MONITOR

Practical solutions...at every level!

Flexar® Guided Wave Radar

FEATURES & ADVANTAGES

- **Real-time continuous output** provides immediate level measurements.
- **TDR technology (Time Domain Reflectometry)** is unaffected by dust, bulk density and temperature.
- **Focused / directed energy field** prevents undesired detection of obstructions within the vessel.
- **No moving parts** to wear which leads to long operational life.
- **Dual-compartment enclosure** allows separation of access between the wiring and the setup/display areas. Each area has its own access cover.
- **Measuring range up to 100 feet (30m)** for powder & bulk solids in bins and silos. Can work up to 200 feet (60m) for many liquid applications (Dependent on target material dielectric constant).

Practical Tip

Flexar's capability to penetrate dust clouds makes it suitable for applications using pneumatic conveying such as flour, cement and fly ash.

PRINCIPLE OF OPERATION

Flexar® smart guided wave radar sensors operate using TDR (time domain reflectometry) principles. In the application of TDR for process level measurement, radar pulses are focused down to the material surface by the unit's wave guide (a heavy duty cable). The time-of-flight of the pulse and its reflection back to the instrument electronics is directly related to the empty distance in the vessel and the material level. The output from the electronics is continuously updated as the level of the material surface changes.

Flexar® units are suited for almost any application, can operate with process temperatures up to 392° F (200°C), can be provided with a variety of process connections and can work reliably with materials having a wide range of bulk densities and dielectric constants. Flexar sensor technology has also been proven in many difficult applications including those where dust levels make it difficult for other technologies to perform reliably, especially at longer ranges.

PRACTICAL APPLICATIONS

- Use when instantaneous level measurement is required.
- Ideal for dusty storage conditions.
- A properly mounted Flexar® can prevent reflections of internal structures (For example support beams, let-down ladders, clean-out cages).
- Perfectly suited for a variety of liquid level measurement applications.
- Typical applications include, but are not limited to: Grains, Feeds, Flour, Coal Dust, Bulk Chemicals, Carbon Black, Aggregates, Cement, Fly Ash, Lime, Silica, Plastic Pellets, PVC Powders, Liquids and Oils.

For more detailed information, please contact a Monitor representative or visit Monitor's website at http://www.monitortech.com/product_c_f_flexar.shtml

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OPTIONS

- Three models to choose from:
  - Smart RS-485 version for use with **HMI²** or **SiloTrack™**.
  - Analog output version for use as a standalone transmitter.
  - Smart RS-485 + passive analog 4-20mA.
- Choice of operating power: universal 100-240 VAC or 24 VAC/DC.
- Flexible or rigid probe variations.
- Assortment of process flange connections.
- Available in ordinary location and $CSA_{US/C}$ hazardous location.
- Split architecture configuration for high temperature or high vibration locations.
- Selection of operator interfaces: **HMI²** local operator interface control console or **SiloTrack™** inventory management software.
- Optional independent analog & relay outputs are offered for RS-485 systems using an Auxiliary Output Enclosure (AOE).

Scan this with a smartphone QR-Code app for more product details.

SPECIFICATIONS

More product specifications can be found on Monitor's Web site.

Power Requirements:	100-240VAC (+10%/- 15%); 9VA; 50/60Hz or 24VAC/VDC (+10%/- 15%); 9VA/W
Process Temperature:	-40° F to 300° F (-40° C to 149° C)
Ordinary Loc. Units:	-20°F to +300°F (-30°C to +150°C);
Hazardous Loc. Units:	-20°F to +392°F (-30°C to +200°C)
Ambient Temperature:	-5°F to +120°F (-20°C to +50°C)
Measurement Range††:	
Single Cable 0.16" (4mm):	150ft (45mm)
Single Cable 0.31" (8mm):	100ft (30mm)
Twin Cable 0.16" (4mm):	200ft (60mm)
Single Rod 0.38" (10mm):	10ft (3mm)
Accuracy:	
Direct Mode:	
Solids:	± 0.8" (20mm)
Liquids:	< 20ft (6m): ± 0.2" (5mm)
TBF:	≥ 20ft (6m): ± 0.2" (5mm) + 0.02% of distance measured
Repeatability:	± 0.04" (1mm)
Resolution:	± 0.012" (0.3mm)
Approvals:	
Integral Electronics Only:	
Ordinary Location:	CE Mark
Hazardous Location:	$CSA_{US/C}$ Class I, II & III; Groups B-G

Min. Dielectric Constant†:	
Direct Mode:	Twin cable ≥ 1.8; Single cable/Rod ≥ 2.1
TBF Mode:	All probe styles ≥ 1.4
Process Mounting Connection:	
Single Cable/Rod Only:	1-1/2" NPT; G 1-1/2 (1-1/2" BSP)
All Probe Styles:	2" ANSI 150lb. flange; DN50PN40 flange
Probe Styles:	
Single Cable:	316SS; 0.16" (4mm), 0.31" (8mm)
Single Rod:	316SS; 0.38" (10mm) diameter
Twin Cable:	316SS; Two 0.16" (4mm) cables, FEP spacers
Min. Separation From Objects:	
Single Cable/Rod:	12" (300mm)
Twin Cable:	4" (100mm)
Dead Zones:	
Single Cable/Rod:	
Dielectric = 80 (water):	Top = 15.75" (400mm); Bottom = 0.8" (20mm)
Dielectric = 2.4 (oil):	Top = 19.7" (500mm); Bottom = 3.9" (100mm)
Twin Cable:	
Dielectric = 80 (water):	Top = 9.8" (250mm); Bottom = 0.8" (20mm)
Dielectric = 2.4 (oil):	Top = 13.0" (330mm); Bottom = 3.9" (100mm)
Enclosure Rating:	ENCLOSURE TYPE 4X, IP66
Enclosure Weight:	18lb (8kg) without probe - ordinary location; 20lb (9kg) without probe - hazardous location

† Overall measuring range affects the minimum dielectric constant that can be measured.
†† Maximum measuring range is also limited by the dielectric constant of the material being measured.

ORDERING INFORMATION

Flexar® Guided Wave Radar [1]

Select	Electronics Type
1	Integral electronics
2	Remote electronics [4]

Select	Output
1	"Smart" RS-485 output [2]
2	4-20mA analog output
3	"Smart" RS-485 + passive analog 4-20mA [7]

Select	Probe Type [6]
1	Single Cable, SS, 0.16" (4mm) Diameter
2	Single Cable, SS, 0.31" (8mm) Diameter
3	Twin Cable, SS, 0.16" (4mm) Diameter
4	Single Rod, SS, 0.38" (10mm) Diameter

Select	Approvals
1	Ordinary location
2	Hazardous location CSA US/C (North America) [4]

Select	Operating Voltage
1	Universal high voltage (100-240VAC)
2	Low voltage (24VAC/VDC)

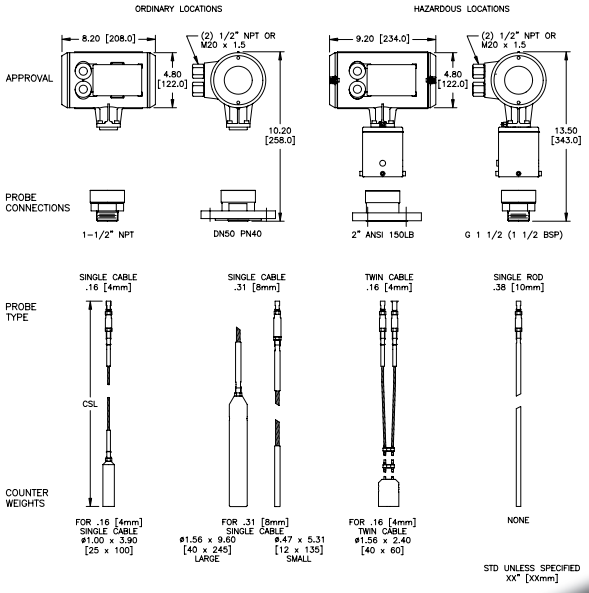
Select	Probe Connection
1	1-1/2" NPT Threaded, SS[3]
2	G 1-1/2 (1-1/2" BSP) Threaded, SS[3]
3	2" ANSI 150lb SS Flange, SS
4	DN50PN40 DIN Flange, SS

Select	Counterweights
1	For 0.16" (4mm) single cable
2	For 0.31" (8mm) single cable, large CW
3	For 0.31" (8mm) single cable, small CW
4	For 0.16" (4mm) twin cable
5	None required (rods only)

16 - 8 X X X - X X X X Order Number

MECHANICALS

DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS



Information on this sheet is subject to change without notice.

ACCESSORIES [1]:

Part #	Description
16-3060	Flange, 2" ANSI 150 LB, 1-1/2 NPT [5], Carbon Steel, Powder
16-3062	Flange, DN50 PN40, 1-1/2 NPT [5], Carbon Steel, Powder
16-3064	Flange, 4" ANSI 150 LB, 1-1/2 NPT [5], Carbon Steel, Powder
16-3066	Flange, DN100 PN40, 1-1/2 NPT [5], Carbon Steel, Powder
16-3070	Flange, K-style, Flat, 1 1/2 NPT [5], Aluminum
16-3072	Flange, K-style, 10 Deg, 1 1/2 NPT [5], Aluminum
R0514-22001 [8]	Belden® 9322 RS-485 Communication Cable (Overall Beldfoil® Shield - 100% Coverage, PVC Insulation, Chrome PVC Jacket, Nominal OD is .201" [5.10mm])

2-Year Limited Warranty

NOTES: **1** Consult Monitor Technologies factory for all applications prior to pricing and issuing quotation.
2 For use with SiloTrack V3.5 and higher **3** Single Cable/Rod probes only
4 Hazardous Location approval of Remote Electronics version is not available.
5 Flange accessories include a 1-1/2" NPT center hole for attaching to Flexar® units with 1-1/2" NPT threaded process connection.
6 Customer specified probe length is from the bottom of the process connection to the bottom of the counterweight (end of rod on single rod probe).
7 Requires transmitter power supply on receiving end of Passive 4-20mA output.
8 R0514-22001 cable is not for plenum installations. Consult local electrical codes and verify compliance before installing.

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