CABLE PREP AND ASSEMBLY PROCEDURE (OPEN UNIT BEFORE PROCEEDING)

A. CONNECTOR END

1. DETERMINE CONNECTOR END — RED, WHITE & GRAY WIRES IN CCW ROTATION.
2. ASSEMBLE STRAIN RELIEF, BACK NUT AND COLLET TO CABLE.
3. REMOVE 1 1/2" OF JACKET AND REMOVE FOIL.
4. STRIP AND TIN WIRES & SHIELD.
5. CONNECT WIRES & SHIELD TO THE INSERT (INSIDE OUT) WITH 1/16 x 1/4" LG SHRINK TUBING.
6. PULL JACKET TOWARD THE INSERT.
7. ASSEMBLE CLAMS AND SHELL, LOCK DOWN WITH WRENCHES.

B. MODULE END (PERFORM OPEN PROCEDURE BEFORE PREPING THIS END, (PAGE))

1. ASSEMBLE STRAIN RELIEF (AND "MINI" CASE) TO CABLE.
2. REMOVE 2 1/2" OF JACKET AND REMOVE FOIL.
3. CUT 1" FROM WIRES. LEAVE GROUND DRAIN AS IS.
4. STRIP & TIN WIRES.
5. CONNECT WIRES TO PC BOARD AS FOLLOWS:

N100 & N200 "MINI"	
1	BLUE
2	BLACK
3	RED
4	BROWN
5	GREEN
6	ORANGE
7	YELLOW
8	VIOLET
9	GRAY

N200 WITH ECG	
1	BLACK
2	RED
3	YELLOW
4	GRAY
5	VIOLET
6	ORANGE
7	WHITE
8	NC
9	BLUE
10	BROWN
11	GREEN

N100 (4 BUTTON)	
1	BLACK
2	RED
3	YELLOW
4	GRAY
5	VIOLET
6	ORANGE
7	WHITE
8	GREEN
9	BLUE
10	BROWN

6. TEST UNIT BEFORE CLOSING UP.
7. CLOSE-UP UNIT AND RE-TEST. (SEE PAGE FOR CLOSING PROCEDURE)
8. SEAL AND LABEL UNIT.

EPIC MEDICAL EQUIPMENT SERVICES, INC.
Dallas, Texas

SCALE: NA	APPROVED BY:	DRAWN BY WORLEY
DATE: 11/27/95		REVISED

NELLCOR PATIENT MODULE – N100 & N200 OXIMETERS

REPAIR STANDARDS

DRAWING NUMBER NELLCOR2 PAGE 2 of 3

MODULE DISASSEMBLY & ASSEMBLY PROCEDURE

A. N100 & N200 "MINI"

1. DISASSEMBLY

a. SAW BETWEEN BIG "N" & "E" ON ALL SIDES.
b. CUT STRAIN RELIEF AT REAR OF MOLD.
c. ASSEMBLE HOUSING & STRAIN RELIEF TO CABLE.
d. REMOVE & DISCARD CRIMPING SLEEVE FROM METAL SHIELD
e. DISASSEMBLE METAL SHIELD FROM MODULE.
f. PREP BOARD FOR CABLE ATTACHMENT
g. ATTACH NEW CABLE TO PC BOARD (SEE PAGE 2 FOR ASSEMBLY PROCEDURE)
h. TEST UNIT

2. ASSEMBLY

a. FLATEN REAR FLANGES OF METAL SHIELD.
b. PULL CABLE JACKET DOWN.
c. ASSEMBLE METAL SHIELD TO MODULE.
d. WRAP SHIELD DRAIN AROUND FLANGE (TOP) ONE TURN.
e. PULL STRAIN RELIEF OVER FLANGE.
f. PULL CASE OVER THE MODULE. PUSH CASE DOWN AS FAR AS POSSIBLE.
g. SEAL WITH GLUE AND FILLER.
h. TEST AND LABEL.

B. N200 WITH ECG

1. DISASSEMBLY

a. Remove CLIP AND SPRING.
b. SEPARATE CASE AND REMOVE MODULE.
c. REMOVE METAL SHIELD AND STRAIN RELIEF. (ASSEMBLE STRAIN RELIEF TO CABLE).
d. CUT BLACK FILLER BACK FROM CABLE END 5/8" (SEE NOTE).
e. PREP BOARD FOR CABLE ATTACHMENT
f. ATTACH NEW CABLE TO PC BOARD (SEE PAGE 2 FOR ASSEMBLY PROCEDURE)
g. TEST UNIT.

2. ASSEMBLY

a. PULL DOWN CABLE, ATTACH PC BOARD TO STRAIN RELIEF AND ZIP TIE JACKET TO CABLE.
b. GLUE WIRES TO JACKET.
c. ASSEMBLE METAL SHIELD TO MODULE AND SOLDER SHIELD DRAIN TO METAL SHIELD.
d. ASSEMBLE CASE TO MODULE, SEAL W/GLUE AND CLAMP
e. TEST AND LABEL.

C. N100 (4 BUTTON)

1. DISASSEMBLY

a. SEPARATE CASE (MAY HAVE END CAP).
b. REMOVE STRAIN RELIEF FROM CASE AND MODULE.
c. REMOVE METAL SHIELD
d. CUT BLACK FILLER BACK FROM CABLE END 5/8".
e. PREP BOARD FOR CABLE ATTACHMENT
f. ATTACH NEW CABLE TO PC BOARD (SEE PAGE 2 FOR ASSEMBLY PROCEDURE)
g. TEST UNIT.

2. ASSEMBLY

a. PULL DOWN CABLE, ATTACH PC BOARD TO STRAIN RELIEF AND ZIP TIE JACKET TO CABLE.
b. GLUE WIRES TO JACKET.
c. ASSEMBLE METAL SHIELD TO MODULE AND SOLDER SHIELD DRAIN TO METAL SHIELD.
d. ASSEMBLE CASE TO MODULE, SEAL W/GLUE AND CLAMP.
e. TEST UNIT AND LABEL.

INTERNATIONAL OXIMETRY SENSORS & CABLES, INC.
DALLAS, TEXAS

QUALITY CONTROL PROCEDURE

REPAIRED NELLCOR PATIENT MODULE

Original Copy - Engineering
Copy #1 - Quality assurance
Copy #2 - Quality Control
Date Initiated 11/29/95 by GW

Rev: ___ Date _____ by _____

MODEL N100 & N200

I. PHYSICAL

A. CONNECTOR
1. Inspect for bent or broken pins.
2. Inspect strain relief.
3. Inspect for proper connector assembly and secure mechanical union.

B. CABLE
1. Inspect for cuts and/or abrasions.
2. Inspect for cleanliness.

C. PREAMP HOUSING
1. Inspect connector.
2. Check strain relief.
3. Check for proper labels attached in the presribed manner.

II. ELECTRICAL

A. CONTINUITY
1. Connect cable to "AA" and "BB" connectors on the text fixture.
2. Place the "GREEN (P3)" switch in position "1" and depress the "WHITE" buton. The GREEN LIGHT should glow.

3. Repeat step 2 above in positions 2 - 6. The GREEN LIGHT should glow in all positions.

II. ELECTRICAL (cont.)

B. OP AMP
1. Turn on the +/-15v power supply.
2. Set scope to : * - 0.2v/Div (CH1)
* - 1.0msec/Div (A&B)
3. Depress the "BLACK (P4)" button. The scope should indicate the following patern.

III. PERFORMANCE

A. CABLE CONNECTOR
1. Connect N200 or N100 (5 button) to "Nellcor" N200 Oximeter Monitor.
NOTE: Connect N100 (4 button) to N100 Monitor.

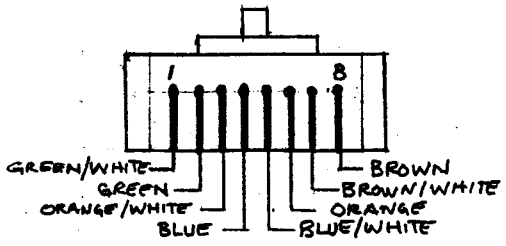
B. SENSOR/CLIP CONNECTOR
NOTE: Use your finger for confirmation of the N100 (4 button).
1. Attach the NELLCOR TESTER PT-2500 to the N200 or N100 (5 button) cable.
2. Make sure the "RED" light is glowing.
3. The Oximeter should read 81% SaO2 (+/- 1%) and pulse rate of 47 (+/- 1bpm).

IV. GENERAL

A. Make sure all required entries are recorded.
B. Initial "Acceptance" or "Failure".
C. Record the date QC was performed.
D. Send the unit to SHIPPING for return to the customer.

WIRING DIAGRAM

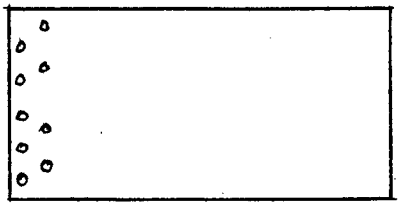
8 BIT CONNECTOR



END VIEW.

PC BOARD

CONNECTS TO CABLE (See page 2 for wiring)



SCHEMATIC

PARTS LIST

18" X2DL5STR CABLE, [illegible] CONNECTOR

SPECIAL INSTRUCTIONS

REPLACE CABLE ON ALL REPAIRABLE UNITS. SEE PAGE 2 FOR SPECIAL INSTRUCTIONS TO DISASSEMBLE, REPLACE CABLE AND ASSEMBLE.

EPIC MEDICAL EQUIPMENT SERVICES, INC.
Dallas, Texas

SCALE: NA	APPROVED BY:	DRAWN BY: WORLEY
DATE: 11/28/95		REVISED

NELLCOR PATIENT MODULE - N10 OXIMETER

REPAIR STANDARDS

DRAWING NUMBER: NELLCOR3

MODULE DISASSEMBLY & ASSEMBLY PROCEDURE

A. N10 "MINI"

1. DISASSEMBLY

(SEE N100 & N200 "MINI" PROCEDURE PAGE 3)

2. ASSEMBLY

(SEE N100 & N200 "MINI" PROCEDURE PAGE 3 AND CABLE ASSEMBLY BELOW)

B. N10 "OLD STYLE"

1. DISASSEMBLY

(SEE N100 (4 BUTTON) PROCEDURE PAGE 3)

2. ASSEMBLY

(SEE N100 (4 BUTTON) PROCEDURE PAGE 3)

CABLE PREP AND ASSEMBLY PROCEDURE (OPEN UNIT BEFORE PROCEEDING)

A. CONNECTOR END

(PRE-WIRED)

B. MODULE END

1. ASSEMBLE STRAIN RELIEF (AND "MINI" CASE) TO CABLE.
2. REMOVE 1½" OF JACKET.
3. STRIP AND TIN WIRES.
4. CONNECT WIRES TO PC BOARD AS FOLLOWS:

N10 "MINI"	
1	ORANGE/WHITE
2	ORANGE
3	BROWN
4	BROWN/WHITE
5	NC
6	GREEN
7	BLUE/WHITE
8	GREEN/WHITE
9	BLUE

N10 "OLD STYLE"	
1	BROWN
2	GREEN/WHITE
3	BROWN/WHITE
4	GREEN
5	ORANGE
6	ORANGE/WHITE
7	BLUE/WHITE
8	BLUE
9	NC
10	NC

EPIC MEDICAL EQUIPMENT SERVICES, INC.
Dallas, Texas

SCALE: NA	APPROVED BY:	DRAWN BY: WORLEY
DATE: 11/28/95		REVISED

NELLCOR PATIENT MODULE – N10 OXIMETER

REPAIR STANDARDS

DRAWING NUMBER: NELLCOR3 PAGE 2 of 2

INTERNATIONAL OXIMETRY SENSORS & CABLES, INC.
DALLAS, TEXAS

QUALITY CONTROL PROCEDURE

REPAIRED NELLCOR PATIENT MODULE

Original Copy - Engineering
Copy #1 - Quality assurance
Copy #2 - Quality Control
Date Initiated 11/29/95 by GW

Rev: ____ Date ____ by ____

MODEL N10

I. PHYSICAL

A. CONNECTOR
1. Inspect for bent or broken pins.
2. Inspect for proper connector assembly and secure mechanical union.

B. CABLE
1. Inspect for cuts and/or abrasions.
2. Inspect for cleanliness.

C. PREAMP HOUSING
1. Inspect connector.
2. Check strain relief.
3. Check for proper labels attached in the presribed manner.

II. PERFORMANCE

A. CABLE CONNECTOR
1. Connect cable to N10 Nellcor Oximeter Monitor.

B. SENSOR CLIP CONNECTOR
1. Attach the NELLCOR DS100A to the cable.
2. Attach to your finger.
3. The Oximeter should read approximately 97% Sat.

III. GENERAL

A. Make sure all required entries are recorded.
B. Initial "Acceptance" or "Failure".
C. Record the date QC was performed.
D. Send the unit to SHIPPING for return to the customer.

WPDOCS\QCPROC\NELLCOR3.QCP

Nellcor Pre-Amp Cables

Cable Preparation and Assembly

Connector End

Determine connector end; this is when looking into the cable the red, white and grey wires are in an anti-clockwise rotation.

Assemble Lemo connector parts onto cable; strain relief first, then the back nut and finally the collar.

Remove about 4cm of sleeving and foil.

Strip and tin only about 2mm of wires, twist and tin shield.

Place about 8mm of heat shrink onto each wire.

Solder wires into connector in the following order:

12- Open

11- Black

10- White (omit if 100 Mini)

9- Green

8- Red

7- Grey

6- Violet

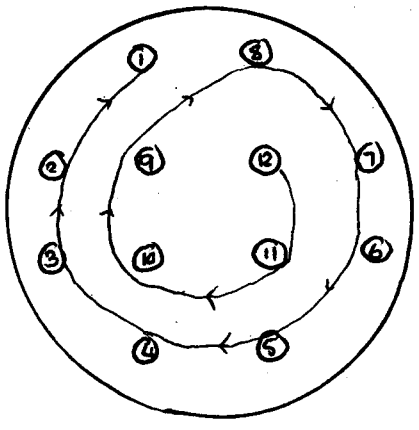
5- Yellow

4- Orange

3- Blue

2- Brown

1- Shield



Shrink heat shrink on each wire as it is connected.

Push on sleeving along the length of the cable to reduce the gap between the cable and connector.

Assemble the connector and close with spanners.

Slide strain relief onto back of connector.

Module End

If cable is to be used on a 'mini' then put the housing onto the cable.

Put strain relief onto cable..

Remove about 6cm of the outer sleeving and inner foil.

Cut about 3cm from the coloured wires but leave the shield wire at its original length.

Strip only about 2-3mm of insulation from the coloured wires.

Tin wires and shield.

Connect the wires to the PCB as follows.

N100/N200 'mini'	N200 with ECG	N100 (4 button)
1-Blue	1-Black	1-Black
2-Black	2-Red	2-Red
3-Red	3-Yellow	3-Yellow
4-Brown	4-Grey	4-Grey
5-Green	5-Violet	5-Violet
6-Orange	6-Orange	6-Orange
7-Yellow	7-White	7-White
8-Violet	8-Open	8-Green
9-Grey	9-Blue	9-Blue
	10-Brown	10-Brown
	11-Green	

Test unit **before** closing it up.

Close unit and retest. (See individual procedures for disassembly/assembly/closing up method)

Seal and label unit.

Nellcor N100/N200 Mini Pre-Amp Cable

Disassembly

Cut cable a few centimetres from the strain relief.
Place housing in a vice with the word 'NELLCOR' uppermost.
Saw between letters 'N' & 'E' of NELLCOR on the top of the housing.
Saw down either side of the housing, then join these cuts together by sawing along the bottom.
Turn the housing around and grip the end in the vice whilst holding the housing, pull the housing free.
Remove strain relief and cable sleeve from housing.
Cut strain relief in half at the moulding line to increase diameter.
Remove cable from strain relief by pushing a small screwdriver down between sleeve and strain relief to break glue seal, discard sleeve.
Remove and discard crimping sleeve from metal shield.
Disassemble metal shield from module.
Remove spacers, being careful not to lose them, and hold board in a mini vice with solder pads uppermost.
Remove coloured wires in turn.

Assembly

N100 & N200 mini do not require white wire so this can be cut off at the sleeve.
Put housing and strain relief onto cable.
Attach cable to PCB as mentioned in "Cable Preparation and Assembly- Module End".
Test unit.

Closing up

Push along the cable to push the sleeve right up to the P.C.B.
Replace spacer pegs.
Squash the cable clamp part of the metal shield with pliers, then replace the shield onto the P.C.B.
Wrap the shield wire around the flattened end of the metal shield.
Push the strain relief up to the shield and fix with super-glue.
Push plastic casing over module, using super-glue before closing casing as far as possible.
Fill the remaining crack with silicone, removing any excess sealant by wiping at right angles across the crack with a cloth soaked with alcohol.
Place a foil sticker around the module over the silicone.

Nellcor N100 Pre-Amp Cable

Disassembly

Cut cable off a few centimetres from the strain relief.
Open up the outer plastic casing.
Remove strain relief from case and module.
Remove metal shield.
On the side where the rubber sealant is thinnest, lightly slice across and remove the 2cm of rubber nearest the cable. This should reveal 2 sets of solder pads to which the wires attach.
Turn the module over and cut the rubber along the other side, being very careful to lift the scalpel if it hits any resistance to avoid cutting the capacitor under the rubber.
Remove all wires and prepare board for new cable.
Remove old cable from strain relief with a small screwdriver.

Assembly

Put strain relief onto cable.
Attach cable to PCB as mentioned in "Cable Preparation and Assembly- Module End".
Test unit.

Closing up

Push along the cable to slide the sleeving up to the PCB.
Tie-wrap the cable and secure with a spot of super-glue.
Glue down the sleeving to secure the wires to it.
Push strain relief up to the tie-wrap and glue in place.
Replace metal shield and solder shield wire to it.
Assemble outer casing, glue it into place and hold with clamp.
Add label and retest.

N200 with E.C.G

Disassembly

Cut cable off a few centimetres from the strain relief.
Remove the clip and the spring.
Separate and remove the outer casing by prying it apart.
Remove old cable from strain relief with a small screwdriver.
Remove the metal shield. If the shield is made of foil, cut away the amount necessary as oppose to removing it all.
On the side where the rubber sealant is thinnest, lightly slice across and remove the 2cm of rubber nearest the cable. This should reveal 2 sets of solder pads to which the wires attach.
Turn the module over and cut the rubber along the other side, being very careful to lift the scalpel if it hits any resistance to avoid cutting the capacitor under the rubber.
Remove all wires and prepare board for new cable.

Assembly

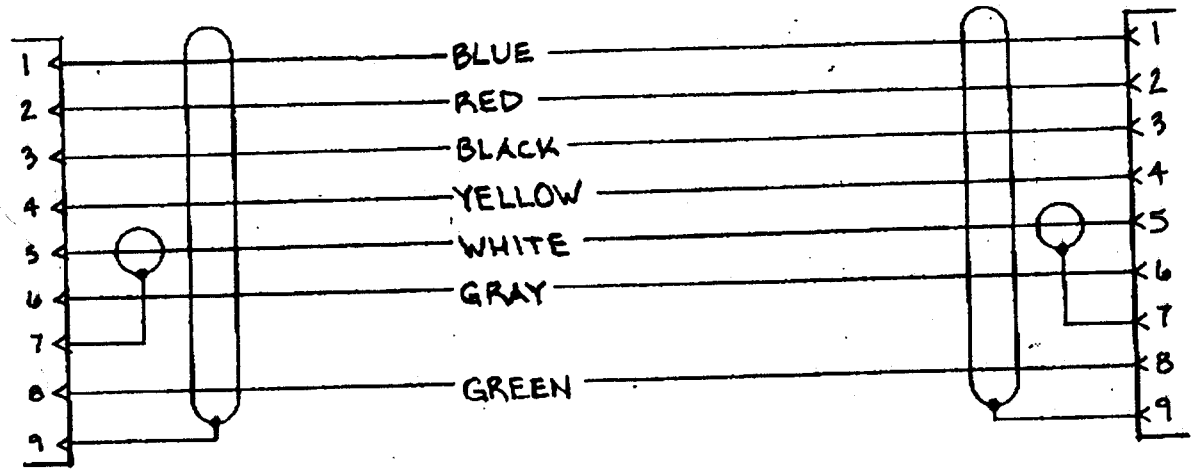
Put strain relief onto cable.
Attach cable to PCB as mentioned in "Cable Preparation and Assembly- Module End".
Test unit.
If the amp connector needs replacing, cut the legs off and de-solder from the PCB before soldering a new connector on.

Closing up

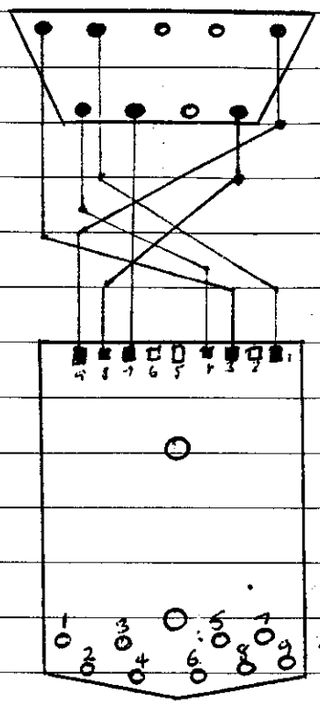
Push along the cable to slide the sleeving up to the PCB.
Tie-wrap the cable and secure with a spot of super-glue.
Glue down the sleeving to secure the wires to it.
Push strain relief up to the tie-wrap and glue in place.
Replace metal shield and solder shield wire to it.
Assemble outer casing, making sure that the bezel for the amp connector is in place and the pin locates properly.
Glue it into place and hold with clamp.
Add label and retest.

DB-9 MALE

DB-9 FEMALE



Rear view



1 Blue
2 Black
3 Red
4 Brown
5 Green
6 Orange
7 Yellow
8 Purple
9 Grey

These 4 contacts