A Higher Level of Performance

User Manual

Centurion

Guided Radar

CGR Modbus Interface Series

For more information, please visit >

www.hawkmeasure.com

Contents

Principle of Operation

Guided-wave technology sends the radar pulse down a probe to measure liquids & liquid interface (low to high dielectric layers).

The pulse hits the surface of the first layer (low dielectric layer) and is reflected back up the probe. The pulse continues to the second interface (high dielectric layer) and is then reflected back to the probe. The transit time for both layers is translated into a distance using time of fight and time expansion.

Function

The HAWK range of Guided Radar products are ideal for the measurement of liquids, sludge, powders and granules to a range of 18.5m for level and interface. This technology is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe.

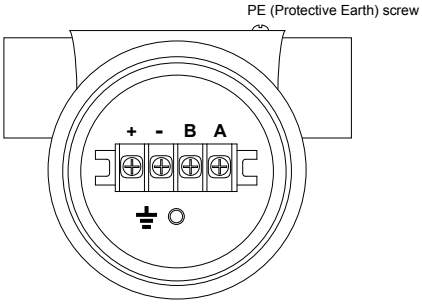
Primary Areas of Application

- Chemicals
- Petrochemicals
- Cement
- Building Aggregates
- Mining / Minerals
- Food & Beverages
- Oil & Gas
- Pharmaceutical
- Pulp & Paper
- Wastewater

Features

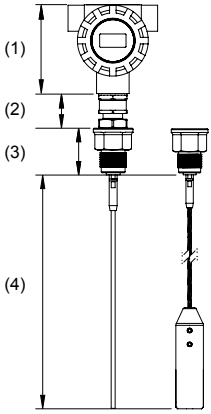
- Interface level measurement
- Up to 18.5m (60ft 8in) range
- Very short minimum range (150mm, 6")
- Simple setup
- Auto-Calibration to any dielectric ≥ 1.5
- Adjustable Sensitivity
- Precise & continuous accuracy
- 14-28VDC
- Modbus
- Protection class IP66, NEMA 4x
- Measures extremely low dielectric (1.5)
- Programmable fail safe mode

Wiring Terminal Compartment

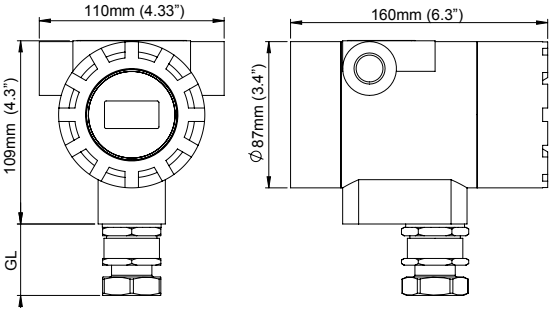


Dimensions - Reference

1	Housing
2	Barrier Gland / High Temp extension with Barrier Gland / End position with Barrier Gland
3	Threaded Connection / Flange
4	Probe Length

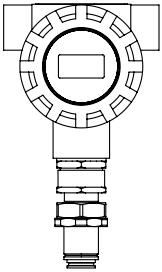


Dimensions Housing + Barrier Gland



Housing with Process Temperature option '2'. Visual reference only.

Approval Option XX

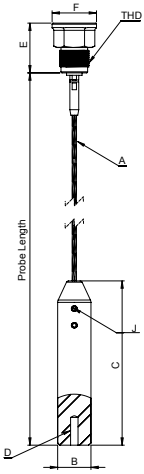


Barrier Gland Length (GL)			
Process Temperature Option*	Approval Option	GL	
		mm	in
1	XX	55	2.2
2	XX	105	4.1

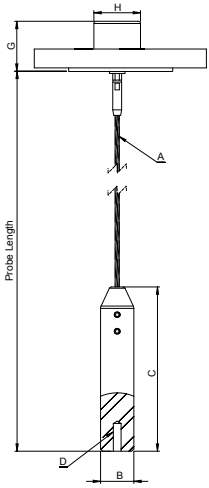
Dimensions - Probe Variants

A04 / A06 / A08 / J04 / J06 / J08

Threaded

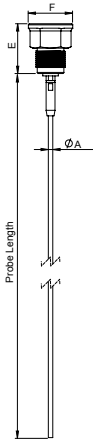


Welded Flange

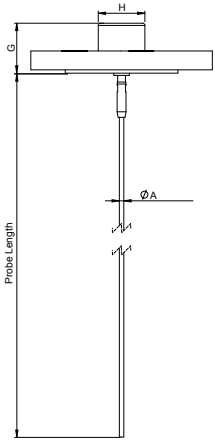


B04 / B06 / B08 / K04 / K06 / K08

Threaded



Welded Flange

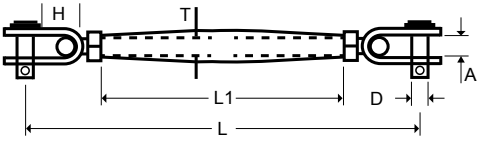


Probe / Cable Dimensions														
Probe Type	**THD BSP or NPT**	**A**		**B**		**C**		**E**		**F**		**D Internal Threads (A04, A06, A08 only)**	**J (Tightening Torque = 20Nm)**	
	in.	**mm**	**in.**	**mm**	**in.**	**mm**	**in.**	**mm**	**in.**	**mm**	**in.**		**Set Screw**	**Hex Key Size**
A04, B04, J04, K04	3/4	4	0.16	22	0.9	120	4.7	45	1.8	40	1.6	M10x1.25, 24mm deep	3x M8x1.25x12	4mm
A06, B06, J06, K06	1	6	0.24	28	1.1	150	5.9	45	1.8	40	1.6	M10x1.25, 24mm deep	3x M8x1.25x12	4mm
A08, B08, J08, K08	1-1/2	8	0.31	36	1.4	200	7.8	72	2.8	64	2.5	M10x1.25, 24mm deep	3x M10x1.5x18	5mm
	Welded Flange	**G**		**H**										
		mm	**in.**	**mm**	**in.**									
A04, B04, J04, K04		45	1.8	42	1.6									
A08, B08, J04, K04		72	2.8	70	2.7									

Cable Weight Tank Fastening Kit

The tank fastening kit (CGR-A0X-WL-SS) includes 2 eye bolts and 1 adjustable rigging lock.

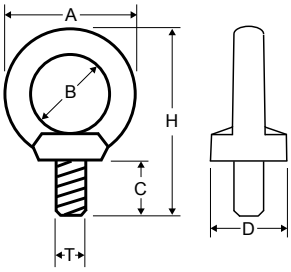
Rigging Lock



Dimensions	
T (thread)	M12
A	14mm (0.55")
D	12mm (0.47")
H	25mm (0.98")
L	252mm (9.9")
L1	150mm (5.9")

Recommended Working Load	983kg (1.05 ton)
Total Deformation Load	3750kg (4.13 ton)
Weight	576g (1.27lb)

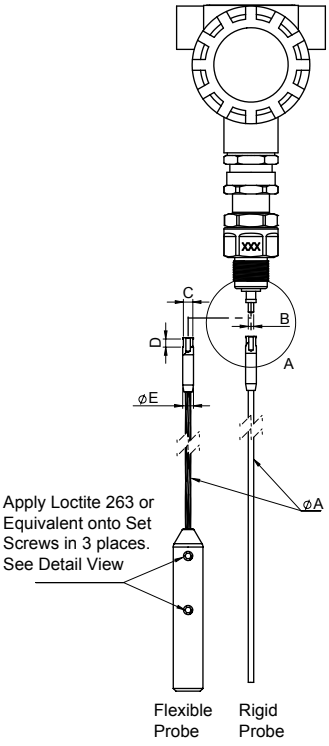
Eye Bolt

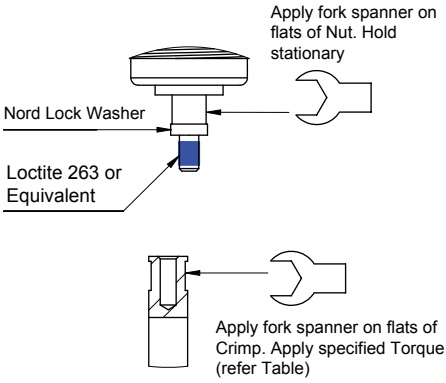


Dimensions	
T (thread)	M10
A	40mm (1.57")
B	25mm (0.98")
C	21mm (0.82")
D	20mm (0.79")
H	63mm (2.48")

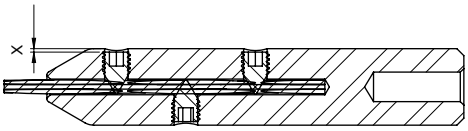
Recommended Working Load	675kg (0.74 ton)
Total Deformation Load	2600kg (2.87 ton)
Weight	60g (0.13lb)

Instructions for Assembling Detached Probe





Rope Weight



Note: Only Probes supplied by HAWK can be fitted in situ. Mounting of any other probe voids Hazardous Location Approval

Probe	Ø A(mm)	B(mm)	C(mm)	D(mm)	Ø E(mm)	T. Torque
J04, K04	4	M4	7	6	8	5 Nm
J06, K06	6	M6	10	6	11	10 Nm
J08, K08	8	M10	15	10	16	20 Nm

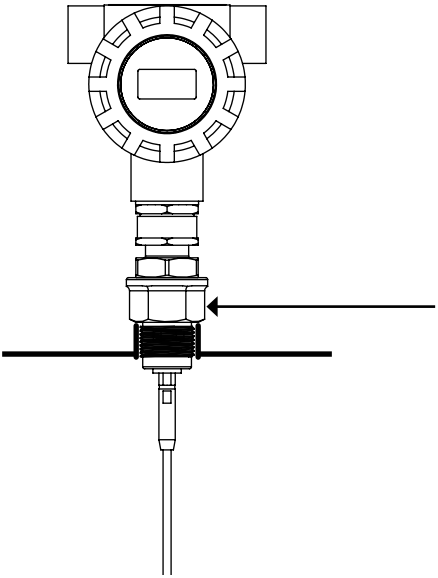
Set Screws on Rope Weight				
Probe	**Set Screw**	**Length**	**X**	**Torque**
J04, K04	3XM8X1.25	12mm	1mm	20 Nm
J06, K06	3XM8X1.25	12mm	3mm	20 Nm
J08, K08	3XM10X1.5	18mm	3mm	20 Nm

Mounting - Instruction for Rotating the Housing

There are specific rotation points which should be used while mounting the unit into place.

The Housing Compartment should never be used to rotate the device during mounting.

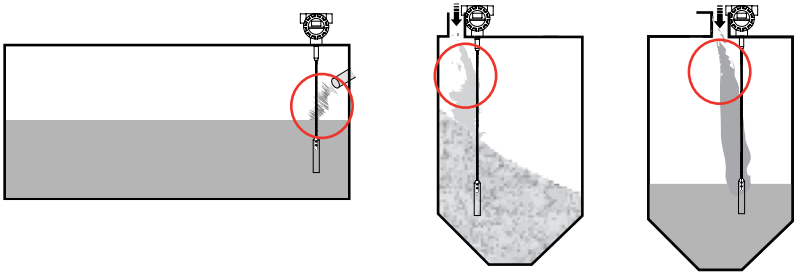
For rotating the housing after installation, see 'Rotating the Enclosure' section.



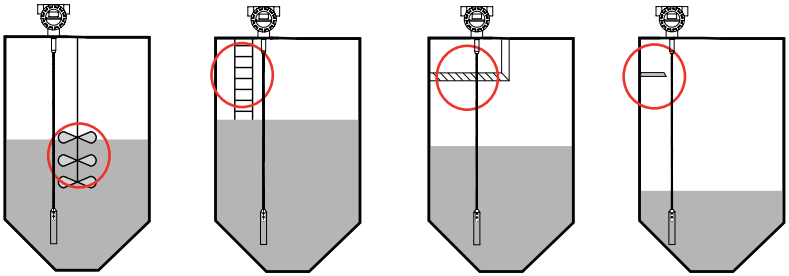
When Installing the CGR unit, use spanner or wrench ONLY at Process Fitting as indicated.

Placement Requirements

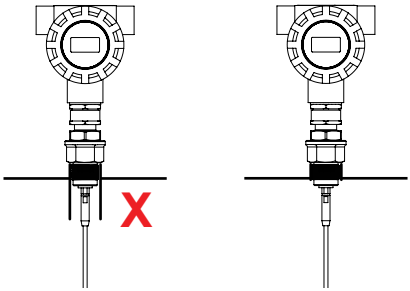
Do **NOT** mount near infeed



Do **NOT** mount over or adjacent to **any** obstacles



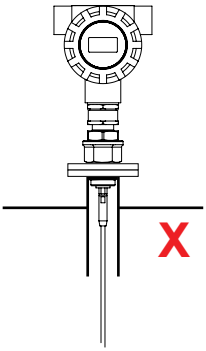
Nozzle / Socket Mounting



Nozzle / Socket should not protrude into vessel

Stand Pipe / Flanged Mounting

1



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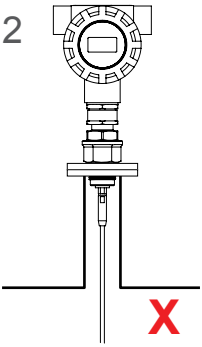
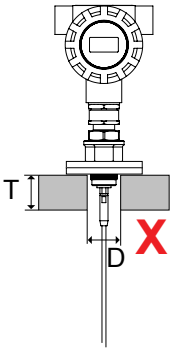


1. Stand pipes protruding into vessel may cause signal interference. Digitisation and / or Blanking Distance must be adjusted to avoid measurement issues

2. Long / narrow stand pipes may cause signal interference. Digitisation and / or Blanking Distance must be adjusted to avoid measurement issues

3



3. Roof Thickness (T) should not exceed Diameter (D) of cut away. Digitisation and / or Blanking Distance must be adjusted to avoid measurement issues

Mounting - Conductive Vessel

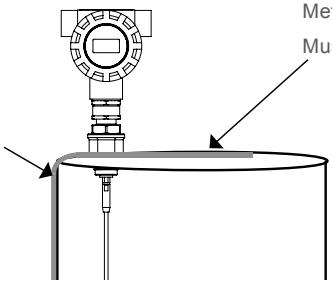
Unit performance is most optimized when there is a ground reference between the mounting (metal flange or thread) and the vessel. Metallic or metal reinforced vessels are ideal.

Mounting - Non Conductive Vessel

A non conductive vessel will require a conductive metal strip or equivalent connected to the metal flange or thread and running along side the vessel for at least the Probe insertion length. A conductive metal sheet (min 0.5m (8") should also be mounted on the roof and be in contact with metal thread or flange.

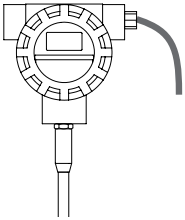
If a seal / gasket is used between the flange and the vessel ensure non coated / painted bolts are used to create ground reference with vessel.

Metallic strip connected to flange / mounting thread and running along side of non-metallic vessel



Metal Sheet (min 0.5m (8")
Must contact with metal thread / flange

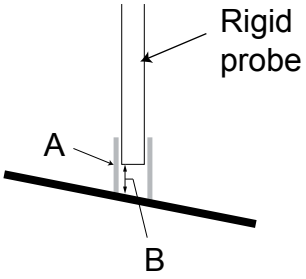
Gland Entry Wiring



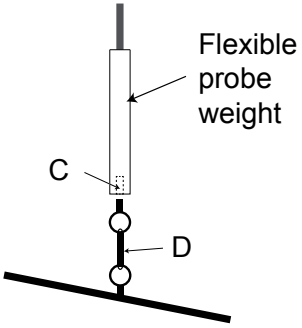
Wire at gland entry must angle down

Securing The End of The Probe

- Securing the end of rigid probes is not required unless there is risk of excessive lateral forces.
- Securing flexible cable weight via M10 thread on base of weight is recommended to prevent movement.



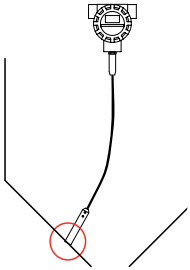
A	Metal socket
B	Floor clearance (min 50mm, 2")

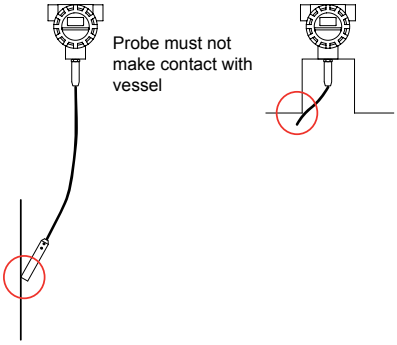


C	M10 thread
D	Cable Weight Fastening Kit or appropriate O ring & link secured to vessel floor.

Flexible Probe Movement

- Avoid mounting adjacent to internal structures (eg ladders, walkways). The cable must not make contact with any part of the vessel
- Take into consideration that material forces may push probe laterally. Secure Cable Weight if required.





Adjusting Probe Length

Rigid Probes

Cut rigid probes to appropriate length. After adjustment, you must change the 'ProbeLength' Parameter in 'Advanced' menu to represent the new length (password 222).

Flexible Probes

(a) Mark the point at which the flexible cable enters the cable weight.

(b) Release the cable weight grub screws with hex key.

(c) Measure and note the length of cable concealed within cable weight.

(d) Cut cable noting the length of cable must include the concealed length above.

(e) Re-insert the cable into the weight and tighten grub screws to tightening Torque of 20Nm.
Use loctite 243 or equivalent on grub screws to secure once completed.

(f) Adjust ProbeCalibr Parameter in 'Advanced' menu to represent new length (password 222).

Rotating non Ex d Rated Enclosures (page 1 of 2)

The gland which couples the sensing probe to the enclosure provides a critical sealing function for the enclosure. Internal wires are passed through this gland and the high integrity seal. This gland incorporates a Union Joint which is designed to rotate.

However, this rotation is limited to one-time adjustment of Display orientation after installation on site, as shown below:

ONLY one 36mm spanner applied to the Hex of Union Joint to rotate enclosure to desired orientation as allowed. DO NOT hold the enclosure during this procedure.

As Installed, but LCD display not visible.

Rotation at Union Joint

Max 360° allowable one-time rotation in either direction.

Desired Orientation.

Rotation beyond these strict limits can damage the internal cables

Ensure Enclosure follows the spanner rotation and assembly integrity is not compromised

Rotating non Ex d Rated Enclosures (page 2 of 2)

Forces On The Probe

Tensile forces are heavily dependent on the viscosity and abrasive characteristics of the product in the vessel. Ensure tensile loading is appropriate for the selected cable as well as the silo cover and mounting structure. In critical cases it is better to select the larger flexible cable (8mm).

Probe Type	Tensile Load
A04 / J04 (4mm flexible cable @ 20°C, 68°F)	0.5 Ton
A06 / J06 (6mm flexible cable @ 20°C, 68°F)	1.0 Ton
A08 / J08 (8mm flexible cable @ 20°C, 68°F)	4.0 Ton

Lateral forces can exist due to movement and gradual flow of the product in the vessel, particularly with powder and granular materials.

These forces can cause stress and strain on the probe, as well as the process fitting and mounting hardware. Ensure that lateral forces are minimized by following the installation guidelines and Placement Requirements.

Probe Type	Lateral Load
B04 / K04 (4mm rigid probe @ 20°C)	1 Nm
B06 / K06 (6mm rigid probe @ 20°C)	3 Nm
B08 / K08 (8mm rigid probe @ 20°C)	8 Nm

Installation should only be performed by suitably qualified personnel.

A. Confirm mounting is within recommended specifications.

B. Check the selected unit matches the required application specifications.
For Hazardous Locations, see appropriate safety instructions available at http://www.hawkmeasure.com

C. Check the wiring is correct and all connections are secure.

D. Apply power to the unit.

When power is applied the unit will start its normal load sequence.
The following messages will cycle on the display.

Hawk
CGR Series
Serial Number
Software Revision

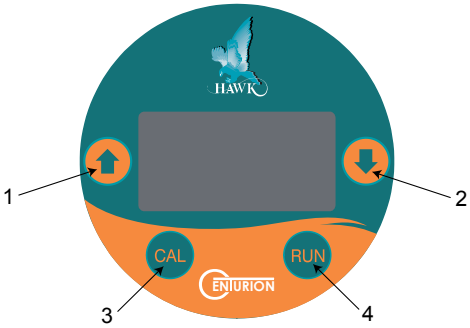
Menu Navigation

1 Navigate up, increase value

2 Navigate down, decrease value

3 CAL Proceed, select, save

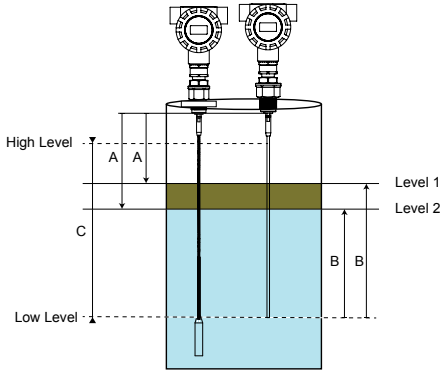
4 RUN Go back, return unit to operational mode



Displayed Measurements

Measured Span Reference

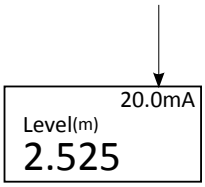
A	Distance - measured from base of thread or bottom of flange to material level
B	Level - measured from Low level to material level
C	% Level - proportional percentage of measured level based on Low and High level setting



Displayed Diagnostics

While pressing the arrow buttons the top corner of the display cycles through various unit diagnostics

mA	Simulated current output in mA
Normal	Unit operating normally
Failed	Unit in failsafe conditions
Recover	Unit searching for level / attempting to amplify signal
Level - 1	Upper Material Level measurement
Level - 2	Lower Material Level measurement



Setup Menu

```
Main Menu
▸Setup
 Advanced
 Autoset
```

Parameter	Description	Options
Display Mode	Select default Display mode	Volume(2) Level %Level Distance
Display Unit	Adjust displayed measurement unit	Centimeters Metres Feet Inches
Low Level	Set Low Level (4mA) distance	Adjustable (1)
Hi Level	Set High Level (20mA) distance	Adjustable (1)
Damping	Adjust output response time & smoothness	Adjustable
Tracking	Program application Fill and Empty speeds. Fast (90m/h, 265ft/h). Medium (30m/h, 98ft/h), Slow (10m/h, 32ft/h) InstaTrack is a special mode which we respond immediately to any detected reflection. 'Test' Mode adjusts unit function to be suitable for bench testing and demonstration. The unit will track nearest detected reflection regardless of size.	• Fast • Medium • Slow • InstaTrack • Test
Dielectric	Applies a pre-set value to Sensitivity based on selected Dielectric Constant range of material.	• <2 • <5 • <10 • <20 • <40 • <80 • >80
Fail Mode	Set Failsafe reading	3.80mA > 20.20mA LastKnown 4mA 20.00mA > 21.50mA
Fail Time	Set time delay for FailSafe condition (in seconds)	Adjustable
Digitize	The 'Digitize' function is an automatic setup routine used to eliminate false reflections. See 'Digize Function' for further information.	• No • Yes • Disable

(1) See 'Measured Range Reference' on next page

(2) Volume activation requires GosHawk. See dedicated CGR GosHawk manual.

Digitize Function

The 'Digitize' function is an automatic setup routine to create a digital map of false echoes generated by problems such as non-recommended mounting.

The function should be performed after physical installation to the application.

When executing the function the unit scans for the Upper Material Level. You will be prompted with a distance value (measured from base of connection thread / flange down). This must be either be the Upper Material Level if material is present or the end of probe if the vessel is empty. If the correct level is not detected, see 'Troubleshooting' 'Digitize displays incorrect distance'.

Ensure the value is not greater (further away) than the distance to the material level.

For best results follow this routine:

1) Ensure the unit is mounted according to mounting specifications and requirements.

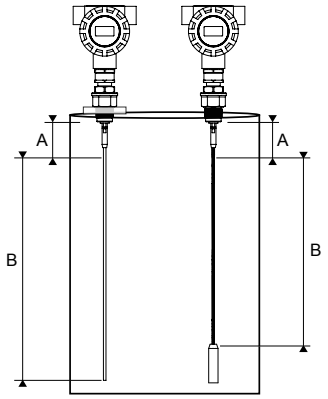
2) Ensure the material to be measured (If this is an Interface application, the Upper Layer) is in contact with the actively measured part of the probe.

3) Select Dielectric pre-set value of most similar to material to be measured (If this is an Interface application, it must be the Upper Layer).

4) Run Digitize routine. Confirm displayed distance is the correct material level (If this is an Interface application, it must be the Upper Layer.

Measured Range Reference

A	Blanking (non-measurable zone)
B	Measurable Span (blanking to top of cable weight or end of rigid probe). High level must be = to or > than Blanking



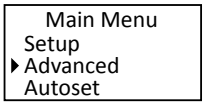
Minimum Range (Blanking)

Probe Variant	
A04 / J04	150mm (6")
A06 / J06	150mm (6")
A08 / J08	150mm (6")
B04 / K04	150mm (6")
B06 / K06	150mm (6")
B08 / K08	150mm (6")

Maximum Range

Probe Variant	
A04 / J04	18.5m (60ft 8in)
A06 / J06	18.5m (60ft 8in)
A08 / J08	18.5m (60ft 8in)
B04 / K04	4m (13ft 1in)
B06 / K06	4m (13ft 1in)
B08 / K08	4m (13ft 1in)

Advanced Menu



Parameter	Description	Options
Comms	Adjust communication protocol settings. The default ID is 1, and the default baud rate is 19200.	• Device ID • Baud Rate
Sensitivity	Manual adjustment of Sensitivity. Digitize automatically sets this value based on application conditions. Sensitivity is the primary adjustment for the unit's ability to detect media	• 0-100
Blanking	Blanking is a non-measurable zone. This can be increased to 'Blank' out high level false echoes caused by mounting	• Adjustable <150mm (6") is not recommended
Interface	Enable or Disable Interface Measurement mode. See 'Interface Setup' on next page.	Enable Disable
Factry Reset	Restore all parameters to factory default.	• Yes • No
Device Info	Display device information	
Lock Code	Enable / Disable lock code. If enabled, select lock code number.	• Enable / Disable
ProbeCalibr	If physical length of probe is adjusted you must adjust the Probe Length in this parameter. Password protected (222.)	• Adjustable • Password protected (222)
ProbeFault	Probe Fault will activate Failsafe in the event of a missing Probe	• Enable / Disable
Dist Calibr	Calibrate distance correction factor. Some applications or environments can affect time of flight signal travel affecting the measured distance reading. This function allows the detected distance to be adjusted to suit the application.	• Adjustable

Interface Mode Setup

The Interface mode is designed to measure applications with low to high dielectric constant layers.

The transmited signal relfects off the Upper Layer and continues through the Interface and reflects from the Lower Layer.

The unit provides a level reading for both the Upper and Lower Layers available via HART. The Lower Layer will always be transmitted to the 4-20mA output.

When Interface mode is Enabled, the following parameters are adjustable.

Parameter	Description	Options
DK Comp	Set dielectric of interface layer. This adjusts the velocity compensation for the transmitted signal as it passes through the interface. Default 2.22	• 0-100
IFace Width	Set water reading (level 2) offset in the event of a merged echo. A merged echo will occur if the interface is too thin to produce a separate echo. The offset is measured from the end of the merged echo backwards. Default 150mm (0.5ft) *Note: This is an advanced setting and should not be adjusted without expert knowledge*	• Adjustable
IFace Size	Sets the echo size (in signal voltage) to dictate whether an echo is from the Interface or Level. If the echo is larger than the value the unit will assume no Interface is present and will set Level 1 reading to be the same as Level 2 reading. If the echo is smaller it will assume there is only an Interface layer measurable and will set Level 2 to end of probe measurement. Default 2.34 *Note: This is an advanced setting and should not be adjusted without expert knowledge*	• 0-2.49

Commissioning

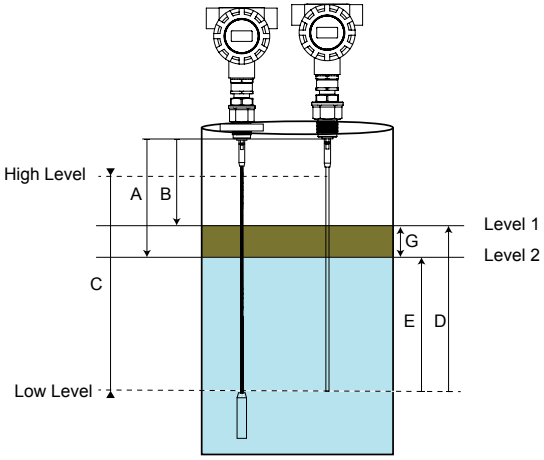
For commissioning via PC and GosHawk, see dedicated CGR GosHawk Manual.

Parameter	Instruction
1. Set Interface Mode	If the application is NOT an Interface application, disable Interface mode.
2. Set High and Low level	High and Low level distances can be programmed manually or you can run Autoset. Autoset can be used to program the High or Low level based on the material level which is touching the probe when the function is run.
3. Set Tracking Speeds	Tracking speeds can be set to Fast, Medium, Slow and Custom (measured in Displayed Units per hour)
4. Select Dielectric	Choose closest Dielectric range of Upper Material Level from the pre-set list. Select lower value if unsure. <2 will be appropriate for most Interface applications.
5. Run Digitize	Confirm displayed distance the correct material level (for Interface applications this must be the Upper Material Level) or end of probe if vessel is empty. Ensure the value is not greater than the distance to the material level.. See 'Digitize Function' for further information.
6. Set Dk Compensation	Program Dielectric value of Upper Material Layer in Interface menu
7. Add Damping	Increasing Damping value if a smoother response trend is required. This value is automatically set by the Tracking speed.
8. Run unit	Press RUN several times to commence unit operation

Registers

Address	Variable / Description	Conversion to Feet	Measurement Reference
720	Primary Variable (Level 2 Level in mm)	Div. by 304.7851	E
721	Secondary Variable (Level 1 Level in mm)	Div. by 304.7851	D
722	Tertiary Variable (Interface Height in mm)	Div. by 304.7851	G
723	Low Level (mm)	Div. by 304.7851	
724	High Level (mm)	Div. by 304.7851	
725	Primary Variable Status		
726	Primary Variable (Level 2 Distance in mm)	Div. by 304.7851	A
727	Primary Variable Percentage		C
728	Secondary Status		
729	Secondary Variable (Level 1 Distance in mm)	Div. by 304.7851	B
730	Secondary Variable Percentage		C

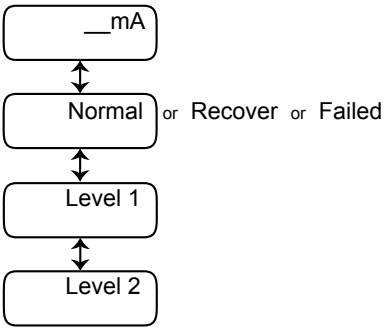
Measurement Reference



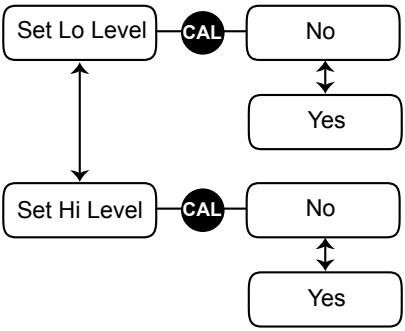
Status Bit Mapping

Bit	Description
4	Confirmed Status (Unit tracking valid echo)
F	Failed (unit in failsafe condition) Primary Variable only

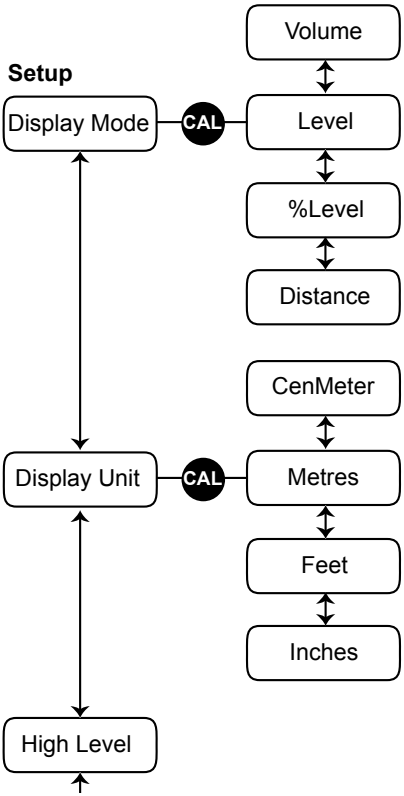
Diagnostics

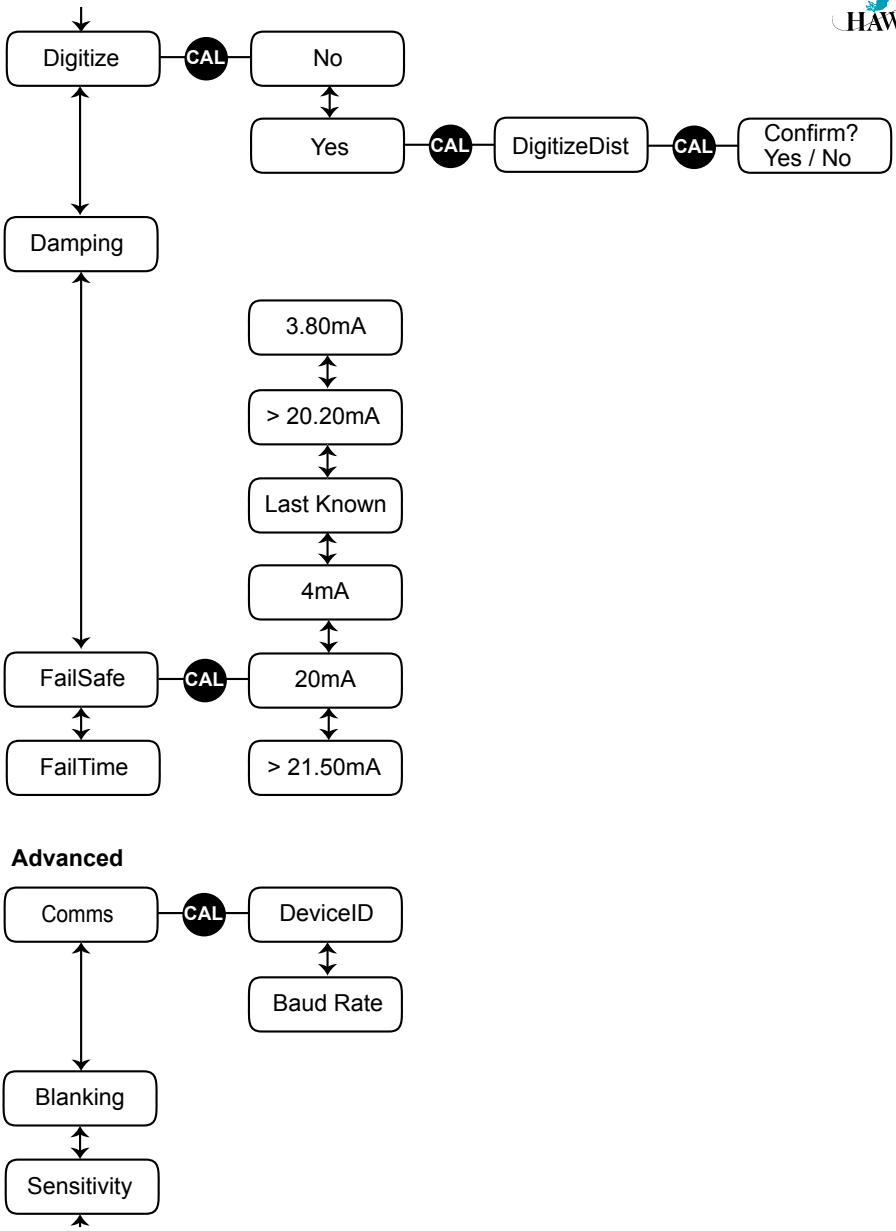


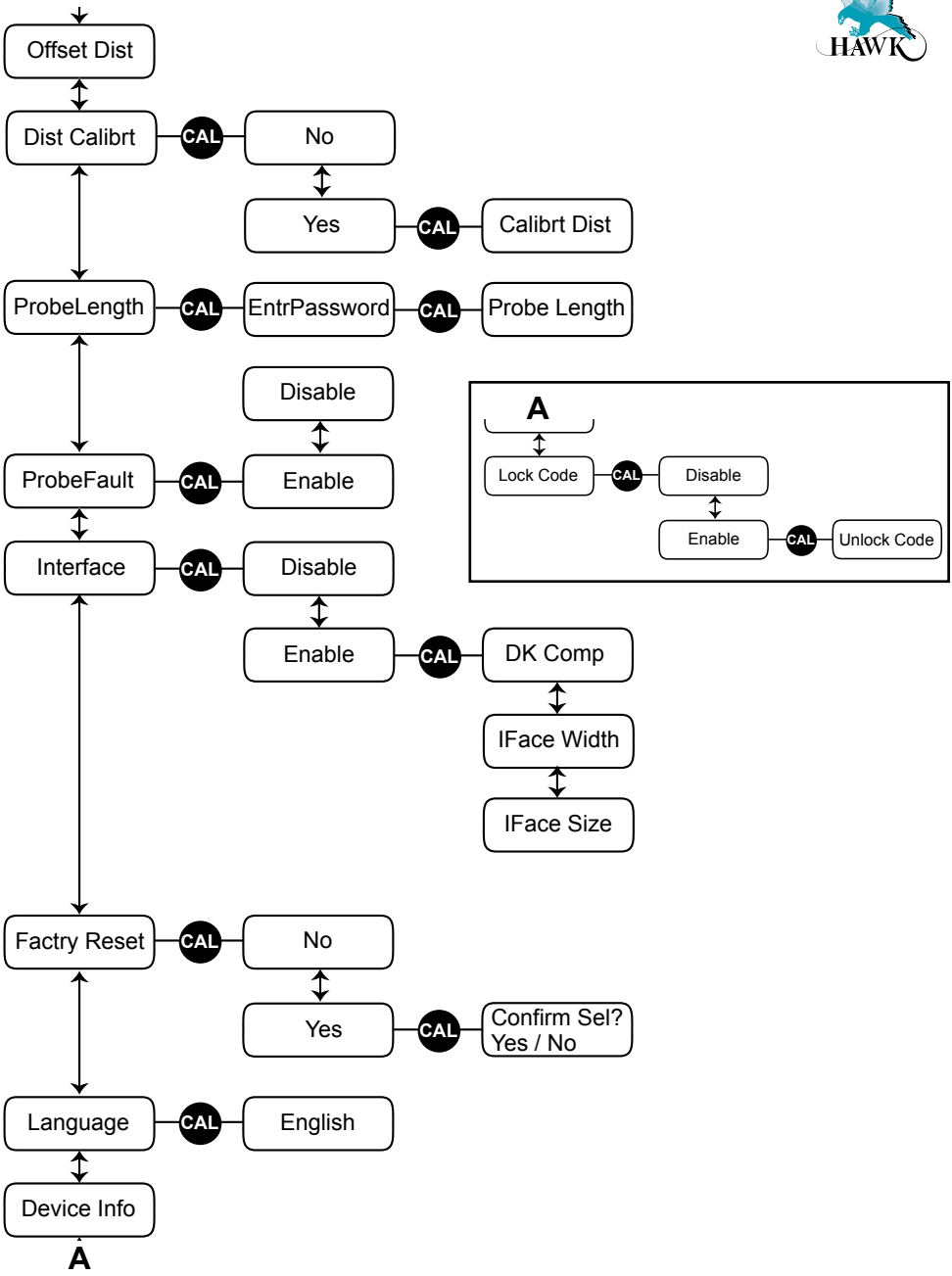
Autoset



Setup




Digitize
CAL
No
Yes
CAL
DigitizeDist
CAL
Confirm?
Yes / No
Damping
3.80mA
> 20.20mA
Last Known
4mA
FailSafe
CAL
20mA
FailTime
> 21.50mA
Advanced
Comms
CAL
DeviceID
Baud Rate
Blanking
Sensitivity


Offset Dist
Dist Calibrt
CAL
No
Yes
CAL
Calibrt Dist
ProbeLength
CAL
EntrPassword
CAL
Probe Length
Disable
ProbeFault
CAL
Enable
Interface
CAL
Disable
Enable
CAL
DK Comp
IFace Width
IFace Size
A
Lock Code
CAL
Disable
Enable
CAL
Unlock Code
Factry Reset
CAL
No
Yes
CAL
Confirm Sel?
Yes / No
Language
CAL
English
Device Info
A

Troubleshooting

Problem	Check
Display is blank Unit continually re-starts	Check incoming power on loop is to specification. Check incoming power on loop is continuous. Bench test with new 24V supply.
Measurement is non-responsive (material touching probe)	Run Digitize routine. If routine has already been run, Lower Dielectric selection or increase Sensitivity parameter. Check unit status for 'Failsafe'. The unit will go to Failsafe if it cannot detect any reflections. Check the probe element for damage or excessive build up. Ensure mounting is correct to specification with good ground reference. Ensure probe is not touching the vessel. Ensure Modbus packets are being transmitted and received correctly
Unit is indicating a material level while no material is present	**A) If the unit is indicating full / high** Ensure no structure is making contact with the probe. Check for build up bridging between the probe and vessel / nozzle Run Digitize routine while no material is contacting the probe. Set Display Mode to Distance, note the measurement. If distance is near high level use Blanking to eliminate reflection interference. Adjust High level to ensure it is not within the Blanking range. **B) If the unit is indicating other level** The unit should measure the end of probe while nothing is touching the probe. Run Digitize routine while no material is contacting the probe. Confirm 'Low Level' is set correctly. Ensure no structure is making contact with the probe. Check for excessive build up and clean the probe. Ensure mounting is correct to specification with good ground reference.
Unit measurement is locked at or near end of probe	The material touching the probe may not be generating a large enough reflection in the application conditions. Ensure unit is mounted as per specifications. Take note of the ground reference requirement. Ensure the probe is not making contact with the vessel. Use a minimum 2" / 50mm flange to improve signal transmission. Change unit Tracking to 'Demo' mode to measure closest echo instead of largest. Increase Sensitivity.

Troubleshooting (con't)

The probe is too long	See 'Hardware Adjustment / Modifying Probe Length'
Adjusting / commissioning the unit without removing the lid	You will require a HAWKLINK-USB PC connector and HAWK GosHawkII software. See CGR GosHawk user manual' for further information.
Digitize displays incorrect distance	If Digitize displays a closer distance than the Upper Material level / end of probe enter the distance to the correct Upper Material Level. The unit will automatically eliminate the detected echo and find the correct level. If Digitize displays a longer distance than the Upper Material level the measured material may not be returning a large enough signal. Select lower DK value or if already set to lowest increase Sensitivity and change Tracking to 'Test' mode. Ensure unit has conforming ground reference. If Digitize displays a longer distance than the end of the probe length adjust see 'Measurement Accuracy' below or the 'ProbeLength' parameter in 'Advanced' menu if the Probe length has been modified.
Measurement Accuracy	Material / Dielectric or environment can create small measurement inaccuracy. Run Dist Calibrt parameter in software to manually adjust measured distance to new value.

Centurion Guided Radar System

Model

CGR4 — 4 wire Centurion Guided Radar, 14-28VDC

Communication

W — Modbus with Interface Measurement

Housing

1 — Aluminum, Epoxy Painted
2 — 316L Stainless Steel

Gland Entry

1 — 1/2" NPT Cable gland entry
2 — 3/4" NPT Cable gland entry
3 — M20 x 1.5 Cable gland entry
4 — M25 x 1.5 Cable gland entry

Probe Type[3]

A04	4mm flexible cable
A06	6mm flexible cable
A08	8mm flexible cable
B04	4mm rigid probe
B06	6mm rigid probe
B08	8mm rigid probe
J04	Detached 4mm flexible cable
J06	Detached 6mm flexible cable
J08	Detached 8mm flexible cable
K04	Detached 4mm rigid probe
K06	Detached 6mm rigid probe
K08	Detached 8mm rigid probe

Probe variant / materials[3]

S — 316L

Mounting[3]

TN07	3/4" NPT Thread (316L) or threaded flange mount[2]
TB07	3/4" BSP Thread (316L)
TN10	1" NPT Thread (316L)
TB10	1" BSP Thread (316L)
TN15	1.5" NPT Thread (316L) or threaded flange mount[2]
TB15	1.5" BSP Thread (316L)
FXXX[1]	Pre-Welded Flange (replace XXX with 3 character Welded Flange Code)

Process O-ring seal[4]

V — FKM (Viton) (-20°C to +204°C)
B — NBR (-35°C to +110°C)[5]
S — Silicone (-60°C to +230°C)

Process Temperature

1 — -40°C to +80°C (-40 to +176°F)
2 — -40°C to +150°C (-40 to +302°F)

Process Pressure

1 — 5 bar
3 — 20 bar
4 — 40 bar
5 — 100 bar[6]

Approval Standard

XX — Not Required

Probe Length[3]

Specify in cm to the nearest 10cm

[1]See Weld Code selection in Flange Table.

[2]Order flange as separate line item. See Probe / Mounting combination table matching size and variants options. See Flange Table Accessory Code for ordering.

[3]See Probe Table for valid Probe, Variant / Materials, Mounting and Length combinations prior to selection

[4]Select O-Ring based on application requirements.

[5]Not available with Process Temperature option 2

[6]Not available with Mounting options TN15 or TB15

CGR4	W	1	3	B04	S	TN15	B	1	1	1D	200

Probe Combination Table

Probe / Mounting Combination Table

Each line represents valid part combinations

Probe Code	Variant / Materials	Mounting	Flange Sizes		Max. Length
			Min. Size	Max size	
A04 / J04	S	TN07, TB07, FXXX	1", DN25, 25mm	1-1/2", DN40, 40mm	1850cm
A06 / J06	S	TN10, TB10	N/A	N/A	1850cm
A08 / J08	S	TN15, TB15, FXXX	2", DN50, 50mm	4", DN100, 100mm	1850cm
B04 / K04	S	TN07, TB07, FXXX	1", DN25, 25mm	1-1/2", DN40, 40mm	400cm
B06 / K06	S	TN10, TB10	N/A	N/A	400cm
B08 / K08	S	TN15, TB15, FXXX	2", DN50, 50mm	4", DN100, 100mm	400cm

Accessories

Tank Fastening Kit

CGR-A0X-WL-SS

Kit includes:

Qty1 RIGGING-SCR-JAW-JAW-SS-M12

Qty2 EYEBOLT-SS-M10

Mounting Flanges

Threaded Flanges

Model

FLA -

Flange Size

1	1” or DN25 or 25mm
H	1 1/2” or DN40 or 40mm
2	2” or DN50 or 50mm
K	2 1/2” or DN65 or 65mm
3	3” or DN80 or 80mm
L	3 1/2” (ANSI ONLY)
4	4” or DN100 or 100mm

Flange Type

A1	ANSI B16.5 150LB FLANGE
A3	ANSI B16.5 300LB FLANGE
A6	ANSI B16.5 600LB FLANGE
A9	ANSI B16.5 900LB FLANGE
AA	ANSI B16.5 1500LB FLANGE
AB	ANSI B16.5 2500LB FLANGE
D6	DIN2527 PN6 FLANGE
D0	DIN2527 PN10 FLANGE
D1	DIN2527 PN16 FLANGE
D2	DIN2527 PN25 FLANGE
D4	DIN2527 PN40 FLANGE
J5	JIS 5K FLANGE
J0	JIS 10K FLANGE
J1	JIS 16K FLANGE
J2	JIS 20K FLANGE
J4	JIS 40K FLANGE
S1	AS 2129 Table D
S2	AS 2129 Table E
S3	AS 2129 Table F
S4	AS 2129 Table H

-

Material

SS SS316L

-

Thread Type

TB07	3/4” BSP THDs
TB10	1” BSP THDs
TB15	1 1/2” BSP THDs
TN07	3/4” NPT THDs
TN10	1” NPT THDs
TN15	1 1/2” NPT THDs

FLA - 2 A1 - SS - TB15

Welded Flanges

Model

F

Flange Size

1	1” or DN25 or 25mm
H	1 1/2” or DN40 or 40mm
2	2” or DN50 or 50mm
K	2 1/2” or DN65 or 65mm
3	3” or DN80 or 80mm
L	3 1/2” (ANSI ONLY)
4	4” or DN100 or 100mm

Flange Type

A1	ANSI B16.5 150LB FLANGE
A3	ANSI B16.5 300LB FLANGE
A6	ANSI B16.5 600LB FLANGE
A9	ANSI B16.5 900LB FLANGE
AA	ANSI B16.5 1500LB FLANGE
AB	ANSI B16.5 2500LB FLANGE
D6	DIN2527 PN6 FLANGE
D0	DIN2527 PN10 FLANGE
D1	DIN2527 PN16 FLANGE
D2	DIN2527 PN25 FLANGE
D4	DIN2527 PN40 FLANGE
J5	JIS 5K FLANGE
J0	JIS 10K FLANGE
J1	JIS 16K FLANGE
J2	JIS 20K FLANGE
J4	JIS 40K FLANGE
S1	AS 2129 Table D
S2	AS 2129 Table E
S3	AS 2129 Table F
S4	AS 2129 Table H

F 2 D4

Electronics

Power

• 24VDC (14 to 28VDC)

Power Consumption

• <500mW @ 24VDC

Communications

• Modbus
• GosHawkII via Modbus.

Maximum Range

• Flexible cable probe:18.5m (60ft 8in)
• Rigid probe: 4m (13ft 1in)

Minimum Range (Blanking)

• 150mm (6")

Dielectric Range

• ≥ 1.5

Frequency

• 2.2 GHz

Resolution

• Display: 1.0mm

Accuracy[1]

• +/- 3mm

Measurements per second

• 3

Response Time

• <1 second (based on application selection)

Sum of non linearity, non repeatability, hysteresis

• +/- 0.02%

Repeatability

• +/- 3mm

Memory

• Non-Volatile (No backup battery required)
>10 years data retention

Operating Temperature (Electronics)

• -40°C to +80°C (-40 to +176°F)

Display

• 4 line graphic display (128 x 64 pixels)

Language

• English

Configuration

• 4 button (Up, Down, Cal, Run), GosHawkII via Modbus

Cable Entries

• 1/2" NPT
• 3/4" NPT
• M20 x 1.5
• M25 x 1.5

Enclosure

Type

• Dual Compartment with Glass window

Material

• Die-cast Copper-Free Aluminum, Epoxy Painted
• 316L Stainless

Cable Entries

• 1/2" NPT
• 3/4" NPT
• M20 x 1.5
• M25 x 1.5

IP Rating

• NEMA 4X
• IP66

**Specifications model dependent. Consult part number listing.*
[1]Accuracy dielectric & material dependent

Probe

Probe Size / Wetted Materials

- 4mm SS316L rod
- 4mm DIN3055 (7x7 strand) SS316L flexible cable
- 6mm SS316L rod
- 6mm DIN3055 (7x7 strand) SS316L flexible cable
- 8mm SS316L rod
- 8mm DIN3055 (7x7 strand) SS316L flexible cable

Probe Entry Wetted Materials[2]

- TN07 / TB07 / TN10 / TB10 / Welded Flange[1] SS 316L, PEEK
- TN15 / TB15 / Welded Flange[1] - SS 316L, PTFE, GF25

[1] *See Probe / Mounting Combination Table for flange types*

Probe O-Ring Seals[3]

- Silicone / VMQ (-60°C to +230°C)
- NBR (-35°C to +110°C)
- Viton (-20°C to +204°C)

Process Connections

- 3/4" NPT or BSP
- 3/4" NPT with Flange
- 1" NPT or BSP
- 1.5" NPT or BSP
- 1.5" NPT with Flange
- Welded Flange

Electromagnetic Compatibility

CAN ICES-3(A)/NMB-3(A)

This device complies with Part 15, Subpart B Class A of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Process Pressure*

- -1 to 100 BAR

Process Temperature[3]

- -40°C to +80°C (-40 to +176°F)
- -40°C to +150°C (-40 to +302°F)

Tensile Load (flexible cable probes)

- Probe Type: A04 / J04 0.5 ton
- Probe Type: A06 / J06 1.0 ton
- Probe Type: A08 / J08 4.0 ton

Lateral Load (rigid probes)

- Probe Type: B04 / K04 1 Nm
- Probe Type: B06 / K06 3 Nm
- Probe Type: B08 / K08 8 Nm

Maximum Probe Length

- Probe Type: A04 / J04 1850cm
- Probe Type: A06 / J06 1850cm
- Probe Type: A08 / J08 1850cm
- Probe Type: B04 / K04 400cm
- Probe Type: B06 / K06 400cm
- Probe Type: B08 / K08 400cm

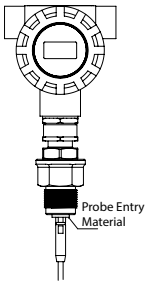
Minimum Probe Length

- Probe Type: A04 / J04 100cm
- Probe Type: A06 / J06 100cm
- Probe Type: A08 / J08 100cm
- Probe Type: B04 / K04 20cm
- Probe Type: B06 / K06 20cm
- Probe Type: B08 / K08 20cm

**Specifications model dependent. Consult part number listing.*

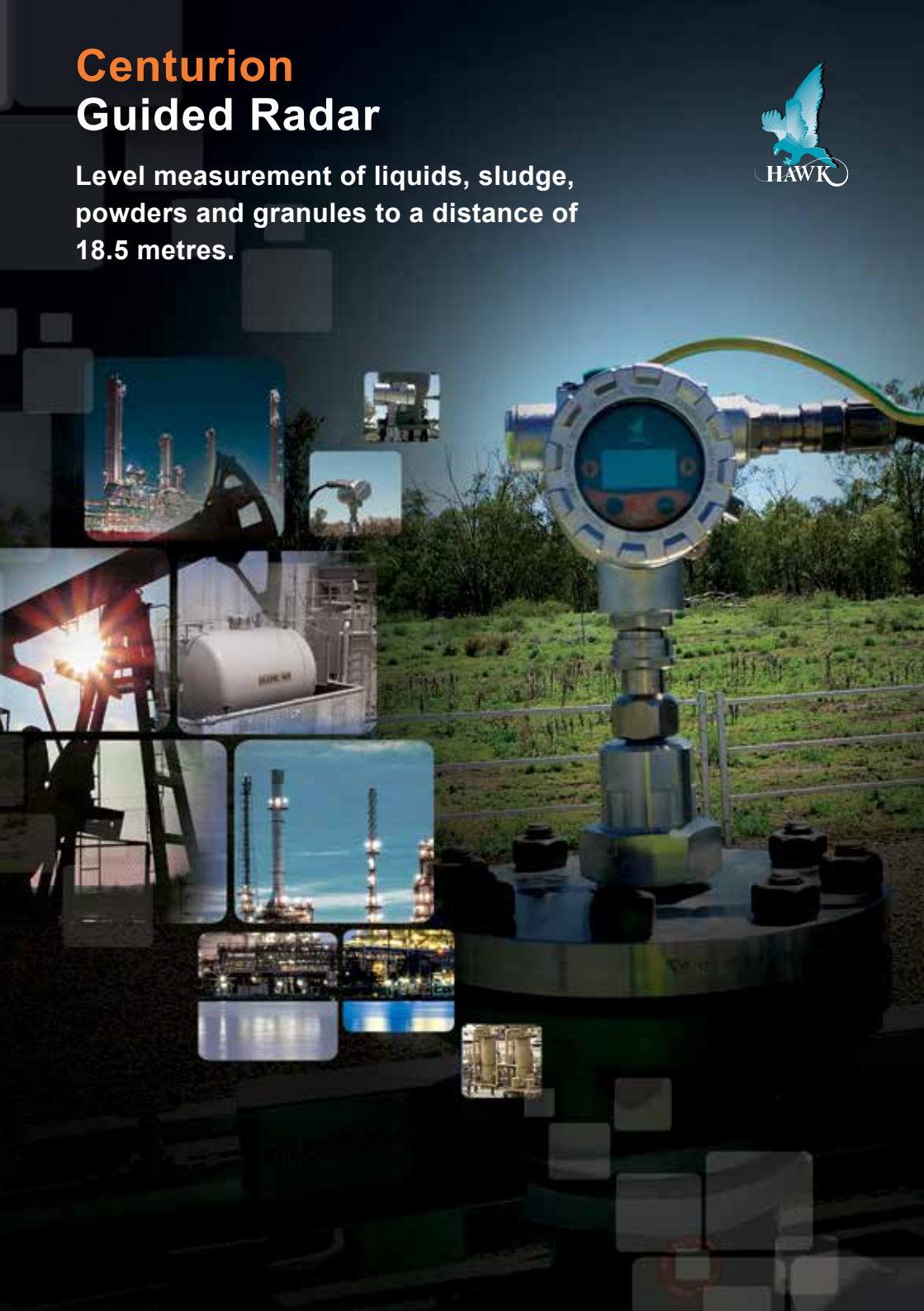
[3] Observe min / max temperatures for O-ring seal.

[2] Probe Entry



Centurion
Guided Radar

Level measurement of liquids, sludge, powders and granules to a distance of 18.5 metres.



Ordering Instructions

Threaded unit type

Assemble part number taking note of the valid combinations and exclusions for the full system.
The unit is ordered as a single line item. For example:

CGR4W13B08STB15B11XX200

Flanged type - Threaded flange

Assemble part number taking note of the valid combinations and exclusions for the full system. The unit and the threaded flange are ordered as separate line items. For example:

CGR4W13B08S**TN15**B11XX200
FLA-FA4-SS-**TN15**
or
CGR4W13B08S**TN07**B11XX200
FLA-FA1-SS-**TN07**

Flanged type - Welded flange

Assemble part number taking note of the valid combinations and exclusions for the full system.
In the Mounting part code enter 4 character Welded flange code from the table. All Welded flanges have F as the first character. For example:

CGR4W13B08S**F4A1**B11XX200

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DOC-CGRM(Interface)-MAN Rev. 1.10
0517