

APPLICATION NOTE

SMARTLITE

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1. SCOPE

The purpose of this document is to introduce a new product: SmartLite and provide the basic information on its applications, set-up and spec.

The SmartLite is a 2-part product for liquids applications, covering a range of up to 10m/32.80ft and includes 2 SPDT relays.

2. INTRODUCTION

SmartLite is a non-contact, ultrasonic, continuous-level measurement instrument that is able to provide accurate measurement for liquids applications, while automatically compensating for changes in temperature and other environmental conditions.

SmartLite is designed for applications such as process tanks, storage vessels, open air piles, and more.

SmartLite is a four-wire, low-voltage device, and is available with a customized graphic LCD display. Smartlite has two major components, the main control unit and the sensor (connected via a cable).

3. PRODUCT'S SPECIFICATIONS

The SmartLite product has the following specifications;

1. Measuring Range - up to 10m/32.80ft.
2. Application - liquid only
3. Accuracy - 0.25% of measuring range
4. Dead Zone – 0.6m
5. Power Supply – DC or AC
6. Relay options – 2 SPDT relays
7. Communication/interface – 4-20mA, RS232
8. Display – graphic LCD

4. APPROVALS



Smartlite is compliant with the following approvals:

Control unit

CE – EMC

FM – 3810 (unclassified)

NI: Class I, II, III, Division 2 Group A B C D E F G

25KHz sensors

ATEX - II 1G EEx ia IIC T4.

ATEX - EEx m (pending)

FM: Class I Division I,II,II Group A B C D E F G

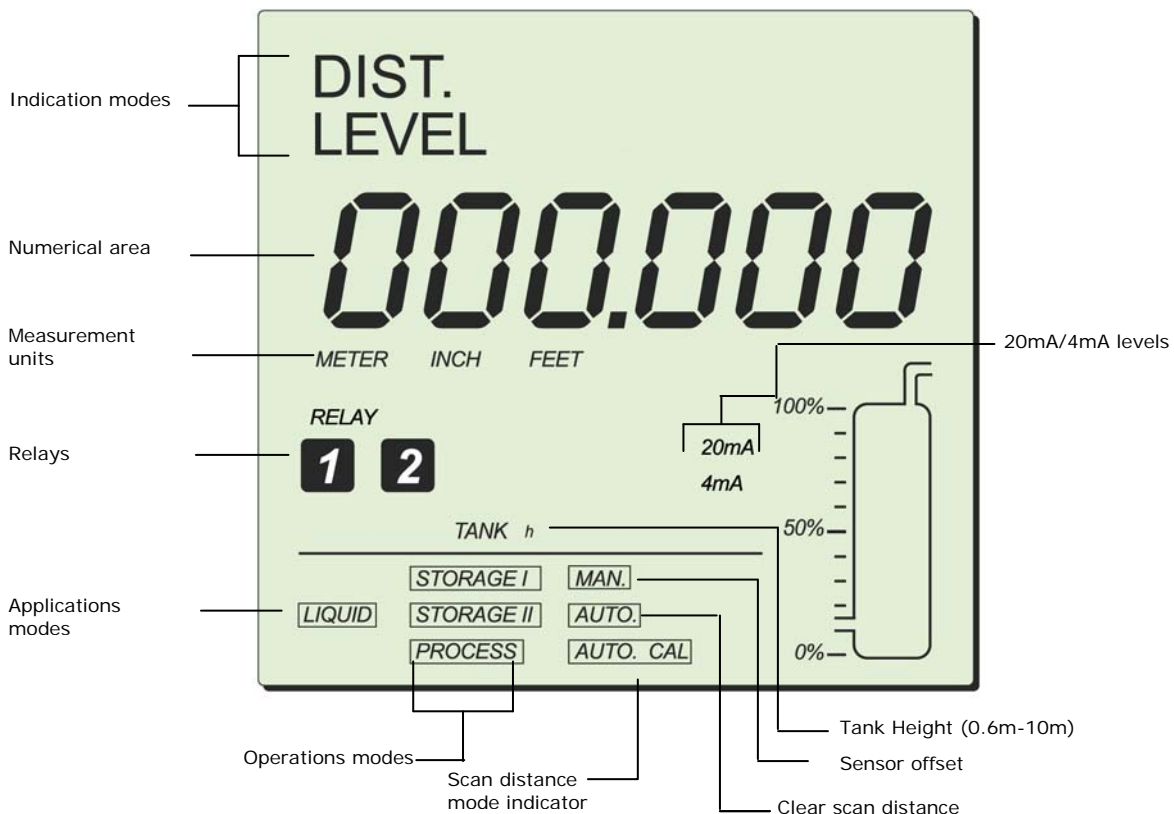
FM: DIP,Class I , II, III, Division 2 Group A B C D E F G

NI: Class I, II, III, Division 2 Group A B C D F G

5. SOFTWARE DEFINITIONS

This chapter describes SmartLite's main menu options.

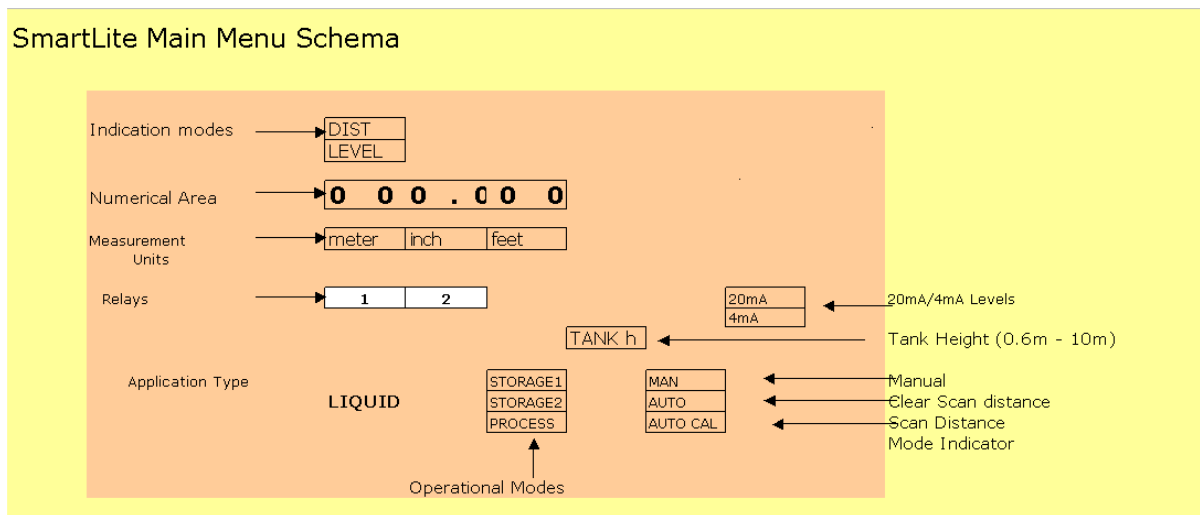
5.1.1 Main menu display



5.1.2 Main configuration menu:

The main menu allows the following options:

- **Indication mode:** Level or Distance.
- **Numerical area**
- **Measurement units:** Meter, Feet and Inch.
- **4-20mA:** Level/Distance.
- **Relays setting:** For Open/Close as either Level or Distance.
- **Tank h:** Distance from the sensor's surface to the tank's bottom.
- **Application type:** Level
- **Operation mode:** Process, Storage I and storage II.
- **Manual:** sensor offset
- **Scan distance:** For programming interfering signals.

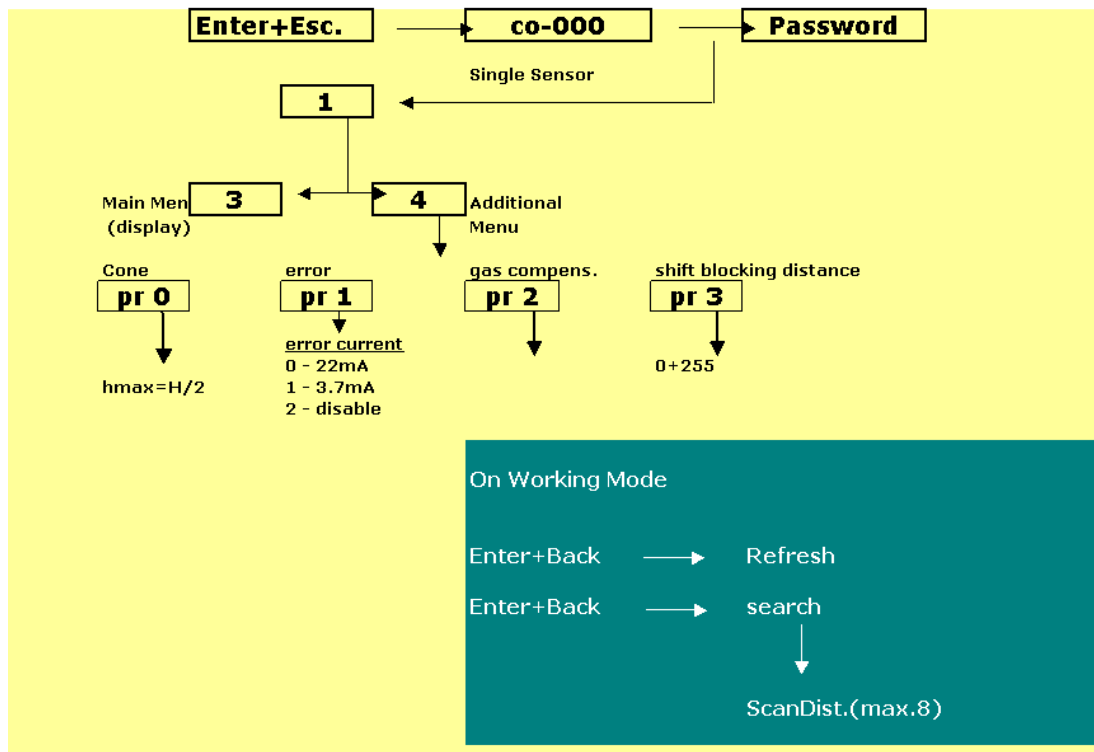


5.1.3 Additional Menu

The additional menu allows the following options:

- **Pr. 0:** Cone's height
- **Pr. 1:** Disable/Enable error signals
- **Pr. 2:** gas compensation
- **Pr. 3:** shift blocking distance

SmartLite Additional Menu Schema



6. RELAY CONFIGURATION

This chapter specifies SmartLite's relay configurations.







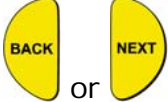




You can set up to 2 relay switches for SmartLite. Each relay enables you to define open and close values for the switch, for functions such as triggering an alarm.

The relay values function as follows:

- Open value: (Default = 0) The relay opens if the level measured in the tank is higher than the entered open value.
- Close value: (Default = 0) The relay closes if the level measured in the tank is lower than the entered close value.

Accessing the relay configuration is done by selecting the RELAY icon.

For each relay, the user should configure opened and closed values as shown below:

	Press/Action	Display	Explanation
ŷ	 to enter relay setup.		With the RELAY icon flashing.
ŷ	 to enter open mode.	 and 	Enters the open values mode of the relay setup. The relay number flashes throughout the process of defining its values.
ŷ	 or 		Displays 0 or the previously entered relay value.
ŷ	Press  on the far-right digit to save the value.	 and 	Repeat the previous steps to set an open/close values for each relay to be used.

During display, relays icon will represent whether a relay is in open or closed mode.

7. TROUBLESHOOTING SMARTLITE

This chapter describes the error messages appeared when an illegal value is entered for a SmartLite function, or when an option is selected that is not applicable for this model.

7.1.1 Displayed errors

Error	Description
<i>Err. 1</i>	The value entered is greater than the maximum permitted value.
<i>Err. 2</i>	The value entered is less than the minimum permitted value.
<i>Err. 3</i>	The Close value entered for a relay is greater than the Open value entered for the relay.
<i>Err. 4</i>	The value entered for 4 mA is equal to the value entered for 20 mA .
<i>Err. 5</i>	The selected function/option is not applicable for the model in use.
<i>Err. 7</i>	The value entered for the 20 mA , 4 mA or Relay function is greater than the tank height.
<i>Err. 8</i>	The value entered for the tank height is greater than the maximum value supported by the SmartScan model in use.
<i>Err. 9</i>	The measurement unit selected is not applicable for the model in use.
<i>Err. 10</i>	The Open value entered for the relay is greater than the Close value entered for the relay (in Distance mode).
<i>EE EEE</i>	The value entered for the tank height is smaller than the actual height, as measured by SmartLite.
<i>AUTO.</i>	If displayed at the base of the display screen, this indicates a problem with the current procedure, for example, acoustic interference.

7.1.2 22mA/3.7mA Signal Error Messages

The following list of messages will appear on the display and coincides with a 22mA or 3.7mA (depends on your set-up) analog current error output signal (the default is set to 22mA):

Error	Description
EE EEE	Tank is empty or echo is lost
FF FFF	The sensor is located near the dead zone

8. SUMMARY OF BENEFITS

- Supplied with 4–20mA, RS232 and 2 SPDT relays
- Light equipment
- Simple to install and easy to handle
- No calibration or maintenance required
- 0.25% accuracy of measured range
- Resolution: 1 mm (0.04 inch)
- Approved for classified locations (ATEX, FM)
- Cost effective solution