

ECOLOG-PRO G

Operation Manual





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1 Safety Instructions

Intended Use

All electrical devices produced by ELPRO are intended for commercial use („business to business“).

Environmental Conditions

Temperature	Temperatures outside operation range may damage battery. Operation ranges: ECOLOG-PRO 1TGi, 1THGi, 1 TGe: 0°C ... +55°C
Water/Humidity	Limited protection against dust ingress and protected against splash water from any direction.
Pressure	Overpressure or vacuum can damage the device. Do not vacuum if used for airfreight.
Mechanical Force	Avoid violent knocks and blows.
IR radiation	Avoid exposure to IR radiation (heat and superheated steam can result in deformation of the case).
Microwave	Do not expose to microwave radiation (risk of battery explosion).
X-ray	Avoid long-term exposure to X-ray (risk of harm to device). Tests of short x-ray exposures as part of transportation processes (airports, customs) have been performed and documented (available at ELPRO).

Battery

Batteries can be changed. After removing (empty) batteries from the battery compartment, you must wait 20 seconds before inserting new batteries. Material safety data sheet according to provisions of directive 91/155/EEC and shipping information are available from ELPRO. Do not subject the batteries to mechanical stress nor dismantle them. The leaking battery fluid is highly corrosive and can generate severe heat when it comes into contact with moisture or it can ignite fire.

Safe Use

Ordinary people may install and operate the device without further safeguards.

Radio Equipment

This equipment emits radiated power: LTE Bands 1, 2, 3, 4, 5, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 28, 66
maximum power: 23 dBm

Note: For Taiwan the equipment emits radiated power: LTE Bands 3, 8 28.

ELPRO-BUCHS AG

Langaaulstrasse 45
9470 Buchs SG
Switzerland

2 System Overview

The ECOLOG_PRO G autonomous Mobile-IoT sensors with replaceable battery, communicate via public telecom network. The data logger family described in this document are used for stationary temperature and humidity monitoring. The measured values are transmitted via the cellular network to a monitoring software (ELPRO Cloud) which stores and analyzes the data, provides alerts if alarm limits are violated, and generates reports. The system provides superior visibility and transparency in meeting GxP requirements. The sensor-based monitoring software is easily accessible via a web browser and is also used to configure the devices.

Following pages cover key functionality of the wireless data logger (ECOLOG-PRO 1TGi / 1THGi / 1TGe). For more detailed software support, please visit our online knowledge base:

<https://www.elpro.cloud/support/elpro-cloud>



Monitoring Software



2.1 Brand: ELPRO

2.2 Model: ECOLOG-PRO G

2.3 ECOLOG-PRO G Types



ECOLOG-PRO 1TGi



ECOLOG-PRO 1THGi



ECOLOG-PRO 1TGe

Wireless realtime data logger, cellular data transmission (**NB-IoT** / LT-M).
Data logger has a display and internal memory so that all data is available.

Stationary Use
2-8 °C, 15-25 °C

internal temperature sensor	internal temperature / humidity sensor	internal & external temperature / sensor
Alkaline or Lithium iron sulfide batteries (replaceable)	Alkaline or Lithium iron sulfide batteries (replaceable)	Alkaline or Lithium iron sulfide batteries (replaceable)
Voltage: 2 x 1.5 Volts	Voltage: 2 x 1.5 Volts	Voltage: 2 x 1.5 Volts

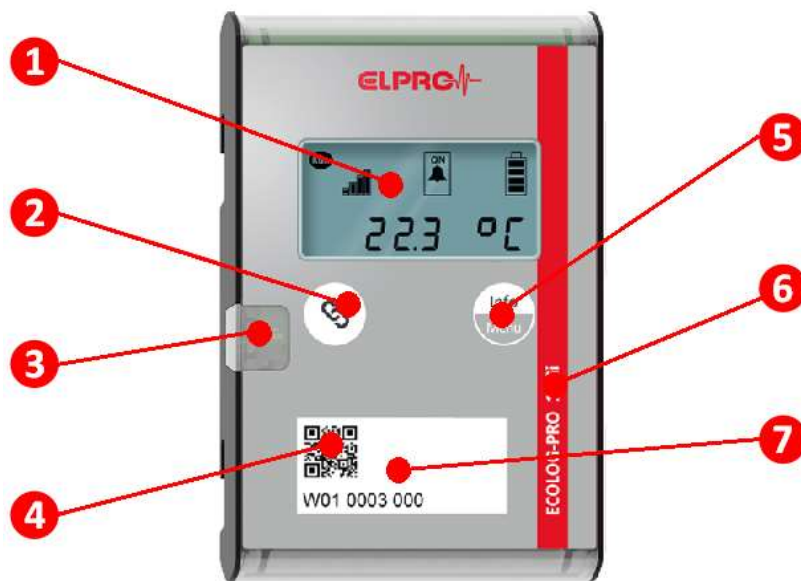
⇒ For technical specifications: please go to www.elpro.com/liberog

3 Functionality and Modes

Unless otherwise noted the following information applies equally to all three ECOLOG-PRO G models. After configuration of the data logger measured values for temperature and relative humidity (ECOLOG-PRO 1THGi only) are recorded, stored and evaluated with regard to the defined alarm criteria. The display shows the current mode.



3.1 Elements

3.1.1 Generic elements



1	Display
2	Pairing button ⇒ Press long (> 2 seconds) initiates communication with cloud ⇒ Note: after input of batteries the device goes into pairing mode
3	Light sensor ⓘ if light sensor is configured, make sure it is not dirty or covered
4	QR-Code containing Device ID and weblink to cloud
5	Info / Menu button ⇒ Press short (< 1 second) = <i>Info</i> (toggle display / menu) ⇒ Press long (> 2 seconds) = <i>Menu</i> (open menu / select menu entry)
6	Device type
7	Device ID and Start before date

3.1.3 Specific elements

Logger type	Element	
ECOLOG-PRO 1TGe	M8 connector for Pt100 probe ⇒ Compare chapter 5.2 - External Pt100 Probes for ECOLOG-PRO 1TGe 1TGe for available probes	
ECOLOG-PRO 1THGi	Slot for combined temperature / humidity sensor	

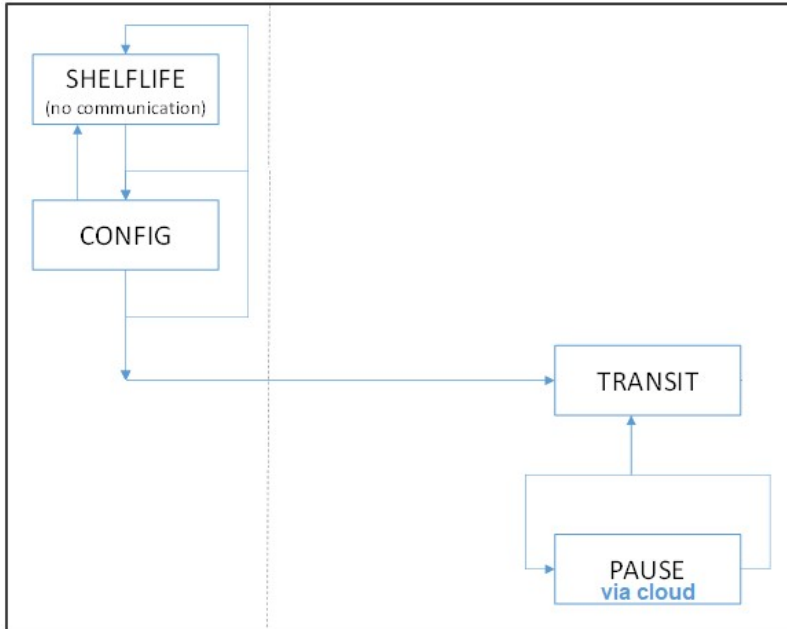
3.2 Display



Icon	Name	Description
1	No connection to Cloud	No connection to Cloud possible
2	Run	Measure and buffer Shown in <i>TRANSIT</i>
3	Communication strengths	Not visible if radio off / flight-mode
4	Warning	Warning (configurable) for - Temperature warning limit - Communication warning - Light warning - Low battery warning
5	Alarm On/Off	Shows if Alarm criteria are active or paused
6	Alarm Status	Display (configurable in future versions) OK or Alarm (pushed from Cloud) After excursion, Alarm will remain on display
7	Battery level	4 battery levels ⓘ Level one: approximately 30 days runtime remaining
8	8 Digit display	Various functions, e.g. - temperature - status - customer field (e.g. pallet no.)

3.3 States

ECOLOG-PRO G devices are mainly used to monitor temperature sensitive products through stationary use. The device has various configuration options available. The device states are visualized below and further described in subsequent chapters. The workflow options may vary depending from configuration and device type (e.g. single use).



3.3.1 Shelflife

When delivered, the device is in SHELFLIFE.

- In this state, the device is not transmitting and the display is switched off.
- By pressing the pairing button (>2 seconds) the battery level is visible and the configured device will activate communication

3.3.2 Configuration & Start

- By pressing the pairing button (>2 seconds) the device is pulling a configuration of the cloud and activate communication (see 3.3.1) and the **RUN** icon on the display indicates a successful start.
- ⓘ to reconfigure a device, delete the sensor in the cloud and reset the device

3.4 Menu

The ECOLOG-PRO G family feature a menu to operate the device:

- To enter the menu, press the Menu button for at least two seconds
- To switch between the menu options, press the Info button shortly
- To select a menu item, press the Menu button for at least two seconds. To confirm, a selected menu item blinks once.
 - ⓘ the menu item FCT.RESET has to be confirmed by pressing the Info button again shortly
- to leave the menu
 - wait for 5 seconds
 - press the Start/Stop button
 - select the last menu item EXIT

All menu items and its availability are described in the table below (now menu available in SHEFLIFE / SLEEP mode)

Menu item	State						
	CONFIG	START	DELAY	TRANSIT	PAUSE	ARRIVED	STOP
GET.CONFI trigger communication to pull (new) configuration from cloud	✓	✓					✓
PUSH.DATA trigger communication			✓	✓	✓	✓	✓
RADIO.ON Terminates flight mode (manually)	✓	✓	✓	✓	✓	✓	✓
RADIO.OFF The communication turns off <ul style="list-style-type: none"> • state changes from CONFIG / START to SHEFLIFE (configuration remains if device started again) • state changes from ARRIVED / STOP to SLEEP (device returns to STOP mode if started again) 	✓	✓				✓	✓
LAST COM show last communication time	✓	✓	✓	✓	✓	✓	✓
MARK set marker				✓	✓	✓	
FCT.RESET reset device and confirm by pressing <i>Info</i> button again ⇒ a reset device has to be paired again in cloud	✓	✓					✓

4 Further instructions

4.1 Pairing procedure



4.2 Calibration

Device Calibration is managed by elproCLOUD.

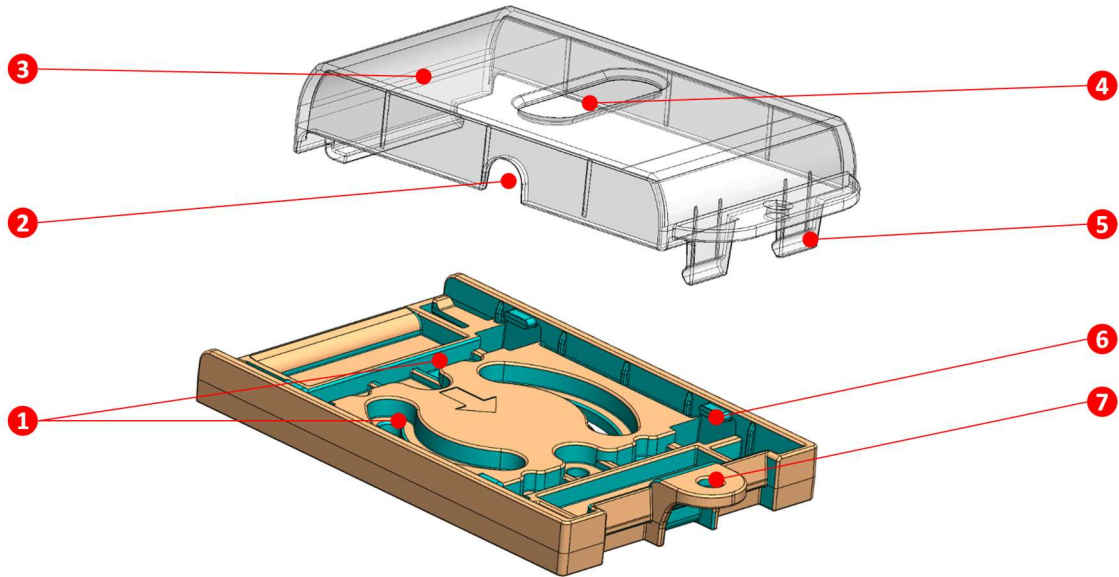
4.3 Expiry Date

The **Expiry Date** indicates the end of the runtime of the device. The date (MMM/yyyy) is visible via elproCLOUD. Runtime is calculated from the initial start date. Device stops automatically (logging and

5 Accessories

5.1 Bracket

ELPRO offers an optional bracket (**BRA_LIBERO Gx, article number 802286**) for mounting of ECOLOG-PRO xG data loggers if required. The bracket is made of solid ABS plastic to protect the data logger but not influence the communication. It consists of an upper and a lower part. The ECOLOG-PRO G is inserted into the lower holder from above.



1	Various mounting options <ul style="list-style-type: none"> • 360° screwing • Adhesive tape • Cable strap
2	Cable wire mouth
3	Transparent cover allows to read display
4	A button slot to operate the device
5	The A snapping mechanism to close the cover
6	Secure fixation for the ECOLOG-PRO G
7	Possibility to lock the cover

5.2 External Pt100 Probes for ECOLOG-PRO 1TGe

ECOLOG-PRO 1TGe can be used for different applications, depending on the sensor element. ELPRO offers standard probes for three main applications: Refrigerator & freezer monitoring:

- Freezer (-25 °C...-15°C, typical)
- Fridge (+2 °C...+8 °C)
- ambient (+15 °C...+25 °C) storage

❗ to ensure correct measurement values, do only use external sensor elements provided by ELPRO

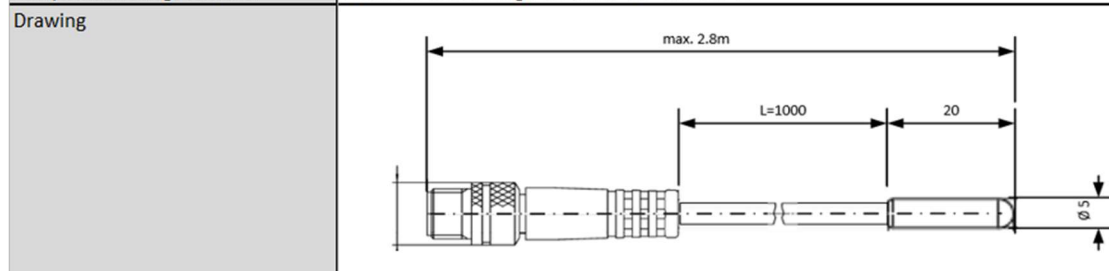
5.2.1 Freezer / fridge / ambient storage

For temperature monitoring of freezers, refrigerators or rooms, ELPRO offers two waterproof silicon Pt100 probes with different cable lengths as standard articles:



PRO_PT100_P20D5_PLA1_M8 (part number 802290)

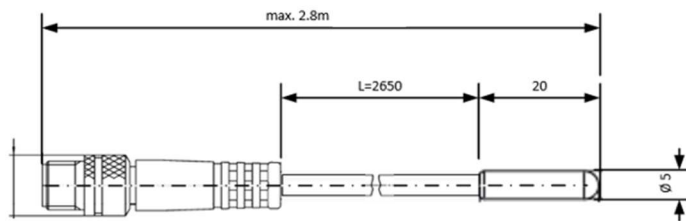
Note	Cable with mounted M8 plug (male). Waterproof
Probe length	2 cm
Probe diameter	5 mm
Temperature range of probe	-50 °C...+105 °C
- Temperature range Class A	-30 °C...+105 °C
- Temperature range Class B	-50 °C...+105 °C
Cable length	1 m
Cable diameter	4.0 mm
Litz wire	4x AWG 24
Cable material	Silicon
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C



PRO_PT100_P20D5_PLA2.65_M8 (part number 802291)

Note	Cable with mounted M8 plug (male). Waterproof
Probe length	2 cm
Probe diameter	5 mm
Temperature range of probe	-50 °C...+105 °C
- Temperature range Class A	-30 °C...+105 °C
- Temperature range Class B	-50 °C...+105 °C
Cable length	2.65 m
Cable diameter	4.0 mm
Litz wire	4x AWG 24
Cable material	Silicon
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C

Drawing



5.3 Extension of sensor cables

An extension cable with two M8 connectors at a length of 1m is also available to attach the data logger and the probe.

ATTENTION:

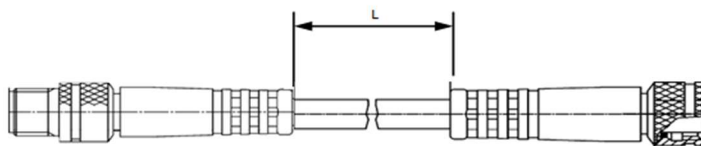
Total cable length (including sensor and cable tail on the data logger) must not exceed 3 m!



ECA_PLA_1M_M8 (part number 802282)

Note	M8 plugs on both ends (male, female)
Probe length	n.a.
Probe diameter	n.a.
Temperature range of probe	n.a.
- Temperature range Class A	n.a.
- Temperature range Class B	n.a.
Cable length	1 m
Cable diameter	3.5 mm
Litz wire	4x AWG 28
Cable material	PVC
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C

Drawing



5.4 M8 connector incl. mounting service on Pt100 probe

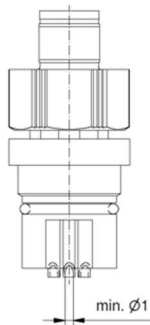
ELPRO offers a mounting service, adding an M8 connector to a Pt100 temperature sensor in order to use any 4-wire Pt100 probe in combination with ECOLOG-PRO 1TGe.



CTR_M8_SER (part number 802289)

Note	M8 connector incl. mounting on any 4-wire Pt100 temperature probe
Probe length	depends on the selected probe
Probe diameter	depends on the selected probe
Temperature range of probe	depends on the selected probe
- Temperature range Class A	n/a
- Temperature range Class B	n/a
Cable length	depends on the selected probe
Cable diameter	depends on the selected probe
Litz wire	must be 4-wire
Cable material	depends on the selected probe
Cable color	depends on the selected probe
Temperature range of cable	depends on the selected probe

Drawing



6 Disposal

a) Device



Electronic devices are recyclable and do not belong in the household waste. Dispose of the product at the end of its service life in accordance with applicable laws. Remove any batteries and dispose of them separately from the product.

b) Batteries



You are legally obliged to dispose of all used batteries according to applicable laws; disposal via household waste is prohibited. Batteries are marked with the adjacent symbol, under which is printed the chemical symbol for the heavy metal (Cd = cadmium, Hg = mercury, Pb = lead). This indicates the battery contains hazardous material. You can dispose of used batteries at collection points in your local community. Please help protect our environment and dispose of batteries properly.

7 Declaration of Conformity

7.1 EU Declaration



EU Konformitätserklärung Déclaration UE de conformité EU Declaration of conformity

Hersteller Fabricant Manufacturer	ELPRO-BUCHS AG
Adresse Adresse postale Postal address	Langgäulstrasse 45
PLZ Code postal Postcode	9470
Stadt Ville City	Buchs
Land Pays Country	Schweiz Suisse Switzerland
Telefon Téléphone Phone	T +41 81 552 08 08
E-Mail E-mail E-mail	swiss@elpro.com
Produktnamen Noms du produit Product names	LIBERO GE, LIBERO GS, LIBERO GL, LIBERO GH, LIBERO GF, LIBERO GFext, ECOLOG-PRO 1TGI, ECOLOG-PRO 1THGi, ECOLOG-PRO 1TGe
Produkt Nr. No de produit Product no.	802325, 802326, 802327, 802328, 802331, 802387, 802332, 802333, 802386

Beschreibung | Description | Description:

LIBERO Gx und ECOLOG-PRO 1T(H)Gi sind Geräte zur kontinuierlichen Temperatur- oder Feuchtigkeitsüberwachung mit internem Funkmodul für das zellulare Funknetz. LIBERO GE wird betrieben mit externem Pt100 Fühler, bis zu einer Kabellänge von 3m. | LIBERO Gx et ECOLOG-PRO 1T(H)Gi sont des appareils pour la surveillance en continu de température ou de l'humidité avec un module radio interne pour le réseau radio cellulaire. LIBERO GE fonctionne avec une sonde externe Pt100, longueur maximale du câble 3m. | LIBERO Gx and ECOLOG-PRO 1T(H)Gi are devices for continuous temperature or humidity monitoring including an internal radio module for the cellular network. LIBERO GE is operated with an external Pt100 probe, maximum cable length 3m.

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union. | L'objet de la déclaration décrit ci-dessus est conforme à la législation d'harmonisation de l'Union applicable. | The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Funkanlagen - Richtlinie 2014/53/EU | Directive sur l'équipement radio 2014/53/UE | Radio Equipment Directive 2014/53/EU
RoHS - Richtlinie 2011/65/EU | Directive RoHS 2011/65/UE | RoHS Directive 2011/65/EU

Harmonisierte Normen und Spezifikationen | Normes harmonisées et spécifications | Harmonized standards and specifications:

Elektromagnetische Verträglichkeit Compatibilité électromagnétique Electromagnetic compatibility	EN 301 489-01:2019 (v2.2.3) EN 301 489-52:2021 (v1.2.1) EN 61326-1:2013
Funk Radio Radio	EN 301 908-1:2019 (v13.1.1)
Elektrische Sicherheit Sécurité électrique Electrical security	EN 62368-1:2014 + AC 2015 + A11:2017

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. | La présente déclaration de conformité est établie sous la seule responsabilité du fabricant. | This declaration of conformity is issued under the sole responsibility of the manufacturer.

Buchs, den 11. Februar 2022
Buchs, le 11 février 2022
Buchs, February 11, 2022

ELPRO-BUCHS AG


Dirk Neumann
Leiter der Entwicklung
Chef du développement
Head of Development

we prove it





7.2 FCC/ISED Regulatory notices



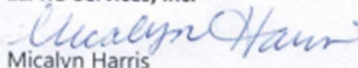
**Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information**

Unique Identifiers	LIBERO GS (Part number: 802326) LIBERO GL (802327) LIBERO GE (802325) LIBERO GH (802328) LIBERO GF (802331) LIBERO GFext (802387) ECOLOG-PRO 1TGi (802332) ECOLOG-PRO 1THGi (802333) ECOLOG-PRO 1TGe (802386)
Responsible Party –U.S. Contact Information	ELPRO Services, Inc.
Address	2335 State Route 821, Marietta, OH 45750
Postal code	45750
City	Marietta
Country	USA
Phone	+1 740 568 9900
E-mail	usa@elpro.com

FCC Compliance Statement: 47 CFR FCC Part 15 Subpart B

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation

Marietta, February 17th 2022

ELPRO Services, Inc.

Micalyn Harris
CEO



7.3 NCC Regulatory notices

In order to reduce the effects of electromagnetic waves, please use the appropriate MPE standard value: 0.9 mW/cm^2 , measured value: 0.012239 mW/cm^2 , recommended for use with the antenna at least 20 cm from the human body.

減少電磁波影響，請妥適使用

電波功率密度 MPE 標準值： 0.9 mW/cm^2 ，送測產品實測值： 0.012239 mW/cm^2 ，建議使用時設備天線至少距離人體20公分。

8 Revision History

Date	Version	Author	Description
04. March 2021	01	SIKAUF	Initial Version

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SWITZERLAND



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For local agencies see:
www.elpro.com