Automatic Identification and Data Collection (AIDC)

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- Used to identify and track items.
- Automatic identification and data collection is a family of technologies that identify, verify, record, communicate and store information on discrete, packaged or containerized items.
- Because the process is automated information is gathered quickly and accurately.

- The most common technologies used to identify and capture data are barcodes, handheld and fixedposition scanners and imagers, radio frequency identification (RFID) tags and readers, and voice recognition, weighing and cubing devices.
- Typical applications include receiving and put away, inventory picking, order fulfillment, determination of weight and volume, and tracking and tracing throughout the supply chain.

There are several types of AIDC technology and equipment. These include:

- Barcode
- Radio frequency identification (RFID)
- Voice recognition
- Labels
- Cubing and weighing
- Multi-modal data collection

Barcode

• Linear or one-dimensional barcode symbologies (such as UPC, Code 128, Code 39 and Interleaved 2 of 5 Code) use patterns of dark lines and light spaces to represent numeric or alphanumeric data.

Matrix or two-dimensional barcode symbologies (such as data matrix and QR Code) store information in a pattern of black and white squares or dots. 2D symbols can store considerably more information in smaller spaces than linear barcodes.

When a barcode is scanned by a hand-held or fixed position barcode reader, **barcode scanner** or **imager**, the information stored in the code is validated and then transmitted to a system for further processing and use. Types of barcode



RFID

- An **RFID reader** (or **interrogator**) is a fixed or mobile data capture device that generates an electromagnetic field to trigger and capture a data response from an encoded tag present in a defined interrogation zone.
- Reader-activated Passive tags use power derived from the RFID reader's electromagnetic field to transmit their data back to the reader. Batteryassisted or semi-passive tags use batteries to run the microchip and onboard temperature, vibration and other sensors. They have a longer read range than passive tags. Battery-powered active tags transmit data back to the reader(s) in their network when activated or at predetermined times.





Voice Recognition

- Instead of relying on a set of paper-based instructions or RF equipment, a worker wears a voice headset and a wireless, system-linked device that permit hands- and eyes-free task execution.
- Task instructions are transmitted to the worker through the headset.
- When the task is finished, the wearer speaks into the headset to confirm completion. This process is commonly used in **voice-directed** picking and put away.

Labels

- Imprinted with human and machine readable verbiage, numbers and barcodes, labels are used to identify products and containers, as well as storage locations.
- Produced (and sometimes applied) by printers using ink, toner or thermal transfer, a label stores information related to the item or location that can be retrieved using AIDC systems.
- Sophisticated labels may also include an RFID tag.

Cubing and weighing

- Dimensioning equipment uses optical or ultrasonic scanners to determine the dimensions and volume of an item or package.
- This information helps with the selection of the appropriate location for storage, or for placement on a truck for outbound shipping.
- Scales determine the weight of a product or load either upon receipt (to confirm that the correct amount of goods has been received) or prior to shipping (to calculate transportation charges).

 Multi-modal data collection – In some operations, a combination of two or more of the above AIDC technologies may be used to further streamline the data collection process.

- How is AIDC Used?
- Assembly: Verification that the right component is selected for assembly
- Order picking: Providing confirmation that the right item and quantity has been picked
- Quality control: Directing a worker to a location and/or to perform a task and requiring confirmation of both
- **Replenishment:** Confirmation that the right items are being restocked in the right locations
- **Storage:** Verification that items are being stored in the correct location

• What are the Benefits?

- **Control** AIDC technologies help maintain control over inventory from time of receipt through processing and to outbound shipping. Also facilitate and simplify cycle counting.
- **Identification** AIDC makes it easy to identify products or items by stock keeping unit (SKU) number.
- **Inventory accuracy** Because AIDC enables real-time monitoring of the number of the number of units in a facility, it maintains an accurate count of inventory.
- Location Data collected by AIDC yields information about the location of stored products as well as open space available for storage.
- **Picking accuracy** By confirming the accuracy of items picked to fill orders, AIDC reduces errors.
- **Picking efficiency** Because AIDC eliminates paper-based picking, workers can fill more orders faster.
- Visibility AIDC aids in monitoring the completion of a processes.