

# Mecmesin

testing to perfection

## CrimpTest-1 kN Operation and Installation Manual



# CrimpTest-1 kN Operation and Installation Manual

Thank you for choosing a Mecmesin CrimpTest-1 kN. Used correctly, this rugged tester will give many years of reliable service in regular working environments.

This manual is to guide you in its operation, care and capabilities. Please read this manual before operating the device, if you or others are unsure of the device operation consult your local Mecmesin agent for further support.

The firmware referenced in this document is V3.0.2, for the change log associated to this version of firmware please see **Section 13**.

## Important

It is essential that you familiarise yourself with the contents of this *Manual* and the separate *Guide to Safe Use of Mains Powered Test stands* (part no. 431-398) before attempting to operate your Mecmesin CrimpTest-1 kN test stand.

2018 © Mecmesin Ltd, supplied with Mecmesin test systems and not for redistribution

Part no. 431-461-03

# Contents

---

<b>1. Overview</b>	<b>5</b>
Supplied With Your Tester	6
Optional Fixtures	6
Safety	6
<b>2. CrimpTest-1 kN System Diagram</b>	<b>7</b>
<b>3. Attaching and Changing Fixtures</b>	<b>8</b>
<b>4. The Control Panel</b>	<b>11</b>
<b>5. Settings</b>	<b>12</b>
<b>5.1 Units</b>	<b>12</b>
<b>5.2 Edit test</b>	<b>12</b>
Speed	12
Upper Load and Lower Load	12
Break Threshold	14
<b>5.3 Printer settings</b>	<b>14</b>
Enabled	14
Baud	14
Result	14
Auto Print	14
<b>5.4 PIN Code</b>	<b>14</b>
<b>5.5 Languages</b>	<b>14</b>
<b>5.6 Information</b>	<b>14</b>
<b>6. The Test Display</b>	<b>15</b>
<b>6.1 Pre-Test Display</b>	<b>15</b>
<b>6.2 Test Running Display</b>	<b>15</b>
<b>6.3 Test Paused Display</b>	<b>16</b>
<b>6.4 Test Completed Display</b>	<b>16</b>
<b>7. Pull Testing</b>	<b>17</b>
<b>7.1 Crimped wire terminals</b>	<b>17</b>
<b>7.2 Cable ties</b>	<b>18</b>
<b>8. Internal ELS Firmware Upgrade</b>	<b>19</b>

Step 1 - Starting the Upgrade	19
Step 2 - Flashing the Device	20
<b>9. Table of Pull-out Values</b>	<b>21</b>
<b>10. Servicing, Maintenance and Repair</b>	<b>22</b>
10.1 Servicing and calibration	22
10.2 Cleaning	22
10.3 Repair	22
<b>11. Specification</b>	<b>23</b>
<b>12. Declaration of Conformity</b>	<b>24</b>
<b>13. Change Log</b>	<b>25</b>
<b>14. Operator Notes</b>	<b>26</b>

# 1. Overview

---

The CrimpTest-1 kN is horizontal test stand designed to pull test crimped, soldered or welded wire terminals to a force of 1 kN.

Typically, this unit is suitable for wires up to AWG 10. It has interchangeable fixtures for handling wires of various gauges and terminals of different types, as well as an optional bollard fixture for testing cable ties.

It has four pre-set constant speeds (25, 50, 100 and 200 mm/min) to conform to international test standards:

- ASTM B913: Standard Test Method for Evaluation of Crimped Electrical Connections to 16-Gauge and Smaller Diameter Stranded and Solid Conductors
- SAE AS39029 and AS7928: general specification for terminals, lug: splices, conductor: crimp style, copper
- IEC 60352-2: solderless crimped connections
- BS 5G 178 (Part 1): crimped joints for aircraft electrical cables and wires
- DEF STAN 59-71 : crimped electrical connectors for copper conductors
- ISO 1966: crimped joints for aircraft electrical cables
- NASA-STD-8739.4: space applications, crimping, cabling and harnessing

The CrimpTest-1 kN displays current speed, current load, peak load achieved and user-set pass-fail status.

The unit is powered by an external 24 V supply, it is important only the Mecmesin supplied unit is used with the test stand. The casing is IP52 rated against ingress of dust, particles and water droplets. Clean the unit by using a damp cloth with mild detergent, and remove wire fragments regularly using a soft brush.

The CrimpTest-1 kN is designed for up to 16 hours use per day. The unit should be used in environments from 10° to 40° C.

There are no internal user-serviceable parts, attempting to open the unit will invalidate any warranty.

## Supplied With Your Tester

- CrimpTest-1 kN test unit,
- Rotating crimp receptacle with stepped ring terminal pin,
- Wire cam grip,
- Certificate of calibration,

## Optional Fixtures

- Large wedge-action terminal grip (part no. 432-607),
- Small wedge-action terminal grip (part no. 432-606),
- Cable tie break fixture (part no. 432-653),

## Safety

The CrimpTest-1 kN is designed for a working load up to 1 kN.

If the tester reaches 1 kN, the moving grip will stop and return to the start position.



Any tensile test, especially at higher forces, can result in the ejection of particles, and wire testing will leave sharp fragments. Wear safety gloves and/or eye protection in accordance with workplace requirements.

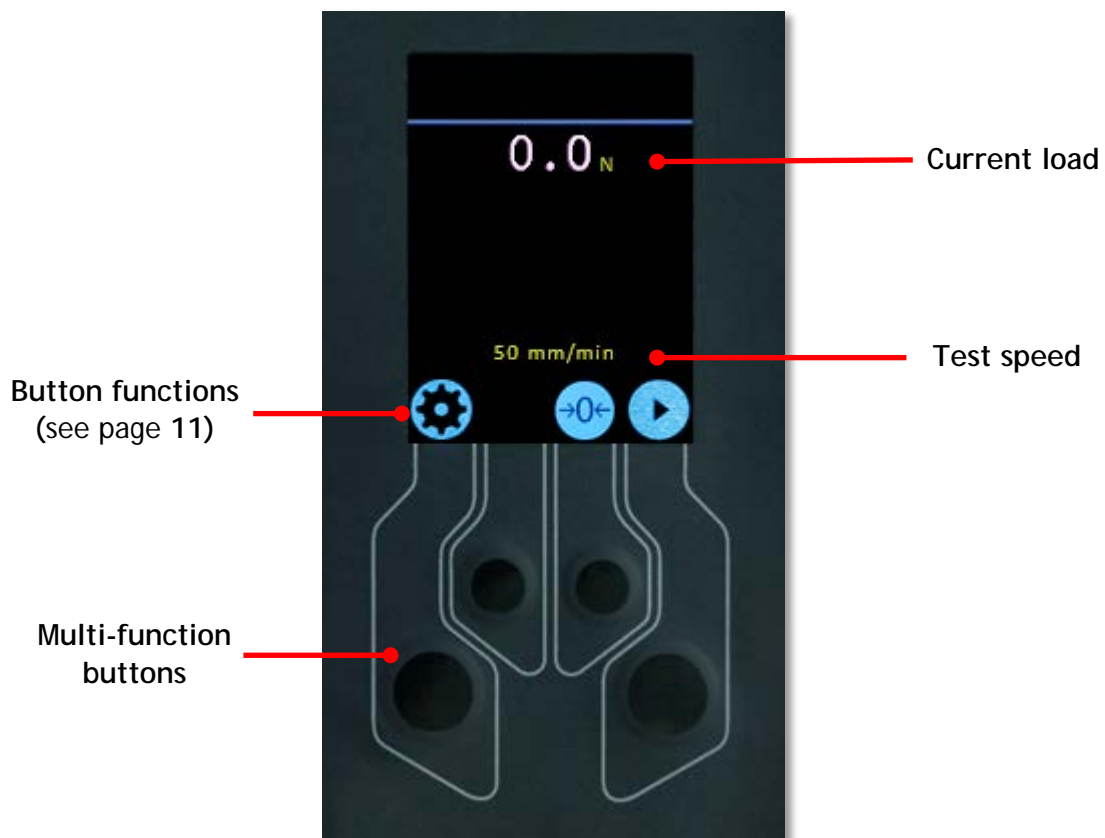


To avoid the possibility of injury, do not place your fingers in the test area while a test is in progress.

## 2. CrimpTest-1 kN System Diagram



When first switched on, the unit will display the VectorPro icon and current firmware version. Press the tick button and the unit will be ready for testing using its current settings. The control and display will look like this:



### 3. Attaching and Changing Fixtures

---

The CrimpTest-1 kN has interchangeable fixtures. You will need an M5 Allen key to remove and attach these.

#### Rotating Crimp Receptacle - Part No. 432-605



The RCR has nine graded slots and a stepped pin for ring terminals. Two countersunk M5 screws secure the mounting plate to the tester. A central M5 screw attaches the RCR to the mounting plate.

#### Wire Cam Grip - Part No. 432-660



This fixture holds the tail of the wire using a rotating cam. It is secured to the lower mounting point by two M5 cap-head bolts. The cam grip fixture is designed to work with a wide range of wire gauges for maximum usability.



## Large Wedge-Action Terminal Grip - Part No. 432-607



The quick release spring action allows easy loading and unloading of samples. Two M5 cap-head bolts secure the wedge-action terminal grip mounting plate to the tester. Suitable for wire with a diameter up to 8mm.

## Cable Tie Break Fixture - Part No. 432-653



The stepped cable tie bollards are symmetrical allowing for easy use and fitment. The stepped design allows the fixture to test an array of common cable tie sizes. Two M5 cap-head bolts secure each section of the fixture.

## Calibration Checking Rig - Part No. 432-671














The calibration checking rig is used to support the unit securely whilst hanging calibrated masses off the loadcell. The kit includes complete instructions for easy checking of your devices calibration.

## 4. The Control Panel

---

The icons located at the bottom of the display indicate the action of the physical control buttons. Below is a table detailing each of the icons and their action:

Icon	Action
	Settings menu to select units of measurement, speed and test criteria, printer settings, and language.
	Go back one level
	Confirm selection
	Move up a list or increase value
	Move down a list or decrease value
	Clear (Zero) the force reading
	Start a test
	Pause the test
	Stop a test (or test ended)
	Return a stopped test to the start position
	Send current test value to the printer

# 5. Settings

---

## 5.1 Units

Select your desired force and displacement units, the available options are:

Speed	Force
mm/min,	N,
mm/sec,	gf,
in/min,	kgf,
in/sec,	ozf,
	lbf,
	mN,
	N

## 5.2 Edit test

Configure your test speed, load limits and break threshold using the following options:

### Speed

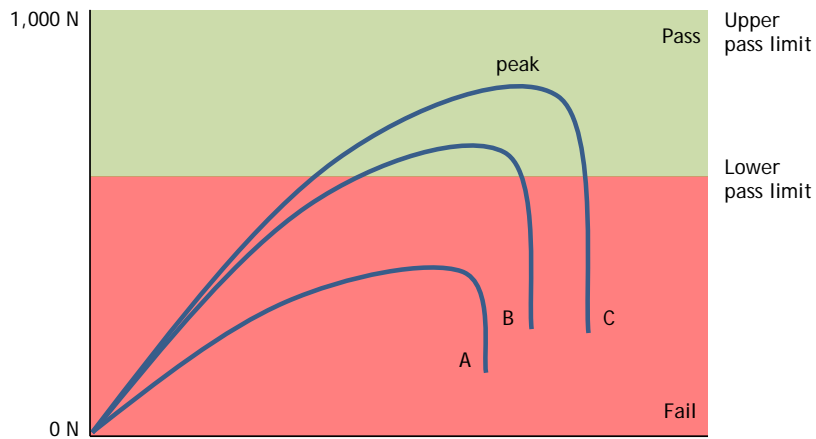
Select a speed for the required test standard: 25, 50, 100 and 200 mm/min (1, 2, 4, 8 in/min).

### Upper Load and Lower Load

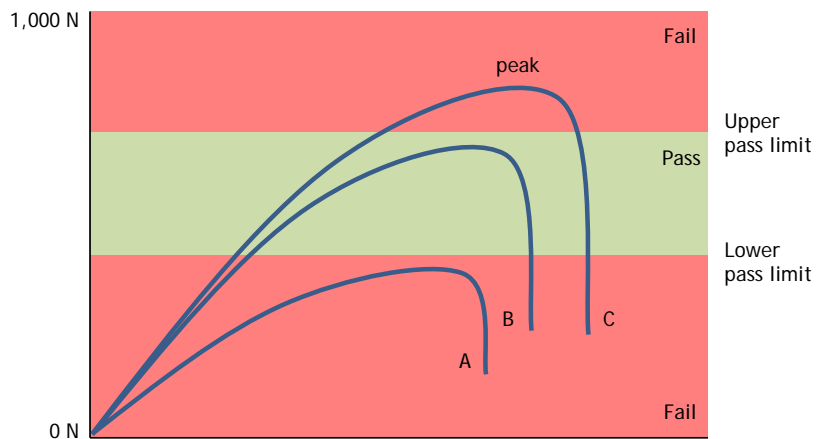
The upper and lower load limits are used to set the 'Pass' or 'Fail' criteria for your test sample.

To fail only samples that achieve a peak load below a certain value, set the upper load as 1000 N and the lower load as your desired threshold. This can be seen in the first graph, located on the next page.

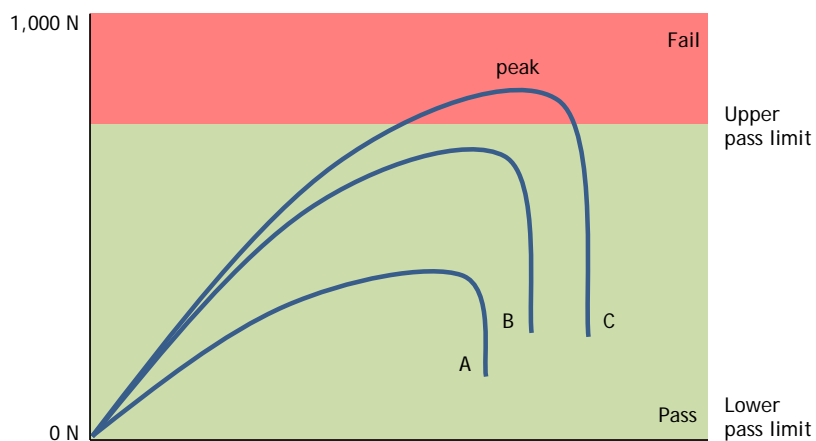
Here 'Sample A' fails because its peak load is too low, all samples below the lower pass limit will fail.



To pass only samples that achieve peak load within a *passband*, set both upper and lower load values. Here, only 'Sample B' passes the other two samples peak values are outside of the pass/fail bands.



For connectors designed to fail below a certain load, set the lower load to zero and the upper load to the fail limit. Here, 'Sample C' fails, the other two samples pass.



## Break Threshold

This is the percentage the reading must drop from the last max value for a break condition to be detected. For example, if set to 90% a specimen pulled to 100N would need to exhibit a sharp drop from 100N to 10N for a break condition to be detected. You can use this menu to set your desired break threshold.

## 5.3 Printer settings

The CrimpTest-1 kN can be connected to a serial (RS232) printer or data terminal, via the RJ11 socket on the back panel.

### Enabled

Select 'Yes' to reveal the settings features below.

### Baud

Select the required Baud rate for your printer, from 9600 to 115,200.

### Result

Select 'Yes' to include 'Pass' and 'Fail' in the results print.

### Auto Print

Select 'Yes' for automatic export after each test. If you select 'No', you will still be able to use the Print button after individual tests.

## 5.4 PIN Code

To set your own PIN code, use the arrow buttons to change each digit and the tick button to confirm each in turn. This will lock the settings menu; the specified PIN code will then be required to access the settings menu.

## 5.5 Languages

The tester can be operated in a number of languages. Use the arrow buttons to scroll to the required language, and press the tick button to confirm your choice. This setting is retained when the unit is switched off.

## 5.6 Information

This screen is used to display key information relating to your CrimpTest-1 Kn.

Here you can see hardware and firmware properties as well as the calibration date for the test stand and the number of overloads that have occurred.

# 6. The Test Display

---

## 6.1 Pre-Test Display



The pre-test display shows the current load reading at the centre of the display. The bottom control panel shows:

- **Settings icon:** To open the settings menu,
- **Print icon:** Prints the previous result (only present if a test has been completed),
- **Tare icon:** To zero the load reading,
- **Play button:** To start the test,

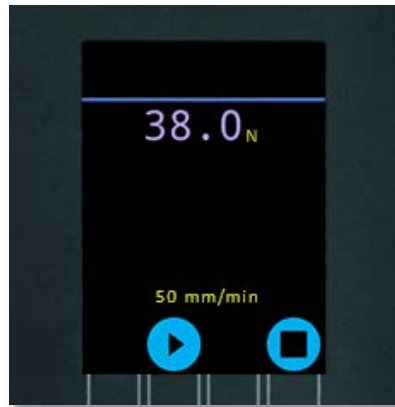
In addition to the above items, if a test has already been completed the peak reading and pass/fail result will be displayed at the top of the screen.

## 6.2 Test Running Display



The test running screen displays the current load, test speed and direction. The control panel at the bottom enables the test to be paused at its current position.

## 6.3 Test Paused Display



The test paused display gives you two options:

- **Play icon:** Continues the test from the current position,
- **Stop icon:** Ends the test at the current position. If pressed the stand will remain where it is, upon exiting the test completed screen, you will be presented with the option to return the stand to its home position.

If a test is stopped before completion, no result is shown and the value above the line is cleared (i.e. there is no result or peak to show).

## 6.4 Test Completed Display



The test completed display shows the peak load achieved at the top of the display and the test result in the centre of the screen. In the image above the test passed, this is indicated by the 'tick' icon. The control panel has two options:

- **Print icon:** Prints the results using the configured printer settings,
- **Back icon:** Takes you to the pre-test display ready for the next sample.

Upon test completion the stand will automatically move back to the home position, pressing the pause button during this operation will stop this movement. You can then either continue the movement, by pressing play or stop the home operation by pressing the stop icon.



# 7. Pull Testing

---

## 7.1 Crimped wire terminals

The CrimpTest-1 kN allows crimped terminals to be held below the crimp barrel, through the ring terminal or by using an appropriate gripping fixture. The opposite end of the wire is held using a quick release cam fixture.



Ring terminal

Push-fit terminal

Before starting your test, ensure the wire is a minimum of 140 mm long and is properly secured to the test stand at both ends. The test process consists of:

1. Secure the terminal using your preferred fixture,
2. Secure the wire tail in the cam fixture,
3. Set the test parameters, such as speed, load and pass/fail limits,
4. Press play to start the test,
  - The tester will display the increasing load as it draws the terminal away from the stationary cam fixture at a constant speed,
  - If the sample does not break between upper and lower set loads, the tester will pull to the top of its travel or the maximum loadcell capacity and return to the home position,

- If the sample breaks, peak force is displayed, along with a tick (pass) or cross (fail) and the tester will automatically return to its start position,
5. Record the result manually as required, or press the print button to send the results to an attached printer. Auto print can be set in the settings menu to automatically print the results at the end of the test,
  6. Remove the sample,

## 7.2 Cable ties

Cable ties can be tested using the stepped bollards:



To perform a test with a cable tie first fix the sample tightly around the most suitable steps for its length, then follow the process in the previous section to complete the test.

## 8. Internal ELS Firmware Upgrade

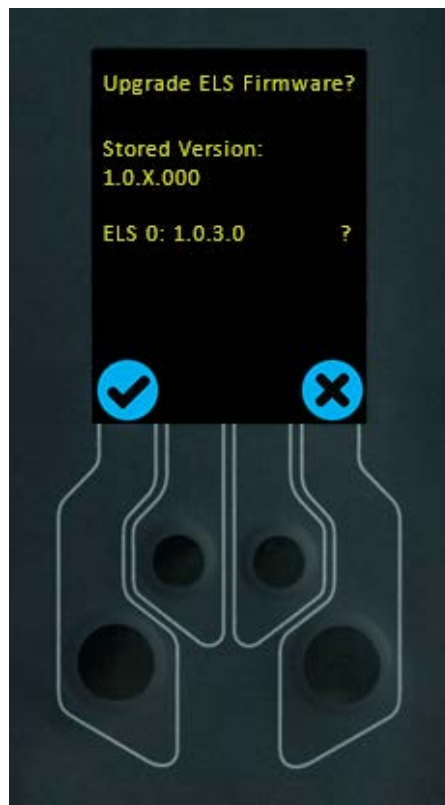
---

CrimpTest-1 kN test stands contain a Mecmesin Enhanced Load Sensor (ELS) device which provides load readings to the test stand.

This intelligent device contains its own firmware, which can be upgraded by the CrimpTest unit; typically, this will only occur if the CrimpTest's firmware has been updated.

### Step 1 - Starting the Upgrade

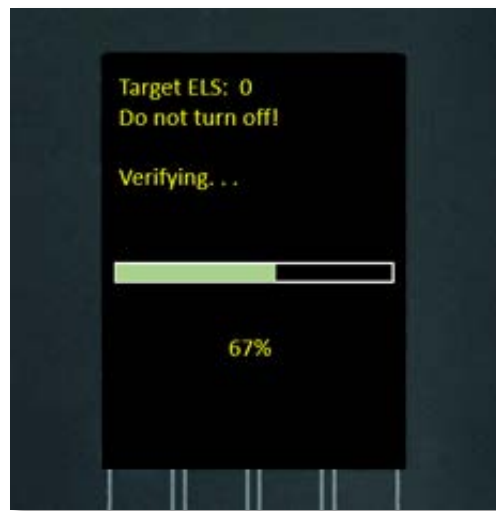
If the internal ELS requires an upgrade, you will be presented with the following screen upon powering up the device. This displays the current firmware version (ELS



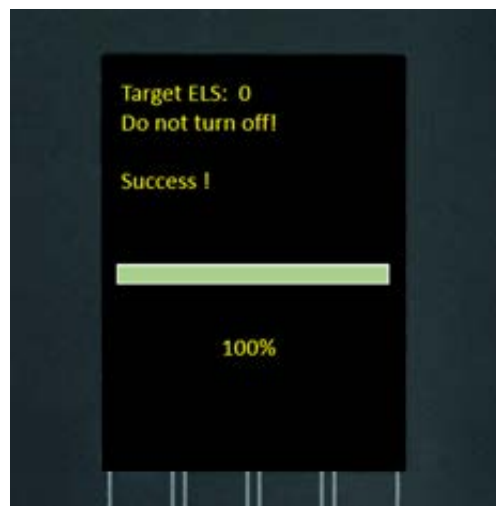
To update the internal ELS press the 'tick' icon. This will start the flashing process pictured below.

**Note:** If you press the 'Cross' icon the upgrade can be started manually by opening the information screen located within the settings menu and scrolling to the ELS firmware version. This will have a '\*' next to it, pressing the 'tick' icon will open the firmware upgrade screen pictured above.

## Step 2 - Flashing the Device



The flashing of the device is carried out automatically and progresses through several stages. It is important that the test stand is not turned off or disconnected. Disconnection of the ELS could lead to irreversible damage.



Once the process is at 100%, the display will indicate that the firmware upgrade has been successful.

You can check the version of the internal ELS firmware manually by accessing the 'Information' screen located in the 'Settings' menu, **See Section 5.4** for more information.

## 9. Table of Pull-out Values

Below is a table displaying the minimum pull strength of common wire sizes. Please consult your desired standard for full details on pull speed, sample description and test preparation, to ensure full compliance.

Values are shown in N (lbf) and rounded above 13 N (3 lbf).

AWG	SAE AS7928 Table II (MIL-T-7928G)	UL 486A terminals	BS EN / DIN EN / IEC 60352-2	NASA-STD 8739.4
30			6 (1.4)	
28			11 (2.5)	22 (5)
26	32 (7)		18 (4)	36 (8)
24	45 (10)		28 (6)	36 (8)
22	67 (15)	36 (8)	40 (9)	57 (13)
20	85 (19)	58 (13)	60 (13.5)	92 (21)
18	170 (38)	89 (20)	90 (20)	142 (32)
16	222 (50)	133 (30)	135 (30)	183 (41)
14	312 (70)	222 (50)	200 (45)	290 (65)
12	490 (110)	312 (70)	275 (62)	459 (103)
10	667 (150)	356 (80)	355 (80)	707 (159)
8	1,001 (225)	400 (90)	370 (83)	1,281 (288)

**Note:** SAE-AS-7928 replaced MIL-T-7928 and IEC 60352 replaced DIN 41611-3.

# 10. Servicing, Maintenance and Repair

---

The CrimpTest-1 kN contains no internal user-serviceable parts. Removal of the cover will invalidate the warranty.

## 10.1 Servicing and calibration

To ensure optimal safe performance, your tester must be regularly serviced and the load cell (a Mecmesin Enhanced Load Sensor – ELS) calibrated by Mecmesin Ltd or an authorised distributor.

If the tester is damaged in use, advise your local supplier and have the unit repaired to a safe working condition. Do not use the machine until it has been repaired.

Calibration can be checked using optional part no. 432-671 with accompanying manual (431-471).

## 10.2 Cleaning

Keep your CrimpTest-1 kN clean, removing loose debris with a soft brush, then wiping with a damp cloth with mild detergent. Under no circumstances should organic solvents or any other cleaning fluid be used.

## 10.3 Repair

If the machine fails or appears to behave in an unusual manner, contact your local supplier for support. Do not continue to use the machine until it has been checked and, if necessary, repaired, and returned to you in safe working condition.

# 11. Specification

CrimpTest-1 kN		
Rated capacity kN	kN	1
	kgf	100
	lbf	220
Load accuracy		±2 N (±0.2 kgf, ±0.4 N lbf)
Load resolution		0.1N (0.01 kgf, 0.02 lbf)
Overload		150%
Break definition		
Break event detected at		10% of peak load (90% drop from peak)
Speed		
Speed range	mm/min	25, 50, 100, 200,
	in/min	1, 2, 4, 8,
Speed accuracy		±0.2% of indicated speed
Dimensions		
Height		180mm (7")
Width		192mm (7.5")
Depth		500mm (19.5")
Weight		11 kg (24 lbs)
Electrical supply		
External adapter voltage output		24 V
Maximum power requirement (at 24V)		160 watts
Environment specification		
Operating temperature		10°C to 40°C
Ingress protection rating		IP52
Fixture capacity		
Slotted holder with terminal pin		9 slots, from 1.5 mm (1/16") to 8 mm (5/16") Stepped pin for 4, 6, 8, and 10 mm loops
Cam grip		Max. capacity 11 mm (0.4")
Large wedge grip		Max. capacity 8 mm (0.3")
Small wedge grip		Max. capacity 5 mm (0.2")
Warranty		
Warranty duration		2 years

# 12. Declaration of Conformity

Mecmesin Ltd  
Newton House  
Spring Copse Business Park  
Slinfold  
West Sussex, RH13 0SZ  
United Kingdom



Date of Issue 2<sup>nd</sup> August 2016

## EC DECLARATION OF CONFORMITY

We confirm that the Technical Construction Files for the product(s) identified on this certificate comply with the essential safety requirements of the following EU Council directives. Technical documentation to support this is available from the above address.

- Machineries Directive 2006/42/EU
- EMC Directive 2014/30/EU

They were tested to the following standards and other normative documents:

- EN 61000-6-1:2007 Electromagnetic compatibility (EMC). Generic standards.
- EN 61000-4-3:2006 +A2:2010 Electromagnetic compatibility (EMC). Testing and measurement techniques.
- EN 60204-1:2006 +A1:2009 Safety of machinery. Electrical equipment of machines. General requirements
- EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements
- EN 60950-1:2006 +A2:2013 Information technology equipment. Safety. General requirements

---

Primary Product Name(s): CrimpTest 1.0

Derivative Product(s): n/a

---

Signed on behalf of Mecmesin Ltd

---

Technical Director: Patrick Collins



Registered in England No. 1302639

431-DoC30-01 L00



# 13. Change Log

---

The following changes are inclusive to the Product: CrimpTest-1 and firmware version 3.0.2. These changes are in comparison to the previous version of firmware (V2.0.11.).

The firmware used in the CrimpTest test stand is also implemented in other Mecmesin products. There are additional changes that are not related to CrimpTest. The changes that directly affect the CrimpTest-1 kN are detailed below.

- Fix issue with load cell exceeding 1000N limit,
- Additional Menu Item “Information” Screen,
- Pin Code 0000 now disables PIN Code protection,
- Swedish Language option added,
- Polish Language option added,
- Test controls changed to include Pause/Stop/Continue operation,





# Mecmesin

testing to perfection

## Mecmesin : a world leader in affordable force and torque testing solutions

Since 1977, Mecmesin has assisted thousands of companies achieve enhanced quality control in design and production. The Mecmesin brand represents excellence in accuracy, build, service, and value. In production centres and research labs worldwide, designers, engineers, operators, and quality managers endorse Mecmesin force and torque testing systems for their high performance across countless applications.

[www.mecmesin.com](http://www.mecmesin.com)

Algeria	Estonia	Lithuania	Slovakia
Argentina	Finland	Macedonia	Slovenia
Australia	France	Malaysia	South Africa
Austria	Germany	Mexico	Spain
Bangladesh	Greece	Morocco	Sri Lanka
Belgium	Hungary	Myanmar (Burma)	Sweden
Brazil	India	Netherlands	Switzerland
Bulgaria	Indonesia	New Zealand	Syria
Cambodia	Iran	Norway	Taiwan
Canada	Ireland	Paraguay	Thailand
Chile	Israel	Peru	Tunisia
China	Italy	Philippines	Turkey
Colombia	Japan	Poland	UK
Costa Rica	Korea South	Portugal	United Arab Emirates
Croatia	Kosovo	Romania	Uruguay
Czech Republic	Kuwait	Russia	USA
Denmark	Laos	Saudi Arabia	Vietnam
Ecuador	Latvia	Serbia	
Egypt	Lebanon	Singapore	

The Mecmesin global distribution network guarantees your testing solution is rapidly delivered and efficiently serviced, wherever you are.



### Head Office - UK

Mecmesin Limited

w: [www.mecmesin.com](http://www.mecmesin.com)

e: [sales@mecmesin.com](mailto:sales@mecmesin.com)

### North America

Mecmesin Corporation

w: [www.mecmesincorp.com](http://www.mecmesincorp.com)

e: [info@mecmesincorp.com](mailto:info@mecmesincorp.com)

### France

Mecmesin France

w : [www.mecmesin.fr](http://www.mecmesin.fr)

e: [contact@mecmesin.fr](mailto:contact@mecmesin.fr)

### Asia

Mecmesin Asia Co. Ltd

w: [www.mecmesinasia.com](http://www.mecmesinasia.com)

e: [sales@mecmesinasia.com](mailto:sales@mecmesinasia.com)

### Germany

Mecmesin GmbH

w: [www.mecmesin.de](http://www.mecmesin.de)

e: [info@mecmesin.de](mailto:info@mecmesin.de)

### China

Mecmesin (Shanghai) Pte Ltd

w: [www.mecmesin.cn](http://www.mecmesin.cn)

e: [sales@mecmesin.cn](mailto:sales@mecmesin.cn)