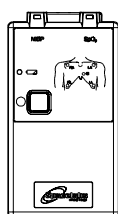


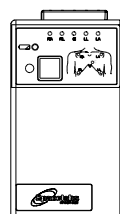
EXHIBIT G – User Manual 2

FCC ID CM676A90343-04

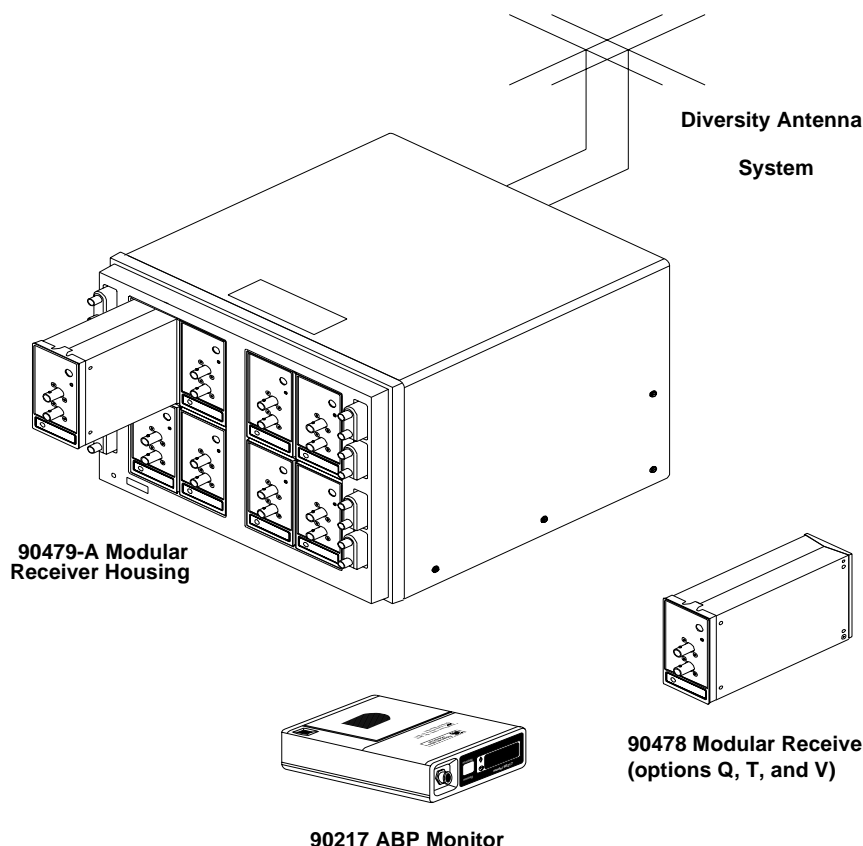


90343
Digital
Telemetry
Multi-parameter
Transmitter

90347
Digital
Telemetry
ECG
Transmitter



Ultraview™ Digital Telemetry 90343, 90347, 90478-Q,-T,-V, 90479-A



- 602-620 MHz frequency operation, including 608-614 MHz Wireless Medical Telemetry Service (WMTS) band
- Touchscreen control of all module functions and compatible with all Ultraview Care Network™ monitors
- Multi-parameter telemetry monitoring ECG, SpO₂, and NIBP (optional)
- Lightweight, water resistant transmitters
- Diversity antenna system
- Tunable modular receiver
- Modular receiver converts bedside monitors to telemetry operation
- Multi-lead ECG with ST segment analysis option; comprehensive arrhythmia and ST trending
- Module Configuration Manager enables the hospital to customize the receiver's ECG patient monitoring functions to specific patient populations, clinical protocols, or operating preferences
- Graded alarm functions enables the hospital to define high, medium, or low alarm tones according to critical, warning, or advisory event severity

SPECIFICATIONS

PARAMETER CHARACTERISTICS

ECG

Maximum Input — ± 4 mV ($\pm 10\%$)

DC Offset — Up to ± 300 mV, with no more than 2% signal amplitude degradation

Overdrive Recovery Time — < 1 second circuit settling time with offset voltage < 500 mV

Noise — < 30 μ V p-p, referred to input (rti), at 30 Hz bandwidth

CMRR — > 85 dB (monitor mode)

QRS Detection — Detects QRS complexes with amplitudes of 0.2 to 4.0 mV (adult) or 0.15 to 4.0 mV (neonatal)

Defibrillator Protection — Meets IEC 60601-2-27, AAMI EC-13

Resolution — 2.5 μ V per LSB, rti

Input Impedance — > 10 M Ω minimum differential at 10 Hz

Gain Accuracy — $\pm 5\%$

Pacer Rejection — Baseline shift < 0.2 mV (measured at ECG $\times 1,000$ output)

Pacer Detection — Detects pacer pulses of ± 2 mV to ± 700 mV with pulse widths of 0.2 to 2 msec and rise times 10% of width not to exceed 100 μ sec

Signal Bandwidth — 0.05 to 30 Hz $\pm 10\%$ (-3 dB)

Sample Rate — 120 samples per second

Ultraview Digital Telemetry 90343, 90347, 90478-Q, 90478-T, 90478-V, 90479-A

SPECIFICATIONS

SpO₂

SpO₂ Sensor Interface —

Red LED drive (max): 175 mA peak at 10% duty cycle
IR LED drive (max): 105 mA peak at 10% duty cycle

SpO₂ Measurement Method — Functional saturation (oxygen saturation of functional hemoglobin)

SpO₂ Measurement Mode —

Continuous, episodic (2 minutes, 5 minutes, and 30 minutes) sampling intervals; factory default setting is continuous

ST Segment Analysis

Resolution — 0.08 mm

Range — ± 9 mm (1 mV = 10 mm)

Leads — ST Segment Analysis continuously performed on up to seven leads

Alarms — Single lead or multiple leads; individual leads can be deselected

Trends — Up to 24 hours of trend data can be displayed in 1.5-, 3-, 6-, 12-, or 24-hour time tracks

DISPLAY CHARACTERISTICS

ECG Display

Heart Rate Range — 30 to 300 bpm; heart rates > 300 bpm are displayed as “+++”

Heart Rate Alarm Limits — High: 5 to 300 bpm, Low: 0 to 200 bpm; alarms automatically enabled over a range of 40 (adult) or 100 (neonatal) to 300 bpm

Accuracy — $\pm 1\%$ or ± 2 beats per minute (whichever is greater)

Numeric Update Rate — Every 3 seconds or immediately at the onset of an alarm

Trace Sweep Speeds — 50, 25, 12.5 mm/sec

SpO₂ Display

Measurement Range — 30 to 100% O₂ Saturation

Saturation Accuracy: — Sensor Dependent

Saturation Resolution — $\pm 1\%$

Pulse Rate Range — 30 to 250 bpm

Pulse Rate Resolution — 1 bpm

Alarms — High and low saturation values; factory default limits are: high 100%; low 85%

High range: 31% – 100%

Low range: 30% – 99%

Numeric Update Rate — Every 2 seconds for continuous SpO₂ readings

NIBP Display

(Refer to specifications for the 90217 ABP Monitor)

Measurement Range (adult only) —

Systolic: 8.0 – 35.0 kPa (60 – 260 mmHg)

Diastolic: 9.0 – 27.0 kPa (30 – 200 mmHg)

Mean: 5.3 – 31.0 kPa (40 – 230 mmHg)

Pressure Accuracy — $\pm 2\%$ or ± 3 mmHg (whichever is greater)

Resolution — 1 mmHg

Time Between Readings — selectable, from 6 to 120 minutes

Alarms — High and low alarms for all measured parameters

High range: 8.0 – 35.0 kPa (60 – 260 mmHg)

Low range: 4.0 – 27.0 kPa (30 – 200 mmHg)

TRANSMITTERS (90343, 90347)

ECG Transmission — View 2 of 7 available leads from four vectors (90343, 90347) synchronized RF digital signal

Electrode Configuration — Individually replaceable DIN standard safety lead wires

Multi-parameter Transmission (90343) — SpO₂ (saturation, SpO₂ sensor status, pulse rate) and optional NIBP (systolic, diastolic, mean pressure, measurement time, alarm conditions) with the model 90217 ABP monitor

Additional Data Transmitted — Patient record, low battery indicator, pacer flag, patient ID code, and electrode connection status

Output Power — 4 mW ERP, typical

Spectral Efficiency — 0.11 bps/Hz

External Indicator — Yellow LED flashes when battery level is low

Battery — 9 V battery; refer to Table 1 for battery life expectancy

Frequency Band Option —

-04: 602-608 MHz

-05: 608-614 MHz

-06: 614-620 MHz

TRANSMITTER PHYSICAL DIMENSIONS

90343 (Multi-Parameter)

Height: 5.25 in (13.3 cm)

Width: 2.85 in (7.2 cm)

Depth: 1.18 in (2.9 cm)

Weight (w/out battery): 8.5 oz (241.0 gm)

90347 (ECG-only)

Height: 5.25 in (13.3 cm)

Width: 2.85 in (7.2 cm)

Depth: 0.98 in (2.5 cm)

Weight (w/out battery): 6.78 oz (192.7 gm)

SPECIFICATIONS

MODULAR RECEIVER

(90478 Options Q, T, and V)

Module Configuration Manager capability (refer to the *Module Configuration Manager* chapter of the *Ultraview Care Network Operations Manual* for complete feature specifications)

Trends — (with appropriate mainframe option) 24 hours of trended data can be displayed in 1.5-, 3-, 6-, 12-, or 24-hour segments; data is stored in 1-minute resolution

High Level Analog Output —

ECG 1: Used for defibrillator synchronization
Connector: 3-conductor TT phone jack
Dynamic Range: ± 5 mV ($\pm 10\%$), rti
Gain: ECG x 1000 ($\pm 5\%$)
Bandwidth: 0.05 to 30 Hz $\pm 10\%$ (-3 dB)

Module Parameter Count — This module counts as 1 or 2 parameters when computing parameter capacity for monitors
1 displayed ECG lead = 1 parameter
2 displayed ECG leads = 2 parameters

Receiver Options —

The following system configuration options are available in the 90478

- A — Basic Arrhythmia: High and low heart rate, asystole and ventricular fibrillation (2 leads)
- B — MultiView™ I Arrhythmia — Enables users to review trends of abnormals per minute; provides additional alarms for abnormals per minute and abnormals in a row (2 leads)
- C — MultiView II Arrhythmia — Enables users to review the dominant morphology as well as episodes or classes of ventricular fibrillation, ventricular tachycardia (runs), couplets, single abnormals, tachycardia, pauses, ventricular and atrio-ventricular pacing; provides additional alarms for abnormals in a row, abnormals per minute, and tachycardia (2 leads)
- S — ST segment analysis/review/trend (2 leads)
- Q — Band operation, 608 to 614 MHz
- T — Band operation, 602 to 608 MHz
- V — Band operation, 614 to 620 MHz

RECEIVER ELECTRICAL REQUIREMENTS

Power Consumption — ≤ 5.0 watts

External Indicators — LED lights when user accesses control

RECEIVER PHYSICAL DIMENSIONS

Height: 4.46 in (11.32 cm)
Width: 2.24 in (5.68 cm)
Depth: 7.00 in (17.78 cm)
Weight: 2.4 lbs (1.11 kg)

RECEIVER HOUSING (90479-A)

Accommodates up to 8 modular receivers

HOUSING PHYSICAL DIMENSIONS

Height: 12.0 in (30.5 cm)
Width: 13.5 in (34.3 cm)
Depth: 17.5 in (44.5 cm)
(includes protective cover)
Weight: 32.0 lbs (14.6 kg)
(without modules loaded)

RECEIVER HOUSING POWER REQUIREMENTS

100–120 VAC, 50/60 Hz, 2A; 220–240 VAC, 50/60 Hz, 1A

ENVIRONMENTAL REQUIREMENTS

Operating —

Temperature: 50° to 104° F (10° to 40° C)
Humidity: 10 to 95% (non-condensing)
Altitude: 0 to 10,000 ft (0 to 3,030.3 m)

Storage —

Temperature: -40° to 149° F (-40° to 75° C)
Humidity: 10 to 100% (non-condensing)
Altitude: -500 to 40,000 ft (-151.5 to 12,121.2 m)

Water Resistance — Meets EN60529 IPX1

REGULATORY APPROVALS

All models are ETL listed and meet UL544 or UL2601-1 standard for electrical safety; approved by CSA; Models 90343, 90347, and 90478, approved by FCC (47CFR 15.242 and 47CFR) and Industry Canada (RSS - 210, 608-614 MHz operation only)

**Ultraview
Digital
Telemetry
90343,
90347,
90478-Q,
90478-T,
90478-V,
90479-A**

Ultraview Digital Telemetry 90343, 90347, 90478-Q, 90478-T, 90478-V, 90479-A

Spacelabs Medical, Inc.
15220 N.E. 40th Street
P.O. Box 97013
Redmond, WA 98073-9713
(425) 882-3700

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061-0801-00 Rev. D 9/2000

SPECIFICATIONS

ACCESSORIES

Please refer to the Spacelabs Medical Supplies
Catalog for availability of ECG lead wires and
electrodes, blood pressure cuffs, and SpO₂
sensors from Spacelabs Medical

90343/90347 Transmitter Pouch

Part Number: 015-0500-00

DIN Standard Safety ECG Lead Wire Set (5 wire)
24" snap

Part Number: 012-0605-00

Receiver Housing Protective Cover

Part Number: 200-0180-00

Whip Antenna (UHF)

Part Number: 117-0040-00

Belt Clip

Part Number: 344-0020-00

SpO₂ Adapter Cable (Nellcor)

Part Number: 700-0014-00

ABP Telemetry Adapter Cable

Part Number: 700-0015-00

ABP Pouch

Part Number: 015-0501-00

ABP Shoulder Strap

Part Number: 016-0262-00

ABP Waist Belt

Part Number: 016-0080-00

ABP Report Management System

Part Number: 90121

ABP Report Management System Adaptor Cable

Part Number: 012-0097-02

ABP Adult Adapter Assembly

Part Number: 714-0017-00

NELLCOR SpO₂ SENSOR ACCURACY AND SENSOR SELECTIONS

Nellcor Reusable SpO₂ Sensors —

Finger Clip (DS-100A) (P/N 690-0003-00)

70–100%, $\pm 3\%$ absolute saturation

OXIBAND A/N (OXI-A/N) (P/N 690-0004-00)

70–100%, $\pm 3\%$ absolute saturation

OXIBAND P/I (OXI-P/I) (P/N 690-0039-00)

70–100%, $\pm 3\%$ absolute saturation

Nellcor Disposable SpO₂ Sensors —

Adult (N-25) (P/N 690-0006-00)

70–100% $\pm 2\%$ absolute saturation

Neonatal (N-25) (P/N 690-0006-00)

70–100% $\pm 3\%$ absolute saturation

Pediatric (D-20) (P/N 690-0007-00)

70–100% $\pm 2\%$ absolute saturation

Adult (D-25) (P/N 690-0001-00)

50–69% $\pm 3\%$ absolute saturation

70–100% $\pm 2\%$ absolute saturation

Nasal (R-15) (P/N 690-0005-00)

80–100% $\pm 3.5\%$ absolute saturation

Infant (I-20) (P/N 690-0002-00)

50–69% $\pm 3\%$ absolute saturation

70–100% $\pm 2\%$ absolute saturation

Table 1: Transmitter Battery Service Life¹ (hours)

Battery Type	9 Volt Alkaline (ANSI/NEDA 1604A)					9 Volt Lithium (ANSI/NEDA 1604LC)				
	ECG Only	ECG and Con- tinuous SpO ₂	ECG and 2 minute Episodic SpO ₂	ECG and 5 minute Episodic SpO ₂	ECG and 30 minute Episodic SpO ₂ and NIBP ²	ECG Only	ECG and Con- tinuous SpO ₂	ECG and 2 minute Episodic SpO ₂	ECG and 5 minute Episodic SpO ₂	ECG and 30 minute Episodic SpO ₂
90343	48	24	36	38	40	120	60	100	104	106
90347	52	Not Applicable	Not Applicable	Not Applicable	Not Applicable	132	Not Applicable	Not Applicable	Not Applicable	Not Applicable

¹ Operational service life (in hours) assuming a new
alkaline battery (minimum 580 mAH capacity) or
lithium battery (minimum 1200 mAH capacity) used
until the local low battery indicator begins to flash.

² NIBP operations from a 90217 ABP Monitor sending
readings to the 90343 Multi-parameter telemetry
transmitter. The 90217 ABP monitor will inflate a
standard size adult cuff at least 240 times with alkaline
batteries.

Medical telemetry spectrum allocations may be assigned to frequencies already allotted to other priority
users. This means that telemetry operations may be exposed to radio frequency interference that may
disrupt or impede telemetry patient monitoring. Additionally, medical telemetry spectrum allocations
may be changed by government action and Spacelabs Medical accepts no responsibility for such
changes, including the possibility that the product may not operate in the modified permissible
spectrum ranges other than those expressly set forth in Spacelabs Medical's published product data
sheets. Spacelabs Medical cannot, and does not, guarantee interference-free telemetry operation.