MOHR™ EFP-HL

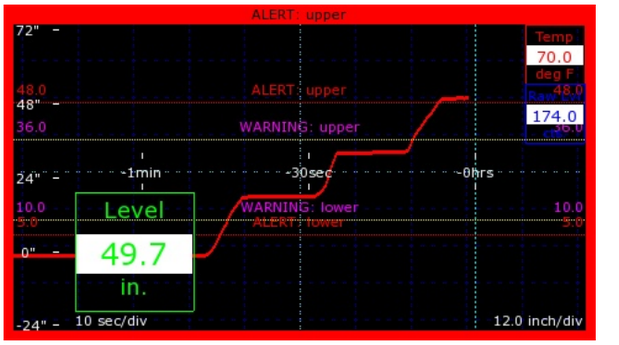
Guided Ultra-Wideband (UWB) Radar Tank Level Indicator (TLI) System

Next-generation liquid level measurement system designed for nuclear applications

EFP-HL ruggedized portable liquid level signal processor.

EFP System Key Features

- *Industry's most accurate liquid level measurements*
- *System designed specifically for nuclear applications*
- *Characterize boiling / frothing environments*
- *Electronics can be >300 m (1000 ft.) from probe*
- *In-situ instrument calibration*
- *Inline probe signal-path integrity monitoring*
- *Ideal for use with MOHR SFP-1 spent fuel pool probe*



EFP-HL real-time level history graph with level alarms.

MOHR EFP Series Guided UWB Radar sensors utilize MOHR's Electric Field Perturbation technology and are the industry's most accurate liquid level / TLI sensors. With thousands of hours of reactor system operation, EFP Series instruments are ideal for nuclear tank level monitoring applications.

Features and Benefits

Unmatched Precision and Accuracy

EFP signal processors offer precision and accuracy of approximately 0.1 mm (0.004 in.) and 1 mm (0.04 in.), respectively. Real-world TLI system accuracy is better than ± 12.5 mm (0.5 in.) for most industrial applications.

Accurate Measurements in Boiling Media

Characterize boiling / frothing environments that can fool legacy TDR / guided-radar systems. EFP signal processors are designed to accurately measure liquid level in accident conditions.

Rugged Portability, Flexible Power Options

Portable battery-powered instrument operates for more than 6 h from replaceable internal battery and uses external DC power for extended monitoring. Meets applicable MIL-SPEC and NRC seismic, shock, vibration, environmental, and EMC requirements.

Intuitive, Informative Interface

- Graphical user interface reports instantaneous level in units of length and/or calibrated volume.
- Level history graph lets the operator quickly evaluate recent trends in tank level stored in flash memory.

Multiple Interface Options

- Ethernet, USB, 802.11 b/g/n WiFi
- Remote monitoring and configuration over Ethernet
- Optional thermocouple signal processor

MOHR SFP-1 Spent Fuel Pool Probe Assembly

- Configurable lengths of 1.5 - 10+ m (5 - 32+ ft.)
- MIL-SPEC hardened, exceeds Seismic Category I
- >20 y life at 210°C (410°F) using standard materials
- Excellent long-term radiation resistance
- EFP-IL/HL interconnect cable >300 m (>1000 ft.)
- Relative accuracy 2.5 mm (0.1 in.) at 300 m (typ.)
- Absolute accuracy ± 25 mm (1 in.) at 300 m (typ.)
- Compatible with EFP system in-situ calibration

Specifications

Level Measurement System
Advanced liquid level measurement capabilities:
Very low dielectric measurement capability (ε_r > 1.1)
Liquid/liquid interface, boiling, and froth detection
Level measurement precision: 0.1 mm (0.004 in.)
Accuracy:
Absolute measurements: 1 mm (0.04 in., max.)*
Real-world accuracy: better than 12.5 mm (0.5 in., typ.)**
Response time: ~2 ms (min.)
Level alarms: multiple individually-configurable alarms
Level alarm hysteresis: user-configurable
Level display: length or calibrated volume units
Inline TDR signal path integrity verification
Raw backscatter data storage, post-processing capability
* Laboratory setting, excluding surface tension effects.
** Ruggedized probe in industrial settting, including surface tension effects.

Connectivity Options
USB host/client, 10/100 Ethernet
802.11 b/g/n WiFi (WPA2 256-bit AES encryption)

Thermocouple Signal Processor Option
K-type (Chromel/Alumel), cold-junction compensated
Range: -270ºC to +1372ºC
Resolution: 0.25ºC
Accuracy: ±2ºC (-200ºC to +700ºC)

RTD Signal Processor Option
Uses 100Ω to 1kΩ platinum RTDs (PT100 to PT1000)
Compatible with 2-, 3-, and 4-wire sensor connections
Range: -200ºC to +550ºC (typ.)
Resolution: 0.03125°C (may vary due to RTD nonlinearity)
Accuracy: 0.5°C (0.05% of full scale) max.

Display
Color LED-BL 4.3 in. (10.9 cm) WQVGA TFT-LCD, > 600 cd/m^2

Data Storage
Standard 2 GB flash memory storage

Power System
AC Power: 90-264 VAC, 47-63 Hz using AC adapter
Battery Power: Internal swappable NiMH battery*
Battery Life: >6h (typical use)
Battery Charging: <1 h low-battery, <4 h fully-discharged
* Seamless transfer to backup power upon loss of external power. Upon total loss of power, resumes normal operation without user intervention following restoration of power.

Environmental and Mechanical
Operating / Non-Operating Temp.: -10ºC to +55ºC / -20ºC to +85ºC
Dimensions: 27.0 (H) x 24.6 (W) x 17.4 (L) cm (10.6 x 9.7 x 6.9 in.)
Weight: 3.2 kg (7.0 lbs., est.)
IP67-rated case (dust-proof, immersible, crush-proof)

Regulatory
CE Complies with all applicable EU directives, as specified by the Declaration of Conformity supplied with the instrument.

Designed to meet the following standards:
MIL-PRF-28800F (Class 2) Environmental, Shock/Vibration
MIL-STD-461F EMC MIL-STD-810G 511.5 Exp. Atm.,
EPRI TR-102323-R3 EMC, Seismic Category I criteria.

Designed to meet relevant requirements for Naval shipboard liquid level indicating equipment per MIL-L-23886C and ASTM F 2044-00.

Complies with Canadian ICES-003.

MOHR™
Test and Measurement Solutions for Industry™

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