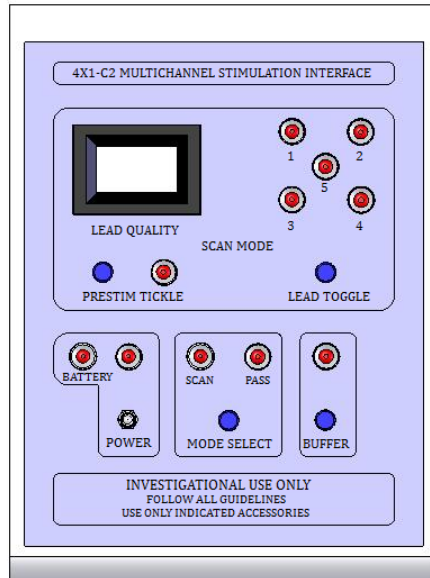


Multichannel Stimulation Interface Device



Installation and Instruction Manual

Model 4X1-C2

V1371

NOTICE

THE MATERIAL IN THIS MANUAL IS FOR INFORMATION PURPOSE ONLY. THE CONTENTS AND THE PRODUCT IT DESCRIBES ARE SUBJECT TO CHANGE WITHOUT NOTICE. IN NO EVENT SHALL WE BE LIABLE FOR ANY DAMAGES, DIRECT OR INCIDENTAL, ARISING OUT OF OR RELATED TO THE USE OF THIS MANUAL.

SAFETY

As an ultimate user of this apparatus, you have the responsibility to understand its proper function and operational characteristics. This operational manual should be thoroughly read and all operators given adequate training before attempting to place this unit in service.

Awareness of the stated cautions and warnings, and compliance with recommended operating parameters – together with maintenance requirements – are important for safe and satisfactory operation. The unit should be used for its intended application. Recommended accessories should be used while using this system.

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General Information

The 4X1-C2 Multi channel Stimulation Interface Device is designed to be used as an interface device between an isolated 2-channel current controlled DC stimulator and 5 stimulation leads; where 4 leads (colored) are connected to one output of the DC stimulator and the remaining lead (white) is connected to the other output of the DC stimulator.

In PASS MODE, the 4X1-C2 does not modulate the waveform of the DC stimulator, and acts only as a passive current divider.

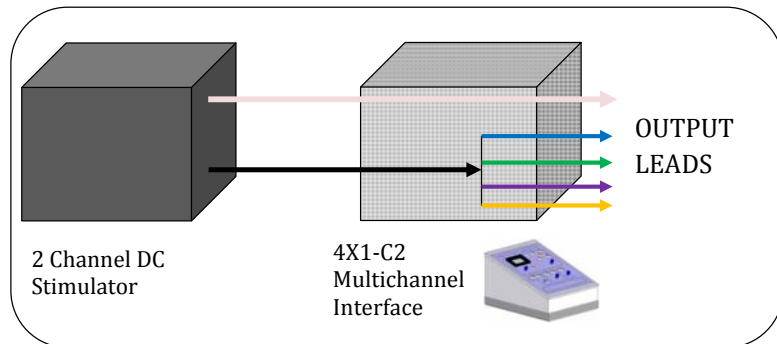


Fig-1: The schematic illustrates that in Stimulation Mode, the 4X1-C2 acts as a passive current divider.

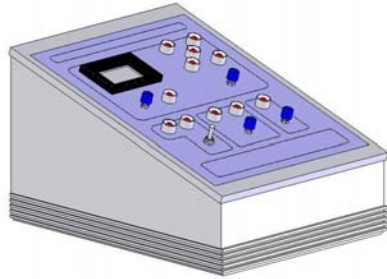
General Information

When not in PASS MODE, the 4X1-C2 provides functionality for accessing lead quality and buffering system output. Though these functions are intended to facilitate multi channel stimulation, in PASS MODE this functionality is disengaged, leaving only passive current division.

Package Contents

Carefully remove all components from the shipping container. One of each should be included:

- **4X1-C2 Multi channel Interface device**
- **CSIN-X2 input cable**
- **CSOP-D5 output cable**



Multichannel stimulation interface Device



CSIN-X2 Input Cable



CSOP-D5 Output Cable

Specifications

Scan Mode

Output Current (to measure total voltage drop across each channel): $60\mu\text{A}$

Number of channels: 5

Range of measurement: 0-2V

Power Source

Batteries: 3 alkaline 9.0V batteries

Run time: ~ 8hrs depending on use

Low Battery Indicator: At 75% of max voltage

Cables

Input Cable: Shielded 2 channel

Connectors: 3 pin XLR type

Length: 4 Feet

Weight: 0.6 lb.

Output Cable: Shielded 5 channel

Connectors: Circular Din

Length: 5 feet

Weight: 0.8 lb

Physical Size

Dimensions: 197mm X 155mm X 121mm

Weight: 2.8 lb

Display:

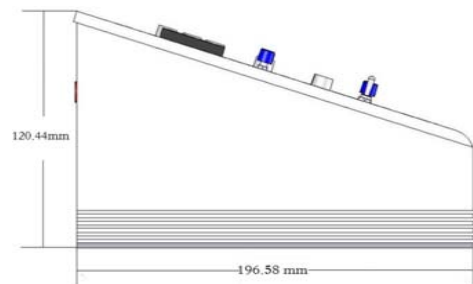
Datel 4 digit LCD with built in low Battery indicator

Switches

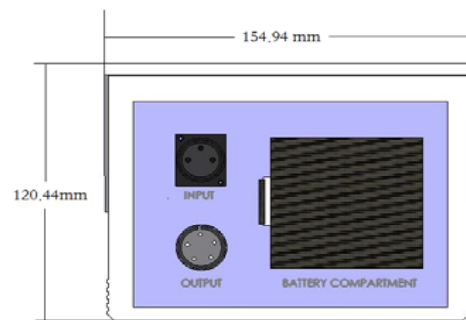
Mechanical: Push type

Digital: Electronic IC

Emergency stop: Buffer switch



Side View



Back View

Connecting the 2-Channel DC stimulator to the 4X1-C2 Interface Device

The CSIN-X2 cable is intended to connect a 2-channel isolated current-controlled DC stimulators with the 4X1-C2 interface device.



The CSIN-X2 can be connected to the DC stimulator in one of two polarities:

- 1) The white connector may be connected to the positive (anode) output of the 2-channel DC stimulator and the colored connector is connected to the negative (cathode) output of the 2-channel DC stimulator as shown in (Fig.-2)

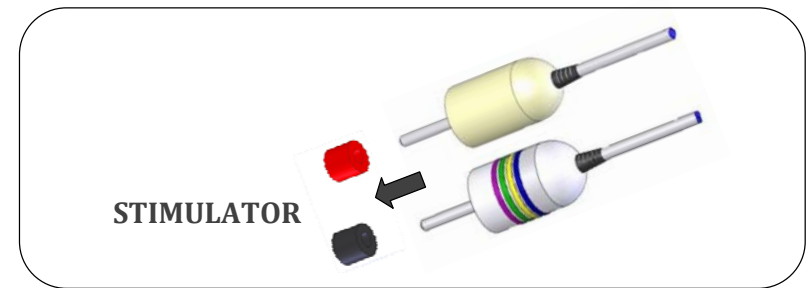


Fig.2: Model CSIN-X2 Cable

Or

2) The colored connector may be connected to the positive (anode) output of the 2-channel DC stimulator and the white connector is connected to the negative (cathode) output of the 2-channel DC stimulator as shown in (Fig.-3)

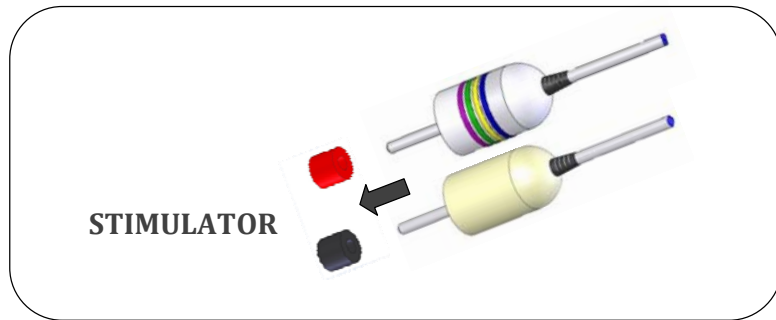


Fig.3: Model CSIN-X2 Cable

Which polarity option is selected will determine the connectivity of the device output channels.



WARNING: It is the responsibility of the device operator to fully understand both the DC stimulator and 4X1-C2 device function and to guarantee that the CSIN-X2 cable is connected to the DC stimulator in the correct polarity.

Connect the CSIN-X2 cable to the “Input” port on the back panel of the 4X1-C2 as shown in (Fig.-4)

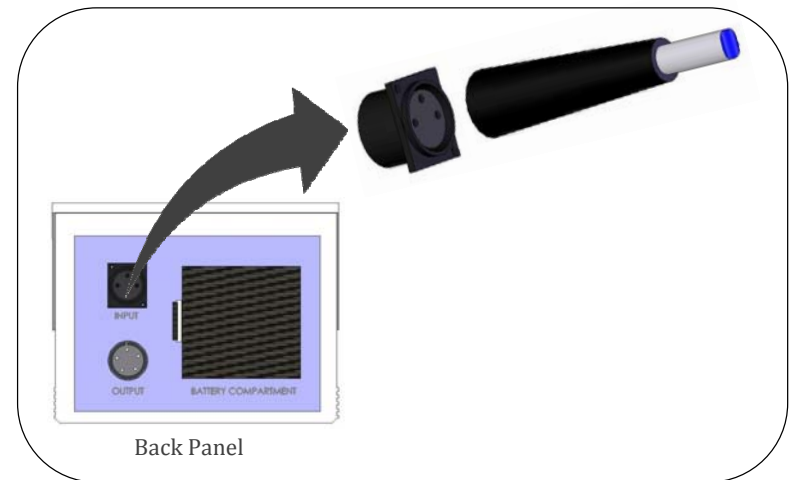


Fig.4: Model CSIN-X2 Cable



Do not connect or disconnect the output connector, the input connector, or any leads when the DC stimulator is generating an output.

Connecting the CSOP-D5 Output Cable to the 4X1-C2 Interface Device

Connect the CSOP-D5 connector to the OUTPUT port on the back panel of the 4X1-C2 interface device (Fig.-5)

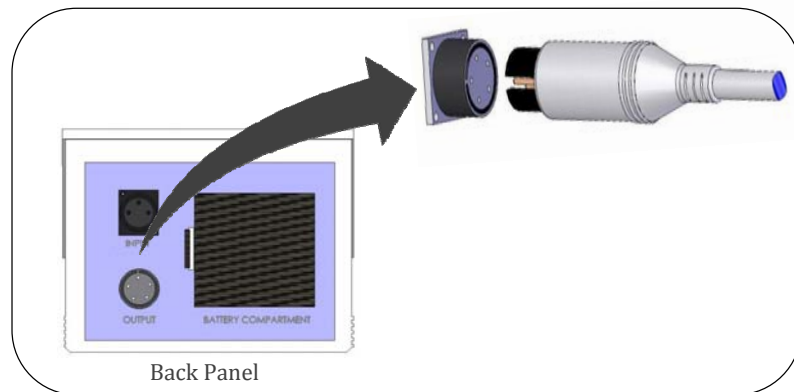


Fig.5: Model CSOP-D5 Cable

- Always use the supplied cable to connect 4X1-C2 device with the stimulator
- Ensure that all cables and leads are fully inserted in receptor sockets before operating the 4X1-C2

Connecting 5 Stimulation leads to the CSOP-D5 Output Cable

Leads can be connected on the flat-connector end of CSOP-D5 Output Cable. The 5 output ports are each color coded as shown in (Fig.-6).

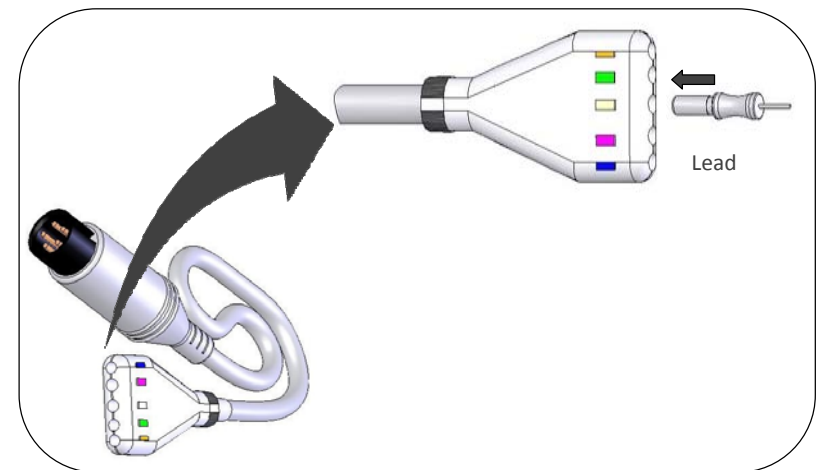
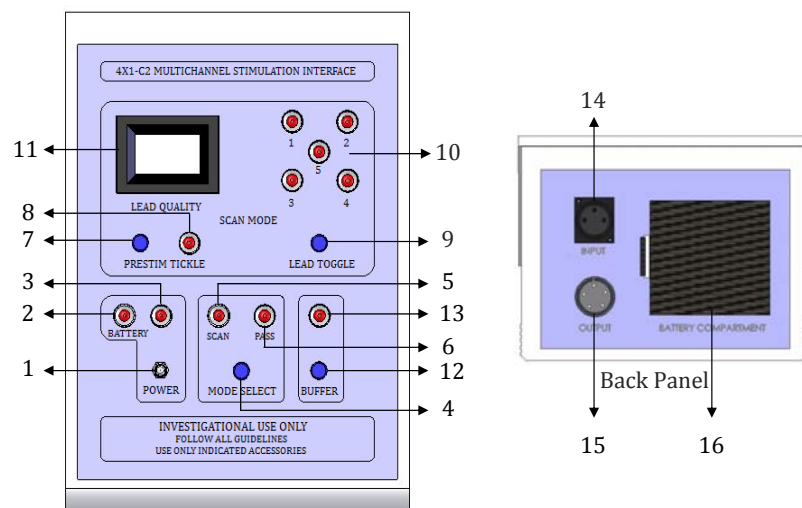


Fig.6: Model CSOP-D5 Cable



WARNING: It is the responsibility of the device operator to fully understand both the DC stimulator and 4X1-C2 device function and to guarantee that the CSOP-D5 cable is properly connected to the 5 output leads.

Panel Description



Front Panel

- | | |
|--------------------------|---------------------------|
| 1) Power On/Off switch | 9) Lead Toggle Switch |
| 2) Low Battery Indicator | 10) Lead Indicator |
| 3) Power On Indicator | 11) Lead Quality Display |
| 4) MODE Selection Switch | 12) BUFFER MODE On Switch |
| 5) SCAN MODE Indicator | 13) BUFFER MODE Indicator |
| 6) PASS MODE Indicator | 14) Input Receptacle |
| 7) Prestim On/Off Switch | 15) Output Receptacle |
| 8) Prestim On Indicator | 16) Battery Compartment |

Turning the 4X1-C2 System On

The Power switch is located near the lower left portion of control panel as shown in (Fig.-7).

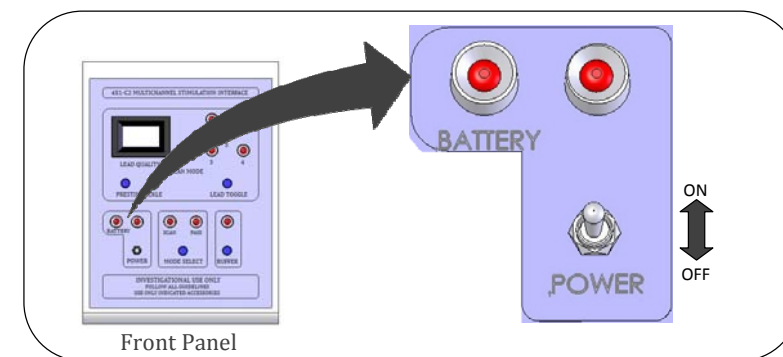


Fig.-7 Model 4X1-C2 Control Panel

After turning the Power on, if the battery light is on then the batteries must be changed. Do not try and operate the 4X1-C2 when the battery light is on. Turn off the power and follow the battery change instructions.

WARNING: Do not turn the 4X1-C2 interface unit ON when the DC stimulator is already generating an output.

Changing Between SCAN MODE and PASS MODE

After turning 4X1-C2 system ON, select the mode using the MODE SELECT switch located next to power switch as shown in (Fig.-8). The corresponding indicator will turn on for SCAN or PASS MODE.

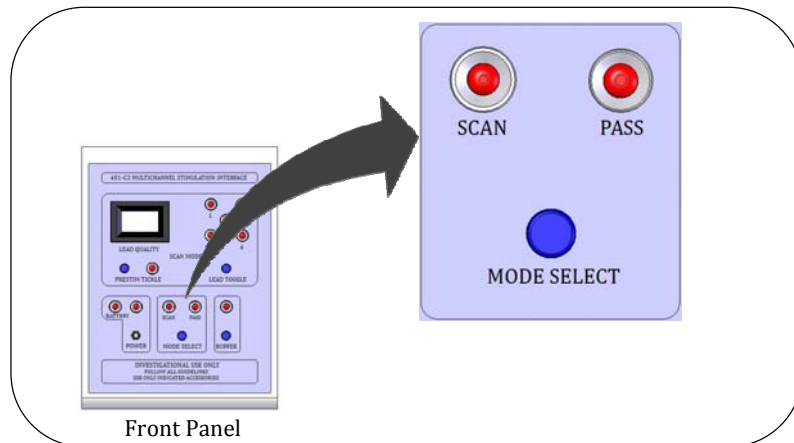


Fig.8: Model 4X1-C2 Control Panel



While a DC stimulator is generating an output in PASS MODE do not change to SCAN MODE.

Activating PRESTIM TICKLE in SCAN MODE

When in SCAN MODE pressing the PRESTIM TICKLE button once will activate a single electrical conditioning pulse.

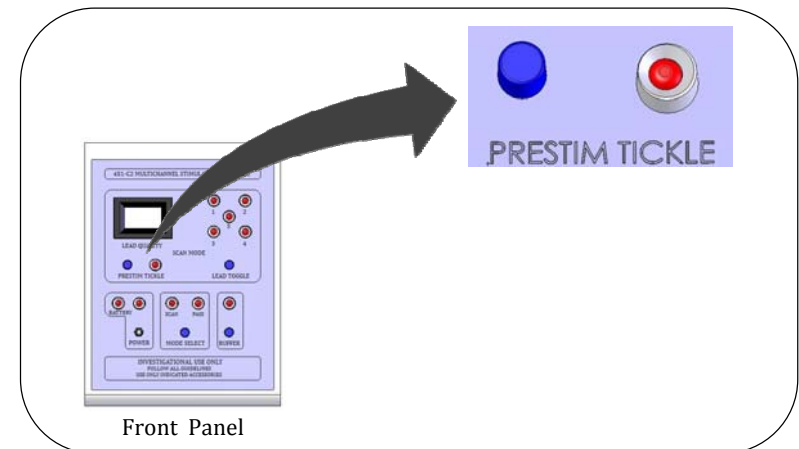


Fig.9: Model 4X1-C2 Control Panel



WARNING: Do not activate the PRESTIM TICKLE without fully understanding the 4X1-C2 operation and all safety factors related to lead outputs.

TOGGING Between Leads in SCAN MODE

LEAD TOGGLE is used to toggle between leads. Press once to select the next lead. The corresponding lead indicator will turn on indicating the selected lead; the selected lead number and color is indicated. The LEAD QUALITY display will give the value of lead quality for the selected lead.

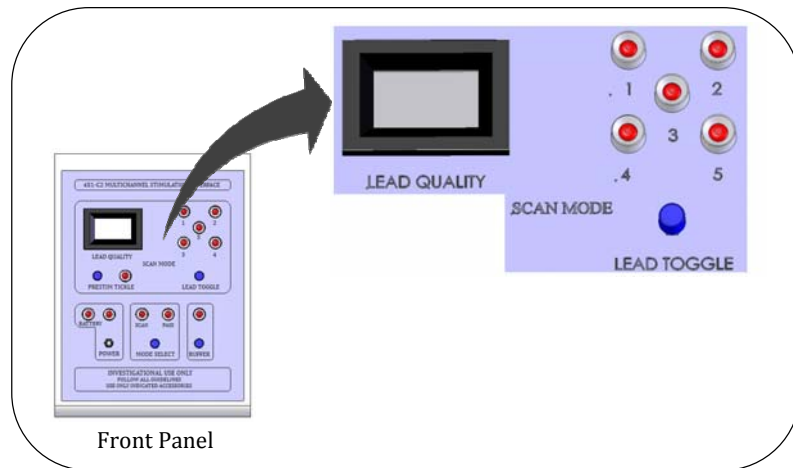


Fig.10: Model 4X1-C2 Control Panel

- Wait for at least 5 seconds for the system to give a stable LEAD QUALITY value
- In PASS MODE, the LEAD TOGGLE has no function

Engaging/Disengaging BUFFER MODE

Pressing the BUFFER MODE button will engage or disengage the buffer mode. The BUFFER MODE light will turn on. The BUFFER MODE will activate regardless of if the device was previously in PASS MODE or SCAN MODE.

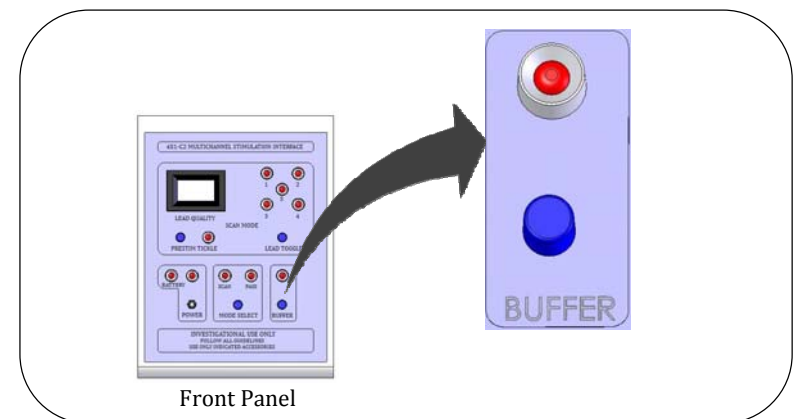


Fig.11: Model 4X1-C1 control Panel



Warning: Pressing BUFFER MODE while the DC stimulator is on will disengage the output leads from the DC-stimulator. It is the responsibility of the device operator to fully understand both DC stimulator and 4X1-C2 device function.

Troubleshooting

Problems	Possible Reason	Possible Solutions
System not turning on	<ul style="list-style-type: none"> Batteries are running out 	<ul style="list-style-type: none"> Replace Batteries Contact dealer
Display is too dim	<ul style="list-style-type: none"> Batteries are running out. 	<ul style="list-style-type: none"> Replace Batteries
Lead quality value not stable	<ul style="list-style-type: none"> System is still measuring Cable contact is loose Lead contact is bad 	<ul style="list-style-type: none"> Wait for atleast 5 seconds Properly connect input and output cables Improve lead contact integrity
No LEAD QUALITY display	<ul style="list-style-type: none"> System is not ON System is in PASS MODE Batteries depleted 	<ul style="list-style-type: none"> Turn on instrument Change to SCAN MODE if needed Replace Batteries
No Lead Output	<ul style="list-style-type: none"> System is in SCAN MODE Cables are not connected 2 Channel Stimulator is not activated System is in BUFFER MODE 	<ul style="list-style-type: none"> Change to PASS MODE Connect input and output - cables Activate stimulator if needed Disengage BUFFER MODE

Lead Toggle switch not working	<ul style="list-style-type: none"> Switch is not pressed properly Switch needs replacement 	<ul style="list-style-type: none"> Depress toggle switch completely Reset system by turning power off and then on
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