A Higher Level of Performance

User Manual

Senator

H80 Radar Series

Level Measurement



For more information, please visit >

www.hawkmeasurement.com

Contents

Overview 3

Applications, Dimensions, Wiring 4

Wiring 4
Dimensions 4

Installation 9

Mounting 9
Placement Considerations 10

Configuration 11

Start up Sequence 11
Echo Graph 11

Commissioning 12

Quick Commissioning 12
Response Times For Unexpected Change In Measurement 13
Fill / Empty Speed with Response Times 1-10 13
Fill / Empty Speed with Response Times 11-20 15
Echo Tracking 16

Software 17

Setup Menu 17
Advanced Menu 18
Factory / Tracking Menu 19

HawkBTConnect 20

HRC HART Remote Configurator 21

Troubleshooting 22

Example of Errors in Trends & Unit Adjustments 22
Using Strength Diff 24
Error Codes 24
Maintenance 24

Software Flow Chart 25

Setup Menu 25
Advanced 26
Factory 27

Part Numbering 28

Specifications 39

Contact Information 40

Overview

Offering a unique blend of compact design and efficiency, the HAWK H80 is an 80GHz FMCW radar level transmitter ideal for continuous level measurement of liquids, slurries and solids. With its flexible mounting options, high chemical compatibility, and a 120m (393.7ft) measuring range, the Senator H80 is versatile enough to meet the demands of diverse industrial applications. Simple commissioning available by multiple convenient methods including keypad, HawkBTConnect bluetooth App, Goshawk PC software & the HRC HART Remote Configurator.

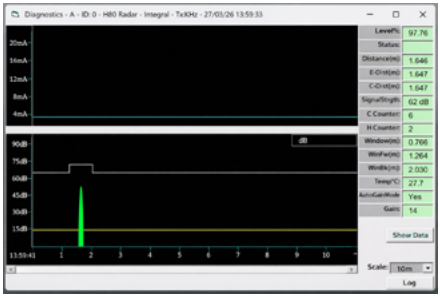
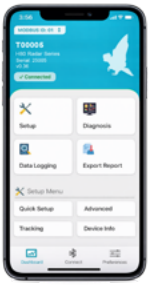
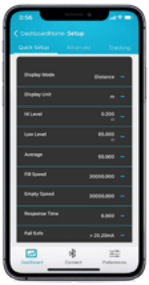
Principle of Operation

The H80 FMCW (Frequency Modulated Continuous Wave) radar measures material level by continuously emitting high-frequency microwave signals that sweep through a range of frequencies. The sensor calculates distance by measuring the frequency difference between the transmitted wave and the reflected echo, which corresponds directly to the time delay and empty space above the material

Primary Areas of Application

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

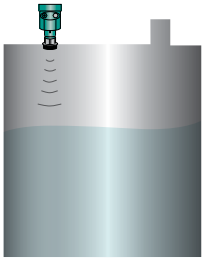
Simple Commissioning via Keypad, HawkBTConnect Bluetooth App & Goshawk Software & HRC HART Remote Configurator.

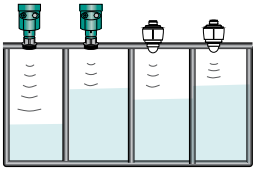




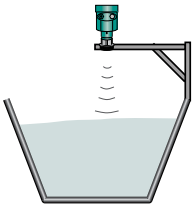

Features

- 80GHz FMCW Radar
- 4-20mA HART, Modbus output
- Full commissioning via Keypad & Display, HawkBTConnect Bluetooth App, Goshawk PC software or HRC HART Remote Configurator
- Maximum range to 120m (393.7ft)
- Non-contact measurement
- Low cost per measuring point
- Ingress protection class IP67
- Variety of mounting options

Level Measurement

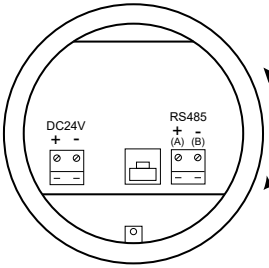






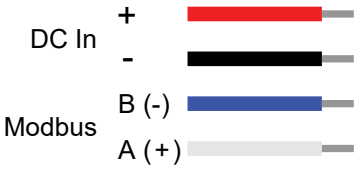
Wiring

Integral



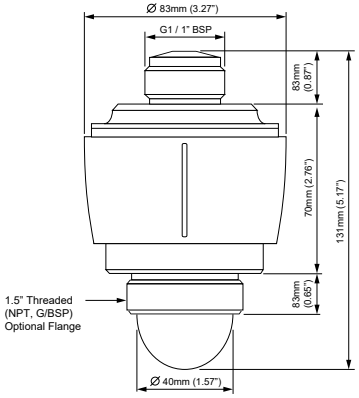
Rotate electronics puck to release and expose wiring terminals

Compact

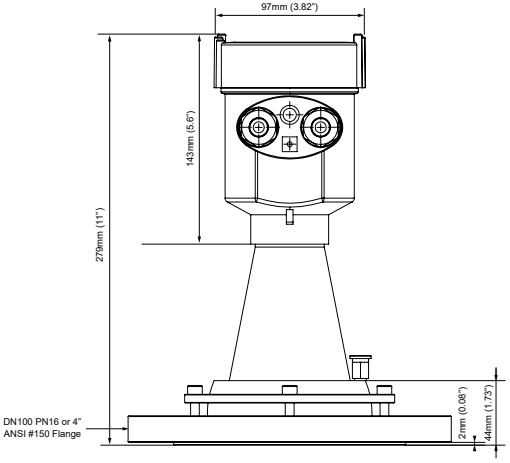


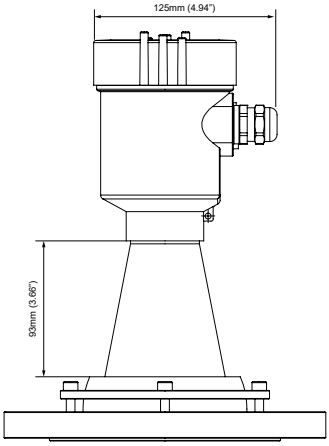
Dimensions

Compact

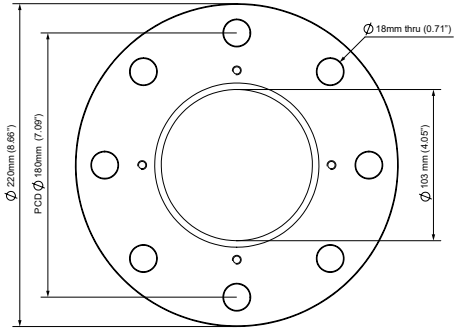


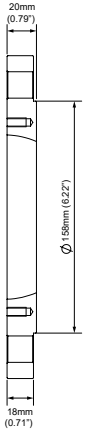
Integral - 3.5” / Aiming Flange version



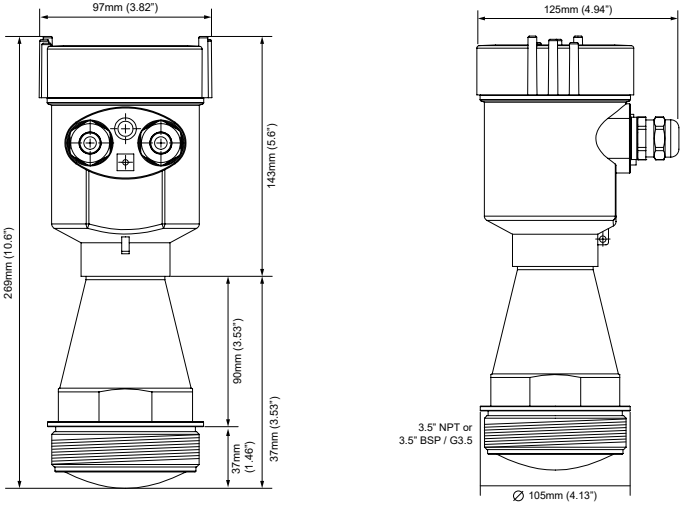


The adjustable flanged requires a 3/16” Allen key
Air purge fitting: PC6-M5 push to connect. 6mm tubing.

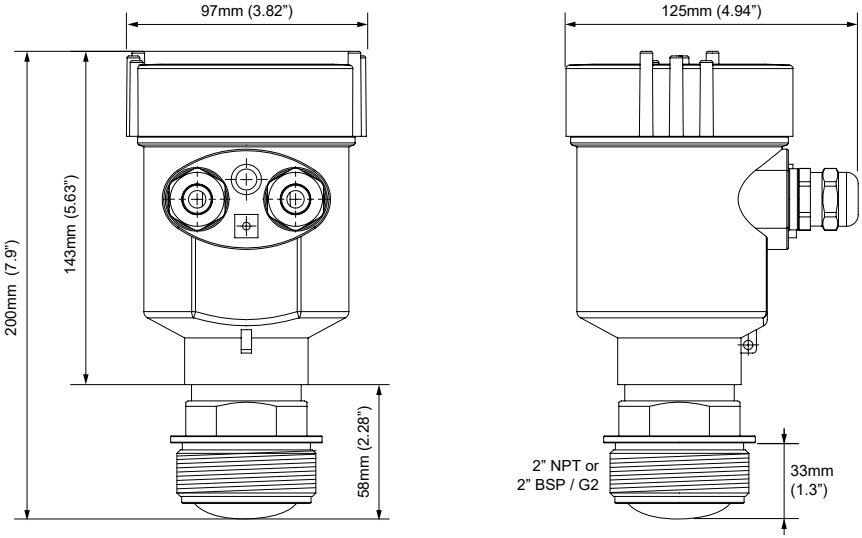




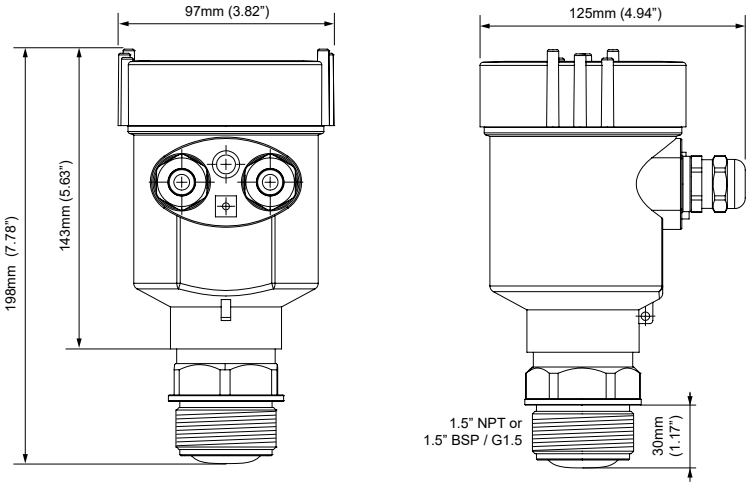
Integral - 3.5” Threaded version



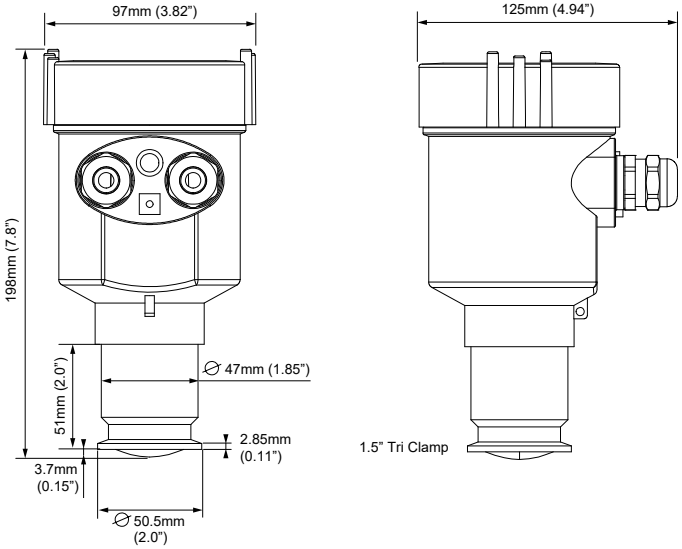
Integral - 2” Threaded version



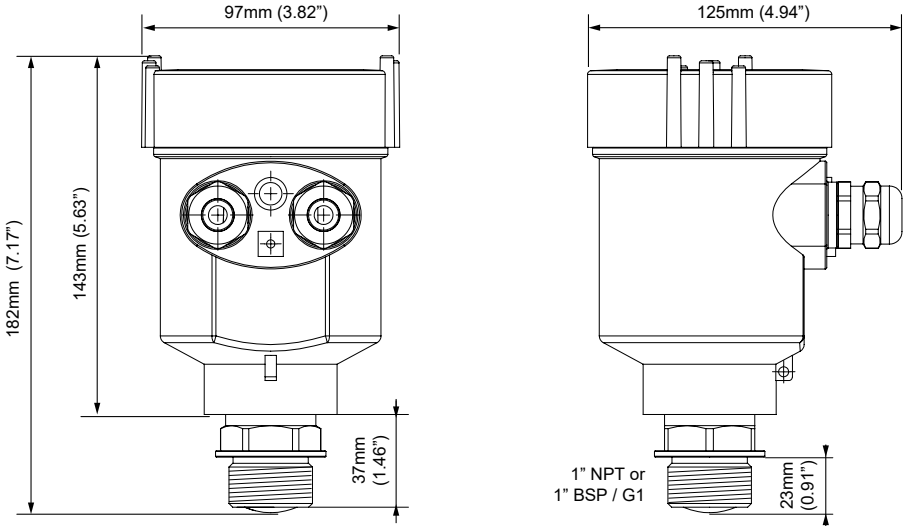
Integral - 1.5” Threaded version



Integral - 1.5” Tri-Clamp Version

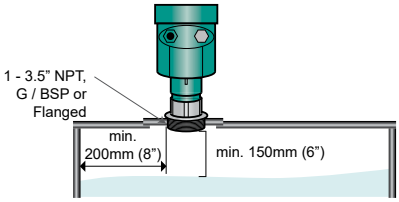


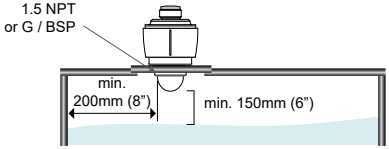
Integral - 1” Threaded version



Mounting

- Sensor should be mounted 1/3 the diameter of the vessel from the vessel wall
- Ideally the Sensor Face should protrude into the main vessel
- Sensor Face should never be closer than 150mm (6") to the measured level. Take into account repose angle of materials that may form in the tank of powders and solids.
- Do not mount over or near objects which can interfere with the unit measurement with consideration for the beam angle. Refer to Beam Angle Table
- Do not mount in the centre of a curved roof to avoid the potential of parabolic echoes





Beam Angle Table

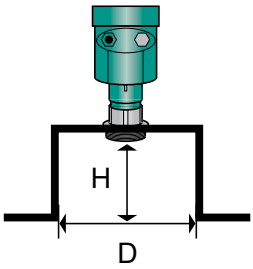
Beam Angle	Beam Spread	
1" Antenna: 8°	69mm per m	0.84" per ft
1.5" Antenna: 7°	61mm per m	0.73" per ft
2" Antenna: 5.8°	51mm per m	0.61" per ft
3.5" Antenna: 3.8°	33mm per m	0.40" per ft

Stand Pipe Considerations

Avoid mounting in tall or narrow stand pipes. As a general guide, the stand pipe height H should not exceed the maximum values shown below. For best performance, keep the sensor face as close as practical to the vessel opening.

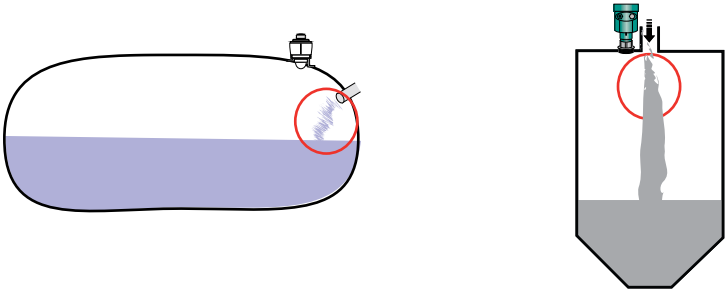
It is recommended to set Blanking for dimension H + 50% safety margin, or at least H.

Diameter (D)		Height (H)	
40mm	1.5"	<150mm	<5.91"
50mm	2"	<200mm	<7.87"
80mm	3"	<300mm	<11.81"
100mm	4"	<400mm	<15.75"
150mm	6"	<600mm	<23.62"
200mm	8"	<800mm	<31.5"

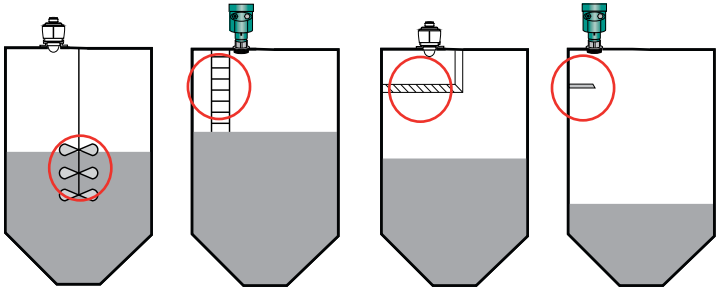


Placement Considerations

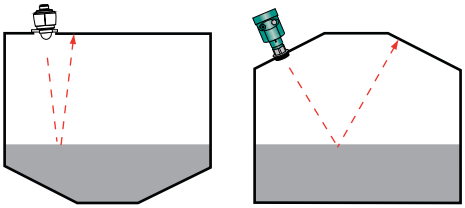
Do **NOT** mount near infeed



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



Do **NOT** mount on angle
in liquid applications



Configuration

Depending on the model type, the unit can be configured via:

- Keypad / display
- Android / iOS using **HawkBTConnect** Bluetooth app
- Goshawk (PC Software) via a Hawklink-USB Modbus communicator or HAWK-M195 HART communicator. Other Modus or HART modules may be supported however it is recommended to only use HAWK supplied modules. Goshawk is available free from https://hawkmeasurement.com/

Keypad & Display

RUN — Go back, return unit to operational mode. Cycle between measurement and Echo graph.

CAL — Proceed, select, save

Navigate up, adjust/increase value

Navigate down, cycle to next digit



Start up Sequence

When power is applied, the unit will start up automatically. The LCD will scroll through its device information displaying the model type, software version, and device ID.

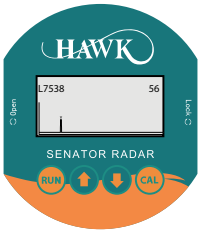
The unit will then go through a scanning sequence. When complete the unit will begin measuring and when confirmed the selected Display Mode will be visible with a measurement.

The unit will re-scan for the level whenever it is powered up.

The top left hand corner Diagnostic displays the operating mode.

Echo Graph

Pressing RUN will display the detected echo graph which includes the distance and echo size

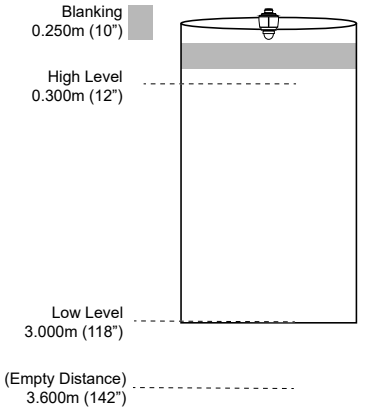


Echo Graph

Quick Commissioning

1. Set Span: Empty Distance, High and Low Level:

Example values only



Menu Path: Advanced > Empty Distance
Menu Path: Setup > High Level
Menu Path: Setup > Low Level

a): Set Empty Distance (any echoes beyond this distance will be ignored, so set with additional safety margin of approx. 20% where possible. For vessels with irregular shaped floor, set to a distance to account for multiple bouncing echoes (see example).

b): Set High (100% / full) and Low (0% / empty) **Note:** The distance for these parameters is measured from the Sensor face down.

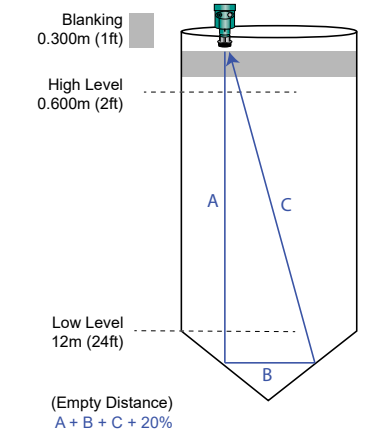
2. Set Blanking:

Menu Path: Advanced > Blanking

a): A typical Blanking distance should be minimum 50mm (1.8") less than the High level.

The minimum is Blanking is 150mm (6"). Extended Range Version recommended 1000mm (40")

If the level enters the Blanking distance, the unit will no longer report an accurate measurement and may read a double bounce, showing double the distance of the actual level.



3. Set Filling / Emptying Speed & Response Time:

Menu Path: Setup > Fill Speed
Menu Path: Setup > Empty Speed
Menu Path: Setup > Response Time

See Fill / Empty Speed & Response Times section for important setup information.

4. Averaging:

Menu Path: Setup > Averaging

Applies averaging (smoothing) to the measurement output. Each unit value is per pulse (approximately every 3 seconds). For smoother trend, increase the value. For a faster response time, decrease the value.

Response Times For Unexpected Change In Measurement

The Response Times are designed to protect the unit from moving to incorrect echoes during measurement. Each time value sets a hold counter which begins when the measured echo has moved faster than the Forward & Back Step (Max. Movement Per Pulse), or the echo has disappeared and the unit is moving to another measured level. When these situations occur, the unit begins to count down process measured per pulse before expanding its search area.

The first counter is designed to be fast, and all subsequent count counters are slower, noting that each unit is per pulse (approximately. once every 3 seconds).

Fill / Empty Speed with Response Times 1-10

The Fill / Empty Speed with Response Times 1-10 are pre-configured values which set how the unit will respond to movements in the level and how long the unit will wait before opening a search process.

When selecting a Fill & Empty speed, ensure the speed is faster than the application. If the speeds are not appropriate for the application, see 'Fill / Empty Speed with Response Times 11-20' for faster movement and increased customisation.

The table below shows examples of the fill & empty speeds based on the inputted values and the selected response time.

Response Time	Fill / Empty Speed Values & Movement Per Pulse (Forward Step & Back Step) (in mm)			First Hold Counter	All Subsequent Hold Counters
	20000	40000	65000		
1	649mm (2.13ft)	1249mm (4.10ft)	2000mm (6.56ft)	9 (27 sec)	36 (108 sec)
3	516mm (1.69ft)	983mm (3.23ft)	1566mm (5.14ft)	7 (21 sec)	28 (84 sec)
5	383mm (1.26ft)	716mm (2.35ft)	1133mm (3.72ft)	5 (15 sec)	20 (60 sec)
8	183mm (0.60ft)	316mm (1.04ft)	483mm (1.58ft)	2 (6 sec)	8 (24 sec)
10	66mm (0.22ft)	83mm (0.27ft)	104mm (0.34ft)	1 (3 sec)	1 (3 sec)

Fill / Empty Speed with Response Times 1-10 (con't)

Complete table of Hold Counters for each response time

Response Time	First Hold Counter	All Subsequent Hold Counters
1	9 (27 sec)	36 (108 sec)
2	8 (24 sec)	32 (96 sec)
3	7 (21 sec)	28 (84 sec)
4	6 (18 sec)	24 (72 sec)
5	5 (15 sec)	20 (60 sec)
6	4 (12 sec)	16 (48 sec)
7	3 (9 sec)	12 (36 sec)
8	2 (6 sec)	8 (24 sec)
9	1 (3 sec)	4 (12 sec)
10	1 (3 sec)	1 (3 sec)

Fill / Empty Speed with Response Times 11-20

The Fill / Empty Speed with Response Times 11-20 are a specific way to program the unit for the application requirements. For these modes, the Fill and Empty speed will set the Forward & Back Step max. movement per pulse.

For example, Fill Speed of 300mm and Empty Speed of 100mm will respond at a maximum of 300mm (11.8”) per pulse during filling and 100mm (3.94”) during emptying.

For fast moving applications such as truck or train unloads and object detection these types of setup would be more appropriate. For example Fill Speed of 5000mm (16.4ft) and Empty Speed of 1000mm (3.3ft).

The Response Time will set the Hold Counter with options for faster response times as follows.

Response Time	First Hold Counter	All Subsequent Hold Counters
11	1 (3 sec)	1 (3 sec)
12	1 (3 sec)	2 (6 sec)
13	1 (3 sec)	3 (9 sec)
14	1 (3 sec)	4 (12 sec)
15	1 (3 sec)	5 (15 sec)
16	1 (3 sec)	6 (18 sec)
17	1 (3 sec)	7 (21 sec)
18	2 (6 sec)	8 (24 sec)
19	2 (6 sec)	9 (27 sec)
20	2 (6 sec)	10 (30 sec)

Echo Tracking

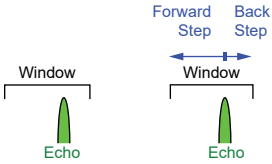
The system uses a tracking Window to follow the measured level echo. The size and movement speed of this Window is based on the Fill, Empty Speeds & Response Time. These settings also pre-set the Hold Counter, which controls how the unit responds if there is no echo detected within the Window.

An example using the below settings.

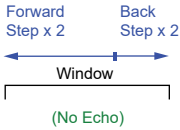
Setting	Value	Max. Movement Per Pulse (mm)
Response time	9	
Fill Rate	40000mm	316mm (Forward Step)
Empty Rate	20000mm	183mm (Back Step)
First Hold Counter	2 (6 sec)	
All Subsequent Hold Counters	8 (24 sec)	

1. In normal running mode, the Window will sit above the level echo. The size of the Window is measured using the Forward and Back Step values.

The Window will also follow the echo at a speed up to the Forward & Back Step values.

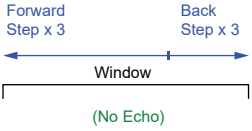


2. If there is no longer an echo within the Window, the unit will count down the first Hold Counter, then open the size of the Window by an additional Forward & Back Step value.



After 6 seconds

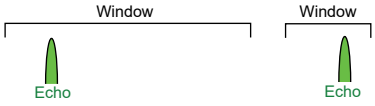
3. The unit will then count down the Subsequent Hold Counter before opening the Window by another Forward & Back Step value and continue this until an Echo is detected.



After 24 seconds

4. When the Echo is confirmed, the Window will snap back to its original size.

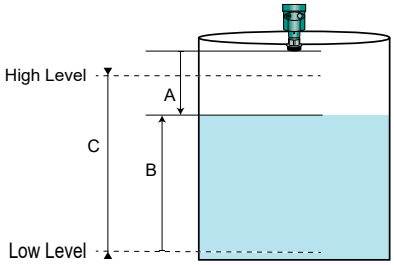
If no Echo is detected, and the Window expands to fill the entire span of Blanking to Empty Distance, the unit will begin the Failsafe count down and then set the output to Failsafe condition.



Setup Menu

Parameter	Description	Options
Display Mode	Set LCD measurement display mode. See 'Display Mode' reference.	%Level Distance Level Volume%[1] Volume[1]
Display Unit	Adjust displayed measurement unit.	mm / cm / m / ft / in / %
High Level	Set High level measurement point (20mA). Minimum value is restricted by Blanking.	Adjustable
Low Level	Set Low level measurement point (4mA). Maximum value is restricted by Empty Distance.	Adjustable
Average	Adjust output response time & smoothness.	Adjustable (pulses)
Fill Speed	Refer to section 'Fill / Empty Speed & Response Times'.	Adjustable
Empty Speed	Refer to section 'Fill / Empty Speed & Response Times'.	Adjustable
Response Time	Refer to section 'Fill / Empty Speed & Response Times'.	Adjustable
Fail Mode	Set Fail Mode output.	>20.20mA >21.50mA 20mA 4mA Last
Fail Time	Set Failsafe Delay Time	Adjustable (pulses)

Display Mode reference



(A) Distance
(B) Level
(C) %Level

[1] Volume setup requires Goshawk via Modbus (Hawklink-USB). Timeout speed must be set to minimum 500mS.

Advanced Menu

Parameter	Description	Options
Blanking	Blanking is a dead-band / non measured range. The unit cannot measure within this range. If the level passes into this range it will report a false distance.	Adjustable - minimum 150mm (5.9”) Extended Range version Recommended 1000mm (40”)
Empty Dis	Sets the maximum possible measured range. The system will not accept any echoes beyond this distance. The Low Level also cannot be set longer than the Empty Distance.	Adjustable
Offset	Add or subtract an offset from the measured distance.	Adjustable
HART ID	Set HART Device ID. Default = 0	Adjustable
Modbus ID	Set HART Modbus ID. Default = 1	Adjustable
Baud Rate	Modbus Baud Rate (HART is always 1200, Modbus is adjustable, and is 19200 by default).	1200 - 115200
Analog	Adjust Analog output. Switch from 4-20mA to a Current Park for testing or multi drop networking.	4mA-20mA 4mA 8mA 12mA 16mA 20mA 20.2mA
4mA Trim	Manually trim the 4mA reading.	Adjustable
20mA Trim	Manually trim the 20mA reading.	Adjustable
Device Info	Displays the device serial number, maximum range and version (Liquids or Solids).	

Factory / Tracking Menu

The factory menu is protected by a dynamic password. The password is the dynamic code value x 2 plus 1. For example for dynamic code 43 the password will be 87.

Parameter	Description	Options
EchoSelect	The unit can be set to follow either the largest or first (nearest) echo. Default = Largest	Largest First
Hold Number	Set by the Response Time (not adjustable).	
Confirm Number	Number of similar repeatable echoes the unit requires to accept a new measurement. Default 2.	Adjustable
Forward Step	How quickly the unit can follow the level during filling (refer to Fill / Empty Speed & Response Times). Set in mm per pulse.	Adjustable
BackStep	How quickly the unit can follow the level during emptying (refer to Fill / Empty Speed & Response Times). Set in mm per pulse.	Adjustable
Restore Factory	Restores all parameters to Factory Defaults. If adjusting via the HRC HART Remote Configurator use Unlock Code 222	
Strength Diff	The difference in echo size (measured in dB) for echo selection. If the difference between the nearest echo and the largest echo is smaller than this setting, the unit will track the nearest echo. If the difference is larger, it will track the largest echo. If set to 0, the unit will always track the largest echo. See 'Troubleshooting - 'Using Strength Diff' for more information. *Note: Strength Diff will only function with 'EchoSelect' set to Largest.*	Adjustable (dB) Default = 0
FixedOff	Factory setting - not adjustable	
Version	Displays the Software and Display revisions	
Restart	Restarts the unit	

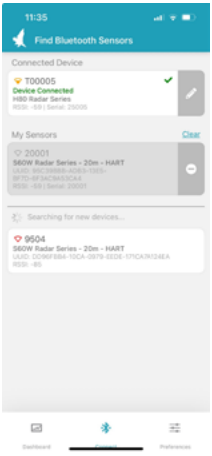
HawkBTConnect

HawkBTConnect is available free for Android & iOS devices via the respective app stores.

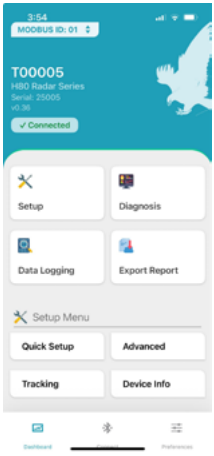
The App will only detect compatible Hawk Bluetooth devices.

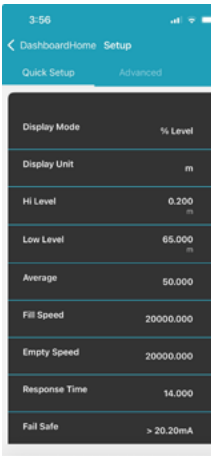
The device can be identified via it's serial number.

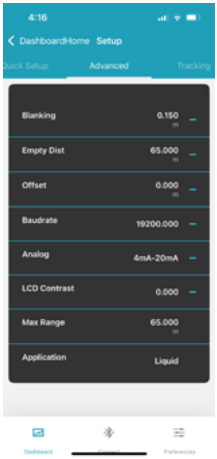
By default, the App will scan for units with device ID 0 through 5. For other IDs this can be adjusted in the App (Preferences - Bluetooth Connection - Lower & Upper search band).











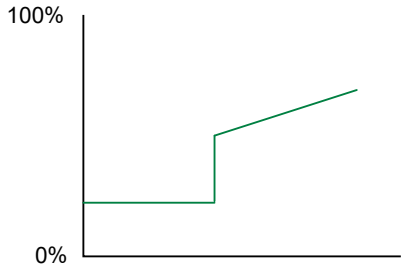
HRC HART Remote Configurator

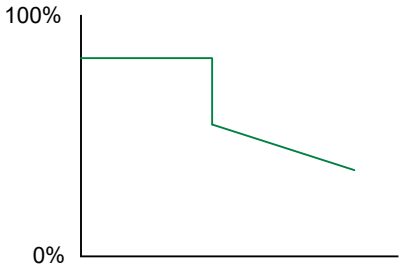


Full commissioning & parameterization also supported via the HRC HART Remote Configurator. Additional information about the HRC available at https://www.hawkmeasurement.com/

Example of Errors in Trends & Unit Adjustments

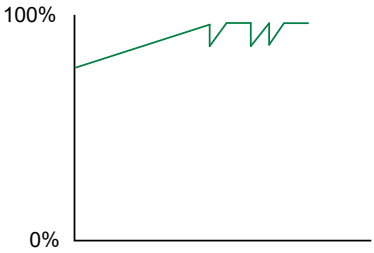
Unit not responding to Fill / Empty cycle





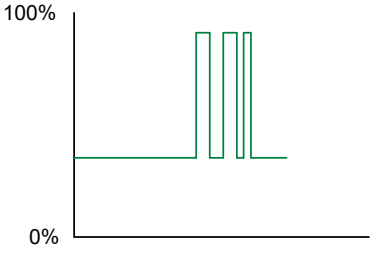
- The 'Fill / Empty Speed and / or Response Times speed may not be appropriate. Choose a value with a faster response.

Unit dipping to <100%



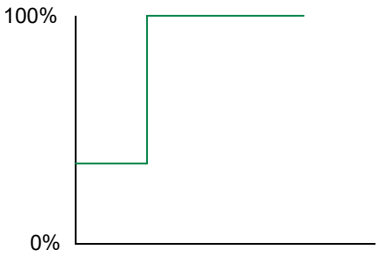
- Ensure the vessel is not being filled above capacity.
- The level may have entered into the Blanking distance which can create a 'double bounce' echo effect. Ensure the Blanking distance is appropriate. Extend the High Level to control the level at a safer distance.

Level spiking to unexpected value



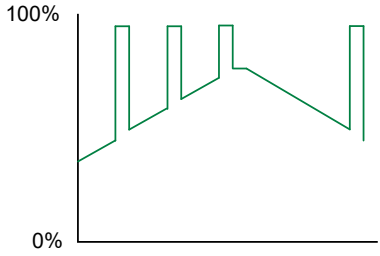
- There may be a mechanical structure creating a false echo.
- Move the mounting position of the unit to a different location.
- Use Blanking to eliminate the false echo as a target if appropriate.

Unit Locking up to 100% or >100%



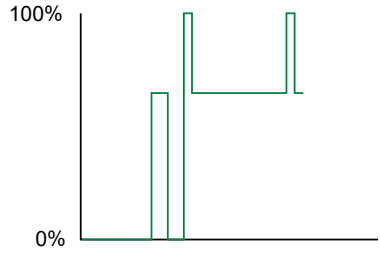
- The unit may be locked onto a false echo >100% level. Use Blanking to eliminate the false echo as a target if appropriate.
- The unit may be in FailSafe condition (this can be identified by the 4-20mA reading or the Diagnostic section of the display). Ensure there is a measurable path to the level. If the unit does not respond to testing it may need replacement.
- Move the mounting position of the unit to a different location.

Unit is spiking during fill or emptying cycle



- There may be a mechanical structure creating a false echo. Use Blanking to eliminate the false echo as a target if appropriate.
- Move the mounting position of the unit to a different location
- Choose a slower responding The 'Fill / Empty Speed and / or Response Time

Unit is spiking while the vessel is empty



- There may be a mechanical structure creating a false echo. Use Blanking to eliminate the false echo as a target if appropriate.
- If the base of the vessel is not flat, extend the Empty Distance. There may be a measurable echo beyond the Low Level.

Using Strength Diff

If the unit is reading an incorrect longer distance, you can set the Strength Diff to instruct the unit to ignore the larger echo.

For example if the first echo (real level) is an 25dB echo but the unit is tracking a larger/longer echo that is 35dB, set Strength Diff to 20dB (for example). This would require the largest echo to be at least 46dB to be considered the real level, thus ignoring the 35dB incorrect reading.

The Echo Table showing the Echo Strength (dB) is available via the HawkBTConnect App Diagnosis screen, and in the Goshawk Diagnostics screen in (click on 'show data' to display the Echo Table).

Echo Table		
E#	Distance-m	Strength-dB
1	1.751	52
2	2.604	49
3	2.787	49

Diagnostics - A - ID: 0 - H80 Radar

EID	Start	End	EWdth	dB
1	2.314	2.329	0.015	55
2	1.736	1.751	0.015	52
3	2.559	2.574	0.015	51

Error Codes

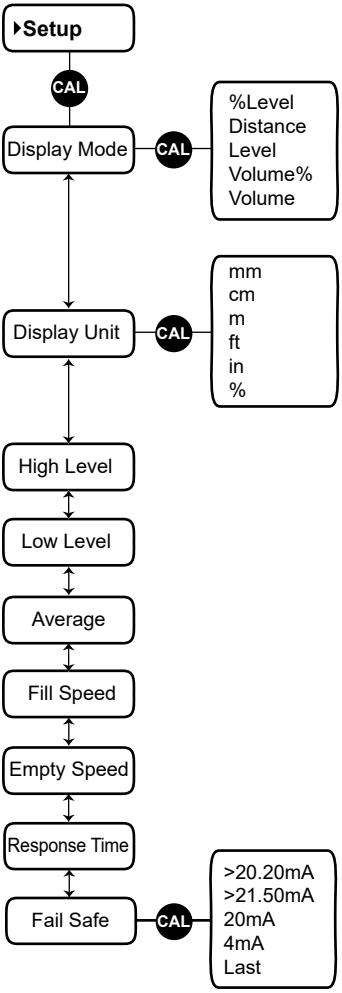
Code	Description
E101	Level not found
E102	Level jump is too large
E104	Capacitor charging abnormality
E140	Screen communication failure
E108	The actual level does not match the 4mA and 20mA settings

Maintenance

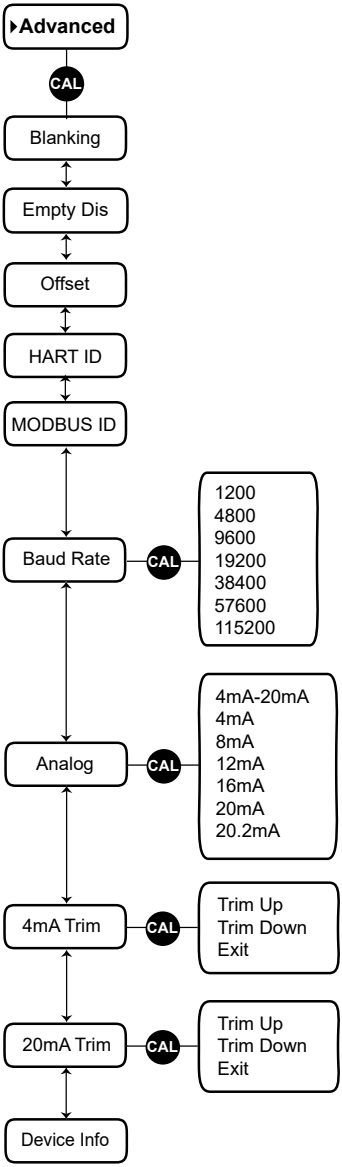
Generally no ongoing maintenance is required.

In applications where there is possibility of build up on the sensor face/antenna (particularly with high dielectric materials) then scheduled cleaning may be required. Build up can suppress the amount of transmitted and returned signal which can reduce performance or create false measurements.

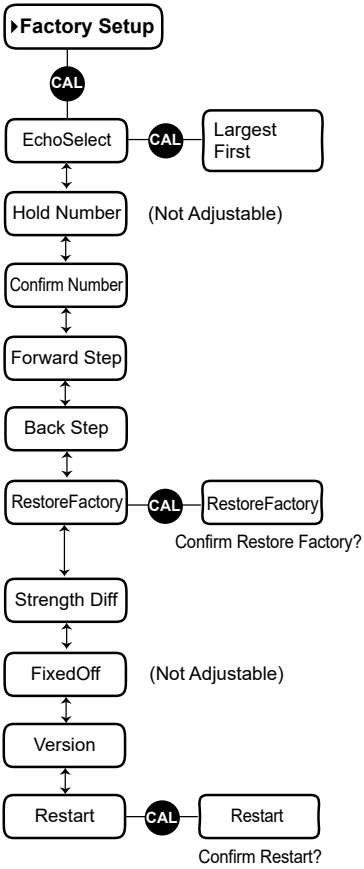
Setup Menu


Setup
CAL
Display Mode
CAL
%Level
Distance
Level
Volume%
Volume
Display Unit
CAL
mm
cm
m
ft
in
%
High Level
Low Level
Average
Fill Speed
Empty Speed
Response Time
Fail Safe
CAL
>20.20mA
>21.50mA
20mA
4mA
Last

Advanced


Advanced
CAL
Blanking
Empty Dis
Offset
HART ID
MODBUS ID
Baud Rate
CAL
1200
4800
9600
19200
38400
57600
115200
Analog
CAL
4mA-20mA
4mA
8mA
12mA
16mA
20mA
20.2mA
4mA Trim
CAL
Trim Up
Trim Down
Exit
20mA Trim
CAL
Trim Up
Trim Down
Exit
Device Info

Factory


Factory Setup
CAL
EchoSelect
CAL
Largest First
Hold Number
(Not Adjustable)
Confirm Number
Forward Step
Back Step
RestoreFactory
CAL
RestoreFactory
Confirm Restore Factory?
Strength Diff
FixedOff
(Not Adjustable)
Version
Restart
CAL
Restart
Confirm Restart?

Part Numbering

3.5" / Flanged Integral Extended Range Version

Note: Unit should be purchased with Flange (3.5" fittings are uncommon)

Model

H80I Hawk Radar 80GHz Integral Version, Bluetooth

Application

X Extended Range

Maximum Range

120 120m (393.7ft)

Output

H 4-20mA HART, Modbus

Housing

A Powder Coated Aluminium

Cable Entries / Glands

M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting

AF35 DN100 PN16 Aiming Flange with Air Purge
FFFF Flange[1]
TB35 3.5" BSP / G3
TN35 3.5" NPT

Mounting / Antenna / Flange Material

C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature

1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure

1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval

XX Not required

H80I	X	120	H	A	M	AF35	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

3.5" / Flanged Integral Version for Liquids Applications

Note: Unit should be purchased with Flange (3.5" fittings are uncommon)

Model

H80I Hawk Radar 80GHz Integral Version, Bluetooth

Application

L Liquids

Maximum Range

65 65m (213.2ft)

Output

H 4-20mA HART, Modbus

Housing

A Powder Coated Aluminium

Cable Entries / Glands

M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting

AF35 DN100 PN16 Aiming Flange with Air Purge
FFFF Flange[1]
TB35 3.5" BSP / G3
TN35 3.5" NPT

Mounting / Antenna / Flange Material

C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature

1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure

1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval

XX Not required

H80I	L	65	H	A	M	AF35	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

3.5" / Flanged Integral Version for Solids Applications

Note: Unit should be purchased with Flange (3.5" fittings are uncommon)

Model

H80I Hawk Radar 80GHz Integral Version, Bluetooth

Application
S Solids

Maximum Range
30 30m (98.4ft)

Output
H 4-20mA HART, Modbus

Housing
A Powder Coated Aluminium

Cable Entries / Glands
M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting
AF35 DN100 PN16 Aiming Flange with Air Purge
FFFF Flange[1]
TB35 3.5" BSP / G3
TN35 3.5" NPT

Mounting / Antenna / Flange Material
C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature
1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure
1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval
XX Not required

H80I	S	30	H	A	M	AF35	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

2" Threaded Integral Version for Liquids Applications

Model

H80I Hawk Radar 80GHz Integral Version, Bluetooth

Application

L Liquids

Maximum Range

10 10m (32.8ft)
20 20m (65.6ft)
30 30m (98.4ft)
65 65m (213.2ft)

Output

H 4-20mA HART, Modbus

Housing

A Powder Coated Aluminium

Cable Entries / Glands

M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting

TB20 2" BSP / G2
TN20 2" NPT
FFFF Flange[1]

Mounting / Antenna / Flange Material

C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature

1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure

1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval

XX Not required

H80I	L	20	H	A	M	TN20	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

2" Threaded Integral Version for Solids Applications

Model

H80I Hawk Radar 80GHz Integral Version, Bluetooth

Application

S Solids

Maximum Range

10 10m (32.8ft)
20 20m (65.6ft)
30 30m (98.4ft)

Output

H 4-20mA HART, Modbus

Housing

A Powder Coated Aluminium

Cable Entries / Glands

M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting

TB20 2" BSP / G2
TN20 2" NPT
FFFF Flange[1]

Mounting / Antenna / Flange Material

C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature

1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure

1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval

XX Not required

H80I	S	20	H	A	M	TN20	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

1.5" Threaded Integral Version for Liquids Applications

Model

H80I Hawk Radar 80GHz Integral Version, Bluetooth

Application

L Liquids

Maximum Range

10 10m (32.8ft)
20 20m (65.6ft)
30 30m (98.4ft)

Output

H 4-20mA HART, Modbus

Housing

A Powder Coated Aluminium

Cable Entries / Glands

M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting

TB15 1.5" BSP / G1.5
TN15 1.5" NPT
TC15 1.5" Tri-clamp fitting
FFFF Flange[1]

Mounting / Antenna Material / Flange Material

C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature

1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure

1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval

XX Not required

H80I	L	20	H	A	M	TB15	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

1.5" Threaded Integral Version for Solids Applications

Model

H80I Hawk Radar 80GHz Integral Version, Bluetooth

Application

S Solids

Maximum Range

10 10m (32.8ft)
20 20m (65.6ft)

Output

H 4-20mA HART, Modbus

Housing

A Powder Coated Aluminium

Cable Entries / Glands

M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting

TB15 1.5" BSP / G1.5
TN15 1.5" NPT
TC15 1.5" Tri-clamp fitting
FFFF Flange[1]

Mounting / Antenna Material / Flange Material

C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature

1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure

1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval

XX Not required

H80I	S	10	H	A	M	TB15	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

1" Threaded Integral Version for Liquids Applications

Model

H80I 80GHz Integral, Bluetooth

Application

L Liquids

Maximum Range

10 10m (32.8ft)

Output

H 4-20mA HART, Modbus

Housing

A Powder Coated Aluminium

Cable Entries / Glands

M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting

TB10 1" BSP / G1

TN10 1" NPT

FFFF Flange[1]

Mounting / Antenna Material / Flange Material

C 316

P 316 Antenna / Flange with PTFE seal

T 316 Antenna, 304 flange with PTFE seal

Temperature

1 -40 to +80 (-40 to +176°F)

2 -29 to +150°C (PTFE Sealed Flange only)

3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure

1 3 Bar (43 psig)

2 16 Bar (232psig) (PTFE sealed flange only)

Approval

XX Not required

H80I	L	10	H	A	M	TB10	C	1	1	XX

[1] See Flange Part Selection

Part Numbering

1" Threaded Integral Version for Solids Applications
(1" version not recommended for solids unless necessary / simple application)

Model

H80I 80GHz Integral, Bluetooth

Application
S Solids

Maximum Range
10 10m (32.8ft)

Output
H 4-20mA HART, Modbus

Housing
A Powder Coated Aluminium

Cable Entries / Glands
M 1 x M20 IP68 Cable Gland & 1 x M20 Blanking Plug

Mounting
TB10 1" BSP / G1
TN10 1" NPT
FFFF Flange[1]

Mounting / Antenna Material / Flange Material
C 316
P 316 Antenna / Flange with PTFE seal
T 316 Antenna, 304 flange with PTFE seal

Temperature
1 -40 to +80 (-40 to +176°F)
2 -29 to +150°C (PTFE Sealed Flange only)
3 0 to +260°C (+32 to 500°F) (PTFE Sealed Flange Only)

Pressure
1 3 Bar (43 psig)
2 16 Bar (232psig) (PTFE sealed flange only)

Approval
XX Not required

H80I	S	10	H	A	M	TB10	S	1	1	XX

[1] See Flange Part Selection

Part Numbering

Compact Version for Liquids Applications

Model

H80C HAWK Radar Compact Version, Bluetooth

Application

L Liquids

Maximum Range

10 10m (32.8ft)
20 20m (65.6ft)
30 30m (98.4ft)

Output

H 4-20mA HART, Modbus

Housing

P Polypropylene

Cable Entries / Glands

X Not required

Mounting

TB15 1.5" BSP / G1.5
TN15 1.5" NPT

Mounting / Antenna Material

P Polypropylene

Temperature

1 -20 to +60 (-4 to +140°F)

Pressure

1 Atmospheric

Approval

XX Not required

Cable Length

06 6m (19.6ft)

H80C	S	20	H	A	M	TN15	P	1	1	XX	06

Part Numbering

Flange Selection (replaces FFFF 4 Digit Mounting Option)

Thread Type

1	1” G/BSP
A	1.5” G/BSP
2	2” G/BSP
B	3.5” G/BSP
5	1” NPT
C	1.5” NPT
7	2” NPT
8	3.5” NPT

Flange Size (must be suitable to fit thread size)

1	1” or DN25 or 25mm
2	2” or DN50 or 50mm
3	3” or DN80 or 80mm
4	4” or DN100 or 100mm
5	5” or DN125 or 125mm
6	6” or DN150 or 150mm

Flange Type

A1	ANSI B16.5 150LB
A3	ANSI B16.5 300LB
D1	EN 1092-1 PN16
D2	EN 1092-1 PN25
C1	HG/T 20592 PN16
C2	HG/T 20592 PN25

7	4	A1

Frequency

- 80GHz FMCW

Operating Voltage

- 18 - 36VDC at the terminal

Communications

- Modbus
- HART 7
- PC Software (Goshawk)
- iOS & Android HawkBTConnect App (via Bluetooth)

Keypad / Display

- Integral: 4 button, 128 x 64 LCD

Blanking Distance

- 150 mm (5.9”)
- Extended Range Version: 1000mm (40”)

Maximum Range

- Integral: Up to 120m (393.7ft), model dependant
- Compact: Up to 30m (98ft)

Resolution

- 1mm (0.04”)

Accuracy

- +/- 2mm (0.08”)

LCD Response Time

- 1 second

Sample Rate

- 3 seconds

Startup Time

- Approx. 50 seconds

Memory

- Non-volatile

Operating Pressure

- Compact: Atmospheric
- Integral: 3 Bar (43 psig), 16 Bar (232 psig)

Operating Temperature

- Integral -40°C to +80°C (-40°F to +176°F)
  -29°C to +150°C (-20°F to +302°F)
  0°C to +260°C (+32°F to 500°F)
- Compact: -20°C to +60°C (-4°F to +140°F)

Beam Angle

- 1” Integral: 8°
- 1.5” Integral: 7°
- 2” Integral: 5.8°
- 3.5” Integral & Flanged: 3.8°
- Compact: 8°

Enclosure Material

- Integral: Powder Coated Aluminium
- Compact: Polypropylene

Antenna / Mounting Material

- Integral: 316
- Compact: Polypropylene

Enclosure Sealing

- IP67

Cable Entries / Glands

- 1 x M20 IP68 Cable Gland
- 1 x M20 Blanking Plug

Mounting

- 1”, 1.5”, 2”, 3.5” Threaded (NPT, G/BSP)
- Flanged
- 1.5” Tri-clamp

Air Purge

- PC6-M5 Push-to-Connect Fitting
- Intermittent Mode: Max. 6 bar
- Continuous Mode: Max. 1 bar

Typical Weight

- Integral: 2kg (4.4lb)
- Compact: 0.4kg (0.89lb)

All company or product names are registered trademarks or trademarks of their respective owners.

Hawk Measurement Systems
(Head Office)
15 - 17 Maurice Court
Nunawading VIC 3131, AUSTRALIA
Phone: +61 3 9873 4750
Fax: +61 3 9873 4538
info@hawk.com.au

Hawk Measurement
5010 Gateway Drive, Medina,
OH 44256, USA
Phone: +1 888 HAWKLEVEL (1-888-429-5538)
Phone: +1 978 304 3000 / +1 877-356-5463
Fax: +1 978 304 1462 / +1 330-331-7172
info@hawkmeasurement.com

For more information and global representatives: **www.hawkmeasurement.com**

DOC-H80-MAN Rev. 1.04 0526