

*process measurement solutions*



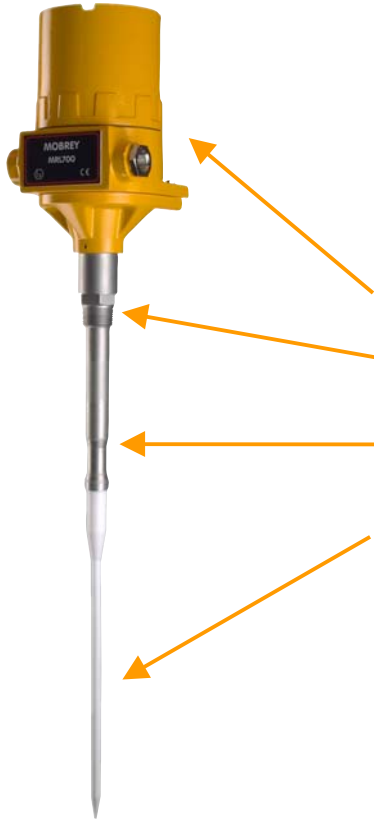
# Mobrey MRL700 transmitter

non-contacting radar level transmitter

IP293



# MRL700 delivers ... premium performance at the right price



Level and contents measurement using microwaves - radar - is not new. What is new is the MRL700, delivering the performance normally associated with more expensive systems at prices in line with traditional level transmitters. Installed above the medium to be measured, which may be either a liquid, slurry or dry product, the transmitter antenna emits a continuous microwave signal ramping between 9.55GHz and 10.55GHz. The antenna receives a reflected echo and sophisticated microprocessor controlled electronics compute the level to an accuracy of +/- 3mm.

- ▶ Tough IP66 / IP67 metal enclosure housing 4 wire 24Vdc electronics.
- ▶ 1" threaded mounting for low cost installation  
Flange mounting also available
- ▶ 316 Stainless steel wetside for excellent corrosion resistance  
Hastelloy C wetside also available
- ▶ PTFE antenna allows use in almost all applications  
Horn antennas and Process seal versions available
- ▶ CE Meets all of the essential requirements of the R&TTE 1999/05/EU Directive
- ▶ Certified for use in hazardous areas:-  
ATEX II 1/2G (EExd)    ATEX II 3G (EExn)    FM & CSA approval also

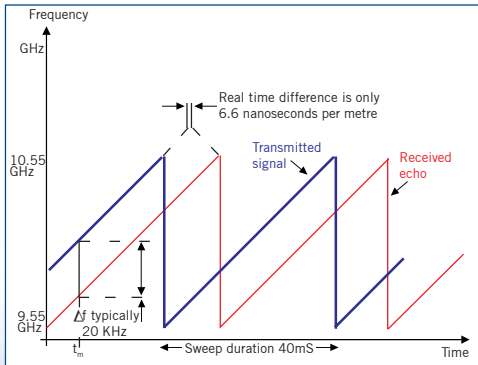
MRL700 is an FMCW (Frequency Modulated Continuous Wave) based transmitter, far more powerful than pulsed systems and thus able to perform reliably in all manner of applications. The transmitter electronics does not attempt to measure the time taken for the echo to return as this is such a short period and errors are bound to occur.

Instead, a continuous frequency sweep is transmitted and the frequency difference between transmit and return signals is measured, the distance travelled being proportional to this easily measured frequency difference.

### User friendly commissioning and programming

Once installed, the MRL700 is very easy to commission. Connect the Mobrey Hand Held Programmer or the Mobrey Windows based programme on a PC (the optional RS232 kit is required for this), and simply enter the relevant application dimensions. The MRL700 will compute level, distance or contents as required and transmit this as a 4-20mA signal. If tuning is needed, perhaps to eliminate echoes from a stirrer or to deal with low dielectric liquids at extreme range, this can be programmed in the same way.

MRL700 is used on these 17m fly-ash silos



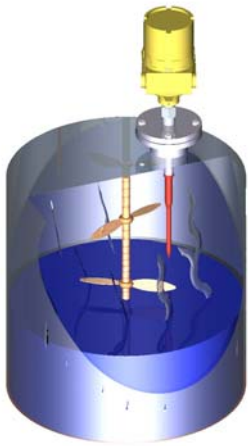
MRL700 process seal model



HHP connected to transmitter



# MRL700 performs ... reliably and repeatably

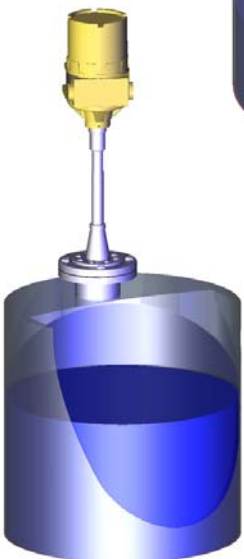


10GHz Microwave FMCW technology

- ▶ Selective echo recognition software
- ▶ Tight beam angle
- ▶ See through foams



- ▶ Hygienic process seal
- ▶ Maintains vessel integrity



- ▶ Liquids and solids
- ▶ Dielectric down to 1.4
- ▶ Horn antenna
- ▶ Range to 35m



## Vaporous liquids and difficult ullage conditions

Many liquids are best measured and controlled using non-contacting instrumentation, avoiding problems of corrosion and errors due to changing liquid density. Such liquids also tend to create difficult in-tank conditions, such as vapours, blanket layers and mists.

The Mobrey MRL700 radar level transmitter is ideal in such applications as the continuous high frequency signal punches through the vapour space to give a reliable and accurate reading liquid level or contents, operating over a pressure range from full vacuum to +40b.

## Agitated liquids

When a liquid needs to be continually stirred or agitated as part of the process, surface conditions can become difficult. Turbulence and foams affect echo size and as the liquid level falls, agitator blades become exposed and create false echoes. Specialised software is needed to extract and reliably track the correct echo.

MRL700 has comprehensive and time proven software to deal with these issues, and is easily set-up using either the Hand Held Programmer or the Windows based PC programme.

## Non-invasive measurement

Where hygienic requirements are paramount it is preferable to make measurements from outside of the process vessel, avoiding any contact with the medium and maintaining vessel integrity at all times.

MRL700 can be supplied with an integral process seal which is fitted between the vessel and the transmitter. The seal, available in several materials which are hygienic and transparent to microwaves, maintains vessel integrity even if the transmitter is removed for maintenance.

## Low dielectric liquids and solids at long ranges

Propane has a dielectric of 1.6, Flyash is 1.5. The echo size is directly proportional to dielectric constant and the smaller the dielectric constant, the smaller the echo. Propane will reflect just 1.3% of the transmitted signal.

MRL700 transmits a continuous microwave signal with sufficient power to get an acceptable echo from low dielectric liquids or solids at ranges up to 35m, and has unique software to ensure the level is tracked right down to the bottom of the tank.

For particularly difficult applications, a horn antenna can be specified in place of the standard rod antenna.

MRL700 on an acetic acid tank

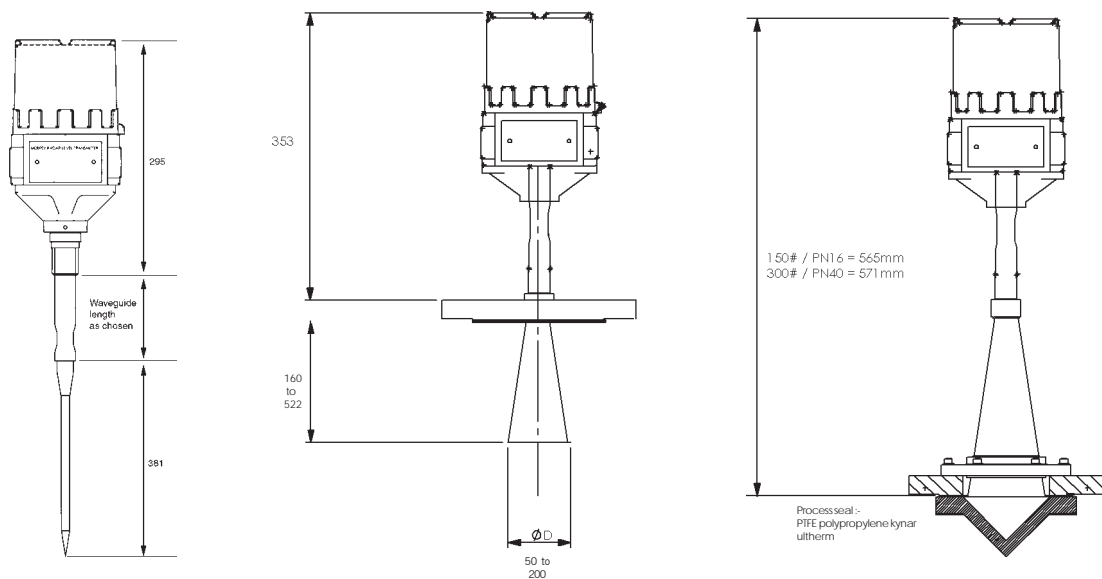


## Technical specification

Measuring range	0 to 35m
Material dielectric	> 1.4
Resolution	+/- 3mm
Reference accuracy	+/- 3mm
Operating temperature	See below
Ambient temperature	-40°C to +70°C
Operating pressure	See below
Power supply	4 wire 24V dc (18 to 30V dc)
Power consumption	12W max
Cable	4 core shielded
Connection	1 x M20; 1 x 3/4"NPT
Output	4 - 20mA into 750 Ohm
Communications	Socket for programmer
Option	RS232 kit
Option	HART kit
Mounting	1" thread or flange

Wetside material	316SS / PTFE
Enclosure	Al. Alloy; Painted
Rating	IP66 / IP67
Weight	3.0kg (threaded)
Hand Held Programmer	164mm x 88mm x 39mm 260g
Display	4 line Dot matrix LCD
CE marking	EMC: Emissions EN55022 Class A EMC: Immunity EN50082-1
Hazardous area	ATEX: II 1/2G; II 3G FM/CSA: CLI, Div 1 Gr.B,C,D CLII, III, Div 1 Gr.E,F,G CLI, Div 2 Gr.A,B,C,D CLII, III Div 2 Gr.F,G
Radio frequency	R&TTE Directive 1999/05/EU FCC: Part 15 & Part 90 type acceptance

**Model types:** Refer to Solartron Mobrey for full ordering information



### MRL700R

Operating temp -40 to +150°C  
High temp version N/A  
Operating pressure Full Vac to 40b

### MRL700H

-40 to +200°C  
-40 to +480°C  
Full Vac to 40b

### MRL700S

-40 to +232°C  
N/A  
Full Vac to 23b

## Programming options

- MRL-HHP Hand held programmer and lead. Connects to socket in standard MRL700 transmitter
  - MRL-PCK Retrofit kit comprising additional RS232 pcb, connection lead for PC and Windows programme on CD
  - MRL-HTK Retrofit kit comprising additional HART comms pcb.
- Note : RS232 and HART options cannot be used together

### Solartron Mobrey Limited

Authorised distributor: **Ward Industries Limited**

Tel: +44 (0)1933 624963  
Fax: +44 (0)1933 625458  
Email: sales@wardindustries.co.uk  
Web: www.wardindustries.co.uk

  
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