WORLDE®

PANDA MIDI CONTROLLER
USER'S MANUAL

HANGZHOU WORLDE DIGITAL PIANO CO., LTD

Introduction

The eight fully assignable pads give you the ability to trigger samples. The eight fully assignable endless rotary encoders and sliders can be assigned as135 controllers.
The versatile and easy-to-use Panda keyboard is a great controller in the studio and live on stage.

What's in the Box ?

- Panda keyboard
- User manual CD-ROM
- USB cable

Panda Keyboard overview

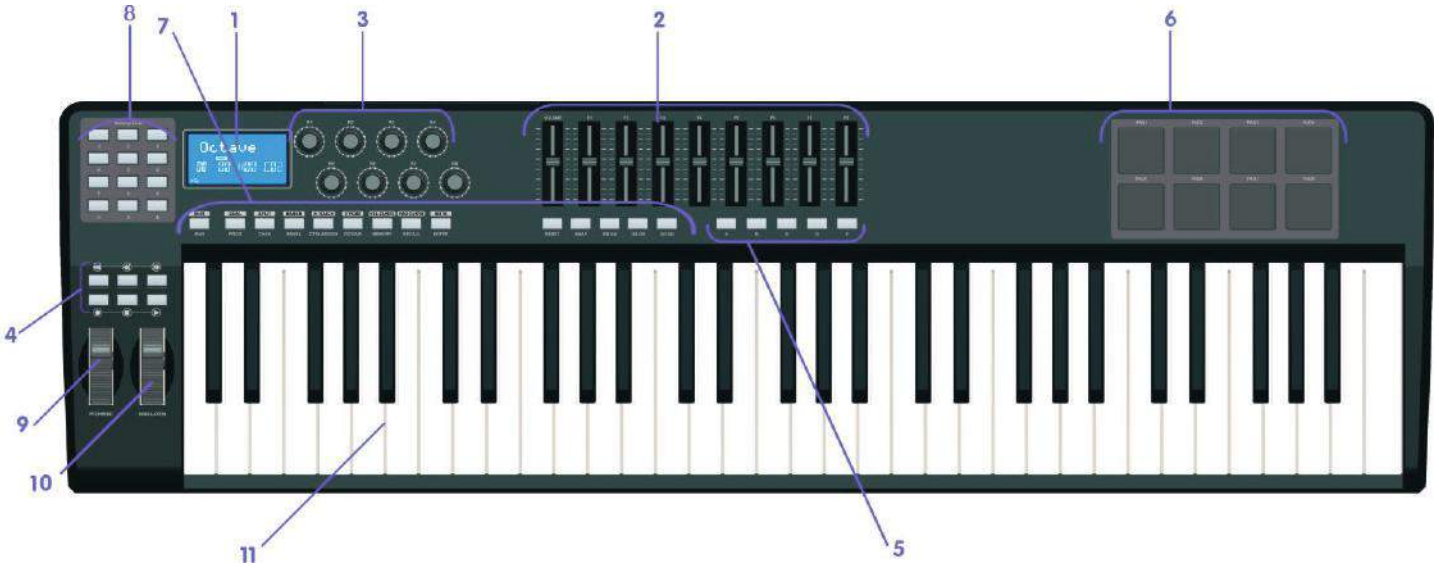
Here is a rundown of some of the great features the Panda keyboards have to offer:

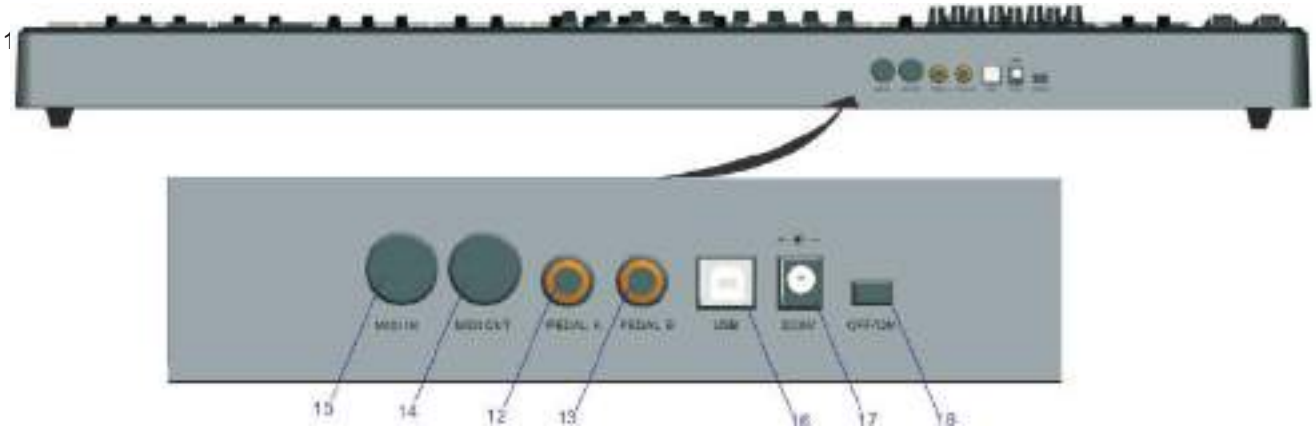
- 8 trigger pads with velocity.
- 2xAssinable Pedal Interfaces (PEDAL A， PEDAL B), which can be assigned as 135 controllers
- 8xAssignable Dials. Each dial can establish an independent channel , and can be assigned as 135 controllers
- 8xAssignable Slider, each slider can be assigned as 135 controllers
- Assignable Pitch Bend Wheel and Modulation Wheel(Wheel P & Wheel M),which can be assigned as 135 controllers.
- 6 Buttons for MMC.
- 1xMaster Volume Slider.
- 8 double Function button with shift, providing 15 functions like PROGRAM, CHANNEL, VEL-CURVE, OCTAVE, TRANSPOSE,
- BANK M, BANK L, DUAL, SPLIT, MUTE, AFTER TOUCH, CONTROL ASSIGN and etc.
- 10xData entry and +/- button.
- Built-in Memory, which can store/load 6 groups of user' s parameter.
- 1xMIDI OUT, 1X MIDI IN
- USB interface, adaptable to USB 2. 0(FULL SPEED). Power supplied by USB and DC 9 V.
- Have the ability for future upgrading via USB(Please visit www.worlde.com.cn)
- Compatible with Windows XP/Vista/Windows7 and Mac OSX. Drive free and hot-plug supported.

Section1: Getting Started

1.1 Panda Keyboards Overview

1.1.1 Top Panel Overview





1.1.3 Control Definitions

The controls are referred by name throughout this manual.

1: LCD DISPLAY
2: Slider(49/61 only)
3: Encoders
4: Transport buttons
5: Assignable buttons(49/61 only)
6: Trigger Pads
7: Function buttons
8: Numeric keypad
9: Pitch Bend wheel
10: Modulation wheel
11: Keyboard with Aftertouch
12: Pedal A
13: Pedal B(press 'Shift' button to select the polarity of Pedal B when switch on the unit)
14: MIDI OUT port
15: MIDI IN port
16: USB 2.0 port
17: DC power socket
18: Power switch

1.2 Setup

If you intend to connect your Panda keyboard to a computer, please read sections 1.2 and 1.3 first. If you only intend to use your Panda keyboard to control a sound module or synthesizer using the external MIDI OUT you should skip to section 1.4.

1.2.1 Minimum System Requirements
If you are using your Panda with a computer, the following minimum system requirements apply:

Windows	Mac OS
Pentium 3 800 MHz or higher	Macintosh G3* 800/G4* 733 MHz or higher
(CPU requirement may be higher for laptops)	(CPU requirement may be higher for laptops)
256 MB RAM	OS X 10.3.9 with 256 MB RAM,
DirectX 9.0b or higher	OS X 10.4.2 or greater with 512 MB RAM
Windows XP (SP2) or higher	*G3/G4 accelerator cards are not supported.
(Windows 98, Me, NT or 2000 not supported)	

WORLDE suggests you also check the minimum system requirements for your software, as they may be greater than the above.

USB hubs are not supported. Worlde suggests that you connect directly to one of your computer's built in USB ports.

1.3 Using The Panda With Your Software

When installed, the Panda appears as a simple MIDI device with one input port and one output port. You should select the listed Panda input port as the MIDI input device in your software. Once this is set, your software should be able to receive notes and controller data from the Panda.

If you have connected external MIDI gear like a drum machine or another keyboard to your Panda's MIDI IN port, this gear can be interfaced to the computer by selecting the listed Panda input port. This way, your Panda is acting as a MIDI to USB interface.

The port names are defined as USB Audio Device when connecting to USB port.

It will appear as a single USB Composite Device in the Device Manager.

1.4 MIDI Connections

The MIDI Out port accepts a standard 5-pin DIN-type MIDI plug (available from most professional audio retailers).

The MIDI Out port can be used to connect the Panda to a hardware sequencer, an external synthesizer or sound module, for example.

1.5 Power Supply

If you are using your Panda with a computer via its USB port, there is no need for an external power supply. Your Panda will draw its power from the computer.

However, if you are intending to use your Panda without connecting to a computer's USB port, then you will need to use an external power supply. No power supply is included in the box, so please select one that meets the following requirements:

< 9V DC < 250mA – 300mA < Center positive

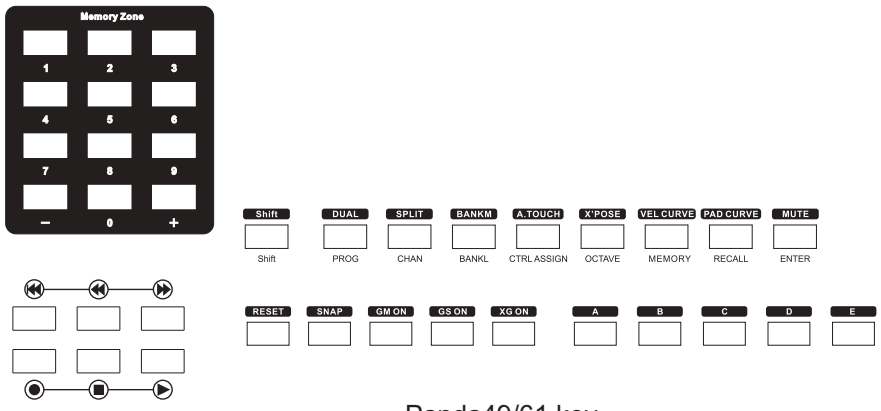
Section 2:Basic MIDI Control From Your Panda

Your Panda controller will not make any sound unless it is connected to a computer or other external MIDI gear. This is because the Panda sends MIDI data when you play it and does not produce sound on its own. Instead, it is used to control a virtual instrument on your computer or a MIDI sound module to generate sounds.

This is a good place to introduce you to the way we approach the differences between the Panda 61 and 49 and the Panda 25. The appearance and functionality of the Panda 61 and 49 are the same, it's just the size of the keyboard that is different, so when we give instructions for these models, these two are always grouped together. The Panda 25 looks different and a number of its functions are accessed in a different way, so for this model we will always give you a separate set of instructions.

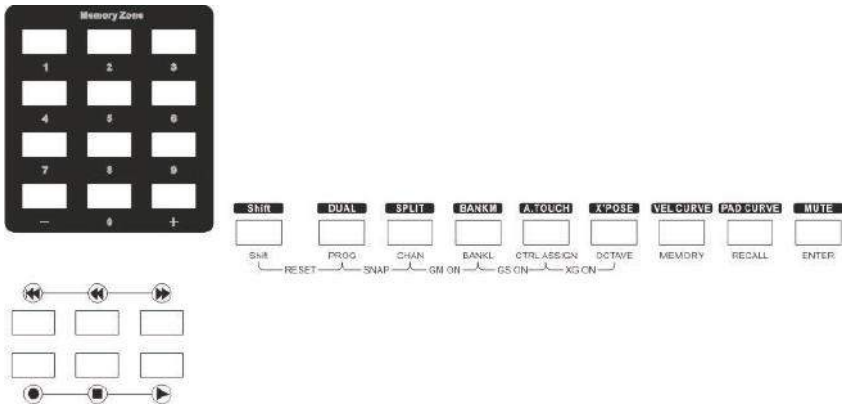
2.1 Function Keys

2.1.1 Panda 49 and 61 Functions



Panda49/61 key

2.1.2 Panda25 Functions



Panda25 key

Numeric Keypad:

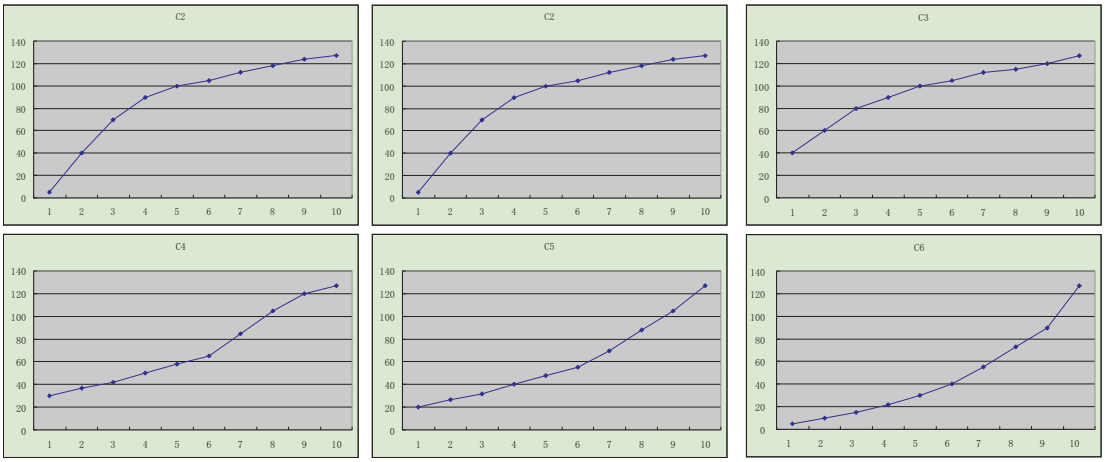
Use the numeric keypad to enter values during programming. The LCD display will show the values as you enter them.

2.2 The Keyboard

When you play the keyboard, MIDI note messages are sent. These messages are read by your computer software or external MIDI gear and used to generate sound accordingly.

2.2.1 Velocity Curve

Every time you press a key, a MIDI note message is sent with a velocity value between 0 and the maximum; this value specifies how hard you pressed the key. Since different people have different playing styles, your Panda offers a number of different velocity curves. You should experiment with the different velocity curves to find the curve that best suits your playing style.



To change the velocity curve:

CURVE

Velocity Curve selection function button. When this button is valid, the LCD displays the 'VelCURVE' and the number of current velocity curve. It can be adjusted by +/- button or Numeric Button and confirmed by Enter button. The initial value is 1, adjusting scale is 1～6.The LCD displays the following:

2.2.2 OCTAVE

Octave adjusting function button. This function allows the keyboard to change the Pitch up/down by octave. When this button is valid, the LCD shows the 'OCTAVE' and the value of current transposition. It can be adjusted by +/- button. The initial value is 0,adjusting scale is -4~5.

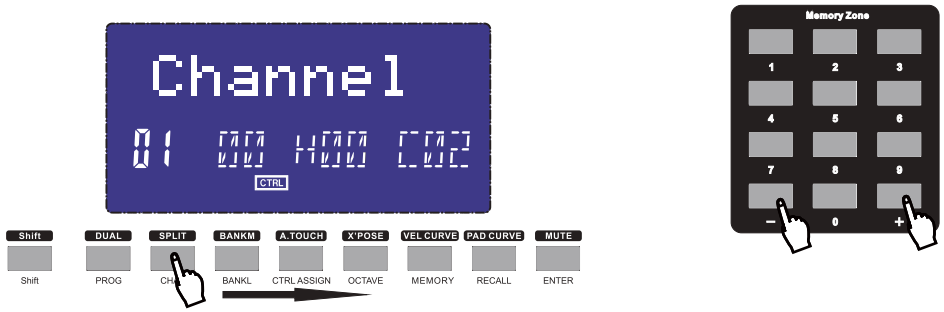
The LCD displays the following:

2.2.3 TRANSPOSE

Transpose adjusting function allows the keyboard to change the Pitch up/down by semi-tone.When this button is valid, the LCD displays the 'x'pose' and the value of current transpose. It can be adjusted by +/-button. The initial value is 00, adjusting scale is -12~12. The LCD displays the following:

2.3 CHANNEL

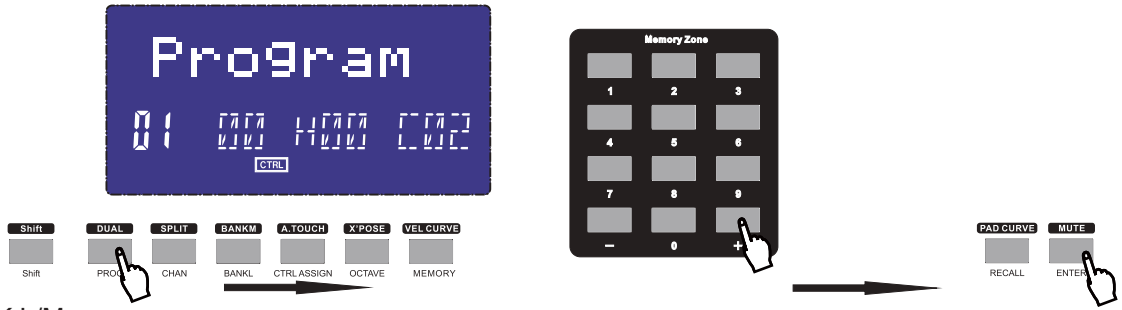
Channel selection function button, selecting current MIDI channel. When this button is valid, the LCD displays the 'Channel' and the current channel number. The channel can be selected with +/- Button or Numeric button and confirmed by Enter button. The initial setting is 1,adjusting scale is 1~16.The LCD displays the following:



2.4 CHANGING VOICE AND VOICE BANK

2.4.1 PROGRAM

Voice adjusting function button. adjusting the voice of current channel. When this button is valid, the LCD displays the 'Program' and the current voice number. The voice can be adjusted or selected with NUMERIC button or +/-Button. The initial setting is 00,adjusting scale is 0~127.The LCD displays the following:



2.4.2 BANK L/M

Voice bank adjusting function button, adjusting the voice bank of current channel. When these buttons are valid, the LCD displays the 'BANK L/M' and the current voice bank number. The voice can be adjusted or selected with NUMERIC button or +/- Button. The initial setting is 00,adjusting scale is 0~127.

2.5MIDI Controller Messages

There are 135 MIDI controller messages that are used for controlling the MIDI-adjustable parameters in your software or on your external MIDI gear. Examples of these controllable parameters include volume, pan, expression, reverb, chorus and portamento.

Each of the controls on your Panda keyboard is able to send any of the 128 standard MIDI controller messages to control such parameters. Please note that in order for these effects to work, the MIDI device you are sending to must be able to receive these messages. A full list of these control messages is given in Appendix C.

For example, you may want to set the Modulation wheel to control the reverb amount. This is done by assigning controller 91 to the Modulation wheel.

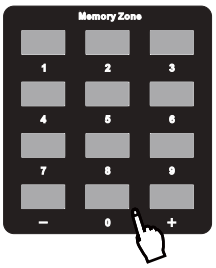
Examples of other popular effects are listed in the table below. (Please consult Appendix C for the full list.)

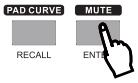
Effect	Control Number
Modulation	1
Volume	7
Pan	10
Expression	11
Reverb depth	91
Chorus depth	93

There are many different types of virtual instruments available and most of these respond to MIDI controller messages, allowing you to control a variety of parameters from your Panda keyboard. Please review the manual that came with your software or external gear to see what these controller numbers are.

2.5.1 Programming the Controls on Your Panda

When programming a physical controller on your Panda, the controller that was last used will be the first one selected for programming. To select a different physical controller for programming,the method is: Move the physical controller you wish to program ,and press the assignable button.
When in assign, the LCD displays the following:





2.5.2 ASSIGNABLE DIAL

8 dials that can be assigned channel and controller No. independently. First press the “assign”button. Then operate the dial to select the dial, and the LCD shows the controller number and the controller value. Input the No. with NUMERIC button or +/- button when the dial is selected. The numbers are the controllers. you also need to use enter to confirm the data.

2.5.3 ASSIGNABLE SLIDER

9 sliders that can be assigned controller No. independently. First press the “assign” button
Then operate the slider, and the LCD shows the controller number and the controller value. Input the No. with NUMERIC button or +/-button when the slider is selected, The numbers are the controllers.
You also need to use enter to confirm the data.

2.5.4 ASSIGNABLE WHEEL

The modulation and pitch bend are the default function of the 2 wheels. It can be assigned controller No. independently. First press the “assign”button. Then operate the wheel to select the wheel, and the LCD shows the controller number and the controller value. Input the No. with NUMERIC button or +/- button when the wheel is selected. The numbers are the controllers.
You also need to use enter to confirm the data.

2.5.5 ASSIGNABLE PEDAL

2 pedal interfaces that can be assigned controller No. independently.First press the “assign”button. Then operate the pedal to select it, and the LCD shows the controller number and the controller value. Input the No. with NUMERIC button or +/- button when the pedal is selected. You need to use enter to confirm the data.

2.5.6 MASTER VOLUME
It sends GM Master Volume message（F0 7F 7F 04 01 00 xx F7）

2.5.7 PAD SETTING

Activate a pad, Press the Ctrl Assign button .The LCD display will display the currently assigned controller of the pad. The controller number 128 is for pad note. Press“shift” to edit the Pad note. Enter the new pad number you want the pad to assigned with the numeric button or +/- button.

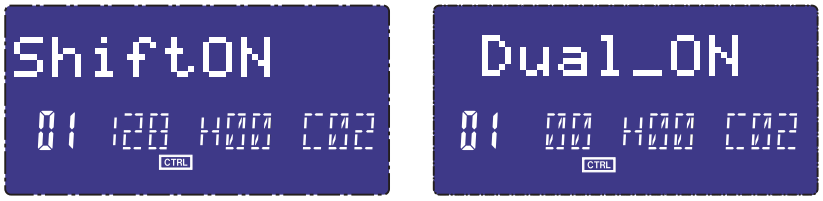
2.5.8Groups:A,B,C,D,E(49/61)
The button can be assigned as a controller, Press the ‘CTRL ASSIGN’ button, then press a button, the LCD display ‘ctrldata1’, input the number of the controller that you want to operate, press the 'enter' to confirm the value. The LCD will display 'ctrldata2',at this moment, you can input the value that the controller should be send.

Section 3. Advanced Settings

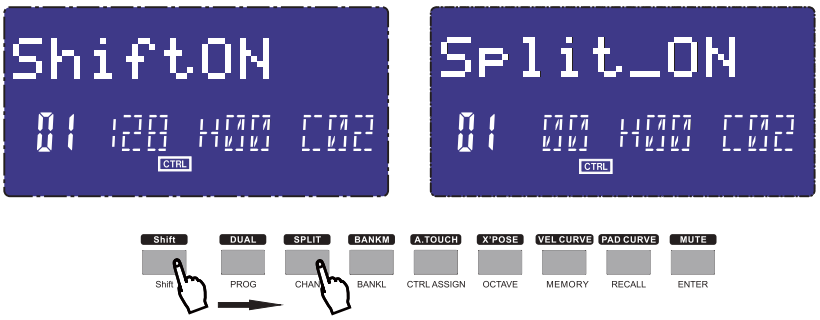
3.1 How to make good use of the keyboard

3.1.1 DUAL

Dual switch function button.
When Dual is ON, the LCD displays the ‘DUAL_ON’, Keyboard sends MIDI info of two channels, with the voice/channel of both channels adjustable. The 2nd voice and channel of 2 layer can be adjusted currently (Dual is ON). Dual and Split can not be used at the same time. When Dual is ON, Split is OFF.
The LCD displays the following:

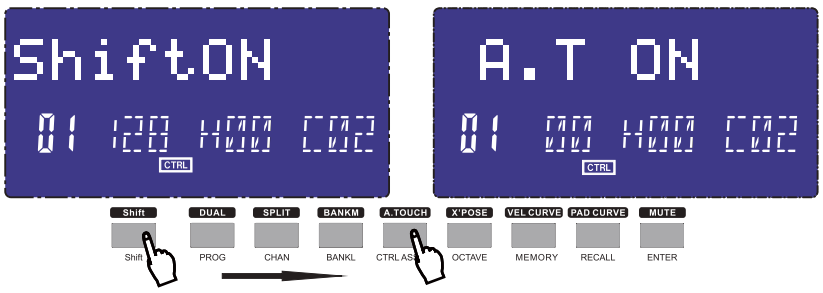


3.1.2 SPLIT
Keyboard Split ON/OFF function button. When Split is ON, the LCD displays the’SPLIT_ON’. the keyboard is split to right section and left section by the split point, with each section use it’s own channel. The voice /channel of both channels is adjustable. The voice and channel of right section can be adjusted currently(Split is ON),Dual and Split can not be used at the same time. When Split is ON,Dual is OFF. The LCD displays the following:



SPLIT POINT
Default Split Point is the central C (MIDI No. 60). User can choose the Split Point. Hold the Split button, LCD shows CHO, reminding user to select the SPLIT POINT. Press the key that needs to be the new Split Point, LCD shows don, meaning this key is set to be the new Split Point.

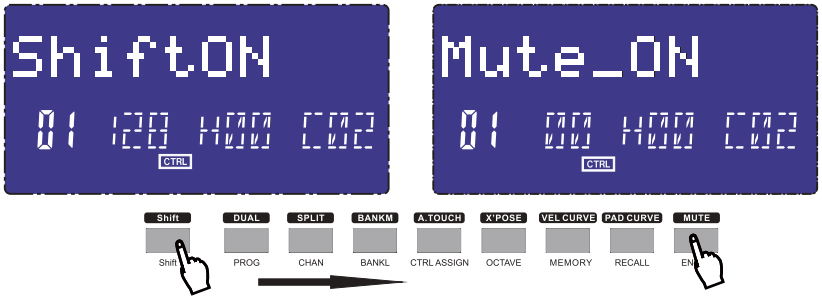
3.1.3 A. TOUCH
Channel After Touch ON/OFF function button. When Touch is ON, the LCD shows ‘TOUCH ON’ and the system sends Channel After Touch info when pressing the keys.
The LCD displays the following:



3.2 Other controls

3.2.1 MUTE

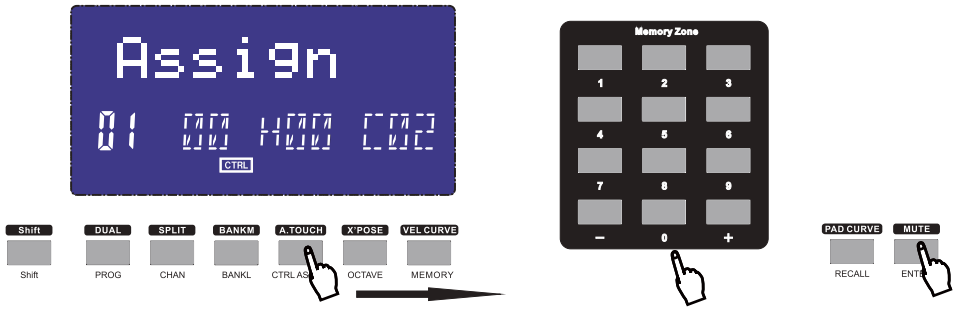
MUTE ON/OFF function button. When MUTE function is ON, The LCD shows ‘MUTE ON’ no MIDI info will be sent. The LCD displays the following:



3.2.2 ASSIGN

ASSIGN mode ON/OFF function button. When ASSIGN mode is ON, The LCD shows ‘ASSIGN’, default as assigning the controller number. that is assignable. Operate the controller to be assigned and select the very controller LCD shows the controller No. of current controller. Input the desired controller No. with NUMERIC button or +/- button (e.g. when a dial is selected, LCD shows the default No. 007. If you input 010, the dial is assigned as PAN).

The LCD displays the following:



3.2.3 GM

GM:Press CHAN and BANK L buttons at the same time(25)/GM ON button(49 and 61)to send GM ON message（F0 7E 7F 09 01 F7）. LCD shows ‘GM ON’ when the message is sent. The LCD displays the following:

3.2.4 GS

Press CTRL ASSIGN and BANK L buttons at the same time(25)/GS ON botton (49 and 61)to send GM ON message F0 41 10 42 12 40 00 7F 00 41 F7). LCD shows 'GS ON' when the message is sent. The LCD displays the following:

3.2.5 XG

Press CTRL ASSIGN and OCTAVE buttons at the same time(25)/XG ON button (49 and 61)to send GM ON message (F0 43 10 4C 00 00 7E 00 F7). LCD shows 'XG ON' when the message is sent. The LCD displays the following:

3.2.6 Reset

Press PROGRAM and SHIFT buttons at the same time(25)/RESET button (49 and 61) to reset the system restoring to factory setting, sending system initial setting info at the same time.

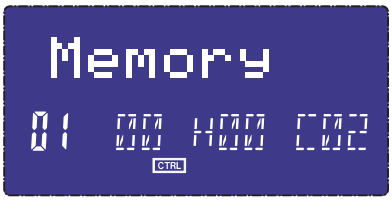
3.2.7 SNAP SHOT

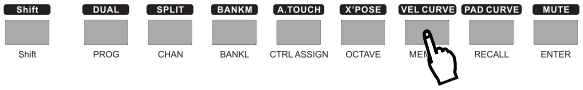
Press CHAN and PROG buttons at the same time(25)/SANP button (49 and 61) to send message of all user settings. LCD shows SNAP when the message is sent. The LCD displays the following:

3.3 Memory and data call back

3.3.1 MEMORY

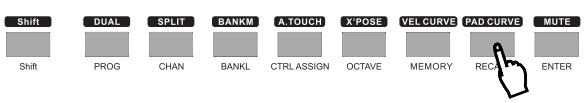
Press the MEMORY button. The system enters the storing state, it stores 6 groups setup value. Using the NUMERIC button1~6 to select the memory area. Press ENTER to store the control setting. The LCD displays the following ;





3.3.2 RECALL

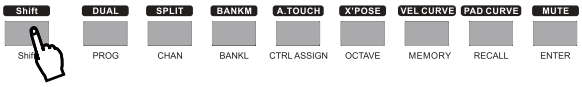
Press the RECALL button, The system enters the recall state. Using the NUMERIC button 1~6 to select the memory area. Press ENTER to recall the parameters The LCD displays the following:



3.4 Control functions

3.4.1 SHIFT

Using SHIFT KEY to select the upper function of the key. The LCD displays the following:



3.4.2 ENTER

Press ENTER to confirm the data

3.5 Pad Control

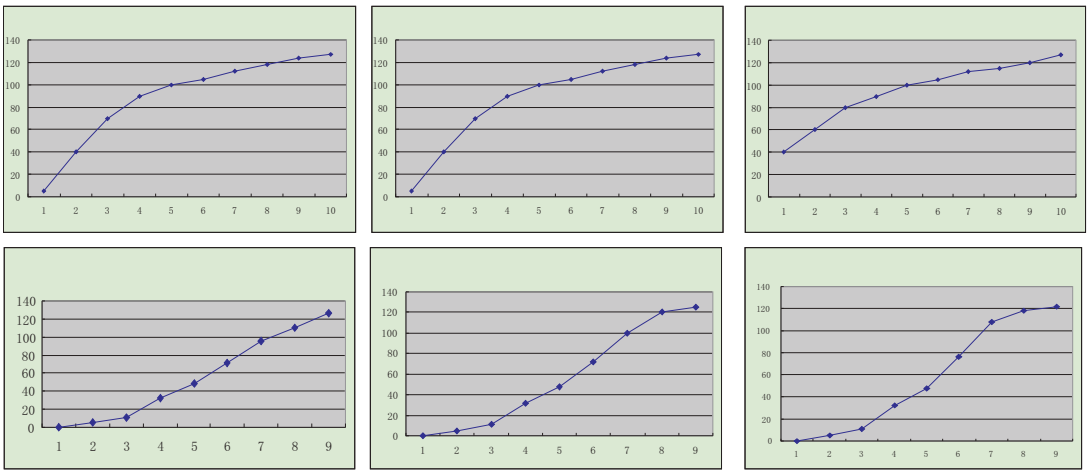
3.5.1 Pressure Control

Using the pressure control, the pads give you a different type of performance option on your Panda. You can control parameters on your software in a way that would not be possible on a standard dial or slider. The pressure pads can be used to make some very interesting effects.

As we've seen above, each pad can be assigned an individual MIDI controller number.
As you apply more and more pressure to the pad, the value of the controller you are sending will increase, until the maximum value is reached. On release, the pad will return to the minimum value.

3.5.2 Pad Curve

The Pad Curve setting is used to set the response curve of all eight pads. It is not possible to set the response curve of the pads independently.



3.5.3 Pads Note setting

Press one pad, then press assign. After that you shall press shift, then you can set the MIDI note by numeric buttons or +/- buttons. and press ENTER to confirm.

3.6 MMC(MIDI MACHINE CONTROL)

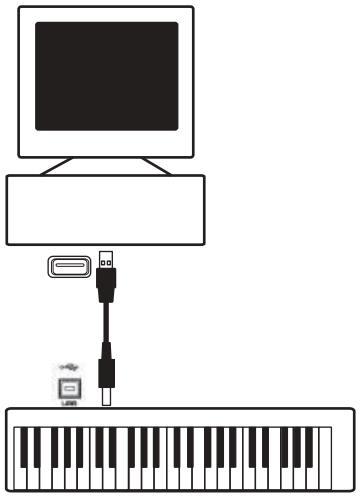
There are 6 buttons used for MMC-[|<<],[<<],[>>],[O],[stop], [play]. It is common to set the 6 buttons as Sequencer remote control buttons, it needs to be working with sequencer software.

3.7 NRPN/RPN setting

Assign the controller to 132~135,after that you can set the NRPN OR RPN by numeric buttons. Please consult Appendix D on Page 18 for full list.

Section 4: Usage Examples

4.1Recording Your Performance On A Sequencer



A MIDI sequencer will allow you to record, play back, store and edit MIDI data. Although hardware sequencers exist, we will focus on the more commonly used software sequencers in this manual. Examples of popular software sequencers are Pro ToolsTM, CubaseTM and LogicTM, although there are many different sequencing applications available for your computer.
In order to use the Panda with your sequencer, you need to set up the sequencer software so that the Panda is recognized as the sequencer's MIDI input device.
You need to choose a MIDI output device that is capable of making sound when MIDI data is sent to it. This may be a soundcard on your computer, a VST instrument or a sound module connected to a MIDI port which is in turn connected to your computer. Please consult your sequencer's user manual for more information on how this is done. In this manual, section 1.3.1, "Using The Panda With Your software" details how the Panda will appear in the device listing of your sequencer.
With the Panda set up to communicate with the sequencer, data will go into the sequencer and will be routed to a virtual synthesizer within the sequencer software or sent to an external sound module via a MIDI output port. The virtual synthesizer or external sound module will turn the MIDI data into audible sounds. You can then record the incoming MIDI data and edit your performance using your sequencer.

Section 5:MIDI Information Specification

5.1 Program & Bank Changes Explained

The original GM MIDI Specification was designed to access only 128 different sounds using Program Change messages (0-127).
As MIDI devices grew to be more sophisticated and contain more sounds, Bank Change messages were included in the specification to allow for more than 128 sounds to be accessed. Within each bank there are a possible 128 different sound patches that can be accessed using the standard Program Change command. Using the expanded 14-bit Bank Change command, there are now 16,384 banks available—each with 128 sounds patches. Technically speaking, the first 7 bits of the 14-bit Bank Change message are sent in a single byte known as the Bank LSB. The last 7 bits define another byte known as the Bank MSB. The Bank LSB is the most commonly used. This allows for 128 bank changes, and often there is no need to send a Bank MSB.
You will find almost all MIDI devices respond to Program Change commands and many are organized according to the GM listing. In all General MIDI devices, the different sounds are always organized in the same way from device to device, so the piano sounds are in their particular place, the string sounds are in their place, the drum sounds and so on. All GM devices (both hardware and software sound modules) are clearly labeled as such, so you know that their sounds are organized in the General MIDI structure. So when a GM device receives a MIDI Program Change, it calls up a type of sound that you expect from the GM sound set. All non-GM devices call up unique sounds from their memory upon receiving MIDI Program Changes. Since the sounds in a non-GM device are not arranged in a particular order, you need to take a look at the device itself to see which sound you want and at which location in the memory it resides. Many VST instruments such as Native Instruments' FM7 or the synth modules in Reason are non-GM devices.
Bank Change messages are useful when calling up sounds from a large library that may exist in a particular sound module or software synth. For example devices that are built with Roland's GS specification or Yamaha's XG specification require you to specify a Bank Change in order to access the extra voices and effects that these devices provide.
Sending Program, Bank LSB and Bank MSB data is made simple using the Panda. Please consult section 2.4 to see how this is done.

Section 6: Troubleshooting

The Panda has been designed to give you high performance MIDI control. It has been tested under a wide range of system and operating conditions. However, there are virtually limitless numbers of operating scenarios, any of which could affect your system's performance. Though this section cannot cover all possible situations you may encounter, we would like to offer some suggestions for dealing with common problems.

If you are connecting to a computer, we recommend that you avoid connecting too many devices to your computer at the same time. The more devices you have connected to the computer, the greater the load on the computer's CPU. Although it is possible in theory to connect multiple USB devices at the same time, doing so may degrade your system's performance.

My Panda suddenly stopped working after having performed well since installation on a computer:

< Switch off the unit and leave it off for 10 seconds. Then restart your computer, power up your Panda and try again.

I have connected the Panda to my computer. When I press a key, there is a delay before I hear any sound.

< This delay is known as latency. Latency with MIDI signals is caused at the computer and is not coming from the Panda. This may be due to the CPU load of the soft-synth you are using. MIDI data is simply control data. MIDI data is read by the soft synth; the soft synth then completes a large number of complex calculations in order to produce the sound you hear, and all of this processing activity takes time. If you already have adjusted the appropriate parameters relating to latency on your sound card, try re-installing the latest drivers for the sound card, or try reducing the buffer sizes of the sound card. If you are using a host application, check its buffer size settings as most applications allow for user adjustment to improve timing.

< PC only: If your soundcard supports ASIO or WDM, then please use these drivers. It is suggested that you'd better not use the MME driver which is older and less efficient in design and will have a much higher latency. In the audio device settings, please select the ASIO driver if available.

Section 7:Technical Info

Caution:

Electro Static Discharge, Electrical Fast Transient and Conducted RF interference may cause the unit malfunctioning. In such case, unplug the unit and plug it in again to restore normal operation.

Note: Your WORLDE product has been tested to comply with FCC Standards FOR HOME OR OFFICE USE. Modifications not authorized by the manufacturer may void users authority to operate this device.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

< Re-orient or relocate the receiving antenna.

< Increase the separation between the equipment and receiver.

< Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

< Consult the dealer or an experienced radio/ TV technician for help.

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VST is a trademark of Steinberg Soft– und Hardware GmbH

WARNING:

This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. **Wash hands after handling**.

Section 8: Appendices

Appendix A – MIDI IMPLEMENTATION CHART

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	X X	
Mode	Default Messages Altered	Mode 3 0 *****	X	
Note Number	 True Voice	0-127 *****	X	
Velocity	Note ON Note OFF	0 X	X X	
After Touch	Key's Channel	X 0	X X	
Pitch Bend		0	X	
Control Change	0-119 120-127	0 0	X X	
Program Change	 True #	0-127 *****	X	
SystemExclusive		0*	0*	*GM, GM2, MMC,
System Common	Song Position Pointer SongSel Tune Request	X X X	X X X	
System Real Time	Clock Commands	X X	X X	
Aux Messages	All Sounds Off ResetAl l Controllers Local ON/OFF All Notes OFF Active Sensing SystemReset	0 0 0 0 X X	X X X X X X	
Notes				

Mode 1: OMNI ON, POLY Mode 2: OMNI ON, MONO 0: Yes

Mode 3: OMNI OFF, POLY Mode 4: OMNI OFF, MONO X: No

Appendix B – Useful MIDI Data Tables

BI-General MIDI Instruments-Program Change Numbers

Piano	*Bass*	*Reed*	*Synth Effects*
0 Acoustic Grand Piano	32 Acoustic Bass	64 Soprano Sax	96 SFX Rain
1 Bright Acoustic Piano	33 Fingered Bass	65 Alto Sax	97 SFX Soundtrack
2 Electric grand Piano	34 Electric Picked Bass	66 Tenor Sax	98 SFX Crystal
3 Honky Tonk Piano	35 Fretless Bass	67 Baritone Sax	99 SFX Atmosphere
4 Electric Piano 1	36 Slap Bass 1	68 Oboe	100 SFX Brightness
5 Electric Piano 2	37 Slap Bass 2	69 English Horn	101 SFX Goblins
6 Harpsichord	38 Syn Bass 1	70 Bassoon	102 SFX Echoes
7 Clavinet	39 Syn Bass 2	71 Clarinet	103 SFX Sci-Fi
Chromatic Percussion	***Strings/Orchestra***	***Pipe***	***Ethnic***
8 Celesta	40 Violin	72 Piccolo	104 Sitar
9 Glockenspiel	41 Viola	73 Flute	105 Banjo
10 Music Box	42 Cello	74 Recorder	106 Shamisen
11 Vibraphone	43 Contrabass	75 Pan Flute	107 Koto
12 Marimba	44 Tremolo Strings	76 Bottle Blow	108 Kalimba
13 Xylophone	45 Pizzicato Strings	77 Shakuhachi	109 Bag Pipe
14 Tubular bells	46 Orchestral Harp	78 Whistle	110 Fiddle
15 Dulcimer	47 Timpani	79 Ocarina	111 Shanai
Organ	***Ensemble***	***Synth Lead***	***Percussive***
16 Drawbar Organ	48 String Ensemble 1	80 Syn Square Wave	112 Tinkle Bell
17 Percussive Organ	49 String Ensemble 2	81 Syn Sawtooth Wave	113 Agogo
18 Rock Organ	50 Syn Strings 1	82 Syn Calliope	114 Steel Drums
19 Church Organ	51 Syn Strings 2	83 Syn Chiff	115 Woodblock
20 Reed Organ	52 Choir Aahs	84 Syn Charang	116 Taiko Drum
21 Accordion	53 Voice Oohs	85 Syn Voice	117 Melodic Tom
22 Harmonica	54 Syn Choir	86 Syn Sawtooth Wave	118 Syn Drum
23 Tango Accordion	55 Orchestral Hit	87 Syn Brass & Lead	119 Reverse Cymbal
Guitar	***Brass***	***Synth Pad***	***Sound Effects***
24 Nylon Acoustic	56 Trumpet	88 New Age Syn Pad	120 Guitar Fret Noise
25 Steel Acoustic	57 Trombone	89 Warm Syn Pad	121 Breath Noise
26 Jazz Electric	58 Tuba	90 Polysynth Syn Pad	122 Seashore
27 Clean Electric	59 Muted Trumpet	91 Choir Syn Pad	123 Bird Tweet
28 Muted Electric	60 French Horn	92 Bowed Syn Pad	124 Telephone Ring
29 Overdrive	61 Brass Section	93 Metal Syn Pad	125 Helicopter
30 Distorted	61 Syn Brass 1	94 Halo Syn Pad	126 Applause
31 Harmonics	62 Syn Brass 2	95 Sweep Syn Pad	127 Gun Shot

B2–Roland GS And Yamaha XG NRPN Messages

NRPN	NRPN	Data	Data
MSB	LSB	MSB	LSB
CC99	CC98	CC06	CC38
01	08 00-7F	n/a	(-64 - 0 - +63) Vibrato Rate (relative change)
01	09 00-7F	n/a	(-64 - 0 - +63) Vibrato Depth (relative change)
01	0A 00-7F	n/a	(-64 - 0 - +63) Vibrato Delay (relative change)
01	20 00-7F	n/a	(-64 - 0 - +63) Filter Cutoff Freq. (relative change)
01	21 00-7F	n/a	(-64 - 0 - +63) Filter Resonance (relative change)
01	63 00-7F	n/a	(-64 - 0 - +63) EG (TVF&TVA) Attack Time (relative change)
01	64 00-7F	n/a	(-64 - 0 - +63) EG (TVF&TVA) Decay Time (relative change)
01	66 00-7F	n/a	(-64 - 0 - +63) EG (TVF&TVA) Release Time (relative change)
*14	00-7F 00-7F	n/a	(-64 - 0 - +63) Drum Filter Cutoff Freq. (relative change)
*15	00-7F 00-7F	n/a	(-64 - 0 - +63) Drum Filter Resonance (relative change)
*16	00-7F 00-7F	n/a	(-64 - 0 - +63) Drum EG Attack Rate (relative change)
*17	00-7F 00-7F	n/a	(-64 - 0 - +63) Drum EG Decay Rate (relative change)
18	00-7F 00-7F	n/a	(-64 - 0 - +63) Drum Instrument Pitch Coarse (relative change)
*19	00-7F 00-7F	n/a	(-64 - 0 - +63) Drum Instrument Pitch Fine (relative change)
1A	00-7F 00-7F	n/a	(0 to Max) Drum Instrument Level (absolute change)
1C	00-7F 00-7F	n/a	(Random, L>C>R) Drum Instrument Panpot (absolute change)
1D	00-7F 00-7F	n/a	(0 to Max) Drum Instrument Reverb Send Level (absolute change)
1E	00-7F 00-7F	n/a	(0 to Max) Drum Instrument Chorus Send Level (absolute change)
%1F	00-7F 00-7F	n/a	(0 to Max) Drum Instrument Variation Send Level (absolute change)

* added by Yamaha XG; % changed from Delay to Variation by Yamaha XG

B3-General MIDI Drums-Note assignments

0. Small Room
1: Medium Room
2: Large Room
3: Medium Hall
4: Large Hall
8: Plate

B4-Gm2 Chorus Types

0. Chorus1
1: Chorus 2
2: Chorus 3
3: Chorus 4
4: FB Chorus
5: Flanger

B5-General MIDI Drums-Note assignments

MIDI Note	Drum Sound	MIDI Note	Drum Sound	MIDI Note	Drum Sound
35	Acoustic Bass Drum	52	Chinese Cymbal	69	Cabasa
36	Bass Drum 1	53	Ride Bell	70	Maracas
37	Side Stick	54	Tambourine	71	Short Whistle
38	Acoustic Snare	55	Splash Cymbal	72	Long Whistle
39	Hand Clap	56	Cowbell	73	Short Guiro
40	Electric Snare	57	Crash Cymbal 2	74	Long Guiro
41	Low Floor Tom	58	Vibraslap	75	Claves
42	Closed Hi-Hat	59	Ride Cymbal 2	76	Hi Wood Block
43	High Floor Tom	60	Hi Bongo	77	Low Wood Block
44	Pedal Hi-Hat	61	Low Bongo	78	Mute Cuica
45	Low Tom	62	Mute Hi Conga	79	Open Cuica
46	Open Hi-Hat	63	Open Hi Conga	80	Mute Triangle
47	Low-Mid Tom	64	Low Conga	81	Open Triangle
48	Hi-Mid Tom	65	High Timbale		
49	Crash Cymbal 1	66	Low Timbale		
50	High Tom	67	High Agogo		
51	Ride Cymbal 1	68	Low Agogo		

Appendix C – General MIDI Controller Numbers（MIDI CC's）

0~127	General controller
128	PAD controller
129	Pitch Bend
130	Master Volume
131	Program Change
132	RPN Coarse
133	RPN Fine
134	NRPN Coarse
135	NRPN Fine

Appendix D – Assignable Controller Numbers to Linear Controllers

This table applies to the following controls on your Panda:

- Sliders
- Aftertouch strip
- Pitch bend wheel
- Modulation wheel
- Expression pedal

0~127	General controller
128	PAD controller
129	Pitch Bend
130	Master Volume
131	Program Change
132	RPN Coarse
133	RPN Fine
134	NRPN Coarse
135	NRPN Fine

Appendix E-Assignable Controller Numbers to Non-Linear Controllers

This table applies to the following controls on your Panda

- Assignable buttons Panda 49/61 only)
- Transport controls
- Sustain pedal

0~127	General controller
128	PAD controller
129	Pitch Bend
130	Master Volume
131	Program Change
132	RPN Coarse
133	RPN Fine
134	NRPN Coarse
135	NRPN Fine

Appendix F – Assignable Controller Numbers to Rotary Encoders

This table only applies to the Rotary encoders on your Panda

0~127	General controller
128	PAD controller
129	Pitch Bend
130	Master Volume
131	Program Change
132	RPN Coarse
133	RPN Fine
134	NRPN Coarse
135	NRPN Fine

Appendix G – Assignable Controller Numbers to Pressure Pads

This table only applies to the pressure Pads on your Panda.

0~127	General controller
128	PAD controller
129	Pitch Bend
130	Master Volume
131	Program Change
132	RPN Coarse
133	RPN Fine
134	NRPN Coarse
135	NRPN Fine

Appendix H – Factory Presets

Penal controller	Controller number	Controller name
R1	07	Standard MIDI Controller
R2	92	Standard MIDI Controller
R3	91	Standard MIDI Controller
R4	74	Standard MIDI Controller
R5	131	Program Change
R6	81	Standard MIDI Controller
R7	73	Standard MIDI Controller
R8	93	Standard MIDI Controller
PITCHBEN WHEEL	129	Pitch Bend
MODULATION WHEEL	01	MODULATION
S1	130	Master Volume
S2	42	Standard MIDI Controller
S3	65	Standard MIDI Controller
S4	94	Standard MIDI Controller
S5	07	Standard MIDI Controller
S6	67	Standard MIDI Controller
S7	95	Standard MIDI Controller
S8	71	Standard MIDI Controller
S9	70	Standard MIDI Controller
Pad	128	Pad controller
Pedal A	67	Standard MIDI Controller
Pedal B	11	Standard MIDI Controller

Appendix I – Hexadecimal Conversion Chart

Hexadecimal value	Decimal value	Hexadecimal value	Decimal value	Hexadecimal value	Decimal value
0	0	2B	43	56	86
1	1	2C	44	57	87
2	2	2D	45	58	88
3	3	2E	46	59	89
4	4	2F	47	5A	90
5	5	30	48	5B	91
6	6	31	49	5C	92
7	7	32	50	5D	93
8	8	33	51	5E	94
9	9	34	52	5F	95
0A	10	35	53	60	96
0B	11	36	54	61	97
0C	12	37	55	62	98
0D	13	38	56	63	99
0E	14	39	57	64	100
0F	15	3A	58	65	101
10	16	3B	59	66	102
11	17	3C	60	67	103
12	18	3D	61	68	104
13	19	3E	62	69	105
14	20	3F	63	6A	106
15	21	40	64	6B	107
16	22	41	65	6C	108
17	23	42	66	6D	109
18	24	43	67	6E	110
19	25	44	68	6F	111
1A	26	45	69	70	112
1B	27	46	70	71	113
1C	28	47	71	72	114
1D	29	48	72	73	115
1E	30	49	73	74	116
1F	31	4A	74	75	117
20	32	4B	75	76	118
21	33	4C	76	77	119
22	34	4D	77	78	120
23	35	4E	78	79	121
24	36	4F	79	7A	122
25	37	50	80	7B	123
26	38	51	81	7C	124
27	39	52	82	7D	125
28	40	53	83	7E	126
29	41	54	84	7F	127
2A	42	55	85		

Contact information:
HANGZHOU WORLDE DIGITAL PIANO CO., LTD
5 Houshan Road, GujiaQiao, Wuchang Industry Park,
Yuhang District, Hangzhou, Zhejiang 310023,China
Tel:+86-571-88730848
Fax:+86-571-88730748
Email:sales@worlde.com.cn
Website:www.worlde.com.cn