D6 Labs™
Engineered IoT Solutions

WSK-900-0014

Server Room Monitoring Kit, Ethernet Interface



General Description

This kit contains a complete IoT sensor network. It is the ideal solution to remotely monitor a server room for temperature and moisture. It features the Smart.Hub (Pro, Ethernet version) with power supply and antennas for cloud connectivity and (2) Whisker.Block® sensor modules. The first Whisker.Block® is for measuring ambient (room) temperature.

The other Sensor Block has the following features:

- A rope-type H20 sensor that can be laid along piping or on the floor to detect moisture.
- An internal temperature sensor to measure the ambient temperature of the Whisker.Block® location.

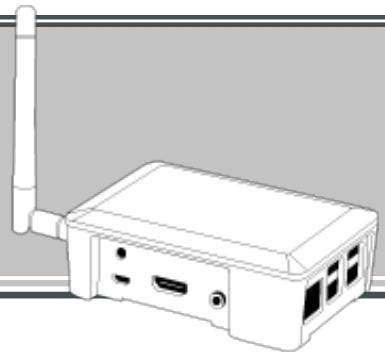
This bundle contains the following components:

Quantity	Part Number	Description	
1	WH1-9-00-PDNEN-N	Smart.Hub™ Pro, Ethernet Interface Whisker.io™, Smart.Hub™, Pro, 900MHz, Ethernet, 120VAC	
1	WB1-9-00-NNNNNNNN-0000-LR	Whisker.Block®, Internal Temp 900MHz, battery powered, int. antenna, int. temperature	
1	WB1-9-00-DCNNNNNN-0000-LR	Whisker.Block®, Dry Contact Digital Input 900MHz, battery powered, int. antenna, int. temperature, ext. dry contact input qty. (1)	
1	WBP_SC_0015_01	Sensor Cable / Rope Leak Sensor	

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WH1-9-00-PDNEN-N

Smart.Hub™ Pro, Ethernet Interface



General Description

The Smart.Hub™ Pro is a versatile and reliable IOT gateway device for use in indoor applications. Smart.Hub™ products are gateways used to move data from Whisker.Block® sensor blocks and end user customized Whisker.Engine™ based sensor nodes to the Whisker.io™ cloud platform.

Features

- Plug and play operation
- Ethernet & Cellular options
- Data buffering during loss of connectivity
- Supports all Whisker.io Cloud services
- Works with 3rd party platforms via Whisker.io Forwarding
- Supports two-way communication with field devices – monitor and control
- Communicate with field devices over distances more than 1.6 kilometers.

Robustness and Reliability

If the hub loses connectivity to the Internet, it will buffer all incoming messages from field devices to storage on the SD card. When hub connectivity is restored, the messages will be sent to the cloud for storage and forwarding. In the event of catastrophic failure, the data on the SD card can be recovered using our Data Recovery App (Windows).

Throughput

The number of devices that can be supported by this hub varies with the reporting rate of the connected devices. This is a single channel hub, which ultimately determines its limitations; with a single channel, this hub can process about 1,800 messages an hour. The following table estimates device capacity for several different update rates.

Update Rate	Estimated number of devices
5 Minutes	250
1 Hour	1500
4 Hours	5000
24 Hours	10000

This hub supports two-way communications with field devices that support the Whisker.io™ protocol. For battery powered devices, the hub will queue down-stream messages (commands) and send them to the device when it reports in at its sampling interval; therefore, the command latency is equivalent to the update rate of the device. For line powered devices, commands are sent immediately, with a latency of less than 1 second.

Whisker.io Services

Storage



Devices that are configured with the storage service will persist their historic data in the Whisker.io cloud, making it available for visualization and analysis using our Whisker.io™ Portal web-based software.

Alerting



Rules based alerting allows a text or email to be sent when the specified condition is met and when it clears.

Dashboard



Secure, user friendly dashboard with visualization through gauges, graphs, sensor signal strength and fuel gauges.

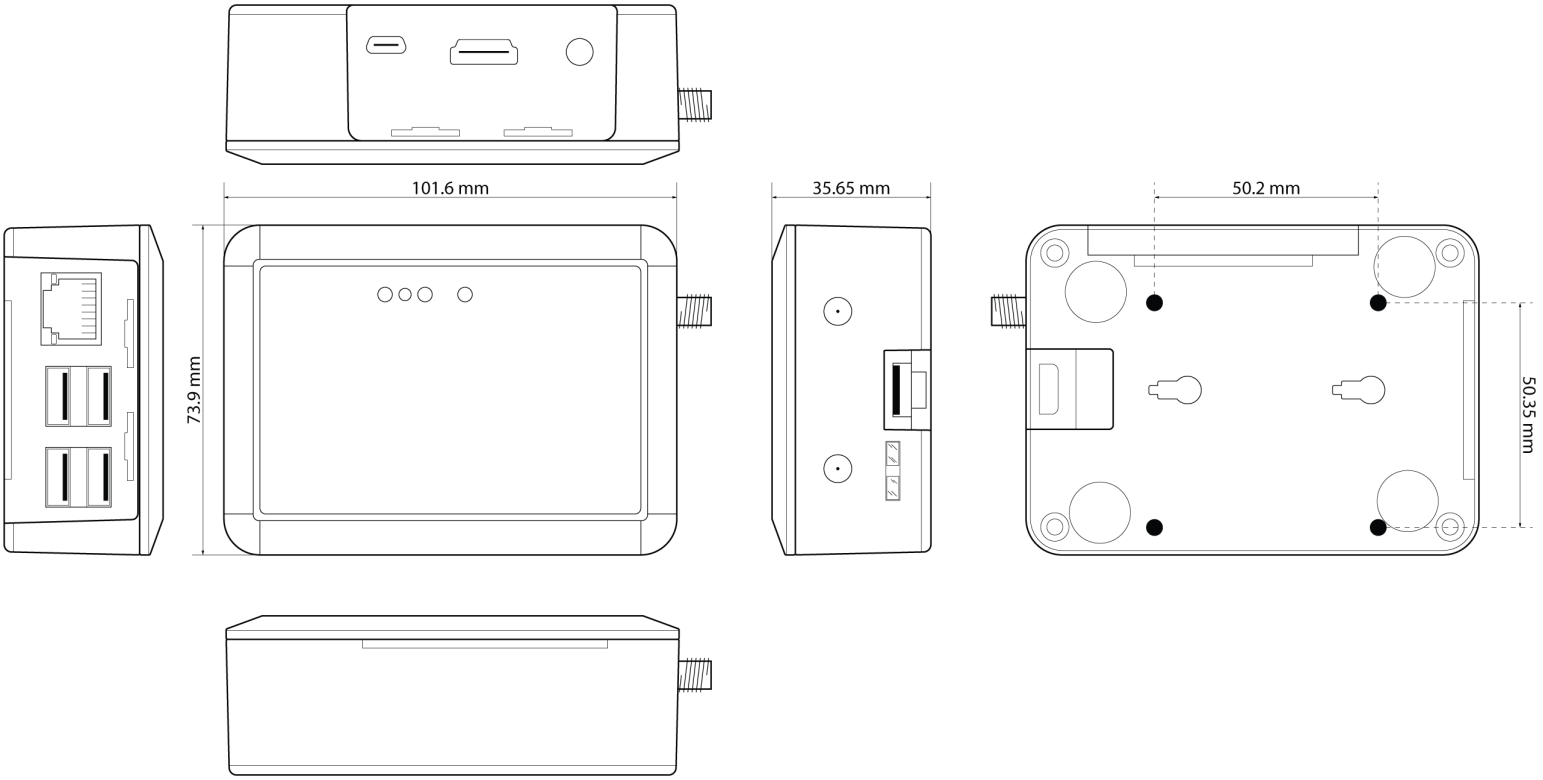
Forwarding



The forwarding service allows two-way communications between Whisker.io devices and third party platforms such as Amazon, ThingLogix, etc.

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Mechanical



Connectivity Options

Every Whisker.io™ Hub can connect to the Internet via Ethernet. Hubs that are purchased with the Cellular option can also connect via Cellular.

Installation and Setup

All Whisker.io™ hubs are truly plug-and-play, requiring no provisioning or setup in the field. Simply mount the hub, connect it to power, and wait for all the status lights to come on.

Once a hub is installed, it is automatically configured to work with devices within its transmission range.

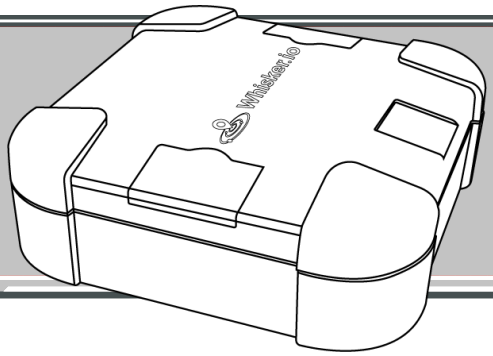
Order Information

Part Number	Description
WH1-9-00-PDNEN-N	Whisker.io™, Smart.Hub™, Pro, 900MHz, Ethernet, 120VAC

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WB1-9-00-NNNNNNNN-0000-LR

Whisker.Block®, Internal Temp



General Description

Whisker.Blocks® are long-range, wireless sensors that come in a variety of I/O and power configurations. These sensor blocks use our proprietary long range wireless communication technology, ensuring reliable and robust operation.
They can be configured for battery or external power. When powered from internal batteries, the sensors can operate for 10 or more years, depending on the sensors use and configuration.
Each sensor is housed in a durable, IP67 enclosure that supports a variety of mounting methods. External sensors are connected via one or two 4-pin M8 style waterproof connectors, depending on how many external channels are configured.
The long range, exceptional battery life, and flexible I/O configurations of the Whisker.Block® make it the perfect choice for nearly any IoT application.

Power

This Whisker.Block® is powered internally using a 3.7V, 5.2A-H LiThCl battery pack that should give 10+ years of service life before a battery change is required, assuming a 5 minute update period.

Range

They come in a variety of configurations with multiple external channels for various analog and digital inputs.In an unobstructed, outdoor line-of-site environment, the sensor should be able to communicate for more than 0.8 kilometers assuming a receiving antenna elevation of 3.0 meters. If the receiving antenna is raised to 6.1 meters or more, the range should increase to more than 1.6 kilometers.
When used in environments where line of sight cannot be obtained or where there are many reflective obstacles in the transmission path, the range will degrade due to multi-path fading. It is impossible to predict the transmission range of a Whisker.Block® in any specific situation, so we do encourage users to take advantage of our site survey tools to ensure coverage exists anywhere a sensor is to be deployed. For more information on site survey techniques, see application note .

Internal Channels

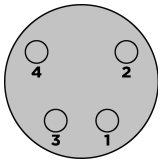
This Whisker.Block® is configured with two (2) internal channels:

Battery Voltage

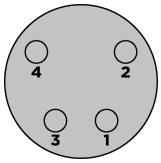
Ambient Temperature

External Connections

This Whisker.Block® has no configured external channels



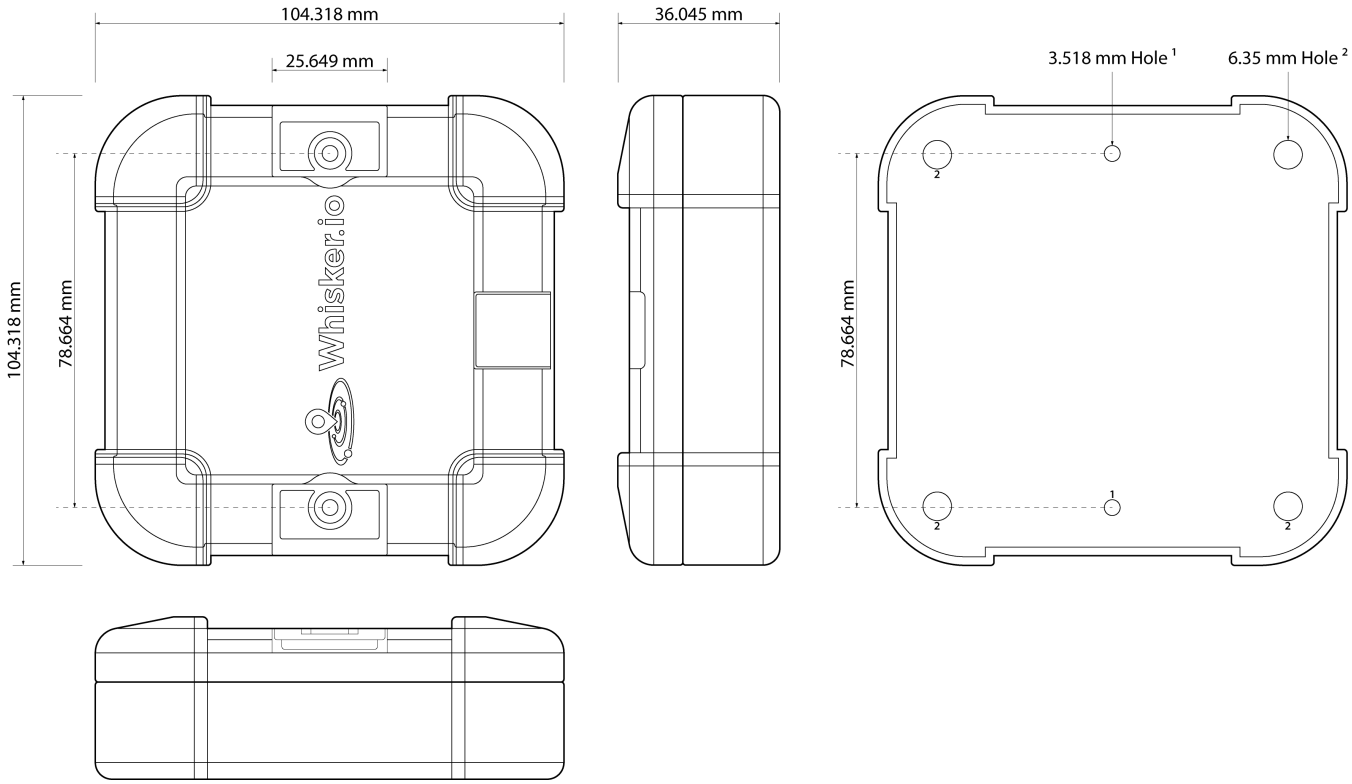
Con 2: Not used



Con 2: Not used

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Mechanical



Electrical Specifications

Parameter	Minimum	Typical	Maximum	Units
Battery Life—Standard Pack	N/A	10	20	Years
Operating Temp. Range	-40		+85	Degrees Celsius
Transmission Range		0.8-1.6		kilometers[1]
Frequency Range	902		928	MHz
Internal Temperature Measurement Range	-40		+85	Degrees Celsius
Internal Temperature Measurement Accuracy	-1		1	Degrees Celsius
Sensor Sample Rate		5		Minutes

1) Typical range: Outdoors, line of sight, unobstructed, antenna elevation 3 meters. Max range: Outdoors, line of sight, unobstructed, antenna elevation 12 meters

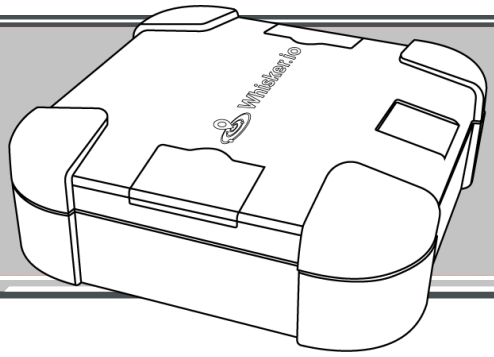
Order Information

Part Number	Description
WB1-9-00-NNNNNNNN-0000-LR	900MHz, battery powered, int. antenna, int. temperature

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WB1-9-00-DCNNNNNN-0000-LR

Whisker.Block®, Dry Contact Digital Input



General Description

Whisker.Blocks® are long-range, wireless sensors that come in a variety of I/O and power configurations. These sensor blocks use our proprietary long range wireless communication technology, ensuring reliable and robust operation.
They can be configured for battery or external power. When powered from internal batteries, the sensors can operate for 10 or more years, depending on the sensors use and configuration.
Each sensor is housed in a durable, IP67 enclosure that supports a variety of mounting methods. External sensors are connected via one or two 4-pin M8 style waterproof connectors, depending on how many external channels are configured.
The long range, exceptional battery life, and flexible I/O configurations of the Whisker.Block® make it the perfect choice for nearly any IoT application.

Power

This Whisker.Block® is powered internally using a 3.7V, 5.2A-H LiThCl battery pack that should give 10+ years of service life before a battery change is required, assuming a 5 minute update period.

Range

They come in a variety of configurations with multiple external channels for various analog and digital inputs.In an unobstructed, outdoor line-of-site environment, the sensor should be able to communicate for more than 0.8 kilometers assuming a receiving antenna elevation of 3.0 meters. If the receiving antenna is raised to 6.1 meters or more, the range should increase to more than 1.6 kilometers.
When used in environments where line of sight cannot be obtained or where there are many reflective obstacles in the transmission path, the range will degrade due to multi-path fading. It is impossible to predict the transmission range of a Whisker.Block® in any specific situation, so we do encourage users to take advantage of our site survey tools to ensure coverage exists anywhere a sensor is to be deployed. For more information on site survey techniques, see application note .

Internal Channels

This Whisker.Block® is configured with two (2) internal channels:



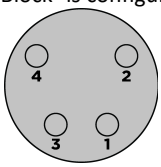
Battery Voltage



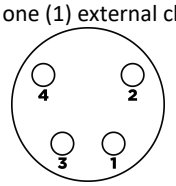
Ambient Temperature

External Connections

This Whisker.Block® is configured with one (1) external channels:



Con 2: Not used

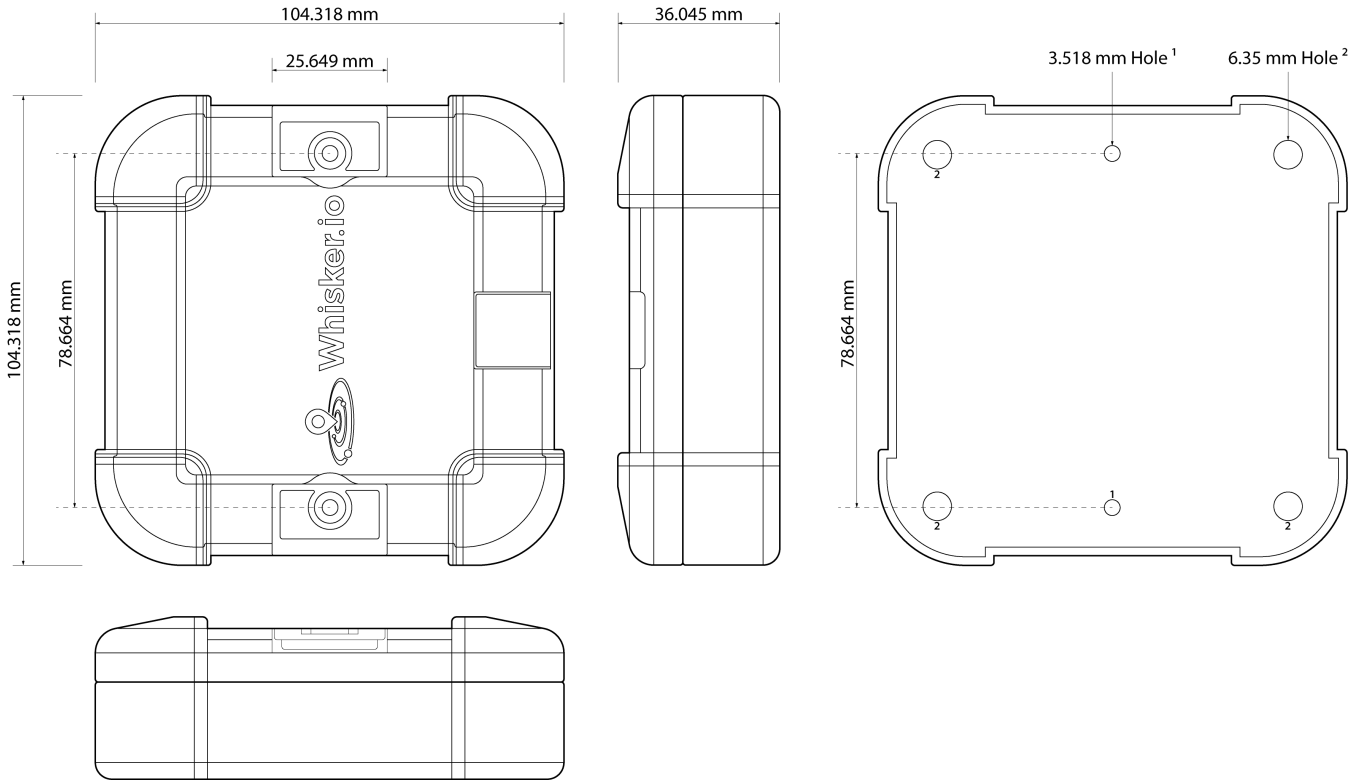


Con 1 (Right)

Connector	Pin	Function	Description
1	1	Not used	Not used
1	2	Channel 1	Dry Contact Input
1	3	Not used	Not used
1	4	Ground	Circuit ground

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Mechanical



Electrical Specifications

Parameter	Minimum	Typical	Maximum	Units
Battery Life—Standard Pack	N/A	10	20	Years
Operating Temp. Range	-40		+85	Degrees Celsius
Transmission Range		0.8-1.6		kilometers[1]
Frequency Range	902		928	MHz
Internal Temperature Measurement Range	-40		+85	Degrees Celsius
Internal Temperature Measurement Accuracy	-1		1	Degrees Celsius
Sensor Sample Rate		5		Minutes

1) Typical range: Outdoors, line of sight, unobstructed, antenna elevation 3 meters. Max range: Outdoors, line of sight, unobstructed, antenna elevation 12 meters

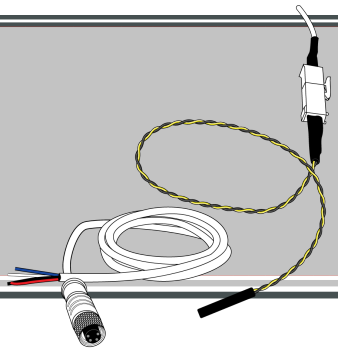
Order Information

Part Number	Description
WB1-9-00-DCNNNNNN-0000-LR	900MHz, battery powered, int. antenna, int. temperature, ext. dry contact input qty. (1)

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WBP_SC_0015_01

Sensor Cable / Rope Leak Sensor



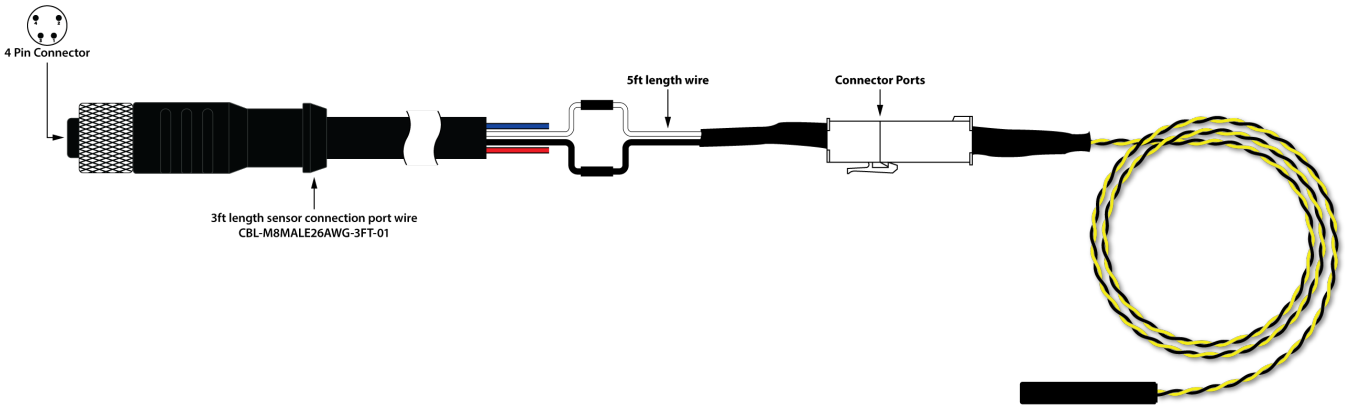
General Description

This cable kit contains a base Sensor Attachment Cable that is connected to the sensor block. The below listed components are shipped attach to the listed Sensor Attachment Cable as shown in the below diagram.

This bundle contains the following components:

Quantity	Part Number	Description	
1	WBP-WL-02-3F	H20 Leak Detection, 91cm Rope Sensor, 152cm Cable	
1	CBL_M8MALE26AWG_3FT_01	Sensor Attachment Cable, 91cm Cable Blue/No Marker = Channel 1, Yellow Marker = Channel 2	

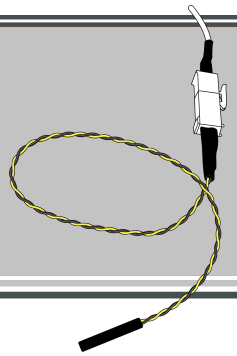
Wiring Diagram



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WBP-WL-02-3F

H20 Leak Detection, 91cm Rope Sensor, 152cm Cable



General Description

Whisker.Blocks® are long-range, wireless sensors that come in a variety of I/O and power configurations. These sensor blocks use our proprietary long range wireless communication technology, ensuring reliable and robust operation. They come in a variety of configurations with multiple external channels for various analog and digital inputs.

This external sensor is designed to work with a Whisker.Block® that is configured with an external dry contact (DC) input. When properly mounted close to the floor, this sensor will detect standing water on the floor.

When there is no water present, the DC channel will indicate a “low” state. When water is present, the DC channel will indicate a “high” state.

Alternatively, you can use if you need to monitor pipes or hoses for leaks. That sensor is a rope-type H20 detector that can be laid along piping runs.

Power

This is a passive sensor that requires no external power.

Mounting

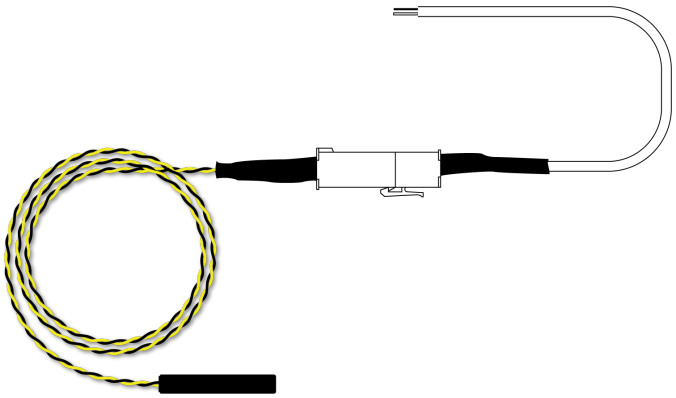
This sensor is designed to mount on a vertical surface, close to the floor that is being monitored. The height above the floor will determine how much standing water is required before the sensor provides a positive indication of water on the ground.

The sensor is mounted via the hole in its body. A simple sheetrock screw is all that is needed. Ensure that the sensor has a secure and level mount.

Compatible Whisker.Blocks®

Part Number
WB1-9-00-DCNNNNNN-0000-LR
WB1-9-00-DCTRNNNN-0000-LR
WB1-9-00-DCTRTRNN-0000-LR
WB1-9-00-DCA4NNNN-0000-LR
WB1-9-00-DCA4A4NN-0000-LR
WB1-9-00-DCA5NNNN-0000-LR
WB1-9-00-DCA5A5NN-0000-LR

Wiring



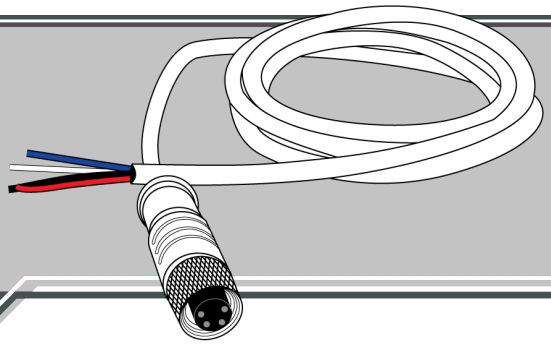
Recommended Wiring:

Connector	Pin	Sensor Wire	Description
1	2 or 3	Blue/Black	Dry Contact In
1	4	White	Ground Reference

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CBL_M8MALE26AWG_3FT_01

Sensor Attachment Cable, 91cm Cable



General Description

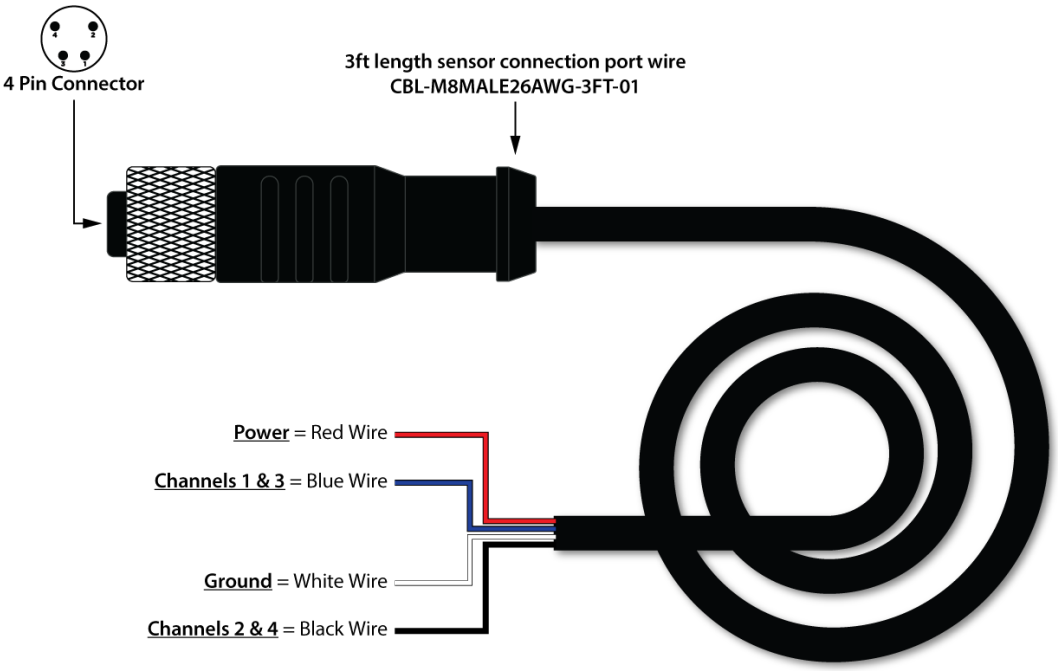
Whisker.Blocks® are long-range, wireless sensors that come in a variety of I/O and power configurations. These sensor blocks use our proprietary long range wireless communication technology, ensuring reliable and robust operation. They come in a variety of configurations with multiple external channels for various analog and digital inputs.
The Sensor Attachment Cable is installed on the Whisker.Block® to provide a means to connect up to two (2) sensors to the Whisker.Block® without having to wire the sensor(s) directly to the Whisker.Block® circuit board connector.

Mounting

The Sensor Attachment Cable comes attached to the Whisker.Block®. In some cases, the sensors must be connected to the Sensor Attachment Cable using the wiring configuration shown on the sensor data sheet.

Compatible Whisker.Blocks®

Part Number
WB1-9-00-A5NNNNNN-0000-LR
WB1-9-00-C1NNNNNN-0000-LR
WB1-9-00-C2NNNNNN-0000-LR
WB1-9-00-C3NNNNNN-0000-LR
WB1-9-00-C4NNNNNN-0000-LR
WB1-9-00-C1TRTRNN-0000-LR
WB1-9-00-C2TRTRNN-0000-LR
WB1-9-00-C3TRTRNN-0000-LR
WB1-9-00-C4TRTRNN-0000-LR
WB1-9-00-C2TRTRNN-0000-LR
WB1-9-00-DCNNNNNN-0000-LR
WB1-9-00-TRNNNNNN-0000-LR
WB1-9-00-TRTRNNNN-0000-LR



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