
Development guidelines applicable for Qualcomm 6690 (Dragonwing) Devices

TC501, TC701, TC201 & ET4 Tablets.

Flexible Connection Modes

RFID_ONLY Mode (Max Performance)

- **How it works:** Dedicates the device's full resources to the RFID reader while temporarily pausing cellular connectivity.
- **Benefit:** Eliminates potential radio interference to guarantee the fastest read rates and peak throughput.

RFID+WAN Mode (Real-Time Sync)

- **How it works:** Allows standard data operations to co-exist simultaneously with active RFID scanning.
- **Benefit:** Enables instant data updates while keeping cellular data active. It intelligently prioritizes voice calls, pausing RFID scanning only while you are on a call.

Seamless API Control:

- By default, the device starts in **RFID_ONLY** mode to ensure the best possible scanning performance right away.
- Developers can easily switch the device to **RFID+WAN** mode using this simple code command:
`void connect(ENUM_CONNECTION_MODE mode)`

WWAN + RFID use cases: SIM combination

SIM 1 Status	SIM 2 (eSIM) Status	Resulting System Behavior
Configured	Not Configured	RFID and VoIP calls can co-exist, while cellular calls are paused during RFID use on SIM 1.
Not Configured	Configured	RFID and VoIP calls can co-exist, while cellular calls are paused during RFID use on SIM 2.
Configured with data preference	Configured	RFID, Data apps, and VoIP apps co-exist on SIM 1. SIM 2 is paused to ensure a stable connection.
Configured	Configured with data preference	RFID, Data apps, and VoIP apps co-exist on SIM 2. SIM 1 is paused to ensure a stable connection.

Performance Management

Cellular (WAN) State	Resulting RFID Behavior
Idle	✅ Maximum Performance: Delivers full RFID throughput for high-speed scanning.
Hold Voice/Data	🧡 Balanced Performance: Enables simultaneous scanning and data use by expertly sharing resources.
Active Voice Call	📞 Prioritizes Voice: Intelligently pauses RFID to ensure perfect call clarity, then automatically resumes.

Built-in Safeguards for Reliability & Safety

- **Stable USB Connection:** To ensure a stable data connection and prevent conflicts, RFID is not active while the USB cable is plugged in for charging or data transfer.
- **Low Battery Protection:** To preserve power for critical functions, the RFID reader automatically enters a low-power state when the battery is below 10%.
- **Airplane Mode:** As required by aviation regulations, all radios, including RFID, are disabled in Airplane Mode.
- **Idle Power-Save:** To maximize battery life, the RFID connection automatically sleeps if idle for more than 9 minutes and instantly wakes when you resume scanning.
- **Prioritizing Communications:** The system always prioritizes voice calls. RFID is temporarily paused during a VoIP call to ensure clear communication and will resume after.

Single-Client Architecture for Maximum Stability

- **Exclusive Reader Control:** Only one application has control of the RFID reader at any given moment. This intentional safeguard prevents background programs from interrupting active scans or sending conflicting commands.

This is why you cannot run both Data Wedge and 123RFID at the same time, ensuring your active application has uninterrupted access to the scanner.

Feature Updates & New Architectural Approach

Features Not Supported	Architectural Approach & Benefit
AB Flip Configuration (This is planned to be supported in future))	Replaced by high-performance session management directly on the chip, optimized for faster inventory workflows.
Separate RFID Firmware Updates	RFID enhancements are now part of standard OS updates, simplifying IT maintenance and ensuring system stability.
Periodic Start/Stop Triggers	Eliminates background battery waste by waking up instantly only when the scan button is pressed.
Custom (CSP)	CSP is focused strictly on foundational needs (factory reset, region configuration) for a more secure and stable platform.
Data wedge don't support RFID only mode	By default, Data wedge connects to RFID + WAN mode to support simultaneous tag scanning and cellular connectivity
Access Filter	Post-filtering is removed to optimize chip performance. Alternative: Use prefilter to filter early at the hardware level.
Block Write	The chip prioritizes core single-write commands to maximize processing speed and save battery. Standard sequential writes are used instead.
Summary Events	The chip works so fast that grouping data is no longer needed to save time. Tag reads are sent instantly.

Frequently Asked Questions and Answers

Q: Is RFID enabled when in an eConnex cradle?

A: Yes, it is enabled. However, it is automatically disabled under two specific conditions

- When the device is actively charging.
- When an external RFID reader is attached to the cradle.

Q: Does the "Low Battery" state affect transmit power or duty cycle?

A: It directly reduces transmit power to conserve the remaining battery life.

Q: Does "Idle Power" mode impact all device functions?

A: No, it exclusively applies to inventory rounds, saving power without disrupting other system tasks.

Recommended settings by use cases

- Inventory operations in small tags population
[session: S0 or S1, link: PR-ASK M4 40KHz or PR-ASK M2 80KHz, Tx power 25 dBm]
- Inventory operations in large tags population
[session: S2, S3, link: PR-ASK M1 160KHz or PR-ASK M2 80KHz, Tx power 25 dBm]
- Read/write operations on specific tags
[session: S0, link: PR-ASK M4 40KHz or PR-ASK M4 40KHz, reduce Tx power]