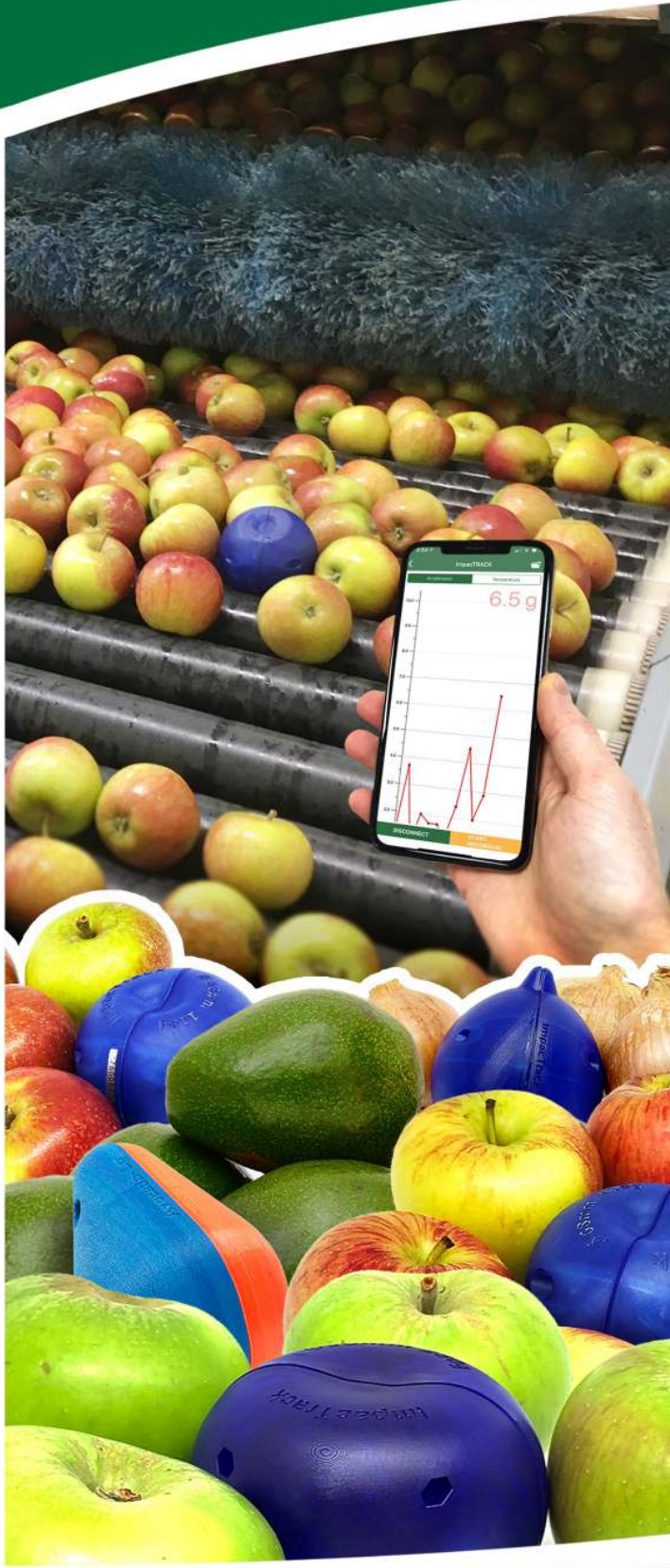


Martin Lishman

IMPACTTRACK



Shock and Temperature Sensor and Logger

ImpactTrack Shock Sensing

ImpactTrack



Avocado processors using ImpactTrack have made changes to grading and packing equipment and eliminated significant damage losses



ImpactTrack has helped Apple processors to improve handling systems and carry out remedial action quickly to prevent damage



Real-time data view



Stored data view

The ML Sensing App is free to download for iOS and Android

IMMEDIATELY Finds Sources of Damage to Fresh Produce

The ImpactTrack shock sensor and logger monitors damage to fresh produce caused by handling and transport operations. It can help to reduce food production waste, monitor transport and logistics and improve quality control systems.

The ImpactTrack logger is encased in a shell which mimics the dimensions, shape, weight and density of the real produce. It will behave and react (including floating in water) in the same way as the produce you are working with.

ImpactTrack enables immediate improvements to quality problems in fresh produce production and assists with the prevention of economic losses caused by bruising and damage.

Key Features

- **Wide range of shells** to mimic the movement of fruit and vegetables prone to damage and bruising during handling and transport
- **Immediate results** - Impact readings are viewed instantly via Bluetooth interface on a tablet or smartphone, using the App supplied
- **Shock and temperature data** are stored for download after testing or transport events

See ImpactTrack in action - log on to:
www.martinlishman.com/impacttrack

BENEFITS of ImpactTrack

The ability to monitor impacts during handling and transport results in less waste and higher production yields.

Handlers and shippers are more aware of the effects of their processes, leading to more sympathetic handling systems.

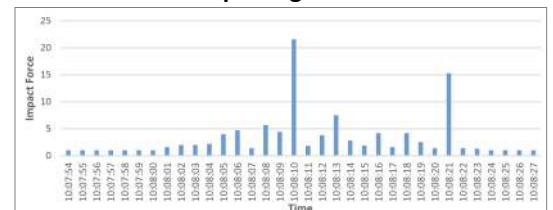
Suited to reducing damage in many types of fresh produce



6 different apple shapes with many different weights have been created, to reflect different varieties and densities - allowing the shape to float at the same level as the real fruit

Complex shapes such as garlic or mussel can be created, and can be waterproof if required, to suit the handling and processing systems

Interpreting Results



This data chart, created from data downloaded from the App and exported to Excel, shows the highest impact every second and highlights two significant shocks. Using quality control systems, actual damage caused to the real produce by the impacts would be calibrated with the ImpactTrack results. Further ImpactTrack testing would indicate damage sources without the need for regular calibration.







ImpactTrack Shape Data

ImpactTrack - used during HANDLING and TRANSPORT

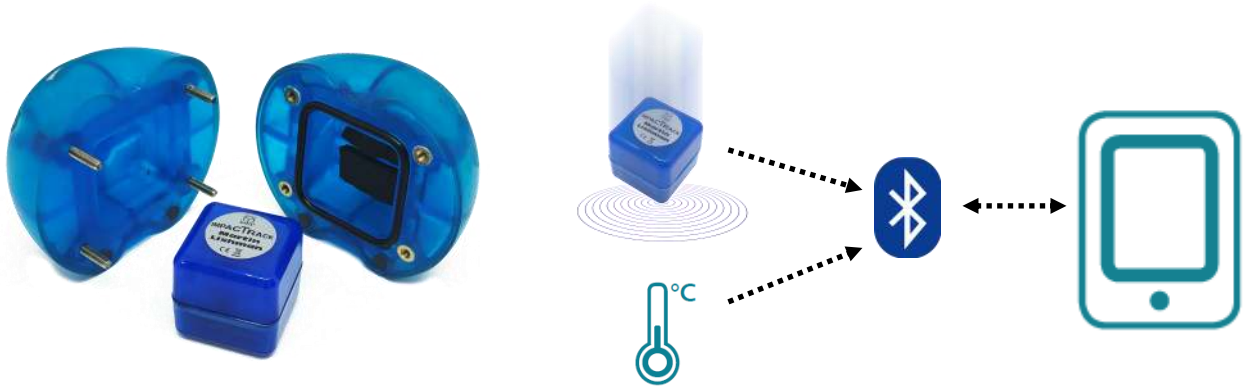
For monitoring processing, handling and transport operations, the ImpactTrack logger can be encased in a wide range of 3D-printed shapes designed to mimic the dimensions, shape weight and density of the real produce. **The table below lists the data and specifications for each shape.** If the dimensions of the shape you require are not listed, we can make a different size for you.

The recommended weight range reflects typical weights of real produce with the dimensions listed. When choosing a shape, it is important to know the average weight of the produce with the same average dimensions. The final weight of the ImpactTrack is then matched to this so that it behaves and reacts (including floating in water) in the same way as the real produce. Most shapes are waterproof and can have the same buoyancy as the produce being processed.

The ImpactTrack logger can also be used on its own to monitor transport operations. It is small enough (a 3cm cube) to be located discretely inside packing containers. Using the smartphone App, the logger can be set to begin recording at the start of a transport event and, when retrieved at the destination, the data can be downloaded to another smartphone.

Shape type	Diameter (mm)	Height (mm)	Recommended Weight Range (g)
	64	60	100-140
	68	55	115-145
	68	68	140-180
	74	60	140-180
	90	65	220-300
	100	65	280-360
	54	164	180-250
	64	165	180-250
	49	165	190-240
	60	92	160-200
	73	105	200-260
	76	109	260-300
	59	57	75 - 110
	62	89	120 - 203
	52	65	75 - 100
	81	98	225 - 325
	80	71	105-155
	60	55	85-95
	36 x 31	83	35-45

ImpacTrack Features and Specifications



Measuring and recording impacts

ImpacTrack measures impacts at the rate of 25 times per second (25Hz) and records, in the logger memory, the largest impact during the logging interval (which can be set between 1 second and 24 hours).

Adjustable logging start delay

Measurement of impacts can be delayed for between 1 second and 6 months until the start of a specific part of a handling or transport process.

Adjustable data recording thresholds

Minor impacts and normal temperatures can be ignored in the logger memory, giving more focus on large impacts and extreme temperatures, and also avoiding filling the logger memory too quickly.

Data transfer

Using Bluetooth 4.0 LE, with transmission distance up to 50 meters depending on conditions.

ML Sensing App for iOS or Android smartphone or tablet

Data is viewed using the App in real-time or recorded for download and export in Excel compatible data format (CSV). Free to download from the App Store or Google Play, it can be loaded on multiple devices and is available in English, French, German, Spanish, Portuguese and Russian.

Battery - replaceable lithium battery (½ AA 3.6V/1Ah) gives c. 6 month battery life, depending on recording threshold and logging interval settings.

Logging memory - up to 32,000 measured values, with over 10 years data storage without battery

Impact range/accuracy/resolution - up to 27g (G-force) / ±0.25g / 0.1g

Temperature range/accuracy/resolution - from -25 to +75°C / ±0.5°C / 0.1°C

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