

RAIN RFID Antenna Selection Quick Reference Guide

Transport, Logistics & Supply Chain Series

Cold Chain
Cold Storage



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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 cold chain environments, we recommend three antennas from our range: the A5020LX, A5020CX, 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 7 for possible antenna configurations. If you have questions regarding antenna selection and antenna placement, our engineering team are available to provide technical support.

Recommended Cold Chain/ Cold Storage Antennas

See pages 4 for guidance on selecting the right antenna for your application, then **pages 5-6** for full specifications, key features, and customer benefits for each of our three recommended cold chain 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 cold chain and cold storage applications

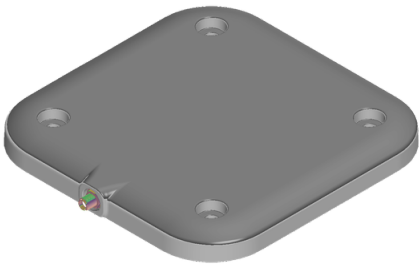
Cold chain environments challenge both the equipment and the installation. Temperature cycling, from ambient to freezer and back, stresses antenna housings, connectors, and cable assemblies. Condensation from freeze-thaw cycles infiltrates any enclosure that is not rated for it. The antenna fitted in a cold store needs to maintain read performance from deep freeze to ambient without degrading or requiring premature replacement.



A5020LX

When to use:

Deep-freeze cold chain tracking where extreme low-temperature tolerance is the deciding factor: a blast freezer, a cryogenic store, or a pharmaceutical cold store.

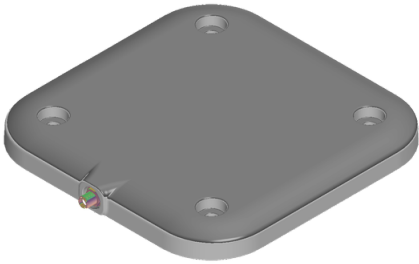


Supporting Spec	Key Feature	Customer Benefit
-90 °C to +65 °C operating range	Times-7's lowest temperature-rated antenna.	Maintains read performance in blast freezers and cryogenic storage, enabling continuous tracking of temperature sensitive products.
IP69K and IP68	Withstands high-pressure, high-temperature water and steam wash-down as well as full immersion.	Survives the aggressive cleaning cycles common in cold chain and food processing facilities.
5 dBi gain, linear (vertically polarised)	Linear polarisation with a wide beam for controlled cold-store layouts.	Consistent reads across standard cold-store configurations where tag orientation is fixed.
100° XZ x 105° YZ beam	Very wide coverage in both planes.	Wide readzone coverage in compact cold store environments, no missed items at the fringes of the read zone.
150.7 x 149.4 x 14.5 mm, 0.23 kg	Same compact footprint as the rest of the A5020 series.	Fit easily into a wide variety of cold chain storage and transport environments.

A5020CX

When to use:

Both circular polarisation and IP69K wash-down protection are required together, such as a cleanroom-adjacent cold store or a waste-management cold environment. The LX gives IP69K but only linear; the CP gives circular but only IP68. The CX is the only one that does both.



Supporting Spec	Key Feature	Customer Benefit
IP69K and IP68	Withstands high-pressure, high-temperature water and steam wash-down as well as full immersion.	Survives the aggressive cleaning cycles common in cold chain and food processing facilities.
5.5 dBiC gain	Moderate gain	Covers the readzone, reading items you want and not the ones you don't
-30 °C to +65 °C operating range	Rated for standard cold chain temperature cycling.	Reliable performance in freezer-to-ambient environments. For blast freezing below -30 °C, specify the LX.
105° beam in both planes	Wide circular beam handles for uncontrolled cold stored items.	Consistent reads across a wide readzone regardless of how items are moved or stored throughout the storage life cycle.
Grey ABS radome, 150 x 150 x 14 mm	Grey housing distinguishes it from the white CP at a glance.	Maintenance staff can tell the wash-down-rated units from the standard ones on sight.

A5020CP

When to use:

General cold chain and wash-down environments where circular polarisation is needed to handle mixed tag orientation on cold-stored goods.



Supporting Spec	Key Feature	Customer Benefit
IP68, -30 °C to +65 °C	Sealed and rated for freezer-to-ambient temperature cycling.	Reliable reads without condensation-related failure through repeated freeze-thaw cycles.
105° beam, RHCP circular	Wide circular beam handles for uncontrolled cold stored items.	Consistent reads across a wide readzone regardless of how items are moved or stored throughout the storage life cycle.
5 dBiC gain	Moderate gain	Covers the readzone, reading items you want and not the ones you don't
150.7 x 149.4 x 14.5 mm, 0.23 kg	Same compact footprint as the rest of the A5020 series.	Fit easily into a wide variety of cold chain storage and transport environments.

How a cold chain readpoint is configured

A cold chain RFID readpoint is designed around the location and orientation of the tagged items, the required read zone and the operating environment.

The A5020LX, CX and CP provides a 105° beam, making it suitable for creating broad read zones from overhead, side or shelf-mounted positions.

What determines the number and position of antennas

Storage layout

Cabinet size, shelf arrangement and tag distance determine antenna quantity and placement.

Tagged product

Liquids, blood products and densely stored items can affect RF performance and antenna positioning.

Antenna polarisation vs tag position

A5020CX/CP: Circular polarisation for variable tag orientation.

A5020LX: Linear polarisation for controlled tag orientation.

Read-zone coverage

The 105° beam provides broad coverage

Cold-storage environment

A5020LX: -90°C to +65°C, IP69K/IP68, deep-freeze, cryogenic and wash down resistant.

A5020CX: -30°C to +65°C, IP69K/IP68, cold storage and wash-down resistant.

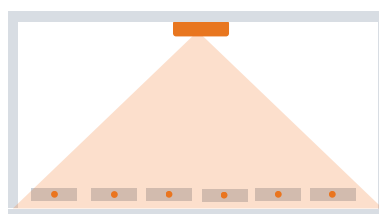
A5020CP: -30°C to +65°C, IP68, general cold-chain environments.

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



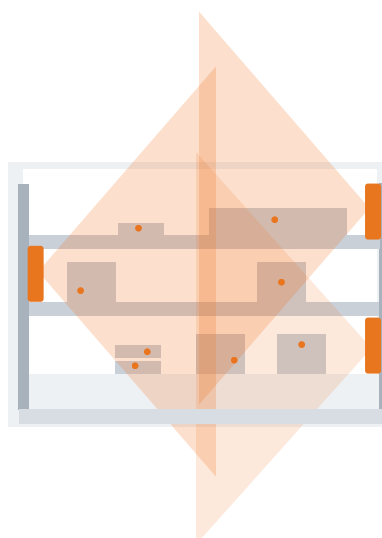
Multi-side mounted

For variable tag positions. Coverage from multiple directions supports products stored at different heights and orientations, particularly where tag placement cannot be tightly controlled.



Overhead mounted

For predictable tag positions. Directs coverage down through a defined storage area. Suited to refrigerators or freezers where products are consistently positioned below the antenna.



Generic, one antenna per shelf

For dense or defined storage zones. Places the antenna closer to tagged items for targeted coverage. Suited to densely stored pharmaceuticals, blood products, vials, medications and refrigerated food.



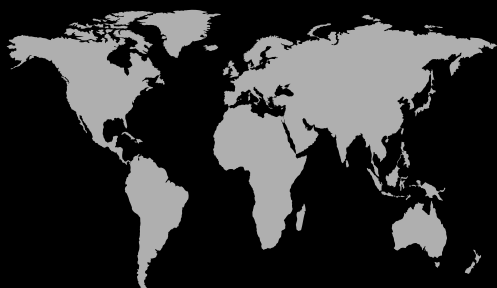
Global Partner Network

Times-7 works with a worldwide network of authorised distributors and integration partners to deliver local expertise, fast product availability, and trusted support.

Many popular models are stocked regionally, with rapid-ship options and clear lead times for build-to-order antennas.

Find your local Times-7 antenna partner:

<https://www.times-7.com/partners/distributors>



Times-7 Research Ltd
10 Te Puni Street
Petone
Lower Hutt 5012
New Zealand
Phone: +64 4 974 6566
Email: sales@times-7.com

For more information, visit
www.times-7.com