ABLE INSTRUMENTS & CONTROLS

# MAGNETROL

## RADAR SOLUTIONS FOR LEVEL MEASUREMENT

MAGNETROL LEVEL MATTERS

AMETEK LEVEL MEASUREMENT SOLUTIONS

## A COMPLETE FAMILY OF SOLUTIONS

- Non-contact, maintenance-free measurement
- Measurement unaffected by medium properties like density and conductivity, in bulk solids also unaffected by filling noise and dust
- No calibration required – GWR requires only a simple configuration
- Freely adjustable measuring range
- Use in high temperatures up to +450°C/+842°F
- Low cost of ownership – competitively priced, inexpensive to install

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# RADAR SOLUTIONS FOR LEVEL MEASUREMENT

**ABLE's valued partner Magnetrol® is recognized as the global leader in level solutions, and in many process control industries, the name "Magnetrol" has become synonymous with radar measurement.**

The use of radar level measurement devices is growing because of their accuracy, user focus on safety, and low maintenance requirements. Low total cost of ownership, ease of use, higher accuracy, and competitive pricing make radar level measurements an attractive value proposition for users.

## RADAR – THE KEY ADVANTAGES

- **Superior Accuracy**: Radar level transmitters reach unmatched accuracy by utilising modern signal processing techniques to produce very precise and reliable level measurements. These transmitters excel in giving exact data, optimising process control, and assuring operational efficiency even in hostile settings characterised by severe temperatures, pressure differentials, or vapours.
- **Non-Contact Measurement**: The ability of radar level transmitters to measure levels without making physical contact with the substance is its defining characteristic. This non-intrusive technology reduces the possibility of contamination, corrosion, or sensor damage.
- **Versatility Across Materials**: Radar-level transmitters are intended to work with a wide range of materials, including liquids, slurries, granules, and powders. Their measuring precision is unaffected by changes in density, viscosity, or dielectric constant.
- **Range Capability**: Using radar technology, these transmitters have outstanding measuring ranges, allowing for exact level detection in towering tanks or deep vessels. They easily penetrate vapours, foam, or dust, ensuring accurate readings even under the most difficult operating circumstances.

ABLE Instruments & Controls Ltd are **Magnetrol's exclusive representative** for sales and service in the UK and Ireland

# GUIDED WAVE RADAR VS. NON-CONTACT RADAR

Two of the most commonly used types of radar transmitters on the market today are Guided Wave Radar and Non-Contact (pulse) Radar. Guided Wave Radar (GWR) uses a probe to guide high frequency, electromagnetic waves as they travel down from a transmitter to the media being measured. Non-Contacting Radar sends down an electromagnetic wave through the air, it then reflects off the media and returns back to the device.

## GUIDED WAVE RADAR

Guided Radar level transmitters work with high-frequency radar pulses which are guided along a probe. As the pluses impact the medium surface, the characteristic impedance changes and part of the emitted pulse is reflected. The time between pulse launching and receiving is measured and analysed by the instrument and constitutes a direct measure for the distance between the process connection and the product surface. The sensor can output the analysed level as a continuous measurement reading through its analogue output, RS-485 communications output, or optional switching output depending on output options required.

GWR technology also has the ability to measure a liquid interface. When an interface level of two immiscible layers is to be measured, the first fluid should have a lower dielectric. The reflection from this first low dielectric fluid is weak. This permits the rest of the signal to detect the interface between these two fluids. Less than 5% of the signal is reflected back to the transmitter for a fluid with a dielectric of 2. A typical application would be an oil and water interface, in which the oil being of a lighter specific gravity and lower dielectric than water would be measured as the top liquid level and the water would be the interface level.

## ECLIPSE 706 GWR – NO OTHER GWR CAN ECLIPSE THIS PERFORMANCE

The Eclipse 706 is a loop-powered, 24 VDC level transmitter with best-in-class Signal-to-Noise Ratio. Its advanced diagnostics, including pro-active build-up detection, automated echo curve capture and SIL2 certification make it the clear market leader.

## SUPERIOR SIGNAL PERFORMANCE

The Eclipse Model 706's innovative front-end circuitry achieves a higher transmit pulse amplitude and improved receiver sensitivity, resulting in superior signal-to-noise ratio. This assures precise, dependable control for every level application, including extremely low dielectric media, extended measuring ranges, and punishing conditions where foaming, boiling or flashing can occur.

## PROBE CONFIGURATIONS FOR EVERY APPLICATION

The Eclipse Model 706 provides the total range of GWR measurement solutions. An extensive line of dedicated coaxial and single-element probes delivers accurate, reliable level control. The Model 706 is suitable for applications ranging from routine water storage to process media, exhibiting corrosive vapours, foam, steam, coating and build-up, surface agitation, bubbling or boiling, high fill/empty rates, low level and varying dielectric or specific gravity conditions.

## OVERFILL CAPABLE PROBES

Magnetrol offers the only GWR transmitter on the market with overfill-capable probes. Unlike other GWR transmitters, the Model 706 measures true level to within specification all the way up to the process flange. Coaxial and single rod overfill capable probes can be installed in various configurations and can bring peace of mind in those applications where the risk of flooding exists.

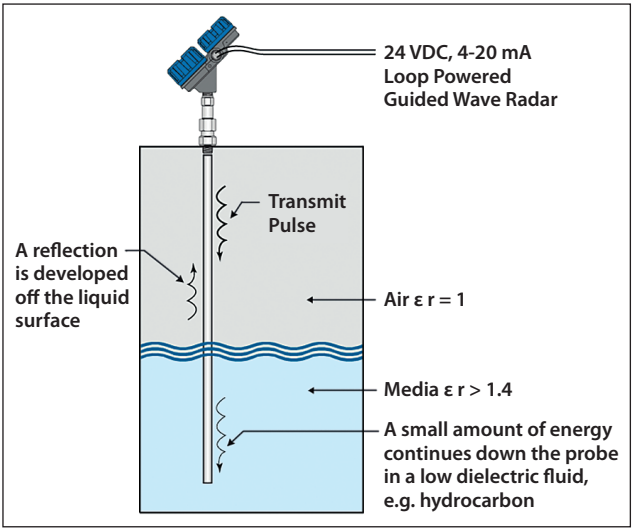
## ADVANCED DIAGNOSTICS

The Eclipse Model 706 conveys critical real-time waveform and trend data with outstanding ease of use.

- ***4-button user interface and graphical LCD display provide enhanced depth of data, indicating on-screen waveforms and troubleshooting tips***
- ***Programming options can be set to automatically capture waveform data by time or by event occurrence***
- ***Conforms to NAMUR NE 107 standards***
- ***User friendly/intuitive DTM***

MAGNETROL® LEVEL MATTERS

AMETEK® LEVEL MEASUREMENT SOLUTIONS




## NON-CONTACT RADAR

Non-contact or air firing radar, accurately and reliably measures a wide range of media in a broad array of process conditions, from calm product surfaces and water-based media to turbulent surfaces and aggressive hydrocarbon media. As a non-contact device, air firing radar is not susceptible to the complications that can arise whenever a probe is in contact with the process media, such as coating by viscous media or corrosive attack due to aggressive chemicals.

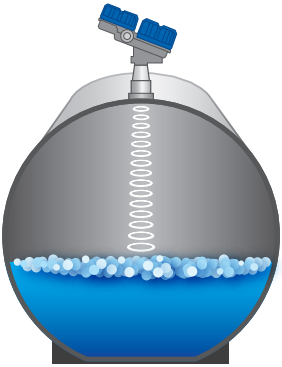
The greater the measuring range, the more the radar proves itself to be the economical solution, given the cost of extended probe lengths. Radar is virtually unaffected by temperatures, pressures, the presence of vapours, or air movement within a vessel's free space. Changes in specific gravity, conductivity, or dielectric constants also have no effect on measurement accuracy. As a 100% electronic instrument, the absence of moving parts translates into minimal maintenance costs; and, being a two-wire, loop-powered device, power requirements and installation are vastly simplified. There are two types of non-contact radar transmitters:

- ***Frequency Modulated Continuous Wave (FMCW)***
- ***Pulse Burst***

# THE PULSAR MODEL R80 – SMARTER ON EVERY LEVEL

The Pulsar® Model R80 radar transmitter is the latest generation of Magnetrol® 24 VDC, loop-powered, non-contact radar transmitters. Utilizing FMCW radar technology, this transmitter offers enhanced performance, proactive diagnostics, and various configuration wizards to bring simplicity to an often-complex technology.

FMCW devices transmit a continuous signal with constantly changing frequency down toward the liquid. The detected difference in frequencies between the transmitted signal and the return echo is a function of the distance. Level is then calculated by factoring in tank height and other configuration information. FMCW captures its process variable information in the frequency domain, which supports more accurate signal conversion. The main advantage of FMCW is that it utilises higher receiving sensitivity and higher-strength signals over pulse systems, allowing it to perform better in demanding situations where they may be turbulence, foam or aggressive vapours.



The Pulsar Model R80 is the first 80 GHz FMCW Non-Contact Radar transmitter from Magnetrol. More importantly, it is the transmitter with the innovations today's process industries need. Its powerful microprocessor offers significant memory for exciting useful features, including volumetric capability with nine common tank shapes and a 30-point strapping table for uncommonly shaped vessels and data logging that can be programmed to save data/ echo curves on event- or time-based conditions.

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