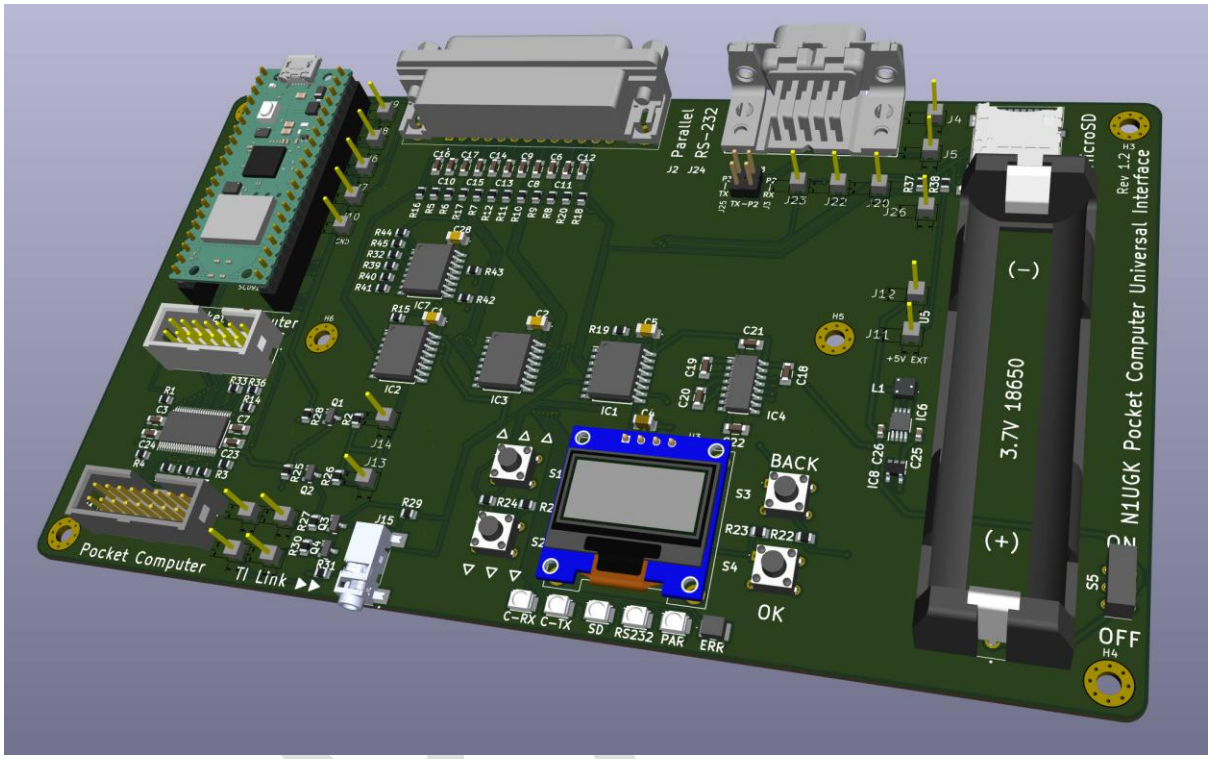


Pocket Computer Universal Interface (PCUI)

Hardware Version 1.2

Document Version 1.0

May 1, 2026

Owners Manual

I. Introduction

A. Purpose

The Pocket Computer Universal Interface (PCUI) provides a printer and storage interface for various models of vintage pocket computers and scientific / graphing calculators. Because many of these pocket computers' printers and cassette interfaces are difficult to find these days, expensive, and use consumables that are difficult or impossible to find, the PCUI provides a modern replacement for those peripherals.

Although some pocket computers had printers which were thermal, and therefore in theory had consumables (such as the paper) still available today, others had plotters which used pens. Even though it is possible to find pens today, they are either used and potentially dried up, or will eventually dry up. Newly manufactured pens (hard to find) are made of plastic and do not work in vertical carousel plotters (such as the Casio FP-100 or the Sharp 515P, etc).

At least one pocket computer, the Casio FX-702P, used a "spark" printer, which requires aluminum coated paper, no longer made today.

For all of the reasons above, and perhaps others such as scarcity, expense, maintenance / repairs, the PCUI provides a modern printer interface to many of these vintage pocket computers and calculators.

Regarding the cassette storage options for these same pocket computers and calculators, the cassette interfaces are also sometimes difficult to find, expensive, and they are sometimes difficult to get the levels correct. Often times loads from cassette fail due to poor quality recordings, cassettes, or both.

The PCUI eliminates the frustration of loading from cassette using modern micro SD storage media. Further, edits can be made to programs on a PC or Mac, and then transferred to the pocket computer via a removable drive interface with the PCUI. The PCUI can "tokenize" or convert plain ASCII files to BASIC programs the pocket computer recognizes.

B. Features Summary

- Provides cassette interface emulation to read and write programs and data directly to and from a micro SD card.

- Provides a printer interface between the pocket computer or calculator and most standard "line printers" such as dot matrix, thermal receipt printers, serial and parallel.
- Supports printing of custom glyphs, including math, scientific and engineering symbols unique to each model.
- Works independently without a computer and can be powered by a single 18650 lithium ion rechargeable battery.
- OLED screen with user-friendly menu system and operating modes
- Interface packs provide connectivity to each supported model, no need for OEM connection cables.
- Updatable firmware and PC or Mac connectivity via USB for mounting micro SD card
- Plotter emulation mode to provide printouts of plots using modern printers allowing programs which leveraged plotter features to be used on modern printers.
- ASCII BASIC conversion to and from tokenized BASIC "on the fly", allowing for program edits and program creation on a Mac or PC and directly sending it to a pocket computer.
- WiFi connectivity and web interface for program viewing, editing, UI control, and status.

C. Supported Models

Brand	Model(s)
Texas Instruments	Graph Link Graphing Calculators TI-82*, TI-85*, TI-86*, TI-89*, TI-92*, TI-92 Plus*, Voyage 200*
Sharp	Older 11-pin "CE-126P" Compatibles PC-1245, PC-1246, PC-1246S, PC-1247, PC-1248, Tandy PC-8* PC-1250, PC-1250A, PC-1251, PC-1251H, PC-1255, Tandy PC-3* and PC-3 A/B*
Sharp	Newer 11-pin "CE-126P" Compatibles PC-1401, PC-1403*, PC-1421, PC-1430, PC-1450, EL-5500, EL-5500 II, EL-5500III*

Casio	12-pin PB-100 Series PB-100, PB-110, PB-120, PB-200, PB-400, FX-700P, FX-710P, Tandy PC-4*
Casio	12-pin FX "Clamshell" Series FX-770P, FX-780P, FX-781P, FX-785P, FX-790P, FX-791P, FX-795P, Tandy PC-5*, Tandy PC-6*
Casio	15-pin "FA-10" Compatibles PB-700*, PB-770*
Casio	FX-702P*, FX-602P*

* Tested and Verified, others should work since they use the same interface

D. Parts and Components

1. PCUI Main PCB

The PCUI is comprised of a single main PC board (PCB) and one or more pocket computer interface pack PCBs (if applicable). The main PCB will be identified with a hardware version number – be sure the version number on your unit matches the version number of this guide.

2. Pocket Computer Interface Packs

Your PCUI kit might have one or more pocket computer interface packs. These packs contain a small PCB, a connector, and some have additional components. An interface pack is designed for a particular line of pocket computers that share a specific bus interface or pinout.

Use of the TTL pocket computer interface packs will plug into the 16-pin shrouded IDC style header on the main PCB. Use of the CMOS pocket computer interface packs will plug into the 14-pin shrouded IDC style header on the main PCB.

If using a Texas Instruments graphing calculator, a 2.5mm stereo jack is on the main PCB labelled TI Link. The connection cable itself is not

included. Any standard "stereo" or 3 pin 2.5mm cable will work if you do not have the original Texas Instruments graph link cable.

3. Lithium Ion Battery

The PCUI uses an 18650 lithium ion battery for portable use. The battery itself is not included due to shipping regulations. 18650 batteries can be purchased from many online retailers such as Amazon and are very inexpensive. The PCUI currently does not have a charging circuit for the battery, and therefore the battery should be charged using an external charger.

Note that a battery is not required for PCUI operation. If a battery is not used, then a USB based power source would be required.

4. Test Headers

The PCUI includes test header pin locations on the PCB which are optional. These would be useful for debugging or troubleshooting. They are convenient for attaching test leads and can be added later on if you need them.

II. Getting Started

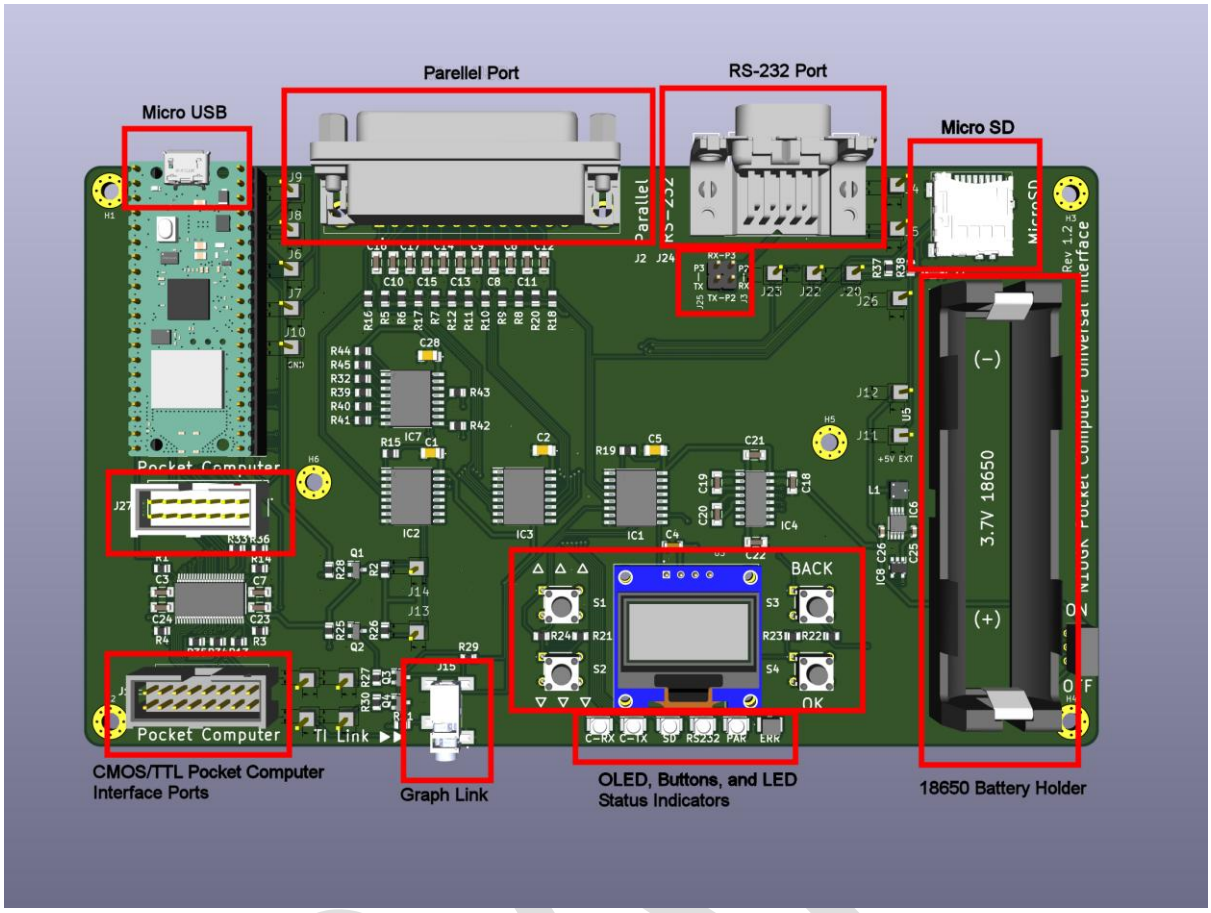
A. Unpacking and Inspection

When you first receive your PCUI, make sure all components are intact, not damaged.

1. Inspect the packaging for any signs of damage during shipping.
2. Check that all components are present, based on the particular options you selected.

B. PCUI Main Board

The fully assembled PCUI main board is shown below.



C. RS-232 Jumper Headers

Solder the jumper headers J3 and J25 near the RS-232 port connector. These jumpers form a 2.54mm "square" arrangement, which allows you to switch the RX and TX pins on the port.

Place two jumpers **horizontally** over these pins such that the RS-232 port will be configured as a host or DTE terminal (PC). This configuration allows for the use of a standard serial cable to connect between the PCUI and a serial printer or DCE device.

If planning on connecting the PCUI to a PC or DTE device, then place the jumpers in a **vertical** orientation.

These jumpers allow for easy switching between DTE and DCE without the need for a null modem adapter.

III. Operation

The PCUI is designed to interface with various pocket computers and graphing calculators. Depending on the options you have chosen when purchasing your PCUI kit, some features may not be available.

Before using your PCUI, be sure to install an 18650 Lithium Ion battery (if using the PCUI in a portable environment), or, plug the PCUI into a USB power source such as a battery bank, PC, or Mac.

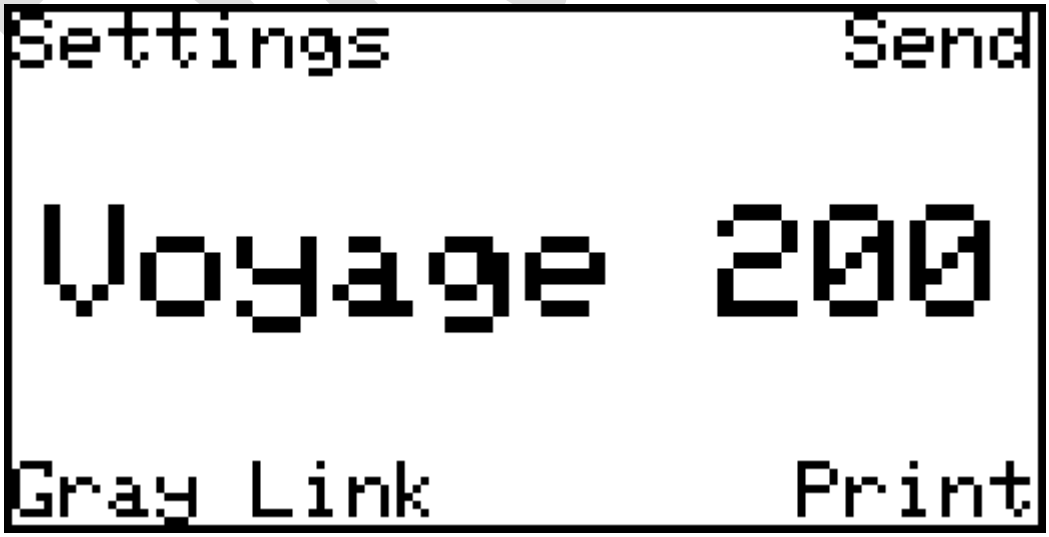
> **WARNING**! Note the battery polarity indicator on the silkscreen on the PCB. Plus or positive points downward toward the OLED or near the on/off switch, whereas negative points upwards towards the micro SD holder. Irreversible damage to the PCUI and/or the battery will occur if polarity is reversed.

Also install a micro SD card into the micro SD holder. Note that the PCUI supports SDHC models only.

The OLED display is used for configuration and status of the PCUI, along with the four hotkey buttons around the OLED display provide the user interface.

Although there is labelling on the silkscreen for each of the hotkeys, depending on the context, the function of each key may change from what they are labelled as.

An example of the home screen for the Voyage 200 mode:



In this example, the upper left hotkey is for settings, the lower right hotkey is to perform a screen capture and print from the attached TI Voyage 200 graphing calculator.

WARNING! Be sure to use the correct interface pack for the pocket computer or calculator you have the mode set to and for your model! Otherwise, serious irreversible damage can be done to the PCUI and/or the attached device.

Also, be sure to plug the interface pack into the pocket computer or calculator with the correct orientation. The interface packs are labelled with direction on the silkscreen.

Lastly, **be sure both devices are turned off before unplugging or plugging in any interface packs into either device**.

Order of operations for powering up:

If connecting for the first time, or when switching modes (new model):

1. Start with both devices off (the PCUI and the pocket computer or calculator).
2. If you have yet to select the operating model/mode or are changing the operating mode, power up the PCUI without any interface pack plugged into the PCUI. Using the settings menu, choose the correct model from the calculator model selection.
3. Turn on the PCUI first. Double check the operating model/mode is correct.
4. Connect the interface pack to the pocket computer or calculator (device) first if it is not already connected.
5. Connect the other end of the interface pack to the PCUI.
6. Turn the pocket computer or calculator on.

Order of operations for powering down:

1. Turn off the pocket computer or calculator.
2. Turn off the PCUI.
3. Disconnect the interface pack from the PCUI (if necessary).
4. Disconnect the interface pack from the device (if necessary).

A bit of explanation is necessary for the above steps. The PCUI should always be off or the interface pack not connected to the PCUI when plugging the other end of the

interface pack into the pocket computer or calculator. The reason is that many of the pocket computers have metal housing very close to where the interface pack is to be plugged into. This allows for an easy short circuit across the pins of the interface pack, which would damage the PCUI TTL buffer.

As a reminder, the green LED on the calculator side of the interface pack lights up when it is connected to the PCUI and the PCUI is turned on. Never plug in or unplug the interface pack to/from the calculator when the green LED is lit.

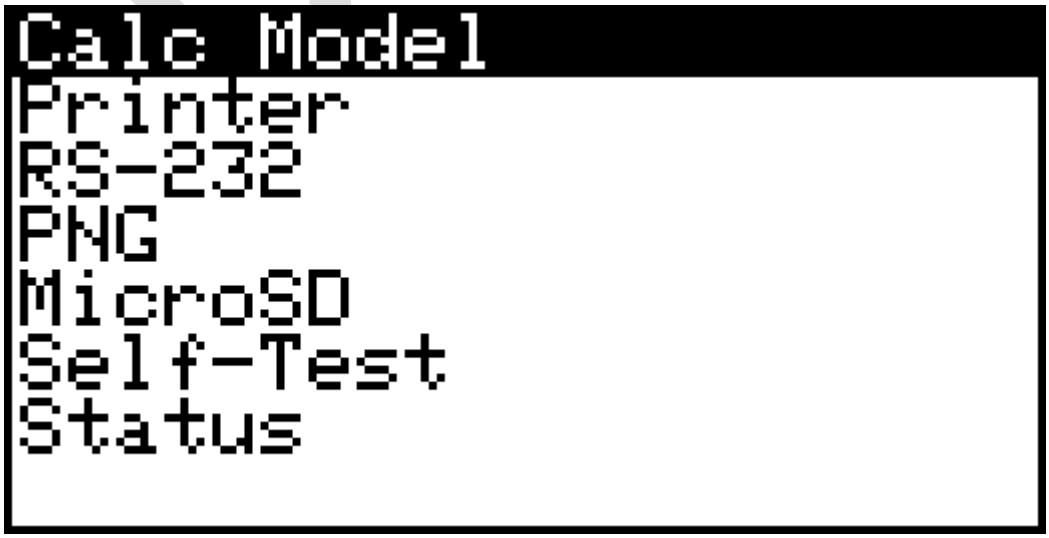
In addition, selecting the incorrect mode or model on the PCUI with a calculator connected can cause damage to either the PCUI and/or the calculator – the reason this is possible is different models have different pins assigned to inputs and outputs. If two outputs are connected, one or the other can be damaged. Starting up the PCUI without being connected to any calculator ensures that the correct mode is selected before making a connection.

The reason for powering up the PCUI first, before the pocket computer or calculator is this follows the same order as most instruction manuals for the printer and cassette interfaces designed for the pocket computer or calculator.

These precautions and process are important for the PCUI, since it is a multi-use device, not dedicated to any particular model.

IV. Settings

The PCUI settings need to be configured based on the calculator you are connecting it to and the peripherals you have attached, such as a printer. The settings menu can be accessed from the home screen:



The settings screens combine pick lists and other interfaces to select or change options. The UP/DOWN hotkeys change the selection of a picklist, while the OK hotkey can be used for either selection of a choice in the list, or continuing onward to the next submenu. The BACK hotkey will jump back to the previous screen or menu.

A. Calc Model

Before using the PCUI, the calculator model must be chosen. This choice drives the functionality of the rest of the PCUI and making a selection here first may open other menus or choices which can be set later.

If using a TI graphing calculator, be sure to use the TI Link connector on the PCUI. If using any other supported pocket computer, use the Pocket Computer header for connection to your device and the appropriate connection pack.

B. Printer

If you wish to use a printer with the PCUI, choose a type of printer you are attaching. However, if you are not using a printer, be sure to set this choice to None. This will prevent lockups or attempts by the PCUI to print to an attached printer.

1. Type

The Generic printer choice should be chosen for any standard line printer which does not have any specific emulation support. Most vintage printers accept standard ASCII bytes for printing, and this should be selected for those printers.

The ESC/POS choice is for Epson ESC/POS thermal receipt printers.

The ProPrinter X24 choice should be chosen if your printer supports this emulation mode, while the Epson LQ choice is similarly available.

2. Port

You can attach either a parallel or serial printer to the PCUI. Make your selection accordingly for the Port. Note that if you select RS-232, be sure to set the RS-232 parameters under the RS-232 settings menu.

3. Pixel Width

This sets the horizontal pixel width of the attached printer. For ESC/POS this would be 512, for an IBM ProPrinter compatible, this would be 2880.

4. Scaling

Depending on the width of your printer and its graphics density, you may wish to increase the scaling or output size for the printouts. Note that a selection here does not guarantee your printer can print to the scale you choose. The PCUI will automatically limit the scaling accordingly.

5. Transpose

This option will rotate the printout by 90 degrees. Depending on the attached printer and paper size, this rotation results in a larger printout in most cases.

6. Auto Cut

This option will send the paper cut command to the printer once a screen shot is done printing. Note this is relevant only to models which support screen shots and the ESC/POS printer types.

7. Char Size

Because many vintage pocket computer printers had relatively small paper width and characters per row (20 chars for example), if using a larger printer on the PCUI with a wider character per row capability, you can increase the font or character size of the printer output if desired. A good setting here would be 2.

8. Debug Mode

If you are seeing mismatched character outputs between an attached pocket computer, calculator or graphing calculator and the attached printer, enabling debug mode will output the character code in hex along with the character to help determine what characters are actually being sent to the attached printer.

C. Plotter Emulation

The PCUI can emulate a plotter, such as the Casio FA-10/FA-11 for example. If this feature is enabled, and the attached pocket computer sends plotter

commands, the PCUI will capture and process those commands in memory on a virtual canvas, and then print the result when character mode is enabled again.

D. RS-232

If you wish to use a serial printer with the PCUI, set the appropriate baud rate here. Or, if you are using the PCUI RS-232 port for another function, the baud rate should be set appropriately.

E. WiFi

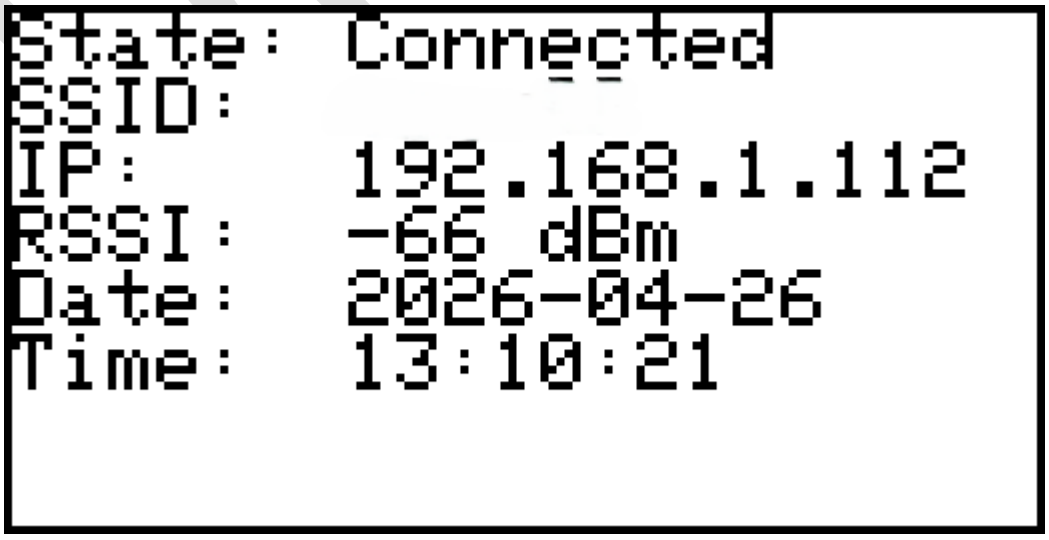
The PCUI can connect to a WiFi network to get the current date and time as well as fetch programs and data from an online repository. If WiFi is enabled and the PCUI is able to fetch the time and date, file(s) written to the micro SD card will use the current date and time value, otherwise no date and time will be stamped on files written to the micro SD card.

1. **Enable**

   This enables or disables the WiFi on the PCUI.

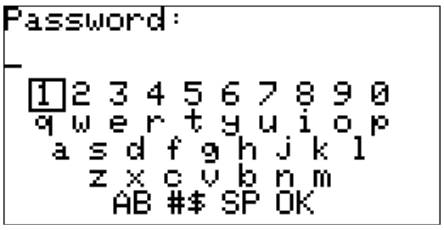
2. **Status**

   This shows the current status of the WiFi connection, including the IP address, signal strength, date and time. Take note of the IP address for connections to the PCUI from other devices such as a PC or Mac.



3. **Networks**

This is where you select a WiFi network to join. The screen will show current visible networks. Scroll down to select the network you want to connect to. A password entry screen will then appear.



Note that the WiFi password will be stored on the micro SD card. AES encryption is used to prevent casual viewing of the password should the SD card be removed and read. Further, the encryption key is tied to the unique device ID (Pico W in the PCUI), the password cannot be read in another PCUI.

Note that if WiFi is enabled and authentication fails, the ERR LED will be illimunated.

Note: The PCUI will appear on your network as "PCUI". You can find the IP address assigned to the PCUI on the Status screen.

4. **Web Server**

   The PCUI has a basic web interface, if you wish to enable this feature, you can do so here.

5. **Forget**

   Choosing this option will disconnect from the current WiFi network and no longer connect automatically. The stored password will be removed.

F. PNG

The PCUI can write screen shots or other outputs to the micro SD card. This menu allows changing the scaling of the PNG files generated as well as other options.

1. **Scaling**

   This sets the scale for the captured PNG image(s).

2. **Inverse**

The PNG can be inverted such that the "on" pixels are black on a white background. If this is enabled, a black border is added to the screen capture.

G. Micro SD

The PCUI can write screen shots or other outputs to the micro SD card. The micro SD card will be used to store saved programs and data as well.

1. USB Drive

If the PCUI is plugged into a PC or Mac, the USB Drive feature will present the micro SD card as a USB Drive. You can then copy files, screen shots, or other data to and from the micro SD card.

2. Format

This will format the micro SD card, which erases all contents.

V. WiFi and Web Interface

A. WiFi

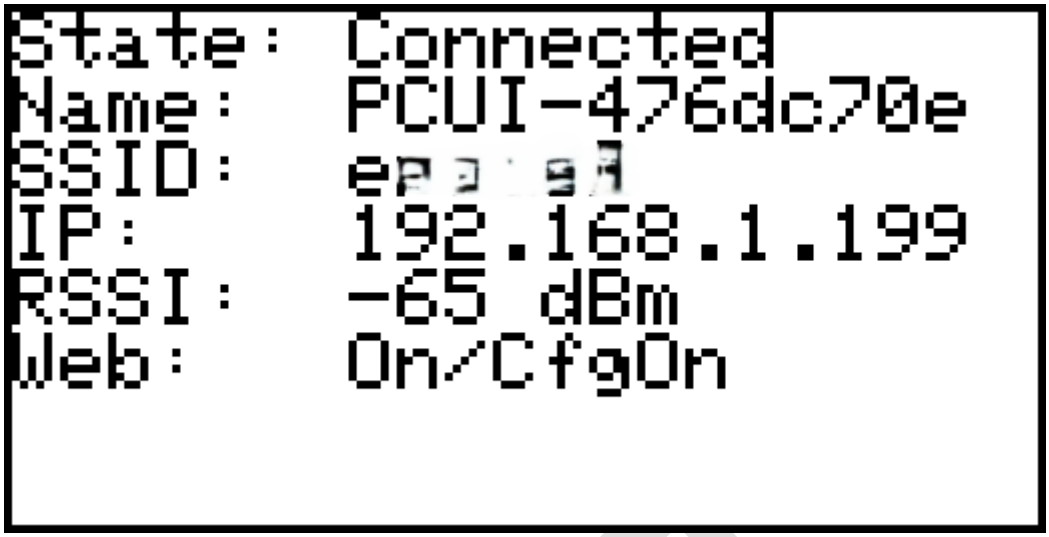
The PCUI can connect to a WiFi network for various functions, mainly for getting the current date and time. This is useful for the micro SD card writes, as without the date and time, all files modified or created on the SD card will be without a timestamp.

B. Web Interface

The PCUI provides a web interface for status, program viewing and editing, and more. In order to use the web interface, a standard browser is required. WiFi must be enabled in order for the web interface to be enabled.

C. Enabling the Web Interface

To use the web interface, enable WiFi and web server options in the settings menus. The PCUI will connect to the WiFi network and request an IP address via DHCP. Then, browse to the IP address shown on the WiFi status screen:

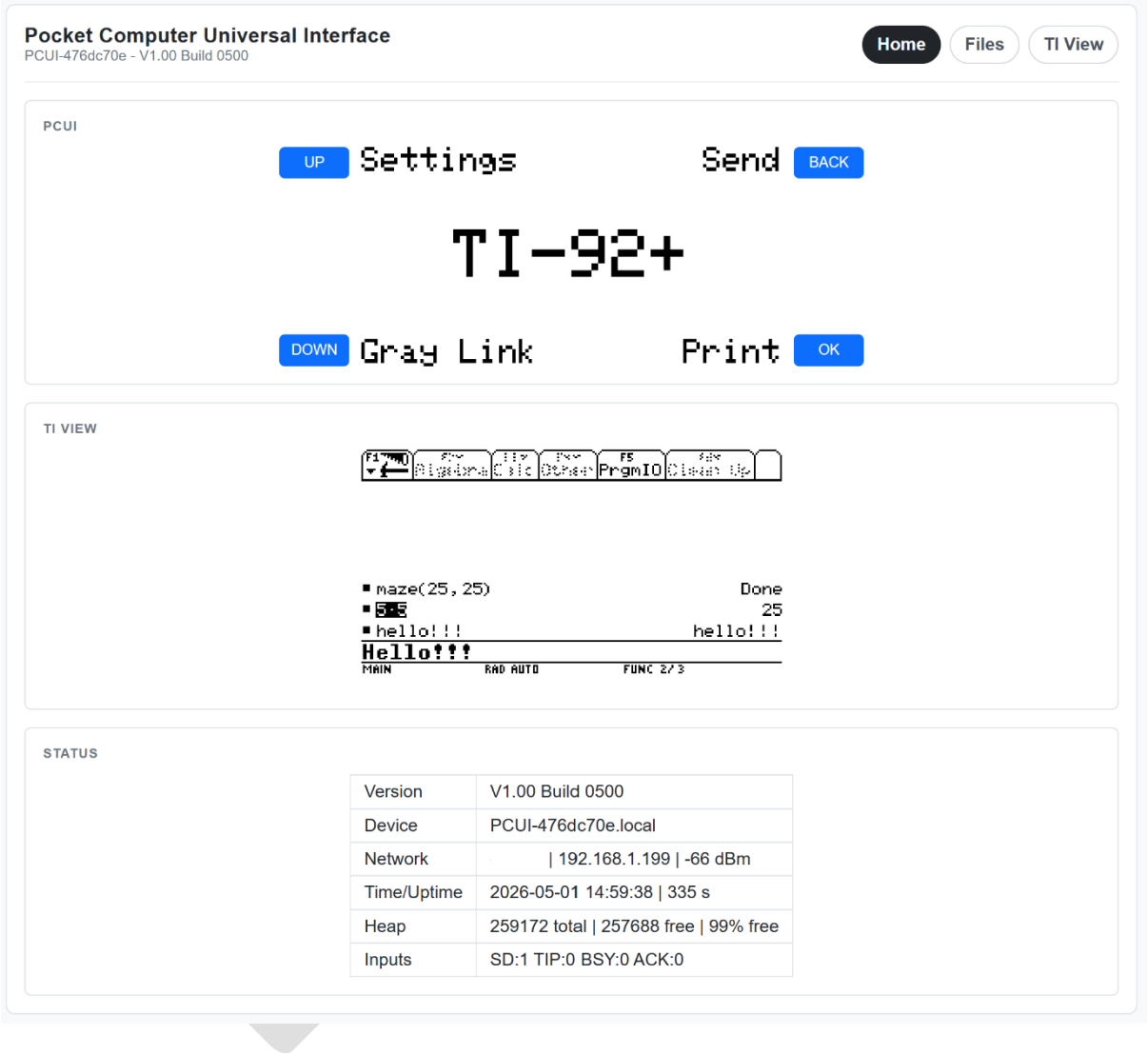


When WiFi is enabled, mDNS is active and the PCUI will broadcast it's device name as "device name".local, and in the example above, the name would be PCUI-476dc70e.local, and therefore you can access the PCUI web interface at http://PCUI-476dc70e.local. Note that your router must allow mDNS and your device (Mac, PC, etc) must support mDNS – if not, simply use the IP address shown, such as http://192.168.1.199. Note that your router may have a different name for your network than "local".

D. Home Page

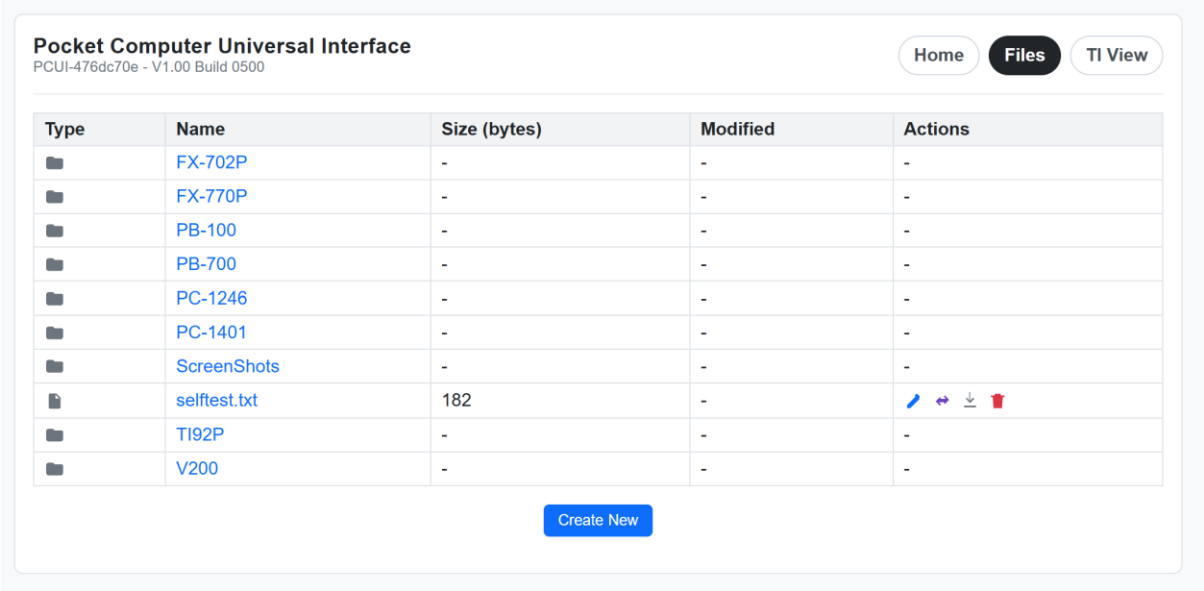
The web interface has a navigation bar at the top indicating the device name along with the current firmware build, and navigation buttons to the right.

The home page includes a "live" view of the PCUI's OLED display, along with the four interface buttons located around the display.

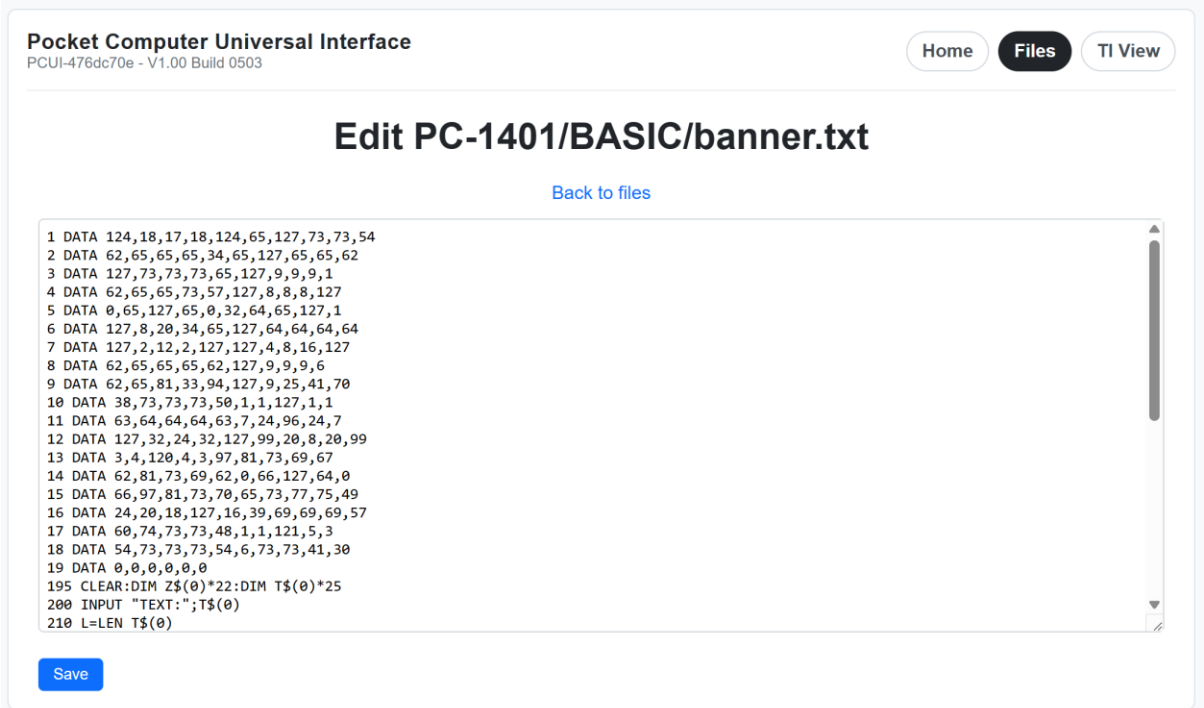


E. File Browser

The web interface includes a file browser which allows deleting, renaming, creation, and editing of programs.

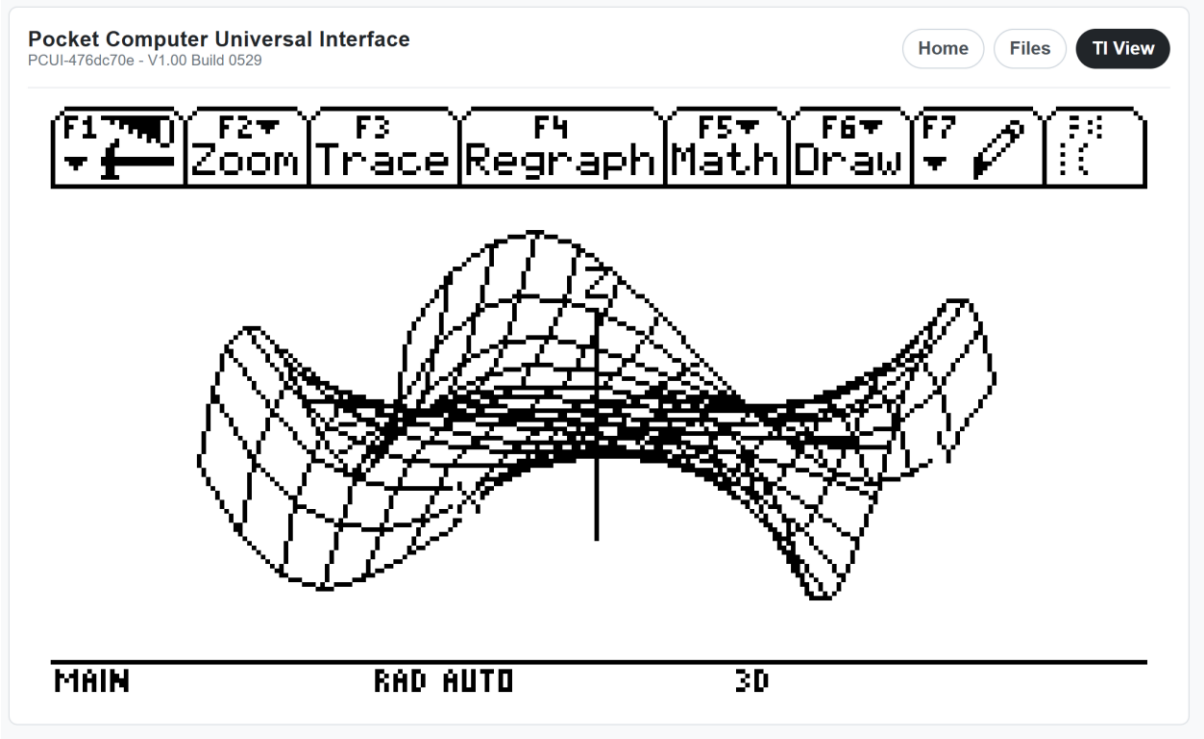


If you click on a file to edit, such as a TXT or BIN file (depending on the pocket computer model), a text editor will appear allowing for in place edits:



F. TI View

If in a TI graphing calculator mode, the TI View will be visible, which is a snapshot of the current screen. The snapshot automatically refreshes. The Home Page has the TI View as well as a dedicated larger sized view if clicking the TI View button on the header or the image itself from the home page.



G. TI Remote Control

The PCUI will accept characters while typing with this page open, and translate and send them to the attached TI, such as the TI-92, TI-92+ and Voyage 200. Keys such as the arrow keys, F-keys, enter, backspace, and others have the required mapping to the TI remote keypress.

VI. Sharp 11-Pin Pocket Computers

PC-1245, PC-1246*, PC-1246S, PC-1247, PC-1248, Tandy PC-8*
PC-1250, PC-1250A, PC-1251, PC-1251H, PC-1255, Tandy PC-3 and PC-3 A/B

The asterisks indicate actual testing was done on these models. Other models mentioned use the same peripherals and should also be compatible.

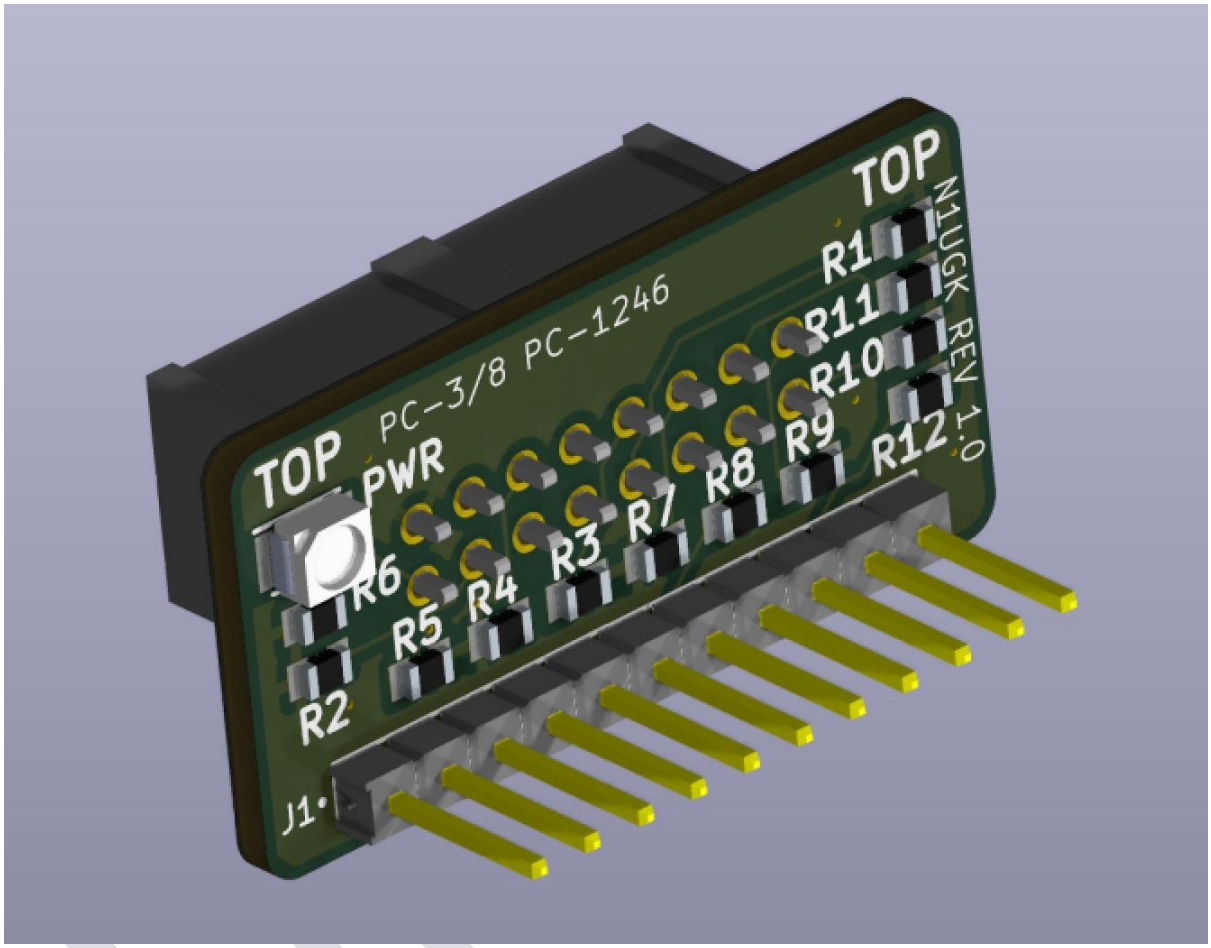
For all models mentioned above, select PC-1245 (the first in this series of pocket computers). A subfolder named "PC-1245" will be used as the root directory for all micro SD card functions for these models.

PC-1401, PC-1402, PC-1403*, EL-5500, EL-5500 II, EL-5500 III*

The asterisks indicate actual testing was done on these models. Other models mentioned use the same peripherals and should also be compatible.

For all models mentioned above, select PC-1401 (the first in this series of pocket computers). A subfolder named "PC-1401" will be used as the root directory for all micro SD card functions for these models.

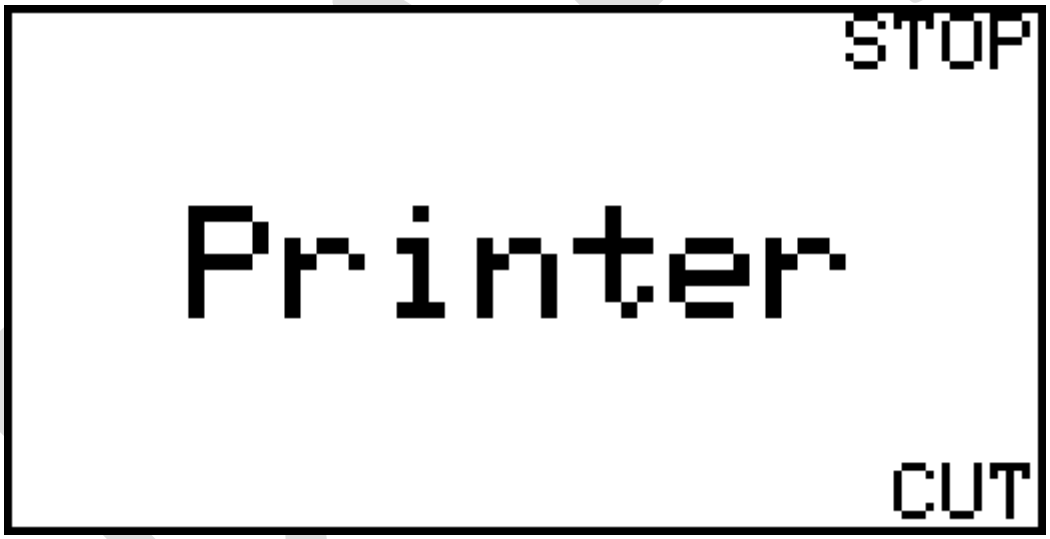
Use the 11-pin PC-1246 interface pack for these models:



The home screen will indicate PC-1245 or PC-1401 for the operating mode, and the softkeys will change to:

A. Printer

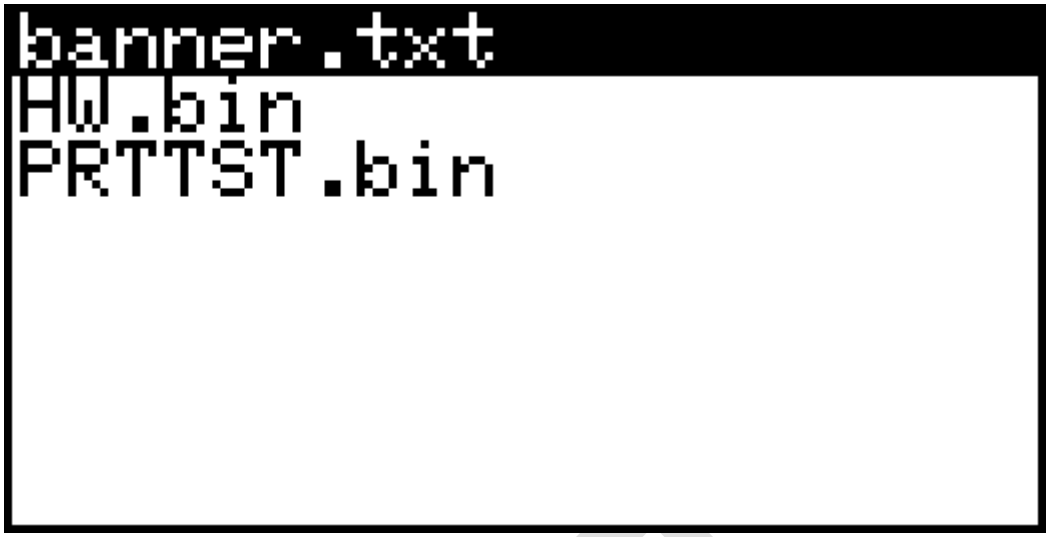
This will enable the printer mode, sending all captured printer output to the attached printer on the PCUI.



If using an ESC/POS printer, there is a "cut" softkey which appears. Pressing CUT will send a few form feeds and issue a paper cut command to the printer.

B. Send Program

This will allow you to send a stored program from the micro SD card to the pocket computer. A menu of file names will appear to select from:



Be sure to type CLOAD and enter on the pocket computer before sending a program. *The file name for CLOAD on the pocket computer is optional. If you specify a file name, then the pocket computer will compare the file name you specify with the file name sent by the PCUI. If they do not match, then the pocket computer will not accept the incoming file.*

C. Send Vars

This will allow you to send stored variables from the micro SD card to the pocket computer. A menu of file names will appear to select from:

Be sure to type INPUT# and enter on the pocket computer before sending variable contents. *The file name for INPUT# on the pocket computer is optional. If you specify a file name, then the pocket computer will compare the file name*

you specify with the file name sent by the PCUI. If they do not match, then the pocket computer will not accept the incoming file.

D. Saving a BASIC Program

To save a BASIC program to the micro SD card, type CSAVE and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

The file name for CSAVE on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming BASIC program onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file BAS_xxx where xxx is a sequential number.

E. Detokenization to ASCII / Tokenization to BASIC

Any BASIC program saved on the micro SD card as a BIN file will be automatically detokenized from BIN format to ASCII format and saved with the same name as a .txt file. This is the BASIC source and allows for easy viewing and editing via the web interface or if mounting the SD card as removable storage on a PC or Mac.

When sending a file to the pocket computer, if you select a .txt file, which should be an ASCII BASIC file, the PCUI will tokenize the file on the fly and send it to the pocket computer in a tokenized BASIC format. This allows you to create or edit a program using the web interface or if mounting the SD card as removable storage on a PC or Mac and send it without needing to convert it first.

F. Saving Variables

To save the variable contents on the pocket computer to the micro SD card, type PRINT# and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

The file name for PRINT# on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming variable contents onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file mem_xxx where xxx is a sequential number.

VII. Casio 12-Pin Pocket Computers

PB-100, PB-110, PB-120, PB-200, PB-400, FX-700P, FX-710P, Tandy PC-4*

The asterisks indicate actual testing was done on this model. Other models mentioned use the same peripherals and should also be compatible.

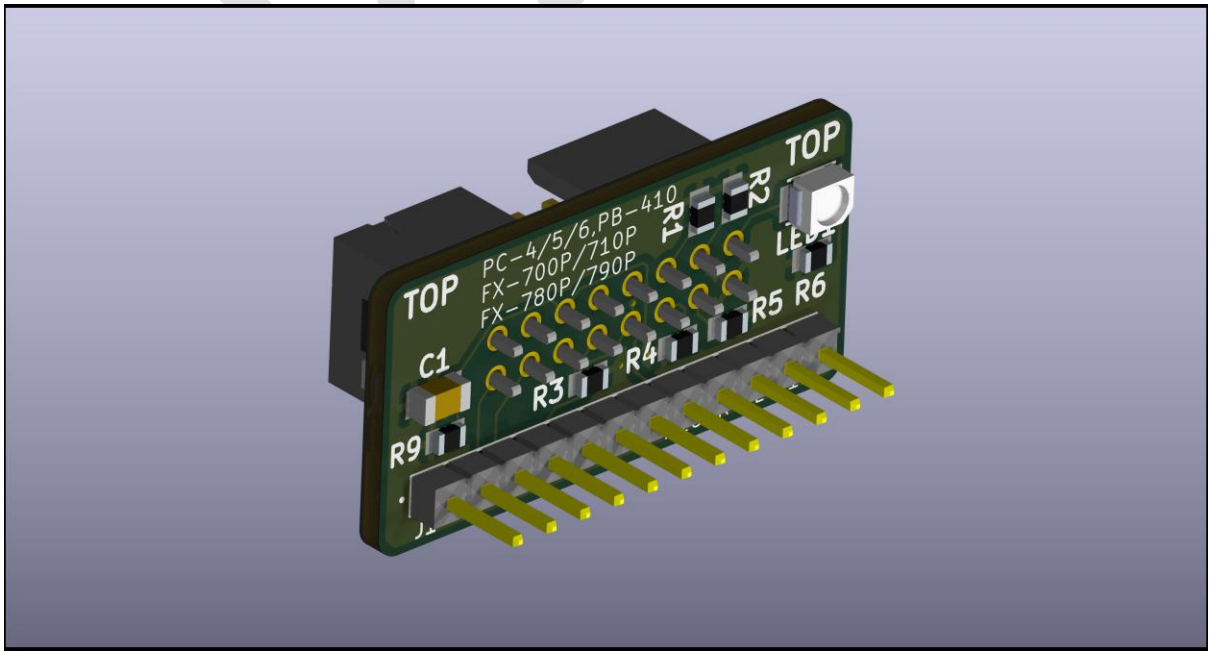
For all models mentioned here, select PB-100 (the first in this series of pocket computers). A subfolder named "PB-100" will be used as the root directory for all micro SD card functions for these models.

FX-770P, FX-780P, FX-781P, FX-785P, FX-790P, FX-791P, FX-795P, Tandy PC-5*, Tandy PC-6*

The asterisks indicate actual testing was done on this model. Other models mentioned use the same peripherals and should also be compatible.

For all models mentioned here, select FX-770P (the first in this series of pocket computers). A subfolder named "FX-770P" will be used as the root directory for all micro SD card functions for these models.

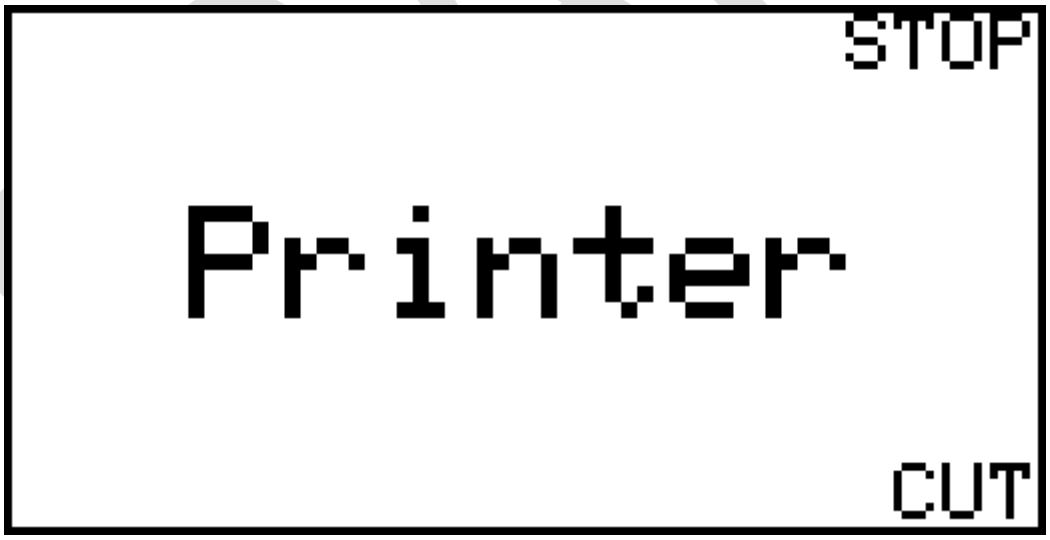
Use the 12-pin Casio interface pack for these models:



The home screen will indicate either PB-100 or FX-770P for the operating mode, and the softkeys will change to:

A. Printer

This will enable the printer mode, sending all captured printer output to the attached printer on the PCUI.

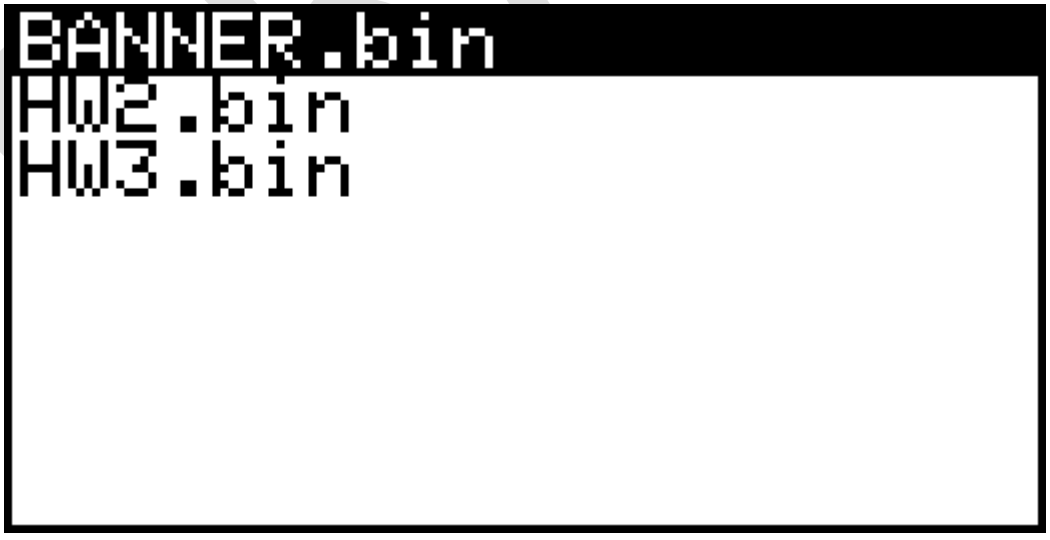


It should be noted that the Casio FP-12S printer (and it's variants) had a maximum of 20 characters per line. However, there is no forced carriage return on the bus protocol for these pocket computers after 20 characters. Your BASIC programs can use the full width of the attached printer, beyond 20 characters. If using an ESC/POS printer, there is a "cut" softkey which appears. Pressing CUT will send a few form feeds and issue a paper cut command to the printer.

B. Sending a Program, Variable(s) or Memo:

This will allow you to send a stored program, variables, or memos from the micro SD card to the pocket computer. To initiate the transfer, type LOAD or GET on the PB-100. The PCUI will detect the status on the bus and automatically open the send menu:

Select the appropriate type of file to send (based on your LOAD/GET command) and then a menu of file names will appear to select from:



The file name for LOAD or GET on the pocket computer is optional. If you specify a file name, then the pocket computer will compare the file name you specify with the file name sent by the PCUI. If they do not match, then the pocket computer will not accept the incoming file.

C. Saving a BASIC Program

To save a BASIC program to the micro SD card, type SAVE and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

The file name for SAVE on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming BASIC program onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file BAS_xxx where xxx is a sequential number.

D. Detokenization to ASCII / Tokenization to BASIC

Any BASIC program saved on the micro SD card as a BIN file will be automatically detokenized from BIN format to ASCII format and saved with the same name as a .txt file. This is the BASIC source and allows for easy viewing and editing via the web interface or if mounting the SD card as removable storage on a PC or Mac.

When sending a file to the pocket computer, if you select a .txt file, which should be an ASCII BASIC file, the PCUI will tokenize the file on the fly and send it to the pocket computer in a tokenized BASIC format. This allows you to create or edit a program using the web interface or if mounting the SD card as removable storage on a PC or Mac and send it without needing to convert it first.

E. Saving Variables

To save the variable contents on the pocket computer to the micro SD card, type PUT and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

The file name for PUT on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming variable contents onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file mem_xxx where xxx is a sequential number.

F. Character Map

There are some characters in these models which do not have a direct ASCII mapping for line printers. If using an ESC/POS printer, these characters from the

Casio character set will automatically be defined as custom characters in the ESC/POS printer attached.

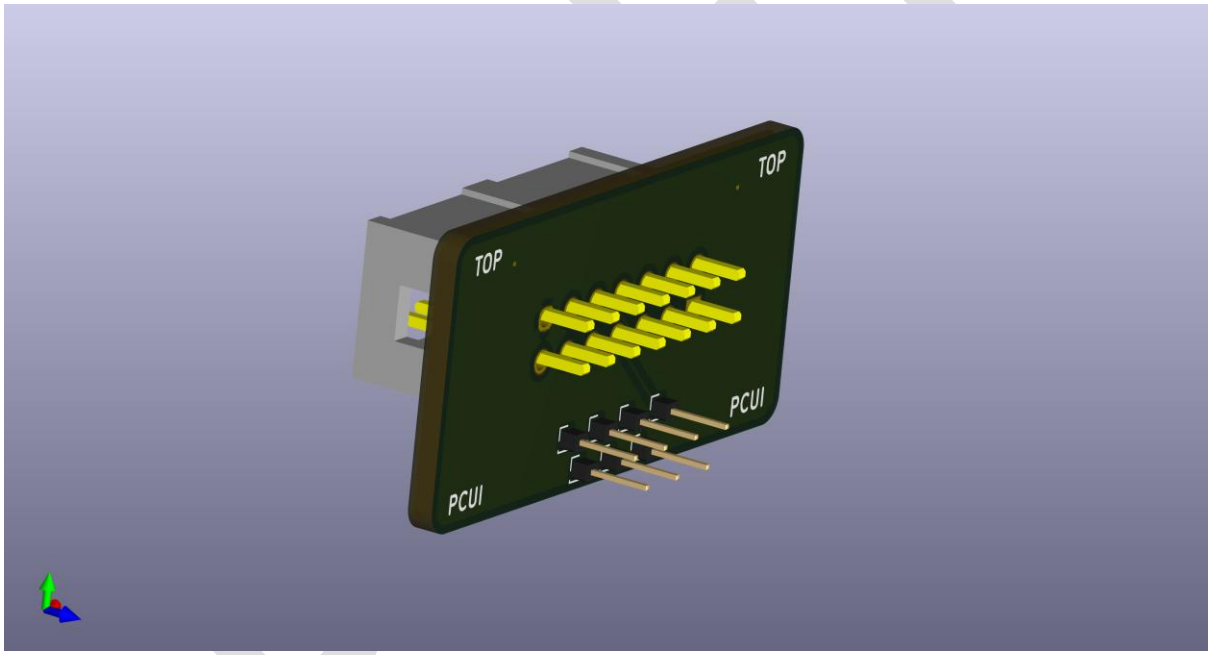
VIII. Casio 7-Pin Pocket Computer and Calculators

FX-501P, FX-502P*, FX-601P, FX-602P*, FX-603P, FX-702P*

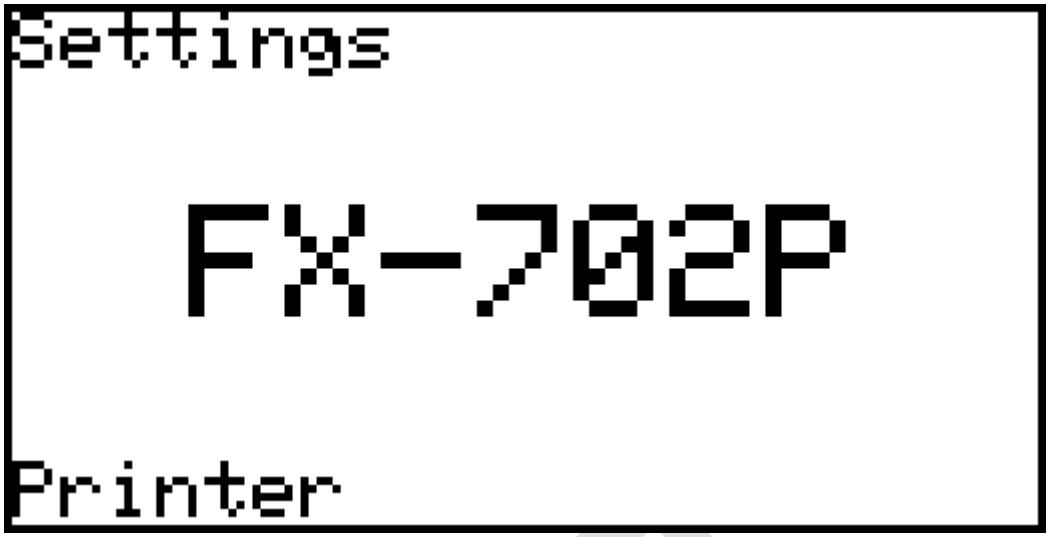
The asterisks indicate actual testing was done on this model. Other models mentioned use the same peripherals and should also be compatible.

For all models mentioned here, select FX-702P (the BASIC programmable in this series of calculators). A subfolder named "FX-702P" will be used as the root directory for all micro SD card functions for these models.

Use the 7-pin Casio interface pack for these models:

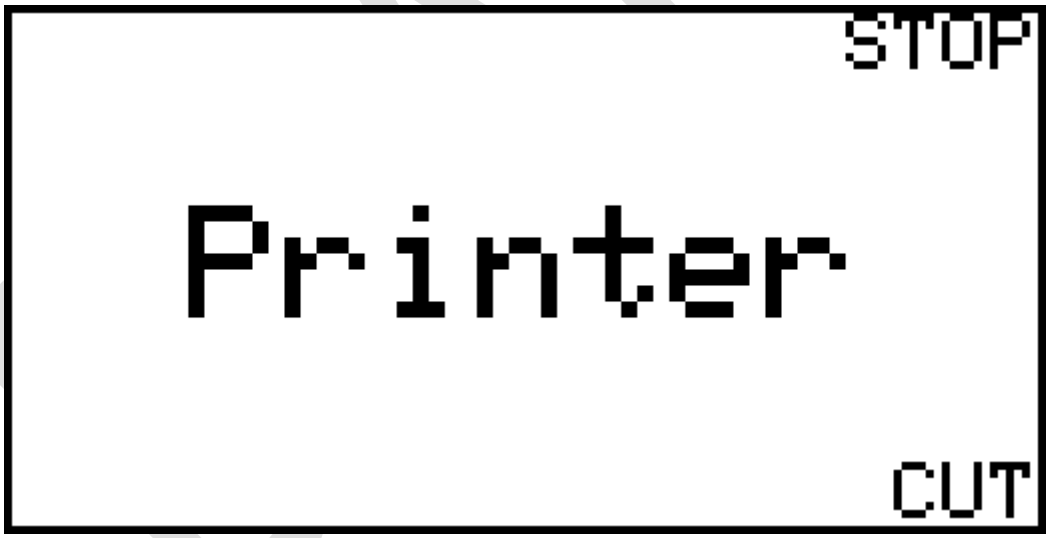


The home screen will indicate FX-702P for the operating mode, and the softkeys will change to:



A. Printer

This will enable the printer mode, sending all captured printer output to the attached printer on the PCUI.

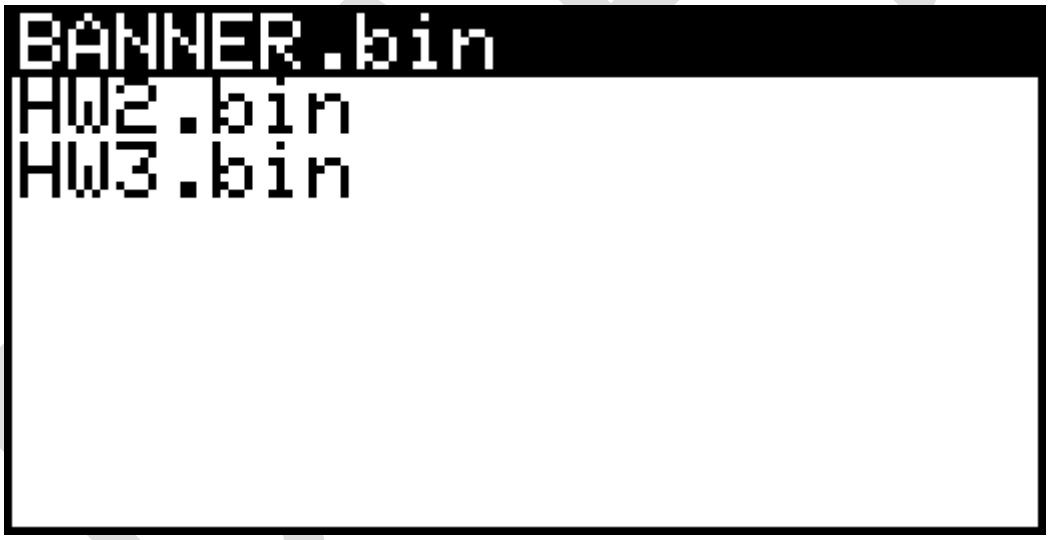


If using an ESC/POS printer, there is a "cut" softkey which appears. Pressing CUT will send a few form feeds and issue a paper cut command to the printer.

B. Sending a Program, Variable(s) or Memo:

This will allow you to send a stored program or variables from the micro SD card to the pocket computer. To initiate the transfer, type LOAD or GET on the Fx-702P. The PCUI will detect the status on the bus and automatically open the send menu:

Select the appropriate type of file to send (based on your LOAD/GET command) and then a menu of file names will appear to select from:



The file name for LOAD or GET on the pocket computer is optional. If you specify a file name, then the pocket computer will compare the file name you specify with the file name sent by the PCUI. If they do not match, then the pocket computer will not accept the incoming file.

C. Saving a BASIC Program

To save a BASIC program to the micro SD card, type SAVE and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

The file name for SAVE on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming BASIC program onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file BAS_xxx where xxx is a sequential number.

D. Detokenization to ASCII / Tokenization to BASIC

Any BASIC program saved on the micro SD card as a BIN file will be automatically detokenized from BIN format to ASCII format and saved with the same name as a .txt file. This is the BASIC source and allows for easy viewing and editing via the web interface or if mounting the SD card as removable storage on a PC or Mac.

When sending a file to the pocket computer, if you select a .txt file, which should be an ASCII BASIC file, the PCUI will tokenize the file on the fly and send it to the pocket computer in a tokenized BASIC format. This allows you to create or edit a program using the web interface or if mounting the SD card as removable storage on a PC or Mac and send it without needing to convert it first.

E. Saving Variables

To save the variable contents on the pocket computer to the micro SD card, type PUT and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

The file name for PUT on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming variable contents onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file mem_xxx where xxx is a sequential number.

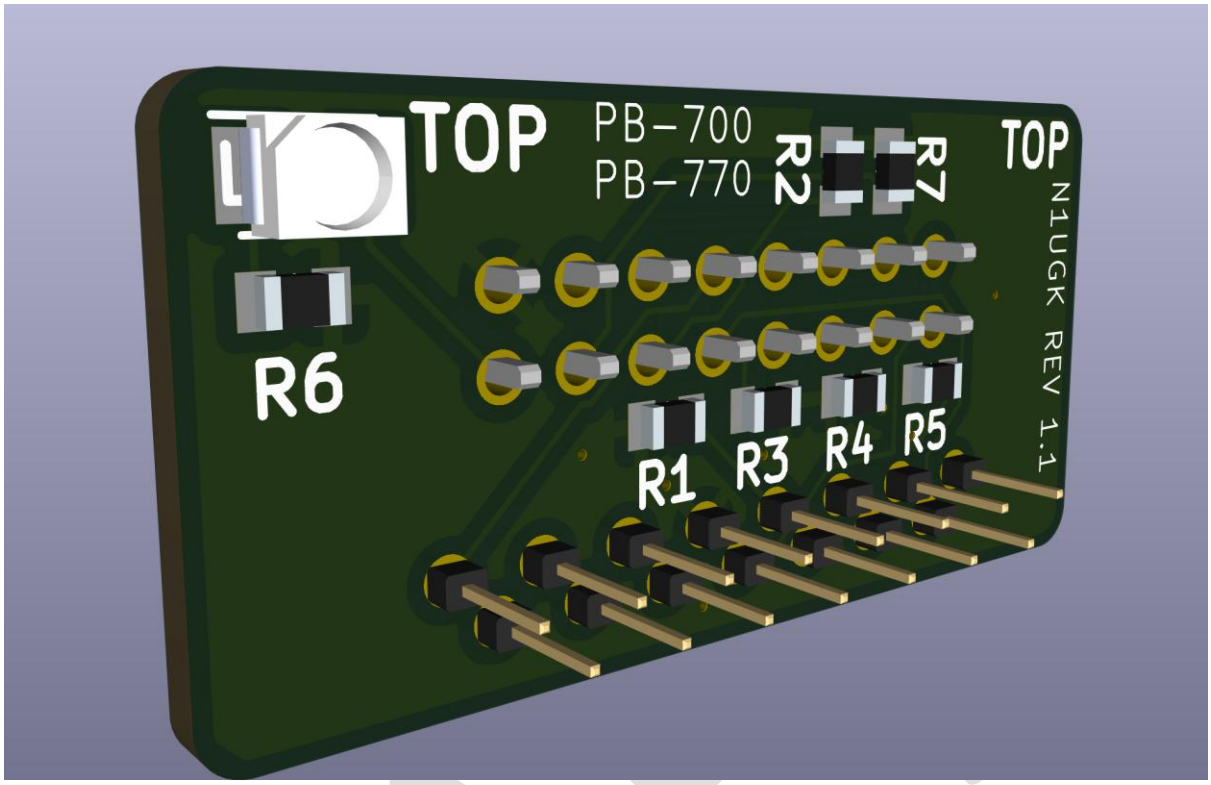
IX. Casio PB-700, PB-770 15-pin Pocket Computers

PB-700, PB-770

Actual testing was done on both of these models.

For both models mentioned here, select PB-700. A subfolder named "PB-700" will be used as the root directory for all micro SD card functions for these models.

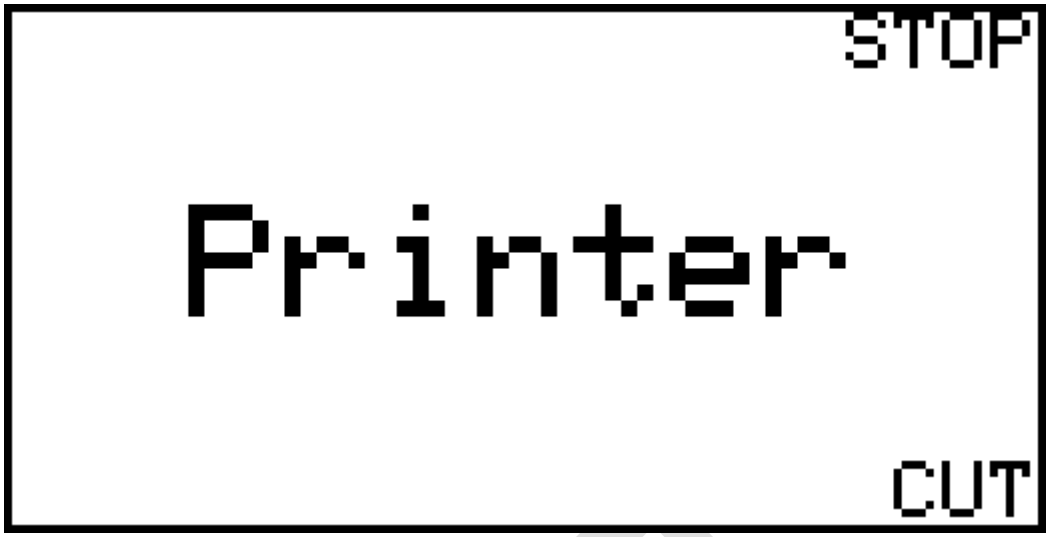
Use the 15-pin Casio interface pack for these models:



The home screen will indicate PB-700 for the operating mode, and the softkeys will change to:

A. Printer

This will enable the printer mode, sending all captured printer output to the attached printer on the PCUI.



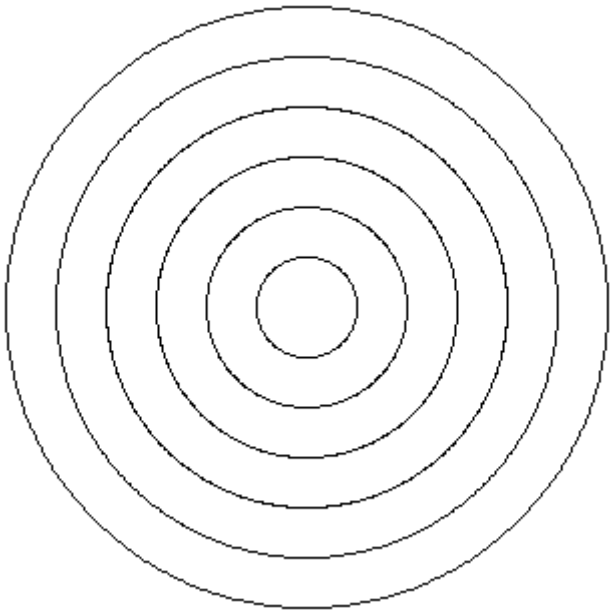
If using an ESC/POS printer, there is a "cut" softkey which appears. Pressing CUT will send a few form feeds and issue a paper cut command to the printer.

B. FA-10 / FA-11 Plotter Emulation

The FA-10 plotter for the PB-700 and PB-770 provided for methods to plot lines, shapes, points, and text. The PCUI has a plotter emulation which will listen for the plotter commands, plot them on a canvas in memory, and then print out the canvas when the return to character mode is received.

In addition, a PNG file of the canvas will be saved. The PCUI can print the plots to a printer that supports either ESC/POS or ProPrinter modes.

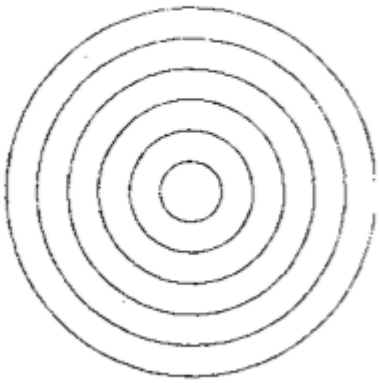
Below is an example of a plot from the FA-10 owners manual, output by the PCUI in PNG format:



The sample program is:

Example:

```
10 LPRINT CHR$(28);CHR$(37)
20 LPRINT "050,-50"
30 FOR R=5 TO 30 STEP 5
40 LPRINT "C0,0,";R
50 NEXT R
```



Note that line 60 was added:

```
60 LPRINT CHR$(28);CHR$(46)
```

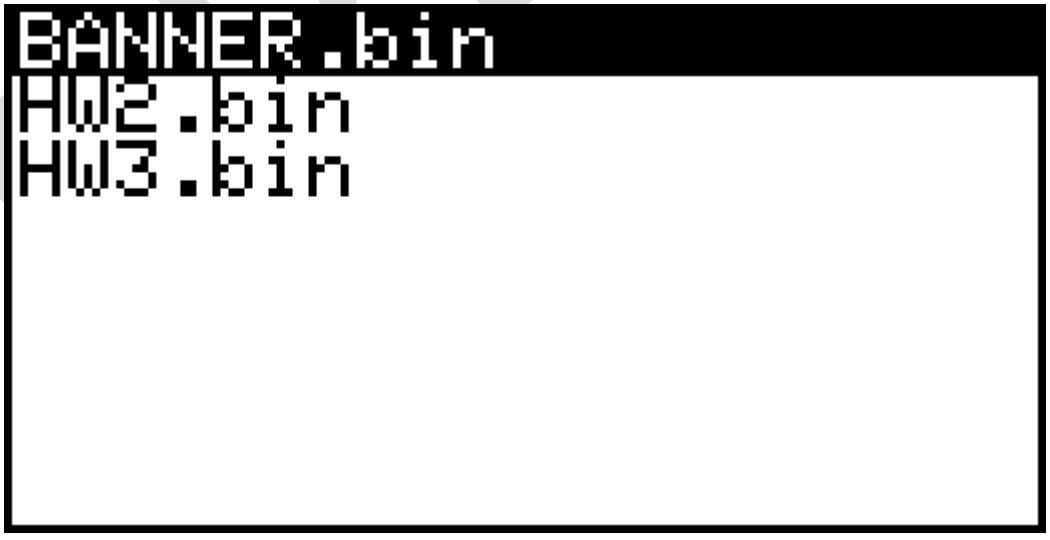
The character combination above is required in order to tell the PCUI to save and print the current canvas.

The PNG images from the saved plots are stored in the Plots subfolder under the model subfolder on the micro SD card.

C. Sending a Program, Variable(s) or Memo:

This will allow you to send a stored program or variables from the micro SD card to the pocket computer. To initiate the transfer, type LOAD or GET on the pocket computer. The PCUI will detect the status on the bus and automatically open the send menu:

Select the appropriate type of file to send (based on your LOAD/GET command) and then a menu of file names will appear to select from:



The file name for LOAD or GET on the pocket computer is optional. If you specify a file name, then the pocket computer will compare the file name you specify with the file name sent by the PCUI. If they do not match, then the pocket computer will not accept the incoming file.

D. Saving a BASIC Program

To save a BASIC program to the micro SD card, type SAVE and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

The file name for SAVE on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming BASIC program onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file BAS_xxx where xxx is a sequential number.

E. Saving and Loading in ASCII Mode

The PB-700 and PB-770 allow saving BASIC programs to ASCII and loading from ASCII. The PCUI will save and load ASCII files, which is convenient for editing with a text editor on a computer and then loading directly into the pocket computer.

Use the SAVE,A and LOAD,A variants for this mode.

Note that unexpected format, lines longer than the PB-700 supports, and syntax issues will cause a RW Error to occur when loading. This is relevant if creating or editing a program from a PC or Mac. Also, be sure to terminate the file with two line feeds in a row (or two carriage return and line feed combos).

F. Saving Variables

To save the variable contents on the pocket computer to the micro SD card, type PUT and enter on the pocket computer. Be sure to do this only when the PCUI is on the home screen, not when printer mode or any other menu or function is being displayed.

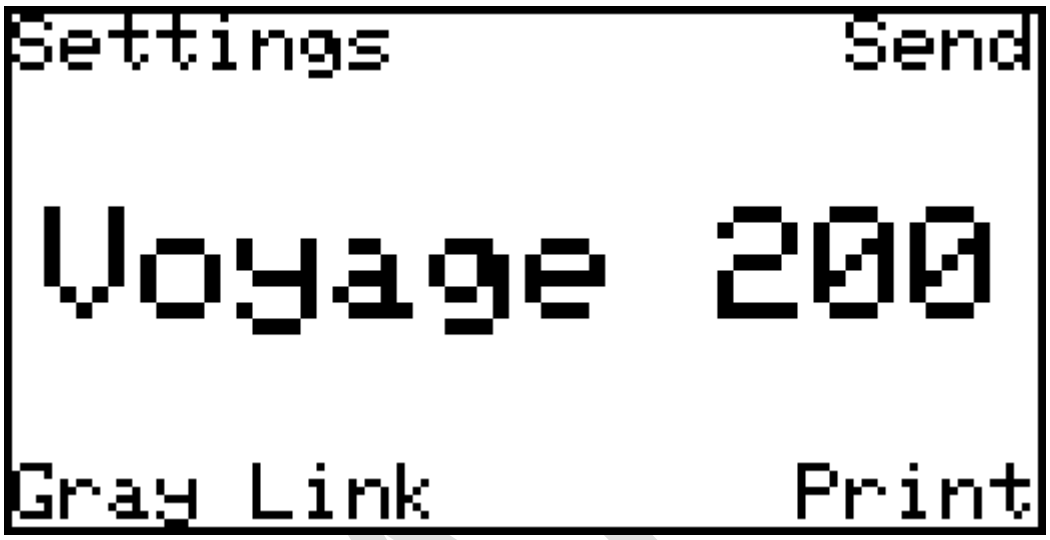
The file name for PUT on the pocket computer is optional. If you specify a file name, then the PCUI will save the incoming variable contents onto the micro SD card with the name you specify. If you do not specify a file name, the PCUI will name the file mem_xxx where xxx is a sequential number.

X. Texas Instruments Graphing Calculators

TI-82*, TI-85*, TI-86*, TI-89*, TI-92*, TI-92 Plus*, Voyage 200*

The asterisks indicate actual testing was done on this model. Other models mentioned use the same peripherals and should also be compatible.

A subfolder named by model will be used as the root directory for all micro SD card functions for these models.



A. Print

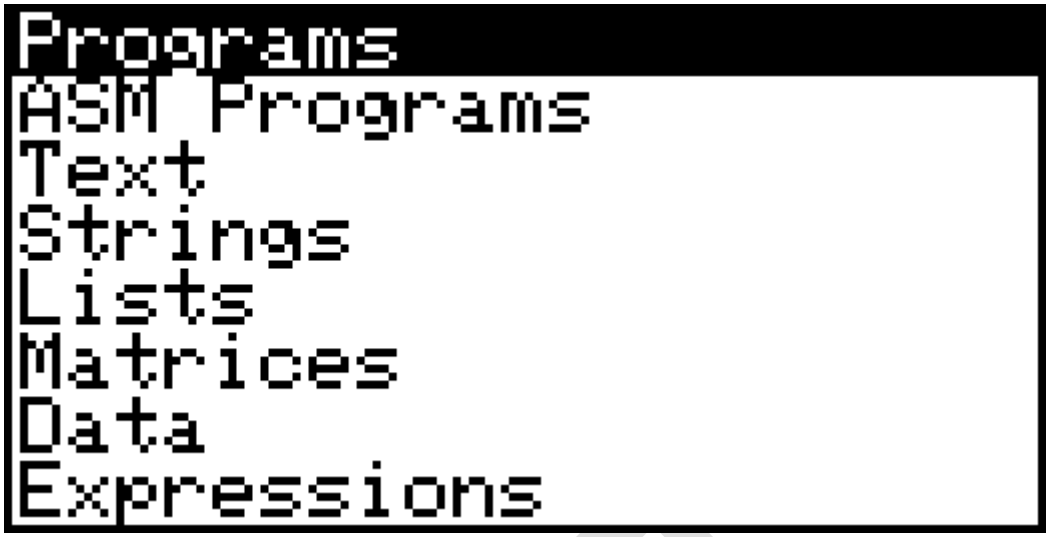
This will grab the current screen from the attached TI graphing calculator and save a PNG of the screen as well as print out to the attached printer (if printer is enabled).

B. Gray Link

This will enable the passthrough mode between the attached TI graphing calculator and the virtual COM port on the USB connector. This effectively emulates a "Gray Link" USB cable, allowing both TI software and TiLP software to communicate to the TI via the PCUI.

C. Send

This will send a selected program, string, text, or other object type to the attached TI graphing calculator.



D. Sending from the TI to the PCUI

You can send a program, string, text, or other object at any time to the PCUI, provided the PCUI is on the home screen. The object will be stored in the appropriate subfolder on the micro SD card.

E. Printing from BASIC Programs

The PCUI adds printer support to BASIC programs with a creative hack. Since the PCUI can receive variables, and the TI BASIC allows for programs to send variables using the "sendcalc" function, the PCUI can intercept these variables and use the variable contents to drive settings and/or send data to the attached printer.

This functionality works by inspection of the variable name and then directing the contents according to the name. The following table outlines the specific variable names the PCUI recognizes and their purpose / function:

Variable Name	Variable Type	Purpose / Function
print	String	Sends a string to the attached printer
print	Integer	Sends the integer (byte value ranging from 0 – 255) to the printer
prtscr	String	If the PCUI receives this variable with any content, it will request a print screen from the

		TI and print it to the attached printer
prtx	Integer	The x offset of the print screen location, default is 0
prty	Integer	The y offset of the print screen location, default is 0
prtw	Integer	The number of pixels for the width of the screen shot
prty	Integer	The number of pixels for the height of the screen shot
prtscl	Integer	The scaling factor for the screen shot printout
prtcut	Integer	If the value is 1, enables the automatic paper cut after printing the screen, default is zero.

Example:

"Test 123" → print
SendCalc(print)

XI. Casio FA-10/FA-11 Plotter Emulation

The PCUI supports Casio FA-10/FA-11 plotters by recognizing the plotting commands and utilizing an in-memory canvas, save to PNG, and output to printer process. The same commands noted in the Casio FA-10 or FA-11 owners manual are included here as a reference:

A. Drawing Commands

Cmd	Name	Syntax	Description
D	Draw	D x1,y1,x2,y2,...	Draw lines. First pair sets starting point (pen move); subsequent pairs draw line segments. If the first

Cmd	Name	Syntax	Description
			parameter is omitted (D,x2,y2,...), drawing starts from the current pen position.
I	Relative Draw	I dx,dy,...	Draw lines using relative offsets from the current pen position. Multiple pairs chain together.
M	Move	M x,y	Move pen to absolute position (relative to ORG). No drawing.
R	Relative Move	R dx,dy	Move pen by a relative offset. No drawing.
A	Quadrangle	A x1,y1,x2,y2	Draw a rectangle defined by two opposite corners.
C	Circle/Arc	C cx,cy,r[,start,end]	Draw a circle or arc. Center can be omitted (,r,start,end) to use current pen position. If start/end angles are omitted, a full circle is drawn. Angles in degrees.

B. Axes & Grids

Cmd	Name	Syntax	Description
X	Axis	X dir,div,count	Draw an axis from the ORG origin. dir: 0=+Y, 1=+X, 2=−Y, 3=−X. div: tick spacing (mm). count: number of divisions.
G	Grid	G dir,xrange,yrange[,sep]	Draw a grid rectangle with internal lines. dir: 1=horizontal stripes,

Cmd	Name	Syntax	Description
			2=vertical stripes. sep defaults to 1.

C. Text & Symbols

Cmd	Name	Syntax	Description
P	Print	P<text>	Print a character string at the current pen position using the current scale, rotation, and spacing settings. ASCII 0x20–0x7E.
N	Mark	N type	Draw a marker symbol at the current pen position. Types: 1=+, 2=×, 3=* (+ and ×), 4=□, 5=◇, 6=○, 7=△, 8=⊠, 9=⊞.

D. Settings Commands

Cmd	Name	Syntax	Description
O	Origin	O x,y	Set the coordinate origin. No params = current pen position becomes origin.
L	Line Type	L n	Set line style: 0=solid, 1=broken, 2=one-dot chain, 3=two-dot chain.
B	Line Scale	B n	Set pitch (mm) for broken/chain line types. Default 6.4.

Cmd	Name	Syntax	Description
S	Alpha Scale	S n	Set character size (0–9). Rendered as (n+1)× scale.
Q	Alpha Rotate	Q n	Set text rotation: 0=0°, 1=90° CCW, 2=180°, 3=270° CCW.
Z	Space	Z charspace[,linespace]	Set character spacing and line spacing (in plotter units).
Y	Horizontal/Vertical	Y n	Set text direction: 0=horizontal, 1=vertical.
J	New Pen	J n	Set pen colour: 0=black, 1=blue, 2=green, 3=red. (Stored but rendered mono.)

E. Control Commands

Cmd	Name	Syntax	Description
H	Home	H [mm]	With parameter: feed paper and reset origin to (0,0). Without: return pen to origin.
F	Line Feed	F n	Advance pen downward by n lines (based on current scale/spacing).
@	Test	@	Draw 4 small rectangles (colour-check pattern).

F. Protocol Framing

- **Enter graphic mode:** 0x1C 0x25 (FS %)
- **Exit graphic mode:** 0x1C 0x2E (FS .) — triggers rendering, PNG save, and printing
- Commands are terminated by any control character (0x01–0x1F) or by the start of the next command letter
- All command letters are case-insensitive
- Parameters are comma-separated signed decimals (integers or floats)
- Coordinates are in mm relative to the current ORG unless otherwise noted

XII. Miscellaneous Functions

A. Deleting a File

On any file selection dialog, you can delete the file by pressing BACK and OK simultaneously.

B. Screen Shot

On most screens, a screen shot can be taken by pressing the UP and DOWN keys simultaneously. The file is saved in PNG format.

C. USB Drive Mode

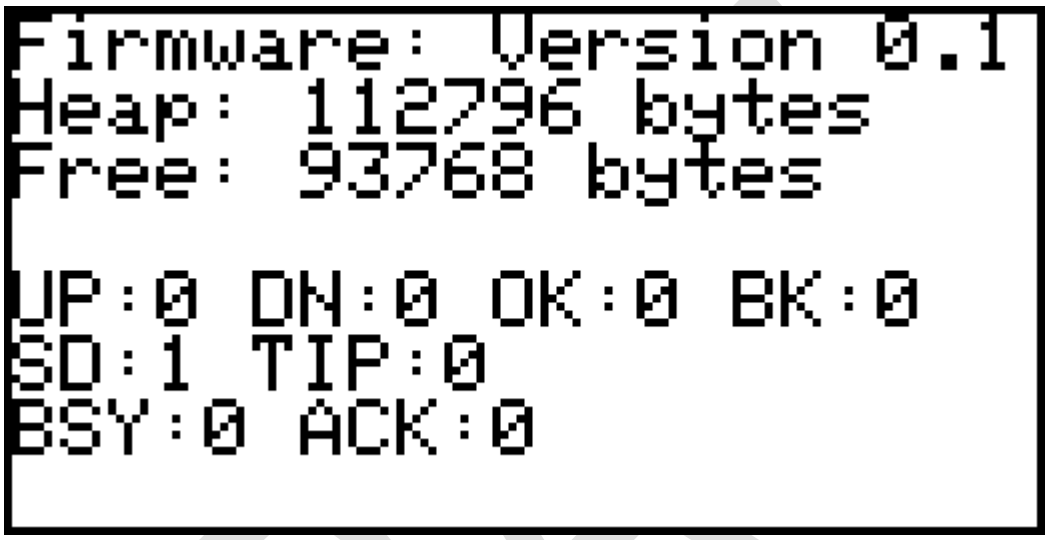
On most screens, USB drive mode can be enabled by pressing the BACK and OK buttons simultaneously.

D. Reset to Default Settings

If you need to start up with default settings, press both the BACK and OK keys when powering on the PCUI, until the main screen appears.

E. Status

If you need to troubleshoot inputs such as buttons, micro SD card switch, or others, the Status menu under Settings will display those items. This is useful if for example you need to troubleshoot the micro SD card switch contact point, parallel port input(s), etc.

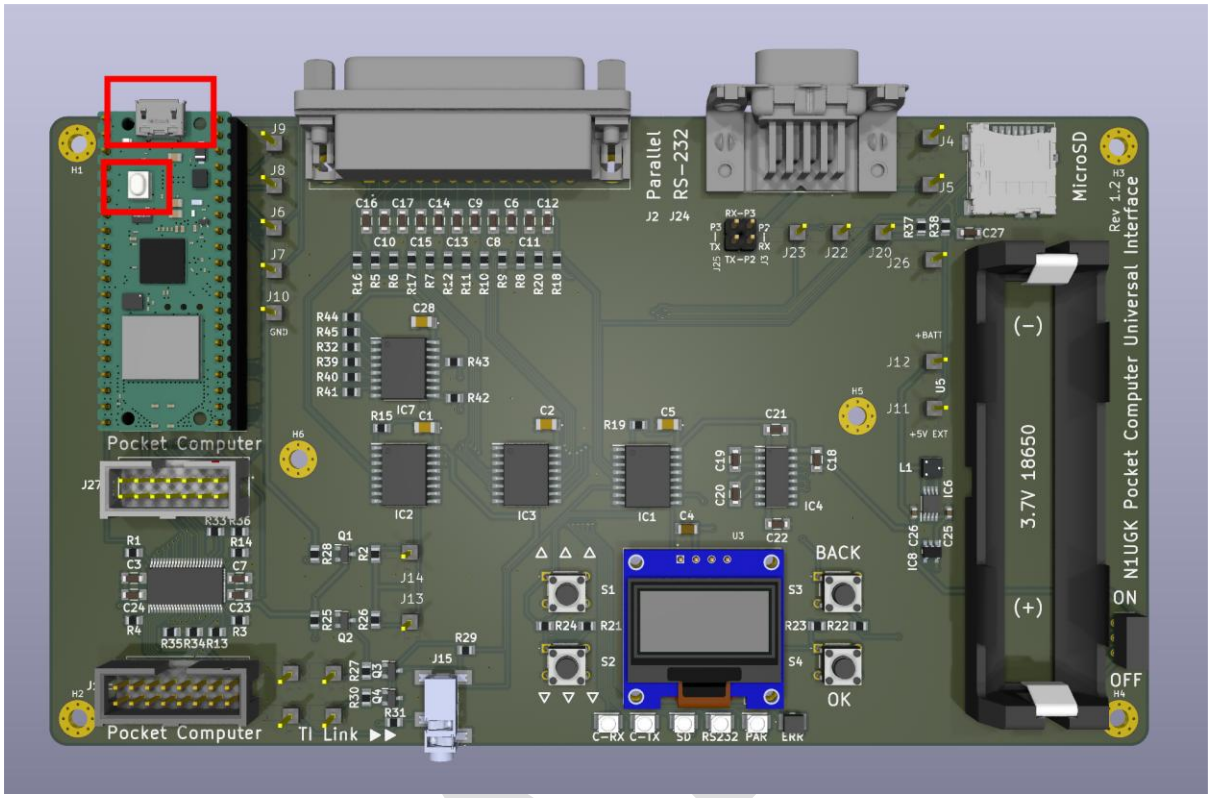


XIII. Firmware Updates

As with almost everything which has embedded software in it these days, the PCUI is no exception when it comes to the need for periodic firmware updates.

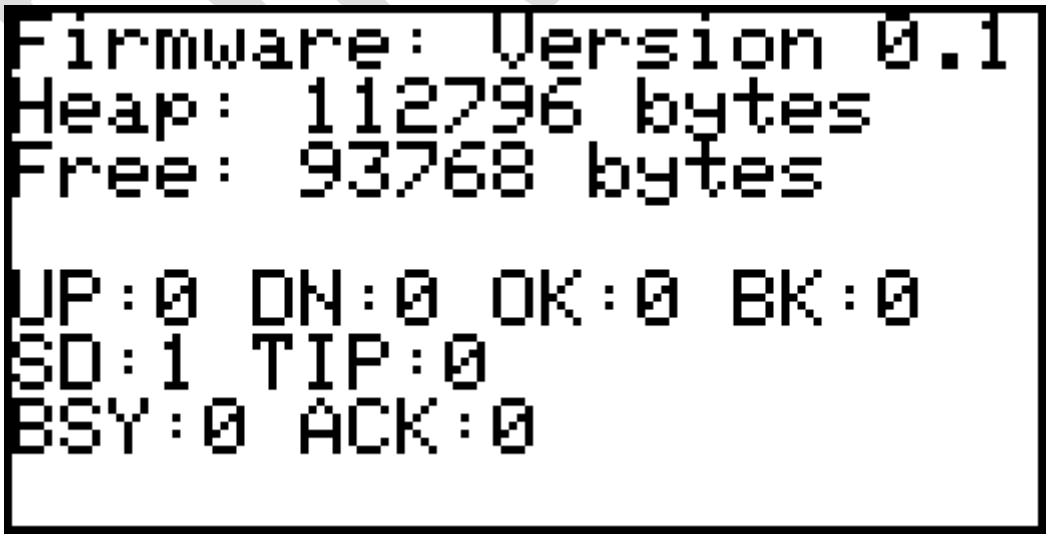
Updates may fix bugs and/or add new features. Check the web site often for updates, and if one is available, you can download the update and save it on your computer.

To update the PCUI firmware, start with the power off and USB cable unplugged. Press and hold the BOOTSEL button while plugging in the USB cable to a PC or Mac.



A removable drive should appear on your PC or Mac, and when it does, drop the firmware update file onto the drive in the root folder.

Once the file copies, the PCUI will flash the new firmware file and reboot. You can confirm the current running firmware by clicking the settings menu and then the status option:



XIV. File Format Technical Notes

When the PCUI receives a bit stream from an attached pocket computer or calculator via the cassette save function, framing, leaders, stop/start bits, etc are removed before being saved to SD card. When sending the file back to the pocket computer, that information is added back. This allows for easier inspection of binary file content if needed.

XV. Acknowledgments

I would like to thank the following for their documentation and projects:

Piotr for the excellent sample AVR code, documented bus timing and wiring diagrams for various Casio pocket computers: https://www.pisi.com.pl/piotr433/

Marcus von Cube for his work on the Casio Utilities: https://www.mvcsys.de/doc/casioutil.html

Tim Singer and Romain Lievin for their work documenting the TI graphing calculator protocol: https://merthsoft.com/linkguide/

The Pocket Computer Museum for their Sharp tools: http://pocket.free.fr/

Hey Birt! – his YouTube videos for repairs, tools, methods, inspiration from the backpack drive and CE-158X projects. https://www.youtube.com/channel/UC2V0T-vGOewtuCW3pazzczQ

Codaris – His work on the SharpManager project helped bridge the gap between my 1246 support and the "new" 1401/1403 protocols the CE-126P was performing with these models. https://github.com/codaris