



YAMAHA

Power User

PLG100-XG TUTORIAL

PLG100-XG: XG/GM Multi-Part Board

The PLG100-XG board is a 16-part multi-timbral synthesizer. Sounds are accessed via PERFORMANCE Mode as Parts 17-32 when used in the S30/80 and CS6x/6R synthesizers (S/CS). The board must be installed in slot 2. (Slot 1 on the S30, which has only one slot). The PLG100-XG board is unique and behaves differently than the other PLG series boards. Even if you are familiar with one or more of the PLG series you will want to pay close attention to how this board works within the S/CS products.

You select and play the PLG100-XG sounds normally from Performance Edit mode. Because the board is multi-timbral and built for sequencing and sequence playback, you do not access it from Voice mode. The PLG100-XG is multi-timbral and like the internal S80, the multi-timbral mode is **Performance mode**.

The PLG100-XG Voices occupy MIDI channels 1-16. But, hey so do the Internal Parts. How do you not play both simultaneously?

First, press the [UTILITY] button and set the main Receive Channel OFF (also called the Basic Channel).

◆ MIDI Ch)	Recv	Trans	Local	DevNo
Sys	off	1	on	all

Fig: The Receive channel parameter is automatically set to off when a GM/XG Reset command is received **and** the INTERNAL PART parameter is set to ALL OFF (the default condition).

To audition the sounds on the board:

- Select **any** Performance
- Press [EDIT]
- Use Knob 'A' to select Part 17; Knob 'C' to advance through the sounds.

▼ MIX Vce)	Bank	Number
Part17	NORM/000	▶001(A01) [--:GrandPno]

- If you are hearing two parts layered this is because both Part 1 and Part 17 default to the same MIDI channel (1) and by default you are probably transmitting on channel 1. If you wish to isolate just the XG sounds, turn the basic MIDI receive

channel OFF. The basic Receive Channel is found under [UTILITY]. (More on this later).

When you have a PLG100-XG board installed in a host keyboard product you may want to turn the basic Receive channel OFF. The advantages are that you will be able to play just the PLG100-XG sounds when you select them via Performance Edit **and** they will not play in the background when you want to play your internal Performance Layers from Performance Play mode.

The way that the PLG100-XG works, you can use any Performance to access the XG sounds. They are separate from the rest of your S/CS sounds. The **GM/XG reset** command in conjunction with the **INTERNAL PART** parameter (discussed in detail later in this article) will automatically turn off unwanted parts according to 3 different templates.

MULTI-TIMBRAL: PARTS and MIDI channels

Now let's see how the Multi-timbral capability of the S/CS series works when you add a multi-part board. The S30, S80, CS6x and CS6R are **16 MIDI channel** systems. You have access to your sounds in as a multi-timbral setup (called Performance) via what are called PARTS. AWM2 sounds from [PRE1], [PRE2], [INT], and [EXT] occupy Part01 through Part16. You may be familiar with the PLG150 series boards (AN, DX, PF and VL), which add a **single PART** to either [PLG1] or [PLG2] as PartP1 and PartP2, respectively. (Single part means they are only capable of contributing a single sound at a time). The PLG100-XG board is a multi-part board that adds 16 additional AWM2 Parts to the system. A Part is assigned a MIDI channel and you can place as many Parts on a single MIDI channel as you require. A Part can be key limited, velocity limited, and edited as you deem necessary.

The purpose of the XG/GM board is principally to playback MIDI song files that have been specifically prepared to take advantage of the XG/GM sound set and protocol. These prepared XG/GM files will automatically setup and recall the proper Voices and effects. It is important to understand that although there are now **32 Parts**, there are still only **16 MIDI channels** in

the system. This means that sounds will *share* MIDI channels. You can **layer** PLG sounds with internal AWM2 sounds or you can key zone them to create splits on a particular channel. Or you can use the XG sounds exclusively, or not at all. Of course, you can change the MIDI channel of any Part, as required.

Summary: As you add Plug in boards each will have its own Part but *share* a MIDI channel with one of the internal sounds. You can then choose to layer (play together) or split (limit the key range) the Parts on a single MIDI channel. You also can turn each of the Parts ON or OFF, as suits your needs. [Although the board goes into slot 2, the [PLG2] bank button cannot be used to access the XG Voices. They are only accessible via a PERFORMANCE (edit).

Checking Installation

Check to make sure your board is properly installed. Here's how:

On the host: Press [UTILITY]

Use the MENU feature (SHIFT+PAGE) or PAGE knob to navigate to the PLG Status screen

◆ PLG Status>	PLG1:PLG150-DX	Expand
Plugin	PLG2:PLG100-XG	▶ ----

Figure 1: Your screen may differ according to which boards you have. The "Expand" parameter will be active only when you have two boards of the *same* type installed and polyphony expansion is possible. The PLG100-XG must occupy slot 2 in a S80, CS6x or CS6R. The S30 has only one slot but it **can** use a PLG100-XG.

For more details about XG visit the XG website at <http://www.yamaha-xg.com/> The source for all things XG.

Specification and Operation

The **PLG100-XG** board has 480 normal preset voices and 12 Drum kits. The technology behind the XG board is AWM2 sample playback. The board has its own Reverb, Chorus and Variation processors. Variation is so called because it is switchable between being a system-wide effect (where all parts have a send to it) and an Insertion Effect (where it is isolated on a single part but can be manipulated via MIDI in real time).

XG is a special protocol that features more than 32 real time control change (cc) messages that can be used to do everything from tuning individual drums in real time to setting up effect processors from the sequencer. XG is an extended set of General MIDI that not only gives you more sound selections, it lets you control the performance of sounds remotely via MIDI commands. Think of the set of 128 sounds as the

principal bank and in parallel banks you can select alternate sounds. XG gives you access to more sounds by listing the sounds in parallel banks. You just need to use the correct bank select code to access them (MSB/LSB bank select commands). Even the PLG150 series boards have XG extension banks that conform to the XG standard – allowing you to select and substitute sounds from alternate technologies within XG. For example, you could substitute a DX electric piano, a VL saxophone, an AN synth bass, or a PF acoustic piano for the appropriate XG sound. More on this feature in another Power User issue.

When you install the PLG100-XG board in the host S/CS product, you have the option of turning GM/XG Receive Switch ON. This is set under [UTILITY] MIDI System – this screen will only appear when a PLG100-XG board is installed.

MIDI GM/XG Receive>	Sw	InternalPart
Sys	on	all off

Fig: shows the default condition - ready to playback GM/XG song files when a reset message is received

Typically, the first command sent from a properly prepared GM or XG file will be the GM reset and /or XG ON command. A bit of explanation is due here. In GM and XG modules the parameters that edit Voices, the mix and the effects are not stored in RAM, as with a typical synthesizer or module – they are stored within the sequence data. Typical GM modules do not have an internal RAM bank that memorizes your multi – the multi is stored in the so called "Setup Bar" in the song. Each new song has its own setup – system exclusive and Control Change messages that represent every parameter. Therefore, the very first event of a good GM/XG file will return all parameters to a neutral condition via a RESET command. RESET condition places a grand piano in each channel except MIDI channel 10, which is reserved for drum kits. It will return all pan positions to center, all volumes to 100, all reverbs to 40, all chorus sends to 0, and it will neutralize all controllers. Following the reset comes all the information to reconfigure the song. The SETUP BAR (usually one measure) is a very important concept within XG and GM. Open the MIDI file that came with your PLG100-XG and take a look at the first measure of track one in your sequencers 'event list' view. What happens to the internal S80/30, CS6/6R sounds when this reset message is received via MIDI – that will depend on the settings of the GM/XG receive Switch and the appropriately named INTERNAL PART parameter (as in, "What happens to the Internal Parts?" parameter.

INTERNAL PART setting and GM/XG Resets

If you have the GM/XG Receive Switch ON and the unit receives a GM ON and/or XG Reset command from a sequencer or via MIDI, the system will react in one of three ways, depending on the setting of the [UTILITY] **INTERNAL PART** parameter. The Internal Part parameter refers to what will happen to the **Internal** S/CS Parts 1-16 of a Performance when a **reset is received** - for the S80, CS6x and CS6R this also includes PartP1 (the PLG1) if a PLG150 series board is installed in [PLG1]. These settings will determine how your S/CS synth reacts when you playback a GM/XG song file.

When GM/XG is ON and INTERNAL PART =

ALL OFF: only the XG board parts will be output. When a GM ON/XG Reset command is received, MIDI Receive channels of the internal sounds are turned OFF - including the main Basic Receive Channel in Utility mode - **only** the XG board sounds will be output. The PLG100-XG Parts 17-32 will occupy MIDI channels 1-16. All Internal host sounds will be shut off, including the PartP1 (PLG1). This is the default condition. This effectively makes the S/CS host a GM/XG device. XG default condition will place a Grand Piano on all XG parts 17-25, 27-32; **Part 26** (MIDI Ch. 10) will be Standard Drum Kit; Parts 17-32 will occupy MIDI channels 1-16.

When GM/XG is ON and INTERNAL PART =

ALL PART: with this setting you can combine or replace any of the 16 PLG100-XG sounds with internal sounds of the S/CS. All parts are output and available for use. You access sounds by assigning their receive channels 1-16. (You can mute any internal or PLG1 sound by setting its receive channel to OFF.) The internal parts maintain their MIDI channel assignments - including the main Basic Channel setting. The XG sounds will reset to the default XG condition. Your selected internal S/CS sounds can be stored with the Performance - the XG setup must be stored in the song data.

When GM/XG is ON and INTERNAL PART =

LAYER PART: this setting will let you combine an internal Performance Layer sound with a 16-part XG setup. Any internal part that has its Layer Switch set to ON (up to a maximum of 4 Parts) will be active along with the XG board sounds. In this manner you can play a Performance Layer sound on top of a GM/XG sequence. A Performance Layer refers to a sound that is made up from up to 4 internal Voices - (one of which can be a PLG1 sound). The other individual internal parts will have their MIDI

receive channel set to OFF, and **only** those with the LAYER switch ON will be active. The setting of the basic Receive Channel in [UTILITY] will not change. You can play the internal layer sound(s) on the Layer Channel as set in Performance Common (see below) for details). The XG sounds will reset to the default XG condition.

TRY IT: You can experiment with how this all works by sending an XG reset command to the S/CS from the XGworks 3.0 Lite software or the XG Editor software. Here's how: From the main track screen you will see an XG icon on the toolbar, . Clicking this will launch the XG Editor (Mac users - XG Editor is a stand-alone program). Once the XG Editor screen is open you will see another small XG icon on the toolbar of the editor  - this one will automatically send the XG Reset message, which looks like this:

F0 43 10 4C 00 00 7E 00 F7

Experiment with sending this to see how your synth's PERFORMANCE mode responds to the various settings.

SOME PRACTICAL APPLICATIONS

Playing back GM/XG files: ALL OFF

If your intention is to playback an XG or GM file using just the PLG100-XG board sounds, you will want to set the MIDI System [UTILITY] page with GM/XG Receive Switch **ON** and the INTERNAL PART parameter set to **ALL OFF**. In this condition, when Reset command (usually the first event of a well-prepared GM/XG file) is sent it will turn the receive channel OFF for all Internal parts and let the XG board sounds have exclusive access to the 16 MIDI channels. You can choose any Performance because the Reset will insure that only the XG Voices will be heard. Program Changes to Internal sounds is not possible.

Combining and/or Replacing PLG100-XG sounds with S/CS sounds: ALL PART

If you want to replace some of the GM/XG sounds with rich Internal sounds, set the INTERNAL PART parameter to **ALL PART**.

MIDI GM/XG Receive) Sw	InternalPart
Sys	on ▶ all part

To activate an internal sound you need to set the RECEIVE channel for the Part. The MIDI receive channel is found in each Performance part on the "LYR Mode" screen. From [PERFORM] mode, press [EDIT]. You can select an Internal Part for editing by turning Knob A or touching the Program buttons [1]-[16], or [PLG1] directly.

Use the PAGE knob to scroll down to it (shown below).

For example, let's say you want to replace the XG sound for MIDI channel 6 with an internal sound: Activate the MIDI receive channel for PART 6. Set the other internal Parts to RcvCh OFF, Parts01-05, and Parts07-16:

◆LYR Mode)	Mode	Arp	Layer	RcvCh
Part 06	poly	off	off	▶06

You can deactivate the XG sound on channel 6 by locating its corresponding PART and turning the RECEIVE channel to OFF. Part 22 will correspond to ch06 (see chart 2). To select Part 22 you must use Knob A.

◆LYR Mode)	RcvCh
Part 22	▶off

Fig: Notice that the XG Parts do not have a Layer Switch.

This will effectively replace the PLG100-XG sound with the Internal sound selected for Part 6. If you use a bank select / program change message to select the Internal PART 06 sound in the track controlling MIDI channel 6, it will automatically silence the XG part. A Bank Select/PC for the S/CS sound will send the XG board to a 'silent' Voice. (Each bank of sounds has its own unique bank message).

The chart below lists the MSB/LSB and Program Change range for the various Memory host locations. Obviously, the order in which the events occur is important. For example, bank select and program changes for individual PARTS should always follow those that select the Performance (common sense rules here). The Single # column is for systems that only allow a single number for bank select (i.e., Cakewalk).

Bank Select and Program Change Information Change individual PARTS within a PERFORMANCE

MEMORY	--Bank Select--		PC	Single #
	MSB	LSB		
Preset 1	63	0	0-127	8064
Preset 2	63	1	0-127	8065
INT	63	8	0-127	8072
EXT	63	9	0-127	8073
PLG1	63	24	0-63	8088
PLG2	63	25	0-63	8089
Drum Preset	63	32	0-7	8096
Drum INT	63	40	0-1	8104
Drum EXT	63	41	0-1	8105

To select a Performance*

INT PERFORM	63	64	0-127	8128
EXT PERFORM	63	65	0-63	8129
CLIP KIT (CS6)	63	104	0-3	8168

*requires a main Receive channel setting

Chart 1:

For information on the XG Bank Select and Program Change messages see the PLG100-XG booklet.

In order for you to prevent a GM/XG program change from adversely affecting the internal Parts, you can deactivate the Program Change setting for each internal Part that you want to use in place of an XG sound. Use your PAGE knob to locate the Receive Switch 4 (RCV Sw4) page that lets you turn Bank Select and PC to OFF for the PART (shown below). The internal sounds used will be memorized in the S/CS Performance – XG sounds will be recalled via Bank Select and Program changes in the song data. XG setups are **not** stored in S/CS Performances.

◆RCV Sw 4)	BankSel	PgmChng	CtrChng
Part06	off	off	on

PLG Part	MIDI Channel (default)
17	1
18	2
19	3
20	4
21	5
22	6
23	7
24	8
25	9
26	10 Drums default channel
27	11
28	12
29	13
30	14
31	15
32	16

Chart 2

Playing a Performance Layer sound along with an XG sequence: LAYER PART

If you want to play along with a GM/XG MIDI sequence using an internal S/CS Performance Layer sound (up to 4 internal sounds) - set the MIDI Sys page in [UTILITY] Internal Part parameter as follows:

MIDI GM/XG Receive)	Sw	InternalPart
Sys	on	▶layer part

Any sound from Part 1-16 (internal) and PartP1 (Plug-in 1) can be activated for real time play by turning the LAYER switch ON for that part.

◆LYR Mode)	Mode	Arp	Layer	RcvCh
PartP1	poly	off	▶on	off

Parts with the LAYER SWITCH ON Parts receive on the Layer Channel - which is programmable per Performance (shown below):

GEN MIDI	Arp Out	ArpCh	LayerCh
Common	off	1	1

Fig: Each Performance can store its own Layer Channel setting (MIDI channel on which the 4 Parts are communicated with). Selection is 1-16, or Basic Channel. Found in the Common parameter area.

Summary: Basically, **any** Performance will do when you use the ALL OFF setting. If you have favorite Performance Layer sounds that you want to feature in a MIDI sequence, use the LAYER PART setting. Simply adjust the Performance's Layer Channel, as necessary, and turn off the internal parts you do not need. If you want to creatively replace some or eventually all the sounds of GM or XG sequence, use the ALL PART setting. You may want to store a template Performance that has all the internal Parts 1-16 and PartP1 (PLG1) set to receive channel = OFF and the PC set to OFF as well. This way you can activate them, as you need them. XG setups can only be stored via System Exclusive and Control Change messages – they are not stored in the Performance.

Things you must know about using the PLG100-XG board in the S/CS synths

- The primary purpose of the PLG100-XG board in the S/CS system is to bring GM/XG playback compatibility to the unit.
- The PLG100-XG sounds are accessed from PERFORMANCE mode **only**. You will see it as PARTS 17-32, while internal AWM2 sounds occupy Parts 1-16. You must access the board from Performance EDIT via KN A. The [PLG2] button is not active with a PLG100-XG board installed.
- The PLG100-XG can **only** occupy slot 2 in the S80/CS6x and CS6R (the multi-timbral slot). The S30 only has only one slot but it is capable of using the PLG100-XG board.
- There are **16** MIDI channels in the system – you can choose to combine (split/layer) internal Voices with the XG sounds or you can replace them. The [UTILITY] INTERNAL PART parameter will determine how the host responds when a GM Reset or XG ON command is received. Even though the XG board is Parts 17-32, it will use MIDI channels 1-16.
- The best way to access the XG multi-part system, when sequencing, is via the provided XG Editor. The software allows you to easily navigate through the 480 XG Voices and 12 drum kits via an organized category listing. The way that GM/XG systems work is that program setups are stored as part of the sequence data. Usually found at the very beginning of all *properly* prepared GM/XG

files are the reset commands. A GM ON/XG RESET command returns all settings to default values: Grand Piano on MIDI channels 1-9, 11-16, standard GM drum kit on channel 10; volumes set to 100; pan to center; Reverb to 40; chorus send to 0; etc. In the very first bar you would put all your setup data, i.e., bank select/program change, volume, setting for the effects, pan and so on. The XG Editor lets you set everything using a graphic interface map and when you have it sounding just as you like, you can have the software create (insert) the entire XG parameter setup into the sequence for you. This includes all effect routing, voice selections and the GM/XG reset commands – *it is all done for you* (icon on the toolbar for Insert XG Parameter). Or you can store this setup data separately and send it prior to playing back the file. If you are **not** using XGworks as your principal sequencer you will want to download an instrument definition/mixer map/environment for the PLG100-XG for the software you are using. You should be able to find XG maps for most of the popular sequencing programs. Look up a program called XG-edit (for Windows and Mac). You can find this at the Yamaha site: www.xgfactory.com Look under Shareware.

- If you do not have a mixer map or definition and you are not using XGworks, good-luck selecting sounds. No, just kidding. It can be done. It is just that there are a lot of sounds to wade through. Recognize that the Program Changes in the XG protocol 1-128 call up the basic GM sound and in parallel banks XG offers substitutes. For example, sound #82 is Saw Ld (sawtooth lead) but in parallel banks you will find 12 substitutes for the sawtooth lead. Use knob C to select individual program changes and knob B to move through parallel banks. Sound #34 is Fingered Bass (Electric Bass w/Finger) but in bank 65 you will find a fingered bass with a modulation effect, "Mod Bass". You may wonder why the basic sound is repeated so much – well in other products you may find a different substitute in those repeated slots. The MU128 and MU2000 will offer more selections as substitutes for that program change number. But if someone prepared an XG file using a 'fingered bass' substitute sound that you did not have, well you would still get the basic fingered bass sound – you just wouldn't know you were missing it! (This illustrates some of the important features of XG: compatibility, scalability and expandability.

- It is **normal** for the screen of the host S/CS product **not** to reflect the settings and program names as you change data in the software. You will hear the results, however, but the screen will **not** update. This may seem a bit strange at first but is due in part to the fact that the screen is part of the host, not the PLG board, after all. It will only reflect selections you make via its front panel. The Board does not have a screen but uses the computer to help you select sounds. Don't panic if you hear a flute and the S/CS screen reads Grand Piano. This is normal when you are using the computer to edit the PLG100-XG board.
- In order to view the names of the selected instruments in an XG song file: open the XG Editor prior to beginning playback of the song. When you start playback from XGworks, the setup bar will cause the software to show you the names and the mixer setup for the file.
- XG Parts 17-32 are **not** stored in the S/CS Performance. All GM/XG parameters must be stored in the sequence data (setup bar). All data concerning the Internal or PLG1 banks will be stored in the S/CS Performance.
- Bank select and Program change messages can help you distinguish between the PLG100-XG sounds and the sounds of the mother. A bank select/program change command for the internal sounds will send the corresponding XG board PART to a 'silent' Voice. Bank Select/Program messages can be blocked for internal parts, as necessary.

Tips: Troubleshooting

- A GM ON/XG Reset message will, under the default conditions, turn all Internal parts of a Performance (Part01-Part16, and PartP1, to OFF. It also turns the overall basic MIDI receive channel OFF in UTILITY. Any system (main Receive) Program Changes that follow this will be ignored.

MIDI Ch)	Recv	Trans	Local	DevNo
Sys	off	1	on	all

- When **not** using the XG board you can set the main Receive channel to OFF in [UTILITY] (see figure above) – this will let you play just Internal sounds from Play mode and not have to hear the XG board.
- You will only need the Basic Receive Channel in a scenario where you need to send the entire unit a Program Change. For example, you want to select an entire Performance remotely from the sequence. You can actually place the message in the sequence.

In this case you would have to select a main Receive channel on which you are going to send the selection messages. A Basic Receive Channel can be set and maintained when you are using the LAYER PART and ALL PART (Internal PART) settings, **not** with an ALL OFF setting – when ALL OFF is select the basic channel will be switched OFF. The timing sequence of Bank Select and Program Change messages is important.

- Even with the main Receive channel in the OFF position individual Parts of your Performance will receive all MIDI messages.
- If you are getting multiple sounds playing a part of music, please check and set the Internal Part parameter appropriately in [UTILITY]. Check your receive channel assignments. And **verify that a GM or XG reset is included in the song file.**
- Remember that 3 Parts can default to channel 16: Part 16 (host AWM2 sound), Part 32 (PLG100-XG) and PartP1 (PLG150 board).
- Internal S/CS sounds will be stored in the S/CS Performance – XG setups are **not** stored in the Performance. The PLG100-XG voice and effect setups should be stored as part of the sequence song data.
- Go to www.yamaha-xg.com for more details on the expert use of XG – it is much deeper than most people think. There is an excellent tutorial on XGworks. Also point your browser to www.xgcentral.com to find tons of XG files made by end users from all over the world.
- If you are getting no sound from any Parts, Performances or Voices, try the Master Volume in [UTILITY]. Some song files have a fade out and leave the Master Volume set to 0 (another good reason to use reset commands). If you stop a song during a fade out you may inadvertently lower the volume of the entire machine.

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