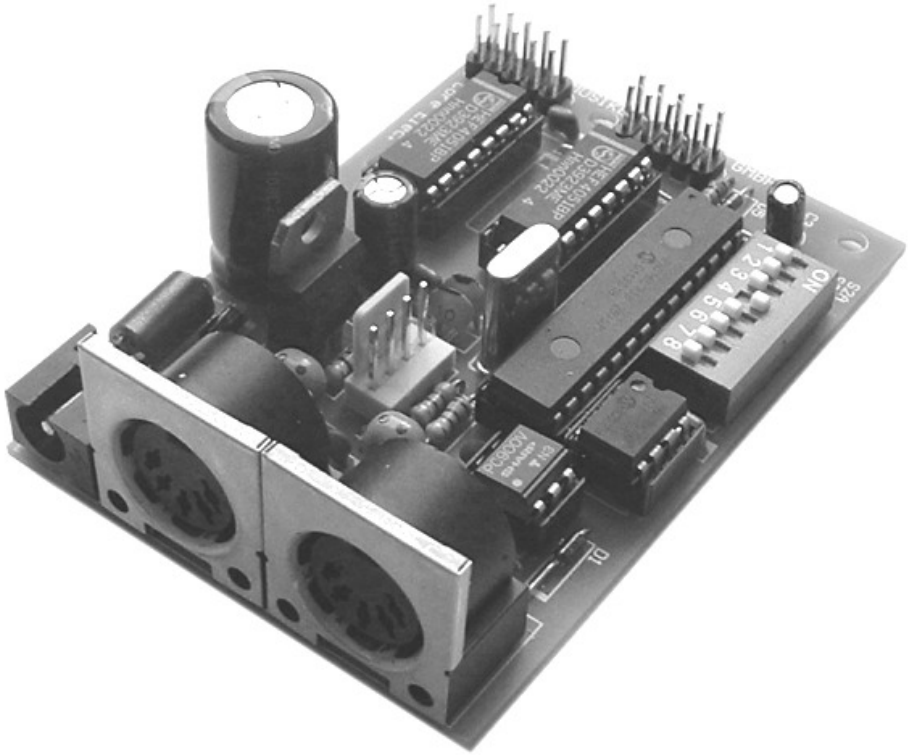
DOEPFER MUSIKELEKTRONIK GMBH



POCKET ELECTRONIC

(Universal Midi Control Electronics)
Installation and User's Guide

Table of contents

Electrical safety / EMC compatibility

POCKET ELECTRONICS (abbreviated "*PE*" in the following) is a so-called **OEM product** (OEM original equipment manufacturer) that cannot be used independently but has to be combined with additional electrical or electronical equipment to become a working device (e.g. potentiometers, switches, power supply, case/housing). The manufacturer of *PE* does not know the final assembly of the complete device in which the *PE* is used as a part of the complete device. The final responsibility with regard to **electrical safety** and **electromagnetic compatibility** is up to the user who is assembling the complete device.

Electronic basic knowledge is required to install PE and to connect the controls resp. control voltages. If you are not sure whether your knowledge is sufficient please consult an expert. We cannot take back modules that became defective because of wrong installation or wrong connection of the controls or voltages.

Please pay attention to the following items:

The **power supply** used in combination with the *PE* has to be a closed type (in Germany a power supply with VDE approval is required). Normally an AC adapter with plastic case is used. It is not allowed to use **open power supplies** whith open **mains voltage** access (e.g. via mains lead, pcb tracks, electronic parts).

On the *PE* **preventing measures** against **electromagnetic radiation** are taken (RF filters at the power supply input and the Midi lines). But it is impossible to estimate to what extend the **components added by the user** affect the **EMC properties** of the complete assembly. Therefore the **complete device** has to be **shielded** against **electromagnetic radiation** (incoming and outgoing)**.** These demands are normally met by a closed metal case that covers the complete assembly. The metal case should be connected to GND of the *PE*.

Warranty

- Applying any negative voltage (< 0V) or positive voltage above +5V (> +5V) to one of the 16 analog inputs (JP1, JP2) will destroy the circuit !
- If potentiometers and/or switches are connected between GND and +5V of *PE* as described in this manual no problems will occur.
- When external control voltages are connected to *PE* the user has to pay attention that the voltages applied are strictly within GND and +5V referenced to GND of *PE* !
- Do not solder directly to any of the pin headers but use female connectors to make the connections between *PE* and the potentiometers, switches or voltages. A cable set that contains all required connectors and cables is included with *PE*.
- Carry out all connections in the off-state of *PE* (i.e. when powered-off only) !
- Do not power on *PE* (i.e. do not connect the power supply to the corresponding jack socket) before all 16 analog inputs are connected. Do not leave analog inputs unconnected !
- The 4-pin connector is allowed to connect a button and LED only as described in the manual. Do not connect any other electronic parts or voltages.
- *PE* electronics is an electrostatic sensitive device. Avoid any electrostatic charges ! Do not touch the analog inputs with your fingers !
- Avoid short circuits !
- Ignoring any of these items will cause warranty loss !
- Return of the *PE* within the 2 weeks return time limit (valid only in Germany) is only possible if all these items have been met. Return of used cable sets is not possible. We also cannot take back modules that have been soldered by the user.

Introduction

- *PE* is an universal electronics DIY kit to built your own Midi control box. Up to 16 controls can be connected to *PE* transmitting 16 different Midi messages on different (or even the same) Midi channels. The most important messages are probably the Midi Control Change messages – often simply called "Midi controllers". In the following we are sometimes talking about Midi controllers though other Midi messages are possible. The available Midi messages are described in the manual of the editor software.
- Typical examples for controls that can be used are rotary potentiometers, fader/slider potentiometers, momentary switches, toggle switches, foot switches or foot controllers). The controls are not included but have to be added by the customer.
- Even voltages sources can be used instead of the controls provided that the voltages applied are strictly within the range 0...+5V (referenced to *PE* GND)! Voltages beyond this range will destroy the electronics !
- The *PE* configuration (i.e. the assignment of Midi messages and channels to the controls in the 128 presets) is made with a editor program (PC version, free download from our web site www.doepfer.com). It enables the user to program his own 128 presets. Sorry we do not offer a Mac version of the editor program. But we have available the OEM version of Emagic's Sounddiver (both PC and Mac version, extra charge).
- The factory presets are described in the appendix of this manual These can be changed with the editor program.
- The 16 controls resp. control voltages are connected to double row pinheaders (10 pins each). To these headers two 10 pin ribbon cables are put up. The terminals of the controls are soldered to the free ends of the ribbon cables. In this way the controls might be disconnected from the electronics very easily.
- *PE* is equipped with Midi In and Midi Out. The incoming Midi messages are merged to the data generated by *PE* provided that the Midi data does not exceed a certain amount. In this way several *PE* can be linked together to obtain larger controller arrays with more than 16 controls.
- *PE* is available only as an assembled and tested pc board (about 80 x 56 x 25 mm).
- *PE* includes two 10 pin ribbon cables (about 30 cm each), button and LED (snapshot function) and the power supply.
- An external power supply (7-12VDC@min. 100mA) is required for the *PE*. It is included for all shipments within Germany (230V version with European mains plug). For shipments outside Germany please ask your local representative or dealer.
- We do not offer a suitable housing as this would have to be completely different for various combinations of controls.

Connection and Installation

Please pay attention to the following notes !

Electronic basic knowledge is required to install the PE electronics and to connect the controls resp. control voltages. If you are not sure whether your knowledge is sufficient please consult an expert. We cannot take back modules that became defective because of wrong installation or wrong connection of the controls or voltages. We also cannot take back modules or cables which have been soldered by the user.

Power Supply (1)

PE does not have a built-in power supply. Instead it uses a plug-in type external power supply (AC adapter). One reason for this feature is electrical safety. Keeping danger voltages (main) out of the *PE* increases the electrical safety. Therefore an external power supply of high quality and safety should be used. If *PE* is used in Germany the external power supply has to be VDE approved. Another reason for the external power supply is the fact that mains voltages and plug types vary considerably from country to country. Using a plug-in external supply *PE* can be used any where with a locally purchased power supply, thus keeping the retail price down.

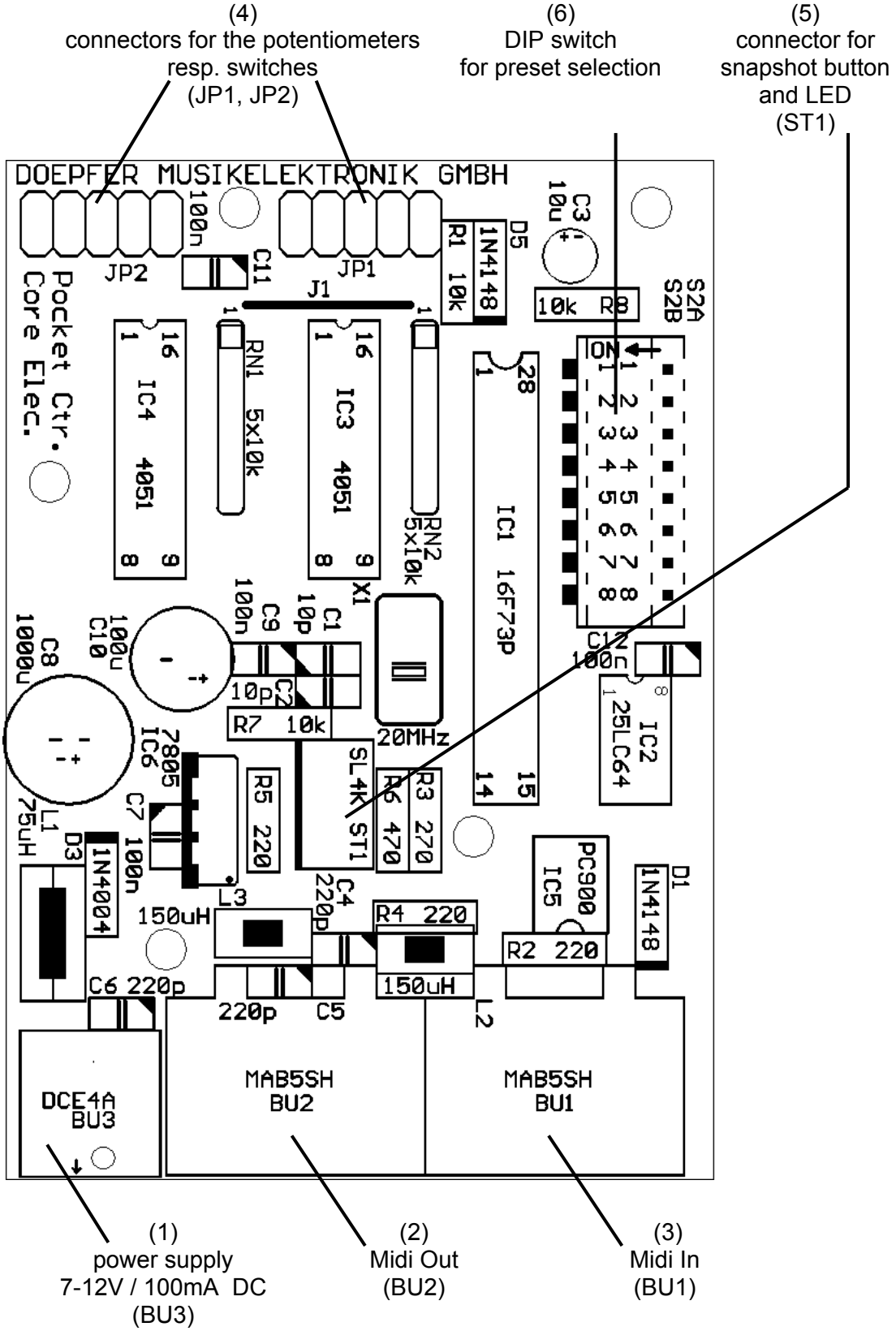
The power supply has to be able to deliver 7-12 VDC unstabilized voltage, as well as a minimum current of 100mA. *PE* is switched ON by plugging the AC adapter into a wall outlet and connecting it to the appropriate jack on the *PE* board. There is no separate ON/OFF switch. After power on the preset adressed by the settings of the DIP switch is called up, as well as the current settings for Midi thru mode and master channel. For details please refer to the user's manual of the free editor software.

If the polarity of the power supply is incorrect, *PE* will not function. However, there is no danger of damage to the circuitry since it is protected by a diode. The correct polarity is: outside ring = GND, inside lead = +7...12V. A power supply for 230V mains voltage with European type mains plug is included with the *PE* (valid only within Europe, for other countries ask you local Doepfer representative or dealer).

Midi Out Socket (2)

Connect the Midi Out socket with Midi In of the device to be controlled by *PE* (e.g. Computer, Synthesizer, second daisy-chained *PE*) via a suitable Midi cable. If you want to control more than one Midi device you have to use daisy chain Midi Thru / Midi In connection of the devices ore use a external Midi Thru box.

Overview: Pocket Electronic Connectors



Midi In Socket (3)

The *PE* features a Midi input. This input may be connected to another Midi device (e.g. Midi keyboard). The incoming Midi data are merged to the data generated by *PE*. The Midi input may be used as well for daisy-chaining several *PE*. The Midi input of *PE* is not suitable for large amounts of Midi data (e.g. SysEx strings or Midi messages coming from an computer sequencer) as the *PE* has only a small Midi in buffer. In case of large amounts of incoming Midi data loss or delay of data may occur.

The Midi input is also required when *PE* is programmed with the editor software. In this case the Midi input of *PE* has to be connected to the Midi output of the computer on which the editor program is running. The Midi output of *PE* has to be connected to the Midi input of the computer. Details can be found in the manual of the editor program.

If the merge feature of the *PE* is not required and the programming option is not used the Midi input is left open.

Connectors for the 16 controls (4)

The two pin headers JP1 and JP2 are used to connect the controls. Both pin headers have available these signals: GND, +5V and 8 control voltage inputs (range 0...+5V).

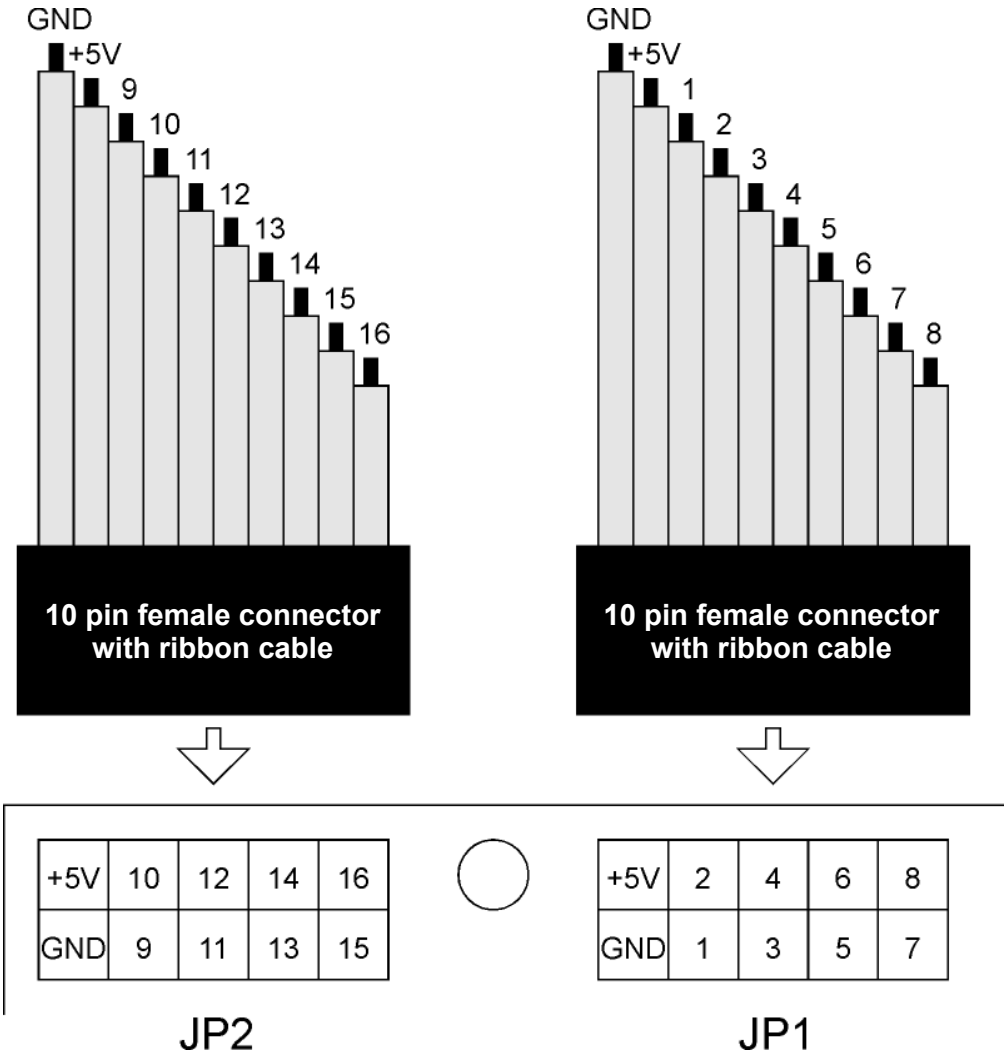
Remark: In the following the terms GND (= abbreviation of ground) and 0V (zero volts) are used synonymous.

The control voltages are normally generated by rotary or fader potentiometers that are connected between GND and +5V. In this case the wiper of the potentiometers outputs a voltage in the range 0...+5V while the potentiometer is operated. Another possibility is the connection of momentary switches or toggle switches.

The lower part of the sketch on the next page shows the pinout of the two pin headers JP1 and JP2 (same orientation as the picture on page 5). The pins labelled 1 ... 16 are the 16 control voltage inputs.

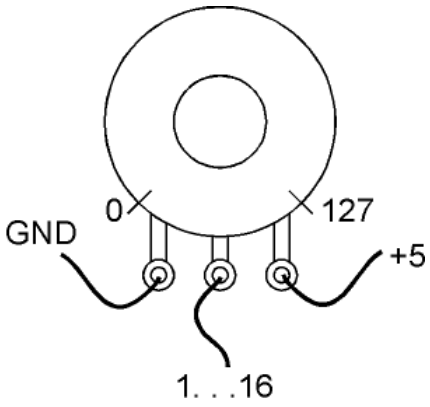
Normally two 10 pin female connectors with ribbon cables are plugged to the pin headers JP1 and JP2. The female connectors with ribbon cables are included with the *PE*. The controls (e.g. potentiometers, switches) are soldered to the open ends of the ribbon cable.

The upper part of the sketch shows the pinout of the 10 wires of the ribbon cables. We strictly recommend this type of wiring but not to solder the wires directly to the pin headers JP1 and JP2. Usage of the ribbon cables with female connectors allows to disconnect the controls from the electronics very easily.

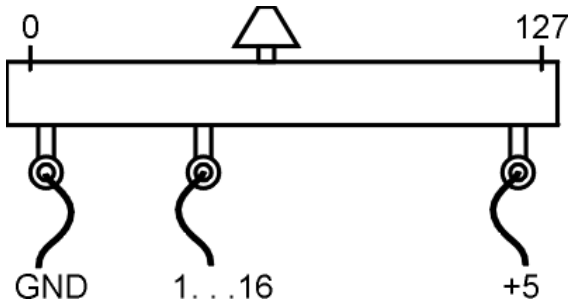


Rotary or slider potentiometers are connected in this way:

- lower resp. left end terminal to GND
- wiper / middle terminal to one of the analog inputs 1 ... 16
- upper resp. right end terminal to +5V



Connection of a
rotary potentiometer



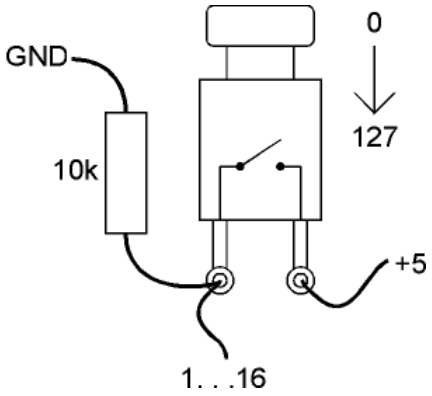
Connection of a
slider potentiometer

Linear potentiometers with resistance values 4k7 ... 100k can be used. We recommend 10k (linear).

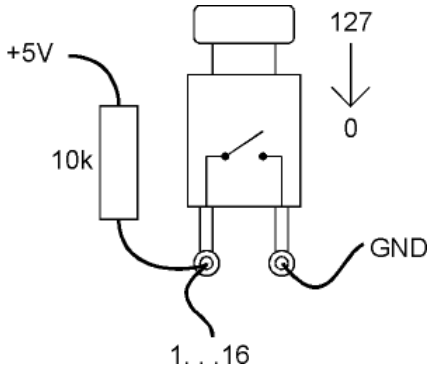
Momentary or toggle switches can be used in two different ways:

	state of rest		aktive state	
	Midi data	voltage	Midi data	voltage
version 1	0	0V	127	+5V
version 2	127	+5V	0	0V

Simple momentary switches (1 contact, open at rest) or simple toggle switches (1 contact on/off) are required. According to the desired behaviour (version 1 or 2 in the above table) the switch has to be wired correspondingly:



Connection of a momentary or toggle switch (<u>version 1</u>)



Connection of a momentary or toggle switch (<u>version 2</u>)

In both cases an additional 10k resistor is required (possible range 4k7 to 100k) to pull the analog input to a defined state during the switch is open.

- <u>Version 1</u>: The resistor is soldered between GND and the control voltage input 1...16. This way the input is pulled to GND (=0V corresponding to Midi data 0) as long as the switch is left open. When the switch is closed the voltage jumps to +5V corresponding to Midi data 127.

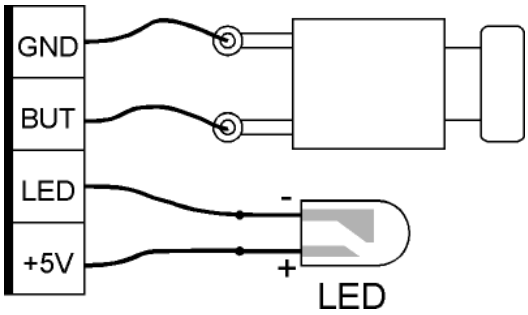
- <u>Version 2</u>: The resistor is soldered between +5V and the control voltage input 1...16. This way the input is pulled to +5V (corresponding to Midi data 127) as long as the switch is left open. When the switch is closed the voltage jumps to 0V corresponding to Midi data 0.

Sixteen 10k-resistors (range 4k7 ... 100k) are enclosed witch each *PE* delivery. Suitable resistors are available in each electronic shop too (value: 10k, power: ¼ W, tolerance: 5%, material: carbon).

<u>Unused inputs have to be connected to GND. Avoid open inputs !</u> An open input will cause the transmission of random Midi data causing undesirable side effects at the Midi receiver (e.g. Midi overflow or random parameter fluctuations).

Connector for snapshot button and LED (5)

PE has two simple controls available: a so-called snapshot button and a LED. If the user wants to have available these controls they are connected to the pin header ST1 in this way:



The button is a simple momentary switch (open at rest) and any standard LED can be used (3 or 5 mm or rectangle, red/yellow/green/blue/white color). Pay attention to the polarity of the LED. Normally the cathode (minus terminal) is indicated by a shortened pin and is the bigger electrode inside the LED.

A 4 pin female connector can be used for wiring. This allows to disconnect the button and LED from the electronics very easily.

The LED is essentially used as a control display, the button is used to send off all 16 Midi messages with the data corresponding to the present positions of the 16 controls (snapshot function). The functions of the snapshot button and the LED are described in detail in the operation chapter of this manual.

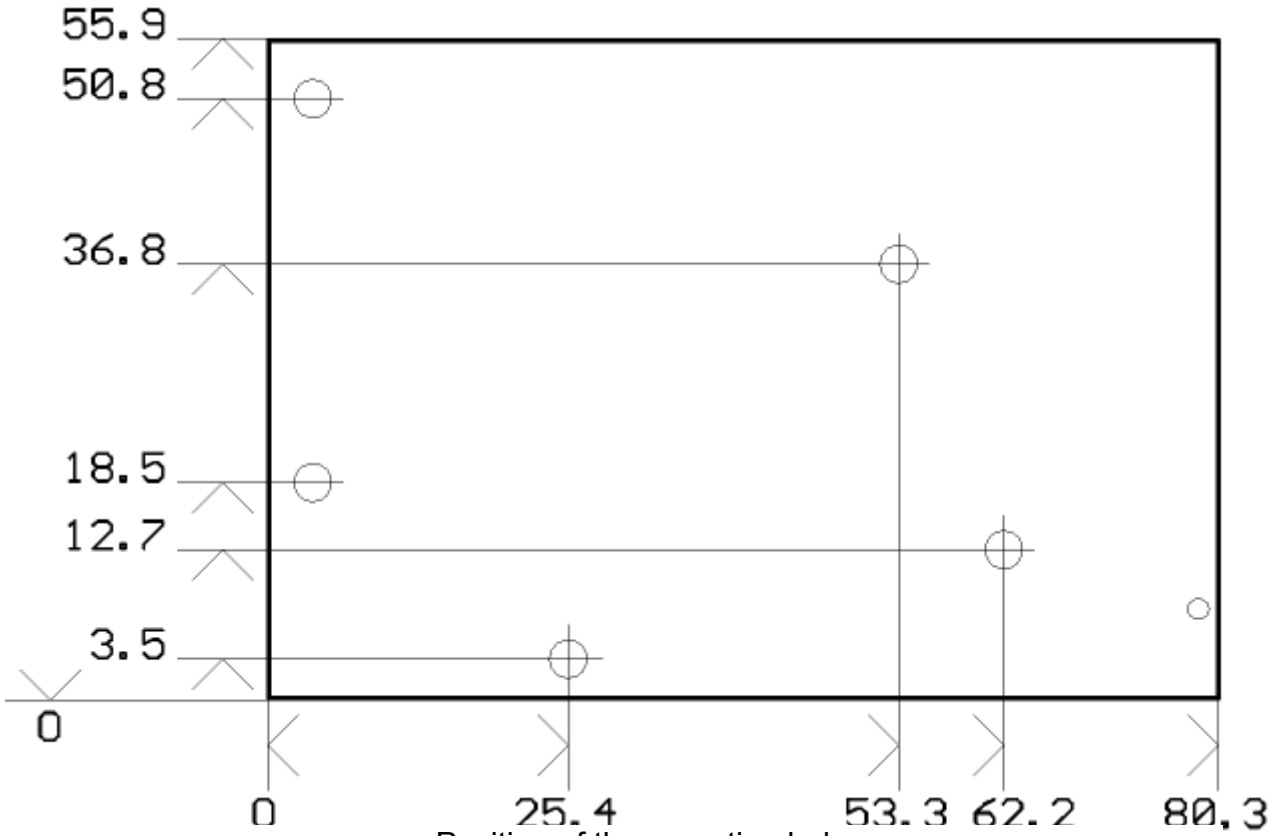
DIP Switches (6)

The positions of the 8 switches of S2 determine the number of the preset that is called up during power on. For details please refer to chapter "controls and operation".

Mounting

Before *PE* is put into operation the board has to be fixed on a suitable support and built into a metal case together with the controls (refer to EMC notes on page 2). The metal case has to be connected to GND of *PE.* We recommend to use the metal plate of the voltage regulator 7805/IC6 or the GND terminal of the power supply socket for this connection.

The board measures about 80 x 56 x 25 mm. Five mounting holes with 3 mm diameter are available for mounting the board inside the case e.g. with distance sleeves or spacers (> 5 mm in length) and suitable screws. Pay attention that no short circuits are made – neither on the top of the board (electronic parts) nor on the bottom (solder points or pcb tracks). In case of doubt use isolating plastic parts (e.g. plastic screws, nuts and washers) for mounting.



Position of the mounting holes
(measures in mm)

Controls and Operation

Apart from the 16 potentiometers and/or switches that are connected to JP1 and JP2 *PE* has these controls available:

- momentary switch/button (connected to ST1, please refer to page 10)
- LED (connected to ST1, please refer to page 10)
- 8 pin DIP switch (please refer to page 10)

Functions of the LED

After power on the LED will stay lit for around one second when the power is first applied to the *PE* . If this does not happen probably the power supply used is not suitable (i.e. correct polarity, voltage and current) or defective.

Under normal operation the LED indicates MIDI input activity, and also MIDI output activity when moving the potentiometers or operating the switches connected to *PE* .

The LED also indicates these situations:

- The status of the Snapshot function (details see "functions of the button")
- Data and status when setting the Master channel
- Indication that a preset has been changed
- Any error at the MIDI input
- Whenever an overflow at the Midi input is recognized by *PE* the LED turns permanently on. This is an indication that the merge capacity of *PE* has been exceeded, or that SysEx messages intended for *PE* have been transmitted too fast. In both cases the Midi data have been probably received or transmitted incomplete. If applicable the data rate at the Midi input of *PE* has to be reduced as *PE* is not able to process high Midi date rates (e.g. a complex Midi sequence sent by a sequencer). To clear the error the button has to be operated (details see "functions of the button")

Functions of the button (momentary switch)

The button has various functions:

- to send a "snapshot"

  The snapshot function is not achieved by just pressing the snapshot switch, as this could be accidentally pressed too easily. So to activate the snapshot function, first briefly press the switch once, this causes the LED to flash, the switch needs to be pressed again within at least one second (whilst the LED is still flashing). This then invokes the snapshot function, and the data from all 16 inputs is transmitted from the *PE*.

- to set the master Midi channel

The Midi master channel is used to select which channel the *PE* will transmit on when using relevant presets (i.e. presets using the master channel). Some presets (such as the MIDI volume - preset 0) has each input on a different channel, whilst other presets have all inputs on the same channel, it is on these presets that the Master channel is used. The master channel is also the channel which the *PE* will receive program change data on. To set the master channel, hold the snapshot switch down for at least one second and keep it held down, the LED then stays on to indicate the *master channel setting mode* (do not let go of the button until the required value has been selected). In this mode the inputs become channel selectors, and do not transmit the normal control data. To select a channel, simply move one of the potentiometers or operate one of the switches connected to JP1 or JP2 that relates to the channel required (to set channel 5, move potentiometer/switch in input #5). If you accidentally operate the wrong potentiometer or switch, just operate the correct one, as it is the last potentiometer/switch operated that determines the actual Master channel set.

- to reset the *PE* after a Midi overflow at the Midi input

  To clear any Midi input error such as a Midi overflow (too much data in one go), press the snapshot switch briefly once (do not press it again until at least one second has passed, or this would enter the snapshot mode).

Functions of the DIP switch

The eight DIP switches select the number of the preset that is called up after power on. The settings of the DIP switch can be looked upon as a binary number where each switch can be either on or off. This allows up to 256 values to be selected from the eight DIP switches.

A switch is referred to **1** when it is in the **ON** position, and referred to **0** in the **OFF** position. The on or off (or both) position is printed or labelled on the DIP switch. Only seven of the switches are actually used to select one of the 128 available presets. The eighth switch is not used at present and has no functions, but it is good practice to leave it in the OFF position, as a future update may make use of this switch position.

The switches are numbered one to eight. The upper switch (near the capacitor C3 or restistor R8) is switch number one, the lower switch (near IC2/25LC64) is switch number eight.

The following listing, lists all the available presets that are shipped in the *PE* (i.e. the factory presets). These presets may be modified with the free editor software mentioned earlier. The presets are described in detail in the appendix.

Up to 128 different presets are available. If none of the factory presets can be used the editor program enables the user to program his own presets.

Switch 12345678	No.	Preset Explanation	Switch 12345678	No.	Preset Explanation
00000000	1	Volume Channel 1 - 16	00000100	33	XG Level Chn 1 - 16
10000000	2	Panorama Channel 1-16	10000100	34	XG Pan Chn 1 - 16
01000000	3	Cutoff Channel 1-16	01000100	35	XG Reverb Chn 1 - 16
11000000	4	Resonance Chan. 1-16	11000100	36	XG Chorus Chn 1 - 16
00100000	5	Volume/Pan Ch.1 - 8	00100100	37	XG Dry Chn 1 - 16
10100000	6	Volume/Pan Ch.9 - 16	10100100	38	XG Var Chn 1 - 16
01100000	7	Cutoff/Reson. Ch.1-8	01100100	39	XG Low EQ Gain Chn 1 - 16
11100000	8	Cutoff/Reson. Ch.9-16	11100100	40	XG Low EQ Chn 1 - 16
00010000	9	Ctrl 0-15 Masterchn	00010100	41	XG High EQ Gain Chn 1 - 16
10010000	10	Ctrl 16-31 Masterchn	10010100	42	XG High EQ Chn 1 - 16
01010000	11	Ctrl 32-47 Masterchn	01010100	43	XG Mpart-Effect Masterchn
11010000	12	Ctrl 48-63 Masterchn	11010100	44	XG Level AD1/2,W1-12
00110000	13	Ctrl 64-79 Masterchn	00110100	45	XG Pan AD1/2,W1-12
10110000	14	Ctrl 80-95 Masterchn	10110100	46	XG Reverb AD1/2,W1-12
01110000	15	Ctrl 96-111 Masterchn	01110100	47	XG Chorus AD1/2,W1-12
11110000	16	Ctrl 112-127 Masterchn	11110100	48	XG Var AD1/2,W1-12
00001000	17	GS/XG Masterchn	00001100	49	XG Dry AD1/2,W1-12
10001000	18	AWE/SB 1 Masterchn	10001100	50	XG EQ
01001000	19	AWE/SB 2 Masterchn	01001100	51	XG Reverb
11001000	20	AWE/SB 3 Masterchn	11001100	52	XG Chorus
00101000	21	AWE/SB 4 Masterchn	00101100	53	XG Variation
10101000	22	AWE/SB 5 Masterchn	10101100	54	XG Insertion 1
01101000	23	GS/XG Drum Pitch	01101100	55	XG Insertion 2
11101000	24	GS/XG Drum Level	11101100	56	GS Reverb/Chorus
00011000	25	GS/XG Drum Pan	00011100	57	Strings
10011000	26	GS/XG Drum Reverb	10011100	58	Rebirth Mchn
01011000	27	GS/XG Drum Chorus	01011100	59	CS1x Masterchn
11011000	28	GS/XG Drum Delay/Var	11011100	60	Waldorf Pulse Mchn
00111000	29	XG Drum Cutoff	00111100	61	ASR-X Masterchn
10111000	30	XG Drum Reson.	10111100	62	Doepfer MAQ 1 Mchn
01111000	31	XG Drum Attack	01111100	63	Doepfer MAQ 2 Mchn
11111000	32	XG Drum Decay	11111100	64	K5000 MCB10 Mchn

Switch 12345678	No.	Preset Explanation	Switch 12345678	No.	Preset Explanation
00000010	65	Yamaha Promix Mchn	00000110	97	
10000010	66	ProFive Osz/LFO	10000110	98	
01000010	67	ProFive Mix/Filt./ADSR	01000110	99	
11000010	68	Cubase VST Vol 1-16	11000110	100	
00100010	69	Cubase VST Pan 1-16	00100110	101	
10100010	70	Cubase VST Vol/Pan 1-8	10100110	102	
01100010	71	B4 Console/TubeAmp/Pedal	01100110	103	
11100010	72	B4 Rotator	11100110	104	
00010010	73	B4 Upper Manual 1	00010110	105	
10010010	74	B4 Upper/Lower 1	10010110	106	
01010010	75	Sherman Filterbank Chn16	01010110	107	
11010010	76	Sherman Filterbank Mchn	11010110	108	
00110010	77		00110110	109	
10110010	78		10110110	110	
01110010	79		01110110	111	
11110010	80		11110110	112	
00001010	81		00001110	113	

10001010	82		10001110	114	
01001010	83		01001110	115	
11001010	84		11001110	116	
00101010	85		00101110	117	
10101010	86		10101110	118	
01101010	87		01101110	119	
11101010	88		11101110	120	
00011010	89		00011110	121	
10011010	90		10011110	122	
01011010	91		01011110	123	
11011010	92		11011110	124	
00111010	93		00111110	125	
10111010	94		10111110	126	
01111010	95		01111110	127	
11111010	96		11111110	128	

Remarks:

- The **upper** DIP switch (near the capacitor C3 or restistor R8) corresponds to switch no. **1**
- The **lower** DIP switch (near IC2/25LC64) is switch number **8**.
- A switch is referred to **1** when it is in the **ON** position (column 1 and 3 of the table)
- A switch is referred to **0** when it is in the **OFF** position (column 1 and 3 of the table)
- It depends upon the type and orientation of the switch if these correspond to the right or left position of the switches. The **ON** or **OFF** (or both) position is printed or labelled directly on the DIP switch.
- The eighth switch is not used at present and has no functions.

Presets 75 to 127 are left blank for your own custom requirements.

The adjustment of the preset with the DIP switch is normally carried out only once or onöy very rarely. The idea is to have the favourite preset available after power on.

Changing the preset during power on

There are two possibilities to change the preset during power on:

- changing the settings of the DIP switch (as described above)
- sending a Midi program change message on the current Midi master channel to the Midi input of *PE*

In both cases the preset change is indicated by turning on the LED for about one second. During this short time no Midi merge or data transmission is possible.

If a Midi program change message is used to change the preset number this change is only temporary. After power off/on the preset defined by the DIP switch settings is called up again.

Check list

In case that your *PE* installation does not work at the first go please check the following points:

- Is the power supply working correctly ? Provided that a LED is connected to ST1 (pay attention to the polarity) it should light up for a short time and then go out.
- Are the controls connected as described in this manual ?
- Was no short circuit made (neither in the wiring nor mounting) ?
- When the diode D1 and the voltage regulator IC6 become hot probably a short circuit between GND and +5V was made !
- When momentary or toggle switches are used: Are the 10k (4k7...100k) resistors soldered accordingly?
- Are unused inputs connected to GND ? When the LED is flickering permanently without operating one of the controls probably one of the 16 analog inputs is left open !
- Is the LED flickering if incoming Midi messages appear at the Midi In of *PE* (e.g. from a keyboard)?
- Are the Midi connections between *PE* and the other Midi devices installed correctly ? Midi Out of *PE* has to be connected to Midi In of the Midi device controlled by *PE*. Especially when computers are used Midi In and Out are very often mixed up by the user. Once again: Midi Out → Midi In (not Midi Out → Midi Out nor Midi In → Midi In).
- Please use only cables that are suitable for Midi.
- When a PC with sound card is used only high quality multimedia cables should be used. Low cost multimedia cables without optocouplers for Midi In and without drivers for Midi Out very often cause Midi data problems.
- Is the right preset number selected with the DIP switch ? A good preset number for testing is no 0: if all 8 switches are "off" one obtains volume on the Midi channels 1...16 (provided that the factory presets are unchanged, otherwise the Midi messages you have programmed to preset no 1 will appear).

Extent of delivery

The PE delivery contains the following parts:

- Pocket Electronic pc board, assembled and tested
- Power Supply (230V mains voltage, European type mains plug, output voltage range 7...12V, current min. 100 mA) included only for shipments within Germany, for shipments outside Germany please contact your local representative or dealer
- This Pocket Electronic user's guide
- Two 10 pin ribbon cables with double row female connectors, about 30 cm each (for connection of the 16 controlling potentiometers or switches)
- One momentary switch/button (snapshot function)
- one LED (control display)
- One 4 pin single row female connector with cables, about 30cm (for connection of the switch and LED)
- 16 resistors 8k2...100k (5% carbon)

Appendix 1: Detailed description of the factory presets

Presets 1 ~ 4 use a single controller type, with each knob relating to it's corresponding MIDI channel, this allows full control of 16 parts within a multitimbral sound generator, or realtime mixing in sequencer automation:

Preset 1	**Volume**	**Controller 7**	**Channels 1- 16**
Preset 2	**Panorama**	**Controller 10**	**Channels 1- 16**
Preset 3	**Cutoff Channel**	**Controller 74**	**Channels 1- 16**
Preset 4	**Resonance**	**Controller 71**	**Channels 1- 16**

Presets 5 ~ 8 use two controllers, one across the top row of knobs and the other across the bottom row. With Preset 4, the top row is MIDI controller 7 (Volume) with the MIDI channel corresponding to the knob number, whilst the lower row is MIDI controller 10 (Pan) on the same channel as the knob above it, hence knob 9 is channel 1, knob 10 is channel 2 etc. Preset 5 follows the same idea except the MIDI channel is channels 9 to 16, so the actual MIDI channel relates to the lower knob numbers. Preset 6, again follows the same idea as Preset 4 except the top row is MIDI controller 74 (Filter Cut off) and the lower row is controller 71 (Filter Resonance), and finally Preset 7 is the same as Preset 6 except the channels are 9-16.

Preset 5	**Volume/Pan**	**Controller 7/10**	**Channels 1- 8**
Preset 6	**Volume/Pan**	**Controller 7/10**	**Channels 9- 16**
Preset 7	**Cutoff /Resonance**	**Controller 74/71**	**Channels 1- 8**
Preset 8	**Cutoff/Resonance**	**Controller 74/71**	**Channels 9- 16**

Presets 9 ~ 16 are general controller sets, which transmit on the Master Channel. Where the receiving MIDI device can be programmed to any controller it can receive, these presets maybe the only presets needed, although preset 8 is perhaps best avoided for general use as it includes controller 0 (could trigger MIDI program bank changes) and controller 1 which is the mod wheel, although of course there may be instances when MIDI controller 1 is required, such as adding a modulation wheel function to a keyboard (such as a digital piano). Preset 12 also needs to be used with caution, as controller 64 is defined as the sustain/damper pedal function, and most devices will always receive this controller as Damper or Hold.

Preset 9	**general controllers**	**Controllers 0 - 15**	**Masterchannel**
Preset 10	**general controllers**	**Controllers 16 - 31**	**Masterchannel**
Preset 11	**general controllers**	**Controllers 32 - 47**	**Masterchannel**
Preset 12	**general controllers**	**Controllers 48 - 63**	**Masterchannel**
Preset 13	**general controllers**	**Controllers 64 - 79**	**Masterchannel**
Preset 14	**general controllers**	**Controllers 80 - 95**	**Masterchannel**
Preset 15	**general controllers**	**Controllers 96 - 111**	**Masterchannel**
Preset 16	**general controllers**	**Controllers 112 - 127**	**Masterchannel**

Preset 17 has the top row of knobs transmitting relevant NRPN controller data for GS/XG instruments, and the lower row is general controllers:

Preset 17	**GS/XG general controls**	**NRPN/controllers**	**Masterchannel**
Input 1	Filter Cutoff	NRPN	
Input 2	Filter Resonance	NRPN	
Input 3	Vibrato Rate	NRPN	
Input 4	Vibrato Depth	NRPN	
Input 5	Vibrato Delay	NRPN	
Input 6	EG- Attack	NRPN	
Input 7	EG Decay	NRPN	
Input 8	EG Release	NRPN	
Input 9	Pitch Bend	PitchBend	
Input 10	Modulation	Controller 1	
Input 11	Portam.Time	Controller 5	
Input 12	Reverb Send	Controller 9	
Input 13	Chorus Send	Controller 93	
Input 14	Delay/Var Send	Controller 94	
Input 15	Pan	Controller 10	
Input 16	Volume	Controller 7	

Presets 18 ~ 22 are specific NRPN controllers that control the specified functions on the Sound Blaster AWE 32/64 soundcards:

Preset 18	AWE/SB 1 Masterchn	NRPN	Masterchannel
Input 1	Filter Cutoff Coarse		
Input 2	Filter Resonance Coarse		
Input 3	Vibrato Rate Coarse		
Input 4	Vibrato Depth Coarse		
Input 5	Vibrato Delay Coarse		
Input 6	EG- Attack Coarse		
Input 7	EG Decay Coarse		
Input 8	EG Release Coarse		
Input 9	Filter Cutoff Fine		
Input 10	Filter Resonance Fine		
Input 11	Vibrato Rate Fine		
Input 12	Vibrato Depth Fine		
Input 13	Vibrato Delay Fine		
Input 14	EG- Attack Fine		
Input 15	EG Decay Fine		
Input 16	EG Release Fine	NRPN	

Preset 19	AWE/SB 2	NRPN	Masterchannel
Input 1	LFO 1 Delay Coarse		
Input 2	LFO 1 Freq Coarse		
Input 3	Env1 Delay Coarse		
Input 4	Env1 Attack Coarse		
Input 5	Env1 Hold Coarse		
Input 6	Env1 Decay Coarse		
Input 7	Env1 Sustain Coarse		
Input 8	Env1 Release Coarse		
Input 9	LFO 1 Delay Fine		
Input 10	LFO 1 Freq Fine		
Input 11	Env1 Delay Fine		
Input 12	Env1 Attack Fine		
Input 13	Env1 Hold Fine		
Input 14	Env1 Decay Fine		
Input 15	Env1 Sustain Fine		
Input 16	Env1 Release Fine		

Preset 20	AWE/SB 3	NRPN	Masterchannel
Input 1	LFO 2 Delay Coarse		
Input 2	LFO 1 Freq Coarse		
Input 3	Env2 Delay Coarse		
Input 4	Env2 Attack Coarse		
Input 5	Env2 Hold Coarse		
Input 6	Env2 Decay Coarse		
Input 7	Env2 Sustain Coarse		
Input 8	Env2 Release Coarse		
Input 9	LFO 2 Delay Fine		
Input 10	LFO 2 Freq Fine		
Input 11	Env2 Delay Fine		
Input 12	Env2 Attack Fine		
Input 13	Env2 Hold Fine		
Input 14	Env2 Decay Fine		
Input 15	Env2 Sustain Fine		
Input 16	Env2 Release Fine		

Preset 21	AWE/SB 4	NRPN	Masterchannel
Input 1	Master Tuning Coarse		
Input 2	LFO 1 to Pitch Coarse		
Input 3	LFO 2 to Pitch Coarse		
Input 4	Env1 to Pitch Coarse		

Input 5	LFO 1 to Volume Coarse		
Input 6	LFO 1 to Cutoff Coarse		
Input 7	Env 1 to Cutoff Coarse		
Input 8	undefined		
Input 9	Master Tuning Fine		
Input 10	LFO 1 to Pitch Fine		
Input 11	LFO 2 to Pitch Fine		
Input 12	Env1 to Pitch Fine		
Input 13	LFO 1 to Volume Fine		
Input 14	LFO 1 to Cutoff Fine		
Input 15	Env 1 to Cutoff Fine		
Input 16	undefined		

Preset 22	**AWE/SB 5**	**NRPN/Controller**	**Masterchannel**
Input 1	Filter Cutoff Coarse	NRPN	
Input 2	Filter Resonance Coarse	NRPN	
Input 3	Modulation	Controller1	
Input 4	Reverb Send Coarse	NRPN	
Input 5	Chorus Send Coarse	NRPN	
Input 6	Portamento	Controller5	
Input 7	Balance	Controller8	
Input 8	Expression	Controller11	
Input 9	Filter Cutoff Coarse	NRPN	
Input 10	Filter Resonance Coarse	NRPN	
Input 11	Mono Aftertouch	MonoAftertouch	
Input 12	Reverb Send Fine	NRPN	
Input 13	Chorus Send Fine	NRPN	
Input 14	Portamento Off/On	Controller65	
Input 15	Pan	Controller10	
Input 16	Volume	Controller7	

Presets 23 ~ 28 control the drum kit, which would normally require the master channel to be set to channel 10. The knobs all relate to the same drums on these presets as shown below, with each preset controlling Pitch, Level, Pan, Reverb Send, Chorus Send or Delay/Var. Send depending on the preset selected.

Preset 23	**GS/XG Drum Pitch**	**NRPN**	**Masterchannel**
Preset 24	**GS/XG Drum Level**	**NRPN**	**Masterchannel**
Preset 25	**GS/XG Drum Pan**	**NRPN**	**Masterchannel**
Preset 26	**GS/XG Drum Reverb**	**NRPN**	**Masterchannel**
Preset 27	**GS/XG Drum Chorus**	**NRPN**	**Masterchannel**
Preset 28	**GS/XG Drum Delay/Var**	**NRPN**	**Masterchannel**

Presets 29 ~ 32 control the drum kit, which would normally require the master channel to be set to channel 10. The knobs all relate to the same drums on these presets as shown above, with each preset controlling Filter Cut Off, Filter Resonance, Envelope Attack or Envelope Decay depending on the preset selected.

Preset 29	**XG Drum Cutoff**	**NRPN**	**Masterchannel**
Preset 30	**XG Drum Reson.**	**NRPN**	**Masterchannel**
Preset 31	**XG Drum Attack**	**NRPN**	**Masterchannel**
Preset 32	**XG Drum Decay**	**NRPN**	**Masterchannel**

Input 1	Bass Drum Pitch	9	Bongo Pitch
Input 2	Snare Drum Pitch	10	Conga Pitch
Input 3	Tom Pitch	11	Timbale Pitch
Input 4	Hi-Hat Pitch	12	Hi Q Pitch
Input 5	Hand Clap Pitch	13	Seq Click Pitch
Input 6	Rim Shot Pitch	14	Finger Snap Pitch
Input 7	Crash Pitch	15	Click Noise Pitch
Input 8	Ride Pitch	16	Tambourine Pitch

Presets 33 ~ 42 control the XG parts, with each knob controlling the corresponding MIDI channel. Each preset controls either Part volume, pan, reverb send, chorus send, dry level, variation effect send, low eq gain, low eq frequency, high eq gain or high eq frequency.

Preset 33	**XG Multi-Part Volume Level**	**SysEx**	**Channels 1 - 16**
Preset 34	**XG Multi-Part Pan**	**SysEx**	**Channels 1 - 16**
Preset 35	**XG Multi-Part Reverb Send**	**SysEx**	**Channels 1 - 16**
Preset 36	**XG Multi-Part Chorus Send**	**SysEx**	**Channels 1 - 16**
Preset 37	**XG Multi-Part Dry Level**	**SysEx**	**Channels 1 - 16**
Preset 38	**XG Multi-Part Variation Send**	**SysEx**	**Channels 1 - 16**
Preset 39	**XG Multi-Part Low EQ Gain**	**SysEx**	**Channels 1 - 16**
Preset 40	**XG Multi-Part Low EQ Frequency**	**SysEx**	**Channels 1 - 16**
Preset 41	**XG Multi-Part High EQ Gain**	**SysEx**	**Channels 1 - 16**
Preset 42	**XG Multi-Part High EQ Frequency**	**SysEx**	**Channels 1 - 16**

Preset 43 offers general effects control for an XG instrument.

Preset 43	**XG Mpart-Effect**	**SYSEX**	**Masterchannel**
Input 1	High EQ Frequency		
Input 2	Low EQ Frequency		
Input 3	*undefined*		
Input 4	Dry		
Input 5	*undefined*		
Input 6	*undefined*		
Input 7	*undefined*		
Input 8	*undefined*		
Input 9	Hi Eq Gain		
Input 10	Lo Eq Gain		
Input 11	*undefined*		
Input 12	Reverb		
Input 13	Chorus		
Input 14	Variation		
Input 15	Pan		
Input 16	Level		

Presets 44 ~ 49 control the A/D inputs 1 and 2 as well as the 12 wave channels on relevant Yamaha sound cards. These relevant controls are shown below. Note that knobs 15 and 16 have no defined function for these presets.

Preset 44	**XG AD & Wave Level**	**SysEx**	**Masterchannel**
Preset 45	**XG AD & Wave Pan**	**SysEx**	**Masterchannel**
Preset 46	**XG AD & Wave Reverb Send**	**SysEx**	**Masterchannel**
Preset 47	**XG AD & Wave Chorus Send**	**SysEx**	**Masterchannel**
Preset 48	**XG AD & Wave Variation Send**	**SysEx**	**Masterchannel**
Preset 49	**XG AD & Wave Dry Level**	**SysEx**	**Masterchannel**

1	AD Input 1	9	W7
2	AD Input 2	10	W8
3	W1	11	W9
4	W2	12	W10
5	W3	13	W11
6	W4	14	W12
7	W5	15	*undefined*
8	W6	16	*undefined*

Preset 50	**XG Effects - EQ**	**SysEx**	**Masterchannel**
Input 1	EQ Gain 1		
Input 2	EQ Frequency 1		
Input 3	EQ Q1		
Input 4	EQ Gain 2		
Input 5	EQ Frequency 2		
Input 6	EQ Q2		

Input 7	EQ Gain 5		
Input 8	EQ Frequency 5		
Input 9	EQ Gain 3		
Input 10	EQ Frequency 3		
Input 11	EQ Q3		
Input 12	EQ Gain 4		
Input 13	EQ Frequency 4		
Input 14	EQ Q4		
Input 15	EQ Q5		
Input 16	EQ Type		

Preset 51	**XG Effects - Reverb**	**SysEx**	**Masterchannel**
Input 1	Reverb Type		
Input 2	Reverb Parameter 1		
Input 3	Reverb Parameter 2		
Input 4	Reverb Parameter 3		
Input 5	Reverb Parameter 4		
Input 6	Reverb Parameter 5		
Input 7	Reverb Parameter 6		
Input 8	Reverb Parameter 7		
Input 9	Reverb Parameter 8		
Input 10	Reverb Parameter 9		
Input 11	Reverb Parameter 10		
Input 12	Reverb Parameter 11		
Input 13	Reverb Parameter 13		
Input 14	Reverb Parameter 15		
Input 15	Reverb Return		
Input 16	Reverb Pan		

Preset 52	**XG Chorus**	**SysEx**	**Masterchannel**
Input 1	Chorus Type		
Input 2	Chorus Parameter 1		
Input 3	Chorus Parameter 2		
Input 4	Chorus Parameter 3		
Input 5	Chorus Parameter 4		
Input 6	Chorus Parameter 6		
Input 7	Chorus Parameter 7		
Input 8	Chorus Parameter 8		
Input 9	Chorus Parameter 9		
Input 10	Chorus Parameter 10		
Input 11	Chorus Parameter 11		
Input 12	Chorus Parameter 12		
Input 13	Chorus Parameter 13		
Input 14	Chorus to Reverb		
Input 15	Chorus Return		
Input 16	Chorus Pan		

Preset 53	**XG Variation**	**SysEx**	**Masterchannel**
Input 1	Variation Type		
Input 2	Variation Parameter 1		
Input 3	Variation Parameter 2		
Input 4	Variation Parameter 3		
Input 5	Variation Parameter 4		
Input 6	Variation Parameter 6		
Input 7	Variation Parameter 7		
Input 8	Variation Parameter 11		
Input 9	Variation Parameter 12		
Input 10	Variation Parameter 13		
Input 11	Variation Parameter 14		
Input 12	Variation Parameter 15		
Input 13	Variation to Reverb		
Input 14	Variation to Chorus		

Input 15	Variation Return		
Input 16	Variation Pan		

Preset 54	XG Insertion 1	**SysEx**	**Masterchannel**
Input 1	Insert1 Type		
Input 2	Insert1 Parameter 1		
Input 3	Insert1 Parameter 2		
Input 4	Insert1 Parameter 3		
Input 5	Insert1 Parameter 4		
Input 6	Insert1 Parameter 5		
Input 7	Insert1 Parameter 6		
Input 8	Insert1 Parameter 7		
Input 9	Insert1 Parameter 8		
Input 10	Insert1 Parameter 9		
Input 11	Insert1 Parameter 10		
Input 12	Insert1 Parameter 11		
Input 13	Insert1 Parameter 12		
Input 14	Insert1 Parameter 13		
Input 15	Insert1 Parameter 14		
Input 16	Insert1 Parameter 15		

Preset 55	XG Insertion 2	**SysEx**	**Masterchannel**
Input 1	Insert2 Type		
Input 2	Insert2 Parameter 1		
Input 3	Insert2 Parameter 2		
Input 4	Insert2 Parameter 3		
Input 5	Insert2 Parameter 4		
Input 6	Insert2 Parameter 5		
Input 7	Insert2 Parameter 6		
Input 8	Insert2 Parameter 7		
Input 9	Insert2 Parameter 8		
Input 10	Insert2 Parameter 9		
Input 11	Insert2 Parameter 10		
Input 12	Insert2 Parameter 11		
Input 13	Insert2 Parameter 12		
Input 14	Insert2 Parameter 13		
Input 15	Insert2 Parameter 14		
Input 16	Insert2 Parameter 15		

Preset 56	**GS Reverb/Chorus**	**NRPN**	**Masterchannel**
Input 1	Reverb Preset		
Input 2	Reverb Charakter		
Input 3	Reverb Low PassFilter		
Input 4	Reverb Level		
Input 5	Reverb Time		
Input 6	Reverb Delay Feedback		
Input 7	Reverb to Chorus		
Input 8	*undefined*		
Input 9	Chorus Preset		
Input 10	Chorus LoPass Filt.		
Input 11	Chorus Level		
Input 12	Chorus Feedback		
Input 13	Chorus Delay		
Input 14	Chorus Rate		
Input 15	Chorus Depth		
Input 16	Chorus to Reverb		

Preset 57	**Strings**	**SysEx/Controller**	**Masterchannel**
Input 1	GM-Reset	Strings	
Input 2	GS-Reset	Strings	
Input 3	XG-Reset	Strings	

Input 4	All-Sounds Off	Controller 120	
Input 5	All Ctrl Reset	Controller 121	
Input 6	All Notes Off	Controller 123	
Input 7	OMNI Off	Controller 124	
Input 8	OMNI On	Controller 125	
Input 9	Mono On	Controller 126	
Input 10	Poly On	Controller 127	
Input 11	*undefined*		
Input 12	*undefined*		
Input 13	*undefined*		
Input 14	*undefined*		
Input 15	*undefined*		
Input 16	*undefined*		

Preset 58	**Rebirth**	**NRPN**	**Masterchannel**
Input 1	Synth 1 Cutoff	Controller 25	
Input 2	Synth 1 Resonance	Controller 26	
Input 3	Synth 1 Envelope Mod	Controller 27	
Input 4	Synth 1 Decay	Controller 28	
Input 5	Synth 2 Cutoff	Controller 32	
Input 6	Synth 2 Resonance	Controller 33	
Input 7	Synth 2 Envelop Mod	Controller 34	
Input 8	Synth 2 Decay	Controller 35	
Input 9	Synth 1 Accent	Controller 29	
Input 10	Synth 2 Accent	Controller 36	
Input 11	Drum BD Tone	Controller 39	
Input 12	Drum BD Decay	Controller 40	
Input 13	Drum SD Snappy	Controller 43	
Input 14	Synth 1 Mix Level	Controller 11	
Input 15	Synth 2 MixLevel	Controller 14	
Input 16	Drum Mix Level	Controller 17	

Preset 59	**Yamaha CS1x**	**NRPN/ Controller**	**Masterchannel**
Input 1	Filter Cutoff	Controller 74	
Input 2	Filter Resonance	Controller 71	
Input 3	Vibrato Rate	NRPN	
Input 4	Vibrato Depth	NRPN	
Input 5	Vibrato Delay	NRPN	
Input 6	EG- Attack	Controller 73	
Input 7	AEG Decay	NRPN	
Input 8	EG Release	Controller 72	
Input 9	Pitch Bend	PitchBend	
Input 10	Knob 3 Par	Controller 17	
Input 11	Konb 6 Par	Controller 18	
Input 12	Reverb Send	Controller 91	
Input 13	Chorus Send	Controller 93	
Input 14	Delay/Variation Send	Controller 94	
Input 15	Pan	Controller 10	
Input 16	Volume	Controller 7	

Preset 60	**Waldorf Pulse**	**Controller**	**Masterchannel**
Input 1	Filter Cutoff	Controller 50	
Input 2	Filter Resonace	Controller 56	
Input 3	Cutoff Keytrack	Controller 51	
Input 4	Evv 1 Sens	Controller 52	
Input 5	Env 1 Attack	Controller 14	
Input 6	Env 1 Decay	Controller 15	
Input 7	Env 1 Sustain	Controller 16	
Input 8	Env 1 Release	Controller 17	
Input 9	LFO 1 Speed	Controller 24	
Input 10	LFO 2 Speed	Controller 26	
Input 11	VCF Mod Amount	Controller 25	
Input 12	Port. Time	Controller 5	

Input 13	Env 2 Attack	Controller 18	
Input 14	Env 2 Decay	Controller 19	
Input 15	Env 2 Sustain	Controller 20	
Input 16	Env 2 Release	Controller 21	

Preset 61	**Ensoniq ASR-X**	**NRPN/Controller**	**Masterchannel**
Input 1	Filter Cutoff	Controller 74	
Input 2	Filter Resonance	Controller 71	
Input 3	Vibrato Rate	Controller 75	
Input 4	Vibrato Depth	NRPN	
Input 5	Vibrato Delay	NRPN	
Input 6	Filt Env Attack	NRPN	
Input 7	Filt Env Decay	NRPN	
Input 8	Filt Env Release	NRPN	
Input 9	Pitch Bend	PitchBend	
Input 10	Modulation	Controller 1	
Input 11	EG Attack	Controller 73	
Input 12	EG Decay	Controller 76	
Input 13	EG Release	Controller 72	
Input 14	Vel. Sense	NRPN	
Input 15	Port.Time	Controller 5	
Input 16	Volume	Controller 7	

Presets 62 ~ 63 provide the MAQ16/3 with advanced realtime control with features that may not have been apparent that the MAQ16/3 could do. Converts an MAQ16/3 into a Super MAQ 16/3 !

Preset 62	**Doepfer MAQ 1 Mchn**	**Controller**	**Masterchannel**
Input 1	Velocity Row 1	Controller 0	
Input 2	Velocity Row 2	Controller 1	
Input 3	Velocity Row 3	Controller 2	
Input 4	Gate Time Row1	Controller 7	
Input 5	Gate Time Row2	Controller 8	
Input 6	Gate Time Row3	Controller 9	
Input 7	Prg Chng Row 3	Controller 30	
Input 8	Tempo	Controller 3	
Input 9	Step Pos Row 1	Controller 4	
Input 10	Step Pos Row 2	Controller 5	
Input 11	Step Pos Row 3	Controller 6	
Input 12	Note Time Row 1	Controller 10	
Input 13	Note Time Row 2	Controller 11	
Input 14	Note Time Row 3	Controller 12	
Input 15	Prg Chng Row 1	Controller 28	
Input 16	Prg Chng Row 2	Controller 29	

Preset 63	**Doepfer MAQ 2**	**Controller**	**Masterchannel**
Input 1	First Step Row 1	Controller 13	
Input 2	First Step Row 2	Controller 14	
Input 3	First Step Row 3	Controller 15	
Input 4	Run Mode Row1	Controller 19	
Input 5	Run Mode Row2	Controller 20	
Input 6	Run Mode Row3	Controller 21	
Input 7	Prg Chng Row 3	Controller 30	
Input 8	Tempo	Controller 3	
Input 9	Last Step Row 1	Controller 16	
Input 10	Last Step Row 2	Controller 17	
Input 11	Last Step Row 3	Controller 18	
Input 12	Midi-Chan Row 1	Controller 22	
Input 13	Midi-Chan Row 2	Controller 23	
Input 14	Midi-Chan Row 3	Controller 24	
Input 15	Prg Chng Row 1	Controller 28	
Input 16	Prg Chng Row 2	Controller 29	

Preset 63 emulates every function of the Kawai MCB10 Macro Control Box designed for the K5000 range.

Preset 64	K5000 MCB10 Mchn	Controller	Masterchannel
Input 1	Cutoff	Controller 74	
Input 2	Resonance	Controller 77	
Input 3	FF Speed	Controller 19	
Input 4	FF Depth	Controller 75	
Input 5	FF Bias	Controller 18	
Input 6	Attack	Controller 73	
Input 7	Decay	Controller 78	
Input 8	Release	Controller 72	
Input 9	Hrm Lo	Controller 16	
Input 10	Hrm Hi	Controller 17	
Input 11	Even / Odd	Controller 71	
Input 12	Velocity	Controller 76	
Input 13	User 1	Controller 80	
Input 14	User 2	Controller 81	
Input 15	User 3	Controller 82	
Input 16	User 4	Controller 83	

Preset 65	Yamaha Promix	Controller	Masterchannel
Input 1	Stereo In Level	Controller 16	
Input 2	Stereo Out Level	Controller 21	
Input 3	Stereo Out Balance	Controller 67	
Input 4	Stereo Out 2 Cue	Controller 82	
Input 5	Stereo In to Cue	Controller 75	
Input 6	Send 4 Level	Controller 20	
Input 7	Send 3 Level	Controller 19	
Input 8	Intrn FX 1 Type	Controller 20	
Input 9	Send 3 to Cue	Controller 80	
Input 10	Sned 4 to Cue	Controller 81	
Input 11	Send 3/4 Bal	Controller 66	
Input 12	FX Rtn 1 Level	Controller 17	
Input 13	FX Rtn 2 Level	Controller 18	
Input 14	FX Rtn 1 to Cue	Controller 78	
Input 15	Fx Rtn 2 to Cue	Controller 79	
Input 16	Intrn FX 2 Type	Controller 21	

Preset 66	ProFive Osz. / LFO	Controller	Masterchannel
Input 1	Poly-Mod Filt Env	Controller 20	
Input 2	Poly-Mod Osc B	Controller 21	
Input 3	Osc A Frequ	Controller 40	
Input 4	Osc A Shape-Saw	Controller 41	
Input 5	Osc A Shape Pulse	Controller 42	
Input 6	Osc A Pulse Width	Controller 43	
Input 7	Osc A Sync	Controller 44	
Input 8	Osc A Glide	Controller 5	
Input 9	Wheel Mod Source Mix	Controller 34	
Input 10	LFO Freq	Controller 26	
Input 11	Osc B Frequ	Controller 50	
Input 12	Osc B Frequ Fine	Controller 51	
Input 13	Osc B Shape-Saw	Controller 52	
Input 14	Osc B Shape-Triangle	Controller 53	
Input 15	Osc B Shape Pulse	Controller 54	
Input 16	Osc B Pulse Width	Controller 55	

Preset 67	Pro Five Mix/Filt./ADSR	Controller	Masterchannel
Input 1	Filt. Cutoff	Controller 70	
Input 2	Filt. Resonance	Controller 71	
Input 3	Filt. En Amount	Controller 72	
Input 4	Filt. Kbd	Controller 73	
Input 5	Mixer Osc A	Controller 45	
Input 6	Mixer Osc B	Controller 46	

Input 7	Noise	Controller 47	
Input 8	Volume	Controller 7	
Input 9	Filt. Attack	Controller 75	
Input 10	Filt. Decay	Controller 76	
Input 11	Filt. Sustain	Controller 77	
Input 12	Filt. Release	Controller 88	
Input 13	Osc B Attack	Controller 80	
Input 14	Osc B Decay	Controller 81	
Input 15	Osc B Sustain	Controller 82	
Input 16	Osc B Release	Controller 83	

Preset 68	**Cubase VST (Vol 1-16)**	**Controller**	**Channel 16**
Input 1	Vol 1	Controller 64	
Input 2	Vol 2	Controller 65	
Input 3	Vol 3	Controller 66	
Input 4	Vol 4	Controller 67	
Input 5	Vol 5	Controller 68	
Input 6	Vol 6	Controller 69	
Input 7	Vol 7	Controller 70	
Input 8	Vol 8	Controller 71	
Input 9	Vol 9	Controller 16	
Input 10	Vol 10	Controller 17	
Input 11	Vol 11	Controller 18	
Input 12	Vol 12	Controller 19	
Input 13	Vol 13	Controller 20	
Input 14	Vol 14	Controller 21	
Input 15	Vol 15	Controller 22	
Input 16	Vol 16	Controller 23	

Preset 69	**Cubase VST (Pan 1-16)**	**Controller**	**Channel 16**
Input 1	Pan 1	Controller 72	
Input 2	Pan 2	Controller 73	
Input 3	Pan 3	Controller 74	
Input 4	Pan 4	Controller 75	
Input 5	Pan 5	Controller 76	
Input 6	Pan 6	Controller 77	
Input 7	Pan 7	Controller 78	
Input 8	Pan 8	Controller 79	
Input 9	Pan 9	Controller 24	
Input 10	Pan 10	Controller 25	
Input 11	Pan 11	Controller 26	
Input 12	Pan 12	Controller 27	
Input 13	Pan 13	Controller 28	
Input 14	Pan 14	Controller 29	
Input 15	Pan 15	Controller 30	
Input 16	Pan 16	Controller 31	

Preset 70	**CubaseVST (Pan/Vol 1-8)**	**Controller**	**Channel 16**
Input 1	Pan 1	Controller 72	
Input 2	Pan 2	Controller 73	
Input 3	Pan 3	Controller 74	
Input 4	Pan 4	Controller 75	
Input 5	Pan 5	Controller 76	
Input 6	Pan 6	Controller 77	
Input 7	Pan 7	Controller 78	
Input 8	Pan 8	Controller 79	
Input 9	Vol 1	Controller 64	
Input 10	Vol 2	Controller 65	
Input 11	Vol 3	Controller 66	
Input 12	Vol 4	Controller 67	
Input 13	Vol 5	Controller 68	
Input 14	Vol 6	Controller 69	

Input 15	Vol 7	Controller 70	
Input 16	Vol 8	Controller 71	

Preset 71	**B4 Console/TubeAmp/Pedal**	**Controller**	**Channel 1**
Input 1	Percussion Volume	Controller 70	
Input 2	Percussion Decay	Controller 71	
Input 3	Percussion Harmonic	Controller 72	
Input 4	Tube Amp Drive	Controller 76	
Input 5	Tube Amp Volume	Controller 7	
Input 6	Pedal Keyboard 16'	Controller 33	
Input 7	Pedal Keyboard 5 1/3'	Controller 34	
Input 8	Pedal Keyboard 8'	Controller 35	
Input 9	Vibrato Mix	Controller 73	
Input 10	Vibrato Depth	Controller 74	
Input 11	Vibrato Amount	Controller 75	
Input 12	Tube Amp Body	Controller 78	
Input 13	Tube Amp Bright	Controller 79	
Input 14	Pedal Keyboard 4'	Controller 36	
Input 15	Pedal Keyboard 2 2/3'	Controller 37	
Input 16	Pedal Keyboard 2'	Controller 38	

Preset 72	**B4 Rotator**	**Controller**	**Channel 1**
Input 1	Treble Rotor Slow	Controller 81	
Input 2	Treble Rotor Fast	Controller 82	
Input 3	Treble Rotor Accel	Controller 83	
Input 4	Treble Rotor Tone	Controller 80	
Input 5	Microphones Balance	Controller 8	
Input 6	Microphones Pan	Controller 10	
Input 7	Rotator Slow/Fast	Controller 1	
Input 8	Rotator Off/On	Controller 68	
Input 9	Bass Rotor Slow	Controller 91	
Input 10	Bass Rotor Fast	Controller 92	
Input 11		Controller 0	
Input 12	Bass Rotor Tone	Controller 90	
Input 13	Microphones Spread	Controller 9	
Input 14	Microphones Distance	Controller 3	
Input 15	Swell	Controller 11	
Input 16	Vibrato Lower	Controller 30	

Preset 73	**B4 Upper Manual 1**	**Controller**	**Channel 1**
Input 1	Upper Manual 16'	Controller 12	
Input 2	Upper Manual 5 1/3'	Controller 13	
Input 3	Upper Manual 8'	Controller 14	
Input 4	Upper Manual 4'	Controller 15	
Input 5	Upper Manual 2 2/3'	Controller 16	
Input 6	Upper Manual 2'	Controller 17	
Input 7	Upper Manual 1 3/5'	Controller 18	
Input 8	Upper Manual 1 1/3'	Controller 19	
Input 9	Upper Manual 1'	Controller 20	
Input 10	Rotator Slow/Fast	Controller 1	
Input 11		Controller 0	
Input 12	Percussion Off/On	Controller 66	
Input 13	Drive Off/On	Controller 67	
Input 14	Rotator Off/On	Controller 68	
Input 15	Swell	Controller 11	
Input 16	Select Preset	Prg-Change	

Preset 74	**B4 Upper/Lower 1**	**Controller**	**Channel 1**
Input 1	Upper Manual 16'	Controller 12	
Input 2	Upper Manual 5 1/3'	Controller 13	
Input 3	Upper Manual 8'	Controller 14	
Input 4	Upper Manual 4'	Controller 15	
Input 5	Upper Manual 2 2/3'	Controller 16	

Input 6	Upper Manual 2'	Controller 17	
Input 7	Upper Manual 1 3/5'	Controller 18	
Input 8	Upper Manual 1 1/3'	Controller 19	
Input 9	Lower Manual 16'	Controller 21	
Input 10	Lower Manual 5 1/3'	Controller 22	
Input 11	Lower Manual 8'	Controller 23	
Input 12	Lower Manual 4'	Controller 24	
Input 13	Lower Manual 2 2/3'	Controller 25	
Input 14	Lower Manual 2'	Controller 26	
Input 15	Lower Manual 1 3/5'	Controller 27	
Input 16	Lower Manual 1 1/3'	Controller 28	

Preset 75	**Sherman Filterbank 1**	**Controller**	**Channel 16**
Input 1	Cutoff freq filter 1	Pitch Bend	
Input 2	Resonance Filter 1	MonoAftertouch	
Input 3	Cutoff freq filter 2	Controller 1	
Input 4	Resonance Filter 2	Controller 2	
Input 5	FM depth	Controller 4	
Input 6	VCA bias	Controller 7	
Input 7	AM / ring depth	Controller 11	
Input 8	Attack Time ADSR	Controller 5	
Input 9	Decay Time ADSR	Controller 16	
Input 10	Release Time ADSR	Controller 17	
Input 11	Attack Time AR	Controller 18	
Input 12	Release Time AR	Controller 19	
Input 13			
Input 14			
Input 15			
Input 16			

Preset 76	**Sherman Filterbank 2**	**Controller**	**Masterchannel**
Input 1	Cutoff freq filter 1	Pitch Bend	
Input 2	Resonance Filter 1	MonoAftertouch	
Input 3	Cutoff freq filter 2	Controller 1	
Input 4	Resonance Filter 2	Controller 2	
Input 5	FM depth	Controller 4	
Input 6	VCA bias	Controller 7	
Input 7	AM / ring depth	Controller 11	
Input 8	Attack Time ADSR	Controller 5	
Input 9	Decay Time ADSR	Controller 16	
Input 10	Release Time ADSR	Controller 17	
Input 11	Attack Time AR	Controller 18	
Input 12	Release Time AR	Controller 19	
Input 13			
Input 14			
Input 15			
Input 16			

Appendix 2: Creating your own presets

New presets can be created or present ones can be altered, though it is recommended to dump all new presets into free locations 77 ~ 127. Every input of the *PE* can be assigned with three 7-bit parameters (between 0 and 127), these parameters define the Midi event transmitted by the inputs. Each preset can be dumped into the *PE* by a System Exclusive message. This is a two stage process, first the data is sent to the *PE* (Single Dump) and then a second message stores the data into non-volatile memory (Single Store). The data is only stored if the preset number is the same in both the Single Dump and Single Store messages are the same.

Parameter 1:

This first parameter defines the Midi channel that the event will be transmitted on (values 1 ~ 16), or if the event will use the Master Channel (value set to 0).

Parameter 2:

The second parameter describes the type of event. The PE does not allow you to program any MIDI string, but uses one of it's 128 preset events (which is the number set with parameter 2). This list of events include controllers, pitch bend, mono & poly aftertouch, note on, note off, RPN's and many NRPN's along with some more complex Sys-Ex strings for controlling Roland GS and Yamaha XG instruments.

Parameter 3:

The third parameter is an extension of parameter 2, many events need two values to determine the event, for example, if a value of 00 is set in parameter 2 (which is controller) then parameter 3 sets the controller number (perhaps a value of 7 to define Volume events).

The Sys-Ex message can be generated within a sequencer program (it is best to use Hex if possible), or the free editor program that is available for download from our website. The default file contains the following message (Hex):

F0 00 20 20 14 00 20 00 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 F7

F0 00 20 20 14 00 30 00 00 F7

The first message is the Single Dump and the second message is the Single Store. Please note, that this default is about to overwrite preset number 00, shown in bold above as the eighth data byte. It is an idea to experiment with preset 127 (set the data to Hex 7F), but don't forget to change the value in both strings. The function of this default dump is to set the knobs to Midi volume on their own channels - this is actually the preset data in preset 01 anyway.

The Sys-Ex data can be broken down into sections, the first part is the Sys-Ex format for the Doepfer Pocket Series (Pocket Control/Fader/Dial/Electronic) Single Dump, which is (numbers in Hex):

F0 00 20 20 14 00 20 preset channel (16 bytes) data (32 bytes) F7

F0	Sys-Ex byte
00	European Sub ID
20	Doepfer Sub ID 1
20	Doepfer Sub ID 2
14	Device "Pocket Series"
00	*reserved*
20	Command Byte "Single Dump"
00 ~ 7F	Preset Number
00	*reserved*

00 ~ 10	Parameter 1. There are 16 data bytes setting the MIDI channel of each knob, a setting of 0 sets the knob to the Master Channel.
00 ~ 7F	Parameter 2. There are 16 data bytes setting the event type for each knob, a setting of 7F defines “No Event” to the knob
00 ~ 7F	Parameter 3. There are 16 data bytes setting the additioanl event data for each knob. The definition of parameter 3 depends on what parameter 2 is set to.
F7	EOX (End of System Exclusive)

The data that must follow is the Single Store message which is:

F0 00 20 20 14 00 30 F7:

F0	Sys-Ex byte
00	European Sub ID
20	Doepfer Sub ID 1
20	Doepfer Sub ID 2
14	Device “Pocket Series"
00	*reserved*
30	Command Byte “Single Store”
00 ~ 7F	Preset Number (Must be the same as in the first message above)
00	*reserved*
F7	EOX (End of System Exclusive)

Parameter Tables

Parameter 1: MIDI Channel

00	Master Channel
01 ~ 10	MIDI Channels 1 ~ 16
11 ~ 7F	values undefined (decimal values 17 - 127)

Parameter 2: Event Definition

Decimal	Hex	Definition
0	00	Controller
1	01	Pitch Bend
2	02	Mono Aftertouch
3	03	Program Change
4	04	Poly Aftertouch
5	05	Note On
6	06	Note Off
7	07	*free*
8	08	RPN0 MSB
9	09	RPN0 LSB
10	0A	RPN1 MSB
11	0B	RPN1 MSB
12	0C	*free*
13	0D	*free*
14	0E	RPN127 MSB
15	0F	RPN127 LSB
16	10	NRPN0 MSB
17	11	NRPN0 LSB
18	12	NRPN1 MSB [XG Multi / GS]
19	13	NRPN1 LSB [XG Multi / GS]
20	14	NRPN8 MSB
21	15	NRPN8 LSB
22	16	NRPN9 MSB
23	17	NRPN9 LSB

24	18	NRPN10 MSB
25	19	NRPN10 LSB
26	1A	NRPN20 MSB [XG Drum Instrument Cutoff]
27	1B	NRPN20 LSB [XG Drum Instruemnt Cutoff]
28	1C	NRPN21 MSB [XG Drum Instrument Resonance]
29	1D	NRPN21 LSB [XG Drum Instrument Resonance]
30	1E	NRPN22 MSB [XG Drum Instrument EG Attack]
31	1F	NRPN22 LSB [XG Drum Instrument EG Attack]
32	20	NRPN23 MSB [XG Drum Instrument EG Decay]
33	21	NRPN23 LSB [XG Drum Instrument EG Decay]
34	22	NRPN24 MSB [XG/GS Drum Instrument Pitch Coarse]
35	23	NRPN24 LSB [XG/GS Drum Instrument Pitch Coarse]
36	24	NRPN25 MSB [XG Drum Instrument Pitch Fine]
37	25	NRPN25 LSB [XG Drum Instrument Pitch Fine]
38	26	NRPN26 MSB [XG/GS Drum Instrument Level]
39	27	NRPN26 LSB [XG/GS Drum Instrument Level]
40	28	NRPN28 MSB [XG/GS Drum Instrument Pan]
41	29	NRPN28 LSB [XG/GS Drum Instrument Pan]
42	2A	NRPN29 MSB [XG/GS Drum Instrument Reverb Send]
43	2B	NRPN29 LSB [XG/GS Drum Instrument Reverb Send]
44	2C	NRPN30 MSB [XG/GS Drum Instrument Chorus Send]
45	2D	NRPN30 LSB [XG/GS Drum Instrument Chorus Send]
46	2E	NRPN31 MSB [XG/GS Drum Instrument Variation Send]
47	2F	NRPN31 LSB [XG/GS Drum Instrument Variation Send]
48	30	NRPN32 MSB
49	31	NRPN32 LSB
50	32	NRPN33 MSB
51	33	NRPN33 LSB
52	34	NRPN99 MSB
53	35	NRPN99 LSB
54	36	NRPN100 MSB
55	37	NRPN100 LSB

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