



Line Troll® 110Eµr

Fault Passage Indicator for overhead lines, Prod. Nr.04-1200-60

LineTroll®110Eµr Fault Passage Indicator detects phase-to-phase (PTP) and phase-to-earth (PTE) faults in 6-69kV distribution networks. The online indicator independently indicate both permanent and transient (temporary) faults with bright LEDs. All alarms, status messages and load current values are transferred (RF) to a communication unit (Collector) mounted on the pole underneath. The collector (LineTroll R110CQ) can address up to 9 LineTroll 110Eµr indicators and communicates with the SCADA system through GPRS mobile link.



Some features on LineTroll®110Eµr

- Remotely configurable
- Load current monitoring
- Integrated short-range radio.
- Ultra High visibility (40 lumens with strobe effect) 360°
- Usable on multi circuit systems
- Configurable response time
- Voltage or current as start criteria (configurable)
- Di/dt, threshold or automatic Trip Setting values, configurable.
- Dual indications (permanent and transient faults)
- Loss of Voltage detection
- Battery capacity monitoring

Functional Description

LineTroll 110Eµr continuously monitors the line voltage and phase current to detect downstream faults. The unit is fully self-contained, no external transformers or connections is required.

The indicator is looking for a specific sequence of line conditions to happen before it indicates. The general sequence is as follows:

1. The line should be energised (voltage or current present) for a minimum of 5 seconds. B. Di/Dt: The line current should increase more than the specified di/dt trip value Response time is configurable
2. And/or
3. Threshold: The line current exceeding a pre-set current level or automatic trip-level dependent on the load current
4. The line should be de-energised. (voltage or current not present)

After detected a fault, the type of alarm is transferred to SCADA together with the load current value prior to the fault.

Ordering Information

Product nr: 04-1200-60 LineTroll110Eµr

Product nr: 17-1200-00 KBN-4 Reset/mounting tool with bolt hot-stick adaptor

Product nr: 1056 KBB-11 replacement battery

Product nr: 04-0110-03 LineTroll R110CQ collector for 3—9 indicators



Technical Specifications

Application:	Online Short circuit and Earth fault indication for overhead lines.
	System Voltage: MV– voltage network (6-69kV)
	Grounding system: Isolated, resistor and solidly grounded
Frequency:	50Hz / 60 Hz
Fault-detection:	Sensitivity Di/Dt (50Hz): 6, 12, 25, 60, 90, 120A, 160 [A] (optional)
	Sensitivity thresh.(50Hz) 100, 200, 500 or 600 [A] (Optional)
	Automatic threshold: 50, 100, 200, 400, or 600A Ref. UG
	Response time: 20, 50, 100, 200 [ms]
	Inrush-blocking: 5 sec CB-tripping: Within 5 sec
Reset:	Automatic: Re- energized line (Voltage or current,programmable) Timer: 2, 4, 8, or 16 hours (optional)
	Manual: Handheld unit or smart-phone APP from ground
Indication	Remote: 3, 6 or 9 LT110Eµr sends alarms to LineTroll R110CQ set up a GPRS connection to SCADA and transfer:
	<ul style="list-style-type: none"> • Transient Fault (temporary faults) • Permanent Fault • Loss of voltage or load current = 0 • The actual load current from each indicator [3—400A] • Communication lost with indicator(s) • Low Battery Warning
	Locally: 3 high intensity LED's
	Permanent faults: Ultra Bright Red Strobe Flash (40 lumens) Transient faults: 1 green LED (f = 0,2Hz)
	Low battery: 1 Led (f = 0,1Hz) <20% of tot capacity (16,5Ah) remaining.
Built-in Radio:	Frequency: 2,4 GHz, ISM-band
	Output Power: 1mW (0dBm) Data rate: 250kbit/s Range: 20m LOS, (margin =20dB/ Rec.sens: -90dBm)
Visibility day/night/dir.:	<500m/2km / 360°
Power supply:	1 Lithium Cell D-size total capacity: 16,5 Ah
	Battery change: Every 1500 flash hours, normally every 10years, 20 year shelf life.
Mounting:	Hot-stick: Live-line mounting with Grip-All Clamp hot-stick or KBN-4 mounting tool.
	Conductor size: 5-36 mm
Temperature range -40° to +85°C	
Housing:	Material: Polycarbonate, UV stabilized
	Dimension: 202 x 54mm (with box 235 x 65 x 85)
	Weight: 345g incl– battery
Protection Ingress:	Ingress: EN 60529 IP 67
	Mechanical Impact:EN 62262 IK 09 (10J)



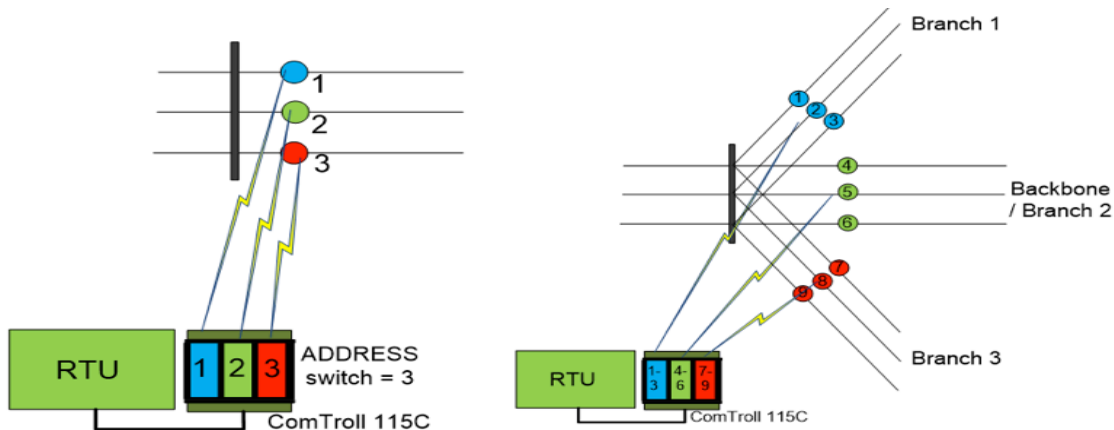
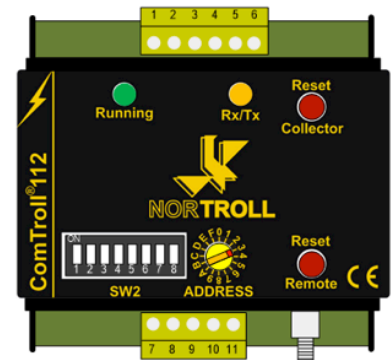
Comtroll 115

Communication Between Linetroll and Comtroll 115

The rotary switch on the ComTroll 115 called "ADDRESS" should be set to the number of indicators used in this location, in this case '3'.

Able Integration with any type of RTU Modem's supported by Digital Input and Output.

The indicators will in PtP mode operate one individual relay output on the ComTroll 115C each. The Communication failure/Low Battery relay on the ComTroll 115C will be activated if one or more the three indicators send this message.



ComTroll 118C Collector

Com. Unit for Integration With NorTroll or Third Party RTU

Communicates with 1 – 12 line mounted indicators

Communicate with the RTU on MODBUS

Output Messages

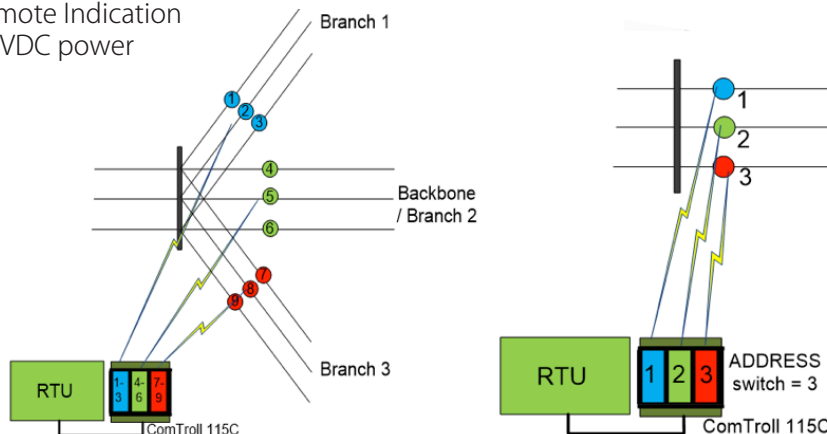
- 3 for indicators (phase / feeder)
- Missing "heartbeat"/low battery
- Los of Voltage
- Load current

Short range radio; 2,4 GHz

Range up to 30-50 meter

Remote Indication

12 VDC power



ComTroll 118 C Collector/Modbus

The ComTroll 118C is short range radio module which can communicate with up to 9 FPI's present the data for a RTU by means of a Modbus link. It is possible to configure each of FPI from the RTU by writing to the Modbus registers and to collect status from each FPI by reading the Modbus registers.



LineTroll R110CQ Collector GSM Sleep Mode

Overhead line Distribution 6-69kV

Features:

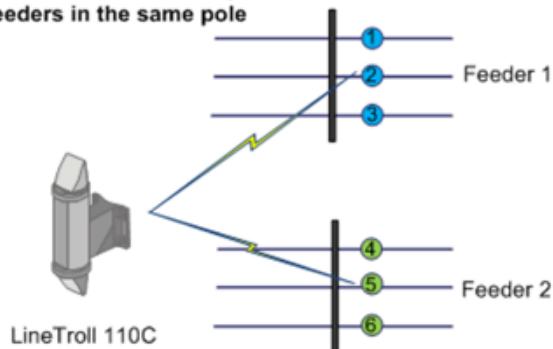
1. Communication with 1 – 9 line mounted indicators
2. Fault messages
 - Transient Fault
 - Permanent Fault
 - Low battery/missing heart beat
3. Can connect to NetTroll or third party SCADA
4. Short range radio; 2,4 GHz
5. Range up to 30 – 50 meter
6. Battery powered (no need for external power)
7. Can be remotely programmed from ground
8. GPRS & SMS Communication (3 SMS numbers)



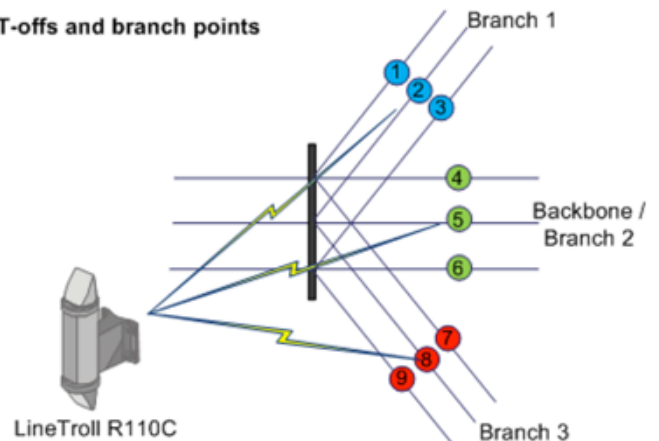
Collector GSM Sleep Mode

3, 6, or 9 fault indicators can communicate with one <<collector>>

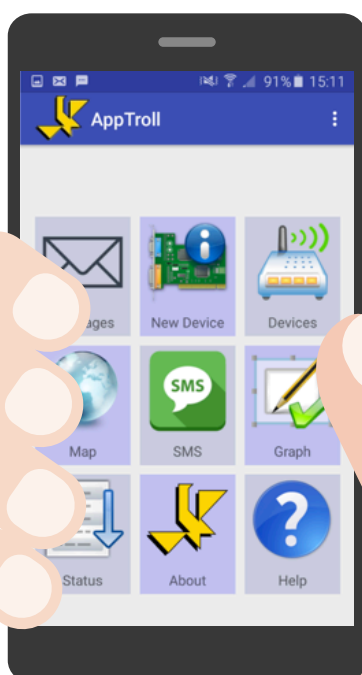
Parallel feeders or multiple feeders in the same pole



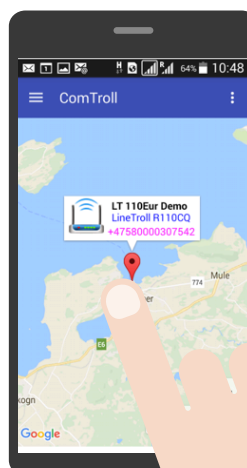
T-offs and branch points



ComTroll Smartphone APP



- Receive alarms/messages and status updates from Fault Passage Indicators
- Send status request and configuration settings to indicators in the field
- View all installed indicators in a geographical map
- Get GPS driving instructions to the fault location



Tap on the last indicator on the feeder with alarm color (red) to see the type of fault and other information

