Unisonic® 796

8 DIGIT ELECTRONIC SLIDE RULE CALCULATOR
WITH \( \times \), \( \div \), \( \sqrt{\phantom{x}} \), \( \exp \), \( \ln \), \( \gamma \), \( \log \), \( \text{STD} \), \( \% \), \( \text{RCL} \)

\( \sin \), \( \cos \), \( \tan \), \( \text{INV} \), \( \text{SM} \), \( \text{COS} \), \( \text{TAN} \), \( \pi \), \( \text{EE} \), \( \text{([ ]}) \)

INSTRUCTION MANUAL
FEATURES AND SPECIFICATION

1. DISPLAY
   - 5-digit mantissa with sign, and 2-digit exponent with sign.
   - Zero suppression.
   - Minus sign.
   - Overflow condition indicator.

2. FUNCTIONS
   Addition, subtraction, multiplication, division, reciprocal, square root, square, power, credit balance, repeating addition and subtraction, automatic constant calculation for Multi and Div, one independent memory, bracket calculation, $\pi$ calculation, exponent calculation, sine, cosine, tangent, arc sine, arc cosine, arc tangent, natural logarithm, natural antilogarithm, common logarithm, common antilogarithm.

3. DECIMAL POINT SYSTEM
   Full floating decimal point.
4. CAPACITY

10^{-9} through 9.9999999 x 10^{-9}

5. OTHER FUNCTION

Negative: Credit balance with minus sign.
Auto clear: Automatic clear at power on time.

6. POWER SOURCE

Dry cells (UM-3 or AM-3) or by AC Adaptor.

7. DIMENSIONS

1 2/5 inches(H) x 3 1/2 inches(W) x 6 1/10 inches(L)

8. WEIGHT

9 3/5 oz. (with dry cells)

9. POWER CONSUMPTION

350 mW (DC 6V)

10. ELEMENT

Mos LSI complete 1 chip
KEYBOARD ORGANIZATION AND KEY DESCRIPTION

- Numerical entry keys.
- Decimal point key.
- Addition key. Used for addition.
- Minus key. Used for subtraction.
- Multiply key. Used for multiplication.
- Division key. Used for division.
- Clear and Clear entry key. Used for all clear and clear entry.
  - Depress once: Clear entry.
  - Depress twice: All clear.
- Equal key. Express results of any straight arithmetic processes.
- Reciprocal key. Used for reciprocal calculation.
- Square root key. Used for square root calculation.
- Store key. Used for memory input with clearing of the old value.
- Recall memory key. Used for recall memory.
- Open brackets key. Used for bracket calculation.
- Close brackets key. Used for bracket calculation.
- Entry of exponent value key.
Pi key
Sign change key
Square key
Power function key
Natural antilogarithm function key
Natural logarithm function key
Common logarithm function key
Inverse function key
NOTE: Do not depress [INV] key twice.

Trigonometric function key
Secondary function key

\[ \sin^{-1} \cdot \cos^{-1} \cdot \tan^{-1} \]

Inverse trigonometric function key.

RD DG Radians, Degrees Radians, Degrees switch

Used for degrees, radians select.
CALCULATION EXAMPLES

1. MIXED ADDITION, SUBTRACTION
   \[ 1.23 + 4.56 - 7.89 = -2.1 \]
   \[ 1.23 \quad + \quad 4.56 \quad = \quad 7.89 \quad = \quad -2.1 \]

2. MIXED MULTIPLICATION, DIVISION
   \[ 123 \times 456 \div 789 = 71.087452 \]
   \[ 123 \quad \times \quad 456 \quad \div \quad 789 \quad = \quad 71.087452 \]

3. POWER
   \[ 2^4 = 16 \]
   \[ 2 \quad \times \quad 4 \quad \div \quad = \quad 16 \]

4. REPEATED CALCULATION
   \[ 21 + 3 + 3 + 3 - 3 - 3 - 3 = 21 \]
   \[ 21 \quad + \quad 3 \quad + \quad - \quad - \quad 3 \quad - \quad - \quad = \quad 21 \]
5. CONSTANT MUL/DIV

(1) MULTIPLICATION

\[
\begin{align*}
2 \times 123 &= 246 \\
5 \times 123 &= 615 \\
8 \times 123 &= 984 \\
\end{align*}
\]

\[
\begin{align*}
2 \times 123 &= \rightarrow 246 \\
5 \times 123 &= \rightarrow 615 \\
8 \times 123 &= \rightarrow 984 \\
\end{align*}
\]

(2) DIVISION

\[
\begin{align*}
123 \div 3 &= 41 \\
333 \div 3 &= 111 \\
999 \div 3 &= 333 \\
\end{align*}
\]

\[
\begin{align*}
123 \div 3 &= \rightarrow 41 \\
333 \div 3 &= \rightarrow 111 \\
999 \div 3 &= \rightarrow 333 \\
\end{align*}
\]

6. CHAIN OPERATION

\[
\frac{(3 + 4) \times 6 - 2}{5} = 8
\]

\[
\frac{3 + 4 \times 6 - 2}{5} = \rightarrow 8
\]
7. **KEY OPERATION**

\[
5 + [5 (16 + 2)] = 95
\]

\[
5 + \left( \left( \left( 5 \times \left( 16 + 2 \right) \right) \right) \right) = 95
\]

8. **ENTRY CORRECTION**

\[
123 \times 123 = 15129
\]

\[
123 \times 122 \overline{\text{C}} 123 = \text{mis-entry}
\]

\[
\text{mis-entry} \rightarrow 15129
\]

9. **SQUARE ROOT**

\[
\sqrt{81} = 3
\]

\[
81 \sqrt{81} \rightarrow 3
\]

10. **RECIPROCAL**

\[
\frac{1}{4} = 0.25
\]

\[
4 \frac{1}{4} \rightarrow 2.5 01 \quad (2.5 \times 10^{-1} = 0.25)
\]
11. \( \ln \cdot e^x \) KEY OPERATION

\[
\begin{align*}
\ln 100 &= 4.60517 \\
100 \ln &\rightarrow 4.60517 \\
e^{4.60517} &= 100 \\
4.60517 \ e^x &\rightarrow 100
\end{align*}
\]

12. \( \log \) KEY OPERATION

\[
\begin{align*}
\log_{10} 6 &= 0.69897 \\
6 \ \log &\rightarrow 0.69897 \ (6.9897 \times 10^{-1} = 0.69897)
\end{align*}
\]

13. \( \pi \) KEY OPERATION

\[
\begin{align*}
2\pi &= 6.2831852 \\
2 \times \pi \ \pi &\rightarrow 6.2831852
\end{align*}
\]
14. **SQUARE**

\[(2^2)^2 = 16\]

15. **EE KEY OPERATION**

\[(111 \times 10^{-4}) \times (111 \times 10^{1.0}) = 1.2321 \times 10^{1.0}\]

<table>
<thead>
<tr>
<th>ENTRY</th>
<th>DISPLAY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>111.</td>
<td></td>
</tr>
<tr>
<td>EE</td>
<td>111. 00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>111. -04</td>
<td></td>
</tr>
<tr>
<td>\times</td>
<td>1.11 -02</td>
<td>111 \times 10^{-4}</td>
</tr>
<tr>
<td>111</td>
<td>111.</td>
<td></td>
</tr>
<tr>
<td>EE</td>
<td>111. 00</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>111. 10</td>
<td>111 \times 10^{1.0}</td>
</tr>
<tr>
<td>\div</td>
<td>1.2321 10</td>
<td>1.2321 \times 10^{1.0}</td>
</tr>
</tbody>
</table>
16. \( \sin^{-1} \) \( \sin \)

(1) \[
\text{SIN} 30^\circ = 0.5
\]

\[
\begin{array}{c}
\text{RD} \\
\text{DG}
\end{array}
\]

\[
\begin{array}{c}
30 \\
\sin
\end{array}
\]

\[
5. \quad -01 \quad (5 \times 10^{-1} = 0.5)
\]

(2) \[
\text{SIN} \frac{\pi}{6} = 0.5
\]

\[
\begin{array}{c}
\text{RD} \\
\text{DG}
\end{array}
\]

\[
\begin{array}{c}
\pi \\
+ \\
6 \\
= \\
\sin
\end{array}
\]

\[
5. \quad -01 \quad (5 \times 10^{-1} = 0.5)
\]

(3) \[
\sin^{-1} 0.5 = 30^\circ
\]

\[
\begin{array}{c}
\text{RD} \\
\text{DG}
\end{array}
\]

\[
\begin{array}{c}
0.5 \\
\inv \\
\sin
\end{array}
\]

\[
30
\]
ADVANCED PROBLEM SOLVING

(1) Find the hypotenuse when two sides of a right triangle are known.

\[ x^2 = 3^2 + 4^2 \]
\[ x = \sqrt{3^2 + 4^2} \]

Answer \( x = 5 \) inch

(2) 

\[ a = 30^\circ \]
\[ r = 2.5 \text{ inch} \]
\[ b = ? \]
\[ b = 2 \cdot \pi \cdot r \cdot \frac{30}{360} \]

Answer \( b = 1.3089969 \) inch
(3) \[ \sum_{i=0}^{5} (2.5) = 1 + 2.5 + (2.5^2) + (2.5^3) + (2.5^4) + (2.5^5) \]

Answer: 162.0937

(4) Find the root of \( X^2 - 4X + 2 = 0 \)

The general formula of a quadratic is:

\[ A X^2 + BX + C = 0 \]

\[ X = \frac{-B \pm \sqrt{B^2 - 4A \cdot C}}{2 \cdot A} \]

Solution

\[ X = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 2}}{2 \cdot 1} = \frac{4 \pm \sqrt{(-4)^2 - (4 \times 2)}}{2} \]
ENTRY | DISPLAY | MEMORY | COMMENT
---|---|---|---
4 | 4 | 16. | 16 | (-4)^2
x | 16 | 8. | 16 | (4x2)
+ | 2 = | 2.8284271 | 2.8284271 | (4-(-4)^2)
+ | 2.8284271 | 6.8284271 | 6.8284271 | (4+(-4)^2)
- | 2.8284271 | 3.4142135 | 3.4142135 | (-4)^2
+ | 2 | 1.1715729 | 2.8284271 | 2.8284271 | (4-√(-4)^2)
= | 2 | 5.8578-01 | 2.8284271 | (4-√(-4)^2) | 2

Answer: X = 3.4142135
and: X = 0.58578

Note: The key transfers the displayed into the memory and at the same time clears the previous memory value.

(5) COSH 1.5 = 2.35241

COSH x = \( \frac{e^x + e^{-x}}{2} \)

1.5 | e^x | 1.5 | e^-x | + | 2 = | 2.35241

(6) SIN 30°+ COS 60° = 1

RD | 30 | SIN | 60 | COS | = | 1
ERROR AND UNDERFLOW CONDITION

ERROR CONDITION

a) Division by zero
b) \( \sqrt{X} \), where \( X < 0 \)
c) \( X^2 \), where \( |X| \geq 10^5 \)
d) \( \sin, \cos \) or \( \tan \), where \( X > (180^\circ \text{ or } 3.1415927 \text{ radians}) \)
e) \( \tan \), where \( |X| = (90^\circ \text{ or } 1.5707963 \text{ radians}) \)
f) \( \sin^{-1} \) or \( \cos^{-1} \), where \( |X| > 1 \)
g) \( \tan^{-1} \), where \( |X| \geq 5 \times 10^9 \)
h) \( \log \) or \( \ln \), where \( X \leq 0 \)
i) \( e^X \), where \( X \geq 230.25851 \)
j) \( Y^X \), where \( Y \leq 0 \) or \( X \times \ln y \geq 230.25851 \)
k) \( \frac{1}{X} \), where \( X = 0 \)
l) Result of operation \( > 9.9999999 \times 10^9 \)
UNDERFLOW CONDITION

a) $X^2$, where $|X| \leq 10^{-30}$

b) Sin or tan, where $|X| \leq 5.7295779 \times 10^{-30}$ degrees

c) $e^X$, where $X < -227.95592$

d) $X^Y$, where $X \ln Y < -227.95592$

e) $\frac{1}{X}$, where $X > 10^{30}$

f) Result of operation $< 10^{-30}$
HOW TO CHANGE BATTERIES

Be sure the power switch is in the "off" position when changing batteries. The battery compartment is located in the rear of the machine. To expose contents, slide battery access cover toward the bottom of the calculator. Remove dysfunctioning batteries by pulling them out of their individual slots. Insert new batteries by positioning the (+) pole of each battery against the spring of its respective slot. Press the battery in place. Replace battery access cover by inserting it in the bottom-most position of compartment groove and sliding it upwards until it locks into place.

TO AVOID DAMAGE TO THE CALCULATOR, SET THE BATTERIES IN CORRECT POSITION.

OPERATING FOR AC ADAPTOR

You can operate the calculator with AC adaptor by plugging the AC adaptor plug into the AC jack located on the top of the calculator. Plug UL-Type Socket prongs into wall receptor. The calculator is now ready for use.
SERVICE CERTIFICATE

Your electronic calculator is a highly precise electronic instrument which will serve you for many years with normal care.

UNISONIC PRODUCTS are guaranteed against defects in materials or workmanship for a period of ninety (90) days from date of purchase. This guarantee applies only to the original owner registered on the card below. This card must be completed and mailed, postage paid, within ten (10) days from date of purchase. Any merchandise that has been repaired by an unauthorized party, tampered with, or abused is not covered by this guarantee.

If, within (90) days from date of purchase, you send in your calculator to us, please send us also $5.00 to cover postage which includes cost of registered mail with return receipt requested.

If you return your calculator after (90) days from date of purchase, then kindly send us a check for $9.90 which covers registered mail with return receipt plus handling charges.
Please be sure to include check or money order with package.

All merchandise must be returned, prepaid and fully insured, in the original packaging container or in a similarly-constructed container, via U.P.S. where possible. Enclose a letter explaining the problems, with place and date of purchase.

All defective units should be returned to
UNISONIC
Service Department
16 West 25th Street
New York, N.Y. 10010

MODEL NO. ____________________________
DATE OF PURCHASE ____________________________
DEALER'S NAME ____________________________
SERIAL NO. ____________________________