CF Menu

There are two menus; **Data** menu for data manipulation and **Stats** menu for **Setup** and **Control**.

CF Menus are available only from **CF** mode; therefore, the unit must be flipped to **CF** mode with **<MENU+ENTER>** keys. The unit is in **CF** mode if `CAL=` or `PGF=` is displayed when **<MENU>** key is first pressed. If `CE-3` is displayed, it indicates that the unit is still in CE mode.

To get to Data menu, press **<DATA>** key. Pressing **<MENU>** key brings up the first Data menu; display is `CAL=`.

To get to Stats menu, press **<STATS>** key. Pressing **<MENU>** key brings up the first Stats menu; display is `PGF=`.

Menu Movement and Control keys

Keys	Name	Action
<MENU>	**<Left>**	Main menu *left*
<MENU+DATA>	**<Right>**	Main menu *right*
<UNITS>	**<Down>**	Submenu *Down*
<POWER>	**<Up>**	Submenu *Up*
<ENTER>	**<Exe>**	*Execute* menu or view results
<ENTER+POWER>	**<Inc>**	*Increment* value or flip value
<ENTER+UNITS>	**<Dec>**	*Decrement* value or flip value

When modifying large numbers such as Bullet mass in `buL_` menu, you can use auto increment or decrement feature. When **<Inc>** or **<Dec>** is held pressed, number starts to increase or decrease faster and faster. The longer you hold these keys down, the faster the number will change. When you let go of the keys, it slows down again. This way you can set your number to any large value without much trouble. When the keys are released, unit returns to the same menu.

Value that can be modified is viewed by pressing **<Exe>** key and it is displayed as long as you hold down this key. When the key is released, unit returns to the same menu.

For executable functions, such as clear shot, execution progress is displayed, before it returns to the same menu.

DATA Menu list

System	Shot	String	Folder	Error	User	Com	eDisk
`CAL=`	`Sho=`	`Srn=`	`FoL=`	`Ern=`	`UCi=`	`Con=`	`ddr=`
`Arc_`	`CLr_`	`dEL_`	`dEL_`	`Nor⁻`	`bRR_`	`dLF_`	
`SLL_`	`Unc_`	`Und_`	`Und_`	`Erc_`	`CEL_`	`dLR_`	
`buL_`		`Uno_`	`SRU_`	`CLr_`	`FRH_`	`dLH_`	
`_NE_`			`Fri_`				
`_CE_`							
`USR_`							
`NEC_`							
`CRP_`							
`Lcc_`							
`FLL_`							

Some menu functions appear only when **CAM** mode is turned on with `CRN=` menu (see page 15). These are: `Lcc_`, `FLL_` and `dLH_`. Data menu does not have setup parameters that may cause serious problems. From Data menu you can only manipulate data-related setup.

*Only **Stats Menu** permits Setup changes*

System – Data menu	EXE	INC	DEC
`CAL=` Run Adaptive **Calibration**	x		
`Arc_` **Archery** mode, On - Off	x	x	x
`SLL_` **Sensitivity level** control, 00% - 99%	x	x	x
`buL_` **Bullet mass**, maximum 631.95-grn, 40.950-gm	x	x	x
`_NE_` **Meters/Sec**, On - Off	x	x	x
`_CE_` Temperature in **Celsius**, On - Off	x	x	x
`USR_` Persistent-always **Imperial units**, *On - Off*	x	x	x
`NEC_` Persistent-always **Metric units**, On - Off	x	x	x
`CRP_` **Run** Calibration Interference meter, test mode	x		
`Lcc_` **Long Calibration**, On – Off, CAM-2 Only	x	x	x
`FLL_` **Fine Sensitivity** control, 0.0 -100.0%, CAM2 Only	x	x	x

Shot – Data menu

		EXE	INC	DEC
`Sho=`	**Display** next-pending shot location in the string	x		
`LLr_`	**Clear** current shot	x		
`Unc_`	**Restore** last cleared shot	x		

String – Data menu

		EXE	INC	DEC
`Srn=`	**Display** String number and size	x		
`dEL_`	**Delete** current string	x		
`Und_`	**Undo** last string delete	x		
`Uno_`	**Restore** Old shots from trash bin	x		

Folder – Data menu

		EXE	INC	DEC
`FoL=`	Select folder, scroll **Forward** & **Backward**	x	x	x
`dEL_`	**Delete** folder	x		
`Und_`	**Restore** deleted folder	x		
`SRU_`	**Save** Current Folder to eDsik	x		
`Fr,_`	**Free** Space in the Folder, number of shots	x		

Error – Data menu

		EXE	INC	DEC
`Ern=`	**Display** Current Error (Crr, Prr, Mrr, Orr)	x		
`Nor¯`	**More** errors, (Prr, etc.)	x		
`Erc_`	**Total** Error Count (Crr errors only, page 10)	x		
`LLr_`	**Clear** all errors	x		

User – Data menu

		EXE	INC	DEC
`Uc,=`	Display CAM level, **CAM1** or **CAM2**	x		
`bRR_`	View **Battery** Voltage, After internal load	x		
`CEL_`	View Ambient Temperature in **Celsius**	x		
`FRH_`	View Ambient Temperature in **Fahrenheit**	x		

Memory Overflow Errors

When the string is almost full, a warning alarm comes on. This is a user option that must be set within **CF** mode first. **CE** default at start-up is a simple interface with these alarms disabled. The unit tracks data history and only the oldest shots are overwritten first. Circular mode has this alarm disabled.

`Rrr0` Memory is full, there is no more room. If you fire more shots, then the oldest ones will be lost.

`Rrr1` You have room for one more shot in this string

Displayed value has no decimal point

If there is no decimal point showing, even when **<ENTER>** key is pressed, it implies that the decimal point is after the fourth digit. For example, numbers **1000.00** to **9999.99** and **1000.000** to **9999.999** will have no decimal point displayed.

CF mode

This is an advanced mode that provides full control over data manipulation and environment settings. This mode uses scroll keys and menus; a far better system then multi-key operations. This mode is selected with **<MENU+ENTER>** key and it provides over **70** functions. **CF-Mode** has easier access to cross-string statistics, power factor, energy etc.

Please note: when **CE-3** detects remote control requests from PC, it automatically switches to **CF** mode. It stays that way until it is flipped to **CE** mode with **<MENU+ENTER>** keys. To check the unit's mode, just press **<MENU>** key. Display `CE-3` indicates **CE** mode, otherwise the unit is in **CF** mode.

One Key functions, CF Mode only

<POWER>   **Scroll Up** to previous Data or Stats location
<UNITS>   **Scroll Down** to next Data or Stats location
<ENTER>   Displays **hidden** last **digits** for Data or Stats value
<MENU>   Go to **Menu Mode**, either Stats or Data Menu
<STATS>   Set **Stats Mode** & Display current Stats
<DATA>   Set **Data Mode** & Display current Data

To enter Stats Menu press **<STATS>** key first then **<MENU>** key.
To enter Data Menu press **<DATA>** key first then **<MENU>** key.

Errors & Alarms

Alarms are displayed as a flashing message. The message will flash for 10 seconds and then disappear. Pressing **<ENTER>** key acknowledges and clears the alarm. The **CF** mode has advanced alarm control settings; see **Stats Menu** (page 15). Flashing **dots** and flashing **colon** are special alarms that stay and indicate bad light conditions. They disappear only if you correct the problem, or turn the sensors Off by pressing **<MENU+UNITS>** keys.

- *Flashing colon*: sensors are Off, unit will not accept shots
- *Flashing decimal points*: calibration failed, bad conditions
- *Flashing decimal points* & *colon*: requires recalibration
- *Flashing last digit*: displayed number is greater then 9999.99, you must press **<ENTER>** key to see the rest of the number.

Battery Alarms

Battery alarm is activated when battery voltage goes below required value. It is acknowledged by pressing **<ENTER>**, or it times out. It comes on again when conditions change or timer, at 60-sec intervals, activates it again.

`Prr1` Battery power level is **Low**, performance will degrade

`Prr2` Battery power level is **Very Low** for normal operation

`Prr3` Battery is **Dead**, only data and stats review possible

Chronograph Alarms

Chronograph alarms always time out. These alarms may be turned by *Off* by pressing **<MENU+UNITS>** keys.

`Crr1` *Front* sensor was missed

`Crr2` *Rear* sensor was missed

`Crr8` *Interference* encountered during shooting

`Crr9` *Muzzle blast* or interference.

Operator Errors

Operator errors come on when an illegal function is attempted. This is due to access violation, improper use of functions etc.

`Orr1` *Undelete* shot *not possible*, trash bin empty or lost

`Orr2` Memory is *not empty*, String is in use

`Orr3` Action *not possible*

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eDisk – Data menu	EXE	INC	DEC
`ddr:` Display Current Disk drive and Folder used	x		

Com – Data menu	EXE	INC	DEC
`Con:` Communications Baud Rate **300** to **4800**	x	x	x
`dLF_` Download *Folder* – Forced Send	x		
`dLA_` Download *All folders*, Entire eDisk, Forced Send	x		
`dLH_` eDisk *Memory Dump*, Test mode, Forced Send	x		

STATS Menu list

System	Stats	String	Chrono	Error	User	CAM
`POF=`	`SLL=`	`Snn=`	`Crr=`	`Err:`	`U..=`	`CAN=`
`SOF`	`Loc`	`C.r`	`FAF`	`ELc`	`N.n`	`Edd`
`PLL`		`N.c`	`SNO`	`Hrr`	`Pdc`	`Cdd`
`Nod`			`SLE`	`Nrr`	`Pdo`	`ALL`
`S.r`			`HCO`	`Prr`	`Pro`	`OCO`
`Son`					`Sd.`	
					`PnL`	

Any changes made in this menu will affect unit's operation.

The following functions: `Sd.`, `PnL`, `Edd`, and `Cdd` appear only when **CAM** mode is turned on from `CAN=` menu.

The following functions: `SNO`, `SLE`, `HCO`, `ALL`, `OCO`, are for service personnel and factory use only. If you activate them, please do not change their setting. If they are accidentally changed, do the following in order to restore them: from CE or CF mode, press **<MENU+POWER>** key to save your work on eDisk. Then press **<DATA+STATS+MENU>** keys to reset the unit and make sure you release **<DATA>** and **<STAT>** key first.

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System – Stats menu	EXE	INC	DEC
`POF⁻` Turn unit off and **save** Status & Data to eDisk	x		
`SOF⁻` Turn **Sensors Off**, Save power during data review	x		
`PLL⁻` Display **Battery Voltage**, internal load point	x		
`Mod⁻` Display **Model** Number	x		
`S,r⁻` Display **Serial Numbers**, Lower, Middle & Upper	x	x	x
`Son⁻` Display Software **Version** Number	x		

Stats – Stats menu	EXE	INC	DEC
`SLL⁻` **Display** Stats Location of "High" or "Low"	x		
`Loc⁻` **Go to** the location of "High" or "Low"	x		

String – Stats menu	EXE	INC	DEC
`Snn⁻` **View** and Set String Size to 4,5,6,7,8,9,10 Shots	x	x	x
`C,r⁻` Data increment to **Circular** mode On - Off	x	x	x
`M,c⁻` **Manual** Data Increment mode **On** - **Of**	x	x	x

Chrono – Stats menu	EXE	INC	DEC
`Crr⁻` Turn **Chronograph** Sensors On - Off	x	x	x
`FAF⁻` **Fast Fire** mode On - Off	x	x	x
`SMO⁻` SMO Type, CAM **factory tests**	x	x	x
`SLE⁻` SLE Value, CAM **factory tests**	x	x	x
`HCO⁻` HCO Enabled, CAM **factory tests**	x	x	x

Error – Stats menu	EXE	INC	DEC
`Err⁻` Display current error **number**	x		
`ELc⁻` **Maximum** Errors allowed count, 00 to 255	x	x	x
`Hrr⁻` **Hold** Errors Displayed, On - Off	x	x	x
`Mrr⁻` Memory **overflow** errors, On - Off	x	x	x
`Prr⁻` **Repeat** Battery Low alarms, On - Off	x	x	x

Special Features
There are two special features that require multiple keys.

<STATS+DATA+MENU>   Hardware Reset, data may be lost
<STATS+DATA+POWER>   Flip between `CAM1` and `CAM2` mode

When these keys ***<STATS+DATA+MENU>*** are pressed and ***<DATA>*** key is released **last**, the unit skips eDisk loading data and setup into memory. It will be confirmed with `E:-.`.

Flipping to `CAM2` mode enables extra functions. Default is `CAM1` mode. See menu section for details (page 17).

USA and Metric display identifiers
When ***<UNITS>*** key is pressed, display will identify units used.

`.ME..` Indicates Metric units are selected, **meters/sec**

`.FE.` Indicates USA units are selected, **feet/sec**

`..03..` Two dots on each side of 03 indicate **Metric velocity**

`.03.` Absence of dots indicates **USA units** for **velocity**

`..Lo..` Two dots on each side of Lo indicate **Metric Stats**

`.Lo.` Absence of dots indicates **USA units** for **Stats**

Archery mode control
When archery mode is changed, display will identify current mode. The keys to do this are ***<ENTER+POWER+UNITS>.***

`Arc0` Archery mode is turned **Off**.

`Arc1` Archery mode is turned **On**.

Sensitivity Control & Muzzle blast
When sensitivity is reduced, muzzle blast has less effect on the unit. But reducing sensitivity also reduces accuracy. Factory setting is **70%**; it can be changed from **00%** to **95%** in steps of **5%**. The keys to do this are ***<ENTER+UNITS>***. Fine adjustment, by **1%**, is only available from **CF** mode.

`LL80` Example of sensitivity set to **80%**

`LL35` Example of sensitivity set to **35%**

Two-key functions, CE & CF

This requires that you press two keys in sequence as shown in the table below. For example, *<MENU+DATA>* sequence requires that you press and hold down *<MENU>* key, and while you hold down *<MENU>* key, press *<DATA>* key. To end this function you must release both keys at the same time.

<MENU>+*ENTER>*	Switch between *CE* & *CF* modes
<MENU>+*UNITS>*	Turn *sensors Off*
<MENU>+*POWER>*	Turn *Power Off* and *Save* data to eDisk
<DATA>+*STATS>*	Find shot position for *High* or *Low*
<ENTER>+*POWER>*	Display *battery voltage*, internal level
<ENTER>+*UNITS>*	Set Sensitivity Level, *00%* to *95%*

<DATA>+*MENU>*	*Decrement* String
<DATA>+*ENTER>*	*Increment* String
<DATA>+*UNITS>*	Select Units, *f/s* or *m/s, CF* only
<DATA>+*POWER>*	Select *Velocity* or *Temperature*, *CF* Only

<STATS>+*MENU>*	*Decrement* String, display its *Stats*
<STATS>+*ENTER>*	I*ncrement* String, display its *Stats*
<STATS>+*UNITS>*	Select *Stats* Units, *f/s* or *m/s*
<STATS>+*POWER>*	Select *Velocity* or *Temperature Stats*.

Three & Four key functions CE & CF

This requires that you press all keys in sequence as shown in the table below. For example: *<STATS+DATA+MENU>* requires that you press and hold down *<STATS>* key then *<DATA>* key and finally *<MENU >* key. To end this function, release all keys at the same time.

<STATS>+*DATA>*+*MENU>*	Hardware *reset*, data may be lost
<ENTER>+*POWER>*+*UNITS>*	Set Archery *On* or *Off*
<ENTER>+*POWER>*+*DATA>*	Delete current *shot*
<ENTER>+*POWER>*+*STATS>*	Delete current *string*

| *<ENTER>*+*POWER>*+*MENU>*+*DATA>* | Undo *Shot* Delete |
| *<ENTER>*+*POWER>*+*MENU>*+*STATS>* | Undo *String* Delete |

Please note: all of these function are available from the *Stats* or *Data* menu. **CE** mode operates in data protection mode and has no access to **Stats** or **Data** menu. This prevents accidental setup or data changes.

User – Stats menu	EXE	INC	DEC
ᵁⁱⁱ⁼ Display **CAM** level, CAM-1 or CAM-2	x		
ⁿⁱⁿ Minimum **Stats** Displayed, On - Off	x	x	x
Pdc⁻ Auto Power Down **Enabled**, On - Off	x	x	x
Pdo⁻ Auto **Power** Down time, 00:00 to 03:51	x	x	x
Pro⁻ **Professional** Mode, On - Off	x	x	x
Sdⁱ⁻ **Slow Down** Changing Display, On - Off	x	x	x
ⁿLo⁻ Return to the **Last** menu **Location**, not first entry	x	x	x

CAM – Stats menu	EXE	INC	DEC
CAⁿ⁼ **Set** CAM Test Mode, On - Off	x	x	x
Edd⁻ **eDisk** Enabled, On - Off	x	x	x
Cdd⁻ **Communications** Delay, On - Off	x	x	x
ALL⁻ ALL Enabled, CAM *factory tests*.	x	x	
OCO⁻ OCO Enabled, CAM *factory tests*.	x	x	x

Statistics List

Statistics needs more than one shot; it does not need a full string.

.Lo.	**Low**	The lowest value found
.Hi .	**High**	The highest value found
.Aᵤ.	**Average**	Average value
.ES.	**Extreme Spread**	Highest value minus lowest
.Sd.	**Standard Deviation**	Uses population (n-1)
.Pd.	**Percent STD**	Percent standard deviation (n-1)
.ᵀo.	**Total shots**	Total shots in the current string
.PF.	**Power Factor**	Power factor, **CF-Mode** only
.Eⁿ.	**Energy**	Energy, **CF-Mode** only

Calibration Status Results

Calibration status number is indicated by the flashing display that follows calibration completion. For example, if calibration status number was **135**, then the display will flash between `CAL:` and `135`. In Auto-Calibration mode display will not flash, instead number **135** with 3 bars is displayed: `135:`. This is true only when unit thinks that the environment is acceptable. Please keep in mind that CE-3 has a limited intelligence.

Indoors calibration status numbers
- 512 to 1023   Fluorescent light overhead or strong EMI.
- 300 to 511   Marginal conditions
- 140 to 300   Functional range
- 000 to 100   Severe interference

Outdoors calibration status numbers
- 512 to 1023   Bad environment
- 300 to 511   Marginal Conditions
- 140 to 250   Functional range
- 000 to 100   Severe interference

Flashing Decimal Points
- Fluorescent lights overhead or other light interference
- Electromagnetic interference or unit is moving.

Quick Reference

Adaptive Calibration

This unit **must be calibrated** before you start your shooting session, light conditions have changed, or it was relocated. Calibration is done by turning the unit *Off* and then *On* with *<POWER>* key. Calibration is over when flashing `CAL:` is displayed. If **decimal points** or **colon** appears, it indicates that calibration failed - see *Run Calibration* (page 23). When Adaptive Calibration is finished, you must *acknowledge* it by pressing *<ENTER>* or *<DATA>* key, otherwise the unit *will not work* and it will simply flash calibration results *forever*. CE-3 has an **Auto-Calibration** mode which is activated when **CE** mode is on or **PC Remote Control** is used. **Auto-calibration** mode will determine if environment is reasonable and enable the unit accordingly. Unit is **Auto-Ready** when calibration number with three bars is displayed. For example, if calibration number was **197,** then display will show `197:`.

Please note: this generation of **CE-3** has a limited intelligence, and therefore, it may not always detect transient environment problems. Also the unit works in light transmission, light reflection and infrared light mode so it will not give warnings for low light conditions.

To run calibration from **CF** mode, press *<MENU>* key then *<ENTER>*. In **CF** mode, adaptive calibration always runs in manual mode. After calibration is finished, you must press *<DATA>* or *<STATS>* key.

One Key functions, CE Mode only

<POWER>   Turns the unit On or Off, unconditionally
<UNITS>   Flips between meters and feet on the fly
<ENTER>   Displays the hidden digits
<MENU>   Displays model number, in CF Mode set menu mode
<STATS>   Sets Stats Mode and reviews statistics
<DATA>   Sets Data Mode and reviews shots, current string.

CE mode is a simple "**One key**" fully automated operation. It manages interference problems, adaptive calibration and data storage without user interference. For advanced features, please switch to CF mode: *<MENU+ENTER>* key.

Important Notes

Sensitivity Control & Muzzle blast
Sensitivity level may be reduced to lower the effect of muzzle blast and other noise. The range may be set from **00%** to **95%** in steps of **5%** for CE-3 and **1%** for CF-3. Lowering sensitivity reduces muzzle blast effect, but unfortunately, it also reduces accuracy. For muzzle blast reduction, it is better to move the unit farther back rather than reducing sensitivity. For loud firearm use **50%** setting. Archery, Paintball and other quiet devices use **80%**. Higher values, **85%** and up, require low Electromagnetic and Optical interference, only found in the countryside.

Turning off sensors and alarms
In order to save battery power, a special function, *<MENU+UNITS>* keys, has been provided to turn Off detection electronics and to stop environment alarms. Use this feature only when data and statistics review are needed. To activate velocity measurement again, you *must* calibrate the unit. From CE mode, turn the unit *Off* and *On*. If you fail to calibrate it, the unit will *stop* detecting shots. To check if sensors are turned Off, press *<MENU>* key; this activates pending warning and alarms.

Change Battery without losing data
Turn the unit *Off* for about 30 seconds. While the unit is *Off* you must *not touch* any of the *keys*. The system will stay alive in hibernation, without battery, at room temperature, from **2** to **20 minutes**. You have about **2** minutes to replace the *old* battery with a *new* one. If the battery is reversed, you do not lose data, damage the unit or the battery. The battery must still be replaced **correctly** within **2** minutes.

Flashing colon or flashing decimal points
Flashing colon or decimal points indicate that the unit will *no longer accept shots* because environment conditions have changed. You can turn sensors off and use the unit for data review only, or you can calibrate it again. Please note that the unit **will not accept shots** unless it is **calibrated** again.

Troubleshooting

Dead Unit

If nothing happens when you replace the battery, please check the following:
- Measure the battery voltage, make sure the battery is installed correctly and not reversed.
- To make sure the unit boots up properly when you have problems, press and hold down the *<POWER>* key for 30 seconds. You do this with the **battery removed**.
- The battery voltage must be at least 4.6 Volts. The unit will not function as a chronograph with such a low battery, but it may be used for data retrieval and stats review.
- The battery may show much more than 4.6 volts on the voltmeter when measured without a load. Once battery is installed, the load may bring the voltage below 4.6 volts and it shows up as a black display, quickly disappearing.
- Please note that the chronograph will not detect velocities properly if the battery voltage is below 7.00 volts under load. The unit will begin flashing power level alarms.

Flashing Decimal Point
If all **decimal points** are flashing, it means that the unit will not detect velocities unless it is calibrated again. The calibration is done by turning the unit **Off** and **On** again. If you want to use the unit just for data retrieval and stats review, then you should turn sensors **Off** by pressing *<MENU+UNITS>* key.

Flashing Colon
When **colon** is flashing, it means that the environment is not suitable for velocity measurements and you must recalibrate the unit. If sensors have been turned Off, flashing colon will stop after you begin stats or shots review.

The unit will however remind you every 60 seconds that it needs to be calibrated again. The reminder will be flashing colon which can be suppressed for another 60 seconds by a simply executing stats or data review.

Unit will not Calibrate

All dots are flashing, indicating that the unit failed to calibrate.
There are three possible conditions,

- **Battery is dead**.
  The voltage is below 7.0 volts under load.
  Check battery power level with *<ENTER+POWER>* keys;
  it should be greater then 34%.

- **Indoors.**
  Fluorescent or sodium lamps are nearby, reflecting off the ceiling and walls.
  Artificial lights may be too strong and are shining directly into the optical slots; try using diffusers.
  There may not be enough light; you must provide some light.
  The unit is in Archery mode. Archery mode does not work well indoors; see "*Archery On-Off*" and "*Archery Notes*".

- **Outdoors**.
  If you have Archery mode **On,** try switching it **Off**;
  see "*Archery On-Off*" function.

  Sky is very blue and you are in Archery Mode. Under very deep blue sky, archery mode may not be able to calibrate.

  When in archery mode, moving tree branches above the chronograph will be interpreted as an unstable environment.

USER'S MANUAL

CE-3
CHRONOGRAPH
Version 1.01
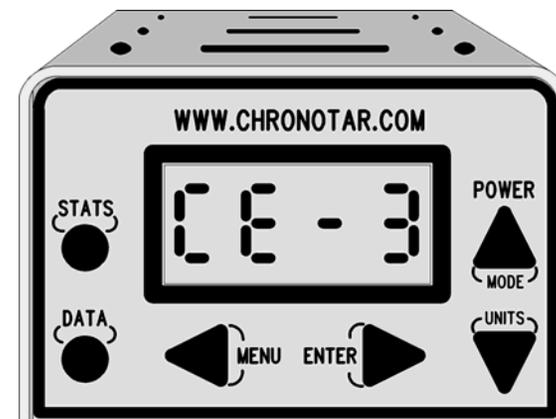
For Quick Reference
see page 7

Latest manuals and software releases
are available from
http://www.chronotar.com
http://www.echrony.com