

Lionel Legacy FAQ's

Rev 4a 1/25/08

When Lionel introduced the Legacy system it brought a new level of control to the O-Gauge model railroading community. As with any new system there were questions. Many questions were posted on the OGR forum bulletin board and answered by the many members of the OGR forum including Marty E, Norm Charbonneau and many others. DCS expert Barry Broskowitz offered his advice to those who were working with both Legacy and DCS.

Also some of the creators of the Legacy system, Neil Young (NY), Lionel's CTO Jon (SantaFeFan) and Mark R Creative Trains senior software engineer made themselves available to answer questions about the system and showed everyone how much fun Legacy could really be

Below is a selection of some of the questions that were asked, as well as the answer. I do not take any credit for the answers provided; I am only trying to put them all in one combined document to make it easier to read. Those who answered them originally are the one that should be thanked

DISCLAIMER: If in doubt, read the owners manual or contact Lionel's technical support. "This FAQ and the owners of this FAQ are not affiliated with Lionel, L.L.C. and the Lionel Legacy system. Lionel ® and Legacy™ are trademarks of Lionel, L.L.C."

If you have any comments, corrections additions or suggestions please email them to me at bojphoto@gmail.com

Thank You
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The Basics

Get the Legacy manual online (New manual due out Feb 1)

<http://www.lionel.com/products/productnavigator/InstructionManuals/00-0000-001.pdf>

What's in the box

<http://www.bojphoto.com/train/Legacy/index.html>

The Lionel Legacy system #990 contains. Legacy Command Base/Charger, Legacy Cab-2 Remote Controller, a wall mount power supply, a "Y" serial Cable, two white generic (Steam and Diesel) memory modules and two blue memory modules used to reprogram the Legacy system and the instruction manual. The wire to connect the Legacy base to the track should also be included, but many report it missing. It is not a special wire so just use the wire currently connecting your TMCC base to your track.

The Lionel Legacy System #993 Expansion Set includes a #991 Legacy Cab-2 Remote Controller and a #994 Legacy Charger

How can I find a list off all the Legacy Products?

1. Go to <http://www.lionel.com/Products/Findex.cfm> and click on Product Finder, On the next screen , go to the Product Search box and type in “Legacy” and press search
2. Visit http://mysite.verizon.net/ejhlti/Legacy_Engines.htm (Courtesy of Ed H)

Lionel's website lists some engines as having the Legacy Control System and Legacy Speed Control while others have only the Legacy Control System, is there a difference?

There is no difference; all these engines will run under Legacy the same

Setting up Legacy

1. You must have a Transformer to supply power to your engines. You can use any transformer from a Lionel CW-80 all the way to a ZW. You can also use a Lionel Powerhouse 135 or 180.
2. The simplest way to set up Legacy it to replace the existing TMCC Command Base with the Legacy Command base. Page 4
3. If you still want to use your Cab-1 then you must connect the TMCC1 base to the Legacy Base using the provided serial Cable. You must remove the signal wire from the TMCC Base and move it to the Legacy Base. This is the wire that either is connected to the outside rail of your track, the U of your TMCC1 base or the common output of the TIU. Page 59

What are the blue memory modules included with the Legacy system used for?

The blue modules are for installing the Cab/Base Operating System. For example, if Lionel releases a newer version of Cab-2 code and for some reason you do not like the code - you can revert back to the original "as-shipped" Operating System. The modules also can clean/repair a corrupt system database.

What are the white memory modules included with the Legacy system used for?

The white memory modules are for loading TMCC engines into the system so you can run them in a Legacy friendly environment. Meaning Legacy will use ICONS for the functions as opposed to numbers. One is for steam and one is for diesels.

I have one question about assigning ENG #s: should you do this first, and then load the module?

Set your ID#, then insert the module. Page 12

Why is my Legacy unit defaulting to Cab-1 Mode?

Without loading specific data for your engine Legacy will default to Cab-1 mode.

To set up trains without the Legacy memory module or Non-Legacy engines

1. See pages 34-35, 40-41, 55 of the Legacy manual.
2. Use if you have non-Legacy engines (Lionel TMCC or other manufactures) or do not have the Legacy memory module for your engine.

3. If you manually enter the info, make sure to select the correct Control Type. A Legacy engine running in TMCC mode is will not have the new features
4. Generic Steam and Diesel modules are included with the Legacy Base, you can load these and then add the Name and Road Number.

In what mode do I see the graph?

The graph shows up in Legacy mode and TMCC mode after the information has been set up. Cab-1 mode does not show the graph (Page 13)

In the upper left hand corner of the LCD screen there is a small icon what is it?

1. It is the battery level.
2. There are actually 4 states of the battery indicator. The 3 bars and then when its really low the battery box will flash on and off and the back light will disable itself

Can I use alkaline batteries in the Cab-2?

Yes but you must disable the recharging circuit on the bottom of the base (Page 5)

Is there a way to see a list of all the locomotives I have added?

To see all your engines, press the engine button (far right of set of 5 under the first screen) and press the scroll button top left. Turning the velocity wheel (big red button) and the system will scroll through all assigned engines. If you toggle the engine button (most times) it will display the last two engines activated.

How do I control my Postwar/Non-TMCC engines?

1. The PowerMaster Bridge will be released soon and you will be able to connect a PowerMaster directly to Legacy using the Cable supplied with the Legacy system Page 59
2. You can control them in Legacy with a TPC 300/400 connected to the supplied Y Cable

How do I reverse directions?

1. Press the multi controller (Boost/Brake) Page 8
2. Try the Velocity Throttle Direction Control. (when at stop, flick the velocity throttle counter clock-wise for a direction change) See VTDC Page 36

How do I delete an engine from the controller?

1. You can enter new info over the old (use the same engine ID)
2. Press info, press select and then press clear. System will ask you if you want to delete engine and settings. Press yes and engine and settings are gone.

Can this be mounted on the wall or does it have to lay flat?

It is designed to go on a flat surface. So no, it won't mount on a wall.

General operation FAQ's

Does the boost function over ride the train brake setting using TMCC engines?

1. The TMCC boost and Brake are NOT controlled by the graph as Legacy is, but by the engine electronics responding to a command. With a TMCC engine, the graph will stay at the speed the engine will return to AFTER you release brake or boost. Experiment with braking a TMCC engine and watch the graph to see how the speed returns to the graph when released. If you stop the train the engine returns to the speed graph set speed when brake is released

When I am running two engines and send a command to engine 1 then toggle to engine 2, will engine 1 continue with it's last command? I would love to be able to have an engine going and hit roll and then address another engine and work with it while the 1st engine is running toward roll.

The Cab-2 remembers what it was last doing with an engine and continues when you re-address the engine. However it will not continue with what it was doing when it is not the engine being addressed

Can I change my momentum settings on the fly (AKA I'm pulling into a yard and my train isn't stopping fast enough)

Legacy Momentum makes a train operate really realistically. But it takes a long time to stop, just like a real train.

Change momentum settings "on the fly" and check out the response. It is easy to change your acceleration and deceleration rate while moving, just press the L, M, or H button.

If you have a target speed that is 0 and a train speed that is high and you want to stop fast, try the L button! You can also use full braking on the independent engine brake (pull it all the way), which is almost as fast.

Are the TR numbers still limited to 0-9 or you can make lash-ups with dual numbers like 10-99?

TR#s 1-99, RTE#s 1-9

You can select any digit to be the first digit of a double-digit route. If you select every digit 1-9 to be the first digit of double digit routes, then you would have 99 routes. Double digit routes are selected in the CTC menu. The default is 9 single digit route addresses. (Expandable to 99)

Keeping single digit route addresses lets you throw your most commonly used routes with speed, while dedicating certain digits as the first digit of double digit routes gives you more addresses on a larger layout.

When does Feedback happen?

Generally speaking, feedback is a subtle effect that is not "on" most of the time. It only happens to let you know you have done something, or an event has occurred. This keeps you in touch with what you are doing in a new way.

Train Brake: Feedback is a short 1 second rumble each time your train Brake settings change from one level to the next.

Starting and stopping: A rumble happens whenever you stop or start your locomotive moving. It is a shudder that you feel for about 1 second.

Independent Engine Brake: When you first apply your brakes to a Legacy engine, you will hear the screeching brakes from the engine. As you apply more brake, you will notice the onboard brake screeching is louder and the rumble begins to vibrate the Cab-2. When you add more levels of Braking, you will get louder brake sounds from the Legacy engine and the rumble and Shudder will increase in the Cab-2.

When the train finally stops all of the rumbling and brake sounds will stop. This allows you to hear when the brakes are applied and then feel the increased braking when you really start to slow down the engine. You don't have to look at the train to know how you are braking. If it is in a tunnel or hidden, you can still feel the control. You can "stop on a dime" with Cab-2 and Legacy engines' independent engine brake.

Boost: Very similar to brake. At first boost, you may hear a change in laboring/rpms. Then more vibration and shudder as you BOOST more.

Continuous Boosting against a Train Brake setting will definitely give you a prolonged shudder.(as was recently discovered here!)

There are 7 levels of Braking intensity available in the system and at this time 3 or 4 of them are in use. More uses will be developed as time goes on. We are considering making the Feedback effect intensity and duration adjustable by the user in the next rev of Cab-2.

What does the Record function control?

The Legacy record function can record activities of anything on the layout, with address changes and different trains, engines and accessories. Currently, the limitation is one long recording. There will be advances made to this feature in future revs of Legacy. The system is ready to expand. We are watching for your input and making our list of possibilities. Thanks for all you ideas.

Can you help me use VTAB Variable Throttle Auto Brake

If you have turned on the Velocity Throttle Auto Brake (CTC options menu), you will find it useful in higher momentums (M4 and higher). The auto brake is a sound effect control that lets you play with the brake sound as your train slows down at the momentum rate you have set. It will not slow your train faster than your preset Momentum rate.

1. Get your train up to speed.
2. With Velocity throttle, move the target line to 0.
3. Hear the brakes as your engine slows down at whatever Momentum level you have set. (M5 or higher recommended for experimenting)
4. Listen to the different intensities of the brake sound as you move the throttle counter clock wise or clock wise. If you move it too far clock wise, the auto brake will stop and the target line will be above 0. During this time your train will continue slowing down at your preset Momentum rate.

5. Auto Brake allows Legacy locomotives to play 8 different levels of brake. Once the target line turns reaches zero, each 'click' of the knob counter clockwise will increase the brake sounds by one. A clockwise turn will relieve brake by one. Remember to turn the knob slowly, or it will skip through the steps

How should I use the Velocity Throttle Direction Control?

1. You should try using in the VTDC using a momentum setting of M5 or higher. Any lower than that and you risk derailments
2. If you are using L momentum for a lot of your operating and have not started using Momentum yet, then you should "turn off " the VTDC

If noticed that when I run my engines in a lash up one runs slightly slower than the other, is there a problem?

This slight speed difference in operation is per design. (I am believe it is to keep the engines from pushing against the lead)

When programming the Cab-2 for a Legacy Engine – what is the difference between the Module and manually entering the info into the Cab-2?

It's faster and already contains the road name and Cab number. Other than that there is no difference.

When you program an engine – it appears that the ID is still limited to two digits, is this correct? (I know you can enter the full Road Number on the Cab-2, but the Engine ID is still two Digits.)

That is correct 2 digits is the limit.

What does the reset button on the Cab-2 do (back side, top Right)

Pressing this 'reset' button will do exactly the same function as pulling out the batteries.

When I shut off the smoke on my engines using the Cab-2 controller, it comes back on as soon as I start the engine again. How can I keep it shut off?

There are 2 ways to start your engines. If you use the start up using the Start Up icon , the smoke unit will reset and begin smoking again . If you use the AUX-1 button to start up your engine the smoke unit will remain off.

How do I control my engines smoke in TMCC or Cab-1 mode?

In TMCC mode the smoke Icons will be the “-“ and “+” signs on the numeric (lower) touchpad. In Cab-1mode they will be 8 and 9 on the numeric (lower) touchpad

What is the Red LED under the speed button on the Cab-2?

It comes on to indicate the Cab-2 has lost communication to the base.

Is there any difference in RS or RS5 in Legacy setup?

The difference is the icon set that will show on the touchscreen, there are no added features when running a Railsounds engine as Railsounds 5.

My engine is not shutting down using AUX1+5, what's wrong?

The Legacy controller does have startup and shutdown icons that work with almost everything. Just press the ENG softkey and then press the black icon with the cross going through it (the one to the right of the power icon on the bottom of the touchscreen) when you press this and the mode is not legacy it will send an AUX1+5 for you!

Steam locomotive FAQ's

I am trying to figure out how to sound the air-horn on the steam locos that have both whistle and air-horn while using the Legacy controller. Examples being my Lionel Cab Forward, GS2 Daylight, and N.Y. Niagara

What you do is use the STEAM type in the info menu. and TMCC for control system. The icon that is in the #6 position is a "blow down icon" That will enable your City horn. The icon will be incorrect for these three steamers with the city horn. We will let you know when a memory module for those 3 specific TMCC locomotives will be available.

In the meantime, just use the steam type in your engine settings and press the 6 position for the city horn.

Electric engine FAQ's

Running the Acela, or GG1

1. Lionel will have an "electric" control panel just for these engines in the near future. Try the "diesel" one for now. If that doesn't work, you will need to go to Cab-1 mode and the old Cab-1 commands will work.
2. Using the Acela in Legacy mode, AUX1, F opens the left doors as it is supposed to. AUX2 closes the left doors. Also AUX1, R opens the right doors. AUX1, Horn toggled between city horn and country horn.

TMCC Engine FAQ's

What else does Legacy do for older TMCC engines?

1. Momentum for much smoother operation absolute speeds for very accurate control vs. relative with Cab-1
2. Train Brake for more control.
3. Speed Graph for accurate speed monitoring
4. Address by Road Number, Name, toggle or TMCC ID#
5. Perfect speed control in multiple unit lashups with powered B units (never lose sync, always perfect)
6. Official Railroad Speeds

Using creative manipulation of the momentum and brake features, your TMCC 1 engines will wake up to a new level of precise control.

My K-Line, (and other) trains have TMCC but no cruise, what Control Type should I use?

You can use TMCC mode if you do not have a cruise control system. Set the speed steps to 32.

TMCC engines and Legacy:

To get the smoothest acceleration from a TMCC engine with Legacy, set the control type to TMCC in the info menu, then set the momentum to a High level. That may be the "H" button or the "M" button. Hold down the "M" button and tune it in to the momentum you would like preset for "M" by turning the Velocity throttle. Address your TMCC engine, turn the target line way up to more than half and watch how smooth it is.

My Pullmor engine has TMCC What Control Type should I use

Any TMCC engine can be run in TMCC or Cab-1 mode. For those engines with 128 or 256 speed steps your choice would be dependant whether you want to set them up in 31 speed step mode or utilize the 128 or higher speed steps.

To utilize those higher steps (because they deviated from the Lionel specifications), it must be in Cab-1 mode. If you are willing to set your engine to 31 speed steps you can utilize the TMCC mode. You can set an engine as Cab-1 but then select RAILSOUNDS 5, the result is Cab-1 control with railsounds touchscreen icons

Any suggestions to make our Pullmor engines run nicely under Legacy?

With Pullmors that are lubricated and broken in use momentum setting of M 5 or 6,. You will also want to set a low stall threshold (Page 21) to improve performance.

I have an engine that has TMCC but no cruise system, what settings should I use?

Using TMCC mode will be the best way to go. Use the generic diesel module to configure this loco.

Third party cruise systems FAQ's

What are the basic guidelines for Third party cruise systems?

1. If you have a cruise and it is set to 32 step, use TM1 mode and RS
2. If you want more than 32 steps use Cab-1 and RS

I have TMCC/EOB engines, TMCC/K-LINE Cruise engines. What is the proper setting for these?

3. If you wish higher speed steps, 128 or 256, then you must use "Cab1" and "RS".
4. If you place the K-Line locos w/ Cruise in 32 speed step mode, you can also use the "TM1" and "RS" selection

With the new Legacy, would I be able to control K-line TMCC locos, or would I have to modify anything?

No modification required. Some units with speed control like EOB and K-Line cruise use relative steps so Cab-1 mode is required for them. Just dial it in that way for those engines in their INFO menus.

Cruise Commander

1. The Cruise Commander intentionally does not respond to Step 1, the lighting features are designed to come on in step 1, and motion in step 2. This allows ditch lights to be activated before roll out.
2. None of the Aftermarket upgrades can respond to Legacy mode, as the R2LC does not support the extended protocol for 200 speed steps. The TM1 mode, when the upgrades are in 32 speed step mode will run fine, (questionable value, as the reason we have the upgrades is for having 100 or more speed steps).
3. The best experience for upgrades is "Cab-1" mode. If you are fine with 32 speed steps, then TM1 mode is fine. When appropriate, I will conform the Cruise Commander to Legacy protocol.

How about the Beep with ERR's Beep TMCC

All ElectricRR products come with a 32 speed step mode (Standard or Cruise), and you can use TM1 when set to 32 speed steps. The Ac/Dc Commander has a jumper setting that will allow 200 speed steps w/ Legacy control when upgrade kits are available/used.

I have a Atlas C630 that under TMCC runs great. I have now hooked up Legacy and this engine was running very weird.

1. Set up your engine in Legacy
2. Address it by its ID
3. Press info
4. Choose "insert mem mod" insert the TMCC Generic module

Make sure your EOB is set to 32 steps.

TPC (300/400) FAQ's

How do I connect a TPC (300/400) to the Legacy unit?

The TPC can be connected to the Legacy using the Y Cable as shown on page 59 in the manual. The TPC goes where the device labeled TMCC controller is shown.

I'm still not sure, any pictures of how to set it up?

Don Breslauer has taken some pictures of how to set up a TPC with Legacy. The pictures can be seen here <http://www.legacyinfo.net/tpc/index.html>

Here are his comments

Picture 1 The red and black wires go to the track, green wire goes to the "U" post on the Legacy base. COM and DAT are from the data Cable that is connected to the SERIAL connection on the "Y".

Picture 2 Note that there is no wire on the "U" Connection of the Base-1, only the "U" on the LEGACY base.

Picture 3 I've added my TPC 400 to the DB in Legacy, so when I call up TR1, I see this on the handheld the red wheel now controls track power.

Note: The U (common) wire runs from the Legacy to the TPC and then to the track

Using Legacy and MTH's DCS FAQ's

1. At this time DCS will not control Legacy features.
2. Run the DCS and Legacy system without a serial interconnect
3. The two systems are compatible. They operate simultaneously on the same track.
4. Legacy features can NOT be accessed from the DCS remote. DCS 4.0 will NOT control the Legacy quilling horn or other Legacy features. In short, DCS still requires a TMCC Base to run TMCC and will only run TMCC features BUT if you are using Legacy then do not use DCS to control the TMCC1 base. This will cause issues with both systems. See #6.

Best advice so far: Run PS2 engines with the DCS remote and run TMCC and Legacy engines with the Legacy remote.

The DCS TIU needs to be disconnected serially from the TMCC1 Base. You can not at this point run TMCC through DCS if you want to use Legacy until a fix is found.

Barry Broskowitz has been working on getting DCS, TMCC and Legacy to work together and has reported great success. The details of his work can be seen here;

<http://ogaugerr.infopop.cc/eve/forums/a/tpc/f/93360682/m/3821099654>

TMCC Accessories FAQ's

How do I set up my TMCC Crane?

The proper configuration for the crane is; type = other, control = Cab1, sounds = none.

By selecting NO sounds will give you a number pad instead of the generic rail sounds pad, which doesn't quite work with the crane.

How do I set up my TMCC accessories?

The proper configuration for the TMCC Accessories is; type = other, control = Cab1, sounds = none.

How can I use my Action Recorder Controller (6-14181) with the Cab-2/Legacy?

If you want to make a recording with a Legacy locomotive you can change the control type to Cab-1 or TMCC and run the Legacy locomotive that way. These commands are 'traditional' and will work with the ARC. At this time the ARC does not recognize the Legacy command set

Troubleshooting

I need to reload my Legacy system, how do I do it?

The blue modules that came with your set can be used to reload your software. The following process is to perform a system update. Using the 1.0 (Blue) modules it will ensure the software is loaded correctly.

For the Cab-2, insert the Cab1.0 module into the remote when it is off. Hold SET and power up the remote. The red light will start flashing quickly. This process takes about 45 seconds.

For the base, insert the Base1.0 module into the base when its off. Hold the channel select button and plug in the base. The yellow light will start flashing quickly. This process also takes about 45 seconds.

You don't have to hold the button once the update starts. Also note this clears the memory on both remote and base - All your engines will be gone and the set will default to channel one.

As for the problem of losing engines/info, this is usually caused by a problem with the memory chip in the base.. If the update process seems to bring everything back, try loading the train module again. If it is successful, cycle the power on the base and make sure the train name is still shown. This will verify that the on board memory is working.

How can I check feedback operation

I just found out a way you may be able to tell if your FEEDBACK is working properly... found this by accident while playing around tonight...

Get your engine running and set the Target Bar about the middle (or speed step "medium") .. then set the Train Brake below (to the left) of the Target Bar and let the train speed (Gray Bar) reach the Train Brake indicator.. it won't go any faster .. now press and HOLD the BOOST .. FEEDBACK on my Cab-2 was constant as long as I held the boost. release the BOOST and it stops vibrating press it again and viola!! Instant feedback...along with some really intense labored chuffing

How to verify that base channel select is functional

1. Power down the remote by holding the power button for 3 seconds. If the remote will not shut off you can use the button on the back (should not be necessary, remote power off sequence should work independent of base)
2. Unplug the base and wait 10 seconds.
3. Plug in the base and observe the 3 lights on the top of the base. First you will see all 3 lights flash on and off at the same time very quickly (GREEN, YELLOW and RED). Then, a few seconds later you will see the YELLOW and then the RED light come on for 1 or two seconds and then go off. This completes the initialization sequence.
4. Press the base channel select button. The yellow light will blink the channel. Observe this, is it what you expected it to be?
5. Regardless of current channel, select a new one by pressing the button again.
6. Power up the remote and scan for bases, did it find the base on the channel you expected?
7. Regardless of results, power down remote again and change the base to the next channel with the button as before.

8. Power up the remote and scan for bases, did it find the base on the new channel as expected?

9. Finally, power down remote and set base to desired channel. Power up remote and play with your trains!

How does the Radio Link Warning Light (RLWL) work?

This is how it works,
If the command fails it will turn on.
If the command passes it will turn off.

The remote and base have a bi-directional communication link. If you see a quick flash of the light you are seeing one command fail and the next command pass.

If you receive a 'timeout check base' message or if the red light stay solid, this means that the communication failed and information/commands were lost. If you get this error you should be concerned.

If you are in line of sight with the base, under 30 feet, you should not experience any red lights. As you reported, even with a red light or two, control is not completely lost.

Fun Things to try:

1. Have you tried setting the "Medium" Momentum to different levels by choosing 2 3 4 5 or 6 ? Hold the M button down and scroll with velocity throttle.
2. With RR speeds, Try the Roll button for slowest available speed
3. Try this with your Big Boy:
Set momentum at medium or high.
Set Train Brake to almost full.
Start er up.
Check out the heavy laboring.

Stop your engine

Leave momentum the same

Remove the Train Brake

Press the speed bar to get the RR speed page

Press the ROLL button (bottom center) on the Touchscreen to start er up.

Check out the light labored start

4. If the Train Brake is set to limit the speed to say 50%, you can use the Velocity Throttle to control the laboring sounds WITHOUT changing the speed? Just move the target line to max and listen, then back it off.
5. Is anyone using the independent engine brake with FEEDBACK turned on? Try it with High or High/medium momentum. What do you think of this control feature that allows you to stop on a dime quickly or slowly and prototypically, depending on how far you pull the multicontroller down?

See Legacy in action

Norm Charbonneau has posted several videos of Legacy in action, if you can avoid staring at his layout, it is a great to see the trains operating under Legacy.

<http://norm.beesky.com/video/FA2-1.wmv>

<http://norm.beesky.com/video/FA2-2.wmv>

<http://norm.beesky.com/video/Veranda1sm.wmv>

<http://norm.beesky.com/video/Allegheny1.wmv>

<http://norm.beesky.com/video/Allegheny2.wmv>

<http://norm.beesky.com/video/BigBoy1.wmv>

<http://norm.beesky.com/video/BigBoy2.wmv>

<http://norm.beesky.com/video/BigBoy3.wmv>

<http://norm.beesky.com/video/BigBoyGP30.wmv>

Marty E has quite a few videos worth checking out

<http://video.google.com/videoplay?docid=1319447695670523828&hl=en>

<http://www.martye.com/Videos/606j2.wmv>

<http://www.martye.com/Videos/606j1.wmv>

<http://www.martye.com/Videos/606j3.wmv>