

# VCC

## Copy & Print controller

**BOSCO**  
**INC.**

### PRODUCT GUIDE



Conforms to FCC CFR 47 part 15 and  
European Community EMC Directive 89/336/EEC  
RoHS compliant under EU Directive 2002/95



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# Virtual Cash Controller 2

## Product Guide

### About the Virtual Cash Controller

Your VCC terminal should arrive in good condition. Check the carton for damage and store it in a safe place in the event you need to return the machine. If there is any visible damage to your machine, notify the shipping company as soon as possible and contact your equipment supplier.

### Contents of package

1. VCC terminal
2. Power cord
3. Switching power supply
4. Warranty card
5. Installer guide
6. Copier harness (option)



### Copier interface

Boscop offers an extremely wide range of interface cables for modern copiers and multifunction devices. We cater to all brands: Canon, Sharp, Océ, Ricoh, Toshiba, Xerox, Minolta, and many others. Contact Boscop for details.

### Keypad

The touch screen is fitted with an anti-splash membrane to try and prevent accidental spill damage. Any liquid caused damage is, however, not covered by our warranty program.

### Power supply

The switching power supply meets worldwide standards and covers universal supplies from 90 to 264 VAC at either 50 Hz or 60 Hz. In the event of failure or theft, please contact Boscop, Inc.

### Product information

Take a few minutes to complete these details. Have the information ready when you call Boscop with questions about your product.

Product type: Virtual Cash controller

Serial number: \_\_\_\_\_ (9 digits)

MAC address: \_\_\_\_\_ (12 digits)



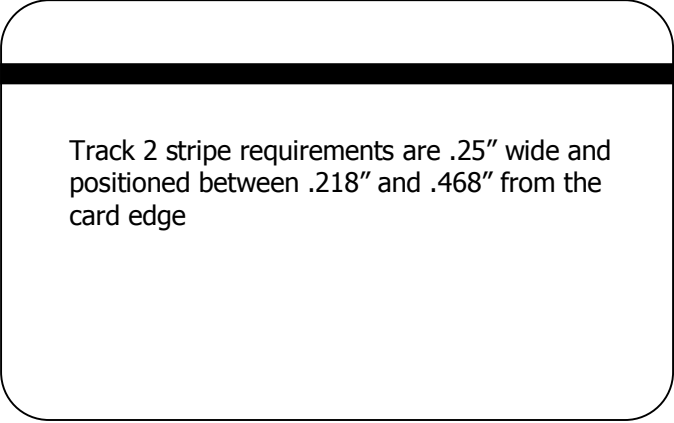
VCC terminal shown on optional Floor stand FS-1 (see following page)

## VCC product options

There are several product options available for the VCC terminal; these are governed by the choice of user ID media for the system users.

### ABA magnetic card reader (track 2)

This will read any ISO7810 track 2, magnetic card and pass the information to the server software for authentication. All credit cards, ATM cards, most student ID cards, drivers licenses (US) use this format. Boscop can supply track 1 or track 3 by special order.



Track 2 stripe requirements are .25" wide and positioned between .218" and .468" from the card edge

### Barcode swipe reader

Ideally suited to printed barcodes where the barcode is printed in the same position as a track 2 magnetic stripe. Track 1 and track 3 positions may be catered for by special order.

**Codes read include** UPC/EAN/JAN & ADDON/25, CODE 39, CODE 39 FULL ASCII, CODE 32, INTERLEAVE 25, INDUSTRIAL 25, MATRIX 25, CHINA POSTAGE, CODE 128, CODE 93, CODE 11, CODABAR/NW7, MSI/PLESSEY, TELEPEN

### Mifare, iClass RFID card reader

Our 13.56MHz proximity reader version can read either iCLASS credentials (transmitting Wiegand formatted data as encoded), Mifare® Standard, Ultralight, or DESFire® credentials (transmitting Wiegand data based on the card serial number in various formats).

**Note** – to read proprietary iClass formats we will need the consent of the format owner.

### HID Proximity card reader

Our HID 125kHz reader can read 26 and 34 bit HID Proximity cards, as well as any iClass cards using 125kHz.

**Note** – to read proprietary HID formats we will need the consent of the format owner.

### EM4102 proximity card reader

Mostly used in Europe, we have fully integrated the 125kHz EM4102 and can supply readers to special order.

### Impro 125kHz proximity card reader

We have integrated the Impro Omni-Scan reader module; this read only device has a scan range of up to 6". It reads Impro Standard, Impro Slim and Impro Pico credentials.

### Barcode scanner option

The VCC terminal can be supplied with an externally mounted barcode scanner fixed underneath the terminal for use when the barcode is either printed out of position for use with a swipe reader or for use when libraries place an adhesive backed barcode onto a card, causing the barcode to be out of position or crooked.

**Codes read include** UPC/EAN/JAN & ADDON/25, CODE 39, CODE 39 FULL ASCII, CODE 32, INTERLEAVE 25, INDUSTRIAL 25, MATRIX 25, CHINA POSTAGE, CODE 128, CODE 93, CODE 11, CODABAR/NW7, MSI/PLESSEY, TELEPEN

### Floor stand FS-1

The optional stand is ergonomically designed to promote greatest ease of use of the terminal. Sloping the keypad and display towards the user, it is accessible by both pedestrian and wheelchair patrons and designed for placement either at the front or rear on either side of the copier. All cables are securely routed inside the stand for maximum security. Picture shows cabling routed inside the stand upright.



### Wall Mount WM-1

If space is at a premium and the equipment has to be set up against a wall or by a pillar then the optional wall mount will help.



# INSTALLATION AND SETUP

## Installing the Virtual Cash controller

The terminal can be easily installed using our dedicated floor stand or it may be placed on a counter or table. The unit can also be mounted securely to a wall using the optional wall bracket from Boscop.

1. Power down and unplug the copier
2. Remove the back and/or side panels to reach the copier's foreign interface connector
3. Attach the copier harness between the VCC terminal (DB15) and the copier's foreign interface connector.
4. If applicable (not all machines require this), switch the copier to foreign device mode (key counter, card reader, coin op etc.) The copier service technician has the procedure and keyboard codes.
5. Check that all connections are secure, then plug in and power up the copier and VCC terminal.
6. The copier should be disabled until a valid user ID is entered and authorized via the terminal.
7. Replace the copier panel(s).

## Circuit boards

Your VCC terminal has been thoroughly tested prior to shipping and so it is unlikely any parts will fail on installation. Problems are more likely to occur with the network connection or the external interfacing. Once you have checked the connections, check the following:

- Power – Is the display lit?
- Network – Is the network link light on, it is situated beneath the up/down arrows?
- Software – All Boscop's products require installation of network software. Check with your software provider's support staff or help desk before calling Boscop.

## Connection

- Power cord to wall socket (90 VAC to 264 VAC)
- Ethernet cable (not supplied)
- Copier interface (harness) – ordered separately

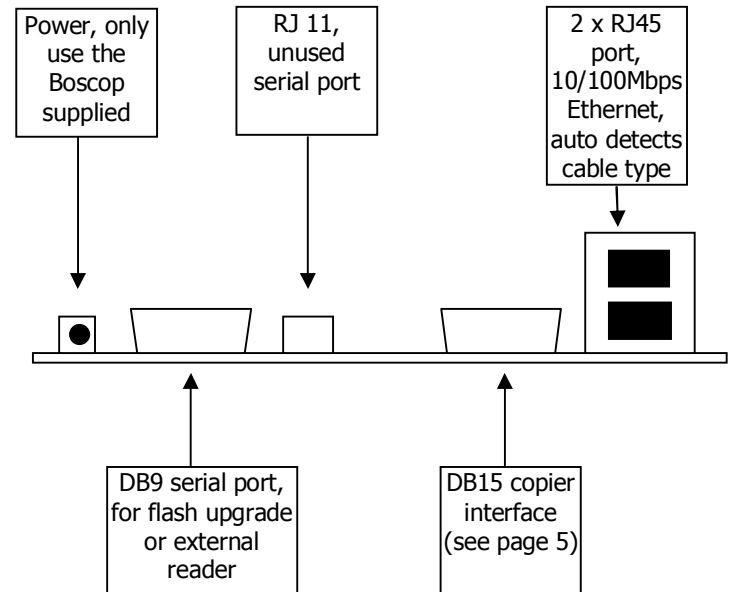
All the connection points are on the rear of the VCC terminal. Be sure that the copier interface is correctly connected BEFORE powering up the VCC and the copier; connecting the copier while power is on may severely damage the copier and the VCC.

Once the network cable is connected and power is provided, the network link light will appear and the display will continue to read "temporarily off-line waiting for network". If it does not, then check the network connections and cabling.

## Network switching

It does not matter which of the network ports is used for the incoming or outgoing network connections, the VCC network switch operates identically in either of the ports.

## The back panel of your VCC terminal:



## DB9 serial port connections

Should you intend to connect an external reader to the VCC it is important to know the pin-outs for the DB9 connector.

1. Unused
2. VCC – Tx
3. VCC – Rx
4. Unused
5. Ground
6. 5v
7. VCC – Rts (flow control only, not active)
8. VCC – Cts (not active)
9. 5v

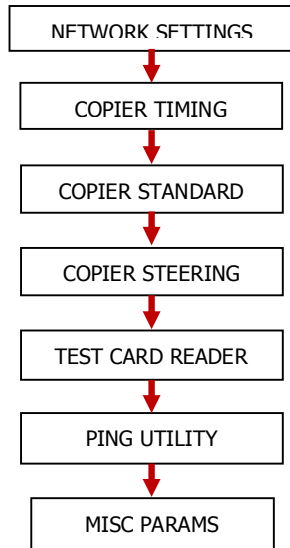
In most cases you will only need to use pins 3, 5 and either 6 or 9. It is important that the external reader issues both a start character (STX) and an end character (ETX) so that the VCC can transmit the package to the server. If in any doubt about this, contact Boscop for technical assistance.

## VCC Parameters Menu

The parameters menu provides access to network settings as well as various test functions. Below is a flow chart of the Parameters menu.

### Network terminal settings

This menu selection provides access to the IP parameters used for communicating with the print server. See below for a flow chart and description of the Network settings menu.



### Copier timing

This control provides a way to adjust the sense time, blind time, reset delay and eject delay used during the copier test modes, Copier standard and Copier steering. These settings apply only during off-line testing. Timer values used when the VCC is online are downloaded from the print vend software and must be set there. The timing adjustments made here apply to both sets of opto inputs and relays; there are no provisions for separate control of inputs one and two in off-line test mode. Timing resolution is 10ms. Press Enter or C/CE to exit and save the changes

- + to increase timing
- to decrease timing
- ↑ to move to previous timer
- ↓ to move to next timer

### Copier standard

This menu selection provides a way to test the VCC in standard mode using the timing parameters set under Copier timing. The VCC display provides a visual of the state each of the optos are in. Relays are turned on and off by pressing '1' for relay one and pressing '2' for relay two. Meters roll over at 10. In standard mode, debit pulses

should only come in on optos 1 and 2 and only Mtr 1 and Mtr 2 should change. Press C/CE to exit this selection

Opto 1 state			Opto 2 state			Opto 3 State		Opto 4 state	
Mtr 1	Mtr 2	Mtr 3	Mtr 4	Mtr 5	Mtr 6	Mtr 7	Mtr 8	Relay (1,2,B)	

### Copier steering

This menu selection provides a way to test the VCC in steering mode using the timing parameters set under Copier timing. The VCC display provides a visual of the state each of the optos are in. Relays are turned on and off by pressing '1' for relay one and pressing '2' for relay two. Meters roll over at 10. In steering mode, debit pulses should come in only on opto 1. Optos 2-4 provide the steering signal as the copier selections change. In this mode Mtrs 1-8 may change. Press C/CE to exit this selection.

Opto 1 state			Opto 2 state			Opto 3 state		Opto 4 State	
Mtr 1	Mtr 2	Mtr 3	Mtr 4	Mtr 5	Mtr 6	Mtr 7	Mtr 8	Relay (1,2,B)	

### Test card reader

This menu selection provides a way to test the card reader whether it's a mag swipe, bar code or contactless card. Everything read off the card is displayed unfiltered. What is viewed here is what gets sent to the server when on-line. The display can show up to 40 characters. Press C/CE to exit this selection.

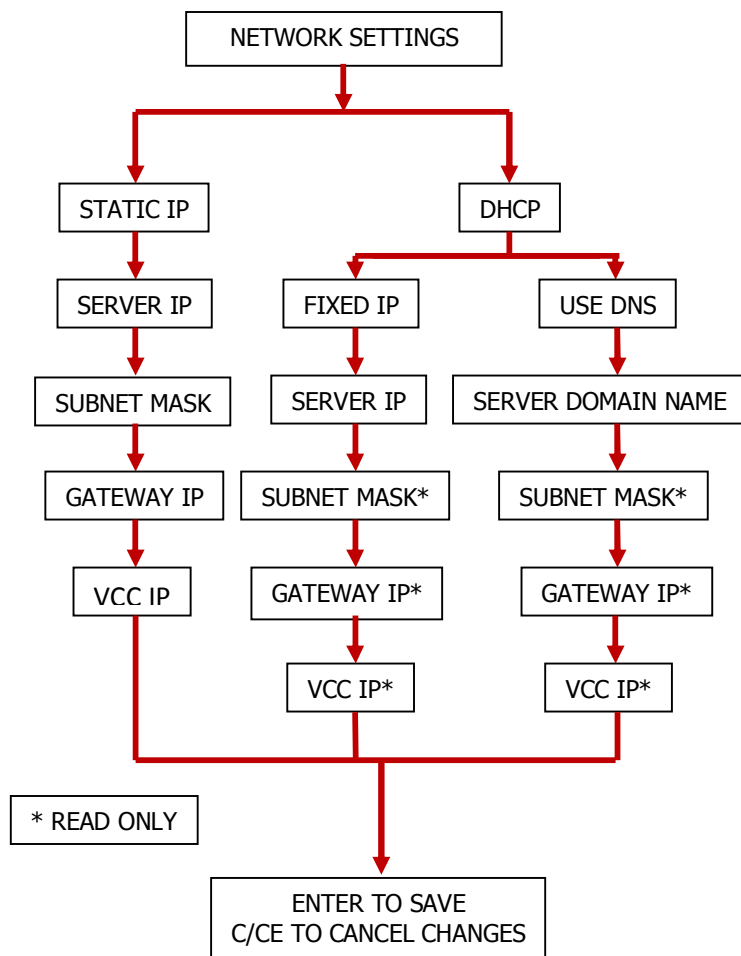
### Ping utility

This menu selection provides a way to send periodic PING echo request packets. When entering this menu for the first time after a boot up, the IP displayed is the server IP whether it's issued through Fixed IP or a DNS operation. The ping utility will send an ICMP packet with 32 bytes of data at 2 second increments for as long as this menu is open. The display shows the bytes sent, bytes received and duplicated received ping echo reply packets. The display counter will roll over at 255. **Note;** the ping address can be edited, simply type in the address you wish to use. Press C/CE to exit this selection.

### Hostname

This is the name given the VCC for the purpose of identifying it on a DHCP/DNS enabled network. This name is not programmable but fixed at "VCCxxxx" where xxxx is the last four digits of the MAC address. The hostname is passed to the DHCP server in the DHCP request packet. The DHCP server must be configured to pass this to the DNS server. This menu selection is only visible in DHCP mode.

## Network settings Flow Chart



**Static IP/DHCP:** Select Static IP if you do not have a DHCP server or would prefer to manually manage your VCC IP pool. Select DHCP to obtain various parameters necessary for the client to operate such as the client IP, subnet mask, gateway IP and DNS servers.

**Server IP:** IP of the print server

**Subnet Mask:** subnet on which the VCC is to operate. Read only in DHCP mode.

**Gateway IP:** IP of local network's Gateway. Read only in DHCP mode.

**VCC IP:** client IP assigned to this VCC. Read only in DHCP mode.

**MAC Broadcast filter:** Filter located in the EMAC of the FPGA. Blocks all network traffic except our ARPs and TCP packets. This may cause additional TCP retries under heavy network traffic. Turn off if units reboot randomly.

**Fixed IP:** Use this in place of doing a DNS operation to obtain the server IP. It is recommended that if the server IP is not going to change that you use this method.

**Use DNS:** Select this option if you want to use DNS to obtain your print server's IP.

**Server Domain Name:** Enter the domain name of the print server here. Maximum characters are 32. All special characters are supported; the VCC will only read and save the characters to the left of the first space character.

### To change the settings (Static IP mode):

- When the terminal is off-line (network cable unplugged) and the unit is fully booted up; swipe your parameters card and select 'Network settings'. If you want to manually control your VCC IP pool, select 'Static IP', otherwise select 'DHCP'.
- Select Static IP and this will bring up the IP parameters settings. You can either go through them line by line or press the enter key to skip to the parameter you wish to change. The display will appear as shown below.
- Press enter or C/CE to exit

<b>Server:</b>	<b>192.168.001.100</b>
<b>Subnet:</b>	<b>255.255.255.000</b>
<b>Gateway:</b>	<b>192.168.001.001</b>
<b>Client:</b>	<b>192.168.001.101</b>

**MAC Broadcast filter:** Filter located in the EMAC of the FPGA. Blocks all network traffic except our ARPs and TCP packets. This may cause additional TCP retries under heavy network traffic. Turn off if units reboot randomly. You can turn off the **keypad entry** to the parameters capability. You should only do this if you have a secure parameters card, otherwise you will not be able to change settings on your terminals.

## TROUBLESHOOTING

The VCC does not function independently — it requires server-installed software to function. Please contact your software provider before investigating hardware issues. For Virtual Cash Controller terminal support, please contact 607-749-2910 or 603-744-2188 between 8:00 a.m. and 6:00 p.m. EST. or e-mail [tsupport@boscop.com](mailto:tsupport@boscop.com)

### Initial install

1. Is the network link light lit on the right side of the terminal? If no, check the cable and connections.
2. Can you ping the VCC unit from the server?
  - a) Yes – check the server software configuration
  - b) No
    - Is the network configured to pass broadcast packets? Destination port 2613 and source port 68 must be open for the terminal to contact the server. TCP ports 1234 and 1235 must also be open.
    - Will another unit work in that same location?
    - Will that unit work in another location closer to the server?
    - Run the VCC test program on a laptop. You will need a standard Cat5e Ethernet cable.
    - Is the hardware in the terminal working? Check the LED status on the circuit board when connected to the network.
3. Does the copier enable when connection is made with the server software? If not, make sure the copier harness is correct and that the copier is set to foreign device or key counter mode. You may use the copier test function found under the parameters menu to do this.
4. Does the VCC debit at all? If not, check that the copier interface is correct with the terminal.
5. Does the VCC debit copies incorrectly? Check the timing parameters (see page 4).

### Post installation

1. Check that the network terminal settings are correct (you may need to contact the network administrator locally).
2. Can you ping the VCC from the print software server?
  - a) Yes. Check all software settings.
  - b) No. Run the VCC diagnostic tool from your laptop through the Ethernet port (you will need a standard Cat5e cable to run the connection through a hub).

c) Replace the terminal, if the problem persists, change the local hub and get the network connectivity verified to your position.

3. The most common fault is caused by the terminal setting having been changed inadvertently. Ask the network administrator to keep a record of all terminal settings for easy reference.

### INTERFACING WITH A COPIER

The VCC terminal was designed to be used as a copier controller and print release station. To function as a copier controller, the VCC terminal requires an interface harness specific to the copier and properly adjusted interface timing to accurately read the debit pulse.

#### VCC Copier harness wiring color

Pin	Wire color	Function	State
1	Red	Copier input 1	Positive
2	Green	Copier input 1	Negative
3	Yellow/Black	Relay 1	NC
4	White	Relay 1	Common
5	Black	Relay 1	NO
6	Blue	Copier input 2	Positive
7	Orange	Copier input 2	Negative
8	Brown	Relay 2	NC or NO
9	Yellow	Relay 2	Common
10	Grey	Copier input 3	Positive
11	Pink	Copier input 3	Negative
12	Light blue	Copier input 4	Positive
13	Purple	Copier input 4	Negative
14	Red/Black	5 volts	
15	Orange/Black	Ground	

#### Interface modes: standard vs. steering

The VCC copier interface port is a high density DB 15; the pin assignments can be seen in the copier interface schematic at the end of this guide.

Your VCC terminal can be set to operate in normally open or normally closed, default is normally open, to change to the normally closed setting move jumper JP1 (located near the DB15) to position (2, 3).

The VCC terminal can provide up to 8 price lines provided the server software gives the relevant command at boot up. There is no requirement to move jumpers or even open the enclosure to achieve this.

## TIMING PARAMETERS

These parameters are adjustable to allow a wide variety of copiers to be used and to ensure that all copies will be accurately counted, regardless of the copier manufacturer and copier speed.

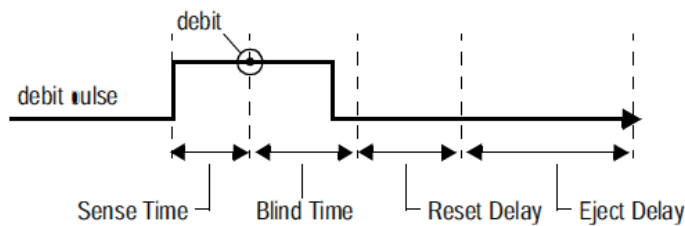
If you are in any doubt how to change these settings please contact [tsupport@boscop.com](mailto:tsupport@boscop.com) or call +1-603-744-2188 ext 1.

### Leading / Trailing Edge debiting

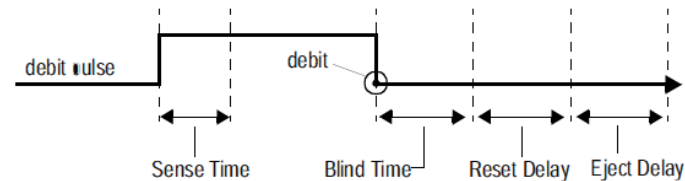
With leading-edge debiting (default), the debit occurs after the minimum pulse-width time (sense time) is satisfied.

With trailing-edge debiting, the software delays the debit until after the debit pulse goes inactive.

The preferred method with today's copiers is leading-edge debiting.



Pic. Example debit pulse with leading-edge debiting



Pic. Example debit pulse with trailing-edge debiting

### Sense Time

This is the minimum length of time a debit pulse must be active for it to be considered a valid debit pulse. The valid range is 0 – 30 seconds in 10ms increments. If sense time is set too short, the VCC could interpret noise as a debit pulse; if it is set too long, the unit may not register all copies made.

The VCC boots with sense time set to 20ms.

### Blind Time

This is the length of time after a valid pulse when any further pulses registered by that opto are ignored. The valid range is 0 – 30 seconds in 10ms increments. Blind Time masks unwanted pulses (i.e., double pulses or glitches). If this parameter is set too short, double debits could occur, but if set too long, vends could be missed.

The VCC boots with Blind Time set to 10ms.

### Reset Delay

This is the length of time that the relays stay energized after the job is terminated (i.e., the patron pushes the terminate button or escrow falls below the vend price). This setting must be long enough for the job to complete and the paper to get through the copier, but not so long that another job starts.

The VCC boots with Reset Delay set to 500ms.

### Eject Delay

This is the length of time between the end of the Reset Delay and the moment the account is closed. If Eject Delay is set too short, the account will be closed while the copier is still running. If set too long, a customer might become irritated, waiting for his or her account to close.

The VCC boots with Eject Delay set to 500ms.

### Troubleshooting

If you are experiencing any problems with copies not counting correctly or copies not registering at all then please use the debug mode (see page 5 of this guide) to adjust the copier timing parameters while off-line so that you can determine the correct settings to apply in your chosen copy and print management software.

## Network upgrade utility

The preferred method for updating firmware in the VCC is using our network upgrade utility. The latest version can be downloaded from <http://virtualcash.biz/ftp/2nd%20gen%20board/>

Once you have installed the utility, all instructions are included in the help file. You will also need to download the latest version of our firmware from the same location or have it e-mailed to you by our support team. You will need a regular Cat5e or crossover cable to complete the upgrade.

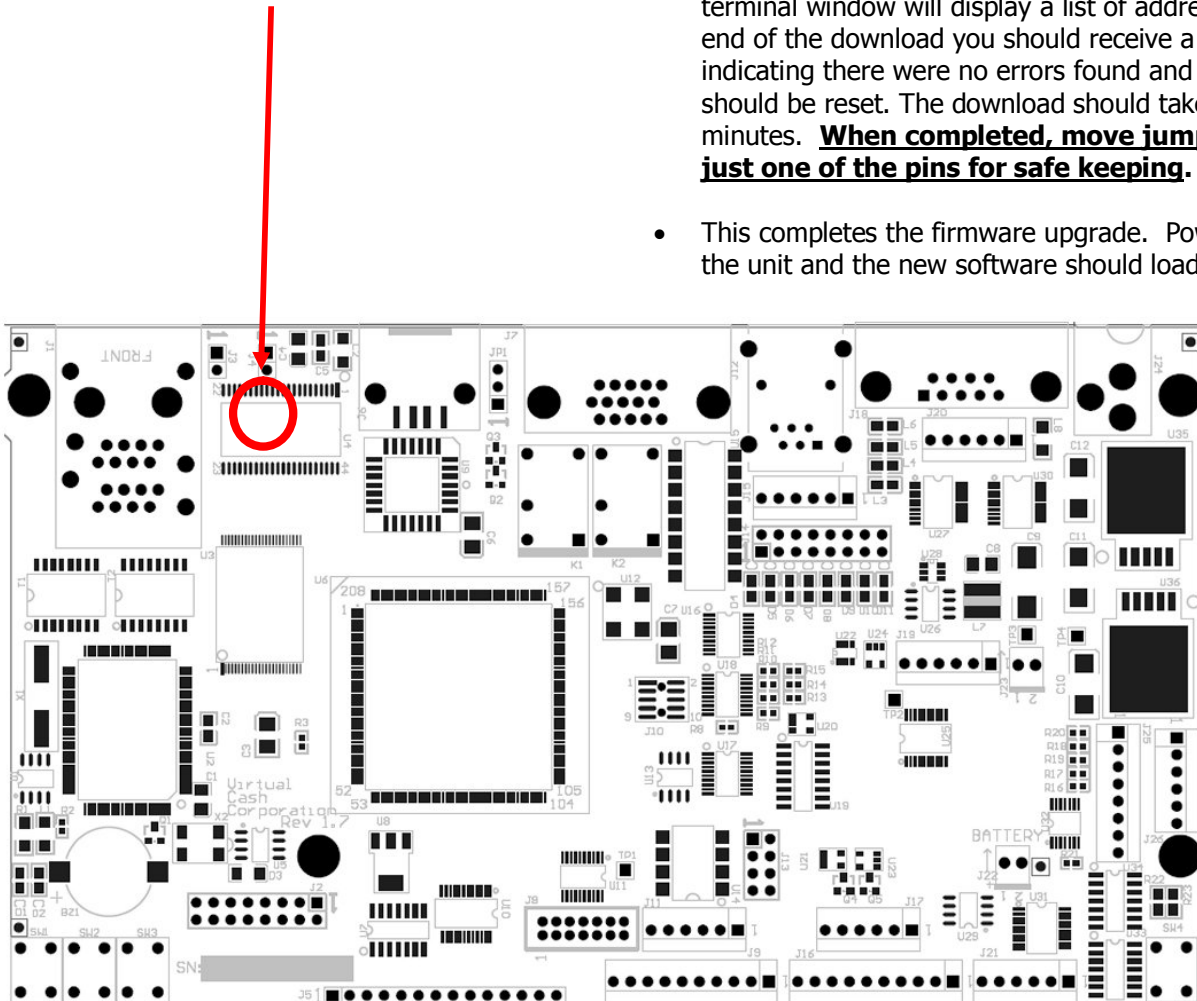
Call 603-744-2188 Ext 1 for live help.

## Serial upgrade utility

In the unlikely event the network utility fails to upgrade your terminal you will need to use our older serial upgrade.

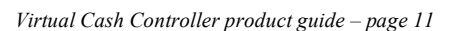
This is the location of jumper J4 (you will need a medium Philips type screwdriver to open the case)

- Open the VCC and install jumper J4 (at end of arrow). This jumper is located just to the right of the RJ45 network port
- Connect a serial cable between the VCC's DB9 and the PC and activate a serial terminal program such as HyperTerminal. Set the communication interface to 57600-8-N-1 and specify hardware flow control. The serial cable should be a straight through male to female.
- Apply power to the VCC which will send a menu to HyperTerminal. From this menu choose "C" to flash current firmware location. The VCC will then erase the flash memory which will take about 15 seconds.
- The HyperTerminal display should now read, "Send ASCII Intel Hex File To Begin Download...". At this point the board is waiting to receive the Intel hex file. In order to send the hex file using HyperTerminal, go to the Transfer→SendTextFile and select the hex file sent to you by Boscop. During the download, the terminal window will display a list of addresses. At the end of the download you should receive a message indicating there were no errors found and that the PCB should be reset. The download should take about 3.5 minutes. **When completed, move jumper J4 onto just one of the pins for safe keeping.**
- This completes the firmware upgrade. Power cycle the unit and the new software should load.

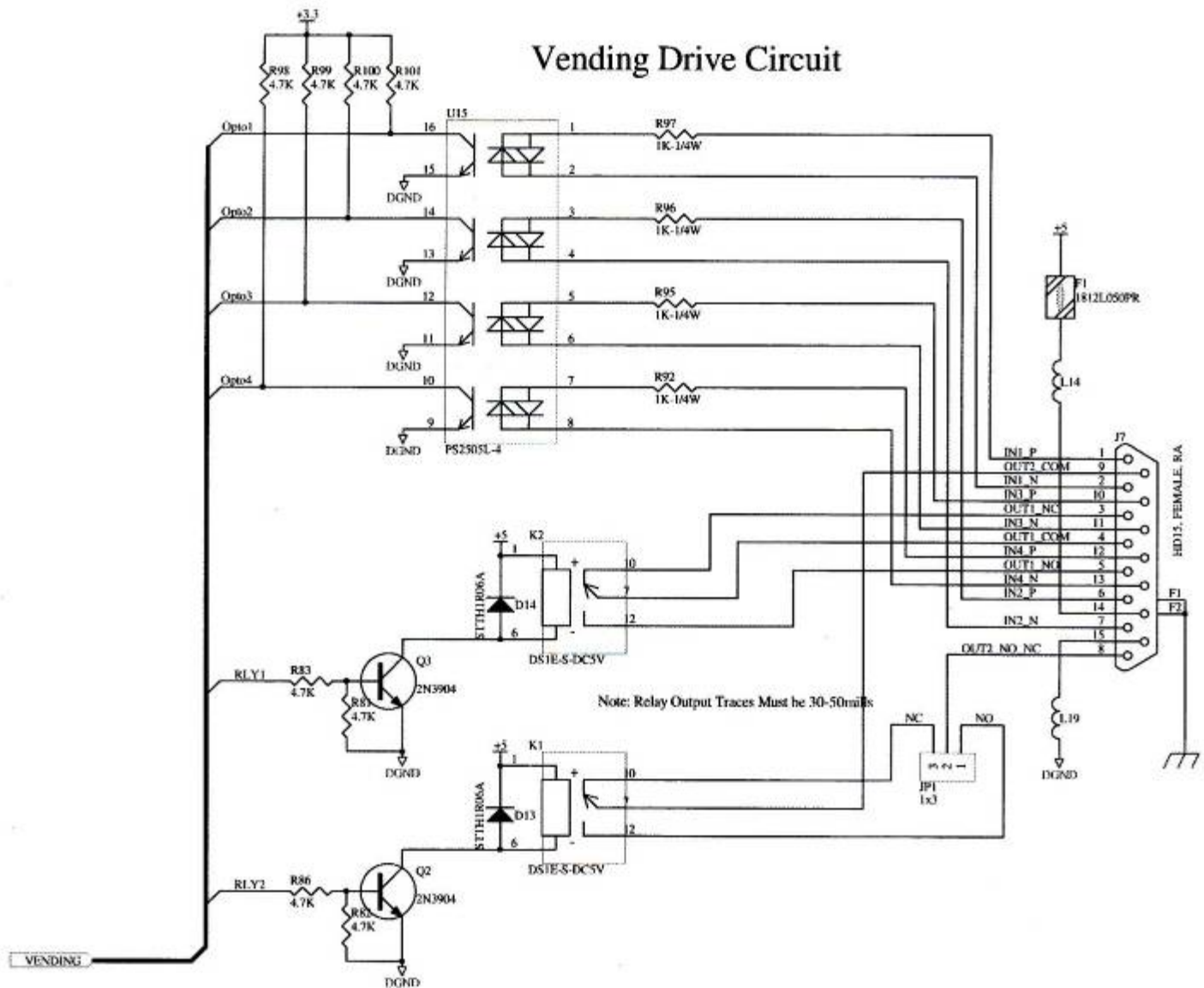


VCC next generation and Alpha terminal board layout

In the event that you need to contact our technical support department, the following diagram may be helpful. There are no components shown on the PCB, just the component locations.



## COPIER INTERFACE SCHEMATIC



## RETURNING A PRODUCT FOR REPAIR

Call +1 603-744-2188 ext 1 for a return authorization. Please have the terminal serial number and a brief description of the problem ready when you call. Any product received outside the warranty period will be subject to our normal rates for parts and labor.

Shipping costs are your responsibility. Please use your shipping account to return your repairs; otherwise, the return shipping will be at the standard UPS rates.

All products should be returned to us in their original packaging. A charge of \$10 will be levied if products are shipped in unsuitable packaging. All products received in a damaged condition will be subject to repair outside the warranty program.