märklin DIGITAL CLUB

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Current Central Station 2 Version – 4.1.0 ***(watch for a new update in April)***
Current Mobile Station 2 Version – 2.5

We've attended the "Rocky Mountain Train Show" and would like to thank those of you who attended, and stopped by to say hello and ask a few questions. We're happy that people took the time to visit the booth.

We are eagerly awaiting a new Central Station 3 to review, and look forward to sharing our thoughts with you as we explore the new features.

MFX Locomotive Not Registering

We've heard now and then an MFX locomotive has trouble registering on a Central Station 2 (CS2). We occasionally have the same issue.

One thing we've noticed is the CS2 has put the locomotive in the "All" category of the locomotive inventory screen. This is a little confusing because the default screen on the CS2 is the "Last used" category. (Fig. 1)

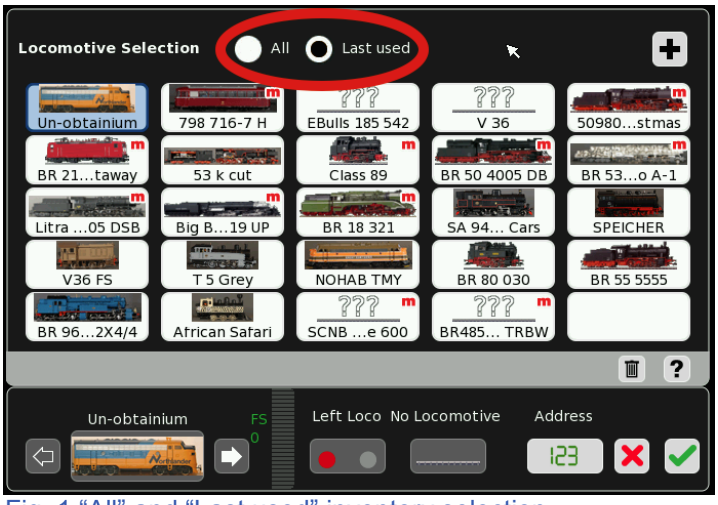


Fig. 1 "All" and "Last used" inventory selection

While we've heard some theories as to why an MFX locomotive doesn't register, we haven't found a definite solution to the problem. If a locomotive won't register, we suggest the following:

1. Make sure your CS2 is up to date.
2. Check the "All" category of the inventory screen to see if the locomotive is registered.
3. Try the layout track and the programming track to register the locomotive.

Picking up from the last newsletter, I will continue on with the basic CS2 setup.

Central Station 2 Basics

Decoder Adjustments

Now that locomotives are entered, it is a good time to enhance the running characteristics. In this section the Acceleration/Braking Delay, the Top Speed and editing the Digital Address will be explained. This can be a little confusing to some that have tried it because it seems that some adjustments work correctly after modifications are made and some don't. This has to do with the type of decoder that is in the locomotive.

Below are the different types of decoders:

Delta – no adjustments - except address
6080 – no adjustments - except address
6090 – no adjustments - except address
6090x – adjustments on the decoder
Fx – adjustments via Configuration Variables (CVs)
MFX/MFX+ adjustments via CS2/MS2 on screen adjustments or CVs

Adjusting 6090x decoders

The first decoders that have adjustments are the 6090x series of decoders. These are adjusted by physically turning the onboard potentiometer (pot). This requires access to the decoder inside the locomotive (Fig. 2).

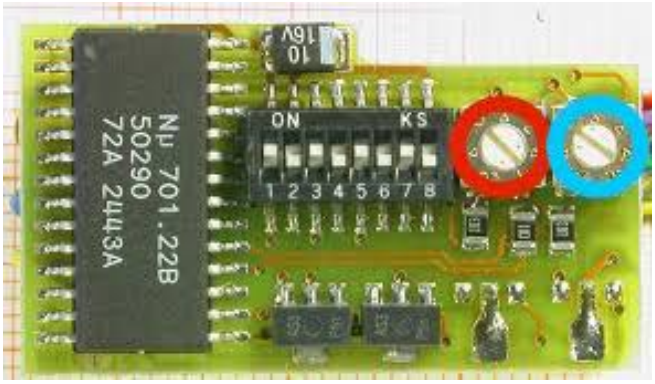


Fig. 2 Märklin 6090x decoder with pots circled

The left pot (red) will control the Acceleration/Braking Delay (ABV). This adjustment determines how far the locomotive will travel before it gets to the set speed and also how far it will travel until it comes to a full stop. Turn the pot clockwise for faster acceleration and braking, and turn counter-clockwise for slower.

The right pot (blue) is for setting the Top Speed. Turn the pot clockwise for a higher top speed and turn counter-clockwise for a lower top speed. The digital address is set with the dipswitches.

Adjusting Fx Decoders

The Fx decoders don't have dipswitches or pots. These must be adjusted with the CVs.

Find the locomotive in the inventory and select it. Once the locomotive is loaded on the Control Screen, place the locomotive on the Programming Track. There must not be any other digital locomotives or accessories connected to the programming track.

To edit the locomotive, click on the wrench image. This will take you to the page that is almost identical to the "Enter Locomotive" page.

From here touch, the CV access box. 

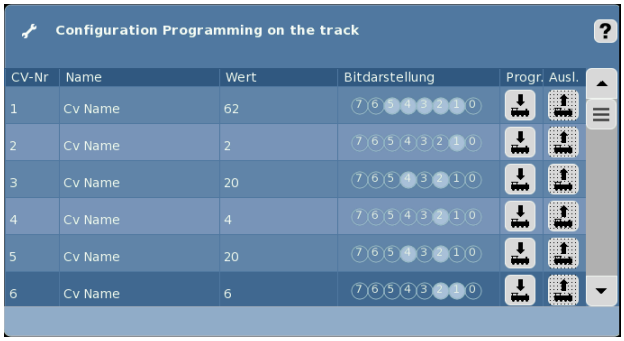


Fig. 3 CV screen for Fx decoders

This is where the locomotive characteristics are edited. It's important to note that only 1,3 and 5 should be adjusted (Fig. 3).

Editing the Address

CV 1 is the digital address. If the address needs to be changed to something that is easier to remember or if there is an address conflict, then this is where it can be changed.

The adjustable range is from 1-80 only. Just touch the box where the value is in row 1 (column "Wert") and a "+" or "–" will pop up. Press the "+" or "-" to change the number or if you like, press the number again and a keyboard will pop up. Make your adjustment then touch the green check mark to save the value in the CS2. If either a "+" or "–" were used then there is no green check mark; the value is input already.

Don't forget to edit the address in the Locomotive Configuration screen on the CS2 later. Basically you need to tell the CS2 what address to transmit the information on. I will cover that process later in this article.

Editing the Acceleration/ Braking Delay

CV 3 is the ABV. This setting will affect both the Acceleration and the Braking delay simultaneously – there is no way to adjust them individually. Touch the box with the number and set it to your desired value. This will most likely take a few tries to get it to your liking. The adjustable range is from 1-63. Press the green check mark in the pop-up screen to enter the ABV value into the CS2.

Editing the Top Speed

CV 5 adjusts the Top Speed. Many children run trains like they are slot cars, but some locomotives with the right weight and speed will roll off the track on a R-1 curve. The Top Speed can be lowered for those with "lead fingers".

Touch the box with the number in row 5 and set the value to your desired number. This will most likely take a few tries to get it to your liking. The adjustable range is from 1-63 also. Press green check mark in the pop-up screen to enter the address into the CS2.


Fig. 4

Once all of the changes have been made, they need to be written to the decoder in the locomotive. Press the image of the locomotive with the down arrow to write to the decoder (Fig 4).

Note: The lights will blink while the information is being transferred.

Edit Address in the CS2

If an address change has been made to the Fx decoder, the CS2 needs to be told what address it should transmit command information on.

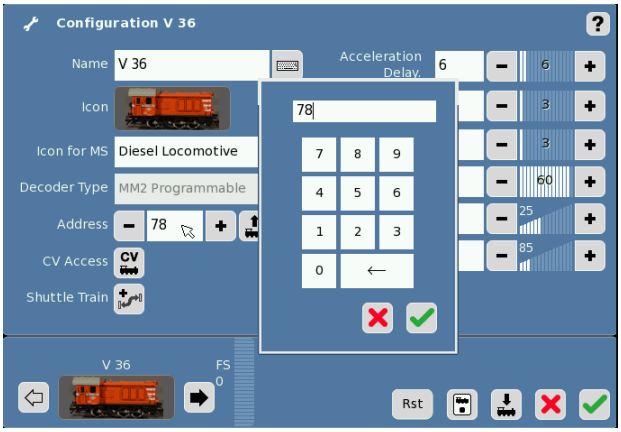


Fig. 5 Locomotive Configuration screen

From the Locomotive Configuration screen, touch the number in the “Address” box and a pop-up window will open (Fig.5). Set the number to the address that was entered in the CV Edit screen and touch the green check mark. Now save the changes by touching the green check mark again and the process is complete.

Editing an MFX/MFX+ Decoder

Because an MFX decoder communicates with the CS2, some decoder modifications can be done in the locomotive configuration screen (Fig 6).

In the Configuration Screen of an MFX decoder all of the parameters are editable, although I believe that the volume was not for early MFX decoders. I say this because I have been able to adjust the volume in certain MFX locomotives with sound and not others.

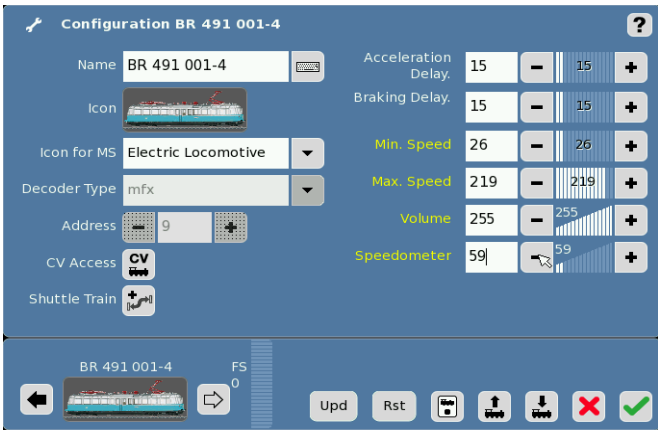


Fig. 6 Yellow text signifies unsaved changes

When a value is changed the text will turn yellow signifying that a change has been made but not saved. This does not apply to the ABV settings. This is because the CS2 has feedback from the decoder. It will accelerate or slow a locomotive by these settings as opposed to the on board settings in the other types of decoders.

Speedometer Adjustment

Now that there’s a basic understanding of how to edit the parameters for a locomotive, there is one explanation left to cover, the “Speedometer”. The Speedometer is the round speed indicator on the Locomotive Control screen (Fig. 7).

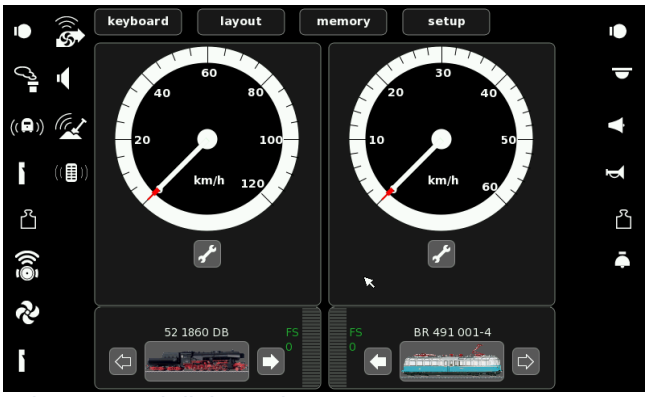


Fig. 7 Speed dials on the CS2

The value in the configuration screen for the Speedometer is the top speed on the dial in kilometers per hour (km/h).

This value can be set to represent the top speed of the locomotive. Many of the locomotive manuals have the top speed information in them at the beginning when it describes the prototype. Basically, if the top speed of a locomotive is 85 km/h, set the speedometer to 85 on the configuration screen.

ABV / Speedometer Representation

This is a little tricky to explain. When the ABV function is “on”, the speed dial will slowly speed up and slow down to give the user a visual representation of the locomotive speed during the Acceleration/ Braking Delay. The CS2 looks at this in two ways; non MFX decoders and MFX decoders.

A non-MFX decoder (Delta, 6090, 6090x, Fx decoders) has no feedback from the decoder so the CS2 doesn’t know how fast the locomotive is actually traveling. Therefore the CS2 doesn’t know how fast or slow it should move the needle on the dial. The CS2 must use the settings that are input for both the Acceleration and the Braking Delay on the Locomotive Edit screen. The numbers that are input tell the CS2 how fast or slow to move the needle on the dial. This is only a visual representation for the user. Any changes to these values do not affect the ABV of the locomotive; they only speed up or slow down the movement of the needle on the dial.

For an MFX decoder, there is feedback to the CS2. The CS2 will read the voltage that the motor is drawing and adjust the dial to the locomotive as a visual reference. This is why the ABV is editable on MFX locomotives in the locomotive configuration screen.

Distance Signal Programming Update

I’ve been taking questions about the new MFX light signals. At the time of my first article I didn’t have a signal with distance to test. I have added some instructions below to the help with the setup of the distance signals. I want to express my thanks to Scott Housman of Helmut’s Hobby Specialties for his questions and research on this.

The new Color Light signals (76495/96/97) that have a distance signal on the mast have caused a little confusion in the set-up. The signals must be in sequential order with their addresses. For example, a simple block signal with distance is set up on address 15. The next signal that is set up must be set to address 16. The distance signal on the mast of the simple block will respond to address 16 as does the next signal.

To set the distance signal so that it will show the correct aspects, you must set the Configuration Variables (CVs) to the correct setting. In other words, a distance signal will not show green/yellow (prepare to proceed slowly) if the next signal that it is associated with cannot show green/yellow (proceed slowly) aspect.

Connect the signal with distance to the programming track and get into the CVs on the “Configuration” page. Under “Typ Vors. Mast”, select the correct type of signal that is associated with the distance signal (Fig. 1).

Kein Signal – No Signal
Blocksignal – Block Signal
Einfahrsignal – Entry Signal
Ausfahrsignal – Exit signal

Save the changes with the green check mark and the setup is complete.

Enjoy your hobbies!
Rick Sinclair

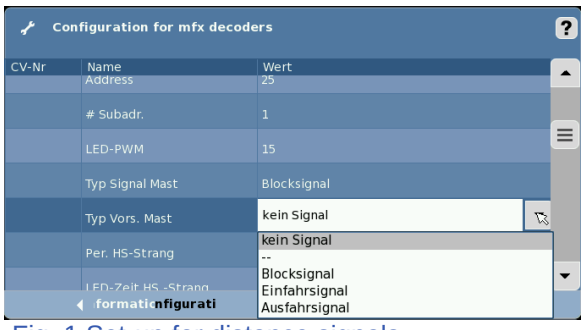


Fig. 1 Set-up for distance signals

A Guide to the Central Station 2's Memory Tab, Part 2

(CS software version 4.0 or greater)

In my last article, I began instruction on how to use basic Memory tab scripting to activate a sequence of events. The event sequences can be a set order of locomotive commands, a turnout sequence or any event that is usually controlled by the Central Station 2. For our users with Mobile Stations only, I regret that memory capabilities do not apply.

In this issue, I will complete my instruction on the uses of the Memory tab by going into detail about the elements found in the Configuration memory panel located at the bottom of the Memory tab edit screen. The primary topic of this issue is setting up your Central Station 2 to activate memory scripts automatically using feedback sensors located within your layout (See Digital Newsletter 2/2015).

The Configuration memory panel

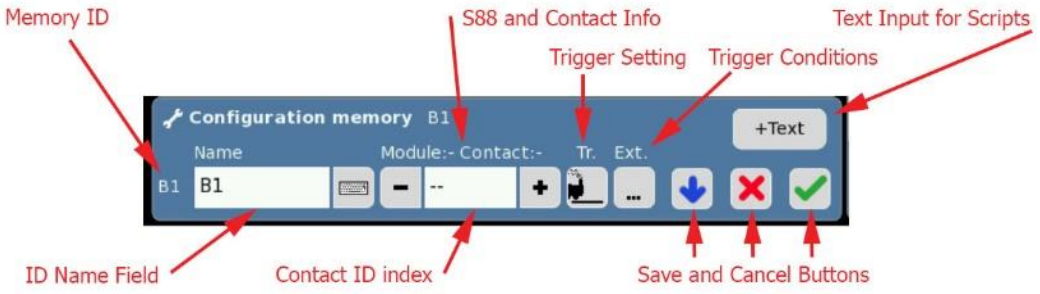


Fig. 1 - Controls for Configuration memory panel

The Configuration memory panel contains the control settings listed in red in Fig. 1 I will explain the specifics of use for the more advanced sections in this panel. Namely the S88 and Contact Info, the Contact ID index, Trigger Setting and Trigger Conditions. The Memory ID, ID Name and Save/Cancel Buttons are commonly used in other sections of the CS2 and will not be covered (at least in depth). The Text Input for Scripts was used and explained in my last article.

Memory ID and ID Name Field

The Memory ID is the default identifier of the memory slot currently being edited. In the example illustrated in Fig. 1, the ID and ID Name is both "B1". If you edit the name of this slot, the name will be displayed (instead of the ID) in the Memory tab page. However, the Memory ID will remain the same and can be identified in the panel.

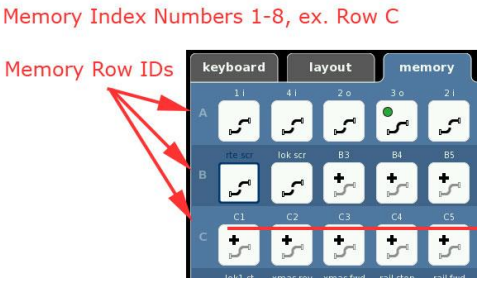


Fig. 2 - Memory ID indexes explained

Fig. 2 shows how the Memory IDs are configured. The alpha index (letters) will indicate the row where the slot is located. There are upper case and lower case row indexes. The numeric index will indicate the slot's position within that row. There are only 8 memory slots per row.

Module and Contact Settings

The Module and Contact information fields are the input settings needed when wiring your layout with feedback sensors. These sensors are then connected to S88 feedback modules which communicate with the CS2. Without these sensor settings, you will not be able to activate any automated scripts.

Feedback sensor identification can be either stated as an indexed number or as Module/Contact numbers. Entering an S88 ID will be set as an indexed number, but the Central Station will more clearly identify the number as the Module and Contact ID. (See Fig. 5.) Each module will hold 16 sensors. To identify the index number for the 5th sensor connection on the 3rd S88, you will need to add 5, to the total connection points from previously connected S88s. We are dealing with the 3rd S88, so there would be 2 prior S88s with 16 inputs each. Therefore, the math would look like (2x16) + 5 = 37. The proper index number would be 37.

Setting the Contact ID index can be tricky to do, however it is easy to correct for when using the S88 and contact info ("Module: - Contact: -"), when the index is set. The ID index only uses numbers for entry. The numbers used are related to one of the 16 inputs found on an S88 feedback module.

Understanding Track Feedback

Before I explain how to use the Trigger Settings and Trigger Conditions, I should first explain how the CS2 detects information via track feedback. The Central Station 2 can interpret four track conditions that occur on your layout. Two of them are stable and two of them are transitional. The four conditions are: Unoccupied (stable), entry point (transition), occupied (stable) and exit point (transition).

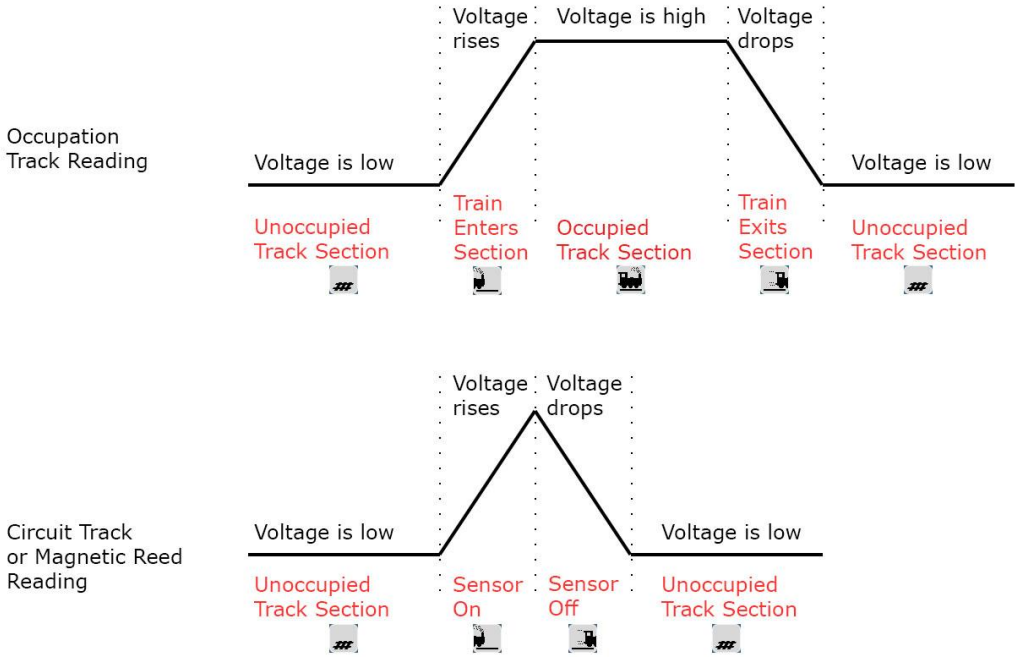


Fig. 3 - Central Station and S88 track sensor conditions

To better understand these conditions, consider each state as a voltage reading. The unoccupied condition starts out as a 0 voltage reference. This voltage doesn't alter, so it is considered a stable state. The entry point will detect the rise in voltage when a connection is first made (like turning on a light switch). In this instance, the voltage is rising from 0 V to a high voltage measurement, in other words, it is transitioning from 0 volts to 15 volts. The occupied voltage can be detected as a high voltage reading. Finally, the exit point will detect the drop in voltage, when the voltage returns back to 0 volts. Fig. 3 illustrates the differences in detection compared to what the voltage is doing on the track.

These four conditions are ideally suited for use with track occupation type sensors and can be examined in the upper graph of Fig. 3 – "Occupation Track Reading". The lower graph, illustrates the voltage representation when using Circuit Tracks or Magnetic Reed sensors. These types of sensors activate the on and off transitions together and have no time for the CS2 to register an occupational state.

Track Feedback Conditions in the Central Station 2

At the bottom of each example in Fig. 3 you can see the icons that are used in the CS2 that are associated with each condition. The two transition conditions (entry and exit points) are initially set under the Trigger Setting ("Tr."). The two stable conditions (occupied and unoccupied) can only be utilized in the Trigger Conditions ("Ext.") section of the Memory section. (See Fig. 1). I'll get back to the "Ext." controls later in this article.

Automated Scripts: Creating an Automated Staging Yard

Creating an automated staging yard in the CS2 can be a complex collection of memory scripts, but it is an ideal example to show how all the conditions in the CS2 can be used for layout automation. The basic concept for a staging yard is to have a multi-line yard where one train enters a yard, while an alternate train leaves the yard. I will use the 2-line yard layout illustrated in Fig. 4. It indicates the turnout number ("T4"), the location and ID numbers for the S88 feedback sensors (6, 7 & 5), and the Signal Lights which will identify the track status of the train on the yard line.

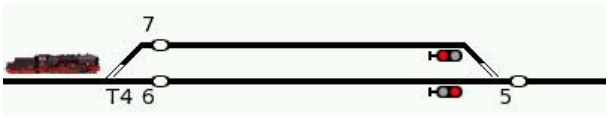


Fig. 4 - Staging yard sample

Script 1

The first script to write will be the entry point script where a train will enter line 1 (bottom) of the 2 line yard. The event trigger is set to be an entry point trigger, where the script is activated when the train makes contact with Contact ID #6. Note that the contact icon has turned to yellow, indicating that it is now active. The scripted action to take place is the block signal on line 2 being set to "go". This is the script event and will result in line 2 being cleared of occupancy, because the occupying train is being released (train not shown) in Fig. 5.

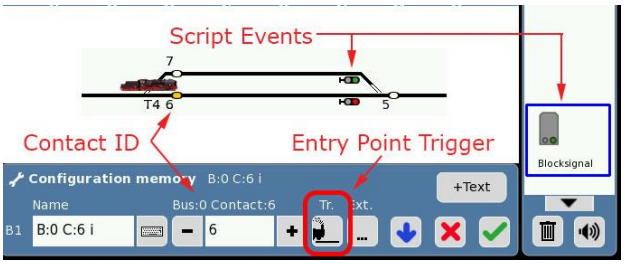
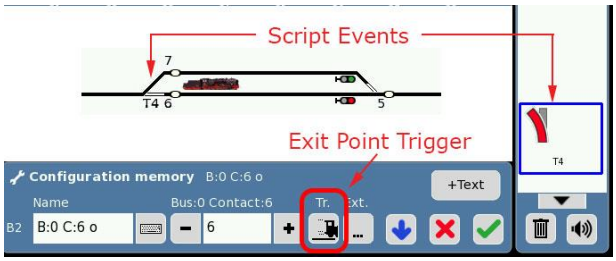


Fig. 5 - Entry point trigger and entry script event

Script 2

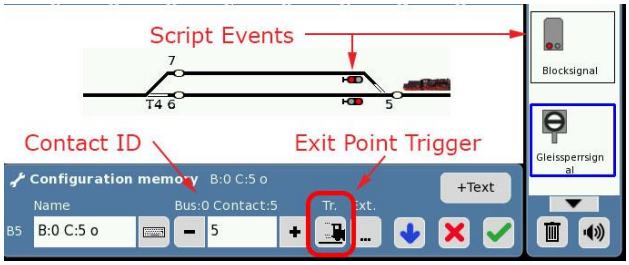
The second script entry will be an exit point script which pre-sets the route for any incoming train to move into the newly vacated line. The event trigger is set as an exit point trigger using the same Contact ID as in Script 1 (ID #6). The exit point is triggered when the train leaves the contact area. The contact icon has returned to white or clear, indicating that it is no longer occupied. Please note in the diagram that with the train clearing contact 6, it has also successfully cleared the turnout ("T4"), thus allowing us to write the script event. It prevents the turnout from changing in the middle of the train.



ID #6

Script 3

Script 3 is set up as a default setting for all lines of a staging yard. Its basic goal is to stop all trains from leaving the tracks. Remember that Script 1 has set one line of the yard block to "go". Rather than having a separate script to stop each line individually (which is necessary to start a train), it is possible to have one script stop all lines. I have set the trigger event as an exit trigger (note that Contact ID 5 is now being addressed).



ID #5

Using these three script examples, it is possible to write repeat scripts for multiple yard lines in a staging yard. In Script 1, a train entering line 1, releases the train on line 2. A similar script will have a train entering line 2 and will release the train on line 3. Using this pattern, 3 releases 4, 4 releases line 5, etc. A train entering the last line, will cycle back and release the train on line 1.

Scripting Shorthand

Keeping track of the memory scripts used can be overwhelming and utilize more script steps than can be practically illustrated. For ease of record we have been using a Scripting Shorthand which comes in handy for use as a reference to memory scripts. They can be written before adding them to your memory slots when it may be easier to visualize your desired steps on the layout. It will also be used in future scripting examples found in our newsletters. Table 1 lists the three script steps described earlier.

Script Names

Naming memory slots is more of code that I use to identify which contact is being used, what type of trigger is being enabled and whether or not there are conditions (or exceptions. *Note – more on this later). I utilize this code, because there is little space in the name field for practical explanation. In the first script sample, the Slot name is “B:0 C:6 i”. “B:0 C:6” references the Buss and Contact ID, in other words, the S88 module contact connection. In this case, the 6th contact connector on the 1st S88 module attached to the Central Station. The contact ID numbers are rarely duplicated in a layout so that makes the Buss number optional when naming. “C:6 i” would be just as informative as “B:0 C:6 i”.

Table 1 - Script shorthand sample

Name	B:0 C:6 i	B:0 C:6 o	B:0 C:5 o
Script step(s)	Blocksignal: Go	T4: turn	Blocksignal: Stop
			Gleissperrsignal: Stop

The “i” and the “o” nomenclature is used to identify the type of script triggering that is used for a script. Remember that there is an entry and an exit point trigger option, but using “e” for entry and “e” for exit would be confusing. So I use “i” for “in” or entry, and “o” for “out” or exit. In the table, note that there are two columns that use contact ID #6 (“B:0 C:6”). However, one is set as an entry point trigger and the other is set as an exit point trigger.

The Script Steps indicate the item to be scripted and the setting that the item should be set at. For example, in “B:0 C:6 i”, the script step will be to set the Blocksignal to the aspect of “Go”. In “B:0 C:5 o” which has two script steps, the first steps sets the Blocksignal to the aspect of “Stop”. The second script step will set the Gleissperrsignal to the aspect of “Stop”.

In Table 2, I have given a complete example of how to plan a 3 line staging yard with Signal Lights and Brake modules (see track plan in Fig. 6). Keep in mind the ID numbers are examples of their line order, actual numbers will depend on your personal setup.

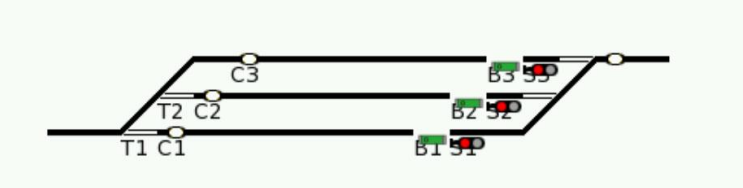


Fig. 6 - Sample Staging Yard: Contact Tracks = C, Turnout Switch = T, Signal Lights = S, Brake/Stop Tracks = B

Table 2 - Memory scripts: Name and script sequence

C1 i	C1 o	C2 i	C2 o	C3 i	C3 o	C4 o
S2: go	T1: turn	S3: go	T1: turn	S1: go	T1: Straight	B1: stop
B2: go	T2: turn	B3: go	T2: Straight	B1: go		B2: stop
						B3: stop
						S1: stop
						S2: stop
						S3: stop

Setting up the “Ext.”, Using Occupancy Signals

There are times when the trigger commands need an extra degree of feedback. This extra level of control is set up by clicking on the “Ext.” button of the Memory edit screen, which will open up the “Advance settings for route _ _” window. What this control does is evaluates an alternate sensor’s condition (occupied or not), then uses that condition to decide if the active trigger’s script should be activated. For example, if you had two train lines: A branch and a main line that will merge together on to the main, and you had a train on each line waiting to enter. How do you keep them from colliding when released by a preceding train? Remember, in block operations the preceding train clears a block and controls when a following train may enter.

The solution is to tell the branch line train to enter, ONLY IF there is no main line train waiting to enter the block. In the simple terms of sensor conditions this would translate to activate Contact #1’s script steps, ONLY IF the Contact #2 is showing as unoccupied. In the next example, I will show how I use the CS2 and “Ext.” functions to control the merge line problem. Fig. 7 shows the track example with S88 contact track locations. Track sensors C1 and C2 show that they are occupied. Track Sensor C5 indicates the exit trigger that will release the trains that occupy C1 and C2. This is basic block operation procedure, where a train that exits C5 has cleared the block between C3 and C5. Then releases train waiting on C1 or C2.

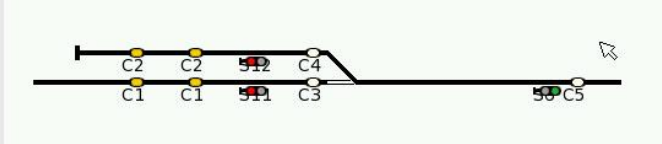


Fig. 7 - Branch and main line merge section.

Table 3 shows a set of basic memory scripts required for safe operation. I use two scripts that are based on the Exit trigger of contact track C5. The scripts are set to control the signal lights of each track. The script for “C5 o” will always activate the main line signal (S11) to go and the adjacent signal (S6) to stop. The main line will always have priority over the branch line.

Table 3 - Basic merger scripts

Slot Name	C5 o	C5 o x
Script Steps	S11: go	S12: go
	S6: stop	Ext. C1: unoccupied

The script for “C5 o x” uses the same trigger identifier as C5, indicating that you can have multiple scripts for a single contact and trigger, but each having a specific script. In this case, the script sets the branch line locomotive to move forward onto the main line. However, there is an external condition (indicated in red text) where this will only happen IF the contact tracks for C1 are showing unoccupied. Otherwise if C1 shows as occupied, the script will be ignored. In the slot name “C5 o x”, “x” is the notation that I use to show that an “Ext.” or external condition has been written into the script.

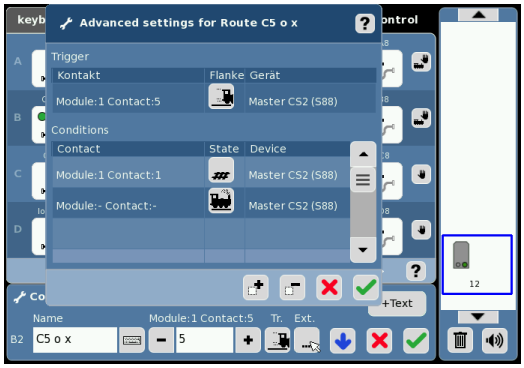


Fig. 8 - Advanced settings for Route C5 o x. At bottom is the "Ext." button used to access this window.

Fig. 8 shows the “Advanced settings for Route C5 o x” configuration window. It is accessed by clicking on the “Ext.” icon at the base of the Memory tab edit page. At the top of the window is the Trigger setting. This is the same setting that is configured in the Memory edit page with one important exception, the Device or Gerat setting. (*note – for this particular software version, the headings for the Trigger and Conditions table are not unified in their translations.) The Device setting must be correctly set if you are using any modules that are connected to the S88 Link module. The contact tracks will not render feedback correctly if this is wrong. The “Master CS2 (S88) setting may remain the same if using the S88’s with ribbon cable connector only.

The bottom half of the “Advanced settings…” window shows the Conditions table. The table contains a list of conditions that need to be met before activating the script. The first line has been set to read the status of Contact: 1. The “State” setting is the condition of the contact track at the moment the memory trigger has been activated. The first line of the table shows the unoccupied icon (track), and the second line shows the icon representing an occupied (locomotive) setting. There is also the Device setting which should match with the S88 connection for that contact.

While the first line of the conditions table has been set, opening this window tends to open with another issue. When opening this window, it defaults to having two condition lines set in the table. This has caused some problems with the scripts not activating, because the CS will try to read the condition of ALL the lines in the table. If you open this window, I advise you to delete any of the lines that do not pertain to the script action being activated, before saving. Select the line that you want to delete, then select the box with the “-“ sign, next to the red “x”. This will delete that condition from the table. If you open this window and you do not wish to have any condition settings, delete these entries as well. They can cause script interruptions, and I consider it a bug in the development that may not have been addressed by Märklin, yet. You may also add conditions to this table should you ever need to.

Fig. 9 illustrates the track plan where C5 shows that a train on the main line has entered into the block, passing the signal S6. C2 shows track occupation of a train waiting to enter the main line. C1 shows that there is no train in that block waiting. Fig. 10 shows the results of the exit trigger scripts set by “C5 o” and “C5 o x”. Note that because the main line track sensor at C1 shows as unoccupied, the script steps for “C5 o x” were allowed to happen. The scripts for “C5 o” had no conditions assigned so the signal lights at S11 and S6 were also allowed to changeover.

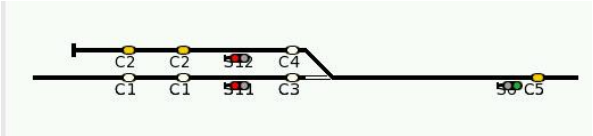


Fig. 9 - C5 shows a train has entered into the block, and C2 shows a train waiting to enter the main line.

There would normally be two additional scripts for C3 and C4 which will stop the opposing train from colliding with the exiting one, but because the object of this example is to explain how the “Ext.” and Conditions are to be used, I will not cover that here.

Being able to use two trigger events and conditional settings has created a very advanced control system for use on a layout. It creates a safer architecture for when you can trigger switching maneuvers and prototypical signal/brake combinations. While the process of explaining these features can be confusing, I hope that it has illustrated the terrific capabilities that many of our CS2 users haven’t learned of.

The final thing to set before triggering your automated scripts in the Central Station 2 will be the Control Priority setting. This setting is found at the end of each row on the CS2’s memory tab pages. The option choices are Manual control or Track control (see Fig. 10). This setting will toggle back and forth with each click on the icon. Setting for Track control activates the entire row to be triggered via S88 sensors. They may still be manually operated, but the automated scripts will override any manual changes that you may make while a script is executing.

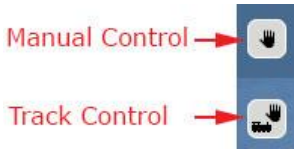


Fig. 10 - Control Priority Switch

In the future, I want to show various ways to program your memory pages to aid in train operational challenges. I will use tables to break down scripts that you can use with your own layouts. If you have any questions, or situations where you would like have an idea of how to script, please send them to us. We’d be happy to have a look.

Cheers, and have fun running your trains!
Curtis Jeung

Upcoming Appearances:

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July 8th-10th
Indiana Convention Center
Indianapolis, IN

National Garden Railway Convention
July, 9th (Public Day)
Santa Clara Convention Center
Santa Clara, CA

Eurowest 2016
July 23-24
Hiller Aviation Museum
San Carlos, CA

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