

42-661 EMO Master Switcher Unit CM6

WARNING
TO AVOID ELECTRICAL SHOCK, READ THESE INSTRUCTIONS CAREFULLY

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These instructions apply to UK versions only.

For further information or servicing please contact your local EMO Dealer.

EMO Systems, Crowther Road, Washington NE38 0BW, U.K. Tel: +44 (0) 191 418 1000
Our Policy is one of continuous development: all specifications and design details are subject to change without notice.

1. Introduction

1.1. Safety

Mains power wiring is dangerous. A suitably qualified person should install the system. Reference should be made to BS & any other local wiring requirements.

Before working on this system or altering any of the options, isolate the units from the electricity supply. When the supply is hard wired turn off the local isolator and preferably remove the fuses. Ensure that all staff know that you will be working on the system. If power is supplied from a pluggable source, remove the plug.

This unit should be fitted in a suitable enclosure (19" rack) to restrict access to the wiring terminals.

1.2. Description

The system allows mains powered electrical equipment to be turned on and off in a particular sequence. Instructions to initiate the sequence are input via a coded keypad. The CR6 Remote Panel allows control from a location remote to the CM6 Master Unit. The CM6 Master Unit contains all the control electronics together with the first two sequential power outputs. A further 8 low voltage outputs are available to control CS6 Slave Units.

A front panel facility socket outlet is fitted to allow soldering irons, working lights to be used during installation/maintenance.

2. Installation

2.1. Fixing

All units are designed for mounting in a standard 19" rack. The plastic bushes supplied should be used beneath the fixing screws to prevent damage to the front panel. We would suggest that rear (or side) supports be used to prevent cabling distorting or bending the chassis. The unit will generate a small amount of heat so should not be placed in an unventilated position.

2.2. Keypad de-select (optional)

When a CR6 Remote Panel is fitted to a system it is sometimes necessary to prevent the keypad on the master unit being able to operate the system. This can be achieved by cutting a wire link on the keypad PCB in the master unit. This link is situated on the LED end of the front panel PCB and is accessible without removing the board from the unit. This link only prevents the keypad from operating, it does not disable the LED's so that the system status can be checked.

2.3. Wiring

Read paragraph 2.3.1 before proceeding.

All connections to the system are 'hard' wired. If a pluggable system is required the E.M.O. 19" Power Distribution System panels will provide a solution.

2.3.1. Power

All power (mains) wiring to the system is via the rail mounting terminal blocks on the rear panel. Supply requirements are single phase 240VAC, under no circumstances should 415V be connected to the system. The power input terminals will accept cables with conductors up to 10mm², which should be provided from a suitable local fused isolator with a rating suitable for the cable size used up to a maximum of 60amps. The unit must be earthed.

If power is being provided via 'pyro' or similar, access to the inside terminations is available through a 20mm hole in the rear panel. The 'live' connection can be made directly into the main rail terminal by removing the rear panel to internal rail cable link. The 'neutral' connection is made to the busbar with the fitted cable connector. The 'earth' termination should be to the chassis earth terminal (M4 ring terminal).

Power outputs from the system are available on three way 'in-line' terminals, 5 ways per output are provided to prevent the need for terminal sharing. Each output terminal will accept up to 4mm² conductors. If regular disconnection is envisaged then the use of crimp pins is recommended to prevent conductor damage. When using flexible cables ensure all cable strands are located in the terminal.

2.3.2. Slaves

Slave units that are connected are controlled from the 10way barrier strip marked SLAVES. Each slave unit requires a pair of wires from this strip and should preferably be run in 'star' fashion. Terminals 1 to 8 are control outputs and terminals 9 & 10 are commons. Connecting cables can be any suitable low voltage wiring, e.g. burglar alarm wire or phone cable. The use of space crimps is recommended. Low voltage cables should be segregated from power (mains) cables.

2.3.3. Remote

The CR6 Remote Panel allows the system to be controlled from a remote location. To give complete control and maximum security a 9 wire cable is required to connect the remote panel to the master unit. Wiring between the barrier strips is 1 to 1, 2 to 2 etc. Most low voltage types are suitable as in 2.3.2. Low voltage cables should be segregated from power cables.

It is possible to use the system with a reduced number of wires in the control cable but this does allow the 'cracking' of the code to be a lot easier and may prevent menu functionality and restrict flexibility when code changing. The wire coinciding with a key which does not appear in the set code need not be run, e.g. if the set code is 3642 then the wires corresponding to keys 1 & 5 need not be used for the code, but the menu would be inaccessible. The barrier strip numbering corresponds with the keypad number, i.e. barrier strip terminal 1 controls key 1 etc. Wires between strip numbers 7, 8 & 9 MUST be connected.

2.3.4. Alarm override

The unit requires a link between sockets 'A' and 'B' on the rear panel of the CM6 in order to operate. When removed, the unit will sequentially turn off any powered channels and will not accept the 'ON' code. This allows automatic external shutdown of the system where required.

2.4. Setting up the system

When a system is first installed it is necessary to program the master unit with information about the number of slaves fitted, and the code also needs setting to the required value.

In an earlier version of the CM6, the unit was configured by moving the small jumper plugs on the headers on the printed circuit board (PCB) in the master unit. However, the method of configuration now uses the buttons on the front panel, and this can be done from both the CM6 and a CR6 remote panel, if connected. Access to the inside of the unit is no longer required for normal operation, unless the security code needs to be reset back to factory default settings.

2.4.1. Modifying the security code

The factory default security code is '1234'. This code can be changed by accessing a menu using the 6 buttons on the front of the unit. To modify the security code, follow this procedure:

1. Hold down buttons '1' and '4' simultaneously for 5 seconds until both the On-LED and Off-LED start blinking together.
2. Enter the existing security code within 8 seconds.
 - a. If correct, the LEDs will now blink alternately, at the same rate to indicate the new code may be entered.
 - b. If incorrect, the LEDs will both be unlit for 5 seconds and the unit will return to normal operation, to indicate that an error was made.
3. Enter the new code within 10 seconds. The new code may be 4-6 digits in length, each digit may use any of the numbers from 1 to 6 (e.g. 5213, 322456). Wait for the LEDs to stop blinking alternately, and to return to blinking together (indicating that the code may be re-entered).
4. Re-enter the new code as confirmation, within 8 seconds.
 - a. If correct, the LEDs will both be lit for 3 seconds to indicate successful modification of the code. The new code is stored and the old code is no longer valid.
 - b. If incorrect, the LEDs will both be unlit for 3 seconds to indicate that an error was made. The code remains unchanged.
5. If the code is lost or unknown, it can be reset using the security code reset procedure.

2.4.2. Modifying the number of slaves

The factory default configuration is for the master unit to operate on its own or with one slave unit connected. If further slave units are to be used with the system then follow this procedure:

1. Hold down buttons '2' and '5' simultaneously for 5 seconds until both the On-LED and Off-LED start blinking together.
2. Enter the security code within 8 seconds.
 - a. If correct, the LEDs will now blink alternately, at the same rate to indicate the number of slaves may be entered.
 - b. If incorrect, the LEDs will both be unlit for 5 seconds and the unit will return to normal operation, to indicate that an error was made.
3. Enter the number of slaves within 10 seconds. The number of slaves can be set by entering either one or two digits. If one digit is entered this sets the number of slaves (e.g. button 3 sets 3 slaves) and the LEDs continue blinking until the 10s have expired. If two digits are entered, the values are added together to set the number of slaves (e.g. when buttons 5 and 3 are pressed, this would set 8 slaves). A minimum of 1 slave, and a maximum of 8 slaves may be set.
 - a. If entered correctly, the LEDs will both be lit for 3 seconds to indicate successful modification of the number of slaves. If the channels are powered, the On-LED will now blink whilst the channels are sequentially turned on or off with 10s intervals until only the correct slave outputs are powered.
 - b. If entered incorrectly, the LEDs will both be unlit for 3 seconds to indicate that an error was made. The number of slaves remains unchanged.

2.4.3. Selecting sequence type: normal, fast or instant

The factory default setting is for normal sequential on/off control. However, in some circumstances it is desirable to use the faster sequence or to override the sequencing feature to allow instant on/off. This setting can be modified by following this procedure:

1. Hold down buttons '3' and '6' simultaneously for 5 seconds until both the On-LED and Off-LED start blinking together.
2. Enter the security code within 8 seconds.
 - a. If correct, the LEDs will now blink alternately, at the same rate to indicate the sequencing selection may be entered.
 - b. If incorrect, the LEDs will both be unlit for 5 seconds and the unit will return to normal operation, to indicate that an error was made.
3. Enter the sequencing selection within 10 seconds.

- a. For normal sequencing, press buttons 1 or 2. A 10 second interval will be applied between each channel being turned on or off.
 - b. For fast sequencing, press buttons 3 or 4. Sequencing behaviour:
 - i. Whilst turning channels on, a 10 second interval will be applied after CM6 channel 1, and a 5 second interval will be applied after each subsequent channel (CM6 ch. 2 and each slave)
 - ii. Whilst turning channels off, all CS6 slaves and the CM6 channel 2 will turn off immediately, then a 40 second interval will be applied before turning off CM6 channel 1.
 - c. For no sequencing (instant on/off), press buttons 5 or 6.
4. Check for confirmation and consider testing the sequencing selection made
- a. If successful, the LEDs will both be lit for 3 seconds to indicate successful modification of the sequencing or instant selection made.
 - b. If unsuccessful, the LEDs will both be unlit for 3 seconds to indicate that no button was pressed.

3. Operation

3.1. System

On first connecting power to the system, the system will be 'OFF' indicated by the Off-LED (marked 'OFF') being lit. Upon entry of the correct security code, all channels will sequentially turn on:

- The On-LED (marked 'ON') will blink.
- Output 1 will be powered and output 1 LED will be lit.
- After 10 seconds output 2 will be powered and output 2 LED will turn on.
- After a further 10 seconds slave 1 will be powered (if connected) or the sequence will end.
- Each configured slave output will be sequentially powered with 10 second intervals between each one.
- Once all configured outputs are powered, the On-LED will stop blinking and will remain on.
- During the turn-on sequence no 'OFF' code will be accepted.

Once the 'ON' sequence has been completed, entry of the correct security code will start the turn-off sequence i.e. turn-on in reverse. Similarly to the 'ON' sequence the 'OFF' sequence will not accept an 'ON' code until the system has completed its cycle.

After entry of the first correct digit of a code the rest of the code must be entered within 8 seconds or the code will be rejected. If an incorrect code is entered, 10 seconds should be allowed before trying again.

The code will not be accepted if the external shutdown link is not present between sockets 'A' and 'B' on the rear of the CM6. See section 2.3.4: Alarm override.

After loss of power the system will reset to 'OFF'.

3.2. Facility outlet

The front panel facility outlet is not switched and is live whenever power is connected. It should not be used to supply permanently connected equipment. To prevent misuse of this socket, remove the rear panel fuse.

4. Factory Reset

4.1. Security code reset procedure

If the security code fails, ensure you wait 10 seconds before re-trying, otherwise the new code will be ignored. No buttons must be pressed during this 10 seconds period.

If the security code is unknown, it may be reset back to the default value. However, this requires access to the inside of the unit. Follow the procedure below:

1. Disconnect power from the CM6.
2. Remove the top panel of the CM6 to give access to the internal electronics.

3. Locate the green printed circuit board (PCB) inside the CM6.
4. Locate the text "RESET" close to the centre of the PCB, and the 3-pin header just besides this text. This is the password reset header.
5. Two of the three pins of the password reset header have a white marked line across two of the pins. Relocate the jumper from its 'resting' position to be across the two pins marked with the line.
6. Replace the top panel back onto the CM6.
7. Reconnect power to the CM6.
8. Ensure the Off-LED is lit for 5 seconds.
9. Disconnect power from the CM6.
10. Remove the top panel of the CM6.
11. Remove the reset jumper and return it to the 'resting' position, so it does not connect the pins marked with the line.
12. Replace the top panel back onto the CM6.
13. Reconnect power.
14. Enter code '1234'.
15. The channels should now sequentially turn on. If you make a mistake, wait 10 seconds before re-entering the code.

4.2. Factory reset procedure

The CM6 may be returned to factory default settings:

- Security code is reset to '1234'.
- Number of slaves is reset to 1.
- Sequential on/off is enabled.

In order to perform a factory reset, access is required to the inside of the unit. The factory reset procedure is identical to the security code reset procedure with an additional two steps highlighted in bold text:

1. Disconnect power from the CM6.
2. Remove the top panel of the CM6 to give access to the internal electronics.
3. Locate the green printed circuit board (PCB) inside the CM6.
4. Locate the text "RESET" close to the centre of the PCB, and the 3-pin header just above this text. This is the password reset header.
5. Two of the three pins of the password reset header have a white marked line across two of the pins. Relocate the jumper from its 'resting' position to be across the two pins marked with the line.
6. Replace the top panel back onto the CM6.
7. **Hold down buttons 1, 3, 4, 6 firmly. Ensure buttons 2 and 5 are not held down.**
8. Reconnect power to the CM6.
9. Ensure the Off-LED is lit for 5 seconds.
10. **Release the buttons.**
11. Disconnect power from the CM6.
12. Remove the top panel of the CM6.
13. Remove the reset jumper and return it to the 'resting' position, so it does not connect the pins marked with the line.
14. Replace the top panel back onto the CM6.
15. Reconnect power.
16. Enter code '1234'.
17. The channels should now sequentially turn on. If you make a mistake, wait 10 seconds before re-entering the code.

5. Fusing

5.1.1. Fuses

The two main outputs are fused at 10amps and 32amps respectively.

Fuses fitted are 'gl' type industrial cartridge fuses, 10.3 x 38 HRC.

Replacement Fuse Part Numbers

	Legrand	Ferraz	RS Components
10Amp	13310	gl 10 10	421-031
32Amp	13332	gl 10 32	209-9349

Certain types of load may blow either the SWITCHER fuses (and /or external supply fuses/breakers) at switch on. This is particularly a characteristic of some audio power amplifiers. As an example there is a particular amplifier that will run perfectly happily on a 10amp circuit but draws in excess of 100amps during the first 50mS after switch on. The solution to this is to reduce the load on each output by adding further slave units until the problem is solved.

Some items of equipment that are fitted with combined circuit breaker and ON/OFF switches do not reliably turn on remotely i.e. when the item is left turned on and the supply is connected. There is no solution to this problem apart from removing the offending circuit breaker, this is not recommended.

5.1.2. Socket fuse

The front panel socket is fused via the rear panel mounted fuse holder. The fuse is 5amp to BS1362 as fitted to square pin mains plugs. The RS part number is 412-576.

6. Troubleshooting

6.1. Power supply and fuses

Symptom	Cause	Solution
Front panel neon not illuminated	Mains supply failure	Check mains supply
Neon on but no LEDs lit (for longer than 3 seconds)	Electronics Failure	Check PCB fuse
Neon on, LEDs lit but mains output does not work.	Main contactor fuse	Check output fuses
Power surges blowing fuses		See section Error! Reference source not found. : Error! Reference source not found.

6.2. LED indication troubleshooting

LED Indication	Unit State	
On-LED is lit; Off-LED is unlit.	All channels are on (excluding the slaves which are not configured; these can be enabled using the configuration menu).	If channels cannot be toggled by entering the code, ensure the alarm override link is in place, and the CM6 keypad has not been disabled (wire cut on PCB). Wait 10s after entering incorrect code before retrying. If correct code is unknown, follow the code reset procedure.
On-LED is unlit; Off-LED is lit.	All channels are off.	
On-LED blinking; Off-LED is unlit.	Channels are being turned on in sequence with 10s interval between each one; wait until complete. Or... Number of slaves has been modified and channels are being sequenced on or off to match the new configuration; wait until complete.	
On-LED is unlit; Off-LED is blinking.	Channels are being turned off in sequence; wait until complete. Or, Alarm override is active and channels are being turned off in sequence	

	<p>automatically. User cannot turn channels on when the override is active. If the alarm override is deactivated whilst some channels are still on, the channels will continue to turn off, but the user may enter the code to prevent further channels being turned off and to instead turn back on the affected channels.</p> <p>Or,</p> <p>If this occurs at power up when all channels are off, there is a system error.</p>
Both LEDs are blinking together.	<p>Unit is waiting for correct code to be entered (within 8s) in order to allow access to menu;</p> <p>Or,</p> <p>New code has been entered in the menu, and unit is waiting for the new code to be entered (within 8s) again, as confirmation before it is stored.</p>
LEDs are blinking alternately, at the same rate.	<p>User has accessed the menu for modifying the security code, by entering the correct access code. User must now enter the new code within 10s. If incorrect code is entered, LEDs will continue to blink for the full 10s.</p>
LEDs are blinking alternately, and the On-LED blinking at a faster rate than the Off-LED.	<p>User has accessed the menu for modifying the number of slaves, by entering the correct access code. User must now enter the number of slaves by pressing either one or two buttons within 10s. If the user presses a single button, this value will be used as the number of slaves (LEDs will continue to blink for the full 10s). If the user presses two buttons, these values will be added together to determine the number of slaves (maximum number of slaves is 8).</p>
LEDs are blinking alternately, and the Off-LED blinking at a faster rate than the On-LED.	<p>User has accessed the menu for selecting sequential or instant on/off of the channels, by entering the correct access code. User must now press buttons 1, 2 or 3 to disable sequencing (to use instant on/off), or press buttons 4, 5 or 6 to enable sequencing, within 10s.</p>
Both LEDs are lit for 3 seconds.	<p>User has successfully modified a configuration setting, which has been saved and will be retained by the CM6.</p>
Both LEDs are unlit for 3 seconds.	<p>An incorrect code was entered when accessing the menu,</p> <p>Or,</p> <p>Whilst modifying settings using the menu:</p> <p>Invalid new code entered (must be 4-6 digits long)</p> <p>Confirmation code doesn't match new code</p> <p>Invalid number of slaves entered (one to two buttons may be pressed, the sum of which must not exceed 8)</p> <p>No selection was made when selecting sequenced or instant on/off.</p>

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