

**DSX-RMS1076
Redundant Monitoring System
UL 1076 Installation Manual**

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Part # DSX-RMS1076 Manual Rev A

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Compliance

You must consult your local fire codes before installing any locking device on doors, gates, or barriers. A construction and fire approval permit may be required before installing any equipment. Call your local Fire Marshall for building code requirements in your area. For UL installations, you must install the DSX System according to the UL Installation Manual and in accordance with the National Electric Code, ANSI / NFPA 70 regulations and recommendations for US Installations. Canadian installations must be in accordance with the Canadian Electric Code C22.1.

The DSX-1022, DSX-1040CDM, DSX-1040PDM, DSX-1042, DSX-1043, DSX-1044, DSX-CKI-C, DSXCKI-K, DSX-DP485 and DSX-FRB8 have been tested and found to conform to the requirements of UL 294.

The DSX-1022, DSX-1040CDM, DSX-1040PDM, DSX-1042, DSX-1043, DSX-1044, DSX-1040-PE-B, DSXMCI, DSX-LAN, DSX-SPS and DSX-2PC have been tested and found to conform to the requirements of UL 1076.

Camera and DVR integration was not tested by UL.

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UL-1076 Requirements

Basic Requirements

- 1) Data Processing equipment and office appliance and business equipment used as central supervisory station equipment shall comply with:
 - A) The Standard for Office Appliances and Business Equipment, UL114
 - B) The Standard for Information-Processing and Business Equipment, UL478 or
 - C) The Standard for Information Technology Equipment, UL1950
- 2) The minimum PC Requirements are as follows:
 - SQL Servers**
 - A) Microsoft Server 2003
 - B) SQL Server 2005 Enterprise Sp3
 - C) Pentium 4 - 3GHz
 - D) 1 G Memory
 - E) Dell Power Vault 220™
 - F) 20 Gig disk storage space
 - Comm Servers**
 - A) Microsoft XP SP2 / Vista Business Sp1
 - G) Pentium 4 - 3GHz
 - H) 1 G Memory
- 3) The system shall utilize supply line transient protection complying with the Standard for Transient Voltage Surge Suppressors, UL1449 with a maximum marked rating of 330V.
- 4) The system shall utilize signal line transient protection complying with the Standard for Protectors of Data Communications and Fire Alarm Circuits, UL 497B, with a maximum marked rating of 50V.
- 5) Modem and Telco communications should not be used for UL Installations.
- 6) The DSX Communications Servers and all other PC related equipment shall be installed in a temperature controlled environment. The Temperature Controlled Environment must be maintained between 13-35C (55-95 F) by the HVAC System. The HVAC System must have 24 hours of standby power. The Standby Power System for the HVAC System may be supplied by an Engine Driven Generator alone. A standby battery is not required to be used.
- 7) All receiving equipment shall be completely duplicated with provision for switchover to the backup system within 30 seconds. The backup system shall be fully operational within 6 minutes of the loss of the primary system. This allows 30 seconds for the backup system to be fully energized and connected to necessary communication lines and other devices, followed by 5 1/2 minutes for the system to boot up, conduct memory tests, file system check, security verifications and prepare for full system operation. The Backup computer shall have the capabilities of the Primary, such as memory, speed and the like.
- 8) There will be a minimum of one UL Listed Reports Printer.
- 9) Failure of the Main Computer System, hard disk, and alarm monitor shall result in switchover to the backup system and shall be indicated by an audible or obvious visual indication.
- 10) A Fault Tolerant System may be used in place of complete duplication of the system if every component in the fault

tolerant system, including the software and the power supply, is duplicated.

- 11) In addition to the main power supply and secondary power supply that are required to be provided at the central supervisory station, the system shall be provided with an uninterruptible power supply (UPS) with sufficient capacity to operate the computer equipment for a minimum of 15 minutes. If more than 15 minutes is required for the secondary power supply to supply the UPS input power, the UPS shall be capable of providing input power for at least that amount of time.
- 12) The UPS shall comply with the Standard for Uninterruptible Power Supply Equipment, UL 1778, or the Standard for Fire Protective Signaling Devices, UL 1481.
- 13) There shall be a means for disconnecting the input to the UPS while maintaining continuity of power to the automation system.
- 14) The communications polling from the Comm Server to the Location Master controller cannot be less than once every two hundred seconds.
- 15) Signal Priority must always be Alarm first, Trouble second, and Supplementary third.
- 16) Abort Delay Time of Entry Exit Doors shall not exceed 60 seconds.
- 17) The number of Monitored Inputs cannot exceed 1000 per location.
- 18) Any Communications Failure shall be treated as a compromise of the Standard Line Security of the proprietary burglar alarm system.

19) Protection for the system is intended to be set from the monitoring equipment only.

20) This application requires WinDSX SQL Software 4.8.73 or higher.

SQL Server Requirements

This product requires advanced knowledge of Microsoft Server 2003™ and Microsoft SQL Server 2005™. It is the responsibility of you the Dealer, or your customer the End User, to have the personnel or access to the personnel that are qualified to Install, Configure, and Maintain Microsoft SQL Server™ in a clustered environment. DSX provides documentation that will assist in creating and configuring the Microsoft SQL Server™ database required by the WinDSX SQL software.

DSX tech support CANNOT provide support for Microsoft SQL Server™ in a cluster. You must have someone on hand that can provide the SQL Server and networking expertise that will be required. You will not be able to just “Figure It Out When You Get There”. SQL Server in a cluster is complicated; you cannot just wing it and expect the system to perform properly. If you do not have someone on staff with this knowledge it is strongly recommended that you pay someone to help you.

High Availability through DSX-RMS1076 Redundant Monitoring System

Communications Overview

The DSX-RMS1076 Redundant Monitoring System provides continued availability of System Communications and Control through the implementation of Primary and Backup Communication Server PCs. Available only with WinDSX SQL the Hot-Swap Supervisor program runs on the Backup Comm Server PC and monitors the Primary Comm Server. When the Primary fails all communications are redirected to the Backup (Redundant) Comm Server.

LAN connected locations are transparently transferred to the Backup Server and with the use of a DSX-SPS Serial Port Switcher all direct serial port connected Locations are also switched automatically. WinDSX SQL Workstations automatically switch to the Backup Server and continually display which Comm Server they are talking to. This feature requires the purchase of the Hot Swap Comm Server software and optionally the DSX-SPS Serial Port Switcher.

Both Comm Servers are defined in the system as either the Primary or Backup Comm Server and both PCs have static TCP/IP addresses. Both PCs are running at all times. The Backup Comm Server PC runs the Hot Swap Supervisor software. The Supervisor Software polls the Primary Comm Server. Once the polls have failed for a predetermined amount of time the Supervisor Program starts an instance of Comm Server on the Backup PC. The Supervisor Software also initiates any hardware switch over that needs to take place (direct connects) by sending the appropriate commands out a serial port to the DSX-SPS Serial Port Switcher.

The Workstation program on all PCs in the system will automatically switch to the

Backup Comm Server when the Primary Comm Server fails. The Workstation program has a real time status display that shows which Comm Server is on line.

The Hot Swap Supervisor Software has a Stop button that allows the Backup Comm Server to be shut down, the Primary Comm Server to be restarted, and the serial port connected communications to be returned to the Primary Comm Server.

LAN connected Location Master Controllers must have a Dynamic IP Mode connection that automatically communicate with the Backup Comm Server PC.

Each DSX-SPS will accommodate the switching of up to 20 serial ports from the Primary Comm Server to the Backup Comm Server. More than one SPS can be used where more than 20 serial ports are required.

Requirements

1. DSX-RMS1076 only works with WinDSX SQL.
2. Backup Comm Server must have 1 more serial port than what is required for the Primary Comm Server when switching communications to direct serial port connected locations.
3. The shared WinDSX SQL folder must be on the SQL Virtual Server.
4. The Primary and Backup Comm Server PCs both require Static TCP/IP addresses.
5. LAN modules must be programmed for Dynamic communications so that they can respond to both the Primary and Backup Comm Servers.
6. The Hot Swap Comm Server program is loaded on the Backup Comm Server PC.
7. The USB Key and Keymon are also run on the Backup Comm Server.

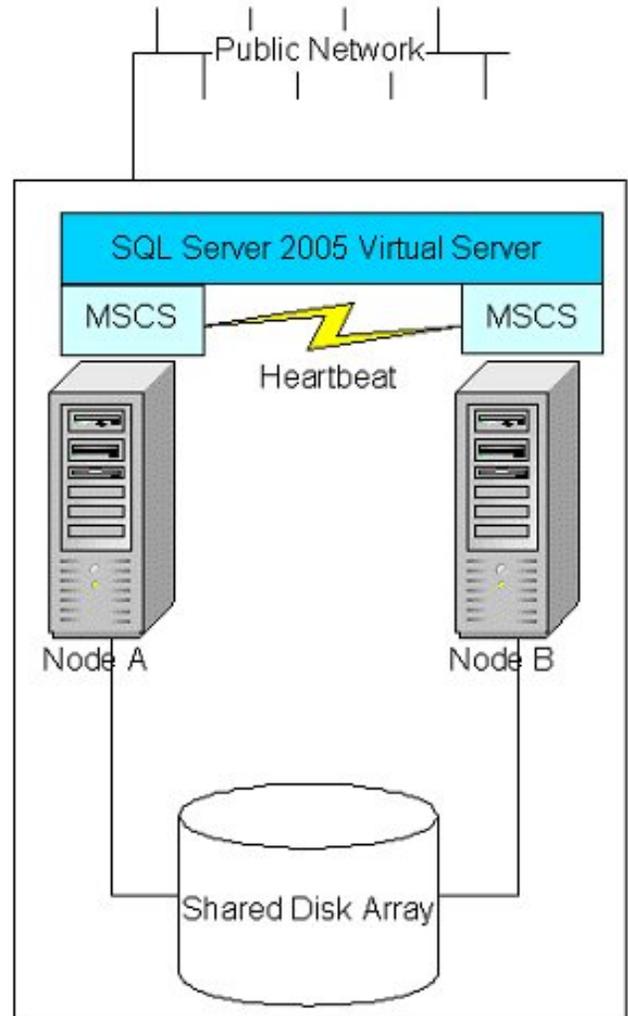
High Availability of DataBase using SQL Server 2005 Failover Clustering

Failover Clustering Overview

Continuous uptime in a production environment is becoming a common security requirement. This information describes Microsoft® SQL Server™ 2005 failover clustering, one method of creating high availability. Failover clustering is available only in SQL Server 2005 Enterprise Edition.

Failover clustering is a process in which the operating system and SQL Server 2005 work together to provide availability in the event of an application failure, hardware failure, or operating-system error. Failover clustering provides hardware redundancy through a configuration in which mission critical resources are transferred from a failing machine to an equally configured server automatically. Failover clustering also allows system maintenance to be performed on one computer while another computer (node) does the work. This benefit can also ensure that system downtime due to normal maintenance is minimized.

The goal of failover clustering is to provide high availability for an overall solution that accommodates backups, redundancy, and performance. If software and/or hardware problems occur, failover clustering can enable a production environment to stay up and running.



How Failover Clustering Works

The clustered nodes use a heartbeat (see diagram on previous page) to check whether each node is alive, at both the operating system and SQL Server level. At the operating system level, the nodes in the cluster compete for the resources of the cluster. The primary node reserves the resource every 3 seconds, and the competing node every 5 seconds. The process lasts for 25 seconds and then starts over again. For example, if the node owning the instance fails due to a problem (network, disk, and so on), at second 19, the competing node detects it at the 20-second mark, and if it is determined that the primary node no longer has control, the competing node takes over the resource.

From a SQL Server perspective, the node hosting the SQL Server resource does a Looks-Alive check every 5 seconds. This is a lightweight check to see whether the service is running and may succeed even if the instance of SQL Server is not operational. The IsAlive check is more thorough and involves running a `SELECT @@SERVERNAME Transact SQL` query against the server to determine whether the server itself is available to respond to requests; it does not guarantee that the user databases are up. If this query fails, the IsAlive check retries five times and then attempts to reconnect to the instance of SQL Server. If all five retries fail, the SQL Server resource fails. Depending on the failover threshold configuration of the SQL Server resource, Windows Clustering will attempt to either restart the resource on the same node or fail over to another available node. The execution of the query tolerates a few errors, such as licensing issues or having a paused instance of SQL Server, but ultimately fails if its threshold is exceeded.

During the fail over from one node to another, Windows clustering starts the SQL Server service for that instance on the new node, and goes through the recovery process to start the databases. The fail over of the SQL Server

Virtual Server will take a short time (probably seconds). After the service is started and the master database is online, the SQL Server resource is considered to be up. Now the user databases will go through the normal recovery process, which means that any completed transactions in the transaction log are rolled forward, and any incomplete transactions are rolled back. The length of the recovery process depends on how much activity must be rolled forward or rolled back upon startup.

Client Connections and SQL Server 2005 Virtual Servers

WinDSX SQL connects to a SQL Server 2005 Virtual Server with the SQL Server Name or IP address of the SQL Server 2005 Virtual Server. The Cluster name, the Cluster IP address, or even the individual node names are not used by the connections. From a client or application perspective, it does not need to worry about which node owns the resources, because connecting to the SQL Server 2005 Virtual Server appears as a normal SQL Server. During the failover process, any active connections are broken. WinDSX SQL checks to see whether the connection exists, and if not, reconnects.

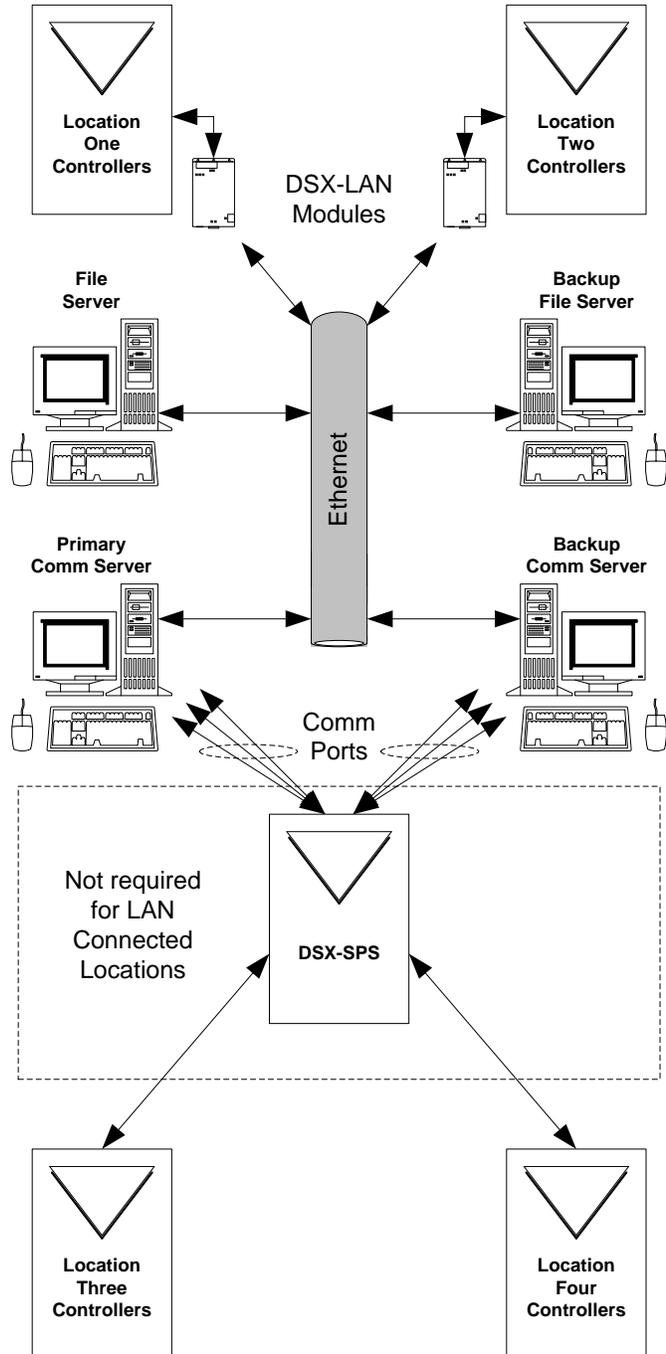
DSX-RMS1076 Typical Application

This drawing shows the typical deployment of the DSX-RMS1076 Redundant Monitoring System. This application depicts two Clustered SQL Server PCs and two Comm Server PCs.

The Clustered SQL Servers provide high availability to the DataBase for both Comm Servers and all Client PCs.

The Hot Swap Comm Servers provide high availability to system communications and control between system controllers and all Client PCs.

Communications to the LAN connected controllers is seamlessly switched from one Comm Server to the other. Communication to the direct connected controllers is handled by the DSX-Serial Port Switcher.



Example of Clustered SQL Servers

DSX configured and tested Clustered SQL Servers in the following manner. Listed below is the equipment used and the configuration.

- PCs - 3 GHZ with 1G of RAM
- OS – Windows Server 2003 and MS SQL Server 2005 Enterprise™.
- Dell Power Vault 220™ shared drive array. The Power Vault can handle up to 14 drives but you lose 1 slot when you cluster the array. The Power Vault has two drives that are mirrored for the quorum files that the Cluster administrator uses. It also has 3 drives that are configured Raid 5 for the SQL server data files. This raid drive also has our file share resource so that when the SQL server fails over so does our shared folder. You could also have another 3 drives for the SQL transaction logs if you wanted. There are several hotswap drives for failover redundancy.
- Each PC has an LSI MegaRaid card that talks to the PowerVault controller. You could also use a Perc Raid controller from Dell. The important thing with these cards is that they are Cluster aware and cluster capable. When you configure the cards they must have a unique LUN so one card is LUN 6 and the other card is LUN 7.

\\ Both PC's run the cluster administration program and are capable of taking control of the cluster. We are using SQL server in an Active/Passive setup. Since this is a stand alone system both PC's are domain controllers and run Active Directory as well as DNS servers. The Heartbeat is facilitated by using a second Network card in both PCs connected together via a network HUB.

Important Configuration Facts

- WinDSX is not compatible with Windows 95, Windows 98, Windows ME, or Windows XP Home Edition, Linux, or the MAC operating systems.
- WinDSX SQL must use the Enterprise Edition of SQL Server.
- When using Windows XP turn off Simple File Sharing.
- You must have Administrator Rights to properly install the WinDSX software.
- To run the programs, the User must have Full Control over the local folder where the WinDSX software is installed, Full Control over the shared resource (Database Path) folder, Full Control over their Temp folders, and Read rights on the local System32 folder under Windows.
- UNC (Universal Naming Convention – ie [\\FileServerWinDSX](#)) must be used for the database path.
- The Comm Server must have a static TCP/IP address. The Workstations can be DHCP.

Create a File Share on the Virtual Server

At this point you have the two SQL Servers Clustered together and ready to start with the WinDSX specific configuration.

First create a file share on the virtual server that was used for the SQL Server Data Files.

1. Open Windows Explorer and create a folder on a shared disk that you want to share out for users.
2. Assign the appropriate NTFS file level permissions on the folder. Make sure that the account used to start the Cluster Service has at least READ rights to the folder.

Note Do not share the folder in Windows Explorer as you normally would for a file share. If you do not grant the Cluster account the appropriate permissions or share the folder through Windows Explorer, it may cause the cluster file share to fail. This also includes any administrative shares that already exist, you do not want to create shares for the root of the drive (Q\$) for example.

3. Start Cluster Administrator (CluAdmin.exe).
4. Select a group that has an existing IP Address and Network Name resources. If you do not have these resources created, you will need to complete this before continuing. For additional information, see the article number below in the Microsoft Knowledge Base:
[257932](http://support.microsoft.com/kb/257932/)
(<http://support.microsoft.com/kb/257932/>) Using Microsoft Cluster Server to create a virtual server.
5. Right-click, and select **New**, then **Resource**.
6. Fill in an administrative name and description for the resource. From the

Resource Type pull down, select "File Share", click **Next**.

Note This is the name that will be displayed in Cluster Administrator and is only used for administrative purposes. This is not the share name that users will connect to, give the resource a name that will be easy to identify and manage.

7. Select the nodes that you want to be possible owners of the resource. Click Next to leave all nodes as possible owners.

Note Possible Owners defines whether a resource is ever able to failover to a specific node. Use extreme caution in defining Possible Owners because defining a possible owner for a single resource will affect the failover for the entire group.

8. Select a Network Name and Physical Disk resource that the file share will be dependent on.

Note Dependencies serve two functions.

- a. They define the bindings for a resource. You want the file share to be dependent on the Network Name resource that clients are going to use when connecting to the file share. The IP Address resource that the Network Name resource is dependent upon is the IP Address that will be used when connecting to this share. You never want a file share resource to be dependent on the "Cluster Name" resource.
- b. They define the start order for a resource. You want to make sure that the network name that the share is going to be created under and the physical disk where the folder resides that is going to be shared are online and available before attempting to bring the File Share online.

When creating a dependency 'Tree' it is best to keep it as simple as possible. A file share resource should always be dependent on a Network Name that the clients will use to connect to this share and Physical disk resource where the folder is located. The Physical Disk resource should never be

dependent on anything. The Network Name resource should be dependent on a IP Address resource which the virtual server will be associated with. The IP Address resource should not be dependent on anything. See the following article for additional information:

[171791](http://support.microsoft.com/kb/171791/)(<http://support.microsoft.com/kb/171791/>) Creating dependencies in Microsoft Cluster Server)

9. On the File Share Parameters screen fill in the following information and click **Finish**:

a. The "Share Name" is the name of the share that will be created for the UNC when clients connect. This needs to be a valid NetBIOS name, and is recommended to be a valid URL name as well.

b. The "Path" is the full path on the local node to the shared disk where the folder is located. For example: T:\Users.

c. The "Comment" is the information about the share that will appear when a client browses the share.

10. By default, when resources are created, they are in an offline state. The following steps are a best practice. Follow them to isolate the effect of the resource failure on other production resources. This will help until the resource is ready to be brought into production for users.

a. Right-click the resource, and then click **Properties**.

b. Click the **Advanced** tab, click to select the **Do not restart** button, and then click **OK**.

c. Bring the resource online. Make sure that it functions correctly.

d. After you confirm that the resource functions correctly, and you are ready to bring it into production, take the resource offline. Then, click to select the **Restart** button.

e. Bring the resource online.

Install WinDSX in File Share

Before Installing the Software in the Virtual Server File Share you must login as a user with full administrator rights. Make sure that the Temp and TMP settings are pointed to an actual directory. This is found in Control Panel/System/Environment.

1. To load the software, place the WinDSX CD in the CD-ROM Drive. Select "My Computer" on the desktop then right click on the CD-ROM Drive and select explore. Navigate to the Install Directory. **Open the Install Directory and double click on Setup.exe**. Follow the prompts and allow setup to install the software into the WinDSX directory on the file share that we just created.

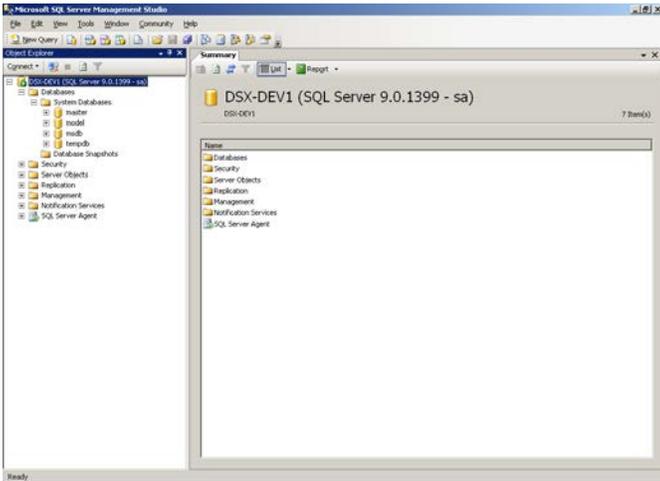
2. After loading the software be sure and run the Database program (DB.EXE) first from the directory where the software was just loaded. After starting the database program for the first time, set the DataBase Path to the file share on the virtual server. Also be sure to assign the PC a unique Workstation Name and Number other than Workstation 1 and #1. The default user name and the default password are master - both entered in lower case.

Configure SQL 2005

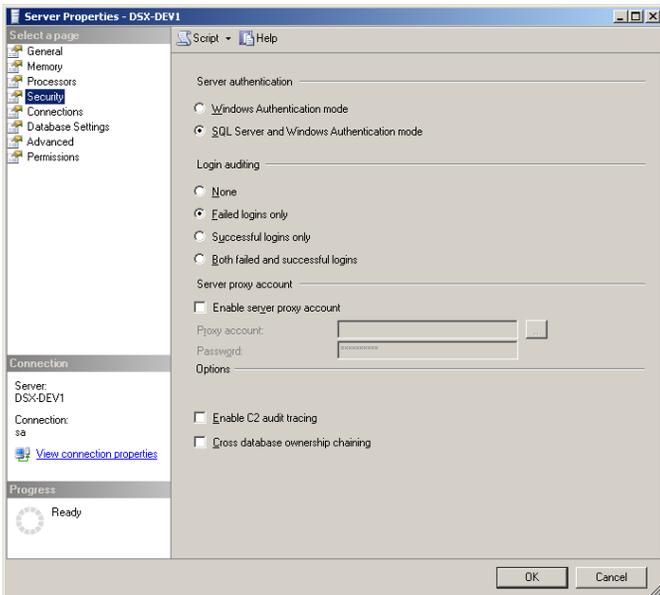
Use these instructions for setting up WinDSX on a Microsoft SQL Server 2005™.

This product requires advanced knowledge of Microsoft SQL Server™ and Networks. This product requires advanced configuration. The Dealer or End User must have a Microsoft SQL Server Administrator to install, configure, and maintain the SQL Server on site.

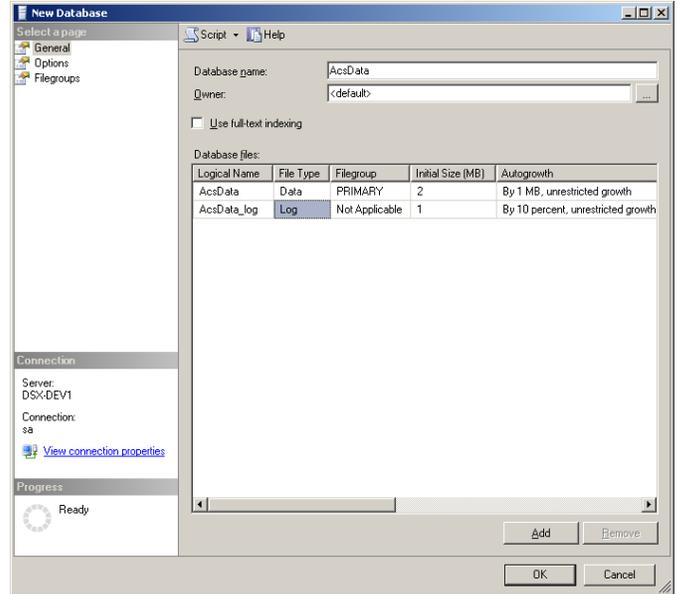
1. Using the **Management Studio**, right click on the Name of the Server and select *Properties*. Make the following settings.



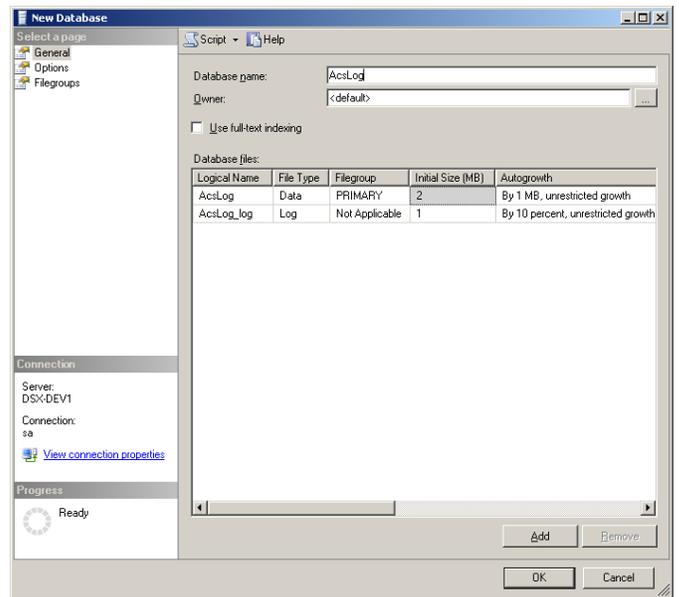
Set for Windows Authentication



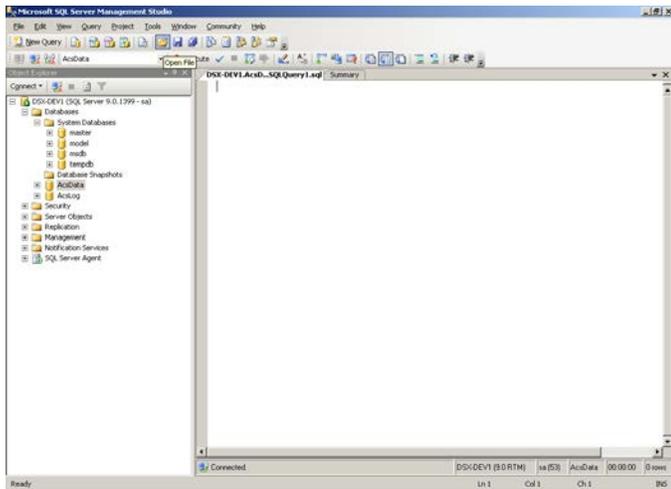
2. Using the **Management Studio** create a new database called AcsData and save. Set the initial size to be 100 Meg. Turn on the *Automatic File Growth* and set the growth to *megabytes and 1 Meg*. Select *unrestricted file growth*.



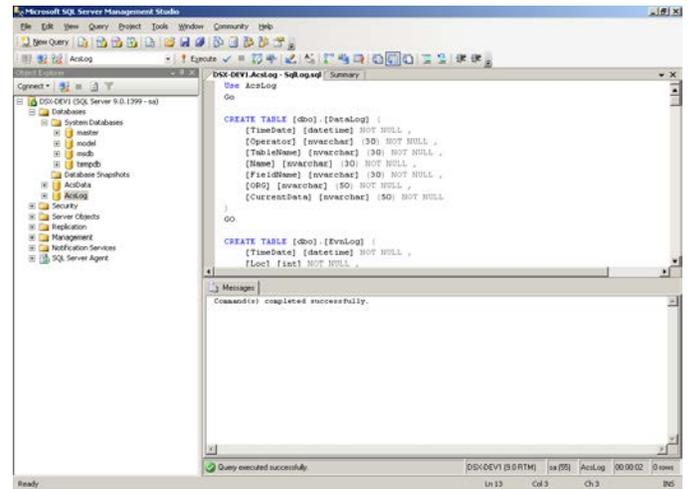
3. Using the **Management Studio** create a new database called AcsLog. Set the initial size to be 200 Meg. Turn on the *Automatic File Growth* and set the growth to *By Percent* and set the percent to *10*. Select *unrestricted file growth*.



4. From the **Management Studio** right click on AcsData and select New Query.



7. From the **Management Studio** right click on AcsLog and select New Query.



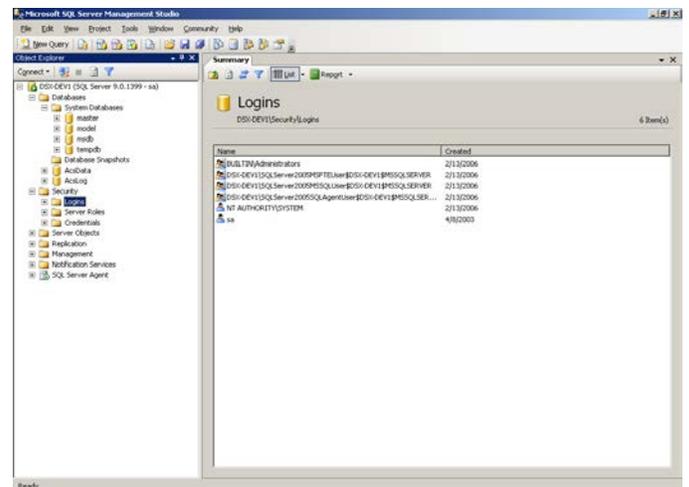
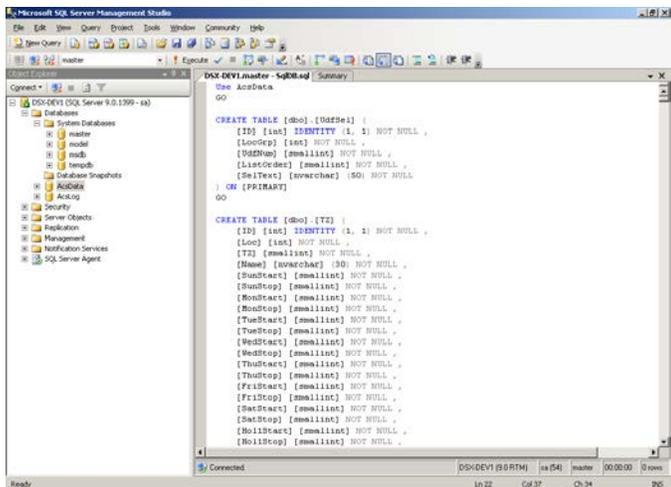
5. Next Select **File/Open** and navigate to the virtual server directory where you installed the WinDSX SQL software. If you have already attempted to run the WinDSX database program you will find a sub directory name MdbStruc. Inside this directory you will find a file called **SqlDb.sql**. If you do not see the sub directory then we need to run the DBSQL.exe file and then cancel at the login screen. Now open the SQLDB.sql file with the query analyzer.

8. Next Select **File/Open** and navigate to the virtual server directory where you installed the WinDSX SQL software. In that directory you will find a sub directory name MdbStruc. Inside this directory you will find a file called **SqlLog.sql**. Open the SqlLog.sql file with the query analyzer.

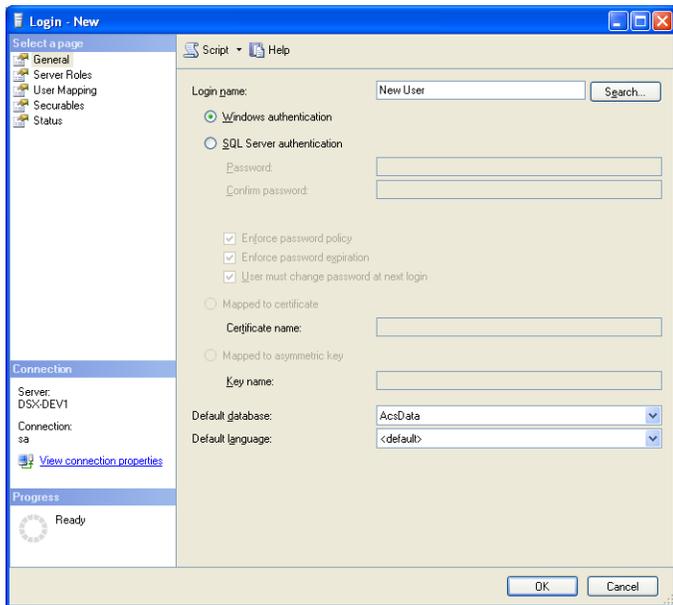
6. Once the file has been loaded click on **Execute Script** in the tool bar. This will instruct the Query Analyzer to run the script. The script will create the structures of the AcsData database.

9. Once the file has been loaded click on **Execute Script** in the tool bar. This will instruct the Query Analyzer to run the script. The script will create the structures of the AcsLog database.

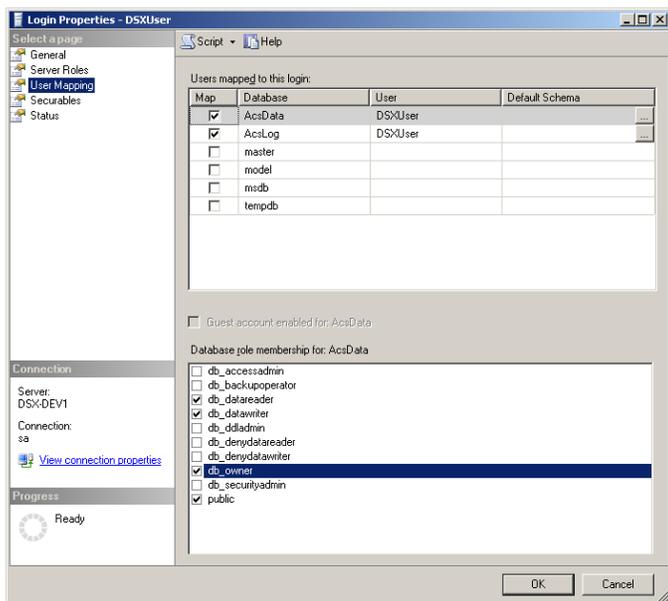
10. From the **Management Studio** select **Security/Logins**. Right click and select New Login.



11. Provide a Name that you wish to use for logging into the SQL server from the workstations. Select *AcsData* as the default database.



12. Select User Mapping and assign the following databases to the Login and set the appropriate permissions as below.



13. The first time that you run the DbSql.exe program there will be a short delay and it will present a SQL login screen. You enter the *EXACT* name of the SQL Server. Once this data is entered successfully the system will store it and you will not need to login again. This will need to be done at each Workstation.

Note /// WinDSX SQL Version 4.7 and higher requires the Software Key Monitor program (KeyMon.exe) and the USB Software Key to be installed on any PC in the System but in this application it must be on the Backup Comm. Server.

Note/// For Windows Authentication or Named Pipes select Windows Authentication. This requires more setup in Windows and AD. When setting up the Client PCs the first time DBSQL.exe is started it will launch SQLSetup. Enter the Name of the SQL Server. Do not enter a User Name or Password. Rights and permissions must be given to the user in AD. This will be done on all PCs the first time the program is run.

Loading WinDSX on Primary Comm Server

Before Installing the Software you must login as a user with full administrator rights. Make sure that the Temp and TMP settings are pointed to an actual directory. This is found in Control Panel/System/Environment.

1. To load the software, place the WinDSX CD in the CD-ROM Drive. Select "My Computer" on the desktop then right click on the CD-ROM Drive and select explore. Navigate to the Install Directory. **Open the Install Directory and double click on Setup.exe.** Follow the prompts and allow setup to install the software into the local hard drive of this pc.

2. After loading the software be sure and run the Database program (DBSQL.EXE) first from the directory where the software was just loaded. After starting the database program for the first time, set the DataBase Path on each PC to the file share created in step 1. Also be sure to assign the PC a unique Workstation Name and Number other than Workstation 1 and #1. The default user name and the default password are master - both entered in lower case.

Loading WinDSX on Backup Comm Server

Before Installing the Software you must login as a user with full administrator rights. Make sure that the Temp and TMP settings are pointed to an actual directory. This is found in Control Panel/System/Environment.

1. To load the software, place the WinDSX CD in the CD-ROM Drive. Select "My Computer" on the desktop then right click on the CD-ROM Drive and select explore. Navigate to the Install Directory. **Open the Install Directory and double click on Setup.exe.** Follow the prompts and allow setup to install the software into the local hard drive of this pc.

2. After loading the software be sure and run the Database program (DBSQL.EXE) first from the directory where the software was just loaded. After starting the database program for the first time, set the DataBase Path on each PC to the file share created in step 1. Also be sure to assign the PC a unique Workstation Name and Number other than Workstation 1 and #1. The default user name and the default password are master - both entered in lower case.

Configuring WinDSX on Backup Comm Server

On the backup Comm Server we need to run DBSql.exe from the local hard drive and enter the SQL Server Login and password. When the WinDSX Login appears select cancel to close.

1. Load the USB Key – Hasp Driver – Hdd32.exe located in the WinDSX SQL folder on the Backup Comm Server. After the driver has been loaded plug the USB Key into an available USB port on the Backup Comm Server.
2. Run the Keymon.exe program located in the WinDSX SQL folder on the Backup Comm Server.
3. Copy the HotSwap.msi installation file from the \Utilities folder located on the WinDSXSQL CD to the WinDSXSQL folder on the Backup Comm Server and install it into that same folder.
4. From the WinDSX SQL folder on the Backup Comm Server start the database program by double clicking on DBSql.exe. Login and select System\Setup\DataBase Path and set the SQL Server name and the path to the shared folder. Close and restart the program.
5. Start and Login to the WinDSX SQL DataBase program. Select System\Setup\System Parameters and edit the Workstation Name.
 - A. On the General Tab make sure the Workstation Name and Number are unique to all other WinDSX SQL software installations.
 - B. On the Yes/No Options Tab select “This PC is BackUp Comm Server”
 - C. On the Communications Server Tab enter the “TCP/IP Address” of this Backup Comm Server PC.
 - D. Close and restart the program.
6. Start the HotSwap.exe program in the WinDSX SQL folder on the Backup Comm. Server by double clicking on it.
 - A. Close the program.
 - B. In the WinDSX SQL folder there will now be a HotSwapIni.txt file.
 - C. Edit the file and change the P0 to a P1 or P2 to reflect the comm. Port that is connected to the DSX-SPS.
 - D. Save the file and close it and then Restart the HotSwap.exe program.
7. If using the DSX-SPS Serial Port Switcher for direct connected locations make those connections now as shown in the next section.

DSX Serial Port Switcher

DSX-SPS

The DSX-SPS Serial Port Switcher is the hardware that physically switches serial ports from a Primary Comm Server to a Backup (Redundant) Comm Server. This occurs in conjunction with the Hot Swap Comm Server software that monitors the Primary Comm Server. When the Primary Comm Server fails, the Backup Comm Server computer takes over. The HotSwap program running on the Backup Comm Server sends an ASCII string to the SPST module telling it to activate. The SPST in turn signals the individual 2PC modules to switch from Primary to Secondary serial ports. When the HotSwap.exe program is instructed to return to the Primary Comm Server, the Backup Comm Server sends another string to the SPST to deactivate, thereby switching everything back to the Primary serial ports. Up to 10 DSX-2PC modules can be used to switch a total of 20 serial ports per SPS.

DSX-SPST

The DSX-SPST (Serial Port Switch Trigger) board is the power distribution and Backup Comm Server monitoring board. It receives +15VDC (Class II Power Limited) from the DSX-1040PDM board and distributes it to the 2PC boards through 4 - 12VDC, 1A fused outputs. The SPST board has an RS-232 port that connects to an extra port on the Backup Comm Server. This is the port which sends the "activate" command. The SPST also has 4 relay outputs that are used to "trigger" the 2PC boards when the "activate" command is received.

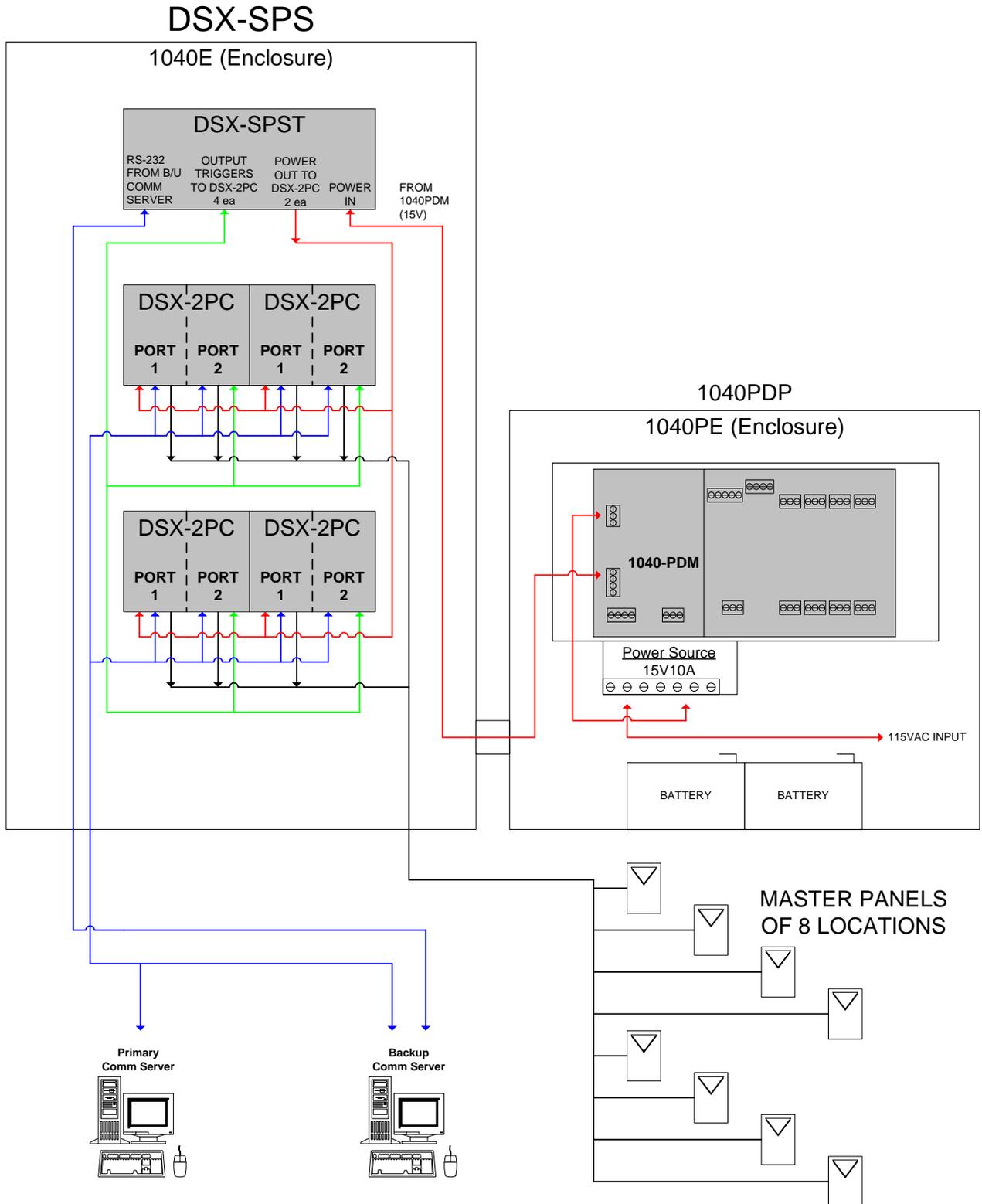
DSX-2PC

The DSX-2PC (Two Port Controller) is where each serial port from the Primary Comm Server and the corresponding serial port from the Backup Comm Server connect. The output of the 2PC then goes to a direct connect DSX controller. This board physically switches the circuits from one PC to the other. Each 2PC module can switch 2 serial ports. The 2PC requires +12VDC@56ma for power and has 2 trigger inputs that connect to the SPST module. Each port on the 2PC can be triggered independently.

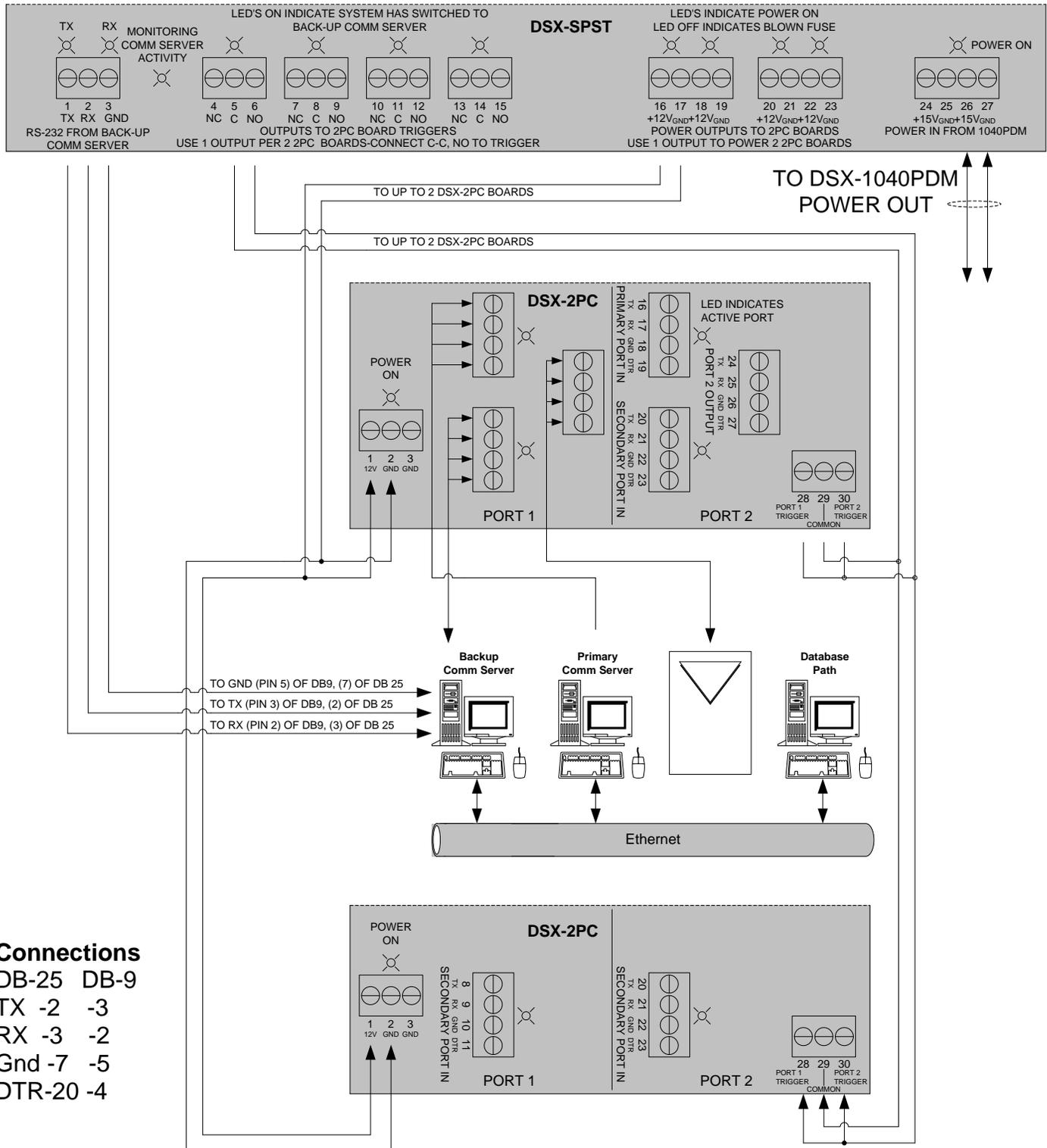
Power Requirements

DSX-SPST – 616ma @12VDC
DSX-2PC – 56ma@12VDC
DSX-MCI – 30ma@12VDC
DSX-LAN – 300ma@12VDC

DSX Serial Port Switcher Typical Application



DSX Serial Port Switcher Wiring Diagram



DSX-MCI Master Communications Interface

Mounting and Power

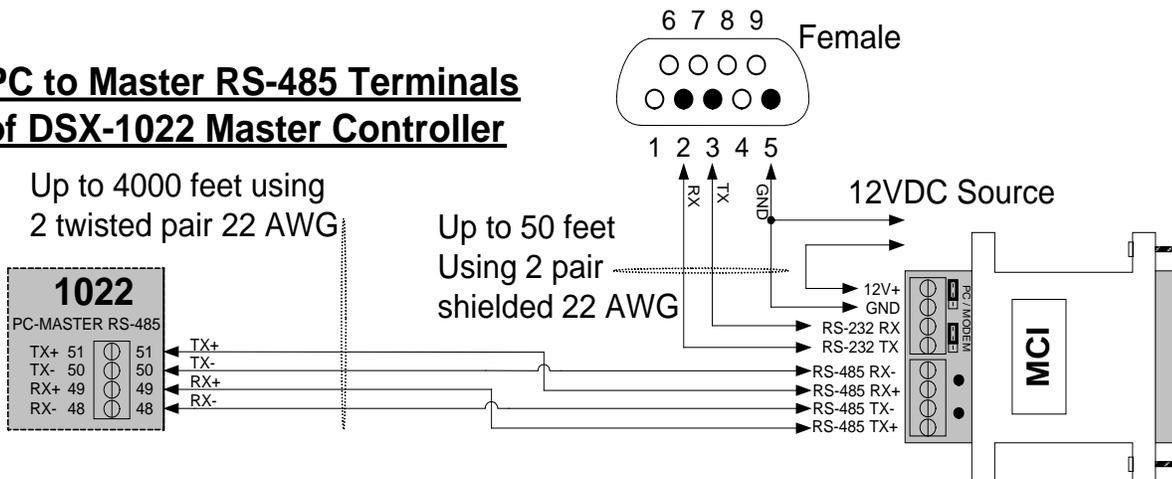
The DSX-MCI is powered by the battery backed up 12VDC fused power of the DSX Controller it is connected to.

The DSX-MCI should be located in the DSX Controller Enclosure. The module can be easily located in the bottom of the enclosure.

The DSX-MCI is a protocol independent communications device that converts RS-232 data to RS-485.

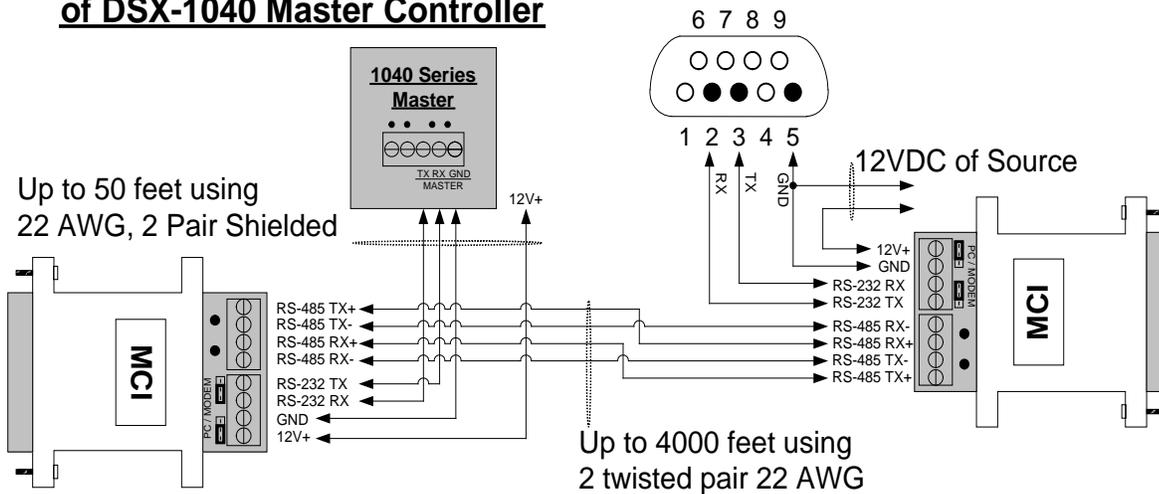
DSX-MCI to DSX-1022 Controller

PC to Master RS-485 Terminals of DSX-1022 Master Controller



DSX-MCI to DSX-1040 Series Controller

PC to Master RS-232 Terminals of DSX-1040 Master Controller



Hot Swap Comm Server Configuration

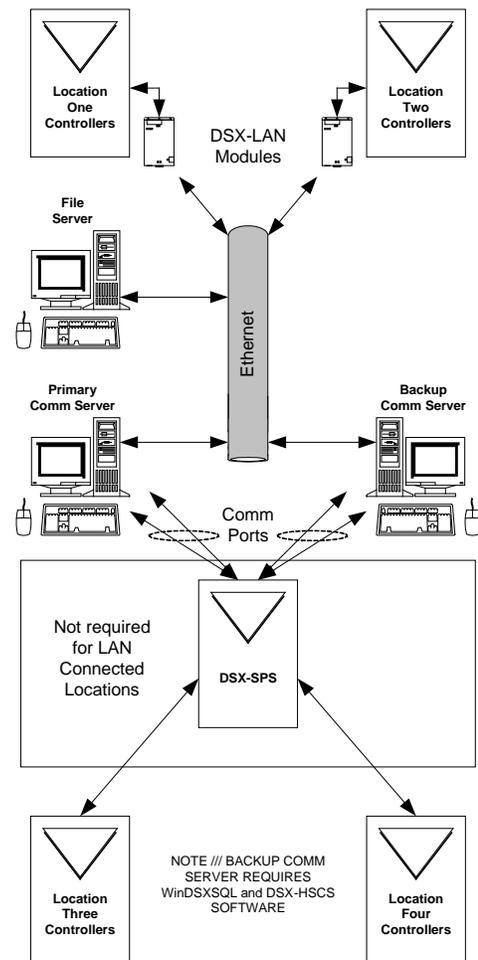
WinDSX Hot Swap Redundancy Software

Hot-Swap Redundant Communications Server provides continued availability of System Communications and Control through the implementation of Primary and Backup Communication Server PCs. Available only with WinDSX SQL, the Hot-Swap Supervisor runs on the Backup Comm Server and monitors the Primary Comm Server. When the Primary Comm Server fails all communications are redirected to the Backup Comm Server. LAN connected Locations are transparently transferred to the Backup Comm Server and with the use of a DSX-SPS Serial Port Switcher all dial-up and direct serial port connected Locations are also switched automatically. WinDSXSQL Workstations automatically switch to the Backup Comm Server and continually display which server they are talking to. This feature requires the purchase of the Hot Swap Comm Server software and optionally the DSX-SPS Serial Port Switcher.

Both Comm Servers are defined in the system as either the Primary or Backup Comm Server and both have static TCP/IP addresses. Both PCs are running at all times. The Backup Comm Server PC runs the Hot Swap Supervisor software. The Supervisor Software polls the Primary Comm Server. Once the polls have failed for a predetermined amount of time the Supervisor Program starts an instance of Comm Server on the Backup PC. The Supervisor Program also initiates any hardware switch over that needs to take place (direct connects, dial-up modems) by sending the appropriate commands out a serial port to the DSX-SPS Serial Port Switcher.

The Workstation program on all PCs in the system will automatically switch to the Backup Comm Server when the Primary Comm Server fails. The Workstation program has a real time status display that shows which Comm Server is on line.

The Hot Swap Supervisor Software has a Stop button that allows the Backup Comm Server to be shut down, the Primary Comm Server to be restarted, and the serial port communications to be returned to the Primary Comm Server.



Operational Notes

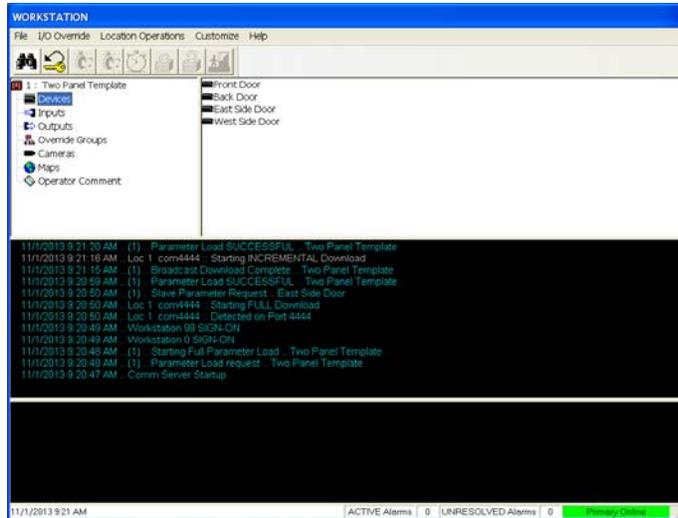
- This feature will require the purchase of the Hot Swap Supervisor software. This feature only works with WinDSX SQL.
- The Hot Swap Supervisor program (HotSwap.exe) runs from the WinDSX folder on the Backup Comm Server PC.
- The HotSwap.exe must be running at all times to take over in the event of a failure on the Primary Comm Server.
- The Shared WinDSX folder should reside on the File Server.
- The Backup Comm Server, through a serial port, activates the DSX-SPS to switch Direct Serial Port and Modem connected Locations from the Primary Comm Server to the Backup Comm Server.
- It is recommended that the Controller communications be performed with DSX-LAN modules and that the module be programmed for "Dynamic".

Configuration

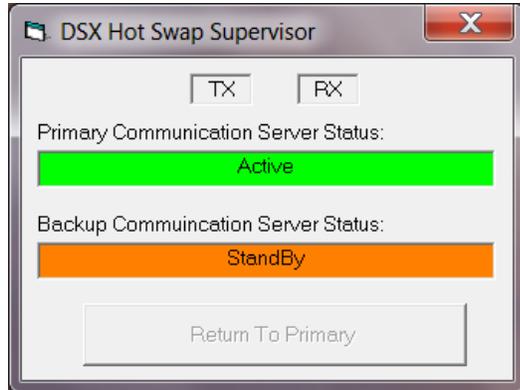
1. Install the WinDSX Software onto the Backup Comm Server PC.
2. Copy the DSXKeyData.xml file from the WinDSX folder on the Primary Comm Server PC to the WinDSX folder on the Backup Comm Server.
3. Run the DBSQL.exe program. (right click, Run as Administrator) Provide the necessary information to get logged into the SQL Server.
4. Under System/Setup/DataBase Path edit the Path that shows the SQL Server Name and change the Path to Data to point to the Shared WinDSX Folder and click OK to Save. Both Comm Servers and all Client Workstations must point to that Shared Folder that is on the File Server.
5. Under System/Setup/System Parameters/ - General Tab - Set the Workstation Name and Number to be unique, / Yes-No Options Tab - Select "This PC is Backup Comm Server", Communications Server Tab - Set the " IP Address" to the IP Address of this PC to be the Backup Comm Server.
6. Restart the WinDSX DataBase Program. Check the Workstation Name, Number, Backup Comm Server selection, and Backup Comm Server IP Address.
7. Define all of the Communication Ports required for the Location Panel Communications just as they are defined on the Primary Comm Server. Restart the WinDSX DataBase program.
8. From the Software distribution media run the HotSwap.msi and install the program into the WinDSX folder on the Backup Comm Server. (right click and select "Run as Administrator")
9. Once installed locate and run the HotSwap.exe program in the WinDSX folder on the Backup Comm Server. Close the Hot-Swap program.
10. If the HotSwap program is controlling a Serial Port Switcher for hardwired connections to the Master Controllers or dial-up phone modems do the following: Close the Hotswap program and edit the file
C:\WinDSX\RunData\HotSwap_Settings.txt on the Backup Comm Server. Locate the HsCommPort key and set the Value to the number of the comm port the Serial Port Switcher is connected to. Save and Close the file. Restart the HostSwap program.

Testing the Hot Swap Supervisor

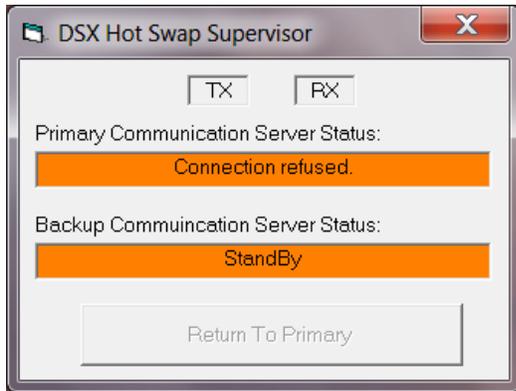
1. Start the Primary Comm Server program or, if running as a Service, Start the DSXComm Service.
2. Start the WinDSX SQL program on a Client Workstation. Workstation should display **Primary Online** in the bottom right corner in Green



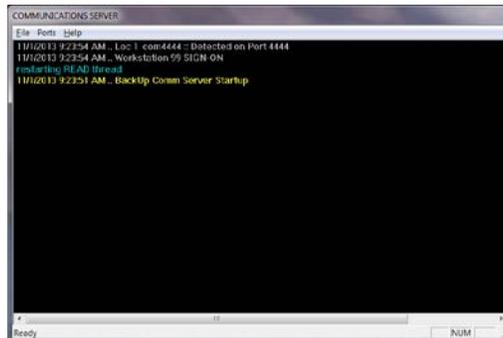
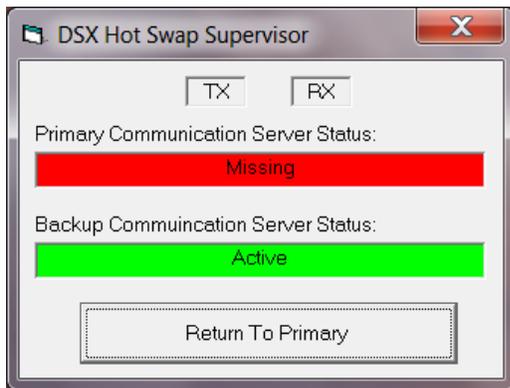
3. Start the Hot Swap Supervisor program on the Backup Comm Server. The Hot Swap Supervisor should look like this.



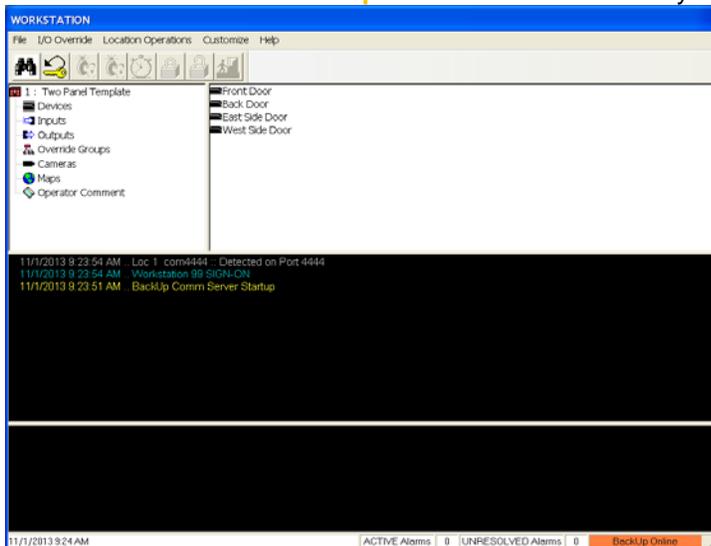
- Close the Primary Comm Server program. If running as a Service, stop the DSXComm Service. The Hot Swap Supervisor should look like this.



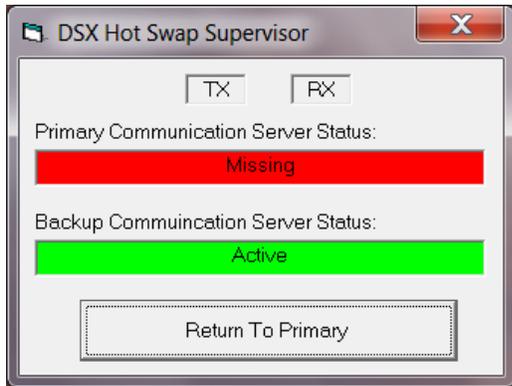
- The Backup Comm Comm Server should start and the Hot Swap Supervisor should display Primary Comm Server - **Missing** and Backup Comm Server - **Active**



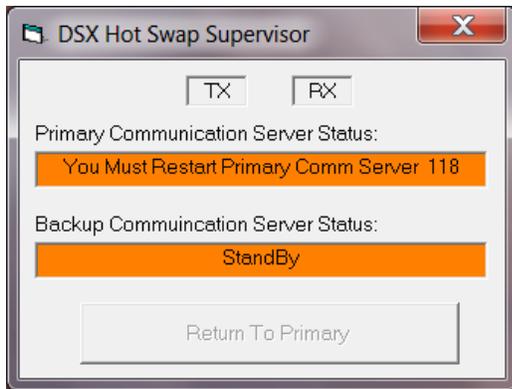
Client PC should show **BackUp Online** instead of Primary Online.



6. To return to the Primary Comm Server go the Hot Swap Supervisor on the Backup Comm Server and click on the "Return to Primary" button.



Once the button is pressed the Hot Swap Supervisor should appear like this.



7. Restart the Primary Comm Server program or DSXComm Service. The Client Workstation should now display **Primary Online** in Green.

