

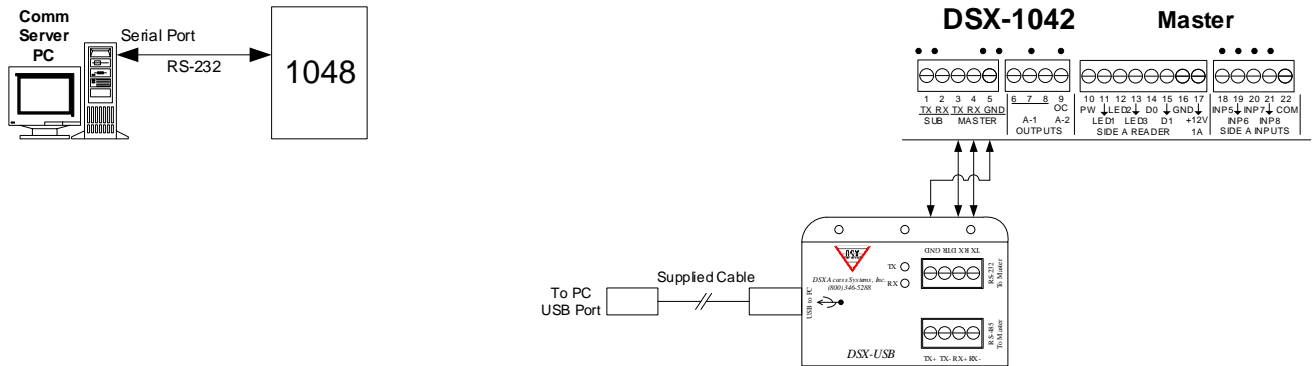


DSX Access Systems, Inc.

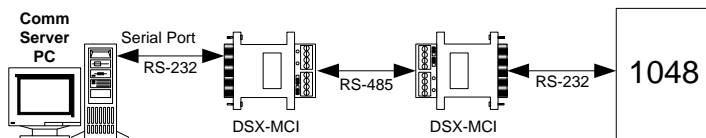
## DSX Master Communications

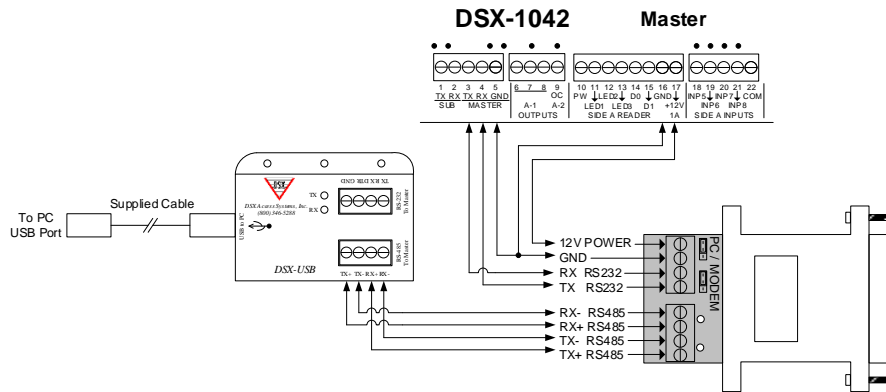
### PC to Master Controller - Direct Connect Communications

Communications between the Comm Server PC and the Master Controller can take several forms which we will discuss in detail here. The most simple and basic of communication approaches is RS-232. This can be used with the DSX-1040 Series Controllers for short distances. The Serial Port of the Comm Server PC is directly connected to the Master Controller. This is done with a 2 pair 22AWG cable with an overall shield. This type of connection is good for up to 50 feet of distance between the PC and the Master Controller. A DSX-USB is also available to convert USB to RS-232.

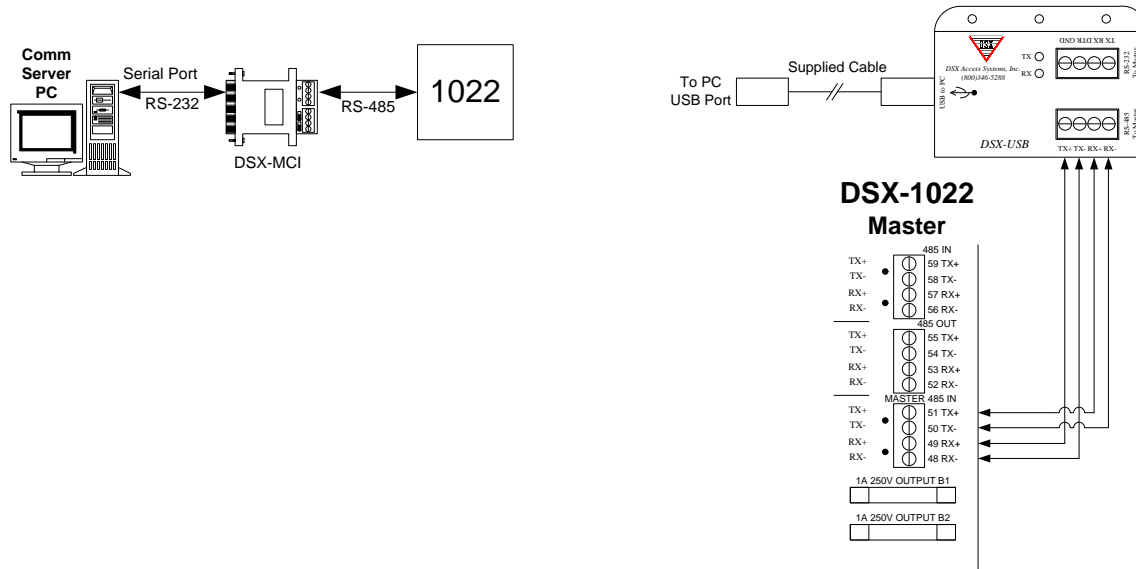


If more than 50 feet of distance is required from the PC to Master Controller two DSX-MCI modules must be used. The first one converts the RS-232 to RS-485 which is good for 4000 feet of distance using a 2 twisted pair 22AWG cable. The second DSX-MCI is used to convert the RS-485 back to RS-232 for the Master 1040 Series Controller. A DSX-USB could also be used with an MCI to gain the distance necessary.



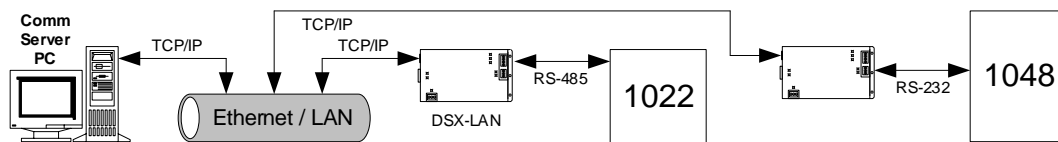


The DSX-1022 Series Controller communicates using RS-485 only. This requires a DSX-MCI or USB module to convert the RS-232/USB port of the PC to RS-485 for the 1022 Series Master Controller. The module is placed at the PC and using a 2 twisted pair 22AWG cable the Master Controller can be up to 4000 feet away.



### PC to Master Controller - TCP/IP Communications

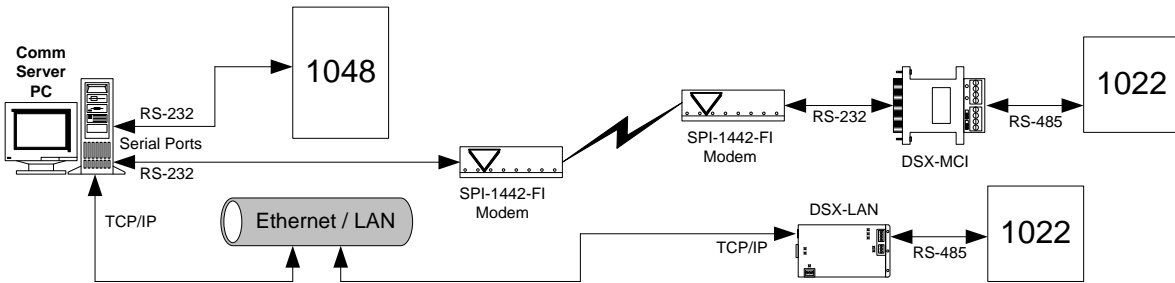
The DSX-LAN module is typically used to connect a Master Controller to the Comm Server PC over a Local or Wide Area Network. The WinDSX software is inherently TCP/IP capable and can redirect communications that would normally be transmitted out a serial port, over a LAN/WAN to a specific IP address. The DSX-LAN module receives that communication and converts it to RS-232 or RS-485 that connects directly to the Master Controller. The illustration below shows the Comm Server communicating with two Location Master Controllers. Data packets between the PC and the Master Controller vary in size.



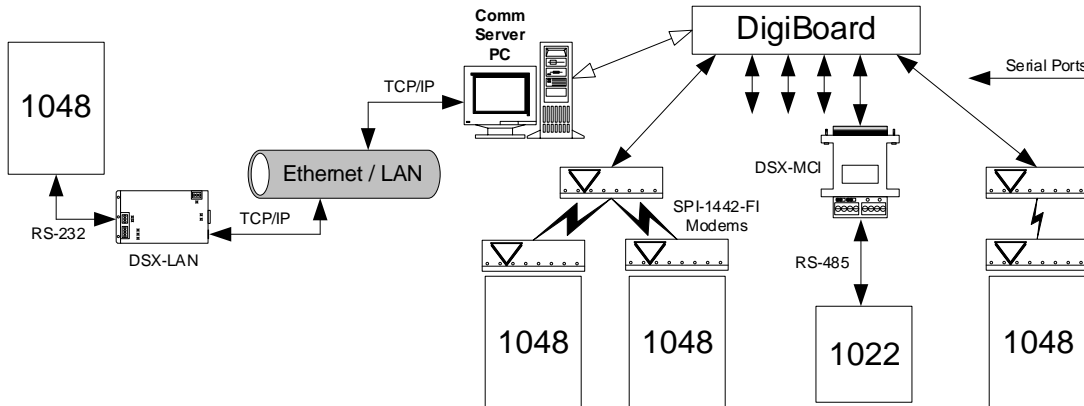
## Bandwidth

Most of the packets between the Comm Server and the Location Master Controller are empty polls and are only 18 bytes long. The longest packet is 200 bytes long. A communications connection between the WinDSX Comm Server and a Location Master Controller uses approximately 4800 bits per second of bandwidth. Size of database is not relevant.

This next illustration shows that there are three types of communications that can be used to Location Master Controllers. All three methods can be used at the same time. There can be multiple Locations using each of the different methods; Direct, Dial-up, and LAN.

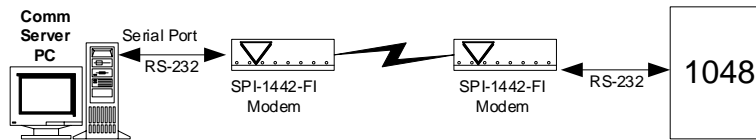


When more serial ports are needed for connections to Location Master Controllers than what the PC has, a DIGI Board can be used. Below is a DIGI Board that can provide up to 64 serial ports for multiple Direct and Modem connected Locations.

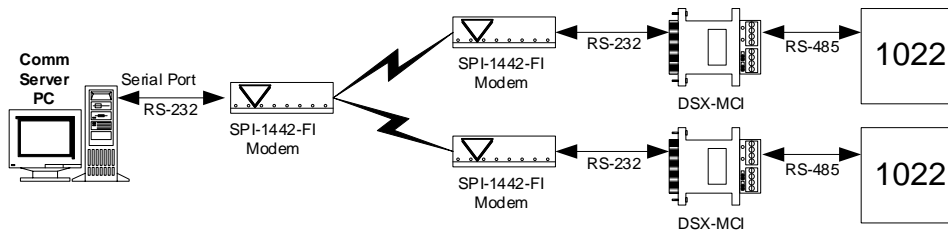


## PC to Master Controller Communications via Dial-Up Modems

The WinDSX system can communicate with many Locations via dial-up phone modems. Since the system is fully distributed and does not require a PC for operation, there is practically no loss of performance in systems using dial-up phone modems. All panels retain all capabilities including card access, anti-passback, and I/O Linking. A DSX modem can be connected to the Comm Server and used to communicate with many Location Master Controllers that also have a DSX Modem. Below is an illustration showing one DSX Modem connected to a serial port communicating to another DSX Modem over a standard dial-up phone line. The second DSX Modem is connected directly to the DSX-1048 Master Controller.



This one modem could be used to communicate with several Location Master Controllers like in the drawing below. This drawing also shows the 1022 Master Controller requires a DSX-MCI module between the Modem and the Master Controller.



## Additional Modem Operation Information

The PC may be programmed to routinely poll each modem-controlled Location. Routine Polls include verification that communications are still functioning and the collection of history logs. If the PC fails to connect with a modem Location on three consecutive attempts, a Location Communications Loss alarm is generated at the PC.

If the PC is not programmed to routinely poll the Location Master, the Master panel will automatically store all transactions until the history buffer reaches 80% of capacity. When the buffer is at 80%, the Master panel calls the PC to upload all transactions if the PC is programmed to do so. The default settings for these two values are to poll the dialup site as often as possible, and also to dial the PC when the Transaction Buffer reaches 80% capacity.

If an alarm event occurs, the Master will initiate a call to the PC to report the alarm event regardless of its buffer status. If the Master panel is reset for any reason, it will automatically call the PC and request a full parameter download to ensure proper operation.

DSX recommends the DSX series modems for dial up phone modem communications. This series of modems are small dial up phone modems that may be powered from the battery backed up 12VDC power of the DSX control panel. By powering the modem from the panel, the modem is battery backed up so that communications will occur even during an AC power loss. An external DC power transformer is supplied with each DSX modem shipped. The wire that connects the power cube to a modem can be removed and used to attach the backed-up power source from the panel to the modem.

DSX configures and initializes all modems before shipping. They are shipped with everything necessary for installation. These are the only modems DSX will support. Other modems may or may not work properly. If it's not a DSX modem you are basically on your own!!!

### **Phone Call Description**

During an incoming call at the PC, the modem transmits a ring signal to indicate that the line is ringing. The Software then commands the modem to go Off-Hook. The two modems form a link by transmitting a carrier tone through the phone line. At this time, the modem will turn on the Carrier Detect (CD) light. Communication will then proceed between the Master and the PC at the defined baud rate. The PC is always responsible for dropping the connection (hanging up the phone). The Master's modem hangs up when the connection is dropped.

The PC modem must be initialized before it will function properly. Each time the communications program is started, and before each outbound call, the modem is automatically initialized. If the modem loses power, or is turned off and then back on, it must be re-initialized. To manually re-initialize the modem, do a manual connect and disconnect or leave the communications program and return.