

# Addendum to the Model 3276 Manual: RS-232 Connection

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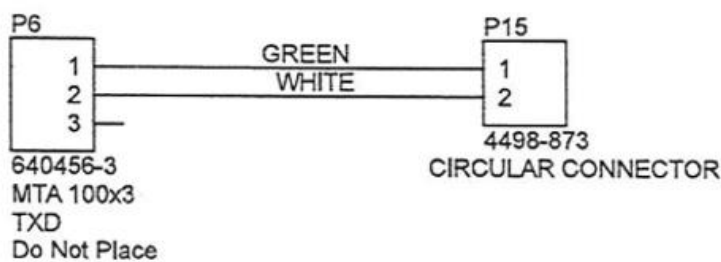
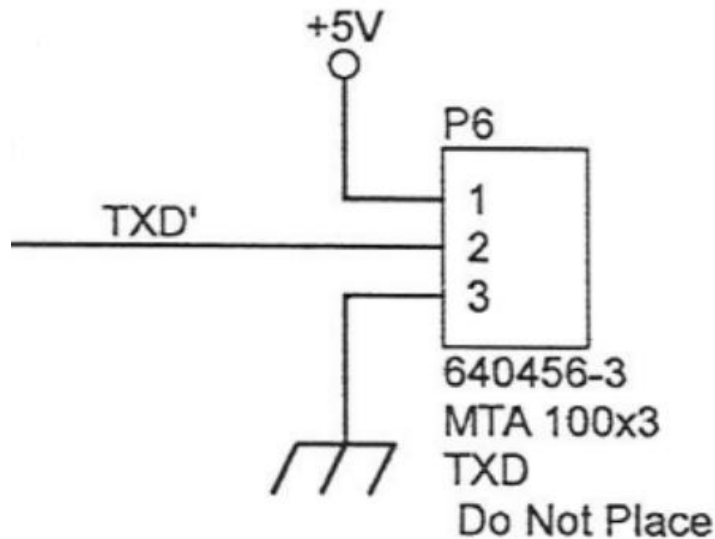
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## Hardware

### Hardware requirements

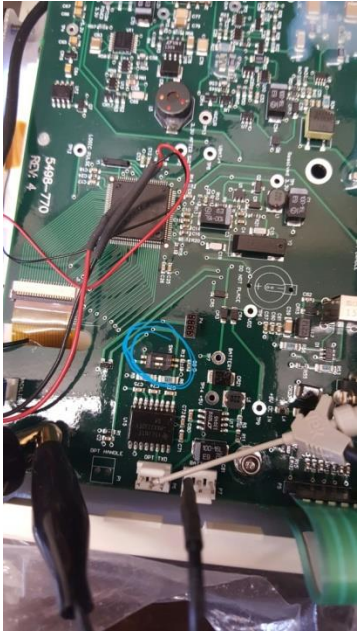
- **RS-232 Connector:** (p/n 4498-873): a 3-pin Hirose connector may either be installed in order to have RS-232 output to a Ludlum Model 272D (p/n 4498-1014) remote with cable, or to use for datalogging. An Ethernet adapter (p/n 4498-958) is also available and allows for connection to Ludlum Universal Software.
- **3-pin MTA Connector:** has been attached in the proper location
- **Dip switch 1 must be on.**

### Wiring



## Dip Switch

The Model 3276 can be purchased with additional options, which may require use of a relay or RS-232 outputs.



To enable RS-232 or Relay operations, open the battery compartment and remove the batteries from the Model 3276. Next, loosen the four captive pan-head screws that fasten the bottom cover. Gently remove the bottom cover of the instrument. The DIP (dual in-line position) switch should now be visible adjacent to the display ribbon cable.

To enable RS-232 or Relay operations on the Model 3276, slide DIP Switch 1 (the left-most switch) to the ON (forward) position. This position will provide power to the RS-232/Relay section of the main board. If DIP Switch 1 is in the OFF (back) position, the Model 3276 RS-232/Relay operations will be disabled. Once the DIP Switch is set as desired, gently replace the back cover and the four pan-head screws. Install the batteries, and replace the battery cover.

**NOTE:** Setting the RS-232/Relay operation (Dip Switch 1 ON) can result in reduced battery life.



## Instrument Settings

Our instrument has several different ways of communicating besides its main USB port. All of these other communications styles or “auxiliary communications” are affected by the list of parameters below.

**Note: All parameters must be enabled through Lumic Software.**

**Note: ONLY USE 2 and 3 values for the Model 3276. Others are not supported.**

### Auxiliary Communications Parameters

<b>Device Auxiliary Communication Mode</b>	<b>Dev_AuxCom_Mode</b>	Default Value: 2 Min Value: =2 Max Value: =3
Sets the mode/type of auxiliary communication <ul style="list-style-type: none"> <li>• <del>0 – Normal Slurm ( DO NOT USE)</del></li> <li>• <del>1 – LMI Direct ( DO NOT USE)</del></li> <li>• 2 – 375 Standard</li> <li>• 3 – 375 Ethernet</li> </ul>		

<b>Device Auxiliary Communication Port Number</b>	<b>Dev_AuxCom_375EthMode_Port</b>	Default Value: 50000
Sets the port number of the instrument. <ul style="list-style-type: none"> <li>• 50000 to 59999</li> </ul>		

## Using the Serial Connection

**Note:** The Model 3276 serial output mimics that of the Ludlum Model 375, which has a **fixed unit of measure, like “mR/hr.”** The Model 3276 has a floating or auto-ranging display, and thus could change from “990 mR/hr” **units to “1.00 R/hr” in a high field. The problem is** that the serial output would **then change from “990” to “1.0,”** and a remote user might think the **radiation field had decreased.** In order to prevent this problem, it is best to set the MIN\_DISPLAY and MAX\_DISPLAY parameters in the **Model 3276** to prevent a display unit’s change.

### Serial Port Settings

Baud Rate: 2400

Parity: No Parity

Data Bits: 8

Stop Bit: 1

Handshaking: No handshaking

### Standard Output

Every two seconds the Model 3276 sends out 14 bytes with a carriage return and a linefeed character ending each message string. The Model 3276 transmits the data continuously even if no computer is connected to it.

The data that is output from each model 3276 is in the following format:

BYTE1	0	x
BYTE2	x	x
BYTE3	x OR	x
BYTE4	x	x
BYTE5	.	.
BYTE6	x	0
BYTE7	Audio Status	1=ON
BYTE8	High Alarm Status	1=ON
BYTE9	Low Alarm Status	1=ON

BYTE10 Over Range Status 1=ON

BYTE11 Monitor Status 1=ON

BYTE12 Error Code

BYTE13 Carriage Return (ODH)

BYTE14 Line Feed (OAH)

### Error Codes

0 = No error.

~~1 = Got a negative number.~~

~~2 = The dtc count exceeded 3 bytes.~~

~~3 = Addition overflow.~~

4 = Ratemeter exceeded 4 bytes.

~~5 = Multiplication Overflow.~~

~~6 = Division by 0.~~

~~7 = Accumulator Overflow.~~

~~8 = Shift Overflow.~~

~~9 = EEPROM write error.~~

### ETHERNET OUTPUT

**Assumed 5 at the start of port number.**

Byte 1 L

Byte 2 M

Byte 3 I

Byte 4 0 x

Byte 5 x x

Byte 6 x OR x

Byte 7 x x

Byte 8 . .

Byte 9 x 0

Byte 10 Audio Status = 1 = on

Byte 11 Alarm Status = 1 = on



Byte 12     Alert Status = 1 = on  
 Byte 13     Over Range Status = 1 = on  
 Byte 14     Monitor Status = 1 = on  
 Byte 15     Error Code  
 Byte 16     UNIT ID CHAR 1  
 Byte 17     UNIT ID CHAR 2  
 Byte 18     UNIT ID CHAR 3  
 Byte 19     PORT NUM CHAR 1  
 Byte 20     PORT NUM CHAR 2  
 Byte 21     PORT NUM CHAR 3  
 Byte 22     PORT NUM CHAR 4  
 Byte 23     3             Firmware version of Model 375  
 Byte 24     9  
 Byte 25     6  
 Byte 26     x  
 Byte 27     x  
 Byte 28     n  
 Byte 29     x  
 Byte 30     x  
 Byte 31     3             Firmware version of Ethernet board  
 Byte 32     9             **Note: The firmware version of the**  
 Byte 33     8             **Ethernet board is not sent out the**  
 Byte 34     x             **serial port of the Model 375!**  
 Byte 35     x  
 Byte 36     n  
 Byte 37     x  
 Byte 38     x

Byte 39      Carriage Return (0DH)

Byte 40      Line Feed (0AH)