

Classic Organ Works
CMK-2
Classic MIDI Keyboard
User Manual
Version 1.00.00

Div. of:
ARTISAN CLASSIC ORGAN INC.



CLASSIC MIDI KEYBOARD CMK-2

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CLASSIC MIDI KEYBOARD CMK-2

LIMITED WARRANTY

Classic Organ Works warrants the Classic MIDI Keyboard (CMK-2) to be free from defects in materials and workmanship under normal use for a period of **ONE YEAR** from the delivery date. This warranty applies only if the product is owned by the original purchaser who has the bill of sale.

This warranty explicitly excludes any cables provided with the CMK-2, which may become defective as a result of normal wear and tear. The DC power adaptor is included in the warranty however.

As soon as a defect is detected, contact Classic Organ Works. In particular, defects due to shipping should be reported within **5 days** for insurance claim purposes. For all other defects, Classic Organ Works agrees to repair or replace all defective parts of said products which are returned, transportation prepaid, for inspection at its service centre within the period of the warranty.

In the event that Classic Organ Works determines the product requires repair because of user misuse or regular wear, it will assess a fair repair or replacement fee. The customer will have the option to pay this fee and have the unit repaired and returned, or not pay this fee and have the unit returned un-repaired.

Classic Organ Works will not be liable for consequential, special, indirect, or similar damages or claims including loss of profit or any other commercial damage, and in no event will Classic Organ Works' liability for any damages to the purchaser or any other person exceed the price paid for the product, regardless of any form of the claim. Classic Organ Works specifically disclaims all other warranties, expressed or implied. Specifically, Classic Organ Works makes no warranty that the product is fit for any particular purpose.

This warranty shall be interpreted, and governed by applicable laws in the province of Ontario, Canada. If any provision of this warranty is found void, invalid or unenforceable, it will not affect the validity of the balance of the warranty, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.

CLASSIC MIDI KEYBOARD CMK-2-1

INTRODUCTION

Description

The CMK-2 is a MIDI keyboard controller designed for the modern organist. It combines technology and classical church organ ideas into an innovative MIDI device.

The keyboard features:

- Tracker organ style key action
- User-programmable pistons
- A stacking mechanism for mounting multiple manuals in a traditional organ configuration
- Inputs for expression shoes
- Velocity sensitive (optional)

With the CMK-2, MIDI software and sound modules may be controlled as if they were part of the organ. The CMK-2 is designed to work with all of your favorite hardware and software, including:

- Crumhorn Labs' Hauptwerk virtual organ software
- Ahlborn-Galanti's Archive MIDI sound modules
- Miditzer virtual organ software
- Products capable of being controlled by standard MIDI messages

Enjoy your new CMK-2!

Package Contents

Table 1: Package Contents

Setup	Items			
	Manual(s)	Stacking Bracket	DC Adapter	MIDI Cable(s)
1 Manual	1	2 x B	1	1
2 Manual	2	2 x B + 2 x C	1	2
3 Manual	3	2 x B + 4 x C	1	3

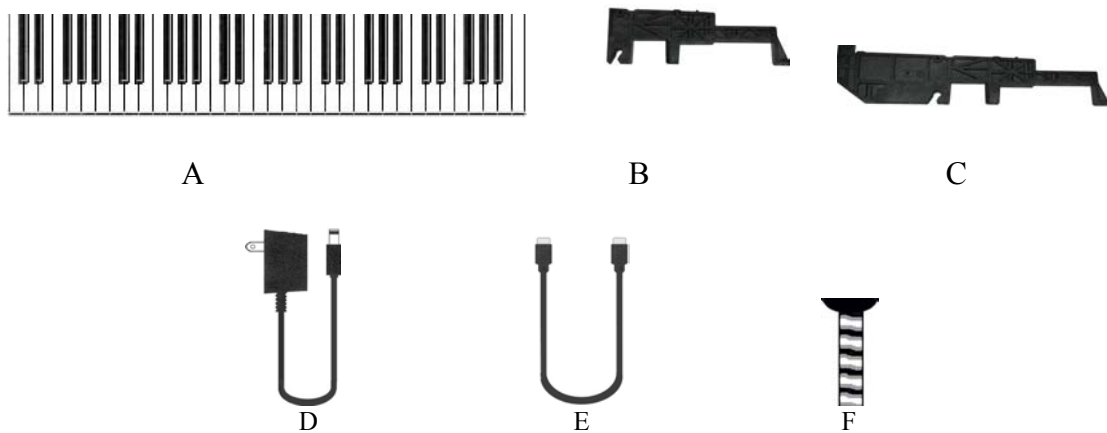
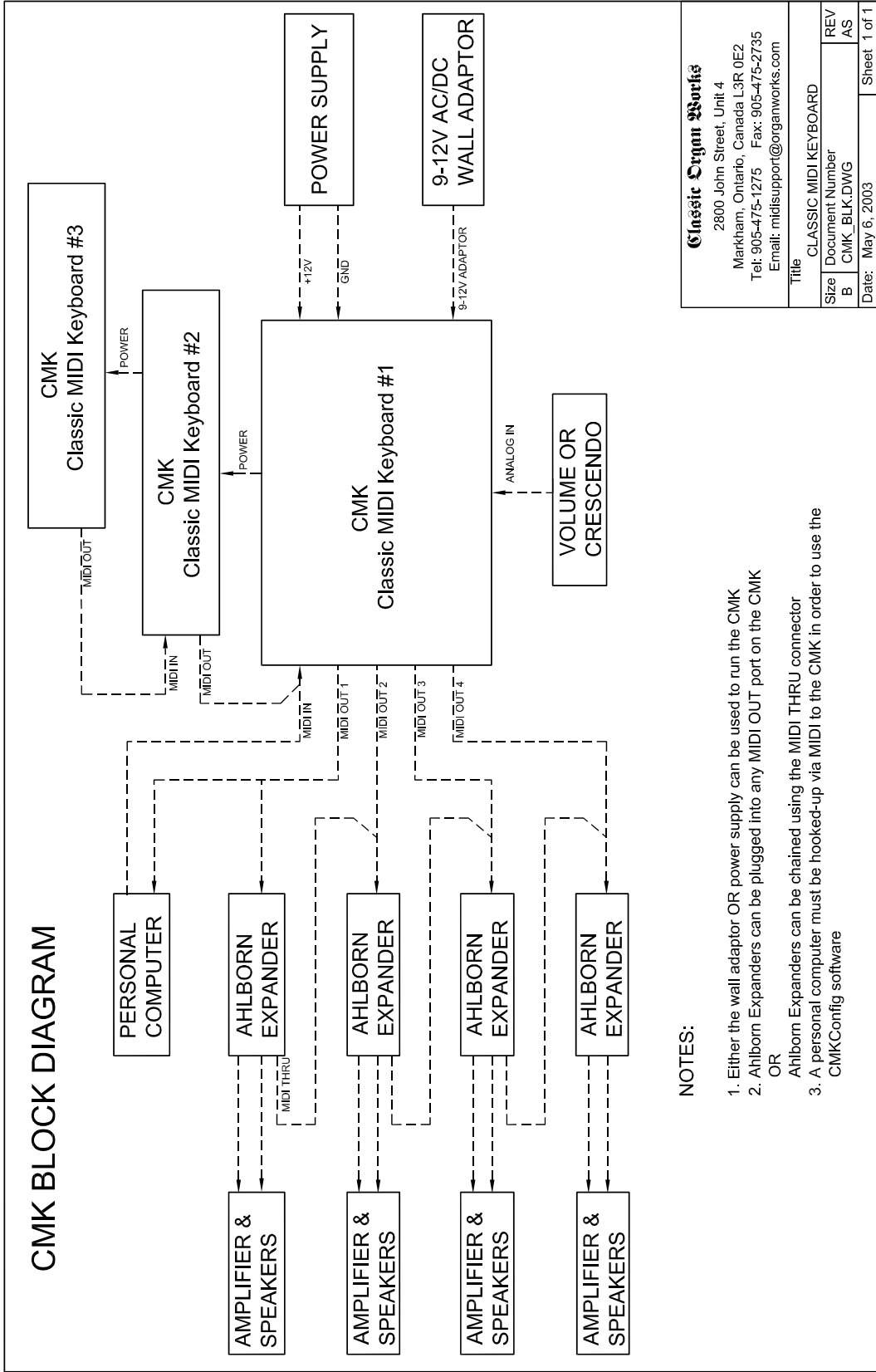


Figure 1: CMK-2 components (from L-R, Top to Bottom):

- A) Keyboard
- B) Fatar small mounting bracket
- C) Fatar large mounting bracket
- D) 12V DC wall adaptor
- E) 6-Ft. MIDI cable
- F) Mounting screw.



NOTES:

1. Either the wall adaptor OR power supply can be used to run the CMK
 2. Ahlborn Expanders can be plugged into any MIDI OUT port on the CMK
- OR
3. Ahlborn Expanders can be chained using the MIDI THRU connector
 3. A personal computer must be hooked-up via MIDI to the CMK in order to use the CMKConfig software

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Title CLASSIC MIDI KEYBOARD	
Size B	Document Number CMK_BLK.DWG
REV AS	
Date: May 6, 2003	
Sheet 1 of 1	

Figure 2: CMK-2 connections

CLASSIC MIDI KEYBOARD CMK-2-1

INSTALLATION

IMPORTANT READ THIS DOCUMENT BEFORE INSTALLATION

Upon receiving this unit, remove any packing material inside the unit that may have been included to prevent movement of components or wiring during shipping.
(For internal access, ensure the unit is disconnected from all power sources.)

Physical Installation

The CMK-2 can be mounted into a traditional organ console or set on a table. The American Guild of Organists' standard dimensions state that the top of the lower manual's keys must be 29.5" from the top of the pedals. If the standard Classic MIDI Pedalboard is used, the table must be 32.5"

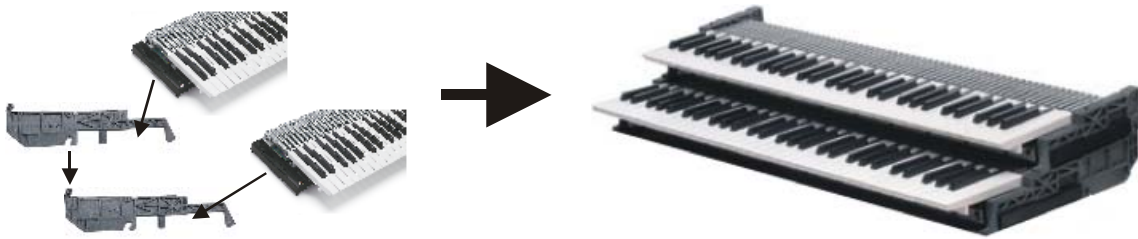


Figure 3a: Bracket Installation

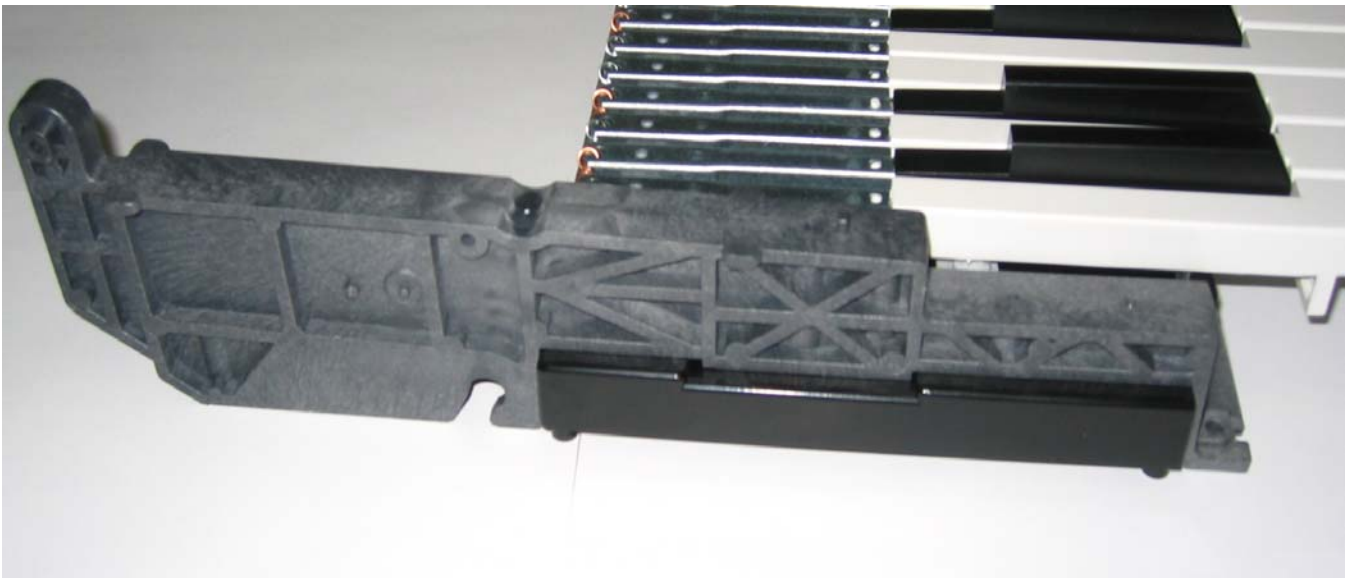


Figure 3b: Bracket Goes Over Top of the Keyboard Mount

First, sit the plastic supports on the end of each keyboard (figure 3b) and fasten them in place with the #8 screws from underneath (figure 3c). Then stack the keyboards by sliding the slots on the upper supports over the pins on the lower supports. To slide the upper supports into place, first tilt the keyboard up about 30 degrees. At that angle, the pins on the lower supports will slide through the slots on the upper supports.



Figure 3c: Install 3 #8 Screws in the Underside

Connections (Rear View)

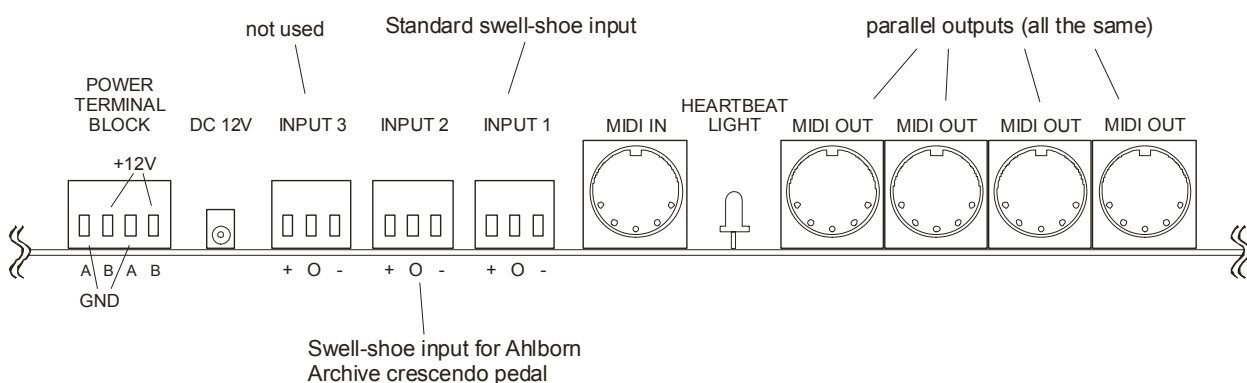


Figure 4: Rear View Connections

Power Connections

Typical Usage:

If you are using multiple keyboards, connect the red and black wires as illustrated in the diagram below and then connect the supplied DC power supply to circular power connector on the board. Make sure you use the red wires for the +12V (the B) and the black wires for the Ground (the A)

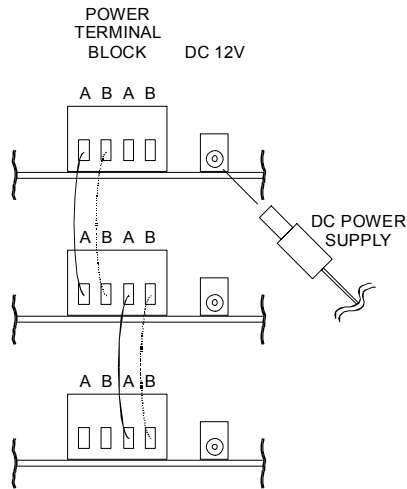


Figure 5: Power Terminal Block Connections

Additional Information:

- If the CMK-2 is to be mounted in an existing organ, it can be connected to the organ power supply. See schematic in appendix for details.
- The CMK-2 has a bridge-rectifier, and can accept power supply positive or negative center power supplies
- The CMK-2 requires between +9V and +15V DC at a minimum current of 400 mA. The co-axial input is 2.1 mm in diameter.
- A 500mA self-resetting Polyfuse provides over-current protection from the common power supply

MIDI Connections

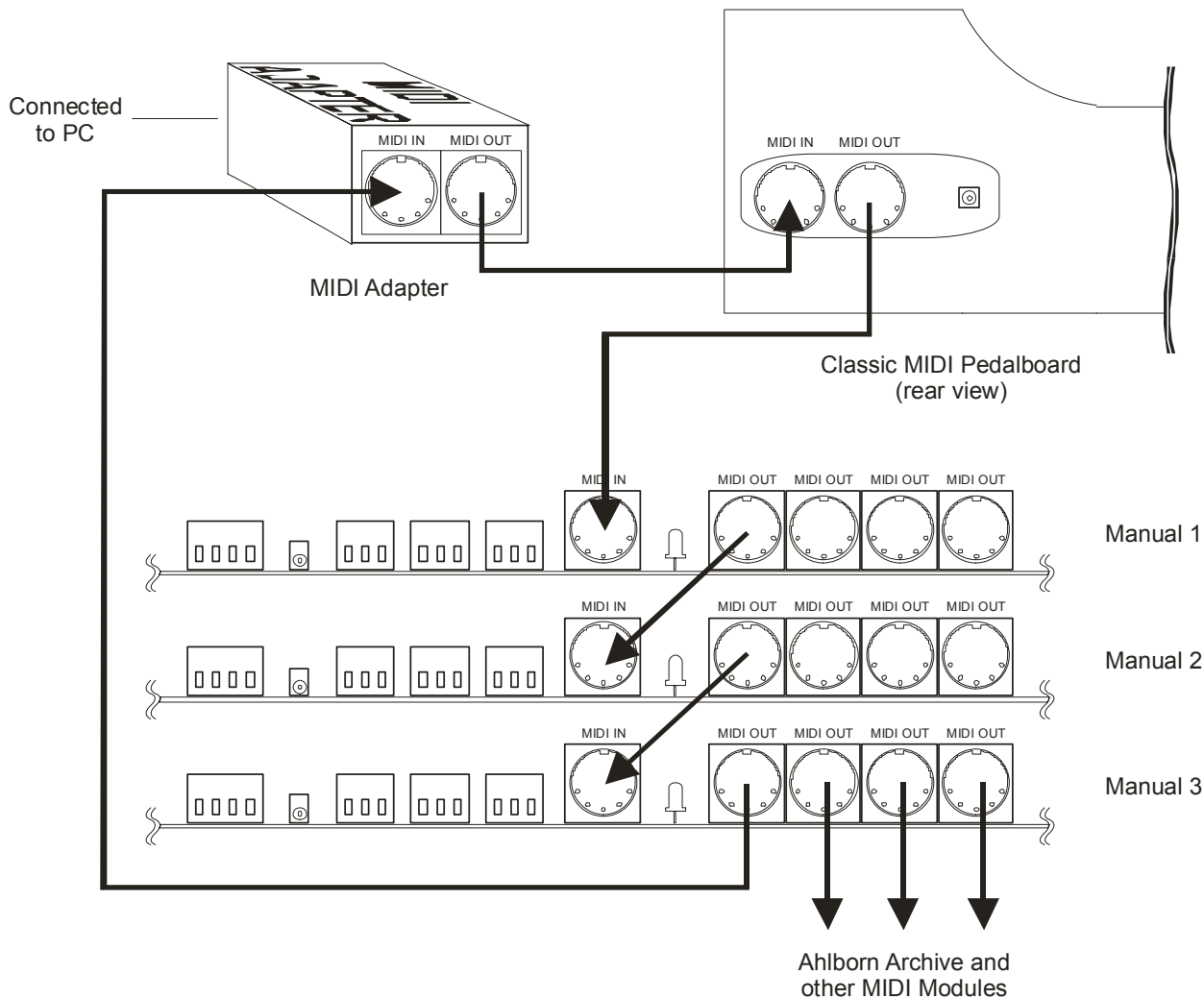


Figure 6: Connecting MIDI Cables to a Keyboard Stack

Connecting Swell Shoes

There are three terminal-blocks for analog input. Analog inputs are used for crescendo and volume/expression adjustment as shown in Figure 4. Schematics for the analog and expression pedal inputs are in Figure 13.

Input 3: not used

Input 2: To this a swell shoe would be connected if it were to be used as a crescendo pedal for an Ahlborn Archive module.

Input 1: To this a swell shoe is connect for use as a normal expression pedal or as a crescendo pedal. Which it is to be used as is configured using CMK Config software on a personal computer.

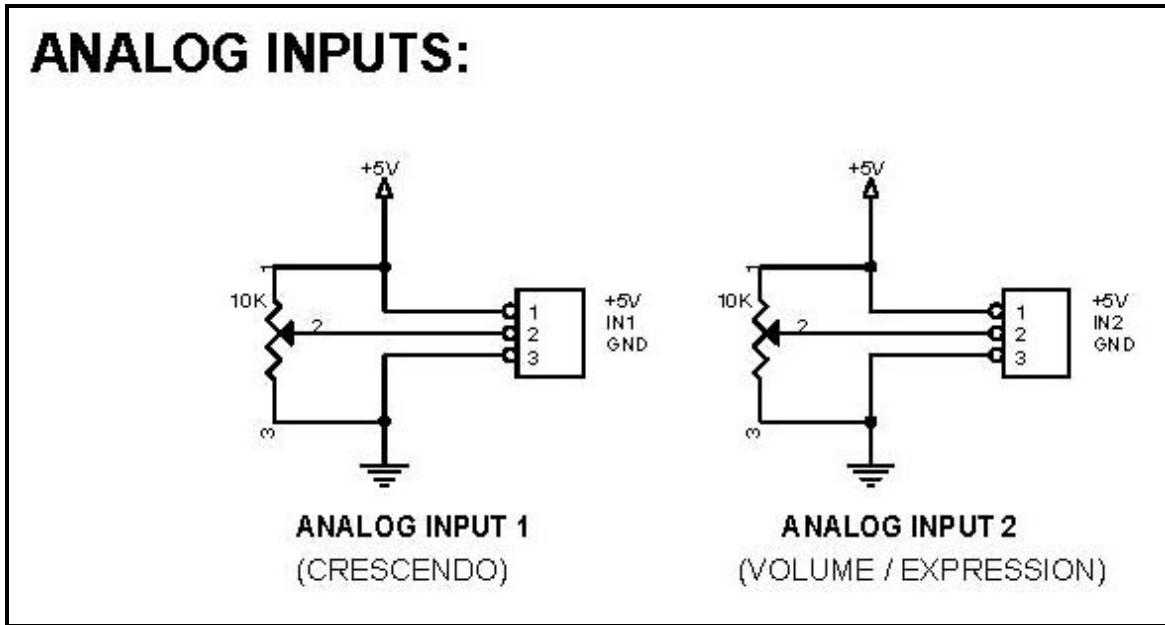


Figure 7 Wiring Schematic for Analog input

The CMK-2 has provision for up to four extra input functions on the circuit board. These inputs are reserved for future use.

Analog Input 1 is used explicitly for the Crescendo controls the Ahlborn Archive module. Analog Input 2 can be configured by the CMK-2 Config software or the setup key sequence described in the Programming section on page 24.

Table 2: Connection Chart

Connection Name	Connection Type	Hardware	Description
Required Connections			
Power	Input	1. Co-ax 2.1mm (either polarity) OR 2. 4-input Terminal Block Input 1 for +12V, Input 2 for GND	9-12V, 400mA minimum
MIDI IN	Input	DIN 5-pin socket 180°	Standard MIDI signals
MIDI OUT 1-4	Output	DIN 5-pin socket 180°	Standard MIDI signals
Optional Connections			
Analog	Input	Pins, 0.025" Square, 0.3" long, 0.1" pitch	'Analog Input 1' is used for crescendo and 'Analog Input 2' is used for volume/expression.

Software Installation (*Windows*¹ users only)

Software installation instructions are described in the 'CMK Configuration Software' section of the manual.

*Note: To use the software, the CMK-2 **must** be connected to a computer via **MIDI**. If a MIDI port is not available on your computer, a commercial MIDI adapter for the game port, USB port, or parallel port may be used.*

¹ Windows is a registered Trademark of the Microsoft Corporation.

CLASSIC MIDI KEYBOARD CMK-2-1

MIDI SPECIFICATION

MIDI (**M**usic **I**nstrument **D**igital **I**nterface) is a communication system between computer-controlled music instruments and describes all the actions of a musical performance. It was originally developed for music synthesizers but, a few years ago, organ-builders began adding MIDI capabilities to pipe organs. However, as MIDI was not designed for a complex musical instrument such as the organ, its standards are subject to organ-builders preferences.

MIDI is composed of three components which are the language (protocol), hardware (MIDI connector), and distribution format (MIDI file) [1]. The MIDI language is in binary format and is a uni-directional asynchronous stream of bits at 31.25 Kbits per second with 10 bits transmitted per byte. The 10 bits per byte consist of a start bit, 8 data bits, and a stop bit. In the hardware domain, the MIDI 1.0 Specification (maintained by the MIDI Manufacturers Association) recommends the 5-pin DIN 180° connector. The 5-pin DIN connector is standard and allows MIDI equipment from differing manufacturers to be connected together. MIDI cables transmit information in a uni-directional manner so connectors are designated as either input or output. MIDI files are the standard distribution format. They capture all the details of MIDI onto a hardcopy medium. MIDI files are similar to the MIDI language except that they add a time-stamp for each event so that MIDI equipment can replicate the timing required to generate accurate performances. [1] MIDI Message information can be found at www.midi.org.

Ahlborn [2]:

The Ahlborn Archive modules allow additional pipe organ sounds to be played on an existing organ. There are four separate Ahlborn Archive modules of 20 different stops each over three separate divisions. For more information on Ahlborn Archive modules, please visit: <http://www.ahlbornorgans.com/archive>. The messages for controlling Ahlborn Archive modules can be found in [Appendix D](#). The stop list for each module is shown below.

Table 3: Classic Module [3]

Division A	Division B	Pedal
Description	Description	Description
Gemshorn 8'	Principal 8'	Contre Basse 32'
Gemshorn Celeste 8'	Holzgedackt 8'	Contre Gambe 16'
Flûte à cheminée 8'	Flûte Harmonique 8'	Contre Bombarde 32'
Koppelflöte 4'	Flûte Octavante 4'	Bombarde 16'
Plein Jeu IV-V	Octave 2'	Div. A to Ped.
Bombarde 16'	Cymbale III	Div. B to Ped.
Harmonic Trumpet 8'	Tremulant	
Corno di Bassetto 8'	Div. A to Div. B	
Festival Trumpet 8'		
Clarion 4'		
Tremulant		
Div. B to Div. A		

Table 4: Romantic Module [3]

Division A	Division B	Pedal
Description	Description	Description
Cello 8'	Open Diapason 8'	Contre Violone 32'
Cello Celeste 8'	Flauto Mirabilis 8'	Contre Gambe 16'
Cornet des Bombardes IV	Concert Flute 4'	Contre Bassoon 32'
Cornopean 16'	Quint Flute 2 2/3'	Ophicleide 16'
Clarinet 8'	Piccolo 2'	Div. A to Ped.
Orchestral Oboe 8'	Vox Humana 8'	Div. B to Ped.
French Horn 8'	Tremulant	
Cor Anglais 8'	Div. A to Div. B	
Tuba Mirabilis 8'		
Clarion 4'		
Tremulant		
Div. B to Div. A		

Table 5: 201 Module [3]

Division A	Division B	Pedal
Description	Description	Description
Bourdon 16'	Gedackt 8'	Subbass 16'
Principal 8'	Gamba 8'	Octave 8'
Flûte à cheminée 8'	Nachthorn 4'	Bourdon 8'
Unda Maris 8'	Cymbale III	Posaune 16'
Octave 4'	Cornet III	Div. A to Ped.
Spitzflöte 2'	Oboe 8'	Div. B to Ped.
Nasard 2 2/3'	Tremulant	
Superoctave 2'	Div. A to Div. B	
Mixture IV		
Trompette 8'		
Tremulant		
Div. B to Div. A		

Table 6: 202 Module [3]

Division A	Division B	Pedal
Description	Description	Description
Contregambe 16'	Bourdon 8'	Soubasse 32'
Diapason 8'	Flûte harmonique 8'	Violone 16'
Quintadena 8'	Flûte octaviante 4'	Contrebombarde 32'
Terz 1 3/5'	Larigot 1 1/3'	Bombarde 16'
Septime 1 1/7'	Corno di bassetto 8'	Div. A to Ped.
Scharff III	Clarion 4'	Div. B to Ped.
Bombarde 16'	Tremulant	
Trompette 8'	Div. A to Div. B	
Tuba Mirabilis 8'		
Chimes		
Tremulant		
Div. B to Div. A		

HAUPTWERK™ [4]

Hauptwerk 2 (German for ‘Great Organ’) is a computer simulation of a pipe organ. It produces a realistic organ sound by use of a ‘virtual sampler’ technique. Traditionally, synthesizers used a small number of samples by recording keys at intervals across the keyboard. In order to simulate all the keys, the samples were time-stretched. Hauptwerk 2 uses a 3 to 10 second sample of every pipe in the organ. To accommodate the intensive requirement for memory, a high-speed personal computer must be used. With current technology, thousands of individual sample sounds can be stored and recalled when a key is pressed. Thus, the software is able to capture many different and customizable organ configurations and sounds which can be loaded via ‘.organ’ files. The ‘.organ’ file contains information regarding number of stops, pistons, and keyboards in addition to other organ-related details.

The CMK-2 provides an interface for volume controls, expression controls, and pistons. MIDI messages will then be sent through the MIDI out port to the personal computer where Hauptwerk software will translate the MIDI message commands into actions on the organ. A table listing the types of messages sent for the individual functions is shown below.

Table 7a: MIDI messages relevant to Hauptwerk

Function	MIDI command
Keyboards	1. Note on/off 2. Channel number 3. Key number
Pedalboard	1. Note on/off 2. Channel number 3. Key number
Stops	Note on/off
Pistons	Program change
Volume	Program change
Expression	Program change
Crescendo	Program change

Table 7b: Configuration for 2 and 3 manual stack with Hauptwerk St. Anne Mosley

	CMK Config	Software	General	Settings		Organ Settings
Physical Position	CMK Config Name	CMK Config MIDI Out	MIDI Channel In	Keyboard Div #	Keyboard MIDI In	Connect MIDI In to Organ Keyboard
Swell	#1	3	3	3	Swell	Swell
Great	#2	2	2	2	Great	Great
Choir	#3	1	1	4	Choir	n/a
Pedal	n/a	n/a	4	1	Pedal	Pedal

This table assumes you are using our pedalboard and that it is wired and connected as per Figures 4,5,and 6

For more information or to download a shareware version of Hauptwerk software, please visit:

<http://www.hauptwerk.co.uk>

SCPOP™ (not supported on the current version of the CMK-2)

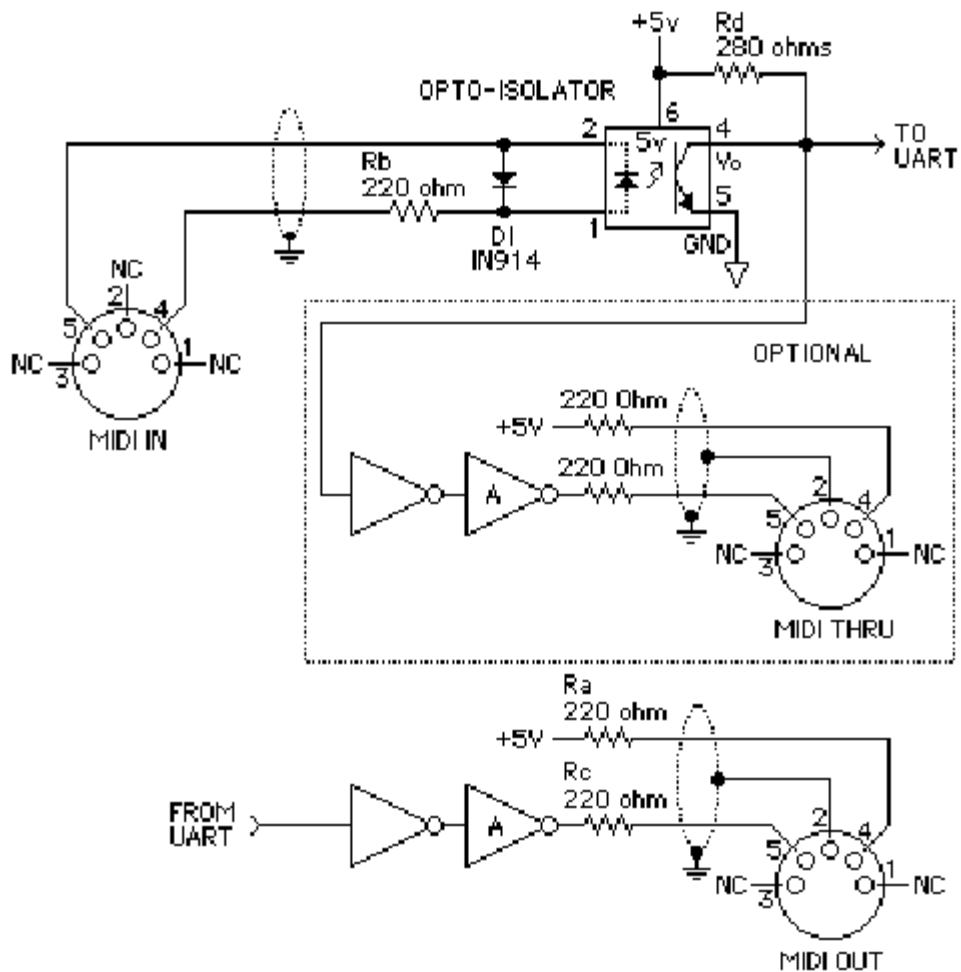
Sound Canvas Pipe Organ Project (SCPOP) is a computer program that emulates organ features like stop changes, keyboard coupling, tremolo, assignable memories, temperament changes, and the ability to choose different reverb settings. All of the features can be accessed using the computer keyboard's keys like a true organ console. [5]

SCPOP requires a Roland Sound Canvas MIDI Expander module and is only compatible with Roland hardware containing the 'Sound Canvas' label [6]. The messages used to control SCPOP can be found in Appendix E.

MIDI Hardware Specification [1]

The only MIDI connector approved by the MIDI Manufacturers Association is a 5-pin 180° DIN connector. There are other ways of connecting devices to send MIDI messages but, it is easier to have compatibility between different MIDI devices if there is a standard connector. In connecting a MIDI device to a personal computer, the simplest way is through the MIDI ports of a computer (MIDI connectors are uni-directional from the 'OUT' connector to the 'IN' connector). Due to space limitations of computer circuit boards, most computers are not equipped with a MIDI port. Thus, adapters must be used which connect the MIDI device to another port. The most common port is the computer's game port which is found on most soundcards. Adapters are also available for the serial port, parallel port, and USB port.

A schematic of the 5-pin DIN connector typical interface is shown below:



Copyright 1985 MIDI Manufacturers Association

Figure 8 Schematic of 5-pin DIN connector

MIDI Hardware NOTES:

1. Opto-isolator shown is Sharp PC-900. HP 6N138 or other types can be used with changes.
2. Gates "A" are Integrated Circuit or transistor; Resistors are 5%.
3. **Maximum cable length** is fifty feet (15 meters), terminated at each end by a 5-pin 180° DIN male plug (e.g. SWITCHCRAFT 05GM5M).
4. Cable is shielded twisted-pair, with shield connected to pin 2 at both ends.

CLASSIC MIDI KEYBOARD CMK-2-1

CMK-2 HARDWARE CONFIGURATION

Introduction

The CMK-2 is customizable to suit many organ applications. Up to three CMK-2 keyboards may be stacked level or tilted if the optional mounting brackets are purchased. Each keyboard has 61-keys which serve programming purposes as well as musical purposes. Two useable analog inputs are available (for volume/expression and crescendo adjustment. The third input is not useable at this time).

Power-On Self Test

The CMK-2 has a built-in self test that executes upon power up.

Analog Input Pins

There are three analog inputs on the CMK-2 Keyboard. Only two are useable at this time. (see Fig 13) **Input 1** is for a standard swell-shoe and **input 2** is for an ahlborn archive crescendo pedal. Analog devices must be connected to the analog input pin, a positive voltage (+5V) on pin '1', and ground potential (0V) on pin '3'. Depending on the position of the analog device, a unique voltage will be read by the processor which will determine the setting. In the case of a volume control, the position of the analog device will determine the loudness level. See Figure 13.

MIDI Crescendo – only for Ahlborn Archive modules

MIDI messages are sent to gradually add stops to a registration. 'Analog Input 2' is used for Crescendo.

MIDI Volume

A MIDI *controller 7* message is sent to change the loudness level of the stop or sound. The MIDI volume analog input must be configured to transmit on one or more MIDI channels as outlined in Table 8.

MIDI Expression

A MIDI *controller 11* message is sent to set the loudness level within the preset volume range. 'Analog Input 1' is used for Expression but can also be used for Volume. Expression messages adjust the loudness within a range not exceeding the maximum set by volume. The MIDI Expression analog input must be configured to transmit on one or more MIDI channels as outlined in Table 8. In multi-manual CMK-2 setups, the range for the Expression control can be set by attaching a Volume control to one of the keyboards and attaching an Expression control to another keyboard. If the volume and expression controls are set to produce messages on the same MIDI channels, the volume control will set the maximum range while the expression control will change the loudness level in the volume range.

Programming

The following chart lists different functions achievable using the piston pushbuttons and keyboard key-switches.

Table 8: Piston programming functions

Name	Steps	Function
SOFT REBOOT	Press the 1 st piston from the left (SET) and 1 st piston from the right (CANCEL) simultaneously	Performs a soft reboot. This will restart the keyboard and reload configuration data from the on-board EEPROM.
SET MIDI CHANNELS FOR THE KEYBOARD	Hold the 1 st piston from the left (SET) and the 1 st black key from the left (C#1). Then select any combination of the 1 st 16 white keys from the left (C1 to D3). Afterwards, release the SET piston.	Sets the output MIDI channels for the keyboard. For example, if we configure the keyboard to output on channels 1, 3 and 5, then all MIDI events originating from that keyboard will produce MIDI messages transmitted on these three channels.
CLEAR MIDI CHANNELS FOR THE KEYBOARD	Hold 1 st piston from the left (SET) and 2 nd black key from the left (D#1). Afterwards, release the SET piston.	Clears the output MIDI channels for the keyboard.
DEFAULT VELOCITY (if keyboard is in non-velocity mode)	Hold the 1 st piston from the left (SET) and 3 rd black key from the left (F#1). Then press one of the white keys and release the SET piston.	If the keyboard is set to non-velocity mode, the default velocity output of the keyboard can be selected. This is accomplished by using the white keys select a velocity level between 0 (bass end: softest) and 127 (treble end: loudest). Keys pressed in between will produce a velocity level between 0 and 127 depending on the location of the key relative to the extremes. The change in velocity level between adjacent white keys is approximately 3. Note that in the event multiple keys are pressed, only the last one released will be registered by the software.

Table 8: Piston programming functions (cont'd)

Name	Steps	Function
VELOCITY SENSING ON/OFF	Hold 1 st piston from the left (SET) and 4 th black key from the left (G#1) to turn off velocity sensing. Hold 1 st piston (SET) and 5 th black key from the left (A#1) to turn on velocity sensing. Afterwards, release the SET piston.	Velocity sensing produces a different volume level corresponding to the force with which a key is pressed. To conform to traditional organ consoles which are not velocity sensitive, the CMK-2 permits users to disable velocity sensing in the keyboard.
ANALOG INPUT – VOLUME SETUP	Hold the 1 st piston from the left (SET) and the 6 th black key from the left (C#2). Then select any combination of the 1 st 16 white keys from the left (C1 to D3). Afterwards, release the SET piston.	Sets the output MIDI channels for the volume analog input. For example, if we configure the analog input to produce General MIDI volume information on channels 1, 3 and 5, then all MIDI events originating from that analog input will produce MIDI messages transmitted on these three channels. Please note that the crescendo input does not require setup because it produces messages for the Ahlborn Archive modules.
DISABLING ANALOG INPUT – VOLUME	Hold the 1 st piston from the left (SET) and the 6 th black key from the left (C#2). Afterwards, release the SET piston.	MIDI messages describing volume information from the analog input will not be transmitted on any MIDI channel.
ANALOG INPUT – EXPRESSION SETUP	Hold the 1 st piston from the left (SET) and the 7 th black key from the left (D#2). Then select any combination of the 1 st 16 white keys from the left (C1 to D3). Afterwards, release the SET piston.	Sets the output MIDI channels for the expression analog input. For example, if we configure the analog input to produce General MIDI expression information on channels 1, 3 and 5, then all MIDI events originating from that analog input will produce MIDI messages transmitted on these three channels. Please note that the crescendo input does not require setup because it produces messages for the Ahlborn Archive modules.
DISABLING ANALOG INPUT - EXPRESSION	Hold the 1 st piston from the left (SET) and the 7 th black key from the left (D#2). Afterwards, release the SET piston.	MIDI messages describing expression information from the analog input will not be transmitted on any MIDI channel.

CLASSIC MIDI KEYBOARD CMK-2-1

CMK-2 SOFTWARE CONFIGURATION (PC Windows™ USERS ONLY)

Introduction

Users with access to a personal computer running Windows™¹ operating system can use the ‘CMK-2Config’ software (contained in the compact disc) to program additional configurations. These configuration files describe the features of each keyboard such as output MIDI channel and the function of each piston. The software allows users to create configuration files, change existing configuration files, and use existing configuration files.

Software Installation

The CMK-2 includes a compact disc (CD) with software allowing users to create custom configurations. To use the software, the CMK-2 **must be connected to a personal computer running Windows operating system** software (Windows 98, 2000, XP). The CMK-2 **must be connected to a computer using MIDI**. If a MIDI port is not available on your computer, commercial MIDI adapters for the game port, USB port, and parallel port may be used. When the installation CD is placed in the optical drive of your computer (CD drive), the software installation wizard should automatically run. If however, the software installation wizard does not automatically run follow the steps below:

1. Open the ‘Start’ menu and click on ‘Run’.
2. Click on ‘Browse’ and select the optical drive (CD drive) from the ‘Look in:’ drop down menu.
3. Locate and click on a file named ‘CMK_Setup.exe’.
4. Follow the instructions in the software installation wizard (screen captures are shown below).

¹ Windows is a registered Trademark of the Microsoft Corporation.

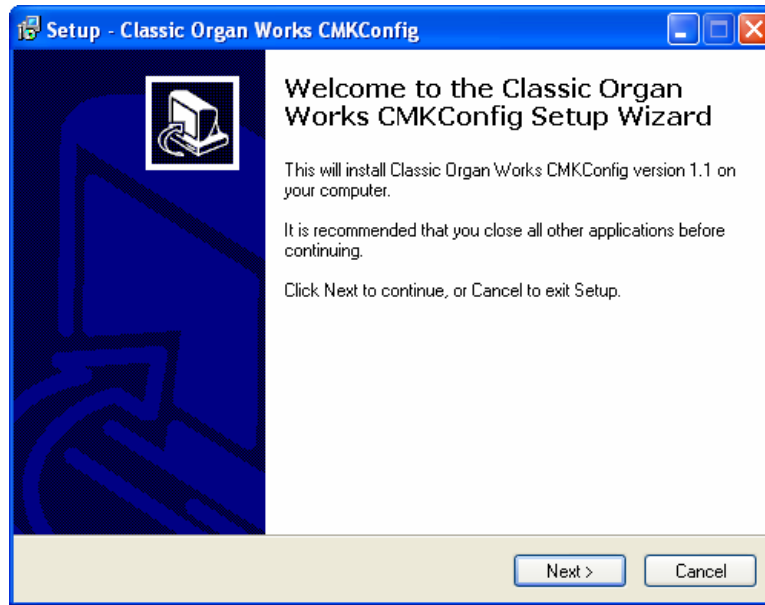


Figure 9 Upon clicking on the 'CMK-2_Setup.exe' file, the above window will appear.

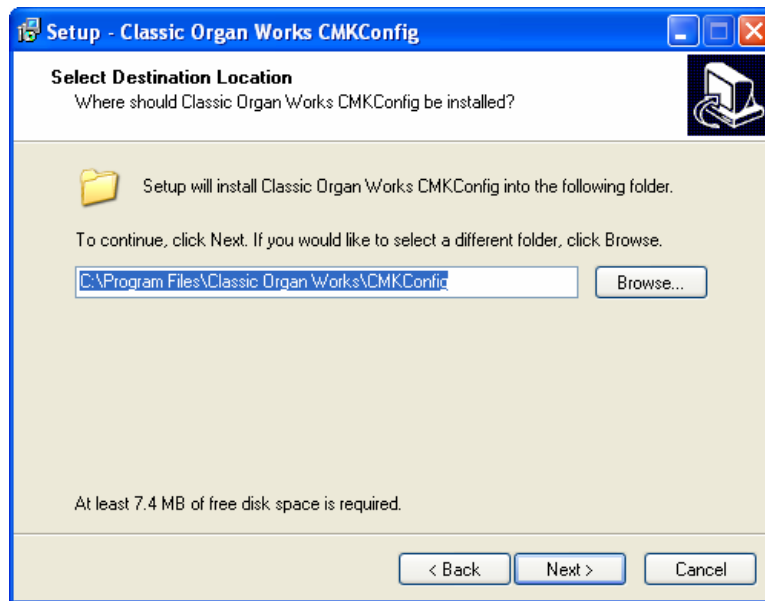


Figure 10 Allows the user to select a directory to install the CMK-2 program file

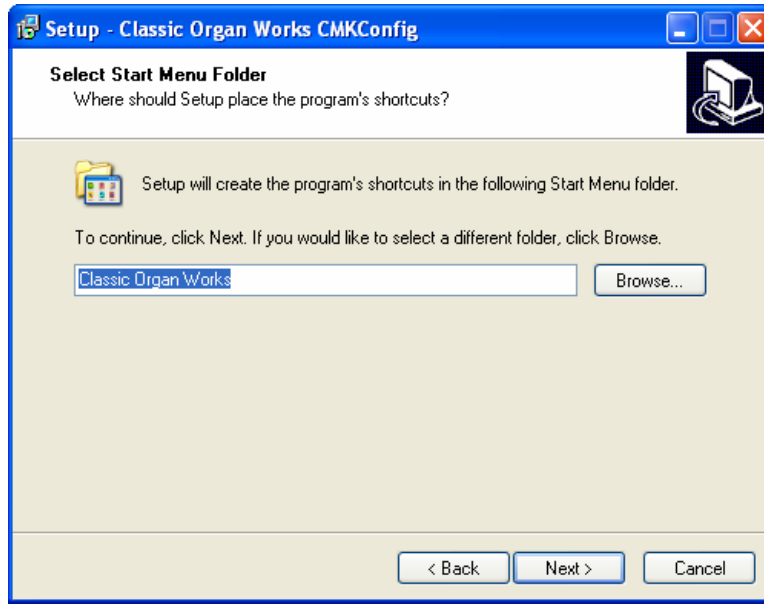


Figure 11 Setup adds an icon to the start menu for convenient access

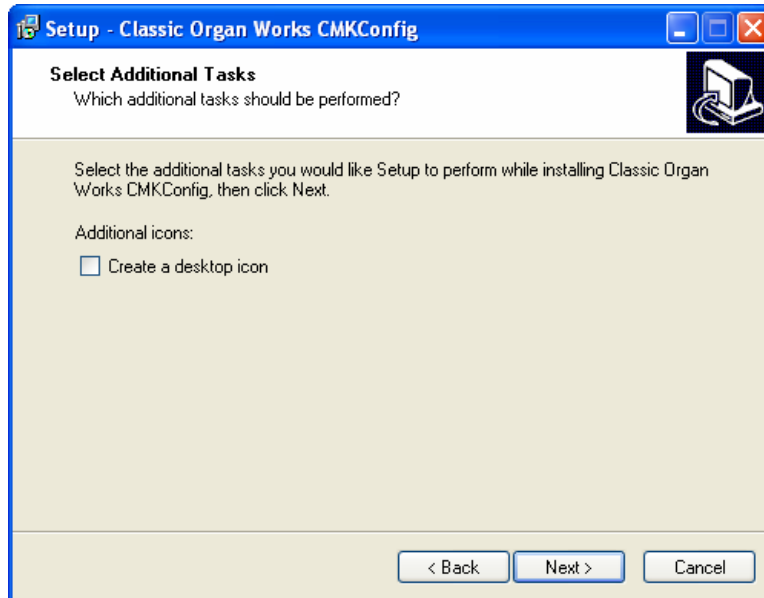


Figure 12 Setup provides the option of creating an icon on the Windows desktop

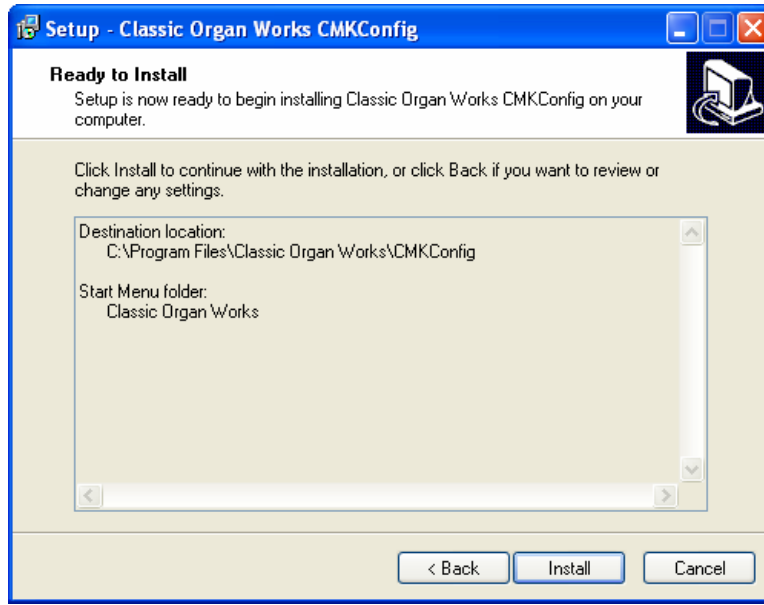


Figure 13 Confirmation window

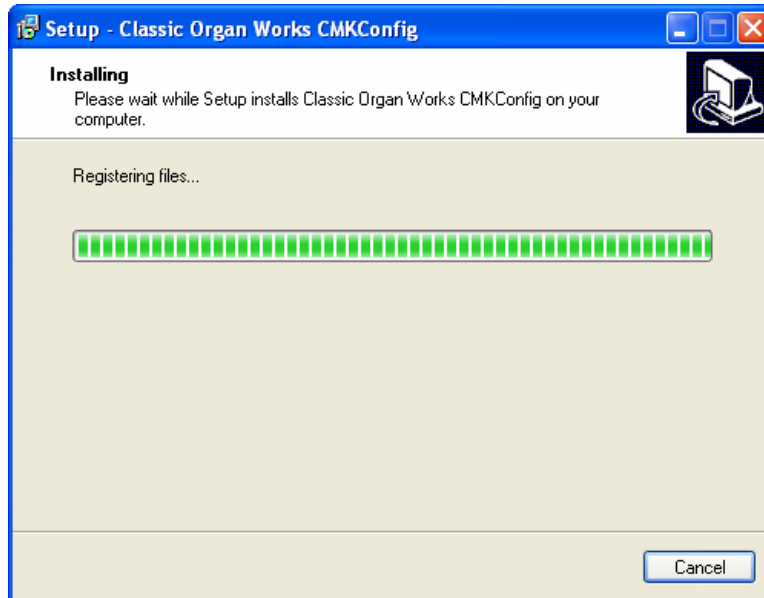


Figure 14 Setup progress window

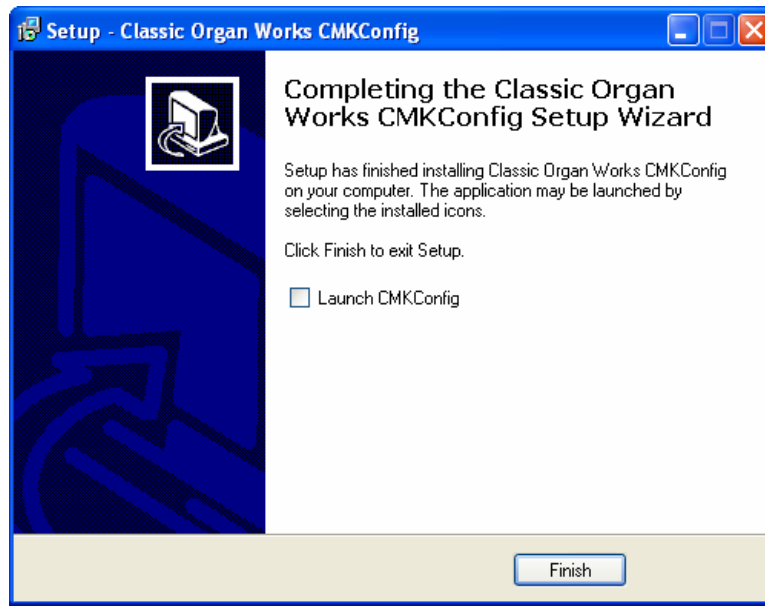


Figure 15 Confirms installation was successful

Software Startup

After installation, a shortcut titled 'CMK-2Config' will be created in the 'Classic Organ Works' folder (Start menu→ Programs→ Classic Organ Works→ CMK-2Config). To start using the software, click your left mouse button on this 'CMK-2Config' shortcut. You should see a screen as shown below:

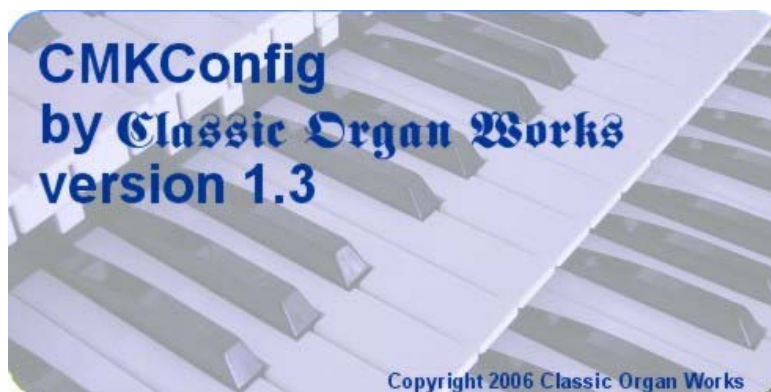


Figure 16 CMK-2Config software startup screen.

Press a key on your computer keyboard or click on any mouse button and the main menu selection will appear:



Figure 17 CMK-2Config software main menu.

The main menu allows you to select one of two editing types:

1. **Configure a Classic MIDI Keyboard from scratch:** This mode allows you to create a new file for storing on the CMK-2 memory or for generating a file on your PC.
2. **Load a previously saved CMK-2 configuration:** This mode allows you to edit a file stored on your PC.

Configure a CMK-2 from scratch

This editing mode allows the user to create a new configuration for the CMK-2. The user can then choose to save the new settings on a computer or transfer the file to the CMK-2 memory as a new configuration. When a user selects the 'Configure a Classic CMK-2 from scratch' option from the main menu, the software attempts to make a connection to the CMK-2 as shown below. **Note:** If this is the first time you run CMK-2Config, the software will prompt the user for the computer's MIDI configuration. See 'MIDI I/O Setup' on page 38.

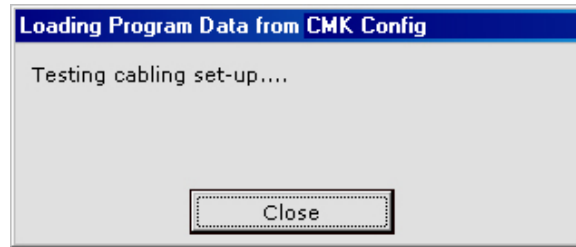


Figure 18 CMK-2Config software attempting to connect with the CMK-2

If a connection is not made, the following window appears:

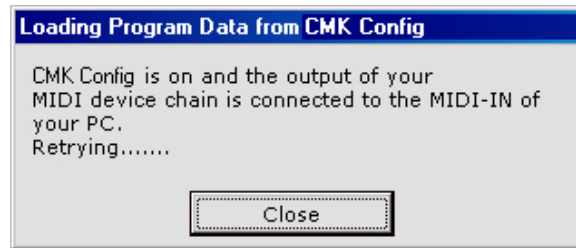


Figure 19 CMK-2Config software unable to connect

If a connection is made, the CMK-2 Config software will indicate the number of keyboards connected.

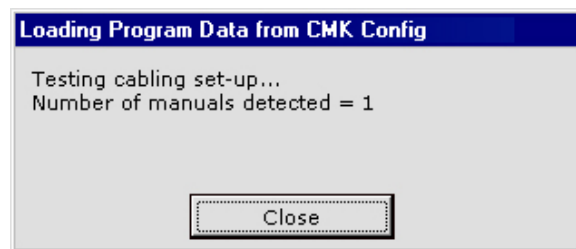


Figure 20 CMK-2Config software successfully connected to the CMK-2.

When the user has specified the configuration number, CMK-2Config software will load data from the CMK-2 to start the configuration process.

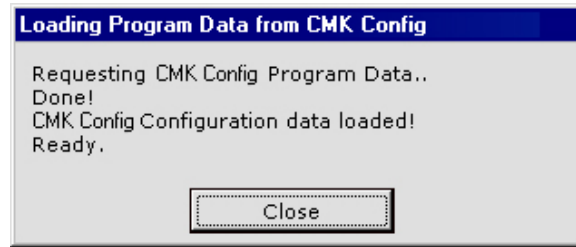


Figure 21 Window confirms the loading of pre-configuration data from the CMK-2 to the PC.

The user can then design a custom configuration to the required specification.

Load a previously saved CMK-2 configuration

CMK-2 configuration files are saved on a PC in the format: *filename.CMK-2*. In this editing type, a configuration file that exists on your computer may be edited to the new specifications. The user can then choose to save the new settings on a computer or transfer the file to the CMK-2 memory as a new configuration. When a user selects the 'Load a previously saved CMK-2 configuration' option from the main menu, the software prompts for a filename through the following window:

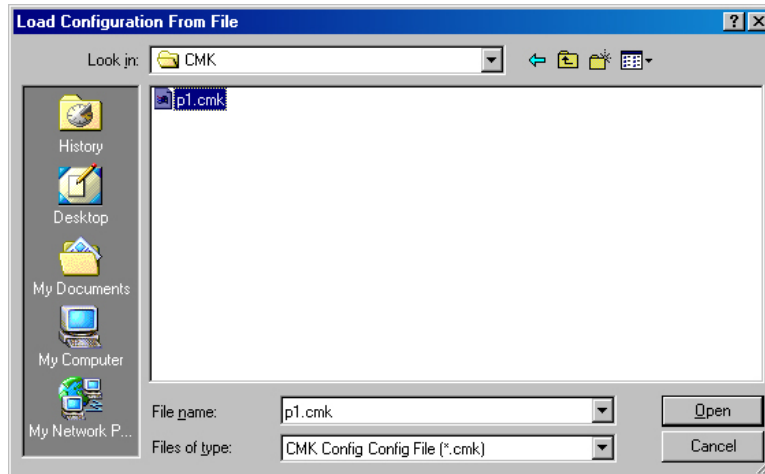


Figure 22: Configuration File selection window.

After selecting the appropriate file, click on the 'Open' button. A window should appear like the one shown below:

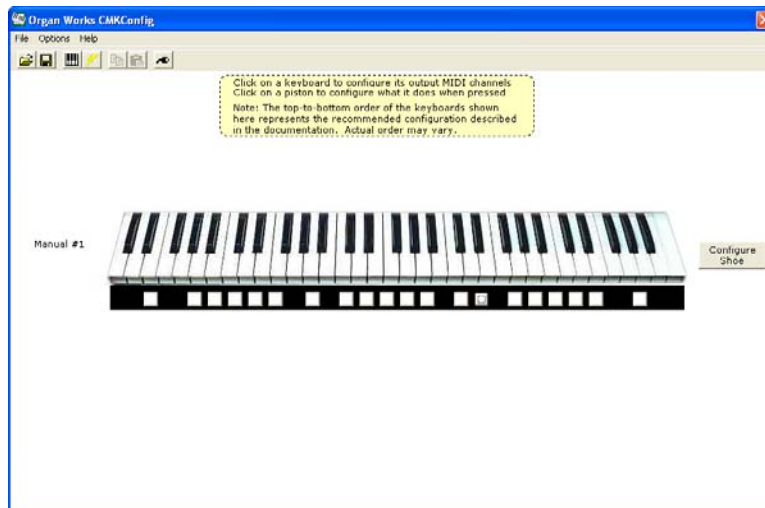


Figure 23: Program window

At this point, the user may customize each of the drop-down menus to their specifications.

Functions of the Toolbars


The software has toolbars which contain four main functions:



Figure 24: Toolbars in CMK-2Config software

1. File Menu

- **Open Program Data File** – Loads a configuration file (with a ‘.CMK-2’ extension) from the PC to the CMK-2Config software. The user may then edit the file to their specifications.

Icon: 

Keyboard shortcut: **Ctrl+O**

To begin loading a configuration go to File → Open Program Data File, or use the Keyboard shortcut, or icon shown above. A window prompting the user for a filename should appear:

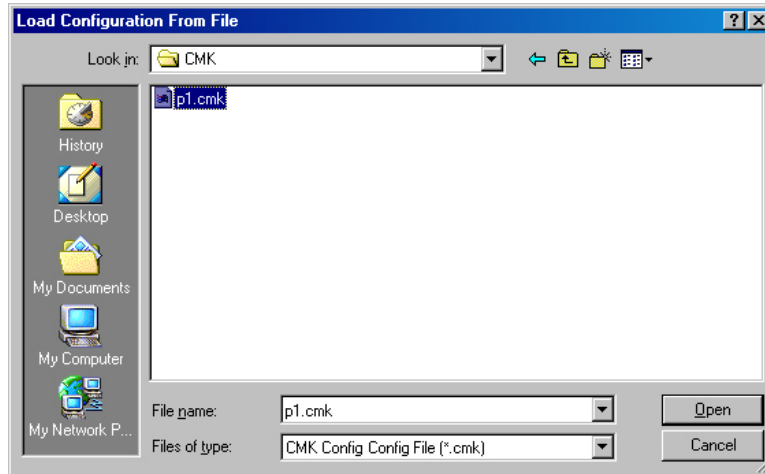



Figure 25: Loading Program Data From File Window

The user can then select the filename and click on the ‘Open’ button.

- **Save Program Data File** – Saves a configuration file to be stored on the PC. All configuration files have a ‘.CMK-2’ extension.

Icon: 

Keyboard shortcut: **Ctrl+S**

To save a configuration file to the PC, go to File → Save Program Data File, or use the Keyboard shortcut or icon shown above.

A window prompting the user for a filename should appear:

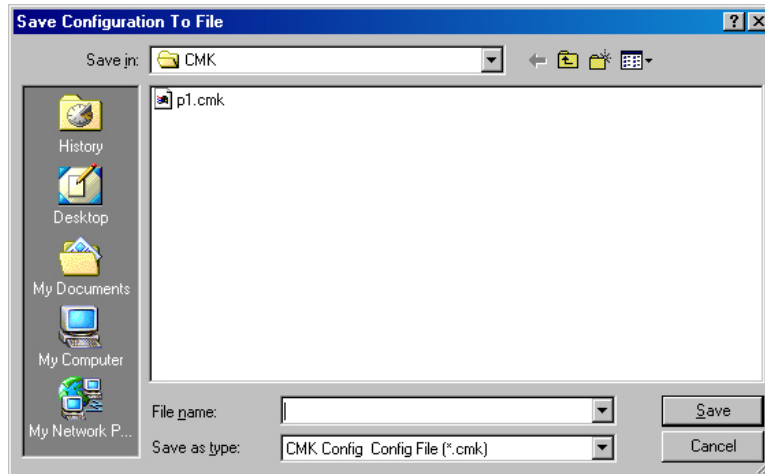


Figure 26: Save Program Data to File Window

If the configuration uses the same name as a previous configuration, a warning window will ask the user for confirmation in replacing the old file with the newly revised one.

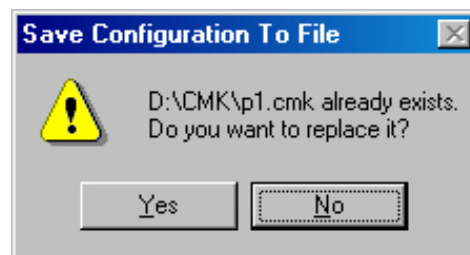



Figure 27: Confirm replacing of file window

- **Load Program Data From CMK-2** – Loads a configuration file from the CMK-2 memory chip. A CMK-2 may contain numerous configuration files which are selectable by changing the DIP-switch so, the software displays an initial configuration number as set in the DIP-switch. If a configuration number different from the DIP switch is required, it may be specified by the user.

Icon: 

Keyboard shortcut: **Ctrl+L**

To load a configuration from the CMK-2 memory chip, the user must ensure that the CMK-2 is connected to power and to a computer using a MIDI cable (please see software installation for details on connecting MIDI devices to computers). Then go to File → Load Program Data From CMK-2, or use the keyboard shortcut or icon as shown above. A window appears attempting to make a connection with the CMK-2 as shown in Figure 28.

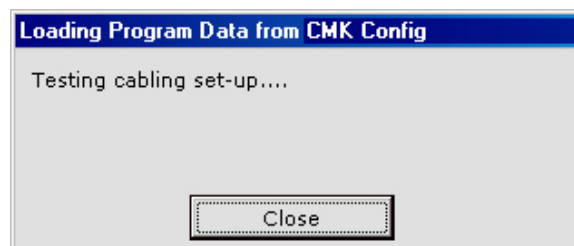


Figure 28: Software attempting to make a connection with the CMK-2

If a connection is not available, a window will appear as a reminder to make connections to the CMK-2:

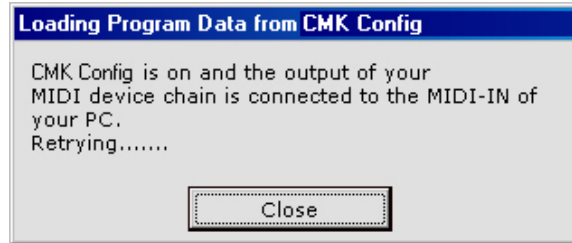


Figure 29: Software unable to make a connection with the CMK-2

If a connection is made, a window will appear to confirm the communication.

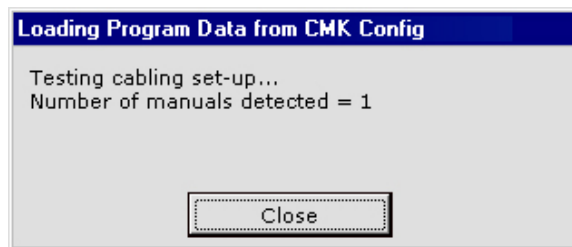


Figure 30: Software detecting number of keyboards

After the user has the desired configuration number, pressing 'OK' will display a window to confirm the selection:

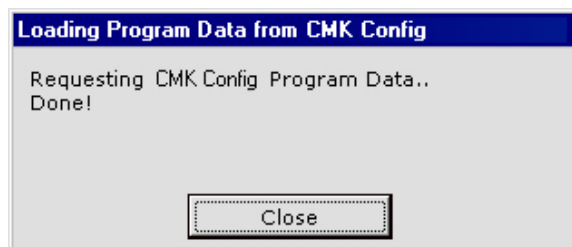


Figure 31: Confirms loading of configuration into CMK-2Config software.

- **Write Program Data to CMK-2** – Saves a configuration file to the CMK-2 memory chip. Typical CMK-2 units will have numerous configuration files so the user should specify the configuration number of the current file.

Icon: 

Keyboard shortcut: **Ctrl+W**

To save a configuration to the CMK-2, go to File → Write Program Data to CMK-2 or, use the keyboard shortcut or icon as shown above. The Software attempts to make a connection to the CMK-2.

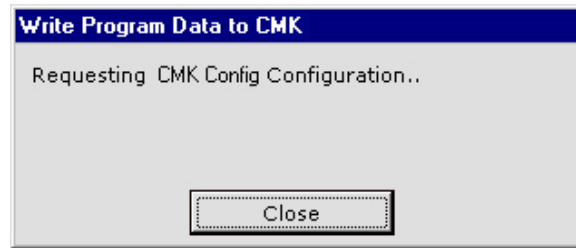


Figure 32: Software attempting to communicate with CMK-2

A window should appear to confirm that the contents were written.

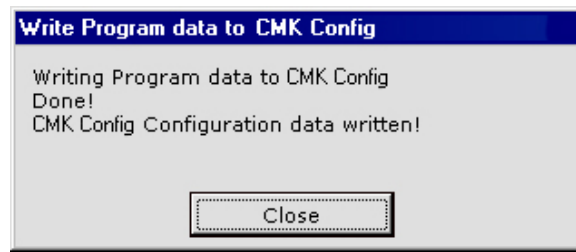



Figure 33: Confirms configuration written to CMK-2 from CMK-2Config software.

2. Options Menu

- **MIDI I/O Setup** – This function sets the MIDI input and output ports on your PC.
Icon:  Keyboard shortcut: **Ctrl+M**

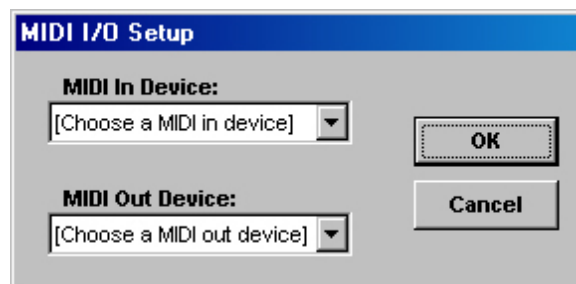


Figure 34: MIDI Input Output Setup window

3. Help Menu

- a. **View CMK-2 Config Documentation** – This function displays the CMK-2 documentation in a web browser.



- b. **About CMK-2Config** – This function contains the software title, company and version number.

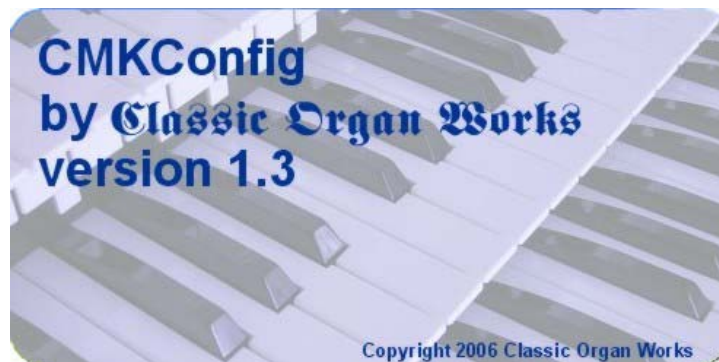


Figure 35: Help Menu

Keyboard Functions

The keyboard is a physical representation of the items that a user needs to specify when configuring the CMK-2. The user must specify functions for two categories: ‘MIDI channel output’ and ‘Piston function’.

- **MIDI Channel output** - This function controls the MIDI Channel(s) on which the keyboard can send messages. To specify the MIDI channel(s), click on the keys of the keyboard and a menu such as the one shown on the next page will appear. To select the MIDI Channel(s), use the mouse cursor to point and click on the numbered buttons inside the blue bubble. These numbers correspond to the MIDI Channels from 1-16 since the keyboard can send on multiple channels. Clicking on a selected numbered button again will deselect it.

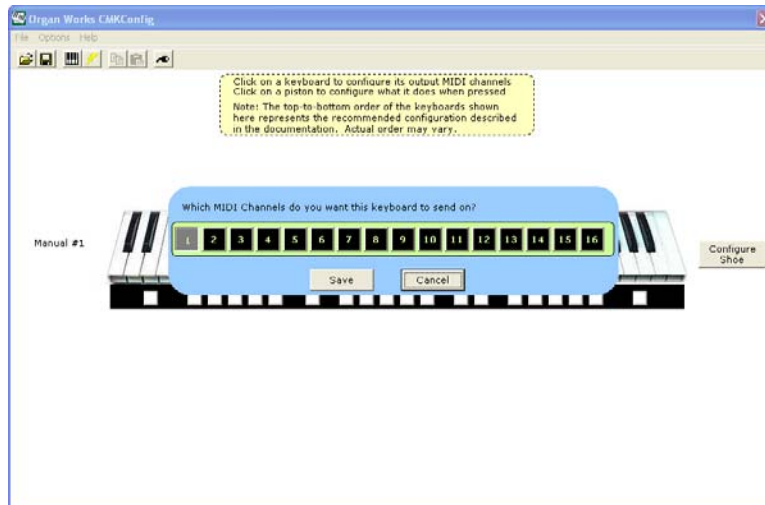


Figure 36: Clicking on the keys of the keyboard invokes a MIDI Channel select menu.

- **Piston Function** – Each piston can be configured for a particular function. To select these functions from a menu, click on any one of the twenty piston buttons and navigate through the resulting drop-down menus.

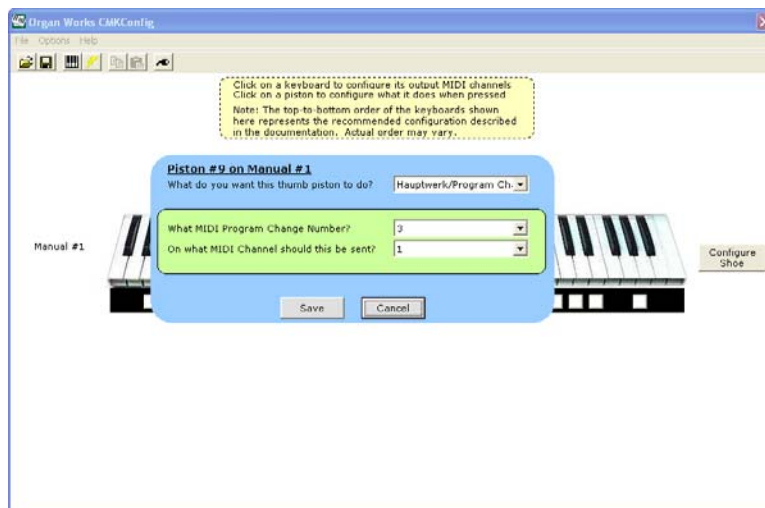


Figure 37: Clicking on an individual piston invokes the Piston function select drop-down menu.

Note that configuring these pistons in software does **not** affect the use of the two end buttons to set keyboard hardware parameters as discussed on page 29.

Three drop-down menus enable the user to select the MIDI device being controlled, specific functions of these devices, and the MIDI output channel for the command.

Table 9: Customizable Functions for each piston

Ahlborn Coupler: Allows a keyboard to play stops from another division					
A to Pedal	B to Pedal	B to A	A to B	A to Aux	B to Aux
Ahlborn Tremulant					
Swell Tremulant	Great Tremulant	Choir Tremulant			
Ahlborn Cancel					
General Cancel	Swell Divisional Cancel	Great Divisional Cancel	Choir Divisional Cancel		
Ahlborn General: associates a combination of stops to a memory level. These combinations can be from different divisions.					
Memory A General #1	Memory A General #2	Memory A General #3	Memory A General #4	Memory A General #5	Memory A General #6
Memory B General #1	Memory B General #2	Memory B General #3	Memory B General #4	Memory B General #5	Memory B General #6
Memory C General #1	Memory C General #2	Memory C General #3	Memory C General #4	Memory C General #5	Memory C General #6
Memory D General #1	Memory D General #2	Memory D General #3	Memory D General #4	Memory D General #5	Memory D General #6
Memory E General #1	Memory E General #2	Memory E General #3	Memory E General #4	Memory E General #5	Memory E General #6
Ahlborn SET: confirms assignment of stops to a piston					
Ahlborn SFZ: activates all stops of the organ					
Hauptwerk/Program Change: Allows users to control Hauptwerk functions or send program change commands using the pistons					
Any Program Change number from 1 to 128					

Table 9: Customizable Functions for each piston (cont'd)

SCPOP function: Allows user to control SCPOP functions					
Left	Up	Center	Down	Right	Clear
Great Flues	Swell Flues	Great Mixture	Great Reeds	Swell Reeds	Pedal Stops
Great to Swell	Great to Pedal	Swell to Great	Swell to Pedal	Tremolo Swell	Tremolo Great
Panic	Rec	Thru	Reset	Cancel	
Free Memory # 1	Free Memory # 2	Free Memory # 3	Free Memory # 4	Free Memory # 5	
Free Memory # 6	Free Memory # 7	Free Memory # 8	Free Memory # 9	Free Memory #10	
Fixed Memory # 1	Fixed Memory # 2	Fixed Memory # 3	Fixed Memory # 4	Fixed Memory # 5	Fixed Memory # 6
Fixed Memory # 7	Fixed Memory # 8	Fixed Memory # 9	Fixed Memory # 10	Fixed Memory # 11	Fixed Memory # 12
Go Flues Mute	Sw Flues Mute	Go Reeds Mute	Sw Reeds Mute	Unused	
Temper Type -	Temper Type +	Temper Key -	Temper Key +	Reverb	

- **Expression Shoe Function** – Each manual has an Analog Input that can be configured for either Expression or Volume Control. To select these functions from a menu, click on the “Configure Shoe” button and navigate through the resulting drop-down menus.

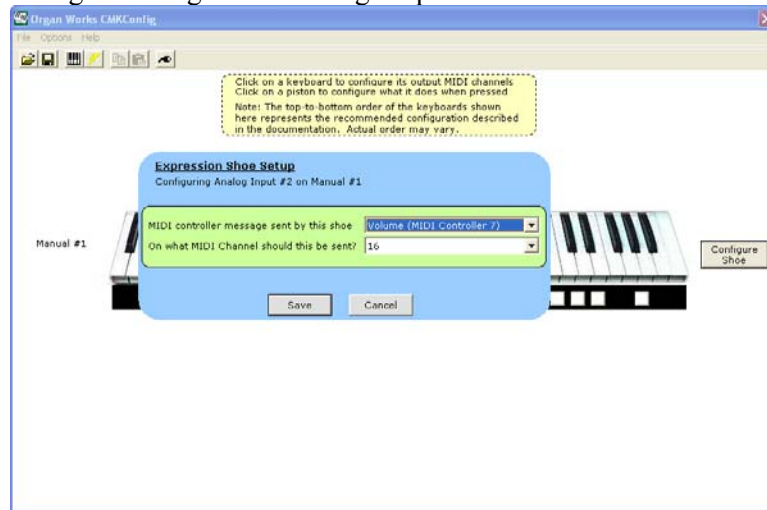


Figure 38: Clicking on the “Configure Shoe” button invokes the Expression Shoe Setup menu.

Configuring Multiple Keyboards

The software supports the two-manual and three-manual CMK-2 setups. For multi-manual setups, the software screen will show multiple keyboards rather than a single keyboard. In the single keyboard setup, the keyboard is labeled ‘Manual #1’ in the CMK-2config program window. However, for a multi-manual setup, the keyboards are numbered according to their place in the daisy-chain. Therefore, the keyboard labeled ‘Manual #1’ represents the keyboard connected directly to the MIDI OUT port of the personal computer. ‘Manual #2’ would be connected to the MIDI OUT port of ‘Manual #1’ and so forth. The final keyboard in the chain will have one MIDI OUT port connected to the MIDI IN port from the personal computer. The final keyboard also connects to any Ahlborn Archive and General MIDI sound modules. Using the software for setup of multiple keyboards is exactly the same as for the single-manual. For more details on correct installation, please see Figure 2 in the ‘Introduction’ section.

MIDI CONTROL UNIT CMK-2

REFERENCES

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- [2] “Archive Technical Specifications” [Online Document], 2002, [cited 2002 December 17], Available HTTP: <http://www.ahlborn-galanti.com/archive/techspec.html>
- [3] “Archive Stops” [Online Document], 2002, [cited 2002 December 17], Available HTTP: <http://www.ahlborn-galanti.com/archive/stops.html>
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- [6] Filippo Tigli, “Frequently Asked Questions” [Online Document], 2002 October, [cited 2003 January 7], Available HTTP: <http://www.chsinet.via.t-online.de/faq.htm>
- [7] R. Sung, System Exclusive Message layouts, Classic Organ Works, Markham, Canada: 2002
- [8] H. Wemekamp, Classic MIDI Keyboard Interface System Software, Classic Organ Works, Markham, Canada: 2002

CLASSIC MIDI KEYBOARD CMK-2

APPENDIX A: SYSTEM EXCLUSIVE MESSAGE LAYOUTS

Messages common to all products [7]

General Information Identity Request

F0 7E dd 06 01 F7

Request the identity and special characteristics of a device. *dd* selects a particular device in the MIDI chain. *dd* = 7Fh selects any and all devices at once.

General Information Identity Reply

F0 7E dd 06 02 00 20 1C pp pp mm mm ss ss tt tt F7

dd: identifies the device which is responding.

pp pp = 04 03 for MKSC v3

mm mm: gives the organ model number

ss ss: identifies the major and minor software revision level, as it affects data format compatibility.

tt tt: identifies the major and minor software revision level, as it affects program capabilities.

In the case of the MKSC v3, after the *tt tt*, also pass two bytes indicated the current DIPSWITCH setting

CMK-2 -- Special layouts [7]

Config Memory

The config memory contains a number of 256-byte blocks. Each contains CMK-2 configuration information.

The message formats are:

F0 00 20 1C dd 04 01 03 aa aa aa ss ss F7

Request Config Memory data. This message should be sent by an external sequencer or by the CMK-2 config application.

dd: identifies the device which is responding.

aa aa aa: starting offset (21-bit address) of the config block (packed 7 bits).

ss ss: number of bytes of original data to be retrieved (packed 14 bits)

F0 00 20 1C dd 04 01 04 bb bb ss <data, 8-for-7 format> F7

Transfer Config Memory data. This message should be sent from the CMK-2 in response to a request message.

dd: identifies the device which is responding.

bb bb: block-count within the sequence of saved data blocks' memory data, low-order 7 bits first. The first message in a restore sequence must have a block-count of 00 00.

ss: number of bytes of original data transferred in this block.

data: 8-for-7 coded bytes of data.

F0 00 20 1C dd 04 01 08 bb bb aa aa aa ss <data, 8-for-7 format> F7

Update Config Memory data. The message with subcommand 08 will be generated by the external CMK-2 config application.

dd: identifies the device which is responding.

bb bb: block-count within the sequence of saved data blocks' memory data, low-order 7 bits first. The first message in a restore sequence must have a block-count of 00 00.

aa aa aa: starting offset (21-bit address) of the config block (packed 7 bits).

ss: number of bytes of original data transferred in this block.

data: 8-for-7 coded bytes of data.

F0 00 20 1C dd 04 01 20 F7

Soft reboot CMK-2. The message will cause the CMK-2 to resume operation and reload the PIC's EEPROM with the contents of the FLASH ROM indicated by the DIPSWITCH.

dd: identifies the device which is responding.

F0 00 20 1C dd 04 02 ii F7

Provides an identification number for each keyboard to identify the number of keyboards and configure each one separately. The first device is set to 0 and increments this number before passing the message to the next device.

dd: not used in this command.

ii: device identification.

CLASSIC MIDI KEYBOARD CMK-2

APPENDIX B: AHLBORN MESSAGES

Table 10: Note On/Off MIDI functions to control Ahlborn Archive sound modules [8]

Slot	Pins:	Data sent: Off ----> On	Data sent: On ----> Off		Description:		Note:
					Key On/Off Data		
1	1-61	90 kk 40	90 kk 00	Sw	Ahlborn - Note On / Off		1
2	1-61	91 kk 40	91 kk 00	Gt	Ahlborn - Note On / Off		2
3	1-61	92 kk 40	92 kk 00	Ch	Ahlborn - Note On / Off		3
4	1-32	93 kk 40	93 kk 00	Pd	Ahlborn - Note On / Off		4

NOTES:

- 1) "Swell Channel" defaults to 1 (0h) - usually the Ahlborn "A" division for key On/Off messages. *kk* = Note number 0-127 (00h to 7Fh) where 60 (3Ch) = middle "C". Normal (untransposed) output from key inputs 1-61 = 36-96 (24h - 60h). Transposer may shift this down or up in the range of -24 to +31.
- 2) "Great Channel" defaults to 2 (1h) - usually the Ahlborn "B" division for key On/Off messages.
- 3) "Choir Channel" defaults to 3 (2h) - usually the Ahlborn "AUX" division for key On/Off messages.
- 4) "Pedal Channel" defaults to 4 (3h) - usually the Ahlborn "Pedal" division for key On/Off messages. Normal (untransposed) output from key inputs 1-32 = 36-67 (24h - 43h). Transposer may shift this down or up in the range of -24 to +31.
- 5) Ahlborn modules respond only in the range - *kk* = 30-99 (1Eh to 63h) for A and B divisions and *kk* = 30-70 (1Eh to 46h) for the Pedal division.

Table 11: Ahlborn Archive 'ROMANTIC' sound module commands for stops and couplers [8]

Group	No.	Data sent Off ----> On	Data sent On ----> Off		Description		Note
		Controller 73	Controller 74		Ahlborn ROMANTIC stops		
0	0	Bn 49 00	Bn 4A 00	Pd	Contre Gamba	16'	1
	1	Bn 49 01	Bn 4A 01		Ophicleide	16'	
	2	Bn 49 02	Bn 4A 02		Contre Violone	32'	
	3	Bn 49 03	Bn 4A 03		Contre Bassoon	32'	
	4	Bn 49 04	Bn 4A 04		A/P coupler		
	5	Bn 49 05	Bn 4A 05		B to Pd coupler		
	6	Bn 49 06	Bn 4A 06	A	Cornoepen	16'	
	7	Bn 49 07	Bn 4A 07		Cornet des Bombardes	IV	
	8	Bn 49 08	Bn 4A 08		Tuba Mirabilis	8'	
	9	Bn 49 09	Bn 4A 09		Clarion	4'	
	A	Bn 49 0A	Bn 4A 0A		Orchestral Oboe	8'	
	B	Bn 49 0B	Bn 4A 0B		Clarinet	8'	
	C	Bn 49 0C	Bn 4A 0C		French Horn	8'	
	D	Bn 49 0D	Bn 4A 0D		Cor Anglais	8'	
	E	Bn 49 0E	Bn 4A 0E		Cello	8'	
	F	Bn 49 0F	Bn 4A 0F		Cello Celeste	8'	
	10	Bn 49 10	Bn 4A 10		B to A coupler		
	11	Bn 49 11	Bn 4A 11	B	Quint Flute	2 2/3'	
	12	Bn 49 12	Bn 4A 12		Piccolo	2'	
	13	Bn 49 13	Bn 4A 13		Vox Humana	8'	
	14	Bn 49 14	Bn 4A 14		Open Diapason	8'	
	15	Bn 49 15	Bn 4A 15		Flauto Mirabilis	8'	
	16	Bn 49 16	Bn 4A 16		Concert Flute	4'	
	17	Bn 49 17	Bn 4A 17		A to B coupler		
	18	Bn 49 18	Bn 4A 18		A to Aux coupler		
	19	Bn 49 19	Bn 4A 19		B to Aux coupler		

NOTES:

- 1) *n* = Channel number used by Ahlborn stop On/Off messages; defaults to 16 (Fh).
- 2) Controls "A" or "B" division Tremulant on corresponding channel number used by Ahlborn divisions.

Table 12: Ahlborn Archive 'CLASSIC' sound module commands for stops and couplers on [8]

Group	No.	Data sent: Off ----> On	Data sent: On ----> Off		Description		Note
		Controller 73	Controller 74		Ahlborn CLASSIC stops		
3	1A	Bn 49 1A	Bn 4A 1A	Pd	Contre Gambe	16'	1
	1B	Bn 49 1B	Bn 4A 1B		Bombarde	16'	
	1C	Bn 49 1C	Bn 4A 1C		Contre Basse	32'	
	1D	Bn 49 1D	Bn 4A 1D		Contre Bombarde	32'	
	1E	Bn 49 1E	Bn 4A 1E	A	Corno di Bassetto	8'	
	1F	Bn 49 1F	Bn 4A 1F		Plein Jeu	IV-V	
	20	Bn 49 20	Bn 4A 20		Clarion	4'	
	21	Bn 49 21	Bn 4A 21		Festival Trumpet	8'	
	22	Bn 49 22	Bn 4A 22		Gemshorn Celeste	8'	
	23	Bn 49 23	Bn 4A 23		Koppelflote	4'	
	24	Bn 49 24	Bn 4A 24		Bombarde	16'	
	25	Bn 49 25	Bn 4A 25		Harmonic Trumpet	8'	
	26	Bn 49 26	Bn 4A 26		Gemshorn	8'	
	27	Bn 49 27	Bn 4A 27		Flute a Cheminee	8'	
	28	Bn 49 28	Bn 4A 28	B	Flute Octaviant	4'	
	29	Bn 49 29	Bn 4A 29		Octave	2'	
	2A	Bn 49 2A	Bn 4A 2A		Cymbale	III	
	2B	Bn 49 2B	Bn 4A 2B		Principal	8'	
	2C	Bn 49 2C	Bn 4A 2C		Holzgedackt	8'	
	2D	Bn 49 2D	Bn 4A 2D		Flute Harmonique	8'	

NOTES:

- 1) *n* = Channel number used by Ahlborn stop On/Off messages; defaults to 16 (Fh).
- 2) Controls "A" or "B" division Tremulant on corresponding channel number used by Ahlborn divisions.

Table 13: Ahlborn Archive '202' sound module commands for stops and couplers [8]

Group	No.	Data sent: Off ----> On	Data sent: On ----> Off		Description		Note
		Controller 73	Controller 74		Ahlborn 202 stops:		
	2E	Bn 49 2E	Bn 4A 2E	Pd	Soubasse	32'	1
	2F	Bn 49 2F	Bn 4A 2F		Violone	16'	
	30	Bn 49 30	Bn 4A 30		Contrebombarde	32'	
	31	Bn 49 31	Bn 4A 31		Bombarde	16'	
	32	Bn 49 32	Bn 4A 32	A	Contregambe	16'	
	33	Bn 49 33	Bn 4A 33		Diapason	8'	
	34	Bn 49 34	Bn 4A 34		Quintadena	8'	
	35	Bn 49 35	Bn 4A 35		Terz	1 3/5'	
	36	Bn 49 36	Bn 4A 36		Septime	1 1/7'	
	37	Bn 49 37	Bn 4A 37		Scharff	III	
	38	Bn 49 38	Bn 4A 38		Bombarde	16'	
	39	Bn 49 39	Bn 4A 39		Trompette	8'	
	3A	Bn 49 3A	Bn 4A 3A		Tuba Mirabilis	8'	
	3B	Bn 49 3B	Bn 4A 3B		Chimes		
	3C	Bn 49 3C	Bn 4A 3C	B	Bourdon	8'	
	3D	Bn 49 3D	Bn 4A 3D		Flute Harmonique	8'	
	3E	Bn 49 3E	Bn 4A 3E		Flute Octaviante	4'	
	3F	Bn 49 3F	Bn 4A 3F		Larigot	1 1/3'	
	40	Bn 49 40	Bn 4A 40		Corno di Bassetto	8'	
	41	Bn 49 41	Bn 4A 41		Clarion	4'	

NOTES:

- 1) *n* = Channel number used by Ahlborn stop On/Off messages; defaults to 16 (Fh).
- 2) Controls "A" or "B" division Tremulant on corresponding channel number used by Ahlborn divisions.

Table 14: Ahlborn Archive '201' sound module commands for stops and couplers [8]

Group	No.	Data sent: Off ----> On	Data sent: On ----> Off		Description		Note
		Controller 73	Controller 74		Ahlborn 201 stops:		
	42	Bn 49 42	Bn 4A 42	Pd	Subbass	16'	1
	43	Bn 49 43	Bn 4A 43		Octave	8'	
	44	Bn 49 44	Bn 4A 44		Bourdon	8'	
	45	Bn 49 45	Bn 4A 45		Posaune	16'	
	46	Bn 49 46	Bn 4A 46	A	Bourdon	16'	
	47	Bn 49 47	Bn 4A 47		Principal	8'	
	48	Bn 49 48	Bn 4A 48		Flute a cheminee	8'	
	49	Bn 49 49	Bn 4A 49		Unda Maris	8'	
	4A	Bn 49 4A	Bn 4A 4A		Octave	4'	
	4B	Bn 49 4B	Bn 4A 4B		Spitzflote	4'	
	4C	Bn 49 4C	Bn 4A 4C		Nasard	2 2/3'	
	4D	Bn 49 4D	Bn 4A 4D		Superoctave	2'	
	4E	Bn 49 4E	Bn 4A 4E		Mixture	IV	
	4F	Bn 49 4F	Bn 4A 4F		Trompete	8'	
	50	Bn 49 50	Bn 4A 50	B	Gedackt	8'	
	51	Bn 49 51	Bn 4A 51		Gamba	8'	
	52	Bn 49 52	Bn 4A 52		Nachthorn	4'	
	53	Bn 49 53	Bn 4A 53		Cymbale/Scharff	III	
	54	Bn 49 54	Bn 4A 54		Cornet	III	
	55	Bn 49 55	Bn 4A 55		Oboe	8'	
	56	Bn 49 7F	Bn 4A 7F		All stops On / Off		
					Ahlborn Tremulants:		
	57	Bn 5C 7F	Bn 5C 00		Swell Tremulant		2
	58	Bn 5C 7F	Bn 5C 00		Great Tremulant		2
	59	Bn 5C 7F	Bn 5C 00		Choir Tremulant		2

NOTES:

- 1) *n* = Channel number used by Ahlborn stop On/Off messages; defaults to 16 (Fh).
- 2) Controls "A" or "B" division Tremulant on corresponding channel number used by Ahlborn divisions.

Table 15: Ahlborn Archive sound module Piston and Crescendo input functions for all four units [8]

Group	No.	Data sent: Off ----> On	Data sent: On ----> Off		Description		Note
	A0	CF 20			Ahlborn - General Cancel		1
	81	CF 01			Ahlborn - Mem. A Gen. #1		2
	82	CF 02			Ahlborn - Mem. A Gen. #2		
	83	CF 03			Ahlborn - Mem. A Gen. #3		
	84	CF 04			Ahlborn - Mem. A Gen. #4		
	85	CF 05			Ahlborn - Mem. A Gen. #5		
	86	CF 06			Ahlborn - Mem. A Gen. #6		
	87	CF 07			Ahlborn - Mem. B Gen. #1		
				etc.		
	9E	CF 1E			Ahlborn - Mem. E Gen. #6		
	E4	CF 64			Cancel Crescendo		
	E5	CF 65	CF 64		Crescendo Stage #1 / Off		3
	E6	CF 66	CF 65		Crescendo Stage #2 / 1		
	E7	CF 67	CF 66		Crescendo Stage #3 / 2		
				etc.		
	EF	CF 6F	CF 6E		Crescendo Stage #11/10		
	F7	CF 77	CF 6F		Crescendo Stage #12/11		
	F8	CF 78	CF 77		Crescendo Stage #13/12		
				etc.		
	FF	CF 7F	CF 7E		Crescendo Stage #20/19		

NOTES:

- 1) Prog#1 (00h) on the Control Channel will actually act as a "Recall Hand Registration", but will correspond to a General Cancel if hand registration is not used.
- 2) Ahlborn Archive Modules have 6 Programmable Presets on 5 Memory levels, accessed by sending Prog#1-30 (01h - 1Eh).
- 3) These functions are presumed to be connected to a "shade roller" Crescendo switch, which provides sequential switch closures and releases. These messages can also be generated by an analog input.

Table 16: Ahlborn Archive sound module additional Piston input commands [8]

Group	No.	Data sent: Off ----> On	Data sent: On ----> Off		Description		Note
	5A	Cn 40			Ahlborn – Division Cancel		1
	5E	BF 47 46	BF 47 06		SET piston		2
	5F	BF 47 42	BF 47 02		SFZ control		3

NOTES:

- 1) Prog. Change 51-85 (32h - 54h) on a Division Channel (1-4) will actually act as a Divisional Cancel.
- 2) Works with General Pistons to allow setting them via remote (MIDI) control, i.e., press & hold SET; press and release a General, then release SET; to store a new registration.
- 3) Should allow for a lamp output for this. Also, possible another input function which would act as a "reversible"; i.e., push-ON, push-OFF.:
- 4) n = Channel number used by Ahlborn stop On/Off messages; defaults to 16 (Fh).

Table 17: Ahlborn Archive and other MIDI sound modules analog input function commands [8]

Input		Data sent	Function		Description		Note
1		CF ss	Crescendo		Crescendo		1
2		B0 07 aa		Sw	Ahlborn – Division Volume		2
3		B1 07 aa		Gt	Ahlborn – Division Volume		2
4		B2 07 aa		Ch	Ahlborn – Division Volume		2
5		B3 07 aa		Pd	Ahlborn – Division Volume		2
6		Bn 65 00 64 01 06 xx 26 yy	Tuning		Tuning and/or Temperature Sensor		3

NOTES:

- 1) "ss" is the Crescendo stage, where Off=64h, Stage#1=65h, #2=66h, etc., #11=6Fh, #12=77h, #13=78h, etc., #20=7Fh.
- 2) Ahlborn modules use Controller #7 for expression. Outputs on Ahlborn channels (1-4) must be configurable, connecting to analog inputs 2-5. aa = volume value from an analog input, where 0<aa<127.

APPENDIX C: CIRCUIT BOARD SCHEMATICS

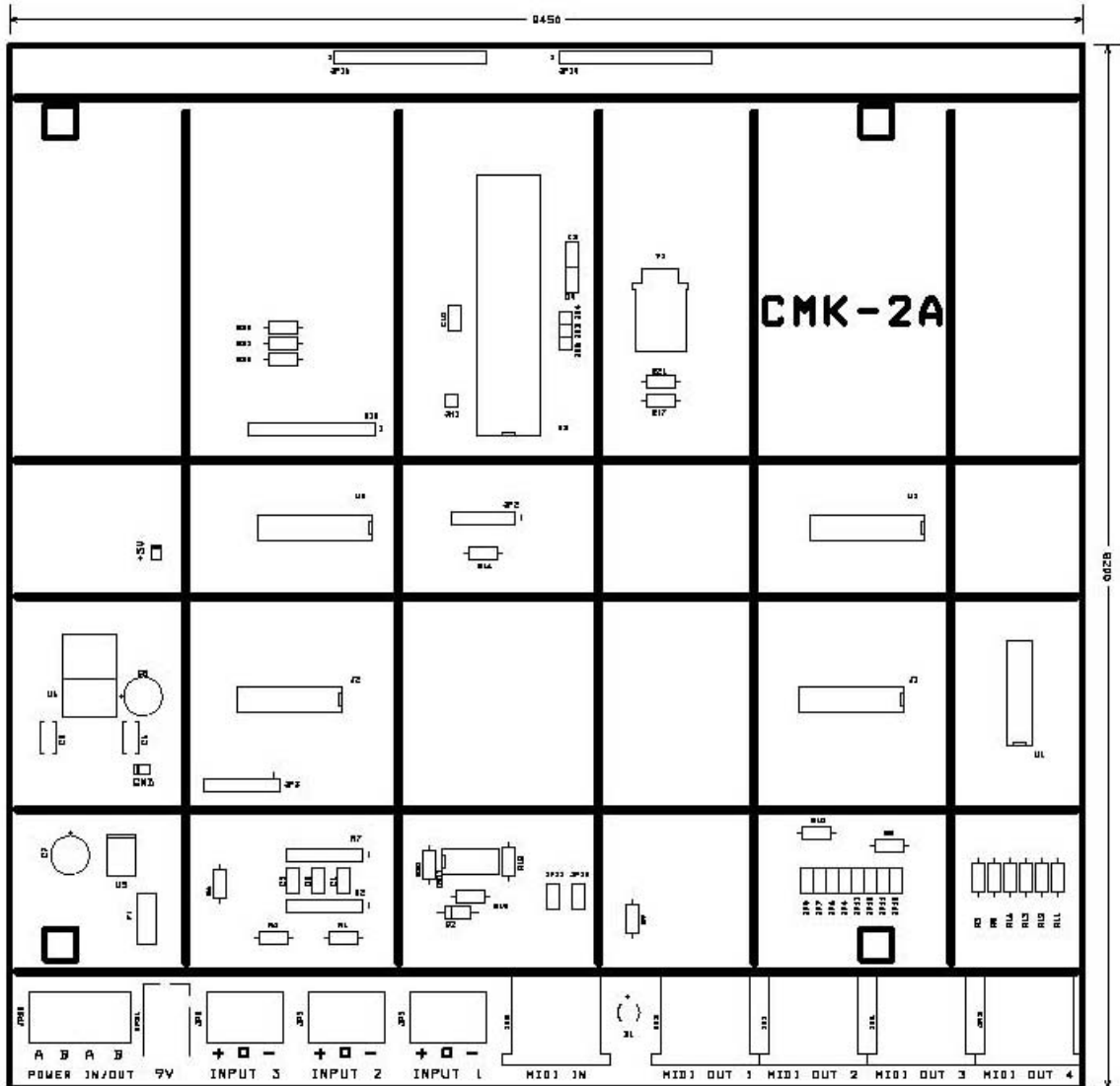
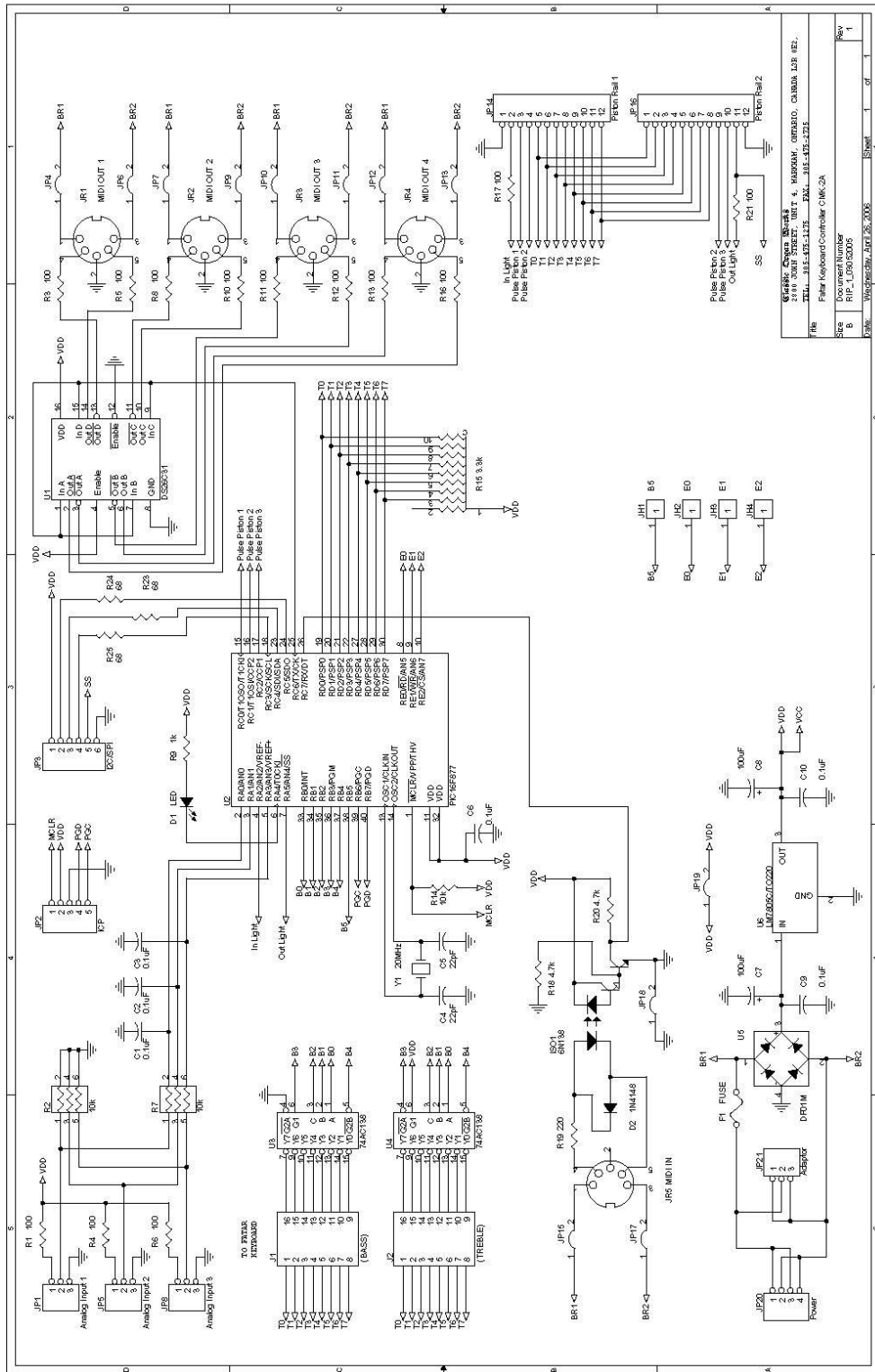


Figure 39: CMK-2A- SS Classic MIDI Keyboard Circuit board Silk Screen



Gerber: CMK-2A Title: CMK-2A Classic MIDI Keyboard File: CMK-2A-1133 Scale: 1:1 Date: 10/15/2008	Author: John... Part: CMK-2A Rev: 1
---	--

Figure 40: CMK-2A Classic MIDI Keyboard Circuit Board Schematic

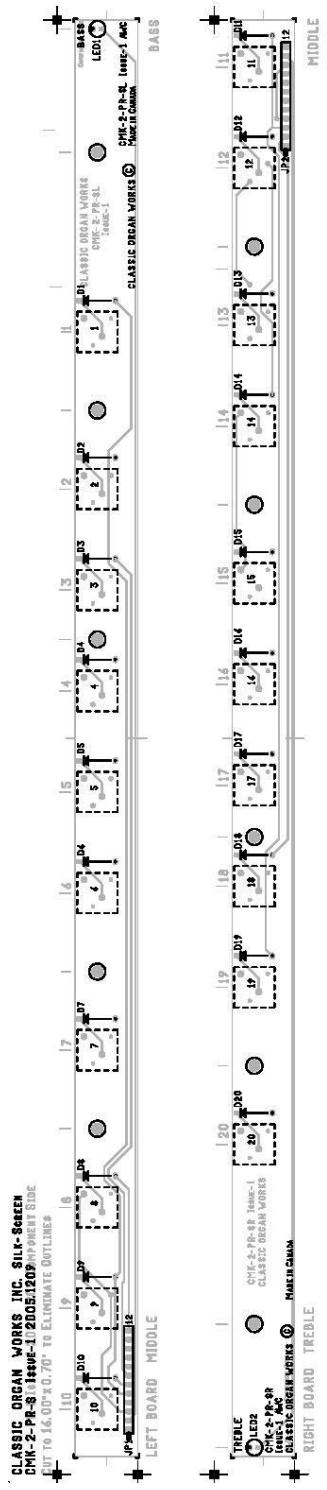


Figure 41: CMK-2 PR-S-SSC v.1 Classic Midi Keyboard Piston Rail Silk Screen

Classic Organ Works	CMK-2 Piston Rail, Sayal Pistons, Schematic	Drawn AWC	CMK-2-PR-S-S	
		Date 2005.1209	1 of 1	Issue 1

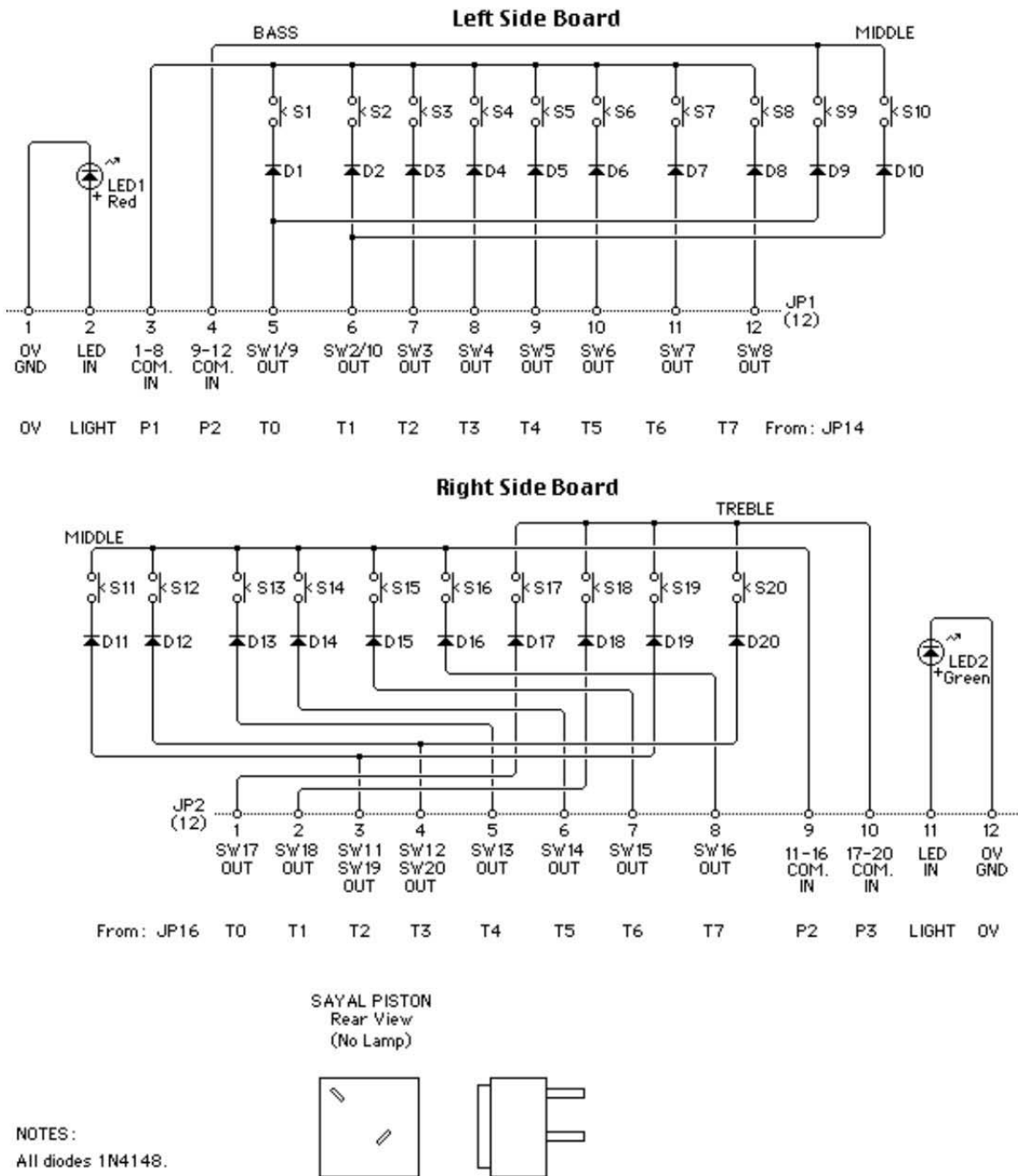
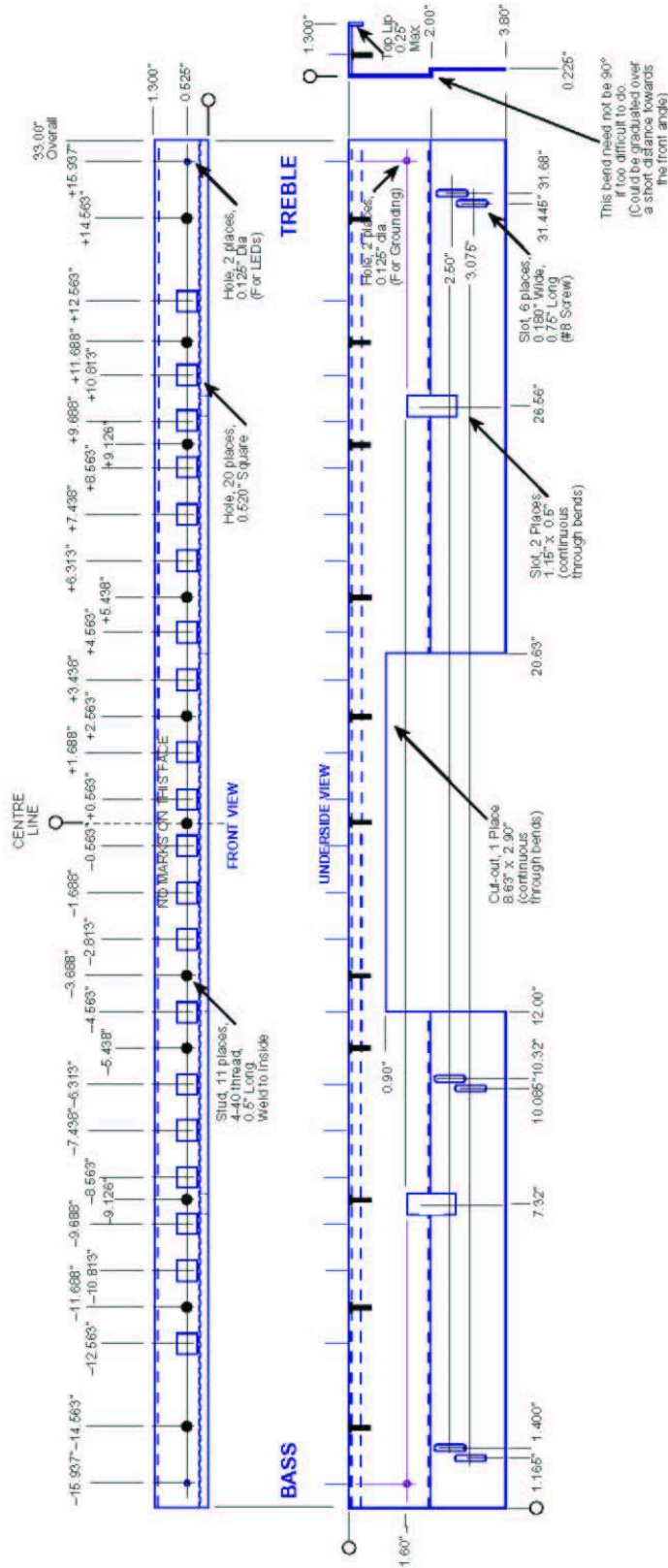


Figure 42: CMK-2 PR-S-S v.1 Classic MIDI Keyboard Piston Rail Schematic

**CLASSIC MIDI KEYBOARD
CMK-2**

**APPENDIX D:
MECHANICAL DRAWINGS**



This revision differs from Version-1 in several dimensions:

- Stud added in centre
- Holes 0.500" Square now 0.020"
- 1.425" now 1.300" (Front Height)
- 2.35" now 2.00"
- 4.00" now 3.80" (Depth)
- 1.90" now 0.90" (Cut-out)
- 7.80" now 7.60"
- 2.55" now 2.50" (#8 Slot positions)
- 3.425" now 3.075" (#8 Slot positions)
- 2 new notes added at ends.

DO NOT SCALE

Classic Organ Works
 2800 JOHN STREET UNIT 14
 MARKHAM, ONTARIO,
 CANADA L3R 0E2.
 Tel. 905-475-1263 Fax. 905-475-2795 1 of 1

MIDI KEYBOARD, PISTON RAIL-2
SAYAL PISTONS, MECHANICAL

Dim. AWP/Date: 2006.021.CMK-2-PR-S-M2 Issue-2

All Bends 90°, minimum radius
 Material: Mild Steel 0.060" thick
 Finish: Paint, Matt Black
 Mask off 2 holes: 0.125" to 0.25" dia on
 inside only (for grounding)

Figure 43: CMK-2 Piston Rail Front Panel Mechanical Drawing

CLASSIC MIDI KEYBOARD CMK-2-1

APPENDIX E:

MIDI and SCPOP RESOURCES

- For information on MIDI Protocol Specifications, General MIDI, Sound Set Groups or Program Numbers please go to www.midi.org
- For information on SCPOP Messages, please go to www.scpop.de

CLASSIC MIDI KEYBOARD CMK-2-1

APPENDIX F: ASSEMBLY PICTURES Mating the Brackets

Your Manuals have come to you pre-assembled. These pictures are here to show you how the brackets connect in case you wish to alter the setup or do maintenance on the manuals themselves.



Figure 44: Small mounting bracket for top manual



Figure 45: Large mounting bracket for bottom and middle manuals



Figure 46: Mating the Small and large Brackets



Figure 47: Connecting Two Brackets



Figure 48: Brackets mated and closed



Figure 49: A Four Manual Stack Open

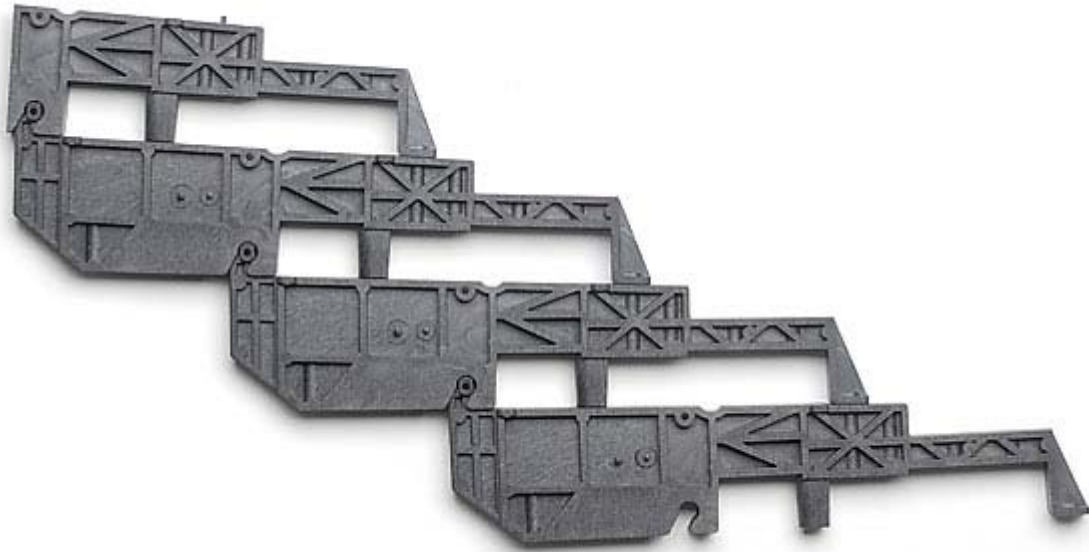


Figure 50: A Four Manual Stack Closed



Figure 51: A Completed Four Manual Stack

CLASSIC MIDI KEYBOARD CMK-2-1

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