

# **Angel MP™ Telemetry Transmitter Operator's Manual**

Model DS2

**Federal law restricts this device to sale by or on the order of a physician.**



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### ***Preface***

The Angel MP telemetry transmitter is intended only as an adjunct to patient assessment. It cannot replace skilled nursing care and proper surveillance. Carefully read this operator's manual, all directions for use of the Angel MP, ESCORT monitors and monitor accessories, and all precautionary information before attempting clinical use of the Angel MP. Always keep high-risk patients under close surveillance.

The information in this document is subject to change without notice.

### ***Warranty***

The Angel MP is warranted against defects in materials and workmanship for twelve (12) months from date of shipment to original purchaser. Accessories such as batteries, cables, cuffs, and sensors are warranted for ninety (90) days from date of shipment. Warranty is valid only to original buyer. Defective equipment should be returned freight prepaid to Medical Data Electronics. Equipment returned with defective parts and assemblies will be either repaired or replaced. To return for warranty, first obtain a Return Material Authorization (RMA) from Technical Support. This warranty is not applicable if repair has been attempted, if the instrument has been damaged due to operation outside environmental and power specifications for product, or due to improper handling or use.

The foregoing warranty is in lieu of all other warranties expressed or implied, including but not limited to any implied warranty or merchantability, fitness or adequacy for any particular purpose or use. Medical Data Electronics shall not be liable for any incidental or consequential damages.

## Technical Support

If you experience any problems with this product, call:

Technical Support (818) 768-6411  
MDE FAX (818) 768-2899

## Trademarks

ESCORT Vision™ and Angel MP, are trademarks of MDE.

## Safety Considerations



**CAUTION:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



**NOTE:** This device complies with Part 95 of the FCC Rules. Operation is subject to the following condition: This device may cause harmful interference to other nearby medical devices.

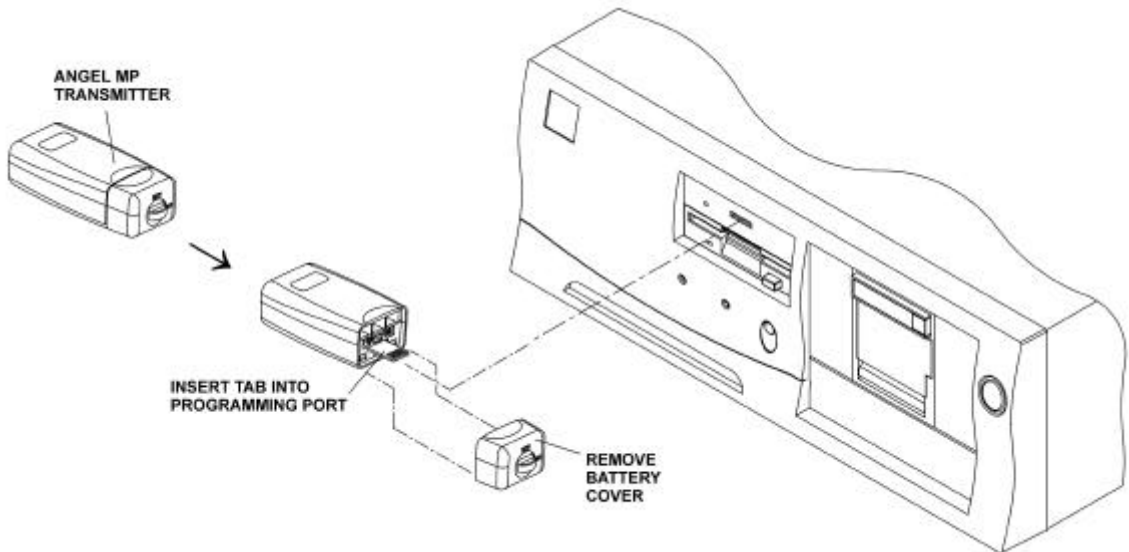
## Symbols

	<b>Attention:</b> Consult accompanying documents.
	<b>Type CF Defibrillation Protected Equipment:</b> Isolated patient connections comply with allowable leakage current limits for direct cardiac application and are protected against effects of defibrillation.
	Does not contain latex.

## Exposure to Radio Frequency Radiation

The radiated output power of the internal wireless radio is far below the FCC radio frequency exposure limits.

### *Programming the Angel MP Telemetry Transmitter*



1. Remove the battery cover to expose the programming tab (turn knob to **OFF** position to remove).
2. Remove the protective sleeve which covers the programming tab contacts.
3. Insert tab into programming port on front of Vision base (see Illustration). **Once transmitter is inserted in programming port, the system will automatically provide instructions for programming.**
4. Follow on screen programming instructions.
5. After transmitter is programmed, remove from programming port and replace the protective sleeve over the programming tab contacts.
6. When ready to begin patient monitoring, refer to the **Power Up** section later in this manual.

## ***What to do if you encounter these Messages:***

### **Message #1**

**ANGEL TRANSMITTER ADMIT: ENTER PATIENT INFORMATION.**

**ANGEL TRANSMITTER ADMIT: ENTER PATIENT INFORMATION.**

<NAME?> <ID??>

PATIENT NAME PATIENT ID LOCATION

1 2 3 4 5 6 7 8 9 0 - +

Q W E R T Y U I O P BKSP

A S D F G H J K L :

CAPS Z X C V B N M , . /

SPACE

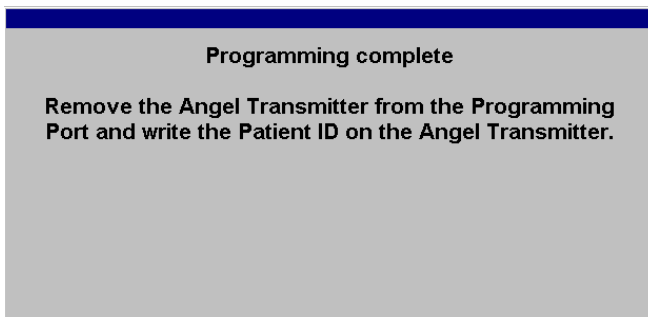
CANCEL

ENTER

- Using on-screen keyboard, enter **PATIENT NAME**, **PATIENT ID**, and **LOCATION**.
- Touch **ENTER** to begin programming operation. **ADMITTING PATIENT...** is displayed at top of on-screen keyboard.
- After programming completes successfully, the following message is displayed:

#### **Programming Complete**

**Remove the Angel Transmitter from the Programming Port and write the Patient ID on the Angel Transmitter.**



Remove transmitter from Vision base, the following message is displayed:

**Has the Patient ID been written on the Angel Transmitter?**

Has the Patient ID been written on the Angel Transmitter?

YES

- d. Touch **YES**.

## Message #2

**Patient is currently Admitted. Confirm Assigning the Angel Transmitter to Patient: <Name> ID: <ID> Location: <Location> Channel: <Channel>?**

Patient is currently Admitted.

Confirm Assigning the Angel Transmitter to

Patient : Robert Jones

ID :

Location :

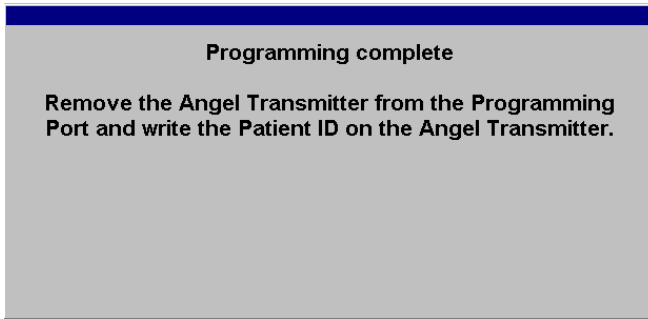
Channel : G39D?

YES NO CANCEL

- a. Touch **YES** if this is desired patient (**touching NO will allow you to discharge patient and admit new patient as described in Message #1**).
- b. After programming completes successfully, the following message is displayed:

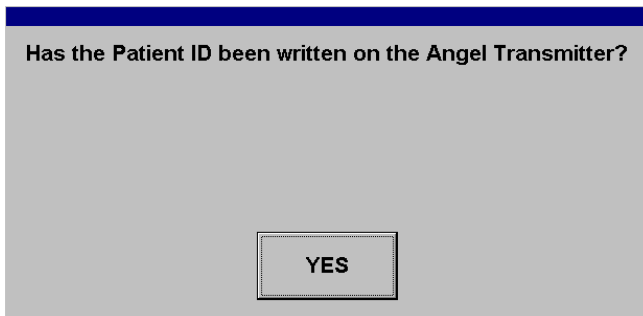
### **Programming Complete**

**Remove the Angel Transmitter from the Programming Port and write the Patient ID on the Angel Transmitter.**



Remove transmitter from Vision base, the following message is displayed:

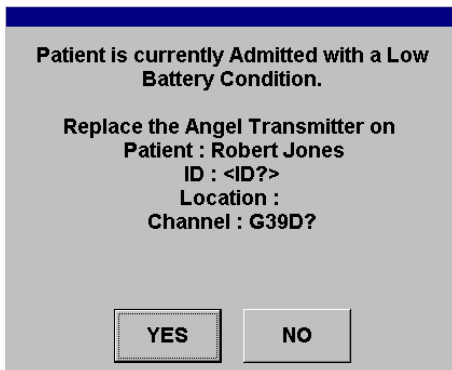
**Has the Patient ID been written on the Angel Transmitter?**



c. Touch **YES**.

### Message #3

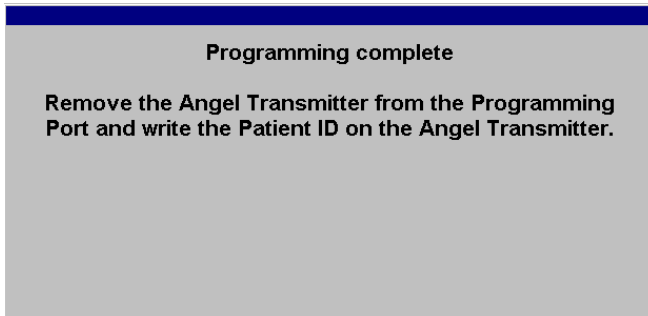
**Patient is currently Admitted with a Low Battery Condition. Replace the Angel Transmitter on Patient: <Name> ID: <ID> Location: <Location> Channel: <Channel>?**



- a. Touch **YES** to replace transmitter.
- b. After programming completes successfully, the following message is displayed:

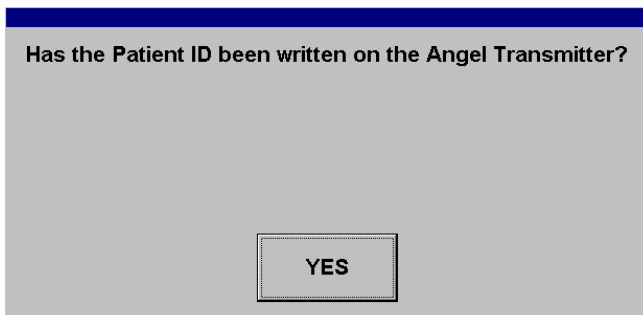
**Programming Complete**

**Remove the Angel Transmitter from the Programming Port and write the Patient ID on the Angel Transmitter.**



Remove transmitter from Vision base, the following message is displayed:

**Has the Patient ID been written on the Angel Transmitter?**



- c. Write the Patient ID on the Angel Transmitter and touch **YES**, the following message is displayed:  
**Deactivate the old Angel Transmitter prior to activating the new Angel Transmitter.**

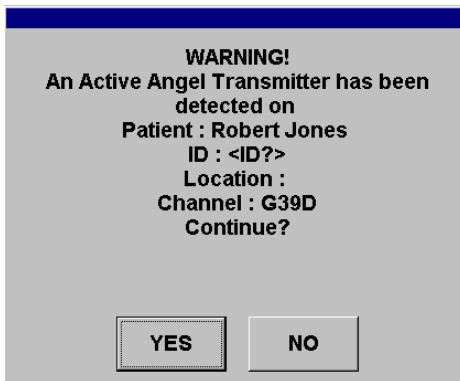




- d. Touch **OK** and *deactivate the old transmitter*.

#### Message #4

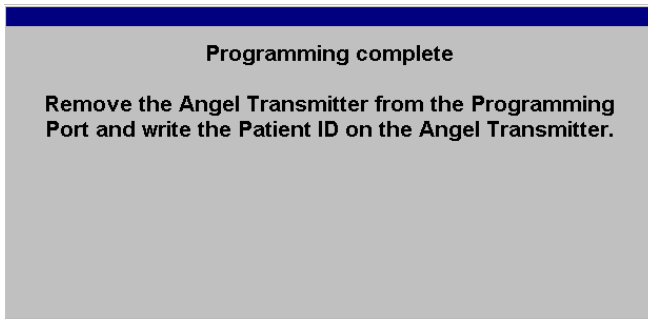
**WARNING! An Active Angel Transmitter has been detected on  
Patient: <Name> ID: <ID> Location: <Location> Channel: <Channel> Continue?**



- a. Touch **YES** if you wish to replace transmitter (or touch **NO** to cancel).
- b. After programming completes successfully, the following message is displayed:

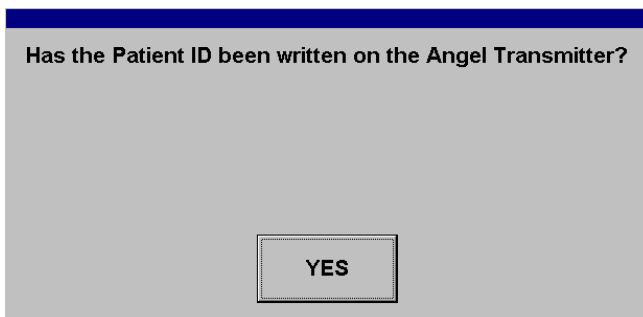
#### **Programming Complete**

**Remove the Angel Transmitter from the Programming Port and write the Patient ID on the Angel Transmitter.**



Remove transmitter from Vision base, the following message is displayed:

**Has the Patient ID been written on the Angel Transmitter?**



- c. Write the Patient ID on the Angel Transmitter and touch **YES**, the following message is displayed:

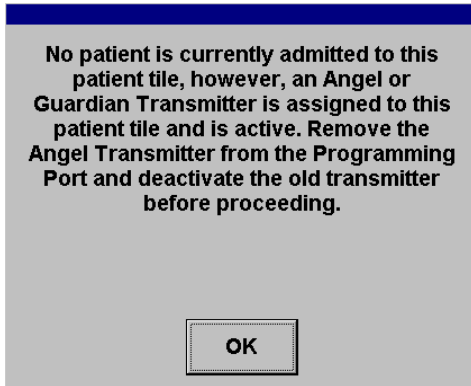
**Deactivate the old Angel Transmitter prior to activating the new Angel Transmitter.**



- d. Touch **OK** and *deactivate the old transmitter*.

## Message #5

**No patient is currently admitted to this patient tile, however, an Angel or Guardian Transmitter is assigned to this patient tile and is active. Remove the Angel Transmitter from the Programming Port and deactivate the old transmitter before proceeding.**



- a. Touch **OK**, remove new transmitter from Vision base and *deactivate old transmitter*.
- b. Start again from **Step 2** in the previous section *Programming the Angel MP Telemetry Transmitter*.

## Message #6

If tile selected does not contain an admitted patient, but has a good signal, and has a Low Battery indication, on-screen keyboard displays and says:

**ANGEL TRANSMITTER ADMIT: ENTER PATIENT INFORMATION.**

**ANGEL TRANSMITTER ADMIT: ENTER PATIENT INFORMATION.**

<NAME?> <ID??>

PATIENT NAME PATIENT ID LOCATION

1 2 3 4 5 6 7 8 9 0 - +

Q W E R T Y U I O P BKSP

A S D F G H J K L ;

CAPS Z X C V B N M , . /

SPACE

CANCEL

ENTER

- Using on-screen keyboard, enter **PATIENT NAME**, **PATIENT ID**, and **LOCATION**.
- Touch **ENTER** to begin programming operation. **ADMITTING PATIENT...** is displayed at top of on-screen keyboard.
- After programming completes successfully, the following message is displayed:

### **Programming Complete**

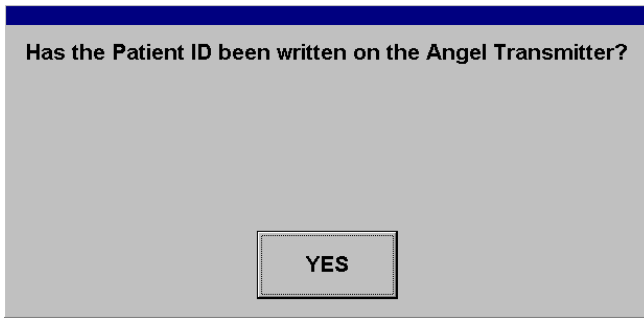
**Remove the Angel Transmitter from the Programming Port and write the Patient ID on the Angel Transmitter.**

**Programming complete**

**Remove the Angel Transmitter from the Programming Port and write the Patient ID on the Angel Transmitter.**

Remove transmitter from Vision base, the following message is displayed:

**Has the Patient ID been written on the Angel Transmitter?**



- d. Touch **YES**, the following message is displayed:

**Deactivate the old Angel Transmitter prior to activating the new Angel Transmitter.**



- e. Touch **OK** and *deactivate the old transmitter*.

# Operation of Angel MP Transmitter

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## Power Up

The Angel MP transmitter will activate upon placement of three 1.5V AAA alkaline batteries into battery compartment and turning the knob on battery cover to the **ON** position. Placement of batteries and turning the knob to **ON** automatically enables the telemetry receiver at the Central (if transmitter is programmed and assigned a window at the Central).



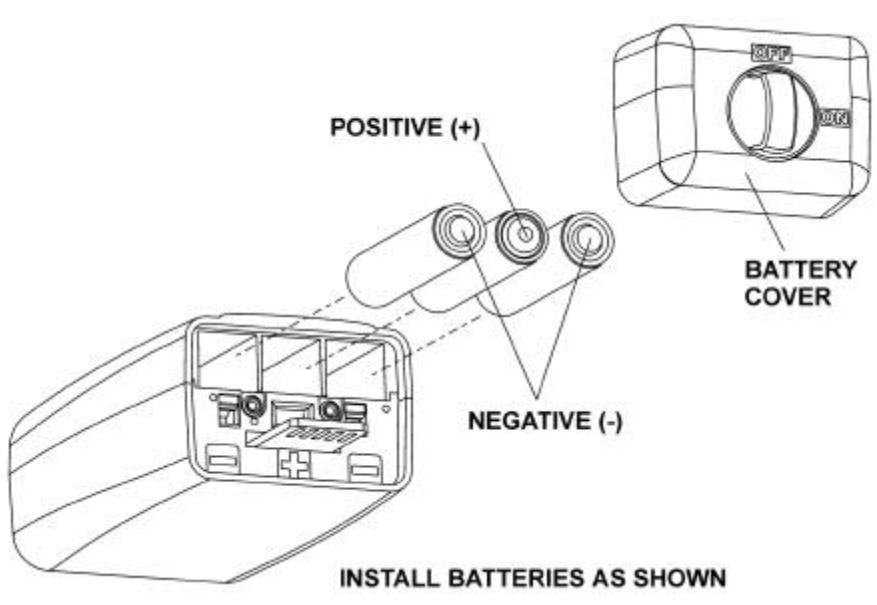
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**CAUTION:** To avoid damage to transmitter, use only 1.5V AAA alkaline batteries.

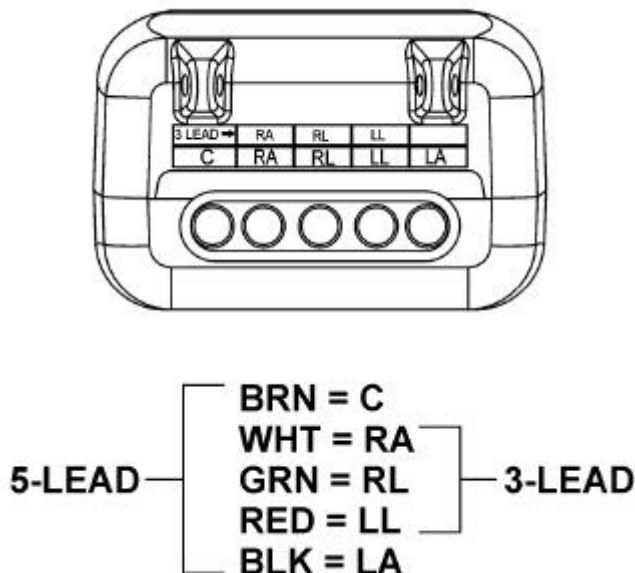
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To install batteries and activate transmitter:

1. Access battery compartment by turning the knob on battery cover to the **OFF** position and removing cover.
2. Install batteries (noting correct polarity) as shown in the following illustration, install battery cover and turn the knob to the **ON** position.



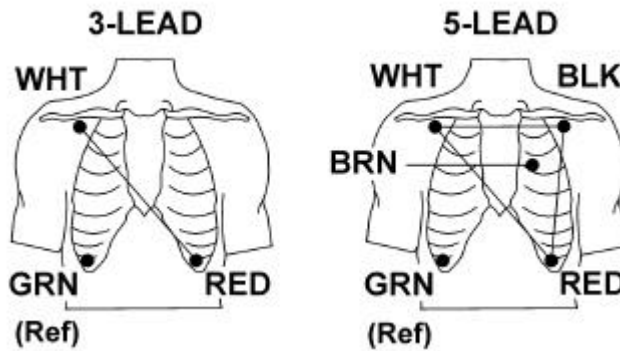
3. Connect the patient cables to the appropriate color-coded ports of the lead block (refer to the following illustration).



### ***Patient Preparation***

Proper skin prep and electrode placement is critical to ensure patient safety and accurate readings. Follow steps below carefully:

1. Shave areas where electrodes will be applied.
2. For adult patients, rub electrode location briskly with dry gauze until skin is pink. If alcohol is used, wait until completely evaporated before applying electrodes. For pediatric patients, prepare according to written hospital policy.
3. Attach lead wires to electrodes before applying electrodes to patient.
4. Apply electrodes to skin, pressing firmly around entire edge of adhesive surface (refer to the following illustration for lead placement).



5. Tape each lead wire to skin to help maintain stable ECG baseline.
6. Insure electrodes are placed in proper locations.
7. Confirm appropriate alarm status and limits exist for patient based on clinical assessment.

### ***Power Down***

Discontinuation of the Angel MP transmitter requires that all leads and cables be removed from patient.

Angel MP's power remains on while batteries are in battery compartment and knob is in the **ON** position. Turn knob to **OFF** and remove batteries from Angel MP for long-term storage or non-use.

Receiver must be **TURNED OFF** at the Central Station to halt lead alarms and display. This is done at the Central by touching patient's window. An ECG window display appears on lower screen. Touch Transmitter tab. Turn receiver to **OFF**.

### ***Caring for the Angel MP***

- For cleaning, use only a lint-free, nonabrasive cloth which has been slightly dampened with mild detergent, a glass cleaner, or a non-alcoholic based solvent.
- Avoid harsh cleaning solutions such as isopropyl alcohol or other solvents that might harm plastic surfaces. Avoid anti-bacterial cleaning solutions, especially those containing Phenol.
- Do not immerse unit or any components in liquid.
- Do not spray liquids directly on the Angel MP.
- Do not allow liquids to penetrate connectors or the Angel MP's case.



## ***Troubleshooting***

<b>If Problem Is...</b>	<b>Try This...</b>
Excessive noise or artifact on display.	Check skin prep. Check electrodes. Placement may be causing motion pick-up.
Signal loss.	Electrode is lost or disconnected.
Central station displays telemetry squelch even after batteries are removed from the Angel MP.	Turn receiver off at the Vision. Refer to Vision Operator's Manual.
Angel MP telemetry is not displayed at the Vision.	Replace batteries. Ensure battery cover switch is in the "ON" position. Check transmitter channel at the Vision.
Can not activate pace detect.	Must be done at Vision central.
Can not set heart rate alarms.	Must be done at Vision central.

## Accessories

Accessories	Part Number
Angel MP Telemetry Transmitter	598100
Angel MP Operator's Manual	598900
24 inch 5-lead safety snap leadwires (1 set)	401604
24 inch 5-lead safety snap leadwires (10 sets)	E2700-77
Angel MP Only 24 inch 3-lead safety snap leadwires (1 set)	598907
Angel MP Only 24 inch 3-lead safety snap leadwires (10 sets)	598907-10
Angel MP 5-lead accessory kit – Includes: 5 lead snap leadwires (401604), set of 3 AAA batteries (598914 Qty 3), Breakaway lanyard (598912)	598909
Angel MP 3-lead accessory kit – Includes: 3 lead snap leadwires (598907), set of 3 AAA batteries (598914 Qty 3), Breakaway lanyard (598912), 2 Protective Caps (598913-2)	598910
Angel MP Lanyard – Standard	598911
Angel MP Lanyard – Standard (Qty 50)	598911-50
Angel MP Lanyard – Breakaway	598912
Angel MP Lanyard – Breakaway (Qty 50)	598912-50
Angel MP Protective Caps (Qty 2)	598913-2
Angel MP Protective Caps (Qty 50)	598913-50
AAA Alkaline Battery	598914
AAA Alkaline Batteries (box of 50)	598914-50
AAA Alkaline Batteries (box of 250)	598914-250
AAA Alkaline Batteries (box of 500)	598914-500
24 inch lead safety snap leadwires WHITE (RA) only (10 wires)	598915-10
24 inch lead safety snap leadwires BLACK (LA) only (10 wires)	598916-10
24 inch lead safety snap leadwires GREEN (RL) only (10 wires)	598917-10
24 inch lead safety snap leadwires RED (LL) only (10 wires)	598918-10
24 inch lead safety snap leadwires BROWN (C) only (10 wires)	598919-10

This product must be used with leadwires compliant to AAMI/ANSI EC53 and electrodes compliant to AAMI/ANSI EC12.

## **Specifications**

### **Physical**

Size: 4.6 x 2.0 x 1.3 inches (HWD)

Weight: 3.7 oz less batteries, 5.0 oz with batteries

### **RF Characteristics**

Transmission type: Digital

Frequency range: 608 – 614 MHz WMTS band

Frequency tolerance: Plus or minus 5 ppm

Output power: 5dbm

### **ECG**

Leads transmitted: Lead II, V

Number of electrodes: 3 or 5

Leads transmitted simultaneously: 2

Input impedance (megohms): >20

Frequency response (Hz): 0.05 – 100

Pacer ID: Yes, 2mV to 700mV, 100usec. To 2msec.

Dynamic range: Plus or minus 5mV

DC Offset: Plus or minus 400mV

Common Mode Rejection Ratio: 80db @ 60Hz minimum

Defibrillation Recovery Time: within 8 seconds

### **Power**

Battery type: 3 1.5V AAA, Alkaline

Battery life (days): Minimum 2.5 days with alkaline battery est.

Reverse battery protection: Yes

Low battery signal: Yes

### **Environmental**

Temperature range: 10 – 40 degrees Celsius

Humidity range: 15% - 95% relative humidity



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**NOTE:** No maintenance or calibration required. If returned to MDE, the Angel MP must be shipped in packaging specified by MDE.

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Part Number: 598900 Rev C  
April 2003