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FCS MAN-170-0001
RadarSens Level
Monitoring System

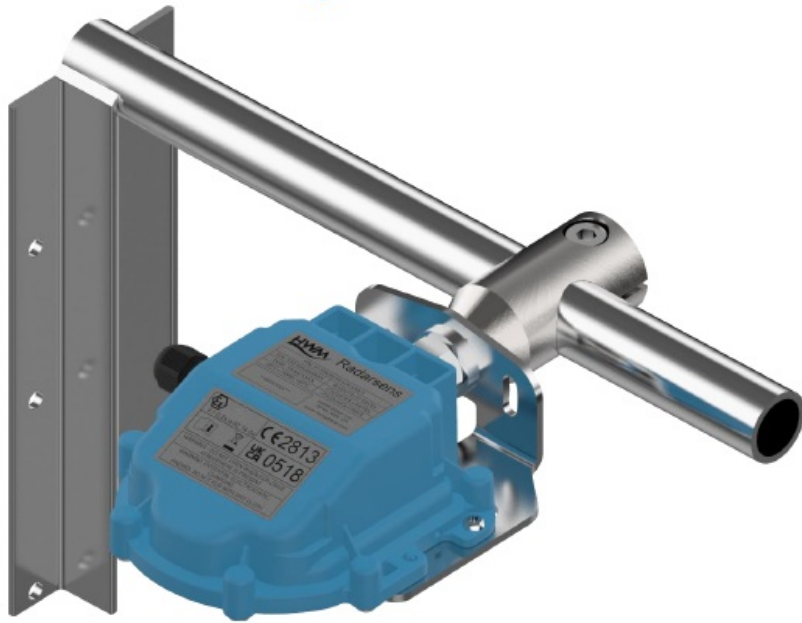# FCS MAN-170-0001 RadarSens Level Monitoring System Installation Guide

Contents

FCS MAN-170-0001 RadarSens Level Monitoring System

Product Information

Specifications

- **Model Number:** S170
- **Device Description:** RadarSens sensor unit

Product Usage Instructions

Introduction
RadarSens is a distance/range measuring sensor device used with an HWM data logger. It utilizes radar signal to measure vertical distance to the surface of water bodies. Contact your sales representative for selecting the appropriate logger configuration.

Installation
Ensure the RadarSens is correctly specified and installed in conjunction with other equipment. Check for safety markings and equipment interconnection suitability. Follow all safety rules and guidelines for the site.

Documentation and Support
This user guide covers the S170 model of RadarSens. Refer to additional documents MANEX-170-0001 and MAN-170-0002 for safety warnings and approvals information. Also, review the user guides for the setup tool used with your logger: MAN-2000-0001 for mobile app and MAN-130-0017 for PC version.

Note
The combined logger and sensor system may have new software features added periodically, leading to minor changes from the manual. Always refer to the IDT screens for current features.

Support
HWM provides customer support through the website: **HWM Customer Support**. For any questions not covered by the manual or online help, contact HWM Technical Support at +44 (0) 1633 489479 or email **cservice@hwm-water.com** .

Safety Considerations
RadarSens is intrinsically safe and designed for use in potentially explosive atmospheres. Connect it to a compatible host logger device approved for such environments. Certification includes various schemes depending

on the model.

FAQ

- **Q: Where can I find additional safety information?**
    - A: Refer to documents MANEX-170-0001 and MAN-170-0002 for safety warnings and approvals information.
- **Q: How do I contact customer support?**
    - A: Visit the HWM customer support webpage or contact HWM Technical Support at +44 (0) 1633 489479 or email **cservice@hwm-water.com** .

The Sound Choice for Leak Detection.”

RADARSENS USER MANUAL:
INSTALLATION AND SETUP (part 1 of 2)

This manual contains important safety and operating information. Please read, understand, and follow the instructions in the manual and also any safety / approvals or Intrinsic Safety (ATEX, IECEx or UKEX) Safety Supplement documents shipped with the device.

INTRODUCTION

“RadarSens” is a distance/range measuring sensor device that is used with a HWM data logger. It uses a radar signal to measure the vertical distance to the surface of a body of water. Please contact your sales representative for help with selection of an appropriate logger configuration for your application.

The RadarSens is designed for use in potentially explosive atmospheres, being an ‘intrinsically safe’ device. It is the responsibility of the installer to correctly specify and install the RadarSens in conjunction with other equipment, making the appropriate checks for safety markings and suitability for inter-connection of the equipment. See section 1.2. The installer should also follow any safety rules or guidelines that may be in place for the site.

DOCUMENTATION AND SUPPORT OF PRODUCT
This user-guide covers the following models

Model Number Device Description
S170 / * / * / IS / * RadarSens sensor unit. This user-guide should be read in conjunction with

Document Number Document Description

- MANEX-170-0001 RadarSens User Manual (2/2) – Safety Supplement
- MAN-170-0002 RadarSens Safety Warnings and Approvals Information

The User-Guide and Safety documents available for the host logger.

(For ATEX approved loggers, the safety supplement and approvals information documents will be supplied with the logger).

Also read the user-guide for the setup tool used with your logger

This user-guide provides details of the RadarSens operation and how to install the product. Your logger user-guide provides details for the logger installation. The IDT app user guide provides guidance on how to check or modify the setup of the logger to use RadarSens, including the settings controlling the sensor operation, allowing you to optimise it for your installation site. The IDT guide also details logger settings for the delivery of measurement data to a server. It includes logger setup for additional messaging features, such as alarms.

Note: The combined logger and sensor system may periodically have new software features added which may lead to minor changes from the diagrams and features described in this manual. Screen shots and descriptions within this manual refer to the functionality that was available within the logger samples used; this can vary from device to device. Therefore, always refer to the IDT screens to determine which features are available on the devices you are installing.

HWM provides support of the logger devices by means of our customer support webpages:
https://www.hwmglobal.com/help-and-downloads/

Should you have any questions that are not covered by this manual or online help, please contact the HWM Technical Support team on +44 (0) 1633 489479,or email **cservice@hwm-water.com**

SAFETY CONSIDERATIONS
The RadarSens is an intrinsically safe sensor device, designed for use within potentially explosive atmospheres. When installed in such an environment, RadarSens is required to be connected to a compatible host logger device which must also be approved for use within potentially explosive atmospheres.
Certification of RadarSens includes the following schemes (dependent on model):

Check the labels of the sensor (and also of the host logger) for the presence of any required approvals marks prior to their use.

Note: Where this manual uses the terms "Intrinsically Safe" or "ATEX" throughout its content, this must be understood to mean whatever intrinsic safety standards (ATEX, UKEX, IECEx) are relevant or applicable to the country of installation.

Note: The installer is responsible for ensuring the logger and any connected equipment are certified for use and are also compatible for interconnection.

Safety Note
Before continuing, carefully read and follow the information in the "Safety Warnings and Approvals Information" document supplied with the product. This provides general safety information. The installer or maintainer must also refer to the safety supplement documents, supplied with intrinsically safe versions of the product. This will provide additional ATEX-related safety information, including port parameters.

Retain all documents for future reference.

Before using this product

- Make a risk assessment of the installation site and expected work activity.
- Installations in a hazardous environment (e.g., ATEX) should be carried out by appropriate technicians with suitable training for that environment.
- Ensure any tools necessary for installation are suitable for use within the hazardous environment.
- Ensure suitable PPE (personal protective equipment) is used and that safe working practices are followed during installation or maintenance.
- Check with the site owner or supervisor for any additional safety requirements before commencing work.
- Ensure any communications device being used to assist in the install or setup of the logger is also suitable for use in any hazardous environment in which you are working.

Within an ATEX environment, use only with a compatible Intrinsically Safe logger. (Refer to: MANEX-170-0001RadarSens User Manual (2/2) – Safety Supplement).

Before entering hazardous area

- Check the sensor and apparatus have the right approvals and certifications for use within the intended installation environment.
- Confirm the equipment has suitable ATEX markings and is being operated within its ATEX limits.
- Check the port parameters of the relevant logger interface and the equipment to be attached. Confirm they are suitable for interconnection.
- Check the equipment includes a suitable cable with connector attached for interconnecting RadarSens to the logger interface. A water-tight connection is required.

OPERATING TEMPERATURE
Refer to the product's Datasheet or your sales representative for guidance on the storage and operating temperature range of the sensor and logger devices. Ensure the unit is within the operating temperature range prior to installation.

VIEWING DATA FROM RADARSENS
To view data remotely from your RadarSens sensor, a viewing tool (website) is required which presents the data stored for the installation site. Data from your sensor can also be viewed locally using the IDT app during a site visit. Refer to the training materials available for your viewing tool and also the IDT app user-guide for further information.

OVERVIEW

DEVICE OVERVIEW
RadarSens (see Figure 2) is a sensor that measures distance. It is typically installed to measure the distance from a fixed location to the surface of a body of water, or a water channel. It can be used with compatible HWM logger devices, which provide it with power and read measurements from it.

- RadarSens is mounted as shown, with labels facing upwards.
- The lower face (see Figure 1) must face the body of water.

Figure 2. RadarSens by HWM
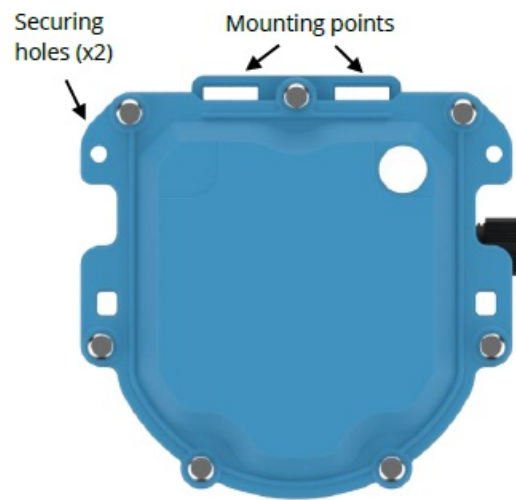

Securing holes (x2)

Mounting points

Figure 1. Lower face of RadarSens

- The sensor is available with either a connector built into the unit, to which a separate cable can be attached, or with a gladden (captive) cable.

- The connectors used with the sensor will form a water-tight connection when correctly attached. The logger end of the cable has a connector with 6-pins, whilst the sensor end of the cable has a connector with 4 pins (unless it is a gladden connection). Several cable lengths are available.

- Ensure your logger has a suitable connector for RadarSens before attempting installation. This can be determined by the logger part-number; refer to your logger's manual for guidance.

- RadarSens can be programmed (via the IDT app) only when it is connected to the logger.

- The RadarSens contains a radar transducer (combined transmitter and receiver). It operates by emitting focused Radar pulses, which travel to the surface of the water and are reflected back to the transducer. The radar beam is highly directional but reflective surfaces within its path can cause false readings or a reduction in power reaching the sensor; these can lead to errors in the measured distance. The sensor recognizes the pulse pattern within the signal and determines the time delay for the reflection to arrive. The time delay is then converted into a distance measurement.

Note: The radar signal is an electromagnetic wave. The user should limit their exposure to the signal by keeping at a distance of at least 20cm (8 inches) away from the underside of the unit when it is operating.

- The top of the RadarSens contains labels that show the model's name, model number, and any applicable approvals markings for the product. Pay attention to any safety warnings on the label and to the safety warnings documents that accompany the delivery of the RadarSens. Each unit also has a unique serial number.

- Each RadarSens is calibrated within the factory before shipment. The calibration settings, model-number and serial number are stored within the sensor.

- **Note:** Each RadarSens stores various settings, including parameters that control the sensor profile (see the RadarSens section of the IDT user-guide for more details). Whenever a RadarSens is newly added, or replaced with another unit, the profile setup process must be re-done for the new sensor.

- The RadarSens has no internal batteries. It is powered by the logger only when a measurement is being taken and returns to a standby state after the logger has the required data. The logger temporarily stores sensor data, until it uploads it to 'the cloud', to a server which stores all the measurement data of the site (e.g., Data Gate); Refer to the logger manual for more details.

- RadarSens must be mounted securely above the body of water, such that it does not change its position during

its period of use. The unit must be levelled and aligned to the deepest part of the water channel during installation. After mounting RadarSens, some checks and distance measurements are usually required to be made from the installation site.

- Although the unit primarily measures the distance to the surface of the body of water, the logger can be used (with site dimensions) to derive additional measurements, such as water depth or water flow rate.

- The center of the lower surface (see Figure 1) should be kept clean and undamaged (no scratches or scuffs from rough surfaces, etc), as this may affect the operation of the unit. Some models include a Hydrophobic film (optional) on this surface; Do not remove if fitted.

Note: The unit should only be cleaned using a damp cloth.

INSTALLATION ACCESSORIES
Accessories for mounting the unit are available to suit most installation situations; discuss availability with your HWM representative.

The following accessories are available
Mounting bracket for RadarSens. The bracket will include a mounting plate for the sensor and may also include logger mountings. (Refer to section 4.2.)

MEASUREMENTS AVAILABLE AND EXAMPLE APPLICATIONS

SITE MEASUREMENTS
The RadarSens can be used to measure

- Distance from the lower surface of the sensor unit to the surface of a body of water. (This is the primary measurement of the sensor.)
- Depth of a body of water. (This is a calculated measurement; distance from sensor base to water channel base is required.)
- Water flow over various types of weirs (if the logger has the option installed).
- Water flow through an open channel (if the logger has the option installed; an additional sensor is required).

A typical application of the sensor is for it to measure water depth, which can be monitored to be within expected limits. If the depth goes outside of the limits, the host logger can be programmed to report it as an alarm condition.

Note: Alarms are a function provided by the host logger and other parts of the HWM system. Refer to your logger user-guide and the IDT App user-guide for information regarding their setup.

AUXILIARY RADARSENS SENSORS & MEASUREMENTS
The RadarSens unit contains auxiliary sensors

- Pitch
- Roll
- Internal temperature

  The RadarSens unit can provide additional information
- Intensity

Pitch and Roll sensors measure the orientation of the unit. These sensors are not used as a logged channel but

can be set up to detect "sensor has moved" error conditions, and subsequently raise a system warning or alarm (which gets sent to the Data Gate server).

When your logger includes the 'intensity' channel option, RadarSens can log the intensity of the returned radar signal. This can provide useful information about changes in the reflectivity of the surface (e.g., when solids are present), which could indicate the start of a blockage. The reflectivity could also change if the water channel is dry. Consider if an alarm would be appropriate during setup of this channel (e.g., water depth is within the expected range, but the reflectivity has a persistent change).

An internal temperature sensor can be used to indicate the ambient temperature of the installation site.

CHOOSING THE CORRECT SENSOR POSITION

PRINCIPLE OF OPERATION AND OPERATING REQUIREMENTS

- The RadarSens emits a focused radar pulse, which travels in a cone-shaped beam from the bottom of the unit (see Figure 3). The beam is approximately a cone with an angle of up to 15 degrees and should be targeted at the lowest point of the water channel. This will require the sensor base to be accurately levelled and then the sensor location adjusted so as to position the center of the base directly over the lowest point. The center of the beam gives the highest signal, with the signal reducing as the angle increases. Accurate alignment is particularly needed when mounted above curved channels, as otherwise RadarSens will not detect the true bottom of the curved channel as the beam may be reflected in a non-vertical direction.
- Similarly, the beam should not be targeted above other sloped surfaces, such as benching.
- The path of the beam cone should be clear of objects, including the side walls of the chamber and equipment wiring, since it can affect the reflection that the sensor is trying to detect.
- Any object present within the cone may also appear in the field of vision of the sensor, causing an unwanted spurious/nuisance reflection. It is important to check for the existence of any features that can cause problems when the water level is low. Otherwise, objects could be hidden below the water surface which may deflect the beam, causing measurement problems that occur only when the water depth is low.
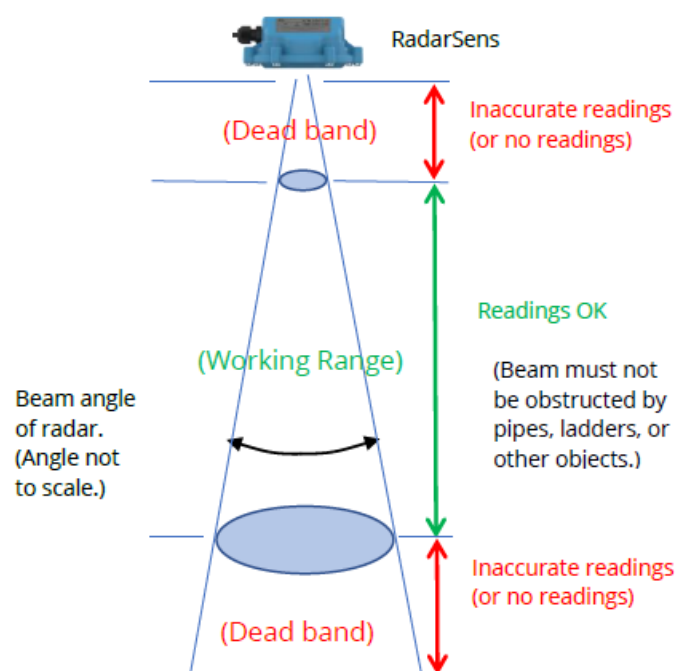

Figure 3. Cone-shaped Radar 'beam'. Working range and 'dead band' areas

- The working range of the sensor is illustrated in Figure 3. There are two areas of the cone of the beam that are

referred to as 'dead bands'. If the water level is closer than the nearest dead-band, the level cannot be measured (the sensor is still generating pulses). If the water level is more distant than the furthest dead-band, the level cannot be measured (the sensor is no longer able to receive the distant reflected pulses).

- The minimum and maximum water levels for the site must be within the working range of the deadband limits. Refer to Table 1 for default deadband limits.
- For optimum results, avoid any unwanted objects within the cone area.
- The measuring system is dependent on a good reflected pulse signal being received. Therefore, when installing, consider what surface features the radar beam may encounter and possibly cause a reflection back to the lower face of the RadarSens unit.
- Accurate positioning is required for best results when targeting the sensor.

Therefore, although the beam forms a cone

- Treat the cone as if it were very narrow for targeting.
- Treat the cone as if it were wider (15 degrees) for evaluating potential reflection problems.

Examples of good and bad scenarios are shown in Figure 4, on page 9.

Deadband (near) (mm)	Deadband (far) (mm)
150	3000

Table 1. Default deadband values (working range limits)

Prior to commencing work, to minimize risk of measurement issues, consider the water flow and any turbulence or bubble-generating areas within the water channel. For best results, try to avoid placing the RadarSens directly over turbulent areas. (Refer to Figure 5).

SITE PREPARATION
Check the water channel material is compatible with RadarSens.

- RadarSens can be used with a flat or curved channel, but for a curved channel alignment of the sensor beam is more critical.
- Wherever possible, the equipment should be installed when the water channel is at a low level or drained. This will assist in finding the location at which the aim of the sensor should be targeted. In addition, the channel can be checked for any hidden objects that can give rise to measurement issues. Clean the channel of any objects and debris prior to installation.
- When it is not possible to drain the water channel, check for any obstacles and debris below the sensor using a suitable tool. A post-level can also be used with a vertical
'probe' during installation to find the deepest part (by comparing depth with the levelled bracket arm); mark the location on the arm for guidance when RadarSens is later being positioned.
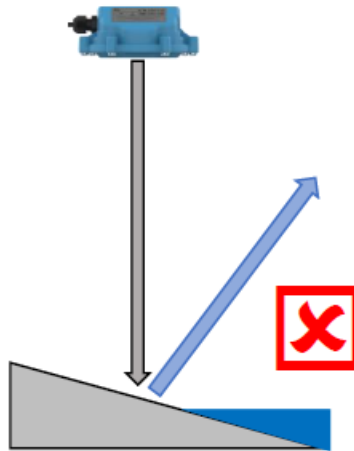- **Ideal**
The signal has a good flat surface to bounce straight back from, even when the water level is low.
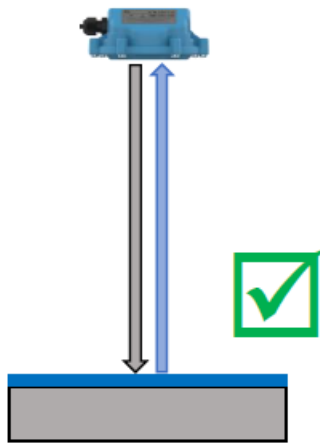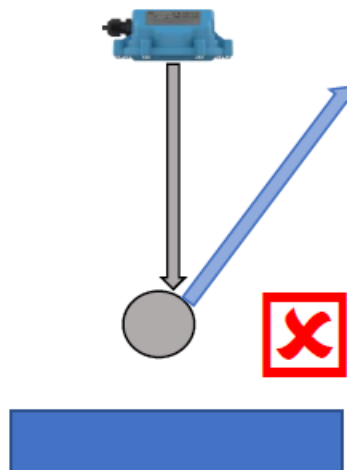
- **Problem**

  RadarSens is looking at a sloping (Benched) surface causing the signal to bounce away.

  This may be a problem that will not appear until the water level is low.
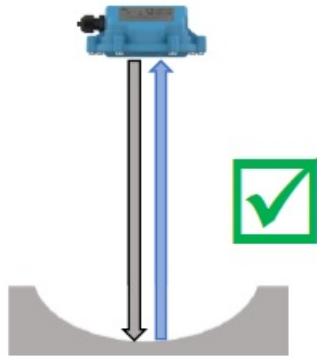

- **Problem**

  The radar beam has struck an object in its path causing all or part of the reflected signal to bounce away. This may be a problem that does not appear until the water level is low.
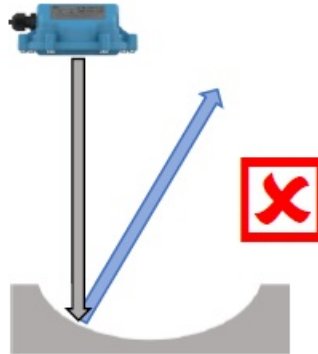

- **Ideal**

  The signal is aimed at the center of a curved channel. It can be reflected vertically to the sensor, even when the water level is low.
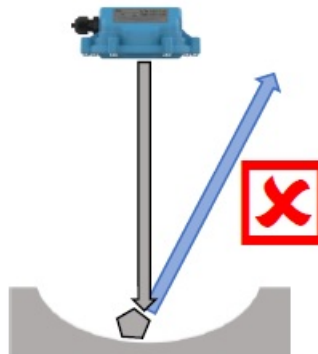
- **Problem**

  The signal is not aimed at the center of a curved channel. It is not reflected vertically and can miss the sensor.
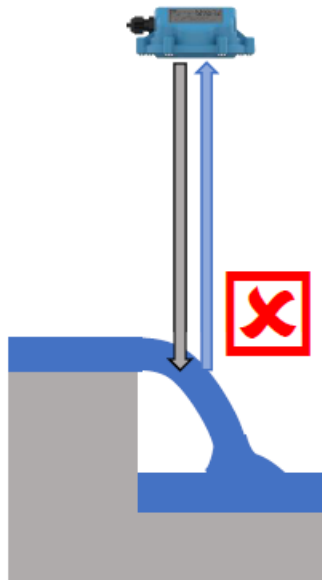

- **Problem**

  Debris not cleared.

  The signal has struck debris at low water level, causing all or part of the reflected signal to miss the sensor.


- **Problem**

  The signal is aimed at a water feed-in area. Measurements will not show true level of static water in the chamber and will show significant variation in levels.
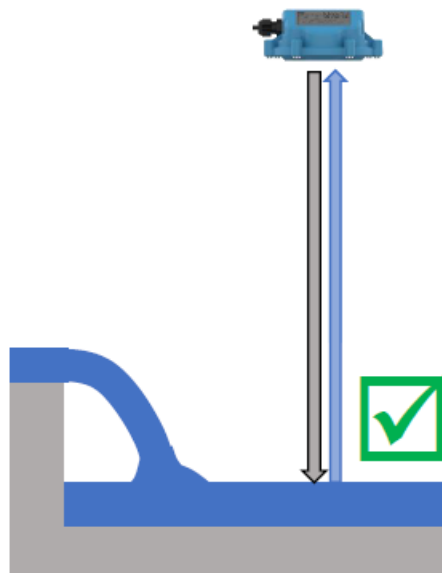
- **Problem**

  The signal is aimed at the water flow with most turbulence. Measurements will show significant variation in levels. Accuracy problems may also be introduced by the presence of bubbles or foam in the water.
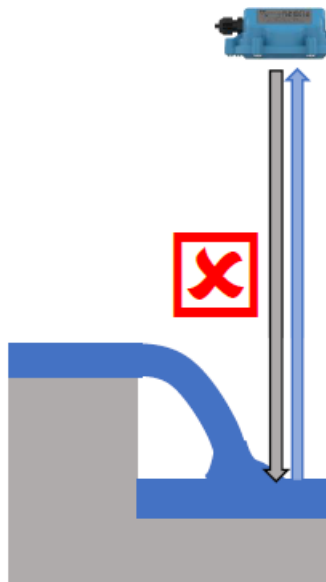
- **Ideal**

  The signal is aimed at water in the chamber that is at the lowest point and is least disturbed by feed-ins. Measurements will show true level of static water and be most consistent. Signal is also aimed at an angle perpendicular to the water surface.
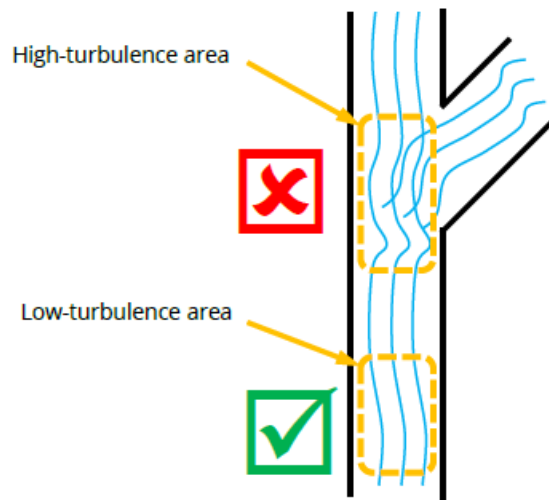
- **Problem**

  Avoid placing RadarSens directly over a point where two streams merge as the turbulence at the mixing point can cause problems with measurements.

- **Ideal**

  RadarSens is placed over an area where turbulence is minimal.

INSTALLATION

SUMMARY OF INSTALLATION AND SETUP STEPS

- Ensure all safety measures have been/are being observed.
- Prior to commencing installation, make any preparations of the chamber, as detailed in section 3.2.
- Make an initial evaluation of the chamber where the equipment is to be installed to get an idea of where each part will be positioned. This will be affected by both the sensor range and position of dead-bands.
- Ensure you have suitable brackets for the installation.
- Ensure there will be sufficient headroom within the chamber to install the logger, attach connectors and fit the chamber lid before finalizing the bracket position.
- Install the bracket, making sure you have considered any required offset between the base of the sensor and the height of the bracket arm.
  (Refer to Figure 6 and Figure 7 for typical offset values.)
- Level the mounting plate and also adjust its location to be directly above the lowest part of the water channel.
- Mount the sensor and secure it to the bracket. Similarly, mount the logger in its final position. Ensure any other logger accessories (e.g., antenna) are going to be positioned where they will not interfere with the path of the radar beam.
- When installing loggers and battery packs, take care to observe any recommendations for orientation for best battery life.
- Use IDT to register the sensor for use with the logger (check or setup).
- Use IDT to select an initial profile for the sensor, then tune it to the requirements of the installation chamber. (e.g., Adjust the Threshold values).
- Use IDT to set up options for handling temporary measurement error issues.
- Use IDT to setup any additional requirements of RadarSens use (e.g., Add an Intensity channel and then set (save) the RadarSens final position).
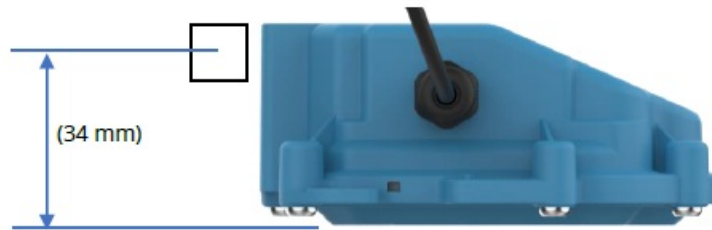
Figure 6. Offset (typical) of RadarSens from center of bracket arm (square)

Figure 7. Offset (typical) of RadarSens from center of bracket arm (round)

BRACKET INSTALLATION

Make an initial assessment of where the RadarSens will be positioned within the chamber. It is useful to measure the height from the bottom of the channel to the proposed mounting position of the sensor and then confirm that the sensor is going to be within its useful operating range.

- The distance to the bottom of the chamber must be less than the maximum range of the device.
- The maximum expected water height must be below the 'dead band' nearest to the sensor.

The bracket and mounting accessories must be positioned accurately and then fastened securely, so that they do not move or rotate over time.

Confirm that the intended mount position of the logger is suitable for the length of the sensor cable. Confirm that no obstructions will be present in the path of the beam cone.

Decide which type of bracket is to be used and mount it in position. Some examples of installation follow.

Figure 8. Brace-bar mount solution

Figure 9. Bracket mount solution

BRACE-BAR INSTALLATION EXAMPLE

- This bracket can be used to mount the RadarSens and certain loggers onto one bracket, as shown in Figure 8. Refer to Figure 10 for details. The brace-bar should span between the walls of the chamber at right-angles to the direction of the channel. The bracket can be secured to a suitable tether point within the chamber if required.

- Determine on which side the RadarSens is to be fitted and then feed the sliding mount onto the brace-bar. Gently tighten the two outermost wingnuts to hold the slider temporarily in position. Ensure the securing bolt end of the brace-bar is just below the correct length and then position within the chamber. The brace-bar needs to be mounted approximately 34mm above the expected position of the base of RadarSens. (e.g., if a 3m range is required, mount at a 3.034m height. Refer to Figure 6.)
- Level the brace-bar on 2 axes using a suitable levelling tool (e.g., a miniature spirit level). Tighten the brace-bar using the securing bolt. The rear of the brace-bar has a spring-plate to give some immunity from thermal expansion and contraction effects. It also prevents rotation of the fixing.
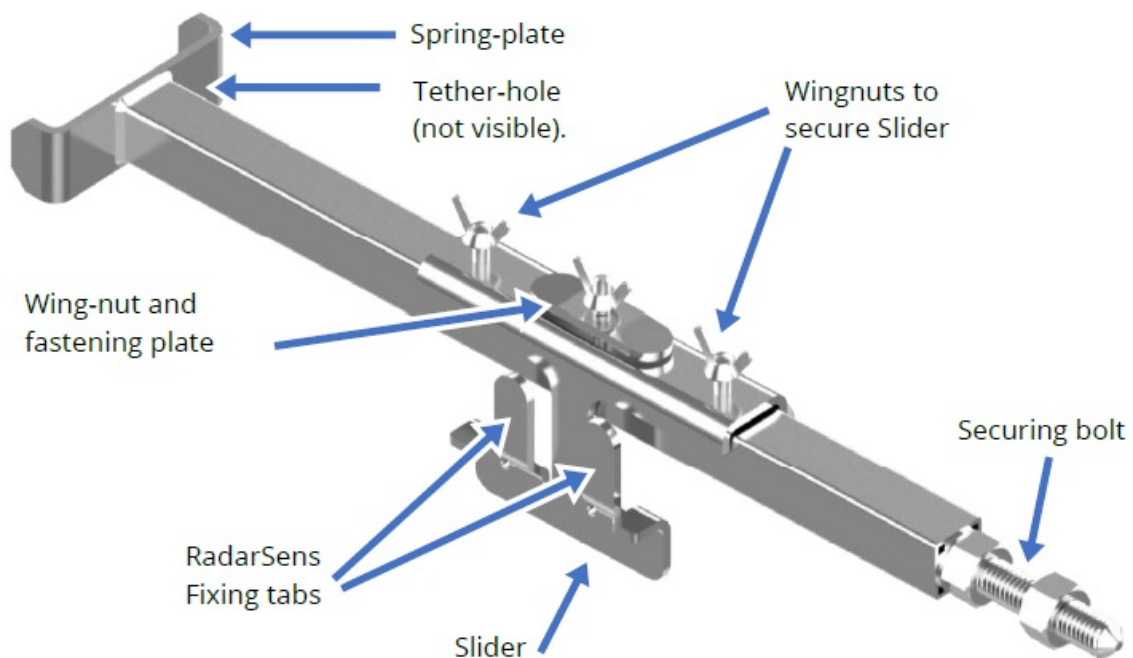

Figure 10. Brace-bar detail

- The slider should now be slightly loosened and positioned on the brace-bar such that its center is directly over the measurement target. Use a vertical alignment tool (e.g., a plumbline) to assist with alignment accuracy. Then re-tighten the slider to secure it in position.
- The RadarSens may now be mounted onto the slider by feeding the mounting points (refer to Figure 1) onto the RadarSens fixing tabs. If a logger is to be fixed onto the locating pins on the opposite side of the slider, mount it at this stage. Then rotate the fastening plate through 90 degrees and use it to clamp the sensor (and logger) securely to the brace-bar. This will prevent the equipment from being disturbed or washed away during any flood conditions.
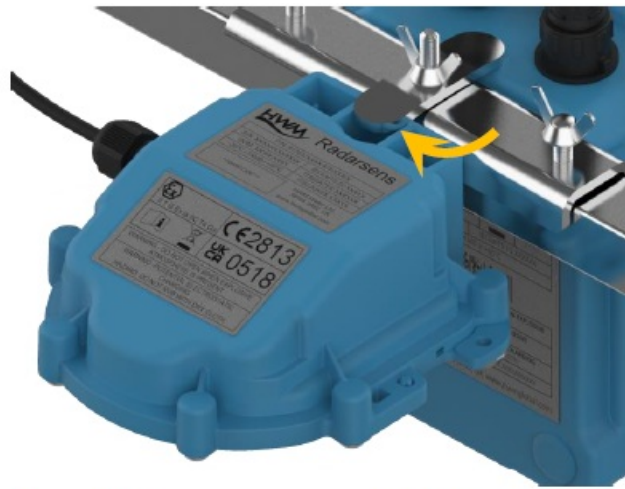
Figure 11. Secure equipment with fastening plate

FIXED BRACKET INSTALLATION EXAMPLE

- This solution mounts the RadarSens onto a wall-mounted L-shaped bracket, as shown in Figure 9. Refer to Figure 12 for details. The horizontal arm of the bracket should be positioned at right-angles to the direction of the water channel. Drill appropriate fixing points and then mount the bracket onto the chamber wall. The center of the bracket arm needs to be mounted approximately 26 mm above the expected position of the base of RadarSens. (e.g., if a 3m range is required, mount at a 3.026m height. Refer to Figure 7.)

- Determine which side the RadarSens is to be fitted and then feed the slider onto the bracket arm such that the slider securing bolt is accessible from the top. Tighten the slider securing bolt so that it is clamped to the bracket in an approximately horizontal position. Add the mounting plate to the slider, rotate it into an approximate horizontal position and then tighten.
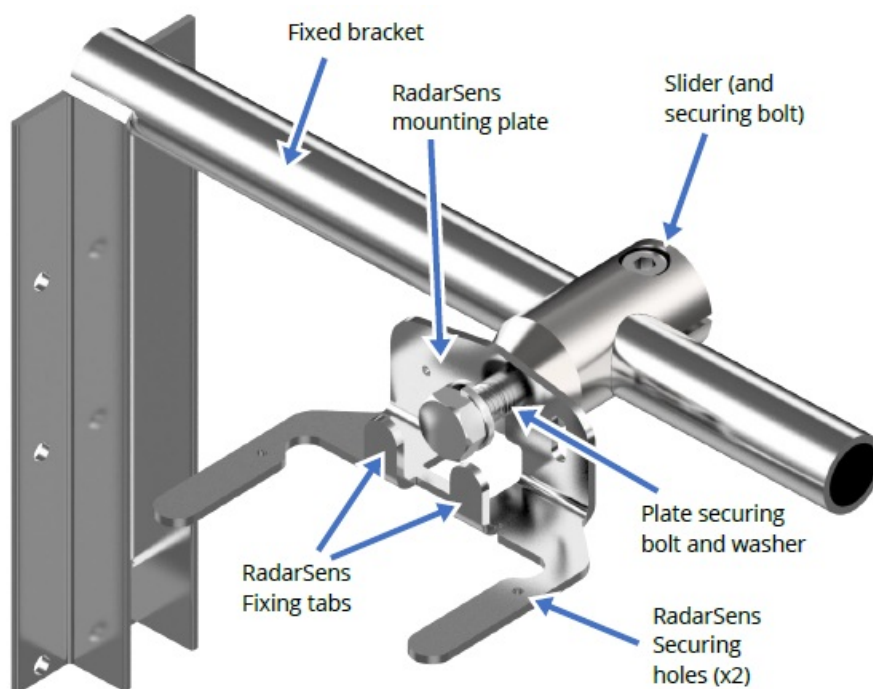

Figure 12. Fixed bracket detail

- The slider should now be slightly loosened and positioned on the bracket arm such that its center is directly over the measurement target. Use a vertical alignment tool (e.g., a plumbline) to assist with alignment

accuracy. Then re-tighten the slider to secure it in position.

- Using a suitable leveling tool (e.g. a miniature spirit level), progressively adjust the rotation of the slider and the RadarSens mount plate until the mount-plate is level in 2 axes.
- Then tighten both.
- The RadarSens may now be hooked onto the fixing tabs of the mounting plate. Secure it in position using two screws (supplied) and the threaded securing holes in the mount plate.
- This will prevent the equipment from being washed away during any flood conditions.

OTHER BRACKET OPTIONS
Various other bracket options are available. Adapt the installation steps from sections 4.2, 4.2.1 and 4.2.2 to suit the bracket supplied. An example is shown below
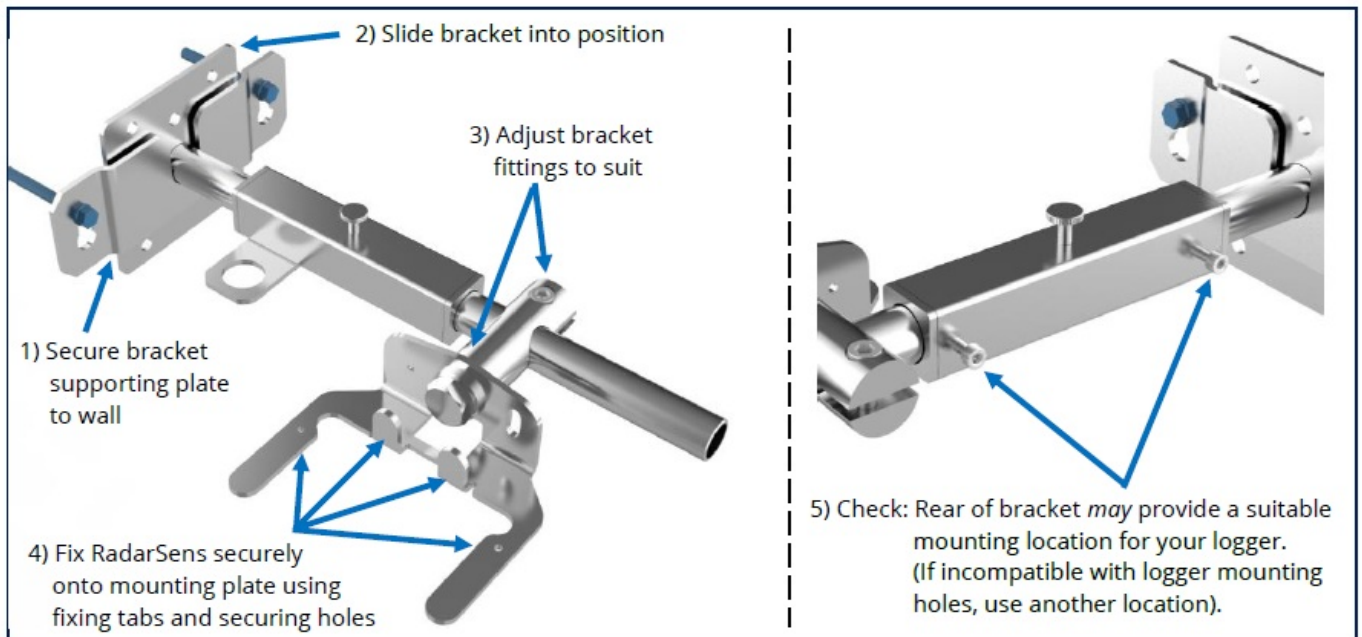
CONNECTING RADARSENS TO THE LOGGER

- Prior to entering the hazardous area, check the port parameters of both the sensor and logger are suitable for interconnection.
- Ensure the logger is mounted before proceeding; refer to Figure 8, Figure 9, section 4.2. and your logger user guide.
- If your RadarSens does not have a built-in cable, attach the supplied cable to the RadarSens connector.
- Attach the far end of the cable to the appropriate logger connector.
- Connectors should be pushed firmly home and then rotated to lock it into place, forming a water-tight connection. All connectors should be clean and dry prior to making the connection.
- Route the cable between the RadarSens and logger making sure that it is not able to interfere with the Radar beam. Secure it in place. Similar attention should be given to other equipment and cables within the chamber.

COLLECTION OF INSTALLATION SITE DIMENSIONS
Following installation of the RadarSens, it will need to be set up using the IDT app tool. However, depending on the application of the sensor, setup may require the collection of various dimensions from the installation site.

Measure (and note) the following, as required

- Distance between the lowest point of the channel (directly under the sensor) and the lower face of the sensor.

  (This is a critical dimension upon which all other calculations are based.

  It is required to check the sensor is being used within its operating range, and also for the setup of depth measurements.)

- Measurements of the cross-section of the open channel or the shape and cross section of any near-by weir.

  (This is required only if the sensor is going to be used as part of the measurement of flowrate.)

SETUP OF RADARSENS

Refer to the IDT App user-guide for details of using the setup tool for programming the logger to use RadarSens. This section provides supplementary information.

PROFILE SETTINGS AND CHECKS

The sensor operation is governed by settings stored within the logger and the RadarSens unit. An important group of RadarSens related settings are collectively referred to as the sensor 'profile'. These include settings that govern the available range of the RadarSens and also the Thresholds (signal level profile) for a reflected signal to be accepted as being valid. It is important to check that the profile selections are compatible with the location of the sensor installation.

Check that

- The furthest dead-band is at a distance that would be below the bottom of the channel.
- The nearest dead-band is at a distance that is above the maximum expected water height.
- Any un-movable objects or other characteristics of the chamber that are causing unwanted reflections to be

  picked up should be compensated for, by adjusting the threshold settings of the profile. This will prevent what

  gives the appearance of a sensor fault but is a setup issue.

SENSOR TEST

Refer to the IDT app user-guide for how to test logger sensors; this will provide live measurement data for sensors to be displayed on the test screen. The RadarSens distance measurement will be included in the listing. A quick check regarding the correct operation of the sensor can be made (if space allows) by positioning a container of water below the sensor and changing its vertical position. Confirm that the IDT test screen shows a change in distance and that the readings look correct.

MAINTENANCE

No user-serviceable parts inside. Unauthorized servicing will void the warranty and any potential liability for HWM-Water Ltd.

The RadarSens equipment is factory calibrated and does not require any subsequent routine calibration. The equipment is, however, required to be installed in a level plane and its profile tuned to the installation location; this is the responsibility of the installer.

CLEANING

Note the safety warnings that are applicable to cleaning. The unit may be cleaned using a mild cleaning solution and a damp soft cloth. Always keep connectors free of dirt and moisture.

The unit contains a sensitive internal transducer which requires an unobstructed line of sight to the water surface. Occasional cleaning maintenance may be required to remove any debris which is on the lower surface.

REPLACEABLE PARTS

RadarSens is a sealed unit and has no user-serviceable parts, except the cable connection between sensor and logger (only applies to sensors without a built-in cable).

RETURN OF PRODUCT

- When returning product for investigation or repair, be sure to follow the instructions of your distributor to document why the product is being returned and provide contact details.
- If returning to HWM, this can be done by completing the on-line RMA (Return Materials Authorisation) form: **https://www.hwmglobal.com/hwm-rma/**
- Ensure the unit is cleaned, disinfected, and dried prior to shipment.

TROUBLESHOOTING

Incorrect measurement

- Check the lower face of RadarSens is not contaminated with dirt or debris. Clean if required.
- Check the RadarSens is level on 2 axes, and that it is vertically above the required measurement target.
- Check the RadarSens profile settings being used are suitable. The measuring range should be between the dead-bands for the selected profile. Other parameters of the profile should be correctly adjusted to suit the installation chamber (e.g., Threshold settings).
- Check the RadarSens beam cone has no visible obstacles.
  Additionally, check that no obstacles are beneath the water surface, which can result in measurement issues when the water is at a low level.
- Where more than one RadarSens is fitted to the logger, check the sensor connections are not swapped.
- Check for scuffs or damage to the lower face of the sensor.

RadarSens not found (using IDT app)

- Check that the latest version of IDT app is being used.
- Check that the logger being used has the latest software (IDT app will offer to upgrade if required). IDT may similarly offer to upgrade the RadarSens software if an update is available.
- Check that the battery voltage of the logger is good.
- Check that the cable and connectors between RadarSens and the logger are in an OK condition, with no damage or water ingress.

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- State College PA, 16803
- **800-531-5465**
- **www.fluidconservation.com**

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Documents / Resources

FCS MAN-170-0001 RadarSens Level Monitoring System [pdf] Installation Guide
MAN-170-0001, MAN-170-0001 RadarSens Level Monitoring System, RadarSens Level Monitoring System, Level Monitoring System, Monitoring System, System

References

- **Convenient Water Delivery Near You | Primo Water Delivery**
- **Fluid Conservation Systems | Remote Water Monitoring Systems**
- **HWM | Energy Management, Pressure Control, Data Collection, Environmental Monitoring, Leak Detection,**
- **Help and Downloads**
- **Service and Warranty Repair Request Form**
- **User Manual**