1

Building A Layout: Controlling Layout Lighting with an MTH AIU

As the installation and use of DCS (and TMCC) becomes more and more prolific on our O gauge layouts, I am continually amazed at how many of these same creators of dazzling train empires willingly put down their DCS remote just to pick up some other kind of remote or manually manipulate toggle switches just to show off the lovely lighting effects on their layouts.

Ladies and gentlemen, that is a completely redundant effort, and is totally unnecessary to do! Not to mention the fact that use of the word "redundant" when it comes to lighting means (to me anyway) that you just nearly doubled your tedious electrical wiring efforts for no good reason. Those of you who use the MTH DCS system to control your trains for some reason miss the fact that the AIU (the *Accessory Interface Unit*) of the DCS system is already there, ready and waiting to manage your layout's lighting effects as well, without the addition of any other method of controlling lights on your layout at all.

With the DCS system, a TIU (*Track Interface Unit*) with the addition of a single AIU allows the operator to control the function of 10 track switches and 10 accessory functions. Due to the flexibility of the DCS system, it is possible to use as many as five AIUs together daisy chained from one TIU. Mathematically, that makes it possible to control up to 50 track switches and 50 accessories from one TIU. If that isn't enough, the DCS system still has the additional capacity to operate as many as five TIUs on one layout. The mind-boggling truth is that the DCS system can handle up to 250 track switches and 250 accessory connections—all controlled by a single remote!

Now it is quite obvious that one person trying to control a layout that complicated with one remote would far exceed the definition of fun. I point this out only to underline the fact that the DCS system has *room* to individually control what nearly anyone could ever want, and most of us maybe never even thought of doing. It also has the ability to control groupings of scenes or sets of action together, which greatly simplifies things for the operator, too (more about this later in the article).

Here's an example. I've traveled and photographed many layouts over the years, and one thing I've noticed is that nearly every layout has a greater need for switch controls that they do for accessory controls. That means that regardless of how many AIUs you employ to handle the track switches, you will probably have an abundance of unused, extra accessory control ports available to you. Why not use those extra accessory ports to manage your layout's lighting in a spectacular way? Spectacular means that you can not only use the DCS remote to turn your layout lights on and off, but you can also use the DCS system to preprogram certain sequences of lights that you wish to turn on and off depending on


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time allotted for evening and night scenes. Some of you may already know that you can preset the AIU's sequence of operating track switches, but did you know that you can use the same method for sequentially controlling the turning on and/or off of layout lighting, as well? It's relatively easy to use the AIU to program your own preferred sequence of illuminating or turning out those lights to create easy, progressive night scenes.

My late friend Barry Broskowitz published a definitive book on how to best use the DCS system titled *The DCS O Gauge Companion* that he researched and continually developed over the years for layout operators. If you don't have access to a copy of his book, it is available from CreateSpace Independent Publishing Platform for about $36.00 (ISBN:9781517374396). It is well worth the investment to have this handbook on the DCS System.

In this book Barry points out that it is very easy to add individual accessories into the system, complete with their own names showing up on the screen of the operator's DCS remote. My thinking is, why not group together lights from building backdrops? As long as you limit the number of watts per group to 60 or 80 watts per accessory channel, you are well within the limits of the electrical relay. If you figure that a grain-of-wheat light bulb (like the one shown in photo 5) is about one half to one watt per bulb, there is certainly less than 80 watts worth of electricity flowing in one group of buildings. All you need to do is to give some name to a set of buildings and control them through a port in the AIU. On my layout I've got 50+ track switches, so that means I'm using five AIUs to control the switches. That also means that I've got 50 accessory ports as well. I should be able to control any lighting combination I can imagine!

That's my own standard: not to exceed 80 watts per relay loading in the AIU, even though the MTH personnel tell me that the individual relays in the AIU can handle a higher loading than that. I prefer to error on the side of caution, and limit the loading to only 80 watts or less per accessory port. If you consider that grain-of-wheat bulb in photo 5, that means you can hook up at least 100 or so bulbs without causing any undue strain on the relays in a single accessory port in the AIU.

Photo 1 at the beginning of this article shows an array of building fronts being used as a scenic backdrop on part of my layout. In Photo 2, look what a difference it makes when you remove those 10 or 11 Ameri-Towne building fronts (or backs)! My friend (and expert O gauge layout modeler) Bill Bramlage has shown me how to build groups of building flats together as a single module (as shown in Photo 3). Photo 4 shows the same three buildings, but from the back side with all the lights and wires installed right at your workbench, before you even take it into the layout.

Note in Photo 5 how carefully he locates the light bulb. Bill points out to make sure that you don't let the bulb touch the window material or the venetian blind graphic material either. Note also that he sparingly uses those grain-of-wheat light bulbs mounted above only certain windows. Note that there are only six or eight bulbs total randomly mounted in the windows of the 3-building module. Adding subtle lighting sparsely is all that's needed to create the effect of a well-lighted building.

Another one of Bill's favorite tricks is to bring all the bulb wires together down to a short piece of N gauge track and use that for a solder buss bar for all the lighting in the module. Then he attaches only one pair of wires from the N gauge track buss bars


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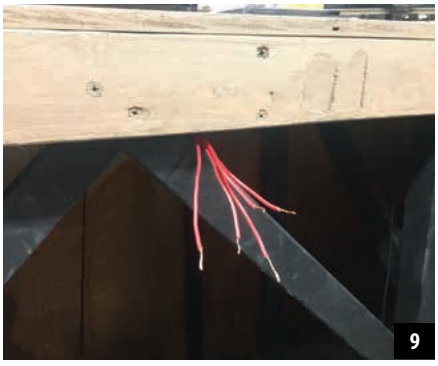

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down through a hole drilled in the bottom of the module frame. I add a strain relief knot (Photo 6) in the wire to keep the wire from pulling on the tiny gentle wires or the N gauge buss bars inside the module.

It should be noted that there are many more tips from Bill about how he makes lighted building front flats, so look for his article elsewhere in this issue for greater details on how he accomplishes these modeling tricks.

The end result is a single pair of wires coming out of the bottom of the module and going through the table. Seen in Photo 7 is the finished module installed at the back of the layout up against the wall. Four additional modules are installed to finish out the back wall as shown in Photo 8.

Here's a real modeler's time saver tip: make that single pair of wires extending from the bottom of each building module at least as long as you need to get through the surface of the train table and reach all the way out to the front edge of the train layout (Photo 9). That will allow you to make all your connections from an easy access position outside your layout at the front edge. It's always so much easier to make electrical wiring on your layout from the comfort of a chair out in the train room instead of crawling under the layout to work on wiring overhead.

In my case, each of the modules has one red wire and one black wire coming from the module. All the black wires are joined together and attached to a single AC(-) or Common bus wire running under the table that connects to the AC(-) or Common posts on all transformers on the layout. The result is that half the wiring for each and every accessory requires only one wire to get to the transformer's AC+ or Supply wire. Each AC- or Common wire runs only from the accessory to the nearest AC Common buss wire under the table.

Photo 10 shows an AIU or *Accessory Interface Unit*. As we discussed before, each AIU has ports for ten track switches and ten accessory ports. If you ever wanted to know what's inside an AIU, take a look at Photo 11. It shows you that the contents consist of many different relays, all soldered to a motherboard allowing you to control each and every one of them from your DCS remote.

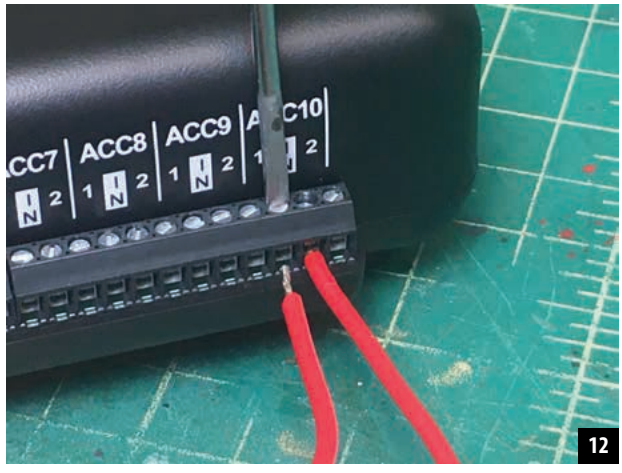
Photo 12 shows that two wires go to each port for an accessory. One is an AC+ supply wire, which comes from the transformer to the AIU, with the accessory voltage you are going to use for what you want to operate. The other wire goes from the AIU to the accessory. In the photo, the supply wire from the transformer is connected to the IN terminal port on the AIU, and the wire going from the AIU to the accessory is connected to the 1 terminal port. In the photo, both of these terminal ports are at ACC10, or accessory port #10, of this AIU. The booklet that comes with the AIU will tell you how to make these connections and how and when to insert the name of the accessory into the DCS remote.

Depending on the size of your layout, you may need to only control one or two accessory ports to turn on all your lighting accessories. If you need more than that, or if you want to use more than just two to be able to turn on some lights at different times than others, then you can easily set up something called a *Scene* in DCS. Setting up a *Scene* simplifies turning on many things at the same time by teaching the system to control many different accessory controls with the simple touch of just one button on the remote. Using the *Scene* command will let you possibly control all the background lighting, all the building lighting, and all the accessory lighting—all from a single one-button command, if desired.

On my layout, I may end up using 30 or more accessory ports, which will allow me to create a progressive lighting scene by grouping buildings all over the layout in small bunches. That will allow me to teach the system the use of the *Scene* command to progressively light up the whole evening scene gradually, building by building, until all the lights are eventually on.

The details on how to make this happen with the AIU are in the booklet that comes with the AIU and also with Barry's book. It involves first connecting all individual lighting groups as we just detailed above, then setting up a *Scene* command on a single key of the AIU that will group all the lighting effects you have already added into the system. From that time on, a single press of the scene key for that single scene will sequentially light up your whole layout.

Ironically, that's how "more complicated" gets to be "more simple"!



12