User Manual

# HAWK
## H80 Radar Series

Level Measurement

For more information, please visit >
**www.hawkmeasurement.com**

# Contents

## Overview

Offering a unique blend of compact design and efficiency, the Senator H80 is a 80GHz FMCW radar level transmitter ideal for continuous level measurement of liquids, slurries and solids. It guarantees value without compromising quality and ease of operation. With its flexible mounting options, high chemical compatibility, and a 65m (213.2ft) measuring range, the Senator H80 is versatile enough to meet the demands of diverse industrial applications. Simple commissioning via keypad, Bluetooth App or PC software.

## Principle of Operation

The Senator H80 transmits a radar pulse at the speed of light, bouncing off the surface of the measured material. Proprietary software then analyzes the returned signal, enhancing the accurate reflection while eliminating any false ones.

## 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
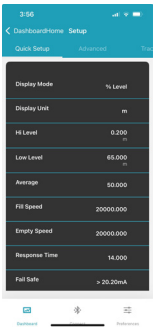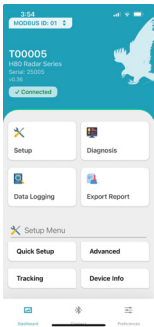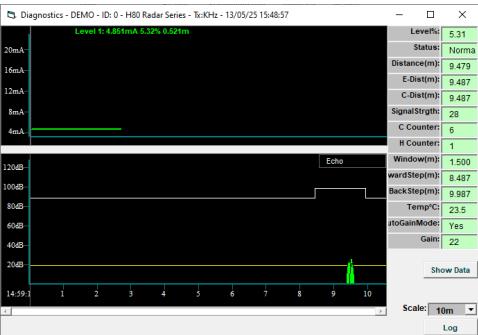


## Features

• 80GHz FMCW Radar
• 4-20mA HART, Modbus output options
• Keypad, display & PC connectivity, Bluetooth compatible with HawkBTConnect App
• Maximum range to 65m (213ft)

• 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

DC24V + −

RS485 + − (A) (B)

### Compact



DC In + −

Modbus B (+) A (−)

## Dimensions

### Compact



Ø 83mm (3.27")
G1 / 1" BSP
83mm (0.87")
70mm (2.76")
131mm (5.17")
83mm (0.65")
1.5" Threaded (NPT, G/BSP) Optional Flange
Ø 40mm (1.57")
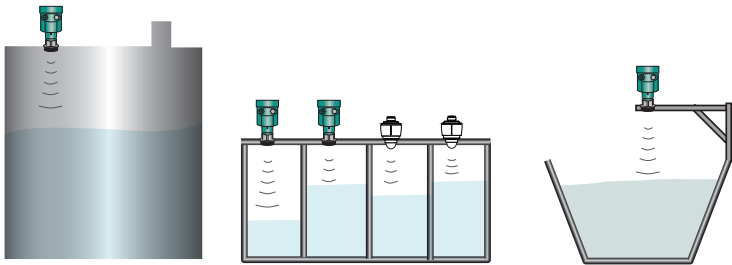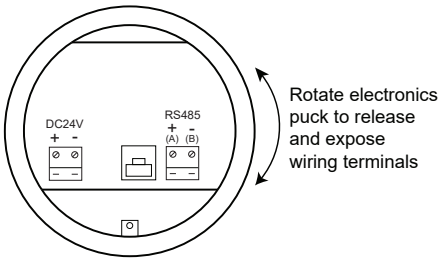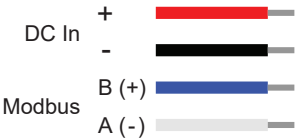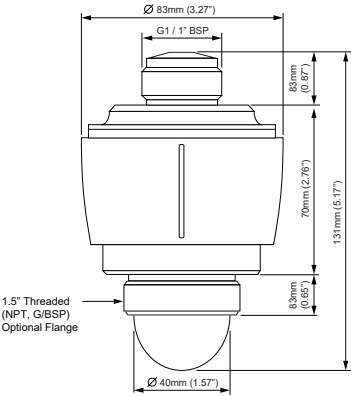
## Integral - 3" / Flanged version



97mm (3.82")

143mm (5.6")

278mm (11")

DN100 PN16 or 4"
ANSI #150 Flange

2mm (0.08")

44mm (1.73")

125mm (4.94")

93mm (3.66")
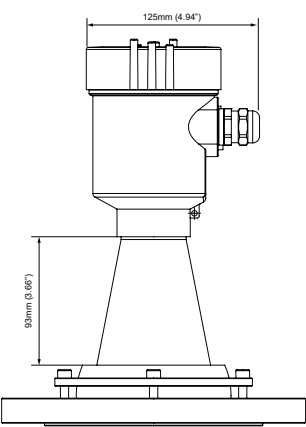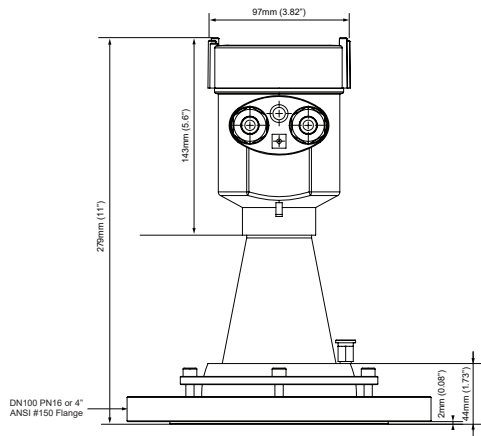
The adjustable flanged requires a 3/16" Allen key

## Integral - 3" Threaded version



97mm (3.82")
125mm (4.94")
143mm (5.6")
269mm (10.6")
90mm (3.53")
126mm (4.97")
3
3" NPT or
3" BSP / G3
⌀ 93mm (3.67")
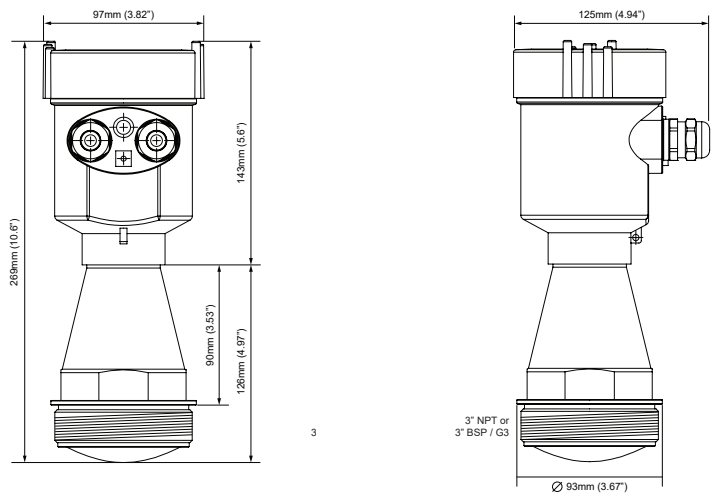
## Integral - 2" Threaded version



97mm (3.82")
125mm (4.94")
143mm (5.63")
200mm (7.9")
58mm (2.28")
2" NPT or
2" BSP / G2
33mm
(1.3")
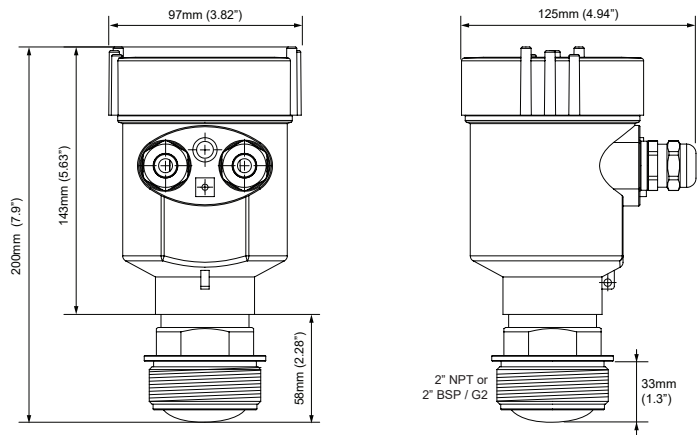
## Integral - 1.5" Threaded version



97mm (3.82")

198mm (7.78")

143mm (5.63")

125mm (4.94")

1.5" NPT or
1.5" BSP / G1.5

30mm (1.17")
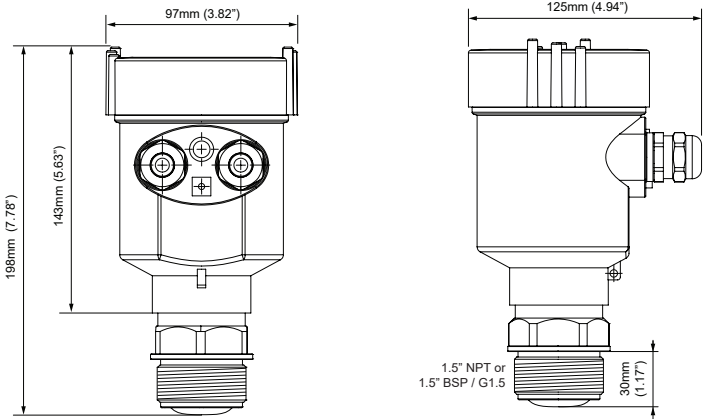
## Integral - 1" Threaded version



97mm (3.82")

182mm (7.17")

143mm (5.63")

37mm (1.46")

125mm (4.94")

23mm (0.91")
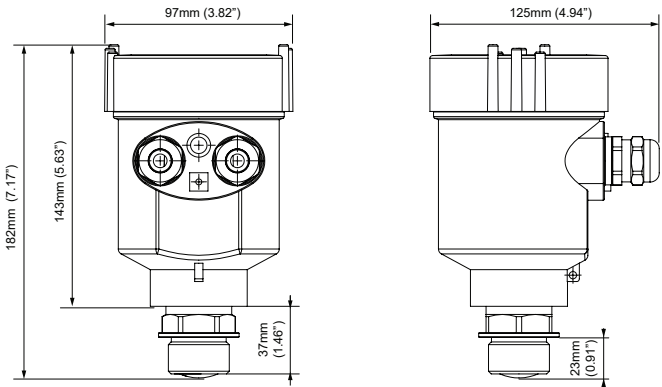
## Mounting

- 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 surface. Take into account response 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
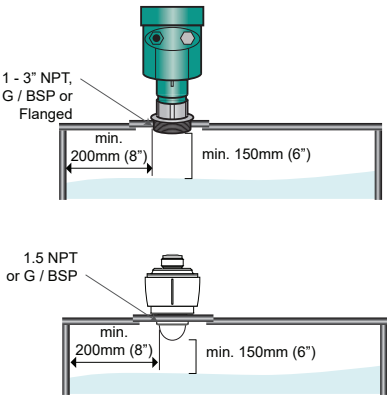
### Beam Angle Table

| 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" Antenna: 3.8° | 33mm per m | 0.40" per ft |

### Stand Pipe Considerations

Avoid mounting in a stand pipe where H height (from sensor face to nozzle base) exceeds the D (diameter) as per below table.

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" |
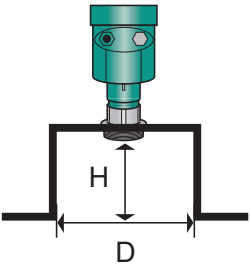
## Placement Considerations

Do **NOT** mount near infeed
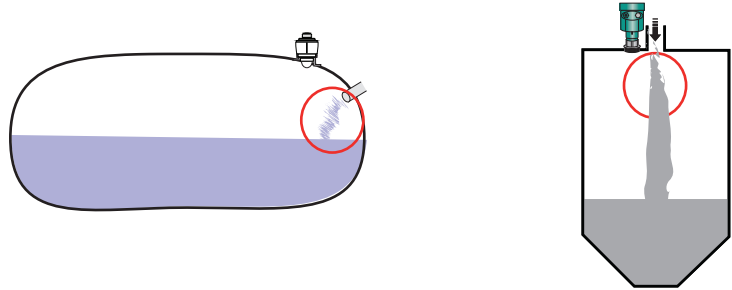


Do **NOT** mount over or adjacent to **any** obstacles
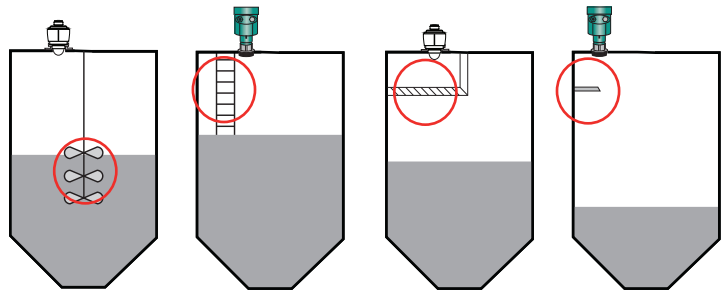


Do **NOT** mount on angle
in liquid applications
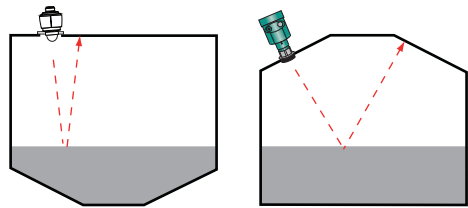
## Configuration

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

**CAL**    Proceed, select, save

⬆    Navigate up, increase value

⬇    Navigate down, cycle to next digit
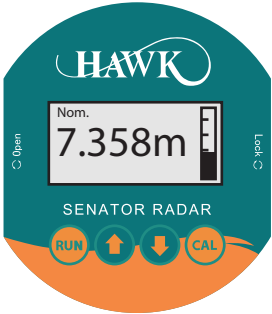
### Start up Sequence

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 an scanning sequence When complete the unit will begin measuring the 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 the operating mode.

Pressing RUN will display the detected echo graph which includes the distance and signal size
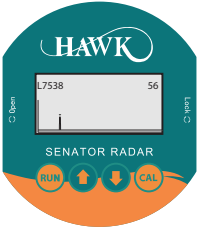
## Quick Commissioning

### 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 signals 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.

Blanking
0.250m (10")

High Level
0.300m (12")

Low Level
3.000m (118")

(Empty Distance)
3.600m (142")
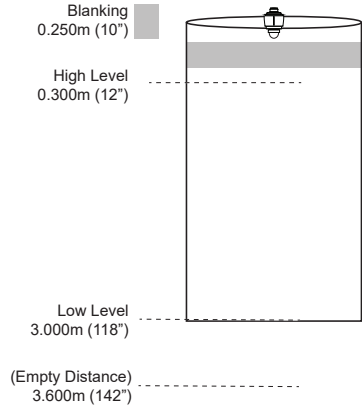
### 2. Set Blanking:

**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″).*

*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.*
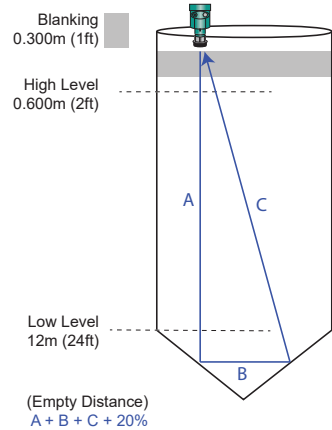
### 3. Set Filling / Emptying Speed & Response Time:

**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.**

Blanking
0.300m (1ft)

High Level
0.600m (2ft)

A    C

Low Level
12m (24ft)

B

(Empty Distance)
A + B + C + 20%

### 4. Averaging:

**Menu Path: Setup > Averaging**

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

HAWK

## Fill / Empty Speed with Response Times 1-10

The Fill / Empty Speed with Response Times 1-10 work together to set how the unit will respond to movements in the level and how long the unit will wait before opening a search process for unexpected movements.

The max movement speeds are per pulse, noting the pulse rate is approximately one every 3 seconds.

When selecting a Fill & Empty speed, ensure the speed is faster than the application.

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

The Response Time is also used to avoid the unit shifting to unexpected changes in level beyond the maximum movement speed.

| Response Time | Fill / Empty Speeds & Max. Movement Per Pulse | | | | | | |
|---|---|---|---|---|---|---|---|
| | 10000 | 20000 | 30000 | 40000 | 50000 | 60000 | 65000 |
| 1 | 349mm (1.15ft) | 649mm (2.13ft) | 950mm (3.12ft) | 1249mm (4.10ft) | 1550mm (5.08ft) | 1850mm (6.07ft) | 2000mm (6.56ft) |
| 2 | 316mm (1.04ft) | 583mm (1.91ft) | 850mm (2.79ft) | 1116mm (3.66ft) | 1383mm (4.54ft) | 1650mm (5.41ft) | 1783mm (5.85ft) |
| 3 | 283mm (0.93ft) | 516mm (1.69ft) | 750mm (2.46ft) | 983mm (3.23ft) | 1216mm (3.99ft) | 1450mm (4.76ft) | 1566mm (5.14ft) |
| 4 | 249mm (0.82ft) | 449mm (1.47ft) | 650mm (2.13ft) | 849mm (2.79ft) | 1050mm (3.44ft) | 1250mm (4.10ft) | 1350mm (4.43ft) |
| 5 | 216mm (0.71ft) | 383mm (1.26ft) | 550mm (1.80ft) | 716mm (2.35ft) | 883mm (2.90ft) | 1050mm (3.44ft) | 1133mm (3.72ft) |
| 6 | 183mm (0.60ft) | 316mm (1.04ft) | 450mm (1.48ft) | 583mm (1.91ft) | 716mm (2.35ft) | 850mm (2.79ft) | 916mm (3.00ft) |
| 7 | 150mm (0.49ft) | 249mm (0.82ft) | 350mm (1.15ft) | 449mm (1.47ft) | 550mm (1.80ft) | 650mm (2.13ft) | 700mm (2.30ft) |
| 8 | 116mm (0.38ft) | 183mm (0.60ft) | 250mm (0.82ft) | 316mm (1.04ft) | 383mm (1.26ft) | 450mm (1.48ft) | 483mm (1.58ft) |
| 9 | 83mm (0.27ft) | 116mm (0.38ft) | 150mm (0.49ft) | 183mm (0.60ft) | 216mm (0.71ft) | 250mm (0.82ft) | 266mm (0.87ft) |
| 10 | 58mm (0.19ft) | 66mm (0.22ft) | 75mm (0.25ft) | 83mm (0.27ft) | 91mm (0.30ft) | 100mm (0.33ft) | 104mm (0.34ft) |

## 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 sets a hold counter which begins when the measured echo has moved faster the Max. Movement Per Pulse, or the echo has disappeared and the unit is moving to another target. When these situations occurs, the unit begins to count down a timer measured per pulse before expanding its search area.

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

| Response Time | First Hold Count Timer | All Subsequent Hold Count Timers |
|---|---|---|
| 1 | 9 | 36 |
| 2 | 8 | 32 |
| 3 | 7 | 28 |
| 4 | 6 | 24 |
| 5 | 5 | 20 |
| 6 | 4 | 16 |
| 7 | 3 | 12 |
| 8 | 2 | 8 |
| 9 | 1 | 4 |
| 10 | 1 | 1 |

## Fill / Empty Speed with Response Times 11-20

The Fill / Empty Speed with Response Times 11-20 are an alternate way to program the unit if the other settings are not appropriate for the application or a more specific setup customisation is required. In this mode, the Fill and Empty speed will set the max. movement per pulse.

For example, Fill Speed of 5000 and Empty Speed of 1000 will respond at a maximum of 5000mm (16.4ft) per pulse during filling and 1000mm (3.28ft) during emptying per pulse.

For fast moving applications such as truck or train unloads and object detection these types of setup would be more appropriate.

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

Note each unit is per pulse (approximately once every 3 seconds).

## Fill / Empty Speed with Response Times 11-20 (con't)

| Response Time | First Hold Count Timer | All Subsequent Hold Count Timers |
|---|---|---|
| 11 | 1 | 1 |
| 12 | 1 | 2 |
| 13 | 1 | 3 |
| 14 | 1 | 4 |
| 15 | 1 | 5 |
| 16 | 1 | 6 |
| 17 | 1 | 7 |
| 18 | 1 | 8 |
| 19 | 1 | 9 |
| 20 | 1 | 10 |

## Setup Menu

| Parameter | Description | Options |
|-----------|-------------|---------|
| Display Mode | Set LCD measurement display mode. | %Level<br>Distance<br>Level<br>Volume%<br>Volume |
| Display Unit | Adjust displayed measurement unit. | mm<br>cm<br>m<br>ft<br>in<br>% |
| High Level | Set High level measurement point (20mA).<br>Minimum value is restricted by Blanking. | Adjustable |
| Low Level | Set Low level measurement point (4mA).<br>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<br>>21.50mA<br>20mA<br>4mA<br>Last |

## 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") |
| Empty Dis | Sets the maximum possible measured range. The system will not accept any signals beyond this distance.<br>The Low Level also cannot be set longer than the Empty Distance. | Adjustable |
| Offset | Add or subtract an offset from the measured distance. | Adjustable<br>Max. +/-9999mm |
| HART ID | Set HART Device ID.<br>Default = 0 | Adjustable |
| Modbus ID | Set HART Modbus ID.<br>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<br>4mA<br>8mA<br>12mA<br>16mA<br>20mA<br>20.2mA |
| 4mA Trim | Manually trim the 4mA reading. | Adjustable |
| 20mA Trim | Manually trim the 4mA reading. | Adjustable |
| Device Info | Displays the device serial number, maximum range and version (Liquids or Solids). | |

## Factory 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 (default) or first (nearest) echo. | Largest<br>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 | |
| FixedOff | Factory setting - not adjustable | |
| Version | Displays the Software and Display revisions | |
| Restart | Restarts the unit | |

## HawkBTConnect

**HawkBTConnect** is available for Android & iOS devices.

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).
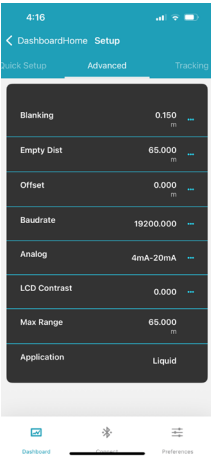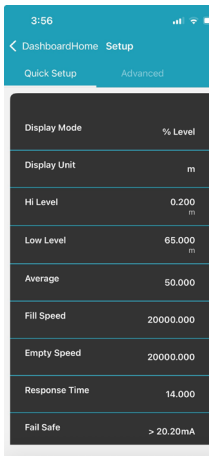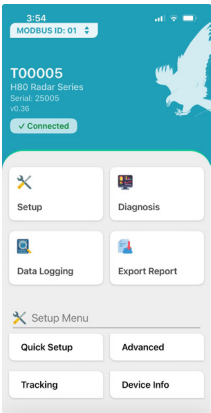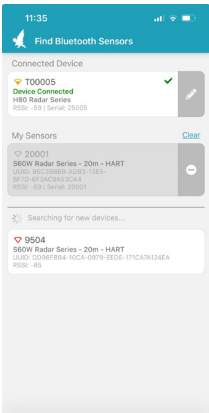
## Example of Errors in Trends & Unit Adjustments

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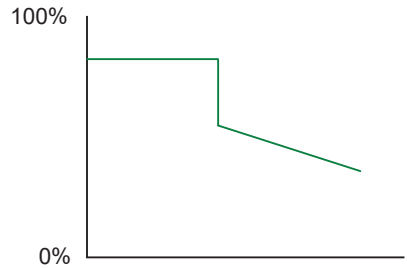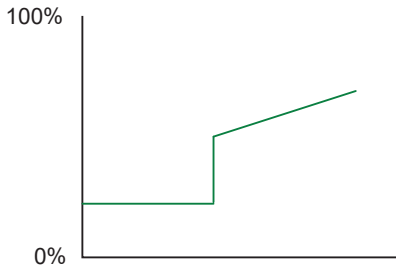
- The 'Fill / Empty Speed and / or Response Times speed may not be appropriate. Choose a value with a faster response.

### Unit dipping to <100%
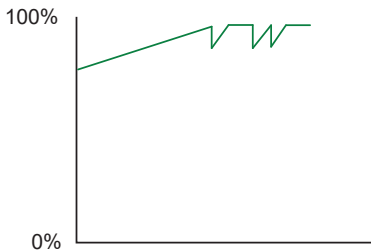
- Ensure the vessel is not being filled above capacity.

- 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
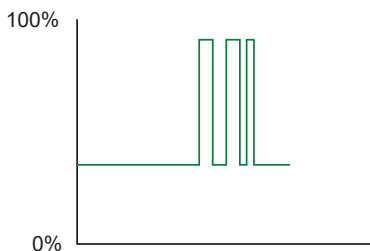
- There may be a mechanical structure creating a false echo.

- Move the mounting position of the unit to a difference location.

- Use Blanking to eliminate the false echo as a target if appropriate.

## Unit Locking up to 100% or >100%
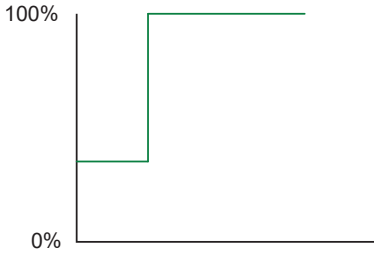
- The unit may be locked of a false echo >100% level. Use Blanking to eliminate the false echo as a target if appropriate.

- 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 difference location.

## Unit is spiking during fill or emptying cycle
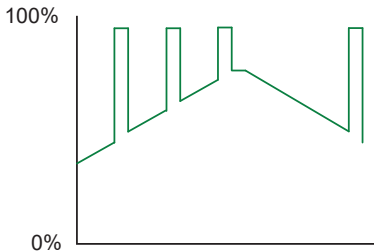
- There may be a mechanical structure creating a false echo. Use Blanking to eliminate the false echo as a target if appropriate.

- Move the mounting position of the unit to a difference location

- Choose a slower responding The 'Fill / Empty Speed and / or Response Time

## Unit is spiking while the vessel is empty
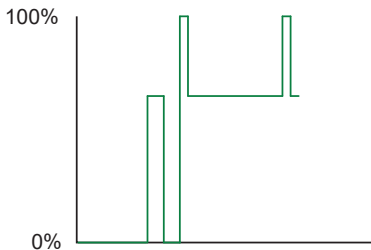
- There may be a mechanical structure creating a false echo. Use Blanking to eliminate the false echo as a target if appropriate.

- If the base of the vessel is not flat, extend the Empty Distance. There may be a measurable echo beyond the Low Level.

## 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
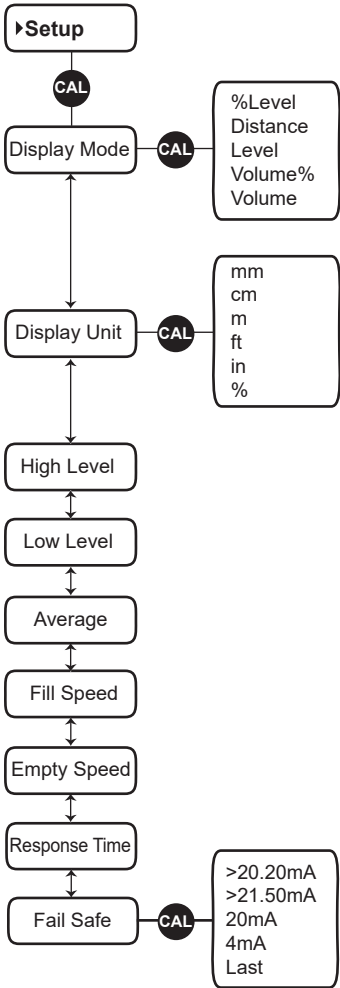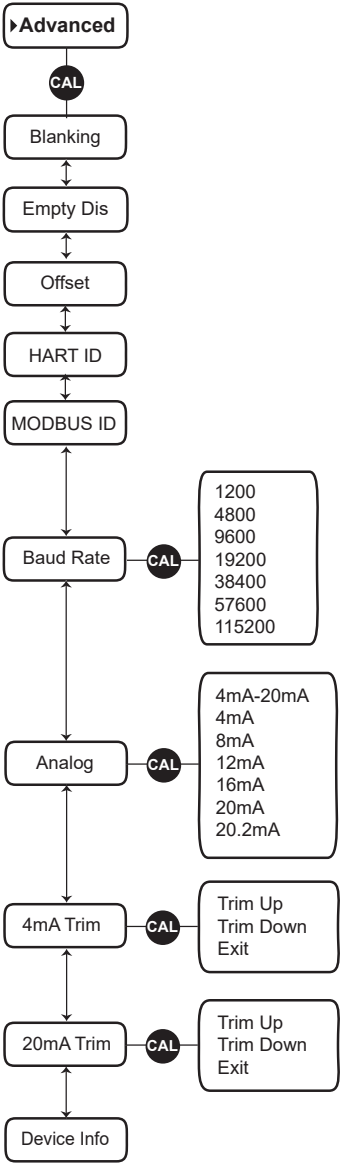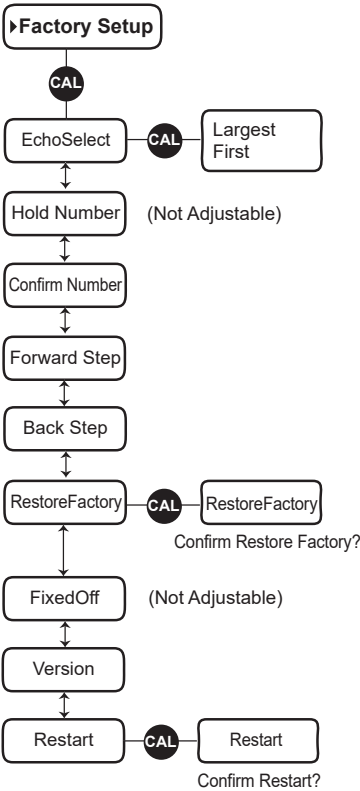
```
▸Setup
   │
  CAL
   │
Display Mode ──CAL──  %Level
                      Distance
                      Level
                      Volume%
                      Volume

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?

FixedOff (Not Adjustable)

Version

Restart —**CAL**— Restart

Confirm Restart?

## Part Numbering

**3" / Flanged 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**

TB30   3" BSP / G3

TN30   3" NPT

A4D6   DN100 PN16 Aiming Flange with Air Purge

A4A1   4" ANSI B16.5 150LB Aiming Flange with Air Purge

**Mounting / Antenna / Flange Material**

C   316 SS

**Temperature**

1   -40 to +80 (-40 to +176°F)

**Pressure**

1   Atmospheric

**Approval**

XX   Not required

| H80I | L | 10 | H | A | M | A4D6 | C | 1 | 1 | XX |

## Part Numbering

**3" / Flanged 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**

TB30     3" BSP / G3
TN30     3" NPT
A4D6     DN100 PN16 Aiming Flange with Air Purge
A4A1     ANSI B16.5 150LB Aiming Flange with Air Purge

**Mounting / Antenna / Flange Material**

C     316 SS

**Temperature**

1     -40 to +80 (-40 to +176°F)

**Pressure**

1     Atmospheric

**Approval**

XX    Not required

| H80I | S | 20 | H | A | M | A4D6 | C | 1 | 1 | XX |
|------|---|----|----|---|---|------|---|---|---|----|

## 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

**Mounting / Antenna Material**

C   316 SS

**Temperature**

1   -40 to +80 (-40 to +176°F)

**Pressure**

1   Atmospheric

**Approval**

XX  Not required

| H80I | L | 20 | H | A | M | TN20 | C | 1 | 1 | XX |
|------|---|----|----|---|---|------|---|---|---|----|

## 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
>>>>>>
>>>>>>> **Mounting / Antenna Material**
>>>>>>> C   316 SS
>>>>>>>
>>>>>>>> **Temperature**
>>>>>>>> 1   -40 to +80 (-40 to +176°F)
>>>>>>>>
>>>>>>>>> **Pressure**
>>>>>>>>> 1   Atmospheric
>>>>>>>>>
>>>>>>>>>> **Approval**
>>>>>>>>>> XX   Not required

| H80I | S | 20 | H | A | M | TN20 | C | 1 | 1 | XX |

## 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

                            **Mounting / Antenna Material**

                            C    316 SS

                                **Temperature**

                              1     -40 to +80 (-40 to +176°F)

                                    **Pressure**

                                  1    Atmospheric

                                        **Approval**

                                        XX Not required

| H80I | L | 20 | H | A | M | TB15 | C | 1 | 1 | XX |
|------|---|----|----|----|----|------|----|----|----|----|

## Part Numbering

**1.5" Threaded Integral Version for Solids Applications**

**Model**

**H80I**    Hawk Radar 80GHz Integral Version, Bluetooth

**Application**

S   Solids

**Maximum Range**
05   5m (16.4ft)
10   10m (32.8ft)
15   15m (49.2ft)

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

**Mounting / Antenna Material**
C   316 SS

**Temperature**
1     -40 to +80 (-40 to +176°F)

**Pressure**
1     Atmospheric

**Approval**
XX Not required

| H80I | S | 10 | H | A | M | TB15 | C | 1 | 1 | XX |
|------|---|----|---|---|---|------|---|---|---|-----|

## 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

**Mounting / Antenna Material**

C   316 SS

**Temperature**

1   -40 to +80 (-40 to +176°F)

**Pressure**

1   Atmospheric

**Approval**

XX   Not required

| H80I | L | 10 | H | A | M | TB10 | C | 1 | 1 | XX |
|------|---|----|---|---|---|------|---|---|---|----|

## Part Numbering

**1" Threaded Integral Version for Solids Applications**

**Model**

**H80I**   80GHz Integral, Bluetooth

    **Application**
S   Solids

        **Maximum Range**
05   5m (16.4ft)

            **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**
TB10   1" BSP / G1
TN10   1" NPT

                            **Mounting / Antenna Material**
C   316 SS

                                **Temperature**
1   -40 to +80 (-40 to +176°F)

                                    **Pressure**
1   Atmospheric

                                      **Approval**
XX  Not required

| H80I | S | 05 | H | A | M | TB10 | S | 1 | 1 | XX |

## Part Numbering

**Compact Version for Solids Applications**

**Model**

**H80C**  HAWK Radar Compact Version, Bluetooth

**Application**

S   Solids

**Maximum Range**

05   5m (16.4ft)
10   10m (32.8ft)
15   15m (49.2ft)

**Output**

H    4-20mA HART, Modbus
M    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

**Compact Version for Liquids Applications**

**Model**

**H80C**   HAWK Radar Compact Version, Bluetooth

### Application
L    Solids

### Maximum Range
10   10m (32.8ft)
20   20m (65.6ft)
30   30m (98.4ft)

### Output
H    4-20mA HART, Modbus
M    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 |

## 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 (6")

## Maximum Range

• Integral: Up to 65m (213.2ft) Liquids, 30m (98.4ft) Solids
• Compact: Up to 30m (98ft) Liquids, 15m (49.2ft)

## 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 Temperature

• Integral: -40°C to +80°C (-40 to +176°F)
• Compact: -20°C to +60°C (-4 to +140°F)

## Beam Angle

• 1" Integral Version: 8°
• 1.5" Integral Version: 7°
• 2" Integral Version: 5.8°
• 3" Integral & Flanged Version: 3.8°
• Compact Version: 8°

## Enclosure Material

• Integral: Powder Coated Aluminium
• Compact: Polypropylene

## Antenna / Mounting Material

• Integral: 316L
• 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" Threaded (NPT, G/BSP)
• Flanged

## Typical Weight

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

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