VOODOO ROBOTICS

2022

VOODOO ROBOTICS

PRODUCT OVERVIEW

ABOUT VOODOO ROBOTICS

IoT-based warehouse and manufacturing solutions

Innovative technology solutions provider for warehouses and manufacturers

Exceptional experience in operations and change management

World-wide customer base

Founded in 2013 by Trevor Blumenau

Privately held and based in Frisco, TX (just north of Dallas)

Customer references available upon request

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Voodoo Robotics

Providing cost-effective technology for manufacturing, data center operations, warehouse inventory management, and order fulfillment.

- Voodoo Robotics is the leading innovator for wireless picking technology, providing cost-effective technology to improve operations.
- Traditionally underserved by technology, the supply chain and logistics industry is justifiably risk averse when it comes to technology modernization. Upgrading outdated technology can be very difficult. Simply put, a failed large-scale modernization could cripple operations.
- The philosophy of Voodoo Robotics is to create new technologies as stepping stones that help companies modernize by making flexible, incremental changes that pose minimal risk to operations while offering substantial improvements to productivity.

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Voodoo Robotics Cloud Display Devices

More than just Pick-to-Light

- Voodoo offers a unique wireless Cloud Display Device designed to modernize warehouse, manufacturing, and data center operations by leveraging the latest IIoT (Industrial Internet-of-Things) technology.
- The flexible solution helps to improve efficiency of business processes that require task acknowledgement and task completion acknowledgement, ranging from standard pick-to-light, put-to-light, and cart scenarios to manufacturing, repair, data center monitoring, shipping, will call/customer pickup, restocking, and other tasks.
- Our solution integrates easily with existing Warehouse Management Systems (WMS) or Enterprise Resource Planning (ERP) systems allowing distribution centers, warehouses, and third-party logistics (3PLs) to manage operations, with little to no integration effort.

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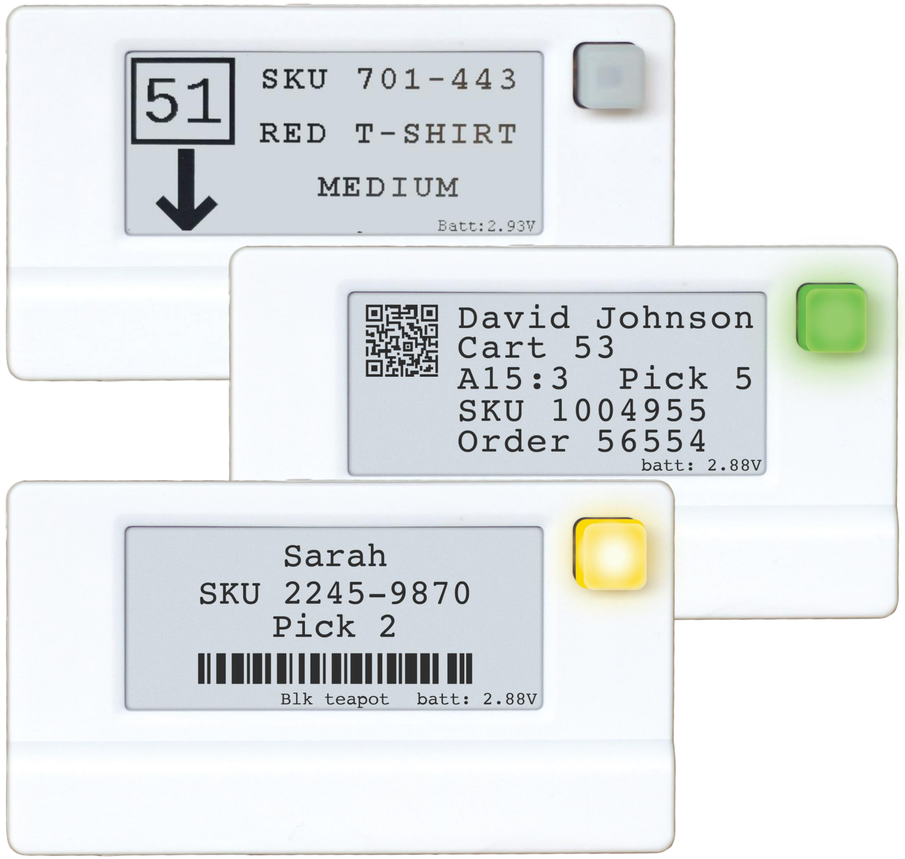
Why Voodoo Robotics

Advantages in a Competitive Marketplace

- *E-ink Display.* Customers display up to 5 lines of information that employees need (e.g., product, order number, quantity, SKU, description) and arrows or barcodes/QR codes.
- *Low Latency.* Average time to light up is 1.5-2 seconds with some installations averaging less than a second.
- *Wireless.* Installation is easy and less costly than traditional solutions.
- *Low Power Consumption.* Devices sleep when there is no active instruction, and the displayed information remains without power. AAA batteries can last for years.
- *Flexible Implementation.* Customers can integrate scenarios incrementally using a simple URL or REST APIs or move devices to areas that need them (e.g., pallet unloading or holiday surge).
- *Integration to multiple systems.* Customers in a shared environment can use the devices simultaneously (e.g., shared pickwall or shipping area) using their own systems.



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TECHNOLOGY OVERVIEW

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CONTENTS

The latest on Pick-to-Light and Put-to-Light Technology

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WHAT IS PICK-TO-LIGHT

Pick-to-light and put-to-light devices help pickers increase speed and accuracy

Picking

Find the right inventory, quickly and accurately.

Putting

Quickly sort picked inventory into the right boxes, bins, or carts.

Sorting

Support and accelerate put-walls, wave picking, or other strategies.

Kitting

Stage a sequence of picks to create or assemble a kit.

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ADVANTAGES OF PICK-TO-LIGHT

Pick-to-light and put-to-light do more than simply increase speed and improve accuracy.

Increased Pick Productivity

Find and pick more inventory faster.

Improved Accuracy

Avoid costly picking and putting errors.

Reduced Order Cycle Times

Fill more orders faster and with fewer resources.

Reduced Employee Training

New employees find things faster.

Optimized Batch and Cluster Picking

Pick multiple orders in one pass through the warehouse.

Improved KPI Tracking

Track productivity for continuous improvement.

Improved Customer Service

Fast and accurate fulfillment means happy customers.

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Advantage 1: Increased Pick Productivity

Find and pick more inventory faster

Time is money! Order picking is the most expensive part of operating a warehouse/distribution center, accounting for up to 55% of the cost.

Light and sound directs order pickers toward items on their pick lists, enabling them to find inventory much faster.

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Advantage 2: Improved Accuracy

Avoid costly picking and putting errors

Zero in immediately on the correct items.

Place the item in the right box or tote.

Synthesize and display custom barcodes or QR codes for **each** transaction, allowing for extra verification.

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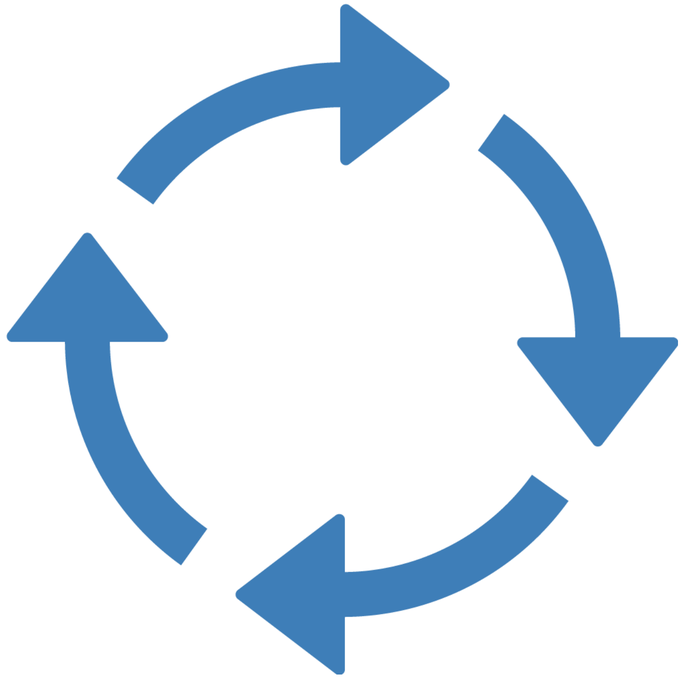
Advantage 3: Reduced Order Cycle Times

Fill more orders, in less, time with fewer errors

Move inventory faster!

The less time it takes to find and pick an item, the faster you can run your overall operation.

Ship items in minutes, not hours or days.



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Advantage 4: Reduced Employee Training

New employees find things faster

Lights are simple to follow. Picks are easy to acknowledge. Almost no training is required.

Make those newbies productive on their first day on the job!

Arrows and other icons can help pickers navigate warehouse shelving.

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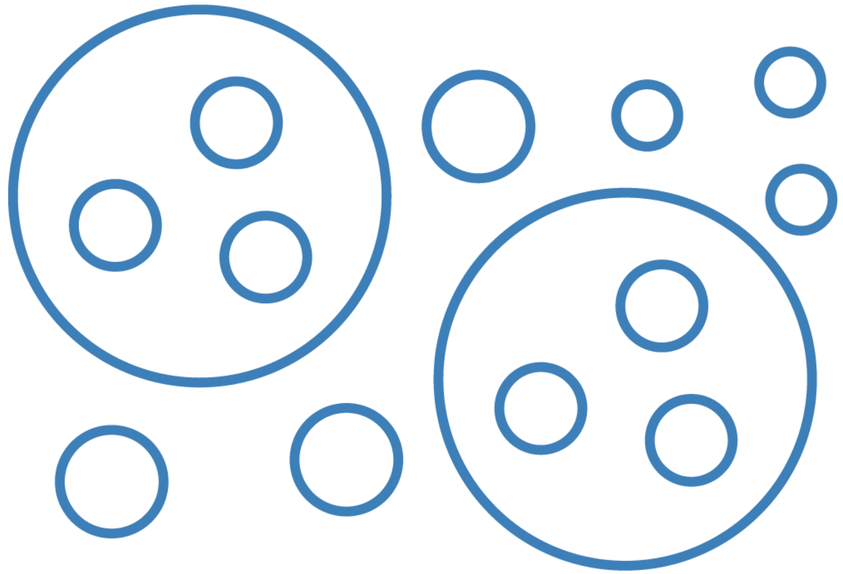
Advantage 5: Optimized Batch and Cluster Picking

Pick multiple orders in one pass through the warehouse

Let technology keep track of orders.

Pickers can pick multiple orders at the same time, with one pass through the warehouse.



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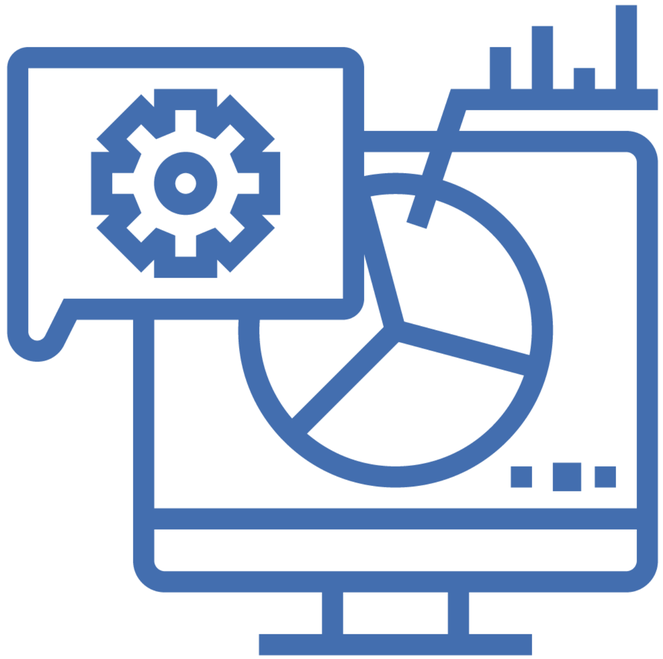
Advantage 6: Improved Picker KPI Tracking

Track productivity for continuous improvement



Pick-to-Light devices help measure and track Key Performance Indicators (KPIs).

Gamify your picking! (The fastest picker wins a prize.)

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Advantage 7: Improved Customer Service

Fast and accurate fulfillment means happy customers

Shipping the right product in a timely manner results in increased customer satisfaction and retention.

Nobody likes waiting for their order, only to receive the wrong item.

Customers expect same day shipping, and some even expect same day receiving!

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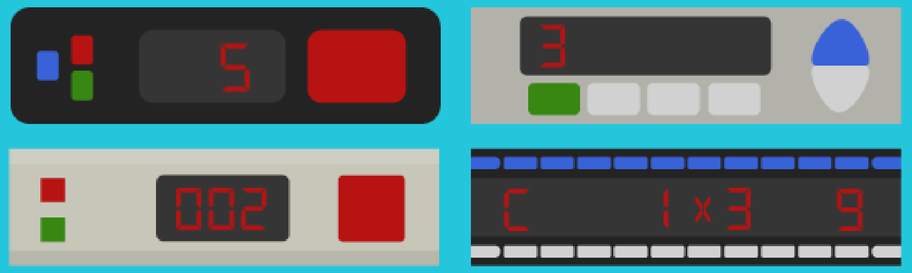
TYPES OF PICK-TO-LIGHT SYSTEMS

Two types of Pick-to-Light System are on the market today: a wired system that displays very limited information and a flexible, wireless system

Wired, Seven-segment Display



Wireless, Internet of Things (IoT) Display

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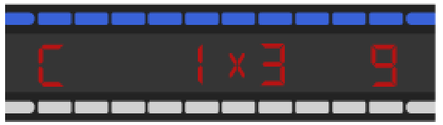
Older Picking Technology

Seven segment displays are still in use but have limited functionality

Older picking devices are still in use, but they:

- Require wiring for each device
- Display only limited information (no text)
- Only work for picking (seldomly for putting, since devices are not mobile)
- Often require modification of the fulfilment process because of their inflexibility
- Are very costly to install for software integration and wiring.



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Newer Picking Technology

Systems based on the Internet of Things (IoT) are far more flexible than older systems

Use modern IoT based wireless devices in new and innovative ways:

- Easily move or remount Wireless Devices
- Use multi-line displays to simultaneously show attributes such as the SKU, quantity, order number, and picker name
- Use color and sound customized for each picker
- Generate regular barcodes and QR codes for each pick
- Use the REST API to simply and quickly integrate with your ERP or WMS.

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PICK-TO-LIGHT USING INTERNET OF THINGS (IoT)

Leverage IoT to implement a flexible, wireless solution

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Wireless and Flexible

Wireless systems are flexible, easier to integrate, and more cost-effective

Attach wireless devices to:

- Racks
- Carts
- Totes
- Bins

There is no need to wire power to each location. Batteries can last for years!

Move and reconfigure devices when your needs change.

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Battery Life

Ultra-low powered devices extend battery life

Batteries

Wireless devices use 2 AAA batteries that are easy to change without removing the ruggedized cover or detaching it from its location (rack, cart, bin, etc.)

Efficient

Devices ”sleep”, but the e-ink display still shows product/order information (or whatever you decide).

Self-monitored

Devices are self-monitored and continuously report voltage to the server. Low voltage alarms can trigger e-mail alerts to your maintenance list.

Extended Battery Life

Altering brightness, duration, and flashing can extend battery life. Batteries can last for years.

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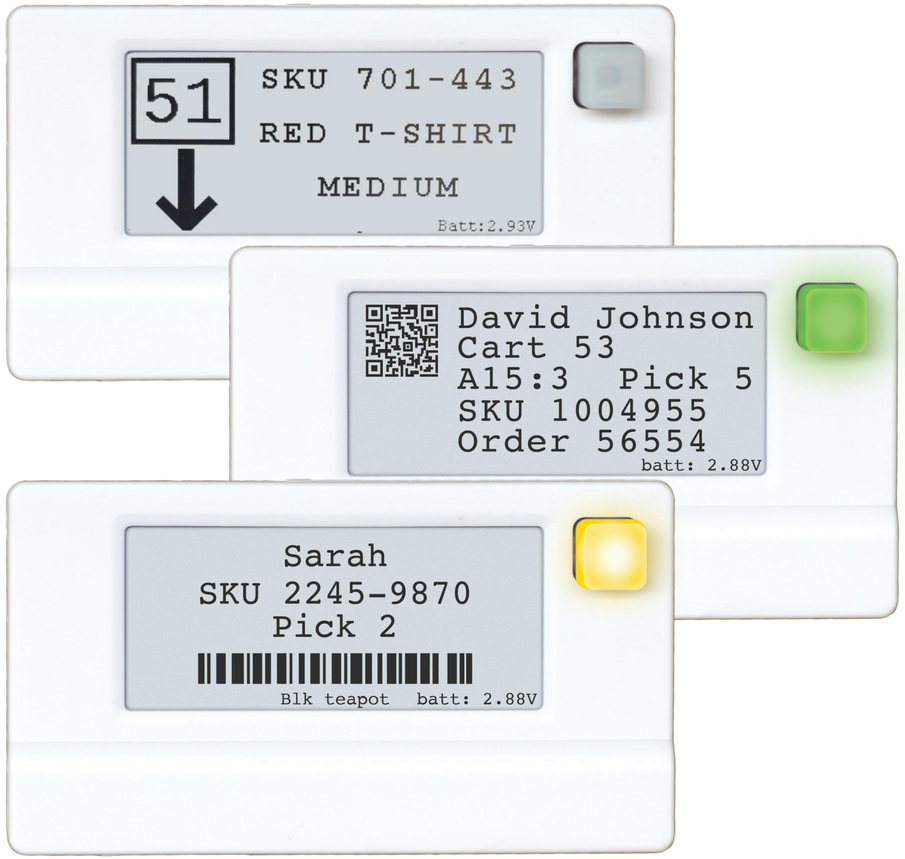
Multiple Line Text Display

Give pickers detailed instructions

Use the multi-line alphanumeric display to describe the product (e.g., between picks) or to tell the picker exactly what to pick or place.

The Cloud Display devices allow up to five lines of text. What you use them for is up to you. Examples include:

- SKU
- Description
- Color
- Order number
- Quantity
- Overflow location.



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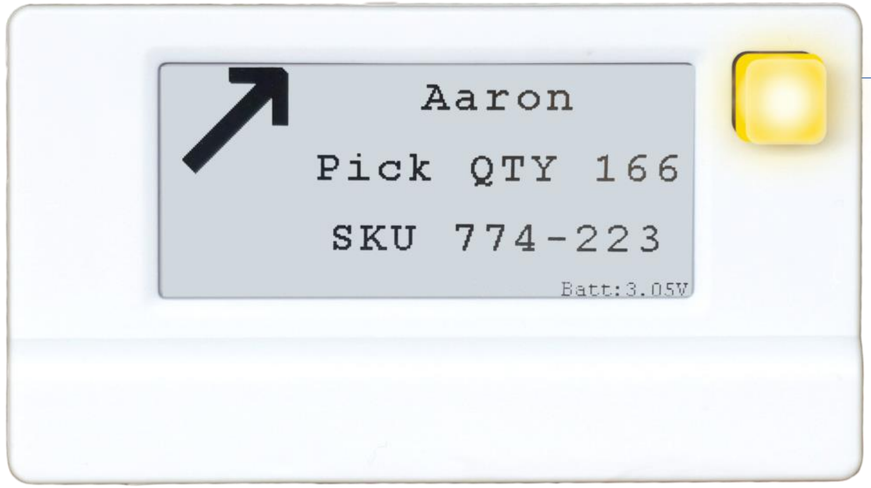
Button and Quantity Parameter

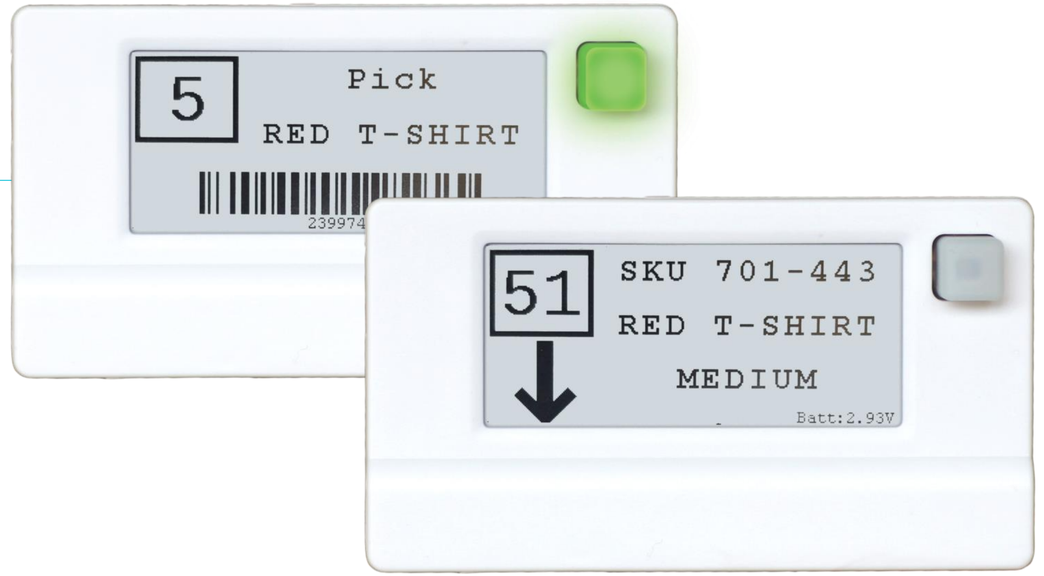
Flexible devices you can use in a variety of ways



Press the button to acknowledge the pick

You can configure the device so that pressing the button to sends a signal to your ERP/WMS and advances the Cloud Display Device to the next step.

You may also use your existing scanner to acknowledge the pick.



Use the Quantity Parameter

Use the quantity parameter to display the number of items in your pick (light on) or the number of items in inventory (light off).

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Directions and Special Instructions

Flexible devices you can use in a variety of ways

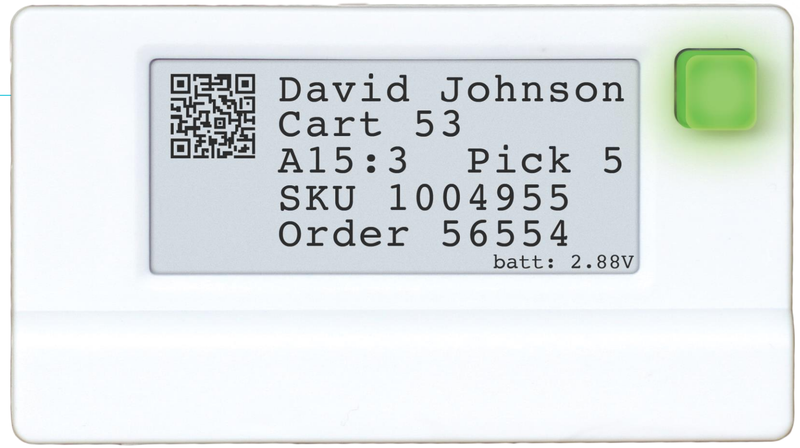
Use Arrows to Describe Location

Arrows point in one of eight directions (up, down, right, left, and diagonals), to specify the location of the items.

A single device can be used to reference many locations. This represents a huge cost savings for any deployment.

Special Instructions

Construct a custom barcode or QR code for **each** transaction.
The QR code can provide access to more complicated kitting instructions.



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Multiple Colors

Devices light up with six possible colors

Consider assigning each picker a different color for a set of picks.

Some customers use color to match a particular bin or tote color. The Picker then focuses on that matching color.

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Barcode Support

Use barcodes and QR codes in a variety of ways

Devices can generate customized single dimensional (traditional) barcodes or two dimensional QR codes.

- Between picks, a barcode can represent a shelf location or a SKU number.
- During a pick, a generated, unique barcode or QR code identifies or confirms that specific operation.

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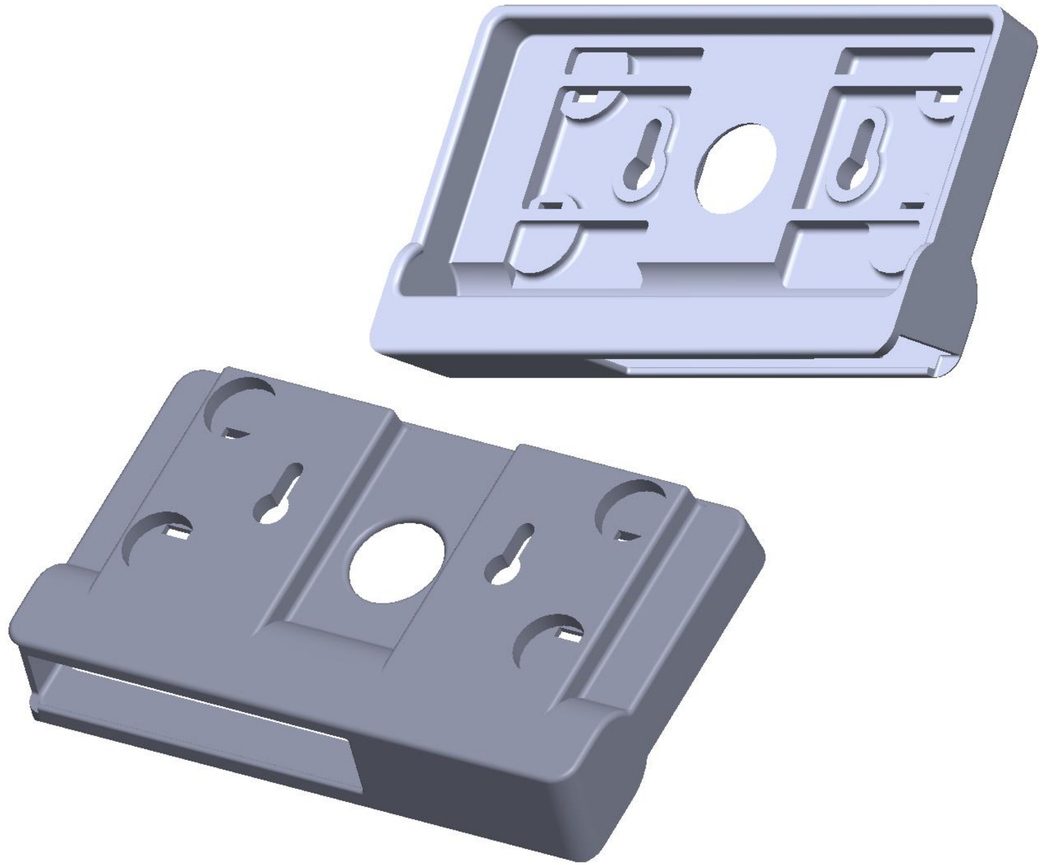
Ruggedized Cover

Like a cell phone cover, the ruggedized covers protect the wireless devices

Ruggedized covers protect devices from the industrial warehouse environment.

They protect devices from dirt and grime, minimizing wear and tear.

The covers include four very strong N52 neodymium magnets, but you can also attach them to racks, carts or totes with screws, zip-ties, or industrial double-sided tape.



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Mounting Options

Attach wireless devices in a variety of ways

Mount devices to racks, carts, bins, totes, and other locations with:

- Double sided tape
- Magnets
- Screws or nails
- Zip-ties
- Industrial Velcro.

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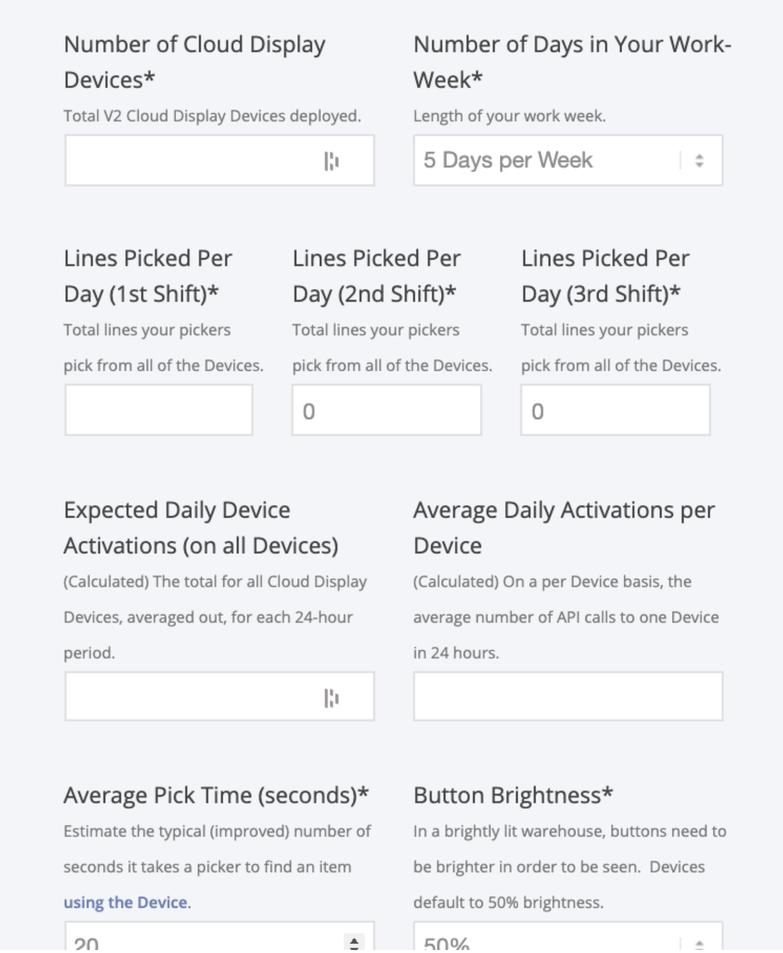
Battery Life Monitoring

Voodoo Robotics predict battery life with a simple on-line battery estimator



Battery usage largely depends on how often you activate devices and how much audio they use.

Expect months, if not **years**, between battery changes.

In our on-line battery estimator, you can enter the specific usage patterns for your planned deployment to calculate the total cost and effort involved in maintaining your batteries.

Because of the exceptional low-power performance of our devices, almost every customer finds battery maintenance to be trivial.

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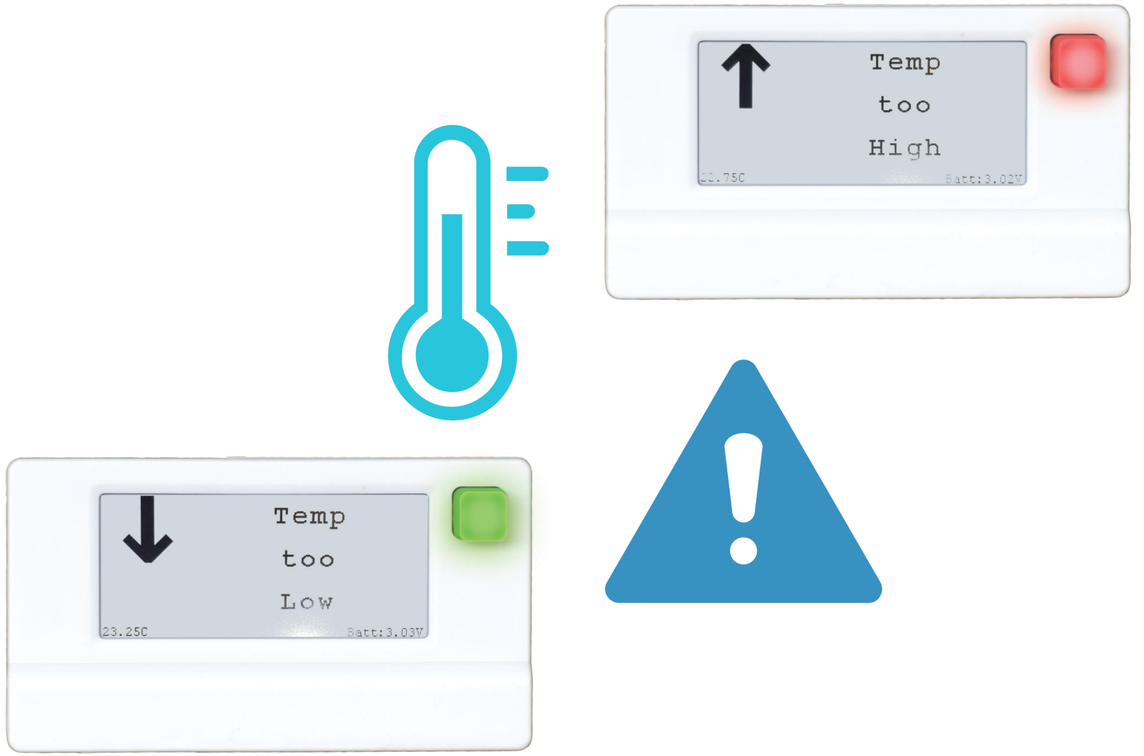
Temperature Tracking & Alarm

Monitor temperature and receive alerts when temperatures fall above or below thresholds

Wireless devices also measure and track temperature.

They can trigger a visual and audible alarm when temperature deviates outside of a predefined range.

A triggered alarm can also immediately send an automatic e-mail to your list of recipients.



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IMPLEMENTATION AND INTEGRATION

Pick to light and put-to-light are light-directed order fulfillment technologies that increase speed and accuracy.

Hosted vs. Local Server

Choose a hosted or local server

REST API vs Query String

Easy and quick integration with REST API or Query String

POE Router Options

Use Power over Ethernet (POE) when possible, to reduce installation costs

Sequencing Technology

Makes integration even easier

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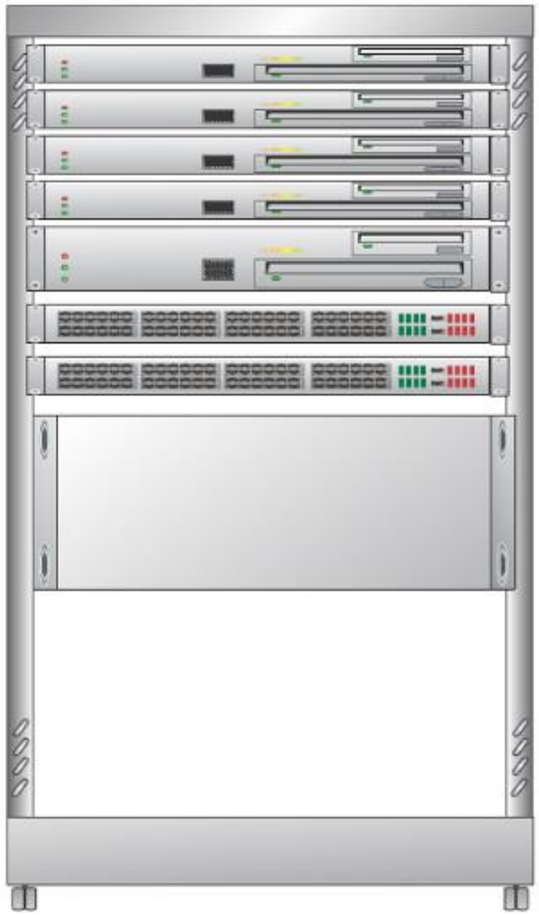
Hosted vs. Local Server

IT Configuration Options

Choose between hosted and local server. With a local server, you can:

- Run on your own cloud
- Reduce latencies
- Eliminate AWS (Amazon) dependency
- Keep all data completely on-site and private
- Use your LAN (even if the Internet is down)
- Support Immediate data alerts
- Track and report on historical data
- Perform sequencing operations.



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REST API

QueryString also available if needed

```
    $xml = "
        <item>
          <API>2.0</API>
          <command>flash</command>
          <line1>$line1</line1>
          <line2>$line2</line2>
          <line3>\bc$bc</line3>
          <seconds>$time</seconds>
        </item>
    ";

    curl_setopt($ch, CURLOPT_POSTFIELDS, $xml);

    curl_exec($ch); // make the request
}
```

State-of-the-art protocols for connecting to devices make integration almost trivial.

Adapt and control the devices according to your data processing needs.

No adjustments to existing operations or routines are required.

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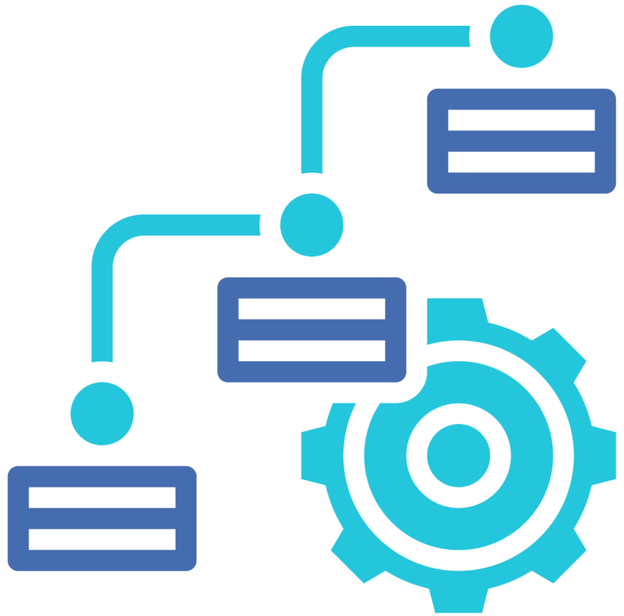
Sequencing

Powerful add-on module for your local server

The fastest way to get up and running

- Designed for companies that do not have IT bandwidth/resources
- Offload integration and real-time processing to Big Block Server
- Pickers have their own interface and can launch picklists with a cellphone or barcode scanner
- Directly upload your Picklists with your own nomenclature (e.g., CSV, XLS)
- REST API is still available, but Sequencing is simpler to use; code does not need to run in real-time
- Keep inventory in sync at every Step with custom feedback (webhooks).



A Sequence is a series of customized steps

- Steps describe which devices (or which locations) should activate and with what messages (text, icons, barcodes, QR codes)
- Steps can activate together at the same time, or sequentially
- Acknowledgement of a Step automatically advances the Sequence to the next Step

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Product Technical Specification: Cloud Display Device

Cloud display device with ruggedized case

Specifications:

- **Display**: Up to five lines with 26 characters on each line. A barcode, QR-Code, icons (e.g., arrows) or a combination can substitute for lines of text.
- **Button**: Lights up or flashes in one of six colors.
- **Product Dimensions**: 5” Wide x 3” Height x 0.6” Depth (excluding the button).
- **Radio Range**: Approximately 50-75 feet depending on surroundings.
- **Batteries**: Two AAA 1.5 Volt batteries not included.
- **Removable Ruggedized Cover:** Made from thermoplastic elastomers (TPE). Four N52 neodymium magnets pre-installed.
- **Mounting Options**: Magnets, screws, zip-ties, Industrial Velcro, industrial double-sided tape.
- **Additional Features**: Plays custom tunes. Continuously reports voltage using built-in voltmeter and temperature using built-in thermometer.

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GETTING STARTED

Let us help you find the right solution for your environment

Get up and running with a **Starter Kit.**

Learn more about us at
VoodooRobotics.com or contact us at:

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