VP330-KBD
RS550-KBD

MIDI Interface for
Roland VP-330 / RS-550

Model 8-440 / 8-441
ver. 1.0

USER MANUAL

Content

This manual in PDF form is available on supplemental CD-ROM or on manufacturer's web-pages.

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1. DEVICE DESCRIPTION

VP330-KBD / RS505-KBD is a MIDI retrofit for Roland VP-330 / RS-505 instruments. It is designed for installation inside the instrument. The device enables the instrument to be controlled via MIDI Notes and commands as a MIDI expander. However, all original features of VP-330 / RS-505 instruments remain unchanged after the interface installation. If the interface is switched off or if it isn't connected to MIDI system, the instrument works exactly the same way as before the interface installation.

1.1. FUNCTION OF INTERFACE

Functional block schematics of the interface is shown on pic. 1. The interface polyphonically controls VP-330's keyboard (pic.1a). If installed in RS-505, the interface controls instrument's keyboard in the same polyphonic way and simultaneously the monophonic bass section (pic. 1b). The interface can control detuning of main oscillator in both VP-330 and RS-505 – PITCH SHIFT function of the instruments.

The interface controls the instrument via MIDI Notes, CC and other commands. Next chapters describe the enhanced functions of the MIDI interface in detail.

Pic. 1a – VP330-KBD - Functional block schematics
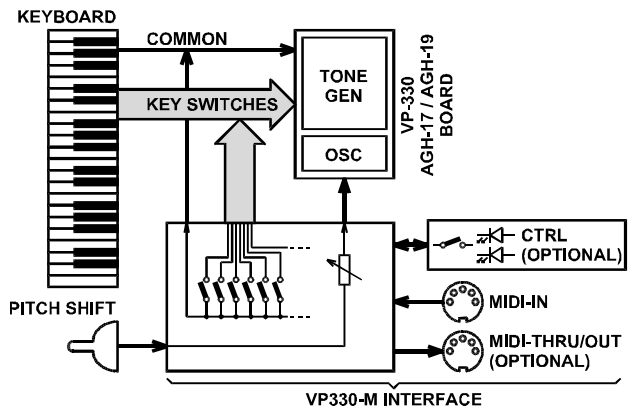
Pic. 1b – RS505-KBD - Functional block schematics

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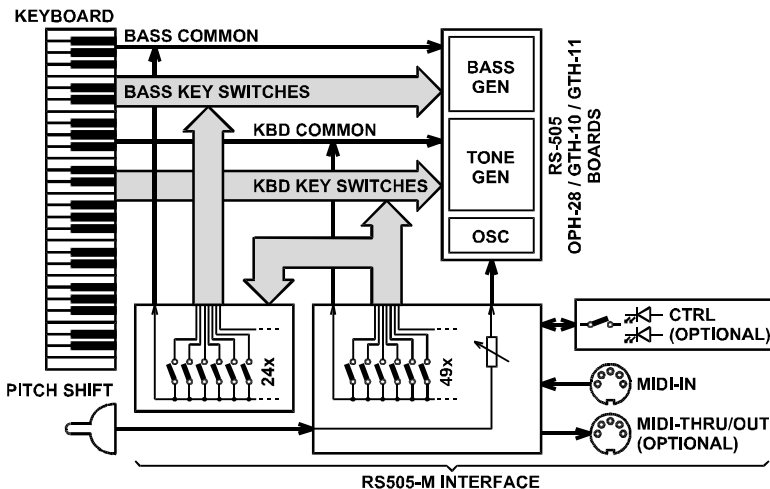
2. CONNECTION TO MIDI SYSTEM

The interface has connectors for both MIDI data input and output. For interconnection, use standard MIDI cables with DIN 41524 connector (5-pin / 180°).

2.1. STANDARD WORKING MODE

If the interface is switched on and active (see chapter 3.2), all incoming MIDI data (from sequencer, master keyboard, etc.) at MIDI input of the interface are transferred to MIDI-THRU/OUT output of the interface remaining unchanged (THRU function). Another MIDI devices might be chained to master / host system without an additional Thru-Box etc. - MIDI input of the next chained MIDI device will be simply interconnected with MIDI-THRU/OUT output of the interface (see pic. 2).

If there are no other devices to be chained and controlled from the MIDI master / host system, only MIDI-IN cable is necessary (from master / host system to MIDI-IN input of the interface). MIDI-THRU/OUT output of the interface remain unconnected.
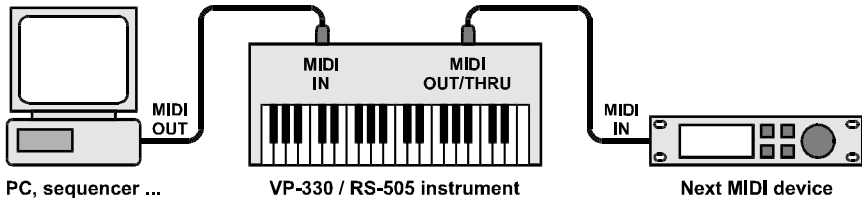
Pic. 2 – Connection to MIDI system for standard working mode

2.2. MEMORY BANK BULK TRANSFER / BACK-UP AND COMMUNICATION

Interface's own System Exclusive messages (Memory bank content, status data, etc.) can be transmitted via MIDI-THRU/OUT output as well. In this case MIDI output MIDI-THRU/OUT must be connected to MIDI input of the master host system (PC, sequencer…) recording / backing-up the data from interface's memory as well as other device specific MIDI messages (see pic. 3).

Pic. 3 – Connection to MIDI system for memory bank content or status data transfer
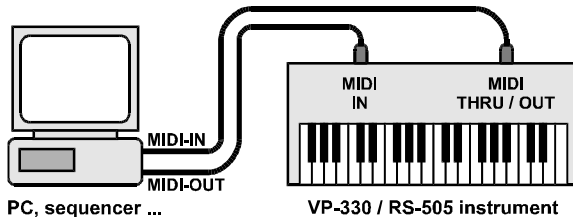
Attention! In this case the MIDI ECHO or THRU function of the recording sequencer has to be disabled (see appendix D). Otherwise MIDI communication loop can occur and "freeze" the MIDI system!

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3. INTERFACE OPERATION

The interface itself has only one manual control element – tumbler switch. It switches the interface on (activation of the interface) or off (deactivation of the interface). Working status and functions of the interface are indicated by bi-color (red / green) LED.

Remark: It is not necessary to install the switch and indication LED. The interface can be switched on and off remotely – by MIDI commands. For details see Appendix E.

3.1. INITIALIZATION SEQUENCE

When the instrument is switched on, the interface reset sequence is executed automatically. During this sequence, system and default preset settings are transferred from internal memory banks to edit buffers (see pic. 4 - [5], [6]). After the initial sequence, the interface checks the status of the tumbler switch.

3.2. INSTRUMENT CONTROL

If the interface is switched "off", it has no effect on VP-330 / RS-505. Both instruments work the same way as there is no MIDI interface installed. In "off" status of the interface, all MIDI communication is disabled and the indication LED doesn't light.

After switching on the interface (by manual switch), it stays inactive awaiting the first MIDI note or other MIDI command.

When the first acceptable MIDI note, controller or other event is received, the indication LED turns red and the MIDI control of the instrument is activated (see pic. 4 - [9], [10]) accordingly to the actual stored interface settings (see chapter 4). All controllers on VP-330 / RS-505 instrument's panel (sliders, switches) remain fully functional.

3.3. WORKING STATUS INDICATION

The actual interface's status is indicated by its bi-color indication LED.

If the interface is inactive, the LED does not light at all.

Active status is indicated by red light of the LED.

The green light indicates user definable functions defined by Indicator Mode preset parameter (see chapter 4.2.4).

If an error occurs during the interface operation, the indication LED starts to blink red constantly – see Appendix B.

4. PARAMETERS

The parameters are divided in two basic groups – system parameters and preset parameters – see pic. 4.

All parameters are stored in memory banks in internal memory of the interface. There is one memory bank for system parameters and 24 memory banks for preset parameters. Whole content of all memory banks can be changed by Bulk Dump SysEx Messages ([1] to [4] on pic. - see description of System Exclusive communication).

After each interface reset the system memory bank is loaded in system edit buffer. Some system parameters can be changed during the device operation by MIDI System Exclusive communication [12]. These settings are temporary only! To keep the changed parameters for future use (after next restart of the instrument) they must be saved in system memory bank [8] by SysEx command (see description of System Exclusive communication).

Pic. 4 – Structure of internal interface's memory
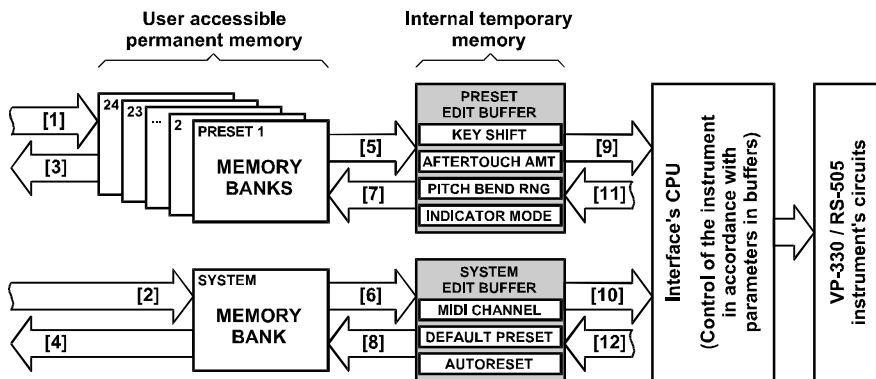
The default preset memory bank (see chapter 4.1.2) is loaded into preset edit buffer [5] after each restart/reset of the interface. Actual preset can be changed by standard MIDI Program Change command (see chapter 5.1.5) or SysEx command (see description of System Exclusive communication). When the preset is changed, the content of selected preset memory bank is loaded into preset edit buffer [5].

The preset parameters can be changed during operation in preset edit buffer by MIDI Control Changes [11]. All changed settings can be saved in any of the preset memory banks [7] by MIDI Control Changes (see chapter 5.1.2.3) or SysEx command (see description of System Exclusive communication).

4.1. SYSTEM PARAMETERS

The system parameters control the basic function of the interface. System parameters are independent on the actual preset settings.

For the factory settings or "Factory reset" SysEx file see table 1 bellow.

Table 1 – Range of valid values and default values of system parameters					
Parameter name	**Valid values**		**Default values (Factory Reset)**		
	[dec]	**[hex]**	**[dec]**	**[hex]**	**Note**
MIDI Channel	0 ~ 15	00 ~ 0F	0	00	Chnl Nr. 1
Default Preset	0 ~ 23	00 ~ 17	0	00	Preset Nr. 1
Autoreset	0 ~ 1	00 ~ 01	1	01	Enabled

System parameters in system edit buffer (expect of default preset program) can be set by MIDI SysEx commands ([12] on pic. 4). These settings are valid immediately after the command is received. However all changes / settings of the system parameters executed in edit buffer are **temporary only**. For further use (after the instrument restart), these **parameters should be saved in system memory bank** by MIDI SysEx command (see description of System Exclusive communication).

System parameters in system memory bank can be backed-up ([4] on pic. 4) and restored by Bulk Dump SysEx Messages ([2] on pic. 4, see description of System Exclusive communication).

To activate the restored / new values of the system parameters, **it is necessary to reset the interface** after restoring the system memory from Bulk Dump.

4.1.1. MIDI CHANNEL

The parameter selects the MIDI channel number for the communication. It is possible to choose any of the 1-16 channels. Valid values of the parameter are 0 to 15. Value 0 is for MIDI channel Nr.1, value 1 selects channel Nr. 2 etc. up to value 15 which selects MIDI channel Nr. 16.

The factory setting is MIDI channel Nr.1 (see table 1). If necessary, MIDI channel number can be user changed.(see description of System Exclusive communication).

4.1.2. DEFAULT PRESET

The parameter specifies the default user preset (memory bank) to be loaded after the interface is turned on (interface reset). Value 0 is for preset Nr.1, value 1 selects Nr. 2 etc. up to value 23 which selects preset Nr. 24.

Preset Nr. 1 is set as default during factory reset (also see table 1). Default preset number can be changed by user (see description of System Exclusive communication).

4.1.3. AUTORESET

The parameter disables (parameter value 0) or enables (parameter value 1) automatic hardware reset procedure if an MIDI communication error occurs (error Nr. 5 – see appendix B).

If the Autoreset is disabled the interface stops working after MIDI communication error. The error status is indicated by indication LED (see Appendix B). To resume the operation, the interface must be switched off and then on manually.

If the Autoreset is enabled and an error occurs in MIDI communication, only short gap in the communication appears and the device continues to work. No user action is necessary in such case.

The Autoreset function is enabled during factory reset (also see table 1). If necessary, the Autoreset can be switched off by user (see description of System Exclusive communication).

4.2. PRESET PARAMETERS

The preset parameters set how MIDI notes, Control Changes and other commands are going to control keyboard and pitch shift circuits of the instrument.

Following table describes the factory settings. All 24 factory preset parameter banks include the same values (see table 2 bellow).

Table 2 – Range of valid values and a default values of preset parameters						
Parameter name	**Valid values**		**Default values (Factory Reset)**		**Adjustable by MIDI CC Nr.**	
	[dec]	**[hex]**	**[dec]**	**[hex]**	**[dec]**	**[hex]**
Key Shift	0 ~ 79	00 ~ 4F	48	30	16	10
Chnl Aftertouch Amount	0 ~ 127	00 ~ 7F	0	00	17	11
Pitch Bend Range	0 ~ 127	00 ~ 7F	127	7F	18	12
Indicator Mode	0 ~ 2	00 ~ 02	1	01	19	13

Actual values of the preset parameters in edit buffer can be edited by MIDI controllers (Control Changes) Nr. 16 to 19 during the instrument operation ([11] on pic. 4).

All edited values of the parameters are stored in the preset edit buffer only. The content of the buffer is saved **temporarily only** (see pic. 4), till the next preset change or the instrument switch off or

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the interface reset. **To keep the edited values** of the parameters for permanent use, it is necessary **to save them** from the preset edit buffer **into a preset memory bank** ([7] on pic. 4).

There are 24 available spaces for user settings. Saving the values in a preset memory bank is done by MIDI Control Changes Nr. 118 (see chapter 5.1.2.3) or by the MIDI System Exclusive command (see manual for SysEx communication).

Preset parameters in a preset memory bank can be backed-up ([3] on pic. 4) and restored by Bulk Dump SysEx Messages ([1] on pic. 4, see description of System Exclusive communication). **To activate the restored / new preset, it is necessary to change / switch the desired preset number** by the MIDI program change.

4.2.1. KEY SHIFT

The interface accepts 49 MIDI notes (four octaves) only (same range as the original VP-330 / RS-550 keyboard). The range of acceptable MIDI notes can be shifted by "Key Shift" parameter in whole scale of MIDI notes. One step is equal to one semitone. Valid range of shift is from 0 to +79 semitones (value of the parameter can be from 0 to 79).

If no shift is chosen (i.e. parameter value is equal to 0), lowest acceptable MIDI key corresponds to MIDI note Nr. 0 and highest key corresponds to MIDI note Nr. 48. If shift is +1 semitone (parameter value is equal to 1), lowest key corresponds to MIDI note Nr. 1 and highest key corresponds to MIDI note Nr. 49. Etc. up to maximum shift of +79 semitones (for detail see pic. 5.)

The parameter value in preset edit buffer can be set anytime during operation by MIDI Control Change Nr. 16 – see chapter 5.1.2.2.

4.2.2. CHNL AFTERTOUCH AMOUNT

Frequency of the main oscillator of the instrument can be detuned down with Channel Aftertouch MIDI command - instrument's function PITCH SHIFT is controlled by MIDI Channel Aftertouch.

The parameter sets the depth of Channel Aftertouch modulation of the instrument's oscillator. Basic (default) detuning is set by the regulators on the left panel of the instrument. This basic value can be increased to maximal possible detuning by Channel Aftertouch MIDI command (see pic. 6).

Value of the Channel Aftertouch Amount parameter can be set from 0 to 127. If the value is equal to 0, Channel Aftertouch MIDI command doesn't affect basic (default) instrument's oscillator frequency at all. If parameter value is set from 1 to 127, the oscillator frequency is decreased directly proportionally to the Channel Aftertouch command value.

The parameter value in edit buffer can be adjusted anytime during operation by MIDI Control Change Nr. 17 – see chapter 5.1.2.2.

Pic. 5 – Effect of "Key Shift" parameter

Range of acceptable MIDI notes

Tone : C3
MIDI : 0

Range of standard MIDI master keyboards

C2
12

A2 C1
21 24
E1
28

C
36

c
48

Key Shift = 0

Key Shift = 12

Basic position after Factory Reset

Key Shift = 24

Key Shift = 36

Key Shift = 48

Key Shift = 60

Key Shift = 72

Key Shift = 79

49 keys

61 keys

76 keys

88 keys

c1
60

c2
72

c3
84

c4
96

g4
103

c5
108

c6
120

g6
127

9
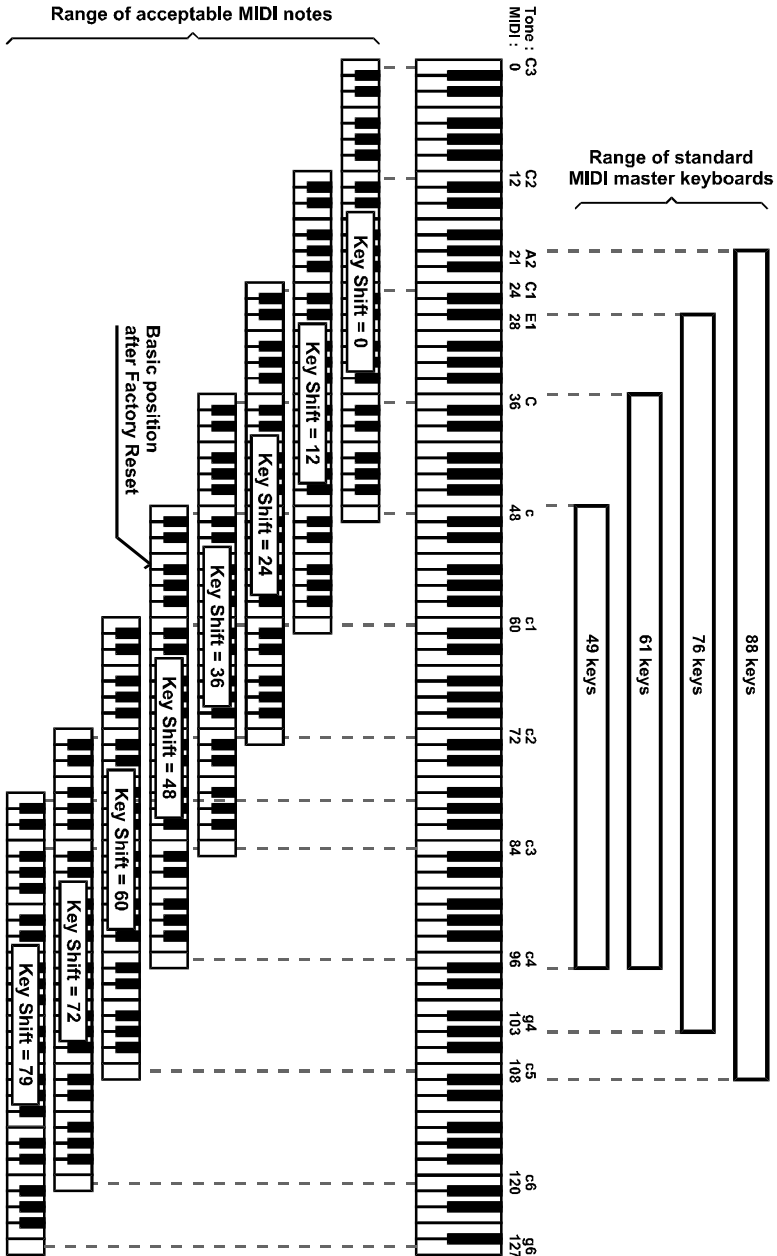
Pic. 6 – Pitch Shift function

a) Basic detuning is set by PITCH SET knob and PITCH SHIFT slider on the instrument's panel. Further decrease of the frequency via MIDI commands (CHANNEL AFTERTOUCH and PITCH BEND) is possible in the range of the knob position and maximal possible detuning – see arrows on the picture.
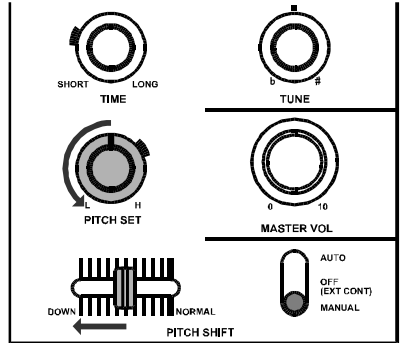
*b) If the PITCH SET knob is set to **H** (max clockwise) and PITCH SHIFT slider to **NORMAL** (max to the right), the range of decreasing of the oscillator frequency via MIDI commands (CHANNEL AFTERTOUCH and PITCH BEND) is in maximal possible range – see arrows on picture.*
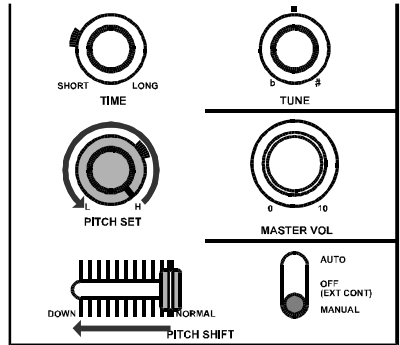
*c) If PITCH SET knob is set to **L** (max counterclockwise) and PITCH SHIFT slider to **DOWN** (max to the left), the basic detuning is set to the instrument´s maximum, so there is no space for further decreasing of the oscillator frequency. It means, that CHANNEL AFTERTOUCH and PITCH BEND MIDI commands have no affect on the main oscillator frequency.*

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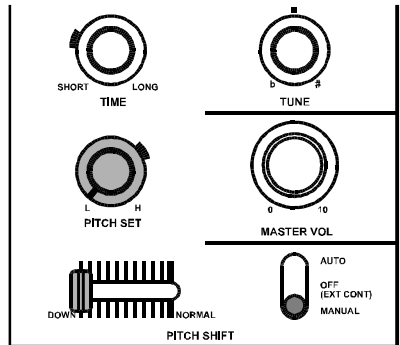
4.2.3. PITCH BEND RANGE

Frequency of the main oscillator of the instrument can be detuned down with Pitch Bend MIDI command (pitch bend wheel, joystick, etc.) - PITCH SHIFT is then controlled by MIDI command Pitch Bend. The "Pitch Bend range" parameter sets the depth of the Pitch Bend MIDI command modulation of the instrument's oscillator. Basic (default) detuning is set by the regulators on panel of the instrument. It can be further increased to its maximal possible detuning range by Pitch Bend MIDI command (see pic. 6).

Value of the parameter can be from 0 to 127. If value is equal to 0, Pitch Bend MIDI command doesn't affect basic (default) instrument's oscillator frequency. If the parameter value is set in the range of 1 to 127, the oscillator frequency is decreased proportionally to the value of Pitch Bend command. The 127 value corresponds to a maximal possible range - Pitch Bend command value -8192.

Note that only bending down is possible (only values from –8192 to 0 of Pitch Bend command are accepted – see chapter 6).

The parameter value in preset edit buffer can be set anytime during the operation by MIDI Control Change Nr. 18 – see chapter 5.1.2.2.

4.2.4. INDICATOR MODE

The parameter sets the function of bi-color indication LED. Value of the parameter can be from 0 to 2. These values set three possible modes: **"Off "** (parameter value 0), **"Keys On"** (parameter value 1) and **"MIDI Event"** (parameter value 2).

The LED indicator works only if the interface is active (i.e. the instrument is switched to MIDI mode – see chapter 3.2). If the interface is inactive, LED indicator doesn't light.

Mode **"Off°"**

Indicator is always switched off. The indication LED lights red only and it indicates that the interface is turned on and active.

Mode **"Keys On"**

In this mode, LED indicator is copying status of a keys pressed by MIDI Note-On command. The indication LED lights green if at least one key pressed via MIDI Note-On command is active.

Mode **"MIDI Event "**

In this mode, the indication LED indicates any incoming MIDI commands acceptable by the interface. MIDI data going through the interface (MIDI "Thru" function) are not indicated. When acceptable MIDI data is received, the LED blinks green. If the data flow is continuous (data more frequent than approx. 120 ms), the green LED lights constantly.

The parameter value in preset edit buffer can be set anytime during operation by MIDI Control Change Nr. 19 – see chapter 5.1.2.2.

5. MIDI IMPLEMENTATION

VP330-KBD / RS505-KBD interface can communicate by all available MIDI methods – it recognizes MIDI channel commands, common system commands as well as SysEx MIDI commands.

5.1. CHANNEL COMMANDS

The interface recognizes channel MIDI commands "Note-Off", "Note-On", "Control Changes", "Channel Aftertouch", "Pitch Bend" and "Program Change". So-called Running Status mode of MIDI communication is fully provided. The commands are received on the channel defined by the MIDI Channel system parameter (see chapter 4.1.1).

5.1.1. NOTE ON/OFF

The interface accepts Note-On and Note-Off commands in the range of max. 49 notes. Accepted note numbers are defined by Key Shift preset parameter (see chapter 4.2.1).

Since the VP-330 / RS-505 are fully polyphonic instruments, the interface can work fully polyphonically too.

5.1.2. CONTROL CHANGES

The interface uses standard MIDI controllers (Control Changes) Nr. 64, 120, 121 and 123. Some other controllers are used for temporary setting of parameters values in edit buffer (CC Nr. from 16 to 19) and for control of interface's functions (CC Nr. 118 and 119).

5.1.2.1. STANDARD CONTROLLERS

CC 64 – Hold

The controller works standard way: holds tone generator of the instrument playing (active) during the time when the Hold command is active (hold pedal pressed). Values from 64 to 127 are recognized as on-status, values from 0 to 63 as off-status.

Note: This controller works **only with tones played by MIDI notes**. It doesn't hold notes pressed on instrument's own keyboard!

CC 120 – All Sound Off

All tone generator of the instrument are switched off immediately after receiving of this controller – independently on MIDI commands Note-On received previously.

Note: This controller works **only with tones played by MIDI notes**. It doesn't hold notes pressed on instrument's own keyboard!

CC 121 – Reset All Controllers

Immediately after receiving of this controller, CC64 and Pitch Bend are set to their initial status:

CC64 Hold → off (value 0)
Pitch Bend (Wheel) → middle position (value 0)

All MIDI notes hold with CC64 are released and Pitch Bend effect to instrument's PITCH SHIFT function is released.

CC 123 – All Notes Off

Same as with All Sound Off, all tone generator of the instrument are switched off immediately after receiving of this controller – independently on MIDI commands Note-On received previously.

Note: This controller works **only with tones played by MIDI notes**. It doesn't hold notes pressed on instrument's own keyboard!

5.1.2.2. CONTROLLERS FOR PRESET PARAMETERS SETTING

These Control Changes set values of parameters in preset edit buffer. All changes takes effect immediately after the commands are received. But all these changes are temporary only (see [11] on pic. 4) - until the preset is changed or the instrument is switched off or the interface reset.

CC 16 – Controller : Key Shift

Received value of the controller Nr. 16 is converted to the value of the Key Shift parameter (see chapter 4.2.1).

Values of the controller from 0 to 79 correspond to the parameter value directly.

Values of the controller from 80 to 127 are converted to closest possible value (i.e. 79).

CC 17 – Controller : Chnl Aftertouch Amount

Received value of the controller Nr. 17 is converted to the value of the Aftertouch Amount parameter (see chapter 4.2.2).

Values of the controller from 0 to 127 correspond to the parameter values (0 to 127) directly.

CC 18 – Controller : Pitch Bend Range

Received value of the controller Nr. 18 is converted to the value of the Pitch Bend Range parameter (see chapter 4.2.3).

Values of the controller from 0 to 127 correspond to the parameter values (0 to 127) directly.

CC 19 – Controller : Indicator Mode

Received value of the controller Nr. 19 is converted to the value of the Indicator Mode parameter (see chapter 4.2.4).

Values of the controller from 0 to 2 correspond to the parameter value directly.

Values of the controller from 3 to 127 are converted to closest possible value (i.e. 2).

5.1.2.3. CONTROLLERS FOR INTERFACE'S FUNCTIONS CONTROL

CC 118 – controller : Save Edit Buffer

The controller Nr. 118 saves the content of preset edit buffer to the permanent memory banks of the interface (see [7] on pic. 4).

Valid values of the controller are from 0 to 23 (it corresponds to memory banks 1-24). If another value of the controller is received, the whole command is invalid and it is ignored by the interface

If values from 0 to 23 are received, data from preset edit buffer will be stored into preset memory bank which is specified by the controller value - 0 for bank Nr. 1, 1 for bank Nr. 2 etc. up to 23 for bank Nr. 24.

CC 119 – controller : Reset

The controller Nr. 119 resets the interface. Value of the controller must be always 0 – the command is unacceptable and it is ignored for all other values.

The interface is deactivated immediately after this controller is received. All circuits of the interface are set to default status (same as after the instrument is switched on – see chapter 3.1). This controller is equivalent to common system command Reset (see chapter 5.2).

5.1.3. CHANNEL AFTERTOUCH

Channel Aftertouch MIDI command can affect instrument's PITCH SHIFT function – detuning the main oscillator of the instrument down. The maximal detune depth depends on Chnl Aftertouch Amount preset parameter settings (see chapter 4.2.2).

The interface accepts whole range of the command values – from 0 to 127.

For value 0, the oscillator detune is set by panel regulators of the instrument only. For values from 1 to 127, the oscillator detuning is increased directly proportionally to the value of the command.

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5.1.4. PITCH BEND

Pitch Bend (Wheel) MIDI command can control instrument's PITCH SHIFT function – detuning of main oscillator of the instrument. The maximal depth of detuning is set by preset parameter "Pitch Bend Range" (see chapter 4.2.3).

Since the instrument can detune the main oscillator down only, the interface accepts the command values from -8192 to 0 only (i.e. only down from the center position of the pitch wheel, joystick, etc.). Values from +1 to +8191 of the MIDI command are ignored.

For value 0, the oscillator detune is set by panel regulators of the instrument only. For values from –1 to –8192, the oscillator detune is increased proportionally to the value.

5.1.5. PROGRAM CHANGE

Program Change MIDI command selects active user preset of the interface. Only program numbers from 0 to 23 are accepted and they correspond to presets numbers 1 to 24. Program numbers 24 to 127 are ignored.

When acceptable Program Change command is received, all tones activated via MIDI notes are muted. When the next MIDI Note-On command is received, the interface starts to work normally accordingly to the parameters of newly selected preset.

5.2. COMMON SYSTEM COMMAND - RESET

The interface recognizes System Rest command only. When the Reset command is received, complete hardware reset of the interface is executed – all interface's circuits are set to their default values (the same as after the instrument is switched on – see chapter 3.1).

5.3. SYSTEM EXCLUSIVE MESSAGES

The interface uses System Exclusive communication protocol for bi-directional memory bulk dumps and some system functions. Detailed description of the System Exclusive communication is in separate manual.

Attached CD-ROM contains software generator for creation of SysEx Messages (see pic. 7) necessary for communication between the interface and MIDI host system The generator is also available on manufacturer's web-pages.

The generator creates any kind of message for control of the interface easily and without knowledge of difficult hexadecimal calculations. The generator is Java script based, so it is computer platform independent. Any internet browser can be used.

For easy calculation of the checksum contained in System Exclusive messages, Checksum Calculator software can be used (see pic. 8). The calculator is available on attached CD-ROM or on manufacturer's web-pages.

The generator is Java script based, so it is computer platform independent. Any internet browser can be used.

Pic. 7 – SysEx Messages Generator window

Pic. 8 – Checksum Calculator window

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6. POSSIBLE LIMITATION DURING THE INTERFACE USAGE AND RECOMMENDED SETTINGS

As mentioned earlier in chapter 5.1.4, MIDI Pitch Bend command can modulate the pitch shift of instrument's main oscillator only in one direction – **the oscillator can be detuned down only.** Moving the pitch bend lever / wheel on a master MIDI device up from the center position will not take any effect on the VP-330 / RS-505 instrument. The range of the oscillator detuning via MIDI commands is affected not only by values of these commands but also by settings of controllers on the instrument's panel. For details see picture 6. To get the maximal range of the oscillator detuning via MIDI commands, use recommended setting shown on pic 6b.

For VP-330 instrument: If too many keys is pressed simultaneously via MIDI notes and on the instrument's own keyboard (approx. over 20 keys simultaneously both MIDI and keyboard), a small amount of distortion in the instrument's sound can be heard.

This distortion doesn't occur if the instrument is controlled via MIDI notes only or only by its own keyboard only. If the instrument is controlled solely from MIDI or own keyboard, any number of keys (up to full range 49 keys) can be pressed simultaneously without any changes of the instrument's sound.

For RS-505 instrument: The Second Touch function is not available if the keyboard is controlled via MIDI. If any (at least one) key is pressed by a MIDI Note command, the function is disabled and it is not working. When all MIDI notes are "Off" and own instrument's keyboard is use, the Second Touch function works normally.

7. TECHNICAL SPECIFICATION

MIDI bus :	fully according to MIDI Manufacturer Association standards
MIDI connectors :	2x DIN 41524 (5 pins / 180°)
Transit data delay MIDI IN → THRU :	max. 1 ms, typ. 0,32 ms
Electrical design :	under the regulations of the ČSN EN 60335-1+A55, ČSN EN 60335-2-45
EMC :	under the regulations of the ČSN EN 55014
Operating environment :	standard
Range of operating temperature :	+10 to +35 °C
Relative environmental humidity :	up to 85 %

8. WARRANTY CONDITIONS

The equipment is provided with **thirty-month warranty** starting from the date of the equipment take-over by the customer. This date must be specified on warranty list together with dealer's confirmation.

During this period of time, all defects of equipment or its accessories, caused by defective material or faulty manufacturing, will be removed free of charge.

Warranty repair is asserted by the customer against the dealer.

Warranty period is to be extended for the time period, during which the product was under the warranty repair.

The relevant legal regulations take effect in case of cancellation of purchase contract.

The customer will lose the right for free warranty repair, if he will not be able to submit properly filled out warranty list or if the defects of the product had been caused by:
  - unavoidable event (natural disaster),
  - connecting the device to the incorrect supply voltage,
  - inputs or outputs overloading by connecting the signals source or load source with not-corresponding characteristics etc.,

- faulty equipment operation, which is at variance with the instructions referred-to in the operating manual,
- mechanical damage caused by consumer during transportation or usage of equipment,
- unprofessional interference with the equipment or by equipment modification without manufacturer's approval.

APPENDIX A. - MIDI IMPLEMENTATION CHART

MIDI IMPLEMENTATION CHART

Device : **VP330-KBD / RS505-KBD** Date : 10 / 2015
Model : **8-440 / 8-441** Version : 1.0

Function		Transmission	Reception	Remarks
Basic	Default	X	1~16	[1]
Channel	Changed	X	1~16	[1]
Mode	Default	X	Mode 3	Not Altered
	Messages	X	X	
Note Number		X	0~127	[2]
Velocity	Note ON	X	O	
	Note OFF	X	X	
After	Key's	X	X	
Touch	Channel's	X	O	
Pitch Bender		X	O	
Control	16 to 19	X	O	Device specific – see description
Changes	64	X	O	Hold
	118, 119	X	O	Device specific – see description
	120	X	O	All Sound Off
	121	X	O	Reset All Controllers
Program Change		X	O	Preset Change (0~23)
System Exclusive		O	O	See description
System	Song Position	X	X	
Common	Song Select	X	X	
	Tune	X	X	
System	Clock	X	X	
Real Time	Command	X	X	
Others	Local ON/OFF	X	X	
	All Notes Off	X	O	
	Active Sensing	X	X	
	Reset	X	O	

Notes : [1] Can be changed by user
[2] Position of 49 acceptable notes depends on Key Shift parameter setting

Mode 1 : **OMNI ON, POLY** Mode 2 : **OMNI ON, MONO** **O** : Yes
Mode 3 : **OMNI OFF, POLY** Mode 4 : **OMNI OFF, MONO** **X** : No

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APPENDIX B. - ERROR STATUS INDICATION

In some extreme cases, an error can occur during the device operation where correct processing of MIDI data is not allowed. In such case, the VP330-KBD / RS505-KBD interface stops its operation and user is informed about the error status by blinking of the red indication LED. Number of blinks specifies the error type (number) – see table 3.

Number of blinks	Error description		Automatic reset
	Name	Indicated problem	
1	EEPROM Malfunction	MIDI interface internal memory does not communicate with CPU - reset the interface by switching the instrument off and on. If the error remains after the reset it is a hardware failure. Please contact the authorized service.	Rejected
2	EEPROM Busy	MIDI interface internal memory is reacting too slowly to the CPU requirements - reset the interface by switching the instrument off and on. If the error remains after the reset it is a hardware failure. Please contact the authorized service.	Rejected
3	EEPROM Failed Cell	Invalid data in the internal memory MIDI cell - reset the interface by switching the instrument off and on and then execute "Factory Reset". If the error remains after the reset it is a hardware failure. Please contact the authorized service.	Rejected
4	DAC Malfunction	Internal D/A converter of the MIDI interface does not communicate with CPU - reset the interface by switching the instrument off and on. If the error remains after the reset it is a hardware failure. Please contact the authorized service.	Rejected
5	MIDI Buffer Overflow	MIDI data loss at the MIDI input - too much MIDI data has been sent to the instrument.	Enabled

Table 3 – Error status indication (title spans top of table)

There are two types of errors – working and fatal errors.

Fatal errors (Nr. 1 to 4) disable correct operation of the interface's CPU. If that error occurs, processing of all data and reading of all control commands is stopped and the interface has to reset for normal working mode by turning the whole instrument off and then on after a moment.

Working error (Nr. 5) occurs if a MIDI caching buffer overflows. This error doesn't block CPU operation, it only does not allow correct processing of incoming MIDI data. Further steps depend on "Auto Reset" system parameter setting (see chapter 4.1.3): If the Autoreset function is on, the interface resets itself automatically and the instrument returns to normal working mode. If the Autoreset function is off, it is necessary to turn the whole instrument off and then on again after a moment as in previous case.

APPENDIX C. – FACTORY RESET

If necessary, complete factory reset of the interface can be executed. During this process, the interface is initialized to the factory status (all parameters are set to the default values). The factory reset process is launched by System Exclusive MIDI command:

F0 00 20 21 7F 5D 30 03 7F 71 F7 [hex]

After successful factory reset completion, the indication LED blinks six times in red.

WARNING - All data stored by user in the internal interface's memory are fully erased after the factory reset. It is recommended to back up all user data by the "BULK DUMP DATA REQUEST" and "BULK DUMP DATA SAVE / LOAD" messages before the factory reset procedure.

APPENDIX D. – LOOP IN MIDI COMMUNICATION

When VP330-KBD / RS505-KBD interface is controlled by a sequencer (HW or SW) and the devices are interconnected bi-directionally (with both MIDI cables) and the sequencer isn't set correctly, communication loop might occur and the entire MIDI system "freezes". In this case all MIDI data incoming from sequencer to interface's input are transmitted to interface's output (THRU function) and back to the sequencer thus. This causes infinite cyclic transfer of the same MIDI data.

To avoid this situation, MIDI thru function must be turned off in a sequencer. This sequencer function is usually called MIDI ECHO or MIDI THRU. For more details check the documentation of your sequencer.

APPENDIX E. – AUTOMATIC ACTIVATION OF INTERFACE

If manual switch of the interface is not installed and it is replaced by jumper (see installation manual for more info), the interface becomes active immediately after initialization sequence (i.e. after the instrument is switched on – see chapter 3.1). MIDI communication is allowed but the interface doesn't affect the instrument until the first MIDI event arrives at MIDI input – the instrument can be used the same way as without installed interface.

After first MIDI command is receipted, the interface turns into operation and control over instrument's keyboard and PITCH SHIFT circuits. The instrument's keyboard and all controllers on instrument's panel are still fully functional.

To return to "non-MIDI" status where the instrument isn't affected by the interface, the interface has to be reset. It is necessary to either turn the instrument off and then turn it on after a moment or reset the interface run by software command – common system MIDI command "Reset", by SysEx command "HW Reset" (see description of SysEx communication) or by MIDI controller (CC) Nr. 119 (see chapter 5.1.2.3).