

Cecilia Magna

virtual pipe organ expander



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Description

The Cecilia Magna a universal MIDI organ expander module (hereinafter “*organ expander*”); in order to achieve a high degree of realism, the organ expander employs, when in operation, organ sound samples that have been recorded from real pipe organs. The number of stops and their distribution into wind-chests differs according to which given sample-set is loaded into the organ expander. Cecilia Magna organ expander is supplied as a compact unit that is equipped with 32 illuminated stop tabs. Individual stop tabs function in a manner as defined by a given particular sample-set.

Individual sample-sets can be changed using a dedicated external FLASH disc. Stop labels can be changed very easily – by changing magnetic strips above the stop tabs. The magnetic labels are supplied together with the particular sample-set system FLASH disc.

All organ functions and control elements (stops, enclosures, memories, tremulants, and so forth) can be controlled by using MIDI messages. These MIDI messages can be set easily and conveniently by the user via use of a touch display of the organ expander.

The organ expander employs highly stable proprietary software (Linux-based), providing rapid loading of sample-set data, as well as providing data memory retention of various user-definable operating parameters at switch-off. Moreover, the MIDI organ expander exhibits a low power dissipation, when in operation, of usually less than 10 Watts.

Technical parameters:

- Supply: DC 12 V.
- Extra galvanic isolation is utilized;
- Input MIDI IN: USB.
- 16bit/44100 Hz-sample-rate audio card is utilized.
- Adjustable additional prolongation of reverberation is utilized.
- Polyphony: 600 parallel samples (sample-set dependent).
- Latency: <15 milliSeconds.
- Core firmware is saved on a read-only partition of the solid-state disc (SD) card of the organ expander, thereby enabling the organ expander to be resistant to an incorrect power connection or an abrupt power disconnection (for example, as may be encountered when the organ expander is incorporated into OEM digital organs).

Sample-set dependent properties:

- Sampled attack of a given pipe.
- Length of sample sustain: adjustable in a range of 4 to 7 seconds.
- Individual release samples for long tones and staccato for dry samples, for achieving enhanced realism.
- Multiple overlapping of new pipe attack with the release sample of the same tone, for achieving enhanced realism.

Module functions:

- Setting of the total loudness/volume of the stereo audio output; setting of individual registers’ relative loudness/volume.
- Safe maximum loudness/volume limitation (i.e. a limiting attenuation is automatically applied if a maximum dynamic range of the organ expander is likely to be exceeded, thereby avoiding signal clipping–effects, for example clipping in audio power amplifiers coupled to the organ expander).
- Setting of true tone height (pitch shift) is continually adjustable (+/- one semitone adjustment range).
- Transposition (+/-12 semitone adjustment range).

- Three types of tuning: equal, $\frac{1}{4}$ coma middle tone, Young well-tempered tuning.
- Several types of reverb: there is an option available to use samples without naturally sampled release (i.e. dry samples); this allows external reverb modules to be employed, if desired.
- Setting of an arbitrary pitch deviation of virtual pipes from their nominal values. It gives a more realistic sound, especially on “full organ” to provide a dense lush chorus of sound. During the switching on of the organ expander, the distribution of such deviations in each sample-set changes randomly within the given adjustable tolerance limits, thereby providing variety as would occur in a true pipe organ as humidity and temperature change.
- Function of “*dynamic wind pressure*” is provided, to simulate wind pressure variations in a pipe organ wind supply system, wherein available wind chest pressure depends on how many pipes are sounding at any given time; particularly in a case of smaller pipe organs with modest wind supply systems, fine changes in pressure during organ play occur depending on an actual air consumption by pipes, resulting in deviations of intonation. The organ expander contains an algorithm that simulates such a wind pressure variation phenomenon.
- Enclosures for all wind chests are provided with adjustable parameters; this allows for various “swell boxes” to be accurately simulated.
- Tremulant is provided with an adjustable period, an adjustable amplitude and an adjustable frequency response.
- 99 stops memories, with “setzer” for setting stop combinations to be invoked from manual thumb pistons, pedal pistons and such like.
- Automatic setting of MIDI channels via an easy-to-use “*MIDI listen*” function.
- “*MIDI learn*” functions are provided for all stops, couplers, memories, tremulants and enclosures.
- Reset function: allows restoration of manufacturer’s initial settings; useful if an error occurs when setting up the organ expander and original settings need to be reapplied.

Connection and switching on/off

1. Connect earphones or amplifier to JACK 6.3 stereo audio output of the organ expander. The microcomputer of the organ expander has a galvanic isolated power amplifier; thus, when the amplifier is used, an effect of earth loop remains suppressed.
2. Connect a USB/MIDI converter or another USB MIDI device to the USB connector of the organ expander. Connect some other MIDI device (typically an organ console or a keyboard). Instead of USB/MIDI converter there is possible to use USB cable directly – for keyboards with USB output. **WARNING:** due to many various implementations of the USB-MIDI standard the direct USB connection can be in rare cases problematic and we cannot guarantee a full compatibility with every USB keyboard.
3. The organ expander is conveniently powered from a DC 12 V/2 A power supply, for example operating power is conveniently delivered from a compact switch-mode power supply. After the power has been connected to the organ expander a logo appears at the display. Within several seconds, the organ expander starts automatically to load sound samples; progress is loading the sound samples is indicated by the display. After loading a given sound sample, a main screen appears at the display.
4. Now, in response to the main screen being displayed, it is time to match MIDI channels to the individual wind-chests according to the used sample-set. Also, individual stops should be matched to specific MIDI controllers, if needed. This can be done via using the touch display; a description of a corresponding procedure is provided in dedicated sections below.

The organ expander is switched off by using a special “*switch off*” item in the menu. We do not recommend disconnecting the organ expander abruptly from the power supply without previously switching off the organ expander safely by using the aforesaid “*switch off*” item; an abrupt disconnection of power from the organ expander can potentially result in user-settings being deleted.

However, if such deletion were to occur, it will be appreciated that the organ expander has a RESET option that allows the organ expander to be returned to its original manufacturer’s settings.

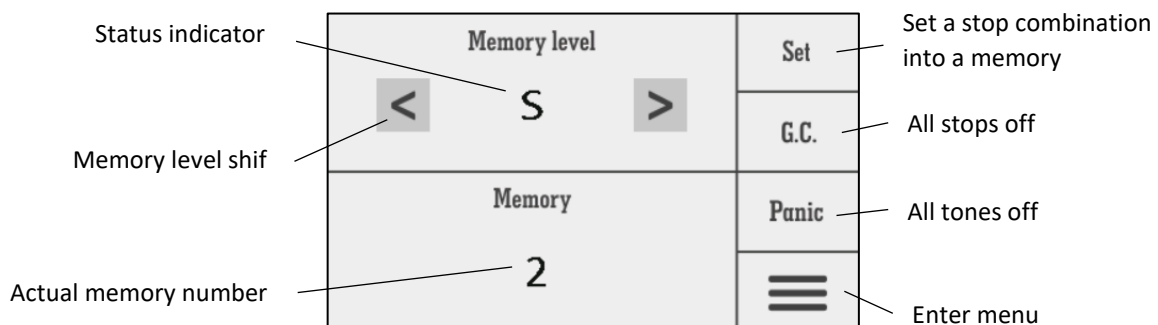
WARNING:

The organ expander unit should not be switched on without supervision; after use, it is advisable (as a precaution) to unplug the organ expander from its power supply.

Touch display, description of functions

Main screen, stop memories

- The stop memories appear after all samples are loaded; after loading samples, the organ expander is prepared and ready for the user to play.
- The MAIN screen is a main interface for working with stop memories. There are in total 99 memories. Units (0-9) of stop memories are accessible via memory buttons (wherein the memory buttons can be mapped to MIDI), memory levels are represented by tens (10, 20, 30...) and can be switched by left/right arrows in the main screen. Each stop combination can be saved into the memory. Just touch the “Set” button and then press the desired memory button. Combinations set remain in the memories after shutdown/power-down of the organ expander.
- A general cancel (G.C.) button deactivates all active stops, and a “panic button” deactivates all sounding tones (important when a problem with a MIDI connection occurs; although MIDI is usually extremely reliable, data glitches can occur, especially in electrical noisy environments).
- The main menu is accessible from the main screen.
- After setting any property via MENU, you should return back (via use of the “Esc” button) into the MAIN screen. During manipulation with any property or parameter of the organ expander, its actual value is not saved into the permanent memory (actual setting is not restored after shutdown). Saving occurs after returning to the main screen. You can set many properties at the same time (i.e. concurrently), but after finishing please return back to the main screen to save your actual settings permanently.



Main menu items

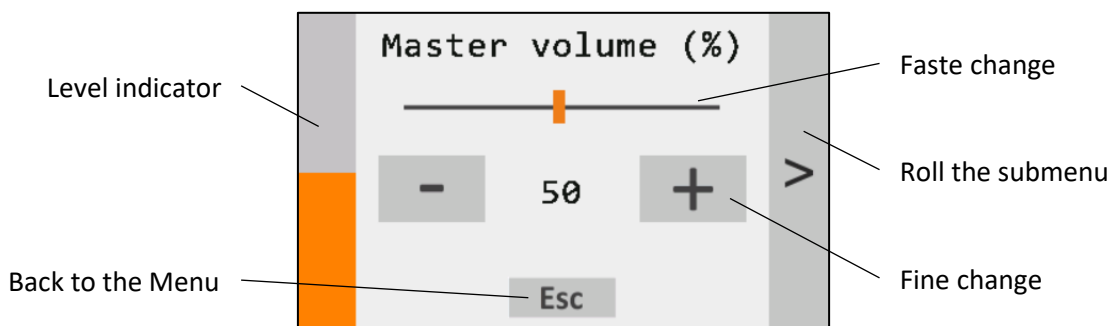
- The main menu consists of two screens, wherein various buttons are provided for the user to select preferred user-definable settings.
- “Turn off” button: use this button to switch off the organ expander safely, namely to avoid any loss of data. Unplug the organ expander when you are prompted by the message in the screen (wherein the message informs of safe record all of data).

- “Volume” button: this button should be used to set total loudness, as well as loudness of individual stops.
- “Pitch” button: this button should be used for setting of the pitch of total tuning in cent units (in a range of -99 to +99).
- “Transp.” button: this button should be used for setting transposition of the organ expander (in a range of -12 to +12 semitones).
- “Reverb” button: this button should be used to set a level of reverberation (levels in a range of 0 to 8, wherein level 8 is greatest reverberation). When the level is set to a value of “0”, sampled release is disabled. Such adjustable levels of reverberation are convenient when the organ expander is used for acoustic environments having good natural acoustical properties. Higher levels of reverberation involve the organ expander adding extra reverberation using mathematical models (for example, using feedback convolution algorithms).
- “Temper.” button: this button should be used to set a temperament system (equal, ¼ coma middle tone, Young well tempered tuning) employed in the organ expander. Setting of tuning tolerance of pipes in cents (tuning randomisation) is also provided as a parameter to adjust; within this tolerance, virtual pipes are put out of tune randomly (in a range of 0 to 100 cents).
- “Pressure” button: this button invokes an effect that simulates pressure fluctuations in a real pipe organ during playing. Pressure fluctuations cause changes in tuning of the pipes in a pipe organ. Using this button, it is possible to set: “Dynamic pressure size” button: allows user setting of the time constant of dynamic pressure effect (in a range of 0 to 100); “Dynamic pressure depth” button: allows for user setting of the frequency response of dynamic pressure effect (in a range of 0 to 100). If both of these properties are set to a value of zero, the pressure variation effect is disabled. In contradistinction, Contrary too high values can deteriorate the reality of this effect.
- “Enclos.” button: this button allows user-setting of enclosures, for example for implementing “swell” boxes that allow adjustment of volume using a pivotal “swell pedal” for example. The organ expander supports enclosures for all wind-chests (but typically the enclosure is set for a second manual only, for example an English “Swell” organ division). There can be set loudness level when the enclosure is closed and also damping of high frequencies (typical for the real enclosure, wherein high frequencies are damped relatively more when the swell box is closed relative to when the swell box is open).
- “Tremul.” button: this button allows user-setting of tremulant parameters. The number of tremulants accommodated depends on the specific sample-set being employed. The user can adjust a tremulant period (tremulant rate), an amplitude (tremulant depth) and frequency response of the tremulant effect (tremulant frequency shift).
- “Midi” button: this button is a very important menu item. MIDI channels for the wind-chests are set here, using the “Midi” button. Moreover, the button also enables matching many other controllers to MIDI events; a more detailed description is provided below.
- “Restore” button: the user can restore original factory settings, namely cause a reset of parameters to default values. It is feasible to restore MIDI events (all previously paired MIDI messages for wind-chests, stops, enclosures, and so forth are cleared when “Restore” is invoked) and sound properties (all properties other than MIDI).



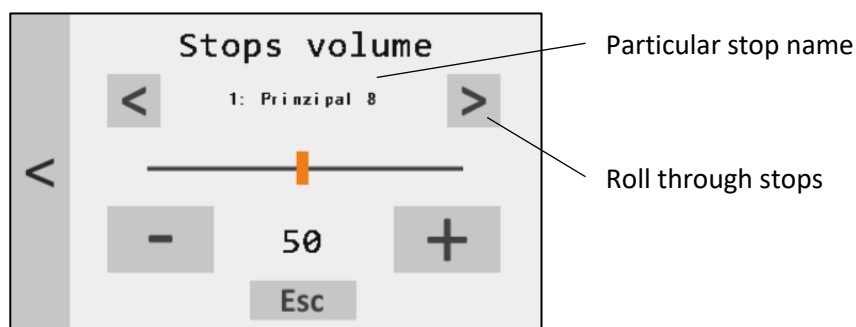
Working with individual properties (total loudness setting)

A majority of the sound properties are accessible via simple screens that are quite similar to each other (“Master volume” setting as the example in the figure below) that are presented on the display. There is a slider provided for implementing fast changes and two buttons provided for implementing fine changing of a given property. Sometimes there are right/left arrows to roll submenu items. Moreover, a “Master volume” screen is provided that also has an indicator for showing total sound level. During playing of the organ expander, this indicator should remain under the top line, namely not to reach amplitude limitation that risks causing audio clipping or saturation effects.



Properties of individual stops

Some properties belong to individual stops (for example, stop volume, MIDI messages...). In this case, menu screens are provided on the display that contain scrolling lists of all stops according to the given loaded sample-set.



MIDI setting

There are simple “wizards” that are provided that enables all MIDI functions to be set in an easily manner. These “wizards” avoid a need for the user to be familiar with quite complex MIDI structures; for the organ expander, all MIDI controlled functions are based on listening to the received MIDI messages and are as simple as possible for the user to set. Conversely, it will be appreciated that implementations of MIDI differ a lot from one given musical instrument to another; we therefore cannot guarantee full compatibility with every MIDI device, but compatibility problems should be uncommonly encountered; please seek additional help if complex problems are encountered that you are unable to resolve.

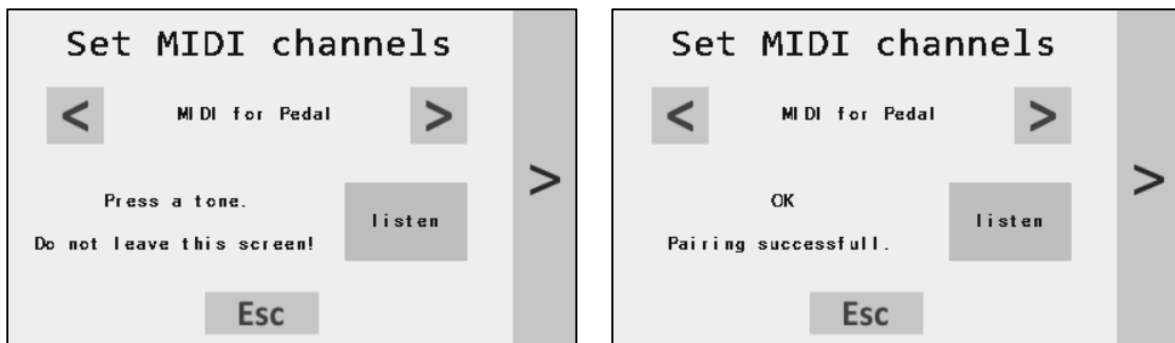
When some problem occurs, please check if your device transmits MIDI signals (when using USB/MIDI adapter you can observe a LED indicating MIDI messages). Sometimes, there can also be problems with transmitting many MIDI events. Some instruments transmit a large amount of MIDI events in a steady and continuous manner. Often, there are some service messages not related to play. This is not a

problem when setting basic properties like MIDI channels; however, occasionally, when matching stops, couplers and especially enclosures, such service messages can potentially disturb the procedure using aforesaid listening functions.

Setting MIDI channels

The number of independent wind-chests that pertain depends on a particular sample-set being employed in the organ expander; most often, sample-sets employed related to two manuals and a pedalboard. However, it will be appreciated that, in practice, the organ expander will potentially receive MIDI signals from at least one of a special MIDI console (e.g. custom-designed MIDI console), a digital organ or also a simple MIDI keyboard. Using the organ expander, it is feasible to match each wind-chest with its own independent corresponding MIDI channel. Moreover, using the organ expander, it is also possible to use all registers with the single MIDI keyboard only; in this case of a single MIDI keyboard, all register groups are matched with the same MIDI channel number. As the organ expander module enables the automatic selection of MIDI channels, it is not necessary to know explicitly the corresponding channel number.

In the menu presented on the display of the organ expander, choose "MIDI" and find a "Set MIDI channels" screen. Next, press the "listen" button (the inscription "Press a tone" appears on the screen of the display, namely it means that the system is waiting to receive a MIDI message corresponding to a pressed note of a manual, a pedalboard or similar). Thereafter, press any tone on the keyboard (or pedalboard, if appropriate); the corresponding MIDI channel is identified by the organ expander and then stored into data memory of the organ expander. As long as the inscription "Press a tone" remains displayed (namely, remains "light"), it means that no MIDI message has yet been received. In a situation that the inscription "Press a tone" persists in remaining displayed, please check the connection of MIDI cable up and verify the right setting of your keyboard for MIDI transmission.



Setting MIDI for stops and couplers

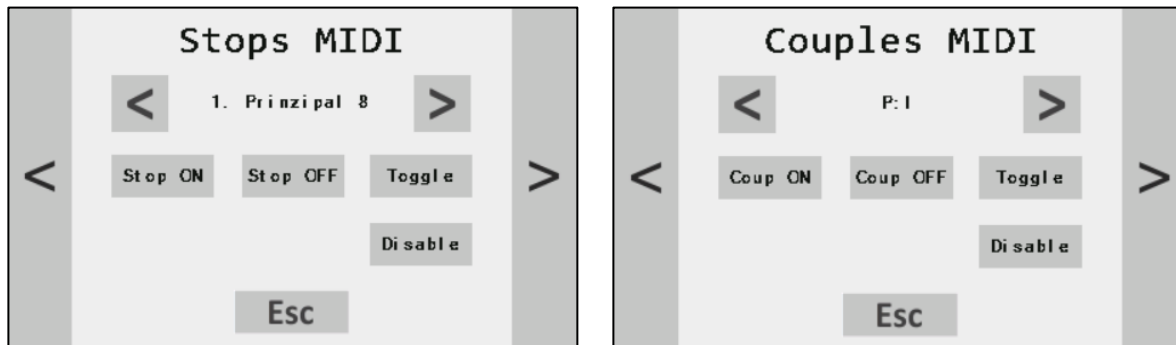
Individual stops of the organ expander can be controlled by external MIDI controllers. The individual stops are individually accessible by employing a scrolling list. Using the scrolling list, it is possible to set a MIDI event for "stop ON", "stop OFF" or "Toggle" activity. "Toggle" activity means that only one MIDI event is used for activating/deactivating the stop respectively. After touching some of that buttons, the device is listening to receive a MIDI message. When the first MIDI message is received at the organ expander, it is paired to the particular activity. Two different MIDI messages can be used for implementing stop ON or stop OFF, for example.

One MIDI message can control more stops/couplers simultaneously. Conversely, it is not possible to match more MIDI messages to one controlled element.

MIDI messages can be used to control not only stops, but also couplers, tremulants and memory elements (memory buttons, +-1 increment/decrement, +-10 increment/decrement, Set button,

General Cancel (G.C.) button). Display dialogues are quite similar. For the memory elements, there are assumed to be employed only momentary switch buttons. From this reason, it is feasible to match only one MIDI event through “Listen switch” function.

If required, it is feasible via use of buttons on the display to deactivate MIDI controlling for every element independently; such individual control is facilitated by use of the “Disable” button.



Setting MIDI for enclosures

Enclosures (for example, swell boxes for various manual divisions) can be controlled by an external MIDI potentiometer (or by employing a pivoting or “pull-down” foot pedal). The organ expander supports enclosures for every wind-chest. For setting MIDI for achieving such enclosures, there is a simple wizard provided. When using the wizard, a following procedure should be followed:

- select a given specific enclosure to be configured by using the scrolling list,
- set a given specific foot pedal to be employed to a fully “enclosure open” position,
- touch an “Opened” button in the screen,
- set the given specific foot pedal to be employed to a fully “enclosure closed” position,
- touch a “Closed” button in the screen,
- move the given specific foot pedal again, to complete setting up of the enclosure on the organ expander.

The wizard will guide you through this process in a simple intuitive manner:



Changing the sample-set

Individual sample-sets can be changed using a dedicated external FLASH disc. The procedure is quite simple:

1. Switch off the organ expander, disconnect the power adapter.
2. Disconnect the USB/MIDI cable and connect the dedicated FLASH disc to the USB connector.
3. Connect the power source again - the logo appears at the display. Within several seconds, the organ expander starts automatically the updating procedure. It is indicated by a blinking LED of a top-left stop tab.
4. After the process is completed, a main screen appears at the display. Now the new sample-set is ready.
5. **REMOVE** the flash disc, connect the USB/MIDI cable again and replace the magnetic labels above the stop tabs.

WARNING: user settings are replaced by default values during the process. So correct MIDI channels must be set again.

