M Series
CCT

ZOLL M Series

9650-0222-01 Rev. B

The issue date or revision level for this operation guide is shown on the front cover.

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Preface

How To Use This Manual

This manual insert describes the use of the M Series CCT option.

CAUTION! The user must be familiar with the M Series before operating an M Series CCT. If not familiar with the M Series, read the *M Series Operator's Guide* and relevant option inserts.

Before operating an M Series CCT, if you are unfamiliar with the M Series, read the *M Series Operator's Guide* and the relevant inserts. Thoroughly read the safety considerations and warnings sections in both the *M Series Operator's Guide* and the relevant option inserts. Consult the *Troubleshooting* section of those manuals if the M Series CCT fails to operate as expected.

This insert only includes information on the features not found in the standard M Series units. Unless otherwise noted in this insert, the M Series CCT features are identical to standard M Series features.

Place this insert in the three-ring binder along with the *M Series Operator's Guide* and all other option inserts.

Safety Summary

The following is a short summary of warnings, cautions and other safety information related to the M Series CCT option. Additional warnings and cautions are in the text of this insert. Read this section thoroughly before operating the M Series CCT.

- Read the *M Series Operator's Guide* and this manual insert before use.
- The M Series CCT is to be operated by qualified personnel only.
- Do not use in the presence of oxygen-rich atmospheres, flammable anesthetics or other flammable agents (such as gasoline). Do not use near the site of a gasoline spill. Explosion may result.
- Avoid using the M Series CCT adjacent to or stacked on other equipment. If unavoidable, check that the M Series CCT operates normally in this configuration before clinical use.
- The device is protected against interference from radio frequency emissions typical of two-way radios and cellular phones (digital and analog) used in emergency service/public safety activities. Users should assess the device's performance in their typical environment of use for the possibility of radio frequency interference from high-power sources. Radio Frequency Interference (RFI) may be observed as shifts in monitor baseline, trace compression, display brightness changes, or transient spikes on the display.
- The M Series CCT should be installed and put into service according to the Electromagnetic Compatibility (EMC) information provided in this insert.
- Route patient cabling and hoses carefully to avoid patient entanglement, strangulation or compression of hose.
- Do not touch the bed, patient, or any equipment connected to the patient during defibrillation. A severe shock to the operator can result.
- Do not allow exposed portions of the patient's body to come in contact with metal objects, such as a bed frame during defibrillation. Unwanted electrical pathways can result.
- If an alarm occurs while the alarms are suspended, audio alarm tones do not sound, only visual alarm messages display.

Safety Summary (cont.)

- Do not immerse the M Series CCT device, batteries, cables, or transducers in water, solvents, or cleaning solutions.
- Do not sterilize M Series unit or accessories except as specifically recommended in ZOLL manuals. Reusable transducers should be sterilized per the manufacturer's instructions.
- Connect the ECG-out jack, VGA-out jack, and modem (if available) only to other equipment with galvanically isolated circuits.
- When using the VGA video output connector, test system operation with target video display device prior to clinical use. Testing should include the Daily Checkout Procedure (see the *M Series Operator's Guide*).

Indications for Use

The M Series CCT indications for use are the same as for the standard M Series. For additional information, see the *M Series Operator's Guid*e and user inserts for installed options.

Contraindications for Use

The M Series CCT contraindications for use are the same as for the standard M Series. For additional information, see the *M Series Operator's Guide* and user inserts for installed options.

The M Series CCT

Introduction

The M Series CCT is an M Series unit with integrated features that provide additional display capabilities. The following sections describe the additional features. A typical M Series CCT front panel is shown in Fig. 1.

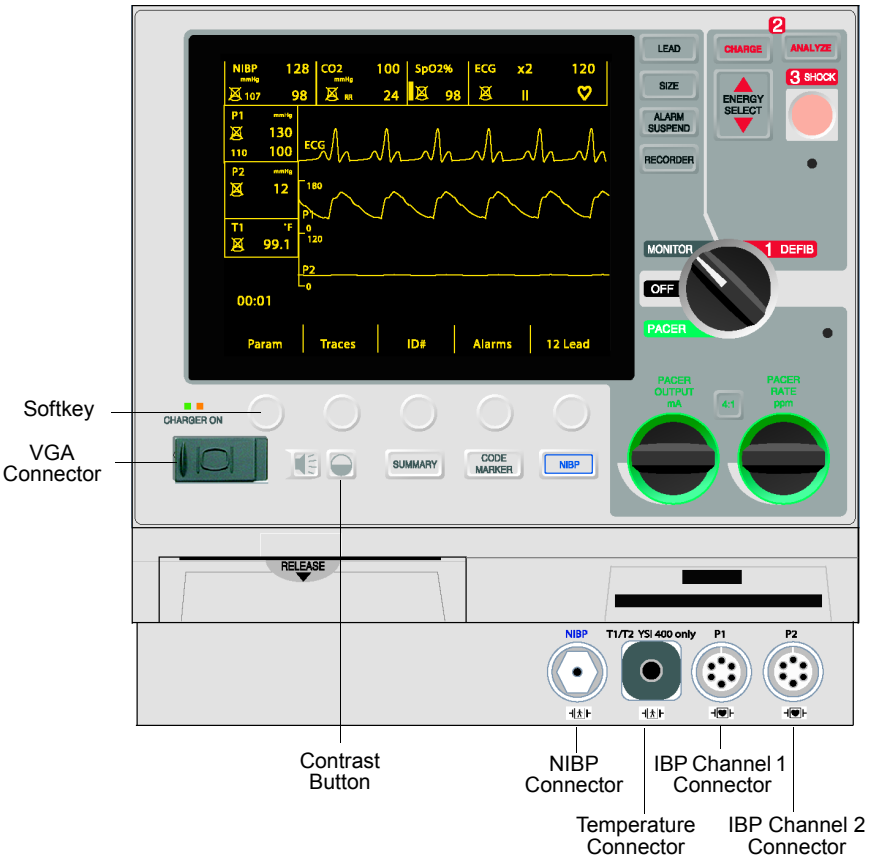

Figure 1: M Series CCT

NOTE: See Section 2 of the *M Series Operator's Guide* for the controls available on both the M Series and the M Series CCT.

M Series CCT Option

In addition to the standard M Series features, the M Series CCT option can do the following:

- Display three traces simultaneously (Trace 1 is always ECG).
- Select which traces display in addition to ECG.
- Connect to an external VGA display.
- Configure displayed parameters by color.

Reading the M Series CCT Display

The M Series CCT display is similar to the M Series display, except for the following:

- M Series CCT units display three traces (except when in **PACER** and **DEFIB** modes, when display messages take the place of Trace 3).
- IBP and Temperature have data display areas (if the unit has these options).
  The IBP and Temperature data display areas are described in detail in the IBP insert and Temperature insert. See Fig. 2 for their location on the display.

The M Series CCT three *Trace display* areas are shown in Fig. 2. The trace type for each display is as follows:

- Trace 1 - reserved for ECG.
- Trace 2 - type of trace determined by user.
- Trace 3 - type of trace determined by user.

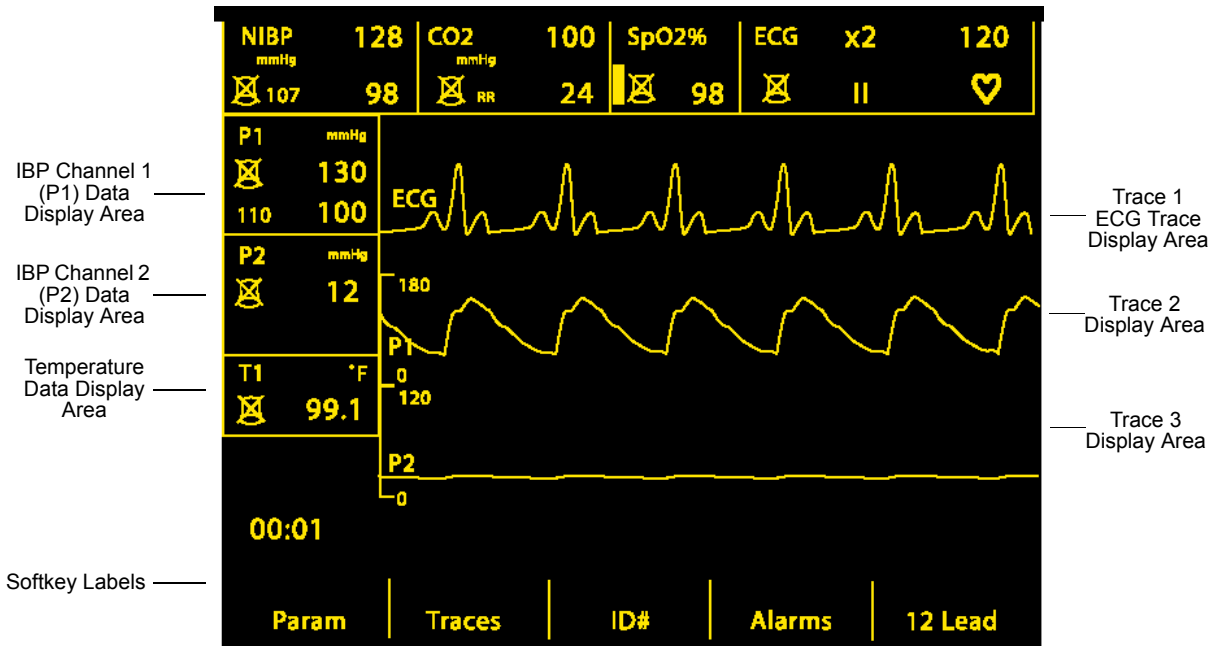

Figure 2: M Series CCT display

NOTE: Depending on the options included in the M Series CCT, the front panel and display may slightly differ from the illustrations in this insert. Each data display area is explained in detail in the applicable option inserts.

Using the M Series CCT options

The following sections describe how to use the M Series CCT option.

Changing the Display Traces

Trace 1 always displays the ECG waveform. You may select or change the waveform display for Traces 2 and 3. If the unit has the appropriate options, you can choose from the following parameters:

- 3 Lead ECG (uses all three display channels)
- IBP Channel 1 (P1)
- IBP Channel 2 (P2)
- $EtCO_2$
- SpO_2

When the unit is in **PACER** or **DEFIB** mode, display messages take the place of Trace 3.

Any changes made remain in effect until either the settings are changed or for 10 seconds after the M Series is turned off (the 10 second interval allows settings to remain in effect when the battery is changed).

Trace 2 and 3 are factory configured to be OFF when the unit is powered-up. However, they can be configured to display specific parameters on power-up (see the *M Series Configuration Guide*).

To select the displayed waveforms:

1. Press the **Traces** softkey (if the "Traces" softkey label is not displayed, press the **Return** softkey until "Traces" displays, and press the **Traces** softkey).
   The *Traces* menu display is shown in Fig. 3:

Figure 3: Traces Menu

2. Press the **Select** softkey to select "3 Lead ECG", "Set Trace 2", or "Set Trace 3."
3. Press the **Enter** softkey.
4. If "3 Lead ECG" is selected:
   - Traces 2 and 3 are set to ECG with each lead based on the active lead group. Trace 1 remains set with the **LEAD** hard key. For example, if Trace 1 is set to Lead II with the **LEAD** hard key, Trace 2 and 3 to are set to Lead I and Lead III respectively.
   - For units with 12 Lead ECG option, Custom Lead groups may be set based on pre-configured choices. For additional information, see the *M Series Configuration Guide* and *12 Lead Operator's Guide*.

Changing the Display Traces (cont.)

4. If “3 Lead ECG” ...(cont.)
   - Standard lead groups are listed below.
     - I, II, III
     - aVR, aVL, aVF
     - V1,V2, V3
     - V4, V5, V6
5. If “Set Trace 2” or “Set Trace3” is selected:
   The *Trace Options* menu displays (see Fig. 4):

Figure 4: Trace Options Menu

6. Press the **Select** softkey to select the type of waveform you want to display. You cannot select a waveform that is already displayed.
7. Press the **Enter** softkey. The unit displays the waveform for the selected parameter.
   To change the other trace, repeat steps 1 through 7.

Connecting to an External VGA Display (monitor)

An external VGA display (monitor equipped with industry standard 15-pin VGA connector) can be connected to the M Series CCT using the VGA connector(|▭| symbol) on the front panel shown in Fig. 1.

To connect the VGA display:

1. Open the rubber boot to expose the connector.
2. Attach the monitor's cable to the connector.

WARNING! Always test the M Series CCT with the target VGA display prior to clinical use. The tests should include the Daily Checkout Procedure (see *M Series Operator's Guide*).

To conserve battery life, the VGA output port is not active when the M Series CCT is initially powered up.

To enable or disable the VGA output port:

1. Press the **CONTRAST** button (see Fig. 1 on page 1), the *Contrast* menu appears (see Fig. 5):

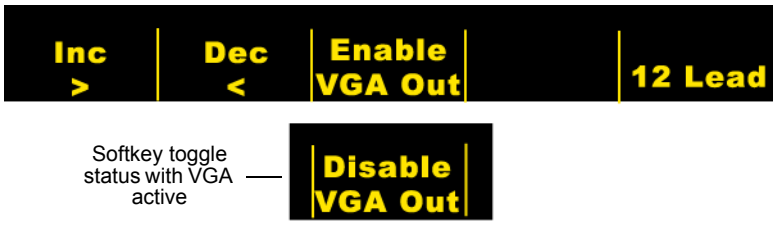

Figure 5: Contrast menu

2. To enable (activate) the VGA output port, press the **Enable VGA Out** softkey; the port is enabled and the softkey label toggles to "Disable VGA Out."

   NOTE: The softkey toggles according to current state of the port.

   NOTE: When the port is enabled and the M Series CCT is powered down (turned off or battery is removed) and then powered up within 10 seconds, the port remains enabled. When power is off for more than 10 seconds, the port is disabled (the default state).

3. To disable (deactivate) the VGA output port, press the **Disable VGA Out** softkey; the port is disabled and the softkey label toggles to "Enable VGA Out."

Configuring Displayed Parameters by Color

The M Series CCT allows you to select the colors used to display numerics and waveforms associated with each physiological parameter (e.g.: ECG, SpO_2, $ETCO_2$, NIBP, Invasive pressure 1 and pressure 2, Temperature, etc.).

The parameter display colors available are Red, Cyan, Purple, Blue, Green, Yellow, and White.

Parameter display colors are factory configured as indicated below.

Parameter	Color
ECG	Green
SpO_2	Yellow
$EtCO_2$	Blue
NIBP	White
Temp	Purple
P1	Red
P2	Cyan
ART	Red
PA	Yellow
CVP	Cyan
ICP	White

To reconfigure a parameter's display color, please see the *M Series Configuration Guide*.

Maintenance

Perform all periodic maintenance of the M Series CCT per the *M Series Operator's Guide* and the supplemental inserts for any other options.

Specifications

Unless described below, M Series CCT specifications are identical to M Series specifications. See the *M Series Operator's Guide* for further details.

Table: General Specifications

Size: w/ NIBP, IBP, Temp: w/o NIBP, IBP, Temp:	10.2" (25.9 cm) high x 10.3" (26.2 cm) wide x 8.7" (22.1 cm) deep 8.6" (21.8 cm) high x 10.3" (26.2 cm) wide x 8.7" (22.1 cm) deep
Weight:	17.2 lbs (7.8 kg) with Multi-function cable and battery 19.2 lbs (8.71 kg) with above and paddles
AC Power:	100-120 V, 50/60 Hz; 220-240 V, 50 Hz; 220 VA
DC Input (Optional):	10-29 V, 130 W
Device Classification:	Class I and internally powered per EN 60601-1 Class II and internally powered per EN 60601-1 (DC input only)
Design Standards:	Meets or exceeds UL 2601, AAMI DF-39, AAMI DF-2, IEC 601-2-4, EN 60601-2-25, and EN 60601-2-27
Patient Safety:	All patient connections are electrically isolated.

Table: Display Specifications

Screen Type:	Active Matrix Color LCD
Screen Size:	6.5" (16.51 cm) diagonal
Number of Pixels:	640 x 480
Sweep Speed:	25 mm/sec
Video Output:	Industry standard VGA, 640 x 480, 60 Hz

Table: Battery Specifications (XL Battery Pack)

Type:	Rechargable, sealed lead acid
Weight:	3.7 lbs (1.68 kg)
Voltage:	2 V/cell; 5 cells wired in series
Recharge Time:	7.2 hours or less with integral charger
Operating Time; For a new, fully charged XL battery pack at 20°C:	60 defibrillator discharges at maximum energy (200J), or 2.5 hours minimum of continuous ECG and SpO_2 monitoring, or 1.5 hours of continuous ECG, SpO_2, $EtCO_2$, IBP, and Temperature monitoring/pacing at 60 mA, 70 beats/min.

Specifications (cont.)

Table: Environmental Specifications

Operating Temperature:	32° to 122° F (0° to 50° C)
Storage and Shipping Temperature:	-4° to 140° F (-20° to 60° C) NOTE: The M Series CCT device may not perform to specifications when removed from storage at either the upper or lower extreme temperature limits and immediately put into use.
Humidity:	5 to 95% relative humidity, non-condensing.
Vibration:	Mil Std 810 E, Minimum Integrity Test
Shock:	IEC 68-2-27, 50g 6mS half sine
Operating Pressure:	594 to 1060 mBar
Material Ingress:	IEC 529, IP23
Electromagnetic Compatibility (EMC):	CISPR 11 Class B - Radiated and Conducted Emissions
Electromagnetic Immunity:	AAMI DF-2: 1996, EN 61000-4-3: 1996, 15 V/m
Electrostatic Discharge:	AAMI DF-2: 1996, EN 61000-4-2: 1995
Conducted Susceptibility:	IEC 61000-4-4: 1995, EN 61000-4-5: 1995, EN 61000-4-6: 1996

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