



MIDI MODULE APPLICATION GUIDE

The MIDI module in the k3 offers the user a level of recall and live control unparalleled in this class of console. Many live engineers are already familiar with the benefits of MIDI, but might not immediately understand the implementation of the Datafader. This short document is intended to assist in the explanation of the Datafader, and to offer some guidance on getting the most out of the k3 MIDI module.

Operation of the module is based on 128 memories, or “scene” locations. A desk setup may be stored into any one of the locations 1-128. This setup will comprise a snapshot of all channel and group mutes, along with an associated program change value with channel, and a continuous controller number with channel.

So how does this help smooth the operator’s task? Consider a 14-scene musical theatre show with passages of speech, using radio microphones, float microphones and live orchestra. The sound designer has been asked by the director to create the various ambient effects required by the sets, from “small room” to “warehouse”, and also to fire off sound effects at appropriate moments.

First of all, **back up the console’s factory default memory settings** by MIDI dump either into a MIDI sequencer or MIDI data filer **before** beginning to program. This will enable the console to be quickly reset to a good starting point for a new show, without having to undo all the settings that were made by a previous user of the console.

Perhaps certain noisy radio mic channels are not required during the opening scene of the show. These would be muted, and the setup stored into location “1” during rehearsals. When the show opens, the user simply recalls scene “1”, and the console will snap to the appropriate settings. This process would be repeated for scenes 2-14. If no other MIDI is programmed, the console by default will send a program change corresponding to the scene number. Of course, if no MIDI gear is connected to the MIDI OUT, the user does not even need to know that this is occurring.

Program Changes and MIDI Program Maps

This default MIDI setup does, however, allow the user to make use of a feature found in many modern effects devices - the program map. In our example, the designer might choose to have several effects devices in the MIDI chain, driven from the OUT of the console. Usually, each FX unit would be set to a different MIDI channel - the k3 would send a program change on a specific channel, and the appropriate unit would respond. But what if the user needs to call up patches on two different devices simultaneously (perhaps reverb on percussion and light chorus on a guitar)? The k3 can only generate a single program change per cue. The units would therefore have to be set to the same basic channel (or OMNI ON, which effectively sets the units to listen on all channels) if they are to respond to that single program change.

But there is still the problem that the same program number will be sent to both machines, which will probably not correspond to the desired patches. The solution lies not in the k3, but in the external units themselves : the program map. This is a simple software “look-up table” inside many FX devices and samplers, which remaps incoming Program Change numbers to the machine’s internal memory locations - for example, the unit as standard will map program change 3 to patch 3, in this case a Delay patch, and the map will therefore read :

“003 - 003 Delay”

If chorus (patch 6) is to be selected by this program change 3, the map should be adjusted to read :

“003 - 006 Chorus”.

By setting up appropriate maps in the client devices, a single program change from the k3 can trigger appropriate settings in as many client devices as are connected in the chain and receiving on its transmit channel. Since the patch selection is performed locally in the unit, the k3 only has to send sequential incremental changes, and the FX units (or samplers etc.) will do the rest.

The Datafader

The Datafader on the  MIDI module may be reconfigured for each “scene” to generate a different continuous controller.

For most users, MIDI starts and stops with note information. But the specification of MIDI goes much further than that. In addition to NOTE data, there are also 128 “continuous controllers” (“CC”). CC information contains a channel number and a controller number followed by the value (from 0-127) of that controller. They are called *continuous* because they are used to send varying values to parameters in the target machine, for example delay time, reverb time, feedback etc.. On the k3 MIDI module, CC *data* is generated by the fader, and the controller *number and channel* may be reset for each cue. Note that the Datafader is generating **data**, and is **NOT** an audio function - it

is a **parameter control device** (much the same as changing parameters on the front panel of an FX device).

Continuous Controllers may be thought of as control “sub-channels” - since they contain the appropriate channel information, it is possible to *independently* address these 128 controllers on each of the 16 MIDI channels. The function of these controllers will vary from unit to unit (although some numbers have defined target parameters, e.g. controller 7 is Main Volume - a list is included in the k3 user guide) , so it is important to select appropriate controller numbers to avoid later conflicts.

Continuous Controllers were designed to cope with the need to change machine parameters remotely. It is useful to think of CC information as direct remote access to chosen parameters within a destination unit. In our example, consider a situation where an actor moves from a spoken passage to a song. Perhaps a small reverb was used on the voice, but now the director would like a slight tapped delay. The transition has to be smooth, as the scenes flow into each other.

First, the effect unit needs to be programmed with a patch which includes both reverb and tapped delay, but initially is mixed 100% to the reverb component. To mix between the two, we shall use continuous controller number 3, as this is undefined, and therefore should not clash with another parameter. The FX unit should then be set up to map controller number 3 onto EFFECT MIX (between reverb and delay), with value 0 being 100% reverb, and value 127 being 100% delay¹. The user now sets up the Datafader to transmit CC 3, and matches MIDI channels and Program Change information with the target unit.

Now when that scene is recalled, the Program Change will set up our special patch. The fader can now be brought down to the bottom end of its travel, and switched ON. When this fader is moved up, the CC information will update the MIX parameter in the FX unit, thus crossfading from the reverb into the delay. Remember that as soon as the next scene is selected, and the next patch is recalled on the FX, the changes from the CC will be forgotten, and the next time our special patch is recalled, the reverb will again be selected.

That is a fairly complex example, but if you can master this, then the rest is simple in comparison. Other examples of Datafader use are:

- 8-output sampler - rather than using 8 independent console inputs, use the stereo out on the sampler, and put each sample on a different MIDI channel, but routed to the stereo outs. Now use the Datafader set to CC7 (Main Volume) on the appropriate channel to gain access to the volume of a particular sample, perhaps to fade it in, while leaving the other samples untouched. Then use CC10 to control the Pan of any particular sample within the Stereo output.

¹ The level of control over incoming CC information varies enormously from unit to unit. Even limited devices, however, usually offer some default settings - perhaps CC7 for main volume and CC10 for Pan.

- Set up an undefined controller to access delay time inserted across a vocal mic. Then use the Datafader to minutely reduce delay time as the actor moves towards the audience.

There are many other pieces of equipment out there which can be addressed by CC information. Experimentation is highly advised, as some extraordinary and innovative results can easily be achieved.

MIDI Note Information

The k3 is capable of generating note information whenever a MUTE is toggled. This allows a MIDI sequencer to be used to record a precise sequence of MUTE switching for playback at a later time. However, since this information is generated such that **NOTE ON** is transmitted for **MUTE OFF**, the function can be used to trigger external devices such as samplers. Going back to our example, the user wants to fire off samples at a precise moment.

Since each of the desk channels sends a unique note number, triggering a sample simply involves positioning that sample to respond at pitch on the corresponding note number in the sampler. Sample HOLD² should be set to ON, and the sample set to an individual output on the rear of the sampler, which should be connected to the appropriate input on the console. Now when that channel is unmuted, the MIDI NOTE ON will trigger the sample, which will pass through the newly-unmuted audio path.

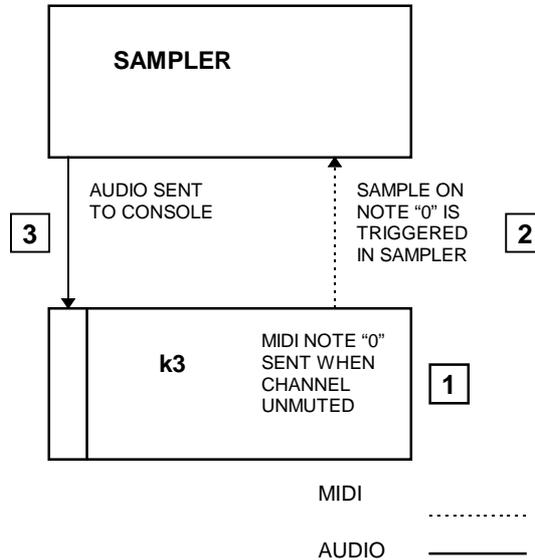


Figure 1 - Using Mutes to Trigger MIDI Samples

² The name of this function will vary from sampler to sampler, but it basically means that the whole sample will be replayed, even though the NOTE ON was momentary.

Other Uses Of The Scene Memories

In ordinary use, each scene memory would correspond to a scene on the stage. Bear in mind, however, that MUTE status need not change from one cue to the next, so if one needed several program changes to be fired out in quick succession, the mutes in three or four consecutive memories could be stored identically, but the memories could carry different program changes - the desk will remain in the same mute configuration, but FX / outboard will change. This also applies of course to the Datafader - perhaps it would be convenient to have access to several parameters during a scene : simply assign as many consecutive cues as required to contain the same program change and mute information, but with different CC numbers. Then alternate between the appropriate memories as required, with control over a different parameter in each memory.³

The 8 MUTE SCENE buttons will normally be used to locate several points during rehearsals, or perhaps between different bands. They could also be used as "milestones", set at 10, 20, 30 etc., for fast location of the first 100 scenes.

There is also an option on the console to change the mode of the MUTE MASTER switches. These may now operate cumulatively, and can therefore be used as ordinary MUTE GROUPS.

³ Note that some FX units will reload the current patch upon receipt of the relevant program change, thus undoing any changes made to that patch with the Datafader, so the effect of multiple CC's cannot be cumulative. Other units (e.g. Lexicon PCM-80) will detect that an incoming Program change is the same as the current patch, and will ignore it, leaving the patch intact for cumulative CC control.