Disclaimer Of Liability

CVP Products (CVP) is not responsible for any direct, indirect, special, or consequential damages and personal injuries, including that to life, and health, resulting from the customer's application and use of CVP's devices. You, the customer, assume full and unlimited responsibility for all device applications and uses. Your purchase and/or use of this device constitutes your agreement to hereafter assume full and total responsibility for your subsequent utilization of the device and you agree to defend, protect, save harmless, and indemnify CVP Products, its owner and employees relative to your potential use and misuse of this device. By purchasing or using a CVP device, you agree to the above terms.

If buyer does not agree with these conditions, immediately return the product, in its original condition, to the place of purchase.

Warranty Information

This warranty covers substantial defects in materials and workmanship of the T6000 PRO-OPS throttle. This warranty does not cover the wall charger or the interface cable.

What This Warranty Does Not Cover

This warranty does not cover any problems which result from normal wear and tear, improper installation, modifications, battery failure, battery polarity reversal, leaking batteries, incorrect charging procedure, 3rd party battery chargers, abuse, accidents, or acts of God such as excessive heat, floods, damage caused by exposure to moisture and rain, lightning, earthquakes, volcanic events, tidal waves or hurricanes. Normal wear and tear includes dirty keys, broken pot, cracked case, broken/cracked display, broken charging jack or other wear caused by use and abuse.

Warranty Duration

The coverage of this warranty lasts for 90 days. After this period, standard repair rates apply. Depending on the problem, CVP reserves the right to repair or replace.

Help, Repairs and Returns

If you purchased your T6000 Throttle from one of our AirWire900 dealers, please call them first. They are your best and quickest for answers about the throttle and its operation.

If you purchased your T6000 Throttle ***directly*** from CVP Products, you may call our office during normal business hours. If the voice mail system answers, it is either after our normal business hours or we are busy helping other customers. Please leave a message. Be sure to leave your phone number and your location. Have your throttle, the instruction manual and your locomotive nearby before you call.

Do not send items to us for repair without first obtaining authorization. In many cases, problems are easily solved via phone or email without the need or expense to return items to us. For more information about repairs, go to the website home page and click on the red box labeled REPAIR SERVICES.

Warning - Absolutely Never Drill The Throttle Case

Absolutely nothing can be mounted to throttle's case; top or bottom. Do not screw, drill or mount items such as lanyards to the throttle's top or bottom. Never drill the case since the battery may be punctured resulting in a fire hazard and damage to the throttle. If drilling has been done and is discovered by CVP, the throttle cannot and will not be repaired and will be returned to you untouched. So don't do it!

If Your Throttle Needs Service

Visit the CVP home page and click on the red box labeled REPAIR SERVICES. Follow the instructions for obtaining service for your throttle. You must have an RMA before sending it. Be sure to include a copy of your invoice or your invoice number.

FCC ID: X7J-A10040601

CVP Products P.O. Box 831333
Richardson, TX 75083 www.cvpusa.com

T6000 Programmer & Operations User Guide

This throttle uses a rechargeable Lithium-Ion (Li-Ion) battery. Li-Ion batteries are volatile if not handled properly. Read the safety instructions and warnings on page 23 before using or charging your throttle. Failure to do so may result in fire, personal injury, and damage to property including your new T6000.

Please read and understand the disclaimer of liability on the back page.

Fully Charge Battery Before Using

AIRWIRE® 900

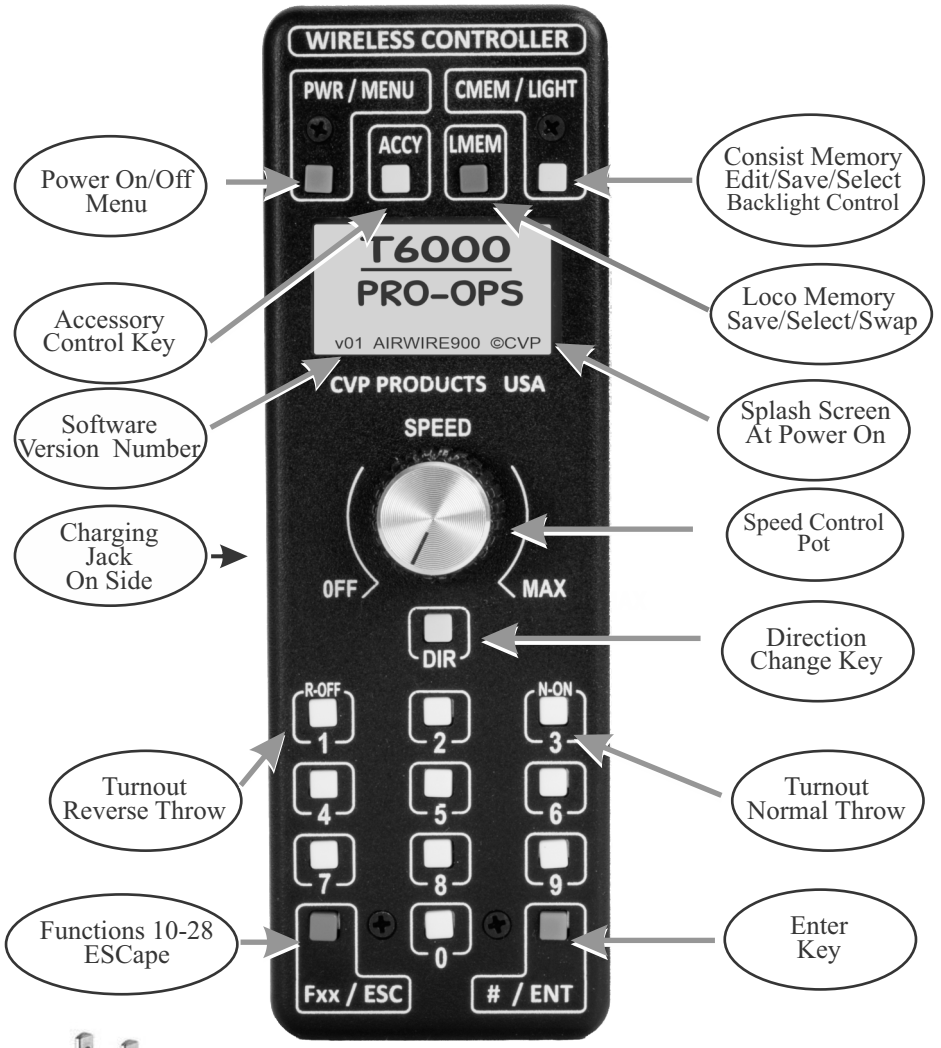
T6000 Combo Contents

T6000 Throttle
*USB Wall Charger
*USB to microUSB Cable
This User Guide

**If the T6000 is purchased alone, the * items will not be present.*

T6000 PRO-OPS Wireless Controller

Fully Charge Battery Before First Use



USB Wall Charger

USB to microUSB Charging Cable

Replacing Internal Battery

The T6000 throttle's internal battery is specified for about 600 full charge-discharge cycles before needing replacement. This means the battery will last for many years of normal use.

However, should a replacement be required, that is simple to do. The replacement battery is called the BAT4 and the latest price is available on the CVP website. Call or email your order to CVP Products.

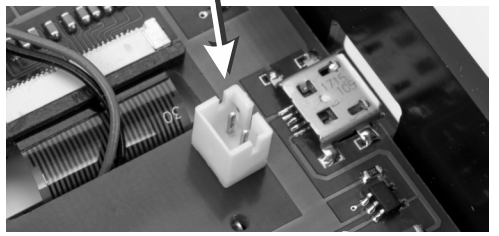
Open up the throttle by removing the 4 screws from the back. Lift the back up and lay it on its side.

The battery plug has two small tabs that keep it from being unplugged. Use a non-metallic tool to gently spread the socket to release the tabs. Then unplug the battery pack by pulling straight up on the plug's wires.

The battery is attached to the back with thin, double sided tape. Remove the battery from the tape and discard in a safe manner.

Remove every piece of the old tape from the back cover. Apply a fresh piece the same length as the battery. Using the picture as a reference, position the battery and press it firmly to the back. Plug in the new battery. The socket is polarized so the plug must be oriented correctly to be inserted.

Place the back onto the throttle and check for pinched wires. When all is clear, reattach the back to the throttle.



Battery And Charger Specifications

Battery Type	Lithium-Ion Rechargeable Battery (Li-Ion)
Battery Voltage	3.7V typical, 4.2V maximum, 2.75V cutoff
Battery Capacity	2000mAh
Battery Protection	Over voltage, under voltage, over current
USB Socket Type	microUSB socket on side of throttle
Charger Voltage	6 VDC maximum (higher voltages will damage throttle)
Charger Current	500mA maximum, lower is OK but charging takes longer

Li-Ion Rechargeable Battery Pack Precautions

NEVER use a NiCd/NiMH charger to charge Li-Ion batteries.

ALWAYS store Li-Ion batteries at room temperature. Never put them in a freezer.

NEVER charge batteries if the ambient temperature is above 113° F.

ALWAYS unplug the battery if storing the throttle for more than 2 months without charging.

ALWAYS charge the battery if it has not been used for more than a month.

ALWAYS keep Li-Ion batteries out of reach of children or pets.

NEVER puncture, cut or drill into the battery pack.

Your Notes, Reminders and Errata

T6000 Wireless Controller Familiarization

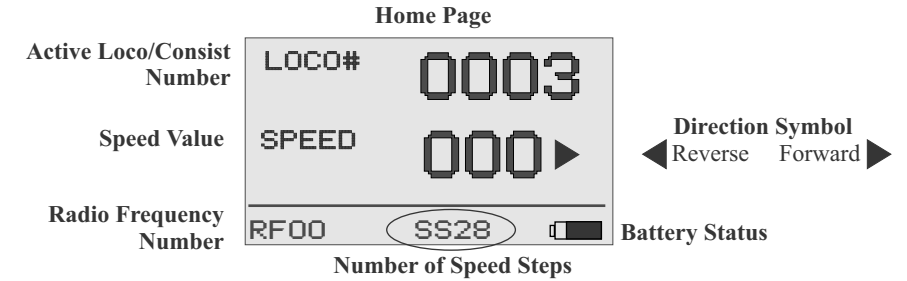
The solid black banner above indicates this is a section for operators. The pictorial instructions are only for basic throttle operation and can be used to explain to your operators, how to use the throttle. T6000 setup information, not needed by your operators, starts on page 9.

To Turn On The T6000 Wireless Controller (throttle), push and release the green key labeled PWR/MENU. The T6000 splash screen will show briefly followed by the home page.

The home page shows the 4 digit loco number (the active loco) to which speed, direction and function commands are being transmitted. If this is the first time the throttle has been turned on, the default factory setting for the loco number is 3. If not the first time, the last used loco number will appear.

A flashing speed *value, after turning on the throttle, means the speed knob is not set fully counterclockwise to the OFF position and the throttle cannot be used. Set the knob to OFF to use the throttle. Remember to set the speed control to OFF before turning on the throttle.*

Home Page



If **LOCO#** is showing, an individual locomotive having this number is being controller. If CONS# is shown, a multi-unit consist is being controlled with the lead locomotive number showing.

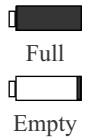
Push the **red ESC** key to cancel any command and return to the home page. Nothing has changed.

RF00 is the current radio frequency on which data is sent to decoders and CONVRTRs.

The **speed value** varies from 000 (off) to 100% of top speed when the value is equals the **number of steps** shown below. (28 in this example).

The **direction** symbol shows which direction the locomotive will move when the speed is increased. The actual locomotive direction is as if you were sitting in the cab. A right facing arrow means the cab will move in the forward direction. A left facing arrow means the cab will move in the reverse or opposite direction.

The **battery status symbol** in the lower right corner of the home page shows the status of the rechargeable battery. When fully charged, the symbol is solid black. When the symbol is not filled, there is only a few minutes of life remaining. The message CHARGE BATTERY will appear. Park the train and stop using the throttle. Connect it to the charger and allow it to charge.



The LCD backlight can be turned off by pushing and holding the CMEM/LIGHT key. The default setting is ON. Turning off the backlight will increase the T6000 run time.

Automatic Power Shut Off occurs after 15 minutes, providing the speed is 000. However, if the speed is not 000, the throttle will not automatically shut off. The speed must be 000 for the automatic shutoff to work.

To Manually Turn Off The Throttle first set the speed knob to OFF with a speed value of 000. Push and release the PWR/MENU key. Press the "1" key to turn off the throttle.

Speed Knob Is Single Turn Only!

Do not turn the speed knob past the mechanical stops. Damage will occur that is not covered by the warranty.

T6000 Is Not Water Proof!

Do not use when it is raining or misting. Water will cause internal damage that is not covered by the warranty.

Selecting The Locomotive Number To Control

*This **DOES NOT** change the locomotive decoder number. That can only be done through decoder programming.*

For this example, the loco number to be used is number 3456.

First press and release the ENT button. This brings up the LOCO number entry screen.

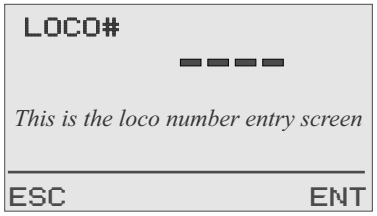
Now press the 3, 4, 5, 6 keys in sequence. Always verify you have the correct loco number showing in the display before continuing. If a wrong number has been pressed, just tap the 0 key until you see 4 zeroes. Then enter the desired numbers. Only the displayed numbers will be used.

If the numbers are correct, press the ENT key.

At any time, you may cancel and return to the home page. Press the red ESC key. If ESC is pressed anytime before the ENT key, the loco number entry is canceled.

When ENT is pressed, the home page will show the new loco number. The direction is set to forward and the speed value will be zero.

You can change the loco number at any time. If the throttle is turned off, the last loco number used will be restored when the throttle is turned back on.



This is the loco number entry screen

Controlling Locomotive Speed and Direction

The single turn "speed" knob controls the locomotive speed. Turn it clockwise, towards MAX, to increase the locomotive speed. Turn it counterclockwise, towards OFF, to decrease locomotive speed. When not using the throttle, always set the speed control to OFF [speed value of 000.]

Push and release the yellow **DIR** key (below the knob) to change the locomotive's direction. Forward is indicated with a right facing arrow next to the speed value. Reverse is indicated with a left facing arrow. Rember that the direction arrow doesn't indicate the physical movement of the locomotive. Rather it shows the locomotive movement as if you were sitting in the locomotive's cab.

Controlling Locomotive Functions

The T6000 throttle will control locomotive DCC decoder functions numbered F0 thru F28. It is the capability and programming of the locomotive decoder that determines how many decoder functions are available and what each function does.

F0 to F9: When the home page is displayed, each of the T6000 number keys are also their respective DCC function keys. For example, the 0 key is F0, the 1 key is F1, the 2 key is assigned to F2, etc. Just push the key to activate the function. Except for F2, all function controls are latching. This means that an "activate" command is sent when the key is first pushed and released. Pressing and releasing the key a second time sends a "deactivate" command. When a function key is pressed, the word FUNC# and the select function number momentarily replaces the speed value. A few seconds after the function key is released, the speed value reappears.

F10 to F19: Push the red Fxx/ESC key once. The display shows **1-**. Push the second number, from 0 to 9. to finish the two digit number.

F20 to F28: Push the red Fxx/ESC twice. The display shows **2-**. Push the second number, from 0 to 8. to finish the two digit number.

F2 is special: F2 is typically assigned to a horn or whistle function. Pressing and holding the F2 key activates or blows the horn or whistle until the key is released.

Miscellaneous Notes

If The Train Doesn't Run
There is no linking or pairing required to run an AirWire equipped locomotive. The only requirement is for the throttle's frequency and displayed loco number to match what is set in the locomotive in order to control it.

Automatic Power Off Timer
The T6000 throttle automatically turn itself off after 15 minutes of non-use but only if the speed knob is set to OFF. However, if the speed control is not set to OFF, like when the active locomotive or consist is moving, the throttle will not automatically turn off.

Teach your operators to always set the speed control to OFF when done running a train. Also verify the knob is in the OFF position before turning the power on.

Low Battery Warning
When the battery has about 5 minutes of life remaining, the BAT icon will show an empty rectangle. When the battery life drops to less than 2 minutes the RECHARGE BATTERY message turns on and stays on. It is strongly recommended to park the train before the throttle automatically shuts down to protect the battery. If the train is still running when the throttle shuts down, the train will be uncontrolled.

Battery Has Automatic Shutoff When Depleted
If the battery is fully depleted, it will automatically shut off. The throttle can't be used and nothing will be displayed. A voltmeter will measure 0 volts. There is nothing wrong with the battery. It needs to be recharged to reset the internal protection circuit. If the battery is fully depleted, allow it to charge overnight. The battery must be charged before the throttle can be used again.

OK To Leave Battery Plugged Into Charger
The battery can remain plugged into the charger when not in use. It cannot be overcharged or harmed in any way. *The battery does not develop a "memory."*

Tips For Best Throttle Performance

The T6000 OPS throttle operates in an unlicenced band shared by many other transmitters. These transmitters can and will create interference resulting in intermittent locomotive control or complete failure of the locomotive to receive throttle commands. The sources of these external interfering signals can be from other AirWIre throttles, your own home, from adjacent homes, nearby businesses or noisy electrical motors including your own locomotives.

Interfering Transmitters. Here's a list of devices known to have caused interference to the throttle: other AirWire throttles on the same frequency, wireless devices attached to computers, TV remote controls, cordless telephones, wireless home or business alarm systems, baby monitors, unlicenced personal communication devices, lawn sprinkler controllers, remote starter switches, cordless light switches, outdoor lighting controllers, toys, wireless headphones, and games.

If you find a strong interfering signal on one or more of your frequencies, don't use those frequencies; pick a different frequency and try it.

Keep your hand away from the top edge of the box. The internal antenna is near this area and the presence of your hand can affect the throttle's range.

Beware Of Other Throttles On The Same Frequency. Each AirWire throttle, no matter what type, must be on a unique frequency. Frequencies can't be shared. Remember that loco numbers are saved along with their frequency. Because of this, it is easy to forget that the newly activated consist or locomotive might be on a frequency already in use by another operator.

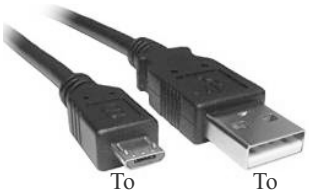
Lost Faceplate Screws

The T6000 uses standard Philips 2-56 threaded flathead screws that are 0.25 inches long. All 4 screws must be present to use the keyboard. Replacement screws can be found at better hardware stores.

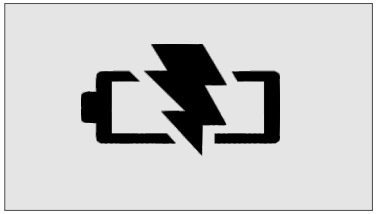
Connecting The Charger Cable and Charger

The CVP Products supplied universal USB charger plugs into any source of AC voltage from 90VAC to 240VAC. Output is 5VDC.

Plug one end of the supplied adapter cable into the USB charger and the other end into the throttle. The plugs are polarized and can only be inserted one way. Don't force them.



When the charger is connected to the throttle, the display will show a lightning bolt symbol for about 15 seconds. After that, the throttle shuts off.



The charging jack is fragile. The jack and plug are polarized so the plug fits only one way.

Do not force the plug into the jack.

Do not yank the plug out.

Don't pickup the throttle by the charging cable.

Simple Battery Status Check

If the charger is connected, simply push the green PWR key. If the battery is fully charged, the charge symbol will not appear.

If the charge symbol does appear, then the battery is not fully charged. The throttle will turn off in about 15 seconds.

The appearance of the charging symbol verifies the battery is not fully charged, the charger is working, and the cable and throttle are properly connected.

The throttle cannot be used when the charger is connected.

Throttle Cannot Be Used While Charging

If the throttle is being charged, it cannot be used. If the PWR key is pressed, the charging symbol will appear, and the throttle turns off in about 15 seconds.

Reset Throttle To Original Factory Settings

There are several throttle settings that are remembered, when the power is turned off or if the battery is unplugged. But, at any time, you may force the throttle back to its original factory settings, just as you received it. When the T6000 RESET command is issued, all memory and settings inside the throttle are erased and restored back to the original factory settings.

From the SETUP menu, select option 6 T6000 RESET.

The moment 3 is pushed, the throttle is immediately reset.

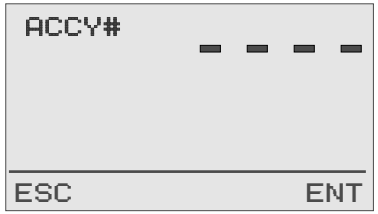
Item	Default	Item	Default
Active Loco	3	Active Freq	0
Speed Steps	28	LMEM	Cleared
Swap Freq	0	CMEM	Cleared
Swap Loco	9999	Freq Select	Hidden

Accessory Decoder Control

The accessory decoder number must be known before it can be controlled. Check with the owner if unsure what the accessory decoder numbers are.

Push and release the yellow ACCY key.

Enter the desired number, 2 for this example, and then press ENT again.



The display shows the entered accessory decoder number as well as the two activation keys which are 1 and 3.

1 R-OFF means "reverse" or curved when referring to a turnout's direction of travel. If using ON/OFF accessories, this will turn OFF the accessory.

3 N-ON means "normal" or straight when referring to a turnout's direction of travel. If using ON/OFF accessories, this will turn ON the accessory.

To activate the turnout in the normal direction, **tap** the 3 key.

To activate the turnout in the reverse direction, **tap** the 1 key.

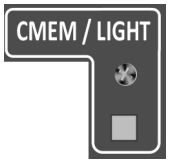
To select a different accessory decoder number, 5 for this example, push #/ENT KEY followed by a 5.

To exit from ACCY mode, push the red ESC key.

The locomotive will continue to respond to direction, speed and function commands while in the accessory mode. Except for the 1 and 3 key, all function commands remain the same. But, for functions 1 and 3, you must **push and hold** the 1 or the 3 key to activate the function.

The throttle cannot be turned off while in ACCY mode. Push ESC first then turn it off.

Backlight Control



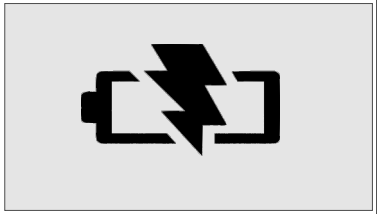
When the throttle is turned on, the built-in LCD backlight turns on. Usually, the backlight is not needed when operating in the daylight or in normal room light. Turning off the backlight will increase battery life by 10%.

To turn off the backlight, press and hold the yellow key labeled CMEM/LIGHT.

To turn on the backlight, press and hold the yellow key labeled CMEM/LIGHT.

The current status of the backlight is not remembered when power is turned off. This means the backlight will turn on again the next time the power is turned on.

Recharging The Battery



The charging jack is a microUSB style jack. It is located on the left side of the throttle.

The charging jack is fragile. The jack and plug are polarized so the plug fits only one way.

Do not force the plug into the jack.

Do not yank the plug out.

Don't pickup the throttle by the charging cable.

When the charging cable is plugged in and the charger is plugged into the wall outlet, the T6000 displays the charging symbol. After 15 seconds, the throttle shuts off.

Storing And Recalling Locomotives From Memory

You do not have to store a locomotive in memory to use it. Just use the # nnnn # key sequence to run a locomotive. The nnnn is the abbreviation for the loco number which is the number programmed into the decoder.

Your T6000 throttle's locomotive memory, accessed with the LMEM key, is used to store locomotive numbers along with their speed, direction, speed-step setting, and frequency. Locomotives can be running or not.

There are 16 loco memory slots, numbered from 1 through 16. If all slots are full, the new loco number is placed at the 16th memory slot and the whole stack is pushed down. So when the memory is full, it is first loco in will be the first loco to be pushed out to make room.

How To Store A Locomotive Number In Memory - Push LMEM Twice

First make sure the loco number on the home page is what you want to store. Set the speed and direction. Then, push the LMEM key twice. This can be done at any time and you may repeat the store command on the same address as often as desired.

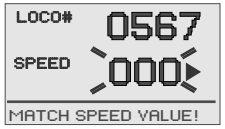
How to Recall A Stored Locomotive Number From Memory

Push LMEM. Notice the new icon in the middle. It means rotate the speed knob to scroll through the 16 slots. Each memory slot is labeled LOCO1, LOCO2, etc. When the desired loco number is found, press ENT to recall the loco and restore its prior speed, direction, speed steps, and its frequency. Also recalled will be the status of all 28 functions. Unused memory slots are shown with dashes.

Note: When the throttle is turned off, *all loco numbers stored in memory will have their speeds set to 0, all directions are set to forward, and all functions are set to OFF. This prevents accidental activation of stored locos when throttle power is turned on. The T6000 memory is retained even if the battery is dead.*

Flashing Speed Value Means Change The Speed Knob!

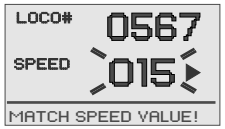
When a loco number is recalled, the speed knob will probably not be set to the proper position. When this occurs, a message will be displayed below the black line saying **MATCH SPEED VALUE!**



The requirement to adjust the speed value insures that a stopped locomotive will not accidentally take off running or, a running locomotive will not suddenly stop or change direction.

There is no need to guess where the speed knob has to be. Just adjust the knob position until the flashing stops. For a stored locomotive speed value of zero, set the speed knob to the OFF position.

Another example is recalling a running locomotive. Since speed value of 15 is about halfway to max speed of 28, position the speed knob to about the 12'oclock position. Once the pot position matches the speed value, the flashing stops, you have normal control of the locomotive speed and direction.

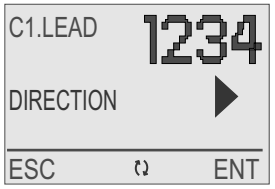


Removing Locos From Loco Memory (LMEM)

Tap the LMEM key to bring up the loco list. Rotate the speed knob to the loco number to be deleted. When the desired loco number is found, press 0 followed by ENT. This will replace the number with dashes and exit to the home page.

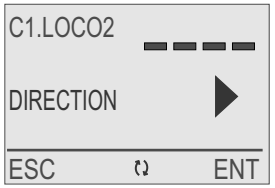
Editing A Consist

Once a consist is built, a consist can be edited to remove individual locomotives or overwrite an existing locomotive with a new locomotive.



First, push CMEM to begin the process. If there are blank consist slots available, the "BUILD CONSIST?" question will appear. Push ESC to skip the "build consist" question.

Rotate the speed knob to bring up the consist to be edited. Then continue scrolling to get to the locomotive to be changed. For this example, the second locomotive in the consist will be edited.



Scroll to the second locomotive . Look for C1.LOCO2.

There are several actions that can be applied to this locomotive.

Remove Locomotive: Push the 0 key. The number becomes dashes.

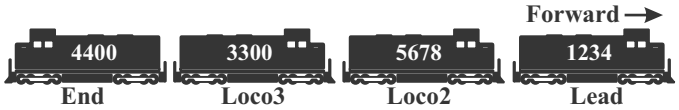
Add a Locomotive: Scroll to an empty slot that shows dashes. Key in the new locomotive number. Set the direction orientation. Push ENT.

Overwrite with a new Locomotive or Fix Locomotive Direction: Scroll to the locomotive that is to be overwritten. Key in the new locomotive number. Set the direction orientation. Push ENT when completed. This is also how a locomotive with an incorrect direction setting is corrected. Just use the same number but change the direction before pressing ENT.

Overwriting the lead locomotive number is not allowed. If you want to change the lead locomotive number, first delete the entire consist and build a new consist with the new lead locomotive number.

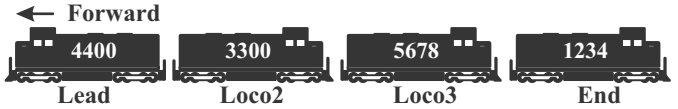
Flip A Consist

Consist Flip: Flipping a consist is handy if you use point-to-point operation. To flip a consist, push the direction key while in the consist edit mode. For example, the consist below moves to the right when the forward direction is selected.



C1.LEAD	**1234 F**
C1.LOCO2	5678 F
C1.LOCO3	3300 F
C1.END	4400 R

However, at the end of its run, the lead unit, 1234, is no longer pointing in the correct direction. Since you can't turn the consist, you can use the flip command. After the flip the end locomotive becomes the lead locomotive with forward now being in the opposite direction. The consist list is reordered and the new lead locomotive number now appears on the home page.

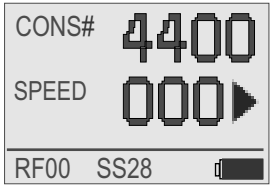


C1.LEAD	**4400 F**
C1.LOCO2	3300 R
C1.LOCO3	5678 R
C1.END	1234 R

To Flip A Consist: While in the edit mode, scroll to the lead locomotive of the consist to be flipped. Push the direction key one time. The consist will be flipped and the throttle returns to the home screen with the new lead locomotive number showing.

Before The Flip

After The Flip



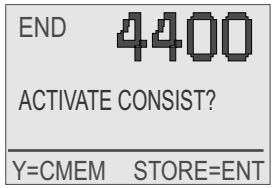
Building A Multi-Unit Consist *continued*

Step 6: Finally, there are three possible responses to the ACTIVATE CONSIST question.

Push CMEM if you are ready to run the consist now. This will activate the consist **and** store it.

Push ENT to store the consist **without** making it active. It can be activated later.

Push ESC to cancel the consist build without storing anything.



For this example, the consist is activated and stored by pushing the CMEM key.

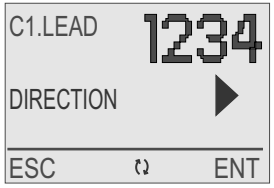
The throttle returns to the home page, where it shows CONS# and the lead loco number.

Viewing The Stored Multi-Unit Consist

To see what is stored in the T6000 consist memory, first start by pressing CMEM. Since there are 2 more consist memory groups available, the "BUILD CONSIST?" question will appear. Since the desire is to view an already built consist, push ESC to skip the "build consist" question.

The first consist lead locomotive number is shown. Notice it is labeled as C1.LEAD. Also notice the new icon which is called the scroll icon 🗘. It means the speed knob is used to move through the list of locomotives.

Slowly turn the knob clockwise. In turn you will encounter C1.LOCO2, C1.LOCO3 and C1.END. If the knob is turned more, the second and third consists will be blank.



Deleting A Consist

A consist can be modified in several ways. The modifications include deleting selected locomotives from a consist, or changing a locomotive number in the consist, flipping a consist end for end or deletion of an entire consist, .

The actions available depend on what is being displayed. Before doing any of the actions, make sure the desired lead locomotive number is showing.

To delete an entire consist and all its locomotives, first scroll to the consist lead locomotive. In our example, C1.LEAD is locomotive 1234.

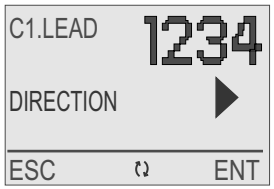
Push the zero key to delete the consist. The loco number will be replaced by blanks.

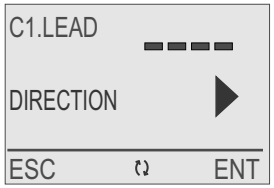
You may cancel the deletion by pushing ESC. Nothing has changed. The consist is still in memory.

If the correct consist is shown, push ENT to accept the deletion.

The consist will be deleted and you return to the home page.

Notice the home page shows that the lead locomotive number is now labeled as a LOCO.





Go Back (SWAP) To Last Loco Number

The LMEM key has a secondary function if it is pressed and held. This secondary function allows the previously used loco number to be restored as the active loco. For example, if loco number 42 was last used, and then loco number 567 was entered, pressing and holding the LMEM key restores locomotive 42. Press and hold LMEM again and locomotive 567 is restored. The last used loco can also be a Consist number.

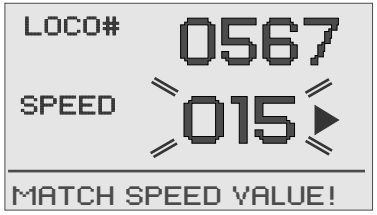
The LMEM swap only remembers the ***very last*** loco number or Consist number. Power must not be turned off when swap is in use. Swap memory is cleared when power is turned off.

When the T6000 is turned on, the swap memory is set to loco 9999.

SWAP with A Running Locomotive or Consist

An active loco can be running when the swap takes place. When the LMEM key is pressed and held, the loco number, its current speed value and its direction are saved. But what if the speed value doesn't match the speed control position when it is recalled?

If the active locomotive's stored speed value doesn't match the present setting of the speed pot, the speed value will be flashing. A message will be displayed below the black line saying MATCH SPEED VALUE!



The flashing speed value is the value to which the pot must be set to. In this example, 15 is about halfway to max speed, so the pot must be rotated clockwise to about the mid position. Once the pot position matches the speed value, the flashing stops and normal throttle operation resumes.

To avoid having to match the pot position with a saved speed value, we recommend that swap be done with stopped locomotives.

Recalling And Running A Multi-Unit Consist

Note: Creating a consist is described in section 2 of this manual - Setting Up The T6000.

As an operator, using a multi-unit consist requires it to be recalled from the CONSIST memory. There can be up to 3 separate consists stored in memory. Any one can be recalled and made active with a couple of key strokes.

Push and Release The CMEM Key

If the message, "BUILD CONSIST?' appears, it means the CONSIST memory is not full.

Push ESC to skip past the "BUILD CONSIST? message.

The abbreviation C1. LEAD followed by the number is the "lead" or front locomotive number in Consist number 1.

Rotate the speed knob to view the other locomotive numbers that make up the Consist 1.

C1.LOCO2 is the second locomotive in Consist 1.

C1.LOCO3 is the third locomotive Consist 1.

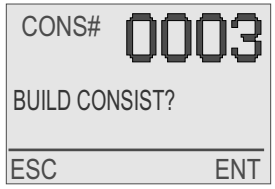
C1.END is the last locomotive in Consist 1.

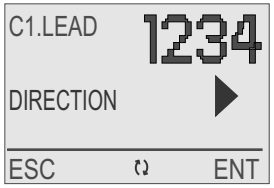
If you continue to rotate the speed knob, you will see the memory slots of the other two consists.

For this example, lets activate Consist 1.

Rotate the speed knob until is shows the C1.LEAD locomotive.

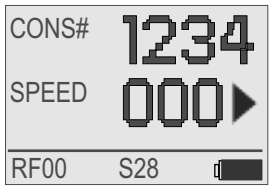
Push and release ENT key to activate the Consist. The display will switch back to the home page.





continued on the next page

Recalling And Running A Multi-Unit Consist *continued*



The home page now shows the lead locomotive number of the selected Consist. It also shows CONS# as a reminder you are in control of a multi-unit Consist and not a single locomotive.

All locomotives that are members of the Consist will move together as if they were a single locomotive.

Function commands will be sent to the lead locomotive ONLY.

Consists recalled from CMEM will have their speed set to zero and their direction set to forward.

Storing of a running Consist is not allowed EXCEPT in LMEM swap memory. When the swap memory is used, you may alternated between running a CONSIST and the loco or CONSIST previously running.

If the locomotive or Consist speed doesn't match the present speed knob setting, the speed value will be flashing and the message below the black line will remind you to match the speed.

Swapping Between Consists or Locos

The swap capability can be used with either locos or consists or multiple consists. For example, you can swap between two different locomotive numbers. You can also swap between a locomotive and a consist. You may also swap between two different consists. Whichever combination is used, the speed and direction are always stored.

Running A Locomotive That Is In A Consist

Except for the consist's lead locomotive, any locomotive that is a member of a consist can be made active and controlled independently. However, the consist must be STOPPED if you want to run one of the member locomotives independently.

This capability also provides a way to make the consist member an active loco so you can change any of the member's lighting.

To make the locomotive number active, ush the ENT key, then key in the loco number, then push ENT again.

How To Set Up Consisted Loco Lights

Function commands are sent only to the lead locomotive in a Consist. But, for the other locomotives in the Consist, you can individually control their lights.

To change the lights of any Consisted locomotive, make the locomotive number active. Push the ENT key, then key in the loco number, then push ENT again. Set the loco lights as desired.

Be sure to change back to your Consist when done.

Before Turning Off The Throttle...

Before turning off the throttle, set it to an unused loco number with the speed value showing 000. If you do this, there is no chance of unintentionally controlling a valid locomotive when the throttle is turned on.

Building A Multi-Unit Consist

Building a multi-unit consist with up to 4 locomotives is easy and only takes a few keystrokes. *But the one key requirement is that all locomotives must be on the same frequency. The frequency is stored as part of the consist.*

The steps to build a CONSIST are the same for all 3 consists. Only one example will be shown in detail.

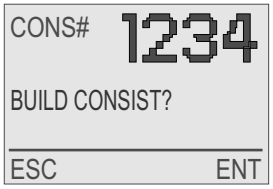
FIrst make a list or a sketch of the Consist. Make note of who is the lead or first locomotive. Then list each locomotive and its cab orientation relative to the lead unit. The picture below is the sketch of a consist used for this example.

Step 1: Set your throttle to the lead loco number which is 1234 in this example. Set the speed to 000 and the direction to forward.

Whatever locomotive number is shown on the home page becomes the lead or first locomotive when initiating the building of a consist. The sketch shows loco 1234 has the lead.

You might want to run the locomotive and verify the throttle is set to the correct frequency. Then set the speed to 000 and direction to forward.

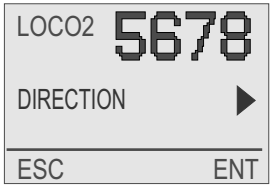
Step 2: Push and release the CMEM/LIGHT key and verify that the CONS address shown is your lead locomotive address. If not, push ESC and go back to step 1 and enter the correct lead locomotive address.



Push ENT to answer YES to the question.

Push ESC anytime during the building of a consist to cancel and exit without saving anything.

Step 3: Enter the 2nd loco address (5678). Notice the direction arrow appears and is set for forward. If the loco is reversed, push the DIR key to set the arrow for revers. When all is correct, push ENT.



During the build consist mode, you will not be able to back up after ENT is pushed. If you think you have made an error, wait until you have loaded all of the locomotives and then EDIT the consist, described in the next section.

Step 4: Now load the 3rd locomotive (3300) using the same sequence. Once the number and the direction are correct, push ENT.

Less Than 4 Locos?

If the consist has only 2 or 3 locos, push the ENT key **twice** after the last loco is entered to indicate there are no more entries. Then proceed to step 6.

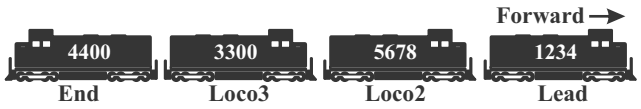
Step 5: Notice the display shows END instead of LOCO4. This is the last loco number that can be added to this consist. Enter the loco number (4400), and set the direction, (this one is reversed so the direction key is tapped to select reverse. Notice the arrow points left.

Once the number and the direction are correct, push ENT.

Continued on next page

Multi-Unit Consist Memory and Definitions

C1.LEAD	**1234**
C1.LOCO2	5678
C1.LOCO3	3300
C1.END	4400



The T6000 can store up to 3 separate multi-unit consists each having up to 4 locomotives. This section describes the definitions, setup rules and provides some simple examples of building, editing and using multi-unit consists.

On the T6000, a multi-unit consist is abbreviated to simply CON# where # is the consist number.

Labels and Consist Members

The example above shows that CON1 has 4 locomotives. The lead locomotive is always the first locomotive. It must face forward and move in the forward direction (as if you were sitting in the cab) when the throttle direction is set to forward. As a reminder, forward is when the T6000 direction symbol is pointing to the right.

The remaining locomotives can face in either direction.

Locomotives in CON2 and CON3 are labeled the same. The only difference will be the consist number. For example, the lead locomotive in consist #2 will be displayed as C2.LEAD. The end locomotive in consist #3 will be displayed as C3.END.

Setup Rules for Multi-Unit Consists

- Locomotives do not have to be in Loco Memory to be used in a Consist. Likewise, any locomotive in Loco Memory can be used in a consist.
- Locomotives may belong to multiple consists as long as they all use the same frequency.
- Other than the lead locomotives, independent control is retained for each of the consisted locomotives.
- A consist must contain at least 2 locomotives.
- The maximum number of locomotives in a consist is four.
- Consists cannot be included in other consists (nested Consists are not allowed).
- All locomotives within a consist must be on the same frequency.
- Each consist can be on a separate frequency although each member of the consist must be on the same frequency.
- The lead locomotive should face normally forward and the throttle set to forward before building the Consist.
- Except for the lead locomotive, the other locomotives can face in either direction.
- When a consist is active, function commands are sent only to the LEAD locomotive.
- A selected consist can be modified or deleted at any time.
- A selected consist can be flipped, end for end and the consist list reordered.
- If the consist memory is full, the "Build Consist?" message will not appear when CMEM is pressed. You must remove one of the existing consist, before a new one can be built.
- The locomotives are not programmed in any way when added or deleted from a Consist.

Consisted Locos Must Be On Same Frequency
Verify that all locos to be placed into a consist are on the same frequency.

T6000 Setup Guide

Note 1: Add A Cell Phone Wrist Strap

Purchase a cell phone wrist strap from a phone supply store or online. Remove one of the rear cover screws and place the strap's loop under the screw and tighten. Never drill into the T6000 box.

Note 2: Fully Charge Battery Before First Use

The internal Lithium-Polymer battery is delivered to you with very little charge. It must be fully charged, preferrably overnight, before using the throttle.

Note 3: Getting Into The T6000 Hidden Menus Requires A Special Key Sequence

To prevent operators from accidentally getting into the hidden setup and programming menus a special key sequence is used.

Accessing The Hidden Menus

The access the hidden menus, you must use a unique keystroke sequence. This will keep your operators from accidentally changing the throttle setup.

To enter the setup menu, first turn on the throttle. Next, press the PWR/MENU key. Now push **and hold** the ENT key. The first page of the hidden menu will now appear. Press the PWR/MENU key again to see the second hidden menu page. This sequence must be used any time there is need to change the throttle setup.

To exit back to the home page, push ESC at any time.

0. OPS PROGRAM
1. POWER OFF
2. SS SELECT
3. FREQ SELECT

Hidden Menu Page 1

4. SVC PROGRAM
5. AUTO OFF TIMER
6. DECODER RESET
7. T6000 RESET

Hidden Menu Page 2

T6000 Throttle Setup Contents

Transmit Frequency Set And Visibility

There are a total of 17 frequencies available for use with AIRWIRE decoders. Check the appropriate user guide for which frequencies are supported.

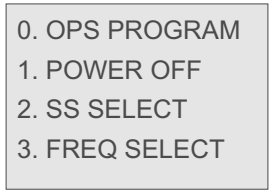
Access the hidden menu, page 1.

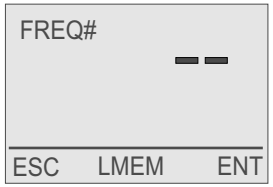
Push the 3 key.

Enter the number corresponding to the frequency you wish to use from the table below. This example shows frequency 2 is used.

Push the ENT key. The change takes effect immediately.

The home page reappears with the new frequency number next to the RF below the black line (circled).





Allowing Operators To Change Frequency

The normal factory setting for frequency selection is hidden. However, if you want operators to be able to change the throttle frequency, the frequency select option can appear on the PWR/MENU screen.

Access the hidden menu, page 1

Press 3 for FREQ SELECT

Push the LMEM key. Upon pressing, the setup mode is exited and the home page appears.

Now when the user pushes the PWR/MENU key, frequency selection will appear in the primary menu. This added menu item remains until it is cancelled or the T6000 is reset.

To remove the Freq Select from the primary menu, repeat the same sequence above.

Power-Off Screen

There is No Change To Decoder
This procedure does not change the decoder frequency. To change the decoder frequency, it must be programmed.

Frequency Table and Decoder Cross Reference

G3, G4 decoders and Drop-In decoders built since 2017, support all 17 frequencies, numbered 0 to 16. Use the appropriate frequency number in the throttle when matching decoder to throttle frequency.

Older Drop-In decoders support only 16 frequencies, numbered 0 to 9 and A to F. For the letter frequencies, above 9, use the table below to load the appropriate ***number*** into the T6000.

G2 decoders and older decoders support only 8 frequencies, numbered 0 to 7. Use the appropriate frequency number when matching decoder to throttle frequency.

Stanton decoders can be controlled when the T6000 is set to frequency 16.

Number	Frequency (MHz)	Number	Frequency (MHz)
0	921.37	9	924.62
1	919.87	10 (A)	923.12
2	915.37	11 (B)	918.12
3	912.37	12 (C)	916.87
4	909.37	13 (D)	913.62
5	907.87	14 (E)	910.87
6	906.37	15 (F)	904.87
7	903.37	16 (na)	916.37
8	926.12		

AirWire Decoder SVC PROGRAM - Cheat Sheet

3 Common Programming Routines Used With AirWire Decoders and Convrtrs

The word Decoder refers to all types of AirWire decoders as well as the C60 and C15 CONVRTRs. However, the C25 uses a different CV for the frequency which is CV58.

Before starting, make sure your Decoder is powered up. The green PWR LED on the decoder will be on. Next make sure the decoder is receiving the throttle. The red GP LED will be on solid when the throttle frequency matches the decoder frequency. If there is an external sound decoder connected to the decoder or CONVRTR, make sure its power is on too.

Push the T6000 keys in exactly the same order as shown in the 3 most common procedures used with the decoders. Watch the T6000 screen to be sure you have pushed the correct keys.

In all examples, SVC PROGRAM mode will be used.

The **Decoder Number** (address) is CV 1. The range is 1 to 9999.

The **Decoder Frequency** is CV200 (58 for older C25). The range is 0 to 16.

The **Decoder Reset** is CV8. The value is 135. Any other value will be ignored.

Only Decoders will chirp. The CONVRTRs are silent.

Program Decoder Number
- Access MENU Page 2,
- Push 4,
- Push 1, then ENT,
- Enter n,n,n,n, [desired loco number]
- ENT, [decoder chirps]
- ESC

Note: to use this command, the frequency of the decoder or CONVRTR must be known.

Set the T6000 to the decoder's frequency before starting.

Program the new decoder number.

Change the T6000 to the new decoder number.

If you are not sure about the frequency, use the decoder's lost frequency mode and the T6000 Decoder Reset from the hidden menu. See page 11 for more details.

Program Decoder Frequency
- Access MENU Page 2,
- Push 4,
- Push 200, then ENT,
- Enter n,n [desired frequency]
- ENT, [decoder chirps]
- ESC

Note: to use this command, the frequency of the decoder or CONVRTR must be known.

Set the T6000 to the decoder's frequency as the decoder or CONVRTR. Program the frequency.

Change the T6000 to the new frequency.

If you are not sure about the frequency, use the decoder's lost frequency mode and the T6000 Decoder Reset from the hidden menu. See page 11 for more details.

Reset Decoder to Factory Settings
- Access MENU Page 2,
- 4,
- 8, ENT,
- 1,3,5,
- ENT, [decoder chirps]
- ESC

Note: to use this command, the frequency of the decoder or CONVRTR must be known.

Set the T6000 to the same frequency as the decoder or CONVRTR to be reset.

This command resets the AirWire decoder or CONVRTR back to its original factory settings.

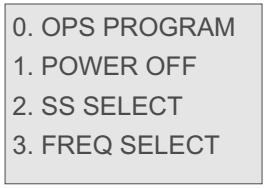
If you are not sure about the frequency, use the decoder's lost frequency mode and the T6000 Decoder Reset from the hidden menu. See page 11 for more details.

How To OPS Program The Decoder Top Speed

This example uses **OPS PROGRAM** mode to program the AirWire G4X maximum motor voltage. With OPS mode, only the active loco number (shown on the home page) receives the programming.

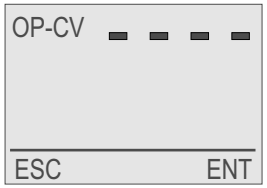
Turn on the T6000 throttle. Set the throttle frequency to match the decoder frequency. Turn on the G4X decoder. Verify the green PWR LED and the red GP LED are both on steady.

On the T6000, access page 1 of the hidden menu. Push PWR/MENU, then push and hold the ENT key. The display shows the first 4 options available.



Push the 1 key to select OPS PROGRAM.

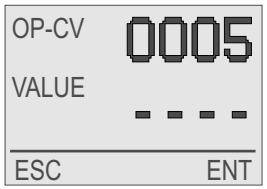
The screen shows OP-CV which is the abbreviation for OPS PROGRAM, Configuration Variable. The dashes are where you will fill in the desired CV number.



Below the black line are prompts for what keys are used in the next step. For example, cancel the programming command by pressing the red ESC key. Otherwise, key in the CV number. From the G4X user guide, the motor max CV is stored in CV5.

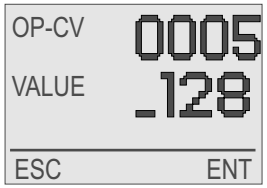
Press the 5 key. Check that "5" appears on the top line. If so, press ENT to accept the entry and move to the next step.

From the G4X User Guide, the range of values for CV5 is 0 to 255. Lets pick the value of 128. Since top speed is 255, this means the top speed will be dropped by half. This will make an obvious change when you test the locomotive's top speed.



Leading zeroes are not needed. If the number is 10, just key in a 1 and a 0. You do not need to enter 0010.

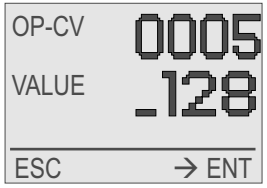
Key in 128. Verify that the number in the display is what you want.



If you make an error, don't start over. Push the 0 key to fill the value line with all zeros. Then key in the proper number. It is only the 4 digits that appear on the value line that will be used. Leading zeroes are ignored.

Press ENT to send the new number to the decoder.

The moment the ENT key is pushed, the decoder will chirp or jump (depends on the decoder). That indicates the decoder has received the programming command. A small arrow now points to ENT.



The small arrow means you can push ENT to program the same or a different CV, or you can ESC to return to the home page.

Do Not Change Decoder Address With OPS PROGRAM
Changing the decoder address with OPS may cause the decoder to stop working. Always use SVC PROGRAM to program the decoder address.

Changing Automatic Shut-Off Timer

The Automatic Shut-Off timer sets the duration of time before the T6000 automatically powers down. The timer range is 1 minute to 9,999 minutes. The factory default is 15 minutes.

The throttle will not shut off if the **active** *(not stored)* loco/consist speed is greater than 000. This prevents inadvertent shut off while a train is in motion.

Access hidden menu, page 2.

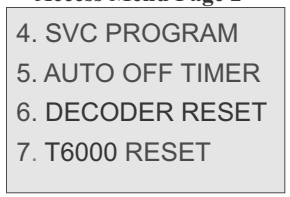
Push the 5 key.

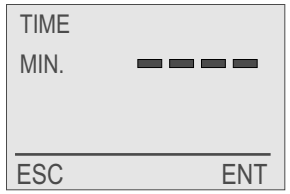
Enter the desired number of minutes before auto turn off.

Push ENT to accept the new number and return to the home page.

Note: the current value of the timer is not shown. Rather than worry about what it is, just put in the value you want.

Access Menu Page 2





Changing Throttle's Speed Steps

Your throttle's rotary speed control can be set to use one of 3 different settings to change the number of steps from off to full speed. These are called speed steps. The throttle's speed display shows the step number being transmitted. The locomotive decoder determines the motor speed for a given speed step. Speed 000 is always stop or off.

You may choose 14, 28 or 128 steps of resolution.

Changing the throttle's speed step setting ***DOES NOT*** *change the decoder's internal speed step programming.*

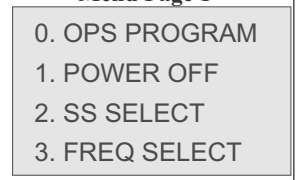
Step 1: Access Menu Page 1 and select item 2.

Step 2: Push the key for the desired number of steps. Once the selection is made, the home page reappears. The new speed step setting will appear below the black line.

The speed step value is actually just a number sent to the decoder. The decoder's programming determines what it does with a specific speed step number.

From an operators point of view, the observed physical speed of the locomotive is what is important.

Menu Page 1



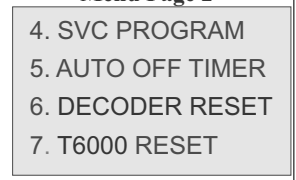
Sending An AirWire Decoder Reset Command

This command works with either any AirWre decoder or CONVRTR. It does not work with other decoder brands or types.

This handy command is used to reset any AirWire product back to its original factory settings with all memory locations cleared.

The reset command is always broadcast on **frequency 0**. This procedure will require using the "lost frequency" mode preparation for the reset command. See the appropriate user guide to learn more about this concept.

Menu Page 2



To send the reset, (1) Turn off the T6000. (2) power up the decoder or CONVRTR. (3) Wait a least one minute; longer is OK. (4) Turn on the throttle. The present throttle frequency or loco number does not matter. (5) Access page 2 of the menu. (6) Push the 6 key to send the reset.

After sending the reset command, the throttle returns to the home page but with the loco number set to 3 and the frequency set to 0 .

Another method to send the reset command is to write a value of 135 to CV 8. This method can be used with either SVC PROGRAM or OPS PROGRAM on any frequency.

T6000 Decoder Programming Modes

All AirWire decoders as well as most other decoder manufacturers allow two types of decoder programming; OPS and SERVICE (SVC) mode. The T6000 can do both.

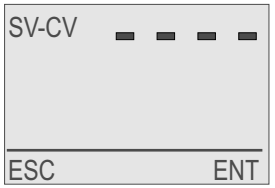
SVC PROGRAM is a broadcast command. This means that any decoder that is powered on and set to the same frequency as the T6000 will receive **AND** obey the programming command. Unused locomotives should be turned off to prevent inadvertent programming.

SVC PROGRAM to always used to set the decoder number (also called a decoder address). Use OPS PROGAM for everything else.

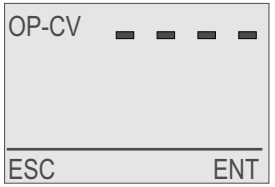
OPS PROGRAM is not a broadcast command. It sends programming commands to the active locomotive number shown on the home page. This means that other decoders on the same frequency, but having different loco numbers will not be programmed.

Use OPS PROGRAM to change any decoder setting **EXCEPT** for the decoder number. Do not use OPS mode programming to change the active decoder's locomotive number; use SVC PROGRAM.

Regardless of which programming mode is used, the exact same key sequence and the displays look the same except for the top line. It shows either **SV** or **OP** as a reminder of which mode is being used.



SVC Programming Display



OPS Programming Display

You Must Know The Proper CV Number & Value Range

Programming of the decoder or CONVRTR allows you to change how it responds to the T6000 commands. When programming, numeric values are stored in unique memory locations inside the decoder. These unique memory locations are numbered and called Configuration Variables. We abbreviate this to CV followed by the number. For example, CV1 is the locomotive decoder address. For AirWire decoders, the value range is 1 to 9999.

There are literally hundreds of CVs in locomotive decoders. With few exceptions, CVs are not standardized. Not all decoders offer the same CVs. For this reason, you must obtain the decoder user guide from the appropriate manufacturer. These can usually be downloaded from their website.

AirWire products have standardized on using the back cover of the user guide to list the available CVs by their number, their definition, their original factory value and there value range. For example, here are the first four lines from the G4X User Guide back cover page.

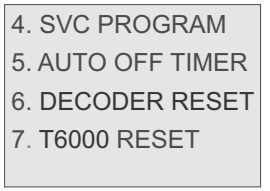
CV #	Orig Value	Value Range	Description
CV1	3	1-9999	Loco Number (Address) + CV17, CV18, CV29
CV2	9	0-255	Motor Starting Voltage MSV
CV3	2	0-255	Motor Acceleration Rate
CV4	2	0-255	Motor Deceleration Rate

How To SVC Program The Decoder Number

This example uses **Service (SVC) PROGRAM** mode to program the AirWire G4X loco number or address. Turn off all other locomotives before using SVC PROGRAM mode.

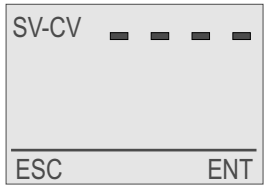
Turn on the T6000 throttle. Set the throttle frequency to match the decoder frequency. Turn on the G4X decoder. Verify the green PWR LED and the red GP LED are both on steady.

On the T6000, access page 2 of the hidden menu. Push PWR/MENU, then push and hold the ENT key. Push the PWR/MENU to go to page 2. The display will show the 4 options available.



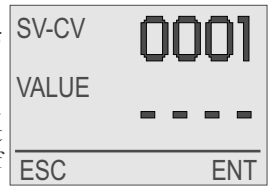
Push the 4 key to select SVC PROGRAM.

The screen shows SV-CV which is the abbreviation for SERVICE PROGRAM, Configuration Variable. The dashes are where you will fill in the desired CV number.



Below the black line are prompts for what keys are used in the next step. For example, cancel the programming command by pressing the red ESC key. Otherwise, key in the CV number. From the G4X user guide, the loco number is stored in CV1.

Press the 1 key. Check that "0001" appears on the top line. If so, press ENT to accept the entry and move to the next step.



Leading zeroes are not needed. If the loco number is 5, just push the 5 key. You do not need to enter 0005.

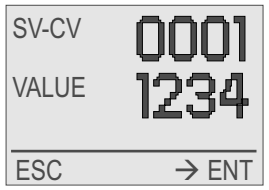
From the G4X User Guide, the range of values for CV1 is 1 to 9999. Most people use the cab number for the decoder number. That makes it easy to know what number to use in the throttle; just look at the side of the cab. For this example, the loco number will be 1234.

Key in 1234. Verify that the number in the display is what you want.

If you make an error, don't start over. Push the 0 key to fill the value line with all zeros. Then key in the proper number. It is only the 4 digits that appear on the value line that will be used. Leading zeroes are ignored.

Press ENT to program CV1 with the CV value of 1234.

The moment the ENT key is pushed, the decoder will chirp or jump (depends on the decoder). This indicates the decoder has received the programming command. A small arrow now points to ENT.



The small arrow means you can push ENT to program another CV or you can ESC to return to the home page.

Frequently Used CVs For AirWire Decoders and CONVRTRs

Loco Number or Address . . . CV1
Radio Frequency CV200
Maximum Motor Voltage . . . CV5
Front Headlight Effect CV61
Rear Headlight Effect CV62
Smoke Timeout CV212

Consult The Decoder User Guide
Always review the appropriate user guide to determine which CVs are available for your decoder. No two manufacturers have the same set.