INDEPENDENT PRODUCT EVALUATION & TECHNICAL FEEDBACK REPORT

CC Athletics CableMate

Linear Dynamometer

PRODUCT MANUFACTURER

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Evaluation commenced	15 September 2026
Report date	30 October 2026
Intended circulation	CC Athletics Founders, R&D, Product Development, Engineering, and relevant stakeholders

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1. EXECUTIVE SUMMARY

This report presents my observations, practical experiences and recommendations following hands-on evaluation of the CC Athletics CableMate linear dynamometer, commencing on 15 September 2026.

The evaluation covered the complete initial user experience, including product delivery, packaging, hardware presentation, initial configuration, software functionality, and practical application across a range of isometric strength assessments.

Additionally, I explored several unconventional applications beyond standard isometric testing, including measuring sled breakaway forces and assessing the force–elongation relationship of a resistance band.

My overall impression of the CableMate is exceptionally positive.

The device demonstrates an excellent combination of portability, versatility, intuitive operation, and high-quality real-time visual feedback. The accompanying accessories are thoughtfully designed, and the overall presentation reflects a clear commitment to delivering a premium product.

Perhaps the CableMate's most impressive characteristic is its potential to serve as a highly adaptable force-measurement instrument across a considerably broader range of applications than conventional isometric strength assessments.

The evaluation identified two relatively minor opportunities for refinement:

1. Superficial corrosion observed on a fastening component associated with the dynamometer's attachment hardware.
2. An intermittent iPad keyboard behaviour within the CC Athletics application, observed across software versions 2.9.1 and 2.10.0.

Neither issue prevented successful use of the device nor materially diminished the overall testing experience.

I also conducted a programme of deliberate overload testing on both the supplied ratchet straps and the device itself, in order to understand the practical margin available beyond the stated operating limits.

The straps were connected in series and subjected to isometric mid-thigh pulls exceeding net 330 kg, with each strap therefore carrying the full load rather than half of it. They sustained this without structural failure. The CableMate itself continued to register force at peaks in excess of 275 kg, approximately 137% of its 200 kg rated capacity, and showed no subsequent sign of damage.

**These were deliberate overload tests conducted on my own initiative and well outside the manufacturer's stated limits. I would not recommend that other users repeat them. Structural survival should not be taken as evidence that measurement accuracy was retained, and the calibration of my own unit is now unverified.*

A further unplanned finding emerged during this testing. The device registered force applied in compression as well as in tension, recording upwards of 63 kg during a chest fly or squeezing action against the unit.

This single observation has the broadest implications of anything in this report.

If the CableMate can be shown to measure compressive load to a validated standard, it opens a route into handheld dynamometry for maximal voluntary isometric contraction testing, a segment occupied by devices such as the VALD DynaMo Plus, ActiveForce 2 and Hoggan microFET2.

I subsequently recorded the CableMate and CC Athletics force plates simultaneously across four isometric mid-thigh pulls. Once system weight was subtracted from the force plate values, the two instruments agreed to within approximately 2% across a range of roughly 104 kg to 287 kg, with a mean difference of 4.6 kg. The CableMate read slightly lower on every pull.

> **For a portable device compared against force plates over a force range of this width, that is close agreement, and it is the most reassuring result in this report.**

This comparison also surfaced a separate observation concerning the force plate application, which reports peak force inclusive of body mass and any supported load. That is a defensible convention rather than an error, but it is not stated explicitly, and the difference it makes is large. This is addressed in Section 7.

Beyond the two minor issues noted above, I have therefore proposed two modular accessory concepts for consideration: a handgrip dynamometer housing, and a handheld attachment for clinical MVIC assessment. The two are independent of one another. The handgrip housing would operate in tension and therefore requires no measurement capability the device does not already have, whereas the handheld attachment would operate in compression and depends on the question above. Both are discussed in Section 9.

Overall conclusion: CableMate is an impressive, highly adaptable product with considerable potential for applications within sports science, strength and conditioning, rehabilitation, and broader applied force-measurement environments.



Figure 1: The CableMate

2. DELIVERY, PACKAGING, AND INITIAL PRODUCT PRESENTATION

2.1 Delivery Condition

The CableMate arrived in excellent condition, with no apparent damage to either the external packaging or the device itself.



Figure 2: External Delivery Box

The unit was securely protected, and I observed no scratches, scuffs, impact marks, or other indications of damage during transport.

The unboxing experience immediately created a positive impression of the product and the attention given to its presentation.

The inclusion of a quick-start guide was particularly welcome, providing users with a convenient introduction to the equipment.



Figure 3: Quick Start Guide - Conveniently Placed

From a customer-experience perspective, the delivery and presentation were extremely well executed.

Supporting video clips

- *Delivery of CableMate*
- *External Delivery Box - First* Opening

2.2 Protective Carrying Case

The custom CableMate carrying case deserves particular recognition.

Its appearance, construction and overall presentation convey a genuinely premium feel. It is clearly an accessory designed specifically around the product rather than an afterthought.



Figure 4: Protective Case - First Sighting



Figure 5: Protective Case - First Opening

For equipment intended to be transported between laboratories, training facilities, clinics and potentially outdoor testing environments, a high-quality protective case is an important practical consideration.

I was extremely impressed with this aspect of the package.



Figure 6: CableMate & Protective Case

Supporting video clips

- *Protective Case - First sighting*
- *Protective Case - First Opening*
- *CableMate in Protective Case*

2.3 Carabiners and Attachment Hardware

The supplied carabiners were excellent in both their appearance and perceived build quality.

The dark black finish is particularly attractive and, in my opinion, represents a substantial aesthetic improvement over conventional silver-coloured alternatives.

Although primarily a cosmetic preference, this attention to visual consistency contributes positively to the overall premium presentation of the product.

The supplied carabiners also appeared well suited to the practical requirements of the testing configurations I explored including maximal exertion isometrics, durability testing, and breakaway sled pulls.



Figure 7: Unpacking the Carabiners



Figure 8: CableMate Black vs. Generic Silver Carabiners

2.4 Mini Ratchet Straps

The supplied mini ratchet straps were another standout component. Three features were particularly impressive:

- The overall construction and practical usability.
- The inclusion of custom CC Athletics branding.
- The graduated distance markings incorporated into the straps.

The graduated markings are particularly valuable from a sports-science testing perspective.

In standardised isometric strength testing, reproducing the same testing position across repeated assessments is essential for obtaining meaningful longitudinal measurements. Changes in joint angle, strap length, attachment position, or overall testing geometry can influence the measured force output.

Consequently, the ability to document and reproduce strap settings is a genuinely useful feature for improving test standardisation and supporting test–retest reliability.

Importantly, these markings complement rather than replace the need to standardise joint angles, participant positioning, and attachment geometry.

> **This is an excellent example of a relatively simple design feature providing meaningful practical value to the end user.**

Credit is due to the design and development team for their inclusion.



Figure 9: CC Athletics Mini Ratchet Straps

Supporting video clips

- *Mini CC Athletics Branded Ratchet Straps*

2.5 Minor Hardware Observation: Superficial Corrosion

One small cosmetic issue was identified during initial inspection.

The bolt and nut associated with the CableMate attachment-hook assembly exhibited what appeared to be superficial rusting or corrosion.

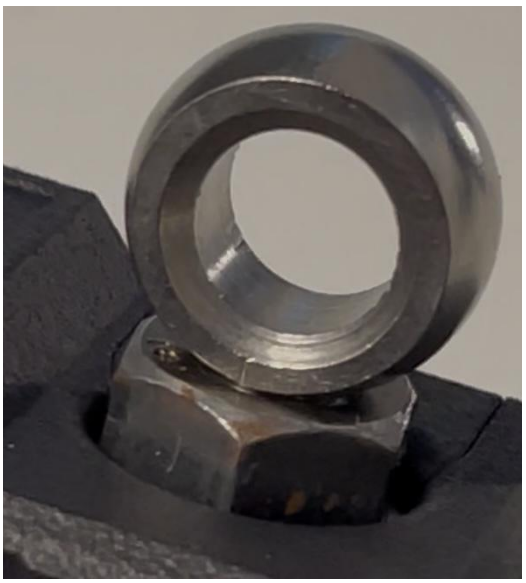


Figure 11: Superficial Rust on Nut

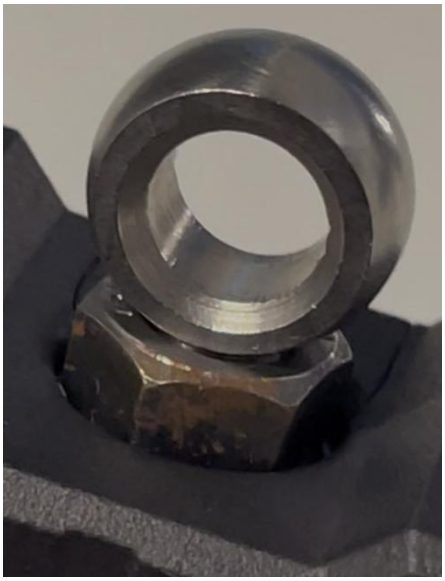


Figure 10: Superficial Rust on Other Nut

This was relatively minor and, importantly, did not appear to affect device operation, attachment functionality, or my ability to perform testing.

However, given the otherwise excellent standard of presentation, it stood out as an area that could benefit from refinement.

It is entirely reasonable to expect exposed metal components to accumulate wear, surface damage, and potential corrosion over their operational lifespan, particularly when subjected to repeated loading, attachment changes, and transportation.

Nevertheless, ensuring that all exposed components are visually pristine when the product first arrives would help maintain the premium standard established by the rest of the package.

Potential considerations for the manufacturing team

- Review the corrosion resistance and surface finish of the current fastener.
- Consider whether an alternative fastener specification or protective coating would improve initial presentation and durability.
- Examine whether surface damage could be occurring during manufacture, assembly, or handling.
- Incorporate a brief visual inspection of exposed metal components into final quality-control procedures.

A relatively inexpensive component substitution or minor refinement to manufacturing procedures may be sufficient.

This should be regarded as a minor quality-control observation rather than a substantive hardware concern.

Supporting video clips

- *Superficial Rust - Locking Nut*

Overall Packaging and Presentation Assessment

The complete delivery experience was excellent.

The protection afforded to the device, quality of the carrying case, attractive attachment hardware and thoughtful strap design collectively create a very strong first impression.

The minor fastener observation does not significantly detract from this assessment.



Figure 12: Unboxing the CableMate

Supporting video clips

- *Full Unboxing of CableMate*

3. INITIAL SETUP, CONNECTIVITY AND USER INTERFACE

3.1 First-Time Configuration

My initial experience powering on and connecting the CableMate was extremely straightforward, specially thanks to the supplied quick-start guide.

The setup process was intuitive, and I encountered no notable difficulties establishing a connection with the iPad.

This is particularly important for a portable testing device, where ease of deployment directly influences its practicality in real-world environments. From iPad and CableMate initial boot-up, the devices can be connected, and test data can begin to be recorded within 25 seconds.

3.2 Application Presentation and Real-Time Feedback

The CableMate application looks excellent on the iPad. The interface is visually appealing, and the live force–time graphs are particularly impressive.

From a practitioner's perspective, clear real-time visualisation provides immediate insight into the force generated during testing.

From the participant's perspective, live force feedback introduces an engaging and potentially motivating element to the assessment. This is especially useful when incorporating externally focused motivational cues, visual targets or attempts to maximise voluntary force production.

The clarity and responsiveness of the displayed force traces contribute considerably to the overall testing experience.

> **The real-time graphical presentation is one of the device's strongest features.**

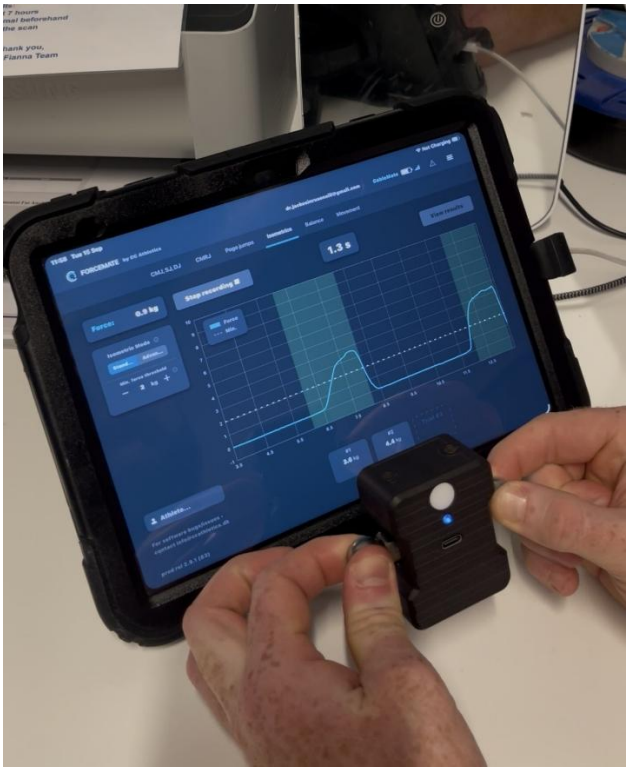


Figure 13: First Boot-up with Live Force-Time Graphs

Supporting video clips

- CableMate - First Boot-up, Connection, and Test

4. SOFTWARE OBSERVATION: INTERMITTENT KEYBOARD SWITCHING

4.1 Device and Software Information

During testing, I identified a recurring minor user-interface issue when entering text within the CC Athletics iPad application.

PARAMETER	DETAIL
Device	Apple iPad (A16)
iPadOS	26.5.2 (as reported during testing)
Device identifier	K2G6JX61JY
Initial app version	2.9.1
Subsequent app version	2.10.0

4.2 Description of Observed Behaviour

The issue was initially identified while creating a new isometric exercise within the application.

When entering a multiword exercise name, such as “Knee Flexion,” pressing the space bar intermittently caused the on-screen keyboard to switch unexpectedly from the standard alphabetic keyboard to the numerical/symbol keyboard.

To continue typing, I had to manually switch back to the alphabetic layout.

Although this initially appeared within the exercise-creation interface, I subsequently observed the same behaviour within the athlete-name entry field when creating a new athlete profile.

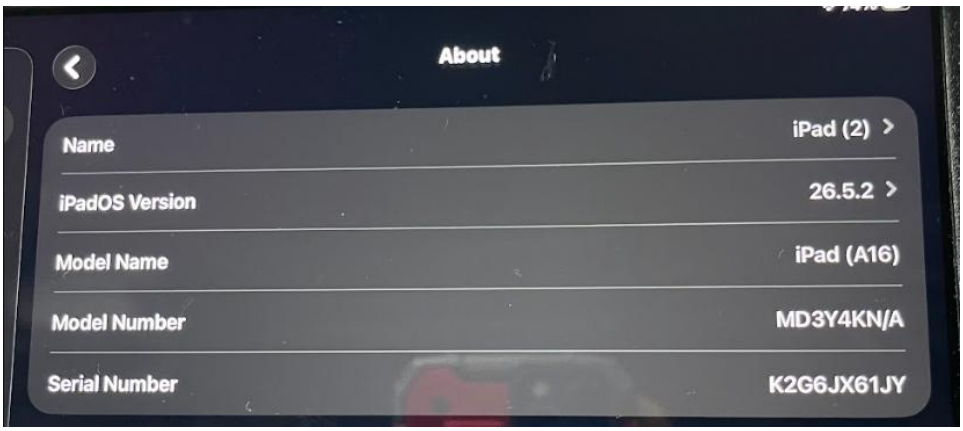


Figure 14: Laboratory iPad OS Version and Model Number

4.3 Reproducibility Across Software Versions

The issue was initially identified while running application version 2.9.1.

Following an update to version 2.10.0, I can confirm that the behaviour continued to occur intermittently.

This suggests that the issue was not fully resolved by the subsequent application release, although its frequency has not been formally quantified.

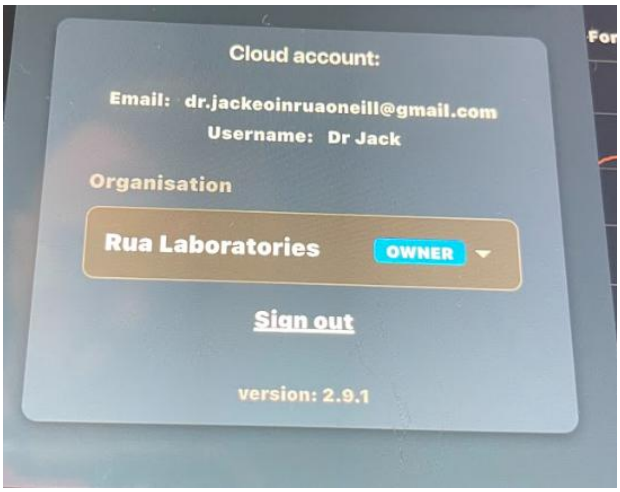


Figure 15: ForceMate App Version on iPad during Initial Testing

4.4 Impact on User Experience

This is a relatively minor issue and did not prevent me from creating athlete profiles, configuring exercises, or performing assessments.

However, it introduces an unnecessary interruption during routine data entry. The effect is primarily related to user experience and workflow efficiency rather than measurement functionality.

For practitioners regularly entering athlete information and creating multiple exercise configurations, eliminating this behaviour would help streamline operation.

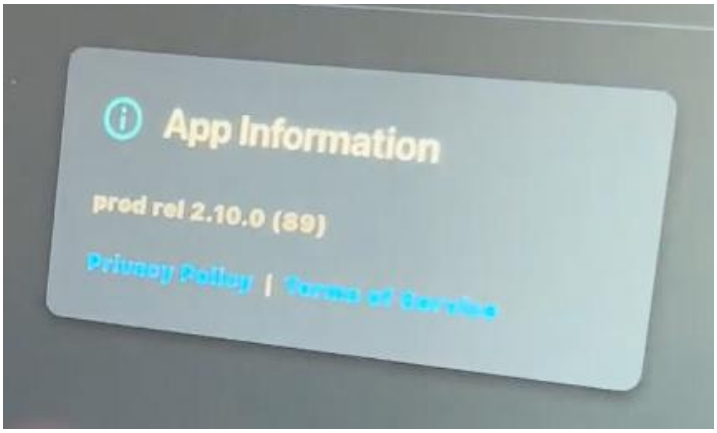


Figure 16: ForceMate App Version during Subsequent Retesting

4.5 Recommendation

I would recommend that the software development team investigate the keyboard behaviour associated with text-entry fields, particularly following the insertion of spaces.

It may be useful to examine the text-input configuration and any keyboard-type or focus changes occurring during input.

Testing across different iPad models and operating-system versions could help determine whether the behaviour is device-specific or more broadly reproducible.

Suggested priority: Low to Moderate — user interface / quality-of-life improvement.

Supporting video clips

- *Initial Keyboard Issue on 2.9.1*
- *Subsequent Keyboard Issue as of 27.10.2026 with Software 2.10.1*

5. CONVENTIONAL ISOMETRIC STRENGTH TESTING

5.1 Overview

Following initial setup, I used CableMate across a range of isometric strength assessments involving the lower limbs, upper limbs, cervical musculature, and hip musculature.

The purpose was to assess the device's practicality and adaptability across different test positions, muscle groups, and attachment configurations.

Across these applications, CableMate performed smoothly, and I did not encounter any significant operational difficulties.

The overall experience reinforced my initial impression that the unit offers considerable flexibility for practitioners conducting multi-joint and multi-muscle-group strength assessments.

5.2 Isometric Assessments Performed

MUSCLE GROUP	ASSESSMENT	VIDEO CLIPS
Quadriceps	Isometric knee extension	HERE
Hamstrings	Isometric knee flexion	HERE
Shoulder rotators	Isometric external rotation	HERE
Shoulder rotators	Isometric internal rotation	HERE
Cervical extensors	Isometric neck extension	HERE
Cervical flexors	Isometric neck flexion	HERE
Cervical lateral flexors	Isometric lateral flexion	HERE
Hip abductors	Isometric hip abduction	HERE
Hip adductors	Isometric hip adduction	HERE
Shoulder rotators	Isometric external rotation (abducted shoulder)	HERE
Shoulder rotators	Isometric internal rotation (abducted shoulder)	HERE

Supporting evidence

- *Isometric Testing Video Clips (folder)*
- *Raw Isometric .CSV files (folder)*

5.3 Practical Performance

The unit operated smoothly throughout the assessments.

I particularly appreciated the ability to adjust the force-trigger threshold, allowing the testing configuration to be adapted to the requirements of different exercises. This flexibility is useful when working across assessments with different force magnitudes or intended testing characteristics.

The live graphical feedback was once again a significant advantage. Being able to observe force production throughout an attempt provides immediate information that can be used to guide participant instruction and evaluate the performance of individual trials.

The visual feedback is also particularly useful when attempting to maximise voluntary force output through external motivation.



Figure 17: Seated Knee Flexion

5.4 Adaptability Across Testing Positions

A major practical strength of CableMate is its ability to accommodate very different testing arrangements.

The transition between seated and supine assessments, and between lower-limb, upper-limb and cervical assessments, demonstrates the flexibility of the linear dynamometer approach.

Rather than requiring a large dedicated testing station for each movement, the same central measurement device can be incorporated into numerous configurations using appropriate attachment points and stabilisation.

For a sports-science laboratory conducting a broad testing battery, this versatility is extremely valuable.

Importantly, while the device itself facilitates a wide range of applications, consistent positioning, adequate stabilisation, and standardised test procedures remain essential for meaningful comparisons.



Figure 18: Seated Shoulder External Rotators

5.5 Interpretation and Limitations

The assessments demonstrated the practical feasibility and ease of use of CableMate across the selected movements.

However, the current evaluation should not be interpreted as a formal independent validation of measurement accuracy, reliability, or agreement with reference dynamometry systems.

Establishing these characteristics would require specifically designed testing protocols, including repeated measurements, appropriate reference instrumentation, and statistical analysis.

Nevertheless, from an operational and practitioner-use perspective, the experience was very positive.



Figure 19: Testing Lateral Cervical Flexion

6. DURABILITY AND OVERLOAD TESTING

Having previously evaluated the CC Athletics IMTP Platform, I was interested in understanding how the CableMate and its supplied accessories behave under loads considerably beyond those encountered during routine assessment.

The objective was not to establish a rated working load or to perform a formal engineering test, but to understand the practical margin available before the equipment becomes the limiting factor in a testing setup.

> **Important: the tests described in this section were conducted deliberately and entirely on my own initiative, at loads well outside the manufacturer's stated operating limits. They were conducted with appropriate precautions using a fixed IMTP platform and force plates. I would not recommend that other users repeat them, and I accept that doing so may have affected the calibration of my own unit.*

6.1 Ratchet Strap Overload Testing

The first test examined the supplied mini ratchet straps.

Both straps were daisy-chained in series and connected to the central hook of the IMTP platform, with a barbell positioned for a conventional isometric mid-thigh pull. I then performed several maximal pulls, the largest of which exceeded net 330 kg.

> **Because the straps were connected in series rather than side by side, each strap carried the full measured force. The load was not divided between them.**

This distinction matters when interpreting the result. A parallel arrangement would have subjected each strap to roughly half the recorded force; in series, both were exposed to the full magnitude.

Observations

Neither strap failed at any point during testing. On subsequent inspection:

- There was no tearing, fraying or significant deformation of the webbing.
- The region where the ratchet mechanism bites into the strap showed only superficial marking, consistent with the compressive action of the mechanism.
- No structural damage was evident at the stitching or at the strap terminations.
- The ratchet mechanisms continued to operate normally afterwards.



Figure 21: Strap 1 Post-Test Condition/Superficial Marking



Figure 20: Strap 2 Post-Test Condition/Superficial Marking

For context, the CableMate is rated to a maximum of 200 kg. The straps therefore sustained more than one and a half times the maximum load the device itself is designed to measure, without structural failure.

From a practical standpoint, this provides considerable confidence that the supplied straps are not the limiting component within a CableMate testing configuration, and that they are comfortably specified for the loads the device is intended to encounter.

> **These observations relate to a small number of single-session pulls. They do not establish a rated working load limit, nor do they address fatigue behaviour under repeated cyclic loading, which is the more common mode of failure for textile webbing. Determining a formal safe working load would require testing to an appropriate standard.*

Supporting evidence

- *Strap Durability Testing Video Clip*
- *Strap Durability Testing Raw .CSV's (folder)*



Figure 22: Strap Durability Testing with IMTP's

6.2 CableMate Overload Testing

Having established that the straps were unlikely to be the limiting component, I repeated the same isometric mid-thigh pull configuration with the CableMate placed within the load path.

Peak forces in excess of 275 kg were recorded through the device; approximately 137% of its 200 kg rated capacity.

> **This figure was reported by the CableMate itself. No independent reference measurement was recorded simultaneously, so the value originates from the very instrument whose accuracy beyond its rated range is the open question. The true force applied may have been somewhat higher or lower. It should be read as an approximate indication of the magnitude involved rather than as a verified measurement.*

Observations

- The device continued to register force throughout, with the trace displayed on the iPad as normal.
- There was no audible or visible indication of mechanical distress during loading.
- Subsequent visual inspection revealed no damage to the housing, attachment points, or hardware.
- The unit continued to respond normally to lighter submaximal pulls afterwards.

From a purely structural perspective this is a reassuring result. A device that remains intact and operational after a substantial overload event offers practitioners useful reassurance, given that accidental overload is a realistic risk in a busy gym or clinical environment; a stronger-than-expected athlete, an unintended dynamic pull, or an inappropriate attachment configuration.



Figure 23: CableMate Overload Testing with IMTP's

Important limitations of this observation

I would caution against reading more into this result than it supports, for two reasons.

First, the fact that the device continued to produce a reading above its rated capacity is not evidence that the reading was accurate. A manufacturer's rated capacity typically describes the range within which linearity and measurement accuracy are specified. Readings obtained beyond that range may carry error even where the sensing element remains structurally undamaged.

Second, the fact that the unit responded normally to lighter pulls afterwards does not confirm that its calibration was unaffected. A small permanent zero-offset or a change in sensitivity would not be apparent without direct comparison against a reference instrument and would be entirely invisible to the user.

I would therefore describe this as evidence of structural robustness rather than of measurement integrity under overload.

Questions for the engineering team

- Does the CableMate have a defined safe overload margin, and an ultimate load limit beyond which damage should be assumed?
- Is there an internal mechanical stop or overload protection within the housing?
- Should a unit known to have been overloaded be returned for inspection or recalibration, and is there a recommended procedure for doing so?
- Is there a user-accessible means of verifying that a unit remains within calibration?

If a safe overload margin exists, stating it within the product documentation or quick start guide would be genuinely useful. Practitioners working with strong athletes will occasionally exceed a 200 kg limit, whether intentionally or otherwise, and clear guidance on what to do afterwards would be valuable.

Supporting evidence

- *CableMate overload testing - IMTP pulls in excess of 275 kg*
- *Raw .CSV Files - Overload Testing*

6.3 Unplanned Finding: Response Under Compressive Load

While completing the above testing, I became curious as to whether the device would register force applied in compression rather than tension. It did.

Holding the unit between both hands and performing a chest fly or squeezing action against it, I was able to record forces upwards of 63 kg.

This was not an application I had anticipated, and to my knowledge it falls outside the device's intended use. It was, however, among the more interesting findings of the entire evaluation.

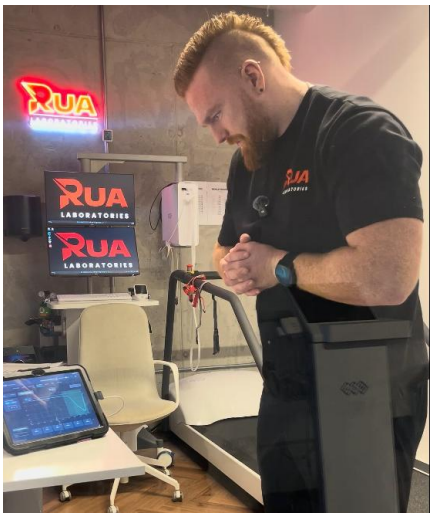


Figure 24: Compression Testing

Why this may matter

A linear dynamometer that measures only tension is limited to applications in which the practitioner can establish a pulling configuration. A device that also responds to compression is a substantially more flexible instrument, because compressive loading is the basis of a large proportion of clinical and rehabilitation strength testing.

This observation therefore has direct implications for the handheld dynamometry concept discussed in Section 9.3. It is worth being clear that it does not bear on the handgrip housing concept, which would operate in tension and is discussed separately in Section 9.2.

Necessary caveats

I would stress that this was an informal observation rather than a controlled test.

- No reference instrument was used, so I cannot comment on the accuracy of the compressive reading.
- The linearity of the response under compression is unknown.
- It is unclear whether the internal sensing element is specified for compressive loading at all, or whether the response observed is simply incidental.
- The effect of repeated compressive loading on the sensor and housing over time is unknown.
- Sign convention, zeroing behaviour and the handling of compressive values within the software would all require clarification.

Whether this represents a genuine bidirectional measurement capability or an unintended artefact is a question only CC Athletics can answer, and the answer determines whether the handheld dynamometry opportunity outlined in Section 9.3 is realistic.

Supporting evidence

- *Compression Testing - Chest Fly / Squeeze Action*
- *Raw .CSV Files - Compression Testing*

6.4 Concurrent Comparison Against Force Plates

Having identified the absence of a paired measurement as the main limitation of the testing above, I went on to carry it out.

This section reports a direct comparison between the CableMate and CC Athletics force plates, recorded simultaneously during the same efforts.

Method

Four isometric mid-thigh pulls were performed on the force plates with the CableMate connected in series at the central hook of the IMTP Platform, so that both instruments were subject to the same applied load throughout each pull. Peak values were taken from each instrument for each pull.



Figure 25: Concurrent Comparison of CableMate and PlateMate

System weight, comprising my own body mass together with the barbell, was 118.4 kg. Because the barbell was supported by me rather than by an independent fixed structure, system weight rather than body mass alone is the correct quantity to subtract here.

> **The force plate application reports live and post-test peak force as total vertical ground reaction force, inclusive of system weight. The net values below were obtained by subtracting the 118.4 kg system weight. This reporting convention is itself worth comment and is addressed separately in Section 7.*

Results

PULL	CABLEMATE (KG)	FORCE PLATE, TOTAL (KG)	FORCE PLATE, NET (KG)	DIFFERENCE (KG)	DIFFERENCE (%)
1	212.4	333.8	215.4	−3.0	−1.4%
2	279.8	405.6	287.2	−7.4	−2.6%
3	102.6	222.6	104.2	−1.6	−1.5%
4	206.6	331.4	213.0	−6.4	−3.0%

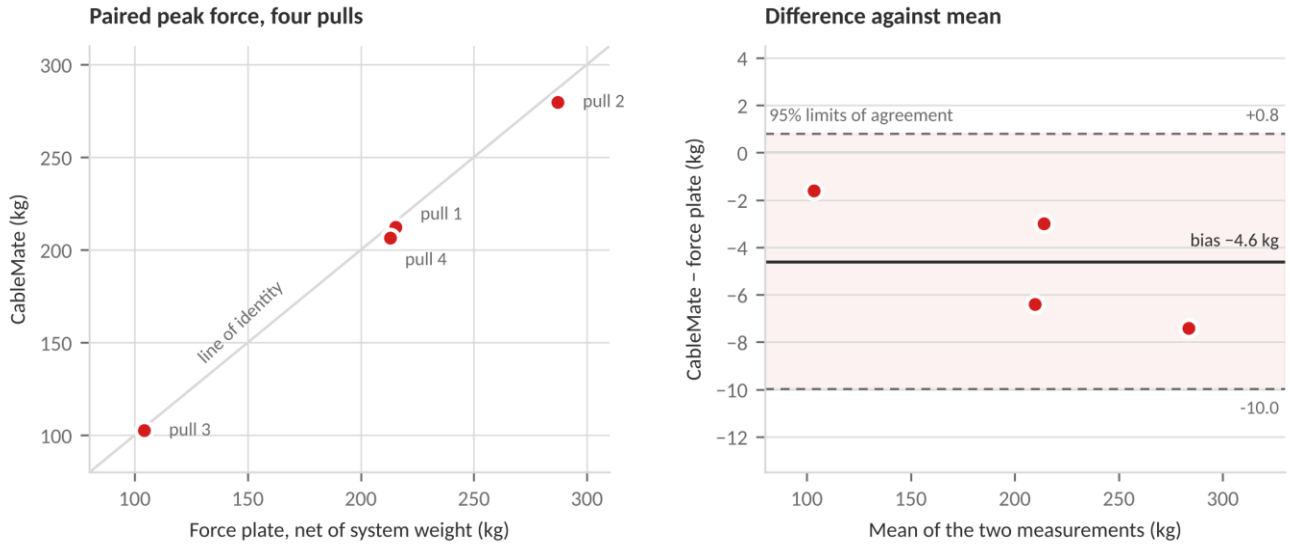


Figure 26: Agreement between CableMate and force plate across four isometric mid-thigh pulls. Left, paired values against the line of identity. Right, the difference between instruments plotted against their mean.

Agreement

STATISTIC	VALUE
Mean difference (bias)	−4.6 kg, the CableMate reading lower
SD of differences	2.7 kg
95% limits of agreement	−10.0 kg to +0.8 kg
Mean percentage difference	−2.1% (range −1.4% to −3.0%)
Pearson correlation	r = 0.9998
Range of forces compared	104 kg to 287 kg (net)

Across a range spanning roughly 104 kg to 287 kg, the two instruments agreed to within approximately 2% of one another.

For a portable device compared against force plates, over a force range of this width, that is close agreement.

**The correlation coefficient is reported for completeness but should not be read as evidence of agreement. Two instruments can correlate almost perfectly while differing by a constant or proportional amount throughout, which is precisely the pattern seen here. The bias and limits of agreement are the informative statistics.*

Direction and possible sources of the difference

The CableMate read lower than the force plate on all four pulls. A consistent direction across every trial suggests a systematic difference rather than random variation, although four pulls is far too few to establish that with any confidence.

Several explanations are plausible, and they are not mutually exclusive:

- Sampling rate. If the force plates sample at a higher frequency than the CableMate, the CableMate may not capture the true instantaneous peak of a rapidly rising signal. This would produce exactly the pattern observed and would be my leading hypothesis.
- Filtering or smoothing differences between the two systems, which would have a similar effect on peak values.
- A small proportional difference in calibration between the two instruments.
- The system weight value used for the subtraction. Had system weight during the pulls been 123.0 kg rather than the 118.4 kg recorded, mean agreement would have been almost exact.

It is worth noting that restraint geometry works in the opposite direction. The CableMate measures tension along the axis of the strap, whereas the force plates measure the vertical component of that tension. Any deviation of the strap from vertical would therefore make the CableMate read higher than the plates, not lower. If such a deviation was present, the underlying difference between the instruments is larger than the figures above suggest rather than smaller.

Comparing the two simplest error models against these data, a proportional difference of approximately 2.3% fits marginally better than a constant offset of 4.6 kg. With four observations this is indicative at best, and distinguishing the two properly would require a far larger sample spanning a wider range of loads.

Limitations

I would not want these numbers to be read as more than they are.

- Four pulls, one athlete, one session.
- Limits of agreement calculated from four differences are very imprecise, and the interval quoted above should be treated as illustrative rather than as a reliable estimate.
- Peak-to-peak values were compared rather than continuous synchronised traces, so nothing can be said here about agreement in the shape or timing of the force–time curve.
- The unit used had previously been subjected to the overload testing described in Section 6.2, so its calibration status at the time of this comparison is unknown.
- No randomisation, no repeated measures across separate sessions, and no predetermined analysis plan.

This is a preliminary comparison, not a validation study. It is, however, sufficient to show that the CableMate tracks a research-grade reference closely across a wide range of loads, which is a genuinely encouraging result.

A fuller study

Extending this into a proper method-comparison study would be straightforward and, I think, worthwhile. It would require multiple participants spanning a range of force-producing capacity, repeated trials within and across sessions, synchronised continuous recording rather than peak extraction alone, controlled restraint geometry, and a predetermined statistical analysis plan.

Rua Laboratories holds both instruments and a varied client population, which makes it a practical place to run such a study. A study of this scope sits outside the evaluation work covered by this report, but I would be glad to put together a proposal covering protocol, timelines, and costs if the team would find that useful.

Independent agreement data against a research-grade reference is the sort of evidence practitioners and researchers increasingly look for when selecting measurement equipment, and it carries more weight coming from outside the company than from internal testing.

Supporting evidence

- *Concurrent PlateMate and CableMate Testing*
- *Raw .CSV Files - CableMate Concurrent Testing*
- *Raw .CSV Files - PlateMate Concurrent Testing*

6.5 Summary of Durability Observations

TEST	LOAD APPLIED	OUTCOME
Ratchet straps (in series)	In excess of net 330 kg	No structural failure; superficial marking at ratchet contact area only
CableMate unit	In excess of 275 kg as reported by the device (approx. 137% of rating)	Continued to register force; no visible damage; normal response afterwards
CableMate under compression	Upwards of 63 kg	Registered compressive force; accuracy unverified

Taken together, these observations suggest a product built with a meaningful margin beyond its stated operating range. That is a genuine strength and, in my view, worth communicating to prospective customers; particularly those working with strong athletic populations.

I would reiterate that these were informal observations arising from deliberate overload testing rather than a validation exercise. The concurrent comparison reported in Section 6.4 provides some reassurance that the unit still tracks a reference instrument closely, though it was performed after the overload testing and so cannot establish what the unit read beforehand.

7. OBSERVATION: REPORTING OF PEAK FORCE RELATIVE TO BODY MASS

The concurrent testing described in Section 6.4 surfaced a separate observation. It concerns the force plate application rather than the CableMate, but it sits within the same product ecosystem and seems worth reporting here.

7.1 The Observation

During the paired testing I noticed that the force plate software reports peak force during an isometric mid-thigh pull as the total vertical ground reaction force, inclusive of the athlete's body mass and of any load the athlete is supporting.

In my case this meant the reported peak of 333.8 kg on the first pull comprised 118.4 kg of system weight and 215.4 kg of force actually produced against the restraint.

Supporting evidence

- Raw .CSV Files - PlateMate Concurrent Testing

7.2 Is Net Force the Expected Convention?

My initial assumption was that peak IMTP force is conventionally reported with body mass subtracted, and that reporting the gross value was therefore an error. Having checked the methodological literature before writing this section, that assumption turns out to be only partly correct, and I would rather state the position accurately than assert something incorrect.

The most widely cited methodological reference for this test is the standardisation paper by Comfort and colleagues (view paper HERE). Their position is that there is no consensus as to the superiority of either net or gross force values for the isometric mid-thigh pull. What they recommend firmly is that researchers and practitioners state which of the two is being reported.

> **The issue is therefore not that reporting gross force is wrong. It is that the convention in use must be unambiguous to the person reading the number.**

Both conventions are in active use. Net force, obtained by subtracting the weight recorded during a quiet standing period before the pull, represents the force the athlete produced against the restraint. Gross force includes body mass and is a larger number that is not directly comparable between athletes of different mass.

7.3 Why This Matters in Practice

I should be concrete here because I am the worked example.

I have been using this system for approximately 10 months. As all tests are preceded with bodyweight measurement, I had assumed throughout that the reported peak force was net of body mass. It was not until I placed a second instrument in the load path, and the two values differed by almost exactly my system weight, that I had cause to check.

I hold a doctorate in this field and read the methodological literature in this area. If I carried that assumption for 10 months, I would be surprised to find I was the only one.

The practical consequence is a matter of scale. In my own case the difference between the two conventions was 118.4 kg, which is more than half of the net force produced on the first pull.

- A practitioner who assumes net force is being reported will substantially overestimate the force an athlete has produced.
- Comparison against published normative data requires knowing which convention those norms used.

- Comparison between athletes of differing body mass is confounded when gross force is used, because a heavier athlete records a higher value for the same pulling effort.
- Longitudinal tracking of an individual is affected by any change in body mass between assessments, which may be precisely the variable an intervention is targeting.
- Comparison against another measurement system, as in Section 6.4, becomes impossible without knowing what each system reports.

None of this makes the current behaviour incorrect. It does mean that a user who has not thought carefully about it may draw conclusions the data does not support.

7.4 Suggestions

- State explicitly within the application and the supporting documentation which convention is used for reported peak force.
- Consider displaying both gross and net values, or offering a user-selectable preference, since different practitioners and research contexts require different conventions.
- Where a net value is calculated, make clear whether body mass alone or total system weight has been subtracted. These differ whenever the athlete is supporting a bar that is not independently fixed, which is the normal case in a portable setup.

I must reiterate that I raise this as a user rather than as a critic of the software. The value reported is a defensible choice. Making that choice visible would simply remove a source of misinterpretation that I suspect is fairly common among practitioners using force plates for this test.

8. NON-STANDARD APPLICATIONS AND EXPERIMENTAL TESTING

One of the most interesting aspects of my experience with CableMate was exploring applications beyond conventional isometric strength assessment.

The device's compact form factor, versatility, and ability to quantify tensile force invite broader experimentation.

In practice, the limiting factor often becomes the creativity of the practitioner and their ability to construct a safe, mechanically appropriate testing configuration.

Two examples are outlined below.

8.1 Sled Breakaway Force Assessment

I used CableMate to explore the force required to initiate movement of a stationary resistance sled.

This involved using the linear dynamometer to measure the tensile force generated during the initial pulling phase, with particular interest in the force associated with overcoming the sled's initial resistance to movement.



Figure 27: Testing Sled Breakaway Force

Although outside the device's typical isometric testing applications, this is an interesting use case.

The mechanical resistance experienced during sled pulling is influenced by multiple factors, including:

- Total sled and external load.
- The contact surfaces between the sled and the ground.
- Surface friction characteristics.
- Pulling angle and direction.
- Static versus dynamic frictional behaviour.

Quantifying the initial breakaway force could potentially provide a useful way to characterise resistance across different sled loads or training surfaces.

From an applied strength and conditioning perspective, this may help practitioners investigate how changes in loading or surface conditions influence the mechanical resistance imposed on an athlete.

It is important to distinguish this application from measuring an athlete's maximum isometric strength: the primary objective here is to characterise an external mechanical resistance.

Further investigation would be required to establish the repeatability of the procedure and the extent to which measured peak forces represent true breakaway resistance rather than transient loading effects.

Nevertheless, CableMate offered an interesting and practical means of exploring this relationship.

Supporting evidence

- *Sled Breakaway Force Testing (video)*
- *Sled Force Raw Data (.CSV)*

8.2 Resistance Band Calibration

A second experimental application involved using CableMate to assess the tensile resistance of an elastic resistance band.

The intention was to investigate the relationship between band elongation and the resulting tensile force.



Figure 28: Resistance Band Calibration

Resistance bands are widely used in rehabilitation, sports performance, and strength training, yet their actual loading characteristics are not always well defined. Resistance varies according to the band material, initial length, percentage elongation, and mechanical properties of the elastic material.

The ability to quantify resistance at different elongations has several potentially useful applications. These include developing more precise loading guidelines for rehabilitation exercises, comparing resistance characteristics between different bands, and documenting changes in resistance associated with wear or repeated use.

A standardised assessment of force at defined elongations could also provide practitioners with a useful reference when prescribing band-based exercises.

Once again, this application demonstrates the broader potential of a compact linear dynamometer beyond its conventional strength-testing role.

For more rigorous calibration, considerations would include preconditioning the band, controlling elongation rate, specifying starting length, and accounting for hysteresis and repeated-loading effects.

Supporting evidence

- Resistance Band Calibration (Video)
- Band Calibration Raw Data (.CSV)

8.3 Broader Implications of Experimental Applications

These two applications may initially appear relatively niche or unconventional.

However, they highlight what I consider to be CableMate's greatest underlying advantage:

> **The ability to quantify tensile force in a wide range of practical environments without reliance on a large, fixed testing apparatus.**

For practitioners with an interest in biomechanics, exercise physiology, sports performance, rehabilitation, or applied equipment testing, this creates numerous opportunities.

The technology is not inherently limited to a predetermined list of exercises. Provided the required loads remain within the instrument's rated capacity and the measurement configuration is mechanically appropriate, the range of possible applications is substantial.

This flexibility deserves to be emphasised as one of CableMate's defining characteristics.

9. PRODUCT DEVELOPMENT OPPORTUNITIES: MODULAR ATTACHMENTS

9.1 Concept Overview

One additional idea arose during my evaluation.

Would it be feasible to develop a dedicated handgrip dynamometer attachment or housing into which the existing CableMate unit could be inserted?

I currently use a standalone handgrip dynamometer in the laboratory, rated to 200 kg.

The GD Dyno-200 (Link to product here: GD DYNO-200 – Cannon PowerWorks)



Figure 29: GD Dyno-200

This led me to consider whether CableMate's existing force-measurement capabilities could be adapted through a purpose-designed mechanical accessory to perform conventional handgrip strength assessments.

Supporting Video

- GD Dyno-200

9.2 Proposed Design

The concept would involve a compact, purpose-built mechanical housing or external frame that accommodates the CableMate unit.

The housing would incorporate a conventional handgrip interface with appropriately designed handles and mechanical force transmission.

When the participant squeezes the handles, the applied grip force would be transmitted through the mechanism to the CableMate's sensing system.

The intention would be to leverage the existing dynamometer and software platform rather than requiring an entirely separate electronic measurement instrument.

In principle, this could allow CableMate to function as a modular handgrip dynamometer.

Direction of loading

It is worth being explicit about the direction of loading because it largely determines how difficult this would be to realise.

Although the participant applies a compressive squeeze at the handles, a sliding linkage converts that input into linear tension across a sensing element positioned between the arms. The CableMate would therefore be measuring load along the axis it is already designed, rated, and calibrated for. The GD Dyno-200 pictured above operates on this principle.

> **This concept requires no measurement capability the CableMate does not already have. It is a mechanical design problem rather than a sensing one.**

That distinguishes it sharply from the handheld dynamometry concept discussed in Section 9.3, which does depend on compressive measurement and on a validation programme to support it. Of the two ideas in this section, the handgrip housing is by some margin the more straightforward and could in principle be prototyped around the existing device without any change to hardware or firmware.

Mechanical efficiency and frictional losses, consistency of transmission across different grip positions, adjustable handle spacing, frame stiffness, and calibration of the complete handle-and-sensor assembly would all still need to be worked through. None of these are novel problems, and all are well understood within the existing handgrip dynamometer market.

9.3 Handheld Dynamometry and Maximal Voluntary Isometric Contraction

The compression observation from earlier prompted a broader and, I think, more commercially significant thought.

Handheld dynamometers are widely used in physiotherapy, rehabilitation, sports medicine, and clinical research for the assessment of maximal voluntary isometric contraction (MVIC). Devices such as the VALD DynaMo Plus, the ActiveForce 2 and the Hoggan microFET2 occupy this space and are familiar to most practitioners working in musculoskeletal assessment.



Figure 30: VALD DynaMo Plus



Figure 31: ActiveForce 2



Figure 32: Hoggan microFET2

These devices are typically used by positioning the unit between the clinician's hand and the participant's limb, with the participant producing force against it, in either a make test or a break test. The applied loading at the device is, in most configurations, compressive.

The question this raises

Having observed the CableMate register compressive force, the obvious question follows:

> **Why could the CableMate not be configured, through an appropriate attachment, to perform the same role as a dedicated handheld dynamometer?**

The reason this seems worth asking is that the CableMate already provides almost every component such a device requires.

- A load cell with a measurement range substantially exceeding that required for most clinical MVIC testing.
- An established wireless connection to an iPad.
- A mature application with athlete profiles, exercise configuration, and a test history.
- Live force–time display, which is valuable for both practitioner feedback and participant motivation.
- An adjustable force-trigger threshold.
- Raw data export.

What it currently lacks for this application is a suitable physical interface and, critically, validation of its performance in compression.

Potential value of such an accessory

If this proved feasible, the practical proposition would be unusual within the current market: a single instrument, a single application and a single athlete database covering both tension-based cable and strap testing and compression-based handheld assessment.

For a physiotherapy practice, a rehabilitation clinic or a multidisciplinary facility, the appeal of consolidating onto one measurement platform, rather than maintaining separate devices with separate software and separate data, would be substantial.

It would also position the CableMate within a considerably larger addressable market than cable-based isometric testing alone, and alongside products that are already well established and well understood by the practitioners who would be buying it.

What would need to be established

This is a considerably more demanding proposition than the handgrip housing. That concept needs no new sensing capability, whereas this one rests on compressive measurement being validated, and clinical measurement carries a higher validation burden in any case. The following would need to be addressed:

- Confirmation that the sensing element is specified, or can be specified, for bidirectional loading.
- Calibration of the device in compression, with its own accuracy and linearity specification.
- Concurrent validity against established handheld dynamometers across a range of muscle groups and force magnitudes.
- Test–retest reliability in the hands of multiple assessors.
- A standardised contact pad geometry since contact area and pad compliance influence both measurement and participant comfort.
- Ergonomics for the assessor, who must stabilise the device while resisting the participant's maximal effort.
- Clear guidance distinguishing make and break testing protocols, as the two are not interchangeable and produce systematically different values.
- Consideration of whether assessor strength becomes a limiting factor, as it does with existing handheld devices.

> **I would note that assessor-dependent limitations are a well-recognised constraint of handheld dynamometry generally, rather than a shortcoming specific to any one device. Any product entering this space inherits them.*

A note on scope

I am conscious that I am extrapolating a long way from a single informal observation of a device being squeezed between two hands. The distance between that observation and a validated clinical instrument is considerable, and I would not want to overstate it.

Equally, the component that is usually hardest to develop; the sensor, the connectivity, and the software ecosystem, already exists and works well. What is missing is an interface and a validation programme. That strikes me as a favourable position from which to assess an opportunity.

9.4 Commercial Potential

A modular handgrip attachment could reinforce CableMate's identity as a multipurpose force-measurement platform.

It would allow CC Athletics to expand the functionality of an existing product through a comparatively compact accessory rather than introducing an entirely separate electronic instrument.

Subject to engineering feasibility and validation, this could provide a worthwhile opportunity for product differentiation and accessory-based revenue.

I would be very interested to hear whether this concept has previously been considered by the team.

Considered together, the two concepts outlined above suggest a potential development pathway rather than two unrelated accessory ideas.

CONCEPT	PRIMARY MARKET	DEVELOPMENT BURDEN
Handgrip housing	Sports science, S&C, general performance monitoring	Moderate; mechanical design and calibration
Handheld MVIC attachment	Physiotherapy, rehabilitation, sports medicine, clinical research	Higher; clinical validation required

10. CONSOLIDATED FINDINGS AND RECOMMENDATIONS

AREA	EVALUATION	RECOMMENDATION	PRIORITY
Delivery & packaging	Excellent protection and presentation	Retain current standard	Maintain
Carrying case	Premium construction and presentation	Retain current design approach	Maintain
Carabiners	High-quality appearance and finish	Retain dark finish	Maintain
Ratchet straps	Excellent design; graduated markings particularly valuable	Retain and emphasise standardisation benefits	Maintain
Attachment fastener/nut	Minor superficial corrosion/rust on arrival	Review fastener specification and quality control	Low
Initial setup	Straightforward, intuitive connection	Retain ease of configuration	Maintain
iPad application	Excellent visual design and live force feedback	Preserve as a core product strength	Maintain
Keyboard behaviour	Intermittent switching to numerical layout	Investigate text-entry behaviour across devices and versions	Low-Moderate
Isometric testing	Smooth operation across varied configurations	Continue supporting flexible test setup	Maintain
Trigger threshold	Useful adjustable function	Retain functionality	Maintain
Non-standard applications	Promising use in sled and resistance-band assessment	Explore and document additional supported use cases	Exploratory
Handgrip attachment	Operates in tension; needs no new sensing capability	Conduct preliminary mechanical feasibility assessment	R&D
Ratchet strap strength	Sustained in excess of net 330 kg in series without structural failure	Retain current specification	Maintain
Device overload tolerance	Continued to function at approx. 137% of rated capacity	Define overload margin and post-overload recalibration guidance	Moderate
Compression response	Registered upwards of 63 kg under compressive load	Establish whether bidirectional measurement can be validated	R&D - priority
Handheld MVIC attachment	Potential entry into clinical handheld dynamometry	Assess feasibility of a validated compression interface	R&D
Concurrent agreement	Within approx. 2% of force plates across 104–287 kg; CableMate reads slightly lower	Investigate sampling rate and filtering as the likely source; consider a fuller method-comparison study	Recommended
Force plate reporting	Peak force reported inclusive of body mass and supported load	State the convention explicitly; consider offering both gross and net values	Moderate

11. ADDITIONAL CONSIDERATIONS FOR FUTURE DEVELOPMENT

Based on my experience with the device, there are several additional areas that could be worth exploring.

11.1 Standardised Testing Protocol Library

Given the large variety of possible assessments, an expanded collection of standardised testing protocols could be a valuable resource.

These might include recommendations or in-app videos regarding body positioning, joint angles, stabilisation, attachment configurations, contraction duration, and familiarisation procedures.

Such resources would support consistency between practitioners and improve the quality of longitudinal strength monitoring.

11.2 Expanded Demonstrations of Alternative Applications

The sled and resistance-band experiments suggest there may be considerable value in highlighting unconventional uses of the device.

A small collection of application demonstrations could help users better appreciate CableMate's versatility.

Any published demonstrations should clearly specify safe load limits, suitable attachment configurations, and whether the procedure has undergone formal validation.

11.3 Documentation of Load Limits and Overload Behaviour

Arising from the testing described in Section 6, it may be worth expanding the product documentation to address load limits more explicitly.

Useful additions might include the rated capacity alongside any safe overload margin, guidance on what a user should do if a unit is known to have been overloaded, and an indication of whether calibration can be verified in the field or requires return to the manufacturer.

Practitioners working with strong athletic populations will occasionally exceed a 200 kg limit, and clear guidance would allow them to respond appropriately rather than either ignoring the event or withdrawing a functioning device unnecessarily.

12. OVERALL CONCLUSION

My experience with the CC Athletics CableMate has been overwhelmingly positive.

From the initial delivery and unboxing experience through to the practical testing sessions, the product consistently presented as a carefully designed, highly capable piece of equipment.

The quality of the carrying case, carabiners and graduated ratchet straps deserves particular recognition. These components contribute meaningfully to the product's presentation, practicality, and overall user experience.

Initial setup was straightforward, the iPad interface is visually excellent, and the real-time force feedback is an especially impressive feature.

Across the range of isometric assessments performed, the unit operated smoothly and proved adaptable to numerous testing positions and muscle groups.

The two issues identified; superficial corrosion on an attachment fastener and; intermittent keyboard switching within the application, are comparatively minor and, in my opinion, readily addressable areas for product refinement. Neither materially affected my overall assessment.

Perhaps the most significant takeaway from this evaluation is that CableMate should not be viewed exclusively as an instrument for conventional isometric strength testing.

Its portability and adaptability create substantial potential for broader applications involving tensile-force measurement. My experimental use of the device for sled breakaway-force assessment and resistance-band calibration provided useful examples of how its capabilities could extend into applied biomechanics and equipment assessment.

The device also proved considerably more robust than I had expected. Deliberate overload testing took the supplied straps beyond net 330 kg and the device itself beyond 275 kg, approximately 137% of its rated capacity, without structural failure in either case. I would stress that this demonstrates mechanical robustness rather than measurement accuracy under overload, and that I would not encourage others to repeat the exercise.

The most significant finding of the evaluation, however, was entirely unplanned. The device registers force applied in compression as well as in tension. That single observation reframes what the CableMate might become.

Furthermore, there is a genuinely interesting opportunity to investigate modular accessories: a handgrip dynamometer housing, and a handheld attachment for clinical MVIC assessment of the kind performed with the VALD DynaMo Plus, ActiveForce 2 or Hoggan microFET2.

The latter rests on one question that CC Athletics is uniquely placed to answer quickly: whether the sensing element can measure compressive load to a defined and validated standard. I would suggest that is the single most valuable question arising from this evaluation.

Separately, the concurrent comparison against force plates reported in Section 6.4 was the most reassuring result of the evaluation. Agreement to within approximately 2% across a range of roughly 104 kg to 287 kg, from a portable device measured against research-grade plates, is a good outcome, and the consistency of the small difference suggests a systematic cause that should be identifiable.

I would encourage the team to extend that comparison into a fuller method-comparison study. It is inexpensive, it would establish the device's agreement with a reference properly rather than indicatively, and independent agreement data is genuinely useful to practitioners choosing between measurement systems.

Ultimately, I consider versatility to be CableMate's greatest strength.

The ability to incorporate a compact force-measurement instrument into a wide variety of testing environments is an exceptionally attractive proposition for practitioners working across sports science, strength and conditioning, and rehabilitation.

I would like to commend the CC Athletics team for the quality of the product developed to date. The attention to detail is evident, the overall user experience is excellent, and there is considerable scope to build upon an already impressive platform.

I hope the observations and suggestions provided in this report are useful to the team as CableMate continues to evolve.

Thank you.

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