



Capture for MultiSystem II Installation Guide

North American Office:
5600 General Washington Drive
Suite B211, Alexandria, VA 22312
USA
Toll Free: (800) 272-4775
T: (703) 933-0024
F: (703) 933-0025



European Office:
Twickenham Avenue
Brandon, Suffolk
IP27 0PD
United Kingdom
T: +44 (0)1842 814814
F: +44 (0)1842 813802

www.ssosystems.com

Contents

Introduction	4
Installation	5
A Two Minute Guide.....	5
Assembly differences	5
Setup	5
Full Installation Guide	6
Connections to the MultiSystem II Network	6
Power Wiring	6
Drawstops and Tabstops	6
Luminous Stops	6
Set Piston and General Cancel	7
SCOPE™ Piston	7
Ordinary Pistons & Piston Lamps	7
Blind Pistons and Lamps.....	8
Blind Switches	8
Level Selector	8
Fitting Control Panels	8
Separate Display and Switches	8
Blind Check, Clear and Copy Panel.....	9
Lock-switch and Indicator Lamp	9
Crescendo Controller.....	10
Calibrating the Crescendo Controller	11
Crescendo Control Panel	11
Using LED's	12
Commissioning.....	13
Wiring Checks	13
Programming	14
Programming Overview	15
1 - Set SCOPES and Data for All Pistons on the First Bank, First Level	15
Divisionals	15
Generals	16
Reversibles.....	16
Blind Pistons (Tuttis and Ventils)	17
2 - Program the First Crescendo	19
3 - Set Default Level and Crescendo Standard.....	20
4 - Initialise the memory levels	21
Additional Features.....	22
Commissioning End Notes.....	23
CFMII Operational Information	24
CFMII Troubleshooting.....	25

Introduction

This MultiSystem II is fitted with an integrated Capture System; we call it Capture For MultiSystem II or CFMII for short.

In the package you will find an operating guide for the organist. Please leave this in the console when you have completed the installation. We are always happy to supply extra copies, should you require them. This document is concerned only with the installation of the system.

CFMII systems are available in two models, CFMII and CFMII-300. Each system is quite different, and to avoid confusion we have provided separate installation manuals for each system.

Installation

A Two Minute Guide

Even if you are not familiar with our MultiSystem IIs and MultiLevel Capture Systems, it is possible to adapt very easily to the CFMII system. The two minute guide should get you up and running with the minimum of fuss.

CFMII is a supplementary product to the MultiSystem II.

In addition to the MultiSystem II, the CFMII adds:

- An extra processor box containing the CFMII processor unit.

- Outputs on the console plane to drive the drawstops (on and off coils).

- Inputs on the console plane for the level change switch and Piston Inputs, Set, General Cancel etc.

Assembly differences

The CFMII processor box must be added to the MultiSystem II Network. It can be added anywhere in the network that is suitable, often next to the console processor, but anywhere that a MSII network connection is available. If the instrument has multiple consoles the CFM processor should be fitted in the organ chamber where there will always be power.

The console will require a cut-out for the level change controls and capture functions as ordered.

Unlike the previous CFM the CFMII does not require a permanent AC supply.

Setup

Even though you are familiar with the setup please take time to follow the information in this guide.

The setup of the CFMII is not the same as the other systems and reading this will avoid some frustrating experiences later.

Full Installation Guide

The following instructions are intended to be read in conjunction with the MultiSystem II Installation Guide which was delivered with the MultiSystem II. If you are upgrading a system and the information has been lost, please contact us and we will gladly supply a fresh copy from our archives.

Connections to the MultiSystem II Network

It is necessary to connect the CFMII system to the MultiSystem II Network.

There are two ways to do this depending on the size of the MultiSystem II.

1. If there is only one MultiSystem II processor then the CFMII processor can be located next to each other and the two can be connected using a link protection board and two patch cables. Use one patch cable to connect the MultiSystem II processor to the Next connector on the link protection board. Use the other patch cable to connect the CFMII processor to the Previous connector on the link protection board.
2. If there is more than one MultiSystem II processor then a Network Switch will be required. The CFMII processor should connect to a free port on the Network Switch using the patch cable.

Power Wiring

The CFMII system requires power from a local DC rectifier (T/R). The box is fitted with a pair of terminals to connect to the supply. This supply must be reasonably stable and free from electrical noise; most commercially available units are suitable. The CFMII processor will operate from a supply between 12 and 32 volts. We supply a range of suitable units.

The system will not operate satisfactorily from DC supplies which are provided by a rotary generator, as the interference level is far too high.

Drawstops and Tabstops

Drawstops and tabstops require three connections to the MultiSystem II as well as one power connection per stop.

The switch contact of the stop unit connects to the stop or coupler input on the console plane.

The on coil of the stop unit connects to the on coil output on the console plane.

The off coil of the stop unit connects to the off coil output on the console plane.

The switch feed and the on and off coil returns all connect to T/R positive.

The switch inputs are suitable for use with mechanical switches, reed switches or electronic switches.

The on and off coil outputs are equipped with 'back EMF' or 'spark' suppression.

Luminous Stops

Luminous stops require two connections to the MultiSystem II as well as one power connection per stop.

The switch contact connects to the stop or coupler input on the console plane.

The stop lamp connects to the stop lamp output on the console plane.

The switch feed and the lamp return both connect to T/R positive.

The switch inputs are suitable for use with mechanical switches, reed switches or electronic switches.

Set Piston and General Cancel

The set piston should be wired to the set input on the MultiSystem II console plane.

The general cancel piston should be wired to the general cancel input on the MultiSystem II console plane.

The feed to both set and general cancel should connect to positive power.

SCOPE™ Piston

SCOPE is a feature which allows the organ builder and organist to define which stops are affected by which pistons.

SCOPE should be mounted as a piston adjacent to the set piston, as it needs to be operated by the same hand that presses the set piston.

If it is not desirable to mount SCOPE on the console, it should be wired to a latching switch behind the music stand or in the back of the console.

One side of the SCOPE piston should be wired to the SCOPE input on the MultiSystem II console plane.

The other side of the SCOPE piston should be wired to positive power.

Important Note: SCOPE is required for setup of the CFM.

Ordinary Pistons & Piston Lamps

General pistons, Divisional pistons, and reversers all referred to as Ordinary Pistons. Their function (SCOPE) will be set during commissioning.

The pistons should be connected as labelled and numbered in the connector list.

General Piston 1 must be connected to the assigned pin if a sequencer or stepper is included as part of the system. The numbering is important if transfers and/or piston couplers are fitted to ensure the correct pistons are transferred or coupled.

The feed to the piston contacts should connect to positive.

If luminous pistons are fitted, their lamps should be connected as follows:-

One side of each lamp should be connected to the Piston Lamp output on the MultiSystem II console plane which corresponds to the piston.

The return for the piston lamps should connect to positive.

Blind Pistons and Lamps

Blind Pistons are those which are reversible, i.e. they turn on when the piston is first pressed, and they turn off when it is pressed a second time. They will normally have an indicator lamp to show whether they are on or off.

MultiSystem II makes no differentiation between Inclusive Tutti (or Sforzando) pistons, Exclusive Tutti pistons, and Ventil pistons. These are all referred to as Blind Pistons. Their function will be set during commissioning.

Wire each blind piston to one of the blind piston inputs as listed in the MultiSystem II console plane documentation.

The feed to the piston contacts should connect to positive.

One side of each lamp should be connected to the Piston Lamp output on the MultiSystem II console plane which corresponds to the piston. The lamp outputs polarity is shown on the connector list and can vary for job to job.

Blind Switches

Blind Switches are those which have an on and an off position. You may hear us call these hfo (High for On).

MultiSystem II makes no differentiation between Inclusive Tutti switches, Exclusive Tutti switches, and Ventil switches. These are all referred to as Blind switches. Their function will be set during commissioning.

Wire each blind switch to one of the blind switch inputs as listed in the MultiSystem II console plane documentation.

The feed to the switch contacts should connect to positive.

Level Selector

Memory level selection on CFMII-300 is by the control panel.

The panel is supplied with a 10 way ribbon cable which connects to the Level Control Panel connector on the MultiSystem II console plane.

Fitting Control Panels

The rectangular panels are 57mm × 114mm and will require a cut-out of 47mm × 104mm.

The square panels are 57mm × 57mm and will require a cut-out of 47mm × 47mm.

Remove the retaining bracket(s) and insert the panel from the front. Ensure the panel is the correct way up (when looking at the back of the rectangular panels the connector should be on the right).

Fit the retaining bracket(s) to the back of the panel to hold it in place. It may be necessary to use wooden blocks to match the height of the brackets. If necessary the ends of the brackets can be bent, but this should only be done when the brackets are not attached to the panel.

Connect one end of the 10 way ribbon cable to the connector on the back of the control panel.

Connect the other end of the cable to the connector on the Interface card on the plane as shown in the connector list.

Separate Display and Switches

If the display does not have metalwork (this can be specified at the time of ordering) there will be a piece of polarized filter (smoked glass) and a display circuit board. These should be recessed from behind the woodwork.

The up and down level controls will be separate connections on the plane. These should be wired to suitably engraved pistons with a positive feed.

Blind Check, Clear and Copy Panel

CFMII is supplied with a switch panel with switches for Blind Check, Clear, Crescendo Adjust and Copy. Each of these switches has a built-in lamp.

The Blind Check switch is used on systems fitted with blind functions such as tuttis, ventils and sforzandos.

See the section "Fitting Control Panels" above for fitting instructions.

If a control panel was not desired (this can be specified at the time of ordering) then separate inputs for the switches and outputs for the indicators will have been provided.

The switch connections should be wired to suitably engraved pistons with a positive feed. Indicator lamps or LEDs should be fitted adjacent to the pistons and wired with a positive feed.

Please refer to the section on Using LEDs if you plan to use LED indicators.

Lock-switch and Indicator Lamp

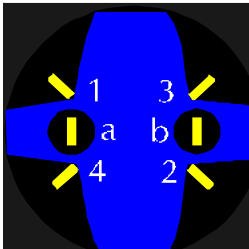
The Lock-switch is a momentary action, key operated switch used for locking and unlocking levels. The lock indicator lights whenever the currently selected level is locked. When a level is locked the set switch is disabled.

If the Locking facility is used then a console positive should be connected to the Locking Enable pin on the MultiSystem II console plane.

The Lock-switch is usually supplied by Solid State.

Connect Pin 3 to positive.

Pin 4 connects to the Lock-switch input on the MultiSystem II console plane.



Lock-switch showing connections, use only pins 3 and 4.

If the level control panel has Solid State black metalwork then a lock indicator will be part of the display and a separate indicator is not necessary. If a separate lock indicator is required then a lamp or LED should be mounted next to the Lock-switch. It should be wired as follows.

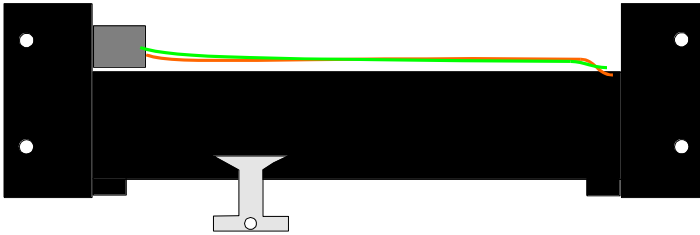
One side of the lock indicator lamp connects to positive.

The other side of the lamp connects to the lock lamp output on the MultiSystem II console plane.

If an LED is used then please refer to the section on using LEDs. The negative side of the circuit is the lamp output pin. The positive side of the circuit is the T/R positive.

Crescendo Controller

The analogue encoder is now the standard unit available. Penny & Giles who are world leaders in quality instrumentation devices manufacture the analogue encoder especially for SSOS. This system allows us greater flexibility of design and will be used for a variety of functions.



The moving arm on the encoder is connected to the crescendo pedal via a link that should be designed to prevent the organist forcing the encoder beyond its normal travel. The maximum travel is 104mm (4 1/8").

You will note that the moving arm is facing down. This is to help prevent dust entering the slot and causing premature wear.

A small slide switch is fitted to the assembly. This switch reverses the direction of the encoder. If you assemble the crescendo and find that the pedal operates backwards, simply switch off and move the switch to the alternate position and restart the system.

When fitting the encoder it is important to get the position with the shoe closed correct as we can't adjust for this electronically. The fully open position should be as close to maximum travel as possible to create a smooth and reliable travel. The calibration of this fader is covered in the Multisystem II installation instructions.

Connection to the system is made using a small 3.5mm jack plug. Do not change this connection with the system power on, damage may occur to the encoder. Please note that although these plugs are readily available they are not all the same. This connector uses the professional standard and is not compatible with other designs. You may damage the system by using plugs other than those supplied by SSOS.

The other end of the jack cable plugs into a separate analogue input board on the plane.

Calibrating the Crescendo Controller

Sometimes it is not possible to adjust the travel of the pedal to be the same as the slider. When the shoe is closed it must mechanically move the slide to one end of its travel. There is a small dead zone at the end of the travel of about 5mm ($\frac{1}{4}$ "). The fully open end can be adjusted using the preset. The fader is connected to the analogue input board on the plane. When the power is on the red led on this board will light. The green led is used to indicate that the slider is at the end of travel.

- Move the shoe to the closed or minimum position.
- Adjust the linkage so that the slider is fully at one end of the travel but is not being forced, as this will damage the unit.
- Check that the green led is lit. If not check the wiring.
- Move the shoe to the approximate centre of travel.
- Check the green led goes out.
- Move the shoe to the opposite end of the travel.
- Check the slider is not stressed beyond the normal limits of travel but is as close to the end of the travel as possible.
- Locate the small preset control next to the green led on the position encoder.
- With a small screwdriver, turn the preset control counter clockwise until the led goes out. Now turn the control clockwise slowly until the green led just comes on.
- Move the pedal a few times open and closed and check that the green led still comes on in the very last part of the travel.
- If the calibration is not completed successfully, some of the highest crescendo positions may not be available.

Crescendo Control Panel

The Crescendo has four programmable settings. These are selected using the Crescendo Select Control Panel. This is a square, four button panel with LEDs

See the section "Fitting Control Panels with Black Metalwork" above for fitting instructions.

Using LED's

Important Note: Do not test an LED using a T/R without using a resistor or it will be damaged. LED's are solid state devices which emit light. They may be used in place of lamps if certain conditions are met.

LED's only work one way round. The cathode connects to the negative side of the circuit and is indicated by the shortest lead, or by a "flat" on the body of the LED.

LED's work at voltages between 2V and 3V. To prevent damage, they require a resistor in series with them in order to limit the current flowing through them. The resistor has two values, its resistance measured in ohms, and its power measured in watts.

To calculate these two values use the following formulae:-

resistance = ((T/R voltage - 2) * 100) ohms (Ω)

power = ((T/R voltage - 2) ÷ 100) watts (W)

Exact values are not necessary, but larger values are safer than lower ones.

Suitable resistors for a variety of T/R voltages are shown below

12V	1K0 (1000 Ω) 5% 1/4W (min.)
15V	1K3 (1300 Ω) 5% 1/4W (min.)
18V	1K6 (1600 Ω) 5% 1/4W (min.)
24V	2K2 (2200 Ω) 5% 1/4W (min.)

All of the above assume LED's rated at a current of 10mA. These values are safe for use with any LED.

Some LED's are recommended to have a higher current of 20mA. In this case, the value of the resistor will need to be reduced. The resistance should be halved, and the power should be doubled.

Some LED's are available with built in resistors. These will usually be labelled as 12V or 24V, and do not require a resistor when used at their rated voltage. Usually the terminals are of different materials. The brass terminal should connect to the positive side of the circuit.

If an LED is too bright (this can be a problem with white and blue LEDs) a higher value resistor (e.g. 4K7-10K 1/4W (minimum)) can be used to dim them.

1K0 = 1,000 Ohms.

Commissioning

Wiring Checks

Having wired all of the above, the system can now be commissioned.

Ensure that the crescendo fader has been calibrated as described in the crescendo section of this manual.

Before programming the system for use the following checks should be carried out.

Check each stop switch as follows:

Turn each stop on in turn and check that it functions correctly in the organ.

If it doesn't:

- Check the positive feed to the switch.
- Check the switch signal is getting to the input pin.

Next check each stop's off coil:

- Turn each stop on one at a time and press General Cancel; check that the stop moves off.

If it doesn't:

- Check the positive feed to the off coil.
- Check the off signal is getting to the stop.
- Another possibility is that the wires are swapped with another stop. Leave this stop on and continue testing by pulling out each stop in turn. If this stop cancels when another one is drawn then there is a wiring error.

To check each stop's on coil it is necessary to program a piston. Set the Scope of one piston to all of the stops and use that piston to check each stop's on coil as follows:

- Turn each stop on one at a time and set it on the piston.
- Press General Cancel to turn the stop off
- Press the piston to check that the stop comes on.

If it doesn't:

- Check the positive feed to the on coil.
- Check the on signal is getting to the stop.

Programming

Once the wiring checks have been made there are four specific tasks that must be performed to properly commission CFMII for operation in a particular installation. They must be performed in sequence to ensure that the unique properties of the installation are properly placed into the systems configuration. Failure to do commissioning in this order will likely create situations where the system does not have the information to properly function when levels are cleared or otherwise initialised.



The CFMII uses a similar system to the MultiSystem II processors for the rest of the organ. However, in this case the SD memory card is always fitted and is used to store all the piston settings. There may be times when the card needs to be removed to update the system software. This card is labelled "Pistons" by the factory and needs to be back in the system before powering up to use the organ.

The CFM system allows you to define how each piston controls the console. There is an input called Scope which is used to program the pistons. On some consoles this control is fitted for the organist to set the scope of individual levels on others it is a switch in the back. If you fit a switch inside the console it should be latching as you will need to push both Set and Scope during programming.

The scope of a piston can always be tested by switching on scope and pushing the piston. The scope of stops controlled by this piston will move on.

When you first switch on the CFMII the display will flash No DFLT. This is to warn you that the system has not been set up completely but you can still use some of the functions.

Once you have Initialised the first 10 memory levels in Stage 4 of the commissioning do not turn off the power until you are ready to do the remaining levels. The reason is that the next time you turn on the power the system will automatically start initializing the remain levels and this could take some time. Best to reserve this for a meal break.

1 - Set SCOPES and Data for All Pistons on the First Bank, First Level

Divisionals

- Press cancel to ensure all stops are off.
- Pull out the stops of a division.
- Hold Set and SCOPE.
- Press each of the division's pistons in turn.
- Press cancel and test that the SCOPE is correct by holding SCOPE and pressing each piston in the division.

Repeat the above process for all divisions.

Generals

- Turn on all of the stops that you wish to be affected by the general pistons.
- Hold Set and SCOPE.
- Press each general piston in sequence starting from General 1.

IMPORTANT NOTE: It is mandatory that General 1 be wired to the first general in the layout so that the system can learn what the size of a general is. It is also mandatory that the generals be SCOPEd in order so that the sequencer table is created properly. When scoping the generals watch the last piston display panel to ensure the piston number is correct. It is possible for the piston to bounce and the general piston to be recorded twice. If this happens simply start from 1 again until the sequence is completed without errors.

Confirm that the SCOPE of the general pistons is as desired. Also confirm that the number indicated on the display corresponds to the general number. If it does not, you must re-SCOPE the generals starting with General 1 and proceeding in sequence. If it is still incorrect, check that General 1 is wired to the correct pin on the system.

Reversibles

- Press cancel to ensure that all stops are off.
- Pull out the one stop that you wish to make a reversible.
- Hold Set and SCOPE and press the reversible piston.
-

Test pistons reverse the correct stop with the scope off. If the stop does not reverse but comes on and stays on it is possible there was another stop switch on at the time the reverser was programmed, this will cause the piston to be programmed like a divisional. It may be necessary to check for a positive signal on a stop input on the plane and then fault find it.

If you wish to have this reversible turn off other stops when it goes off such as 16' and 4'

- Turn on Blind Check
- Turn ON the stops that need to cancel.
- Hold Set and press the reversible piston.
- Turn off Blind Check

Confirm proper operation, that is, the reversible functions as expected and the associated intercanceling stops go off with the reversible stop going off.

Note that the reversible will not function in Blind Check mode as it is displaying the data.

Blind Pistons (Tuttis and Ventilis)

Commissioning the Blind pistons and switches requires three steps to set the SCOPE, the stops and the type.

If you are commissioning a Blind Switch (e.g. Reeds Off) where the instructions say press the piston the switch must be switched on and then off.

Before you start: The instructions refer to Inclusive and Exclusive tuttis. An inclusive tutti will add to the current registration so if the Zimblestern is on it will stay on when the tutti is engaged. An Exclusive tutti will always sound the same, any stops on will be switched off but stay drawn.

STEP 1:

Set the SCOPE of the blind piston:

- Turn on Blind Check.
- Turn on all stops and controls to be affected by this piston.
- Hold Set and SCOPE and press the piston.

STEP 2

Set the piston data:

- Leave Blind Check on.
- Put the stops in the desired position for when the tutti/ventil is on (for an inclusive tutti, they will already be in position from the previous step). For an exclusive tutti, the stops which are to come on must be on and the stops which are to go off must be off. For a ventil, they must be all off.
- Hold Set and press the piston.

STEP 3

Set the piston type:

- Turn off Blind Check
- Leave the stops as they were from the previous step.
- Hold Set and SCOPE and Press the piston. The system will set the blind piston type by comparing the SCOPE with the stop positions.

Note: This sequence must be followed to properly set the blind piston type. After this is done, the setting of the piston can be changed as desired.

Examples:

To SCOPE a Full Organ:

Turn on Blind Check
Turn on all of the stops
Hold Set and SCOPE and press the Full Organ piston
Hold Set and press the Full Organ Piston
Turn off Blind Check
Hold Set and SCOPE and press the Full Organ piston

To change the stops on the Full Organ

Turn on Blind Check

Press the Full Organ piston – the stops will come on

Move the stops as desired

Hold Set and press the Full Organ piston

Turn off Blind Check

To SCOPE an Exclusive Tutti for the Great Reeds:

Turn on Blind Check

Turn on the stops of the Great division

Hold Set and SCOPE and press the Great Reeds piston

Turn off all the stops except the Great Reeds

Hold Set and press the Great Reeds piston

Turn off Blind Check

Hold Set and SCOPE and press the Great Reeds piston

To SCOPE a Ventil on the Swell

Turn on Blind Check

Turn on the stops of the Swell division

Hold Set and SCOPE and press the Ventil piston

Turn off the stops of the Swell division

Hold Set and press the Ventil piston

Turn off Blind Check

Hold Set and SCOPE and press the Ventil piston

NOTE: CFMII determines the Blind Piston type (inclusive tutti, exclusive tutti, ventil) by comparing the data and SCOPE of the tutti. If they are the same, the tutti is set as an inclusive tutti. If the data is less than the SCOPE then the tutti is set as an exclusive tutti. If the data is all off then the piston is set as a ventil. Once this type has been determined, it does not change until you go through the process above.

2 - Program the First Crescendo

The CFM has 4 Crescendi, Standard, which is only settable by the organ builder and A, B and C which are settable by the organist.



By the end of commissioning Crescendo Standard will contain a fixed setting available to any organist. First you need to program this setting into Crescendo A.

- Select Crescendo A on the 4 button panel
- Hold Set and press Crescendo Adjust (The red Crescendo Adjust light will come on)
- Press the Up button on the right side of the control panel to go to Stage 1 (the display will read C01 on the right)
- Turn off Blind Check (if it is on)
- Move the stops as desired for Stage 1
- Press Set (the crescendo automatically goes to Stage 2) (The display will flash S for Setting)
- Add (or change) stops as desired for Stage 2
- Press Set (automatically goes to Stage 3)
- Repeat until the crescendo is set.
- Don't forget to set the last Stage.
- Press Crescendo Adjust to go to normal operation

Since there are 60 stages, it can be helpful to put the same settings on multiple stages and then go back and refine it. It is also not necessary to set every stage, stages not set will remain neutral. If you finish programming the crescendo at stage 30 then all the effect will be squeezed into the first half of the shoe travel.

It is often a good idea to set the first few Stages to nothing so that accidental bumping of the pedal has no effect.

The Bank Up and Down buttons can be used to move through the Crescendo Stages. Pressing Set in Crescendo Adjust mode will save the stops to the displayed Stage and advance to the next Stage.

Initially setting up a crescendo is easiest with Blind Check off. Refining a crescendo is easiest with Blind Check on.

You can check the progression of stops by turning on Blind Check and moving the crescendo pedal. It can also quickly find Stages that are programmed off.

On CFMII, unprogrammed Stages do nothing at all and so do not cause jumping around.

3 - Set Default Level and Crescendo Standard

Set the Default Level:

- Ensure Crescendo Adjust is off
- Select Level 1 on the left side of the display
- Check all the pistons contain the settings you want on a clear level. This is usually where all pistons have no stops set. If required set all the pistons with no stops to achieve this.
- Touch a Positive lead to the Set Default Level (Page 0) pin. The display will indicate "Dflt Set" while the file is written.

Note: This operation copies the contents of the first level to the system default file. This file is used for subsequent commissioning and also defines the memory a level has if it is cleared.

Crescendo Standard:

- Select Crescendo A
- Hold Set and press Crescendo Adjust
- Touch a Positive lead to the Set Default Level (Page 0) pin

This will copy the contents of Crescendo A to Crescendo Standard.

Note: Crescendo Standard is used for subsequent commissioning.

4 - Initialise the memory levels

Once we have programmed the system with tutti, piston scopes and Crescendo Standard it is necessary to format the SD card contents by initialising the working memory complete with the defaults. **This will delete any previous settings on this card.**

49	GO/Pd Reverser Piston
50	Pos/Pd Reverser Piston
51	Tutti Piston
52	Spare Piston 1
53	Spare Piston 2
54	Spare Piston 3
55	Set
56	Scope
57	General Cancel
58	MIDI Cancel
59	Set Default Level (Page 0)
60	Reinitialise 10 Levels (nn1-nn0)
61	Reinitialise All Levels 11 +
62	(not used)
63	Always fire all coils
64	(not used)

The first 10 levels are initialised using a pin on the plane which must be used in conjunction with Set as a safety measure. A typical connector list is shown above but does not represent the actual pins on this system please refer to the connector list in this binder for the correct pins.

- Select Memory Level 1
- You may need someone to hold the Set piston in.
- Hold Set and touch a Positive wire to the 'Reinitialise 10 Levels' pin which is in the same group as set and general cancel.

The display will indicate progress and will display INIT 1A to 1J and take about 5 minutes.

At this point the first 10 memory levels are fully functional. To continue to initialize the remaining levels you may either switch power off and on again or use the following procedure.

Initialise the remaining levels:

- Hold the Set piston in.
- Touch a Positive wire to Reinitialise Levels 11+ . The display will indicate progress.

This will take some time. It takes about 20 minutes to initialise 300 levels. and about 7 minutes to do 100 Levels.

At this point, the system is fully commissioned. Randomly select banks and levels and check operation to see that all is well.

Additional Features

Scope Update

Organist Palette

Libraries

- The CFM system will ignore you if you try and SCOPE a General piston with no stops on. The system may appear to be unresponsive if it has not been SCOPEd.
- When you SCOPE General 1 you teach the CFM what stops are in a General. If you then SCOPE a General input with a different selection of stops the CFM will stop SCOPING Generals and the last General piston number will not count up. This is done in the order that generals are discovered by the system.
- The system default level must be present for the initialisation routines to work. This file is created when the Set Default Level routine is used.
- The system default level must be present for the level double clearing to work properly.
- Recent versions provide indication about the system default file which can help in troubleshooting.
- It is not strictly necessary to initialise levels other than 1 to 10 because the system will do it automatically the first time a higher level is accessed. However, it takes a while and a better user experience is to do the initialisation as part of commissioning. It is also a good test of the overall system integrity.
- The Reinitialise 10 Levels input operates on the current bank and can be used to fix up a that group of 10 should that be necessary.
- The Double Clear function can be used to fix up an individual level.

CFMII Operational Information

Some of the CFM functions require the additional use of the Set piston. This is because they update the system memories or other critical functions.

CLEAR Button:

On its own: Does nothing

Set AND Clear: Will clear the current memory level. The display will change to '-----' to indicate system is busy. A clear level is shown with a C at the left side. SO if you are on Level 6 the 006 display will now show C006

This function clears the piston data but does not rewrite the SCOPE information.

DOUBLE CLEAR

Double Clear is a way to cause the system to clear the level by writing the system default file to it. This is done as follows:

Hold Set in (it must be held in for the duration of the operation)

Press Clear and wait for the display to return with C006 for example

Press Clear again to tell the system to copy the default file to this level.

NOTE: This function depends upon Set being held until the Clear button is pressed the second time. If you release the set button between presses, the process is abandoned.

COPY Button:

This button is used to copy and paste memories between levels much like a copy and paste function on a computer.

The Copy lamp shows if there is a memory ready to paste. The system will only copy if the lamp is off and paste if the lamp is on. The copy button must be used with Set. If you press Copy without Set it will delete the paste memory and the lamp will go out.

- The copy process begins with the lamp off. Press Copy by itself if the lamp is on to abandon the current contents.
- Navigate to the level you want to copy.
- Hold Set and press Copy; the Copy Lamp lights.
- Navigate to the destination level. Hold Set and press Copy.
- The copy lamp remains lit until the process completes and then goes out. A level copy takes about 5 seconds.

- The largest single problem we see when helping installers fault find capture systems is power, or lack of it. A fully loaded CFMII is capable of switching 750 Amps which can also weld a skyscraper. You can never have too much power and the cables can never be too thick. Here are a few tips:
 - The positive cable to the MultiSystem old needs to be able to feed 10 Amps unless there are positive outputs on the plane.
 - The Negative cable must conduct enough current to drive every output. If this cable is too thin the negative or ground reference for the system will be unstable and different parts of the system will operate at different references. This will certainly cause unreliability or at worst a fire in the cable. We are happy to advise on cable thicknesses which are a function of current requirement and length.
 - The power supplies need to be able to supply enough current to move every knob on the console plus a safety margin. Count the knobs and divide by 2 is a good approximation.
- If the generals are not configured, the sequencer will behave oddly or not even function.
- If NO DEFLT shows on the display when the system powers up the Set Default procedure has not been completed and the system will not operate correctly until this procedure is completed. See Page 20 Set the Default Level:
- If there are intermittent network errors, it is possible that the displays will not reflect the CFMII state. If an up or down button is pressed, all displays will be immediately updated. There will likely be network errors showing on the processor display. CFMII depends upon a reliable network.
- The entire system state and piston data resides on the SD card. This card can be transferred to a new processor should a field replacement be necessary.
- The General Cancel button unconditionally sets everything off. If there are coils that are not behaving, the problem will be in the console processor. All coil processing takes place at the local console processor.
- A particularly brutal systems test is to build a complete 60 step crescendo and, with Blind Check on, move the pedal quickly. It is the most processor intensive thing you can do. It tests the CFMII, the network, location processor and the power systems.
- If when transferred or coupled the pistons do not have the correct setting this is usually caused by a wiring error. Check for pistons being wired to the wrong pin. Get someone to hold in each piston in turn and check that the voltage appears at the correct pin. You can also use the built in system diagnostics. When switch 2 on the console processor is on the display will report the most recent input. There is more detail on this in the MultiSystem II installation manual but basically with this switch on you can push a piston and then look at the display for the reference information.