

THE FUTURE is contactless







Introduction

Since 2007, Geolux has been on a mission to revolutionize hydrological monitoring. In a world where climate change is challenging us like never before, the ability to monitor and manage water resources is no longer important—it's essential.

Our instruments are purposely designed for environmental monitoring. They are robust, reliable, and precise—engineered for the harshest environments. Built to last. Designed to perform. Geolux products are trusted around the globe. From flood early warning systems to irrigation control, hydrological monitoring, sewage management, and hydropower control, we provide the innovative solutions that empower effective water management.

Browse our catalog and discover the heart of Geolux: cutting-edge technology and unmatched performance. Our products do more than measure water—they help you understand and manage it, protecting our planet for generations to come. With Geolux, you get more than just equipment. You get a promise of quality and reliability.

Applications

Water Level Monitoring for Rivers and Lakes

Continuous monitoring of water levels in rivers and lakes is essential for managing water resources and ensuring public safety. It provides fundamental data for flood forecasting and supports water management for agricultural and industrial use. Monitoring water levels also helps preserve ecosystems by maintaining optimal conditions for aquatic life.

Non-Contact Radar Measurement

Radar instruments are ideal for measuring water levels because they do not come in contact with the water. Installed above the water surface, these instruments require minimal maintenance and remain unaffected by floating debris, sediment deposition, or other potential damage. While ultrasound instruments are affected by air temperature gradients, radar-based instruments provide accurate and consistent data under all operating conditions.

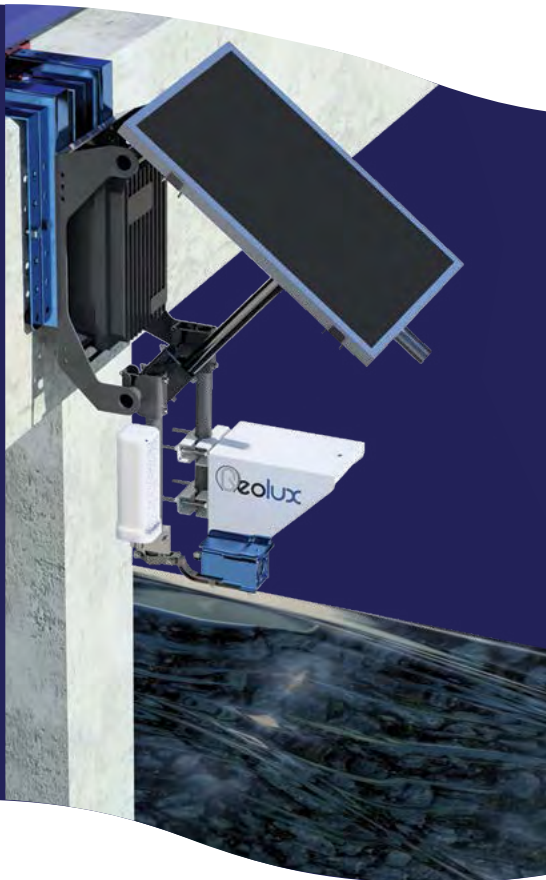


Narrow Radar Beam

The Geolux LX80 water level radar instrument offers the narrowest radar beam width in its class. It achieves a beam width of only $\pm 2.5^\circ$ in an enclosure that is remarkably compact using innovative Geolux technology. This makes the instrument easy to install anywhere, without the need for special adjustments to prevent interference from nearby objects. The narrow radar beam also allows for installation within existing stilling wells.

Discharge (Flow Rate) Measurement in Rivers

Effective water resource management requires accurate measurement of both water levels and river discharge. Discharge measurement provides detailed data for flood forecasting and management of water resources used by irrigation systems and hydropower facilities. Accurate discharge data also supports the optimal planning and operation of water-related infrastructure, such as dams and floodgates.



Measurement by Radar

A radar flow meter combines two radar sensors in a single instrument. One sensor measures the water level, while the second, a Doppler radar, measures the surface flow velocity. The instrument integrates these two measurements in real time with a preprogrammed river channel geometry profile to determine the total discharge accurately.

Superior to Rating Curve Methods

Traditional continuous discharge monitoring often relies on extrapolating discharge values from rating curves based solely on water level measurements. These rating curves correlate past water levels with manually measured discharge values. However, this method is affected by the hysteresis effect, where the flow rate varies for the same water level depending on the water flow regime. By incorporating surface velocity measurements, the hysteresis effect is mitigated, resulting in more accurate and reliable data.

Cost-Effective Solution

Compared to other continuous flow monitoring technologies, such as side-looking Doppler or time-of-travel ultrasound systems, radar-based systems offer a more cost-effective solution. An added advantage is the use of non-contact technology, which reduces the risk of damage from water or floating debris.



Applications

Early Warning Systems for Floods

Floods are natural disasters that cause significant damage globally each year. The goal of early warning systems is to detect an incoming flood as early as possible and to provide timely warnings to save lives and minimize property damage. In developing countries with underdeveloped infrastructure and challenging living conditions, delivering timely warnings is even more critical to ensure people can evacuate on time.

Early Warning System Components

Flood early warning systems consist of several essential components. The first is the instrument that detects rising water levels or increased river discharge at one or multiple locations. This data needs to be reliably transmitted to a central location by a Remote Terminal Unit (RTU) or a datalogger. Software running at the central location then distributes alarms to responsible parties via emails, messages, and other communication channels. In particularly critical areas, direct radio links can be established between monitoring sites and vulnerable areas. Here, alarms such as sirens and warning lights can be installed to alert nearby residents of an impending flood and prompt them to evacuate quickly.

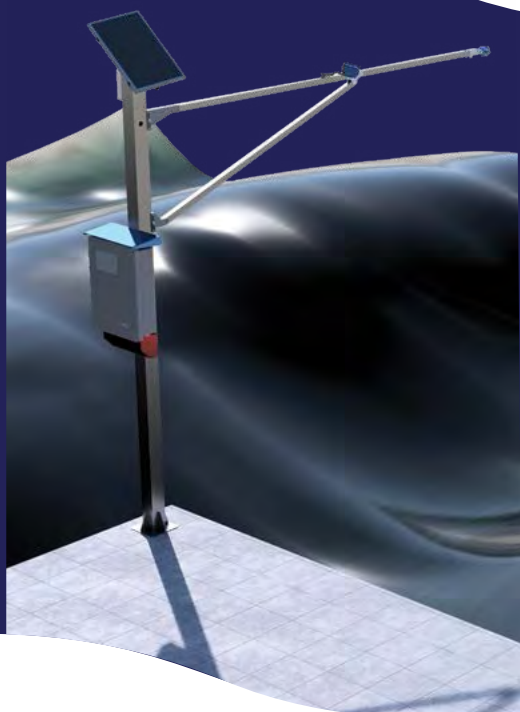


Geolux Hydrostation: Comprehensive Flood Monitoring Solution

The Geolux Hydrostation package provides the means for both measurement and data delivery. Centered around the SmartObserverPlus datalogger, which is flexible and offers multiple communication interfaces, it can transmit data to both central servers and alarm posts via radio links. The Geolux Hydroview software solution enables alarm distribution through various messaging channels, ensuring timely and effective warnings.

Tide and Wave Monitoring

Maritime safety and operational efficiency require real-time tide and wave monitoring. Accurate data on tides and wave heights help in navigation, preventing accidents and ensuring the safe docking of vessels. Offshore structures such as wind turbines and platforms use wave height measurements for preventive maintenance and to optimize operations. Additionally, tide and wave data support environmental protection efforts by providing insights into coastal erosion and habitat preservation. Effective monitoring systems are vital for predicting and mitigating the impacts of severe weather and sea level changes.



Compact Instrument

A specialized version of the Geolux LX80 radar sensor has been developed for accurate tide and wave monitoring. This instrument samples water levels 10 times per second, providing high-resolution data. The rapid sampling accurately captures the dynamic behavior of the ocean surface. The LX80 calculates key wave parameters, including significant wave height and various wave periods. Its compact design makes installation simple and efficient.

Mareographic and Wave Measurements

By taking 10 measurements per second over an extended period (up to 6 minutes), the Geolux LX-80 provides an accurate average tidal level reading. This method ensures precise measurements even with strong waves on the surface, eliminating the need for complex stilling well structures used with float-type mareographs. The sea-surface waveform data collected during this period is analyzed internally by the instrument, determining over 50 different wave parameters. All wave parameter calculations are performed within the instrument.



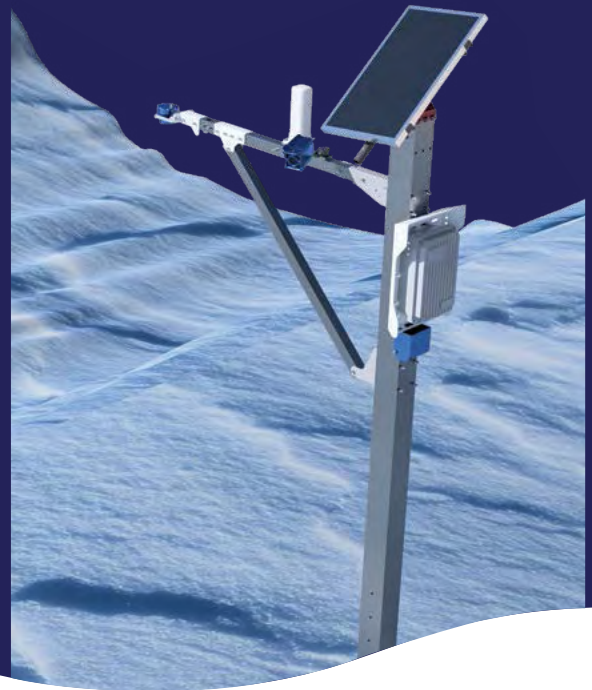
Applications

Snow Depth Measurement

Accurate and continuous snow depth measurement is vital for many applications. It aids road maintenance services by providing insights into road conditions for timely snow removal. It helps solar panel farms monitor snow buildup to prevent overweight issues and optimize snow clearing for uninterrupted electricity production. Farmers use snow depth data to manage irrigation schedules and predict water availability during the growing season by understanding snowmelt patterns. Ski resorts rely on snow depth monitoring to ensure optimal skiing conditions and maintain safety on slopes and trails.

Radar Advantage

Snow depth measurement can be performed using various technologies, including ultrasound, laser-beam, and radar. Radar stands out for its ability to provide accurate measurements in all weather conditions, including snowfall and rainfall, while being very cost-effective.



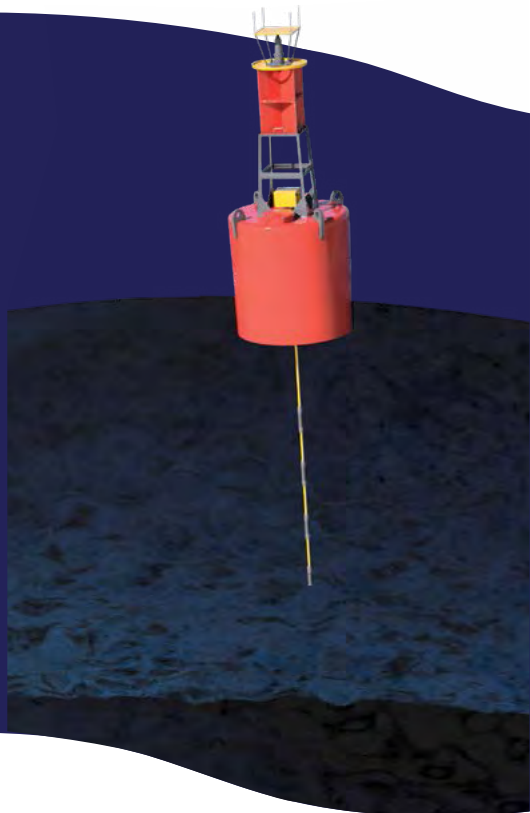
Ease of Installation and Maintenance

The radar-based snow depth sensor is designed for easy installation above the snow surface. It can be mounted on existing structures like buildings or meteorological towers. Once installed, it requires no ongoing maintenance. It operates continuously without needing recalibration or cleaning of the instrument or its surroundings. The sensor remains functional through changing conditions like freezing and melting, providing consistent and reliable performance with minimal intervention.



Temperature Profiling in Aquatic Ecosystems

Measuring temperature at multiple depths in rivers, seas, and lakes provides a comprehensive understanding of aquatic ecosystems. This method reveals thermocline layers, which affect nutrient cycling and habitat zones for various species, helping predictions of algal blooms, managing fisheries, assessing climate change impacts, and helping understand the potential spread of invasive species.

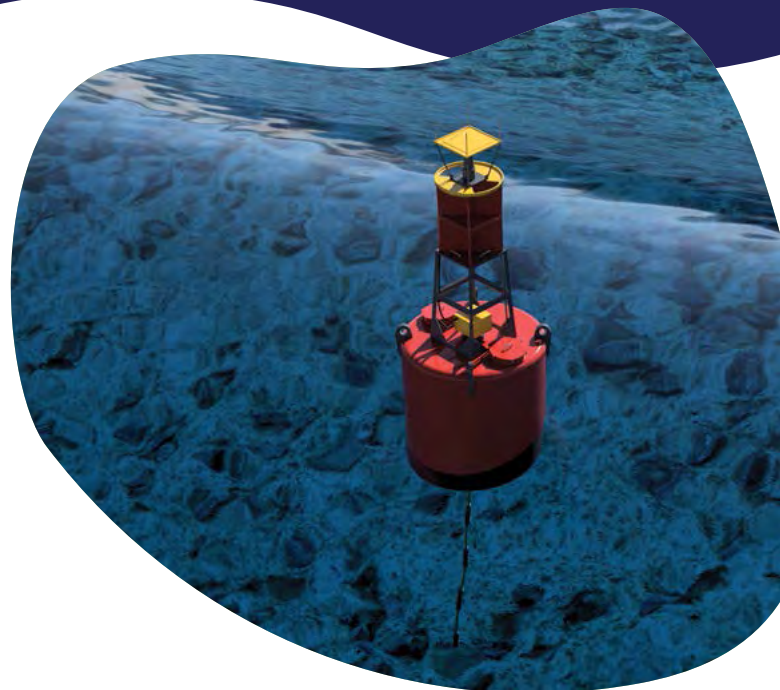


Multidepth Temperature Sensors

Geolux multidepth temperature sensors, designed for scientific-grade accuracy, facilitate efficient temperature profiling by accommodating up to 16 sensors on a single line. These sensors support RS-485 Modbus and SDI-12 bus communication interfaces, with each sensor assigned a fixed address. The sensors are connected via a specialized cable with a Kevlar core and neutral buoyancy. Housed in aviation-grade aluminum enclosures and filled with thermally conductive epoxy resin, the sensors promote rapid temperature response and enhance robustness and pressure resilience.

Efficient and Reliable Data Acquisition

Geolux sensors are engineered for low power consumption and rapid response. In battery-operated systems, the sensors can remain continuously connected to the power supply, entering a low-power sleep mode after 10 seconds of inactivity. Alternatively, the power supply can be completely disconnected and reconnected only when readings are required, further minimizing power usage.



Applications

Sewage System Monitoring

Continuous monitoring of discharge (flow rate) and level at critical points in complex sewage systems helps prevent clogging, facilitate preventive maintenance, improve planning for purification facilities, and provide more reliable service for citizens. Well-maintained sewage systems are resilient to excessive stormwater inflow, preventing overflows and potential environmental damage.

Wastewater Monitoring Components

Geolux has developed a system for reliable monitoring of wastewater in sewage systems, based on the following components:

- **Adaptive and Modular Holder System:** Engineered to accommodate various manhole diameters, ensuring secure and adaptable mounting options for the sensors.
- **IP68 Electronics Enclosure:** This rugged enclosure houses the electronics, battery, and datalogger. It features a communication interface for real-time data transmission in accessible locations and logging functionality for areas where underground communication is not feasible.
- **Radar Sensors:** The LX80 radar level sensor and RSS-2-300W radar surface velocity sensor measure the level and flowrate of the wastewater.



Enhanced Durability and Versatility

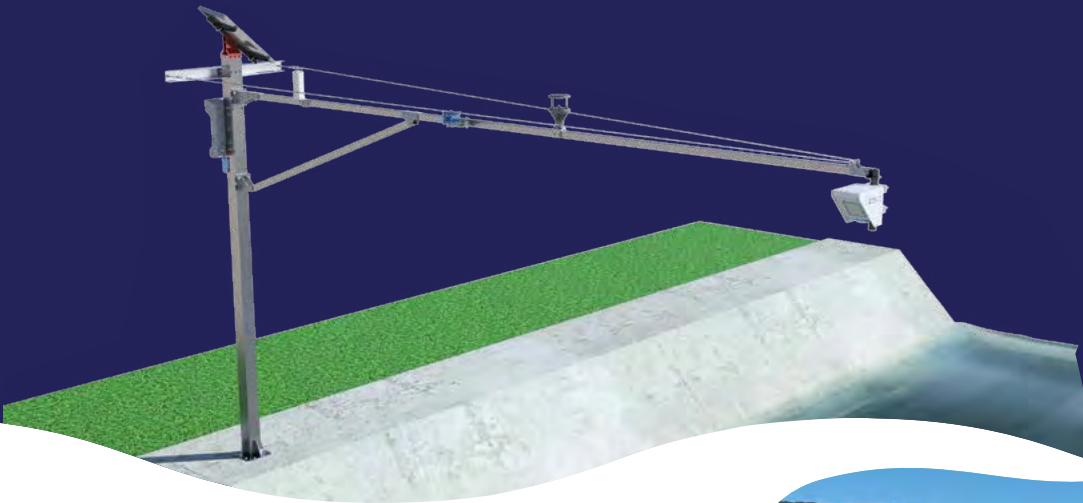
Radar sensors are housed in standard anodized aluminum IP68 enclosures, with stainless steel 316L options available for high H₂S environments. For extreme conditions, sensors can be epoxy-filled for added protection. Additional sensors, like pressure level meters and gas detectors, can be integrated into the system. The battery-powered setup operates for over 90 days without recharging, using a 15-minute reading interval and NB-IoT communication. The accessible electronic box allows for easy battery replacement without entering the manhole. For continuous operation, the SmartObserver data logger includes a flexible, integrated battery charger that supports various power sources.

Irrigation System Monitoring and Control

Monitoring water in irrigation channels is essential for optimizing agricultural productivity. By continuously measuring water levels, flow rates, soil moisture, and various water quality parameters, farmers can ensure efficient water usage and maintain healthy crop conditions, resulting in enhanced crop yields and conserved water resources, thus supporting sustainable farming practices.

Modular Solution for Irrigation Monitoring

To allow easy integration of various instruments and sensors within the same monitoring system, Geolux has developed its Hydrostation package specifically for irrigation system monitoring. It is based around the SmartObserver datalogger, which, thanks to multiple communication interfaces, can retrieve water data from Geolux radar-based water level and flow sensors, as well as from various third-party sensors, including soil moisture and water quality sensors.



All Data in One Place

The collected data can be fed into the Geolux Hydroview software solution, providing a centralized platform for monitoring and data analysis. Within Hydroview, users can analyze real-time data and make informed decisions to manage water flow in the irrigation channel network. Users can set up various alarms to notify them immediately when action needs to be taken, ensuring timely and effective responses.



LX 80 Water Level Radar Sensor

Model	LX80-8	LX80-15	LX80-30
Measuring range	8,0 m	15,0 m	30,0 m
Application hydrology	x	x	x
Application wastewater	x ¹	x ¹	x ¹
Application snow	-	-	-
Application oceanography	-	-	-
Antenna beam	5° (±2,5°)	5° (±2,5°)	5° (±2,5°)
Accuracy	±2,0 mm	±2,0 mm	±2,0 mm
Blind zone	0,2 m	0,2 m	0,2 m
Frequency range	80GHz W-band	80GHz W-band	80GHz W-band
Enclosure material	Anodized aluminum / Stainless steel (optional)	Anodized aluminum / Stainless steel (optional)	Anodized aluminum / Stainless steel (optional)
Mounting	M65 thread + nut ²	M65 thread + nut	M65 thread + nut
Sampling rate	1 Hz	1 Hz	1 Hz
RS-232	x	x	x
RS-485 Modbus	x	x	x
SDI-12	x	x	x
Analog 4-20mA	x	x	x
Temperature range	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Protection class	IP68	IP68	IP68
Input Voltage	9 to 27 VDC ⁵	9 to 27 VDC	9 to 27 VDC

¹ Stainless steel enclosure recommended in highly corrosive environments

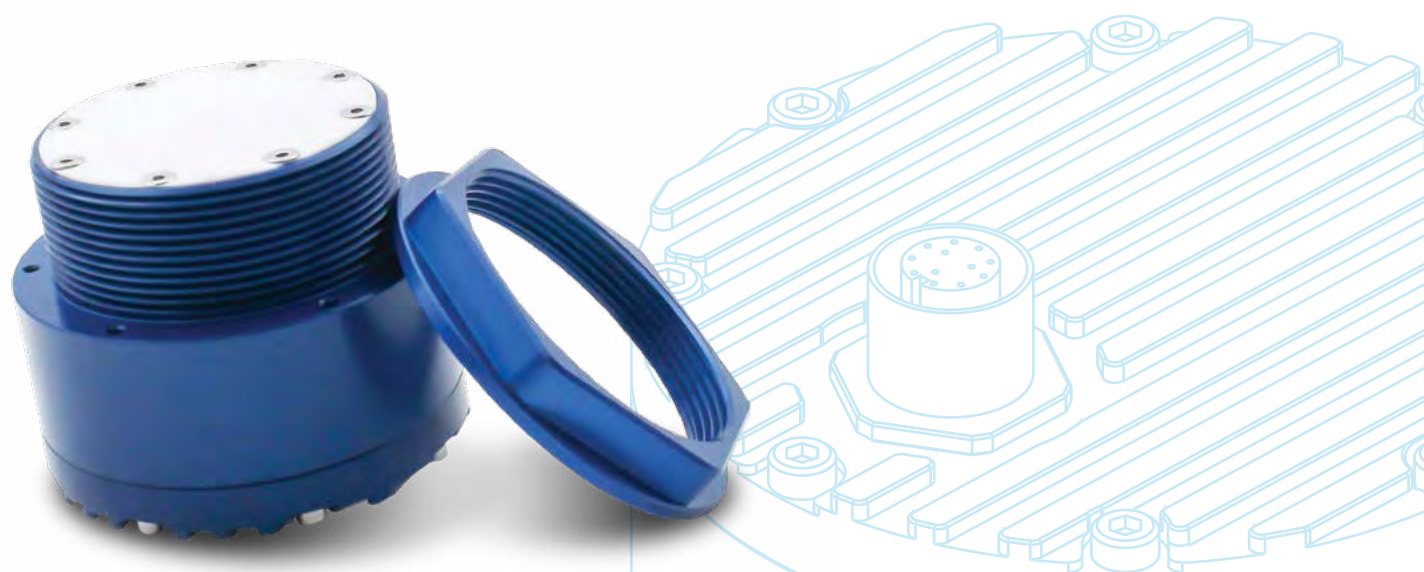
² Nut matching material of the enclosure is shipped together with the sensor

³ Export of raw measurements with 10 Hz sampling rate is not supported on SDI-12 interface due to the speed limitation. All internally calculated wave parameters and current average level measurement are available.

⁴ Only raw current level measurement with 10 Hz sampling rate is available on analog interface for oceanography version of the sensor. For all other measurements and calculations please use digital interface.

⁵ On the instrument input (10m factory provided cable). In case of longer cables ensure voltage on the instrument input is still in specified range even during the current peaks period.

LX80-50	LX80-S	LX80-O15	LX80-O30
50,0 m	15,0 m	15,0 m	30,0 m
x	-	-	-
-	-	-	-
-	x	-	-
-	-	x	x
5° (±2,5°)	5° (±2,5°)	5° (±2,5°)	5° (±2,5°)
±5,0 mm	±2,0 mm	±2,0 mm	±2,0 mm
0,4 m	0,2 m	0,2 m	0,2 m
80GHz W-band	80GHz W-band	80GHz W-band	80GHz W-band
Anodized aluminum / Stainless steel (optional)	Anodized aluminum / Stainless steel (optional)	Anodized aluminum / Stainless steel (optional)	Anodized aluminum / Stainless steel (optional)
M65 thread + nut	M65 thread + nut	M65 thread + nut	M65 thread + nut
1 Hz	1 Hz	10 Hz	10 Hz
x	x	x	x
x	x	x	x
x	x	x ³	x ³
x	x	x ⁴	x ⁴
-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
IP68	IP68	IP68	IP68
9 to 27 VDC	9 to 27 VDC	9 to 27 VDC	9 to 27 VDC



LX 80 Water Level Radar Sensor

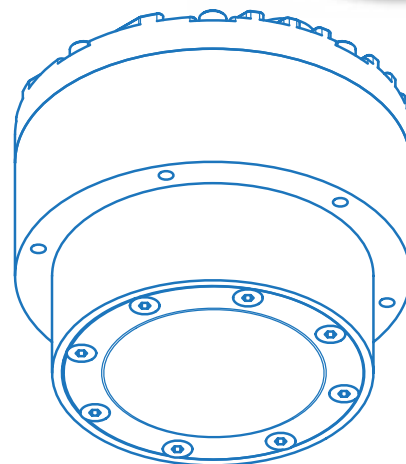
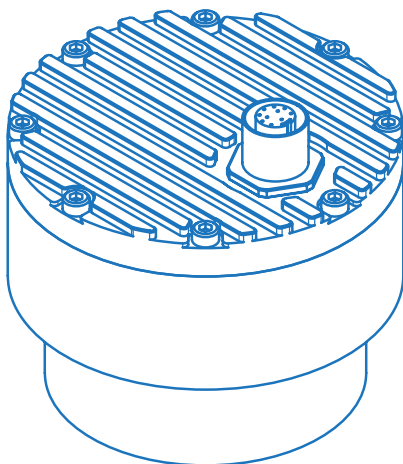
The Geolux LX80 instruments are a cutting-edge solution for contactless radar-based water level measurement. Operating in the 80 GHz frequency range (W band), the LX80 instruments transmit modulated electromagnetic waves and measure the frequency shift of the waves reflected from the water surface. The measured frequency shift accurately corresponds to the distance between the instrument and the water surface, which the instrument reports.

The LX80 is engineered for low power consumption, making it suitable for remote and long-term deployments. It offers multiple communication interfaces, including RS-232, RS-485 Modbus, SDI-12, and analog 4-20 mA, ensuring compatibility with both Geolux and third-party dataloggers. Additionally, all instrument settings can be remotely configured via any available digital communication interface, allowing remote reconfiguration of the instrument's operating parameters.

A key feature of the LX80 is its exceptionally narrow beam width of just 5°. This focused beam allows for simpler installation and ensures that nearby structures, such as bridge railings or pillars, do not interfere with the accuracy of the water level measurement. It also allows for installation in existing stilling well structures.

Highlights:

- Contactless, highly accurate, water level measurement.
- Narrowest beam measurement angle on the market (5°).
- RS-232, RS-485 Modbus, SDI-12, and analog 4-20 mA interfaces included in all models.
- Remote configuration of all instrument parameters through any digital communication interface.
- Robust, small-sized IP68 aluminum or stainless steel enclosure.



Datasheet

Measurement Range	8 m / 15 m / 30 m / 50 m
Antenna Beam Angle	5° (±2,5°)
Accuracy	±2,0 mm
Blind Zone	0,2 m
Frequency Range	W-band 77-81 GHz
Radar Type	FMCW
Mounting	M65 thread + nut
Sampling Rate	1 Hz
Serial Protocols	RS-232 RS-485 / Modbus-RTU SDI-12
Analog Interface	4-20 mA
Connector Type	M12 circular 12-pin
Cable	10 m cable included
Input Voltage	9 to 27 VDC
Power Consumption	0,36 W – operating mode 0,15 W – standby mode 0,03 W – sleep mode 0,6 W – extended operating mode
Maximal Current	< 470 mA
Operating Temperature Range	-40°C to +85°C
Enclosure Material	Anodized aluminum Stainless steel (optional)
Enclosure Dimensions	Φ 65 mm x H 78 mm
Enclosure Protection Class	IP68
Weight (without cable)	500 g – aluminium enclosure 1200 g – stainless steel enclosure

LX 80-O Oceanographic Radar Sensor

Geolux LX80-O Oceanographic radar sensor stands out as a cutting-edge solution for measuring tidal sea levels and wave parameters from coastal and offshore structures. Its compact design makes installation easy, and the non-contact radar measurement ensures minimal maintenance since the instrument does not contact the water.

Unlike the standard LX80 sensor, which measures the distance to the water surface once per second, the oceanographic variant takes 10 measurements per second. The sampled 10 Hz waveform data can be transmitted in real-time and stored internally for up to six minutes. This stored data is analyzed within the instrument to determine tidal and wave parameters such as mean sea level, minimum and maximum levels, significant wave height, wave periods, and various spectral wave components. Using a moving window sampling technique, the measured waveform data and extracted wave parameters are continuously updated with the latest observations.

The LX80-O capabilities have been validated through numerous applications and studies. For instance, research conducted by TU Delft highlighted its role in maritime traffic impact assessments. Another example comes from the U.S. Geological Survey (USGS), which has utilized the LX80 to analyze the impact of sea waves generated by hurricanes on coastal structures.

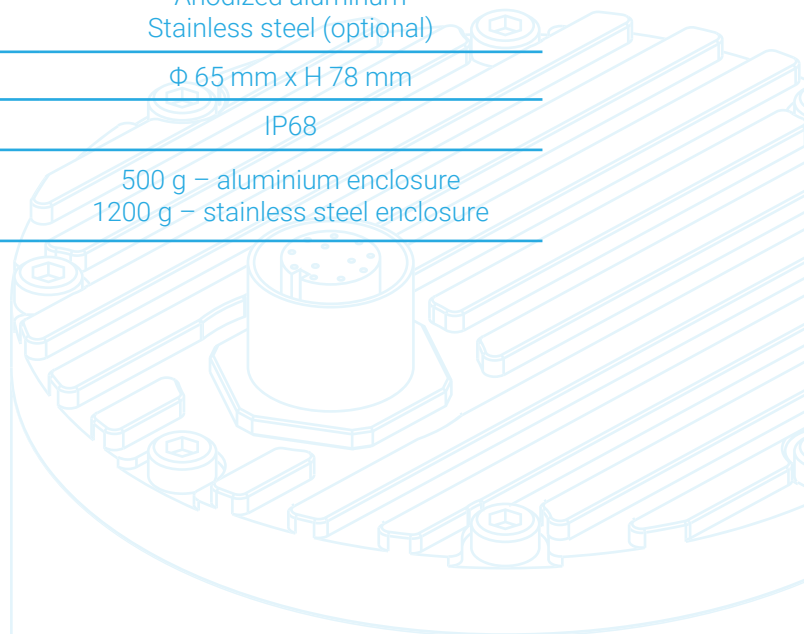
Highlights:

- Internal Wave Parameter Analysis - More than 50 various wave parameters are calculated on-board. There is no need to transfer full waveform data for offline postprocessing, which enables this instrument to be installed on locations where high-speed data transfer does not exist or is not convenient.
- High Sampling Rate: With a water level sampling rate of 10 Hz, the LX80-O provides high-frequency measurements for detailed waveform analysis. This rate exceeds the Nyquist frequency for monitored sea waves, allowing for the filtering of outlier data points caused by water splashing.



Datasheet

Measurement Range	15 m / 30 m
Antenna Beam Angle	5° (±2,5°)
Accuracy	±2,0 mm
Blind Zone	0,2 m
Frequency Range	W-band 77-81 GHz
Radar Type	FMCW
Mounting	M65 thread + nut
Sampling Rate	10 Hz
Serial Protocols	RS-232 RS-485 / Modbus-RTU SDI-12
Analog Interface	4-20 mA
Connector Type	M12 circular 12-pin
Cable	10 m cable included
Input Voltage	9 to 27 VDC
Power Consumption	1,85 W – operating mode 0,15 W – standby mode 0,03 W – sleep mode
Maximal Current	< 470 mA
Operating Temperature Range	-40°C to +85°C
Enclosure Material	Anodized aluminum Stainless steel (optional)
Enclosure Dimensions	Φ 65 mm x H 78 mm
Enclosure Protection Class	IP68
Weight (without cable)	500 g – aluminium enclosure 1200 g – stainless steel enclosure



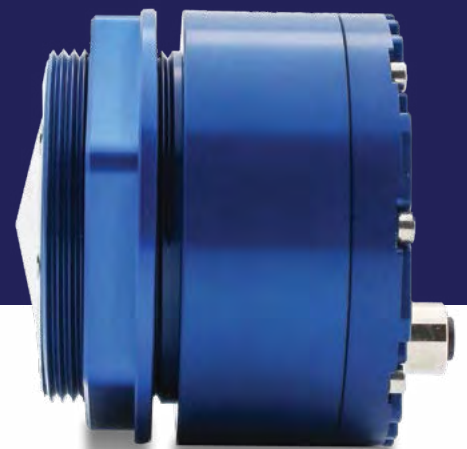
LX 80-S Snow Depth Radar Sensor

The Geolux LX80-S is an advanced radar-based snow depth sensor designed to address the limitations of traditional measurement methods. Unlike ultrasound and laser technologies, which can be affected by temperature gradients, precipitation, and fog, the LX80-S uses radar technology to provide accurate snow depth measurements in all weather conditions. Operating with a narrow 5° beam width, it minimizes errors from nearby structures or wildlife.

The LX80-S has many applications. In transportation, it supports road and railway maintenance by providing real-time snow depth data. For solar power plants, it helps monitor snow accumulation to prevent damage and maintain efficiency. In agriculture, it aids in predicting post-thaw crop hydration and flood risks, contributing to better planning and food security. Additionally, the LX80-S is vital for climate change studies, offering critical insights into snow depth patterns and their environmental impacts. With low power consumption, multiple industry-standard communication interfaces, and robust design, the LX80-S is an ideal tool for snow depth monitoring.

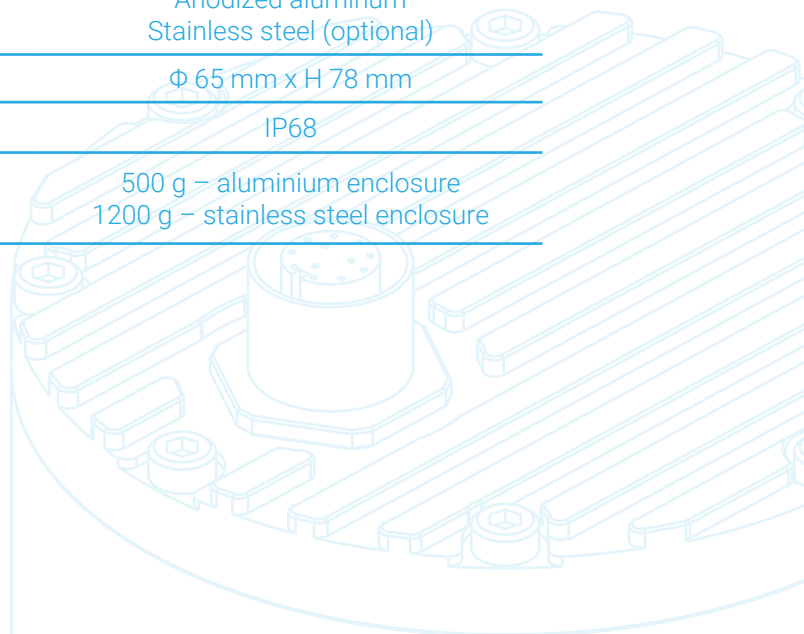
Highlights:

- Accurate, contactless snow depth measurement in all weather conditions.
- Narrow beam width for precise measurement, minimizing interference from nearby structures.
- Low power consumption, with sleep mode for extended remote deployments.
- Supports Modbus, SDI-12, RS-232, and 4-20 mA analog output for easy integration with various systems.



Datasheet

Measurement Range	15 m
Antenna Beam Angle	5° ($\pm 2,5^\circ$)
Accuracy	$\pm 2,0$ mm
Blind Zone	0,4 m
Frequency Range	W-band 77-81 GHz
Radar Type	FMCW
Mounting	M65 thread + nut
Sampling Rate	10 Hz
Serial Protocols	RS-232 RS-485 / Modbus-RTU SDI-12
Analog Interface	4-20 mA
Connector Type	M12 circular 12-pin
Cable	10 m cable included
Input Voltage	9 to 27 VDC
Power Consumption	1,5 W – operating mode 0,15 W – standby mode 0,03 W – sleep mode
Maximal Current	< 470 mA
Operating Temperature Range	-40°C to +85°C
Enclosure Material	Anodized aluminum Stainless steel (optional)
Enclosure Dimensions	Φ 65 mm x H 78 mm
Enclosure Protection Class	IP68
Weight (without cable)	500 g – aluminium enclosure 1200 g – stainless steel enclosure



W&WL Flow Meter

Model	RSS-2-300W	RSS-2-300W-SS	RSS-2-300WL
Surface velocity measurement	x	x	x
Water level measurement	-	-	x
Water discharge (flow) calculation	-	-	x
Velocity measuring range	0,02 to 15,0 m/s	0,02 to 15,0 m/s	0,02 to 15,0 m/s
Maximal distance to water	15,0 m	15,0 m	15,0 m
Application hydrology	x	-	x
Application wastewater	-	x	-
Antenna beam velocity radar	12° / 24°	12° / 24°	12° / 24°
Antenna beam level radar	-	-	5° (±2,5°)
Accuracy (Velocity measurement)	±1% ¹	±1%	±1%
Accuracy (Level measurement)	±2,0 mm	±2,0 mm	±2,0 mm
Blind zone	0,2 m	0,2 m	0,2 m
Frequency range (velocity measurement)	24GHz K-band	24GHz K-band	24GHz K-band
Frequency range (level measurement)	80GHz W-band	80GHz W-band	80GHz W-band
Enclosure material	Anodized aluminum	Stainless steel	Anodized aluminum
Mounting	Brackets (φ25 to φ60 mm)	Brackets (φ25 to φ60 mm)	Brackets (φ25 to φ60 mm)
Sampling rate (Velocity measurement)	10 Hz	10 Hz	10 Hz
Sampling rate (Level and flow measurement)	-	-	1 Hz
RS-232	x	x	x
RS-485 Modbus	x	x	x
SDI-12	x	x	x
Temperature range	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Protection class	IP68	IP68	IP68
Input Voltage	9 to 27 VDC	9 to 27 VDC	9 to 27 VDC

¹ With sufficient surface waviness (required SNR min 15 dB)

RSS-2-300WL-30	RSS-2-300WL-35	RSS-2-300WL-50	RSS-2-300WL-SS
x	x	x	x
x	x	x	x
x	x	x	x
0,02 to 15,0 m/s	0,02 to 15,0 m/s	0,02 to 15,0 m/s	0,02 to 15,0 m/s
30,0 m	30,0 m	30,0 m	15,0 m
x	x	x	-
-	-	-	x
12° / 24°	12° / 24°	12° / 24°	12° / 24°
5° (±2,5°)	5° (±2,5°)	5° (±2,5°)	5° (±2,5°)
±1%	±1%	±1%	±1%
±2,0 mm	±2,0 mm	±2,0 mm	±5,0 mm
0,2 m	0,2 m	0,2 m	0,4 m
24GHz K-band	24GHz K-band	24GHz K-band	24GHz K-band
80GHz W-band	80GHz W-band	80GHz W-band	80GHz W-band
Anodized aluminum	Anodized aluminum	Anodized aluminum	Stainless steel
Brackets (φ25 to φ60 mm)	Brackets (φ25 to φ60 mm)	Brackets (φ25 to φ60 mm)	Brackets (φ25 to φ60 mm)
10 Hz	10 Hz	10 Hz	10 Hz
1 Hz	1 Hz	1 Hz	1 Hz
x	x	x	x
x	x	x	x
x	x	x	x
-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
IP68	IP68	IP68	IP68
9 to 27 VDC	9 to 27 VDC	9 to 27 VDC	9 to 27 VDC



RSS-2-300W

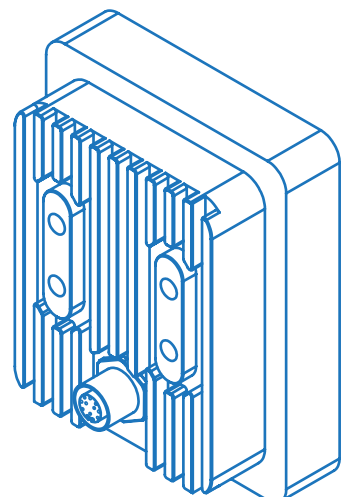
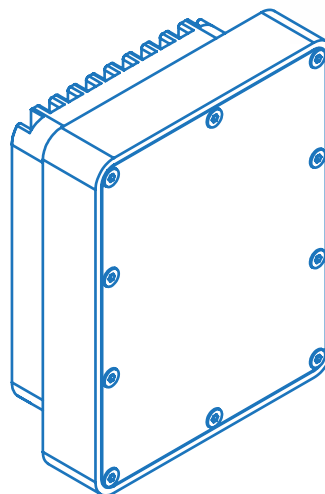
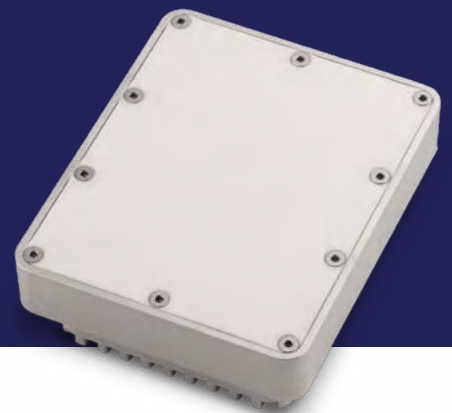
Surface Velocity Radar

The Geolux RSS-2-300W is a highly sensitive Doppler radar sensor designed for the contactless measurement of surface flow velocity. Operating in the K-band (24.075 GHz to 24.175 GHz), the instrument leverages the Doppler effect to accurately measure the velocity of river flow at the surface. Due to its contactless operation, the RSS-2-300W offers quick and easy installation above the water surface, minimizing the need for maintenance.

The instrument provides highly accurate flow velocity readings 10 times per second, which are transmitted via RS-232, RS-485 Modbus, and analog 4-20 mA outputs, ensuring seamless integration with Geolux or third-party dataloggers. An integrated MEMS sensor offers automatic tilt angle compensation and includes internal vibration monitoring and SNR calculation for assessing measurement quality. The instrument's accuracy has been confirmed by multiple laboratories worldwide, including METAS (Switzerland), WATIC (China), KICT (Korea), and Brodarski institut (Croatia).

Highlights:

- Contactless surface velocity measurement. The instrument reports flow speed and flow direction, and can detect flow reversal.
- Accuracy validated by top laboratories worldwide.
- RS-232, RS-485 Modbus, and analog 4-20 mA interfaces included.
- Remote configuration of all instrument parameters
- Robust, small-sized IP68 aluminum or stainless steel enclosure.



Datasheet

Measurement Range	0,02 to 15,0 m/s
Antenna Beam Angle	12° / 24°
Accuracy	±1% of the measured value
Resolution	0,001 m/s
Blind Zone	0,2 m
Maximal Distance to Water	20 m
Frequency Range	24 GHz K-band
Radar Type	Doppler
Radar Output Power	20 dBm EIRP
Mounting	With Brackets Accessory to vertical pole (Φ25 to Φ60 mm)
Sampling Rate	10 Hz
Serial Protocols	RS-232 RS-485 / Modbus-RTU SDI-12
Analog Interface	4-20 mA
Connector Type	M12 circular 12-pin
Cable	10 m cable included
Input Voltage	9 to 27 VDC
Power Consumption	0,950 W – operating mode 0,085 W – standby mode
Maximal Current	< 250 mA
Operating Temperature Range	-40°C to +85°C
Enclosure Material	Anodized aluminum Stainless steel (optional)
Enclosure Dimensions	110 mm x 90 mm x 50 mm
Enclosure Protection Class	IP68
Weight (without cable)	450 g – aluminium enclosure 1200 g – stainless steel enclosure

RSS-2-300WL

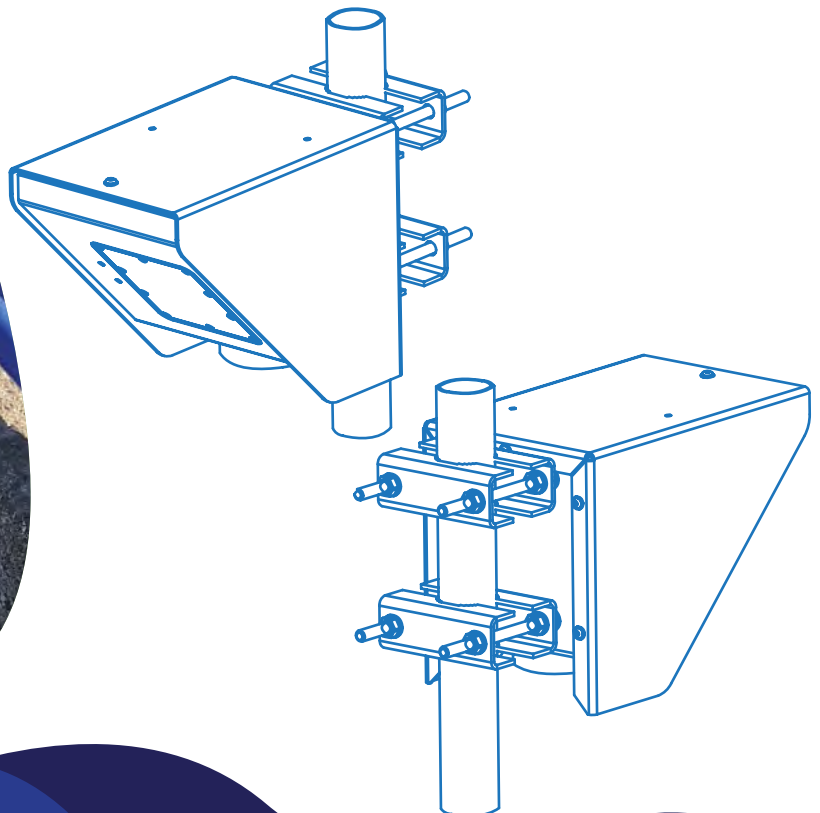
Flow Radar

The Geolux RSS-2-300WL is the flagship product of Geolux. It is an instrument that combines surface velocity and water level measurement with an integrated module for calculating total discharge (flow rate). The discharge is calculated internally by using the measured surface velocity, water level, and a pre-configured cross-sectional profile of the river or channel. Users can easily define measurement parameters, such as the profile cross-section and k-factors, through the Geolux configuration application.

This instrument provides continuous, accurate, measurement of the discharge in any open channel from above the water surface. The benefits of using contactless technology are ease of installation and minimal maintenance. Small size and low power consumption make this an ideal instrument for discharge measurement in many applications, such as flood early warning systems, irrigation systems, and for hydropower management.

Highlights:

- Contactless surface velocity and water level measurement.
- Integrated discharge (flow rate) calculation.
- User-friendly PC software for instrument configuration and discharge calculation setup.
- Continuously updated and improved via firmware updates.



Datasheet

Velocity Measurement Range	0,02 to 15,0 m/s
Antenna Beam Velocity Radar	12° / 24°
Antenna Beam Level Radar	5°
Accuracy (Velocity Measurement)	±1% of the measured value
Accuracy (Level Measurement)	±2 mm
Resolution (Velocity Measurement)	0,001 m/s
Resolution (Level Measurement)	0,5 mm
Blind Zone	0,2 m
Maximal Distance to Water	15 m / 30 m
Frequency Range (Velocity Measurement)	24 GHz K-band
Frequency Range (Level Measurement)	80 GHz W-band
Radar Type (Velocity Measurement)	Doppler
Radar Type (Level Measurement)	FMCW
Mounting	Included brackets to vertical pole (Φ25 to Φ60 mm)
Sampling Rate (Velocity Measurement)	10 Hz
Sampling Rate (Level and Flow Measurement)	1 Hz
Serial Protocols	RS-232 RS-485 / Modbus-RTU SDI-12
Analog Interface	4-20 mA
Cable	10 m cable included
Input Voltage	9 to 27 VDC
Power Consumption	1,3 W – operating mode 0,235 W – standby mode
Maximal Current	< 750 mA
Operating Temperature Range	-40°C to +85°C
Enclosure Material	Anodized aluminum Stainless steel (optional)
Enclosure Dimensions	150 mm x 200 mm x 250 mm
Enclosure Protection Class	IP68
Weight (without cable)	3100 g

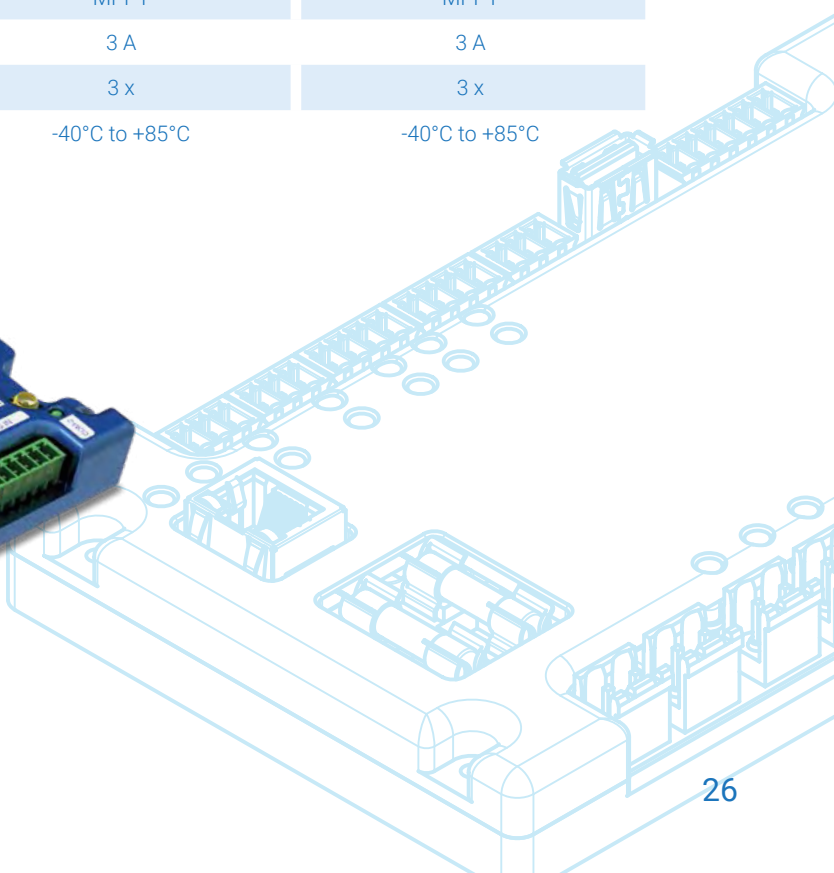
SmartObserverPlus

Model	SmartObserverPlus STARTER	SmartObserverPlus BASIC	SmartObserverPlus M2M
Analog inputs	4 x	4 x	4 x
Analog input type	Voltage or Current configurable	Voltage or Current configurable	Voltage or Current configurable
ADC resolution	24 bit	24 bit	24 bit
Analog sampling frequency	10 Hz	200 Hz	200 Hz
Digital I/O	4 x	4 x	4 x
Digital I/O type	Pulse counter input / Frequency counter input	Pulse counter input / Frequency counter input / Digital output	Pulse counter input / Frequency counter input / Digital output
RS-232 channels	2 x	2 x	2 x
RS-485 / Modbus channels	3 x	3 x	3 x
SDI-12 channels	2 x	2 x	2 x
CAN channels	1 x	1 x	1 x
Ethernet	10 / 100 Mbps	10 / 100 Mbps	10 / 100 Mbps
SD card	1x MicroSD	1x MicroSD	1x MicroSD
Internal flash memory	8 MB	16 MB	16 MB
USB host	1 x ¹	1 x	1 x
USB device	1 x ²	1 x	1 x
M2M modem GPRS, LTE-M, NB-IoT	-	-	X
LTE modem GPRS, 3G, 4G	-	-	-
5G modem + DirectToCell GPRS, 3G, 4G, 5G	-	-	-
Communication protocols	TCP, UDP, HTTP, HTTPS (TLS), FTP, SFTP, MQTT	TCP, UDP, HTTP, HTTPS (TLS), FTP, SFTP, MQTT	TCP, UDP, HTTP, HTTPS (TLS), FTP, SFTP, MQTT
MicroPython scripting	-	X	X
Integrated battery charger	MPPT	MPPT	MPPT
Battery charger max. current	3 A	3 A	3 A
Controlled power outputs	3 x	3 x	3 x
Temperature range	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C

¹ USB host connector can be used to attach USB Flash memory drive to the datalogger

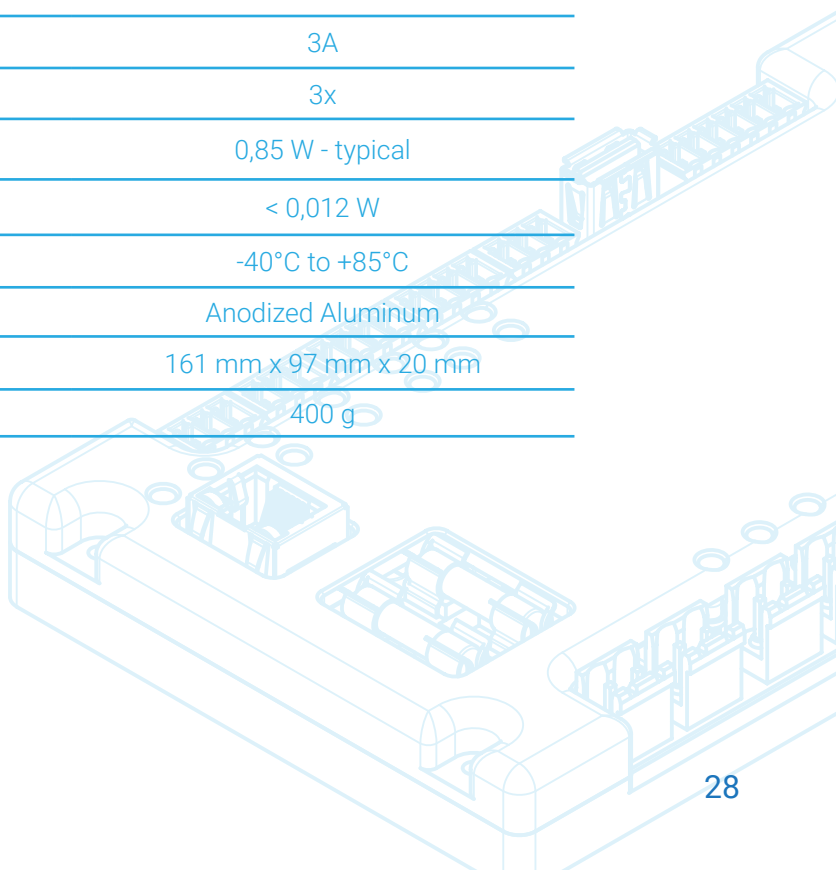
² USB device connector is used to connect the datalogger to the PC for datalogger configuration

SmartObserverPlus LTE	SmartObserverPlus DUAL-SIM	SmartObserverPlus 5G	SmartObserverPlus DUAL-SIM-5G
4 x	4 x	4x	4x
Voltage or Current configurable	Voltage or Current configurable	Voltage or Current configurable	Voltage or Current configurable
24 bit	24 bit	24 bit	24 bit
200 Hz	200 Hz	200 Hz	200 Hz
4 x	4 x	4x	4x
Pulse counter input / Frequency counter input / Digital output	Pulse counter input / Frequency counter input / Digital output	Pulse counter input / Frequency counter input / Digital output	Pulse counter input / Frequency counter input / Digital output
2 x	2 x	2x	2x
3 x	3 x	3x	3x
2 x	2 x	2x	2x
1 x	1 x	1x	1x
10 / 100 Mbps	10 / 100 Mbps	10 / 100 Mbps	10 / 100 Mbps
1x MicroSD	1x MicroSD	1x MicroSD	1x MicroSD
16 MB	16 MB	16 MB	16 MB
1 x	1 x	1 x	1 x
1 x	1 x	1 x	1 x
-	X	-	X
X	X	-	-
-	-	X	X
TCP, UDP, HTTP, HTTPS (TLS), FTP, SFTP, MQTT	TCP, UDP, HTTP, HTTPS (TLS), FTP, SFTP, MQTT	TCP, UDP, HTTP, HTTPS (TLS), FTP, SFTP, MQTT	TCP, UDP, HTTP, HTTPS (TLS), FTP, SFTP, MQTT
X	X	X	X
MPPT	MPPT	MPPT	MPPT
3 A	3 A	3 A	3 A
3 x	3 x	3 x	3 x
-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C



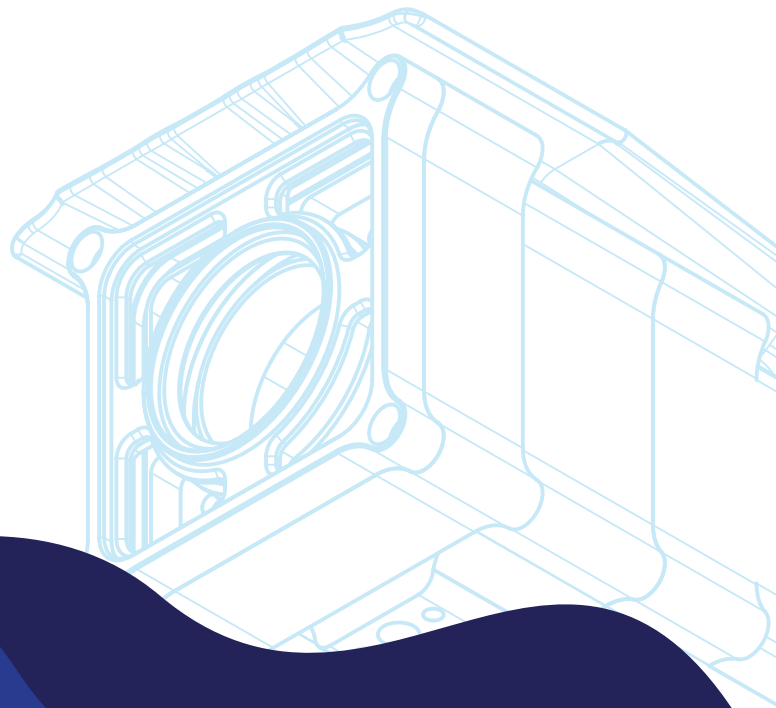
Datasheet

Analog Inputs	4x 24-bit, voltage or current configurable
Analog Sampling Frequency	10 Hz – STARTER version 200 Hz – all other versions
Digital I/O	4x Channels
Digital Input Type	Pulse counter / Frequency counter
RS-232 Channels	2x
RS-485 / Modbus Channels	3x
SDI-12 Channels	2x
CAN Channels	1x
Ethernet	10 / 100 MBps
SD Card	1x MicroSD
Internal Flash Memory	8 MB – STARTER version 16 MB – all other versions
USB host	1x for USB Flash Memory
USB device	1x for connection to PC
Wireless communication	Depending on the datalogger version: GPRS, LTE-M, NB-IoT / 3G, 4G (LTE, HSPA+) / 5G
MicroPython Scripting	Included, all versions except STARTER
Integrated Battery Charger	MPPT
Battery Charger Max. Current	3A
Controlled Power Outputs	3x
Operating Power Consumption	0,85 W - typical
Standby Power Consumption	< 0,012 W
Operating Temperature Range	-40°C to +85°C
Enclosure Material	Anodized Aluminum
Enclosure Dimensions	161 mm x 97 mm x 20 mm
Weight	400 g



HydroCam

Model	HydroCam	HydroCam-ETHERNET
Max. Resolution	5 MPix	5 MPix
Optics	Motorized zoom and focus	Motorized zoom and focus
Focal Length	6 mm to 22 mm controllable	6 mm to 22 mm controllable
Field of View	46,4° to 16,3° controllable	46,4° to 16,3° controllable
Image Modes	Day / Night	Day / Night
IR Illuminator	x	x
RS-232	x	x
RS-485 Modbus	x	x
SDI-12	x	x
CAN	x	x
Ethernet 10/100	-	x
Temperature range	-20°C to +60°C	-20°C to +60°C
Protection class	IP68	IP68
Input Voltage	9 to 27 VDC	9 to 27 VDC





HydroCam

The Geolux HydroCam is a 5-megapixel camera designed for remote visual inspection of hydrological monitoring sites. It offers multiple communication interfaces, including RS-232, RS-485, CAN, SDI-12, and Ethernet. It is compatible both with legacy dataloggers that support only serial RS-232 communication and with modern dataloggers equipped with advanced interfaces like CAN or Ethernet.

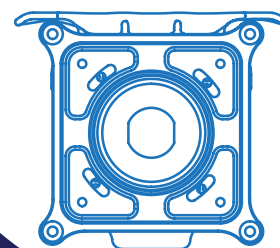
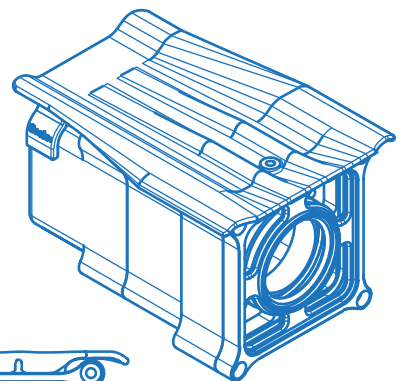
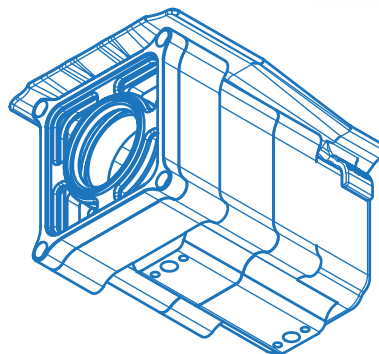
Typically deployed at remote sites, the HydroCam captures periodic snapshots throughout the day, enabling remote inspection of site conditions. This capability is particularly valuable for planning maintenance after events such as flooding, where high water may accumulate debris near the monitoring site.

The camera features advanced configuration options, including the ability to set up privacy zones that blur specific areas in images, such as private residences. It also includes a night mode with powerful IR illuminators that automatically enhance image brightness in low-light conditions, a built-in HDR mode for improved daytime color accuracy, and customizable image compression to ensure essential details remain clear while minimizing file size. Additionally, the motorized zoom and focus are remotely controllable.

The camera is designed with energy efficiency in mind. It can capture a photo just seconds after powering up, making it ideal for periodic on-off operation to minimize overall power consumption. This feature allows the HydroCam to function effectively in remote locations with limited power supply options.

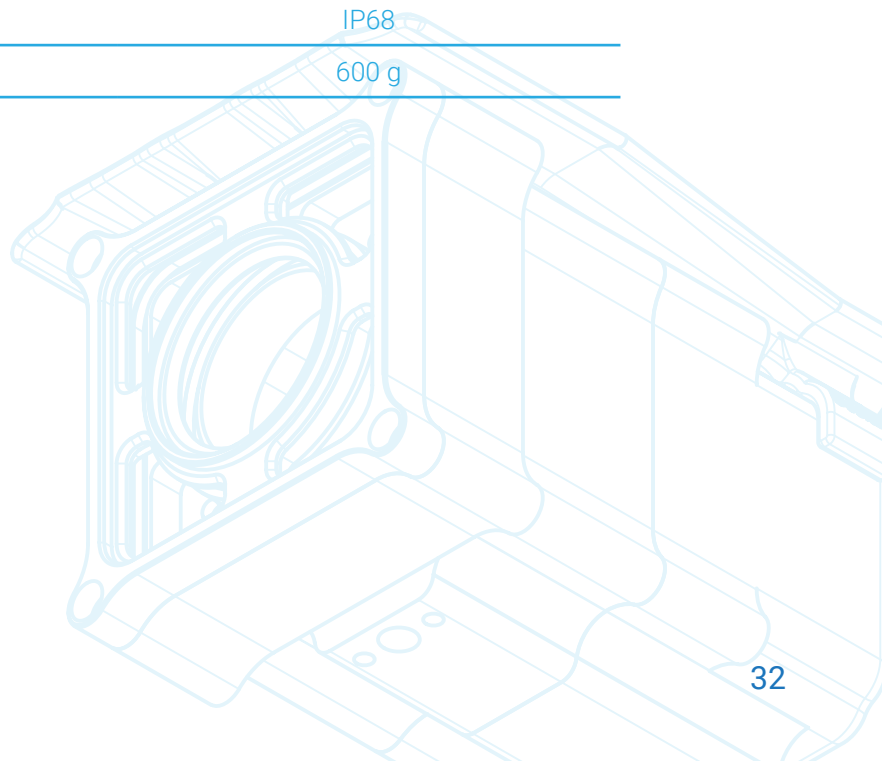
Highlights:

- Periodic snapshots for remote site inspection.
- Integrated IR illuminator for night mode and switchable day/night filter.
- Remotely controllable motorized zoom/focus lens.



Datasheet

Camera Sensor	CMOS 5 Megapixel ¼"
Image Resolution	2592x1944 (Default), 2048x1536, 1920x1080, 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240, 160x120
Image Compression	JPEG, HEIF (HEIC)
Optics	Motorized zoom and focus
Focal Length	6 mm to 22 mm
Field of View	46,4° to 16,3°
Minimum Illumination	0,1 lux
IR-Cut Filter	650 nm
Data Transfer Interfaces	RS-232, CAN Ethernet – IP version only
Camera Control Interfaces	RS-232, CAN, Modbus, SDI-12 Ethernet – IP version only
Input Voltage	9 to 27 VDC
Power Consumption	0,9 W typical 1,8 W maximum
Operating Temperature	-20 °C to +60 °C
Enclosure Material	Anodized Aluminium
Enclosure Dimensions	150 mm x 70 mm x 110 mm
Enclosure Protection Class	IP68
Weight	600 g



HydroTemp Water Temperature Sensor

The Geolux HydroTemp is a scientific-grade temperature sensor designed for precise measurement of water, liquid, or soil temperatures. Available as either a single sensor or a multi-sensor array, the HydroTemp captures temperature data of the surrounding medium at one or multiple points. The instrument is equipped with standard RS-485 Modbus and SDI-12 interfaces, ensuring seamless integration with Geolux and third-party dataloggers.

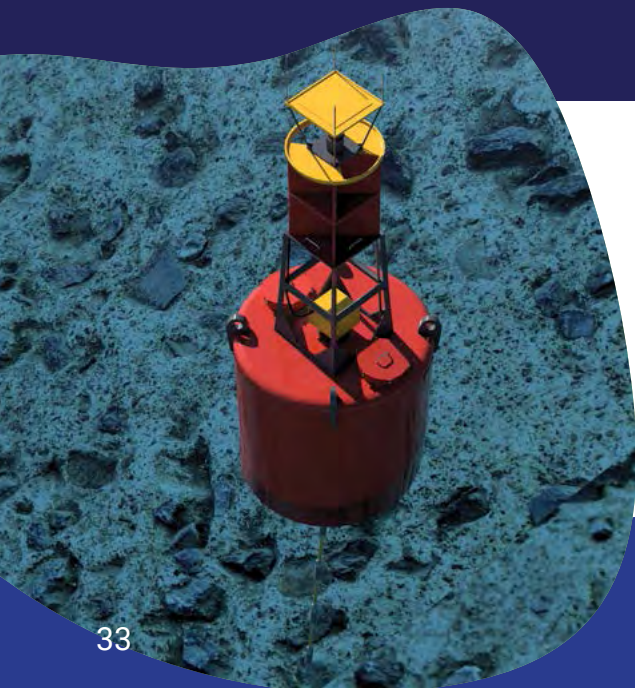
In the multi-depth configuration, up to 16 sensors can be connected on a single line, with customizable distances between sensors ranging from 0,5 m to 5 m, and a total string length of up to 150 m. The HydroTemp sensor is built to withstand extreme conditions, including high pressure (up to 150 m underwater) and freezing environments where ice may form around the sensor.

The sensor's robust construction includes a Kevlar-reinforced, neutral buoyancy cable with specially designed grippers for maximum mechanical strength. This ensures that the sensor array remains durable and reliable even in challenging conditions.

The HydroTemp sensor delivers high accuracy measurement of 0,1 °C with a resolution of 0,01 °C across a temperature range of -20 °C to +70 °C. Its aluminum enclosure, filled with thermally conductive epoxy resin, provides a fast response to temperature changes, making it ideal for dynamic monitoring environments.

Highlights:

- Scientific-grade accuracy with 0,1 °C accuracy.
- Measures temperature in water, liquid, or soil at single or multiple depths.
- Supports up to 16 sensors on a single line with customizable distances.
- RS-485 Modbus and SDI-12 interfaces for easy integration.
- Durable design with Kevlar-reinforced neutral buoyancy cable.



Datasheet

Sensor Type	Digital MEMS Meets ASTM E 1112 and ISO 80601-2-56
Measurment Range	-20 °C to +70 °C
Resolution	0,01 °C
Accuracy	0,1 °C over whole operating range
IP Rating	IP68, up to 150 m water depth
Enclosure Type	Anodized aluminium
Communication Interfaces	RS-485 / Modbus-RTU SDI-12
Input Voltage	9 to 27 VDC
Power Consumption (Per Sensor Node)	0,050 W – operating mode 0,025 W – standby mode
Maximal Current (Per Sensor Node)	< 10 mA
Multi Depth Sensor	Up to 16 sensors on single line
Maximum Water Depth	150 m
Cable	Neutral buoyancy, Kevlar-reinforced wire cable
Weight	50 g – sensor node without cable 400 g – sensor node with 10 m cable



HydroStation

The Geolux HydroStation is a compact, automated hydrological monitoring station designed to provide seamless integration of hydrological instruments with the datalogger, power supply system, and mounting accessories. This all-in-one package simplifies the installation process by combining essential equipment needed for accurate and reliable hydrology monitoring into a single, preassembled unit.

The HydroStation includes a solar panel and battery system, offering a completely self-sustaining power supply, along with a SmartObserver datalogger equipped with an integrated MPPT battery charger and communication module. Geolux radar instruments for water level and surface velocity measurement are also part of the package, with the option to extend the HydroStation with various third-party instruments such as water quality probes or meteorological sensors. The datalogger and battery are housed in a robust, IP68-rated enclosure that is both waterproof and vandal-proof.

Preassembled by Geolux, the HydroStation ensures quick and straightforward on-site installation. Various mounting options are available to accommodate different environments, with detailed descriptions provided in the Mounting Solutions chapter of this document.

The HydroStation is fully compatible with Geolux HydroView, a cloud-based software platform that offers continuous real-time monitoring of all measurements.

Highlights:

- Complete, integrated solution for hydrology measurements
- Self-sustaining with a solar panel, battery, and datalogger featuring an integrated MPPT battery charger
- Easy integration of third-party hydrometeorological sensors
- Robust, modular design with IP68 waterproof and vandal-proof enclosure
- Preassembled for fast and simple on-site installation





Mounting solutions

Simple mounting solutions

The proper installation of non-contact hydrological instruments is crucial for ensuring stable and accurate measurements. To support this, we offer a range of mounting accessories designed to simplify the attachment of our instruments, ensuring they remain secure and reliable in any environment.

Our mounting holders are manufactured from durable aluminum, providing a lightweight yet robust solution for your installation needs. For applications requiring enhanced corrosion resistance, such as installations in marine environments or areas with high H_2S concentrations, we also offer stainless steel versions upon request.

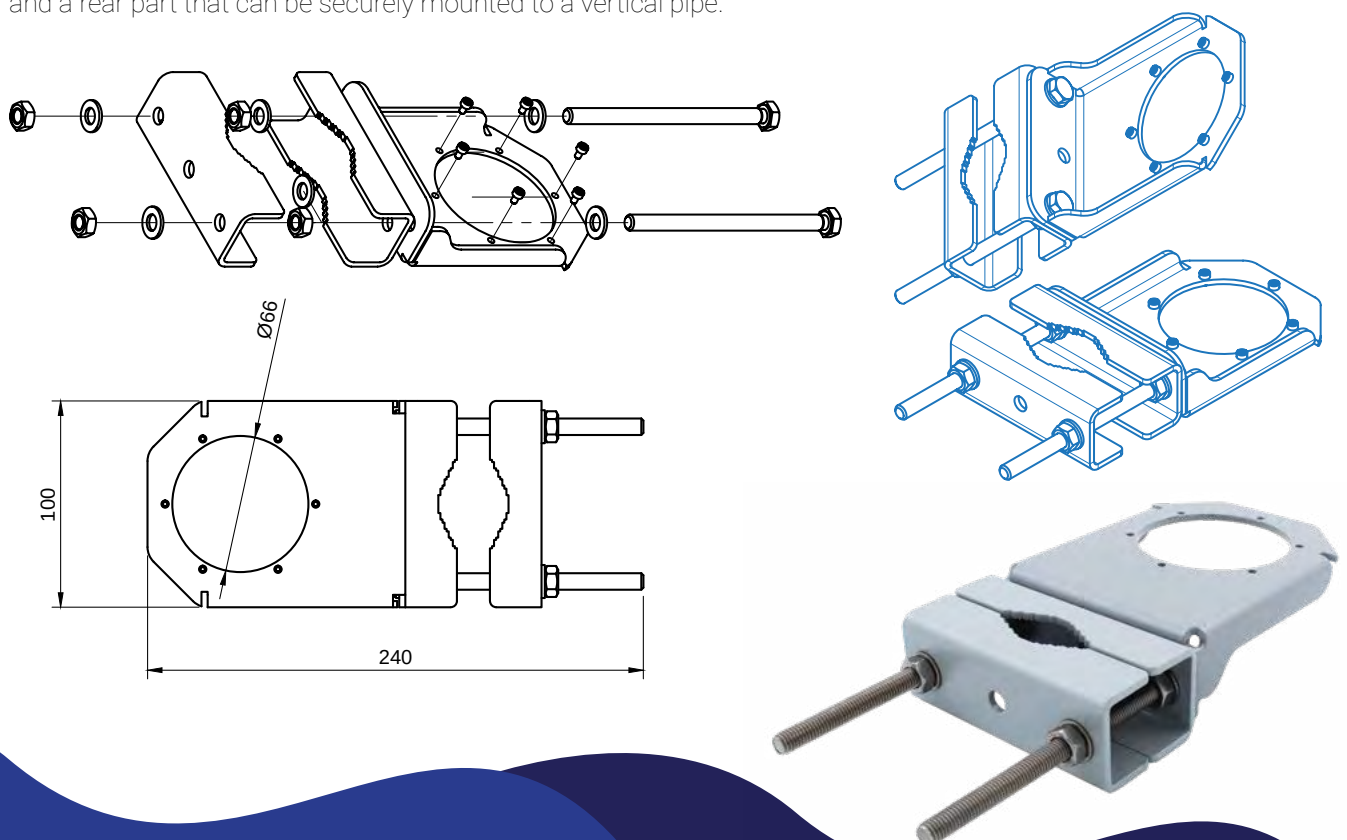
Each set of mounting accessories is shipped as depicted in the accompanying drawings, complete with all necessary screws, nuts, and other components.

LX80

All instruments in the LX80 series share the same enclosure dimensions, allowing for uniform mounting across the entire LX80 family.

The LX80 can be directly mounted on a metal plate with a 65mm diameter opening. The instrument can be attached to the plate with six M3 screws, or it can be secured with the included M65 nut, which attaches directly to the threaded bottom part of the LX80 enclosure.

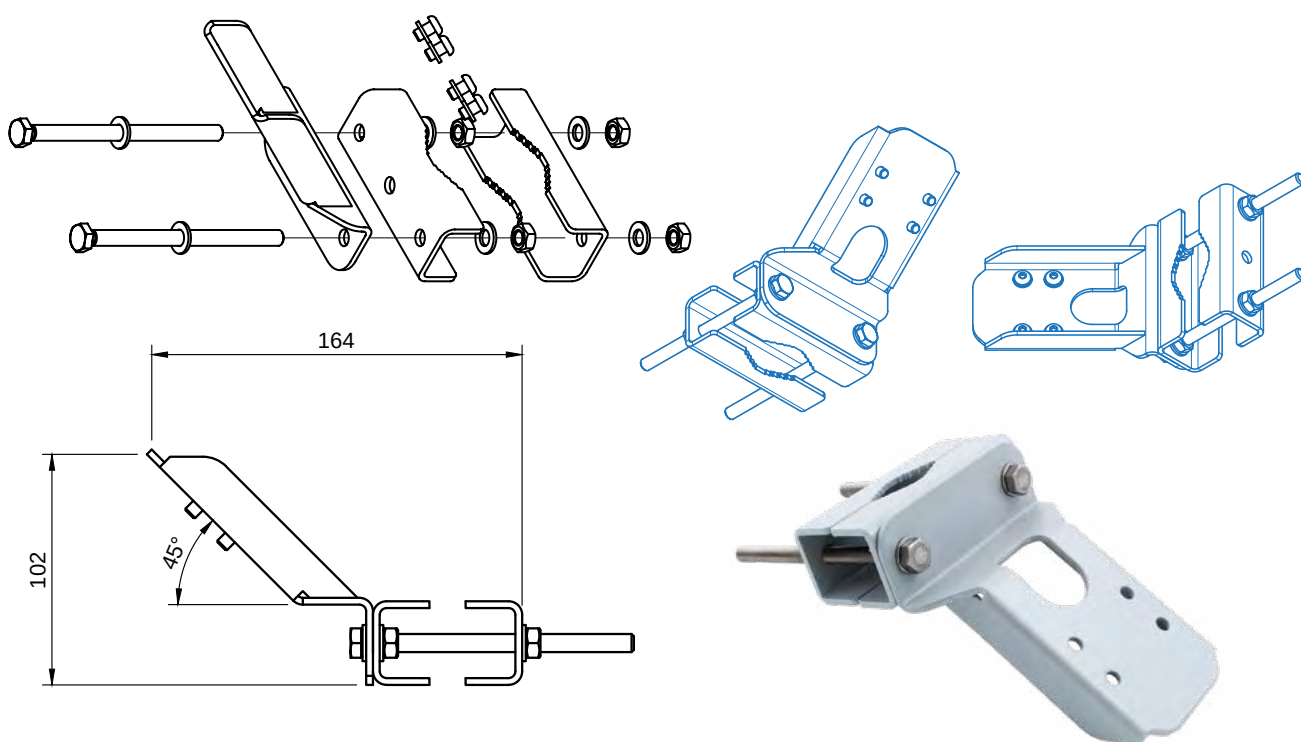
For installations where a metal plate with a 65mm opening is not available, the LX80 mounting accessory provides a convenient solution. This accessory features a front part that easily attaches to the instrument and a rear part that can be securely mounted to a vertical pipe.



RSS-2-300W

The RSS-2-300W surface velocity radar needs to be installed in a tilted position, ideally at a 45° angle to the water surface.

The mounting assembly for the RSS-2-300W is designed to make this installation easy. It features a front part that securely attaches to the instrument, maintaining the necessary tilt angle, and a rear part that can be easily attached to a vertical pipe.



RSS-2-300WL

There is no need for additional mounting assemblies for the RSS_2-300WL flow meter. The instrument's enclosure is already equipped with integrated mounting holders, that allow easy installation to a vertical pipe.

Mounting solutions

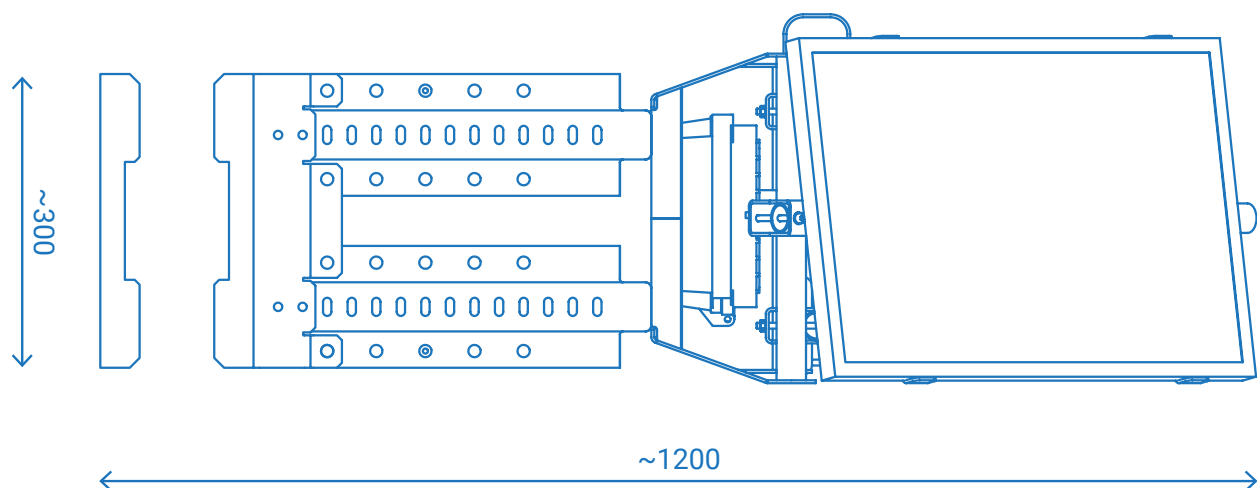
Hydrostation mounting solutions

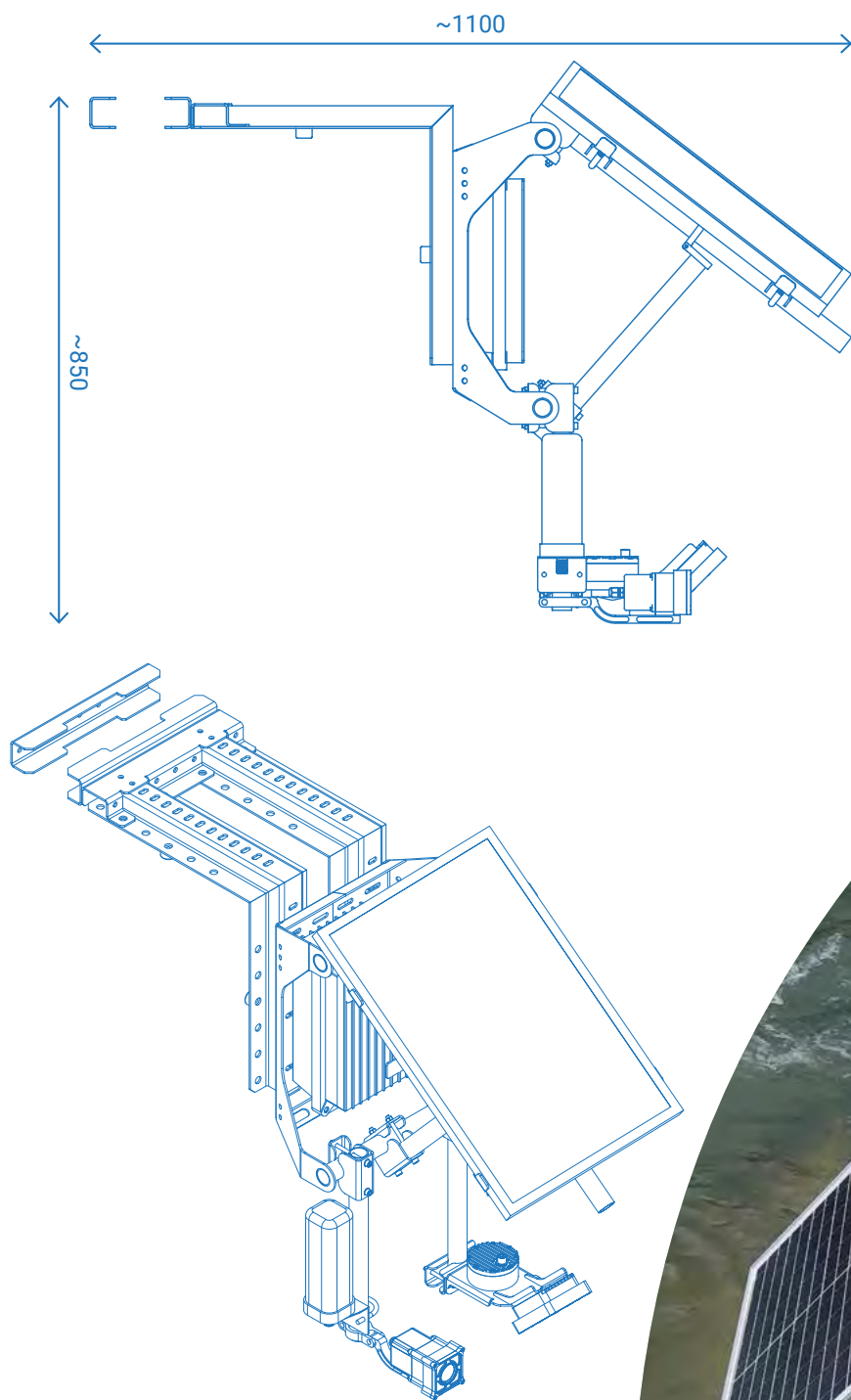
Simple Bridge Mount

The Simple Bridge Mount is a reliable and easy-to-install mounting solution. The system uses inverse-L shaped holders to secure the equipment to the side and pavement of the bridge, allowing for a quick installation process, typically completed in just 30-45 minutes. The equipment is positioned outside the bridge, which helps prevent vandalism.

The main cabinet box, which contains the datalogger and the battery, is securely attached to the holders. Below the box, various non-contact instruments can be easily mounted using the provided holders. A solar panel, positioned above the box, supplies power, and an external GPRS antenna is mounted just below the solar panel.

The entire station weighs less than 20 kg, making it easy for two people to handle. The Simple Bridge Mount ensures accurate water level and flow measurements with minimal effort.





Mounting solutions

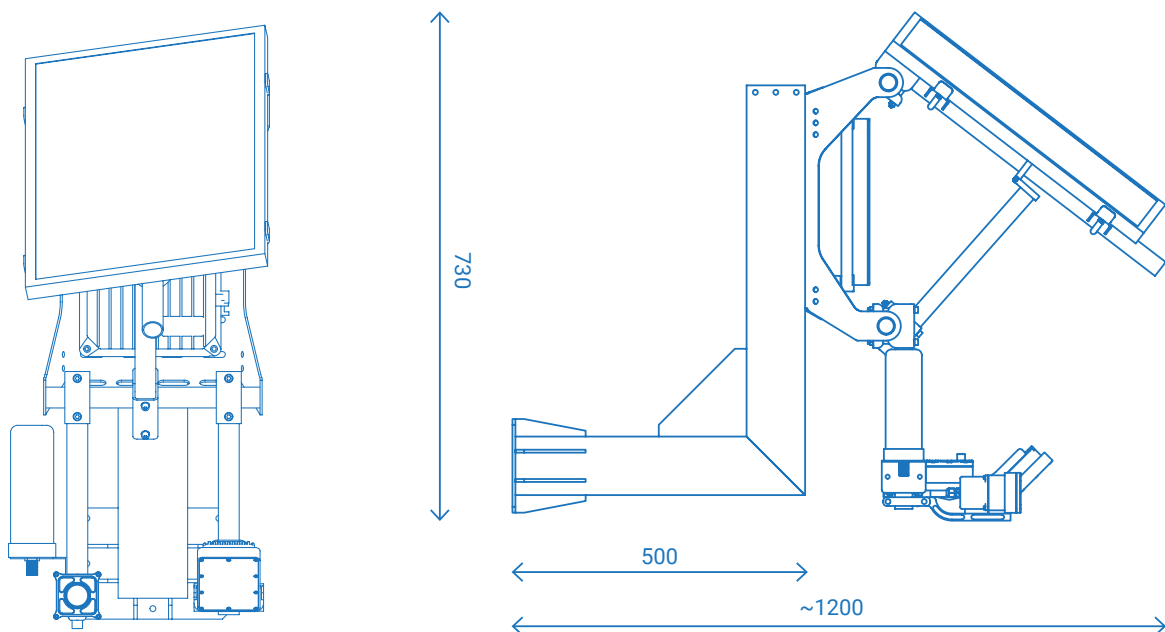
Hydrostation mounting solutions

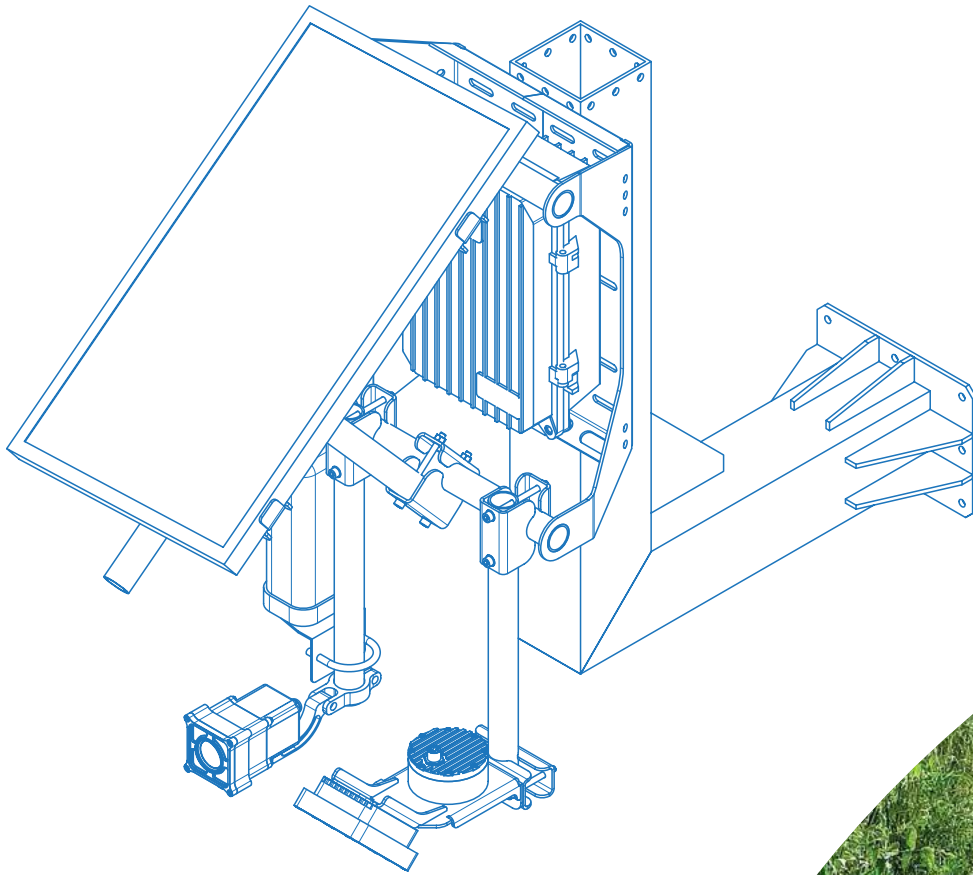
Extended Side Bridge Mount

The Extended Side Bridge Mount is a robust mounting solution designed for larger and more complex installations. It is also suitable for locations where the Simple Bridge Mount positions the equipment too close to the bridge or where placing any part of the holder on the pavement is not allowed. This system secures the equipment firmly to the side of the bridge using a reinforced arm. This arm provides exceptional stability and support.

The main cabinet box, which houses the datalogger and battery, is securely attached to the mounting arm. This arm extends outward from the bridge, ensuring the equipment remains safely positioned above the water. Various non-contact instruments can be mounted below the box using the provided brackets. A solar panel is mounted above the box to supply power. An external GPRS antenna is strategically positioned below the solar panel for enhanced protection. The entire mounting system is designed to withstand harsh environmental conditions.

Despite its heavy-duty construction, the station can be installed by a small team. The Extended Side Bridge Mount is ideal for mounting non-contact instruments on bridges, for situations where the equipment needs to be positioned further away from the bridge or where placing any part of the holder on the bridge road or pavement is not allowed.





Mounting solutions

Hydrostation mounting solutions

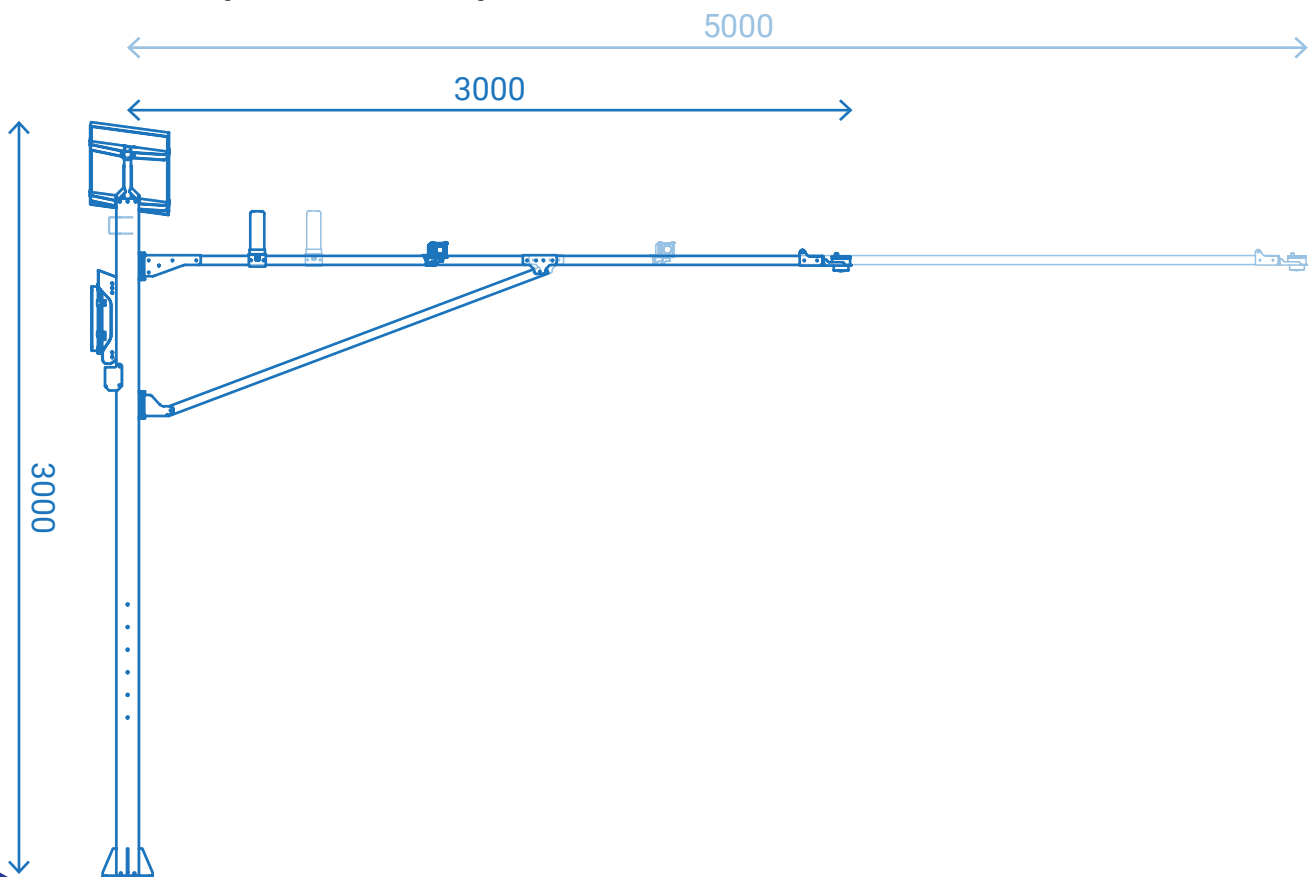
Aluminum Cantilever Mount

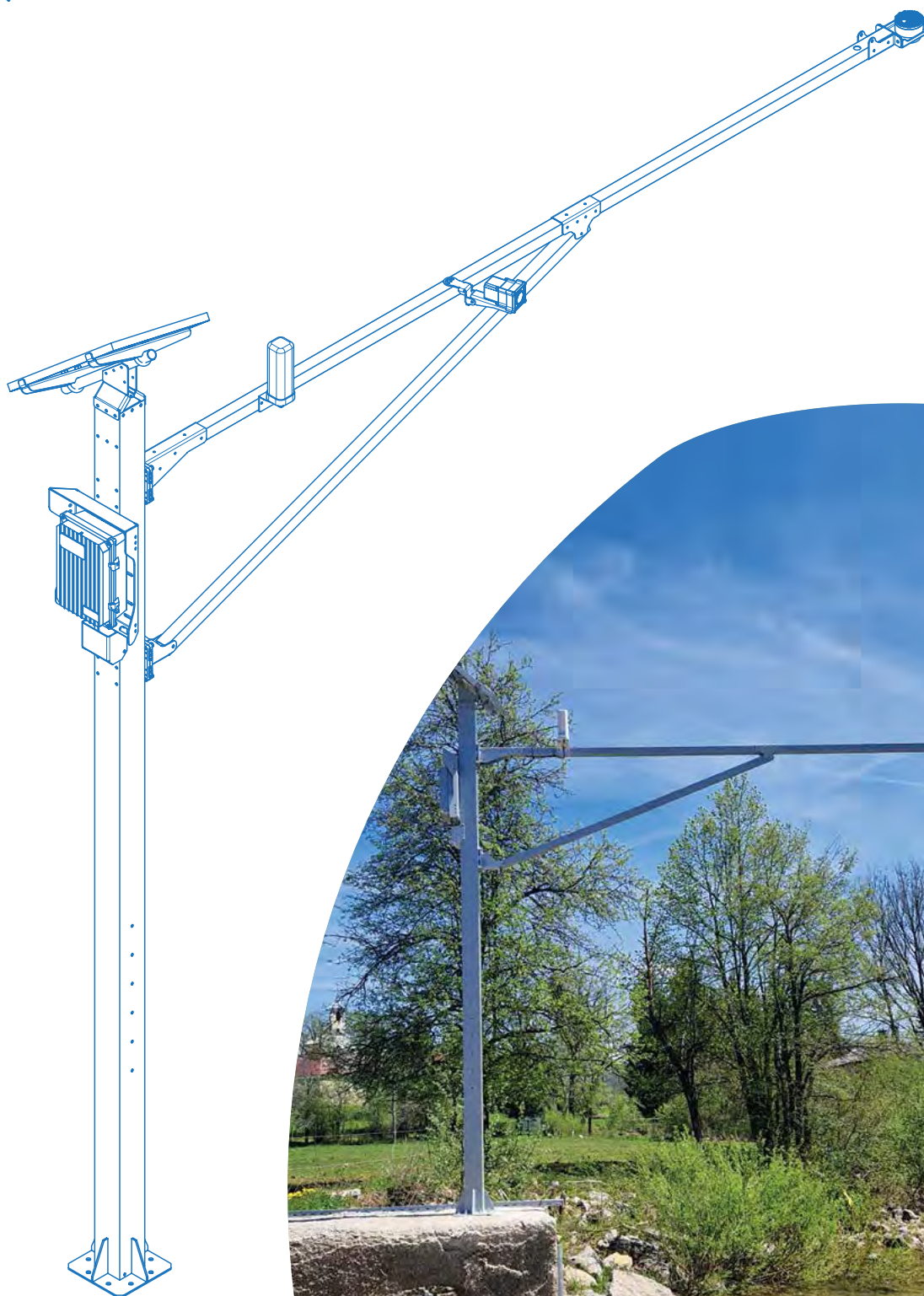
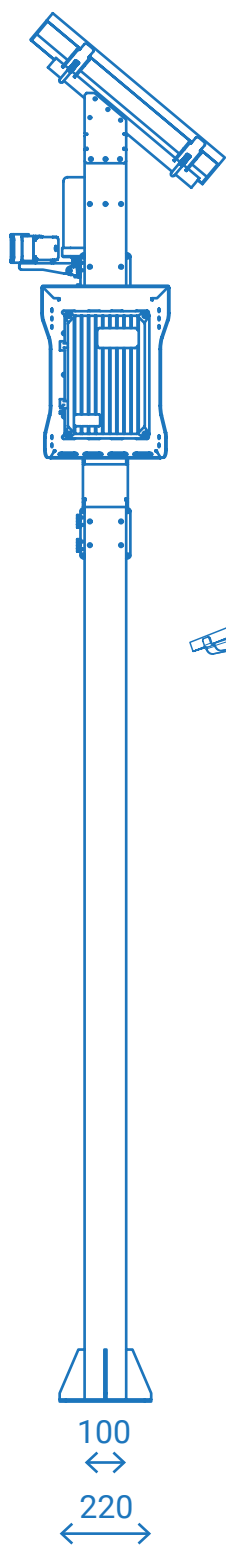
The Aluminum Cantilever Mount is a mounting solution designed for sites where non-contact instruments need to be installed but there is no bridge or other overhead structure available. This system features a 3-meter pole with an extended arm/cantilever, allowing the instruments to be positioned above the water surface. The solar panel is mounted on top of the pole, while the cabinet housing the datalogger and battery is placed high on the pole to prevent vandalism.

The instruments are attached to the arm, which can rotate 180 degrees for convenient maintenance. This feature ensures that any required service on the sensors can be performed efficiently without dismantling the entire setup. The mount is constructed from lightweight aluminum, making it easy for two people to carry.

Arm lengths of 1 meter, 3 meters, and 5 meters are available to suit various site requirements. For the 5-meter arm, additional tension wires are used to ensure stability and support.

The Aluminum Cantilever Mount is an ideal solution for sites without an existing bridge above the water surface, offering a maximum arm length of 5 meters.





Mounting solutions

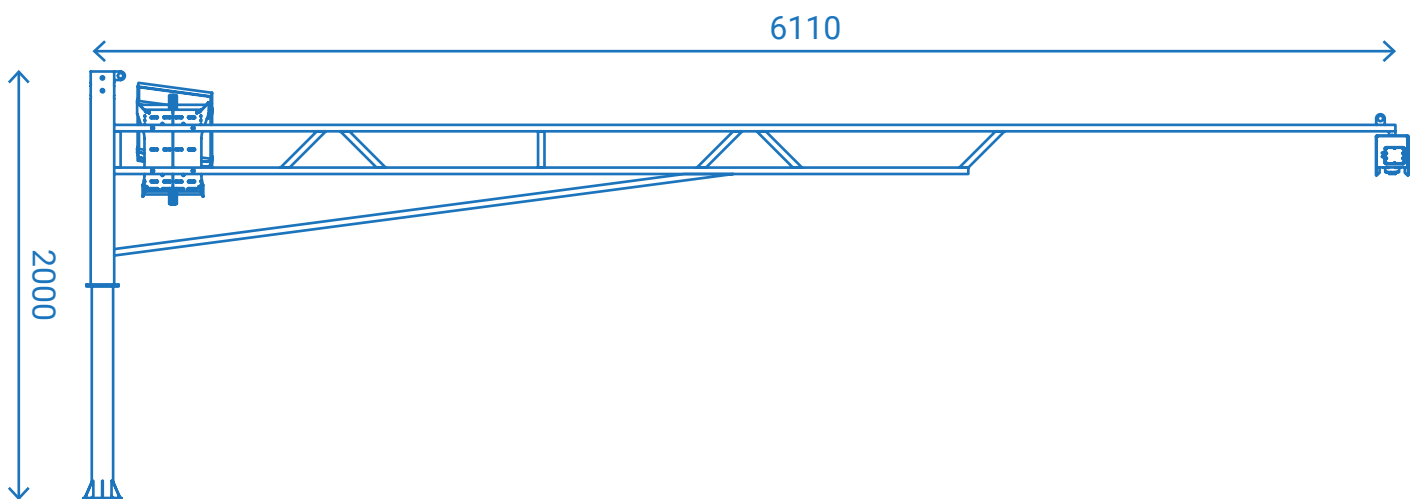
Hydrostation mounting solutions

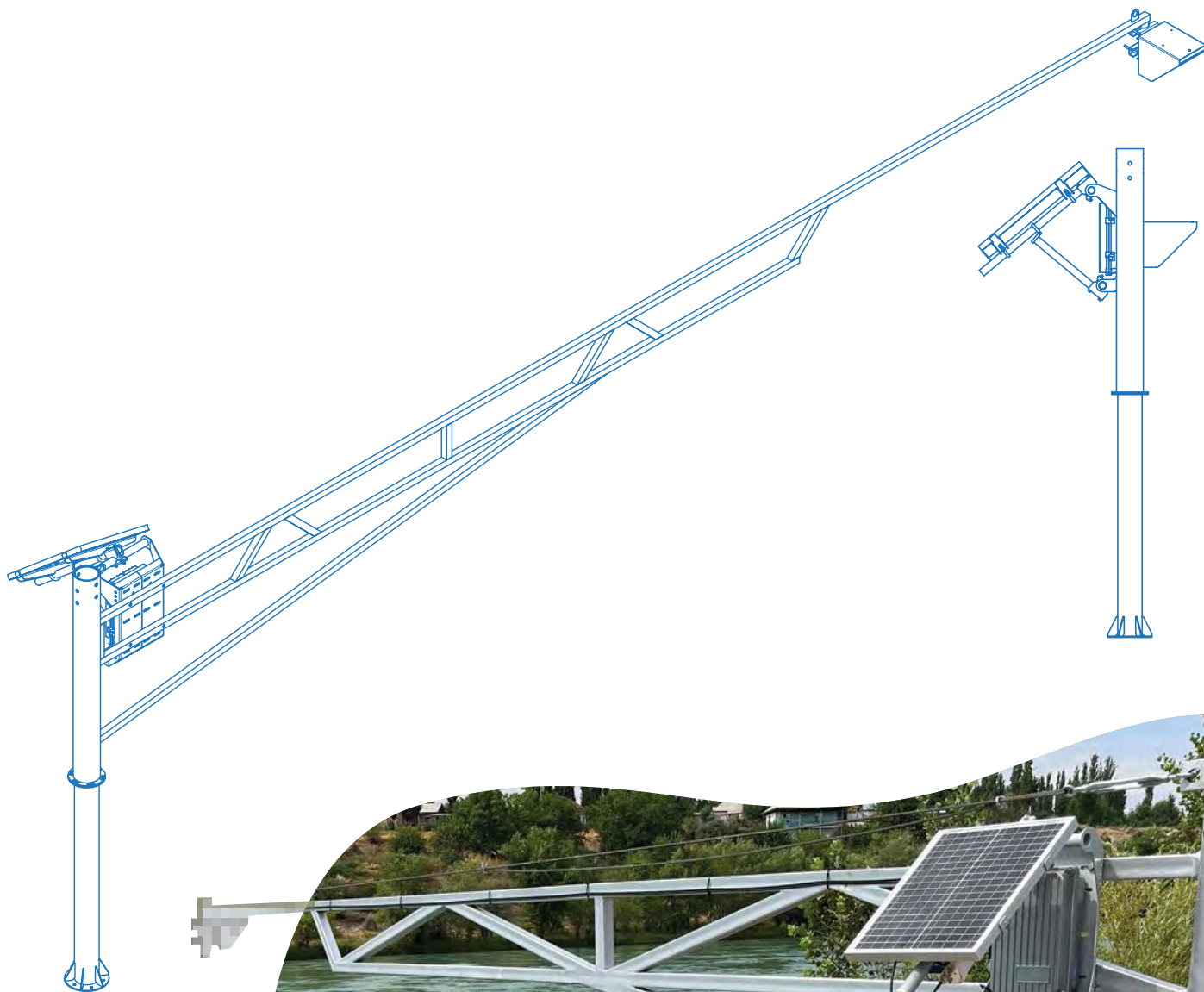
Steel Cantilever Mount

The Steel Cantilever Mount is a robust and heavy-duty mounting solution designed for the most demanding water monitoring applications. This system features a steel pole with an extended cantilever arm that can reach up to 8 meters, providing exceptional coverage and stability for your instruments.

Since the pole is constructed from steel, it can withstand harsh environmental conditions. The cantilever arm is capable of rotating 180 degrees, allowing for easy maintenance and adjustments to the instruments, without the need to dismantle the setup. This feature ensures that any required service on the sensors can be performed efficiently and safely.

The cabinet housing the datalogger and battery is placed on the cantilever close to the pole. Various non-contact instruments can be mounted along the cantilever arm using the provided brackets. The Steel Cantilever Mount is ideal for sites where maximum reach and durability are required, and there is no existing bridge structure available.







PARTNER DISTRIBUTORE PER L'ITALIA
BIO MASS IMPIANTI SRL

20090 Trezzano s/N (MI) Via M. Pagano 28

Tel. 02 4453223 (r.a.) Fax 02 48402025

Email: info@biomassimpianti.com

Web: www.biomassimpianti.com

Geolux d.o.o.

Ljudevita Gaja 62, HR-10430 Samobor,
Croatia

www.geolux-radars.com

geolux@geolux.hr