RS-232 Communications

“Series E / IE” and “Series EM”

Users Manual

INTRODUCTION:

This manual is intended to explain the operation and communication protocol for the “Series E”, “Series IE” and “Series EM” Emergency Lighting Central Inverter. Serial Communication can be established by means of a computer using Hyper-Link windows based software or using a Terminal device.

CONNECTION:

The Central Inverter has a 9 pin Sub-D Female connector located on the front panel located on the door of the inverter. See the Installation Guide for the exact location of the connector.

The Connector between the computer and the Inverter is a straight connection.
Do not use a Null Modem Cable that flips pins 2 and 3.
Pin 2 and Pin 3 are the Data send and receive lines; Pin 5 is the Ground.
Optical isolation on the Interface card provides galvanic isolation between the computers ground and the Inverters ground.

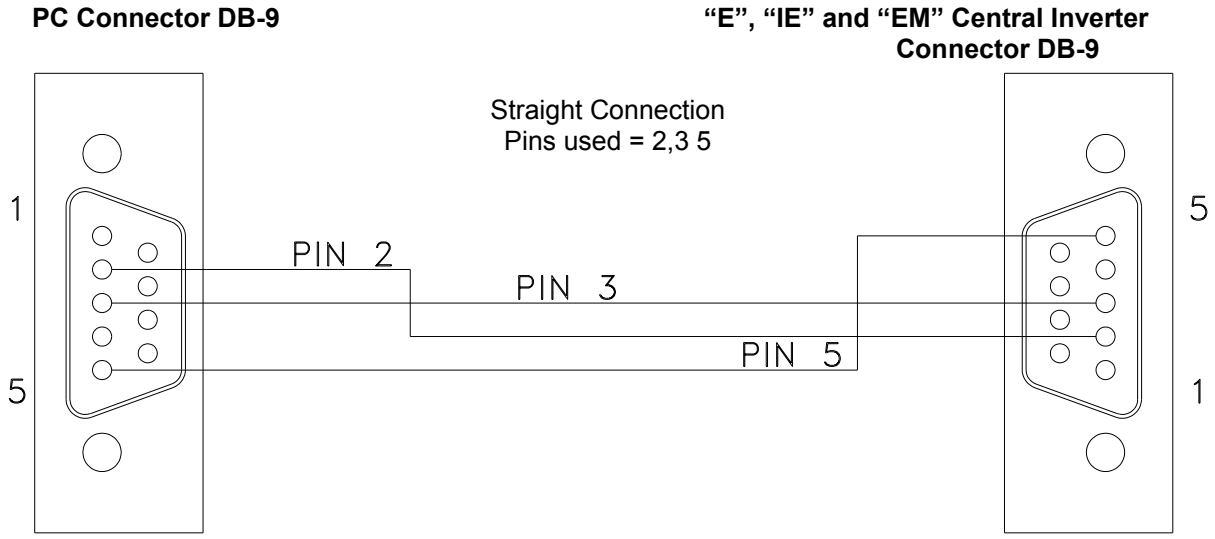


Illustration 1 – Interconnect Schematic for RS-232 Connection

Communication is established through a standard ASCII format of 8 Data bits, 1 Stop bit, No parity, No Flow Control, and a Baud rate of 19,200 BPS.

HYPER TERMINAL SETUP

Hyper Terminal is available with Windows through the Program Menu, Accessories Menu, and Communications Menu.

When HyperTerminal is launched, it asks for a connection name. It is useful to have a name for the connection so it can be saved for a quick launch next time you may use it.
After a name has been typed in, the next item is to make sure that the connection is to the correct port. For most connections this will be done through COM1.

Once the name and connection type are defined, the connection must be configured.
The Local connection should be set to:

Bits Per Second:	19,200
Data Bits:	8
Parity:	None
Stop Bits:	One
Flow Control	None

Once this is accomplished, only two more things to do to setup the connection.

Emulation: Changed from AUTO DETECT to ANSI.

Append line feeds to incoming line ends box should be checked in the ASCII setup. To get to the ASCII setup – File, Properties, Settings, ASCII Setup.

The setup is complete and the communication is now ready.

*** Always use lower case letters for communication unless noted otherwise.***

Shell Command

The first command the PC needs to send to the interface is the shell command.
The shell command acknowledges that the PC is connected. To execute the shell command type "shell" and press enter.
Remember that lower case letters must be used. Upper Case characters are ignored!!
During the shell command, there is no echo back of the characters as they are typed on the computer.
If a typing error is made, when the "ENTER" key is pressed, the display will not change.
The correct spelling of "shell" and the "ENTER" key must be executed correctly before the command prompt is displayed.
Once the shell command is sent, the command prompt (CMD>) will appear at the hyper-terminal display screen.
Once this command prompt (CMD>) appears, then the user can then query the machine.

The command prompt.

CMD>

Once communication is established, all characters will be echoed back to the computer and the monitor will display what characters the user sends.

Help screen

Once the shell command is executed and the command prompt appears the user may type "help" for a listing of various commands available to the user. Now that communication is established, the characters will be echoed back to the display. So, when "help" is typed, "help" will be displayed.

CMD>help

ver	Display current firmware version.
fax	Fax setup wizard.
set point	Display or modify set points.
meter	Display meter values.
status	Display present status.
alarms	Display alarms.
dump	Dump logs (alarms, tests, events).
dt	Display and change date-time setting.
help	List shell commands with brief descriptions.
exit	Exit from shell.

Version

The Revision level of the software is available by the "ver" command.

CMD>ver

Fax Setup Wizard

The fax modem option when purchased can be setup through the “fax” command.
The information that can be entered through the setup wizard is the following points:

CMD>fax

Street Address
City
State
ZIP Code
Building Name
Building Location
Location within Building
Emergency Contact Name
Emergency Contact Phone#
Unit Phone#
User Defined 1
User Defined 2
User Defined 3
User Defined 4
User Defined 5
Inverter Fault faxes report : Disabled
Charger Fault faxes report : Disabled
Output Fault faxes report : Disabled
Overload faxes report : Disabled
Overload Shutdown faxes report : Disabled
High Ambient faxes report : Disabled
High VAC faxes report : Disabled
Low VAC faxes report : Disabled
Low Battery faxes report : Disabled
Near Low Battery faxes report : Disabled
Utility faxes report : Disabled
Load Reduction faxes report : Disabled
Runtime faxes report : Disabled
Circuit Breaker faxes report : Disabled
Overtemp faxes report : Disabled

When a field is displayed, changes can be made. Once the changes are made, the interface sends back the changes. If the field data is correct, press “ENTER” and the next filed will be displayed.

Alarm Set point

When the set point command is entered the following data is displayed:

CMD>setpoint

lvac: 108.0 off
hvac: 132.0 off
nlbatt: 111.0 off
lbatt: 105.0 off
htemp: 45.0 off
lrc: 0.0 off

lvac is the Low Voltage AC alarm,
hvac is the High Voltage AC alarm,
nlbatt is the Near Low Battery Voltage alarm,
lbatt is the Low Battery Voltage Alarm,
htemp is the High temperature alarm set point, and
lrc is the Load Reduction Fault set point.

To change the set points the tab must be used as the delimiter. To change the low voltage alarm to 105 VAC, type “lvac” and then tab and type”105” and then tab and then type “on” or “off” to turn the alarm on or off.

Example:

CMD>setpoint lvac 105 on

Notice how there is a space between the word set point and lvac. The “TAB” character achieved this space. When the user presses “TAB”, a character is sent to the interface, this character inserts the space and also uses the “TAB” character as a delimiter between the data in the string.

The other set points can be changed by the same manner.

Meter Functions

To read Voltages and currents, the meter command may be used.
To use, type, “meter” and press enter. The following display will occur.

CMD>meter

vin: 118.3
vout: 118.3
iout: 12.3
vbatt: 54.1
ibatt: 0.1
tbatt: -61.1
tint: 29.8
imin: 0
days: 0
vaout: 1453.8
iwatts: 6.6

Status

The statuses of the machine are accessible by typing “status” and enter.
The following message occurs when status command is sent:

CMD>status

Battery Power:	0
Battery Charging:	1
Line Present:	1
System Ready:	1

Alarms

The alarm status of the machine is available through the “alarms” command.
When the alarm command is typed, the following information is available.

CMD>alarms

Inverter:	0
Charger:	0
Output:	0
Overload:	0
Overload Shutdown:	0
High Ambient:	0
High VAC:	0
Low VAC:	0
Low Battery:	0
Near Low Battery:	0
Utility:	0
Load Reduction:	0
Runtime:	0
Circuit Breaker:	0
Overtemp:	0

The format is binary. A “1” indicates that the alarm is present; a “0” indicates that no alarm is present.

Alarms, Events, and Tests Dump

The dump command displays all of the memory content for Events, Tests or Alarms.
The dump command must be followed by a tab and then either alarms, tests or events as the second field.
Example – Dump followed by tab and alarms would display all alarms stored in memory to date.

Date and Time

The date and time can be viewed by typing the “dt” command.
When dt is sent, the interface sends back the date and time information. Each parameter of the date and time are assigned a number. The dt command produces the following message:

CMD>dt

(1) day of week:	1..7
(2) month:	1..12
(3) day of month:	1..31
(4) year:	0..99
(5) hours:	0..23
(6) minutes:	0..59

TUE AUG 10, 2004
11:03:57

The Parameter day of week is 1 and its data is 1 through 7. 1 is Sunday, and then the days follow in sequential order.
To change the parameter, type the dt command then the tab and then the parameter number and then the tab and then the parameter information.
The tab is used as a delimiter between the commands and parameter number and parameter data. If the tab is not used, the command will be ignored and no change will be made.

CONFIGURING THE ZOOM MODEM (OPTIONAL)

Connect the 9VDC Power Adapter

Connect the PC serial port to the modem's serial port

On the PC, bring up a terminal communications program such as HyperTerminal.

Configure HyperTerminal to the following:

19,200 BPS
8 Data Bits
No Parity
No Stop Bits
No Flow Control

Make sure there is communication by typing AT<enter> until the message "OK" appears.

Type the following AT commands:

ATM1 <enter> (speaker on until connected)
AT&D0 <enter> (ignore DTR)
AT&K0 <enter> (no flow control)
ATS0=1 <enter> (auto-answer after one ring)
AT&W0 (store to non-volatile memory)

DIALING THE ZOOM MODEM

Type AT<enter> until the message "OK" appears

Type for example:

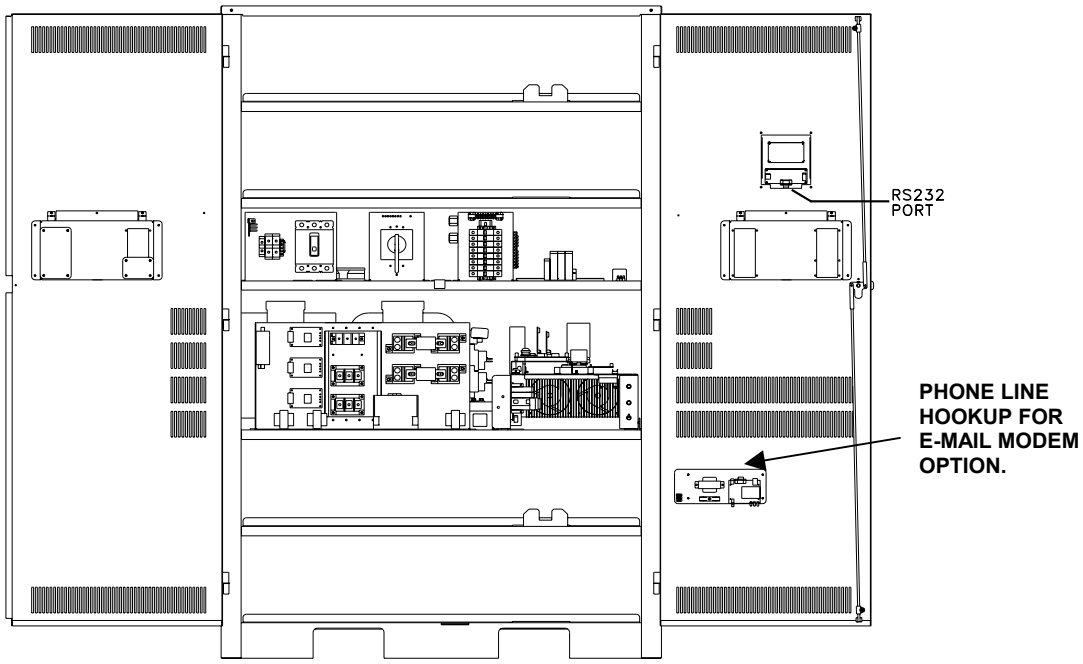
ATD9, 16109545224 <enter>
ATD is the command
9,16109545224 is the phone number –9, for outside line.

Wait for the message "connected"

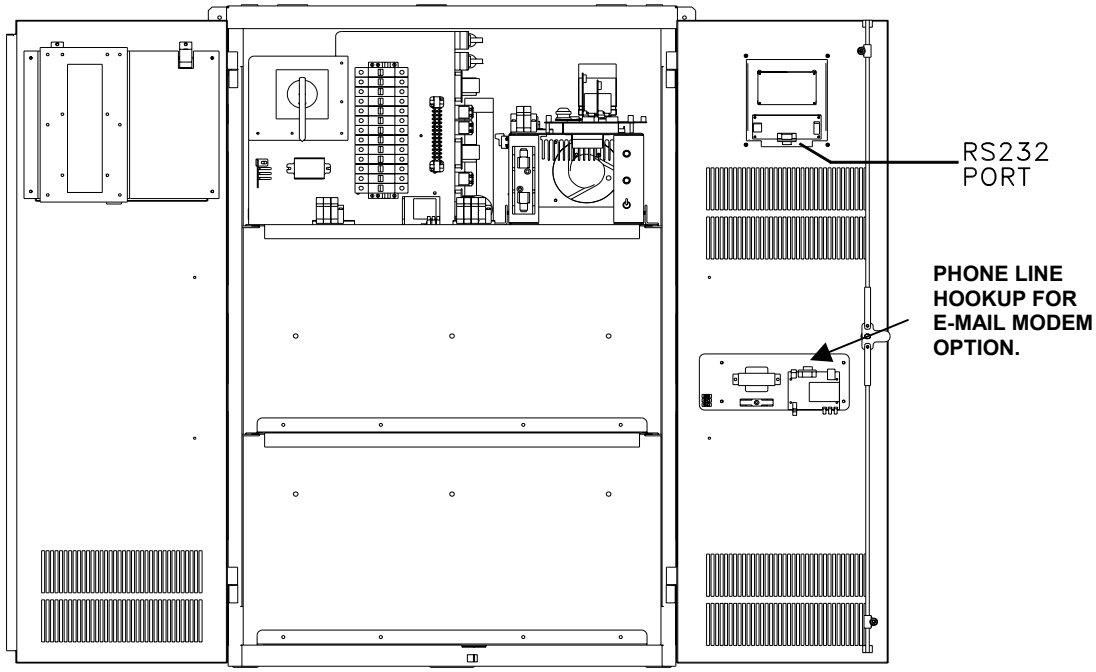
To hang up:

Type three plus signs (+++) and wait for the message "OK"
Type ATH0 <enter> to hang up or,
Type ATO0 <enter> to enter online mode again

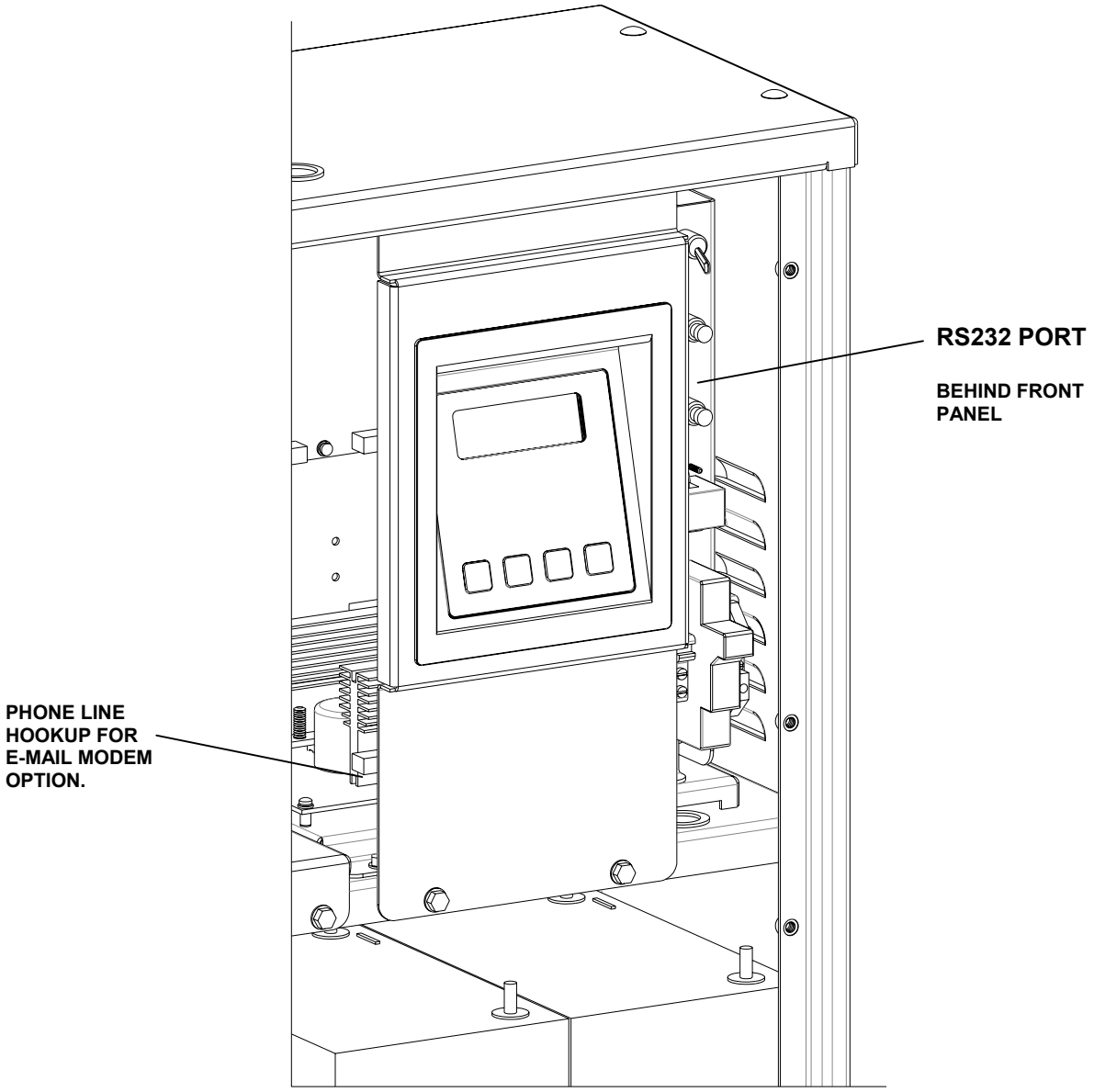
LOCATION OF THE RS232 PORT FOR "E" & "IE" 6-16.7k



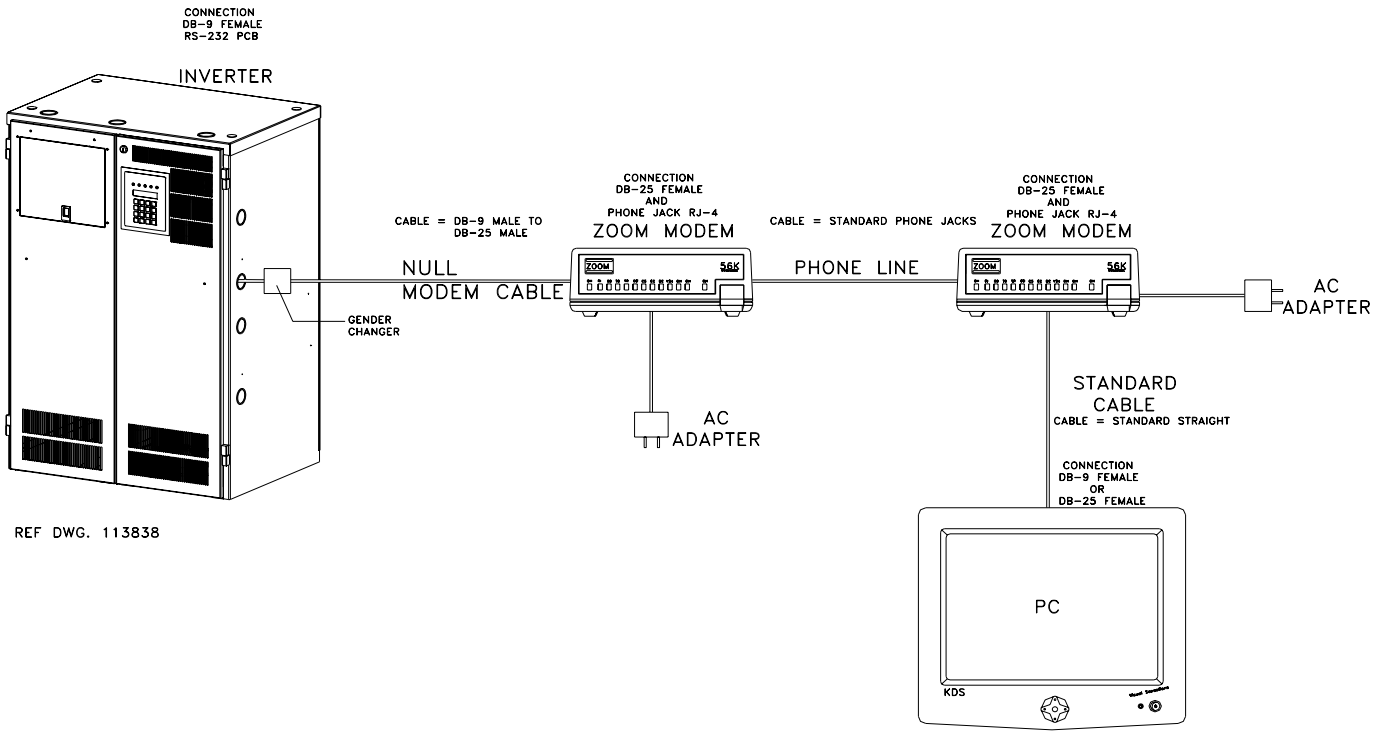
LOCATION OF THE RS232 PORT FOR "E" & "IE" 1.5 –5.0k



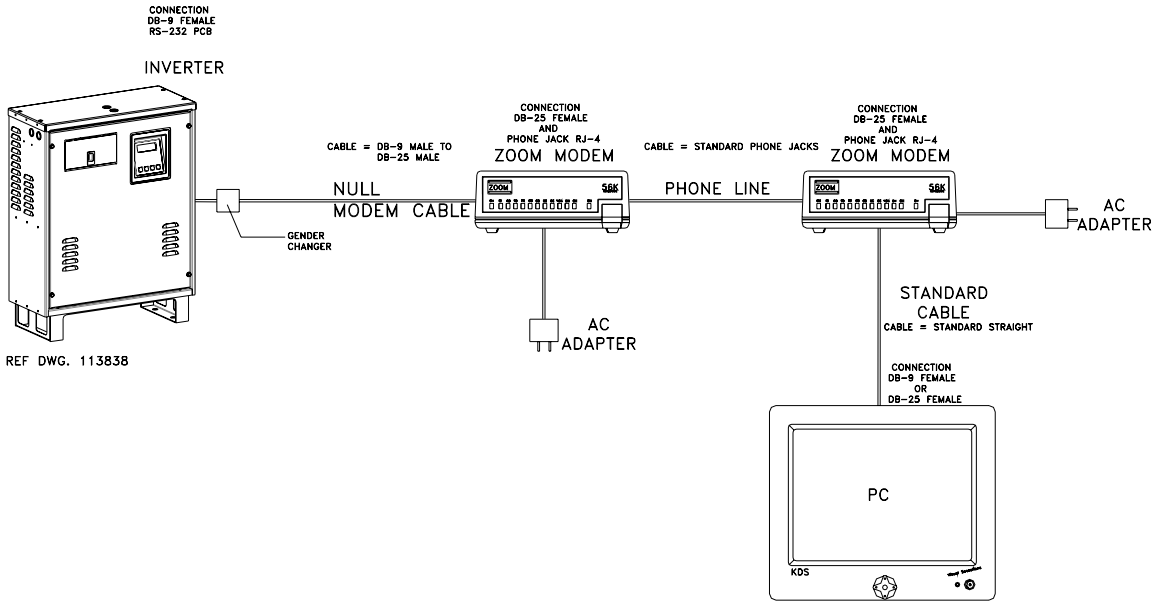
LOCATION OF THE RS232 PORT FOR "EM" 1.0 – 2.8k



ZOOM MODEM CONNECTION BLOCK DIAGRAM "E" & "IE" 1.5 – 5k SYSTEMS



ZOOM MODEM CONNECTION BLOCK DIAGRAM "EM" 1.0 – 2.8k SYSTEMS



DETAILED WIRING DIAGRAM