viscount

V P I

Viscount Pipe Interface

Manuale di installazione ed uso - IT

Installation and use manual - EN

Ver. 1.0

INDEX

1. IMPORTANT NOTES

1.1 LOOKING AFTER THE PRODUCT

- Do not apply excessive force to the device's structures or the controls (knobs, stops, push-buttons, etc.).
- Do not place the device close to heat sources, in damp or dusty places or in the vicinity of strong magnetic fields.
- Do not expose the device to direct sunlight.
- Never insert foreign bodies inside the device or pour liquids of any kind into it.
- For cleaning, use only a soft brush or compressed air; never use detergents, solvents or alcohol.
- Always use good quality screened cables for connections. When disconnecting cables from sockets, always take hold of the connector and not the cable itself; when winding cables, do not knot or twist them.
- Before making the connections ensure that the other units (especially amplification and diffusion systems) you are about to connect are switched off. This will prevent noisy or even dangerous signal peaks.
- Make sure that the electronic boards in your possession are powered with the correct voltage. To know the type of board in your possession, see par. 8.4 and check the code shown on data plate on the PCB.

1.2 NOTES ABOUT THE MANUAL

- Take good care of this manual.
- This manual is an integral part of the instrument. The descriptions and illustrations in this publication are not binding.
- While the instrument's essential characteristics remain the same, the manufacturer reserves the right to make any modifications to parts, details or accessories considered appropriate to improve the product or for requirements of a constructional or commercial nature, at any time and without undertaking to update this publication immediately.
- All rights reserved; the reproduction of any part of this manual, in any form, without the manufacturer's specific written permission is forbidden.
- All the trademarks referred to in this manual are the property of the respective manufacturers.
- Read all the information carefully in order to obtain the best performances from your product and waste no time.
- The codes or numbers in square brackets ([]) indicate the names of the buttons, sliders, trimmers and connectors on the instrument. For example, [ENTER] refers to the ENTER button.
- Illustrations and screens showed are for information purposes only and may differ from your product.

2. WHAT IS VPI

VPI is an interface system for electrical pipe organs. Thanks to VPI Viscount electronic organs can be used to play electromechanical pipe organ registers. Furthermore, VPI is equipped with a tone controller to keep the digital organ in tune with the pipe organ. Should the tune of the acoustic organ be affected by temperature shift, the electronic organ will stay in tune. VPI interacts with the electronic organ through a digital protocol for MIDI instruments. It converts these codes into electric signals, to control the electric valves of the pipe organ. The electronic organ transmits these codes each time a stop is activated or deactivated, a key pressed or an expression pedal moved. VPI receives these codes and then manages the electric valves of the pipe organ so as to perform the commands issued by the electronic instrument. VPI also works in the opposite direction: it measures the environmental temperature, or the sound frequency of the pipe taken as reference. Then, it calculates the tone variation and tunes the electronic organ accordingly.

3. HOW VPI WORKS

The VPI system is made up of the following modules (see par. 8.4 for details on their codes):

- **CPU** (code 985210)
  Programming module for system and tuning controls.

- **Mother Board** (code 985211 or 985212 or 985221 or 985222)
  Link board and Driver modules control.

- **Driver Master for electromechanical valves** (code 985213 or 985214 or 985220 or 985223 or 985224 or 985227 or 985233 or 985234)
  This board controls registers, expression pedals and tremulants of the pipe organ.

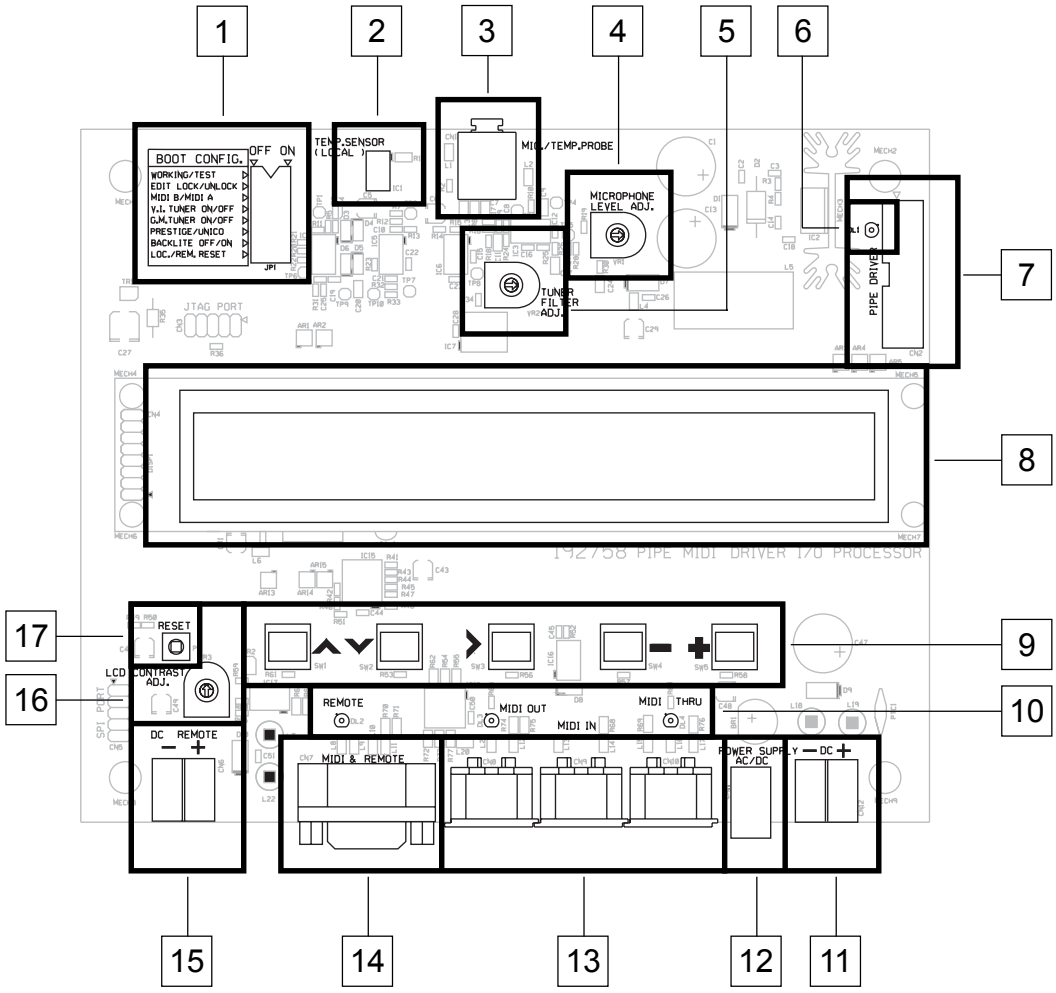
- **Slave Driver for electromechanical valves** (code 985215 or 985216 or 985225 or 985226 or 985228 or 985229 or 985235 or 985236)
  This board controls the notes.

N.B.
Keep in mind that, for the system to work correctly, the minimum of modules required may vary according to the amount of registers and to the organ configuration (except for the CPU module, of which there needs to be only one in any case).

The rationale behind the system is:
- The sound configuration of the electronic organ connected to the VPI is saved in the CPU module
- The electronic stop that controls the organ pipes is set in the CPU module
- Therefore, thanks to the serial line assigned, the CPU module is aware of which Slave module controls the acoustic pipes controlled by an electronic stop.
- Thanks to another serial line, the CPU module is aware of the Master module controlling a stop.
- In the Mother Board, each Master and Slave module is connected to a serial line through jumpers. The serial lines assigned to the modules is also set in the CPU module.

BRIEF CONFIGURATION SAMPLE
Suppose we want the Principal 8' stop of the electronic organ to control the pipes of the Principal 8' stop with "Common" windchest. We should:
- Connect the outputs of a Slave module to the electrovalves of the organ pipes.
- Since the windchest is common, connect one of Master module's outputs to the electrovalve of the Principal 8' register.
- The CPU module acquires the sound configuration of the electronic organ.
- Set the serial line controlling the pipes on the CPU module. Set another serial line controlling the activation of the stop.
- On the Mother Board, assign to the Master module the same serial line (Principal 8' activation) associated to it on the CPU module.
- On the Mother Board, assign the Slave module the same serial line (controlling Principal 8' pipes) associated to it on the CPU module.

3.1 CPU MODULE



1. **Dip-switch selecting operating modes:** these modes are described in par. 8.1.
2. **Local temperature sensor:** used by the system to read the temperature in case the remote sensor-microphone is not connected.

N.B.
When using the local sensor it is advised to place the CPU module close to the organ pipes

3. **Sensor-microphone input:** connect here the cable from the remote sensor-microphone.

N.B.
Place the remote sensor-microphone at approximately 10 cm from the reference pipe (i.e. the A 440.000 Hz).

4. **[MICROPHONE LEVEL ADJ.] trimmer:** adjusts the gain for the signal from the remote sensor-microphone, used for setting up the tuner (see par. 7.1).

5. **[TUNER FILTER ADJ.] trimmer:** adjusts the central frequency (400.00 Hz) of the sampling filter.

N.B.
The tune filter is adjusted by the producer while testing the VPI. Therefore, the [TUNE FILTER ADJ.] trimmer of the CPU board will be locked at the time of delivery.

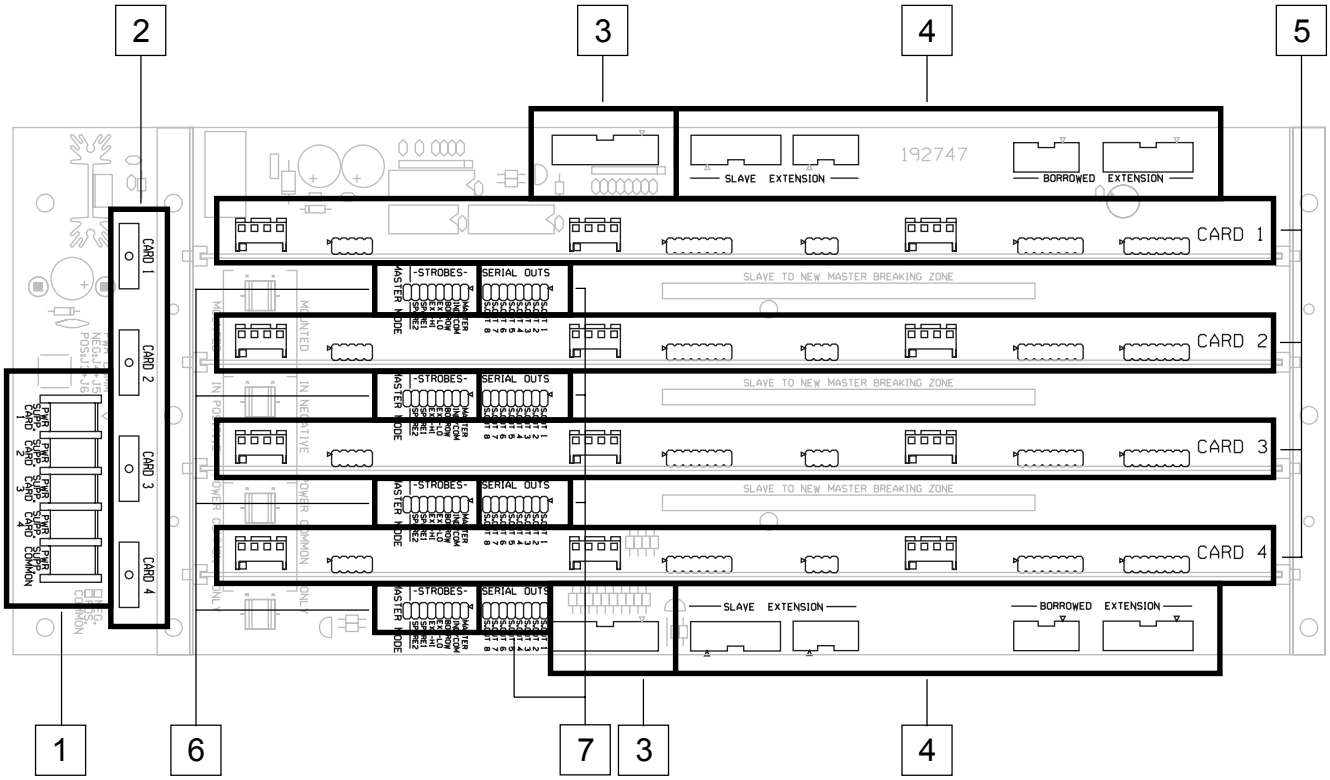
6. **Mother Board Fault LED:** when this LED is on, the Mother Board module is not properly connected and therefore it cannot communicate with the CPU module. Should this happen, check that the flat cable is properly plugged into the [CN9] connector of the Mother Board, and that the cable itself is not damaged.
7. **[PIPE DRIVER] connector:** the flat cable linked to the [CN9] connector of the Mother Board is plugged here. This link provides constant data and power flow from the CPU to the Mother Board.
8. **Display:** 32x2 alphanumeric LCD display. It shows the necessary information to use and program the VPI.
9. **Display control buttons:**
   - **[▲]:** "UP" button, moves the cursor to the previous field. If pressed for a few seconds, it shows the page one level higher.
   - **[▼]:** "DOWN" button, moves the cursor to the next field.
   - **[▶]:** "ENTER" button. Confirms a selection or enters a selected field of a menu.
   - **[-]:** this button decreases the value of a selected parameter. In certain menus this button has an alternative function, shown on the display close to the button (e.g. NO in some confirmation requests)
   - **[+]:** this button increases the value of a selected parameter. In certain menus this button has an alternative function, shown on the display close to the button (e.g. YES in some confirmation requests)

NB:
The cursor location is indicated by a blinking field or a ⁺ symbol.

10. **Port visualization LEDs:** these LEDs show when the following ports are working (either transmitting or receiving): [MIDI THRU] (and therefore also [MIDI IN]), [MIDI OUT] (see point 13), serial port RS232 [MIDI & REMOTE] (see point 14).
11. **[DC] connector:** connects the power cable of the VPI to the [PWR CARD] connectors of the Mother Board module.
12. **[POWER SUPPLY AC/DC] connector:** this connector supplies power to the CPU module in case the Mother Board is not present (when using the VPI only as a tuner). Needs 12V AC or DC, 1A.
13. **MIDI Connectors (DIN 5 pins):**
    - [MIDI OUT]: this port transmits the MIDI data generated by VPI. Connect to the MIDI IN connector of the Viscount organ or to the instrument you wish to tune.
    - [MIDI IN]: this port receives MIDI data. Connect to the MIDI OUT connector of the electronic organ or to the MIDI unit working as Master of the MIDI chain.
    - [MIDI THRU]: this port transmits the MIDI data received from the [MIDI IN] connector of the VPI. Connect to the MIDI IN port of another Slave unit of the MIDI chain.
14. **RS232 [MIDI & REMOTE] connector:** this port receives and transmits MIDI data from and to the VPI. Use it only with Viscount electronic organs, instead of MIDI connectors (DIN 5 pins). This connector also transmits the + 12V DC signal to activate remotely the VPI through electronic organ. Using this port will spare the MIDI connectors of the electronic organ, but requires the installation of a dedicated module in the organ.

15. **[DC REMOTE] connector:** this connector provide the + 12V DC power needed to turn on remotely the pipe organ and/or other amplifications systems (see chap.3). Use this connector only if VPI and electronic organ are connected with the RS232 [MIDI & REMOTE] connector.
16. **Adjust display contrast.**
17. **[RESET] button:** restarts the VPI.

3.2 MOTHER BOARD MODULE



1. **Power connectors:** insert here the power cables connected to the electromechanical valves of the organ pipes (range: 12-30 V)
2. **Fuses**: these fuses protect the Driver modules. Use only **25A / 32V** blade fuses.
3. **CPU connector (CN9):** the flat cable from the [PIPE DRIVER] connector of the CPU module is plugged here. The module is equipped with two connectors of this kind, CN9 and CN10. CN10 should be used as an extension, in case several Driver module are required, more than a single Mother Board can hold. Check that a jumper is inserted in pins 17-18 (a small, screen-printed triangle indicates pin n.1) of the last Mother Board used (that is, the one not connected to other Mother Board modules).
4. **[SLAVE EXTENSION] & [BORROWED EXTENSION] connectors:** use these to connect Mother Board modules, in case you require more Driver modules than can be fit in one single Mother Board.
5. **Driver modules connectors:** insert Driver modules here. [CN1] of the Driver module must be inserted into [CN101] or [CN201] or [CN301] or [CN401] of the Mother Board. The Master module must always be inserted before the Slave module managed by the Master. In the case of CARDS: CARD1, CARD2, CARD 3 etc., insert the Master board in CARD 1 and the Slaves in CARD 2 and further on.
6. **[STROBES]** pins: these pins set the function mode of each single Driver module, through one or more jumpers. The way it works its set up in the CPU module (see par. 6.3), following this scheme:
   - [JP102]: CARD 1
   - [JP202]: CARD 2
   - [JP302]: CARD 3
   - ……..
   - [JPX02]: CARD X

Master modules need two jumpers, one on the first column on the right (indicated by a "MASTER" serigraphy) and one on the first column on the left (beside the MASTER MODE writing).

Each Slave module needs one single jumper, according to the configuration assigned in the CPU module to the controlled register (see par.6.3). The serigraphy indicates:

- IND./COM: Indipendent or Common register
- BORROW: Borrowed register
- EXT-LO: Extended-Low (lower part of the extended register)
- EXT-HI: Extended-High (higher part of the extended register)
- SPARE1: not in use at the moment
- SPARE2: not in use at the moment

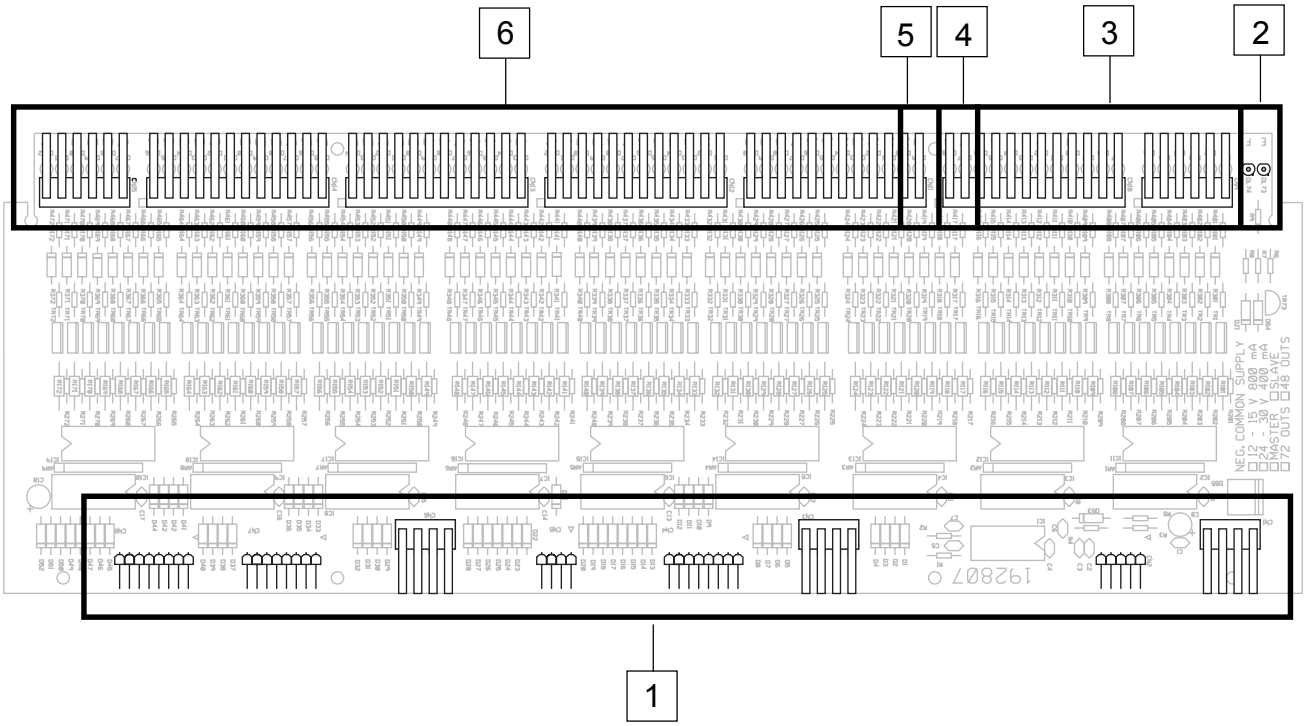
7. **[SERIAL OUTS] pins**: these pins set the serial line of a certain Driver module, through the use of a jumper. This depends on the set up of the CPU module (see par. 6.3), following this scheme:
   - [JP101]: CARD 1
   - [JP201]: CARD 2
   - [JP301]: CARD 3
   - ……..
   - [JPX01]: CARD X

   Set the Master module's serial line:
   - with the same number as the organ section index, if all stop(s) belong to the same section.
   - as n° 7 or n° 8 if the Master module controls stops from more organ sections.

   An index number is assigned to each stop controlling acoustic pipes. The serial line of Slave modules should be set with this number, which has already been assigned.

NB:
- *One serial line cannot be associated to more than one Master module.*
- *For further information about programming Master and Slave modules, see par. 6.3.*

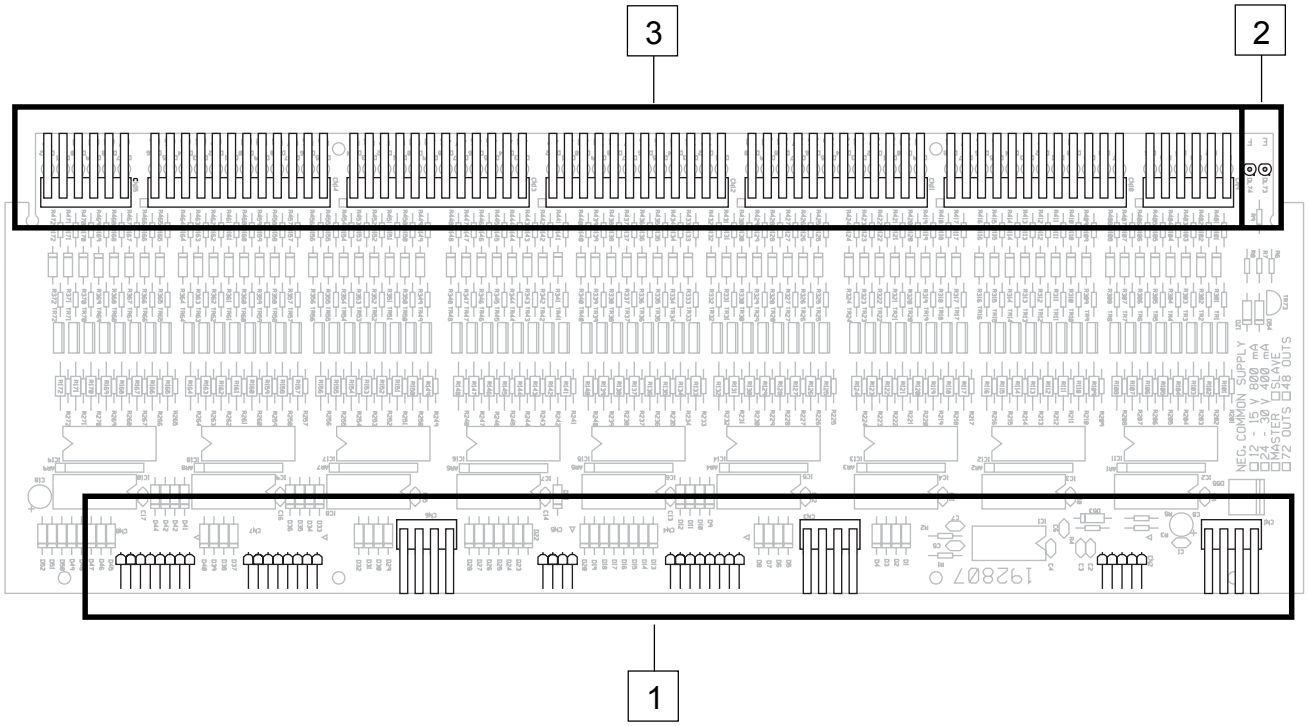
3.3 DRIVER MASTER MODULE



1. **Connectors to Mother Board module:** to connect the Master driver module to the Mother board, insert these connectors into those described at point 6. paragraph 3.1.
2. **Module condition LEDs:** the green LED indicates that the module is working properly. The red LED indicates that the board has power problems. In this case, check that the CARD fuse is in good conditions and properly inserted. If the LED light is red in other modules as well, check the power cables.
3. **Epression pedal output contacts**: connect the electric engine pins to the contacts from 1 to 16 with no more than 16 steps (or 8 steps, if using two electric engines). The LEDs beside the contacts show the expression pedal position, based on the MIDI codes received, and what contacts of the Driver module are connected to the electric enginge.
4. **Outputs contacts for the movement of the expression pedal:** the pins of the electric engine(s) should be connected here, to control the direction of the rotation of opening/closing of the expression case. LEDs beside the contacts indicate which pins receive the signal, when moving the expression pedal. When the LED is on, the swell box is closed, when it is off, the swell box is open.
5. **Tremulant outputs contacts:** connect these pins to the cables of the tremulant valves. The LEDs beside the contacts show which pin is activating the tremulant valve.
6. **Stop output contacts:** connect these pins to the cables of the valves activating/deactivating stops. The LEDs beside the contacts show the state of the stop. LEDs with numbers from 21 to 21+ Slave module number show the state of the Slave Driver modules (active or inactive). This helps to point out which of the installed modules controls the electromechanical valves of the pipe.

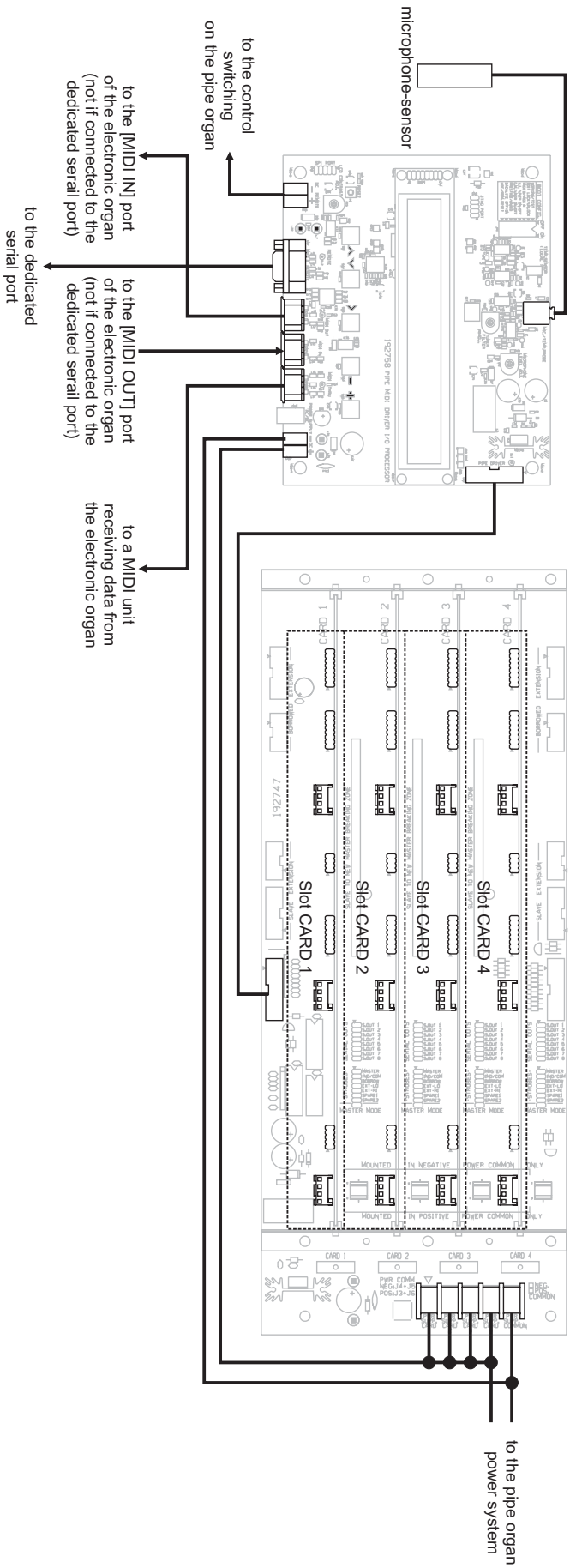
NB:
The first n LEDs (n = number of Slave modules available) of the register outputs show the state of the Slave Driver modules. Therefore, we advice to use the other contacts to control the stops.
This means that the amount of controlled stops is 52 minus the number of Slave Driver modules installed.
Keep in mind that the digits 1...52 shown on the display when configuring and programming the CPU module (see Stop Out parameter in par. 6.3) coincide with the contacts 21...72 of the Master module.

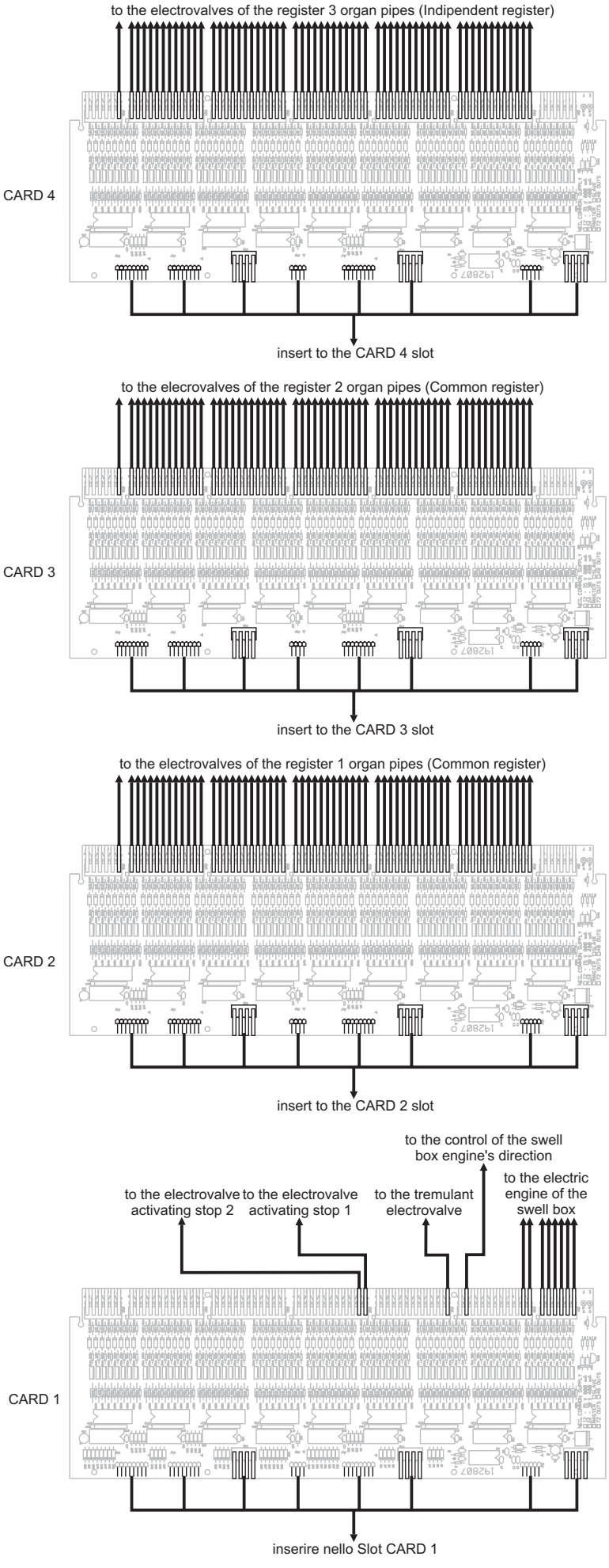
3.4 DRIVER SLAVE MODULE



1. **Connectors for the Mother Board module:** to connect the Slave Driver module to the Mother Board, link these connectors to the ones described at point 6, paragraph 3.1.
2. **Module state LED:** the green LED indicates that the Slave Driver module is on, while the red light means that the board needs power supply. Should this happen, check that the CARD fuse is whole and properly inserted; if other modules as well show a red light, check the power cables.
3. **Note output contacts:** connect these pins to the cables from the electromechanical valves of the pipes you wish to play through that particular Slave driver module. Keep in mind that the C1 note is on contact n.7.

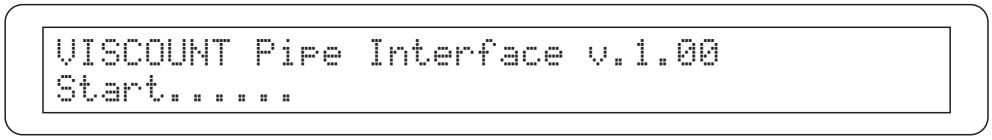
4. INSTALLATION SAMPLE



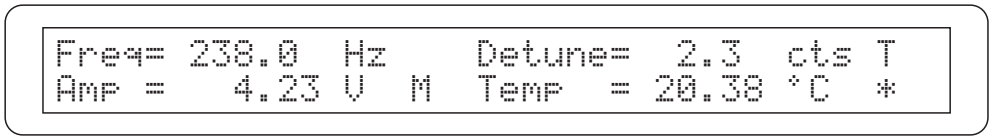

to the electrovalves of the register 3 organ pipes (Indipendent register)
CARD 4
insert to the CARD 4 slot
to the elecrovalves of the register 2 organ pipes (Common register)
CARD 3
insert to the CARD 3 slot
to the electrovalves of the register 1 organ pipes (Common register)
CARD 2
insert to the CARD 2 slot
to the control of the swell box engine's direction
to the electric engine of the swell box
to the electrovalve activating stop 2
to the electrovalve activating stop 1
to the tremulant electrovalve
CARD 1
inserire nello Slot CARD 1

5. SWITCHING ON AND MAIN DISPLAY PAGE

The CPU module is switched on automatically as it receives power. It can also be switched on thanks to the remote control of the [MIDI & REMOTE] port.
While starting the display shows the currently loaded firmware release:



then, after a short while, the normal working screen, called from now on main display page:



The main display page shows the current parameters of the tuner:

- **Freq**: sound frequency of the reference pipe, i.e. the one monitored by the microphone (usually an A3 of a Principal 8', in any case a 440.00 Hz A)
- **Detune:** variation in Cents (from the theoretical value). It is calculated by VPI, according to temperature or actual frequency of the sound produced by the reference pipe.
  An "**F**" will appear:

  Detune= 9.2 cts F

  if the value is calculated by measuring the frequency.
  A "**T**" will appear:

  Detune= 9.2 cts T

  if the temperature is being measured.

  Whenever the frequency difference is of ±½ semitone, the tuning cannot be calculated, as this is considered a measuring mistake. The screen will show:

  Detune= BAD cent F

  The same applies when the tuning differs of more than ±10 cents from the value of the temperature / frequency table. In this case, the screen will show:

  Detune= +64.8 cts F!

  While in temperature reading mode, if a temperature / tuning table has not been created yet (see par. 7.1) or if the temperature is not between 2 °C and 40 °C, the tuning cannot be calculated. The screen will show:

  Detune= BAD cent T

- **Amp:** signal level read by the microphone on the reference pipe. If the level is inside the valid range (see Min/Max Trigger Amp parameter, par. 7.2) an asterisk will appear:

  Amp= 3.58 V *

  If the signal level is out of range, the value will appear without asterisk and the tuning will be deducted from the temperature.
  Beside the signal level, further information might appear, such as:
  - An "**A**" if the tuning is calculated in AUTO mode.

    Amp= 3.58 V *A

  - An "**M**" if the tuning is calculated in Manual mode.

    Amp= 3.58 V *M

  While in Manual mode, the display will also show:
  - An "**N**" if only the sample note has been played:

    Amp= 3.58 V *MN

  - a "**V**" if only the sample (pipe) stop - taken as reference for tuning - is active.

    Amp= 3.58 V *MNV

> **NB**
> *Tuning modes are described in par. 7.1.*

- **Temp:** temperature measured by the sensor inside the microphone, or, when lacking, by the local sensor (see point 2 par. 3.1). If the temperature is between 2 and 40 °C, an asterisk will appear beside the value.

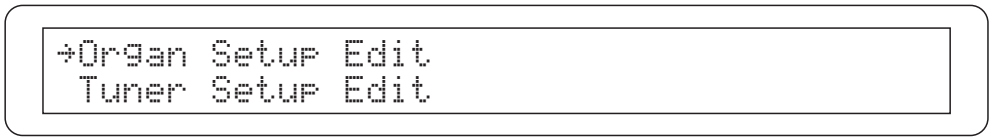
  Temp= 19.54 °C *

6. PROGRAMMING THE ORGAN-PIPES INTERFACE (ORGAN SET-UP)

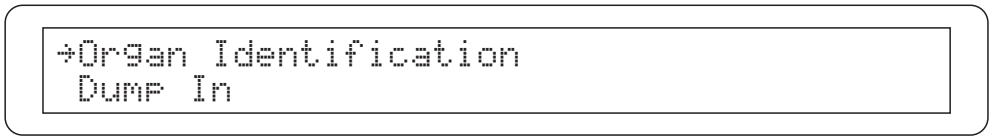
The organ-pipes interface of the CPU module converts MIDI messages from the electronic organ to electric signals for the electric valves.
The CPU modules needs a two-steps programming: first **acquiring** the electronic organ structure, then **configuring** (setup) the working mode of the stops, so as to correctly send out the electric signal to the electrovalves.
The VPI can be also configured by Viscount International, therefore you might have to :

- follow the instructions at par. 6.1 or 6.2, then 6.3 if the VPI has not been programmed.
- follow the instructions at par 6.3 if the VPI has acquired the organ structure already but has **not** been configured yet.
- do nothing, if the VPI has already been completely programmed.

To access the main programming page, press and hold the [▲] button. The display will show:



Now select the **Organ Setup Edit** field (already selected) and press the [▶] button

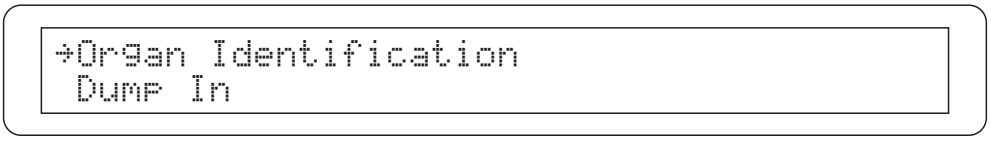


The VPI can be programmed:

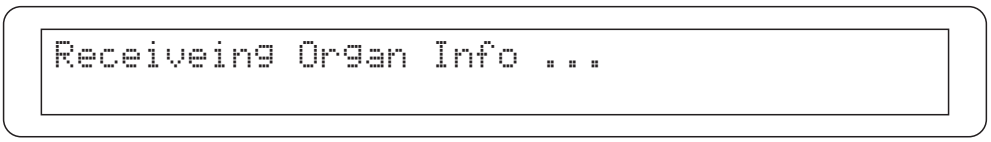
- by having the CPU module acquire the structure directly from the organ itself and then configuring the stops and windchest type to be played by the pipe organ. This procedure is described at par. 6.1.
- by having the CPU module receive a MIDI (.mid) file containing all the information described above. This file can be a dump file from a previous configuration (see par. 6.4) or a file generated by Viscount International. This procedure is described at par. 6.2.

6.1 ACQUISITION FROM THE ELECTRONIC ORGAN

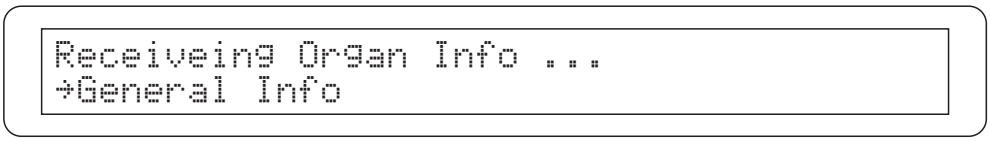
First of all, connect the CPU module to the electronic organ using the [MIDI IN] and [MIDI OUT] or the [MIDI & REMOTE] connectors. In this display page,



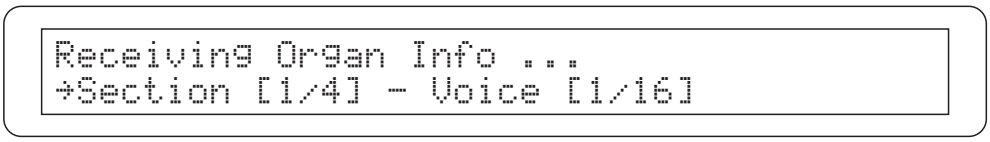
select the **Organ Identification** field (already selected) and press the [▶] button. The display shows:



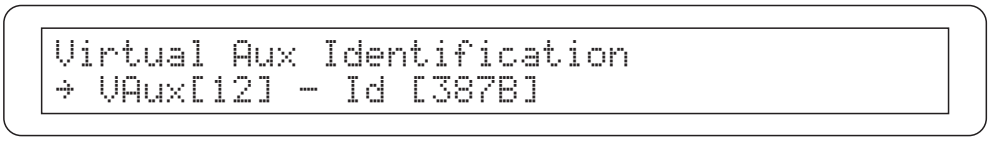
Then,



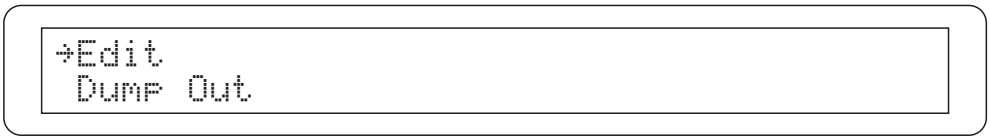
At this stage, the CPU module acquires all the general data about the electronic organ (model, version, number of sections). At the end of this process, the display will show:



While the CPU acquires the relevant data on the various sections (Midi channel and stops). Then:

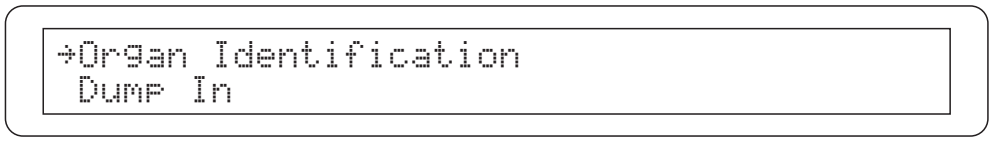


Eventually, when the acquisition is complete, the display shows:

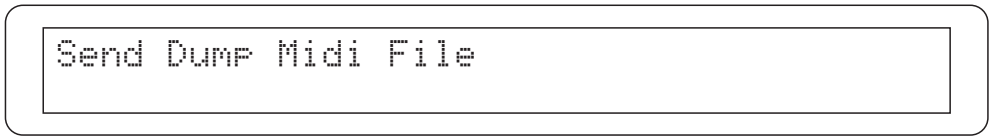


6.2 ACQUISITION FROM MIDI FILE

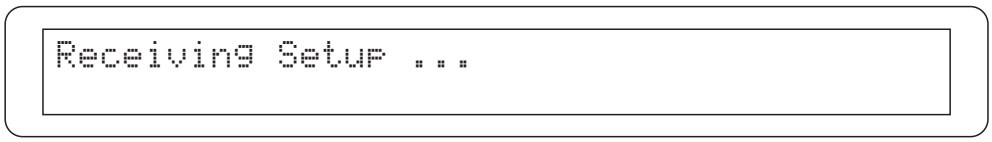
Connect the [MIDI IN] connector of the CPU module to the [MIDI OUT] connector of the MIDI unit sending out the .mid file (sequencer, PC). In this page:



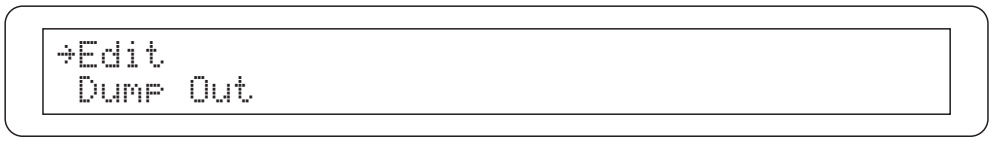
select the **Dump In** field and press the [▶] button. The display shows:



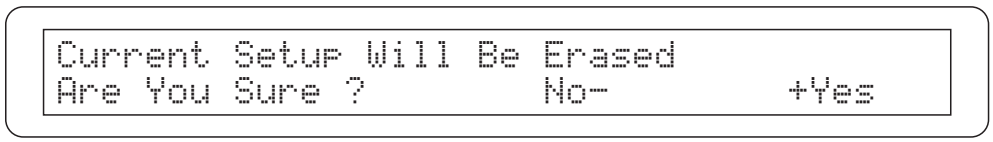
Activate the .mid file transfer within 30 seconds. The display shows:



When the transfer is complete, the display shows again the page:



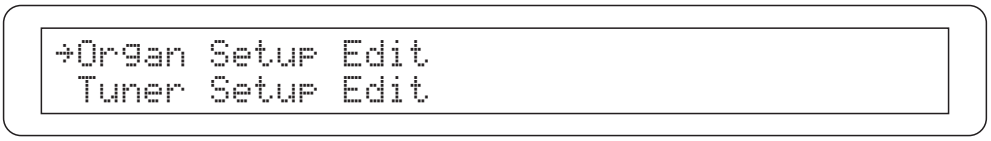
In case the CPU module has already been configured, select the **Dump In** field. The display will show a request to delete the current setup:



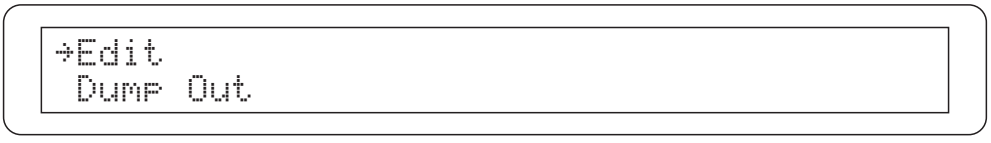
Press [-] to abort the deleting and acquiring process, or [+] to start it.

6.3 CPU MODULE CONFIGURATION

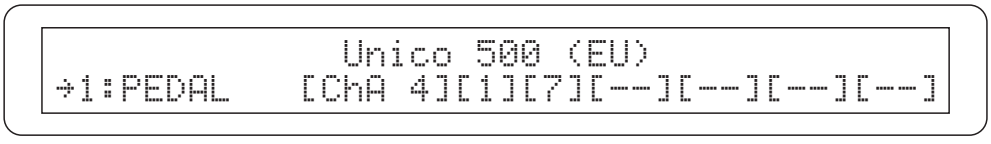
Once the organ structure has been acquired, or in case the MIDI file received is just a dump MIDI of the original acquisition, the CPU module needs to be configured, so as to work properly as an interface between electronic organ and acoustic pipes.
The configuration mostly consists of pointing out which electronic stops has to activate which pipe stop, and how.
From the main video page, press and hold the [p] button. The display shows:



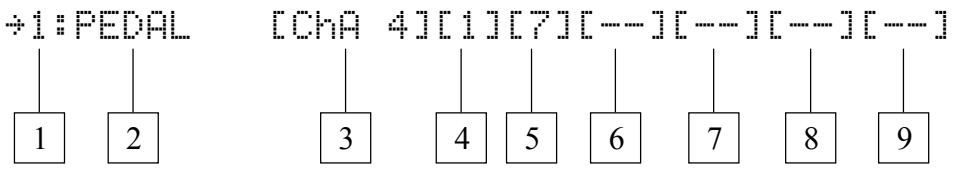
Select the **Organ Setup Edit** field (already selected) and press the [▶] button:



Select **Edit** (already selected)



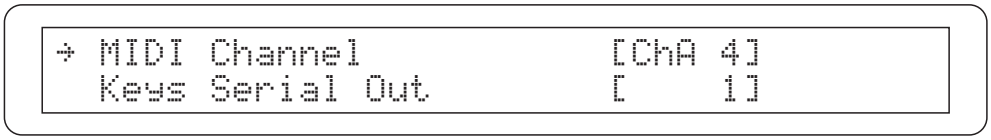
On the top of the screen you can find the organ model, while on the bottom are listed the original features of each pipe organ section:



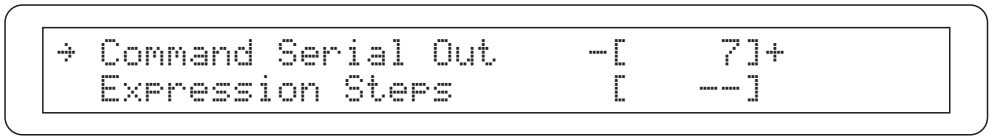
which mean:

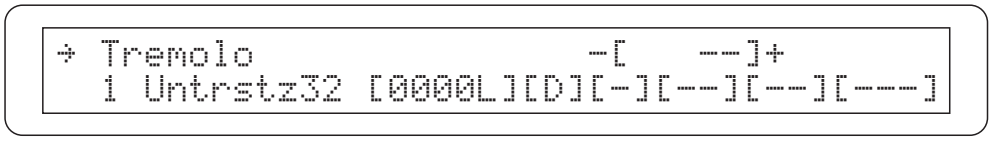
1. Index of the organ section
2. Name of the organ section
3. MIDI channel associated to the section in the electronic organ.
4. Serial line of the Slave Driver module. Controls the notes. It is associated to an organ section.
5. Serial line of the Master Driver module. Controls the stops of the section.
6. Number of steps for the expression pedal.
7. Presence of tremulant
8. Not in use at the moment
9. Not in use at the moment.

These values are only for your information and cannot be modified.
Use the buttons [▲] and [▼] to move through the organ section.
Press the [▶] button to access the setup page. In this page the above mentioned parameters can be modified, as well as the registers to be played by the acoustic pipes.
This is the first video page:



use the [▲] and [▼] buttons to switch between this and the following video pages:





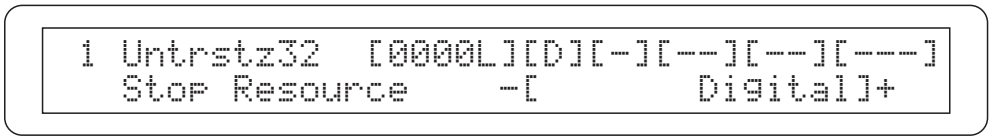
Here you can adjust the general parameters of the section. Adjustable values appear with the + and – symbols beside the square brackets.

- **MIDI Channel:** MIDI channel associated to the electronic organ section (cannot be modified).
- **Keys Serial Out:** serial line of a Master Driver module controlling the notes in a section (cannot be modified).
- **Commands Serial Out:** serial line of a Master Driver module controlling the stops in a section (adjustable). A Master Driver module activates and deactivates the stops, thanks to the outputs from 21 to 72 (see par 3.3 for further information). Master modules are assigned a serial line, that has to be unambiguous, in case several Master modules share the same Mother Board. This parameter informs the CPU module of the Master modules to be used to control the respective stops. Any section can be assigned the serial lines 7,8 or the line with **the same index number of the section.**

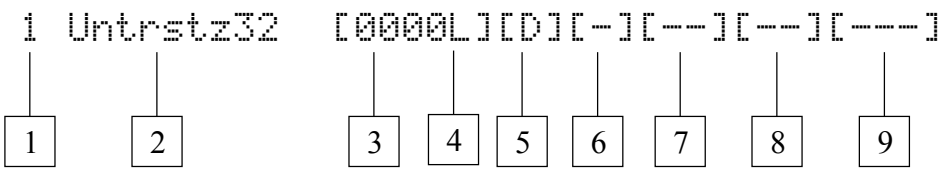
- **Expression Steps:** expression pedal configuration.
  The number of pedal steps can be set according to the characteristics of the engine controlling the swell box. With engines that have 8 (or less) steps, it is possible to control two swell boxes with a single Master Driver module, setting a maximum of eight steps (instead of 16) for each pedal. Available options are:
  - **5/8 L:** use the Master Driver output contacts from 1 to 5
  - **6/8 L:** use the Master Driver output contacts from 1 to 6
  - **7/8 L:** use the Master Driver output contacts from 1 to 7
  - **8/8 L:** use the Master Driver output contacts from 1 to 8
  - **5/8 H:** use the Master Driver output contacts from 9 to 13
  - **6/8 H:** use the Master Driver output contacts from 9 to 14
  - **7/8 H:** use the Master Driver output contacts from 9 to 15
  - **8/8 H:** use the Master Driver output contacts from 9 to 16
  - **9/16:** use the Master Driver output contacts from 1 to 9
  - **10/16:** use the Master Driver output contacts from 1 to 10
  - **11/16:** use the Master Driver output contacts from 1 to 11
  - **12/16:** use the Master Driver output contacts from 1 to 12
  - **13/16:** use the Master Driver output contacts from 1 to 13
  - **14/16:** use the Master Driver output contacts from 1 to 14
  - **15/16:** use the Master Driver output contacts from 1 to 15
  - **16/16:** use the Master Driver output contacts from 1 to 16

  For options x/8 L and x/16, direction signal is transmitted by the output contact 17.
  For option x/8 H direction signal is transmitted by contact 18.
- **Tremolo**: set the output contact to control the section tremulant:
  - T1: tremulant 1, output 19
  - T2: tremulant 2, output 2

Below the **Tremolo** parameter begins the list of stops of the section that is being edited.



There are two CPU module parameters for each stop. The main parameter here is the link between electronic and pipe stops, that is, if a certain electronic stop should activate a stop of the pipe organ.
Press the [▶] button to move the cursor and edit the parameters. Function and value of a parameter are shown on the line below. The symbols + and - beside the square brackets mean that it can be adjusted.
The parameters are:



1. **Stop index number**
2. **Stop acronym**
3. **Stop MIDI ID**
4. **Stop category**
   - **L:** labial
   - **R:** reeds
   - **M:** mixtures
   - **O:** orchestral

5. **Stop Resource:** defines whether an electronic stop control an acoustic one, and of which kind. Options are:
   - **D - Digital:** the stop plays only an electronic register
   - **I - Independent:** independent windchest
   - **C - Common:** common windchest
   - **B - Borrowed register**
   - **E - Extended register**
   - **N - Command register**

NB:
Check the paragraph "Register types" for a detailed description of the advanced functions of the registers.

6. **Keys Serial Out / Command section:** insert here the serial line of the Slave Driver module commanding the acoustic pipes you wish to play with through the electronic organ stop. The parameter cannot be modified for Independent or Common stops, as the serial line has to be the same as the section index. In Command stops, the parameter defines the index of the section on which the command will be executed. **A** (all) indicates that the command works on all sections.
7. **Slave Out / Command Type:** defines the Slave Driver module commanding the electrovalves of the pipe organ. The value shown means:
   1= first slave after the Master module
   2= second slave after the Master module
   3... etc.
   In case of Command stops, the parameter sets the command:
   - **SO:** sub octave
   - **PO**: super octave
   - **UO:** unison off
   - **RC:** reeds cancel
   - **MC:** mixtures cancel
   - **TO:** deactivate tuner
   - **X1** and **X2:** generic commands. Used when in need of a Master module output controlled by an electronic stop

NB:
Slave Driver modules assigned to a specific electronic stop need [STROBES] jumpers placed according to the operating mode, selected as the Stop Resource parameter.

8. **Stop Out:** defines the number (1...52) of the Master module output that controls the electrovalves of the stop.

NB:
The output number (1 to 52) corresponds to the output contact of the Master module from 21 to 72

9. **Stop Offset:** sets the number of semitones for the transpositions of the organ pipes. For Independent, Common and Command stops, this parameter cannot be adjusted.

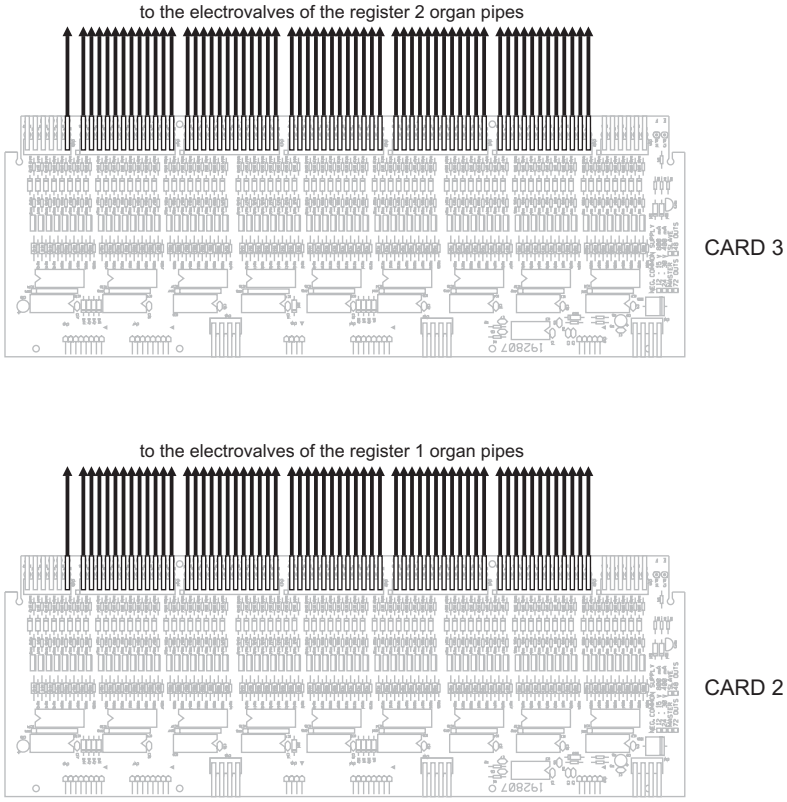
To save the changes made to paramters, press for a few seconds the [▲] button.

REGISTER CATEGORIES

INDEPENDENT

Electronic registers controlling real pipe stops with independent windchest should be set in this mode.
Independent stops have a valve for each pipe of each stop. Therefore to play two stops you need to command 122 valves, using two Slave Driver modules.
While programming, follow this procedure:

- Each electronic stop set as Independent should be assigned to a single Slave Driver module. The 61 outputs of the module should be connected to the pipe valves you whish to use.
- For the relevant Slave module, the jumper needs to be placed on the [IND/COM] of the [STROBES] pins. In the [SERIAL OUT] pins, place the jumper on the serial line indicated by the same digit set under the **Serial Out** parameter on the display. Each Master Driver module can manage a maximum of 8 stops of Independent pipes.
- Although it is not strictly necessary, we advice to assign a single, unoccupied Master Driver output for each INDEPENDENT register, through the **Stop Out** parameter.
- Be careful no to assign more than one stop to each Slave Driver module.

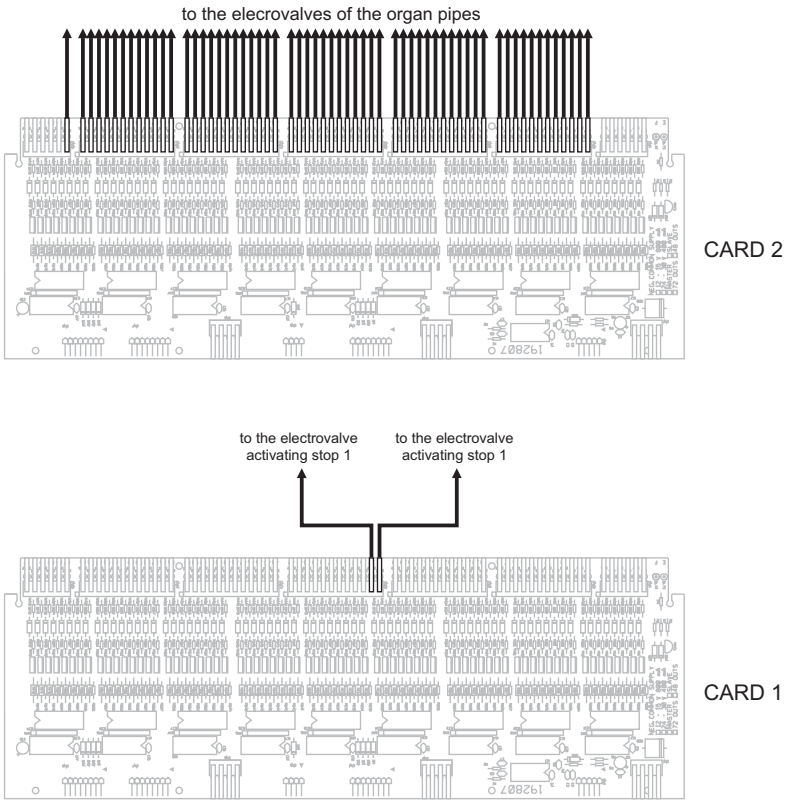


COMMON

Electronic stops controlling pipes with Common windchest (or "channel-per-key") should be set in this mode. This windchest type is named Common, because all pipes playing the same note on the same section are controlled through one single valve. Each stop is controlled by a second valve, to play only the selected stops.
While programming, follow this procedure:

- All Common electronic stops of a section should be assigned to the same Slave Driver module. The 61 outputs of the module should be connected to the pipe valves.
- For the relevant Slave module, the jumper needs to be placed on the [IND/COM] of the [STROBES] pins. In the [SERIAL OUT] pins, place the jumper on the serial line set under the **Serial Out** parameter of the display, corresponding to the index of the electronic organ section.

- Assign to each electronic stop a Master Driver output, through the **Stop Out** parameter. These outputs then need to be connected to the valves of each pipe register.

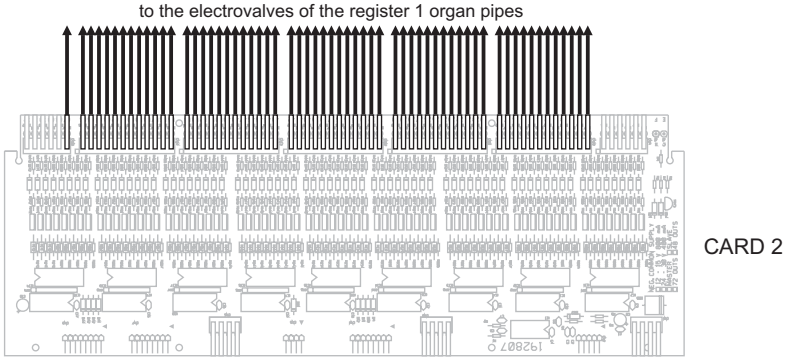


BORROWED

A borrowed register is a pipe register that is shared. This means that it is commanded by several electronic registers, even belonging to different sections.

While programming, follow this procedure:

- In the CPU module just set in Borrowed the stops you wish to use to control the same pipe register, assigning it the same **Serial Output** and **Slave Output**.
- For the relevant Slave module, the jumper needs to be placed on [BORROW] among the [STROBES] pins. In [SERIAL OUT] pins, place the jumper on the serial line set under the **Serial Out** parameter of the display. Each Master Driver module can manage a maximum of 8 stops of Independent pipes.



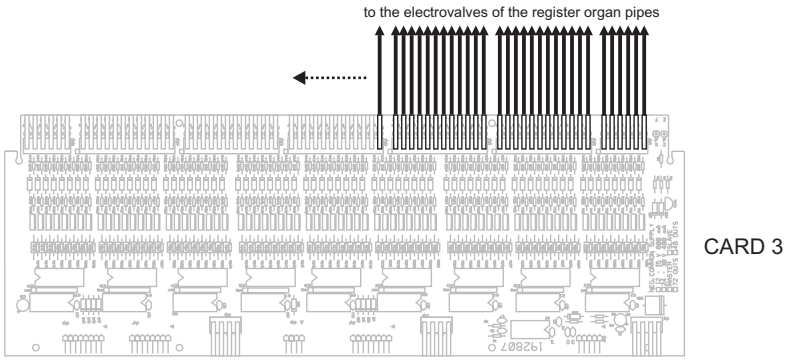
EXTENDED

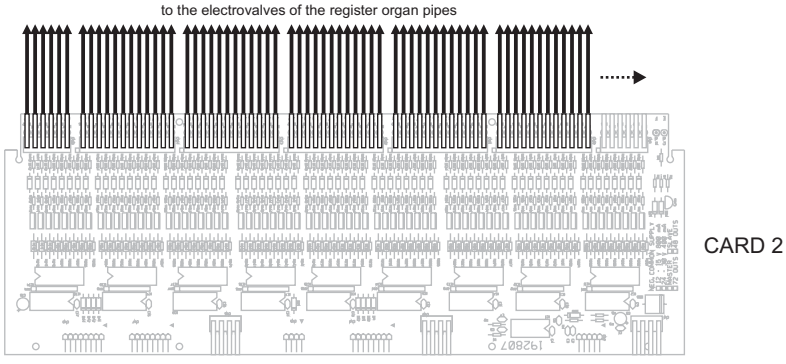
When a register is extended it means it has been "enlarged", that is, it has more pipes (e.g. 73, 85, 97) than a normal register, which has 61. Extended registers can generate notes from stops with different footage.
Each Extended pipe stop needs 2 Slave Driver modules (Low & High) to be used.
While programming, follow this procedure:

- On the Mother Board [STROBES] pin, for the relevant Slave module, the jumper needs to be placed on [EXT. LO] for the first module, [EXT. HI] for the second one. In [SERIAL OUT] pins, place the jumper on the serial line set under the **Serial Out** parameter of the display. Each Master Driver can manage a maximum of 8 Extended pipe stops.
- In the CPU module, all stops controlling an extended register should be set as **Extended**. They should be assigned the same **Serial Output** and **Slave Output** (corresponding to the position of the Slave module set as EXT. LO). Their Stop Offset parameter should be set according to the footage, following this table.

Organ pipe	Electronic register	Stop Offset	Organ pipe	Electronic register	Stop Offset
32'	16'	+12	8	1' 1/3	+31
32'	8'	+24	4'	8'	-12
32'	4'	+36	4'	2'	+12
16'	32'	-12	4'	1'	+24
16'	8'	+12	4	2' 2/3	+7
16'	4'	+24	4	1' 3/5	+16
8'	32'	-24	4	1' 1/3	+19
8'	16'	-12	2'	4'	-12
8'	4'	+12	2'	1'	+12
8'	2'	+24	2'	2' 2/3	-5
8	2' 2/3	+19	2'	1' 3/5	+4
8	1' 3/5	+28	2'	1' 1/3	+7

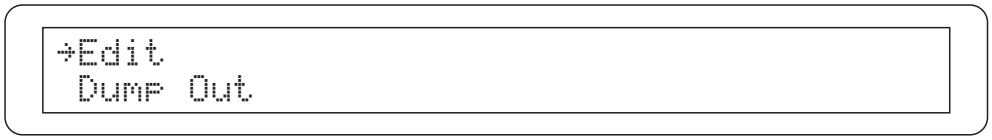
- Connect the two Slave Driver (Low & High) outputs to the extended stop pipes.
- Although it is not necessary, we advise you assign, through the **Stop Out** parameter, a different, unused output of the Master Driver module to each EXTENDED register.



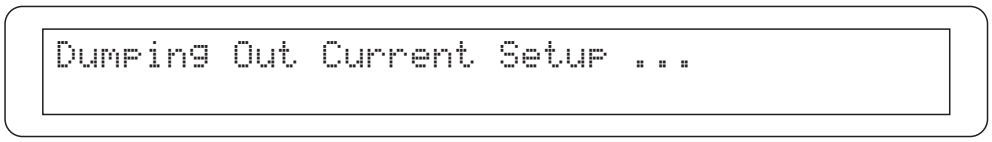


6.4 PROGRAMMING DATA BACK-UP

The programming data can be transferred to external memories, that is a sequencer (either a dedicated module or a computer application), so as to create back-up copies.
To do so, connect the [MIDI OUT] port of the VPI to the [MIDI IN] port of a sequencer or a USB / MIDI interface (using a computer). On the CPU module select the **Organ Setup Edit** page:



Start recording with the sequencer, then place the cursor on the **Dump Out** field, using the [▲] and [▼] buttons. Now press the [▶] button. While transmitting the data, the following page will appear:



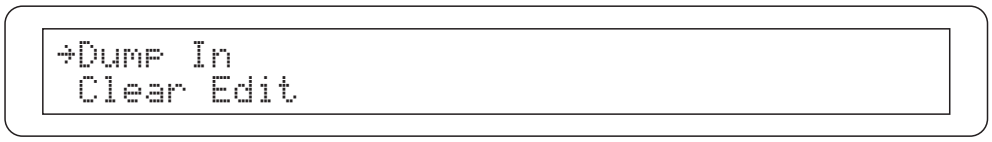
Once the procedure is over, the display will go back to the previous page. Stop recording on the sequencer and save the data in your memory unit of choice.

6.5 DELETING PROGRAMMING DATA

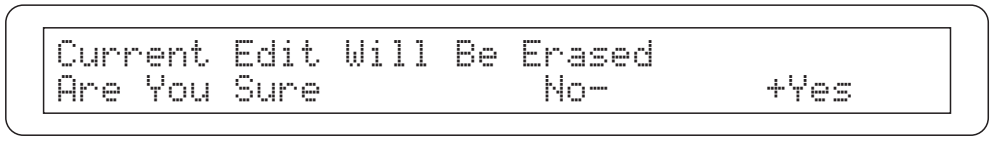
The CPU module has two deleting options: deleting configuration data only (that is, user settings, see par. 6.3), or deleting all programming data (acquisition data and user settings).

DELETING CONFIGURATION DATA

Deleting the configuration data restores the original acquisition data. Select the **Organ Setup Edit** field, press the [▼] button until you see this display page:



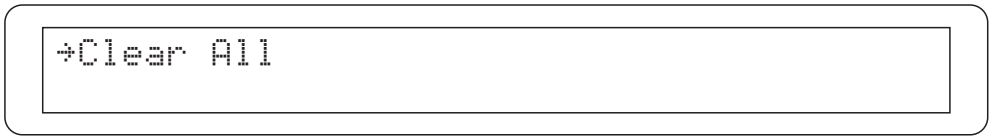
Select the **Clear Edit** field and press the [▼] button:



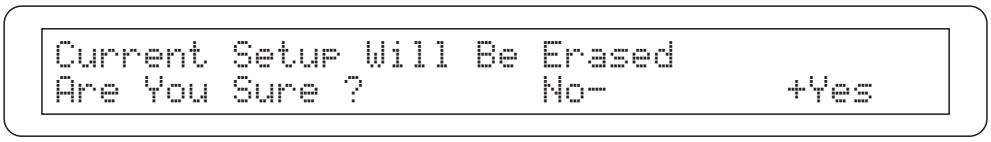
The system now needs you to confirm before deleting the data. Press [+] to confirm or [-] to abort and go back to the previous page.

DELETING ALL PROGRAMMING DATA

Select the Organ Setup Edit, press the [▼] button until you see the page:



Select the **Clear All** field and press [▶]:



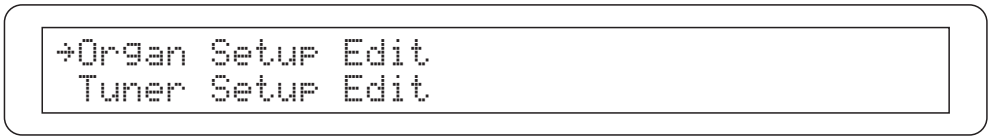
The system now needs you to confirm before deleting the data. Press [+] to confirm or [-] to abort and go back to the previous page.

NB:
After deleting all programming data, the VPI cannot control a pipe organ: it will only work as a tuner. To use again the VPI as a pipe interface, you need to program it again.

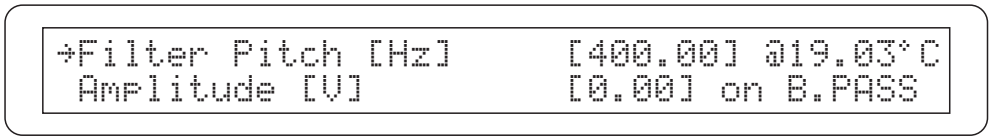
7. SETTING UP THE TUNER (TUNER SETUP)

7.1. FIRST CALIBRATION

In order to tune automatically the electronic organ, the CPU module tuner needs a Temperature/Detune conversion table. This table has to be created when installing the VPI, following these instructions.
First of all, connect the CPU module to the organ through the [MIDI IN] and [MIDI OUT] connectors, or through the [MIDI & REMOTE] connector.
Then, place the sensor-microphone at approximately 10 cm from the reference pipe for tuning. It is necessary to use a pipe that sounds close to 440 Hz (e.g. A3 on a 8' stop, A2 on a 4' stop, A4 on a 16' stop).
Now press and hold the [▲] button. The display will show:



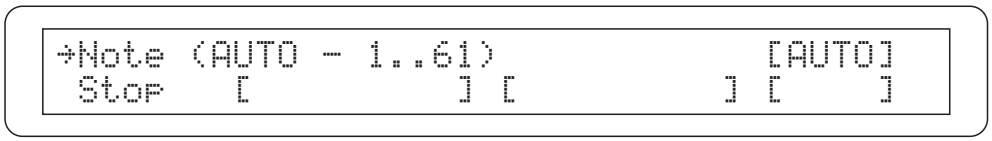
Select the **Tuner Setup Edit** field and press [▶]:



Now play the reference pipe and adjust the **Filter Pitch [Hz]** parameter (using [+] and [-] buttons) to the frequency corresponding to the highest value of the **Amplitude [V]** parameter.
Adjust the signal gain with the [MICROPHONE LEVEL AD.] trimmer (see point 2 par. 3.1) to get an Amplitude value of more or less 3V.
Press the [▼] button to see the next screens and check the following parameters:

- **Min Trigger Amp:** 2.0
- **Max Trigger Amp:** 4.0
- **Temp Slope:** 2.0
- **Learning Rate Coeff:** 0.4
- **State Machine Timing:** FAST

When the following screen appears:



you need to inform the CPU module which note and stop (called from now on "sample note" and "sample stop") will be used to measure the tuning of the reference pipe (that is, the one where the sensor-microphone has been placed).
The screen shows the following functions (adjust with [+] and [-])

- **Note (AUTO - 1..61):** sets the source for tuning. "AUTO" indicates that the system automatically senses when the reference pipe is playing and therefore measures its frequency. There is, however, another mode, more precise and reliable, called Manual. Manual mode should be used only when VPI is connected to a Viscount instrument.
  To do this in manual mode, insert through the display the number of the sample note (and the sample

stop, on the Stop parameter explained later) that plays the reference pipe: 1 is C, 22 is A2, 34 is A3, 46 is A4.

- **Stop:** defines the sample stop, that is which electronic stop, among those assigned to a pipe register, (see also point 5, par. 6.3) should be activated to measure the tuning.

N.B.
*The **Stop** parameter can be programmed only when the **Note** parameter is not in **AUTO** mode.*

Now return to the main screen. We remind you that to move back to a higher level menu you need to press for a few seconds the [▲] button.
Activate the sample stop and play the sample note. If the instructions have been followed thoroughly, the **Amp** parameter will be shown as follows:

```
Amp= 3.00 V *MNV
```

Or

```
Amp= 3.00 V *A
```

As explained in chapter 4:
- *****: indicates that the sample signal is inside the appropriate range.
- **M** or **A**: the reading is either manual (M) or automatic (A).
- **N**: the sample note is being played (only in Manual mode)
- **V:** the sample stop is being played (only in Manual mode)

In Manual mode, all these four conditions are required to detect the frequency of the reference pipe. In Automatic mode, only ***** and **A** are required.
Now, read and keep in mind the value of the **Detune** parameter. Press the [▶] button for a short while. The display will show:

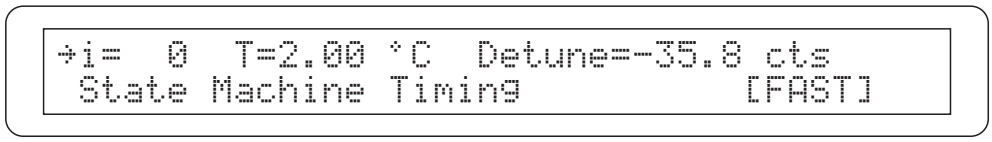
```
→Organ Setup Edit
 Tuner Setup Edit
```

Select the **Tuner Setup Edit** field (already selected) and press the [▶] button. Then, use the [▼] button to scroll the display page until you see this:

```
→Current Temp Detune   FI  0.1] @19.03°C
 Temp Tab            Erase-     +Store
```

Use the [+] and [-] buttons to enter the **Detune** value (seen before on the main screen) beside the **Current Temp Detune** parameter. Near **Current Temp Detune** field you might find the following symbols:
- *****: the value has been modified but not saved
- **F**: the value is already in memory.
- **no symbol**: the value has been automatically calculated by interpolation.

Now press the [▼] button to move the cursor on the following line, then perform the following actions in this order: **Erase** (button [-]), **Yes** [button +]) and **Store** (button [+]).
Press the [▼] button to move to the next display page.



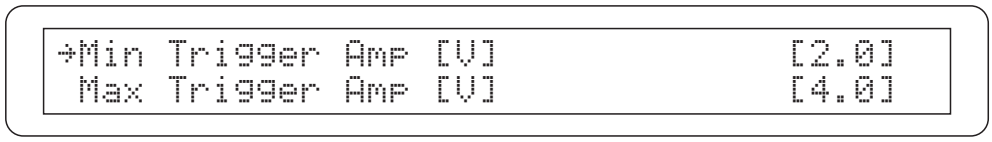
Press again the [▼] button to move the cursor on the line below and press [-] to set the **State Machine Tuning** parameter to **SLOW**.

Now the Temperature/Detune table has been successfully created and the system can automatically tune the electronic organ and keep it in tune with the acoustic pipes.

In time, especially in case of wide temperature variations, the electronic organ might get slightly out of tune with the pipes. Should you experience beats between the two instruments, just tune the system again, by playing the sample stop and sample note alone for a few seconds. This way, the VPI will detect the frequency of the reference pipe and automatically correct the Temperature/Detune table.

7.2 CUSTOMISING THE TUNER

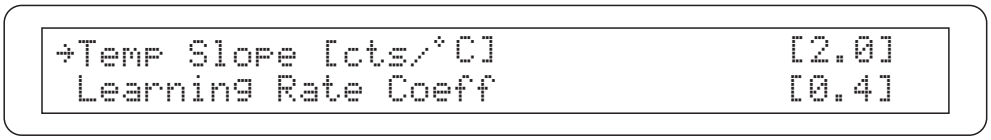
After setting the first tuner calibration, described in par. 7.1, there are other parameters to customize further the tuner. Its behaviour and other parameters can be modified to adjust the VPI according to the environment and organs used.
Enter the **Tuner Setup Edit** menu:



Here, the following parameters will show:

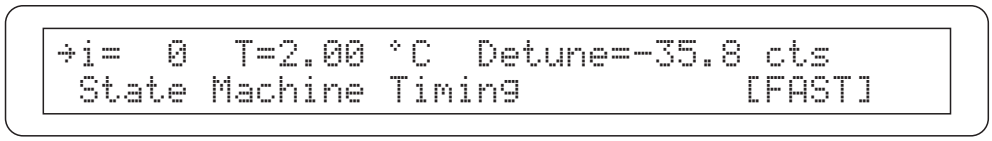
- **Min Trigger Amp:** sets the minimum amplitude level (for the signal from the sensor-microphone) to start measuring the frequency.
- **Max Trigger Amp:** sets the maximum amplitude level (for the signal from the sensor-microphone) to start measuring the frequency.

Press the [▼] button to show the third display page:



- **Temp Slope:** defines the cent/°C slope of the theoretical line of the tuning/temperature graph. The tune needs this value to calculate all the values when the first Temperature/Detune conversion table is created (such as at first calibration).
- **Learning Rate Coeff:** defines the update speed of the Temperature/Detune table based on the new measured values. "1" means that that the table is updated as new values are measured. Set values inferior to 1.0 to update the table through approximation, making it more gradual.

Press the [▼] button to move to the following display page:



- **i:** shows the index of the Temperature/Detune table. **T** stands for temperature. Use the [+] and [-] buttons to see all the indexes. Beside the **Detune** parameter might appear an asterisk. This means that the value has been directly measured by the sensor-microphone. All other values are automatically calculated through interpolation, based on the slope value (see **Temp Slop** parameter above.)

NB:
Values in this table cannot be modified. They are shown only for information and checking.

- **State Machine Timing:** adjusts the tuning times (SLOW or FAST). While the tuner is measuring the sound frequencies, MIDI code is transmission is:
  - SLOW: at each frequency change of the signal.
  - FAST: each 600 msec.

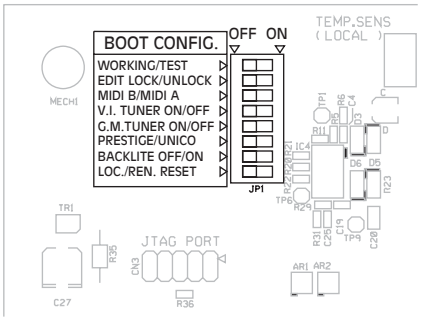
  While the tuner is measuring temperatures, MIDI code transmission is
  - SLOW: every minute
  - FAST: every 2 seconds

  When conditions are not apt for measuring frequency, the tuner will automatically start measuring temperature after a maximum of:
  - SLOW: 5 minutes
  - FAST: 5 seconds

8. APPENDIX

8.1 WORKING MODES

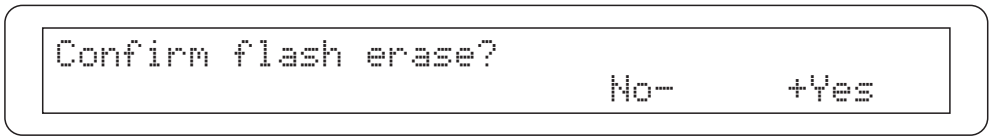
Several working modes of the VPI can be selected through the dip-switch [JP1], on the top right of the CPU module. Except where stated differently, after moving one or more switches it is necessary to restart the system pressing the [RESET] button (see point 16 par. 3.1)



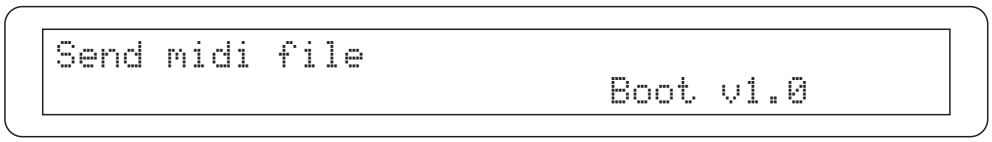
- **WORKING / TEST**: select the operating mode:
  - OFF: normal mode
  - ON: test program, used only by technical support staff.
- **EDIT LOCK / UNLOCK:** activate programming
  - OFF: CPU module can be configured
  - ON: CPU module cannot be configured
- **MIDI B / A:** Select MIDI channels. Some instruments manage MIDI messages on two channels (A and B, see Prestige series) simultaneously. Instruments using one single MIDI channel per section (see UNICO series) have only channel A.
  - OFF: receive MIDI messages only on MIDI channels B
  - ON: receive MIDI messages only on MIDI channels A
- **V.I. TUNER ON / OFF:** transmission of the Viscount MIDI message for tuning
  - OFF: the exclusive Viscount system message is not transmitted.
  - ON: the exclusive Viscount system message is transmitted.
- **G.M. TUNER ON / OFF:** transmission of General MIDI message for tuning.
  - OFF: MIDI Real Time Master Fine Tuning message not transmitted
  - ON: MIDI Real Time Master Fine Tuning message transmitted
- **PRESTIGE / UNICO:** not is use at the moment
- **BACKLITE OFF / ON:** display backlight. It is not necessary to restart the system after using this switch.
  - OFF: backlight off
  - ON: backlight on
- **LOC. / REM. RESET:** start / restart mode.
  - OFF: when the [MIDI & REMOTE] connector receives a control signal of +12V the system is active. Otherwise it remains in stand-by mode.
  - ON: the system is active as soon as it is supplied with power. Restart with the [RESET] button (see point 16 par 3.1).

8.2 FIRMWARE UPDATE

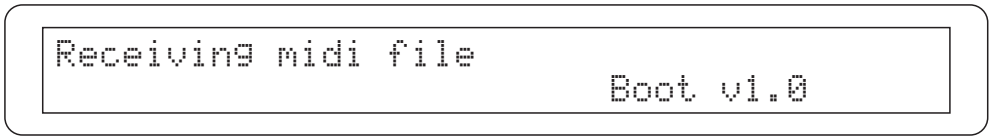
To load a new firmware version, connect the [MIDI IN] port of the VPI to the [MIDI OUT] port of the unit transmitting the MIDI file with the update. Switch on the VPI pressing the [▲] and [▼] buttons.
The system needs you to confirm before deleting the current firmware in memory.



Press [-] to abort the operation. The system will be restarted. Press [+] to confirm and therefore delete the firmware. The system will then wait for the MIDI file with the update, showing the display page:



Now start the MIDI file transmission. When the data has been received, VPI will show the message:



As soon as the data has been successfully received and saved, the system checks it. If no errors occurred, VPI will start automatically and show the main page.

8.3 ERROR CODES

FIRMWARE UPDATE
Error Code 1: checksum verification of the flash memory failed
Error Code 2: firmware deletion on flash memory failed
Error Code 3: VPI and electronic organ syncronisation failed
Error Code 4: wrong Viscout ID received in Sys-Ex
Error Code 5: wrong product type ID received in Sys-Ex
Error Code 6: wrong model ID received in Sys-Ex
Error Code 7: wrong checksum of received Sys-Ex
Error Code 8: wrong length of received Sys-Ex
Error Code 9: firmware checksum verification failed
Error Code 10: wrong firmware address in the flash memory
Error Code 11: excessive length of firmware file

DATA ACQUISITION FROM ELECTRONIC ORGAN
Error Code -10: more sections than available in the electronic organ have been acquired
Error Code -11: more stops than available in the electronic organ have been acquired
Error Code -12: fewer sections than available in the electronic organ have been acquired
Error Code -13: fewer sections than available in the electronic organ have been acquired
Error Code -14: MIDI channel for one or more section has not been acquired
Error Code -15: no data has been received in 30 seconds (time out)

ACQUISITION FROM MIDI FILE (DUMP IN)
Error Code -20: wrong packet address
Error Code -21: received packet ID not recognized
Error Code -22: file checksum verification failed
Error Code -23: too much data received, more than expected
Error Code -24: no MIDI message received in 30 seconds (time out)

8.4 COMPONENTS CODES

985210: CPU module
985211: Motherboard module for 9 Slave modules with Negative Common
985221: Motherboard module for 9 Slave modules with Positive Common
985212: Motherboard module for 4 Slave modules with Negative Common
985222: Motherboard module for 4 Slave modules Positive Common
985213: Master Driver module, 72 outputs,12V power supply with Negative Common
985214: Master Driver module, 48 outputs, 12V power supply with Negative Common
985233: Master Driver module, 72 outputs, 12 V power supply, Positive Common
985234: Master Driver module, 48 outputs, 12 V power supply with Positive Common
985220: Master Driver module, 72 outputs, 24 V power supply with Positive Common
985227: Master Driver module,48 outputs, 24 V power supply with Positive Common
985223: Master Driver module, 72 outputs, 24 V power supply with Negative Common
985224: Master Driver module, 48 outputs, 24 V power supply with Negative Common
985215: Slave Driver module, 72 outputs, 12 V power supply with Negative Common
985216: Slave Driver module, 48 outputs, 12 V power supply with Negative Common
985235: Slave Driver module, 72 outputs, 12 V power supply with Positive Common
985236: Slave Driver module, 48 outputs, 12 V power supply with Positive Common
985225: Slave Driver module, 72 outputs, 24 V power supply with Negative Common
985226: Slave Driver module, 48 outputs, 24 V power supply with Negative Common
985228: Slave Driver module, 72 outputs, 24 V power supply with Positive Common
985229: Slave Driver module, 48 outputs, 24 V power supply with Positive Common

8.5 MIDI IMPLEMENTATION DETAILED

CHANNEL MESSAGES

Note On

Message which is generated when a key is pressed.

```
Data format: 9nH kkH vvH

n=channel number     :00H – 0EH (1 – 15)
kk=note number       :1EH – 65H (30 – 101)
vv=note on velocity  :01H – 7FH (1 – 127)
                     :00H (0) Note Off
```

Note Off

Message which is generated when a key is released.

```
Data format: 8nH kkH vvH
             9nH kkH 00H

n=channel number     :00H-0EH (1 – 15)
kk=note number       :1EH – 65H (30 – 101)
vv=note off velocity :00H – 7FH (0 – 127)
                     ignored
```

- This message can be also received as Note On with velocity=0.

Control Change

Messages to control volumes and expressions and other system controls.

- **Volume (CC 7)**

Message which controls the sections volume.

```
Data format: BnH 07H vvH

n=channel number     :00H – 0EH (1 – 15)
vv=volume value      :00H – 7FH (0 – 127)
```

- **Expression (CC 11)**

Message which controls the sections expression.

```
Data format: BnH 0BH vvH

n=channel number     :00H – 0EH (1 – 15)
vv=expression value  :00H – 7FH (0 – 127)
```

- **All notes off (CC 123)**

Terminates all notes currently on for the specific channel.

```
Data format: BnH 7BH 00H

n=channel number     :00H – 0EH (1 – 15)
```

SYSTEM EXCLUSIVE MESSAGES

- **Register on/off**

```
Data format: F0H 31H snH xxH yyH F7H

F0H : Exclusive status
31H : Viscount ID
sH  : switch
      0H=voice off
      4H=voice on
nH  : channel number (00H – 0EH)
xxH : voice id – first byte
yyH : voice id – second byte
F7H : EOX
```

- **Tremulant Speed**

```
Data format: F0H 31H 2sH 5AH vvH F7H

F0H : Exclusive status
31H : Viscount ID
2sH : channel number (s=0H – EH)
5AH : tremulant speed
vvH : speed value (04H – 20H)
F7H : EOX
```

- This message is transmitted when a Tremulant is switched on.

- **Tremulant Depth**

```
Data format: F0H 31H 2sH 5CH vvH F7H

F0H : Exclusive status
31H : Viscount ID
2sH : channel number (s=0H – EH)
5CH : tremulant depth
vvH : depth value (04H – 20H)
F7H : EOX
```

- This message is transmitted when Tremulant is switched on.
- When switched off, the tremulant depth value is trasmitted as 00H.

- **Reed Cancel**

```
Data format: F0H 31H 2FH 6AH vvH F7H

F0H : Exclusive status
31H : Viscount ID
2FH : system control
6AH : reed cancel
vvH : switch
      00H=on
      10H=off
F7H : EOX
```

- **Mixture Cancel**

```
Data format: F0H 31H 2FH 6BH vvH F7H

F0H : Exclusive status
31H : Viscount ID
2FH : system control
6BH : mixture cancel
vvH : switch
      00H=on
```

- **Viscount Detune**

```
Data format: F0H 31H 2FH 67H 00H 0nH 0nH 0nH
F7H

F0H : Exclusive status
31H : Viscount ID
2FH : system control
67H : fine tuning
0nH 0nH 0nH: nibblezed data of tuning value
           02H 00H 0CH=-50 cents (A=427,47Hz)
           04H 00H 00H=0 cents (A=440 Hz)
           05H 0FH 04H=+50 cents (A=452,89Hz)
F7H : EOX
```

- This message is transmitted onyl and when V.I. TUNER on the dip-switch is selected.

- **GM Detune**

```
Data format: F0H 7FH 7FH 04H 03H llH mmH F7H

F0H : Exclusive status
7FH : Real Time SysEx
7FH : Broadcast ID
04H : Device Control message
03H: Master Fine Tuning
llH: Fine Tuning LSB byte
mmH: Fine Tuning MSB byte
      7FH 1FH=-50 cents (A=427,47Hz)
      00H 40H=0 cents (A=440 Hz)
      7FH 5FH=+50 cents (A=452,89Hz)
F7H : EOX
```

- This message is transmitted only and when G.M. TUNER on the dip-switch is selected.

SYSTEM REAL TIME MESSAGES

```
FEH: Active Sensing
```

- FEH is transmitted every 300 msec. whenever is no other MIDI data being transmitted.

```
FFH: System reset
```

- This message, when received, reboots the VPI.

Disposal of old Electrical & Electronic Equipment (Applìcable throughout the European Union and other European countries with separate collection programs)

Dir. 2002/95/CE, 2002/96/CE e 2003/108/CE

This syrnbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed overt to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment
and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city offi ce, waste disposal service or the retail store where you purchased this product.

CE

This product complies with the requirements of EMCD 2004/108/EC and LVD 2006/95/EC.

viscount

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