

# OPT100 Mobile DGA

**Mobile Dissolved Gas Analyzer Systems  
for use with Transformer Oil  
Designed for use on ENERGIZED Equipment**



Available as a TRAILER or SKID

**Maximize transformer life with real-time, mobile DGA**

**Quickly Deploy Dissolved Gas Analysis  
where you need it, when you need it**

Transformer lead times are extending, are you prepared to make your assets last until new ones are available? Built with the Vaisala Optimus™ platform, the mobile OPT100 safeguards transformers in the toughest environments with no consumables and has the lowest total cost of ownership of any multi-gas DGA on the market. This **easy to deploy** system is easily **setup quickly** and providing data in 2 hours or less. The drift-free measurement of seven fault gases is combined with a unique total gas pressure monitoring system that detects ambient air leaks in sealed transformers, eliminating false alarms for peace of mind.

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13211 State Route 226  
Big Prairie, OH 44611

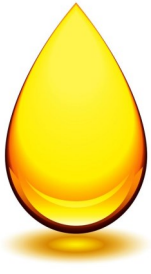
419-827-6061

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**KRIN**  **usa**

**built with**

**VAISALA** **Inside**



# STANDARD FEATURES that matter in a mobile DGA platform

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## DGA Monitoring Device

- Vaisala Optimus DGA measurement technology
  - NDIR light absorption-based measurement with patented gas extraction and leak detection systems
  - No calibration gases required
  - No internal column or measurement components to replace
  - No fixed filters, filter wheels, membranes or capillary tubes to repair or replace
  - Intelligent and intuitive web client to remotely access data from anywhere
  - Auto-calibration ensures long-term stable online measurement
  - Runs on all ester liquids and mineral oils
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## Skid Mounted enclosure, NEMA 4 (IP66) rated

- EASY TO MOVE BETWEEN TRANSFORMERS AND SETUP IS FAST AND EASY - Forklift slots in base as well as lifting eyes for moving the enclosure with an overhead crane. Total setup time is usually less than 1 hour.
  - DESIGNED TO PREVENT SPILLS - Containment integrated with the base and includes spill detection switch.
  - STORAGE FOR EVERYTHING NEEDED TO OPERATE - Includes space for hoses, fittings, and accessories storage
  - BUILT WITH SAFETY IN MIND - Extensive grounding of components to the frame with an equipment ground connection to properly tie the mobile DGA system to station ground using the same ground connection cable used for all your mobile equipment
  - BUILT TO LAST - Heavy duty G-Bond panels construct the enclosure envelope. These panels are galvanized steel on both the interior and exterior, coated with white gelcoat, and have an HDPE core
  - SECURE AND WATERTIGHT - Sea-Lock sealed door openings with heavy duty cam-action latches that are tamper resistant to both humans and wildlife
- 

## Hose connections

- 1/2" INLET and OUTLET hoses, Up to 30ft length
  - Drip-Less ISO Quick Connect Fittings
- 

## Electrical

- 120VAC Single Phase
  - Maximum power consumption 500 watts (4.2 amps at 120 VAC)
  - Entire system can operate on basic extension cord from a 15 or 20 amp outlet
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## Training

- KRIN USA has ALWAYS included on-site training for our products. We come to your facility or substation and teach technicians how to commission, operate, access data and decommission the mobile DGA system. This can typically be done in 1 day.
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## Service and Support

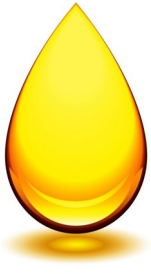
- We are well known in this industry for our customer service and technical expertise. KRIN USA is always available by phone, email, or text for any support issue. Our people are the **most important standard feature** of any of our products.
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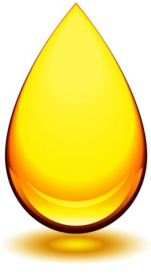
# OPTIONS that tailor the system to your needs

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<b>Configured for Mineral Oil OR Esters like FR3</b>	<ul style="list-style-type: none"><li>• Mineral oil is the standard configuration, but if your fleet includes FR3 or any other natural or synthetic ester, the system can be configured for those fluids.</li><li>• NOTE: system cannot be configured for more than 1 fluid type.</li></ul>
<b>Supply Power</b>	<ul style="list-style-type: none"><li>• 120VAC is the standard, with 240VAC or 110VDC to 220VDC as options</li></ul>
<b>Hose connections</b>	<ul style="list-style-type: none"><li>• Drip-Less ISO Quick Connect Fittings are the standard, but if you prefer cam-lock, JIC, ISO-B or some other connection type, just let us know</li></ul>
<b>Cellular modem</b>	<ul style="list-style-type: none"><li>• KRIN USA utilizes the StrideLinX system for remote access. This option allows for remote communications and control through a VPN over the existing cellular networks, either AT&amp;T or Verizon. While StrideLinX is KRIN's standard, WE WILL GLADLY INSTALL THE CELLULAR MODEM THAT YOUR COMPANY is ALREADY USING.</li></ul>
<b>Trailer mounting</b>	<ul style="list-style-type: none"><li>• KRIN has been building trailer mounted equipment for use in substations for more than 30 years. The trailer conversion kit makes the mobile DGA system a DOT approved trailer with LED lighting, 2 inch ball hitch, safety chains and an MSO for licensing if needed. Additionally, we have so much experience with trailer mounted equipment that we can handle any request your fleet department might have including Pintle Hitch or 7-Pin round lighting connector.</li></ul>
<b>Tell us what you need</b>	<ul style="list-style-type: none"><li>• KRIN USA has been tailoring our systems to the needs of our customers for more than 30 years. If you have a request, (such as lighting, or antenna mast) you can confidently discuss it with us and we will gladly accommodate your needs.</li></ul>

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- True DGA analysis using the Vaisala Optimus DGA measurement technology
- NDIR light absorption-based measurement with patented gas extraction and leak detection systems



## STANDARD FEATURES

Sealed enclosure, NEMA 4 (IP66) rated with PROPER GROUNDING



- 1/2" INLET and OUTLET hoses, Up to 30ft length
- Drip-Less ISO Quick Connect Fittings

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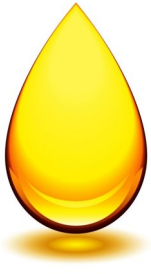
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- 120VAC Single Phase
- Maximum power consumption 500 watts (4.2 amps at 120 VAC)
- Entire system can operate on basic extension cord from a 15 or 20 amp outlet





Configuration for Mineral Oil or Esters like FR3

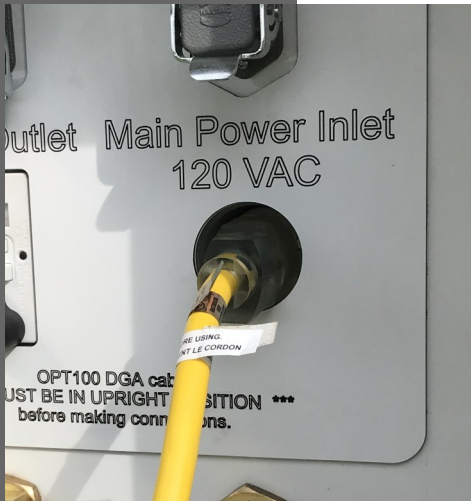
# SOME OPTIONS



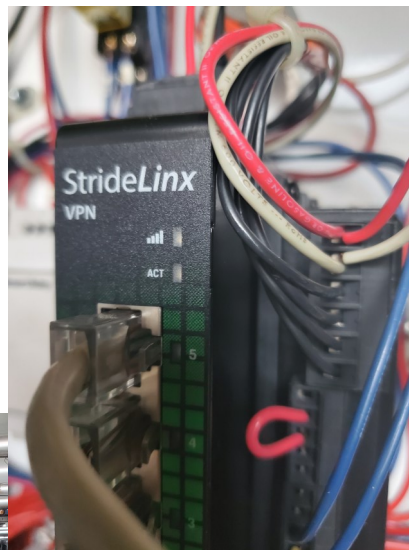
FR3 logo the trademark of Cargill, Incorporated



Drip-Less ISO Quick Connect Fittings are the standard, but if you prefer cam-lock, JIC, ISO-B or some other connection type, just let us know



120VAC is the standard, with 240VAC or 110VDC to 220VDC as options

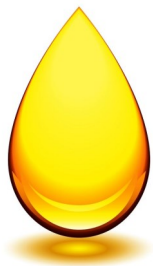


The StrideLinx system for remote access. This option allows for remote communications and control through a VPN over the either AT&T or Verizon.

IF YOU ALREADY HAVE A MODEM YOU PREFER, JUST LET US KNOW. We are happy to install your company preference.



The OPT100-MOB comes standard as a skid, however, the trailer conversion kit makes the mobile DGA system a DOT approved trailer with LED lighting, 2 inch ball hitch, safety chains and an MSO for licensing



# OPT100 Mobile DGA

## DGA Measurement specifications

Parameter <sup>1)</sup>	Range	Accuracy <sup>2) 3)</sup>	Repeatability <sup>3)</sup>
Methane (CH <sub>4</sub> )	0 ... 10 000 ppm <sub>v</sub>	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Ethane (C <sub>2</sub> H <sub>6</sub> )	0 ... 10 000 ppm <sub>v</sub>	±10 ppm or ±5 % of reading	10 ppm or 5 % of reading <sup>4)</sup>
Ethylene (C <sub>2</sub> H <sub>4</sub> )	0 ... 10 000 ppm <sub>v</sub>	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Acetylene (C <sub>2</sub> H <sub>2</sub> )	0 ... 5000 ppm <sub>v</sub>	±0.5 ppm or ±5 % of reading	1 ppm or 5 % of reading
Carbon monoxide (CO)	0 ... 10 000 ppm <sub>v</sub>	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Carbon dioxide (CO <sub>2</sub> )	0 ... 10 000 ppm <sub>v</sub>	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Hydrogen (H <sub>2</sub> )	0 ... 5000 ppm <sub>v</sub>	±15 ppm or ±10 % of reading	15 ppm or 10 % of reading
Moisture <sup>5)</sup> (H <sub>2</sub> O)	0 ... 100 ppm <sub>w</sub> <sup>6)</sup>	±2 ppm <sup>7)</sup> or ±10 % of reading	Included in accuracy
Total gas pressure	0 ... 2000 hPa	±10 hPa or ±2 % of reading	10 hPa or 5 % of reading

1) ppm values are defined as µl/l according to IEC 60567 standard conditions

2) Accuracy specified is the accuracy of the sensors during calibration gas measurements.

3) Whichever is greater.

4) Repeatability of ethane measurement is specified with averaging of five measurements.

5) Measured as relative saturation (%RS).

6) Upper range limited to saturation.

7) Calculated ppm value is based on average solubility of mineral oils.

## DGA Measurement operation

Measurement cycle duration	1 ... 1.5 h (typical)
Response time (T63)	One measurement cycle <sup>1)</sup>
Warm-up time until first measurement data available	Two measurement cycles
Initialization time to full accuracy	Two days
Data storage	At least 10 years
Expected operating life	> 15 years

1) Three cycles for ethane and hydrogen.

## DGA Field performance

Parameter	Typical variance to laboratory DGA <sup>1) 2)</sup>
Acetylene (C <sub>2</sub> H <sub>2</sub> )	±1 ppm or ±10 % of reading
Hydrogen (H <sub>2</sub> )	±15 ppm or ±15 % of reading
Other measured gases	±10 ppm or ±10 % of reading
Moisture <sup>5)</sup> (H <sub>2</sub> O)	±2 ppm or ±10 % of reading

1) Compared with gas chromatography result from an oil sample considering also laboratory uncertainty. Performance of the gas-in-oil measurement may also be affected by oil properties and other chemical compounds dissolved in oil.

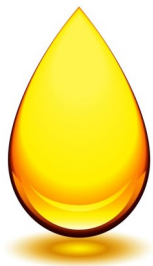
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## DGA Calculated parameters

Total dissolved combustible gases (TDCG)	Combined total of H <sub>2</sub> , CO, CH <sub>4</sub> , C <sub>2</sub> H <sub>6</sub> , C <sub>2</sub> H <sub>4</sub> , and C <sub>2</sub> H <sub>2</sub>
24 h average	Available for single gases, moisture, TDCG, and total gas pressure
Rate of change (ROC)	Available for single gases and TDCG for 24 h, 7 d, and 30 d periods
Gas ratios <sup>1)</sup>	Available ratios: CH <sub>4</sub> /H <sub>2</sub> C <sub>2</sub> H <sub>2</sub> /C <sub>2</sub> H <sub>4</sub> C <sub>2</sub> H <sub>2</sub> /CH <sub>4</sub> C <sub>2</sub> H <sub>6</sub> /C <sub>2</sub> H <sub>2</sub> C <sub>2</sub> H <sub>4</sub> /C <sub>2</sub> H <sub>6</sub> CO <sub>2</sub> /CO

*1) Calculated from 24 h average values. See standard IEC 60599.*

## DGA Outputs

### RS-485 interface

Supported protocols	Modbus RTU, DNP3 (optional feature)
Galvanic isolation	2 kV RMS, 1 min

### Ethernet interface

Supported protocols	Modbus TCP, HTTP, HTTPS, DNP3 (optional feature), IEC 61850 (optional feature)
Galvanic isolation	4 kV AC (50 Hz, 1 min)

### Relay outputs

Number of relays	3 pcs, normally open (NO) or normally closed (NC), user selectable
Trigger type	Gas alert with user selectable limits
Max. switching current	6 A (at 250 V AC) 2 A (at 24 V DC) 0.2 A (at 250 V DC)

### Auxiliary device interface

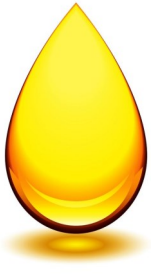
Maximum power	48 W
Voltage output	24 V DC

### User interface

Interface type	Web based user interface, can be operated with standard web browsers
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## Specifications with Trailer Kit Option

Overall Height	75 inches
Overall Width	70 inches
Overall Length	116 inches
Deck Dimensions	48 in Between fenders x 50.5 in Length
Axle	Dexter 3500 lb. rated torsion
GVWR	3500 lb.
Tires	205/75R14, Load Range D, 2040 lb. each
Hitch	2 inch ball type
Safety Chains	3/8 inch G80 x 36" each (2 provided)
Lighting	All LED in compliance with NHTSA requirements
NHTSA Compliance	NHTSA compliant by certification from the National Association of Trailer Manufacturers (NATM)



# OPT100 Mobile DGA

## Specifications of StrideLinx Cellular VPN Router

Series	Pro Industrial VPN
Internet Connectivity	Wired + 4G Global LTE and US LTE Verizon
Number of Ports	5
Communication Port and Connection Type (s)	(5) Ethernet Gigabit (RJ45)
Port Protocol (s)	MQTTs Client
Port Speed (s)	10/100/1000 Mbps auto-detect
Input Control	(1) digital input for local control
Operating Temperature	-20 to +65 deg C
Housing Material	Metal
IP Rating	IP20
Mounting	35mm DIN rail
External Power Requirement	12-24 VDC
Frequency Bands	<ul style="list-style-type: none"> <li>• LTE FDD: B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28</li> <li>• LTE TDD: B38, B39, B40, B41</li> <li>• WCDMA: B1, B2, B4, B5, B6, B8, B19</li> <li>• GSM: B2, B3, B5, B8</li> </ul>
Radio Specification	LTE FDD, LTE TDD, WCDMA, GSM
Firewall	SPI
Interface	Browser and mobile app
Mobile App Enabled	Android/iOS with mobile VPN
Data Cache	8GB (system and I/O data total)
Includes	10GB monthly bandwidth per StrideLinx company account
Subscription (s) Available	Cloud logging, notify, data top-up and service level agreement



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