

RAIN RFID Antenna Selection Quick Reference Guide

Transport, Logistics & Supply Chain Series

Packing Stations

E-commerce Fulfilment



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Times-7 designs and manufactures high-performance RAIN RFID antennas that deliver trusted accuracy, reliability, and RF excellence.

Headquartered in New Zealand and supported by a global distribution network, our products power mission-critical applications across retail, healthcare, logistics, manufacturing, and beyond.



Times-7 is a proud member of the RAIN RFID Alliance and an active participant in global industry events.

Fixed RAIN RFID Read Points in Transport, Logistics and Supply Chain



RAIN RFID readpoints underpin every stage of the modern supply chain: from the first tag read at a packing station to the final scan at a delivery bay. Our antennas are deployed across the full chain: at dock doors, on conveyors, inside tunnel readers, at yard gates, in cold stores, and on forklifts. Each installation type has a different combination of read zone requirements, environmental conditions, and mounting constraints. Our range is built to address all of them.

Whether you are tracking pallets at a distribution centre dock door, individual items on a sortation conveyor, or vehicles moving through a yard gate, the fundamental requirement is the same: a read that is reliable, repeatable, and defined, catching what it should catch and ignoring what it should not. We design our antennas from the ground up for these environments, with the gain, beam shape, environmental rating, and mounting flexibility to make every readpoint perform as intended.

Our range covers fixed and mobile installations (such as moving vehicles), item-level and pallet-level tracking, indoor and outdoor deployment, and environments from controlled ambient warehouses to freezer stores, outdoor yards, and food production wash-down areas. If you are specifying a readpoint or reviewing an existing installation that is not performing, the guidance below will help you identify the right antenna for the job.

How to use this guide

For packing stations and e-commerce fulfilment, we recommend four antennas from our range: the **A9044M**, **A1130**, **A1163**, **A5020CP**. Each suits a different combination of mounting position, environmental exposure, and read zone control.

We have also included a general guidance section on page 8 for possible antenna configurations. If you have questions regarding antenna selection and antenna placement, our engineering team are available to provide technical support.

Recommended for packing stations and e-commerce fulfilment antennas

See pages **4** for guidance on selecting the right antenna for your application, then **pages 5-7** for full specifications, key features, and customer benefits for each of our recommended antennas.

Note: The read point design will specify the number of antennas, mounting requirements and accessories.

How to Select the Right Antenna

The right antenna for a supply chain application is determined by four factors working together.

01 Environment Rating

How exposed is the bay? Covered indoor bays need **IP54** as a minimum. Outdoor and exposed bays require **IP67** (temporary immersion up to 1 m, 30 min). Bays subject to high-pressure wash-downs, extreme humidity, or chemically aggressive environments, such as food production, cold stores, mining, require **IP68**, which covers prolonged immersion and sustained moisture.

02 Mounting Position

Mounting position determines beam direction and read-zone shape. **Overhead mounts** read downward into the bay opening, suited to consistent pallet heights and forklift paths. **Side mounts** read horizontally across the bay width. **Floor/embedded mounts** read upward through the pallet base, useful where overhead clearance is limited or where a discreet, in-floor read point is required.

03 Installation Constraints

Customer-facing or aesthetic environments, retail distribution centres, food distribution all favour compact, unobtrusive form factors. **Cable routing, backplates** for easy mounting, and **connector type** all affect deployment time for large rollouts.

04 Read Zone Control

How tightly must the read zone be contained? Adjacent bays, nearby inventory, and crossing forklifts all create false-read risk. The tighter the physical environment, the more important it is to choose an antenna whose **beam pattern and gain** minimise reads outside the intended zone. **The read distance is another critical factor that controls the read zone**, with **far-field** for mid to long distance reads, and **near-field** for close range on surface reads.

05 Asset Types and Tag Orientation

Circular polarisation handles randomly oriented tags reliably, making it the standard choice for dock doors, conveyors, and portals. **Linear polarisation** is better suited to controlled-orientation applications where the tag is always presented at the same angle.



Antennas for packing stations and e-commerce fulfilment applications

Packing and fulfilment stations are often the final opportunity to verify that the right tagged item or carton is associated with the right order before it leaves the facility.

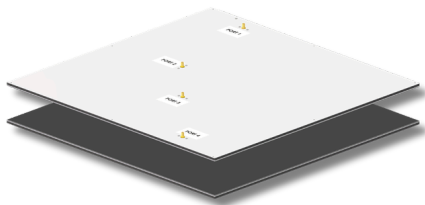
The challenge is creating a reliable read zone that captures the intended tags without picking up other tagged items nearby. The right antenna depends on the size of the verification area, required read distance, tag orientation and the materials being handled.

Times-7 antenna options range from tightly controlled near-field read zones for close-range verification to far-field antennas for high tag density or flexibility in how tagged items are presented.



A9044M Packing Station Antenna

When to use:
Use for packing stations handling varied products and tag orientations. The four independently driven antenna elements create a spatially diverse read zone, making the A9044M particularly suited to dense packing and order-verification applications.

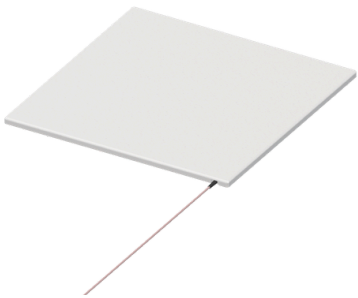


Supporting Spec	Key Feature	Customer Benefit
4 ports in one panel, 7 dBi typical, multi-linear	Four independently driven elements, each shaping its own read zone.	Reduces the need for complex multi-antenna arrangements.
Ports 2 and 3: 65° symmetrical, horizontal and vertical	A matched pair of orthogonal linear elements.	Covers varied tag orientations with highest gain at the centre of the antenna providing greatest penetration for dense packages.
Ports 1 and 4: multi-linear directional, 15-20° tilt	Built-in beam tilt on the outer ports.	Provides incident angle diversity reading stationary packages as if they were in motion.
-15 dB front-to-back ratio	Rejects reads from behind the unit.	No false reads from stock, staged behind the packing station.
640 x 650 x 8.6mm, 2kg	Large flat panel with 8 pre-drilled perimeter mounting holes for ease of installation.	Large format covers a wide range of box sizes. Light-weight makes mounting easier.

A1130 True NearField™ Antenna

When to use:

Use for close-range verification of individual items or small cartons where a controlled read zone is required to minimise stray reads from nearby tagged items. Capable of reading tags on liquid and metal assets.

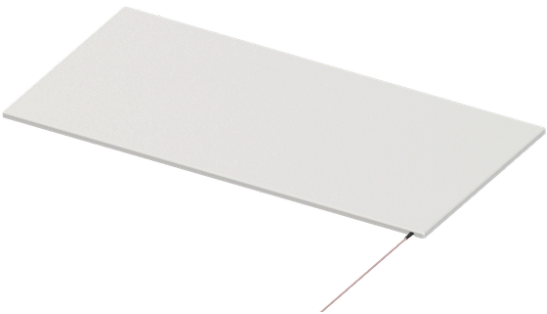


Supporting Spec	Key Feature	Customer Benefit
304 x 304mm read area, no dead zones	Mid-sized True NearField™ footprint, sitting between the A1115 and the A1163.	Provides a defined verification area for smaller cartons or groups of items without occupying excessive bench space.
Near-field polarisation / tightly confined read zone	Uses near-field coupling for close-range tag detection while limiting reads beyond the antenna surface.	Helps prevent nearby stock or items at adjacent packing stations from being tracked.
Designed for liquids and metals	Near-field operation performs effectively with RF-challenging materials that can disrupt conventional far-field reading.	Improves reliability when verifying products such as beverages, cosmetics, pharmaceuticals or metal-rich items.

A1163 True NearField™ Antenna

When to use:

With the same near-field technology as the A1130, use for larger cartons or multiple tagged items that require more surface coverage while maintaining a controlled near-field read zone.

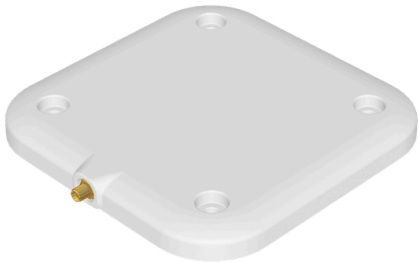


Supporting Spec	Key Feature	Customer Benefit
604 x 304mm near-field read footprint	Largest footprint in the True NearField™ series.	Covers a larger verification area, allowing larger cartons or more items to be presented in a single read operation.
Near-field polarisation / minimised far-field components	Creates a tightly confined close-range read zone across the antenna surface.	Helps verify the intended items without unnecessarily reading items on nearby benches, shelves or passing through the surrounding area.
Reads liquids and metals	Near-field operation performs effectively with RF-challenging materials that can disrupt conventional far-field reading.	Improves reliability when verifying products such as beverages, cosmetics, pharmaceuticals or metal-rich items.

A5020CP Circularly Polarised Antenna

When to use:

Use where a compact far-field read zone is required at a packing or fulfilment station, particularly when tags may be presented in varying orientations or need to be read from greater distance than a near-field antenna provides.



Supporting Spec	Key Feature	Customer Benefit
Circular polarisation	Reads tags across varying orientations more consistently than a single linear polarisation.	Reduces sensitivity to how an operator places or rotates tagged products during packing and verification.
IP68; -30°C to +65°C	Fully sealed construction with a wide operating temperature range.	Suitable for wet, dusty or temperature-variable environments.
5 dBiC typical gain; 105° beamwidth	Broad far-field coverage from a compact antenna.	Covers a useful packing or verification area without requiring a large antenna footprint.
150.7 × 149.4 × 14.5mm; 0.23kg	Compact, lightweight form factor.	Fits easily into space-constrained packing benches, equipment and workstation designs.

How a packing station / e-commerce fulfilment readpoint is configured

A packing station or e-commerce fulfilment read point should create a defined verification area around the item or carton being processed, while limiting reads from tagged items outside that area.

What determines the number and position of antennas

Size of the verification area

Item or carton size determines the required coverage. Use **A1130** for compact areas, **A1163** for wider coverage.

Required read distance

For items placed directly onto a verification surface, the **A1130** and **A1163** create controlled near-field read zone. Where tags need to be captured further from the antenna, a far-field configuration using the **A9044M** is recommended

Tag position and orientation

Predictable tag placement allows a more tightly controlled configuration. Where tag orientation and position vary significantly, circular polarisation of **A5020CP** or the spatial diversity of the **A9044M** can improve coverage.

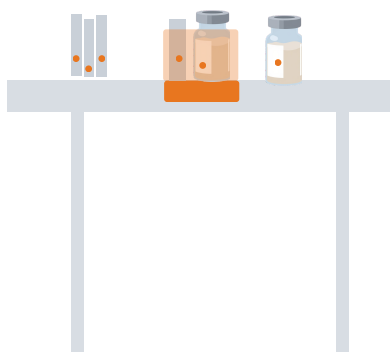
Product materials

Liquids, metals and other RF-challenging products can influence antenna selection. The **A1130** and **A1163** are suitable for tracking such items.

Nearby tagged stock

Packing benches may be surrounded by tagged inventory. Antenna position, read range and power should be configured to keep the read zone focused on items being verified.

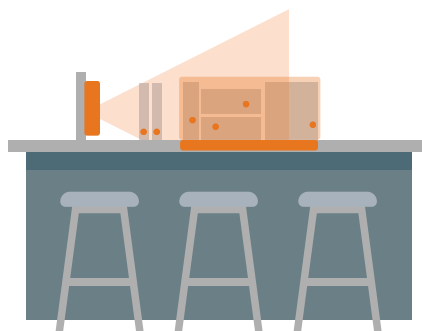
Schematic front elevation, with orange rectangles showing antenna position, orange dots representing RFID tags and orange shading indicative antenna coverage. (Schematics are illustrative only)



Single antenna

Embedded in, or flush mounted on or under the packing surface.

A defined read footprint focuses reads on the presented item, helping minimise unintended reads from nearby tagged products.



Multi-antenna

Side-mounted and embedded OR side and flush mounted to or under packing surface.

For packing stations with high item density or varying tag orientations, a mix of far-field and near-field antennas may provide the best coverage.

