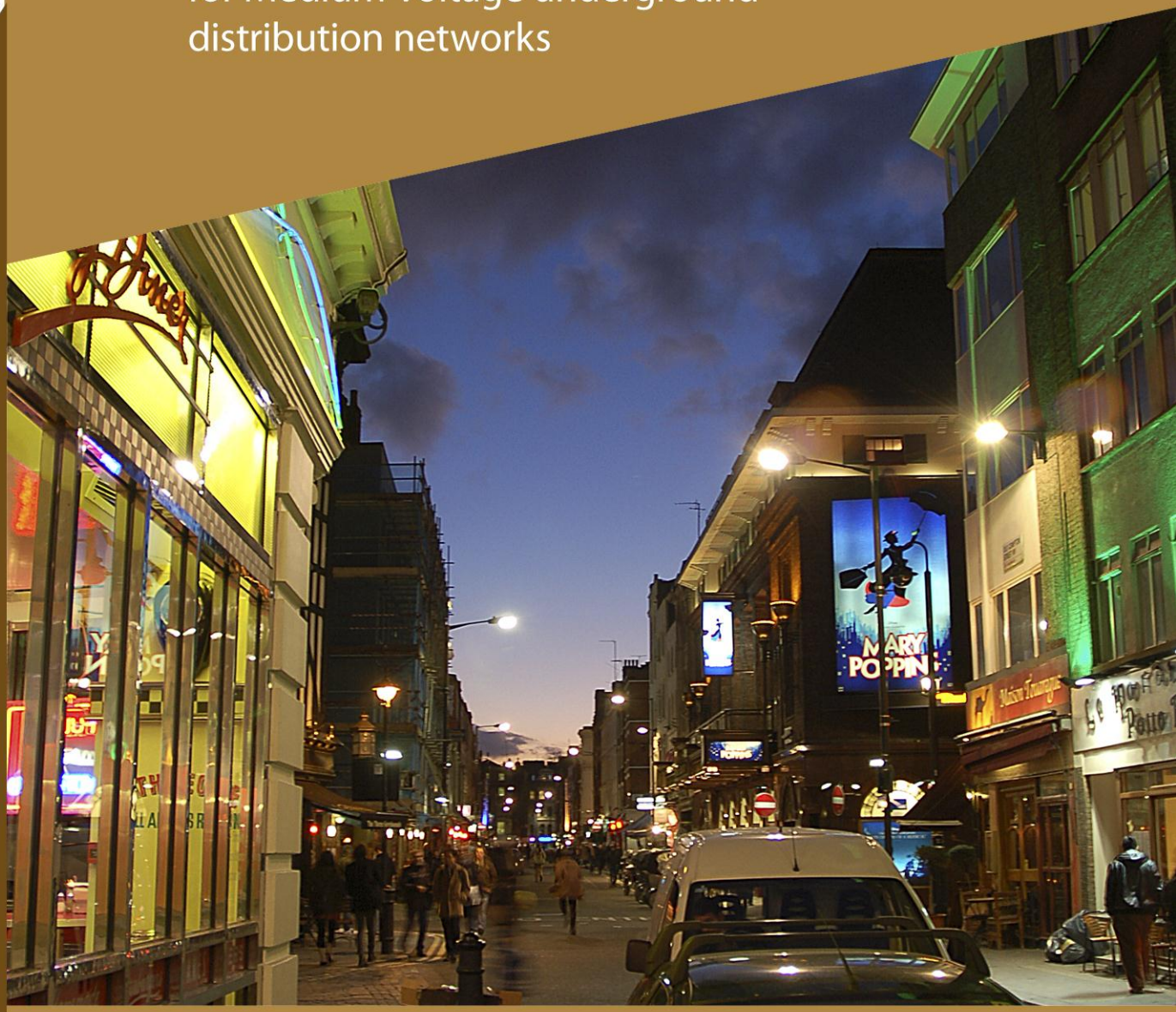
CableTroll®

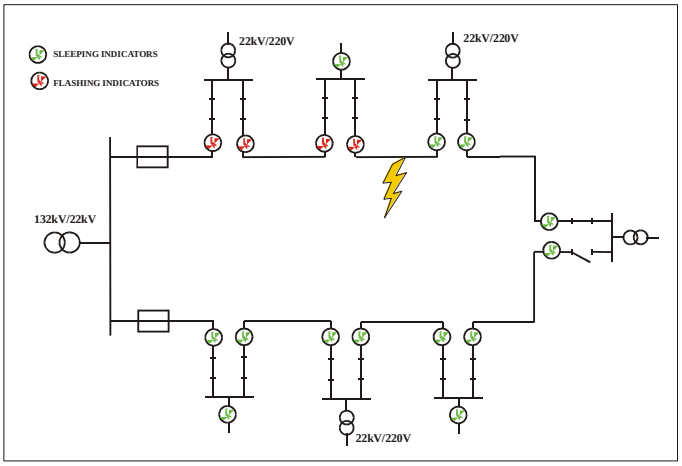
Fault Passage Indicator
for Medium Voltage underground
distribution networks



PRODUCT CATALOG

NORTROLL
SMARTER NETWORK MANAGEMENT

The CableTroll indicators are fault current detectors for the underground medium voltage distribution network (6-36kV). They are used to detect short circuit and earth faults, and can be installed on most types of cable terminations. Some units will give separate indication for short circuit and earth faults, locally by flashing diodes and remotely through separate relay contacts or additional ComTroll communication modules.



All indicators between the feeding transformer and the fault location activate.

CABLETROLL fault indicators provide fast fault localisation enabling reduction in outage times. This represents enhanced service to the customers thereby improving the utilities image and significant reduction in the cost related to faults and outages.
Another important aspect of using fault indicators is that unnecessary operations of circuit-breakers and sectionalizers to locate faults are avoided. This way the indicators help to reduce wear and tear as reclosing cycles causes stress to the switchgear.

Fault currents in cable network

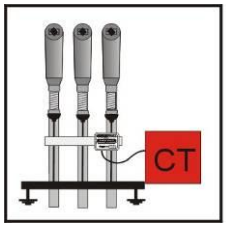
The short circuit current magnitude is mainly given by voltage level, type of transformer, primary feeding network and the distance from the feeding transformer to the fault location.
A cable short circuit will normally cause a fault current in the kA-range. When short circuit appears near the end of a long line, the fault current is most likely to be of a significantly lesser value.
In networks with directly earthed neutral an earth fault is equivalent to a phase-to-earth short circuit. The current magnitude will in this case be almost equal to the fault current of a phase-to-phase short circuit. For networks that do not have a directly earthed neutral, the magnitude of the earth fault current is determined by the size of the galvanic interconnected network, the voltage level, type of cable and the neutral equipment. The magnitude of a fault current during a dual earth fault will be almost equal to a short circuit in networks that do not have a directly earthed neutral.
As the sensor principle is of the threshold type, correct use of the indicator is subject to calculations of earth fault currents and capacitive discharge currents through the sensor element (seen from the feeder). The capacitive discharge current from behind the earth fault element must not exceed the trip level setting of the indicator. The capacitive discharge current will vary between the different types of cable, and the cable supplier should be consulted about the data for your specific type in order to make the correct calculations.

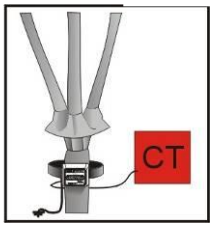
CableTroll 2310

CableTroll 2310 is an indicator for detection of earth faults (PtG) on multi-core and single core cable terminations. The unit uses NorTroll type current sensor (CT)

Programmable:	Dipswitches
Trip level PTG:	5-240A fixed & adjustable levels
Reset:	Manual, timer, automatic and remotely
Indication:	PtG and Battery monitoring
Relay output:	PTG (NO & NC)
Power:	Lithium Battery or 9 -48Vdc with battery backup Mains option available

Suitable Cable terminations:



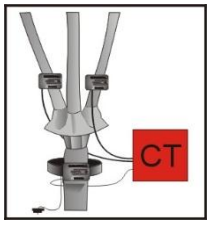


CableTroll 2320

CableTroll 2320 is an indicator for detection of Earth faults (PtG) and short circuit (PtP) faults on multi-core and single core cable terminations. The unit uses NorTroll type current sensors.

Programmable:	Dipswitches
Trip level PtG:	5-240A, fixed & adjustable levels
Trip level PtP:	300-1000A
Reset:	Manual, timer, automatic and remotely
Indication:	Separate PtP and PtG and Battery monitoring
Relay output:	Separate PtP & PtG
Power:	Lithium Battery or 9 -48Vdc with battery backup Mains option available

Suitable Cable terminations:

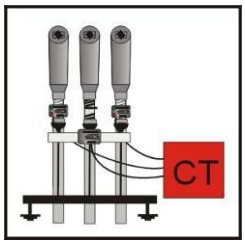


CableTroll 2330

CableTroll 2330 is an indicator for detection of earth faults (PtG) and short circuit (PtP) faults on multi and single core cable terminations. The unit uses NorTroll type current sensors

Programmable:	Dipswitches
Trip level PtG:	5-240A, fixed & adjustable levels
Trip level PtP:	250-1000A
Reset:	Manual, timer, automatic and remotely
Indication:	Separate PtG and PtP and Battery monitoring
Relay output:	Separate PtG & PtP
Power:	Lithium Battery or 9 -48Vdc with battery backup Mains option available

Suitable Cable terminations:

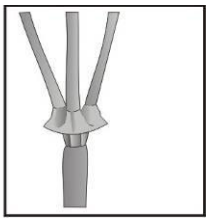


CableTroll 2350

CableTroll 2350 is an indicator for detection of PtG and PtP faults on multi and single core cables. The unit uses standard type current transformers. (40:1, 60:1 or 3x500:1)

Programmable:	Dipswitches
Trip level PtG:	50A
Trip level PtP:	250-1000A
Reset:	Manual, automatic by timer and remotely
Indication:	Separate PtG & PtP
Relay output:	Common PtG & PtP
Power Supply	Lithium Battery
Internal Eventlog	

Suitable Cable terminations:



LED-2

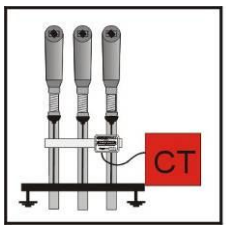
LED-2 is a flashing unit which can be mounted outside a kiosk etc. It provides a strong flash in a rugged design and does not require additional power source

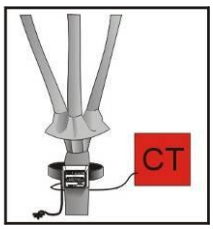
CableTroll 2410

CableTroll 2410 is an eart fault indicator for detection of PtG faults on single and multi-core cables. The unit uses NorTroll type current sensors. The housing is suitable for panel mounting in RMU's.

Programmable:	Dipswitches
Trip level PTG:	6-340A fixed & variable levels
Reset:	Manual, timer and remotely
Indication:	PtG and Battery monitoring
Relay output:	PtG
Power:	Lithium Battery

Suitable Cable terminations:



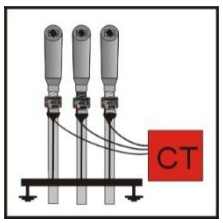


CableTroll 2440

CableTroll 2440 is an indicator for detection of PtG and PtP faults on single and multi-core cable terminations. The unit uses NorTroll type current sensors. The housing is suitable for panel mounting in RMU's.

Programmable:	Dipswitches
Trip level PTG:	20-160A
Trip level PTP:	250-1000A
Reset:	Manual, timer, remotely and automatic by return of Voltage or Current
Indication:	PtG/ PtP and VPI/CPI (Volt/Current Present Indication)
Relay output:	Common PtG- & PtP-fault and Low battery
Power:	Lithium battery

Suitable Cable terminations:



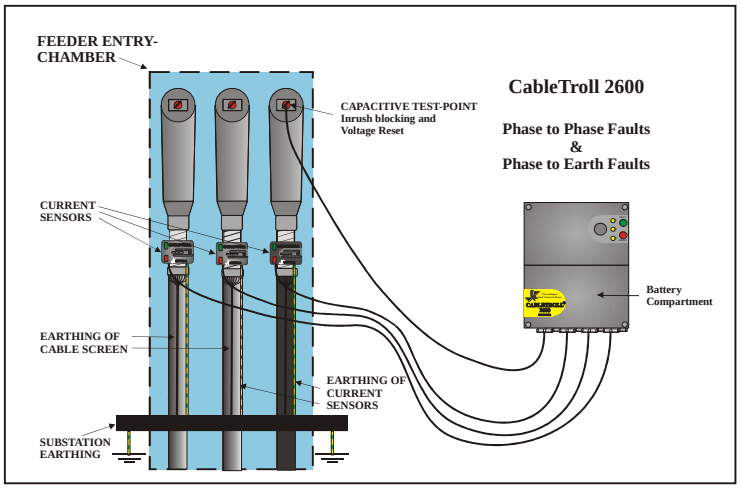
CableTroll 2600

CableTroll 2600 is an indicator for detection of PtG &PtP faults on multi-core (CT 2600M) and single-core (CT 2600S) cables. The unit uses a NorTroll type current sensor.
The CT2600 can be used to as a PtG indicator for up to 3 feeders.

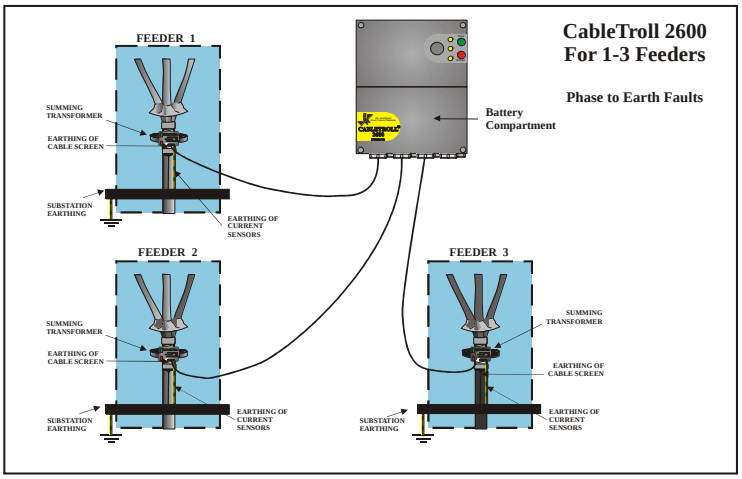
Programmable:	Dipswitches
Trip level PtP:	200-1000A
Trip level PtG:	10- 160A
Reset:	Manual, timer, remote and automatic by return of Voltage or Current
Indication:	a) Separate PtG & PtP (S) or b) PtG for 1-3 feeders (M)
Relay output:	a) Separate PtP & PtG (S) or b) PtG for 1-3 feeders (M)
Power Supply:	Lithium batteries

Applications:

CT-2600 (S) Single Core: PtG- and PtP-fault detection



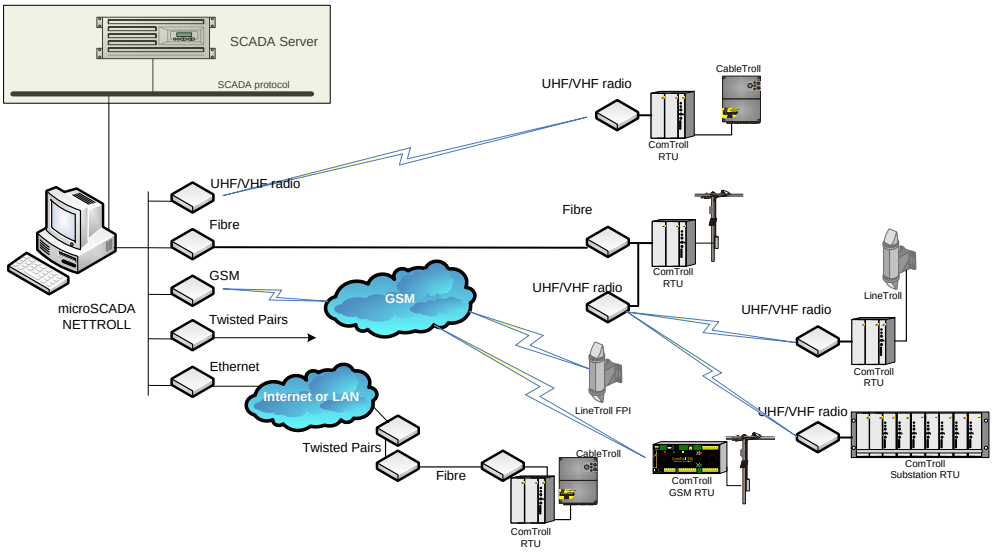
CT-2600 (M) 3-core cable PtG-fault detection on 1, 2 or 3 feeders



Remote Indication

All of our CableTroll fault indicators have a relay output for interfacing with equipment that can forward the alarms to a control center, SCADA system or cell-phone.

Nortroll offers a wide range of communication modules and RTUs with various communication options such as radio, GSM, fibre, Ethernet etc.



Nortroll's range of product comprises

LineTroll Product range	Fault Passage Indicators for overhead lines
CableTroll Product range	Fault Passage Indicators for cable Networks
ComTroll Product range	RTU's for substations and motorized switchgear, communication equipment for fault passage indicators and RTU's, MicroSCADA System for surveillance and control and NetTroll SCADA Gateway

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