



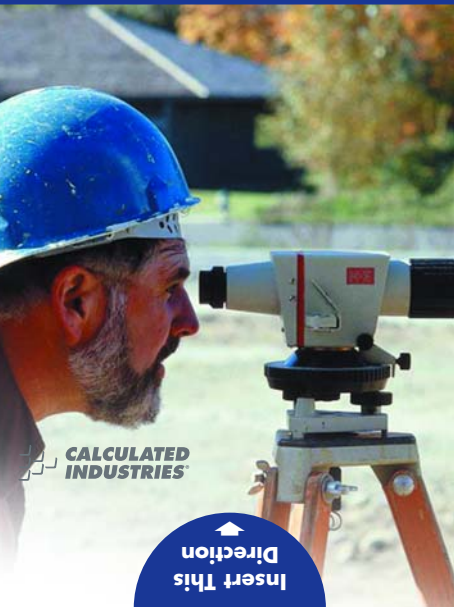
ULTRA MEASURE MASTER[®]



PROFESSIONAL GRADE U.S. STANDARD
TO METRIC CONVERSION CALCULATOR

Model 8025

Pocket Reference Guide



 **CALCULATED
INDUSTRIES[®]**


**Insert This
Direction**

ULTRA MEASURE MASTER®

The *Ultra Measure Master* calculator simplifies conversions between Metric and Imperial weights and measures. The *Ultra Measure Master* can convert the following types of dimensions:

- *Linear*
- *Area*
- *Volume*
- *Weight*
- *Temperature*
- *Linear Velocity*
- *Volumetric Velocity (Flow Rates)*
- *Pressure*
- *Bending Moment*

In addition to the above, the *Ultra Measure Master* performs dimensional calculations with ease!

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GETTING STARTED

KEY DEFINITIONS

Basic Function Keys



Arithmetic operation keys.



Four-function (+, -, x, ÷) percent key.



Keys used for entering numbers.



Off Key — Turns all power off.



On/Clear Key — Turns on power. Pressing once clears the display. Pressing twice clears all temporary registers.



Storage Key — Used to store values.



Recall Key — Recalls values stored in registers.



Convert Key — Used with dimension keys to convert dimensions, or with other keys to access special functions.

Miscellaneous Functions

- ←** Backspace Key.
- Conv** **←** (\sqrt{x}) Square Root.
- Rcl** **=** Paperless Tape.
- Conv** **Stor** Preference Settings.
- Conv** **÷** **(1/x) Reciprocal** — Finds the reciprocal of a number (e.g., **8** **Conv** **÷** 0.125).
- Conv** **×** **Clear All** — Returns all stored values to the default settings. (Does not affect Preference Settings.)
- Conv** **—** (+/–) Toggle.
- Conv** **+** Pi (π) 3.141593.
- Conv** **□** Total Cost (based on entry of per unit cost).
- Conv** **%** x^2 — Squares the value in the display.
- Conv** **/** Exponential Notation ($x10^y$).
- Conv** **0** **Board Feet (BD Ft)** — Enters or converts Cubic values to Board Feet
- Stor** **%** **Weight per Volume** — Stores a new *Weight per Volume* value.

Note: After entering a value and pressing **Stor** **%** continue pressing the **%** key until you've reached the desired *Weight per Volume* format. To recall your setting, press **Rcl** **%**.

Memory Functions

- M+** Memory Plus.
- Conv M+** (M-) Memory Minus.
- Conv Rcl** Clear M+.
- Rcl Rcl** Recall and Clear M+.
- Stor** **0** – **9** **Memory Storage** — When pressed after the **Stor** key, the **0** through **9** keys will store the displayed value into fixed Memory.
- Rcl M+** or **0** – **9** Recall M+ or M0 – M9.

Conversion Functions

- gal** **Gallon Key** — Enters or converts to Gallons.
- fl oz** **Fluid Ounces Key** — Enters or converts to fluid Ounces.
- liters** **Liter Key** — Enters or converts to Liters.
- mL** **Milliliter Key** — Enters or converts to Milliliters.
- tons** **Ton Key** — Enters or converts to Tons.
- lbs** **Pounds Key** — Enters or converts to Pounds.
- dry oz** **Dry Ounces Key** — Enters or converts to dry Ounces.

- kg** *Kilograms Key* — Enters or converts to Kilograms.
- grams** *Grams Key* — Enters or converts to Grams.
- m** *Meters Key* — Enters or converts to Meters.
- cm** *Centimeter Key* — Enters or converts to Centimeters.
- mm** *Millimeter Key* — Enters or converts to Millimeters.
- km** *Kilometer Key* — Enters or converts to Kilometers.
- miles** *Miles Key* — Enters or converts to Miles.
- Yds** *Yards Key* — Enters or converts to Yards.
- Feet** *Feet Key* — Enters or converts to Feet as whole or decimal number. Also used with the **Inch** and **/** keys for entering Feet-Inch values (e.g., **6 Feet 9 Inch 1 / 2**). Repeated presses during conversions toggle between Fractional and Decimal Feet.
- Inch** *Inch Key* — Enters or converts to Inches. Entry can be whole or decimal number. Also used with the **/** key for entering fractional

Inch values (e.g., **9** **Inch** **1** **/** **2**). Repeated presses during conversions toggle between Fractional and Decimal Inches.

/ **Fraction Key** — Used to separate the numerator and denominator when entering fractions: **1** **/** **2**.

← **Backspace Key** — Used to delete entries one key-stroke at a time (unlike the **On/C** key, which deletes the entire entry).

Conv **gal** **Gallons per Minute (gpm)** — Enters or converts to Gallons per Minute.

Conv **fl oz** **Fluid Ounces per Second (oz/sec)** — Enters or converts to fluid Ounces per Second.

Conv **liters** **Liters per Second (liters/sec)** — Enters or converts to Liters per Second.

Conv **mL** **Milliliters per Second (mL/sec)** — Enters or converts to Milliliters per Second.

Conv **tons** **Bars** — Enters or converts to Bars.

Conv **lbs**

Pounds per Square Inch (psi) — Enters or converts to Pounds per Square Inch.

Conv **dry oz**

Pounds per Square Foot (psf) — Enters or converts to Pounds per Square Foot.

Conv **kg**

Kilo Pascals (kPa) — Enters or converts to Kilo Pascals.

Conv **grams**

Mega Pascals (MPa) — Enters or converts to Mega Pascals.

Conv **m**

Meters per Minute (m/min) — Enters or converts to Meters per Minute.

Conv **cm**

Meters per Second (m/sec) — Enters or converts to Meters per Second.

Conv **mm**

Millimeters per Second (mm/sec) — Enters or converts to Millimeters per Second.

Conv **km**

Kilometers per Hour (km/h) — Enters or converts to Kilometers per Hour.

Conv **miles**

Miles per Hour (mph) — Enters or converts to Miles per Hour.

Conv **Yds**

Feet per Minute (ft/min) — Enters or converts to Feet per Minute.

- Conv Feet** **Feet per Second (ft/sec)** — Enters or converts to Feet per Second.
- Conv Inch** **Inches per Second (in/sec)** — Enters or converts to Inches per Second.
- Conv 9** **Newton-meters (N-m)** — Enters or converts to Newton-meters.
- Conv 8** **Foot-Pound (ft-lbs)** — Enters or converts to Foot-Pounds.
- Conv 7** **Inch-Pounds (in-lbs)** — Enters or converts to Inch-Pounds.
- Conv 6** **Acre-Feet (Acre-Ft)** — Enters or converts to Acre-Feet.
- Conv 5** **Acre** — Enters or converts to Acres.
- Conv 4** **Hectare** — Enters or converts to Hectares.
- Conv 3** **Fahrenheit (°F)** — Enters or converts to Fahrenheit.
- Conv 2** **Celsius (°C)** — Enters or converts to Celsius.
- Conv 1** **Metric Tons (met tons)** — Enters or converts to Metric Tons.

PAPERLESS TAPE FUNCTION

Rcl **=** *Paperless Tape* – Useful for checking figures, as it scrolls through your past 20 entries or calculations. Press **Rcl** **=** to access Paperless Tape mode. Press **+** or **-** to scroll forward or backward. Press **=** to exit mode and continue with a new entry or calculation. *See example below.*

Paperless Tape Example

Add 6 Feet, 5 Feet and 4 Feet, then access the paperless tape mode and scroll back through your entries. Then, back up one entry, exit the tape mode and add 10 Feet to the total.

KEYSTROKES	DISPLAY
On/C On/C	0.
6 Feet +	6 FEET 0 INCH
5 Feet +	11 FEET 0 INCH
4 Feet =	15 FEET 0 INCH
Rcl =	TTL= 15 FEET 0 INCH
+	01 6 FEET 0 INCH
+	02 + 5 FEET 0 INCH
+	03 + 4 FEET 0 INCH
-	02 + 5 FEET 0 INCH
=	TTL= 15 FEET 0 INCH
+ 1 0 Feet =	25 FEET 0 INCH

PREFERENCE SETTINGS

Press **Conv**, then **Stor**, then keep pressing **Stor** to toggle through the main settings. Press the **+** key to advance within sub-setting. Use the **-** key to back up. Press **On/C** key to exit Preferences.

PRESS

Conv AND:	SETTING--FUNCTION
<i>First press</i>	<i>Fractional Resolution:</i>
of Stor :	--1/64
+	--1/2
+	--1/4
+	--1/8
+	--1/16
+	--1/32
+	--1/64 (<i>repeats options</i>)
<i>Second press</i>	<i>Area Displays:</i>
of Stor :	--Std.
+	--0. SQ FEET
+	--0. SQ YD
+	--0. SQ M
+	--Std. (<i>repeats options</i>)
<i>Third press</i>	<i>Volume Displays:</i>
of Stor :	--Std.
+	--0. CU YD
+	--0. CU FEET
+	--0. CU M
+	--Std. (<i>repeats options</i>)
<i>Fourth press</i>	<i>Exponential Mode:</i>
of Stor :	--On
+	--OFF
+	--On (<i>repeats options</i>)

(Cont'd)

(Cont'd)

*Fifth press of **Stor**:*
+ --0.000 M
+ --FLOAt M (floating point)
+ --0.000 M (repeats options)

*Sixth press of **Stor**:*
+ --Std.
+ --COntSt
+ --Std. (repeats options)

Note: Press **On/C** at anytime to exit the Preference Settings.

FRACTIONAL SETTINGS

Fractional Resolution is permanently set via the Preference Settings (see **Preference Settings** section for instructions). To select other formats temporarily (e.g., 1/64, 1/32, etc.), see the example below:

Add 44/64 to 1/64 of an Inch and then convert the answer to other Fractional Resolutions:

KEYSTROKES	DISPLAY
On/C On/C	0.
4 4 / 6 4	0-44/64 INCH
+ 1 / 6 4 =	0-45/64 INCH
Conv 1 (1/16)	0-11/16 INCH
Conv 2 (1/2)	0-1/2 INCH
Conv 3 (1/32)	0-23/32 INCH
Conv 4 (1/4)	0-3/4 INCH
Conv 6 (1/64)	0-45/64 INCH
Conv 8 (1/8)	0-3/4 INCH
On/C On/C	0.

*Note: Changing the Fractional Resolution on a displayed value does not alter your Permanent Fractional Resolution Setting. Pressing **On/C** will return your calculator to the permanently set Fractional Resolution.*

Setting Fractional Modes

Standard Mode

In Standard Mode, the fractional result is reduced to its lowest common denominator (i.e., $8/16$ reduces to $1/2$).

Constant Mode

In Constant Mode, fractional results remain in the defined accuracy level (e.g., $1/2$ will be shown as $8/16$). Entries of higher accuracy values will temporarily override the fixed fraction setting (see **Preference Settings** section for instructions).

USING EXPONENTIAL NOTATION

Your calculator is defaulted to have exponential notation set to “on.” Therefore, any integer value exceeding seven digits will display in exponential format. When exponential notation is off, the calculator adjusts dimensioned values to a higher unit when the display limit is exceeded (known as Auto-Ranging); e.g., “20,000,000 mm” exceeds the seven-digit display, so “20,000 m” is displayed. This auto-ranging also applies to other dimensional units, such as Inches to Feet, Feet to Yards, etc.

To enter an exponential value, enter the main value, press **Conv** **/**, then enter the exponential power.

Entering Exponents

Enter 2.34×10^{-8} into the calculator.

KEYSTROKES

DISPLAY

2 **.** **3** **4**

2.34

Conv **/** **8**

2.34⁸

=

2.34000⁰⁸

CONVENTIONS AND UNITS OF MEASURE

CONVENTIONS

UNITS OF MEASURE

Linear

Inches
Feet
Yards
Millimeters
Centimeters
Meters
Miles
Kilometers

Area

Square Inches
Square Feet
Square Yards
Square Millimeters
Square Centimeters
Square Meters
Square Miles
Square Kilometers
Acres
Hectares

Volume

Milliliters
Cubic Inches
Cubic Feet
Cubic Yards
Cubic Millimeters
Cubic Centimeters
Cubic Meters
Cubic Miles
Cubic Kilometers
Acre-Feet
fluid Ounces
Liters

(Cont'd)

(Cont'd)

Volume <i>(cont'd)</i>	Gallons Board Feet
Temperature	Celsius Fahrenheit
Weight	Kilograms Grams dry Ounces Pounds Tons Metric Tons
Linear Velocity	Millimeters per Second Inches per Second Feet per Second Meters per Second Feet per Minute Meters per Minute Miles per Hour Kilometers per Hour
Volumetric Velocity <i>(Flow Rate)</i>	Milliliters per Second Liters per Second fluid Ounces per Second Gallons per Minute
Pressure	Pounds per Square Inch Pounds per Square Foot Kilo Pascals Mega Pascals Bars
Bending Moment	Inch-Pounds Foot-Pounds Newton-meters

BASIC MATH OPERATIONS

Your calculator uses standard chaining logic which simply means that you enter your first value, the operator (+, −, ×, ÷), the second value and then the equals key (=).

- A. (3) (+) (2) (=) 5.
B. (3) (−) (2) (=) 1.
C. (3) (×) (2) (=) 6.
D. (3) (÷) (2) (=) 1.5

This feature also makes the calculator simple to use for dimensional math.

Adding or Subtracting Dimensions

Examples:

KEYSTROKES	DISPLAY
------------	---------

1. Add 7 Feet 3-1/2 Inches to 11 Feet 4 Inches:

(7) (Feet) (3) (Inch) (1) (/) (2) (+)
(1) (1) (Feet) (4) (Inch) (=) 18 FEET 7-1/2 INCH

2. Add 25 psf to 12 psi:

(2) (5) (Conv) (dry oz) (+) (1) (2) (Conv) (lbs) (=)
PSF 1753.

3. Add 14 Gallons to 52 Liters:

(1) (4) (gal) (+) (5) (2) (liters) (=)
GAL 27.73695

4. Subtract 450 Acres from 5 Square km:

(5) (km) (km) (−) (4) (5) (0) (Conv) (5) (=)
3.178915 SQ KM

5. Subtract 32 mm from 8 Centimeters:

(8) (cm) (−) (3) (2) (mm) (=) 4.8 CM

Multiplying or Dividing Dimensions

Examples:

KEYSTROKES

DISPLAY

1. Multiply 5 Feet 3 Inches by 8 Feet 6-1/2 Inches:

5 Feet 3 Inch X 8 Feet 6 Inch 1 / 2 = 44.84375 SQ FEET

2. Multiply 50 Meters per Minute by 12.5:

5 0 Conv m X 1 2 . 5 = M/M 625.

3. Multiply 33.5 Gallons by 2.031:

3 3 . 5 gal X 2 . 0 3 1 = GAL 68.0385

4. Divide 20 Feet 3 Inches by 9:

2 0 Feet 3 Inch ÷ 9 = 2 FEET 3 INCH

5. Divide 30 mph by 2.5:

3 0 Conv miles ÷ 2 . 5 = MPH 12.

Percent Calculations

The percent key **%** can be used to find a percentage of a number or for working add-on, discount or division percentage calculations.

3 5 5	X	1 5	%	53.25
2 5 0	+	6 . 5	%	266.25
2 5	-	5	%	23.75
1 0 0	÷	5 0	%	200.

MEMORY OPERATION

Whenever the **M+** key is pressed, the displayed value will be added to the Memory. Other Memory functions:

FUNCTION	KEYSTROKES
Add to Memory	M+
Subtract from Memory	Conv M+
Recall total in Memory	Rcl M+
Display/Clear Memory	Rcl Rcl
Clear Memory	Conv Rcl

Memory is semi-permanent, clearing only when you:

- 1) turn off the calculator;
- 2) press **Rcl** **Rcl**;
- 3) press **Conv** **Rcl**;
- 4) press **Conv** **X** (*Clear All*).

When Memory is recalled (**Rcl** **M+**), consecutive presses of **M+** will display the calculated average and total count of the accumulated values.

Using M+

KEYSTROKES	DISPLAY
3 5 5 M+	M+ 355. M
2 5 5 M+	M+ 255. M
7 4 5 Conv M+ (<i>M-</i>)	M- 745. M
Rcl M+	TTL STORED - 135. M
M+	AVG - 45. M
M+	CNT 3. M
Rcl Rcl	M+ - 135.

Using Memory Storage Keys (M0 - M9)

In addition to the standard cumulative Memory (as previously described), your calculator has ten independent Storage Registers – M0 through M9 – that can be used to permanently store single, noncumulative values. The following example shows the use of M0 (**Stor** **0**). To use M1 through M9, replace the presses of the **0** key with presses of the corresponding number key (**1** through **9**).

You can replace a value in one of these Memory registers by storing a new value in place of the stored value.

<u>FUNCTION</u>	<u>KEYSTROKES</u>
Store single value in M0	Stor 0
Clear M0	0 Stor 0
Recall M0	Rcl 0


Examples:

Store 175 into M1, recall the value, and then clear the value.

<u>KEYSTROKES</u>	<u>DISPLAY</u>
1 7 5 Stor 1	M-1 STORED 175.
Off On/C	0.
Rcl 1	M-1 STORED 175.
0 Stor 1	M-1 STORED 0.

USING THE ULTRA MEASURE MASTER

ENTERING DIMENSIONS AND UNITS

When entering Feet-Inch dimensional values, you must enter the largest dimension first — Feet before Inches, Inches before fractions. To enter fractions of an Inch, enter the numerator (value above the line), press  (Fraction Bar key) and then enter the denominator (value below the line).

<i>numerator</i>	3
<i>fraction bar</i>	—
<i>denominator</i>	16

For all other units of measurement, you can only enter whole numbers or decimal numbers. You cannot enter combinations of units (for example, you cannot enter 12 Meters 6 Centimeters 4 Millimeters).

Linear Dimensions

The following examples show how linear dimensions are entered:

Note: The **On/C** key should be pressed after each of the entries below to clear the display.

DIMENSION	KEYSTROKES
5 Feet	5 Feet
1/2 Inch	1 / 2
5 Feet 1-1/2 Inch	5 Feet 1 Inch 1 / 2
10 Yards	1 0 Yds
17.5 Meters	1 7 . 5 m

Any units of measurement other than Inches must be entered as whole values (5 Yards) or decimal values (5.5 Meters), and not in combination with Feet and Inches or with themselves. For example, you cannot enter 12 Meters 6 Centimeters 4 Millimeters.

Square and Cubic Dimensions

Examples of how Square and Cubic dimensions are entered (press **On/C** after each entry):

DIMENSION	KEYSTROKES
5 Cubic Yards	5 Yds Yds Yds
130 Square Feet	1 3 0 Feet Feet
33 Square Meters	3 3 m m

CONVERSIONS

Linear Conversions

To convert a displayed linear value, press the **Conv** key, followed by the desired unit key. See below for examples.

Convert 27 Feet to other linear dimensions:

KEYSTROKES	DISPLAY
1. <i>Enter 27 Feet:</i> 2 7 Feet	27 FEET
2. <i>Convert to Inches:</i> Conv Inch	324 INCH
3. <i>Convert to Yards:</i> Conv Yds	9. YD
4. <i>Convert to Meters:</i> Conv m	8.230 M
5. <i>Convert to Kilometer:</i> Conv km	0.00823 kM
6. <i>Convert to Miles:</i> Conv miles	MILE 0.005114

Square and Cubic Conversions

To convert a displayed Area or Volume value, press the **Conv** key, followed by the desired unit key. See below for examples.

Examples

Convert 14 Square Feet to Square Yards:

KEYSTROKES	DISPLAY
On/C On/C	0.
1 4 Feet Feet	14 SQ FEET
Conv Yds	1.555556 SQ YD (1.6 square yards)

Convert 25 Square Yards to Square Feet:

KEYSTROKES	DISPLAY
On/C On/C	0.
2 5 Yds Yds	25 SQ YD
Conv Feet	225. SQ FEET

Convert 12 Cubic Feet to Cubic Yards:

KEYSTROKES	DISPLAY
On/C On/C	0.
1 2 Feet Feet Feet	12 CU FEET
Conv Yds	0.444444 CU YD

Convert 45.75 Board Feet to other volume dimensions.

KEYSTROKES	DISPLAY
1. Clear calculator:	
On/C On/C	0.

2. Enter 45.75 Board Feet:
4 5 \bullet **7 5** **Conv** **0** (Bd Ft)
BDFT 45.75
3. Convert to Cubic Feet:
Conv Feet **3.8125 CU FEET**
4. Convert to Cubic Yards:
Conv Yds **0.141204 CU YD**
5. Convert to Cubic Inches:
Conv Inch **6588. CU INCH**

Find the Volume of a rectangular container 3 Feet by 1 Foot 9-5/8 Inches by 2 Feet 4 Inches then convert to Centimeters and Yards.

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter Length and multiply by Width and Depth: 3 Feet X	3 FEET 0 INCH
1 Feet 9 Inch 5 / 8	1 FEET 9 5/8 INCH
X 2 Feet 4 Inch =	12.61458 CU FEET
3. Convert to Cubic cm: Conv cm	357205.²² CU CM
4. Convert to Cubic Yds: Conv Yds	0.467207 CU YD

Convert 126 Liters to Gallons and fluid Ounces.

KEYSTROKES	DISPLAY
1. <i>Clear Calculator:</i> On/C On/C	0.
2. <i>Enter 126 Liters:</i> 1 2 6 liters	126 L
3. <i>Convert to Gallons:</i> Conv gal	GAL 33.28568
4. <i>Convert to fluid Ounces:</i> Conv fl oz	F-OZ 4260.567

Weight Conversions

To convert a displayed weight value, press the **Conv** key, followed by the desired unit key. See below for examples.

Examples

Convert 150 Pounds to Kilograms.

KEYSTROKES	DISPLAY
1. <i>Clear calculator:</i> On/C On/C	0.
2. <i>Enter 150 Pounds:</i> 1 5 0 lbs	150 LB
3. <i>Convert to Kilograms:</i> Conv kg	68.03886 kg

If your car has a 12 Gallon tank, how many Liters of gas will it take to fill it? What is the cost if one Liter is \$0.75? Use the Cost Function to find the total cost of the gas.

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter 12 Gallons: 1 2 gal	GAL 12
3. Convert to Liters at \$0.75 per Liter: Conv liters	45.42494 L
X 0 7 5 Conv 0 (Cost)	\$34. ⁰⁷

You have received a shipment of 23,000 Kilograms of fill. How many Tons is this?

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter 23000 Kilograms: 2 3 0 0 0 kg	23000 kg
3. Convert to Tons: Conv tons	25.35316 Ton

Weight/Volume Conversions

The *Ultra Measure Master* can convert between Weight and Volume. To recall Weight per Volume factor press **Rcl** **%**. Continue pressing **%** to display as Pounds, Metric Tons, Kilograms, Grams or Tons. The default Weight per Volume factor is:

- 62.42796 Lbs per Cubic Foot
- 1 Metric Ton per Cubic Meter
- 1000 kg per Cubic Meter
- 1 Gram per Cubic Centimeter
- 0.842777 Tons per Cubic Yard
- 1685.555 Lbs per Cubic Yard

To change the Weight per Volume factor, enter the value, then press **Stor** **%**. The first press will enter the Weight as the calculator's current setting. To change the Weight per Volume factor, continue to press the **%** key to cycle through the factors shown above. When you have selected the desired factor, press **On/C** to set and exit.

Examples

Find the total Volume of water needed to fill a rectangular container 10 Feet Long by 6 Feet Wide by 24 Inches Deep. Then find the Weight of the water (use the default Weight factor of 62.42796 Pounds per Cubic Foot, which is equivalent to the Density of water: 1 Gram per Cubic Centimeter).

KEYSTROKES	DISPLAY
1. Clear calculator:	
On/C On/C	0.
2. Enter Depth and multiply by Length and Width to find the Volume:	
2 4 Inch	24 INCH
X 1 0 Feet	10 FEET
X 6 Feet =	4.444444 CU YD
3. Find Weight in Tons, then Kilograms:	
Conv tons	3.745678 Ton*
Conv kg	3398.022 kg

* If this value differs, the Weight per Volume actor is not set to the default value. To change to the default value mentioned above (1 Gram per Cubic Centimeter), enter **1** **Stor** and then **%** until **GRAM Per CU CM** is displayed. Press **On/C** to set the value.

Find the Weight of 15 Cubic Yards in Pounds and Metric Tons at 1.75 Tons per Cubic Yard. Then, return the Weight per Volume factor back to the default of 1 Gram per Cubic Centimeter (equivalent to 62.42796 Pounds per Cubic Foot).

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter 1.75 factor: 1 . 7 5 Stor % % % % % STORED	1.75 Ton per CU YD
3. Enter 15 Cubic Yds: 1 5 Yds Yds Yds	15 CU YD
4. Convert to Pounds then Metric Tons: Conv lbs Conv 1 (met tons)	52500. LB 23.8136 MET Ton
5. Return Wt/Vol factor back to default: 1 Stor % % % % % % STORED On/C	1 GRAM Per CU CM 0.

Temperature Conversions

To convert a displayed temperature value, press **Conv** key, followed by the **2** or **3** key for Fahrenheit or Celsius, respectively. See examples below.

Examples

Convert 78 °F to a °C temperature.

KEYSTROKES	DISPLAY
------------	---------

1. Clear calculator:

On/C On/C	0.
-------------------------	----

2. Enter 78 °F and convert to Celsius:

7 8 Conv 3 (°F)	78 °F
---	-------

Conv 2 (°C)	25.55556 °C
---------------------------	-------------

Convert 11 °C to a °F temperature.

KEYSTROKES	DISPLAY
------------	---------

1. Clear calculator:

On/C On/C	0.
-------------------------	----

2. Enter 11 °C and convert to °F:

1 1 Conv 2 (°C)	11 °C
---	-------

Conv 3 (°F)	51.8 °F
---------------------------	---------

Linear Velocity Conversions

To convert a displayed linear velocity, press the **Conv** key, followed by the key corresponding to the desired linear velocity. See below for examples.

Examples

Convert 55 Miles per Hour to Kilometers per Hour.

KEYSTROKES	DISPLAY
------------	---------

1. Clear calculator:

On/C On/C	0.
-------------------------	----

2. Enter 55 mph then convert to kmh:

5 5 Conv miles (mph)	MPH 55
Conv km (km/h)	KM/H 88.51392

Convert 8 Inches per Second (ips) to Millimeters per Second (mm/s).

KEYSTROKES	DISPLAY
------------	---------

1. Clear calculator:

On/C On/C	0.
-------------------------	----

2. Enter 8 ips:

8 Conv Inch (in/sec)	IPS 8
---	-------

3. Convert to mm/s:

Conv mm (mm/sec)	MM/S 203.2
--------------------------------	------------

Volumetric Velocity Conversions

To convert a displayed Volumetric velocity, press the **Conv** key, followed by the key corresponding to the desired Volumetric velocity. See below for examples.

Examples

Convert 48 fluid Ounces per Second to Liters per Second.

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter 48 oz/s then convert to l/s: 4 8 Conv fl oz (oz/sec)	OPS 48
Conv liters (Liters/sec)	L/S 1.419529

Calculating Aqueduct Slope —

An aqueduct should be sloped so that water travels less than 10 Feet per Minute. After a heavy rainfall, the water traveled at an approximate velocity of 1.72 Inches per Second. Is the aqueduct sloped correctly?

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter 1.72 ips then convert to ft/min: 1 . 7 2 Conv Inch (in/sec)	IPS 1.72
Conv Yds (ft/min)	FPM 8.6*

** Because 8.6 fpm is less than 10 fpm, the aqueduct is sloped correctly.*

The faucet in a house should provide 4.5 Gallons of water per Minute. If you have a two Liter bottle that filled up in 12 Seconds, is the faucet within code?

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Divide Liters by Seconds: 2 ÷ 1 2 =	0.166667
3. Enter as Liters per Second: Conv liters (liters/sec)	L/S 0.166667
4. Convert to Gallons/Minute: Conv gal (gpm)	GPM 2.641721*

** Because 2.641721 gpm is less than 4.5 gpm, the faucet is not within code.*

Pressure Conversions

To convert a displayed pressure value, press the **Conv** key, followed by the key corresponding to the desired pressure. See below for examples.

Examples

A water line is reading a pressure of 0.5 psi. What would the pressure be in Bars, psf, kPa and mPa?

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.

2. Enter psi:
5 **Conv** **lbs** (psi) PSI 0.5
3. Convert to Bars:
Conv **tons** (Bars) BAR 0.034474
4. Convert to psf:
Conv **dry oz** (psf) PSF 72.
5. Convert to kPa:
Conv **kg** (kPa) kPA 3.447379
6. Convert to mPa:
Conv **grams** (mPa) MPA 0.003447

Convert 24 Pounds per Square Foot to Kilo Pascals.

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter 24 psf: 2 4 Conv dry oz (psf)	PSF 24
3. Convert to kPa: Conv kg (kPa)	kPA 1.149126

Bending Moment Conversions

To convert a displayed bending moment, press the **Conv** key, followed by the key corresponding to the desired bending moment. See below for examples.

Examples

Convert 120 Inch-lb to Newton-meters.

<u>KEYSTROKES</u>	<u>DISPLAY</u>
-------------------	----------------

1. Clear calculator:
On/C **On/C** 0.
2. Enter 120 in/lb:
1 **2** **0** **Conv** **7** (in-lbs) 120 LB INCH
3. Convert to N-m:
Conv **9** (N-m) N-M 13.55818

Convert 700 Newton-meters to ft-lb.

<u>KEYSTROKES</u>	<u>DISPLAY</u>
-------------------	----------------

1. Clear calculator:
On/C **On/C** 0.
2. Enter N-m:
7 **0** **0** **Conv** **9** (N-m) N-M 700
3. Find ft/lbs:
Conv **8** (ft-lbs) 516.2936 LB FEET

Your Metric-based plan says that the bridge rail bolt must be tightened to 30 N-m but your torque wrench only shows ft-lb. Find the ft-lb setting required to set up the wrench.

KEYSTROKES	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter N-m: 3 0 Conv 9 (N-m)	N-M 30
3. Find ft/lbs: Conv 8 (ft-lbs)	22.12687 LB FEET

APPENDIX

Default Settings

After a *Clear All* (**Conv** **X**), your calculator will return to the following setting:

STORED VALUES	DEFAULT VALUE
Weight per Volume	62.42796 LB/CU FT

If you replace your battery or perform a *Full Reset** (press **Off**, hold down **X**, and press **On/C**), your calculator will return to the following settings (in addition to those listed above):

PREFERENCE SETTINGS	DEFAULT VALUE
Fractional Resolution	1/64
Area Display	Standard
Volume Display	Standard
Exponent	ON
Meter Linear Display	0.000
Fractional Mode	Standard

Depressing the Reset button located above the **gal key will also perform a Full Reset.*

Accuracy/Errors

Accuracy/Display Capacity – Your calculator has a twelve digit display. This is made up of eight digits (normal display) and four fractional digits. You may enter or calculate values up to 19,999,999.99. Each calculation is carried out internally to twelve digits.

Errors – When an incorrect entry is made, or the answer is beyond the range of the calculator, it will display the word “**ERROR.**” To clear an error condition you must press the **On/C** button once. At this point you must determine what caused the error and re-key the problem.

Error Codes

DISPLAY	ERROR TYPE
OFLO	Overflow (too large)
MATH Error	Divide by 0
DIM Error	Dimension error
ENT Error	Invalid entry error

Auto-Range – If an “overflow” is created because of a calculation with small units that are out of the standard digit range of the display, the answer will be automatically expressed in the next larger units (instead of showing “**ERROR**”) – e.g., 20,000,000 mm is shown as 20,000 m. Also applies to Inches, Feet and Yards.

Note: If Exponential Notation is activated through the Preference Setting, the value will be shown in scientific notation (e.g., 20 million mm – 2.00000^{07} mm).

Auto Shut-Off

Your calculator will shut itself off after about 8-12 minutes of non-use.

Battery

This model uses one (1) CR-2016 battery (included). This should last approximately 800 hours of actual use (1 year plus for most people). Should your calculator display become very dim or erratic, replace the battery.

Note: Please use caution when disposing of your old batteries as they contain hazardous chemicals.

Note: Values in memory or shown on the display will be cleared.

Replacement batteries are available at most discount or electronics stores. You may also call Calculated Industries at 1-775-885-4900.

Replacing the Battery

Turn the calculator over and open user guide door located at the top. Pull battery holder out (top left corner) and turn over. Remove old battery and slide new battery under tabs. Turn holder over (negative side facing you) and insert into calculator.



Reset

If your calculator should ever “lock up,” press Reset – a small hole located above the **gal** key – to perform a total reset.

REPAIR AND RETURN

Warranty, Repair and Return Information

Return Guidelines

1. Please read the **Warranty** in this User's Guide to determine if your Calculated Industries product remains under warranty **before** calling or returning any device for evaluation or repairs.
2. If your product won't turn on, check the battery as outlined in the User's Guide.
3. If you need more assistance, please go to the website listed below.
4. If you believe you need to return your product, please call a Calculated Industries representative between the hours of 8:00am and 4:00pm Pacific Time for additional information and a Return Merchandise Authorization (RMA).

Call Toll Free: 1-800-854-8075

Outside USA: 1-775-885-4900

www.calculated.com/warranty

WARRANTY

Warranty Repair Service – U.S.A.

Calculated Industries (“CI”) warrants this product against defects in materials and workmanship for a period of one (1) year from the date of original consumer purchase in the U.S. If a defect exists during the warranty period, CI, at its option, will either repair (using new or remanufactured parts) or replace (with a new or remanufactured calculator) the product at no charge.

THE WARRANTY WILL NOT APPLY TO THE PRODUCT IF IT HAS BEEN DAMAGED BY MISUSE, ALTERATION, ACCIDENT, IMPROPER HANDLING OR OPERATION, OR IF UNAUTHORIZED REPAIRS ARE ATTEMPTED OR MADE. SOME EXAMPLES OF DAMAGES NOT COVERED BY WARRANTY INCLUDE, BUT ARE NOT LIMITED TO, BATTERY LEAKAGE, BENDING, A “BLACK INK SPOT” OR VISIBLE CRACKING OF THE LCD, WHICH ARE PRESUMED TO BE DAMAGES RESULTING FROM MISUSE OR ABUSE.

To obtain warranty service in the U.S., please go to the website.

A repaired or replacement product assumes the remaining warranty of the original product or 90 days, whichever is longer.

Non-Warranty Repair Service – U.S.A.

Non-warranty repair covers service beyond the warranty period, or service requested due to damage resulting from misuse or abuse.

Contact Calculated Industries at the number listed above to obtain current product repair information and charges. Repairs are guaranteed for 90 days.

Repair Service – *Outside the U.S.A.*

To obtain warranty or non-warranty repair service for goods purchased outside the U.S., contact the dealer through which you initially purchased the product. If you cannot reasonably have the product repaired in your area, you may contact CI to obtain current product repair information and charges, including freight and duties.

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FCC CLASS B

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules.

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Calculated Industries, a leading manufacturer of special-function calculators and digital measuring instruments, is always looking for new product ideas in these areas.

If you have an idea, or a suggestion for improving this product or User's Guide, please submit your comments online at www.calculated.com under "Contact Us", "Product Idea Submittal Agreement". Thank you.



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Designed in the USA

Printed in China

10/07



PRG8025E-B