ARC Base enabled RFID portals

⊙ ARC Base enabled RFID portal solutions

RFID portal solutions are implemented based on RFID readers and antennas, and on ARC Base RFID middleware that integrates with the RFID readers. ARC Base provides advanced data filtering and processing logic depending on the type of RFID portal and supports 3 types of RFID portal implementations.

⊙ Presence detection RFID portals

The RFID presence detection portal is of the least complexity, lowest hardware footprint and cost. This type of RFID portal is typically used for inbound receiving solutions or for internal readpoints with a controlled one-way flow of goods and assets. The basic function of a presence detection RFID portal is to change the location and status of a RFID tagged item or asset once the RFID portal detects the RFID tag: by definition the RFID tagged item is not at the previous location it was recorded at, so the location changes to e.g. "inbound dockdoor", and the status to "received".

⊙ RFID transition portals

RFID transition portals are deployed when only the RFID tagged items that are being moved through the RFID portal may be reported, and all other stationary or moving RFID tags in the immediate vicinity must be discarded. One example is the loading of trailers through dockdoors, where stationary tags on the staging lane or in the truck or tagged items that are moved through an adjacent RFID portal need to be isolated and neglected. For this purpose, 2 read fields are created by positioning the RFID antennas (controlled by 1 or more RFID readers) as per the chart below:
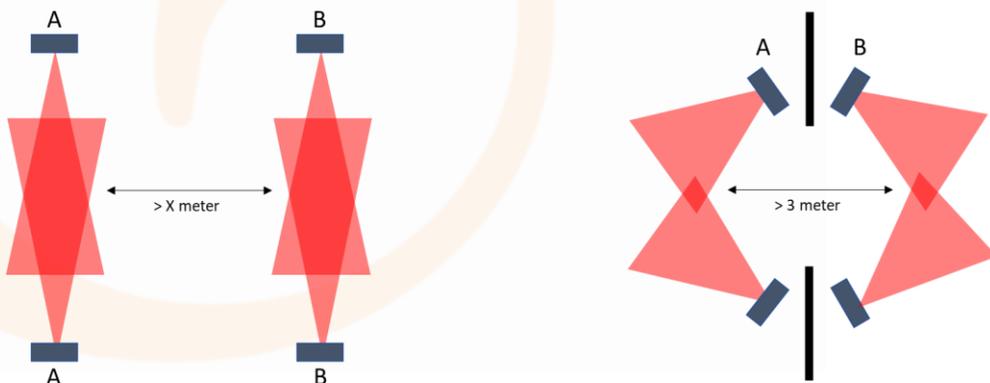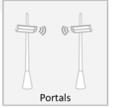
RFID transition portals (continued)

The advanced ARC Base algorithms that ensure only the RFID tagged items that are moved through the RFID transition portal are reported are :

- **Staging lane discrimination**; this algorithm only reports RFID tags that are seen first on readfield A and then on readfield B, within a specified timeframe of x seconds. Stationary RFID tags on the staging lane or already loaded on the truck are discarded.

- **Dockdoor discrimination**; this algorithm filters out RFID tags that move simultaneously through an adjacent RFID portal or dockdoor from RFID tags that move through the target RFID transition portal.

"By design" an RFID transition portal is "directional", it will automatically detect the direction in which RFID tags are moving so also "reverse loading" will be recorded automatically.

Retail store RFID transition portals

RFID transition portals in fashion & apparel retail stores are used to discriminate the inventory in the stock room from the inventory on the sales floor. Typically, 1 door between stockroom and sales floor.

As retail space is expensive, RFID tagged items are typically stacked against the wall separating the stockroom and sales floor, at either side, and sales attendants will move cartons or totes full with tagged items through the RFID portal.

Mieloo & Alexander's transition algorithm for retail stores is able to filter out stationary RFID tagged items at either side of the wall separating stock room and sales floor, whilst detecting the transition of up to 200 densely packed items when moved from the stockroom to the sales floor and vice versa 1).

RFID hardware for RFID portals

M&A's ARC Base middleware is hardware agnostic and provides drivers for Zebra, Impinj, Kathrein, NordicID, Acceliot, readers, and several other OEM's. Typical hardware configuration per RFID portal type, depending on the number of tags that are moved simultaneously and on the MHE and/or load carrier that is used:

- RFID presence detection portal: 1 RFID reader, 2 to 8 wide range antennas.

- RFID transition portal: 1 RFID reader, 4 to 8 narrow beam antennas.

- Retail store RFID transition portal: 1 RFID reader with 8 wide range antennas.

RFID presence detection portal

RFID transition portal

Retail store RFID transition portals

Inbound and Outbound

Directionality

Hardware OEM agnostic