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Installation and Adjustment Guide for the Smart Shelf RFID System

The **Smart Shelf** system is designed for jewelry stores, showrooms, museums, and retail environments where items are displayed on shelves. This guide will walk you through the installation and adjustment of RFID readers and antennas to ensure optimal operation.

Part 1: Preparing the Installation

1. Unpack and Verify Equipment:

- Ensure you have all RFID readers, antennas, power supplies, and necessary cables.
- Check the inventory to confirm RFID tags and mounting accessories are included.

2. Select Installation Locations:

- Identify shelf areas where items will be displayed.
 - Ensure the reader zones cover the shelves evenly and avoid overlapping with other zones.
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Part 2: Connecting RFID Readers

1. Establish Connections:

- Connect RFID readers to the power supply and network router using Ethernet cables for TCP/IP communication.
- Ensure each reader is assigned a unique **IP address** and **port number**.

2. Install RFID Software:

- Install the software provided with the system on the computer or server for system management.

3. Test Basic Connectivity:

- Use the software to detect connected readers. Confirm that each reader is operational and configured correctly in the network.
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Part 3: Installing Antennas

1. Placement of Antennas:

- Mount antennas at optimal positions on or near the shelves.
- Use brackets or adhesive mounts to secure antennas without blocking display visibility.

2. Connecting Antennas to Readers:

- Connect antennas to the appropriate RFID reader ports, ensuring each port corresponds to a designated shelf zone.

3. Optimize Antenna Orientation:

- Use circularly polarized antennas for better coverage and to ensure tags are readable regardless of orientation.
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Part 4: Configuring the System

1. Define Reading Zones:

- Use the software to assign each reader and its connected antennas to a specific zone.
- Avoid overlap between zones to minimize interference.

2. Adjust Antenna Power:

- Fine-tune the power settings of each antenna to ensure it covers its assigned zone without overspill.

3. Assign RFID Tags:

- Register each RFID tag in the system, assigning them to specific items on the shelves.
 - Use the software to categorize items by zone or shelf.
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Part 5: Testing and Final Adjustments

1. Test Individual Zones:

- Place an RFID tag in each zone and move it around to ensure consistent detection.
- Check for any "dead spots" and adjust antenna positioning or power as needed.

2. System-Wide Testing:

- Test the entire system by placing multiple tags on different shelves and verifying they are detected correctly in their respective zones.

3. Check Alerts:

- Confirm the system's alert function is operational. For example, if an item is removed, the system should immediately log the action or trigger a notification.
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Part 6: Preventing Interference

1. Minimize Zone Overlap:

- Ensure there is sufficient distance between zones to avoid interference.

2. Shielding Measures:

- If necessary, use physical or electronic shielding to prevent cross-zone reading issues.

3. Regular Maintenance:

- Periodically inspect and recalibrate the system to account for environmental changes or new shelving layouts.
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Part 7: Monitoring and Maintenance

1. Software Monitoring:

- Use the software dashboard to monitor real-time data from the RFID system, including item status and zone activity.

2. Routine Checks:

- Check antennas, readers, and connections regularly for any physical or operational issues.
- Update system software and firmware to the latest versions.

3. Tag Replacement:

- Replace RFID tags as needed if they show signs of wear or fail to function properly.

This guide ensures the Smart Shelf system operates effectively to monitor and prevent theft while maintaining a seamless experience for your customers. For further assistance, refer to the manufacturer's technical support or user manual.