



CR1000KD

Keyboard/Display for
CR6, CR1000X Series,
CR1000, or CR800



Please read first

About this manual

Please note that this manual was produced by Campbell Scientific Inc. primarily for the North American market. Some spellings, weights and measures may reflect this. In addition, while most of the information in the manual is correct for all countries, certain information is specific to the North American market and so may not be applicable to Europe, Middle East, and Africa (EMEA) or Asia Pacific (APAC) users. Differences include the U.S. standard external power supply details where some information (for example the AC transformer input voltage) will not be applicable for EMEA or APAC use. Please note, however, *that when a power supply adapter is ordered from Campbell Scientific it will be suitable for use in your country.*

Reference to some radio transmitters, digital cell phones and aerials (antennas) may also not be applicable according to your locality. Some brackets, shields and enclosure options, including wiring, are not sold as standard items in the EMEA or APAC market; in some cases alternatives are offered.

Recycling information for countries subject to WEEE regulations 2012/19/EU



At the end of this product's life it should not be put in commercial or domestic refuse but sent for recycling. Any batteries contained within the product or used during the products life should be removed from the product and also be sent to an appropriate recycling facility, per [The Waste Electrical and Electronic Equipment \(WEEE\) Regulations 2012/19/EU](#). Campbell Scientific can advise on the recycling of the equipment and in some cases arrange collection and the correct disposal of it, although charges may apply for some items or territories. For further support, please contact Campbell Scientific, or your local agent.

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1. Keyboard/display overview

The CR1000KD is a portable keyboard and display screen for use with Campbell Scientific data loggers that have a CS I/O port, including the CR6 and CR1000X/Xe, as well as our retired data loggers, the CR1000, CR800, and CR850. The CR1000KD is purchased separately from the data logger.



Figure 1-1. CR1000KD Keyboard/Display

The CR1000KD is a powerful tool for field use. It is an essential installation, maintenance, and troubleshooting tool for many applications and allows interrogation and configuration of the data logger independent of other communications links.

The CR1000KD also allows programmers to create custom menus for task-specific interfaces. For example, you can use CRBasic design menus that show selected data values, provide real-time displays, or allow field personnel to adjust approved settings. Custom menus replace or supplement the default display menus, giving users quick access to the information and controls they need while keeping the full program structure protected.

Watch these videos for more information:

- Introduction to the CR1000KD: www.campbellsci.com/videos/cr1000kd-1 
- Troubleshooting with a CR1000KD: www.campbellsci.com/videos/cr1000kd2 
- Creating custom menus: www.campbellsci.com/videos/custom-menus 

NOTE:

The keyboard/display requires a 12 V power supply to operate when connected through the CS I/O port.

2. Keyboard/display — details

This section illustrates the use of the keyboard/display using default menus. Some keys have special functions as outlined below.

2.1 Character set

The keyboard display character set is accessed using one of the following three procedures:

- The 16 keys default to ▲, ▼, ◀, ▶, Home, PgUp, End, PgDn, Del, and Ins.
- To enter numbers, first press **Num Lock**. **Num Lock** stays set until pressed again.
- Above all keys, except **Num Lock** and **Shift**, are characters printed in blue. To enter one of these characters, press **Shift** one to three times to select the position of the character as shown above the key, then press the key. For example, to enter **Y**, press **Shift Shift Shift PgDn**.
- To insert a space (**Spc**) or change case (**Cap**), press **Shift** one to two times for the position, then press **BkSpc**.
- To insert a character not printed on the keyboard, enter **Ins**, scroll down to **Character**, press **Enter**, then press ▲, ▼, ◀, ▶, to scroll to the desired character in the list that is presented, then press **Enter**.

Table 2-1: Special keyboard/display key functions	
Key	Special function
[2] and [8]	Navigate up and down through the menu list one line at a time
[Enter]	Selects the line or toggles the option of the line the cursor is on
[Esc]	Selects the line or toggles the option of the line the cursor is on
[Esc]	Back up one level in the menu
[Home]	Move cursor to top of the list
[End]	Move cursor to bottom of the list
[Pg Up]	Move cursor up one screen
[Pg Dn]	Move cursor down one screen
[BkSpc]	Delete character to the left

Table 2-1: Special keyboard/display key functions	
Key	Special function
[Shift]	Change alpha character selected
[Num Lock]	Change to numeric entry
[Del]	Delete When pressed during power up, Del changes the PPP interface to inactive (only if set as RS232). This allows you to get into RS232 for PakBus if PPP is keeping you out.
[Ins]	Insert/change graph configuration
[Graph]	Graph

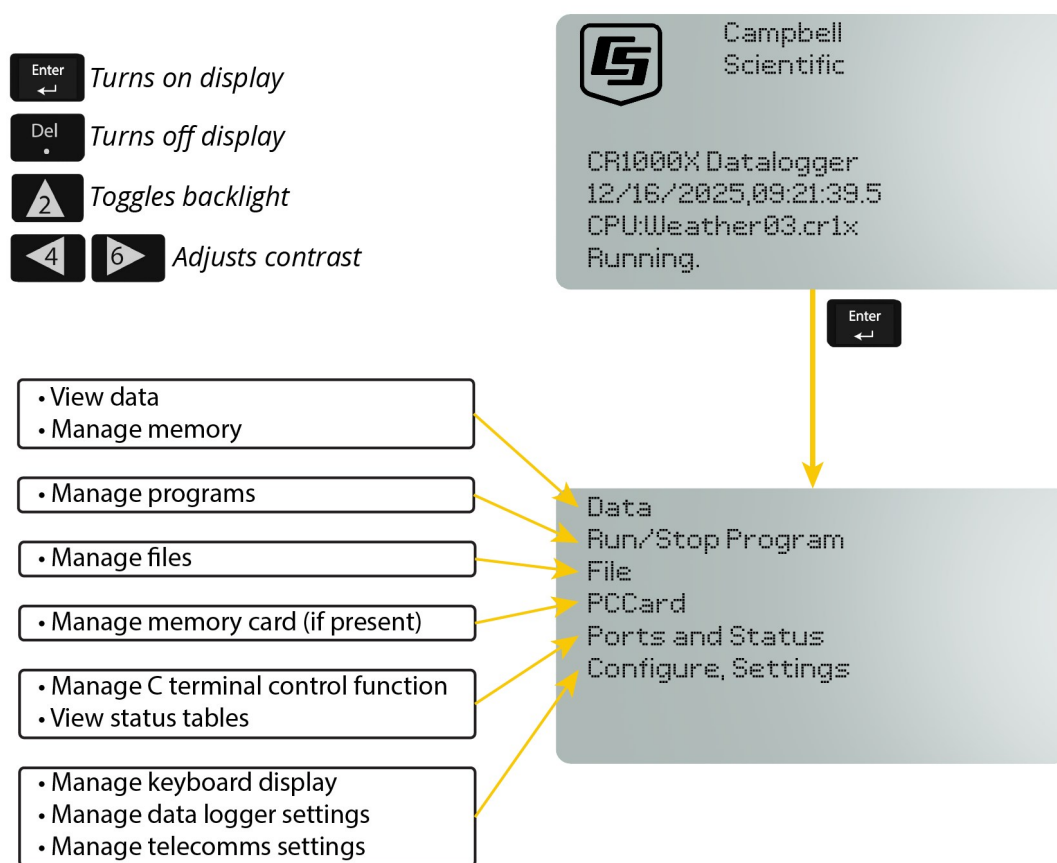


Figure 2-1. CR1000KD navigation

2.2 Data display

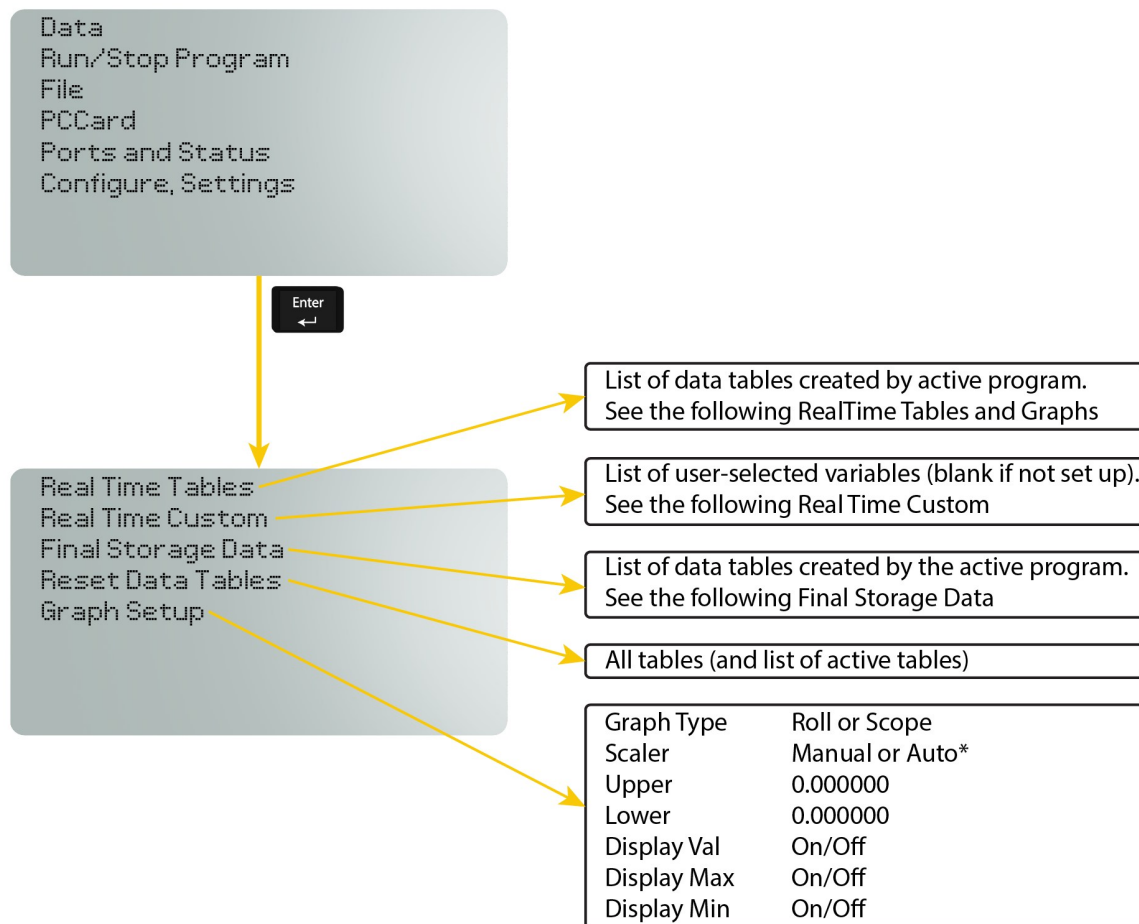


Figure 2-2. CR1000KD: displaying data

2.2.1 Real-time tables and graphs

List of Data Table created by the active program. For example,

```
Public
Table1
TempS
```

Move the cursor to the desired table and press [Enter]

```
Tref      :23.0234
TCTemp(1) :19.6243
TCTemp(2) :19.3429
TCTemp(3) :21.2003
Flag(1)   :-1.000000
Flag(2)   :0.000000
Flag(3)   :0.000000
Flag(4)   :0.000000
```

Public Table values can be changed. Move the cursor to value and press [Enter] to edit value.

```
Edit Field: Num
TCTemp(3)
Current Value:
21.2003
New Value:
```

Press [Num Lock] [Graph] for graph of selected field.

```
30.0      22.35
-----
-----
-----
20.0
```

Press [Ins] for Graph Setup

Move the cursor to setting and press [Enter] to change.

```
Scaler      Manual/Auto
Upper:      30.000000
Lower:      20.000000
Display Val  On/Off
Display Max  On/Off
Display Min  On/Off
Graph Type   Roll/Scope
```

New values are displayed as they are stored.

Figure 2-3. CR1000KD: real-time tables and graphs

2.2.2 Real-time custom

The CR1000KD Keyboard/Display can be configured with a customized real-time display. The data logger retains this setup as long as the defining program is running.

Read More: Custom menus can also be programmed. See [Custom menus — details](#) (p. 16).

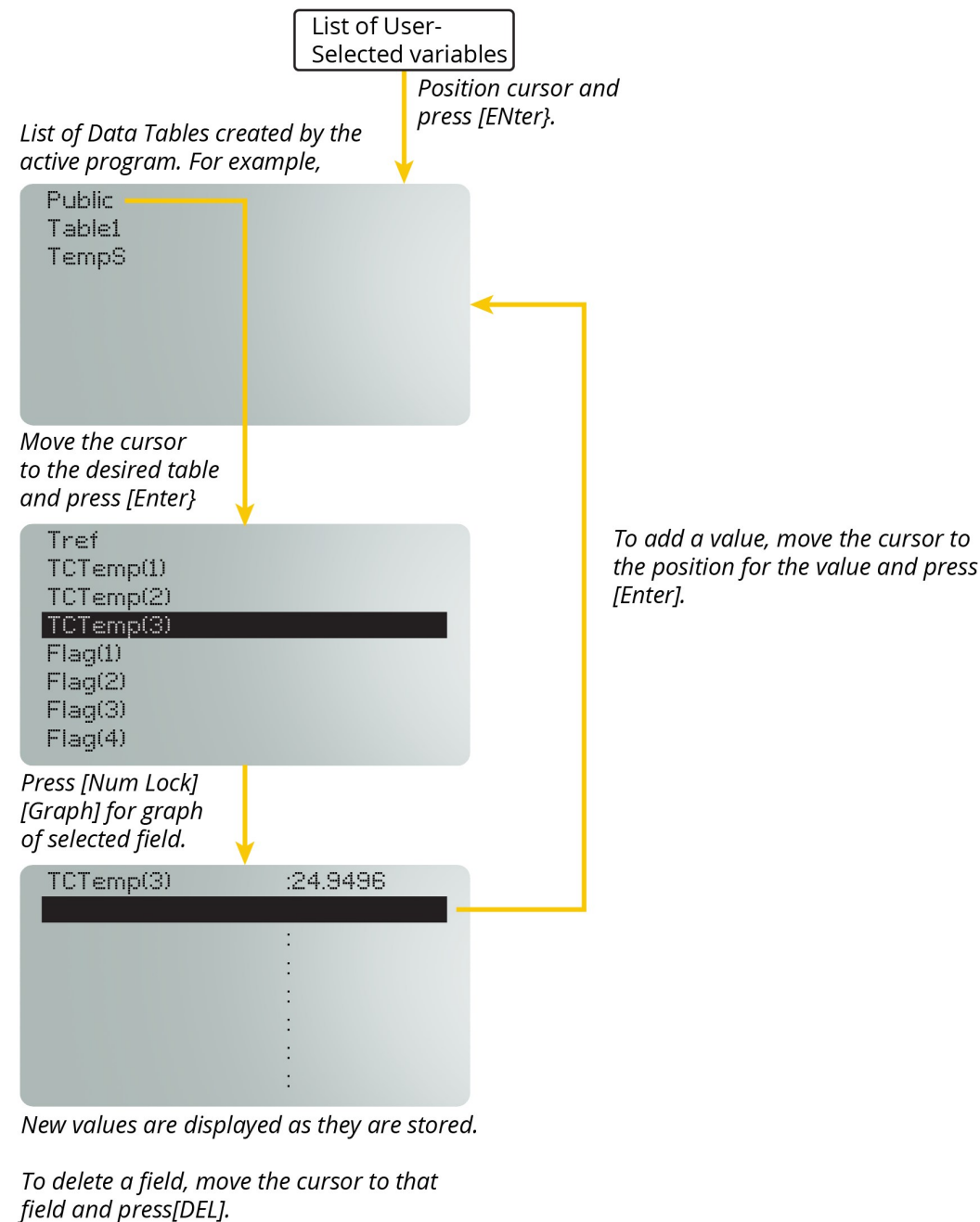


Figure 2-4. CR1000KD: real-time custom

2.2.3 Final storage data

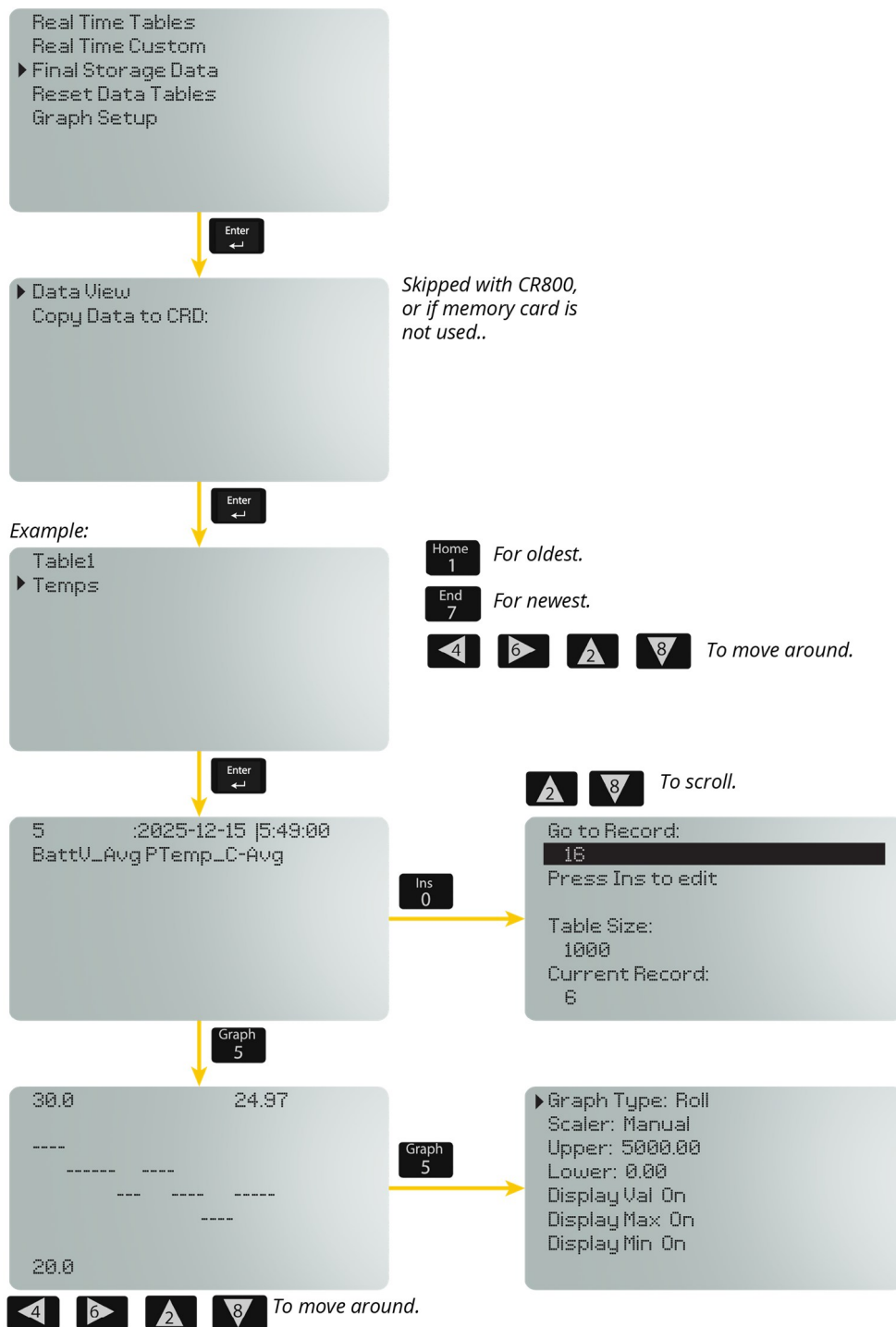


Figure 2-5. CR1000KD: final storage data

2.3 Run/stop program

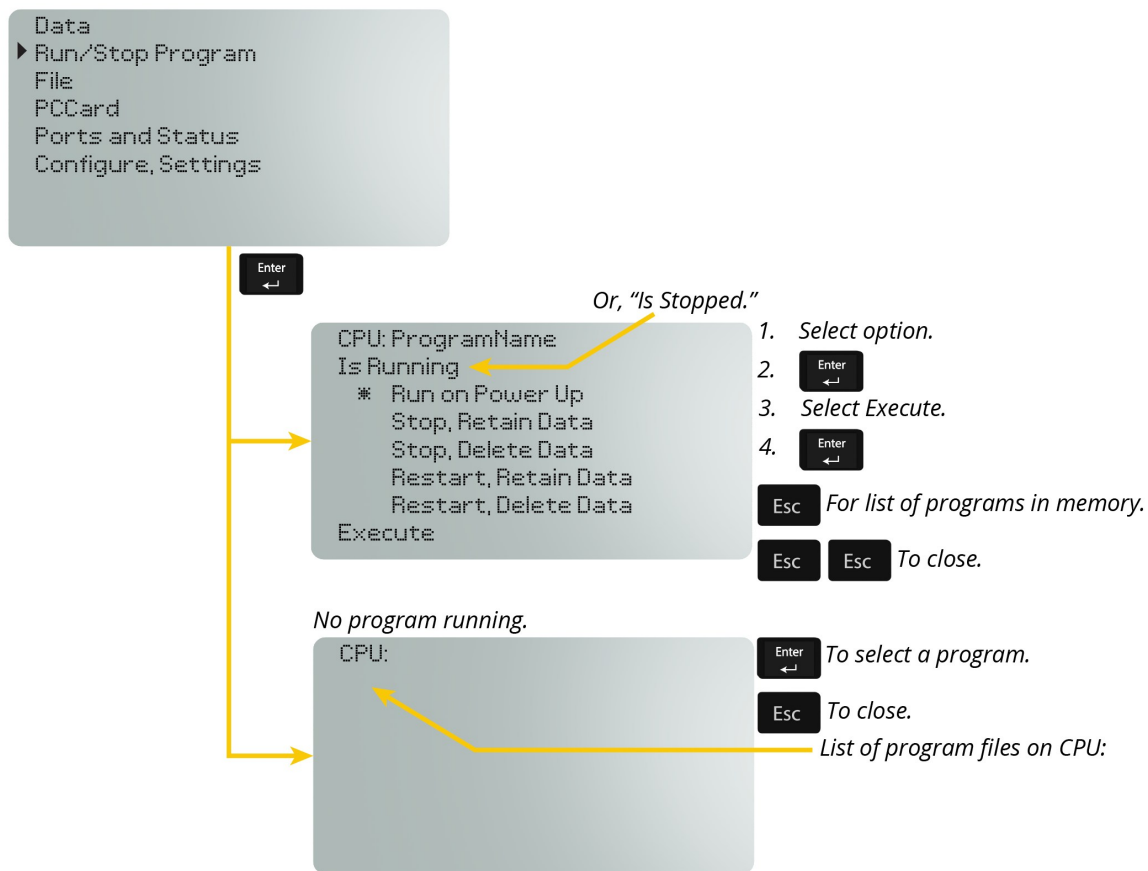


Figure 2-6. CR1000KD: run/stop program

2.4 File management

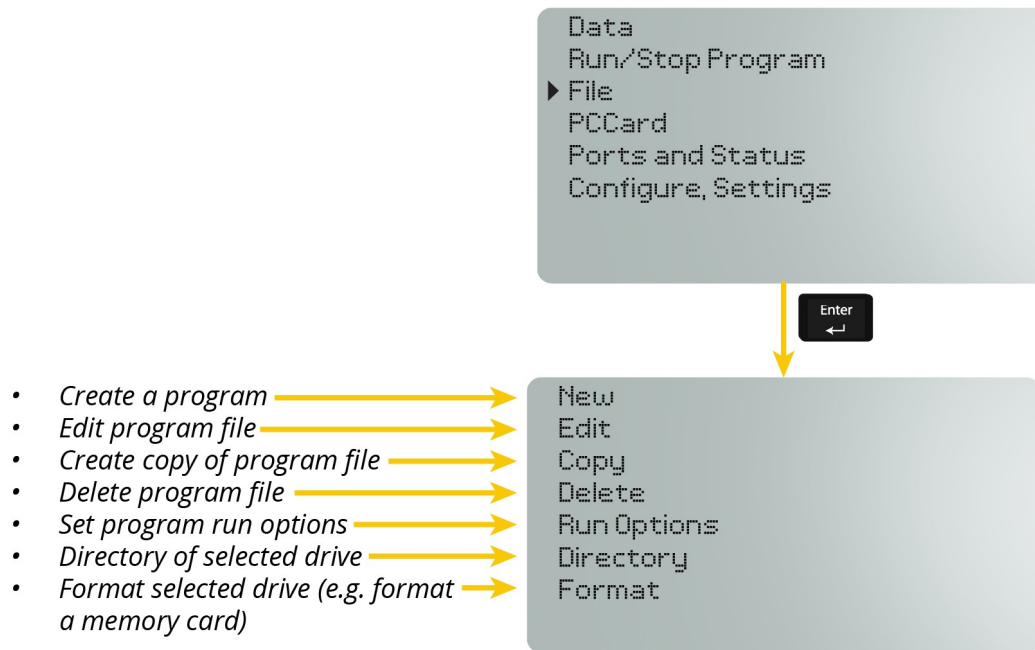


Figure 2-7. CR1000KD: file management

2.4.1 File edit

The **CRBasic Editor** is the recommended tool for writing and editing data logger programs. When making minor changes using the CR1000KD Keyboard/Display, you must restart the program to activate the changes. Be aware that, unless specifically programmed otherwise, all variables and settings will be reset upon restart. Remember that any changes exist **only in the data logger** until the program is retrieved using data logger support software or removable memory.

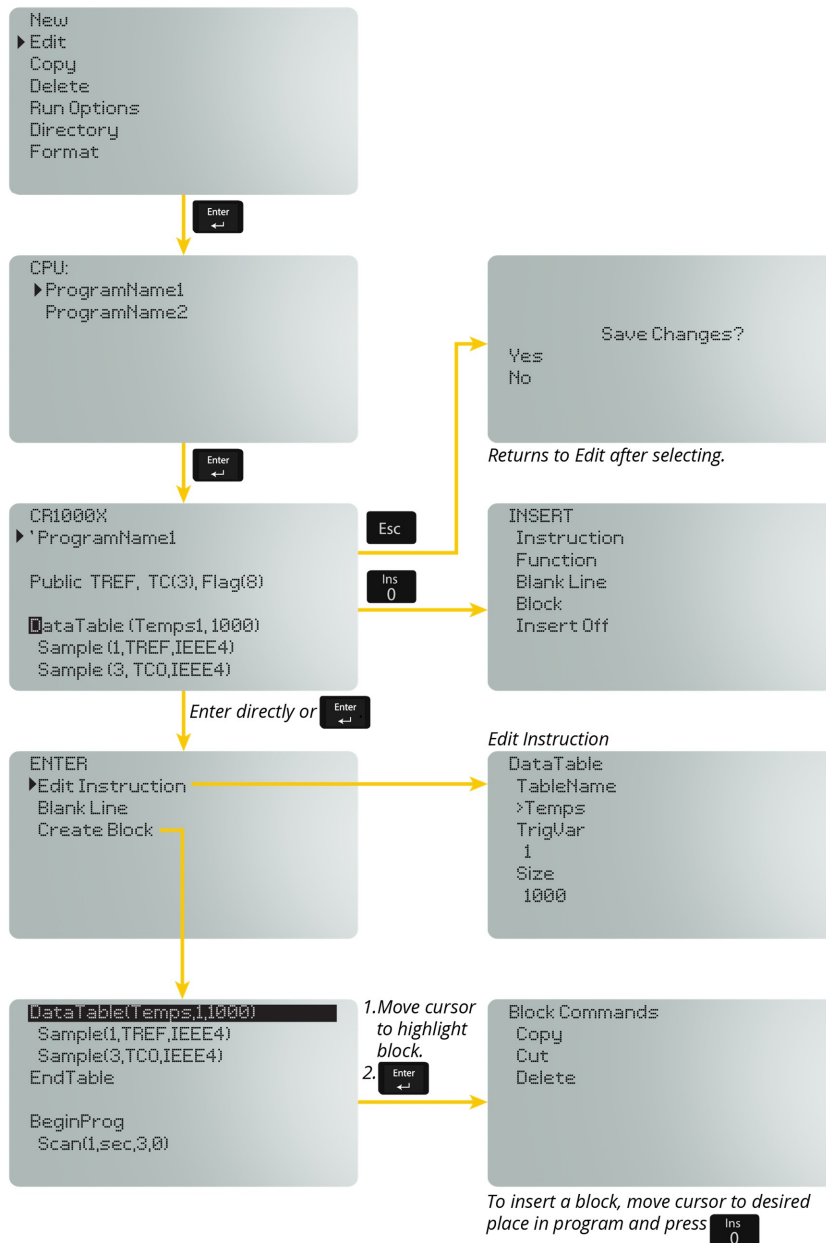


Figure 2-8. CR1000KD: file edit

2.5 PCCard (memory card) management

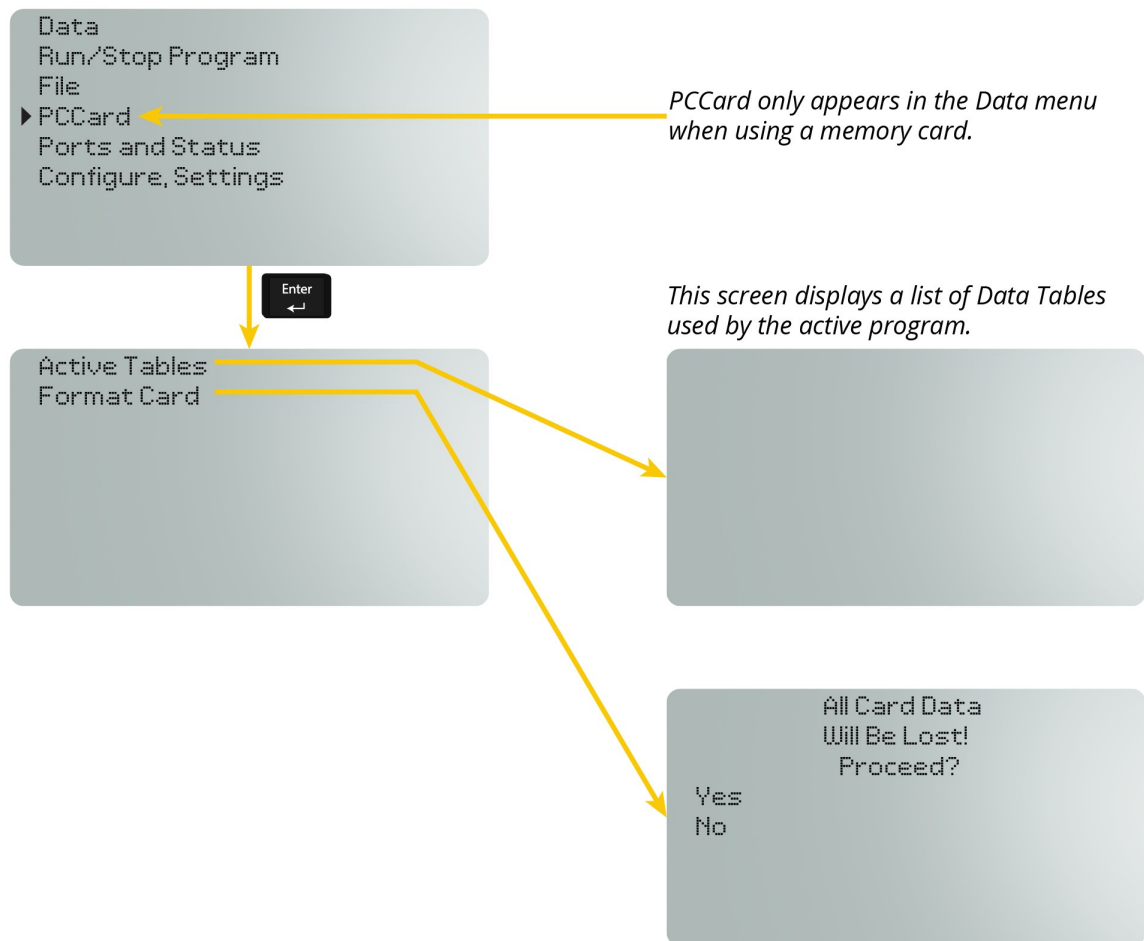


Figure 2-9. CR1000KD: PCCard (memory card) management

2.6 Port status and Status table

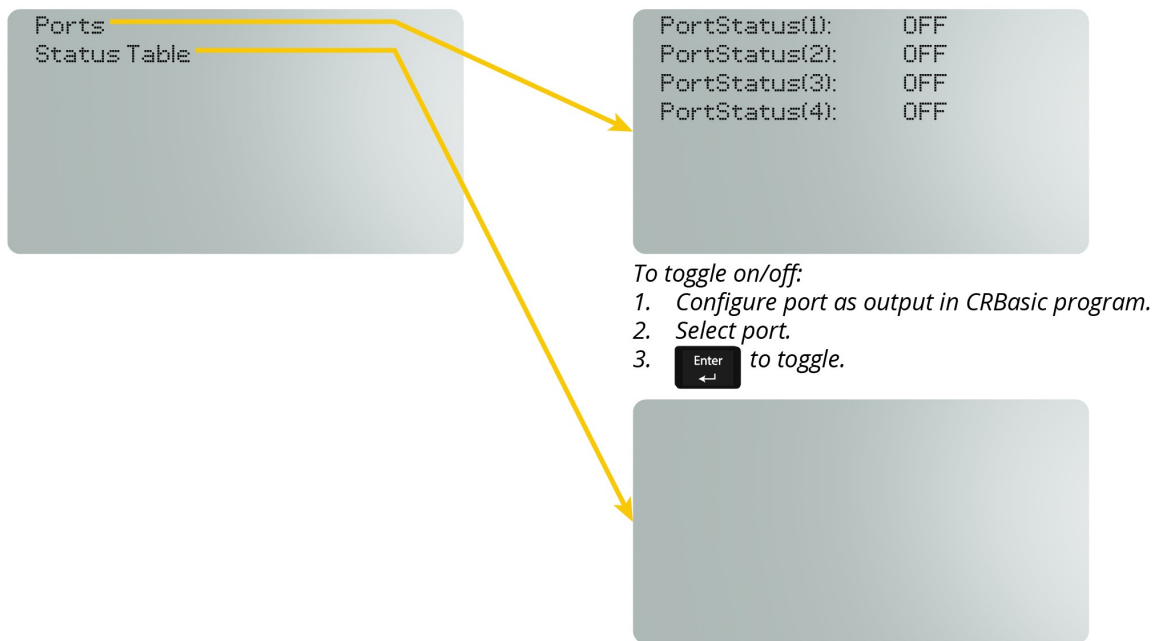


Figure 2-10. CR1000KD: port status and Status table

2.7 Settings

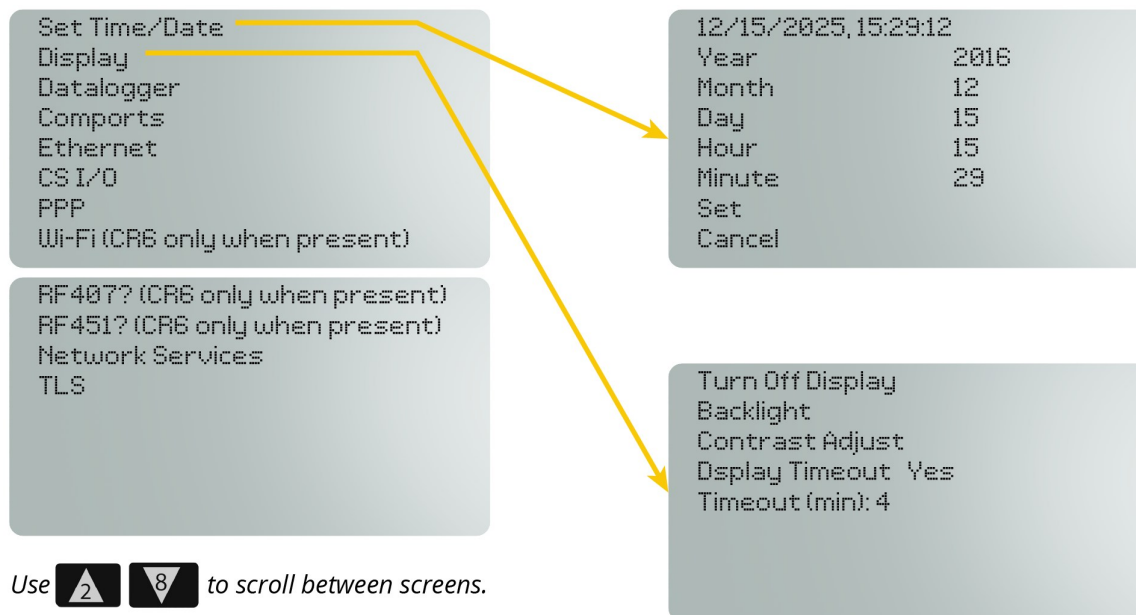


Figure 2-11. CR1000KD: settings

2.7.1 CR1000KD: set time / date

Move the cursor to time element and press **Enter** to change it. Then move the cursor to **Set** and press **Enter** to apply the change.

2.7.2 CR1000KD: PakBus settings

In the **Settings** menu, move the cursor to the PakBus® element and press **Enter** to change it. After modifying, press **Enter** to apply the change.

2.8 Configure display

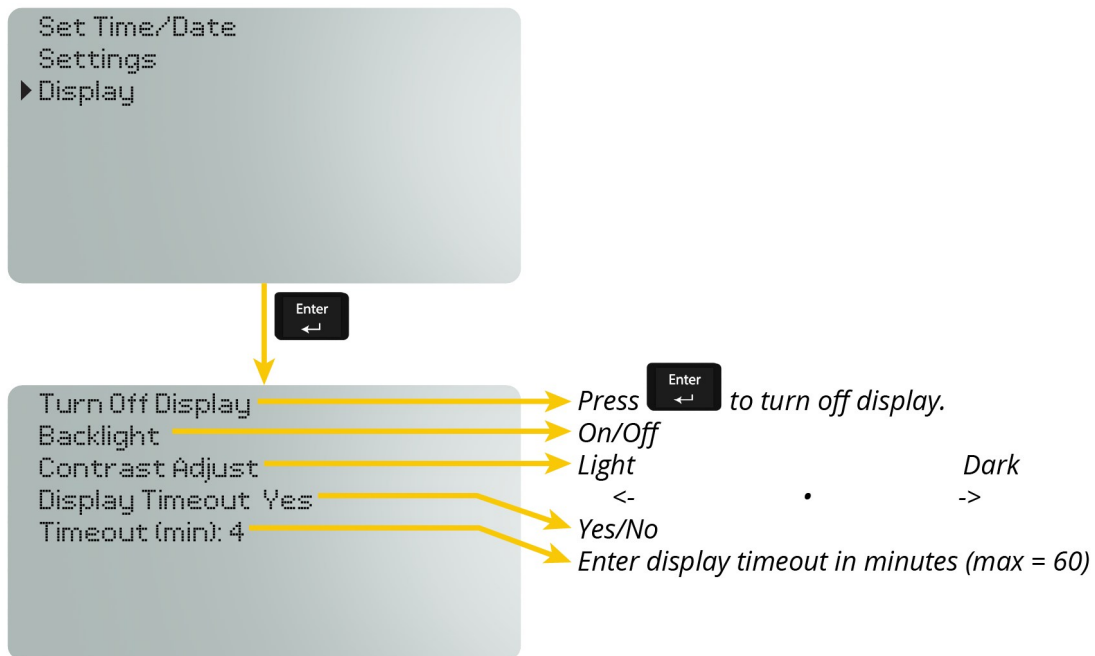


Figure 2-12. CR1000KD: configure display

3. Custom menus overview

CRBasic programming in the data logger allows you to create custom menus for the CR1000KD Keyboard/Display. [Figure 3-1](#) (p. 15) shows windows from a simple custom menu named **DataView**. This menu replaces the default main menu on the keyboard display.

As shown, **DataView** includes the menu item **Counter** and the submenus **PanelTemps**, **TCTemps**, and **System Menu**. The **Counter** option allows the user to select one of four values. Each submenu displays two values from data logger memory:

- **PanelTemps** shows the wiring-panel temperature for each scan and the one-minute panel-temperature sample.
- **TCTemps** displays two thermocouple temperatures.

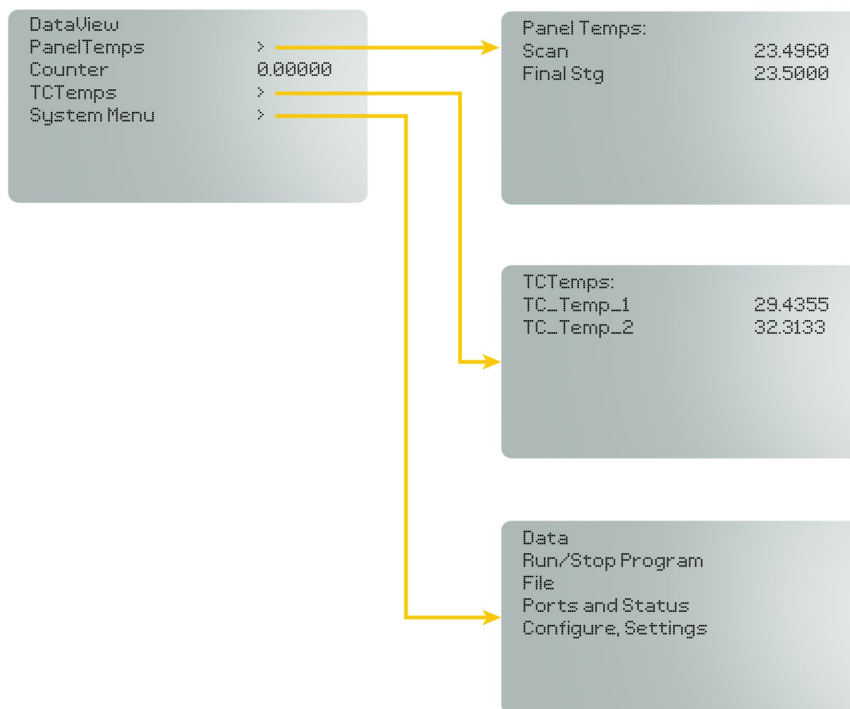


Figure 3-1. Custom menu example

3.1 Custom menus — details

Menus for the CR1000KD Keyboard/Display can be customized to simplify routine operations. Viewing data, toggling control functions, or entering notes are common applications. Individual menu screens support up to eight lines of text with up to seven variables.

Use the following CRBasic instructions. Refer to *CRBasic Editor* Help for complete information.

DisplayMenu()

Marks the beginning and end of a custom menu. Only one allowed per program.

NOTE:

Label must be at least six characters long to mask default display clock.

EndMenu

Marks the end of a custom menu. Only one allowed per program.

DisplayValue()

Defines a label and displays a value (variable or data table value) not to be edited, such as a measurement.

MenuItem()

Defines a label and displays a variable to be edited by typing or from a pick list defined by [MenuPick\(\)](#).

MenuPick()

Creates a pick list from which to edit a [MenuItem\(\)](#) variable. Follows immediately after [MenuItem\(\)](#). If variable is declared **As Boolean**, [MenuPick\(\)](#) allows only True or False or declared equivalents. Otherwise, many items are allowed in the pick list. Order of items in list is determined by order of instruction; however, item displayed initially in [MenuItem\(\)](#) is determined by the value of the item.

SubMenu() / EndSubMenu

Defines the beginning and end of a second-level menu.

NOTE:

[SubMenu\(\)](#) label must be at least six characters long to mask default display clock.

[CRBasic Example 1](#) (p. 20) demonstrates how to program a custom menu to facilitates viewing data, entering notes, and controlling a device. Following is a list of figures that show the organization of the custom menu.

[Custom menu example — Home screen](#) (p. 17)

[Custom menu example — View Data window](#) (p. 17)

[Custom menu example — Make Notes sub menu](#) (p. 18)

[Custom menu example — Predefined notes pick list](#) (p. 18)

[Custom menu example — Free Entry notes window](#) (p. 18)

[Custom menu example — Accept/Clear notes window](#) (p. 18)

[Custom menu example — Control sub menu](#) (p. 19)

[Custom menu example — Control LED pick list](#) (p. 19)

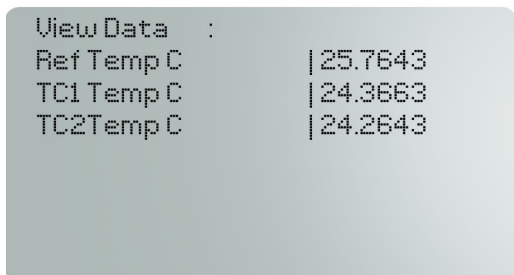
[Custom menu example — Control LED Boolean pick list](#) (p. 19)



A screenshot of a monochrome LCD display showing a custom menu. The title is '* * CUSTOM MENU DEMO * *'. Below the title, there are four menu items: 'View Data', 'Make Notes', and 'Control', each followed by a right-pointing arrow '>'.

```
* * CUSTOM MENU DEMO * *
>
View Data      >
Make Notes     >
Control        >
```

Figure 3-2. Custom menu example — Home screen



A screenshot of a monochrome LCD display showing the 'View Data' window. The title is 'View Data :'. Below the title, there are three data items: 'Ref Temp C' with a value of '25.7643', 'TC1 Temp C' with a value of '24.3663', and 'TC2 Temp C' with a value of '24.2643'. Each item is followed by a vertical bar '|' and its corresponding value.

```
View Data :
Ref Temp C | 25.7643
TC1 Temp C | 24.3663
TC2 Temp C | 24.2643
```

Figure 3-3. Custom menu example — View Data window

```
Make Notes :  
Predefined |-----  
Free Entry |  
Accept/Clear |???????
```

Figure 3-4. Custom menu example — Make Notes sub menu

```
Predefined  
Cal_Done  
Offset_Changed
```

Figure 3-5. Custom menu example — Predefined notes pick list

```
Modify Value  
Free Entry  
  
Current Value:  
  
New Value:
```

Figure 3-6. Custom menu example — Free Entry notes window

```
Accept / Clear  
Accept  
Clear
```

Figure 3-7. Custom menu example — Accept/Clear notes window

```
Control :  
Count to LED |      0  
Manual LED  |    Off
```

Figure 3-8. Custom menu example — Control sub menu

```
Count to LED  
15  
30  
45  
60
```

Figure 3-9. Custom menu example — Control LED pick list

```
Manual LED  
On  
Off
```

Figure 3-10. Custom menu example — Control LED Boolean pick list

NOTE:

See [Figure 3-2](#) (p. 17) through [Figure 3-10](#) (p. 19) in reference to the following CRBasic example.

CRBasic Example 1: Custom menus

```
'This program example demonstrates the building of a custom CR1000KD
'Keyboard/Display menu.

'Declarations supporting View Data menu item
Public RefTemp 'Reference Temp Variable
Public TCTemp(2) 'Thermocouple Temp Array

'Declarations supporting blank line menu item
Const Escape = "Hit Esc" 'Word indicates action to exit dead end

'Declarations supporting Enter Notes menu item
Public SelectNote As String * 20 'Hold predefined pick list note
Const Cal_Done = "Cal Done" 'Word stored when Cal_Don selected
Const Offst_Chgd = "Offset Changed" 'Word stored when Offst_Chgd selected
Const Blank = "" 'Word stored when blank selected
Public EnterNote As String * 30 'Variable to hold free entry note
Public CycleNotes As String * 20 'Variable to hold notes control word
Const Accept = "Accept" 'Notes control word
Const Clear = "Clear" 'Notes control word

'Declarations supporting Control menu item
Const On = true 'Assign "On" as Boolean True
Const Off = false 'Assign "Off" as Boolean False
Public StartFlag As Boolean 'LED Control Process Variable
Public Countdown As Long 'LED Count Down Variable
Public ToggleLED As Boolean 'LED Control Variable

'Define Note DataTable 'Set up Notes data table, written
DataTable(Notes,1,-1) 'to when a note is accepted
  Sample(1,SelectNote,String) 'Sample Pick List Note
  Sample(1,EnterNote,String) 'Sample Free Entry Note
EndTable

'Define temperature DataTable 'Set up temperature data table.
DataTable(TempC,1,-1) 'Written to every 60 seconds with:
  DataInterval(0,60,Sec,10)
  Sample(1,RefTemp,FP2) 'Sample of reference temperature
  Sample(1,TCTemp(1),FP2) 'Sample of thermocouple 1
  Sample(1,TCTemp(2),FP2) 'Sample of thermocouple 2
EndTable

'Custom Menu Declarations
DisplayMenu("***CUSTOM MENU DEMO***",-3) 'Create Menu; Upon power up, the
'custom menu is displayed. The system menu is hidden from the user.

SubMenu("") 'Dummy Sub menu to write a blank line
  DisplayValue("",Escape) 'a blank line
```

CRBasic Example 1: Custom menus

```

EndSubMenu 'End of dummy submenu

SubMenu("View Data ") 'Create Submenu named PanelTemps
  DisplayValue("Ref Temp C",RefTemp) 'Item for Submenu from Public
  DisplayValue("TC 1 Temp C",TCTemp(1)) 'Item for Submenu - TCTemps(1)
  DisplayValue("TC 2 Temp C",TCTemp(2)) 'Item for Submenu - TCTemps(2)
EndSubMenu 'End of Submenu

SubMenu("Make Notes ") 'Create Submenu named PanelTemps
  MenuItem("Predefined",SelectNote) 'Choose predefined notes Menu Item
  MenuPick(Cal_Done,Offset_Changed) 'Create pick list of predefined notes
  MenuItem("Free Entry",EnterNote) 'User entered notes Menu Item
  MenuItem("Accept/Clear",CycleNotes)
  MenuPick(Accept,Clear)
EndSubMenu

SubMenu("Control ") 'Create Submenu named PanelTemps
  MenuItem("Count to LED",CountDown) 'Create menu item CountDown
  MenuPick(15,30,45,60) 'Create a pick list for CountDown
  MenuItem("Manual LED",ToggleLED) 'Manual LED control Menu Item
  MenuPick(On,Off)
  EndSubMenu
EndMenu 'End custom menu creation

'Main Program
BeginProg

  CycleNotes = "?????" 'Initialize Notes Sub Menu,
  'write ????? as a null Scan(1,Sec,3,0)
Scan (1,Sec,3,0)
  'Measurements
  PanelTemp(RefTemp,60) 'Measure Reference Temperature
  'Measure Two Thermocouples
  TCDiff(TCTemp(),2,mv200,1,TypeT,RefTemp,True,0,60,1.0,0)
  CallTable TempC 'Call data table

  'Menu Item "Make Notes" Support Code
If CycleNotes = "Accept" Then
  CallTable Notes 'Write data to Notes data table
  CycleNotes = "Accepted" 'Write "Accepted" after written
  Delay(1,500,mSec) 'Pause so user can read "Accepted"
  SelectNote = "" 'Clear pick list note
  EnterNote = "" 'Clear free entry note
  CycleNotes = "?????" 'Write ????? as a null prompt
EndIf
If CycleNotes = "Clear" Then 'Clear notes when requested
  SelectNote = "" 'Clear pick list note
  EnterNote = "" 'Clear free entry note

```


CRBasic Example 1: Custom menus

```
CycleNotes = "?????" 'Write ????? as a null prompt
EndIf

'Menu Item "Control" Menu Support Code
CountDown = CountDown - 1 'Count down by 1
If CountDown <= 0 'Stop count down from passing 0
    CountDown = 0
EndIf
If CountDown > 0 Then
    StartFlag = True 'Indicate countdown started
EndIf
If StartFlag = True AND CountDown = 0 Then 'Interprocess count down
    'and manual LED
    ToggleLED = True
    StartFlag = False
EndIf
If StartFlag = True AND CountDown <> 0 Then 'Interprocess count down
    'and manual LED
    ToggleLED = False
EndIf

PortSet(4,ToggleLED) 'Set control port according
'to result of processing

NextScan
EndProg
```

Appendix A. Keyboard/display compatibility list

Table A-1: Data logger keyboard/displays¹

Data logger model	Compatible keyboard displays
CR1000(X)	CR1000KD ² , CD100, CD295
CR6	CR1000KD ² , CD100, CD295
CR800	CR1000KD ² , CD100, CD295
CR850	Integrated keyboard display, CR1000KD ² , CD100, CD295
CR3000	Integrated keyboard display, CR1000KD ² (requires special OS), CD100 (requires special OS), CD295
¹ Keyboard displays are either integrated into the data logger or connected through the CS I/O port.	
² The CR1000KD can be mounted to a surface by way of the two #4-40 x 0.187 screw holes at the back.	


Limited warranty

Covered equipment is warranted/guaranteed against defects in materials and workmanship under normal use and service for the period listed on your sales invoice or the product order information web page. The covered period begins on the date of shipment unless otherwise specified. For a repair to be covered under warranty, the following criteria must be met:

1. There must be a defect in materials or workmanship that affects form, fit, or function of the device.
2. The defect cannot be the result of misuse.
3. The defect must have occurred within a specified period of time; and
4. The determination must be made by a qualified technician at a Campbell Scientific Service Center/ repair facility.

The following is not covered:

1. Equipment which has been modified or altered in any way without the written permission of Campbell Scientific.
2. Batteries; and
3. Any equipment which has been subjected to misuse, neglect, acts of God or damage in transit.


Campbell Scientific regional offices handle repairs for customers within their territories. Please see the back page of the manual for a list of [regional offices](#) or visit www.campbellsci.com/contact  to determine which Campbell Scientific office serves your country. For directions on how to return equipment, see [Assistance](#).

Other manufacturer's products, that are resold by Campbell Scientific, are warranted only to the limits extended by the original manufacturer.

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warranties, expressed or implied, including those of suitability and fitness for a particular purpose. Campbell Scientific is not liable for consequential damage.

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Assistance

Products may not be returned without prior authorization. Please inform us before returning equipment and obtain a **return material authorization (RMA) number** whether the repair is under warranty/guarantee or not. See [Limited warranty](#) for information on covered equipment.

Campbell Scientific regional offices handle repairs for customers within their territories. Please see the back page of the manual for a list of [regional offices](#) or visit www.campbellsci.com/contact  to determine which Campbell Scientific office serves your country.

When returning equipment, a RMA number must be clearly marked on the outside of the package. Please state the faults as clearly as possible. Quotations for repairs can be given on request.

It is the policy of Campbell Scientific to protect the health of its employees and provide a safe working environment. In support of this policy, when equipment is returned to Campbell Scientific, Logan, UT, USA, it is mandatory that a “[Declaration of Hazardous Material and Decontamination](#)” form be received before the return can be processed. If the form is not received within 5 working days of product receipt or is incomplete, the product will be returned to the customer at the customer’s expense. For details on decontamination standards specific to your country, please reach out to your [regional Campbell Scientific](#) office.

NOTE:

All goods that cross trade boundaries may be subject to some form of fee (customs clearance, duties or import tax). Also, some regional offices require a purchase order upfront if a product is out of the warranty period. Please contact your [regional Campbell Scientific](#) office for details.

Safety

DANGER — MANY HAZARDS ARE ASSOCIATED WITH INSTALLING, USING, MAINTAINING, AND WORKING ON OR AROUND TRIPODS, TOWERS, AND ANY ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC. FAILURE TO PROPERLY AND COMPLETELY ASSEMBLE, INSTALL, OPERATE, USE, AND MAINTAIN TRIPODS, TOWERS, AND ATTACHMENTS, AND FAILURE TO HEED WARNINGS, INCREASES THE RISK OF DEATH, ACCIDENT, SERIOUS INJURY, PROPERTY DAMAGE, AND PRODUCT FAILURE. TAKE ALL REASONABLE PRECAUTIONS TO AVOID THESE HAZARDS. CHECK WITH YOUR ORGANIZATION'S SAFETY COORDINATOR (OR POLICY) FOR PROCEDURES AND REQUIRED PROTECTIVE EQUIPMENT PRIOR TO PERFORMING ANY WORK.

Use tripods, towers, and attachments to tripods and towers only for purposes for which they are designed. Do not exceed design limits. Be familiar and comply with all instructions provided in product manuals. Manuals are available at www.campbellsci.com You are responsible for conformance with governing codes and regulations, including safety regulations, and the integrity and location of structures or land to which towers, tripods, and any attachments are attached. Installation sites should be evaluated and approved by a qualified engineer. If questions or concerns arise regarding installation, use, or maintenance of tripods, towers, attachments, or electrical connections, consult with a licensed and qualified engineer or electrician.

General

- Protect from over-voltage.
- Protect electrical equipment from water.
- Protect from electrostatic discharge (ESD).
- Protect from lightning.
- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations, such as those of the FAA in the USA.
- Use only qualified personnel for installation, use, and maintenance of tripods and towers, and any attachments to tripods and towers. The use of licensed and qualified contractors is highly recommended.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- Wear a hardhat and eye protection, and take other appropriate safety precautions while working on or around tripods and towers.
- Do not climb tripods or towers at any time, and prohibit climbing by other persons. Take reasonable precautions to secure tripod and tower sites from trespassers.
- Use only manufacturer recommended parts, materials, and tools.

Utility and Electrical

- You can be killed or sustain serious bodily injury if the tripod, tower, or attachments you are installing, constructing, using, or maintaining, or a tool, stake, or anchor, come in contact with overhead or underground utility lines.
- Maintain a distance of at least one-and-one-half times structure height, 6 meters (20 feet), or the distance required by applicable law, whichever is greater, between overhead utility lines and the structure (tripod, tower, attachments, or tools).
- Prior to performing site or installation work, inform all utility companies and have all underground utilities marked.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.
- Only use power sources approved for use in the country of installation to power Campbell Scientific devices.

Elevated Work and Weather

- Exercise extreme caution when performing elevated work.
- Use appropriate equipment and safety practices.
- During installation and maintenance, keep tower and tripod sites clear of un-trained or non-essential personnel. Take precautions to prevent elevated tools and objects from dropping.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.

Internal Battery

- Be aware of fire, explosion, and severe-burn hazards.
- Misuse or improper installation of the internal lithium battery can cause severe injury.

- Do not recharge, disassemble, heat above 100 °C (212 °F), solder directly to the cell, incinerate, or expose contents to water. Dispose of spent batteries properly.

Use and disposal of batteries

- Where batteries need to be transported to the installation site, ensure they are packed to prevent the battery terminals shorting which could cause a fire or explosion. Especially in the case of lithium batteries, ensure they are packed and transported in a way that complies with local shipping regulations and the safety requirements of the carriers involved.
- When installing the batteries follow the installation instructions very carefully. This is to avoid risk of damage to the equipment caused by installing the wrong type of battery or reverse connections.
- When disposing of used batteries, it is still important to avoid the risk of shorting. Do not dispose of the batteries in a fire as there is risk of explosion and leakage of harmful chemicals into the environment. Batteries should be disposed of at registered recycling facilities.

Avoiding unnecessary exposure to radio transmitter radiation

- Where the equipment includes a radio transmitter, precautions should be taken to avoid unnecessary exposure to radiation from the antenna. The degree of caution required varies with the power of the transmitter, but as a rule it is best to avoid getting closer to the antenna than 20 cm (8 inches) when the antenna is active. In particular keep your head away from the antenna. For higher power radios (in excess of 1 W ERP) turn the radio off when servicing the system, unless the antenna is installed away from the station, e.g. it is mounted above the system on an arm or pole.

Maintenance

- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.

WHILE EVERY ATTEMPT IS MADE TO EMBODY THE HIGHEST DEGREE OF SAFETY IN ALL CAMPBELL SCIENTIFIC PRODUCTS, THE CUSTOMER ASSUMES ALL RISK FROM ANY INJURY RESULTING FROM IMPROPER INSTALLATION, USE, OR MAINTENANCE OF TRIPODS, TOWERS, OR ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.

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