

CardMaster
Access and Control Systems

FROM



CARDLOCK VENDING



CardMaster CM-G-6 GATE CONTROL Installation Manual

Rev 09.06.07

Installation Manual for CardMaster Access control

www.cardlockvending.com customers call 888-487-5040

Critical Do's and Don'ts

- ◆ Do not proceed without reading the following information on this page. Critical!
- ◆ All work should be done only by a qualified electrician, experienced in installing Petroleum Equipment in a Class 1 Div 1 or 2 environment.
- ◆ All work needs to be done in conformance with applicable NFPA codes.
- ◆ All work needs to be done in conformance with applicable provisions of the National Electric Code.
- ◆ All work needs to conform to all applicable local codes: electrical, safety, and fire department.
- ◆ Do not substitute telephone wire as communication wire where Belden Shielded Cables are required.
- ◆ CardMaster 120vac Power must be from a dedicated circuit.
- ◆ Do insure clean electrical power.

In case of doubt install “AC” line conditioners with surge suppression

EARTH GROUND– TESTING TO ZERO (0) OHMS REQUIRED

GATE CONTROLLER

You are about to install a CardMaster CM-G-6
Gate Control Unit.

This unit has been programmed with specific ISO numbers that
allow access to whatever device you are controlling.

Only cards programmed with the specific ISO's may be used to
access the device you are controlling. No other card will be
allowed to access the device.

Programming functions are limited in the CM-G-6.
See programming manual.

Gate Control is programmed through the "G" command.

If Key Pad operation is desired only one access code can be
programmed for use with the Key Pad.

Installation procedures are the same for Gate Control as for
CardMaster Fuel Control with the following exceptions:

No OFF Hook is required.

Gate timing is controlled through programming in the "G"
command.

All PINS located in the resident PIN File must be set to 9999
by use of the "Shift +" function. See Programmer's manual.

Call CardLock Vending at 888-487-5040 with any questions.

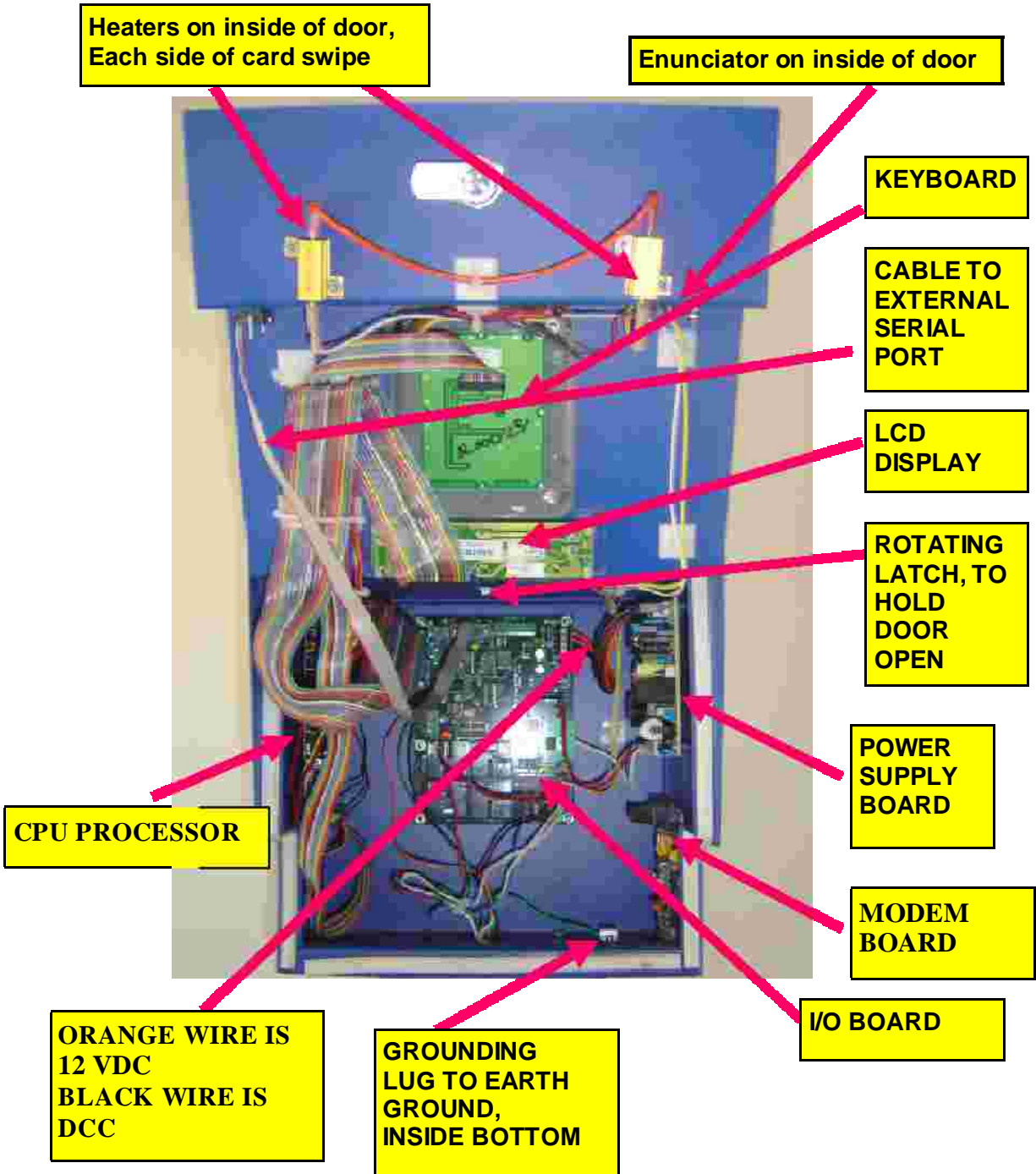
Overview

System Components of the CardMaster Console:

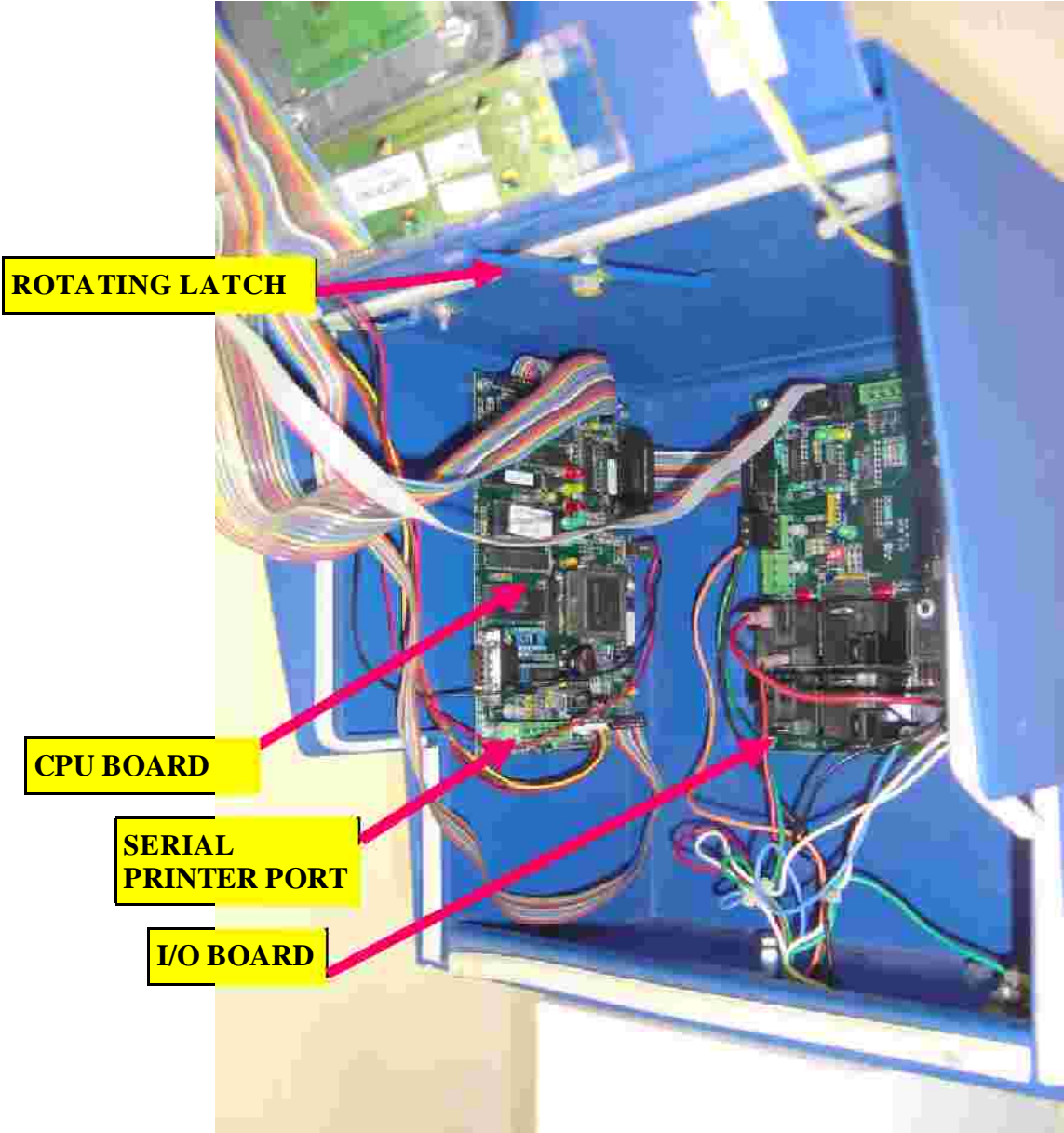
Processor Board (CPU)	This board contains the microprocessors, the EPROM with the operating system firmware and memory for databases and transactions. This board also interfaces to the annunciator, display, card reader, pin-pad (keyboard), and the printer serial port.
Power Supply Board	The PSB inputs 110/220 vac (or 12/24 vdc) and regulates it to 12 vdc—providing DC Voltage to our other boards and peripherals.
I/O Board Pump Control	The I/O board interfaces with the CPU board, and controls two (2) 30 amp hose / pump relays. The PCB-I/O board has AC power inputs, heater output voltage, DC power input, pulser inputs, and the data serial ports (RS-232 or RS-485 as applicable)
Cabinet Heater	The thermostatically controlled cabinet heaters are located on the inside of the front door adjacent to the area of the card swipe. These heaters have multiple purposes: reducing corrosion from humidity, and keeping components at operating temperatures in cold climates. They also help to keep the card swipe from freezing from snow and rain in bad weather.
LCD Display	CardMaster's back-lighted LCD displays 16 characters, 1/2" size, displaying screen prompts and input verifications.
Magnetic Stripe Card Reader	Swipe type magnetic stripe card reader, which reads cards swiped from right to left as you are facing the CardMaster, with stripe side facing away from operator.
12 Key keypad	Weatherproof metal keypad for keyboard entry of PIN, Odometer, Vehicle Number, etc; as well as entry of card number in "card-less" operation.
EMERGENCY STOP	All applicable codes require that an Emergency Stop Switch be provided in an easy to locate position—safely off the fueling islands. This is critical to local and national safety codes, and common sense safety considerations.

**CARDMASTER
INTERNAL
COMPONENT
LOCATIONS**

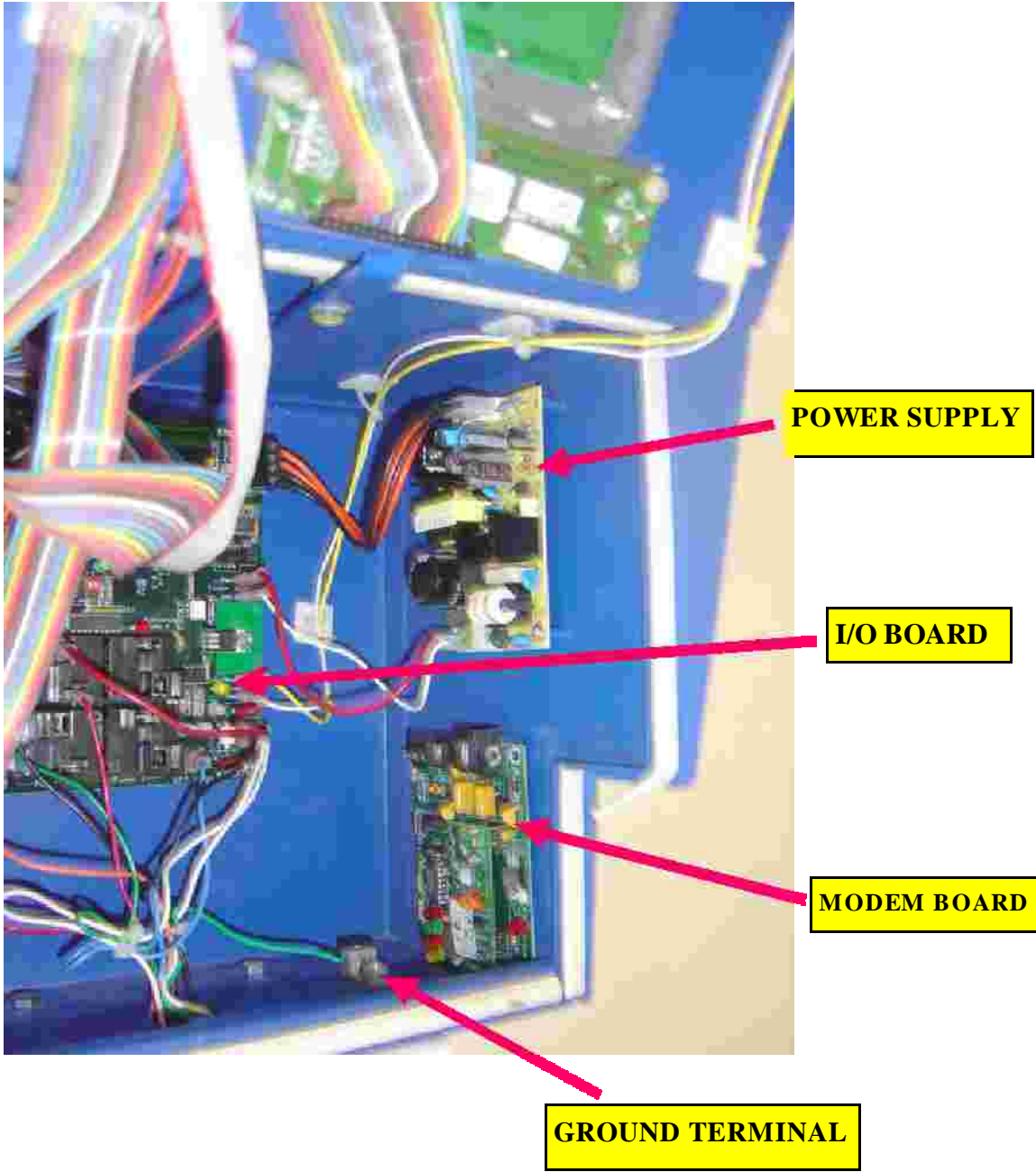
Internal View of CardMaster Cabinet



CARDMASTER LEFT SIDE INTERNAL VIEW



CARDMASTER RIGHT SIDE VIEW

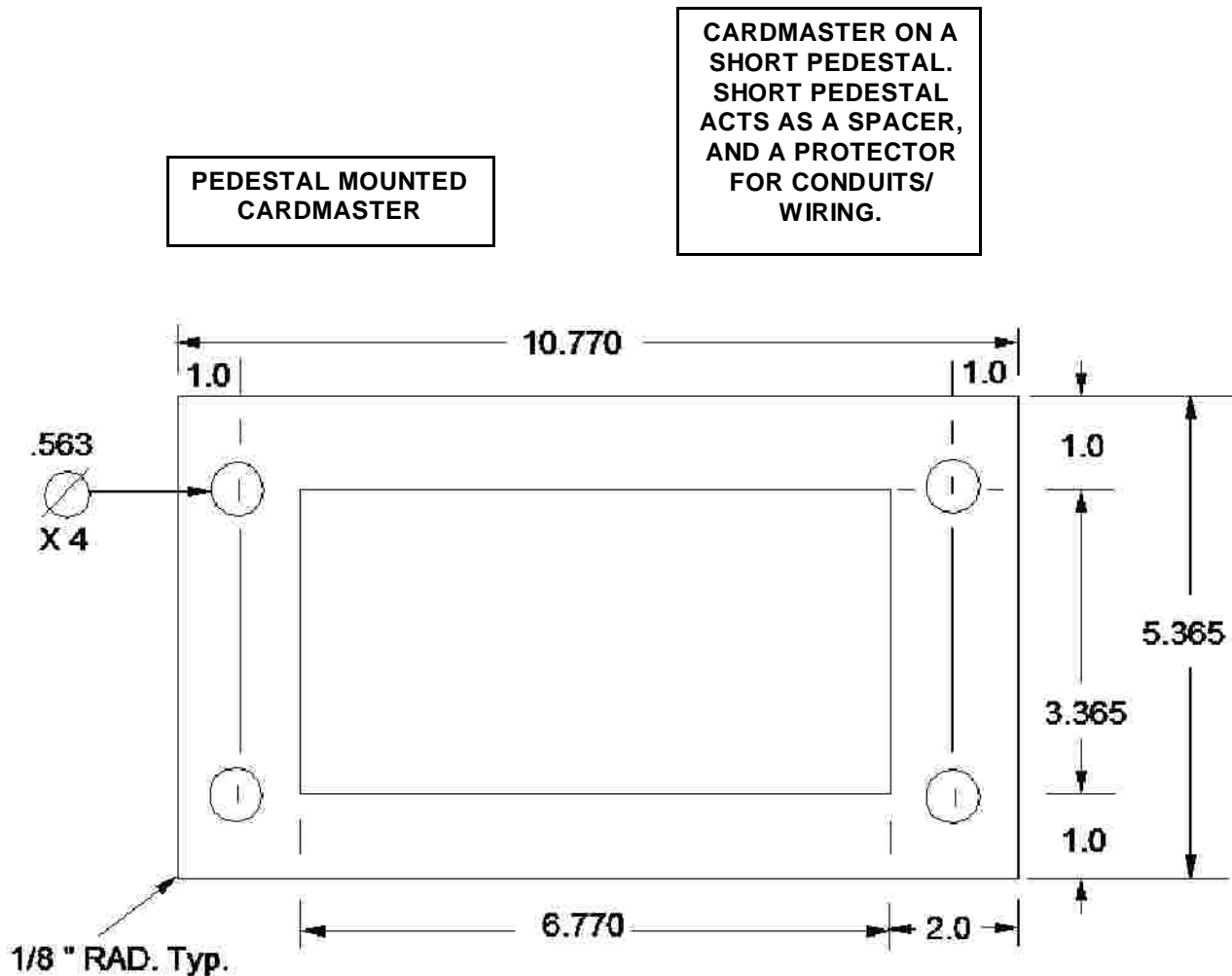


CARDMASTER

PHYSICAL

INSTALLATION

The CardMaster may be mounted on a Island Pedestal, or a "Pump Topper Pedestal". Installation must be done according to all applicable codes as spelled out on page 2 of this manual.



NEC Hazardous Location Installation Parameters

Division 1 is the area around the gasoline/ diesel dispensers.

Division 2 is the area 0" to 18" above grade and 0" to 18" away from the islands out to a distance of 20'.

This means CardLock Vending's CardMaster can be installed 48" above grade & 18" horizontal gap or space between the CardMaster and the dispensers.

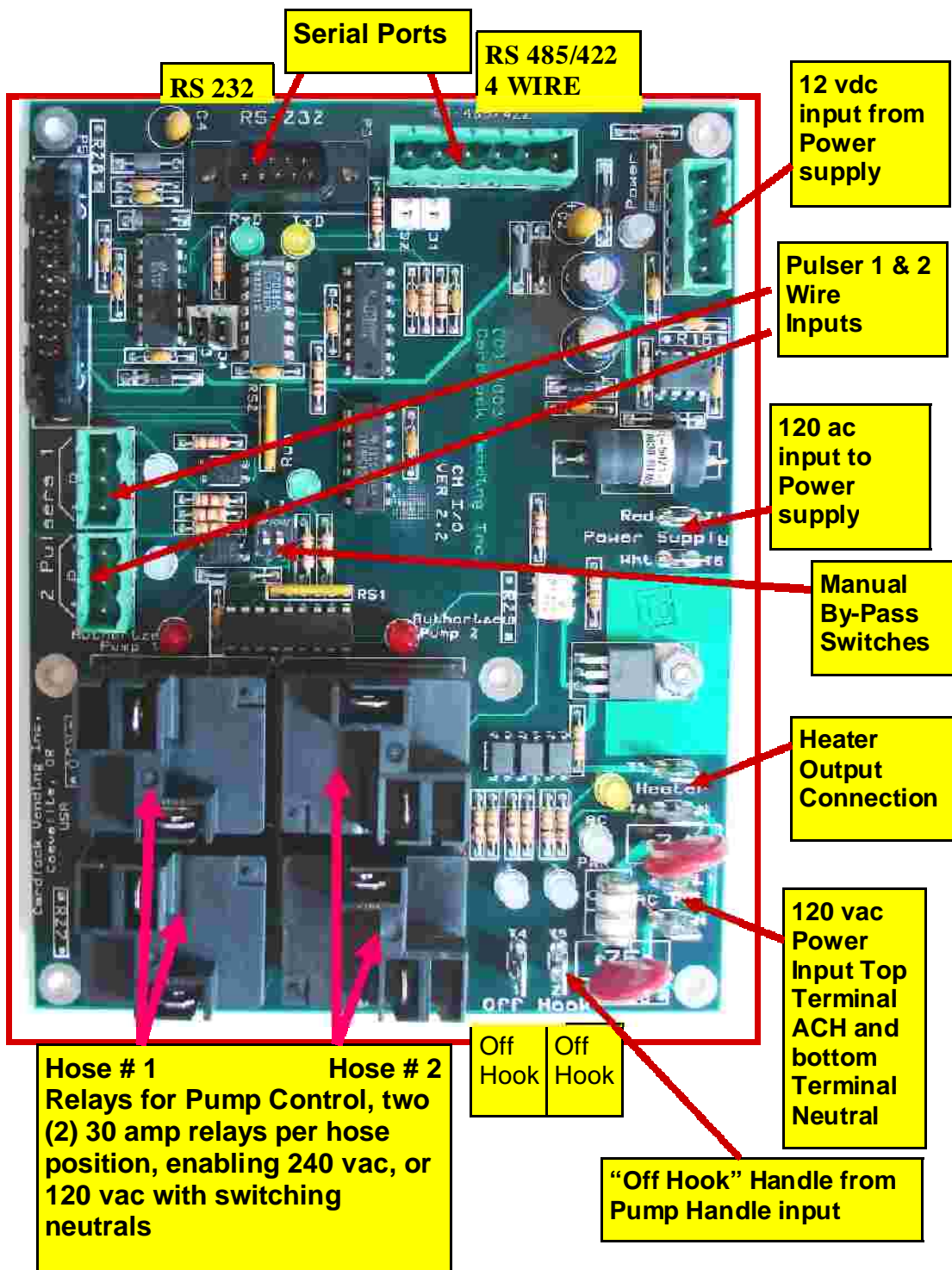
Always follow the local codes and the national electric codes when installing Cardlock Vending equipment. This is true at fueling islands as well as any other locations.

AC

WIRING

SECTION

I/O Board Key Connections and Features Locations



CardMaster WIRING Instructions

Follow all applicable local and national safety codes

Install CardMaster on a dedicated 10 amp circuit.

**“AC” WIRING – 120vac Single Hose Suction Pump:
“AC” wire inputs use “spade” connectors.**

Install according to all applicable codes with steel conduit for the AC voltage. CM must be on a dedicated circuit. AC should be in a separate conduit from the DC, pulser and 485 com lines. Install the following wires, select depending on 120 vac or 240 vac, single hose or two hose, and voltage of pump motor for hose relays:

L1	120 vac	Black Wire	12 Gauge	System Power
N	Neutral	White Wire	12 Gauge*	System Power*
Grn	Ground	Green	12 Gauge	Safety Ground

Earth Grounded with less than 1 ohm of resistance.

*When wiring for 220 vac application the white neutral needs to be changed to a red L-2 wire

Off	120 vac (on)	Blue Wire	12 Gauge	Sale Termination
Hook	zero vac (off)			(pump handle)

P1-	Pulser	Black	18 Gauge	Pulser**	
P1P	Pulser	Purple	18 Gauge	Pulser**	
Hose 1	P1+	Pulser	Orange Wire	18 Gauge	Pulser**

****CardMaster works with reed switch pulsers and most powered pulsers.**

Hose 2	R1	120 vac	Black	12 Gauge	Motor relay	220 vac
	R2	120 vac	Red	12 Gauge	Motor relay	220 vac

R1 Neutral	White	12 Gauge	Motor Relay#	120 vac
R2 120 vac	Red	12 Gauge	Motor relay#	120 vac

****# switch neutral systems require two white wires, instead of 1***

Serial Ports – See separate page

EARTH GROUND

GROUNDING:

INSTALL THE 12 GAUGE GREEN GROUND WIRE TO THE GROUND LUG IN THE CARDMASTER, AND THE OTHER END TO AN EARTH GROUND, AND TEST FOR LESS THAN 1 OHM OF RESISTANCE.

CONDUITS DO NOT REPRESENT AN ADEQUATE SAFETY GROUND.

GROUND ROD AT THE BREAKER PANEL IS THE MOST DESIRED WAY TO ADEQUATELY GROUND SYSTEM.

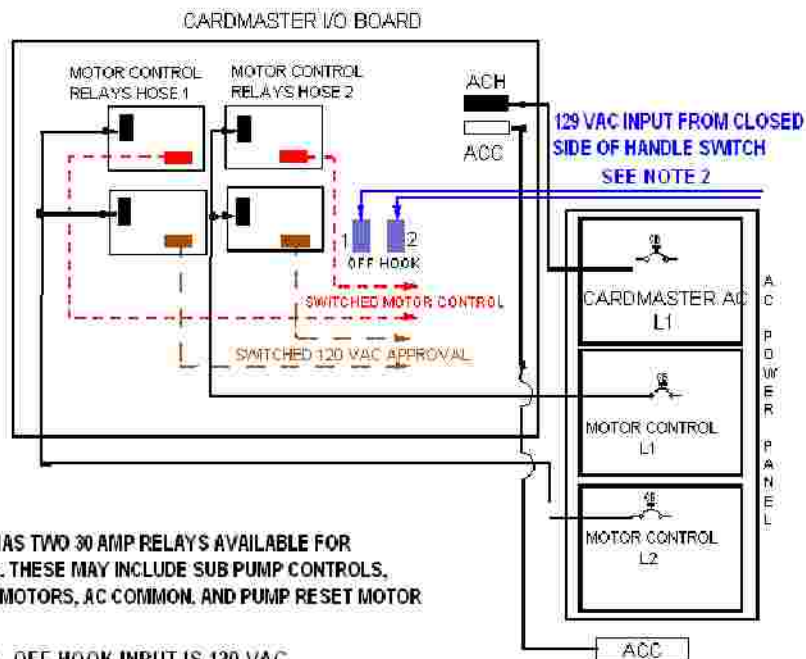
Dry sandy soil will provide a poor ground. Moist dirt is the best.

POLE GROUND IS NOT ADEQUATE.

CARDMASTER 120 VAC POWER SOURCE

1. The 120 vac power circuit used to power the CardMaster must be a dedicated isolated circuit.
2. Submerge Pump, Dispenser, Suction Pump and reset motor switched AC circuits must be separate from the 120 VAC CardMaster power circuit.
3. All AC circuits that interface with the CardMaster, (CardMaster AC Power, Switched Motor control, Relay Control, Switched Off Hook) must be same phase.

CARDMASTER AC CIRCUITS



NOTE 1:

EACH HOSE POSITION HAS TWO 30 AMP RELAYS AVAILABLE FOR SWITCHED AC CIRCUITS. THESE MAY INCLUDE SUB PUMP CONTROLS, 120V OR 220V SUCTION MOTORS, AC COMMON, AND PUMP RESET MOTOR

NOTE 2:

- A. OFF HOOK INPUT IS 120 VAC
- B. OFF HOOK INPUT MUST GO TO ZERO (0) VAC WHEN THE SALE IS COMPLETE.

NOTE 3:

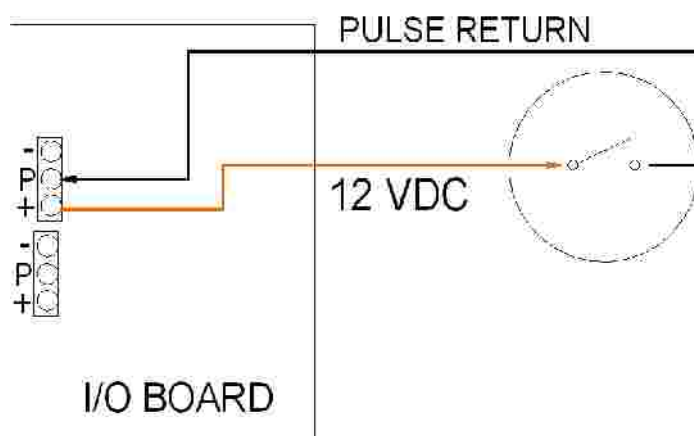
120 VAC FOR CARDMASTER POWER MUST BE SEPERATE CIRCUIT FROM 120 VAC MOTOR CONTROL

4. GROUND MUST BE EARTH GROUND.

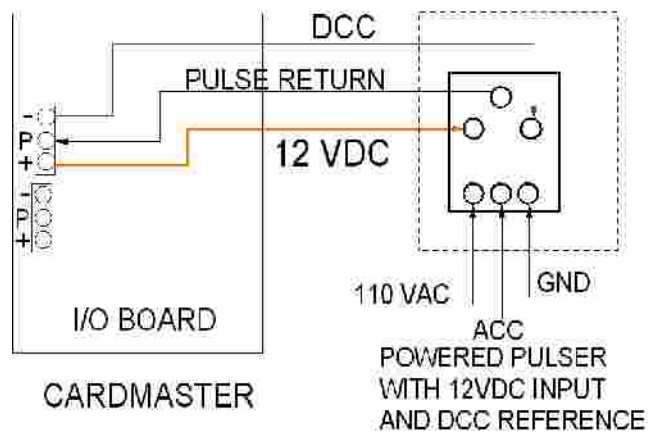
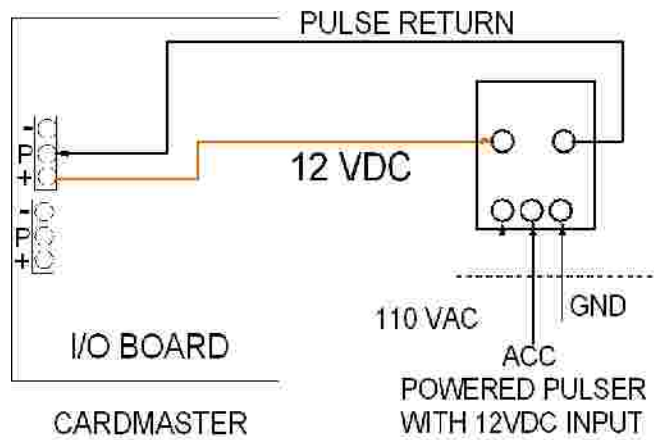
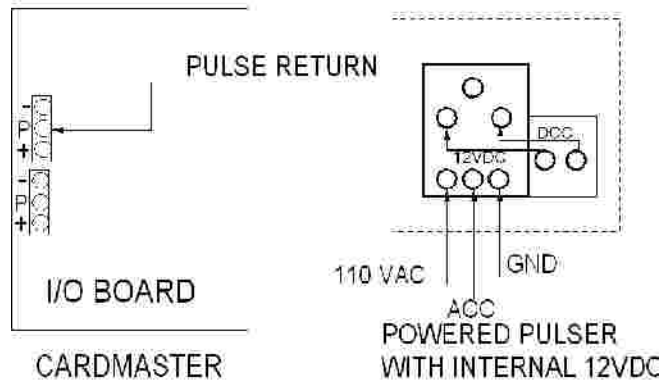
PULSER CIRCUIT

There are several types of pulsers used with dispensing equipment. The basic difference is mechanical pulsers versus electronic power pulsers. Electronic pulsers are further divided into two categories: 12vdc provided from outside source and 12vdc generated by the pulser. In pulsers where the 12vdc is provided by an outside source categories are further divided as to the need for a dc common point or not. The CardMaster unit can manage any of the above situations.

**THE DRAWINGS PROVIDED ARE GUIDELINES.
VERIFY PULSER WIRING REQUIREMENTS WITH
THE MANUFACTURER OF THE PULSER.**



MECHANICAL PULSER

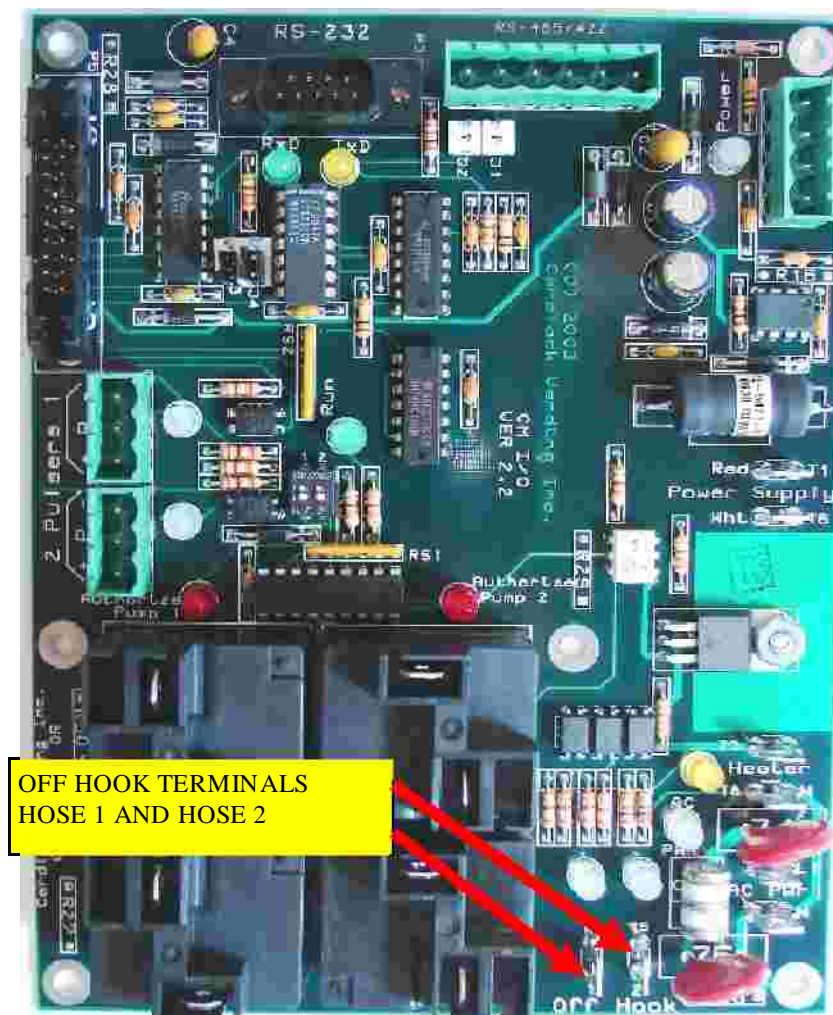


OFF HOOK

The Off Hook circuit is CardMaster's way of determining when a pump is ready to dispense fuel and start counting pulses. It is also how CardMaster determines when the transaction is complete.

The Circuit is a 110vac input to the I/O board and must be applied after the reset is complete or the handle switch is turned on. The voltage must go to 0 vac when the handle is turned off.

0 VOLTS AC IS 0 VOLTS. LEAKAGE VOLTAGE OF 1 VAC OR HIGHER WILL NOT ALLOW THE CARDMASTER TO SENSE A 'SALE COMPLETE' SIGNAL. SEE TYPICAL WIRING DIAGRAMS FOR FURTHER INFORMATION.

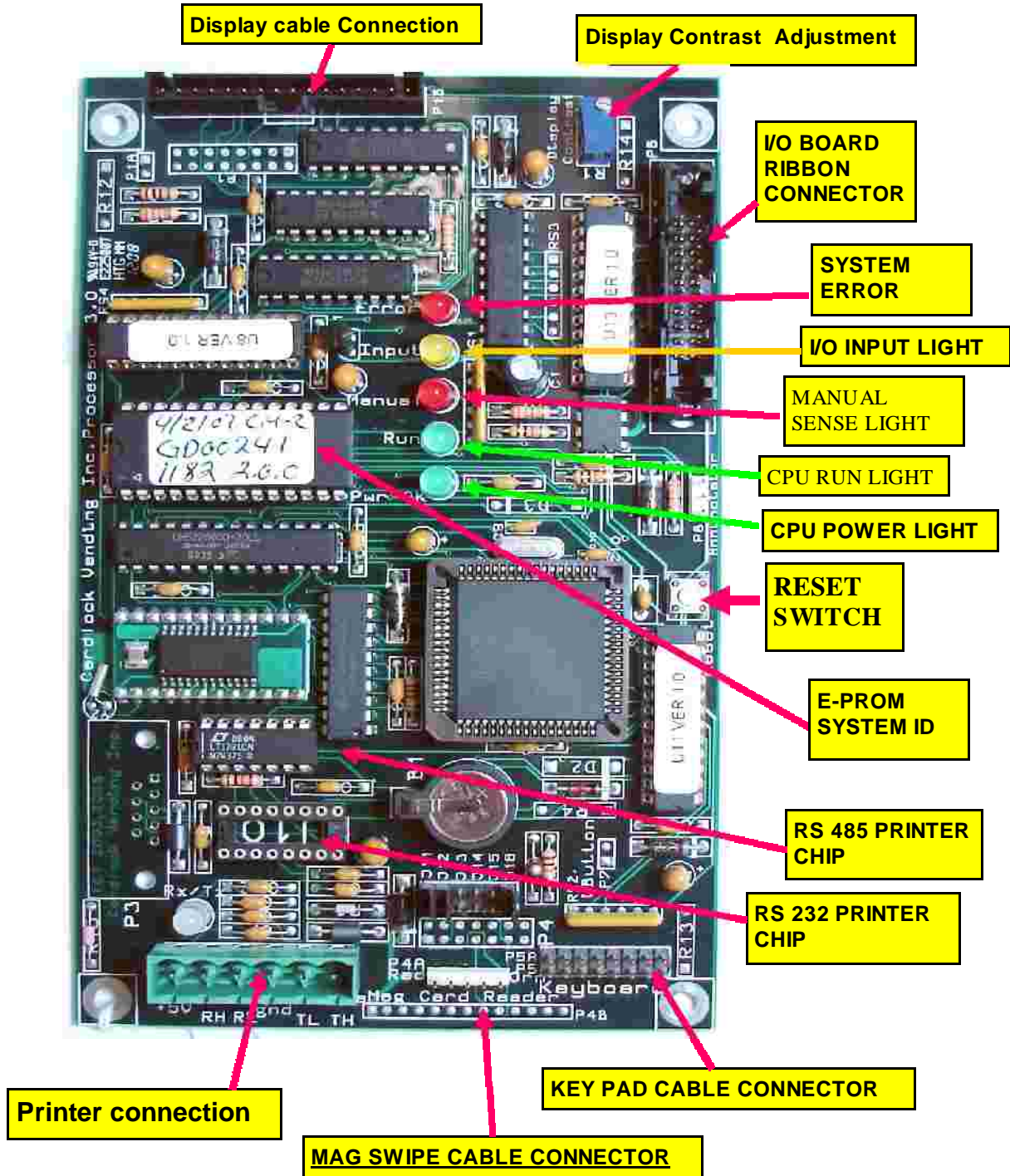


COMMUNICATION

WIRING

SECTION

CPU BOARD LAYOUT



Processor Board (CPU) TYPICAL

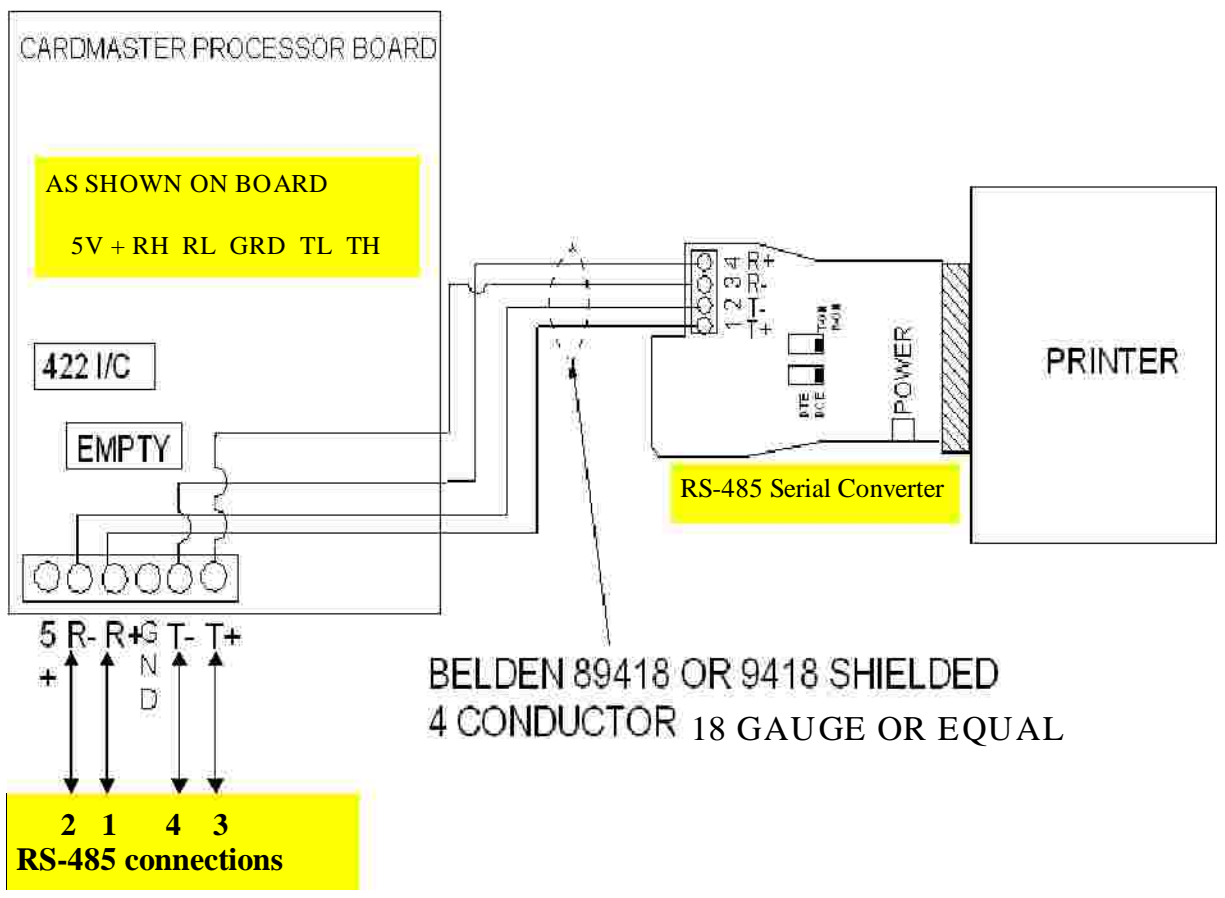
PRINTER COMMUNICATIONS

COM. PORT
RS 485/422
DRIVER CHIP

BLANK SOCKET

RS 485/422 6 PIN CONNECTOR LABELED:
+5V R+ R- GND T- T+

RS 422 TO PRINTER COMMUNICATION

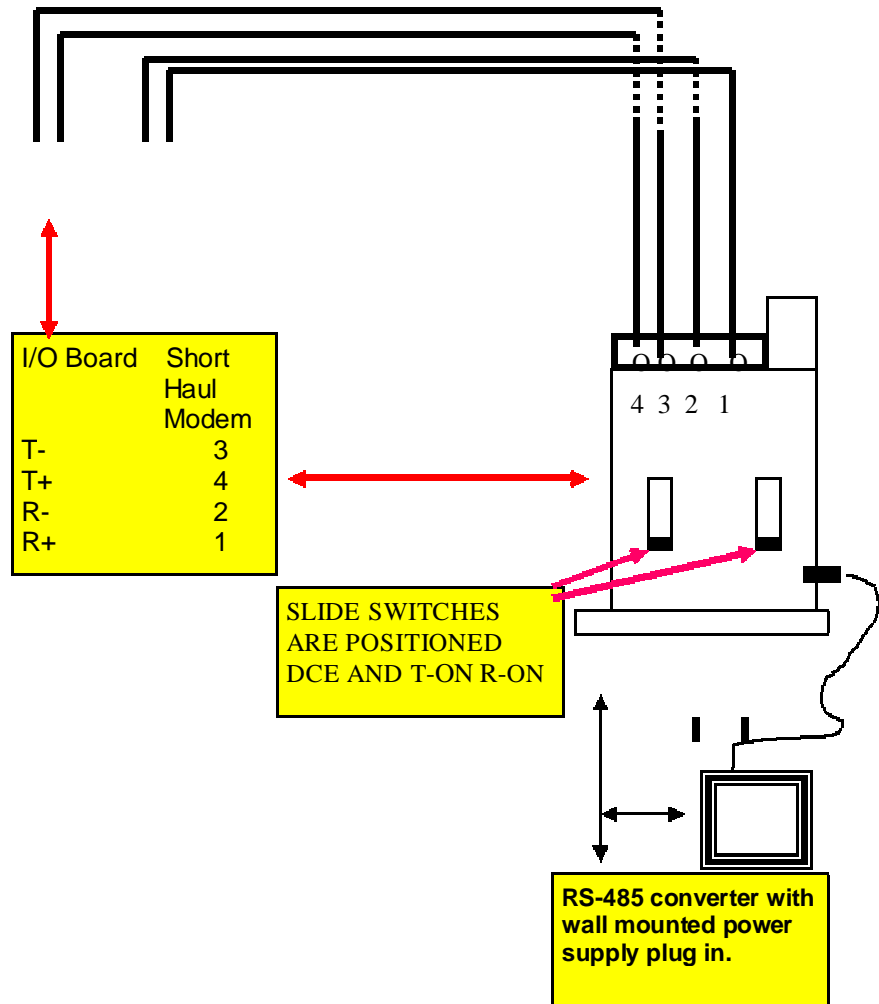


THE CABLE SHIELD SHOULD BE GROUNDED AT ONE END. THE COMPUTER END IS OPTIMUM, BUT MAY NOT BE PRACTICAL. THEREFORE, GROUND THE SHIELD WIRE AT THE CARDMASTER GROUND LUG.

IF THE PRINTER PRINTS ?????????? THEN THE T- AND T+ LINES ARE MOST LIKELY CROSSED.

RS-485 data port wiring information for direct to PC for systems shipped after January 1, 2003

DO NOT GROUND SHIELD WIRE TO TERMINAL



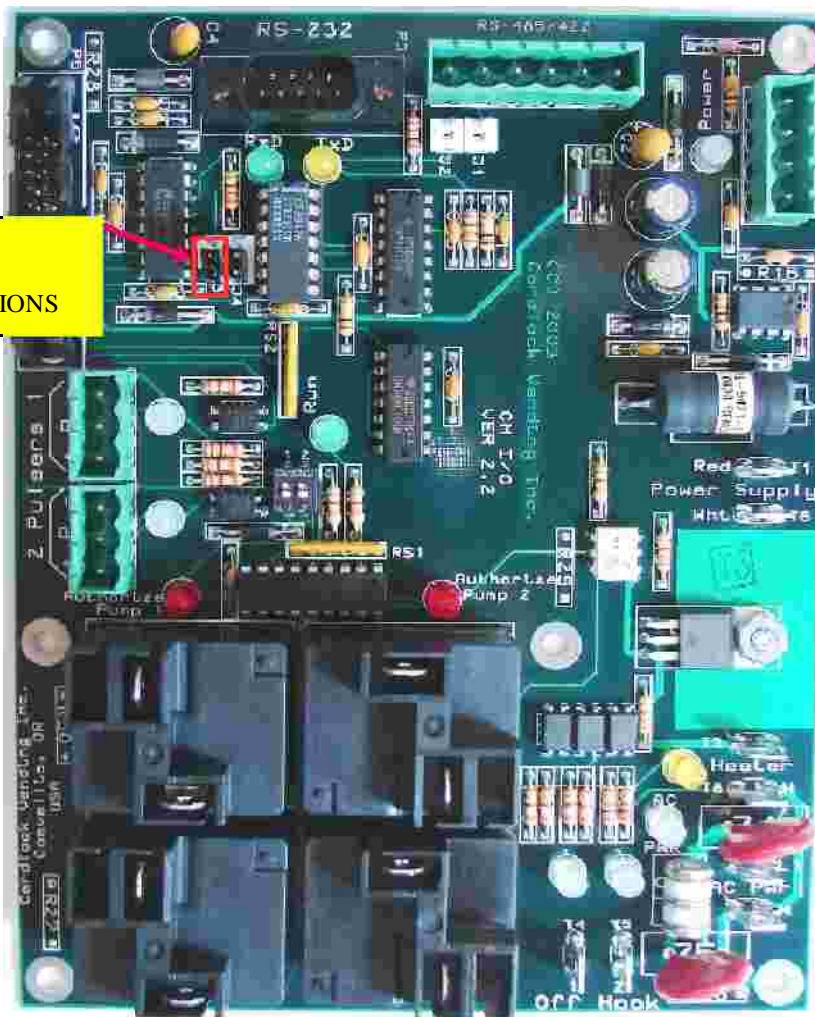
Serial cable specification is Belden 4 conductor #89418 or 9418. Do **NOT** use substitutes such as solid wire or telephone wire. It will void the warranty. For systems with Telco telephone modems please see next page.

232 COMMUNICATIONS TO PC

CERTAIN EARLIER VERSIONS OF CARDMASTER USED 232 COMMUNICATIONS TO TALK TO PC'S. ALTHOUGH 232 COMMUNICATION IS NOT SUPPORTED IN CARDMASTER VERSIONS AFTER MAY 1, 2004 IT IS STILL POSSIBLE TO UTILIZE 232 COMMUNICATION WHEN UPGRADING TO NEW STYLE I/O'S.

WHEN CHANGING AN I/O BOARD IN AN EARLIER VERSION TO A NEW BOARD, 232 COMMUNICATION MAY BE USED WITH THREE WIRE BELDEN CABLE UTILIZING THE 9 PIN PORT ON THE I/O BOARD. JUMPER J3 IS A TWO PIN JUMPER AND MUST HAVE ITS JUMPER SET IN PLACE.

J3 JUMPER
FOR 232 9 PIN
COMMUNICATIONS

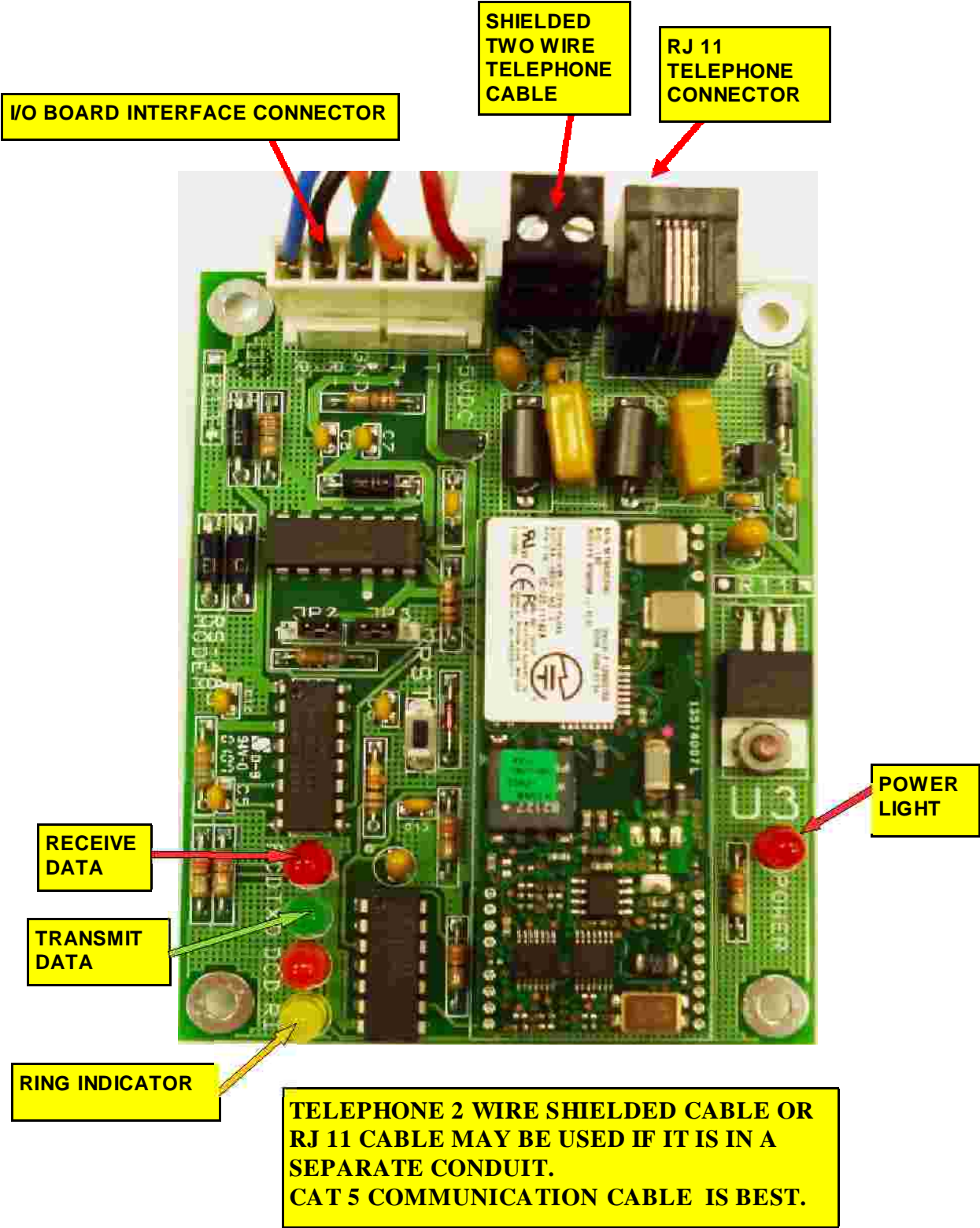


232 COMMUNICATIONS TO PC

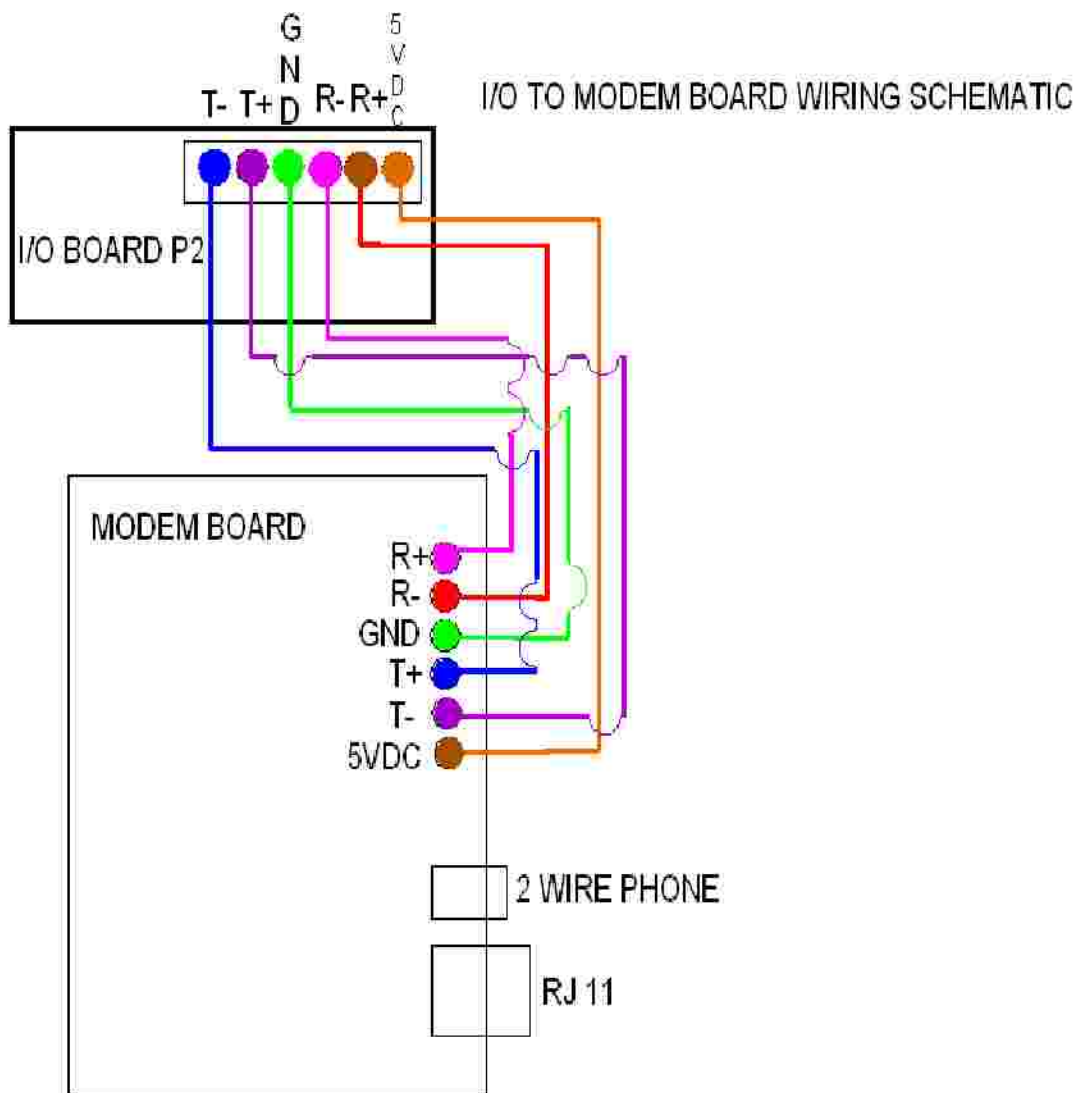
WHEN UPGRADING TO A NEW STYLE I/O BOARD IT IS RECOMMENDED THAT THE COMMUNICATION CABLE BE REPLACED TO A BELDEN 4 WIRE 89418 OR 9418. THEN INSTALL A SERIAL COMMUNICATIONS CONVERTER (CARDMASTER PART NUMBER CM-RS485) TO ALLOW COMMUNICATION VIA THE 422/485 CIRCUIT. THIS CIRCUIT IS BETTER EQUIPPED TO HANDLE NOISE AND VOLTAGE SPIKES THAN THE 232 CIRCUIT IS. HOWEVER, IF THE 232 CIRCUIT IS TO BE USED THEN THE FOLLOWING WIRING SCHEMATIC SHOWS HOW TO HOOK UP THE BOARD TO THE PC. GROUND THE SHIELD WIRE TO THE CARDMASTER GROUND LUG.

BELDON 8770 SHEIDED 3 CONDUCTOR 18 GAUGE CABLE OR EQUAL

MODEM BOARD LAYOUT



RS-485 data port wiring information for Internal Phone Modem for systems shipped after March 1, 2004



FIELD WIRING NOTES: Not all potential wires are shown due to congestion of space. Please read all comments and add applicable wires to your installation.

Pump Handle (OFF HOOK) - This wire input tells the CardMaster the dispenser is on (120 vac) and it initiates the recording of the transaction. When this input is not active because of no input or wire is missing no transaction will occur (voltage is zero input). Likewise, when this wire goes to zero vac it tells the CardMaster the pump handle has been hung up and the sale is terminated. If bleed through voltage exists it will not terminate the sale until a time out, and will not start a new sale properly.

Cardlock Vending includes two relays per hose/motor position. This allows you to wire for neutral switching where required by code, or desired by operator. The second relay also allows you to switch both legs of a 240 vac circuit if desired. We show only one pump handle off hook wire. One is required for each hose if there are two hoses.

RS-232 Serial Data Wires: Laptops or PDA's (Palm Pilots)
PrinterBelden 8770 shielded 3 conductor 18 gauge cable or equal

RS-485 Serial Data Wires:
PrinterBelden 89418 or 9418 shielded 4 conductor 18 gauge cable or equal

Note: RS-485 converters require a wall plug power supply at the indoor end.

NOTE: THE CABLE SHIELD SHOULD BE GROUNDED AT ONE END. THE COMPUTER END IS OPTIMUM, BUT MAY NOT BE PRACTICAL. THEREFORE, GROUND THE SHIELD WIRE AT THE CARDMASTER GROUND LUG.

CARDMASTER TYPICAL INSTALLATION DRAWINGS

**THESE DRAWINGS ARE OFFERED AS
GUIDELINES ONLY**

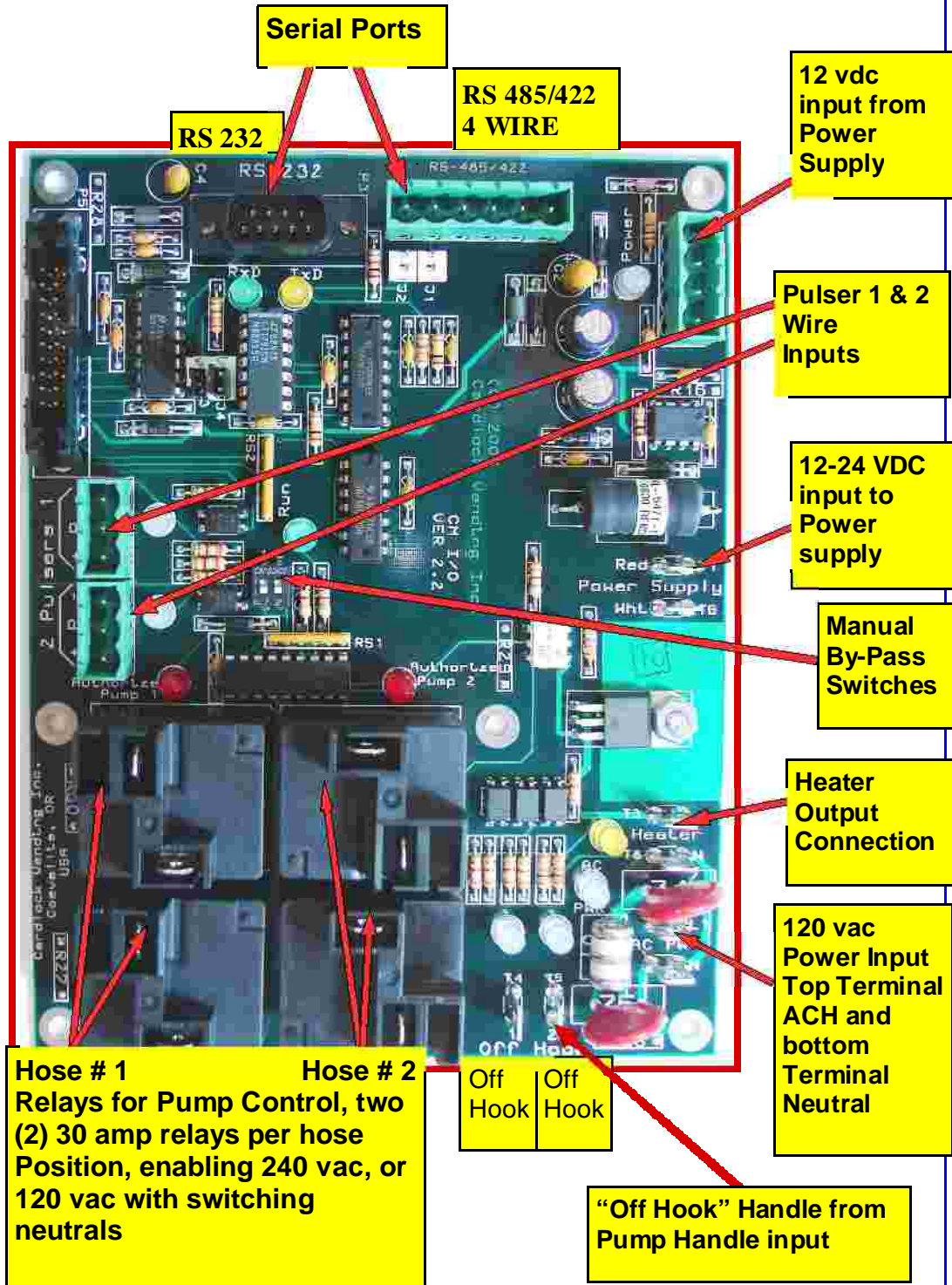
EACH INSTALLATION IS DIFFERENT

**THE INSTALLER MUST ADHERE TO
THE BASIC REQUIREMENTS
OUTLINED EARLIER IN THIS
MANUAL .**

12-24 VDC

SYSTEMS

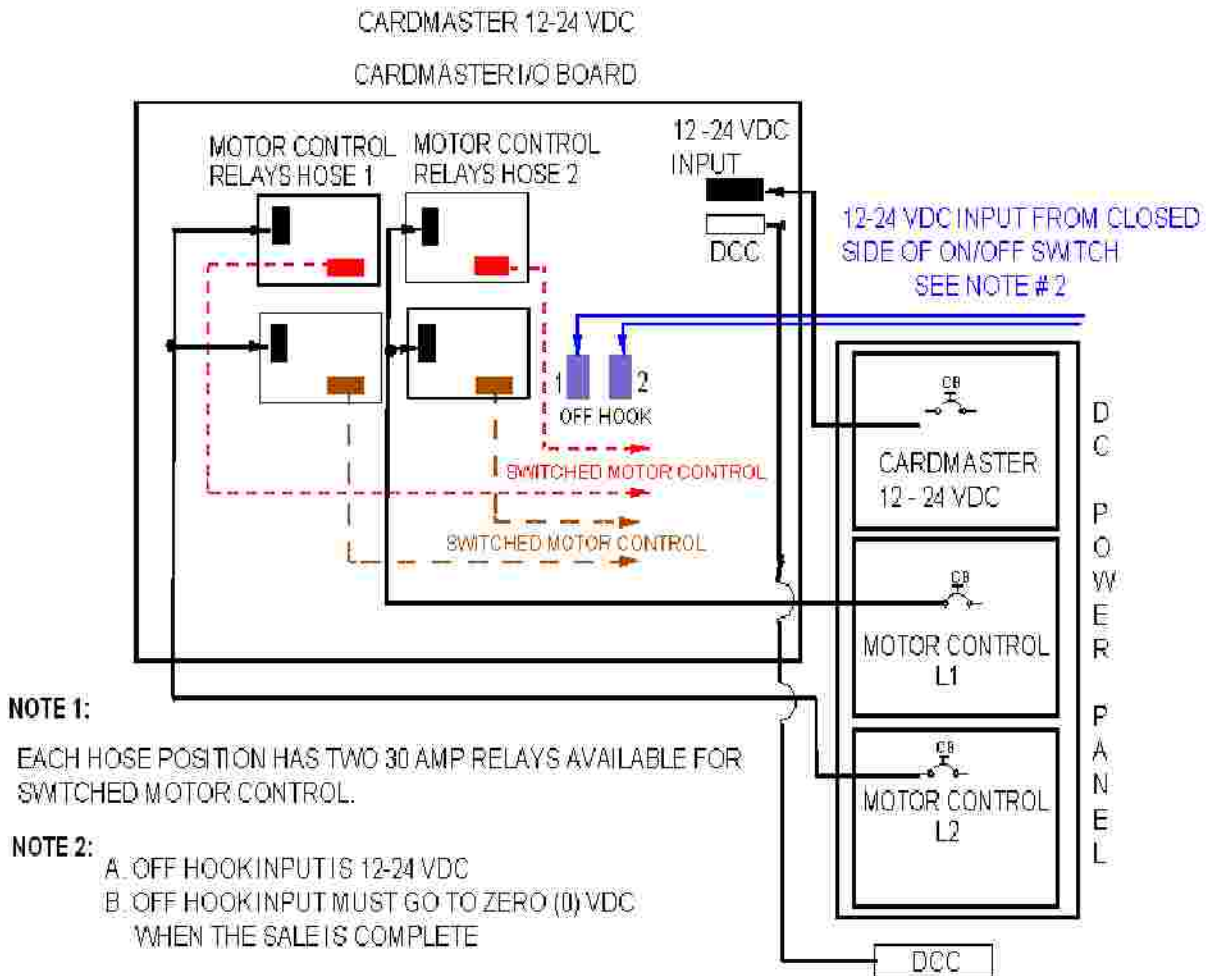
I/O Board Key Connections and features Locations



CARDMASTER 12-24 VDC POWER

The 12-24 VDC power circuit to power the CardMaster must be fuse or circuit breaker protected.

OFF HOOK MUST BE USED AND WIRED ON THE CLOSED SIDE OF THE ON/OFF SWITCH. OFF HOOK MUST GO TO (0) ZERO VOLTS WHEN THE SWITCH IS OPENED—test and verify, or your sales will not count properly.



GateControl WIRING Instructions

Follow all applicable local and national safety codes

Install CardMaster on a dedicated 10 amp circuit.

“AC” WIRING – 120/240 vac:

“AC” wire inputs use “spade” connectors.

Install according to all applicable codes with a steel conduit for the AC voltage, the DC pulser voltages and the Belden shielded RS-232 & RS-485 communications wires. Install the following wires, select depending on 120 vac or 240 vac, single or two gate operation.

L1	120 vac	Black Wire	12 Gauge	System Power
N	Neutral	White Wire	12 Gauge*	System Power
L2	120 vac	Red Wire	12 Gauge*	System Power
Gr	Ground	Green	12 Gauge	Safety Ground

(* select depending on 120 vac operation or 240 vac operation)

Earth Grounded with less than 1 ohm of resistance.

GCS	120 vac	Blue Wire	12 Gauge**	Gate Closure Signal
-----	---------	-----------	------------	---------------------

** Gate Closure can be electrical signal, or a programmed time out.

R1	120 vac	Black	12 Gauge	Motor relay
R1	120 vac	Red	12 Gauge	Motor relay#
R1	Neutral	White	12 Gauge	Motor Relay#

select depending on 120 or 240 vac operation, and number of motors)

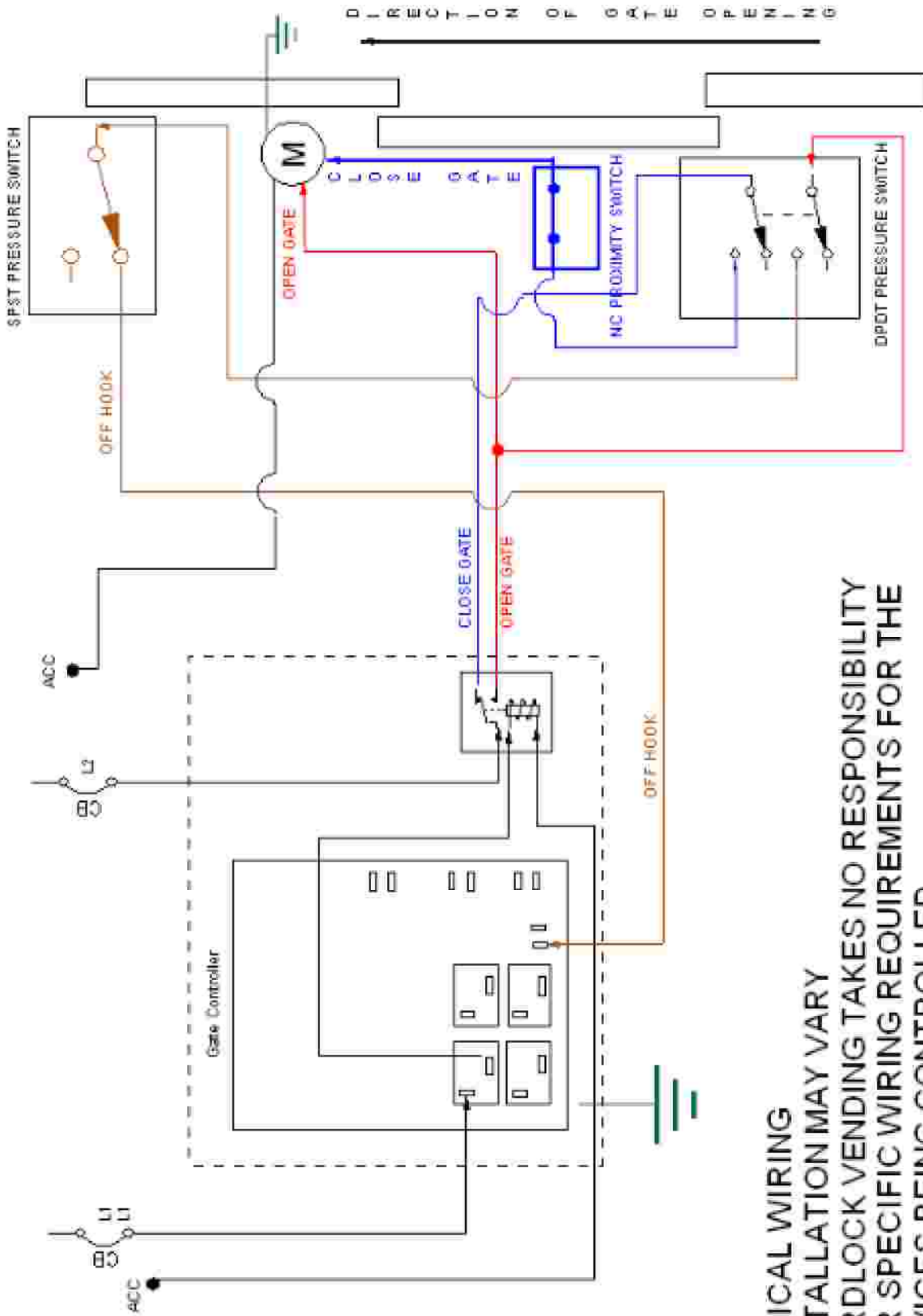
GROUNDING: INSTALL THE 12 GAUGE GREEN GROUND WIRE TO THE GROUND LUG IN THE CARDMASTER, AND THE OTHER END TO AN EARTH GROUND, AND TEST FOR LESS THAN 1 OHM OF RESISTANCE. THE CONDUITS DO NOT REPRESENT AN ADEQUATE SAFETY GROUND.

SERIAL DATA WIRES:

Printer Port – Belden or equal 4 conductor shielded cable

Data Serial Port – Belden or equal 4 conductor shielded cable

NOTE: THE CABLE SHIELD SHOULD BE GROUNDED AT ONE END. THE COMPUTER END IS OPTIMUM, BUT MAY NOT BE PRACTICAL. THEREFORE, GROUND THE SHIELD WIRE AT THE CARDMASTER GROUND LUG.



**TYPICAL WIRING
 INSTALLATION MAY VARY
 CARDLOCK VENDING TAKES NO RESPONSIBILITY
 FOR SPECIFIC WIRING REQUIREMENTS FOR THE
 DEVICES BEING CONTROLLED.**

CARDMASTER CONFIGUARTIONS

CardMaster RF is available for those sites that do not want to tear up concrete or asphalt to install communication wiring. RF CardMasters eliminate problems related to transient voltages such lightning strikes and static discharges.

The CardMaster may be used to control many different devices that need to have a card system control their on/off functions, and the CardMaster will allow accountability for those functions.

Gate Control is the most common usage after fuel control for the CardMaster. Gate control wiring is similar to the fuel wiring. However, it is best to determine wiring requirements from the Gate Manufacturer.

Contact CardLock Vending for assistance.

CardMaster may be used to control devices such as a Carwash. Separate typical wiring diagrams are available. However, please contact the Car Wash supplier for the proper wiring of a control device to their Car Wash System. Please contact CardLock Vending for further assistance with Car Wash Control.

Environments with much sand, dust, cement and other types of airborne contaminants can cause premature failure of magnetic cards and magnetic reader components. When looking to install in these types of environments please consider the Cardless option for the CardMaster.

[Sales and technical help are available at our toll free number 1-888-487-5040](tel:1-888-487-5040)



Thank you for using CardMaster from Cardlock Vending. Cardlock Vending also manufactures:

- GateControl –** for access to bathrooms, gates, RV dumps, garbage compactors, and other electro-mechanical devices.
- CRE-HL -** Card Reader Enclosure, 1/2 height version, similar to partial phone booth type



Please look at Cardlock Vending's web site for more product or sales information.

www.cardlockvending.com Cardlock Vending, Inc.