

ARABLE **MARK** INSTALLATION GUIDE

On your Mark, get set, go!

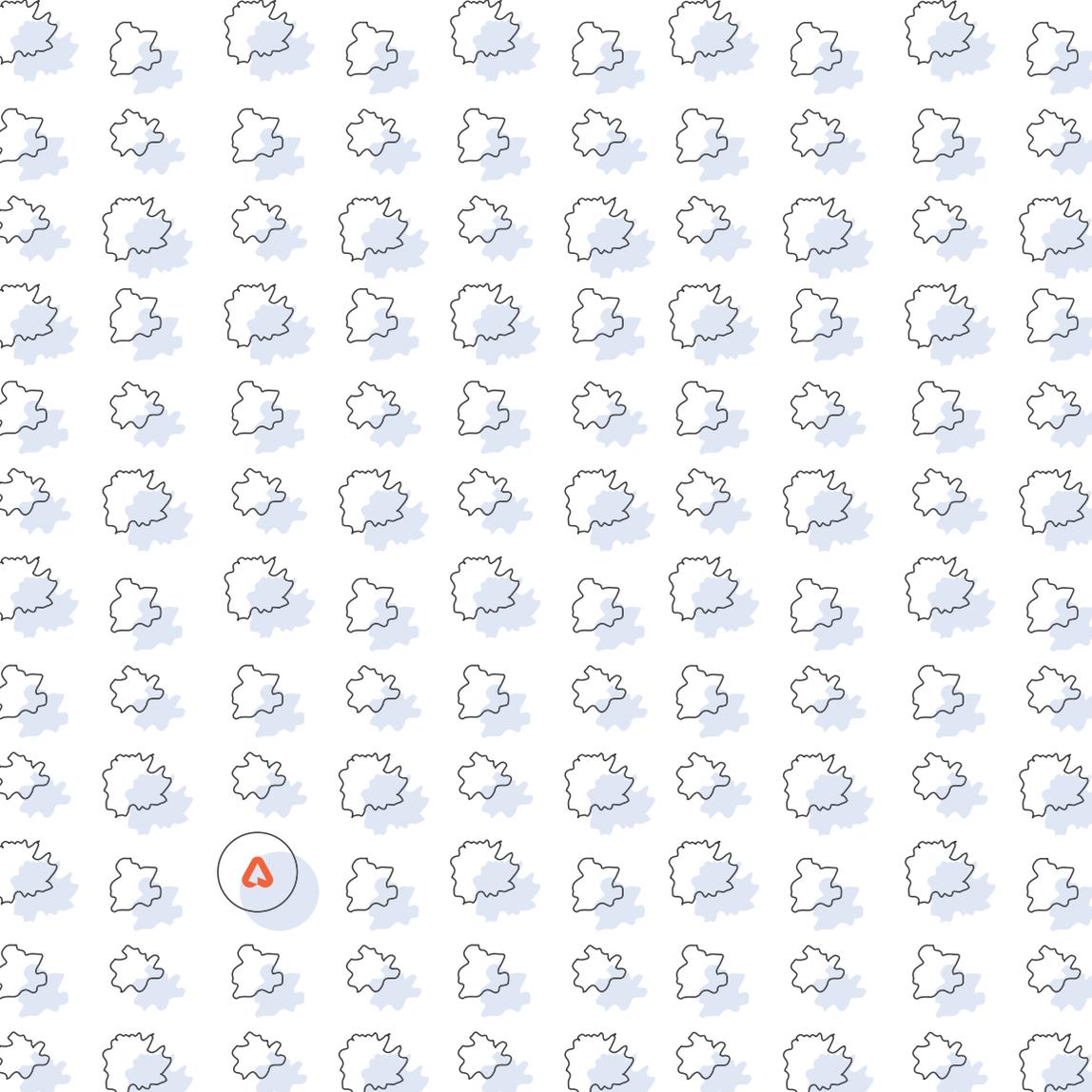


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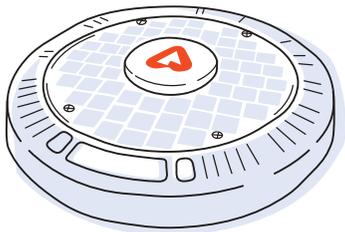
Contact Us

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On Your Mark What's Inside the Box?

Now that your Arable Mark has arrived, please take a few moments to familiarize yourself with the device and its accessories.



Arable Mark

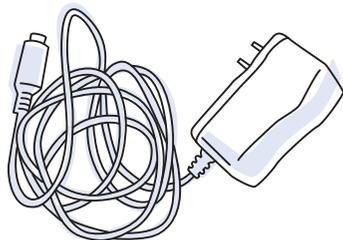
Our patented crop and weather monitor that measures, analyzes, and delivers data relating to weather, irrigation, canopy, integrated pest management, and more.

Mount

The mount attaches to the top of any metal pole with an outside diameter between 1" and 1- $\frac{3}{8}$ ".

For poles with a larger diameter or pre-existing infrastructure, we offer a horizontal mount for purchase.

Reach out to our team at support@arable.com for more information.

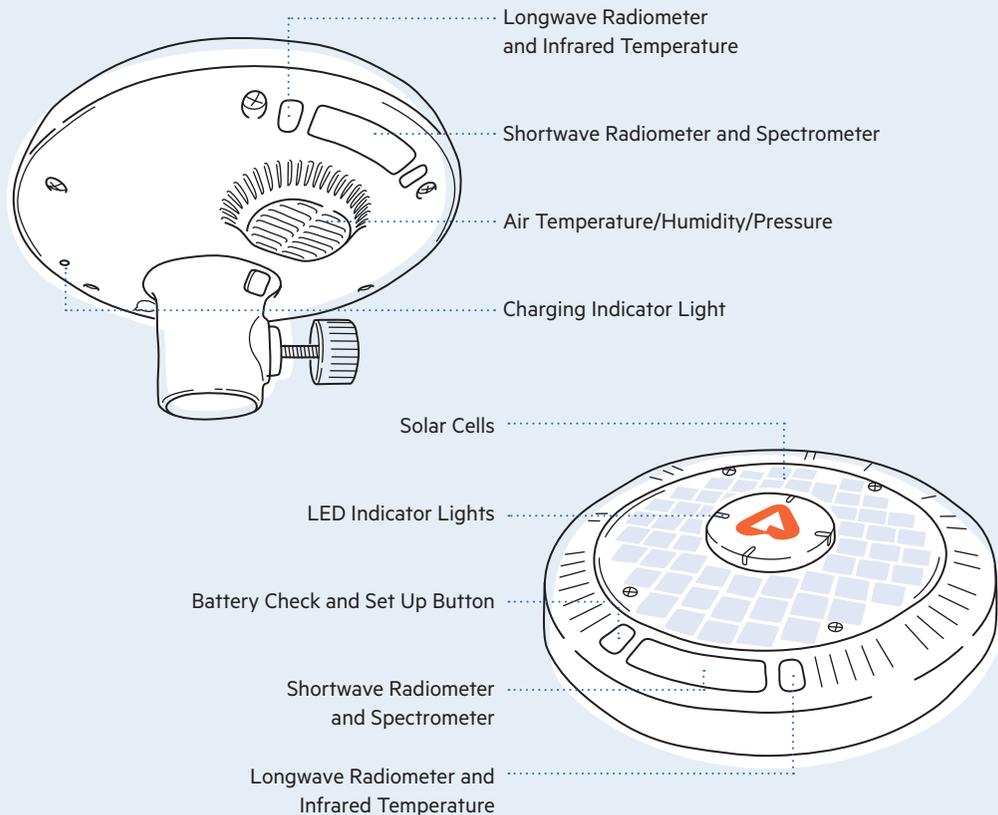


AC-DC Wall Adapter

We recommend charging the device before bringing it out to the field so that the Mark is at least 75% charged. This should take about an hour. You can check the charge of the device by pressing the button on the top of the device. See page 4 for more details.

On Your Mark Getting Acquainted

Crop management in one reliable device and software solution.



On Your Mark What the Mark Measures

Our in-field weather and crop monitor collects over 40 different data streams.



Precipitation

Rainfall measured to within 0.2mm/hr
Surface Wetness for disease risk monitoring
Dew detection



Evapotranspiration

Dynamic Kc
Canopy Temperature to within +/- 0.5°C
Full Radiation Budget
≤ 4% margin of error



Integrations / Accessories

Flow Meter
Wind Speed & Direction
Soil Moisture Probes
Pressure Switch/Transducer



Radiation

Solar Radiation
PAR ≤ 6% daily total
Net Radiation ≤ 10% margin of error



Weather

Temperature to within +/- 0.75°C
Relative Humidity to within +/- 3%
Pressure ≤ 0.1% margin of error



Connectivity

Cellular
US: Hologram, AT&T, T-Mobile, Verizon & Local Carriers
International: Hologram



Plant Health

NDVI / MSAVI
Chlorophyll Index
Seven Band Spectrometer



Harvest / Event Timing

Growing Degree Days
Chilling Hours
Frost Forecast

The data from the device is sent to the cloud using a 3G cellular network. You can log into the Arable platform by going to app.arable.com. If you do not know your organization name or customized organization URL, please reach out to support@arable.com.

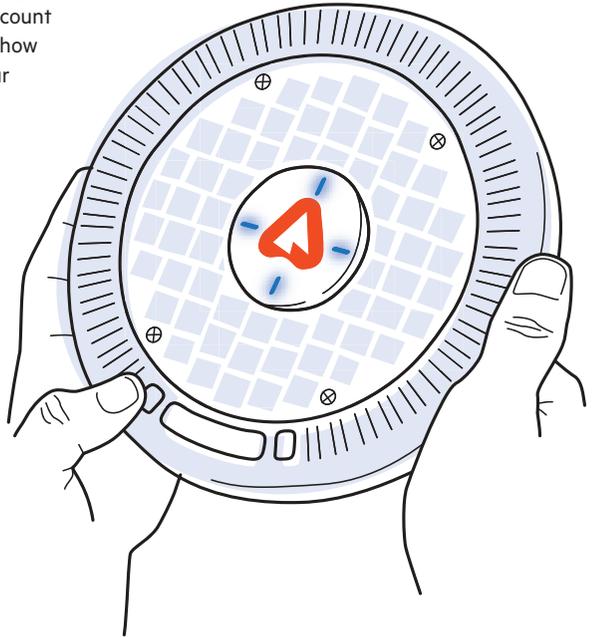
Before Going To The Field Get Prepared

Here are a few things to keep in mind before heading out to the field.

Check the Charge

To obtain a full charge, connect the Mark to an outlet for at least one hour, using the provided power adapter. The device is solar powered, but it's a good idea to deploy at full capacity.

You can check the battery level by briefly pressing the button on top of the device. Four lights will count up around the Arable logo twice, then blink to show battery capacity. At over 75% of capacity, all four LEDs will illuminate in a circle.



Before Going To The Field Installation Accessories Checklist

Be sure to bring these additional items if needed.

- A vertical mounting pole**
Any metal pole with an outside diameter between 1" and 1-3/8" will suffice.
We recommend using 1" inch conduit.

See pages 7-8 for pole length worksheet and Mark height placement guide.

- If you are attaching to preexisting infrastructure**
Reach out to support@arable.com about alternative mounting options.
-

For short crops (under 4')

If inserting into the ground, we recommend:

- A sledgehammer or pole shaft**
to insert the pole into the earth at least 12"
- Soil probe**

For tall crops (4' and above)

If reinforcing the pole by attaching it to pre-existing infrastructure, we recommend bringing:

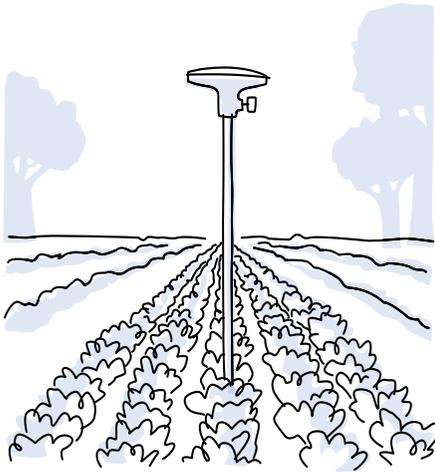
- 2 metal band clamps**
to attach at the top and at the base
 - A socket wrench or flathead screwdriver**
to tighten the clamps; this works especially well for wine grapes
-

You may also want to bring:

- Clean cloth**
to wipe off the top of the device
- Heavy-duty zip ties**
- Ladder**

Mark Placement Overview In the Field

Carefully planning the device's placement will ensure the data obtained is of the highest quality.



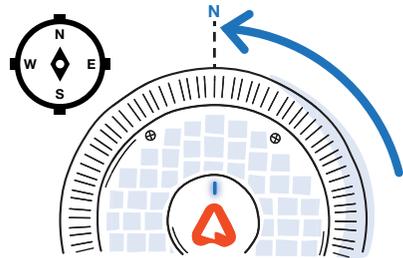
Pick a Representative Spot

First, the Mark should be placed in a location that best represents crop conditions. The Mark's underside has an array of lenses that should be directly above your crop and not pointing at the road or the furrows running between crops. Be attentive to local surroundings such as tall trees that may cast shadows. These can affect the data collected from the lenses and reduce charging potential.

See pages 7-8 for more information on placement.

Point the Arable 'A' logo North if in the Northern Hemisphere

Secondly, if you're in the Northern Hemisphere, the top of the Arable 'A' logo should be pointed northward as long as the lenses on the bottom of the device can remain directly over the crop. It is MOST important that the lenses be above the crop you are trying to measure. Get the positioning as close to northward in this case without pointing the lenses over something you do not want to measure, such as the bare furrow.



Check Cellular Reception

Finally, the device should be placed in a location with good cellular service. If that is not a possibility, please contact Arable to review other options for data communications. Generally, if you see two bars on your phone, the Arable Mark will be able to connect to the server and send data to the cloud at regular intervals.

Mark Placement Overview Pole Length Worksheet

The Mark's optimal height is based on the crop you are monitoring.

Use our worksheet to help determine the length of your pole.

Using our Mark Height Placement Guide on the opposite page, write in the measurements appropriate for your crop. Add the measurements together for your total pole length.

NOTE: the Mark will be looking at a circular area below it with a diameter that is twice its mounted height.

If you are installing a freestanding pole, it should be:

12" in the ground + canopy height + recommended height above the canopy = total pole length

If attaching to pre-existing infrastructure only add in 2-3' and max crop height.

For example, you want to install a new pole among plants with a canopy expected to grow to 18" and planted in a 36"-wide row:

12" (underground portion)

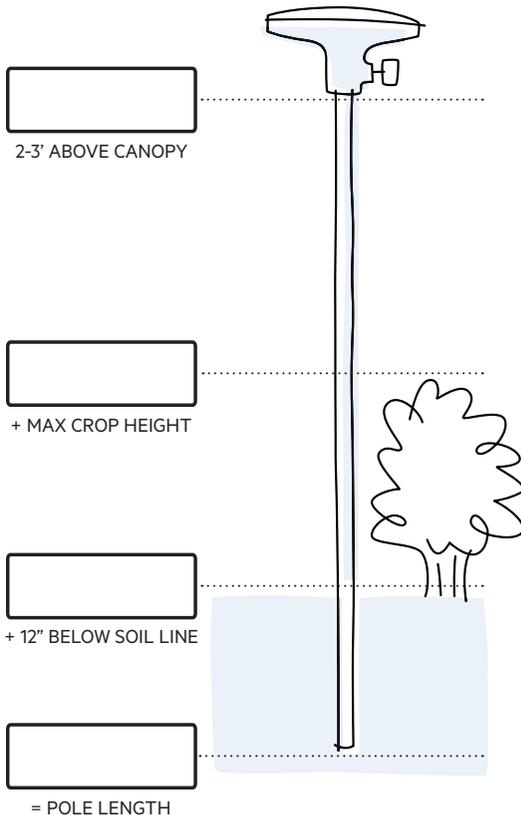
+

18" Crop at full height

+

(36"/2=18") Recommended above-canopy height

48" total pole length



Mark Placement Overview

Height Placement Guide

Use this chart as a general guide for for placing the Mark at the correct height for your crop.

| Crop Type | Recommended Height Above Canopy | Example |
|--|--|--|
| Low Vegetables & Row: Blueberries, Strawberries, Lettuce | ½ row width | If row is 60", then put at 30", or 2 ½' |
| High Vegetables & Row: Corn, Wheat, Soy, Tea, Cannabis | 1 ½ row width | If row is 60", then put at 90", or 7 ½' |
| Wine Grapes | The most important consideration here is getting the full 70° angle of the infrared temperature sensor to hit the canopy. To achieve this, the Mark should be placed above the canopy at a height of about half the width of the vine. | For a 2' wide vine, put it 1' above the canopy. Standard pole height is 7' |
| Orchards: Nuts, Citrus, Coffee | Same as Wine Grapes | For a tree 6' wide, put it 3' above the canopy |

Installation Guide For Short & Tall Crops

Tips on how to place your Mark in the field.

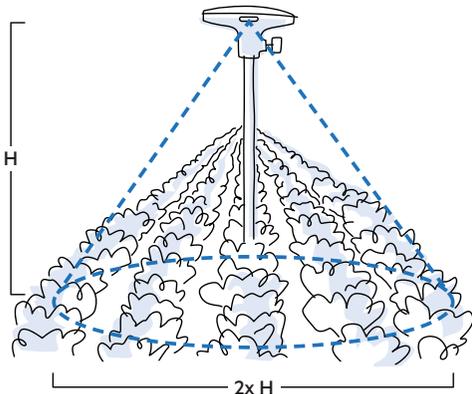
Mark Height and Adjustment

The Mark's optimal height is based on the crop you are monitoring. See Mark Height Placement Guide chart on previous page.

FOR SHORT CROPS (UNDER 4')

Step 1. Pole Placement

Drive the pole firmly into the ground so that it is roughly level and will not slip in time. Make sure to avoid any irrigation lines below the soil.



FOR TALL CROPS (4' AND ABOVE)

Step 1. Pole Placement

Place pole near trellis post. It will take a little adjustment to get the pole flat along the post and in between wires. Don't fix it to the post just yet; you will want to be able to tilt it towards yourself to put the device on the top of the pole before affixing it to the trellis post.

We also recommend creating a hole near the base of the trellis post to bury part of the pole, using a soil probe or hand spade. This gives it some added stability.

NOTE: the Mark will be looking at a circular area below it with a diameter that is twice its mounted height.

Installation Guide For Short & Tall Crops

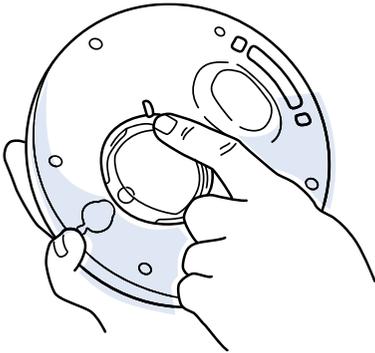
Tips on how to place your Mark in the field.

FOR ALL CROPS

Step 2.

Deploy Arable Mark by Connecting it to the Mount

On the bottom of the device is an alignment 'tick.' Align this tick with the button on the vertical mount and twist clockwise until you hear a click.

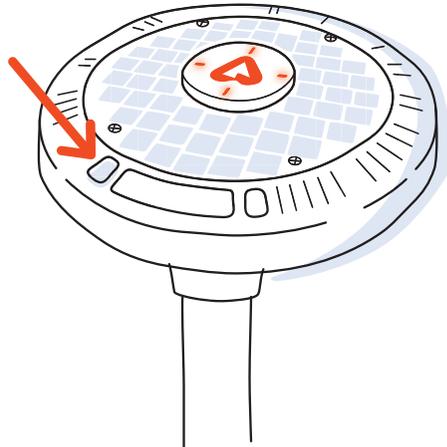


Lights on the device will start blinking to indicate that the deployment sequence has initiated. The initiation sequence boots the system, runs a few sensor tests, and connects to the Arable cloud server. This may take 3 to 5 minutes. **Please stay with the device during this time.**

When the initiation sequence is finished, all four lights around the Arable logo will shine solid blue and blink in unison a few times.

If any of the lights turn red:

If any of the lights during the initialization system check turn red or shut off and don't respond to a quick press of the button, disconnect the device from the mount, recheck the battery by pressing the button on the top, and then try to deploy the device again by reconnecting the mount to the device. (Continued)

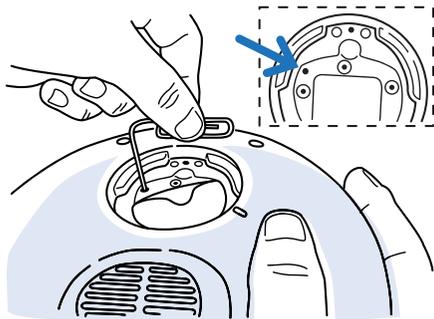


Installation Guide For Short & Tall Crops

Tips on how to place your Mark in the field.

If the lights are still red:

If after a couple of tries this does not seem to work, use a paper clip to push the reset button, located underneath the rubber flap on the bottom of the device. Lift the rubber flap and you will find a small circle on the upper righthand corner. Use the paper clip to push the button for 3-5 seconds. Then wait one minute and try again by reconnecting the device to its mount.

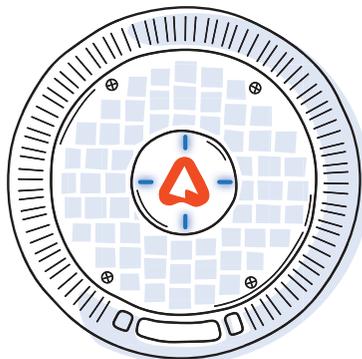


If you redeploy and the light to the right of the Arable 'A' logo is still red, the Mark has failed to reach a server. You may want to try deploying in an area with better cellular service.

If any other lights are red, there may be a problem with your device. Please write down which light turned red and contact support@arable.com.

If all lights have turned blue:

The deployment sequence is now complete.



Hot Tip:

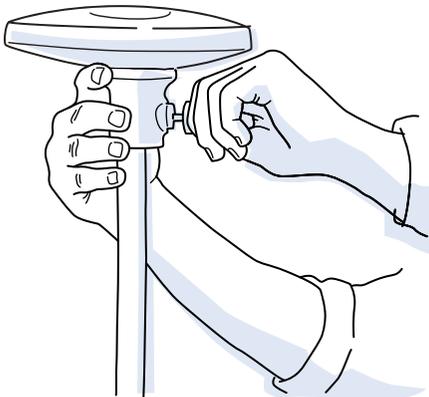
If you missed the lights, simply press the button on the top of the unit. If there were any errors during deployment, one of the lights will turn red.

Installation Guide For Short & Tall Crops

Tips on how to place your Mark in the field.

Step 3. Attach Mark to Pole

Attach the vertical mount to the top of the pole. The knob on the mount should be pointed east if the spectrometer positioning over the crop permits it. Do not fully tighten the knob. **For taller crops, secure the pole to the trellis post using band clamps;** put one at the base and one at the top. Make sure the lenses on the bottom of the device are over the canopy, **NOT** the bare furrow. The device should be positioned at the suggested height from the Mark Height Placement Guide.



Step 4. Check Level and Orientation

Press and hold down the button for a few seconds until all lights blink blue twice; this is how the Mark will go into leveling mode.

The Mark knows when it is level, but needs your help getting there. If the device is not perfectly level, only two or three LEDs will illuminate. The LED that does not illuminate is the low side. Gently push the device away from the low side until that LED illuminates. A different LED may go dark. Repeat the process until all 4 LEDs are illuminated. Once you are successful, all four lights will be illuminated and you may quickly press the button to go to the next step. Devices need to be approximately level to ensure accurate readings.

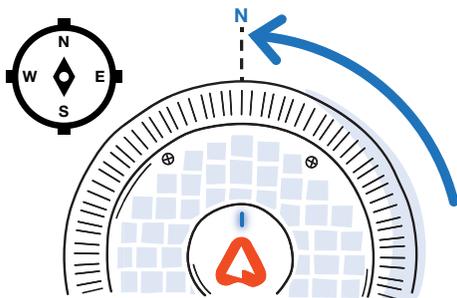
Installation Guide For Short & Tall Crops

Tips on how to place your Mark in the field.

Orientation Mode

Now the Mark will go into orientation mode.

For consistency across installation, we recommend pointing the 'A' generally north. If the device cannot be pointed north with the lower lenses simultaneously positioned over the crop, ignore the orientation step. It is of higher importance that the lenses be over the crop. In orientation mode, the light on top of the Arable 'A' logo will start blinking red. The Mark wants the 'A' to point north.



Once it is perfectly aligned, the light will turn solid blue.

Step 5. Tighten Knob

Ensure the knob is fastened tightly after finalizing orientation.

Step 6. Install Arable Solar

See Instruction Booklet that came in the Arable Solar box, or visit: <http://bit.ly/arable-solar>

All Done

Your Mark is now all set up! Wipe the surface of any mud or debris that may be covering the clear dome. You are now ready to log on to the Arable app and see the weather and plant information for that location. It may take up to 2 hours for the devices to show in the app. You can select the new locations from the list on the right side of the interface, and give them a name or tags (such as the varietal).

Storage

Caring for your Mark.

How should I store the Mark?

If you want to take it down for awhile, you can store your Mark as you would any other piece of valuable technology. Before you take your Mark out of the field, take it off of its mount. When storing the Mark, pay special attention to covering the top dome to make sure it is not scratched. One suggested place to house the Mark would be in the box that it came in with the AC-DC adapter.

It is best to store the Mark indoors in a single location where it is easily accessible for redeployment in the future!

Help General Troubleshooting

When you aren't sure what is wrong, follow these steps.

1. Check the charge

You can check the battery level by briefly pressing the button on top of the device. Four lights will count up around the logo twice, then blink to show battery capacity. At over 75% of capacity, all four LEDs will illuminate in a circle. If the Mark is unresponsive to pressing the button, we recommend taking the device indoors and using the power adapter accessory to plug in and charge the device.

2. Restart the device

Undeploy the device by disconnecting the Mark from its base. Hold down on the trigger on the mount and twist to release the Mark from the mount. On the underbelly of the Mark, there will be a rubber closing. Open the closing and you will see a small circular hole on the *left* corner. This is the reset button. For a detailed diagram of the location of the reset button, see page 17. Use a paper clip or pen to hold button for 3 seconds.

3. Re-deploy the device

Once the Mark is twisted onto the mount, lights on the device will start blinking to indicate that the deployment sequence has initiated. The initiation sequence boots the system, runs two sensor tests, and connects to the server. This may take several minutes. **Please stay with the device.** When the sequence is finished, all four lights around the Arable logo should shine solid blue.

If any of the lights in the system check turn red or shut off and don't respond to a quick press of the button, disconnect the device from the mount, re-check the battery by pressing the button on the top, then use a paper clip to push the reset button on the bottom of the device. Wait one minute, then try to reconnect the device to its mount.

If you redeploy and the light to the right of the Arable 'A' logo is still red, the Mark has failed to reach a server. You may want to try deploying in an area with better cellular service.

If any other lights are red, there is a problem with your device. Please write down which light turned red and contact support@arable.com.

If all lights have turned blue, the deployment sequence is now complete.

4. If you are still having trouble, contact Arable

Our Customer Success team is standing by to help! Reach out at support@arable.com. You can also log into your account at app.arable.com and message our team through the help portal on the lower right hand of the screen.

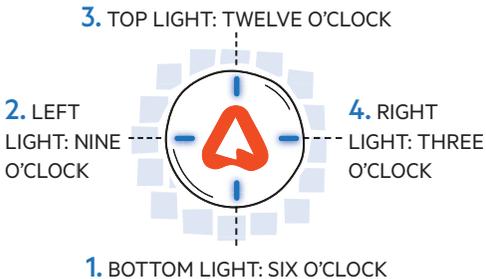
Help Specific Troubleshooting

Problem-solve with your Mark.

1. How do I check the charge?

Check the battery level by briefly pressing the button on top (side with solar panel) of the device.

At over 75% of capacity, all four LEDs will illuminate blue, starting at the bottom and moving clockwise like this:

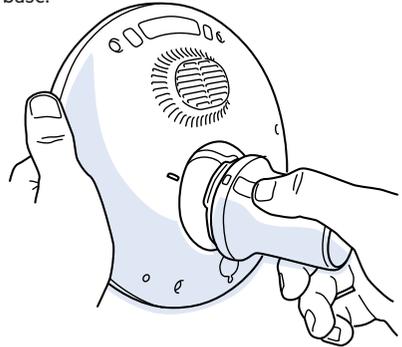


Then all four lights will simultaneously blink blue to indicate battery capacity.

If battery health is less than 25%, the bottom light (6:00) shows up red. Connect the Mark to its AC-DC adapter for at least two hours to recharge and obtain full battery power.

2. Did my device deploy?

On the underside of the device (the side without the solar panel) is a raised 'tick' (see picture). Align this tick with the button on the vertical mount and twist the vertical mount clockwise until you hear a click indicating that the vertical mount is locking into the base.



The vertical mount locking into the base of the device is absolutely critical because it switches the device on.

Lights on the device will start illuminating to indicate the initiation sequence. While the top (12:00) lights are blinking, the initiation sequence boots the system, runs sensor tests, and connects to the server. The right (3:00) light will blink until a connection is formed successfully with the server. (Continued)

Help Specific Troubleshooting

Problem-solve with your Mark.

The light turns solid blue once this is achieved. If there is an error at this stage, the right (3:00) light will illuminate solid red. This process typically takes only a few seconds, but can take several minutes in areas of poor cellular coverage.

Please stay with the device until the sequence is finished. This is indicated by all four lights around the Arable logo lighting up in solid blue.

3. Did my device connect to cellular?

Occasionally, the device will not deploy successfully. We can tell if the device has failed to deploy if the following occurs:

During the initiation sequence, the right (3:00) light flashes red;

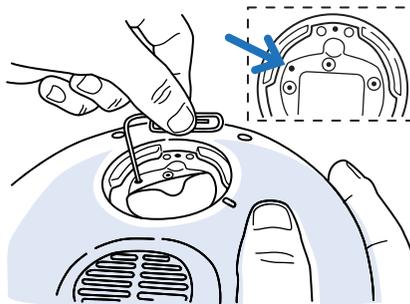
During the initiation sequence, none of the lights illuminate.

This indicates a potential issue with the device's ability to connect to the server. At this point, please double check by redeploying the device using the following steps:

1. Disconnect the device from the vertical mount.

2. Wait one minute.

3. Use a paper clip to push the reset button on the bottom of the device.



4. Wait one minute for the device to reset internally.

5. Redeploy by connecting the device to the vertical mount.

6. Lights on the device will start blinking blue in a circle around the Arable "A" to indicate that the initiation sequence is restarting. While the lights are blinking, the initiation sequence reboots the system, performs sensor tests, and connects to the server. Again, this process typically takes only a few seconds, but can take several minutes in areas of poor cellular coverage.

Help Specific Troubleshooting

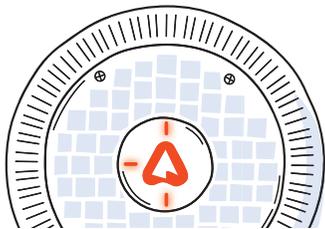
Problem-solve with your Mark.

7. Please stay with the device until the sequence is finished. This is indicated by all four lights around the Arable logo lighting up in solid blue.

8. If after you redeploy the right light (3:00) is still red and flashes any number of times, the device has failed to reach a server. Please note how many times the red light flashes and communicate this to Arable.

9. If this is the case, please try deploying in an area with better cellular service.

10. If any of the other three lights (bottom, left, or top of Arable "A" Logo) blink red, there may be a problem with your device.



11. Please write down which light turned red, how many times it flashed, and contact support@arable.com. If you miss how many times the light flashes red, you can always press the button on top to check again.

4. How do I level my device?

If all lights have turned blue, the deployment sequence is now complete. The final step is to check the level and orientation of the device. Ensuring that the device is level is critical for data quality and diagnostics. Without proper calibration, the accuracy of all data collection is compromised. Please follow these easy steps to ensure that the device is completely level upon installation, following a successful initiation sequence and deployment.

1. To check if the device is level, press and hold down the button on the top side of the device for a couple of seconds, until all lights blink blue twice. The Mark will then go into leveling mode.

2. During leveling mode, the device is running a test using the onboard accelerometer to determine whether or not the device is level. During this test, blue LED lights will illuminate.

3. If the device is not perfectly level, either one, two, or three lights will not be illuminated in blue. The LEDs that do not illuminate indicate which sides of the device are lower than the sides with LEDs illuminated in blue. (Continued)

Help Specific Troubleshooting

Problem-solve with your Mark.

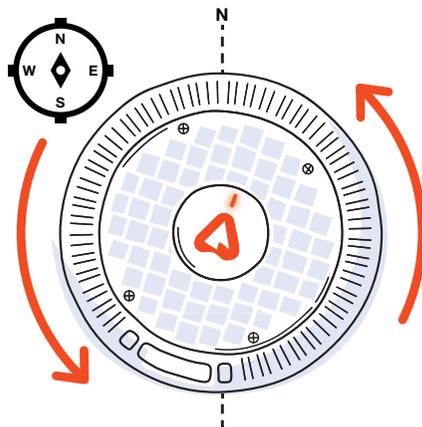
4. Simply balance the device away from the low side until all four LEDs illuminate in blue. When all four lights are illuminated, this indicates that the device is level. Proceed to the next step to check device orientation by pressing the top button.

5. How do I orient my device? (Northern Hemisphere)

The second part of the process that is important to data quality is ensuring that the device is oriented correctly so that the sun-sensor geometry is preserved across devices.

1. Press the top button briefly after the leveling process. This will make the device enter orientation mode.

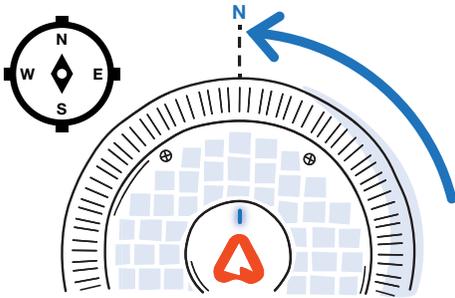
2. Once in orientation mode, the light above the Arable 'A' logo (12:00) will be red if it is not oriented north. Once it points north, it will illuminate blue.



Help Specific Troubleshooting

Problem-solve with your Mark.

3. The blinking light indicates that the compass within the device is searching for the north cardinal direction. The light will continue to be red until it is pointed north.



4. Please move the device until the blinking light turns solid blue. This indicates that the device is pointed north. Press the button once more to exit orientation mode, and you are all done!

6. General System Status Check

You can check the status of the device at any time by pressing the top button again.

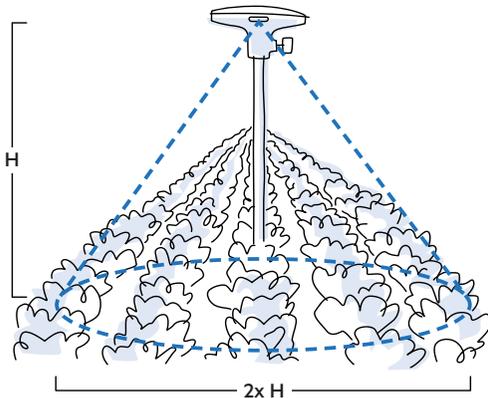
1. A short press checks the battery level.
2. A long press enters leveling mode.
3. A long press followed by a short press enters orientation mode.
4. The device exits the leveling mode either on its own after a short while or with an additional short press of the button.

FAQ Frequently Asked Questions

Commonly asked questions about the Mark.

What area is my Mark measuring?

The Arable Mark is looking at a circular area below it, with a diameter that is twice its mounted height.



Where should I put my Mark?

While we recommend placing the device in an area that is representative of crop conditions, we understand that your goals may vary. A few things to think about when deciding where to put the Mark:

I want to use the Mark to:

1. Tell me about average conditions at a site.

Choose a location that is representative of crop conditions.

2. Capture extreme events or conditions.

Choose a location you are interested in monitoring because the plant or conditions deviate from normal:

- More, or less, vigorous canopy
- Where frost occurs
- Where disease outbreaks first occur

3. Correlate with other data.

Choose a location near your soil moisture probes or other irrigation equipment, where you test or sample often, or where you have geospatial imagery.

FAQ Frequently Asked Questions

Commonly asked questions about the Mark.

How often do I need to clean the Mark?

As with any piece of equipment weathering the outdoor elements, the Mark requires a little TLC. We recommend wiping off the dome every few months to ensure maximum sunlight exposure for good battery charge and data collection accuracy.

Luckily, cleaning your Mark is an easy affair! All you need is soap, water, and clean rag.

Instructions: Wipe off the top dome of the Mark gently. Make sure that there are no soap suds leftover and that the top of the dome is clear once you're done.

Those growing in dusty terrain should be prepared to clean their Marks more often to prevent debris from building up.

If you have a spraying event, you should check afterwards to make sure the top of your Mark is clean.

Can I move my Mark to a new location?

Absolutely! Every time you undeploy a Mark and redeploy it in a new location, you can set it up as a new location with a new name, tags, and crop type. If you undeploy and redeploy in the same location, you can give it the same name, tags, and crop type so that the data reads to the same location as before.

What's the difference between a "short" and "long" press?

Short Press (one m-):

You can check the status of the device at any time by pressing the top button again. A short press will show any errors that might have occurred during the deployment process. If no errors have occurred, the lights will skip straight to a battery level check. The lights will count clockwise from the bottom (6:00).

Long Press (one mississippi, two mississippi):

A long press enters leveling mode, and a long press followed by a short press enters orientation mode. Finally, the device exits the leveling mode either on its own after a short while or with an additional short press of the button.

Contact Us

Get in touch.

Our Customer Success team is standing by to help!

Reach out at support@arable.com.

You can also log into your account at app.arable.com and message our team through the help portal on the lower right hand of the screen.

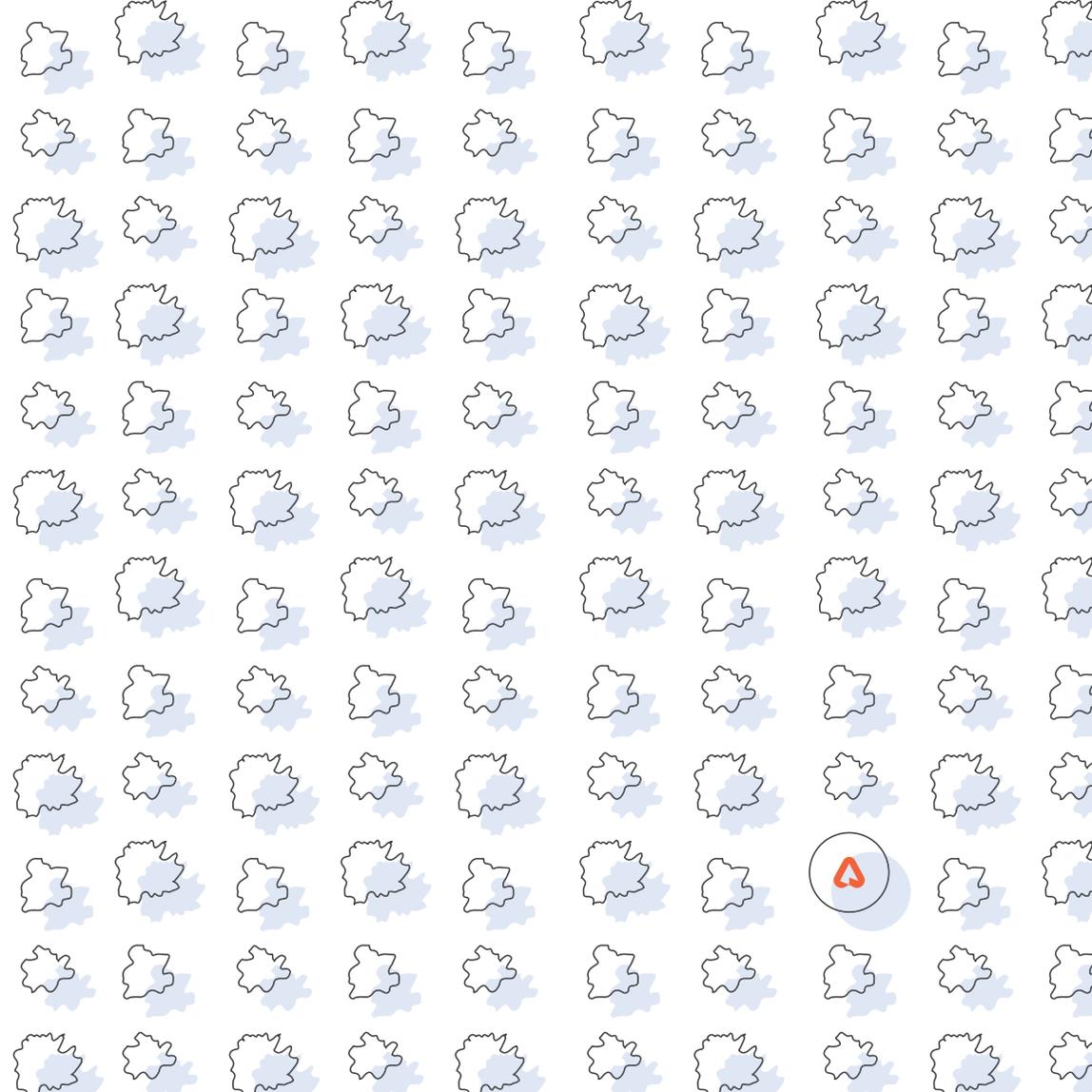
Legal Information

CAN ICES-3 (B)/NMB-3(B)

FCC Part 15 Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.





Arable Labs, Inc.
www.arable.com
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