RealBruiseIQ™ Suite

RealBruiseIQ™ — RealTrackIQ™ — RealStartIQ™

Instrument Use & Limitations Policy

Including Recommended Operating Procedure

! IMPORTANT — READ BEFORE USE

None of the instruments in this suite are waterproof or drop-proof. This document defines exactly what they can and cannot withstand. Real Instruments Limited is the only party authorised to open, repair, or service any of these instruments.

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1. Purpose of This Document

The instruments covered by this document — the RealBruiseIQ™, RealTrackIQ™, and RealStartIQ™ — are precision laboratory and operational instruments. Unlike the RealAppleIQ™ sensor, which is designed to travel through wet apple handling systems, these instruments are designed to be used in controlled, dry environments. They are not waterproof, and they are not drop-proof.

This document exists to make those limits absolutely clear, in plain language, so that any operator can immediately understand whether an instrument has been used correctly without the need for a technical expert or specialist assessment. Where a warranty claim or dispute arises, this document provides a self-contained basis for resolution.

Apple damage comparisons are used throughout, because the people using these instruments work with apples every day. If you can picture what happens to a real apple in a given situation, you already understand what happens to the instrument.

This document forms part of the agreement between Real Instruments Limited and the Customer. It must be read, signed, and retained alongside the Sales Contract and EULA before any instrument is used.

2. The Golden Rule: If a Real Apple Would Suffer — So Will the Instrument

A useful way to understand the limits of all three instruments in this suite is a simple comparison with a real apple placed on a laboratory bench:

- Drop a real apple from 800 mm onto a tiled laboratory floor: it will sustain severe damage. It may not look damaged on the outside, but the tissue is destroyed underneath. These instruments will suffer internal damage from the same drop.
- Submerge a real apple in a sink of water: it floats and is unaffected. Submerge any of these instruments: water will enter and cause permanent damage. They are not designed for wet environments.
- Wipe a real apple with a damp cloth: no effect. Spray it with a hose: the skin may absorb water but the apple is not damaged. Spray any of these instruments with a hose: water will enter through joins and cause immediate, permanent damage.

The apple is tougher than these instruments when it comes to water. The instruments measure what happens to apples — they do not need to be as robust as the handling system itself.

3. Instrument-Specific Design Limits

The three instruments covered by this document share the same fundamental limits: no water, no dropping. The tables below show the specific limits for each instrument, including battery and power information.

Real Instruments Limited makes no warranty commitment for drops onto undefined or variable surfaces regardless of height.

3.1 RealBruiseIQ™ — Design Limits

RealBruiseIQ™ — Bruise Susceptibility Instrument	
Purpose	Determines the force threshold at which a specific apple variety, size, and maturity will bruise to an out-of-grade level. Generates and displays a report in RealAppleIQ™ software and generates data for upload to RealAppleIQ™.
Operating environment	Dry environment only. Laboratory, packhouse office, or cool store assessment room.
Water resistance	NOT WATERPROOF. Any water, liquid spray, or condensation ingress will cause permanent damage.
Cleaning	Damp cloth only on exterior surfaces. No sprays, submersion, or solvents of any kind.
Drop resistance	NOT DROP-PROOF. Any uncontrolled drop onto a rigid surface may cause permanent damage.
Temperature range	5–40 °C
Power	No battery — Mains powered. USB connection to host laptop.
Storage	Store in the protective case provided. Keep dry. Do not stack heavy items on the case.

✕ CRITICAL

Water ingress to the RealBruiseIQ™ is a Warranty Void Event. This instrument is used in a dry environment. It has no water resistance rating. A splash from a nearby wash-down hose, a condensation drip from overhead pipework, or a knocked-over water container are all sufficient to cause permanent, irreparable damage. Keep this instrument away from all water sources at all times.

3.2 RealTrackIQ™ — Design Limits

RealTrackIQ™ — Remote Monitoring & Tracking System	
Purpose	Tracks, communicates and locates the RealAppleIQ™ sensor in real time. Supports training modes for pickers and drivers.

Operating environment	Dry or sheltered packhouse environment. Position away from direct water sources, spray zones, and outdoor wet exposure.
Water resistance	NOT WATERPROOF. Water, liquid spray, or condensation ingress will cause permanent damage.
Cleaning	Damp cloth only on exterior surfaces. No sprays, submersion, or solvents.
Drop resistance	NOT DROP-PROOF. Must be securely mounted or always held during operation.
Mounting requirement	Must be fixed to a stable surface or held securely during operation. Placing on the edge of a bin, on top of a ladder, or on unstable surfaces is not permitted.
Battery type	Rechargeable lithium-ion battery (internal, non-user-replaceable).
Battery life	Refer to current product specification sheet for run time at full charge.
Charging	Charge via supplied USB-C cable. Keep charged above 50% when not in use to ensure the unit is ready to locate a lost RealAppleIQ™ at short notice.
Storage	Store in the protective case provided. Keep dry. Store with battery charged above 50%.

✕ CRITICAL

RealTrackIQ™ must be securely mounted during all operations. This instrument is used in the packhouse to locate the RealAppleIQ™ sensor. An unsecured unit placed on a bin edge, forklift tine, or temporary surface creates a fall risk that will cause permanent damage. A typical packhouse bench is 800–900 mm high — a fall from that height places this instrument directly into the Warranty Void zone.

3.3 RealStartIQ™ — Design Limits

RealStartIQ™ — Session Initiation Instrument	
Purpose	Initialises RealAppleIQ™ training measurement sessions without the need for a laptop.
Operating environment	Dry indoor or outdoor environment only.
Water resistance	NOT WATERPROOF. Any water, liquid spray, or condensation ingress will cause permanent damage.
Cleaning	Damp cloth only on exterior surfaces. No sprays, submersion, or solvents.
Drop resistance	NOT DROP-PROOF. Handle with care at all times.
Battery type	Non-rechargeable lithium primary cell (internal, sealed).
Battery life	Approximately 10,000 session starts under normal operating conditions.
Battery replacement	The RealStartIQ™ is not rechargeable. When the battery is exhausted, the entire unit must be replaced. Two RealStartIQ™ units are supplied with each RealAppleIQ™. Replacement units are available from Real Instruments Limited or your authorised distributor.
Storage	Store in the protective case provided. Keep dry.

✕ CRITICAL

All three instruments share the same critical limits: no water, no dropping. None of the instruments in this suite are waterproof or drop-proof. These are not conservative design choices — they reflect the nature of precision electronic instruments. Damage from water or impact is permanent and irreversible.

4. Battery & Power

Two of the three instruments in this suite contain lithium batteries. This section sets out the key information operators need to manage them correctly.

4.1 RealTrackIQ™ — Rechargeable Battery

The RealTrackIQ™ contains an internal rechargeable lithium-ion battery.

- Charge the unit via the supplied USB-C cable before each session.
- Selecting storage mode on the RealTrackIQ™ screen will automatically set the battery charge for optimal life when the unit will not be used for extended periods.
- The RealTrackIQ™ is used to locate a lost RealAppleIQ™ sensor. A flat battery when it is needed will prevent the search. Keeping it charged is an operational requirement, not just good practice.
- If the battery does not hold charge, contact Real Instruments Limited. Do not attempt to open the unit or replace the battery independently.

⚠ Keep the RealTrackIQ™ charged above 50% at all times.

If the RealAppleIQ™ sensor is lost in a packhouse or orchard, the RealTrackIQ™ must be immediately ready. A depleted unit cannot perform a search. Check the charge level before each session and recharge after use.

4.2 RealStartIQ™ — Non-Rechargeable Battery

The RealStartIQ™ contains a non-rechargeable internal lithium primary cell.

- The battery is sealed inside the instrument and cannot be recharged or replaced by the operator.
- Under normal operating conditions, the battery supports approximately 10,000 session starts.
- When the battery is exhausted, the entire unit must be replaced. Contact Real Instruments Limited or your authorised distributor to order a replacement.
- Two RealStartIQ™ units are supplied with each RealAppleIQ™ system. This provides a backup unit and extends the replacement interval in high-usage operations.
- There is no harm in using a RealStartIQ™ beyond 10,000 starts if it is still functioning — the unit will simply stop initiating sessions when the battery is exhausted. It is not a safety-critical limit.

Two RealStartIQ™ units are supplied with each RealAppleIQ™. When the first unit is exhausted, use the second and order a replacement promptly. Replacement units are available from Real Instruments Limited or your authorised distributor.

4.3 Battery Safety — All Instruments

The lithium batteries in the RealTrackIQ™ and RealStartIQ™ are sealed at manufacture and are not user-serviceable.

- Do not attempt to open, puncture, short-circuit, or dispose of these instruments in general waste. Lithium batteries are subject to local disposal regulations.
- Do not expose either instrument to heat above 40 °C or direct sunlight for extended periods. Excessive heat can damage lithium cells and, in extreme cases, cause swelling or leakage.
- If either instrument shows signs of swelling, unusual heat, or leakage, do not use it. Contact Real Instruments Limited immediately.
- Dispose of exhausted RealStartIQ™ units and end-of-life RealTrackIQ™ units through an approved electronic waste or battery recycling facility in accordance with local regulations.

5. Warranty

A one-year warranty applies to each instrument from the date of purchase, covering defects in materials and workmanship under normal use conditions as defined in this document.

Full warranty terms are set out in the Sales Contract. The key points relevant to this document are:

- The warranty does not cover damage resulting from any of the Warranty Void Events listed in Section 10.
- The warranty does not cover consumable depletion — including exhaustion of the RealStartIQ™ battery after normal use. Battery exhaustion after approximately 10,000 starts is expected and is not a defect.
- The warranty does not cover damage caused by opening, modifying, or attempting to repair any instrument (see Section 6).
- To make a warranty claim, follow the process in Section 11.

This section provides a brief summary for reference. The Sales Contract contains the full warranty terms and governs in the event of any inconsistency.

6. Instrument Integrity: No Unauthorised Opening or Repair

✕ CRITICAL

CRITICAL: Real Instruments Limited is the only party authorised to open, disassemble, rework, or repair any of these instruments. Opening any instrument covered by this document — by any party, for any reason, including inspection after damage — will immediately and permanently void all warranty and support obligations. This applies regardless of whether the opening causes further damage. If you believe an instrument has been damaged, contact Real Instruments Limited immediately. Do not open it, and do not ask a third party to inspect or repair it.

This requirement is not arbitrary. These instruments are manufactured to a sealed specification that cannot be reproduced outside the factory:

- Internal calibration is set at manufacture using factory equipment. It cannot be independently reset or verified in the field.
- Seals, joints, and protective coatings are applied as part of the manufacturing process and cannot be restored to original specification once opened.
- Any evidence of unauthorised opening — tool marks, disturbed components, broken seals, or removed fasteners — will be identified during any warranty inspection and will result in immediate rejection of the claim.

Think of it this way: if you cut open an apple to inspect a bruise, you cannot put it back together. The same principle applies here. Contact Real Instruments Limited, and we will assess it correctly.

7. What These Instruments Are Designed For

Used correctly, in the right environment, these instruments are highly accurate and durable. Their design life — with proper care — spans many seasons of commercial use.

7.1 RealBruiseIQ™ — Permitted Use

- Determining bruise force thresholds for specific apple varieties, size grades, and maturity profiles.
- Generating Susceptibility Data files for upload to the RealDataIQ™, enabling a single handling measurement run to predict bruise outcomes across multiple variety and maturity profiles.
- Supporting variety-specific handling protocol development, harvest timing decisions, and packhouse quality benchmarking.
- Use in published research and formal quality assessments, provided the operating procedure in Section 8 is followed.

7.2 RealTrackIQ™ — Permitted Use

- Tracking and locating the RealAppleIQ™ sensor through packhouse and orchard operations in real time if the unit is lost.
- Supporting operator and driver training modes to display handling behaviour at source.
- Providing real-time data marking during active measurement sessions.

7.3 RealStartIQ™ — Permitted Use

- Initialising RealAppleIQ™ training measurement sessions without the need for a laptop.

8. Recommended Operating Procedures

8.1 RealBruiseIQ™ — Before Each Test Session

- Confirm the instrument is in a dry environment before removing from its case.
- Inspect for visible damage. Do not use if damage is found. Contact Real Instruments Limited.
- Collect fruit samples: minimum 6 fruit of the target variety, size grade, and maturity. Record variety, size grade, maturity estimate (Brix, starch, firmness), and harvest date in description dialogue box.
- Confirm room temperature and record it. Susceptibility results vary with fruit temperature — test at conditions representative of normal handling.

8.2 RealBruiseIQ™ — Conducting a Test

- Position the fruit sample in the test fixture as directed by the software.
- Run the automated test sequence. The instrument applies controlled incremental impact forces.
- After the sequence completes, wait 24 hours to measure the developed bruises. Record bruise sizes in the software.
- Repeat across the required sample size (minimum 4 fruit, 6+ recommended for commercial or research applications).
- Susceptibility Data file is automatically exported for upload to RealDataIQ™ if predictive session analysis is required.
- Clean the instrument exterior with a damp cloth. Store in protective case.

> Susceptibility Data is specific to the variety, size, and maturity tested. Do not apply data from one profile to materially different fruit without repeating the test.

8.3 RealTrackIQ™ — Setup & Operation

- Inspect for damage and confirm battery charge before each session.
- Select the correct aerial for the task.
- Hold or mount the unit securely. Confirm it cannot be knocked or fall.
- Confirm RF pairing with the RealAppleIQ™ sensor before starting a training or measurement marking session.
- After the session, wipe with a damp cloth if needed. Charge if battery is below 50%. Store in protective case.

8.4 RealStartIQ™ — Setup & Operation

- Connect RealAppleIQ™ to laptop and open RealUserIQ™. Set limits for training mode.
- Once RealAppleIQ™ is set to training mode it can be initiated using RealStartIQ™ alone.
- After use, wipe with a damp cloth if needed. Store in protective case.
- If the unit fails to initiate a session, the battery may be exhausted. Retrieve the second supplied unit and order a replacement from Real Instruments Limited.

9. Reference Standards

Susceptibility Data generated by RealBruiseIQ™ is referenced against:

- Primary benchmark: Direct bruise formation in real apple fruit of the same variety, size, and maturity — assessed against published reference images. Results can be replicated by any competent operator without specialist equipment or expert interpretation.
- UNECE Standard FFV-50: Fresh apples and pears — bruise tolerance and defect classification by grade.
- EU Regulation (EU) No 543/2011 (as applicable): Marketing standards, bruise-related defect thresholds.
- OECD Guidance on Objective Tests: Firmness and bruise susceptibility measurement.
- ISO 7558: Produce handling — general principles.

10. Summary: Warranty Void Events

Void Event	Applies To	Apple Equivalent
Any uncontrolled drop onto a rigid surface (concrete, steel, tiles, stone)	All three instruments	*TBD mm bruise from 400 mm drop onto rigid surface. Internal tissue destroyed.*
Water, liquid spray, or condensation ingress	All three instruments	*No apple equivalent — apples tolerate water. These instruments do not.*
Cleaning with spray, submersion, or solvents	All three instruments	*Equivalent to soaking the apple — the skin breaks down.*
Use outside a dry environment	All three instruments	*Placing a ripe apple in a wet packhouse floor puddle. Damage begins immediately.*
Opening or disassembling the instrument	All three instruments	*Cutting the apple open to inspect a bruise. Cannot be undone.*
Repair by any party other than Real Instruments Limited	All three instruments	*Attempting to 'fix' a bruised apple. Not possible.*
RealStartIQ™ battery exhausted — unit forced beyond rated starts	RealStartIQ™ only	*Running an apple through handling after it's already over-grade. Outcome is known.*
RealTrackIQ™ battery depleted — unit used or stored flat	RealTrackIQ™ only	*Leaving fruit in cool store without checking temperature. Silent damage accumulates.*
RealTrackIQ™ placed without secure mounting	RealTrackIQ™ only	*Balancing an apple on the edge of a bin. It will fall.*

11. Dispute Resolution & Warranty Claims

Where a warranty claim or dispute arises, this document provides the primary basis for resolution. No independent technical expert or laboratory is required to determine whether an instrument has been used within its design limits — the comparisons in this document are sufficient.

- The Customer submits the instrument and completes an incident report to Real Instruments Limited, describing the circumstances of the claimed fault.
- The customer sends the unit in its protective case by tracked courier back to Real Instruments Limited.
- Real Instruments Limited will inspect the instrument against the design limits in Section 3 and the Warranty Void Events in Section 10.
- Where evident conditions match a Warranty Void Event, the claim will be declined with written explanation, referencing the specific limit and apple damage comparison.
- Where the fault appears to have occurred within normal use parameters, Real Instruments Limited will repair or replace the instrument under the warranty terms in the Sales Contract.

If the instrument has been opened by any party before being submitted for assessment, the warranty claim will be rejected. Do not open the instrument for any reason.

12. Maintenance Schedule

Frequency	Task	Responsibility
Before each use	Inspect for damage (RealBruiseIQ™). Confirm battery charge (RealTrackIQ™). Check start count indicator (RealStartIQ™).	Operator
After each use	Wipe exterior with damp cloth if needed. Charge RealTrackIQ™ if below 50%. Store RealStartIQ™ in case.	Operator
Monthly	Full visual inspection, case condition check, battery status check.	Operator
Annually recommended	Factory calibration and service check (RealBruiseIQ™).	Real Instruments Limited
After any drop	Do not use. Contact Real Instruments Limited for assessment.	Real Instruments Limited
After any suspect liquid exposure	Do not use. Contact Real Instruments Limited immediately.	Real Instruments Limited
When RealStartIQ™ battery is exhausted	Replace unit. Order replacement from Real Instruments Limited or authorised distributor.	Operator / Distributor

13. Operator Acknowledgement & Sign-Off

By signing below, the Operator confirms they have read and understood this document in full, understand the design limits of each instrument they are authorised to use, and agree to use them only within the conditions described.

A signed copy of this form must be returned to Real Instruments Limited or the authorised distributor before any instrument is used commercially. The Customer must retain a copy for a minimum of five years.

Operator Full Name:	
Organisation / Company:	
Role / Position:	
Instruments Authorised to Use:	RealBruiseIQ™ / RealTrackIQ™ / RealStartIQ™
Instrument Serial Number(s):	
Date of Sign-Off:	
Training Completion Date:	
Operator Signature:	
Supervisor / Witness Name:	
Supervisor / Witness Signature:	

Real Instruments Limited — www.realinstruments.com — For warranty and support enquiries contact your authorised distributor or Real Instruments Limited directly.