CHANGERVIEW

Remote Equipment Monitoring

revision 5

Suncoast Changer Service
2195 S Combee Rd, Lakeland, FL 33801
email: billchangers@msn.com
863-669-9699

WARRANTY and LIABILITIES

Suncoast Changer service / Suncoast Laundry Equipment Inc. ("Seller") warrants to Purchaser that all new CHANGERVIEW product, which includes circuit boards, display unit and housing box, shall be free from defects in material and factory workmanship for a period of one (1) year from the original shipping date. Seller further warrants if any part of said new equipment in Seller's sole opinion, requires replacement or repair due to a defect in material or factory workmanship during said period, Seller will repair or replace said new CHANGERVIEW product. Purchaser's remedies and the liabilities and obligations of Seller herein shall be limited to repair or replacement of the equipment as Seller may choose, and Seller's obligation to remedy such defects shall not exceed the Purchaser's original cost for the equipment. Purchaser EXPRESSLY AGREES this is the EXCLUSIVE REMEDY under this warranty. There are no other express or implied warranties that extend beyond the face hereof. All warranty repair service must be performed by Seller at Suncoast Changer Service, 2195 S. Combee Rd., Lakeland, Florida, 33801 phone 863-669-9699. Product must be returned to "Seller" at owner's prepaid expense.

Warranty does NOT cover extra, optional installation accessories, such as internet cables and mounting hardware. User modification, misuse, abuse, or vandalism is not covered and may be corrected at purchaser's expense. This warranty covers CHANGERVIEW's ability to function as described in the following user manual. Any use not intended in the user manual is not covered, and is done at users discretion and risk.

The design intent of CHANGERVIEW is to collect real time information from connected change machines, and other generic, connected items and display this information on its included display. This collected information may be shared remotely to user/owner via third party services.

CHANGERVIEW is an information collecting system. It IS NOT a SECURITY SYSTEM. It IS NOT an ALARM SYSTEM. Do not rely on CHANGERVIEW for any protection from life threatening, or property damaging activity.

The successful operation of CHANGERVIEW depends on numerous third party vendors; such as RealVNC, internet service providers, internet routers. These third party services are outside the control of Seller. Seller may be able to help with these outside services; but is not responsible, or liable, for them. Seller makes no express warranties with respect to, and disclaims any implied warranties applicable to, any third party product(s), or services, incorporated into CHANGERVIEW including warranties against infringement, warranties of merchantability and warranties of fitness for a particular purpose. However, the manufacturer of third party product(s) may have a warranty which is applicable to the owner of the product.

No other promise or affirmation of fact concerning the product and no other description, sample or model of the product shall be construed as augmenting or supplementing this limited warranty.

Installation and use of the CHANGERVIEW product constitutes acceptance, and agreement to these terms.

Summary of CHANGERVIEW

Get ready to meet a great new product that will help you:
Waste less time, run your business more efficiently, increase your profits, and feel more comfortable with your operation.
Welcome to CHANGERVIEW !

CHANGERVIEW is a system for you to monitor equipment at your business(s). It allows you to be more efficient and get better results. Keep informed of critical situations by email, and spend your time dealing with other important business issues. It is built specifically to monitor the status of up to 4 coin/bill change machines, and allow you to keep informed of their conditions. CHANGERVIEW can send out emails to your choice of e-mail addresses for machine critical conditions such as “out of order” or "low on coins".

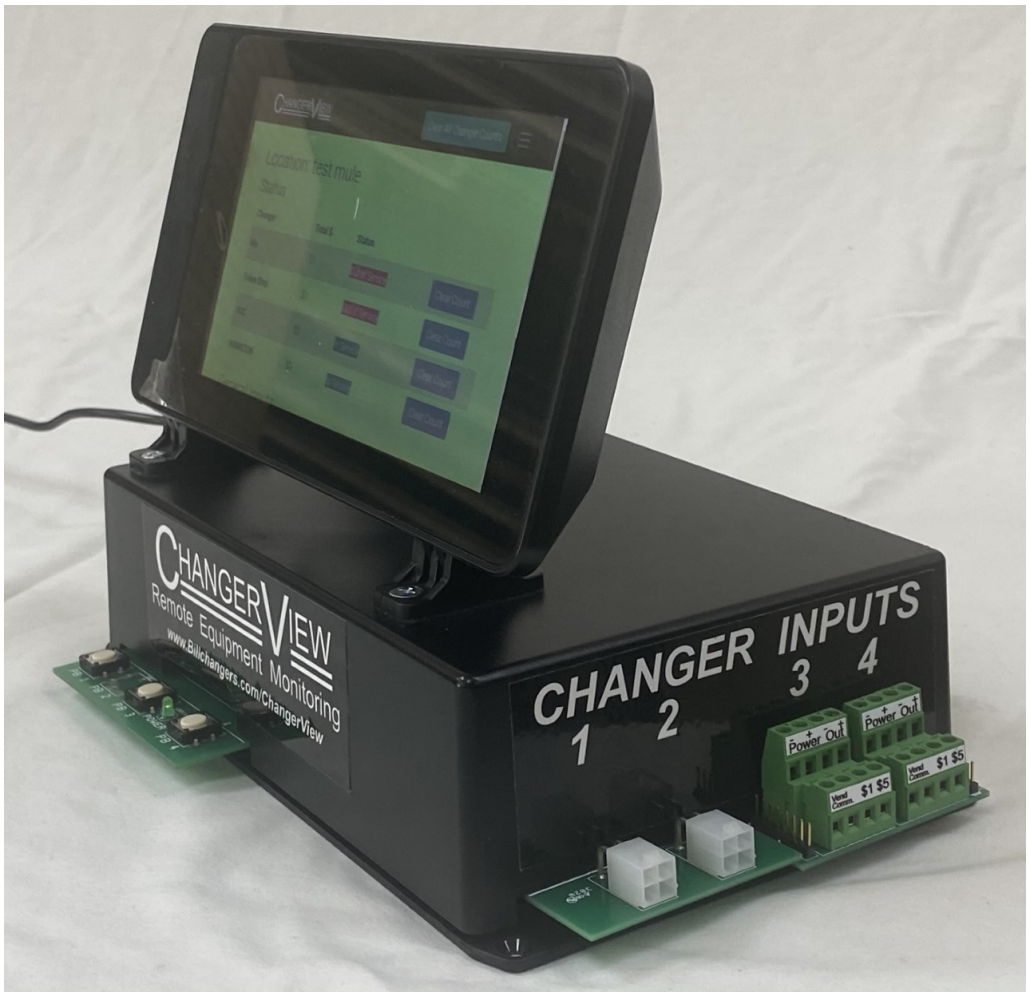
With an optional paid service, you may also log-in to the CHANGERVIEW unit over the internet from your own smart phone or PC/Mac which you have set up on your team. You will see the CHANGERVIEW screen remotely, and even be able to control it's buttons ! Giving refunds through some change machines may also be possible.

CHANGERVIEW also has 6 generic input circuits which can be used in a variety of ways such as: monitoring an office door opening, no hot water, loss of building power, monitor level of liquid in a tank, or maybe pressure in a supply line, counting coins in a carwash bay box. These uses are subject to your creativity, and may require extra hardware NOT INCLUDED with CHANGERVIEW. Some suggestions for circuits are provided later in the Generic Input Circuits section.

CHANGERVIEW also has 2 generic relay output circuits for you to get creative with. Power capability of the relays is 2 amps, and you can use them either as normally open, or normally closed circuits. You may turn the relays ON, or OFF remotely, or from the unit itself. You may also PULSE ON the relays for predetermined timed pulses. One use for this may be to give refunds from a change machine. (Not available with all machines.) You could also power ON or OFF other items at your site; such as lights or siren. Other hardware not supplied may be needed.

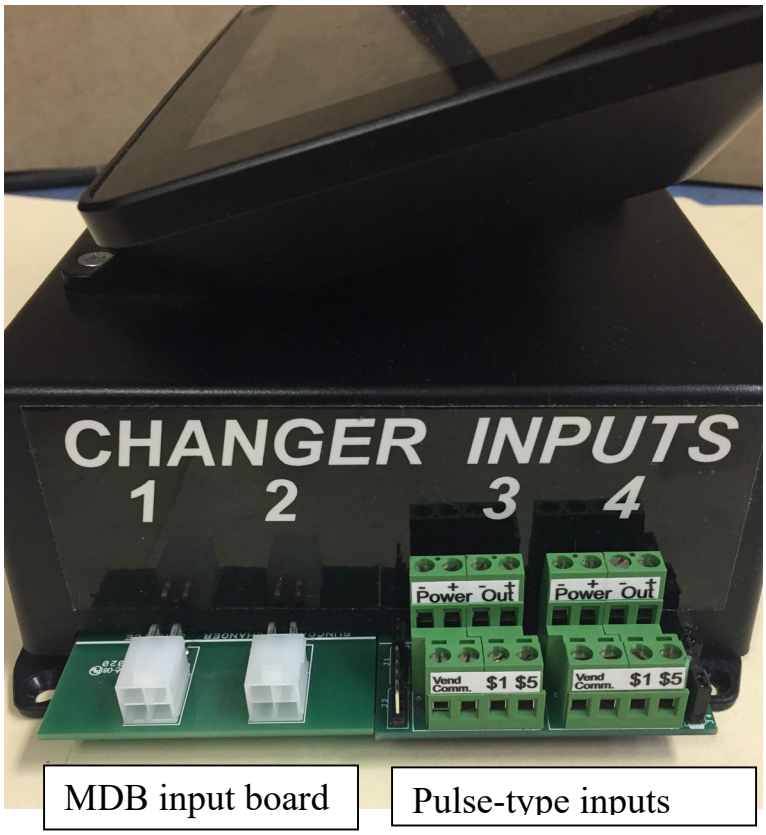
OEM monitoring equipment available for their late-model only machines may give more detailed change machine statistics, but for one machine only; and no other outside equipment is dealt with. Our purpose is to give a broader, overall, more practical picture of what is going on for multiple pieces of equipment at your site.

Sit back and get ready to learn about all the exciting things CHANGERVIEW can do for you!



Overall view of the CHANGERVIEW unit showing: display screen at top, the front side and change machine connections.

Fig 1



Close-up of the CHANGERVIEW unit change machine connections. In this photo #1,2 are connections for MDB-type machines. #3,4 are connections for pulse-type machines. These connections can be: 2 MDB and 2 pulse (as shown), 4 MDB, or 4 pulse. You determine the setup when you order your system.

Fig 2

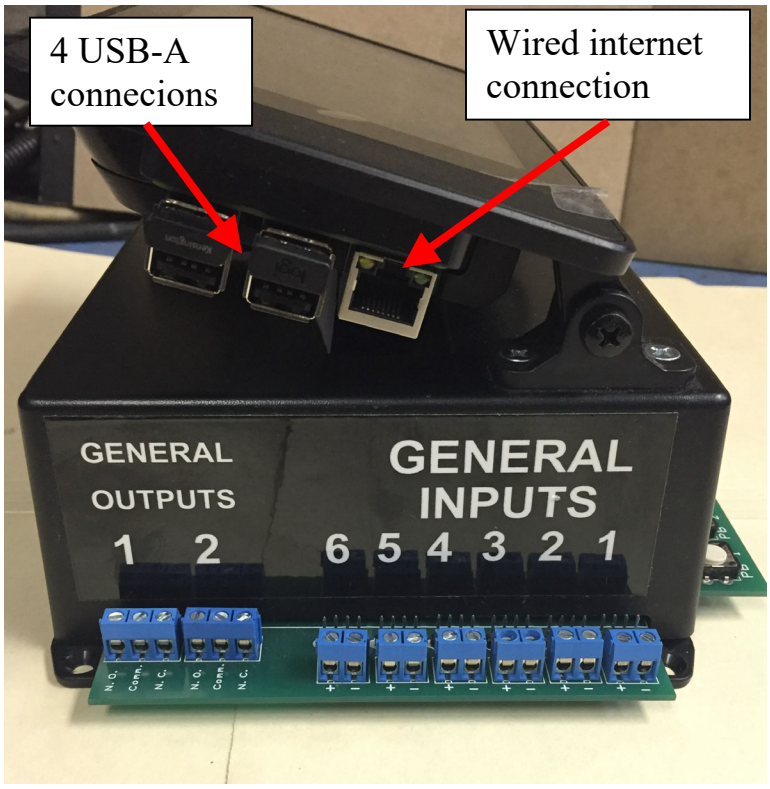


Fig. 3
CHANGERVIEW unit- showing connections for 6 general inputs, and 2 general outputs. On the end of the display screen are 4 USB connections, and a connector for wired internet connect to your router. WiFi is also built in.

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What you will need

The location chosen to mount CHANGERVIEW should be close to the change machines being monitored when possible, in a place that is convenient for good human interfacing. A 110vac building outlet should be available close by. The CHANGERVIEW power cord is about 4ft. in length. CHANGERVIEW will also need to connect to the internet through an internet router, either hard-wired or wireless.

Wall anchors for your type of wall. We suggest plastic expanding anchors.

Typical drill, bits, screwdrivers, wire strippers, channel-lock pliers. Typical hole sizes needed in changer cabinets: 1 pulse-type cable = 5/16”+, 2 pulse-type cables = 1/2"+, 1 MDB cable = 5/8"+, 2 MDB cables = 7/8”+.

A USB mouse/trackball and USB keyboard will be needed for initial CHANGERVIEW setup. Once the unit is fully configured; it can be managed remotely, and/or by continued use of mouse and keyboard.

Possible use of a PC to log in to your local router during setup.

Hook-up wire for making connections to changes machines and other monitored items.

We supply 10ft. of 8-wire, 22 gage cable for each “pulse type" changer being monitored. Extra cable can be ordered separately, or you can make due with what's available at local building supply stores.

For "MDB type" changers; we provide an 8ft. special hook-up harness for each machine. 4ft. extensions for this can be ordered as extra pieces.

The alternate “type 2 MDB" setup will use the 8-conductor cable.

See page 8 for list of optional/extra parts available. Other unknown hardware for monitoring other equipment you choose may be needed depending on your project.

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Site installation planning sheet

Taking the time to plan out your CHANGERVIEW installation will save you a lot of wasted time and expense later.

Site Name- to be entered into CHANGERVIEW. Will show up on CHANGERVIEW screens and used in subject line for emails. Make this name clear to you and your assistants, but don't identify site to outsiders.
_____(enter at WORKSHEET line #1, page 13) If you have more than 1 CHANGERVIEW unit at the same site; they must have different names.

Internet router connection:
For wired internet connection: length of cat5 cable needed _____
(We can supply common pre-made cat 5e cable, or you can source your own. See accessory page 8.)
For wifi connection to router: name of router and wi-fi password (enter at WORKSHEET Line #2.
_____

Changer input circuit boards needed- (1 included in CHANGERVIEW basic system)
A second changer connection board can be ordered as an option.
Each CHANGERVIEW unit is built to accept 2 changer input connection circuit boards. Each connection board can accept 2 of the same type change machines. There are two types of input connection bds: "pulse type" and "MDB type", see Fig 2. So, depending on your mix of machines; you can connect a maximum of 4 change machines to 1 CHANGERVIEW controller.

MY MACHINES and quantities: (a "double" machine, (two bill acceptors), counts as 2 machines)

Machine	pulse type		MDB type
Rowe century	___		
Rowe BC- 100, 200, 1200,1400, 3500	___		
Rowe BC w/factory MEI kit	___		
Rowe BC w/Genesis kit	___		
Rowe/Triad 400			___
Hamilton, all changers	___		
Standard SC	___		
Standard MC			___
Standard EC	___		
Standard EC+	___	or	___
(This is not your choice, it is based on the existing machine.)			
American- very old mechanical counter logic bd.	___		
American- "red number" logic bd	___		

American- “green lcd display bd" ___
GENESIS kits for Rowe or Standard ___
GENESIS 3 control board for American ___

Total your “pulse type” and “MDB type” you have. Each pulse input board can accommodate 2- pulse type machines. Each MDB input board can handle 2-MDB machines. The CHANGERVIEW system can accept 1 or 2 input boards.
How many “pulse type” input boards? _____
How many “MDB type" input boards? _____

Additional pulse-type change machines may be connected through the “generic inputs” provided- but they will not provide all features that the change machine inputs do.

IF you have a large number of change machines at one site; you may need multiple CHANGERVIEW units to accommodate all the equipment you wish to monitor.

A “pulse type 1” input board includes: 2 x 10ft. of 8 conductor cable, 15 tap-on wire connectors, and 8 cable straps to attach cable to wall.
An "MDB input type 1" board includes: 2 x 8ft. of MDB connecting harness, and 6 Cable straps to attach cable to wall.
“pulse type 2” input hardware includes: 2 remote pulse units and 2 x 10ft. of 8-conductor cable, 15 tap-on wire connectors, and 8 cable straps to attach cable to wall.
An “MDB input type 2” board includes: 2 x 10ft of 8-conductor cable, 6 tap-on connectors and 6 cable straps to attach cable to wall.

HARDWARE- (see separate sheet for pricing)
CHANGERVIEW controller with 1 input board (2 changers)

Additional MDB input connection board kit
Additional Pulse-type input connection board kit

OPTIONAL INSTALLATION PIECES-

4ft. extension harness for MDB connections
additional 8-conductor wire (pulse-type cable), per 10ft.
10 tap-on wire connectors
10’ cat5e internet cable
25’ cat5e internet cable
50’ cat5e internet cable

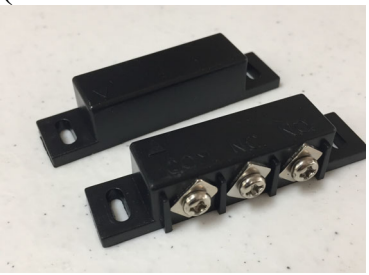
OPTIONAL ACCESSORY PIECES-

Coin refund harness for Standard 600/500E acceptor
and EC(+) series machines (for refunds)

Coin counting harness for Standard MC machines
(for monitoring individual hopper counts in multi-hopper machines)

Refund harness for American Universal board

Magnetic door switch contacts
(Contacts closed when door is closed)



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Pre- Installation of "VNC"

You can use a third party service called "realVNC" to allow you to communicate remotely with the CHANGERVIEW system over the internet from your own smart phone or PC/MAC. RealVNC maintains the cloud servers that that this product works through. Most of their services are through paid subscription for use. You will want to establish a "professional account" with realVNC. This will cost about $3.39 / CHANGERVIEW unit/ month. This will allow you to see your units at all your locations tying into the same VNC account dashboard. It is best to set up this account before you get to the physical CHANGERVIEW installation, so that it's ready to go when you are. You can start with a free trial to see if you want to continue using the remote features. See Appendix A for details on getting started with RealVNC.

WORKSHEET for Names and Passwords

1) Location Name- Default is "user" when you receive unit. Change to something that makes clear sense to you; yet does not identify the location to a stranger. This will show up on CHANGERVIEW screens, and subject line of emails. Keep in mind that you may be setting up multiple units.

_____

Physical location- for your reference only _____

2) Wireless router information, if needed)-

router name: _____

router wireless password: _____

3) VNC account- optional

email address used to establish your VNC account: _____

password for VNC account: _____

4) Pi configuration-

Default name: pi (fixed) Default password: Changerview123

New Device Password: _____

Hostname: _____ (use location name)

5) VNC device settings- optional

hostname: use same name as location (1).

6) Email setups-

sending email account **:** _____

sending email account password: _____

receiving email #1: _____ required

receiving email #2; _____ optional

receiving email #3: _____ optional

All email recipients will receive the same emails.

Installing CHANGERVIEW and Internet configurations

Chose the location to mount your CHANGERVIEW unit. It is intended to mount horizontally on the wall near the change machines it is monitoring, with the hinges of the display to the bottom. You will need to be able to conveniently use unit's pushbuttons and touch screen. The CHANGERVIEW unit has 4 mounting holes at its corners. Using anchors of your choice, secure CHANGERVIEW to the wall at the location you have chosen.

Fig 4 CHANGERVIEW unit on site - connected to 2 Standard SC 34RL-DA machines, total 4 bill acceptors.

Once mounted, the first things we will take care of are internet connections and remote communications setups. Once we have the communications setup; we will then turn to wiring the connections to change machines and whatever else you are monitoring. At this point you need a USB keypad and mouse plugged into the USB ports on the left side of the CHANGERVIEW touch screen display.

Now you can power up the CHANGERVIEW by plugging into a nearby building 110vac outlet. The unit will “boot up” and stop at a green screen- System Status.
The CHANGERVIEW unit looks for plugged-in external hardware (USB, and router) at power-up only; so if you later plug in new devices, you must reboot CHANGERVIEW for them to be acknowledged. There are 2 ways to reboot the system.

1) from CHANGERVIEW Inputs Configuration page- click the button labeled “reboot system".
2) Remove power from system. VERY LEAST FAVORITE.

Configuring the Pi system-

From the green CHANGERVIEW status screen menu icon, click the CONFIG button to get to the red Input Configuration screen. From the reddish CHANGERVIEW Inputs Configuration page menu icon, click the “Configure Pi System” button. This will lead to a system page labeled “Raspberry Pi Configuration”.

In the SYSTEM tab- (Copy these entries into item #4 of WORKSHEET on page 13.)

Existing user name is: pi, and password is: Changerview123 (these do not show up)

Enter new Hostname. I suggest you use your "location name". This name is how unit will appear in VNC, if you use it. (This is different from the hardware "user name" which is fixed at "pi".)

Enter new password. Think about the same password for all your units.

Leave checked the box for: "login as user pi". "Pi" must remain the user name. DON'T TOUCH ANYTHING ELSE IN THIS TAB.

DO NOT go into the Interfaces, or Performance tabs.

In the DISPLAY tab-

In the Display tab is an option box to have your screens ON always, or to go to dark after periods of no activity. If you choose to "sleep" during inactivity; touching screen or movement from mouse, or remote monitoring will re-activate screen. Make your choice here, it can be changed later. This is the bottom line marked as "screen blanking". Don't touch anything else here.

In the LOCALIZATION tab-

Check 4 settings for language and time zone. Click OK when finished.

Exit "Pi configuration".

Internet Connection

Wired connection-

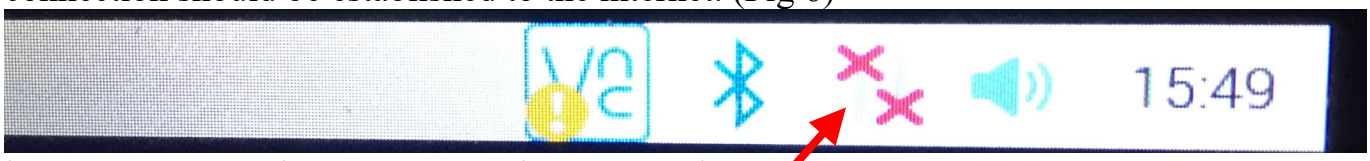
If you are going to connect to your router with a cat5 cable, install it now to CHANGERVIEW (left side of screen, next to USB ports) and your router. You will need enough cat5 cable to go from the CHANGERVIEW unit to your internet router. Once the cable is connected to CHANGERVIEW and router; you need to reboot the system with the "reboot system" button on the Inputs Configuration page, or by removing power. This router connection should establish itself automatically after rebooting. Please anchor your cable securely to the wall in a neat and out of the way fashion.

Wireless connection-

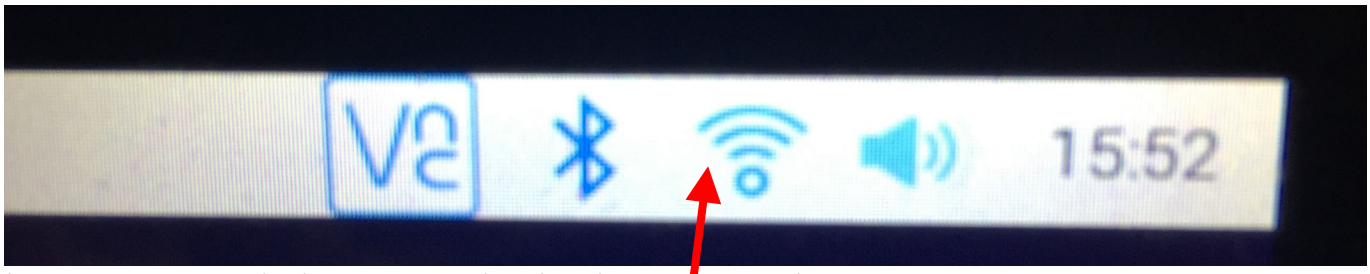
If you plan on a wireless internet connection for CHANGERVIEW; you will need the router wi-fi password to be able to establish connections with your router. Depending on location and distance and interference; this wi-fi connection may not be possible. If you don't know the router wireless access information; you will need to log into the router from a PC already connected to the router. This may require the temporary installation of a PC to log into the router.

Most routers can be accessed by typing “routerlogin.net” into the browser bar of the PC, or check the label of the router. You will need the user name and password for your router. Then maneuver to the wireless connection information of the router control panel to get the wi-fi password shown for the router. Exit when done. WE CAN NOT HELP WITH ROUTER ISSUES BEYOND THIS. YOU MAY NEED LOCAL ASSISTANCE.

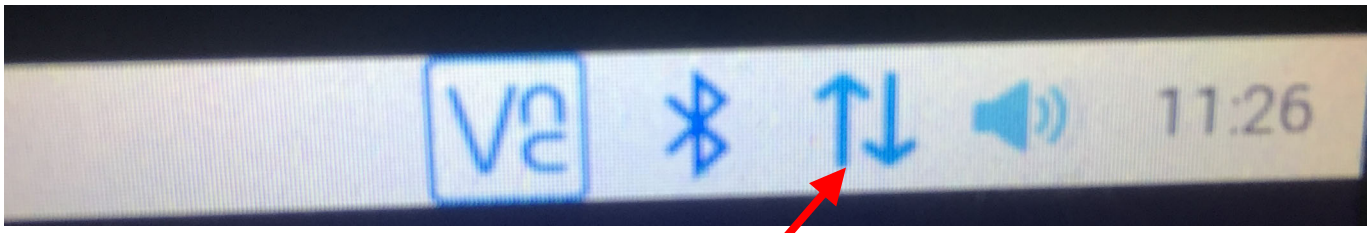
Once you know the router access information, enter it on the WORKSHEET (page 13- item #2). Later you will enter it into CHANGERVIEW. From the green “system status’ page menu icon, click the “configuration” button. This will take you to the pale red “Inputs configuration” page. Next click the menu icon, then “Exit to Desktop” button. Towards the right end of the top menu bar, to the left of the speaker symbol, left-click the internet logo/shortcut to turn on the units Wi-Fi. Wait for the list of found routers to show up. Find your router that you want to connect to in the menu list. Left-click on your router choice, and enter your router wireless password into the box labeled “Pre Shared Key” (worksheet #2). Click OK to finish, and within a few seconds your wireless connection should be established to the internet. (Fig 6)



internet menu- no internet connection Fig 5



internet menu- wireless connection in place Fig 6



Internet menu- Wired internet connection in place Fig 7

<u>Testing internet connection</u>-

To test your internet connection; left-click the 'world' icon (internet) near the left end of the desktop top menu bar. This should open a generic browser window. In the browser bar; enter some website you are familiar with to verify it shows up OK. Close the browser when you are done. Exit the desktop by clicking on the CHANGERVIEW icon on the desktop page.

Email setup

You may want to create a new account for CHANGERVIEW use, or use an existing email account. The “pros” of using an existing account are that; you’ve already got it, and it’s one less new thing to remember. The “cons” of using your existing account is that the “sent mail box" will be swamped with CHANGERVIEW messages, and your password will be visible on the screen.

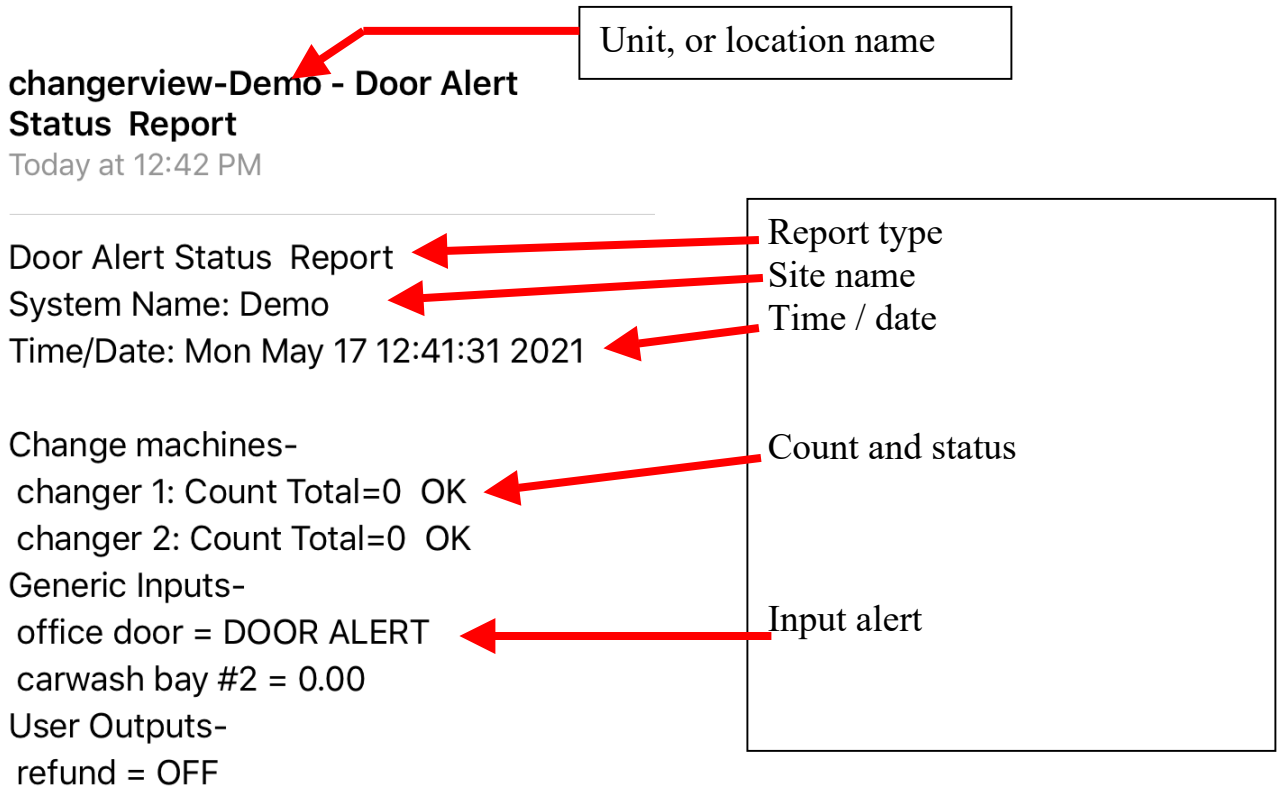
Some email services (such as "gmail") may require you (as email account administrator) to acknowledge and approve any new hardware that tries to send an email out the first time. See Appendix B for more help on setting up a new email account.

Go to the CHANGERVIEW Input Configuration page to enter information the system will use to send email messages out from the CHANGERVIEW unit to you as the remote receiver. In the "Sending email account” box, enter the email address of an active account, which will be used to send out alert emails. Also enter the password for logging into that email account. We suggest you use a “gmail” account.

You also need to fill in the “sending email host" box. This is the SMTP server address for your email account. For help with this: see Appendix B. Also enter up to three email addresses to send status messages to. Start with number 1. Leave unused addresses blank.

Now you should have the CHANGERVIEW unit emailing alerts to your outside team” ! From the green “status page" you can use the "email status report" button to generate a test email.

Here are a couple of email examples-



changerview-Demo - Out of Service Status Report
Today at 12:24 PM

Out of Service Status Report
System Name: Demo
Time/Date: Mon May 17 12:23:44 2021

Change machines-
changer 1: Count Total=21 Out of Service
changer 2: Count Total=0 OK
Generic Inputs-
office door = DOOR CLOSE
carwash bay #2 = 2.00
User Outputs-
refund = OFF

TROUBLESHOOTING receiving emails

If you are not receiving email notices to the addresses you entered into the configuration page: here are some things to check.

Login to the 'sending' account and see if the messages in question show up as "sent messages". If they are there, CHANGERVIEW has successfully sent the emails out to the outside world and the trouble is with the receiving account. If not there, an internet connection, or SMTP server address issue may be the issue.

Login to the receiving email account(s). Find the section for account settings (usually in the upper/right corner area). Look for setting relating to "junk mail". Make sure you are not blocking "gmail.com" addresses, or the sending address in particular. If there is a section for "safe addresses" or "safe lists"; add your sending email addresses to both of these. Look for a section for forwarding emails. Make sure "IMAP" is enabled. Make sure you save any changes. This should take care of known issues.

Many email services will block a new automated sender. You may have to login to your account and confirm that the new device (CHANGERVIEW) is OK.

EMAIL REPORTS SETUP-

There are three types of email reports available- STATUS REPORT, AUDIT REPORT, and ALERT reports. The STATUS and AUDIT reports can be scheduled to generate up to 8 times daily, or can be generated on-demand via: the buttons on the operating screen, push buttons on the circuit board, or remotely (if using RealVNC). PB1 on the control box circuit board will generate a STATUS report, and PB3 will generate an AUDIT report. You can setup these scheduled daily email reports by checking the appropriate boxes on the CHANGERVIEW INPUTS

CONFIGURATION page. Be sure to save changes. Preset times for reports are: 3am, 6am, 9am, 12noon, 3pm, 6pm, 9pm, 12 midnight. Simply choose the boxes, and SAVE CHANGES. You may find this useful if you want to run a study of when most of your business is generated.

STATUS REPORT

These reports are simple 'snapshots' of the condition of all your connections at the time the report is generated and emailed. These reports include location name, date, and time. This will be what is showing on the operating screen. Generating this report does not change any settings or data.

AUDIT REPORT

These are special reports that can be thought of as a 'receipt' or 'collection report'. These include location name, date, and time. The AUDIT REPORTS are numbered sequentially, and can not be altered. These reports are intended to act as a cross-check, or report, for a site change machine collection. These reports use a second set of counting memories different from what shows on the operating screen. An AUDIT REPORT shows how the change machine counts have changed SINCE THE LAST AUDIT REPORT. Also, if any General Inputs are used for counting; the change in count for these are also reported since the last AUDIT REPORT was generated. Any other General inputs are simply shown as their current status.

Typically this report would be generated when you do a site collection. After the AUDIT REPORT is generated; its counters are reset back to zero behind-the-scenes to start a new audit counting cycle. Because these "audit counters" are different from what shows on the operating screen counts; the numbers reported on the email report may be different from what shows on the screen at the time. The intended use here is for "the collector" to generate an AUDIT REPORT when they finish the collection/filling of the sites change machine(s). The email received by the owner should match the bills turned in to the office. PLEASE NOTE- this IS NOT a complete site collection report; since there may be other coinage coming from the coin-op equipment.

Because these reports are numbered and dated you, as the owner/manager, will know if you have all reports in your possession.

I suggest you only provide detailed explanations of these reports to employees who "need to know".

ALERT REPORT

These reports are automatically generated when any of the following events occur:

Change machine goes into "low coin" status
Change machine goes into "out of order" status
General Input DOOR circuit triggers a door opening alert
A General Input that is used as VOLTS OK; goes to NO VOLTS
A General Input that is used as NO VOLTS; OK goes to VOLTS

<u>Setting up VNC communication in CHANGERVIEW- optional remote viewing</u>

(skip to page 22 if not using VNC)

See Appendix A for more details about RealVNC.

From the desktop; go to the VNC logo/shortcut in the top menu bar, and left-click on it to open a new page labeled "VNC Server".

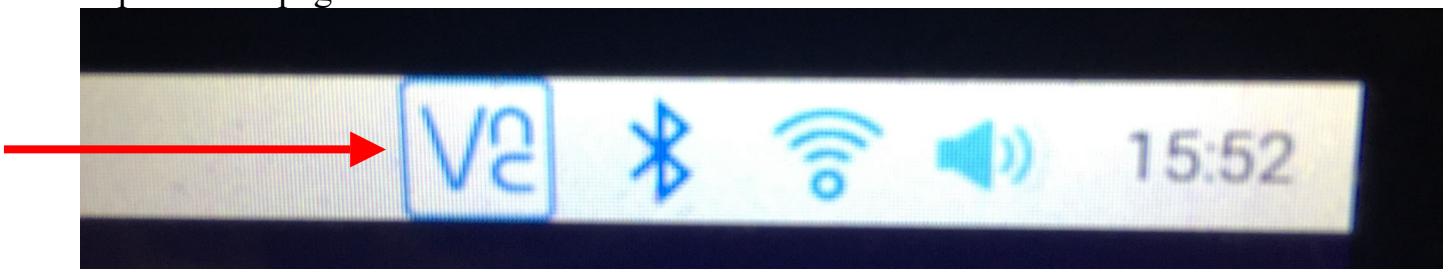


Fig 8

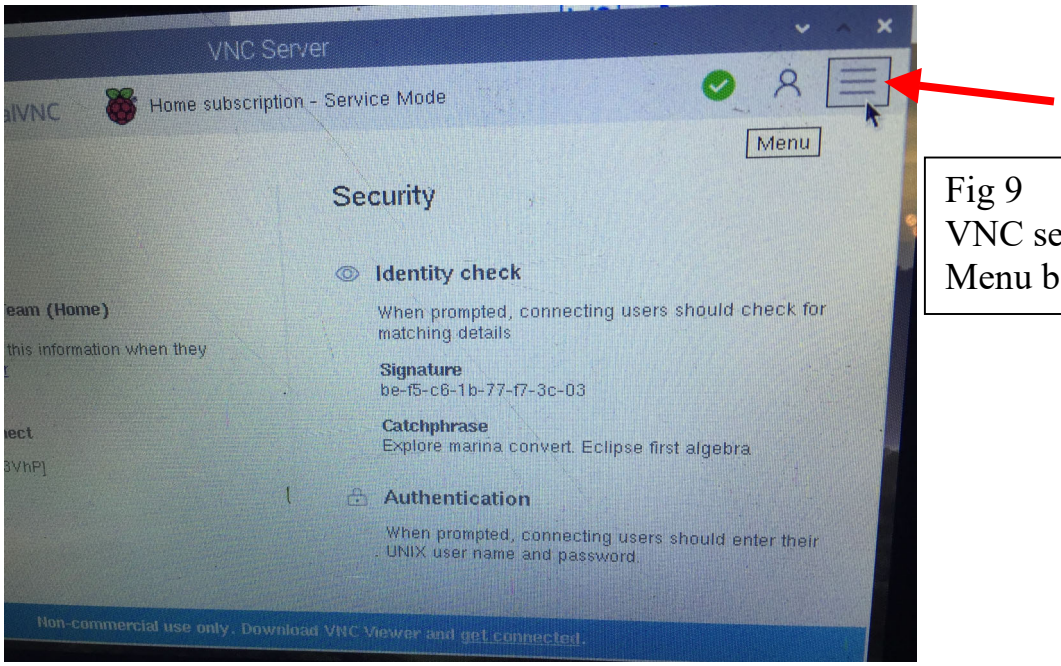


Fig 9
VNC server page
Menu box

Left-click the menu box in the upper, right corner. (box with horizontal lines- Fig 9.) This will open a drop-down list. "LICENSING" is about 2/3 of the way down the list. Left-click on it to open. DO NOT ENTER ANY OF THE OTHER ITEMS ON THE LIST. You need to enter the email and password for the VNC account already created, (WORKSHEET #3). This will allow this unit to enter the "VNC team". Near the bottom of the page is a checkbox for sending anonymous information. Make sure to UNCHECK this box. Click 'sign in' and on the next page: check the box for CLOUD CONNECTIONS, and uncheck the box for DIRECT CONNECTION, click NEXT. The next page will ask for the device's name in the VNC team- Enter your location name from worksheet #1, and click "apply" to exit. (If you have more than 1 CHANGERVIEW unit at the same site; they will need different team names. When you are finished; click the "sign in" button at the bottom. The next screen should show "complete operation"- now ready. Click DONE at bottom. This CHANGERVIEW device should now be viewable from remote devices in your "VNC Team" within a few seconds. Exit VNC pages when

done, and you should be back at the PI desktop. When you add new devices/people to your VNC account; the VNC account email address will receive emails that must be responded to by the team administrator. Click the CHANGERVIEW link on the desktop to get back to the CHANGERVIEW – System Status page. This may take a few seconds.

At this point, the new CHANGERVIEW installation should be available over the internet via your VNC team. Now log in to VNC on a remote viewing device previously setup. At this point, the newly installed CHANGERVIEW (and any other installed units) should show up in the 'team' list. Click on the server device (CHANGERVIEW) to establish a remote connection for viewing and remote control. You will have to enter name, and password for device to connect (worksheet page 13, section 4). Use the "remember password" slider bar to make skip this in the future. You can now view and control the CHANGERVIEW from your remote devices!

Now, you should be able to do further data entry setups with either the connected keypad/mouse, or from the remote device, even if it is your pc right there talking through your VNC team.

MACHINE CONFIGURATIONS

Now is the time to make the physical connections to the machines / equipment you wish to monitor. Go to "Physical Connections" starting on page 26 to make the needed connections to your change machines and other equipment. After your connections are finished, return here to "machine configurations" (page 22) to configure your equipment in the CHANGERVIEW system and learn about using CHANGERVIEW.

CHANGE MACHINE configurations

There are two aspects to connecting your change machines to the CHANGERVIEW System:

1) physical wiring in each change machine and connecting it to CHANGERVIEW, which you should have just finished, and
2) configuring your equipment in CHANGERVIEW (telling the system what you've got going on out there).

Go to the "CHANGERVIEW Input Configuration" page of CHANGERVIEW, Fig 10. This page shows all of the possible machine connections. Enter information for each connected device. The labeling on the CHANGERVIEW case indicates the numbering system for the connected input and outputs. Find the data box for "changer 1" and enter your custom name for the change machine you have connected there. Name is limited to 25 letters max. The second item for each changer is what we call the "low coin target". This is measured in dollars taken in. A special feature of CHANGERVIEW is that it can alert you when a change machine is getting low on coins, or tokens. This is very important to understand. When a machine doesn't have enough coins to continue operation; it goes OUT OF ORDER as EMPTY. At this point, the machine is temporarily useless. Every change machine does this. How wonderful it would be to be warned when the machine is getting close to being low, but still operating. Say your machine holds $1000 in coins or tokens when it is full. If you set the "low coin target" to 800; then email warnings will be sent out to the listed email addresses when $800 has been paid out since the last filling of the changer and reset of the screen counting system in CHANGERVIEW. <u>Be sure to take into account if you have multiple coin hoppers running off of 1 bill acceptor</u>. So now you get an email telling you your "# X" change machine has paid out $800, but more importantly has $200 in useful coins left in it. This gives you time to either: do something about it, or ignore the message. Repeat these two entries for each change machine you are going to monitor. Leave data boxes blank for unused machine inputs. Unused machines will not show up on the operating screen to keep things simple. If you are not using the "low coin feature"; leave it's data box blank. When entering data; <u>do not</u> hit the 'enter' key. 'Tab" between data boxes if you like, or use mouse. Make sure you use the "save settings" button before trying to leave the configuration screen. That's it for changer setups!

Appendix C has further discussion of monitoring individual coin hoppers in multi-hopper machines.

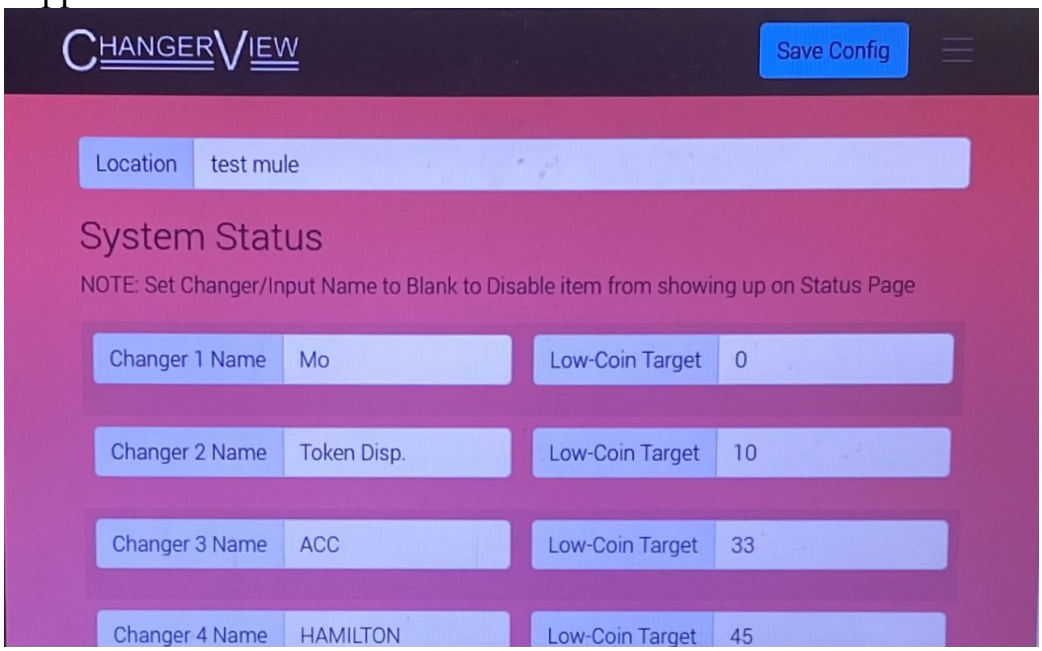


Fig 10
Example of CHANGERVIEW configuration page.

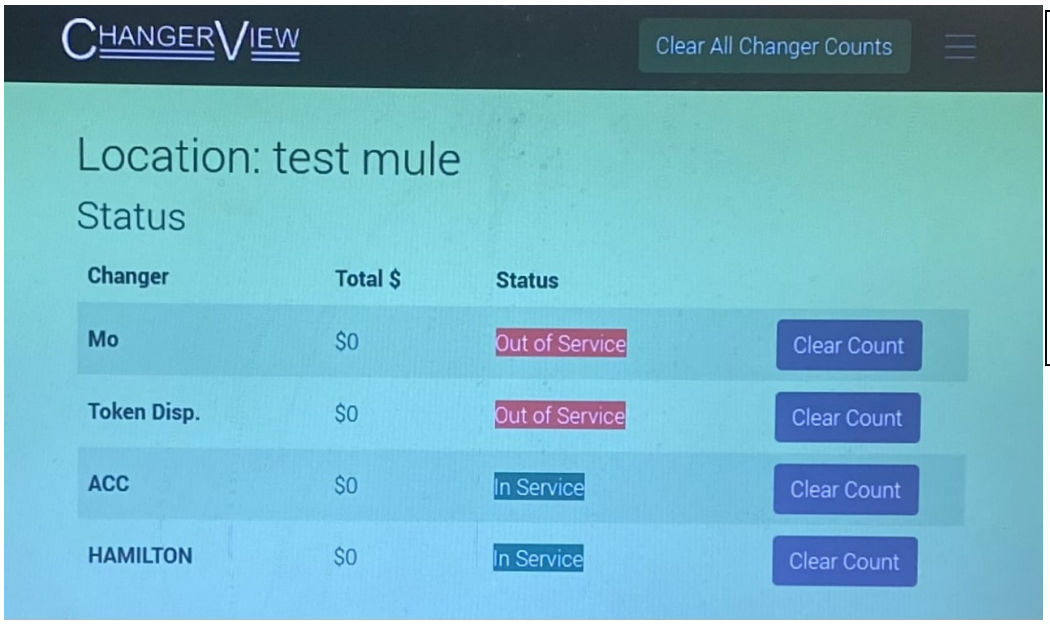


Fig. 11
Example of CHANGERVIEW operating page.

Suncoast Changer Service
2195 S Combee Rd, Lakeland, FL 33801
email: billchangers@msn.com
863-669-9699

Using your CHANGERVIEW

CHANGERVIEW monitors the condition of your changers and other equipment. It does not control them. There is no provision for you to remotely reset a changer with CHANGERVIEW because if a machine has gone "out of service" than a human presence is required to correct the problem.

If you need to 'turn off' CHANGERVIEW, the best option is to unplug the power from the wall outlet. The next option is to unplug the power cable from the "Y" connection leading into the CHANGERVIEW. Both of the power connections leading into CHANGERVIEW from the "Y connector" are needed for normal operation.

In order to minimize potential damage, and to avoid 'false bill counts' you should power off any change machine you may be working on before plugging or un-plugging any item in it you may be working on. Disconnecting or turning off external devices connected to CHANGERVIEW may cause "alert" or "false counts".

The first thing you need to do is to verify that the connections you have made to your changers are working. Insert a bill into each change machine and confirm the 'count' shows up where you expect it on the CHANGERVIEW operating page. If machine actions are not showing up at the proper screen locations; you either need to re-label the machines in CHANGERVIEW configuration to match the connections, or move the connection wiring, or correct wiring errors. Make each changer go "out of order" and confirm the out feature works, and you get the emails you have setup previously. There can be up to a 32 second delay between the time a changer itself goes "out" and when CHANGERVIEW acknowledges the "out" on the operating screen. This delay exists because many machines produce short out periods in their normal operation, which are normal and we want to ignore. In the "big picture" of remote monitoring, this delay is unimportant.

"low coin" monitoring

The typical pattern of a laundry / car wash operation is for management to empty the coin boxes on site, re-fill change machines, empty bills from the changers, and determine income for the collection period. This then becomes the starting-point for the next collection cycle. The whole premise of the "low coin warning" feature is that each change machine is filled to a known, and consistent, coin level at the start of the collection cycle. When you empty coin boxes and re-fill changers; you should reset the "counts" in CHANGERVIEW to start the cycle afresh. You should also generate an AUDIT REPORT now if you are using this feature. This has no effect on the actual change machine operation. In this way you will be able to monitor the usage of the changers over the coming days.

We estimate coin levels by monitoring the dollars taken into the machine. Because of the way coins are split up between multiple hoppers; this sometimes may lead to inexact coin levels at times.

Whenever changers are refilled- they should be filled to the same "full level" of coins and CHANGERVIEW changer counts reset to zero. If you are not using the "low coin" feature; set the low-coin data box to blank.

On the status viewing page is a box for each changer being used for its status condition. There are three possibilities here.

1) "In service". Machine in normal operation, no errors or warnings.
2) "low coins". Machine still operating, but getting low. Email alerts sent out informing management of status. This indicates that the dollars taken into the changer are equal to, or greater than, the number entered as the "low coin target", and hence the machine is getting low on coins. Act on this information as you see fit.
3) "out of service". Machine shut down as "out". Email alert sent out.

You can not change the "in service" or "out" conditions. These are the results of information sent from the change machines themselves. If you clear the machine "counts" on the screen in CHANGERVIEW, the "low coin" status will change back to "in service". Please note that if you clear the counts and DON'T refill the changers to their proper "full levels"; the whole feature becomes meaningless.

You can remotely log-in to your CHANGERVIEW unit anytime through your optional VNC account "team" to monitor real time condition of your change machines, and general inputs you have set up. You can also remotely activate any general outputs you have connected.

Turning off, or disconnecting, a connected MDB change machine will trigger an "out" signal.

CONTROLLER PUSHBUTTONS-

The CHANGERVIEW controller has three pushbuttons on it, along with an indictor light indicating that power is present. See fig 12.

Fig 12-
PB1 duplicates the touchscreen button of "Email Status report".
PB3 duplicates the touchscreen button of "Email Audit report".

PB4 will cancel a door alert if that function is used.

Further information about door circuits and PB4 can be found on page 71.

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Physical Connections for Change Machines

GENERAL, FOR ALL-

For any change machine, you need to determine how you are going to get the needed wiring out of the cabinet. The obvious first choice would be a large enough existing hole in the machine cabinet- NOT ON TOP. If that's not available; you will have to drill a new hole in cabinet side or bottom. We supply 8-conductor cable for connecting to "pulse-type" machines. We supply a special wiring harness to connect to "MDB-type" machines, or the 8-conductor cable. Minimum hole sizes needed:

1 pulse-type cable = 5/16"+	2 pulse-type cables = ½"+
1 MDB cable= 5/8"+	2 MDB cable= 7/8"+

We supply "tap-on" connectors for you to add the needed CHANGERVIEW cable wires to the wiring in your changers. The pictures below should fully explain them if they are not familiar to you. Figure 13 shows that we want to add the black CHANGERVIEW connection wire onto the white wire existing in the machine harness. One slot of the connecter is for the wire that goes all the way through both sides (the white). The other slot of the connector accepts a wire in one side only, and dead ends in the connector (the black). DO NOT REMOVE insulation from wire. First insert the "all the way through" wire into the connector. Then you insert the "dead end wire", note there is a small viewing box to verify the wire is past the pinching blade (fig 14). Press the pinching blade in by hand to partially keep the wires from sliding around on you. Finally, tightly crimp the metal pinching blade tight with a pliers to secure the wire connection. Close and snap the cover shut to finish the connection. (fig 15)

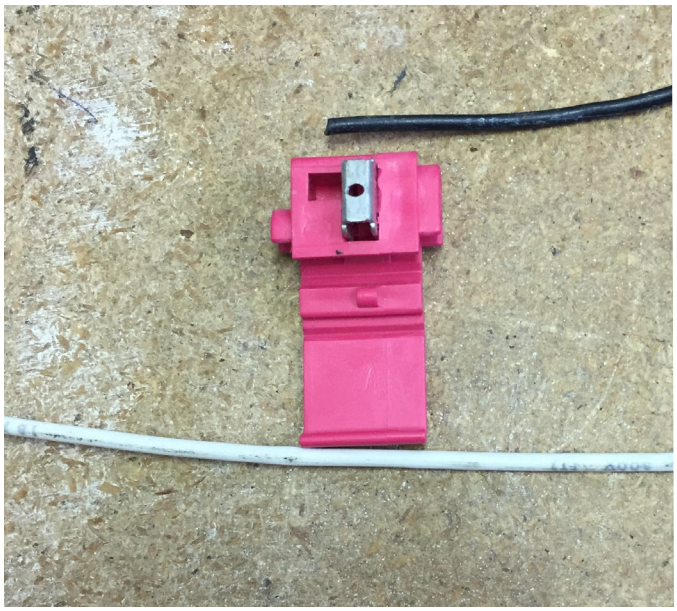


Fig 13

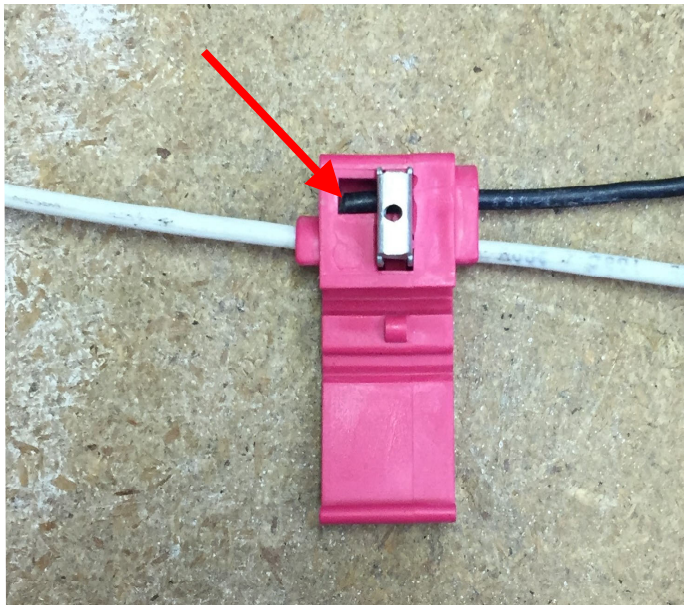


Fig 14

Fig 16 shows the 8-wire cable we supply with the outer cover stripped back to expose the individual wires. The pliers to the right are what we use; but you can use any sharp knife or box-cutters you have available. Be careful to only cut the outer gray jacket, not the individual wires.

Fig 15

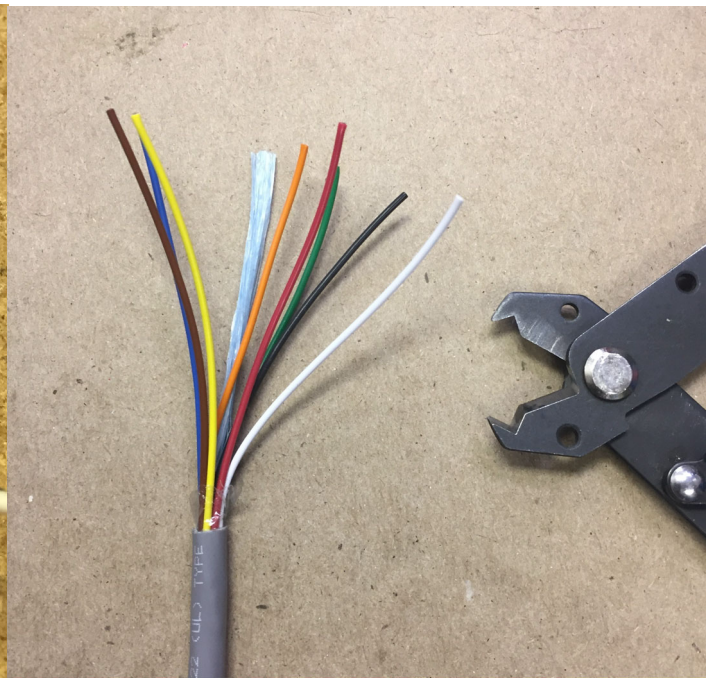


Fig 16

There are four types of input connection boards for the CHANGERVIEW unit. Fig 17 shows the "MDB type 1" input board for MDB change machines and "Pulse type 1" input board for pulse-type machines. Each input board will handle 2 machines; one each at position "A" and "B". Fig 18 and 19 are close-ups of the "pulse type 1" input boards.

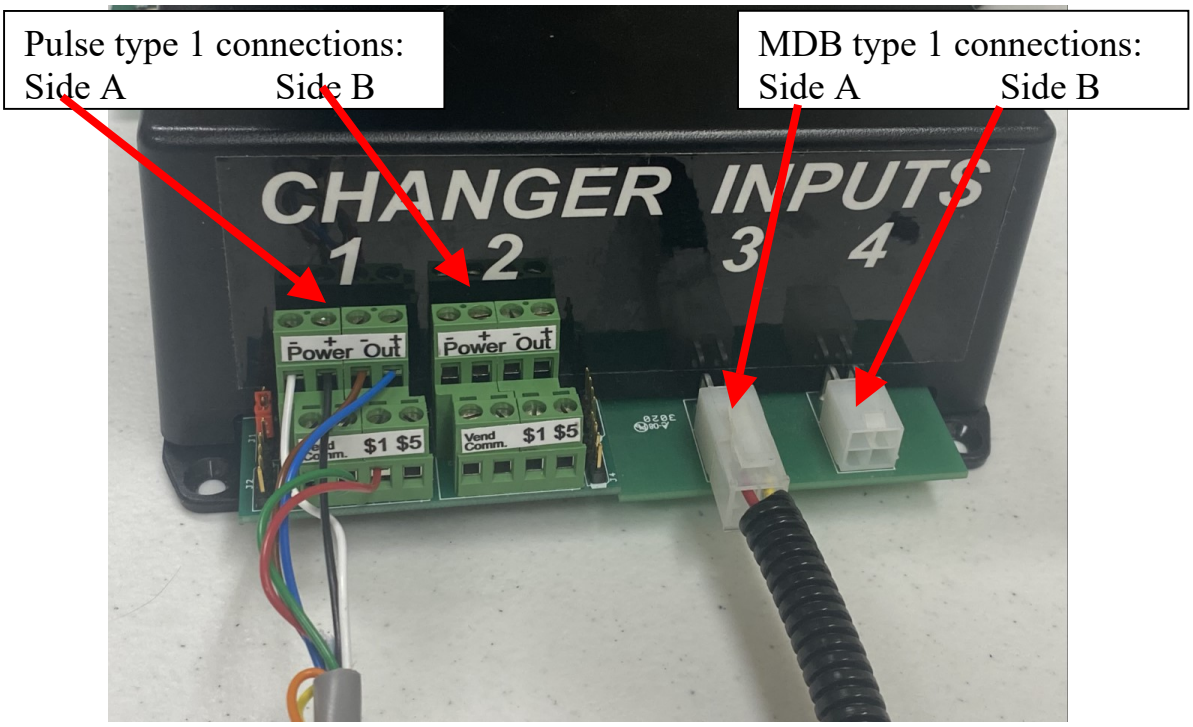


Fig 17 - Changer machine connections- type 1

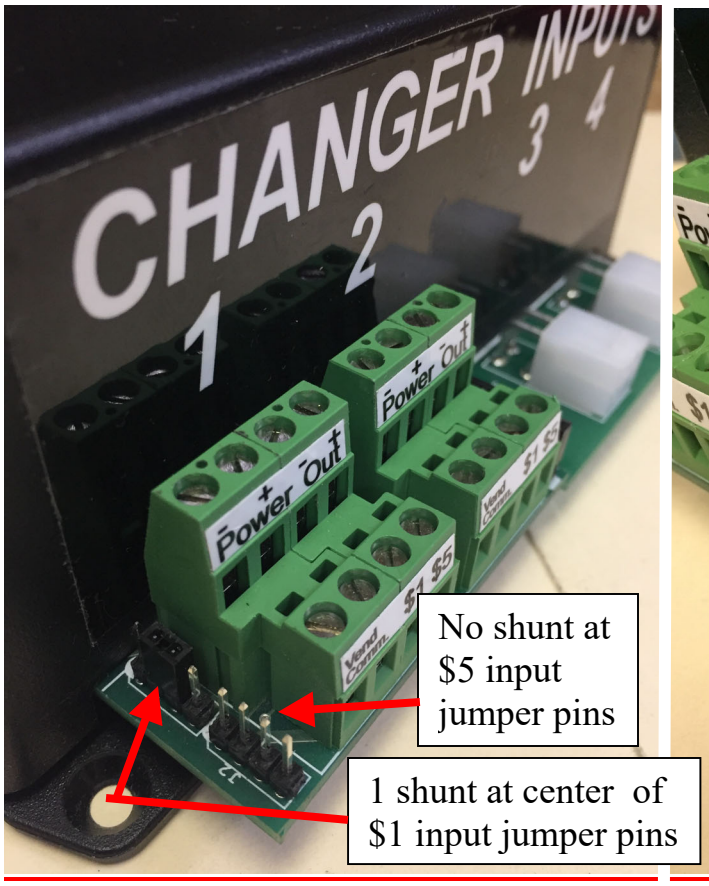


Fig 18

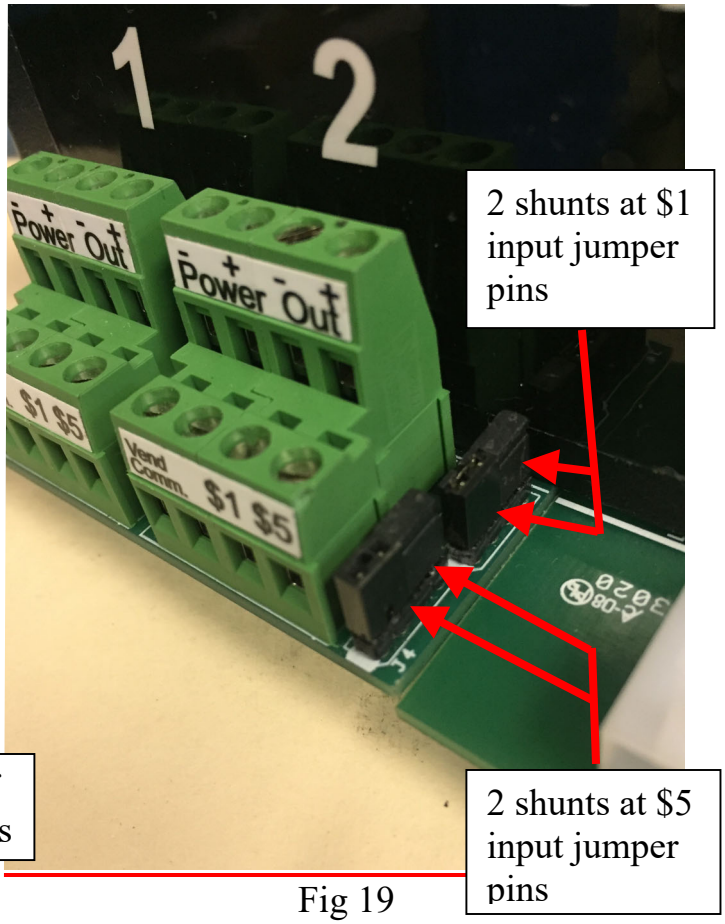


Fig 19

For MDB machines using our type-1 connection, you will connect the supplied "MDB connection harness" to your existing machine bill acceptor wiring. Fig 20 shows a typical existing MDB wiring harness. (This one happens to be an American Uni-bd.) You need to locate the white MDB connection in the line between the machine logic board and the bill acceptor. Open up the wiring at the white connector- Fig 21. Add the new CHANGERVIEW MDB harness into the open wiring connection, and that's it! Fig 23.

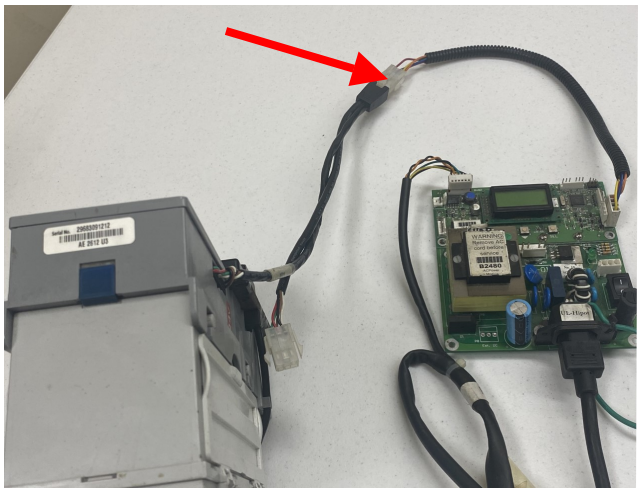


Fig 20

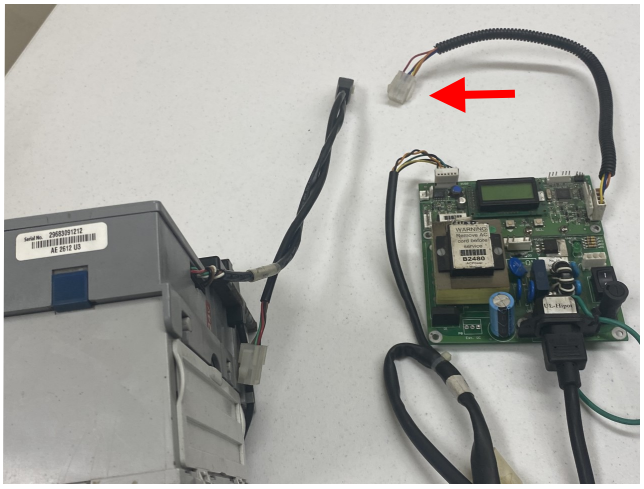


Fig 21

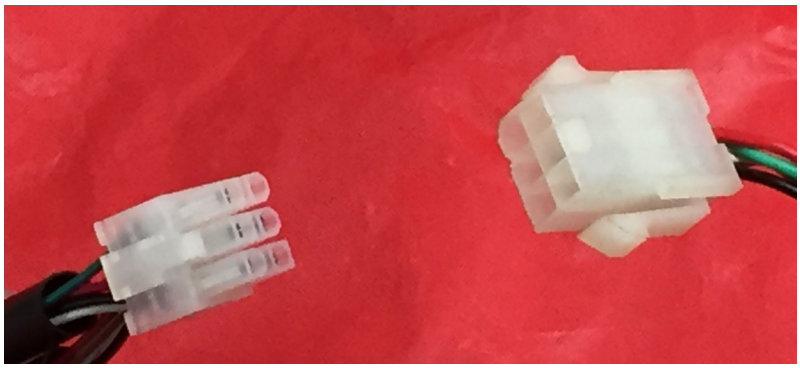
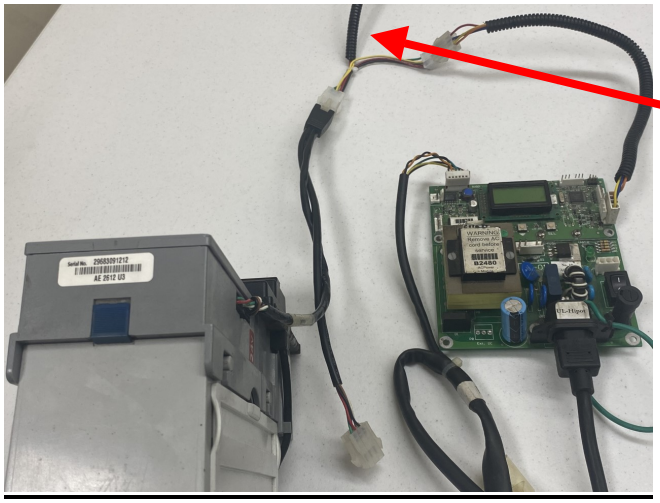


Fig 22
This is a close-up of the "industry standard" MDB connection used for most change machines using MDB. This is the connector you will be looking to connect into with the type 1 MDB harness.



New CHANGERVIEW MDB harness in place

Fig 23

Now route the free end on the CHANGERVIEW MDB harness out of the machine cabinet through the hole you choose, or created, earlier. Route new harness to the CHANGERVIEW main unit and secure in place along the wall. Leave about an extra foot of harness if possible. You may need extra 4ft harness extensions to reach your CHANGERVIEW control. Connect cable to CHANGERVIEW input board (Fig 24).

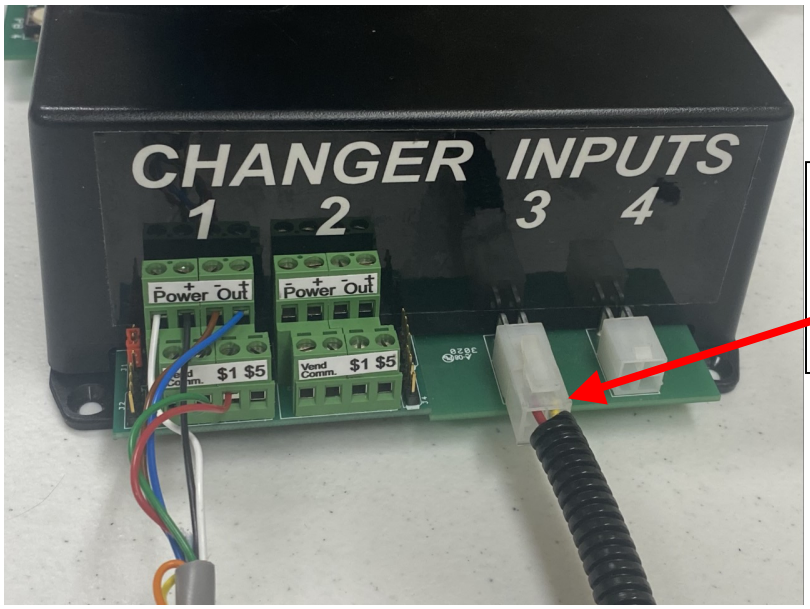


Fig 24
MDB harness connection to CHANGERVIEW MDB input board-type 1.

Shown below are the type 2 input boards. The MDB type 2 input board in Fig 25 uses screw terminal connections for multi-conductor cable instead of the type 1 harness connector. The pulse type 2 input board in fig 26 uses screw terminal connections to accept cable from 1 or 2 remote connection units. The remote pulse unit is shown in fig 27.

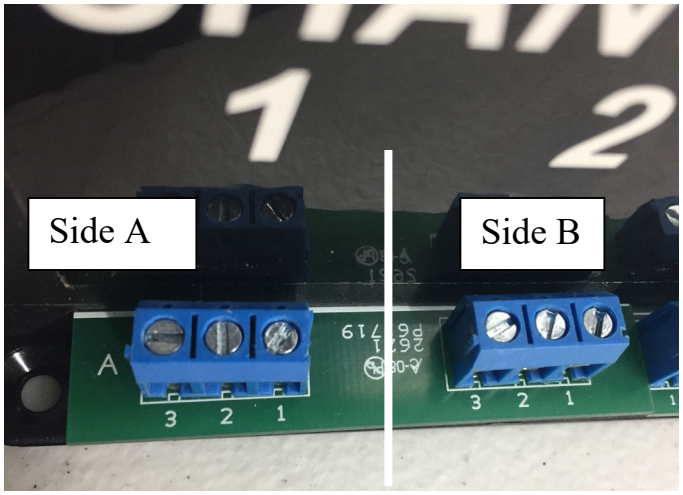


Fig 25
Type 2 MDB connection- Note numbering of terminals

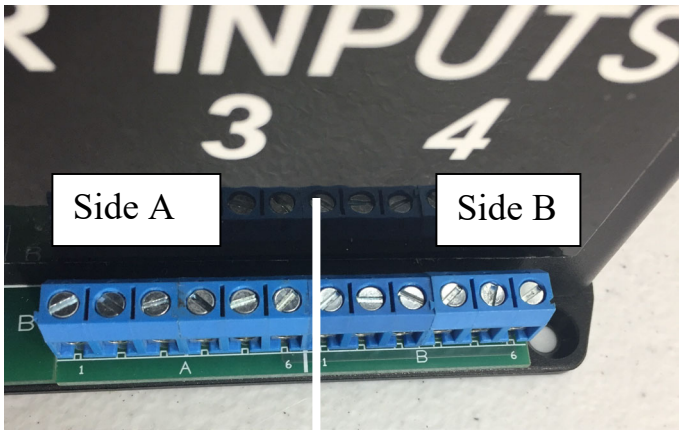


Fig 26
Type 2 pulse connections, Terminal #1 on left, terminal #6 on right end.

Fig 27-
Type 2 pulse remote unit

Connections to CHANGERVIEW unit

Connections to change machine wiring harness

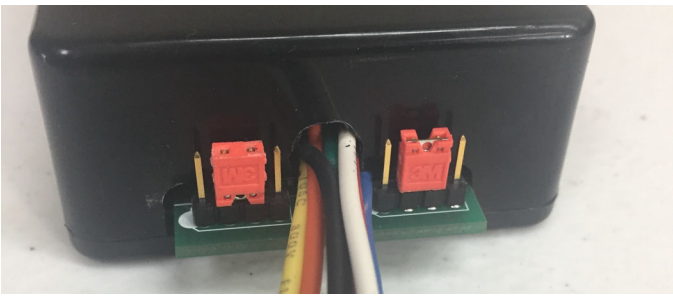


Fig 28

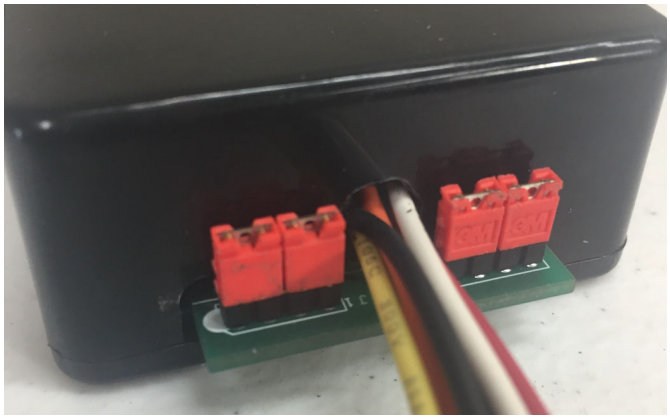


Fig 29

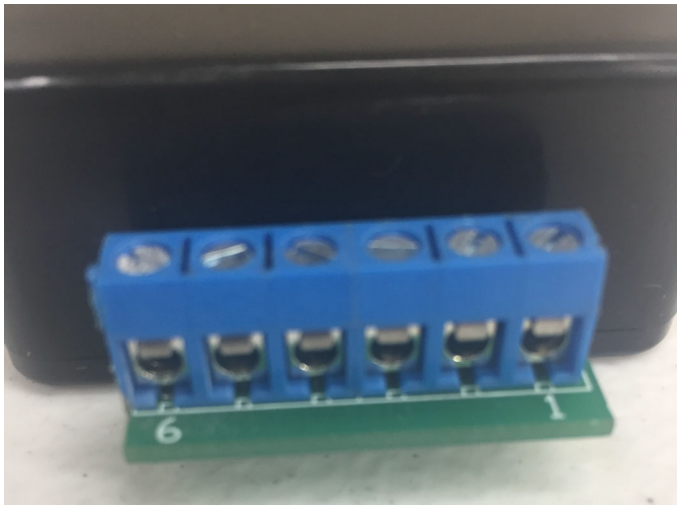


Fig 30

Fig 28 shows the wires coming out of the remote pulse type 2 unit and 1 jumper shunt at the center of each of two jumper pin sets. Figure 29 shows the same wires with 2-jumper shunts on each set of jumper pins. The installation instructions for each type of changer will specify the jumper shunts you need to install. The wires shown are 18" long and will splice into the change machine wiring harness per specific instructions for each model. Not all wires may be used. This remote pulse type 2 unit will be inside of the change machine it connects to. Fig 30 shows the output side of the remote pulse type 2 unit. These terminals will connect back to the main CHANGERVIEW unit via a multi-wire cable you install. These connections will be #1 to #1, #2 to #2, etc.

In general, if your change machines are close together and the CHANGERVIEW box is close: you will probably use "type 1" connections. If your change machines are far away from the CHANGERVIEW control; your will probably use the "type 2" connections.

From here on in this manual; the instructions for type 1 connections will be in BLACK text, and the instructions for the type 2 connections will be in BLUE text.

If you have "pulse type 2" hardware and anticipate making refunds from your change machine(s); please look at Appendix D- Refunds before installing your wiring.