Indian Health Service (IHS)
Electronic Dental Record (EDR)

EDR Technical Reference Guide

Version 3.0
5/11/2021

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DENTRIX ENTERPRISE AND MICROSOFT WINDOWS

Dentrix Enterprise operates in a graphical environment called Windows, created by Microsoft Corporation. Microsoft Windows gives a standard look and feel to Dentrix Enterprise and all other Windows applications. To run Dentrix Enterprise and Microsoft Windows, you need to first license and install Microsoft Windows and Microsoft SQL Server.

Contents

A. IHS Business Continuity/Server Backup Plan for EDR (Dentrix Enterprise)

1. Overview

The recommendations below are guidelines for providing business continuity/disaster recovery for the Electronic Dental Record project (EDR) to be able to provide dental care to your patients and customers should hardware or software failures occur. All policies and procedures for reporting, recovering and supporting your business' critical hardware, software, and data should be in accordance with national IHS policies and your local sites policies and procedures to recover systems as efficiently as possible. The guidelines below are for general recovery of hardware and/or software failures. Disasters resulting from natural or environmental events will need to be addressed through your local sites business continuity plan.

The data in your dental database is one of your most valuable resources used in running your dental business. Dentrix Enterprise Customers are responsible for maintaining their database and for ensuring that they have an adequate disaster recovery plan. To accomplish this, you will need trained personnel and the equipment necessary to support your database and to be able to implement your disaster recovery plan (see Appendix A: Support Contact Information). In order to protect your investment, a backup and disaster recovery plan must be developed, implemented, maintained, and tested to protect the data. Processes must be in place to repair hardware as well recover data and restore/reinstall the associated software needed to run the servers to get systems back on line.

The purpose of this document is to provide general guidelines for a business continuity plan for the EDR in the event of various hardware, software or disaster events that may disrupt normal business operations. This document will provide overview, recommendations, and some specific details that can be used to create a disaster recovery plan for the EDR or to merge the EDR into an existing disaster recovery plan.

However, this document is not intended to provide nor can it provide all necessary information, steps, training, and configurations to fully develop and implement a disaster recovery plan. This document assumes that local IT staff and management will have some existing training and experience in installing, configuring, and supporting IT tools, operating systems, domains, database servers, backup tools, disaster recovery plans, etc. in order to fully and successfully implement an effective disaster recovery plan for the EDR.

2. Hardware & General Data Backup Recommendations

2.1 Hardware

In order to avoid certain system outages, it is recommended to have redundant or backup hardware whenever possible. It is also recommended that you get hardware maintenance support through the hardware vendor for 4 hour response times or better. This will assist in the elimination of or reduction of extended system outages due to hardware failures and allow you to leverage the existing technology solutions to best serve your patients and customers.

2.2 Redundant Hardware

It is recommended that your hardware solution offer redundancy whenever possible. This would include but not be limited to redundant power supplies, various forms of RAID configurations, extra servers, etc.

Vendor Support

Remote Support: Your hardware vendor/manufacturer should have a warranty provided by the manufacturer to assist in resolution of your business critical hardware. This should include 24x7 responses of a certified hardware and software technician to troubleshoot your issues and then offer recommended and supported solutions. It is recommended appropriate personnel be aware of and now how to contact and obtain warranty hardware support from their service contract, should the need arise.

Local/Onsite Support

Your hardware vendor/manufacturer should dispatch a technician with replacement components to get you up and running within the committed service levels of the manufacturer warranty. Manufacturer's warranties (including how to contact the vendor) will be delivered with the server hardware at the time of install

2.3 Operating System

CD's

Original installation CD's and/or DVD's and licenses for the operating system and other purchase products will be delivered with the EDR server hardware. These CD's and/or DVD's should be stored in a safe place for use in a disaster recovery situation in order to reinstall the operating system and associated products and licenses.

OS Files and Data

All critical Operating System directories and OS data files should be backed up to storage media and/or external disk on a nightly basis and should be stored offsite for security purposes. This

will ensure the data is available for recovery should a disaster happen with the facility and all systems are lost. These backups will also allow for recovery of corrupt or missing file(s) and/or directories in the case of a minor failure. These could be critical system files, application files, client files, document folders, etc. The processes associated with this backup methodology should be in accordance with local business continuity policies.

2.4 Business Critical Applications

Application DATA

All business critical application data including non-EDR related applications should be backed up to storage media and/or external disk and be stored offsite for security purposes (detachable drives). This will ensure the data is available for recovery should a disaster happen with the facility and all systems are lost. These storage media will also allow for recovery of corrupt or missing file(s) and/or directories. These could be critical system files, application files, client files, documents, etc. Access to the storage media will allow for quick recovery of the business applications. The processes associated with this backup methodology should be in accordance with local business continuity policies. The restore process should be tested periodically to validate the reliability of the backup solution prior to an emergency need arising.

3. EDR Backup

3.1 Critical EDR Data, Directories and Files

EDR Data

The data stored in the EDR database is crucial to providing patient care and running the dental business.

Ensuring a proper EDR data backup plan for each EDR location is in place and working properly is critical.

Initial Backup Configuration

When the database server is delivered for the EDR project, it will come preconfigured with backup plans at both the MS SQL Server level as well as external backup plans. Training will be provided during the hardware install to show the local IT personnel how to check these pre-configured plans. IT personnel can use pre-configured backup plans or they may want to review and modify/add additional items to meet their specific requirements for their site.

EDR Server Initial Configuration

When EDR servers are delivered to and installed at the sites, a completed hardware configuration form for that specific server will be supplied to the IT personnel. The IT personnel will want to save this form in a safe location. The hardware configuration form will provide all

of the details of how the server hardware is configured including memory, processor, hard drives, raid configuration, OS versions, etc.

Backup Prerequisites

It is very important to run SQL Maintenance plans prior to running your nightly data backups. For those locations that are also storing digital images, you will need to run a maintenance plan for that DB as well. Below are some sample/preconfigured MS SQL maintenance plans for the EDR database and Image database plans and the associated backup data paths.

3.2 EDR Database (SQL) Maintenance Plan

In SSMS go to maintenance plans under the Dentrix_Live instance > Management Folder > Maintenance Plans > RC > Maintenance Plan Wizard > Next > enter **DENTRIX_LIVE DB Backup** for plan name > Schedule – select Change > Occurs daily at **8:00 PM M-F** > new task from the toolbox in the bottom left > Backup up DB task and Maintenance cleanup task

- Backup DB Task > Backup type - full > Dentrix / Master DB > verify backup dir is D:\SQLBACKUPS\DENTRIX_LIVE with bak files...
- Maintenance cleanup task > D:\SQLBACKUPS\DENTRIX_LIVE from the ... browse on the right > bak file extension specified > delete files based on age of the file… 1 week checked

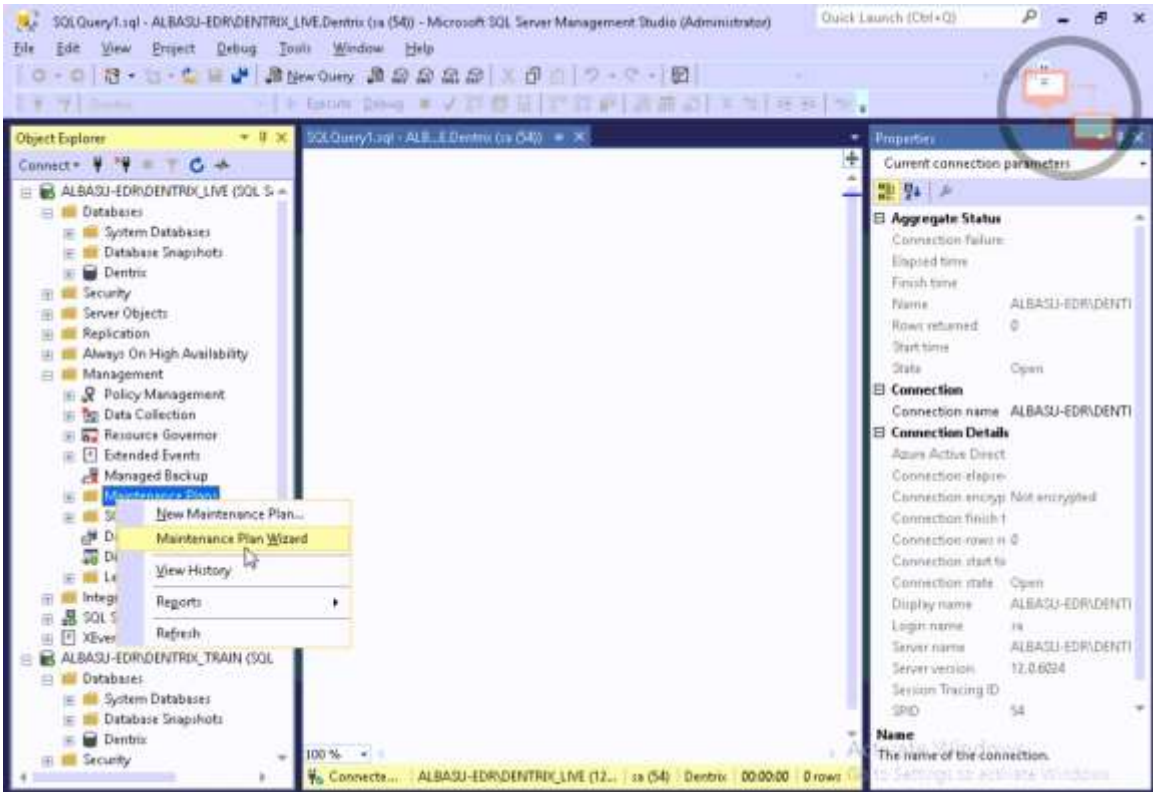
  DO NOT SPECIFY THE DOT BEFORE THE FILE EXTENSIONS e.g. "BAK" – NOT ".BAK"

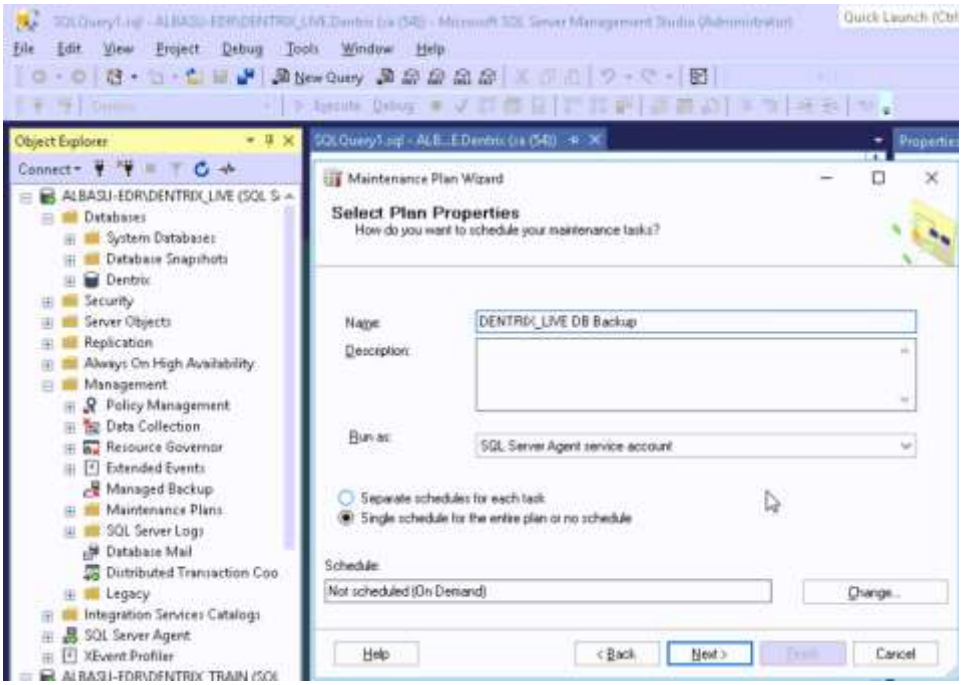
  **Cntrl+S to save the plans... You will see a "*" at the top tab you are configuring letting you know it is not saved yet > after saving your task entry will be visible on the left under the maintenance plans folder*

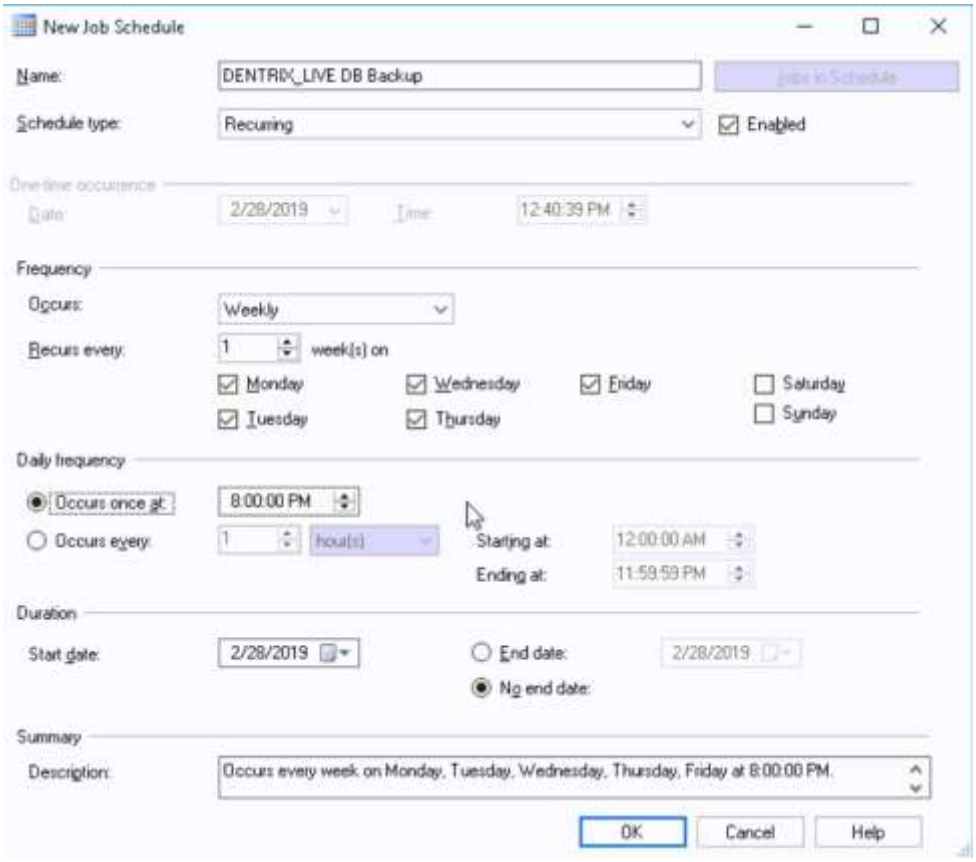
Right click the Maintenance Plan Wizard again and repeat the same steps. This time call the job **DENTRIX_LIVE LOG Backup** > Calendar button at the top toolbar> Daily job **M-F EVERY 15 minutes starting 6:00AM-7:30PM**

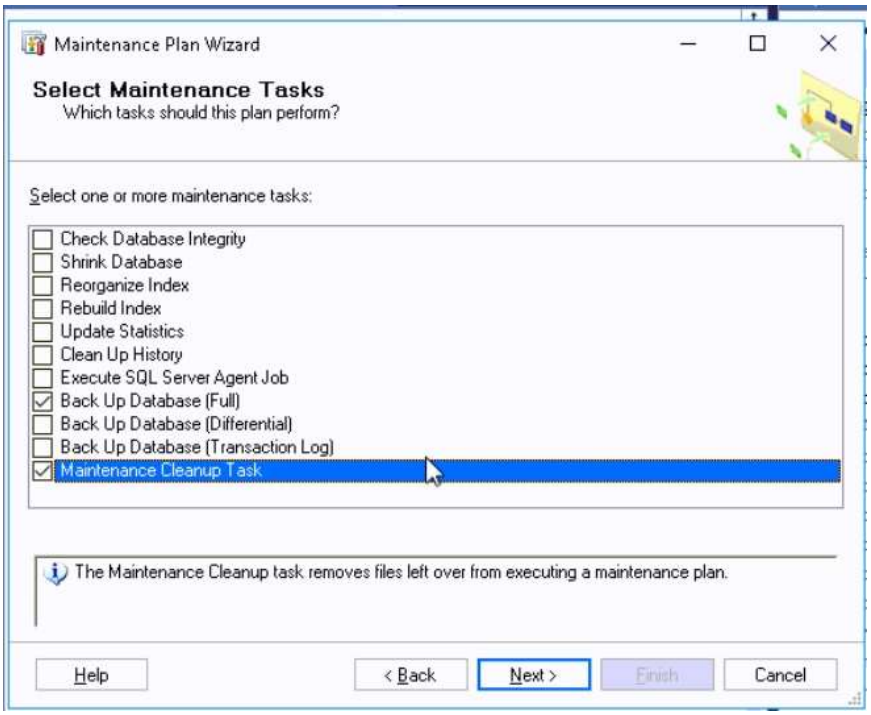
- Backup DB Task > Change DB backup task the backup type to transaction log > specific databases > Dentrix only > D:\SQLBACKUPS\DENTRIX_LIVE trn file extensions
- Maintenance Cleanup task > Backup to D:\SQLBACKUPS\DENTRIX_LIVE > trn files > delete files older than 4 days checked

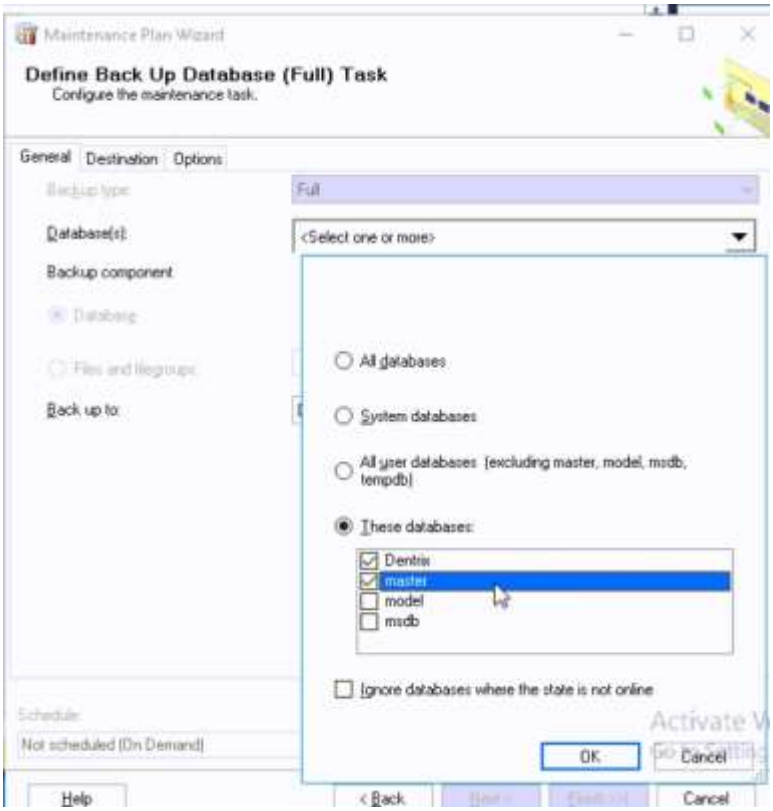
  **Cntrl+S to save the plans... You will see a "*" at the top tab you are configuring letting you know it is not saved yet > after saving your task entry will be visible on the left under the maintenance plans folder.*

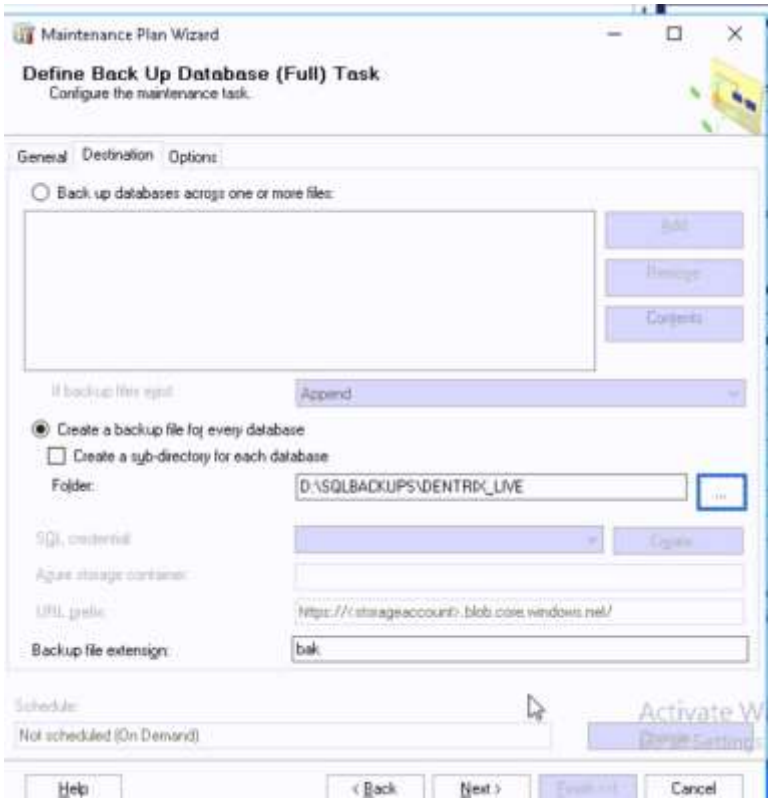

SQLQuery1.sql - ALBASU-EDR\DENTRIX_LIVE.Dentrix (sa (54)) - Microsoft SQL Server Management Studio (Administrator)
File Edit View Project Debug Tools Window Help
New Query
Object Explorer
Connect
ALBASU-EDR\DENTRIX_LIVE (SQL S
Databases
System Databases
Database Snapshots
Dentrix
Security
Server Objects
Replication
Always On High Availability
Management
Policy Management
Data Collection
Resource Governor
Extended Events
Managed Backup
Maintenance Plans
New Maintenance Plan...
Maintenance Plan Wizard
View History
Reports
Refresh
ALBASU-EDR\DENTRIX_TRAIN (SQL
Databases
System Databases
Database Snapshots
Dentrix
Security
Properties
Current connection parameters
Aggregate Status
Connection
Connection name ALBASU-EDR\DENTI
Connection Details
Name
The name of the connection.

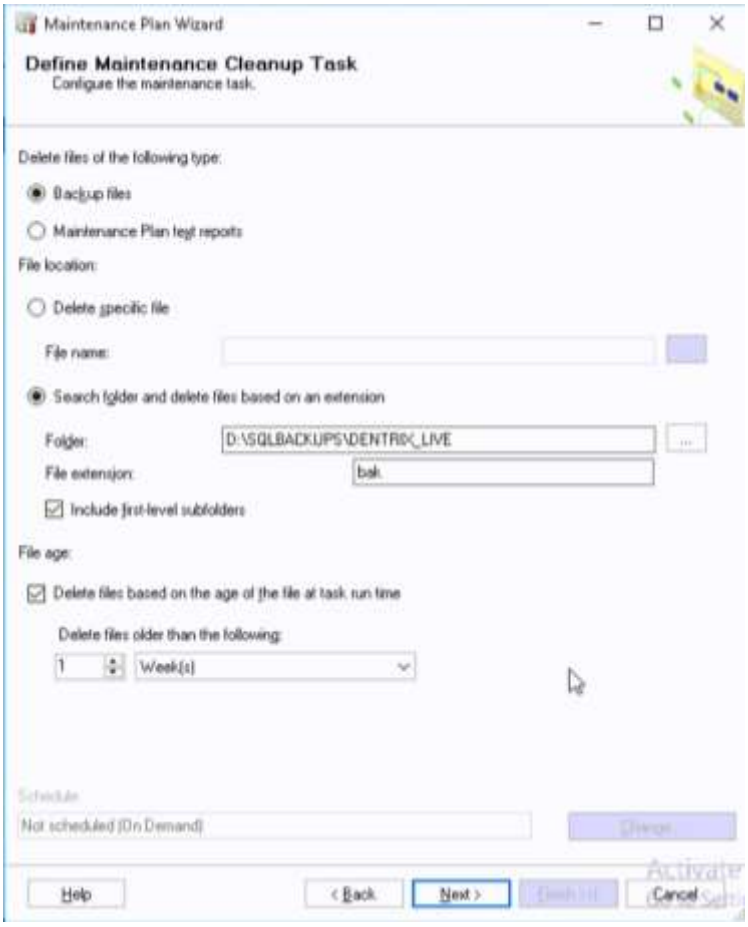

Maintenance Plan Wizard
Select Plan Properties
How do you want to schedule your maintenance tasks?
Name:
DENTRIX_LIVE DB Backup
Description:
Run as:
SQL Server Agent service account
Separate schedules for each task
Single schedule for the entire plan or no schedule
Schedule:
Not scheduled (On Demand)
Change...
Help
< Back
Next >
Cancel

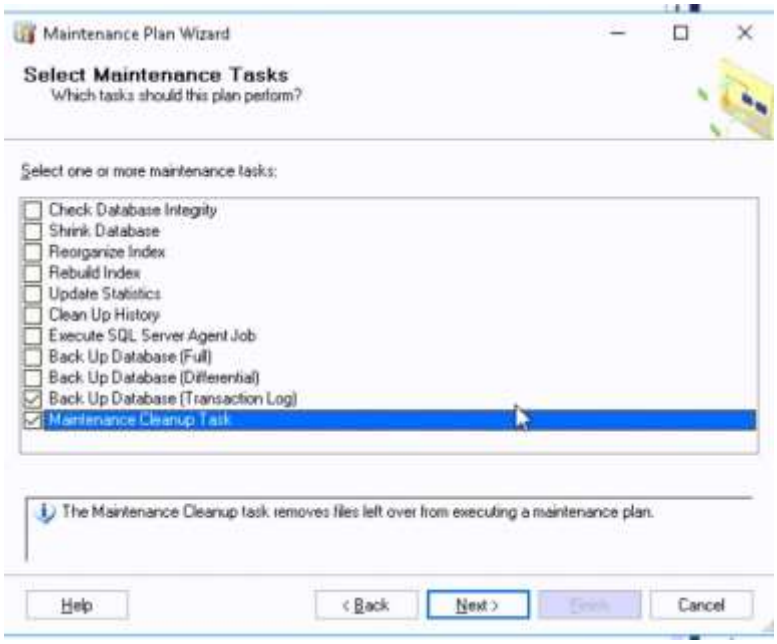

New Job Schedule
Name:
DENTRIX_LIVE DB Backup
Schedule type:
Recurring
Enabled
One-time occurrence
Date:
2/28/2019
Time:
12:40:39 PM
Frequency
Occurs:
Weekly
Recurs every:
1
week(s) on
Monday
Wednesday
Friday
Saturday
Tuesday
Thursday
Sunday
Daily frequency
Occurs once at:
8:00:00 PM
Occurs every:
1
hour(s)
Starting at:
12:00:00 AM
Ending at:
11:59:59 PM
Duration
Start date:
2/28/2019
End date:
2/28/2019
No end date:
Summary
Description:
Occurs every week on Monday, Tuesday, Wednesday, Thursday, Friday at 8:00:00 PM.
OK
Cancel
Help

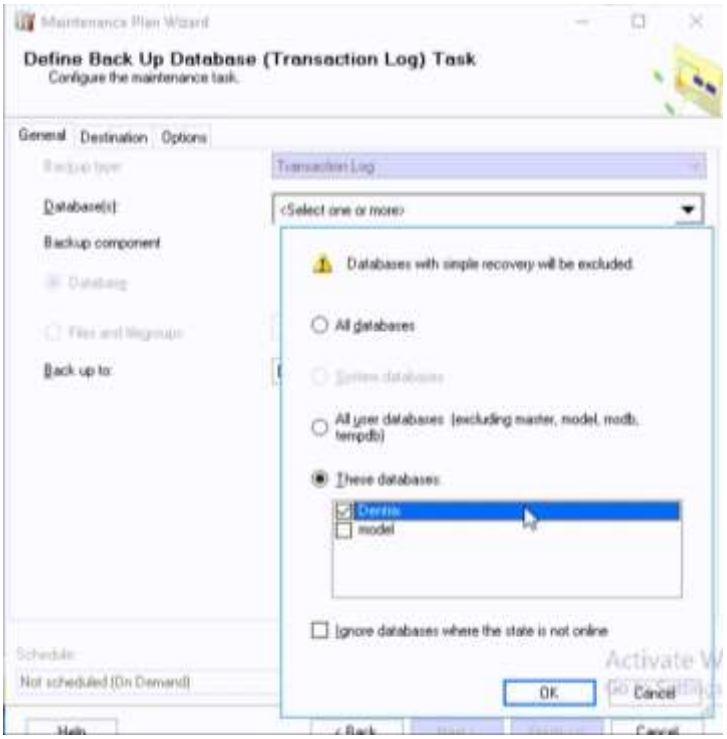

Maintenance Plan Wizard
Select Maintenance Tasks
Which tasks should this plan perform?
Select one or more maintenance tasks:
Check Database Integrity
Shrink Database
Reorganize Index
Rebuild Index
Update Statistics
Clean Up History
Execute SQL Server Agent Job
Back Up Database (Full)
Back Up Database (Differential)
Back Up Database (Transaction Log)
Maintenance Cleanup Task
The Maintenance Cleanup task removes files left over from executing a maintenance plan.
Help
< Back
Next >
Finish
Cancel

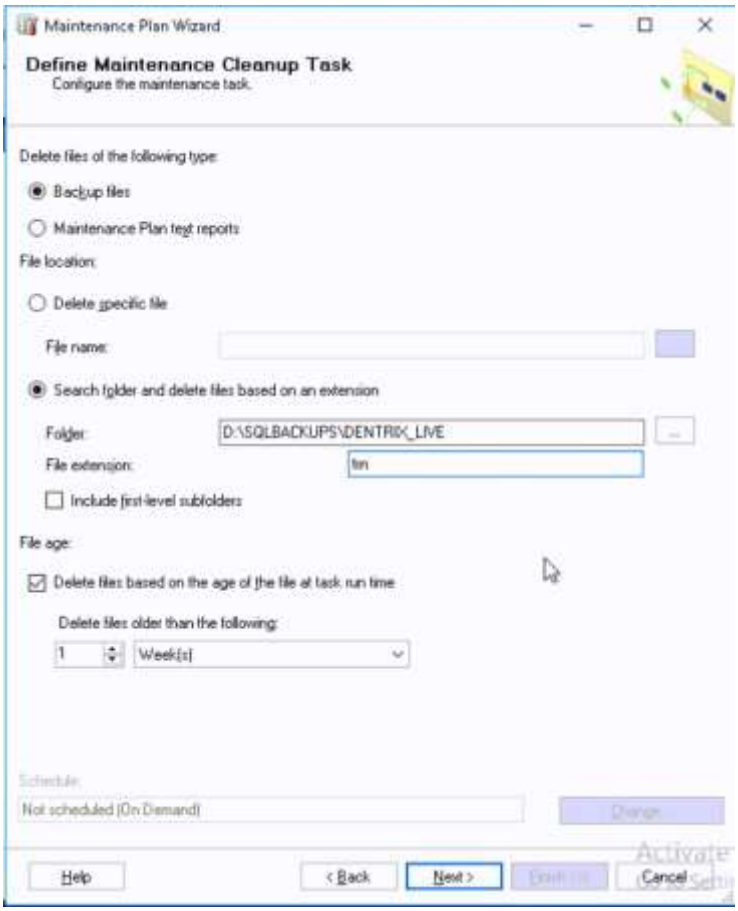

Maintenance Plan Wizard
Define Back Up Database (Full) Task
Configure the maintenance task.
General
Destination
Options
Backup type:
Full
Database(s):
<Select one or more>
Backup component:
Database
Files and filegroups:
Back up to:
All databases
System databases
All user databases (excluding master, model, msdb, tempdb)
These databases:
Dentrix
master
model
msdb
Ignore databases where the state is not online
Schedule:
Not scheduled (On Demand)
OK
Cancel
Help
< Back
Next >
Cancel


Maintenance Plan Wizard
Define Back Up Database (Full) Task
Configure the maintenance task.
General
Destination
Options
Back up databases across one or more files:
Add...
Remove
Contents...
If backup files exist:
Append
Create a backup file for every database
Create a sub-directory for each database
Folder:
D:\SQLBACKUPS\DENTRIX_LIVE
...
SQL credential:
Create...
Azure storage container:
URL prefix:
https://<storageaccount>.blob.core.windows.net/
Backup file extension:
bak
Schedule:
Not scheduled (On Demand)
Change...
Help
< Back
Next >
Cancel


Maintenance Plan Wizard
Define Maintenance Cleanup Task
Configure the maintenance task.
Delete files of the following type:
Backup files
Maintenance Plan text reports
File location:
Delete specific file
File name:
Search folder and delete files based on an extension
Folder:
D:\SQLBACKUPS\DENTRIX_LIVE
File extension:
bak
Include first-level subfolders
File age:
Delete files based on the age of the file at task run time
Delete files older than the following:
1
Week(s)
Schedule:
Not scheduled (On Demand)
Change...
Help
< Back
Next >
Finish
Cancel


Maintenance Plan Wizard
Select Maintenance Tasks
Which tasks should this plan perform?
Select one or more maintenance tasks:
Check Database Integrity
Shrink Database
Reorganize Index
Rebuild Index
Update Statistics
Clean Up History
Execute SQL Server Agent Job
Back Up Database (Full)
Back Up Database (Differential)
Back Up Database (Transaction Log)
Maintenance Cleanup Task
The Maintenance Cleanup task removes files left over from executing a maintenance plan.
Help
< Back
Next >
Finish
Cancel


Maintenance Plan Wizard
Define Back Up Database (Transaction Log) Task
Configure the maintenance task.
General
Destination
Options
Database(s):
<Select one or more>
Backup component
Back up to:
Databases with simple recovery will be excluded.
All databases
All user databases (excluding master, model, msdb, tempdb)
These databases:
Dentrix
model
Ignore databases where the state is not online
Schedule:
Not scheduled (On Demand)
OK
Cancel
Help
< Back


Maintenance Plan Wizard
Define Maintenance Cleanup Task
Configure the maintenance task.
Delete files of the following type:
Backup files
Maintenance Plan text reports
File location:
Delete specific file
File name:
Search folder and delete files based on an extension
Folder:
D:\SQLBACKUPS\DENTRIX_LIVE
File extension:
bin
Include first-level subfolders
File age:
Delete files based on the age of the file at task run time
Delete files older than the following:
1
Week(s)
Schedule:
Not scheduled (On Demand)
Change...
Help
< Back
Next >
Cancel

3.3 EDR Image Database Maintenance Plans

The same process for the EDR Database Maintenance plans will be followed for either the Dexis Imaging Suite Database or MiPACS database.

3.4 Critical Operating System Data Folders & Files

The following are the folders that should be backed up to either a NAS or external media on a nightly basis. Local IT personnel should review their local drives, directories, and files to determine what other data should be backed up and add it to the backup process.

- Doc_Center (Dentrix Enterprise Document Center holding all scanned documents)
- DXONE (Shared Writeable folder containing customizations, report templates)
- Dexis Imaging Suite or TXTOUT, Image store for MiPACS (digital imaging for the clinic)
- ORIGINAL (all software and settings needed to reinstall the implementation)
- SQLBACKUPS (Database backups for Dentrix, Dexis/MiPACS)

3.5 Data Backup Schedule

It is recommended to backup critical system and application files on a nightly basis. Typical schedules will be set to run Monday through Friday after business hours. If the facility is open for business on Saturday or Sunday, then a Saturday/Sunday night backup is recommended as well. Every morning the backup logs should be reviewed to confirm a successful backup completed. If so, then the removable media should be disconnected and replaced with the next device. Disconnected backup media should be stored in a fire-safe location or taken securely offsite.

4. Rebuilding EDR Database Server, Database & Image Server and Hardware Recovery Recommendations and Processes

4.1 Hardware

Restoration of physical hardware configurations should follow your local centers support policy combined with the warranty provided by the hardware vendor. Once you have completed the replacement of failed hardware components, please continue to the Operating System Section below.

4.2 Operating System

When reinstalling the base Operating System (Windows Server), you should follow your local center's support policy. This will include the loading of the Windows Server Operating System, updating system service packs, drivers, patches, etc. and the configuration of the system

(i.e. Computer name, IP address, network settings, etc.). Once the Operating System is reinstalled and configured, continue to the Business Critical Applications Section below.

4.3 Business Critical Applications

Restoration of the business applications will follow your local centers support policy in combination of the following recommendations for Dentrix Enterprise and Image Software.

4.4 Overview of Steps

- Software Requirements
  - All sites need to safely retain a copy of the Microsoft SQL Server database software (loaded under the Original folder on the Data partition) and necessary service packs.
  - All sites need to safely retain a copy of the Microsoft Server operating system software (delivered with server) and necessary service packs.
  - All sites need to safely retain a copy of Dentrix Enterprise and Image software (Delivered with server).
- Install Windows Server OS and Configure Hardware
- Microsoft SQL will need to be installed on the Database server (SQL version appropriate for Dentrix Enterprise version in use – go to https://www.dentrixenterprise.com/support/requirements to verify correct version.
  - Install an instance of SQL Server for Dentrix Enterprise (see section 7. Install SQL Server Instance)
- Restore the SQL maintenance plans (see section 3.2 EDR Database (SQL) Maintenance Plan)
  - Restore the Dentrix Maintenance plan from backup media to a TEMP directory
  - Restore the Image Maintenance plan from backup media to a TEMP directory
- The SQL maintenance plans are restored from the TEMP directory into the SQL instance
- Contact Dentrix Enterprise Support (800) 459-8067 to run scripts
- If the images are on the same server as the database then the images folder needs to be restored from the backup media as well.
- Install the Dentrix Software
- Install the Image Software

5. Standard EDR Database Maintenance Plan

5.1 Recommendations

The data in your EDR dental database is one of your most valuable resources used in running your dental business. Dentrix Enterprise Customers are responsible for maintaining their

database and for ensuring that they have an adequate disaster recovery plan. To accomplish this, you will need trained personnel and the equipment necessary to support your database and to be able to implement your disaster recovery plan. In order to protect your investment, a disaster recovery plan needs to be developed, implemented, maintained, and tested.

We are listing in this section general maintenance items that you should review with your DBA to create a plan to protect and secure your database server and data. Your plan may need to be customized to fit your needs and your environment.

5.2 Certified Database Administrator Recommended

It is recommended that your DBA should be a MCSA (Microsoft Certified Solutions Associate) for SQL Database Administration. A trained and qualified MCSA Database Administrator will already know how to accomplish the tasks listed in this document. The best tool to implement and track your maintenance plan is the MS SQL Server Management Studio, which is available for download from https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms?view=sql-server-ver15

5.3 MS SQL Server Documentation

Note: The link listed below is for all versions of MS SQL Server. A trained DBA will already be familiar with this information but we encourage you to visit the link to learn what is best for you.

https://docs.microsoft.com/en-us/sql/sql-server/?view=sqlallproducts-allversions

6. Detailed EDR Database Backup and Maintenance

6.1 Recommendations

NOTE: Click on the links to jump to the MS SQL documentation that describe concepts/features and provide detailed instructions and steps for completing the item.

As part of your plan, we recommend the following items:

- All databases should have a backup and restore plan

  You need to create a plan to protect your data in case of disaster (equipment failure, employee sabotage, fire, etc.) Determine what recovery plan is best for you. See:

  https://docs.microsoft.com/en-us/sql/relational-databases/maintenance-plans/maintenance-plans?view=sqlallproducts-allversions

- Create MS SQL Maintenance Plans

  One of the easiest ways to implement the backup portion of this plan is to create a database maintenance plan using the MS SQL Database Maintenance Plan Wizard. See:

  https://docs.microsoft.com/en-us/sql/relational-databases/maintenance-plans/use-the-maintenance-plan-wizard?view=sqlallproducts-allversions

- A full database backup for key events

  A full database backup should be created for key events after the initial database setup for any Live, Test, or training Dentrix databases. These events include initial install, go live, upgrading versions, etc.

- Back up and truncate transaction logs

  Back up and truncate transaction logs on a daily basis to keep them small.

- Truncating the Transaction Log

  When SQL Server finishes backing up the transaction log, it automatically truncates the inactive portion of the transaction log. This inactive portion contains completed transactions and is no longer used during the recovery process. Conversely, the active portion of the transaction log contains transactions that are still running and have not yet completed. SQL Server reuses this truncated, inactive space in the transaction log instead of allowing the transaction log to continue to grow and use more space. Although the transaction log may be truncated manually, it is strongly recommended that you do not do this, as it breaks the log backup chain. Until a full database backup is created, the database is not protected from media failure. Use manual log truncation only in very special circumstances, and create a full database backup as soon as it is practical.

- The live EDR database should be backed up every day

  Note: Many backup systems cannot effectively or directly backup MS SQL databases. If the MS SQL Server engine is running, the files that make up the database are locked open and many backup media systems cannot backup the locked database files from outside of the Microsoft SQL Server Management Studio. These backup solutions may see that the database files are open and skips the files.

  You can use the MS SQL Management Studio and MS SQL Server Agent to backup directly to the media. Or you can use the MS SQL Server Agent with your backup program to stop the database, do the backup and then restart the database. Or you can use the MS SQL Server Management Studio to schedule backups to a flat file. This flat file can then be backed up with your backup program. This file can be copied or backup to another machine as well.

- Check Server drive space

  The Servers should be checked weekly or monthly to ensure that you have adequate available free disk space for the growth of the live database files, transaction logs, and backup files. When EDR databases are installed, by default, they are configured to pre-allocate an adequate portion of space on your server hard drives to store the database and transaction logs. The databases are also configured such that the size of the database and transaction log files will grow automatically as needed once the initial pre-allocated space is filled and will continue to grow until the hard drive is full. Use the operating system to check free space on drives.

- Store database backups offsite

  Database backups should be performed weekly or monthly to be stored off site in a secure location. You may want to have a 3 to 6 month rotation component in your plan to rotate the backups stored off site.

- Shrink and defragment databases

  The live databases should be shrunk including moving pages internally to the beginning of the files that make up the database – defragmenting – using the MS SQL Server tools monthly or after significant deletions of data in the database (purging appointment, purging old audit records, etc.). Also, the EDR server hard drives containing database should be defragmented on a regular basis at the operating system level using the operating system defragmenting tools. This defragmenting of the database files at the operating system level will ensure optimal data layout on the drives to enhance database performance.

- Monitor EDR Database performance statistics

  EDR Database performance statistics should be checked monthly or semi-annually to ensure proper server performance.

- Rebuild database indexes

  Database indexes should be rebuilt semi-annually or annually to ensure optimal index performance.

  Contact Dentrix Support (800) 459-8067. This will usually be done as you upgrade to new versions of DXONE as the new versions become available.

- Install patches for OS and SQL Server

  Check monthly with Microsoft for updates to your Windows operating system and MS SQL Server to make sure that you have the latest patches and fixes from them. If you are using any other third party products, you should do the same with them.

Use the Microsoft Update websites to look for, download, and install patch updates for the Windows Server Operating System and MS SQL Server database engine.

- Evaluate EDR server hardware capacity

  The database server hardware should be evaluated every 6 months to 1 year or at other significant events (adding significantly more users to the database, hosting more locations, etc.) to check to see if the hardware performance characteristics (i.e. speed of processor, amount of memory, speed of hard drives, hard drive space available, etc.) are handling the needs for the EDR Server.

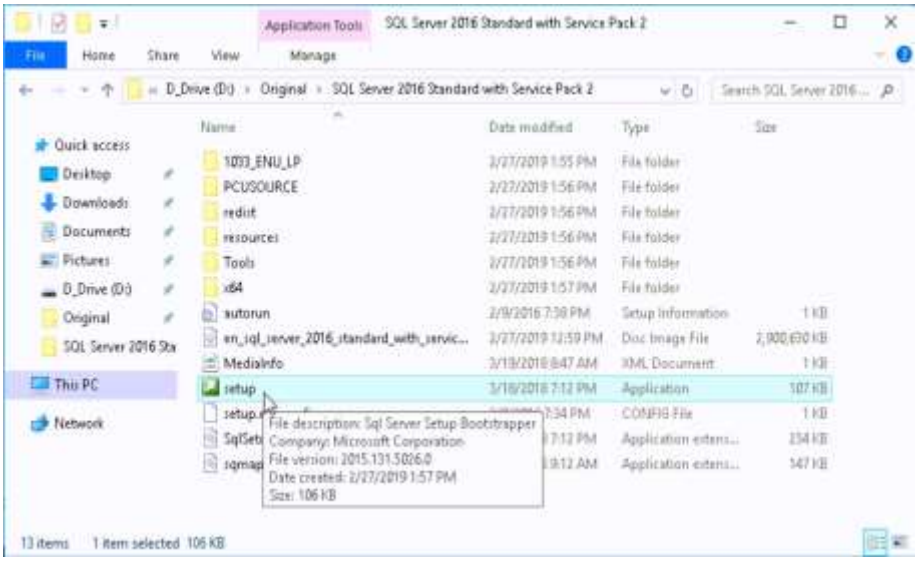
7. Install SQL Server Instance

For this example, SQL Server 2016 SP2 is being used. Adjust folder locations to your server configuration and create your own SA (System Administrator) password and document it.

7.1 SQL 2016 Standard with Service Pack 2 Installation

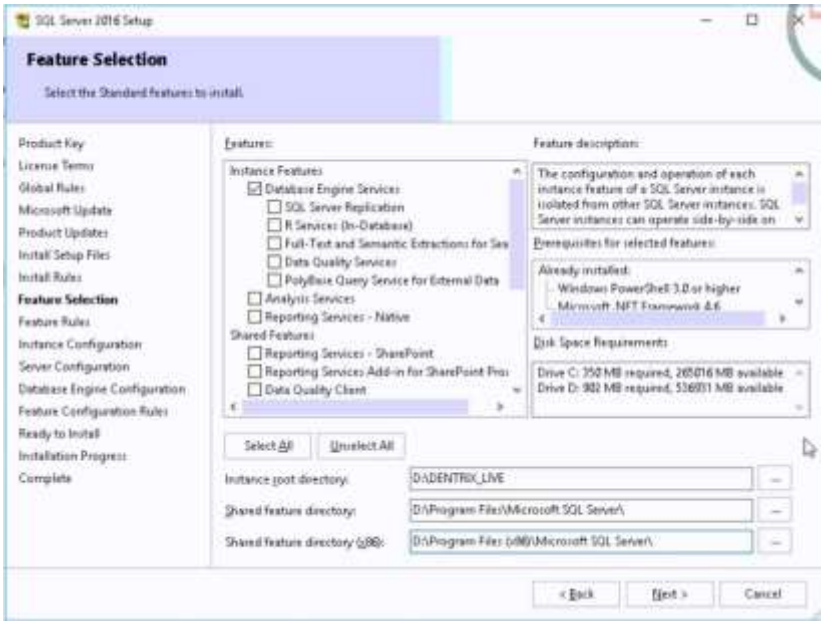
Dentrix Live Instance

- Navigate to D:\Original\ **SQL Server 2016 Standard with Service Pack 2**\ > Install **2016 SP2** - Run SQL installer “setup.exe”

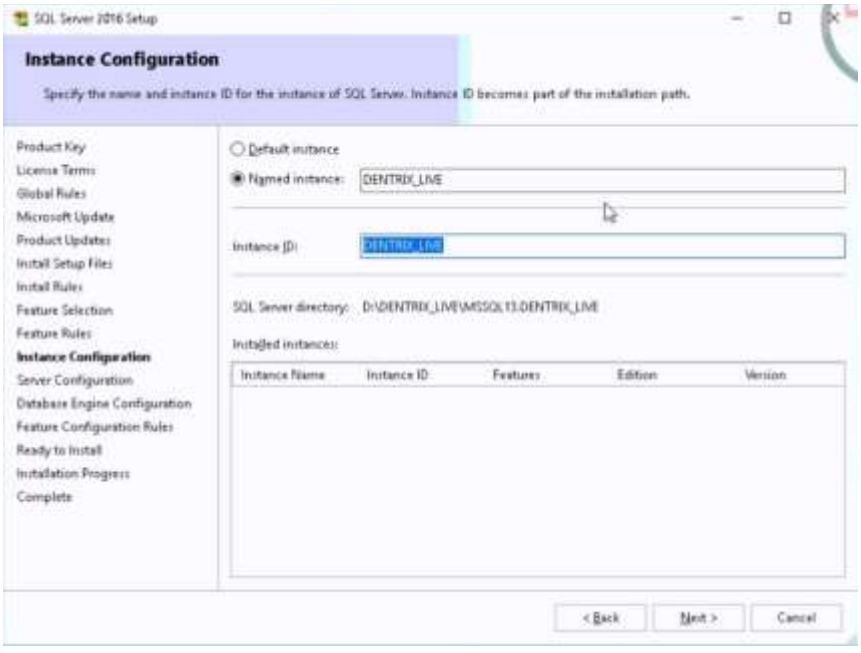


- Select check box for do not show this message again and click “Run the program without getting help” if shown
- Select installation on the left > All pre-installation checks should pass
- Select top option > New installation or add features to an existing installation > confirm operations were successful > OK

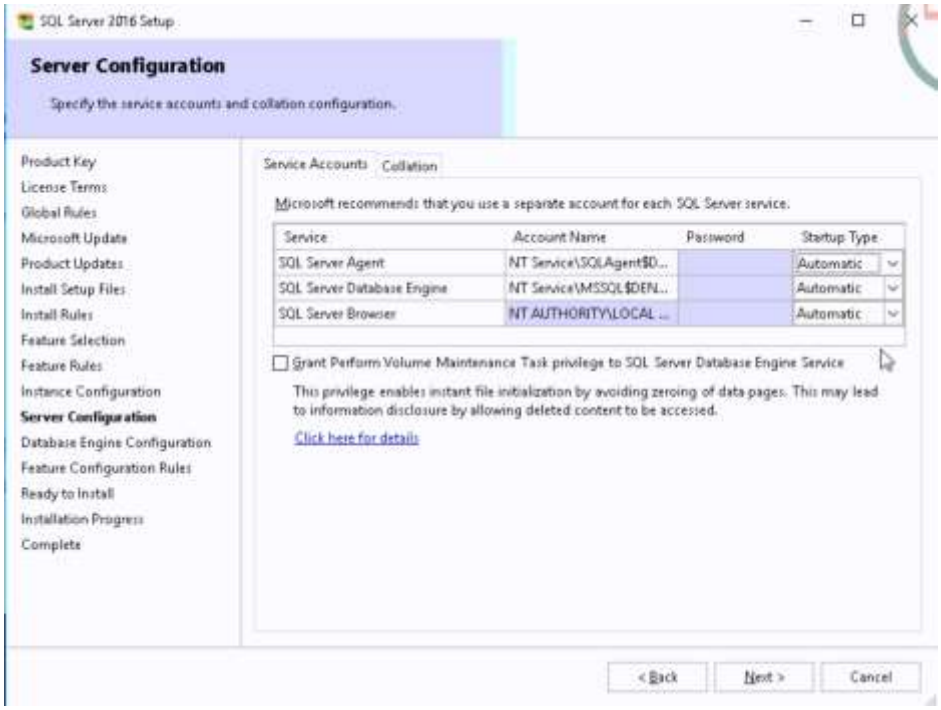
- Leave filled in product key alone > Next > Accept license terms > Next > Install > confirm operations were successful > Next
- SQL Server features installation:
  - Database engine services
  - Client Tools Connectivity
- Change SQL Shared feature installation directories to **D:**…, change Instance root directory to **D:\DENTRIX_LIVE** > Next > confirm operations were successful > Next



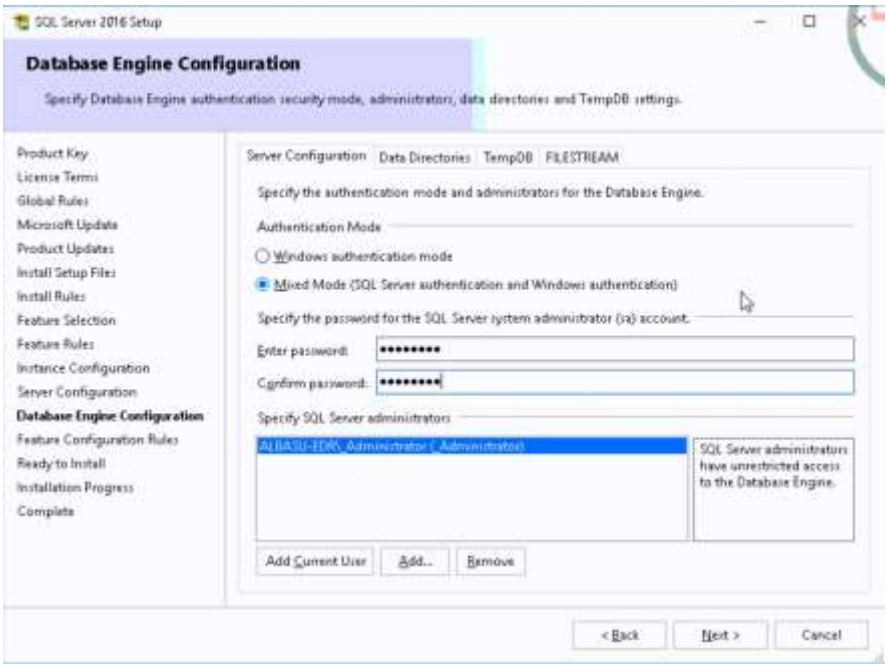
- Named Instance/instance ID > **DENTRIX_LIVE** > Next > Next



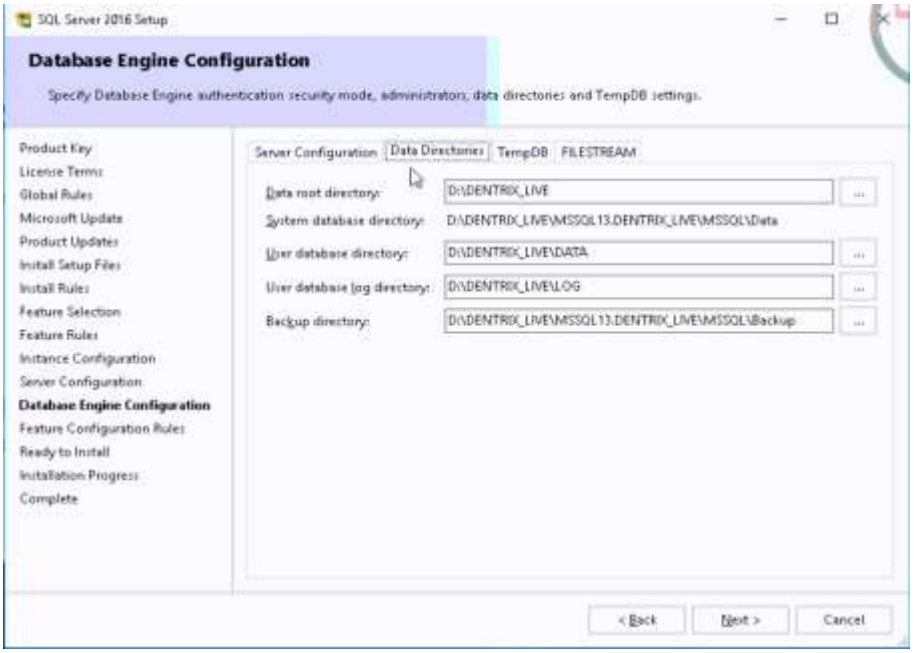
- Leave SQL Server Agent and Database Engine Account Name "**NT Service**" > All startup types to **Automatic** > Next

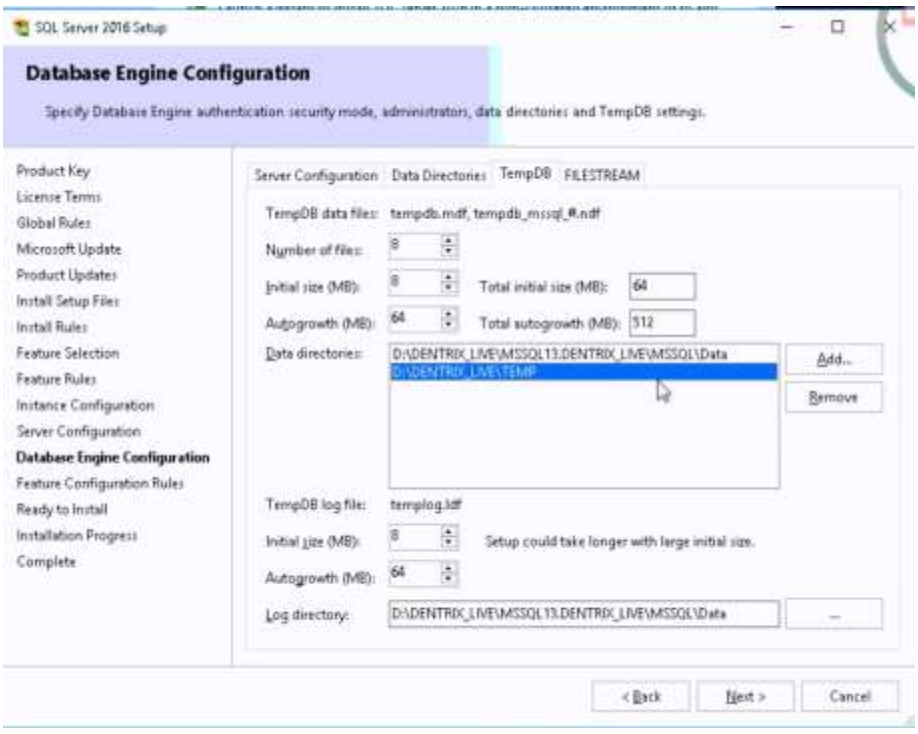


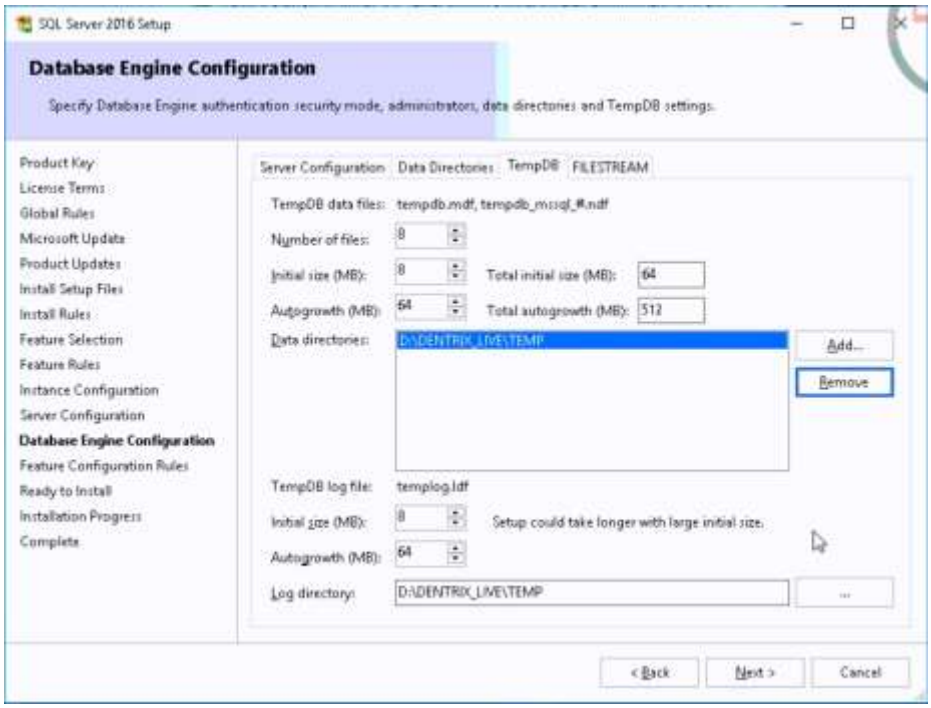
- On the Account provisioning tab > Mixed Mode auth > Ch@ngeM3 > Add current user > (Servername)_Administrator (_Administrator) should be correct and shown. _Administrator should be part of the administrators group > select data directories tab



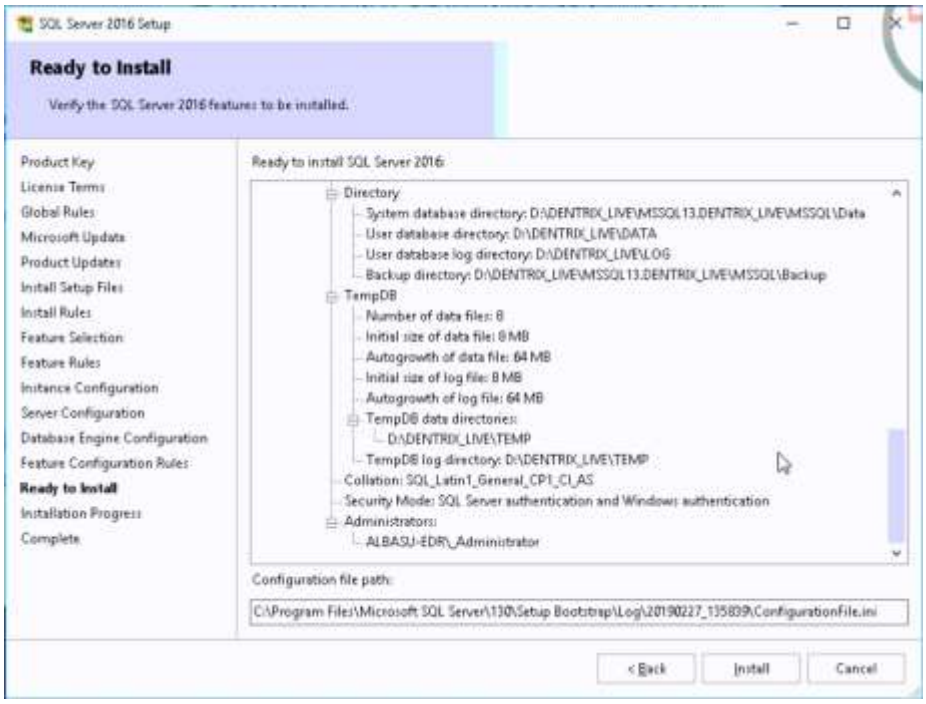
- Data directories Tab
  - Data root dir > D:\DENTRIX_LIVE\
  - User DB dir > D:\DENTRIX_LIVE\DATA
  - User DB Log Dir > D:\DENTRIX_LIVE\LOG
  - Temp DB, DB Log directory > D:\DENTRIX_LIVE\TEMP







- Next > Next > confirm all operations completed > Next > Verify Info > Install



Appendix A: Support Contact Information

Dell Pro Support 866-876-3355, Covers Dell hardware
Microsoft https://support.microsoft.com/en-us , Covers MS Products
Dentrix Enterprise 800-DENTRIX, Covers EDR/Dentrix Software
Tech Central 877-483-0382, Can coordinate with all above

B. MiPACS Dental Enterprise (Medicor Imaging)

1. System Specifications for MiPACS Dental Enterprise PACS Components

MiPACS Dental Enterprise PACS is a modular, scalable dental PACS that can be implemented in a number of ways, depending on the requirements and standard technology practices of an organization. MiPACS can be implemented on both physical hardware and as a virtual server (using any virtualization platform). Recommendations for both are included below, but it is recommended to consult with your MiPACS project manager for implementation recommendations for your particular environment.

Medicor Imaging Software Versions

The specifications provided below and on the following pages are for the following product versions:

MiPACS Storage Server	v3.0.0.0
MiPACS HTML5 Web Viewer	3.0.0.0
MiPACS Dental Enterprise Viewer	v4.1.0.0

1.1 Server Requirements/Recommendations

General Information and Requirements

Environment where there are fewer than 50 concurrent DICOM connections can operate on a single MiPACS application server. A concurrent DICOM connection is considered either (1) an active download of images from the MiPACS server, (2) an active storage of images to the MiPACS Server, or (3) an active query to the DICOM database or Modality Worklist. Viewing images, manipulating image content, measuring, etc. does not count as a concurrent DICOM connection – only active DICOM uploads/downloads/queries count as a concurrent connection. Generally speaking, 50 concurrent connections is adequate for up to 1,000 users.

Hardware Specifications

MiPACS Storage Server Minimum System Physical Configuration

- Microsoft® Windows Server 2012, 2016, or 2019 (64-bit)
- Microsoft® SQL Server Standard Edition 2012, 2014, 2016, 2017, or 2019
- 2.4GHz Intel Xeon 6+ core processor
- 16 GB RAM
- 100 Mbps Network Adapter (1 Gbps highly recommended)
- Microsoft® .NET Framework 4.0+
- Adequate storage for images (variable)

MiPACS Storage Server Recommended Virtual Configuration

- Microsoft® Windows Server 2012, 2016, or 2019 (64-bit)
- 4 Cores
- 16 GB RAM
- Microsoft® .NET Framework 4.0
- Adequate storage for images (variable)

SQL Server Recommended Virtual Configuration

- Microsoft® Windows Server 2012, or 2016 (32- or 64-bit)
- Microsoft® SQL Server Standard Edition 2012, 2014, 2016, 2017, or 2019
- 4 Cores
- 16 GB RAM
- Adequate Storage for database files (5 GB+, variable)

MiPACS Storage Server MiniPACS Minimum System Configuration

- <=10 Clients: Microsoft® Windows 7, 8, or 10 Professional (64-bit)
- >10 Clients: Microsoft® Windows Server 2012, or 2016 (64-bit)
- Microsoft® SQL Server Express Edition 2012, 2014, 2016, 2017, or 2019
- Intel i3/i5/i7 processor
- 8GB RAM or more (16 GB RAM Recommended)
- 100 Mbps Network Adapter (1 Gbps highly recommended)
- Microsoft® .NET Framework 4.0+
- Adequate Storage for Images (variable)

MiPACS HTML5 Web Viewer Server Minimum System Configuration

- Microsoft® Windows Server 2012, or 2016 (64-bit)
- Microsoft® Internet Information Services 7+
- 8GB + 64MB memory per concurrent user (i.e. 60 concurrent users would require 12GB RAM)
- 8 core Xeon Processor (or more)
- Microsoft® .NET Framework 4.0+
- A video card that supports DirectX 9+ must be installed on the web server to enable hardware- based 3D rendering
  - Total number of concurrent users available for hardware rendering will vary depending on the field of view and resolution of each volume loaded at once, but generally speaking, 256MB RAM per expected concurrent user is a good target spec for build-out of a new server
  - If no graphics card (or an underperforming graphics card) is available on the server, or if there is no remaining member on the graphics card, CPU rendering will be used.
  - Recommended video cards (on server):
    - Nvidia GTX 1080 (8GB)
    - Nvidia RTX 2080 Ti (12GB)
- There are no 3D graphics requirements on the client side (i.e. web browser)

Load Balancing the MiPACS Storage Server

It is recommended to operate MiPACS in a load-balanced environment when concurrent DICOM connections to the MiPACS Application Server are greater than 100. Microsoft Network Load Balancing (Windows Server 2003 – 2016) or hardware/virtual load-balancing appliances may be used to spread the network load across multiple PACS Server nodes. Note that any load-balancing appliances must be able to forward the client IP to the MiPACS server as the originating/source IP address. This is typically accomplished by configuring the appliance to include the "Forwarded" and/or "X-Forwarded-For" HTTP header.

Load Balancing the HTML5 Web Viewer Server

The MiPACS HTML5 viewer may be load balanced, but not clustered. Microsoft Network Load Balancing (Windows Server 2003 – 2016) or hardware/virtual load-balancing appliances may be used to spread the network load across multiple web server nodes. Note that any load-balancing appliances do not require identification of the originating client IP, and can simply be load balanced as a standard service.

Clustering

For environments using physical server hardware with high uptime requirements, MiPACS can be implemented in an active/active cluster using Microsoft Clustering Services (Windows Server 2003 – 2016 Enterprise Edition only). An active/active MiPACS cluster consists of two separate cluster resource groups – one for the MiPACS Storage Server DICOM services and one for Microsoft SQL Server (Microsoft SQL Server Standard Edition or higher is required). It is not recommended to cluster virtual MiPACS and/or database servers, as typically better and more responsive redundancy is built-in to the virtual platform infrastructure.

1.2 Desktop Client Requirements/Recommendations

The MiPACS client is a relatively lightweight client desktop application for Microsoft Windows operating systems. It has no prerequisites and can be installed on virtually any relatively modern Windows computer.

4.1 or later MiPACS Dental Enterprise Viewer Minimum System Configuration

- Microsoft® Windows 8/10 Professional (32- or 64-bit)*
- Intel i3/i5/i7 Processor
- 4 GB RAM (8 GB recommended)
- 100 Mbps Network Adapter (1 Gbps recommended)
- XVGA 1024x768 at 24/32 bit color (SXGA 1280x1024 recommended)
- Monitor with at least 400:1 contrast ratio (800:1 or higher recommended)

Please note that capture devices may come with their own requirements, which are separate from the requirements of the MiPACS software. Please consult with the device manufacturer for operating system compatibility for each device.

3.2 to 4.0 MiPACS Dental Enterprise Viewer Minimum System Configuration

- Microsoft® Windows 7/8/10 Professional (32- or 64-bit)*
- Intel i3/i5/i7 Processor
- 4 GB RAM (8 GB recommended)
- 100 Mbps Network Adapter (1 Gbps recommended)
- XVGA 1024x768 at 24/32 bit color (SXGA 1280x1024 recommended)
- Monitor with at least 400:1 contrast ratio (800:1 or higher recommended)

Please note that capture devices may come with their own requirements, which are separate from the requirements of the MiPACS software. Please consult with the device manufacturer for operating system compatibility for each device.

3.1.1404 or earlier MiPACS Dental Enterprise Viewer Minimum System Configuration

- Microsoft® Windows XP/7/8/10 Professional (32- or 64-bit)*
- Intel i3/i5/i7 Processor
- 4 GB RAM (8 GB recommended)
- 100 Mbps Network Adapter (1 Gbps recommended)
- XVGA 1024x768 at 24/32 bit color (SXGA 1280x1024 recommended)
- Monitor with at least 400:1 contrast ratio (800:1 or higher recommended)

Please note that capture devices may come with their own requirements, which are separate from the requirements of the MiPACS software. Please consult with the device manufacturer for operating system compatibility for each device.

1.3 HTML5 Web Viewer Client Requirements/Recommendations

The MiPACS HTML5 Web Viewer is a completely zero-footprint dental/medical viewer, requiring no installation of any applications, controls, or plug-ins. It functions within a web-browser only, so connectivity to the server is required for all operation.

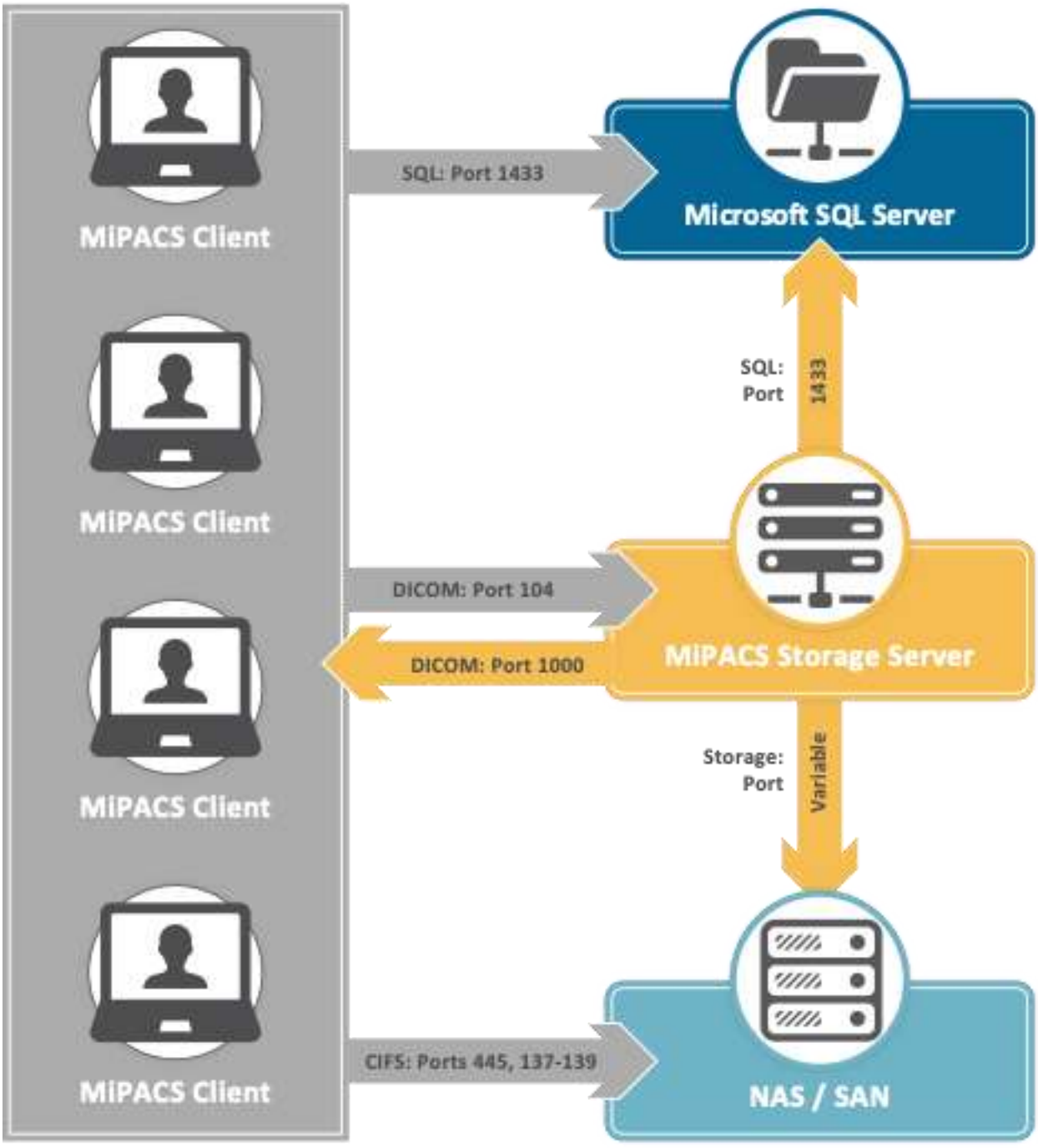
MiPACS HTML5 Web Viewer Minimum System Configuration

Any Operating System (Windows, MacOS, Linux, iOS, Android, etc.)
Any HTML5-compliant web browser (Internet Explorer, Chrome, Edge, Safari, Opera, etc.)
Access to MiPACS HTML5 Viewer server over at least a 1Mbps connection

Load Balancing

The MiPACS HTML5 viewer may be load balanced, but not clustered. Microsoft Network Load Balancing (Windows Server 2003 – 2016) or hardware/virtual load-balancing appliances may be used to spread the network load across multiple web server nodes. Note that any load-balancing appliances do not require identification of the originating client IP, and can simply be load balanced as a standard service.

1.4 TCP/IP Port Communication Diagram



1.5 Network Specifications

Configuration	Minimum Bandwidth	Recommended Bandwidth
Clients directly communicating with server on same local network	100Mbps	1000Mbps
Clients directly communicating with server over a wide area network (local database – SQL or Access)	10Mbps	50Mbps
MiniPACS server communicating with central server over a wide area network	1.5Mbps	10Mbps

1.6 Data Backup Information

- SQL Server database files (*.mdf, *.ldf)
- MiPACS Storage Server image share folder
- MiPACS Viewer image share folder

1.7 Antivirus Exclusions: Files/Folders To Exclude

- MiPACS Storage Server image share folder
- MiPACS Viewer image share folder
- C:\Program Files (x86)\MiDentView
- C:\ProgramData\Medicor Imaging
- X:\Medicor Imaging\MiPACS Storage Server

1.8 Support Contact Information

Phone: 704-227- 2629
Website: https://medicorimaging.com/support/
Email: support@medicorimaging.com

2. MiPACS Dental Enterprise Viewer 4.0, Installation Instructions

2.1 Labelling and Symbols

	**Manufacturer:** Medicor Imaging, Inc. 1927 South Tryon Street, Suite 200 Charlotte, NC 28203 U.S.A. Tel: +1-704-227-2629 Fax: +1-704-372-8161 Email: support@medicorimaging.com Website: www.medicorimaging.com The **date of manufacture** is shown in the software.
	**Read all instructions before use!**
	The catalog number is MiPACS Dental Viewer 4.0. Current product version is shown in the software (MiPACS Dental Viewer 4.0.x). This version of the installation instructions is valid for product versions from MiPACS Dental Viewer 4.0.x.
	**W A R N I N G !** This symbol alerts the user to the risk of possible injury, death or other serious adverse reactions.
	**C A U T I O N !** Instructions with this symbol must be followed in order to ascertain proper function of the equipment.

2.2 Introduction

MiPACS 4.0 is an image management software for dental practices. Before the MiPACS software products put to clinical use, it must have been properly installed and configured according to the **Installation Instructions** (this document).

Installation and configuration is not intended to be performed by an end-user, but by an authorized MiPACS representative or an IT technician with experience in installing software and hardware used in dental practices.

The installation instructions are to be followed together with the **Instructions for Use**. Both documents are distributed with the software and are also available from the distributor or

Medicor Imaging. Please refer to the Instructions for Use regarding product description, regulatory information, intended use and details regarding the user interface and clinical use of the product.

Before installing and configuring software components, please consult sections 2.3 System Requirements and 2.4 Supported Equipment to establish that the product is suitable for the intended use and compatible with the available equipment.

2.3 System Requirements

2.3.1 Workstation System Requirements

The recommended **computer hardware** for a workstation running MiPACS Dental Viewer 4.0 is:

- Processor: Intel Core i3-compatible or better
- RAM: 4GB
- Disk: 40GB available
- Network adapter: 1 Gbit/s
- Screen resolution: 1280x1024, 32-bit color or better

A medical display monitor, (DICOM monitor) is strongly recommended. Alternatively, a high-quality display, properly calibrated, may be used if image rendering is considered acceptable for clinical use.

MiPACS Dental Viewer 4.0 is supported on the following **operating systems**:

- Microsoft® Windows 7, 32-bit or 64-bit
- Microsoft® Windows 8.1, 32-bit or 64-bit

For security reasons, the Windows operating system should be updated with the latest service packs and Windows updates. Use of anti-virus software and firewalls is also recommended, but such software must be properly configured to not interfere with MiPACS and image transfer over the network.

The **Instructions for Use** and the **Installation Instructions** (this document) are installed as PDF files that can be opened from the start menu or in the application. For this to work, a **PDF Viewer** such as Adobe Acrobat must be installed on the computer.

MiPACS can be installed with optional software modules, so called **plugins**, to connect MiPACS with third-party hardware such as sensors and cameras, with software such as other imaging applications or patient management systems and with services for e.g., image transfer.

The third-party hardware and software and the plugins may have different system requirements than those listed above. For example, some sensors may work in 32-bit Windows but not in 64-bit.

Such additional system requirements are listed for each plugin in Appendix B: Component-Specific Instructions. It is important to verify that any hardware that is to be used with MiPACS is supported by the plugin and that the driver version is compatible with MiPACS and with the operating system.

2.3.2 Database Server and Network System Requirements

MiPACS Dental Viewer 4.0 requires a database running on **Microsoft® SQL Server 2012**.

It is not necessary to install MiPACS Dental Viewer 4.0 on the database server.

For best reliability and performance, it is recommended to connect workstations and servers in an Ethernet network with at least 1 Gbit/s bandwidth, in network adapters, switches and cables.

It is recommended to run MiPACS in a Windows domain, but the system works on a single computer or in a peer-to-peer network as well. MiPACS can run in a terminal environment, but performance and hardware compatibility with imaging devices must be considered.

The network and server performance, as well as storage space for the database server and backup system, need to be dimensioned for the expected workload. This is determined by the number of workstations in the network and the type and size of the images captured. Photographic images with high resolution are typically much larger than radiographs.

User statistics show that a dental practice after 5 years has roughly 10-20 images per patient, which typically occupy 3-5 MB per patient. For a medium-sized dental practice with 5-10 workstations, the total database size could reach about 50-200 GB after 5 years.

Based on these estimates, calculate the storage capacity that will be needed in the current environment during the lifetime of the server and storage system before upgrading server hardware and installing MiPACS.

CAUTION!

Follow the system requirements for server, network and workstation performance! If there are reliability or performance problems when accessing the system, there is a risk for delayed dental treatment.

2.4 Supported Equipment

MiPACS Dental Viewer can be connected to many third-party hardware and software systems used in the dental practice. Connection to X-ray devices, cameras and other hardware is made via separately installed plugins. Image transfer via files or internet services is also handled via plugins.

Integration with **patient management systems** (PMS) is typically performed by the manufacturer of the PMS via an application programming interface (API) supplied by MiPACS. If such integration is not available from the manufacturer of the PMS, MiPACS supplies a few alternative methods of connection using software components described below.

Below is a brief description of how supported equipment can be connected to MiPACS using the different types of plugins included with the software.

2.4.1 X-ray Devices

X-ray devices include intraoral sensors, phosphor plate scanners and panoramic X-ray systems. Typically, different X-ray devices from the same manufacturer use a plugin with the name of the manufacturer. There are some exceptions, as noted in section B6. Dentalmind Digital X-ray II, for instance when a certain plugin works with equipment from different manufacturers.

Below is a list of the X-ray plugins available with MiPACS Dental Viewer 4.0. If the manufacturer of the device is supported, please refer to the relevant section for the plugin in Appendix B, for detailed information whether a specific device is compatible with MiPACS and how to connect it.

- Carestream/Kodak
- Dentalmind Digital X-ray II
- Dürr VistaEasy
- ImageLevel NV SA MDX3
- Instrumentarium
- Kavo Gendex
- Morita
- Planmeca
- Schick Intraoral (supports Schick and some Sirona sensors)
- Sirona
- Soredex (supports Soredex and some Instrumentarium devices)

Install the plugin and software supplied with the device, such as drivers with the correct version, according to the instructions in Appendix B. After installation, refer to Instructions of Use, Chapter 9 from the regarding settings in the plugin, such as image enhancement. It is important to **calibrate the imaging system** according to the instructions in chapter 10 before clinical use takes place!

2.4.2 Intraoral Cameras

MiPACS supports intraoral cameras from a variety of manufacturers. Most intraoral cameras and some other equipment, such as microscopes, use DirectShow drivers and can be connected via **Video plugin**, but there are some exceptions such as Gendex intraoral cameras that instead connect via the Gendex plugin. Some intraoral cameras connect via **TWAIN plugin** (such as the Kodak/CS 1500) or via **Camera WIA plugin**. See sections B19. TWAIN and B3. Camera WIA to determine which plugin to use for installing an intraoral camera.

Many cameras have **buttons** on the hand piece for freeze/release and capture functions. Some intraoral camera models are only partially supported in the sense that these buttons may not work, whereas image capture almost always works. As an alternative to using the hand piece buttons the Video plugin also supports foot switches connected to either COM ports or game ports (emulated or real).

2.4.3 Extraoral Digital Cameras

Extraoral digital cameras can be used either in import mode or in direct capture mode.

Import mode means that the images are imported from the camera memory card after they are taken. The import can be done by connecting the camera via a cable or using a memory card reader. All digital cameras support import mode.

Import mode is achieved using the **Camera WIA plugin** or the **Autoimport plugin**. The Autoimport plugin is configured to point to a folder and automatically imports any files saved to it, optionally deleting them after the import. See section B.1 Autoimport.

Direct capture mode means that the camera is connected to the computer with a cable or via Wi-Fi and the image is imported into MiPACS directly when captured. Cameras supporting direct capture include most DSLR camera models like Canon EOS and the Nikon D series.

Direct capture mode can be achieved using the **Camera WIA plugin** for most DSLR cameras (see section B3. Camera WIA). The exception is Canon EOS cameras, using the Autoimport plugin in combination with the “EOS utility” software from Canon. Refer to section B21. Canon EOS Direct Capture for instructions on configuring the Canon EOS Utility for use with MiPACS.

2.4.4 Flatbed and Film Scanners

Flatbed scanners and film scanners can be used to scan analog radiographs and photographs and to import documents as images into MiPACS. Flatbed and film scanners usually have a TWAIN driver and can therefore be connected via the **TWAIN plugin**.

For occasional use, scanning may also be performed directly from the application without a plugin with the **Acquire** function of the **Import** dialog. Please refer to the **Instructions for Use** for more details.

2.4.5 Image Transfer and Communication

The MiPACS application contains features for image file import and export; see the **Instructions for Use** for more information. If the users often import files from the same folder or removable storage device, such as the memory card from a digital camera, the workflow can be made easier by setting up **Autoimport plugin** or **Manual Import plugin**. Similarly, the **Export plugin** can be used to simplify file export to a specific folder.

Files can be transferred via the internet using services such as C-Takt Link and Medspace. To use a service, install the **C-Takt Link plugin** or **Medspace plugin** and configure the plugin with the account login information for the service (refer to sections B5. C-Takt Link and B13. Medspace).

CAUTION!

Only install compatible hardware and software combinations and verify that the system works after installation! If unsupported hardware or software components are installed, the system or the component may not work, causing a risk for delayed dental treatment.

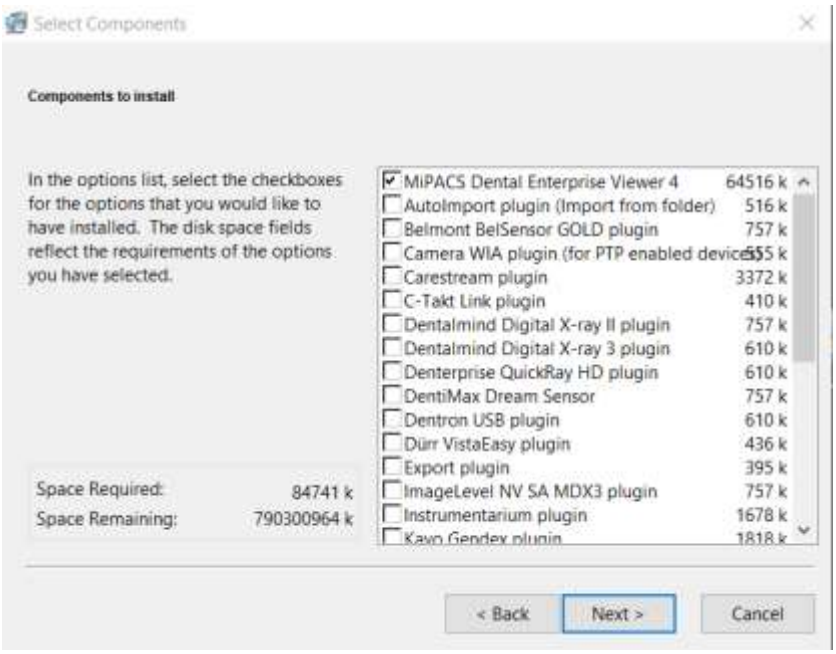
2.5 Installation

The MiPACS 4.0 software is distributed as a single executable file containing a self-extracting installer package. The package contains the MiPACS application, all available plugins and software tools and documentation in all the supported languages. The installer package is available for download from the manufacturer's website, www.medicorimaging.com, or supplied via authorized distributors.

Every MiPACS 4.0 installer package is labelled **4.0.x**, where x is a version number. The name of the executable installer is **MiPACSSetup4.0.4.exe** for the first version of MiPACS 4.0.4 and similar for future versions. The file name of the installer package must not be changed or the installer will not run.

It is only possible to install components from one package version. The package configuration is tested and verified. Attempts to mix components from different versions of MiPACS will cause the installation to fail. It is not possible to install MiPACS 4.0 on a computer with a previous version of MiPACS already installed until the previous version is completely removed.

If the MiPACS configuration becomes corrupted or if components with wrong version number are detected, the application will alert the user with a message stating "**NOT FOR CLINICAL USE**". In that case, uninstall MiPACS and all components completely and reinstall from a valid installer package.



In order to run the installer, the user must have administrator rights in Windows. When started, the installer will show a list of the available components. Select MiPACS 4 to install the application and select the plugins needed to connect the equipment attached to the computer (see Instructions of Use, Chapter 4, and the relevant section in Appendix B).

The installer needs to be run on every workstation in the network. Often, different components are installed on different workstations, depending on the equipment in the treatment room. In large organizations, it is possible to automate the workstation installation. Contact Medicor Imaging for more information.

It is possible to re-run the installer at a later time to add components not previously selected. All components that are selected in the list will overwrite previously installed components. This way, it is possible to reinstall the application or components if the installation has become damaged.

The installer will not uninstall components if they are deselected. The application and all components can be uninstalled with the **Programs and Features** option in **Windows Control panel**.

No hardware drivers or other third-party software needed to connect specific equipment is included in the MiPACS 4.0 package. Drivers and other software can be downloaded from the equipment manufacturer's website or is included with the equipment. Only install drivers with the correct version number according to the relevant plugin section in Appendix B.

CAUTION!

Only install tested software configurations and verify that the system works after installation! If components such as plugins or drivers have a different version than those listed in the Installation instructions, the system or the component may not work, causing a risk for delayed dental treatment.

2.6 Database Setup

The MiPACS Dental Viewer database consists of two parts: a SQL server database that stores patient information and image metadata and a directory structure in Windows that contains the image files belonging to each patient.

The SQL server database and image store typically reside on the same server for small- and medium-sized installations. In large organizations, it may be desirable for performance reasons to separate the server roles and place the image store on a Storage Area Network (SAN), possibly combined with clustering of database servers and/or storage servers.

In MiPACS Enterprise installations, redundant storage can be provided by a DICOM storage server. In such installations, additional redundancy can be obtained if the DICOM storage server cluster is physically separated from the MiPACS database servers.

CAUTION!

Setup database and network combinations that have been tested according to the Installation instructions. If the image database connection is lost, there is a risk for delayed dental treatment.

2.6.1 SQL Server Installation

The MiPACS database requires Microsoft SQL Server. It is available in different editions for large and small organizations and the **SQL Server Express** edition is available for download at no cost. See https://www.microsoft.com/en-us/server-cloud/products/sql-server/ for more information.

Planning and configuration of a large SQL Server installation could be a complex task. Database administrators may contact Medicor Imaging for assistance before deployment.

For small and medium-sized dental practices, it is possible that a SQL Server Express may suffice. Below is a short description of SQL Server Express setup for a small- or medium-sized installation. The description illustrates the general concepts, but SQL Server installation is otherwise beyond the scope of this document. It is the responsibility of the installer or database administrator to install and configure the database server according to the needs of the organization.

SQL Server Express Installation and Setup

Download and run the SQL Server Express with Tools installer. This version contains SQL Server Management Studio which may be needed for maintenance such as restoring backups.

Create Server Instance

The installer will ask for the instance name to set up; either the **default instance** "MSSQLSERVER" which will allow connections using just the server name, or a **named instance** – the default named instance is "SQLExpress". If the server already runs existing SQL Server instances, e.g. for a patient management system database, it is recommended to create a separate instance for MiPACS – change the name of the named instance to e.g. "MIPACS". If this is the only instance on the server, the default instance can be selected.

Server Configuration

Change the setting for **Authentication mode**: select **mixed mode** to allow Windows authentication as well as enabling the administrative user "sa" login. Choose a password for the "sa" user. **Write down the selected "sa" password and store it in a secure location** – the password will be needed later to create and restore database backups!

Accept Incoming Connections

This step may not be needed for a single-user installation where MiPACS, SQL Server and the database are stored on the same computer.

Enter **SQL Server Configuration Manager** and configure the server to accept incoming connections. Select "Network Configuration" and "Protocols". Enable the options **TCP/IP** and **Named Pipes**.

Go back to **SQL Server Services** and restart the SQL Server. Make sure that it starts and that the **SQL Server Browser** is running.

Incoming client connections may be blocked by the Windows firewall or by a third-party security application. Make sure that the necessary ports are open in the firewall(s).

If database access is to take place using Windows authentication, all MiPACS user accounts need to be properly configured with read and write access rights to the SQL Server. This is easier to maintain in a Windows domain environment.

2.6.2 Image Store Setup

The image store is a shared directory on a server. The image store server can be the same server running SQL Server or a different server in the network. The image files can be located on the workstation itself for single-user systems (in that case there is no need to share the folder on the network).

MiPACS will create the directory structure in the share when the database is created. First create the share and set the user access rights. All MiPACS users (domain users or local Windows accounts) need both read and write access rights to the image store directory structure on the operating system level.

The image store path should be made available to all clients through a UNC path on the form **\\server\imagestore**. It is not recommended to use a mapped drive in the path such as X:\imagestore. Such mappings are user-specific and may not be available when the application is run as an administrator.

The image store path is stored in the SQL database. If the SQL database is moved to a new server or if a backup is restored in a new environment, the image store path will need to be changed to the new location.

CAUTION!

Configure the network settings properly according to the Installation instructions. If the system or a component does not work, there is a risk for delayed dental treatment.

2.6.3 Database Creation

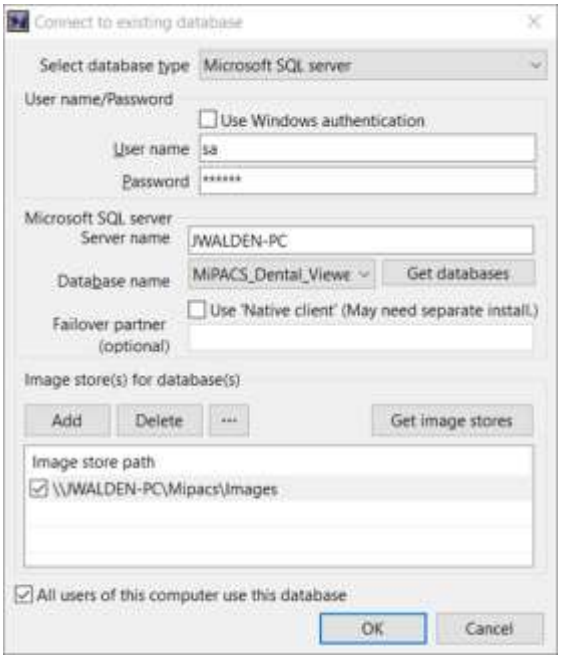
In order to create a new database, start MiPACS on a workstation. In the **System** menu, select **Create new database**. Under **Server name**, enter the name of the SQL Server instance set up previously, e.g. “SERVER\MIPACS” (replace SERVER with the actual name of the server) if a named instance called MIPACS was created. If the default instance was installed, just enter the server name.

Type a name for the new database, e.g. “MiPACS_Viewer”. Then select the path to the **image store**: browse to the image store share configured previously, e.g. \\server\imagestore. Click OK to create the new database.

A SQL Server login box is presented. Enter username: “sa” and enter the password that was selected during the SQL Server installation. Windows authentication can also be selected, e.g. in a Windows domain environment with domain users properly configured with access rights to the SQL Server. Click OK to create the new database.

2.6.4 Database Selection

To connect to an existing database, for example when adding a new workstation to the network, first start MiPACS on an existing workstation and select **Database information** in the System menu. This will show the existing **server instance name** and the **image store path**. Note the information and use it on the new workstation.



In the **System** menu, select **Connect to existing database**. Enter the SQL Server authentication parameters and under **Server name**, enter the name of the SQL Server instance where the MiPACS database is stored. If the client can connect to the server, a list of databases on the server will show up in the list. Select the correct database in the list. The image store path stored in the database is shown and can be changed, e.g. if migrating or restoring a database to a new environment. Click OK to connect to the existing database.

If the SQL Server or the image store cannot be reached from the new workstation, check the network settings and verify that any firewall software in the server and/or the workstation is configured to allow connections.

	**CAUTION!** Configure the database settings properly according to the Installation instructions. If the system or a component does not work, there is a risk for delayed dental treatment.

2.6.5 Database Backup

	**CAUTION!** Configure a system that creates regular backups of the SQL database and image store and verify that the backup system works! If the image database is lost, there is a risk for delayed dental treatment.

It is essential to create regular backups of the SQL Server database as well as the image store files. Backups need to be taken daily or even more frequently and transferred to an off-site location. Third-party backup software is commercially available that is capable of backing up a SQL Server database as well as any other data stored at the practice, such as the patient management system database. In some editions of SQL Server, it is also possible to schedule automatic backups using the SQL Server agent in Management Studio.

If such options are not available, a simple SQL Server backup script is included with the MiPACS installation. After manual configuration, it uses command-line tools to create a SQL database backup to a file that can then be copied to the backup media by any file-copy tool.

The **sqlbackup** script is found in the application folder in Program files. Configure the script according to instructions in section B22. SQL Backup Script and then schedule it to run regularly with **Windows Task Scheduler**.

The script will create a SQL backup file, e.g. “MiPACSDB.bak”, in the desired folder, by default “C:\MiPACSBackup” on the server. The whole MiPACS patient database is then backed up or moved to a new server by copying the “MiPACSDB.bak” file and the entire contents of the image store folder including subfolders.

2.6.6 Move or Restore Database

If the patient database is destroyed or corrupted, possibly due to a database server crash or a fire, it may be necessary to restore the most recent existing backup.

When performing a planned migration to a new server, start by creating a fresh backup according to the instructions above. The backup consists of the following:

- A file named “MiPACSDB.bak” (or similar) containing the backup of the SQL database
- The entire image store directory structure including files and subfolders

Install a new SQL Server and set up a new image store share according to the instructions above. Next use Management Studio to restore the .bak file and copy all the image store contents to the new location. Make sure all users have read and write access rights in the new image share.

Launch MiPACS on a workstation and select **Connect to existing database**. Select the database on the new server and click OK to verify the connection. Open the **Connect to existing database** again and change the image store path (stored in the restored database) to the correct path of the new image store location. **Note**: do not use Add to create a second image store folder.

Test the restored or migrated system by accessing patients and old images on all workstations. Verify that image capture still works.

2.7 Application Setup

WARNING!

Application settings must be set carefully according to the instructions and to the current clinical environment. If the settings are wrong, there is a risk of misdiagnosis or malpractice.

Most of the settings in the main MiPACS Dental Viewer application are accessed from the **Preferences** dialog in the **System** menu. The dialog consists of a number of tabs with different groups of settings. The settings are sometimes stored in the common database and thus affect all users and all computers. Other settings are stored in the registry and affect either the local computer or the currently logged in user.

In order to save some settings after changing them in the Preferences, Windows administrator rights are needed. If **User Access Control** (UAC) is turned on, the application must be started by right-clicking the MiPACS 4.0 icon and selecting **Run as administrator**. A warning message alerts the user when entering Preferences if settings cannot be saved because the user lacks administrator rights.

Below is a short description of the tabs in the Preferences dialog. Some of the settings are described in greater detail in sections below. Only the first tabs, **User** and **License**, are visible for end-users. To access the other tabs, first click the button **Advanced** and confirm the warning message.

User

These settings are intended for end-users and control the language and user-interface appearance for the current user. There is also an option to reset the menus and toolbars if they become corrupted.

License

On this tab, it is possible to view and manage license keys stored in the database. See Instructions of Use, Chapter 8 for more information.

General

These settings allow Referrers to be configured and affect how the system prompts for Referrer during capture. A **Referrer** is the person requesting the images and who is later responsible for approving them.

Integration

These settings control the connection to some patient management systems (PMS). For instance, it is possible to disable the built-in patient edit and search functions when using a PMS.

Display

Settings that control the rendering of images on the computer screen. Use these settings with caution and remember that monitor calibration may be affected (Instructions of Use, Chapter 10).

Capture

On this tab, there are settings for image enhancement and other processing, such as mirroring, which will be applied on images after they are captured with a specific plugin but before they are shown in MiPACS. Individual processing can be applied to different image sources. Do not use additional image enhancement in the Capture settings if it is already applied in the plugin settings. See Instructions of Use, Chapter 9 for more information.

Security

These settings control the login method and user access rights. Described in more detail below.

DICOM

Settings for controlling access to DICOM Storage servers and Modality worklist servers. See below.

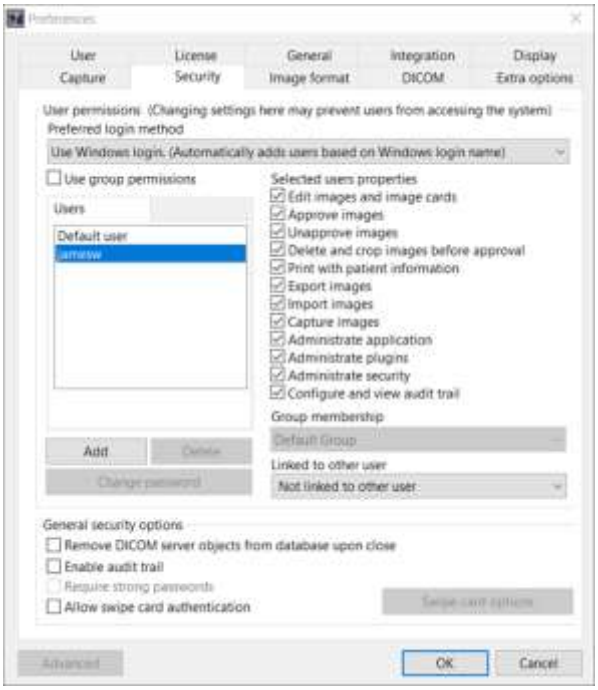
Image Format

These settings control the image file format in the MiPACS database. The choice of file compression affects the size of the image files and the database but could also decrease the image quality. This setting affects all users and should be changed with caution and only if necessary.

2.7.1 Security Settings

The security tab controls access rights within MiPACS for different users or groups of users. The login method is by default to use the login name in Windows. This can be changed to AD login for Windows domains or Application login for peer-to-peer networks. If these settings are used, there is no need to log out from Windows to change user and MiPACS presents a login prompt when launching the application. In this setup, it is also possible to configure MiPACS to use swipe cards for logging in and approving images.

User access rights can be modified for the **Default user**, which affects new users that are added, or separately for each existing user or a group of users. Select a user in the left box and check the boxes to the right to control access to various features.



The installer or administrator that changes permissions for other users must have the permission to **Administrate security**, but once this user is added the **Administrate security** permission should be removed from the Default user and any ordinary users.

The user permissions are dependent on the workflow and roles of the users and should be decided together with a clinic manager or responsible dentist. See the **Instructions for Use** for more information on how user permissions affect the functionality of the application.

For instance, an assistant that captures images but is not allowed to diagnose can have permission to **Edit**, **Capture** and **Import images**. A dentist should have the same permissions and in addition permission to **Approve** and **Export images** and possibly **Delete and crop**. The right to **Unapprove images** should be reserved for a clinic manager or system administrator and

possibly only activated on a temporary basis. This is especially important in MiPACS Enterprise installations. Unapproving approved images is not a routine task and should only be done if the approval was made by mistake.

Installers and IT technicians need to have the permissions **Administrate application** and **Administrate plugins** in order to change the settings in Preferences and plugin settings.

	**C A U T I O N !** Configure the security settings properly according to the Installation instructions. If the system or a component does not work, there is a risk for delayed dental treatment.

2.7.2 DICOM Settings (MiPACS Enterprise Only)

With the settings on the **DICOM** tab, a client can be configured to connect to one or several **DICOM storage servers**. Configure each server by entering its AE title, IP address and port number which can be obtained from the DICOM server administrator. When configuring the connection, make sure that the right network adapter on the client is selected, in case there are several adapters installed.

Multiple servers may be selected for DICOM Query and are then available for searching patients, but only one may be used for storage. In some environments, it is recommended to configure all clients with DICOM Query only (no DICOM Store) and instead setup asynchronous batch transfer of approved images from the MiPACS database server to the DICOM storage server as a scheduled job performed daily or weekly. Unapproved images may be approved and transferred at a later stage with the **List unapproved series** tool.

In order to access a DICOM server, the client needs to be configured with a unique **Client AE title** (Application Entity) and **Client port** number. The same information needs to be entered into the DICOM server by the server administrator. After configuring the Client AE and port, the connection to each storage server can be tested by selecting the server in the list and clicking **Test connection**. On the same tab, **Modality Worklist Query** can be enabled and MWL server settings can be configured.

CAUTION!

Store all images in the MiPACS database as well as in the DICOM server for redundancy. If historic images or data are lost, there is a risk of decreased diagnostic capability.

2.8 License Management

After purchase, a MiPACS 4.0 installation license is created for a certain number of workstations. This is controlled with a license key that is entered on one of the workstations and stored in the database. When the license is renewed or if the number of workstations needs to be increased, a new key is distributed. A list of the license keys stored in the database, their type and expiry date is shown in the **License** tab in **Preferences**.

The license key consists of a text file containing the name of the practice and a code string. When a new license key is distributed via email, simply double-click the license file to import it into MiPACS. If the license file is unavailable, enter the code string in the **License** tab in **Preferences** exactly as shown. If it fails, note that some letters and digits may look similar, such as 1-I-l and 0 and O.

2.9 Plugin Setup

CAUTION!

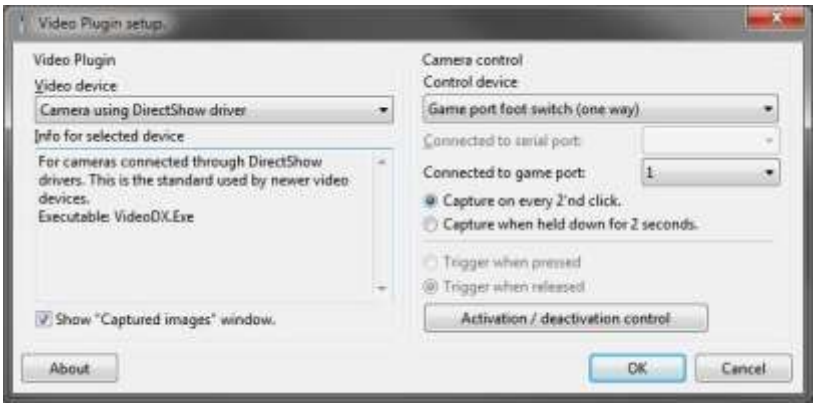
Configure the imaging hardware settings properly according to the Installation instructions. If the system or a component does not work, there is a risk for delayed dental treatment.

Run or re-run the package installer to select and install the plugins needed to connect the desired equipment to the workstation, after determining that the equipment model is supported and the system requirements fulfilled, based on the relevant plugin section in Appendix B.

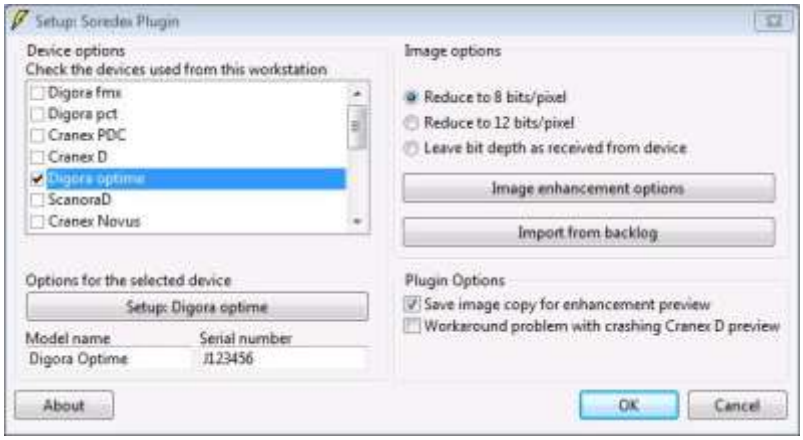
When a plugin is installed, it shows up in MiPACS as an extra toolbar. In the **Tools** menu, **Plugin options** can be used to enable or disable selected plugins. The settings for each plugin can also be accessed in the Tools menu. This requires the user to have the **Administrate plugins**

permission (Instructions of Use, Chapter 7). In the settings dialog for each plugin, there are parameters that may need to be adjusted.

In the **Video plugin**, the intraoral camera model or connection method is selected, possibly with additional parameters according to the plugin in section B20. Video and the camera manufacturer's instructions. If the camera buttons do not work, a foot switch may also be configured in the Video plugin.



For cameras, it is recommended to set up auto-selection of a certain template when images are captured so that photographs are not placed in an X-ray template. Open the **Capture** tab in **Preferences**, select the plugin used for camera capture, then check **Use auto-selected template** and select a suitable template such as PA5 or PA9.



In several **X-ray plugins**, the devices connected to the workstation can be specified, sometimes with additional settings for each device. Review and adjust these settings according to the plugin instructions in Appendix B and the instructions from the device manufacturer.

Some X-ray devices need to be activated before capture. Automatic activation of a specific device when a patient is opened can be configured on the **Capture** tab in **Preferences** once the plugin is installed.

The X-ray plugins also have **image enhancement options**. Adjust these according to the next section. In these plugins, there is also an option to reduce the image quality before storing the image in MiPACS.

Image enhancement can be applied in several steps of the capture chain. Some drivers contain image enhancement filters that sometimes cannot be disabled. The next step is the plugin image enhancement and similar options on the Capture tab in Preferences in the main application. Finally, the user may add image enhancement during analysis with the tools in the user interface.

Some enhancements, such as **noise reduction** and **edge enhancement**, are destructive and can degrade the image quality, especially if applied repeatedly. It is therefore recommended to only apply image enhancement in one of the steps in the capture chain and the preferred step is the plugin image enhancement described below.

Reduction of image quality should be applied after image enhancements for best results. If it is desired to perform extensive image enhancement in the user interface, disable reduction of image quality in the plugin. Images will then consume considerably more storage space.

CAUTION!

Verify that the image acquisition chain works after installation! If the system or a component does not work, there is a risk for delayed dental treatment.

2.9.1 Image Enhancement

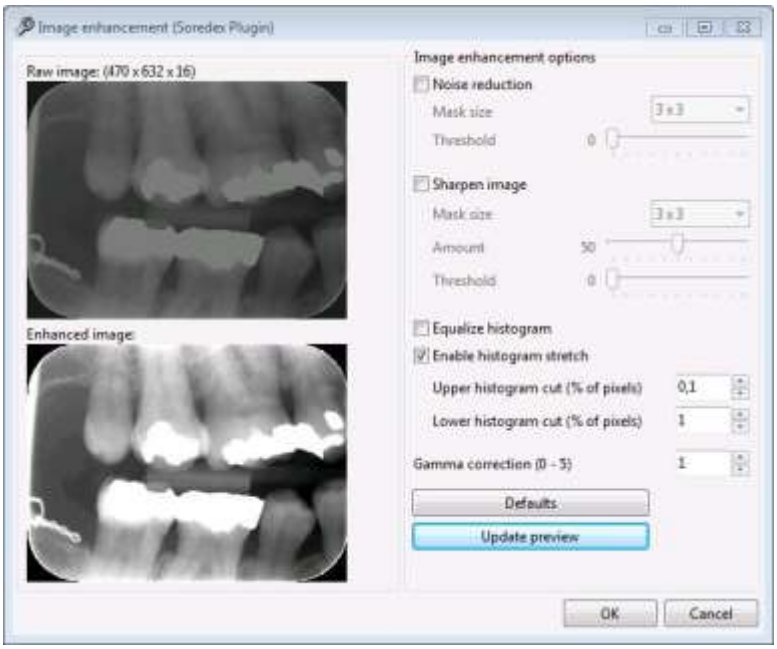
WARNING!

Image enhancement settings must be adjusted carefully according to the instructions and verified by a dentist before being put into clinical use. Incorrect settings could lead to inferior image quality and cause a risk of misdiagnosis or malpractice.

Each X-ray plugin has individual image enhancement settings which will be applied to all new images captured with the connected device. Some plugins support more than one type of device, such as sensors and scanners, and may then have separate enhancement settings for each device.

In the image enhancement dialog, change the settings and click **Update preview** to see the result. Compare the enhanced image to the raw image. Test different settings until the image quality is sufficient to perform accurate diagnosis. **This step requires the approval of the dentist!**

To start over from the default settings, press **Defaults**. Click OK to save the settings or Cancel to close without saving. Resize or maximize the window to get larger images. Click an image to switch between displaying the full image or a zoomed view. On the keyboard, press "+" to zoom in and "-" to zoom out.



Histogram Adjustments

Often, the images are too bright and have poor contrast. This can be improved by reducing the **Gamma correction** value to approximately 0,5-0,8. Too dark images can be brightened up by increasing the gamma value above 1. Gamma = 1 corresponds to an unchanged image.

As a final step after calibrating the X-ray chain, **Histogram stretch** may be enabled, in order to obtain optimal contrast. Adjust the limits **Upper histogram** cut and **Lower histogram** cut to stretch the histogram, 0-2% is usually enough. The **Equalize histogram** option offers even more contrast but can make the image look distorted. Use this option with caution.

Noise Reduction

Noise in the image can sometimes be reduced by checking **Noise reduction**, which will apply a median filter on the image. The degree of noise reduction is adjusted using the **Mask size**. If the smallest mask size (3x3) does not remove all noise, try a slightly larger, 5x5 or 7x7. Note that

too large masks are destructive for the image details. It is possible to set a small threshold value with the **Threshold** slider in order to reduce unwanted side effects of the noise reduction. Use this filter with caution since small details in the image may be lost, especially with large mask sizes.

Sharpening

The **Sharpen image** option can enhance the perceived sharpness of the images. An “unsharp mask” filter will then be applied, and the three parameters may need adjusting to get a good result. The degree of sharpness is set by the **Amount**; 20-50 is often enough. The sharpness is also increased by choosing a larger **Mask size**. The best result is obtained with a small mask size and a moderate amount; too much sharpness will introduce artifacts in the image. Sharpening will also amplify noise in the image; therefore, noise reduction is often used in conjunction with sharpening. In addition, the **Threshold** value for the sharpening filter can be slightly raised in order to further reduce the noise effect. Threshold 2-10 usually provides sufficient noise reduction.

Important Note about Destructive Image Operations

Please note that the image enhancement functions in the plugin settings perform irreversible operations on all captured images. The filters distort information and may even add misleading effects that were not present in the original image, and there is no way to recover the original image after permanent image enhancement has been applied. Use the image enhancement filters with caution and consider that an image with good appearance may not be optimal for diagnostic purposes.

2.10 X-ray Imaging System Calibration

W A R N I N G !

The X-ray imaging system must be properly calibrated before being put into clinical use. Inferior image quality could cause a risk of misdiagnosis or malpractice.

Every X-ray imaging system must be calibrated before it is used for diagnostic purposes. The imaging system must also be checked regularly to verify that it does not deteriorate, due to aging of the X-ray source or due to inadvertently changed settings.

The term ”X-ray imaging system” here includes the whole chain of components, each of which may affect image quality:

- The X-ray source
- Imaging devices such as sensors and scanners
- Drivers, sometimes containing image enhancement algorithms

- A MiPACS plugin with image enhancement filters
- The MiPACS application and other imaging software
- The computer monitor where the result is interpreted by the dentist

Before calibrating the X-ray imaging system, it is important that the X-ray source is in good condition and functioning properly. The performance of the X-ray source must be verified by regular dose measurements. This should be performed by the distributor of the X-ray source.

When installing a new X-ray imaging system, or replacing any of the components in the system, the imaging system must be calibrated. The calibration includes adjusting the exposure time of the X-ray source to obtain optimal image quality from sensors and phosphor plates, while minimizing the X-ray dose to patients. In addition, the image enhancement settings in MiPACS and/or hardware drivers are configured, and the computer monitor is calibrated for correct rendering of X-ray images.

Below is a checklist for calibrating the X-ray imaging system after installing new hardware or replacing some part of the system:

- Install the X-ray sensor or phosphor plate scanner according to the manufacturer's instructions.
- Follow the plugin installation instruction in the relevant section in Appendix B.
- Calibrate the monitor according to the next section.
- Go to **System | Preferences | Capture**. Select the correct plugin under "Select source". Turn off all image enhancements; uncheck all options in the list and disable gamma correction (set gamma = 1). Click OK to save the settings on the Capture tab.
- Open the plugin settings in the **Tools** menu. Click the button **Image enhancement options** and disable all settings as above. If the option **Save image copy for enhancement preview** is available in the plugin settings, make sure it is turned on.
- Sometimes there are also settings in the driver software installed with the device that may affect the image. Check the manufacturer's instructions on how to calibrate and optimize such settings before moving on. Disable image enhancement in the driver as well, if possible.
- Capture a test image under realistic clinical conditions. Use an imaging phantom or ideally real teeth, and expose an image using the recommended X-ray exposure time according to the device manufacturer's instruction.
- In MiPACS, open the tool **Histogram** and check that the grayscale content of the image is within the boundaries of the histogram. Optimally, the main peak should be centered in the range, but sometimes the dynamic range of the device is so wide that the content is in a narrower part. If the grayscale content looks like it is partly outside the histogram range, adjust the X-ray exposure time accordingly and capture a new image. Repeat these

steps until a good exposure is made. Write down the exposure time, voltage and other parameters set on the X-ray source and use them as the standard for future captures.

- Go to the plugin settings again and turn on the **image enhancements** (see Instructions of Use, Chapter 9). In the image enhancement dialog there is now a preview of the last image captured. Use it to adjust the settings for optimal image quality. It is the responsibility of the dentist to finally approve the image quality.
- When done, click OK on the image enhancement dialog and click OK on the plugin setup dialog as well to save all settings.
- Restart the computer and capture another image to confirm that all settings were saved and that the image quality is still good.
- The image quality shall be approved for diagnostic use by the dentist. Use the approval form in Appendix C: Installation Approval Form.

Please note that image enhancement settings may cause loss of information and/or introduction of artifacts in the image. This could decrease the diagnostic value of the image. Use the settings with caution and do not turn on settings unless the dentist determines that they aid accurate diagnosis.

2.10.1 Monitor Calibration

W A R N I N G !

The computer monitor must be properly calibrated before being put into clinical use. Inferior image quality could cause a risk of misdiagnosis or malpractice.

It is important to calibrate the computer monitor to make sure that X-ray images are displayed accurately. With incorrect settings, important clinical information may be lost in the darker or lighter parts of the image. Incorrect settings may also cause distorted image proportions.

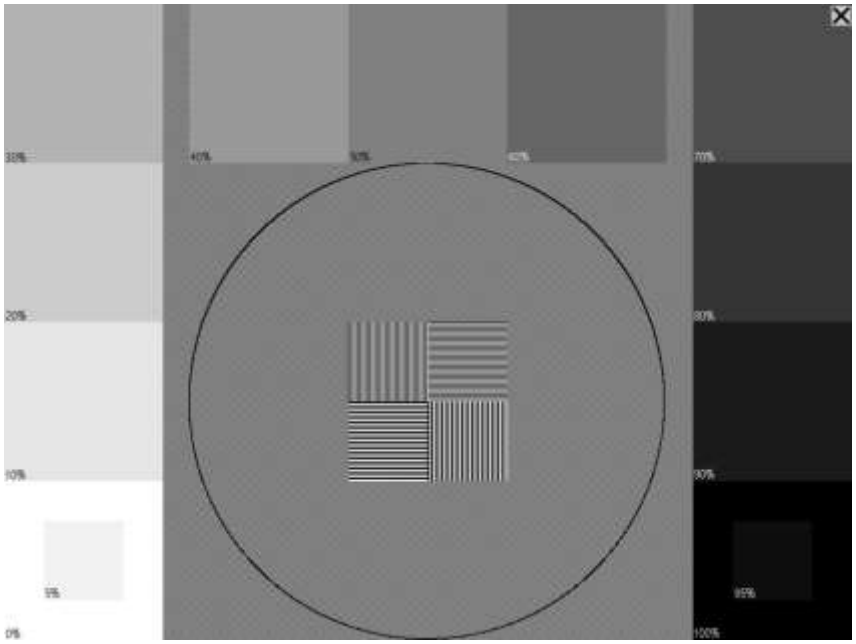
Also consider the lighting conditions of the room, and the fact that the monitor orientation with respect to other light sources and the viewing angle may affect the perception of images on the monitor.

It is very important to use a high-quality computer monitor. It is strongly recommended to use a monitor designed to display medical grayscale images (sometimes called a DICOM monitor). Sometimes such monitors are factory-calibrated and it is not possible to change settings and in other cases, special software and/or hardware must be used for calibrating the monitor. Refer to the manufacturer's instructions.

The computer's graphics adapter must be installed with the proper driver and set to the correct resolution based on the monitor specification. Also check that it is set to at least 24-bit color depth.

The MiPACS function **Monitor calibration** in the **System** menu can facilitate calibration and regular check-up of the monitor. It shows a test image to use when adjusting the display for optimum image quality. Each monitor calibration performed is logged with date and time, workstation, the user who performed the calibration and any comment made. By default, the monitor calibration function shows a list of all monitor calibrations made on the current workstation. Checking the option “Show calibrations for all workstations” will show calibrations from all stations connected to the same database.

Click **Perform new calibration** to show the test image below:



Adjust the brightness, contrast and other settings of the monitor so that it is possible to distinguish the fields inside the boxes at the bottom left and right marked 5% and 95%. Check that all shades of gray are correctly displayed.

Verify that the proportions are correct. Boxes with gray shades should be squares and there should be a circle in the middle. Use a ruler to measure that the height and width of the circle are equal. If the proportions are not correct, the resolution setting of the monitor or the graphics adapter is not configured properly.

2.10.2 Consistency Check

In order to maintain the calibrated state of the X-ray imaging system, regular consistency tests need to be performed and documented, using the MiPACS feature **Consistency check**.

Go to **System | Consistency check**. The function opens a record with the name "Consistency check", similar to a patient record. Images can be displayed and stored as usual. Perform the consistency check as a fixed routine with certain periodicity, each time with the same X-ray exposure time, imaging phantom and distance between phantom and X-ray source. Check that the image quality has not deteriorated since the last time. If it has, it means that some component of the chain has changed for the worse.

When images are captured in the Consistency check file, the average grayscale value of the image is automatically saved as an image comment. This value is normally seen at the bottom right in the status bar when the image is selected. Also, the **Color probe** tool in the **Image | Color/Gray-levels** menu can be used to check the grayscale in various parts of the test image. Enter the measurements as comments.

Please note that there is only one Consistency check-record in the database, so each image series should be saved with a unique name for each workstation, e.g. the name of the treatment room.

When performing the consistency check, it is important that all image enhancement filters that can hide any X-ray imaging system deterioration are turned off wherever possible, in order to get an accurate picture of the state of the capture chain. Some image enhancement functions could compensate for bad exposures, such as **Histogram stretch**, and must be disabled during the consistency check.

Sample routine for consistency check:

- Go to **System** | **Consistency check**.
- Go to **System** | **Preferences** | **Capture**. Select the correct plugin under **Select source**. Turn off all image enhancements; uncheck all the options in the list and disable gamma correction (set gamma = 1). Click OK to save the settings on the Capture tab.
- Open the plugin settings in the **Tools** menu. Click the button **Image enhancement options** and disable all settings as above.
- Sometimes there are also settings in the driver software installed with the device that may affect the image. If such settings are enabled, make sure they are set equally at each consistency check session. At least turn off functions that would hide changes in exposure like "histogram stretching" or "automatic grayscale leveling".
- Capture a few images with different exposure times using the X-ray phantom.

- Check the average grayscale value (in the status bar): measure the grayscale in different parts of the image with the Color probe tool, and check the histogram. Compare with previous checks made under the same circumstances and note any differences.
- Restore all settings to the way they were before the consistency check.
- If deterioration in the system is observed, troubleshoot it to determine the cause and take corrective action.

2.11 Patient Management System Integration

Patient management systems (PMS) are generally adapted to work with MiPACS by the PMS manufacturer. Once installed, configuration of the PMS might be needed to connect it to MiPACS so that it is possible to open a patient in MiPACS by e.g. clicking an icon in the PMS. This is usually performed by the distributor or installer of the PMS.

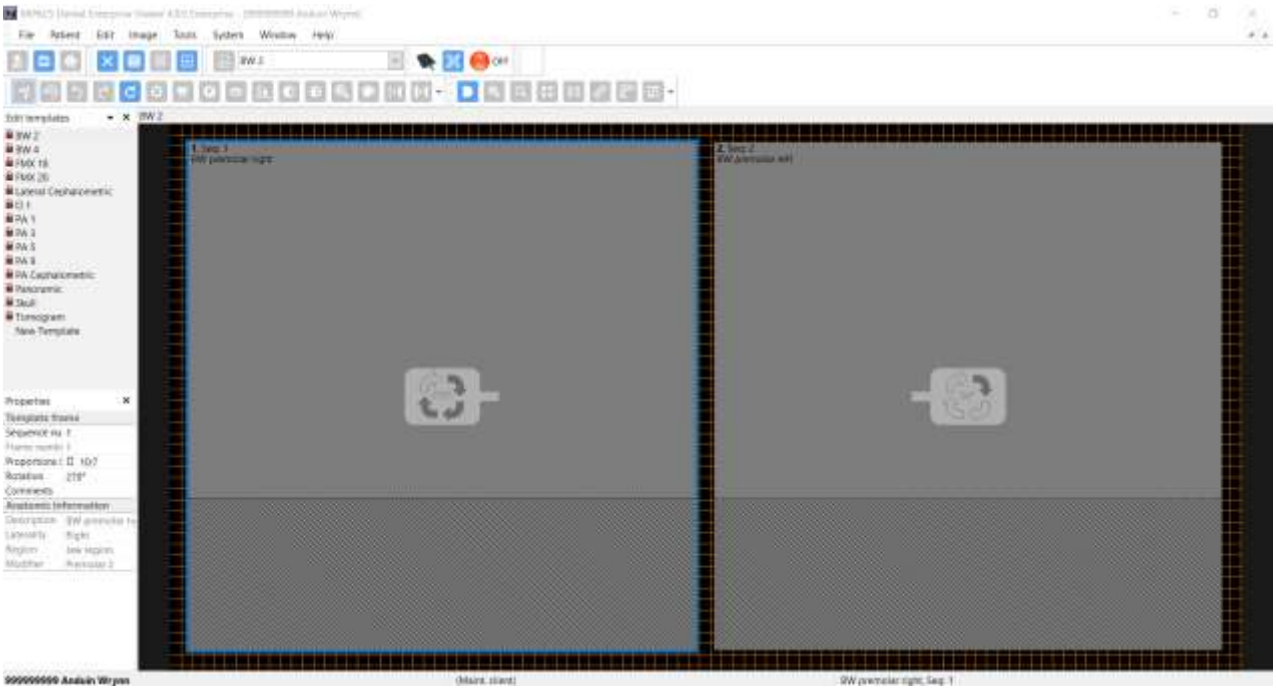
If there is no integration to MiPACS built into the PMS, a couple of tools are supplied that can be used to set up a connection between the PMS and MiPACS. These are the **Patient Selector**, a configurable tool that can be set up to read patient information from the window of the PMS, and the **Command line link** interface to MiPACS. The documentation for these tools is found in sections B23. Patient Selector and B24. Command Line Link.

2.12 Templates

WARNING!

User-defined templates must be created carefully according to the instructions and verified by a dentist before being put into clinical use. If there is an error in a template, there is a risk of misdiagnosis or malpractice.

Templates are used to arrange images for diagnosis and to assign anatomic information to images. In addition to the built-in templates in MiPACS, it is possible to create new templates, optionally by modifying an existing template and to export and import files containing templates. The built-in templates cannot be deleted but can be hidden from the menu in the toolbar.



Select **Edit templates** in the **Window** menu. Either select an existing template in the list pane and save it with a new name using **Save As**, or start with an empty template and add frames using **Tools | Add image frame to template**. Arrange the frames and adjust their size by dragging the corners. Gridlines can be shown with **Show/hide grid** in the **Tools** menu.

Under **Properties** in the list pane, enter **Sequence number**, **Frame number**, **Proportions**, and **Rotation** correctly. The sequence number controls the order in which captured images are placed into the frames. Proportions control the aspect ratio of images by masking off a section of the square frame.

Also, enter correct **Anatomic information** for each frame. The **Laterality**, **Region** and **Modifier** information will be filled in according to the selected **Anatomic Description**. Click **Save** to save the new template, then go back to Properties and give the template a type such as **Intraoral** or **Secondary Capture**.

All template settings must be verified by the dentist before clinical use! After approval, click **Save** again to save the new template in the database and make it available to all workstations.

2.13 Upgrading from a Previous MiPACS Version

It is not possible to install MiPACS 4.0 if an older version, such as MiPACS 3.1, is already installed on the computer. MiPACS 3.1 must first be uninstalled in order for the MiPACS 4.0 installer to run.

Before uninstalling an older version, it is recommended to write down important settings in the old system, especially database settings and plugin settings such as image enhancement. All settings are reset to default values when MiPACS 4.0 is installed.

A major part of equipment, such as sensors and cameras, currently in use by MiPACS 3.1 users is supported with the set of plugins included with MiPACS 4.0. In future releases, support for additional equipment will be added as soon as possible. However, some legacy hardware that was supported in MiPACS 3.1 may not be supported in MiPACS 4.0, based on the number of users and the system requirements of the legacy equipment. For instance, the drivers for some older sensors only work on Windows XP which is a deprecated operating system. In such cases, it will be necessary to replace the hardware with a modern alternative before upgrading to MiPACS 4.0.

2.13.1 Connecting 3.1 and 4.0 Workstations to the Same Database

In some cases it may be necessary to connect both MiPACS 3.1 and MiPACS 4.0 workstations to the same database. Examples of such situations include:

- Legacy hardware is still in use and working with MiPACS 3.1 but not supported by 4.0
- A gradual upgrade of a large system where both versions need to co-exist until all workstations have been upgraded

In order to make this work, both a MiPACS 3.1 and a MiPACS 4.0 license must be stored in the common database. Both licenses must be issued to the same customer name. Add the MiPACS 3.1 license using a 3.1 workstation and the MiPACS 4.0 license from a 4.0 station, after connecting them to the database.

2.14 Problem Solving

If there are any problems with MiPACS or attached equipment, please verify that the **Installation Instructions** (this document) and all instructions from the manufacturers of the attached equipment have been followed.

Medicor Imaging manufactures the image management system and the included software components such as plugins only. Problems with third-party hardware or software attached to MiPACS, such as sensors, cameras, drivers or patient management systems are beyond the scope of Medicor Imaging. In such cases, contact the distributor or manufacturer of the hardware or software for assistance.

If MiPACS has lost the connection to the network or server, a **network error** is shown until connection is restored. Such errors do not generally indicate a problem within the MiPACS software.

If a **software error** occurs in MiPACS, a warning message is shown and the error is logged to a file. Please report any software errors to Medicor Imaging as soon as possible. By using the **System Information** utility in the **Help** menu, the configuration of the system and the error log can be inspected and the report will also be transmitted to Medicor Imaging for collection of user statistics and troubleshooting.

If there are any other problems that cannot be solved using the information in this document, please contact Medicor Imaging for assistance!

2.14.1 Troubleshooting

A few common problems and solutions are listed below for troubleshooting:

Problem	Cause	Solution
Message on workstation saying “No access to network or database”.	Database server is unavailable. Network cables disconnected.	Check network connections of the workstation. Check that the SQL database server is available to the client.
Message on workstation saying “Image store folder not available”.	Server hosting the image store folder or network connection is down.	Check that the server that hosts the MiPACS image store is available to the client. Check that the user has read and write access rights to the image store folder.
Message on workstation saying “There is only XX MB free disk space…”	There is too little disk space remaining in the image store folder.	Free up disk space or replace the disk with a larger one.
Database server non-responsive or backup system is not working.	The SQL Server transaction log file has grown extremely large and the disk is full. The log is deleted when a backup is performed so this is a sign that backups are not working.	Perform a backup of the SQL Server database. This will empty the log file.
Toolbars or menus are corrupted or items are missing.	Menus altered by user or menu file has been damaged.	Enter Preferences | User, check Reset menu and toolbars. Restart the application.
The application alerts the user with the message "NOT FOR CLINICAL USE".	The configuration is corrupted or invalid components are found.	The software must not be used! Completely uninstall MiPACS and reinstall from a verified installation package.

Problem	Cause	Solution
Image replaced with X on screen. Message about manipulated or missing image is shown.	Image file is not found where expected or file cannot be opened.	Verify that the image store folder is available to the user. Right-click the X image and select Image information. Note the path. Open the path in an Explorer window and look for the file. If found, try to open it in the Import images dialog to see if can be opened. Check that it has the correct name according to the path noted. If missing, restore from backup.
X-ray image quality is consistently poor.	Uncalibrated X-ray image capture chain.	Calibrate the X-ray imaging system.
Unable to activate capture device, typically a sensor. Plugin status indicator stays red or switches back to red when activation is attempted.	Hardware or driver failure.	Restart computer and device control box, check device cables and connection. Check hardware. If possible try device on other station to verify that the device is not broken. Reinstall drivers. For a USB device, remove any USB hubs, other USB devices and cable extenders and try without them. Try different USB ports. Make sure power saving features are turned off.
X-ray device is active, but does not trigger on exposure.	X-ray exposure time set too low. Incorrect configuration settings. Uncalibrated image capture chain.	Increase exposure time. Verify installation of drivers and configuration with manufacturers' instructions and the plugin release notes. Calibrate the capture system.
Sensor spontaneously captures/imports images without exposure. Images are white, gray or black.	Sensor is defective and may need to be replaced.	Turn off power to the computer and device. Try again on a test patient file. If possible, try the device on a different station. If it still captures images spontaneously, replace device.

3. MiPACS Business Continuity

3.1 EDR MIPACS Business Continuity Software Setup

If your EDR (Dentrix Enterprise) system if down (offline), make the changes outlined below in order to have the ability to take x-rays during the EDR system outage. You will be able to move the x-rays taken during this time, into the EDR system (database) once the EDR system is back online.

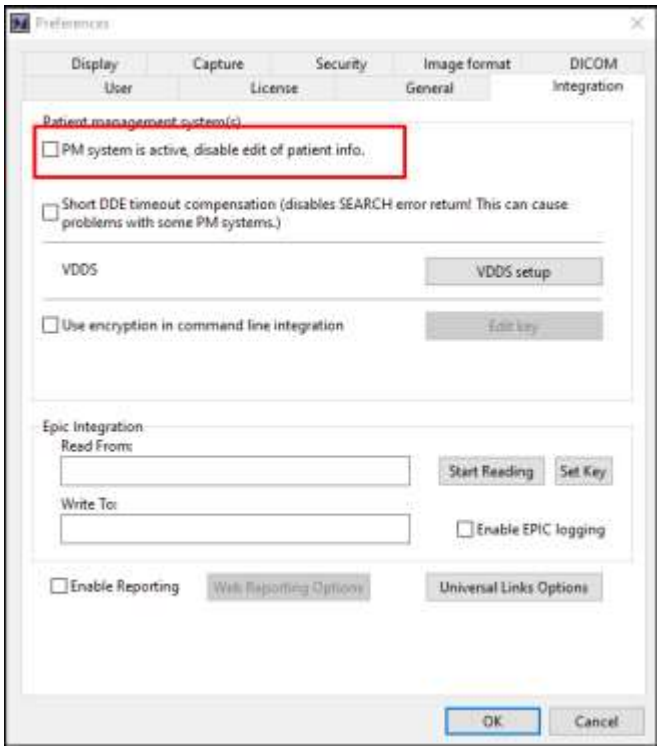
NOTE: It is **highly recommended** you call Medicor support for assistance with re-configuring the MiPACS system when EDR is down.

Medicor (MiPACS) support: (704)-227-2629

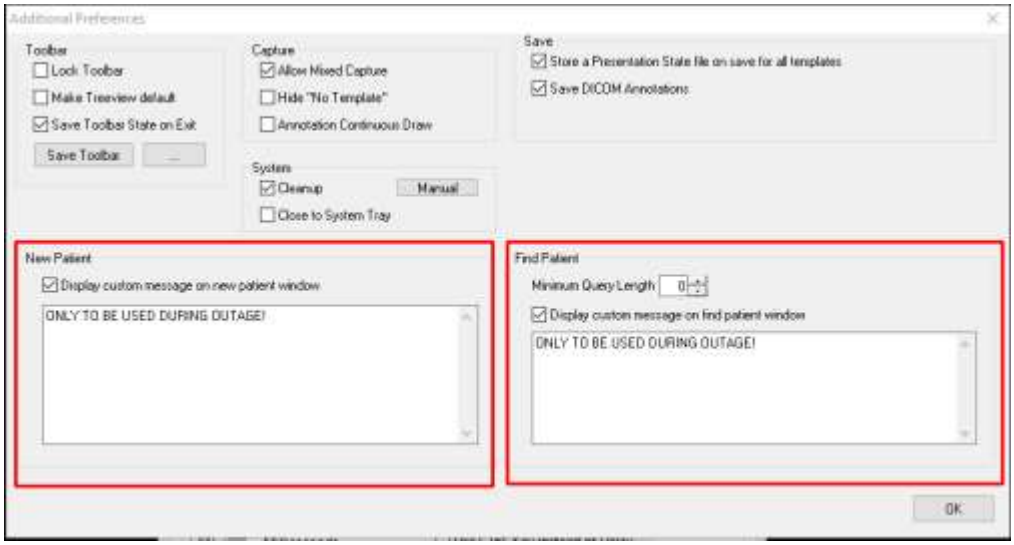
Support Email: support@medicorimaging.com

Configuration Steps:

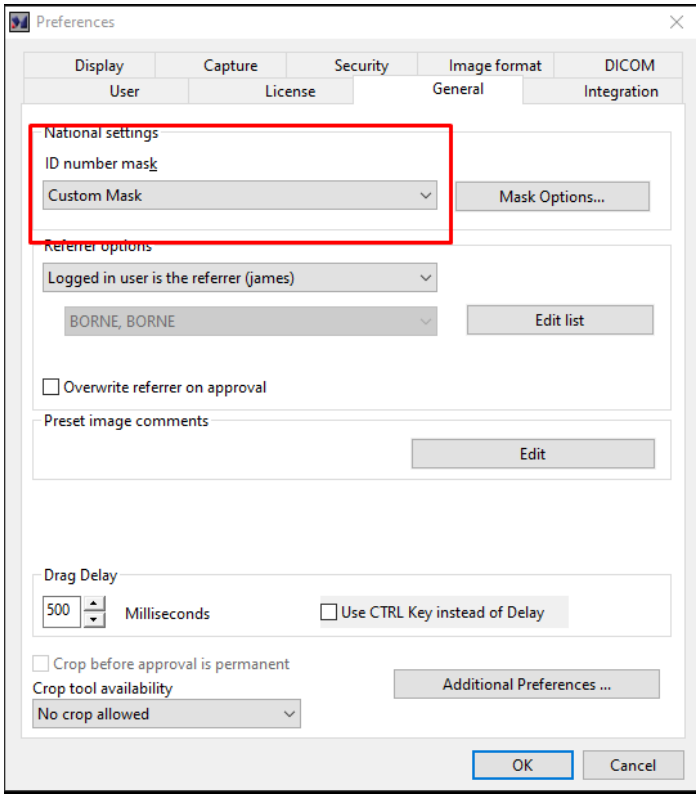
- Open the MiPACS Dental Enterprise Viewer and make the following setting adjustments:
  - System > Preferences > Integration Tab – **Uncheck "PM System is active…"**



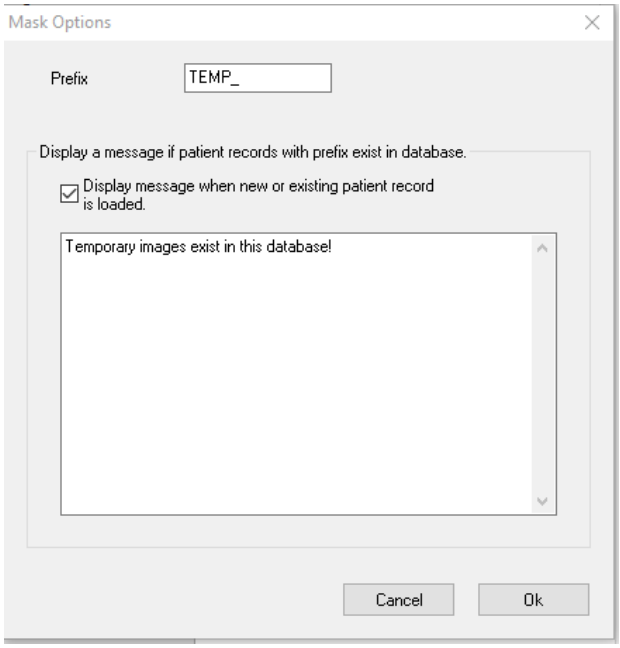
- System > Preferences > General Tab > Additional Preferences – **Check Display custom message on new patient window - (Enter custom message here)**
- System > Preferences > General Tab > Additional Preferences – Check **Display custom message on find patient window - (Enter custom message here)**



- System > General > Mask > ID Number Mask > Select Custom Mask



- System > General > Mask Options > Set Prefix to **TEMP_**
- System > General > Mask Options > Check **Display message when new or existing patient record is loaded.**
- System > General > Mask Options > **Insert custom message here**.



3.2 EDR MIPACS Business Continuity User Setup

If your EDR (Dentrix Enterprise) system if down (offline), make the changes outlined below in order to have the ability to take x-rays during the EDR system outage. You will be able to move the x-rays taken during this time, into the EDR system (database) once the EDR system is back online.

NOTE: It is **highly recommended** you call Medicor support for assistance with re-configuring the MiPACS system when EDR is down.

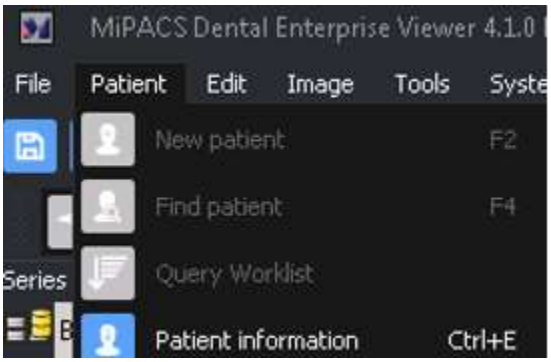
Medicor (MiPACS) support: (704)-227-2629

Support Email: support@medicorimaging.com

If EMR Solution is up:

- Once a patient is selected from the patient chart in Dentrix Enterprise, the user can click on the X-Ray button to open MiPACS.
- MiPACS opens and loads the Patient records

- Once in MiPACS, the following functionalities are NOT available to the office user:
  - Search for Patient
  - Create new Patient



If EMR Solution is down:

- The office users go to Start / MiPACS Dental Enterprise Viewer and launch MiPACS as a standalone solution.
- The office user logs in with Generic Application Login
- **If the Patient has come to the office before**:
  - The office user accesses MiPACS Search (Menu Patient / Find Patient)
  - A popup should remind the user that this functionality should be used during the outage only.
  - The office user must enter at least 3 letters before being able to click the search button
  - Once the Patient record is found, the office user can proceed with capturing/reviewing images
  - Once the EMR is up, the data will be synched up in the background
- If this is a new patient:
  - The office user can create a new Patient Record (Menu Patient / New Patient)
  - A popup should remind the user that this functionality should be used during the outage only
  - The office user enters the Patient Information
  - Only the Patient ID is generated automatically, with the prefix **TEMP_**
  - **The office user cannot alter the Patient ID**
  - Once the Patient Record is created, the office user can proceed with capturing/reviewing images

Once EMR Solution is back up:

- When loading a Patient Record (new or existing) in MiPACS (launched from the EDR/Dentrix Enterprise patient chart):
  - If any Patient Record was created during the outage, and there are Patient Records with temporary ID's in the database, then a reminder popup will display to inform the office user that the Patient Records exist that should be updated with the correct EDR Dentrix Enterprise ID.
  - By clicking OK, the popup will go away, and the user can proceed.
- The Office Team Member will be able to access the list of all Patients created in the MiPACS without EDR /Dentrix Enterprise numbers during downtime by going to the Patient search in the Patient Updater application and looking up Patient(s) with ID's that start with **TEMP_**
- For each of these Patients, the Office Team Member must go into the EDR/Dentrix Enterprise patient chart, create a new record, and get their EDR/Dentrix Enterprise ID.
- The Office Team Member will use the **Patient Updater** application to update the EDR/Dentrix Enterprise ID into the Patient Record created in MiPACS during the outage.

Appendix B: Component-Specific Instructions

B1. Autoimport

Description

The Autoimport plugin can be used to automatically import image files from a folder. A single folder and file name pattern can be configured in the setup of the plugin. All files added to the folder matching the file pattern will be imported. Local, mapped network drive and UNC paths can be used.

Autoimport plugin is useful in combination with other software or hardware that store images in a predefined folder. Digital cameras and card readers are examples of devices that work well with Autoimport plugin.

Installation

- Install MiPACS with the MiPACS and Autoimport plugin options selected.
- Run MiPACS, go to Tools, Auto Import plugin to configure the import folder and file pattern.
- When the configuration is tested and works, check the 'Delete imported files' option to avoid importing the same images more than once.

User Instruction

Open a patient in MiPACS. Make sure the Autoimport plugin is active. Copy an image file to the configured import folder. The image will be imported to the selected patient and deleted from the import folder (if so configured). The plugin will not import the same file more than once per session.

Known Issues

To avoid import attempts on unsupported file types, make sure you specify a file pattern that excludes the unwanted files: C:\Import*.JPG

The pattern above will import all files in C:\Import\ that have the JPG extension and exclude all others (like thumbs.db)

Tested Configuration

MiPACS version: 4.0
OS: Windows 7, 8.1

B2. Belmont BelSensor GOLD

Description

The plugin can be used to acquire images from the Belmont BelSensor GOLD intraoral x-ray sensors. It is possible to connect up to 10 sensors to the same computer at the same time, but tests have only been made with 1 and 2 sensors. All connected sensors are automatically activated on startup.

Installation

- Run the MiPACS installer with the MiPACS and the Belmont BelSensor GOLD plugin option selected. Select a database and add the license key.
- Install the drivers that came with your sensor according to its instructions.
- Connect the sensor(s) and make sure the drivers are installed properly in Device manager. The sensors usually show up under "Universal Serial Bus controllers".
- If your sensor came with a correction file, install it now: Start MiPACS, Go to Tools, Belmont BelSensor GOLD Plugin, Setup Belmont BelSensor GOLD Plugin. Click 'Copy correction files' and browse to the folder containing your correction files. (*.COR or *.CAL).
- Restart MiPACS and test the system.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Select a patient. When the plugin status indicator shows ACTIVE you can start capturing.

The default settings make the plugin activate automatically as soon as a patient is selected. Make sure the status indicator shows ACTIVE before exposing the sensor.

Known Issues

No driver installer is included with the plugin like in the 3.1 version. Use the driver installer provided by the sensor manufacturer.

Tested Configuration

MiPACS version: 4.0
OS versions: Windows 7 32 & 64 bit, Windows 8.1 64 bit
Sensor models: EV71JU213 & EV71JU215
Driver version: Philog SA, ver. 1.3.4.0 2010-02-04

B3. Camera WIA

Description

The Camera WIA plugin can be used to automatically import images from a device supported by WIA (Windows Image Acquisition).

Many scanners and digital cameras have WIA drivers that allow them to be used with this plugin. In particular, many DSLR cameras support WIA so that images can be captured and imported directly when a cable is attached between the camera and PC.

Installation

- Install MiPACS with the MiPACS and Camera WIA plugin options selected.
- Run MiPACS, go to Tools, Camera WIA plugin to configure the plugin.
- Install any WIA devices and their drivers.

User Instruction

Open a patient in MiPACS. Connect or activate the WIA scanner/camera to import images from it. The plugin automatically detects connected devices and shows a button for it in the toolbar. The images will be imported to the selected patient and deleted from the import folder. (If configured to do so).

Known Issues

The "Show video preview" option only works on Windows Vista.

The File format option "Preserve received format as far as possible" is not applicable and will have no effect in Enterprise editions.

Tested Configuration

MiPACS version: 4.0
OS: Windows 7, 8.1

B4. Carestream

Description

The Carestream plugin can be used to capture images from Carestream and Kodak dental imaging devices. This includes RVG intraoral sensors, CS phosphor plate scanners, Panoramic and Cephalometric devices and intraoral cameras.

Installation

- Install and configure your Carestream devices and their drivers according to Carestream instructions. You do not have to install the DIS imaging software.
- Install MiPACS with the MiPACS and Carestream plugin options selected.
- Run MiPACS, go to **Tools** | **Carestream plugin** | **Setup Carestream plugin** to configure the plugin. The plugin setup dialog has a list with detected Carestream devices. Check the ones you want to use from the application toolbar.
- Open a patient in MiPACS. Activate the Carestream plugin by clicking the button on the toolbar for your device and capture an image to test the system.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Open a patient in MiPACS. Activate the Carestream plugin by clicking the button on the toolbar for your device. A dialog will be shown by the drivers. Use the dialog according to instructions from Carestream and capture images. The images will be captured to the selected patient.

Known Issues

Some devices may not have the names expected in the list of devices in the plugin. As an example, the CS 7600 scanner may list as "Stella".

Tested Configuration

MiPACS version: 4.0
CS Acquisition DLL: 2.1.79.2, 2.1.80.0
Hardware: CS 7600, RVG 6000, RVG 6100
OS: Windows 7 32 bit, 8.1 64 bit

B5. C-Takt Link

Description

C-Takt Link plugin can be used to export images, series and image cards to the C-Takt Link communications system. It requires that you have the C-Takt Link client application version 1.82 or newer installed on the PC.

Installation

- Install MiPACS, with the MiPACS and C-Takt Link plugin options selected.
- Install and configure the C-Takt Link client application.
- Run MiPACS, go to **Tools** | **C-Takt Link Plugin** | **Setup C-Takt Link Plugin**. Configure the plugin according to your preferences.
- Open a patient, select images or a series/image card and click the C-Takt Link plugin icon to test the system.

User Instruction

Open a patient in MiPACS, select either a whole series/image card in the list or some images on a series/image card. Click the C-Takt Link plugin icon to add them to a new case in C-Takt Link. C-Takt Link will open and ask for your user credentials. Enter them and accept the data exported when prompted. Use the icon with a + sign to add the images to an already open case in C-Takt Link. Selecting individual images in MiPACS will only export the selected images to C-Takt Link. Selecting a series or image card in the list will include all its images and the layout. Only approved images are exported.

Known Issues

#561 Using the plugin with C-Takt 2.0, 2.0.1 or 2.0.2 causes double and/or accumulated imports. This does not happen in 1.82. C-Takt/Unident has been able to repeat this and will fix it in a future release. In the 2.0.3 beta it works OK.

Tested Configuration

MiPACS version: 4.0
C-Takt link versions: 2.0.2, 2.0.3 beta
OS: Windows 8.1

B6. Dentalmind Digital X-ray II

Description

The plugin can be used to acquire images from the Dentalmind Digital X-Ray II intraoral x-ray sensors. It is possible to connect up to 10 sensors to the same computer at the same time, but tests have only been made with 1 and 2 sensors. All connected sensors are automatically activated on startup.

Installation

- Run the MiPACS installer with the MiPACS and the Dentalmind Digital X-Ray II plugin option selected. Select a database and add the license key.
- Install the drivers that came with your sensor according to its instructions.
- Connect the sensor(s) and make sure the drivers are installed properly in Device manager. The sensors usually show up under "Universal Serial Bus controllers".
- If your sensor came with a correction file, install it now: Start MiPACS, Go to **Tools, Dentalmind Digital X-Ray II Plugin, Setup Dentalmind Digital X-Ray II Plugin**. Click 'Copy correction files' and browse to the folder containing your correction files. (*.COR or *.CAL).
- Restart MiPACS and test the system.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Select a patient. When the plugin status indicator shows ACTIVE you can start capturing. The default settings make the plugin activate automatically as soon as a patient is selected. Make sure the status indicator shows ACTIVE before exposing the sensor.

Known Issues

No driver installer is included with the plugin like in the 3.1 version. Use the driver installer provided by the sensor manufacturer.

The Dentalmind driver installer requires .NET framework 4.X and must be started "As administrator" manually on computers with UAC turned on.

Tested Configuration

MiPACS version: 4.0
OS versions: Windows 7 32 & 64 bit, Windows 8.1 64 bit
Sensor models: EV71JU213 & EV71JU215
Driver version: Philog SA, ver. 1.3.4.0 2010-02-04

B7. Dürr VistaEasy

Description

The VistaEasy plugin can be used to capture images from Dürr devices supported by the VistaEasy framework and drivers. This includes VistaScan phosphor plate scanners, VistaRay sensors and VistaCam cameras.

Installation

- Install VistaEasy drivers (version 5.3 or later). Restart your PC. Configure your Dürr devices according to Dürr instructions.
- Install MiPACS with the MiPACS and VistaEasy plugin options selected.
- Run MiPACS, go to **Tools** | **VistaEasy plugin** | **Setup VistaEasy** plugin to configure the plugin. The plugin setup dialog has a list with detected VistaEasy devices and a number of modes per device. Check the ones you want to use from the application toolbar.
- Open a patient in MiPACS. Activate the VistaEasy plugin by clicking its button on the toolbar and capture an image to test the system.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Open a patient in MiPACS. Activate the VistaEasy plugin by clicking its button on the toolbar. A dialog will be shown by the drivers. Use the dialog according to instructions from Dürr and capture images. The images will be captured to the selected patient.

Known Issues

No known issues.

Tested Configuration

MiPACS version: 4.0
Driver version: 5.7.1.13108
Hardware: VistaScan Mini Plus
OS: Windows 7 32 bit, 8.1 64 bit

B8. Export

Description

Export plugin can be used to export images to predefined folders and file names. Several destinations can be configured. It can optionally run an application with the (first ten) files on the command line. You can select to export in several file formats. Exports are made with a single click. The plugin will add a toolbar button for each configured export destination. Variables can be used in the folder and file names. By default a destination is configured pointing to the user's desktop.

Installation

- Install MiPACS, with the MiPACS and Export plugin options selected.
- Run MiPACS (As Administrator if UAC is turned on), go to Tools | Export Plugin | Setup Export Plugin. Edit the default or add new export destinations. See below for variables that can be used. Optionally check the "Run this application after export" and specify a path to an application.
- Open a patient, select images and click the Export plugin icons to test the system.

Setup Notes

Variables that can be used when configuring export destinations:

%USERDESKTOP%	Will be replaced with the path to the logged in Windows users desktop folder.
%USERDOCS%	Will be replaced with the path to the logged in Windows users Documents folder.
%TEMP%	Will be replaced with the path to the current windows folder for temporary files.
%ID%	Will be replaced with the patient ID
%FN%	Will be replaced with the patient first name
%LN%	Will be replaced with the patient last name
%BD%	Will be replaced with the patient birth date
%SX%	Will be replaced with the patient gender
%IMGID%	Will be replaced with the image database ID
%IMGDT%	Will be replaced with the image capture date

The applications that are configured to run after export must support file paths on the command line. The files will be passed on the command line like in the example below:

C:\Windows\System32\mspaint.exe "C:\TEMP\file1.jpg" "C:\TEMP\file2.jpg" "C:\TEMP\file3.jpg"

User Instruction

Open a patient in MiPACS, select some images on a series/image card or in the image list. Click any of the Export plugin icons to export the selected images to files. Only approved images are exported.

Known Issues

No known issues.

Tested Configuration

MiPACS version: 4.0
OS: Windows 7, Windows 8.1

B9. ImageLevel NV SA MDX3

Description

The plugin can be used to acquire images from the ImageLevel NV SA MDX3 intraoral x-ray sensors. It is possible to connect up to 10 sensors to the same computer at the same time, but tests have only been made with 1 and 2 sensors. All connected sensors are automatically activated on startup.

Installation

- Run the MiPACS installer with the MiPACS and the ImageLevel NV SA MDX3 plugin option selected. Select a database and add the license key.
- Install the drivers that came with your sensor according to its instructions.
- Connect the sensor(s) and make sure the drivers are installed properly in Device manager. The sensors usually show up under "Universal Serial Bus controllers".
- If your sensor came with a correction file, install it now: Start MiPACS, Go to Tools, ImageLevel NV SA MDX3 Plugin, Setup ImageLevel NV SA MDX3 Plugin. Click 'Copy correction files' and browse to the folder containing your correction files. (*.COR or *.CAL).
- Restart MiPACS and test the system.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Select a patient. When the plugin status indicator shows ACTIVE you can start capturing. The default settings make the plugin activate automatically as soon as a patient is selected. Make sure the status indicator shows ACTIVE before exposing the sensor.

Known Issues

No driver installer is included with the plugin like in the 3.1 version. Use the driver installer provided by the sensor manufacturer.

Tested Configuration

MiPACS version: 4.0
OS versions: Windows 7 32 & 64 bit, Windows 8.1 64 bit
Sensor models: EV71JU213 & EV71JU215
Driver version: Philog SA, ver. 1.3.4.0 2010-02-04

B10. Instrumentarium

Description

The plugin can be used to acquire images from Instrumentarium branded and some other PaloDEx group devices using "DICC" drivers. This includes Instrumentarium Snapshot sensors, OP200D and OC200D extraoral devices.

Installation

- Install the PaloDEx IAM drivers version 4.22 or higher.
- Run the MiPACS installer with the MiPACS and the Instrumentarium plugin options selected.
- Restart the computer.
- Run MiPACS and test the system.
- Calibrate the system to get optimal image quality (see the Installation instruction).

User Instruction

Select a patient. Click the activation button on the plugin toolbar to activate your device. When the plugin status indicator shows ACTIVE you can start capturing.

Known Issues

No known issues.

Tested Configuration

MiPACS version: 4.0
Driver versions: IAM 4.22.10099
Windows versions: Windows 7, Windows 8.1
Tested devices: Instrumentarium Snapshot

B11. Kavo Gendex

Description

The plugin can be used to acquire images from the KaVo and Gendex x-ray devices including panoramic devices, KaVo Dig eXam, VisualiX GX-S, eHD, GXS-700 sensors, Intra oral cameras and DenOptix scanners.

Installation

- Install the Gendex gxPicture drivers version 3.5.0 or higher. Select one of the "Other application..." options when prompted. If not using UAC you can install the drivers after running the MiPACS installer. With UAC it is important to run it before though.
- Install any Calibration files for your device if included.
- If MiPACS is not installed yet: Run the MiPACS installer with the MiPACS and the Gendex plugin option selected. In existing MiPACS installation: Run the MiPACS installer with only the Gendex plugin option selected. See the installation instructions for MiPACS.
- Restart the computer.
- Run MiPACS and test the system.
- Calibrate the system to get optimal image quality (see the Installation instruction).

User Instruction

Some Gendex devices like the intraoral sensors are "always-on" devices and will allow capture as soon as a patient is selected in the host application. Others may require you to click the activation button of the plugin before capture.

Known Issues

The status indicator of the plugin toolbar is not a true indicator of the device state for all devices. Use the systray icons of the different devices as your device status indicator. This is a limitation of the SDK construction and not a bug in the plugin.

KaVo/Gendex recommends users to turn off UAC to avoid issues. We realize that there are cases where this is not possible or convenient (i.e. Windows 8.1). To work around problems when using UAC, gxStart and any GxVideoApp must be turned OFF before starting MiPACS. The Gendex plugin tries to help work around the problem by turning off gxStart at start and close. The installer also removes gxStart and any GxVideoApp from the Startup folder on systems where UAC is detected as turned on for this purpose.

Older devices may not work on newer operating systems. Refer to this guide for more information about this: http://www.gendex.com/filebin/pdf/032-0297_B_Software_Compatability_Guide.pdf

Tested Configuration

MiPACS version: 4.0
Driver versions: GxPicture 3.5.1, 3.5.3
Windows versions: Windows 7 32, 64-bit.

B12. Manual Import

Description

The Manual Import plugin can be used to manually import image files from a folder by browsing the file system. Manual Import plugin is useful as a quick way to import files from a folder.

Installation

- Install MiPACS with the MiPACS and Manual Import plugin options selected.
- Run MiPACS, go to Tools, Manual Import plugin to configure the plugin options.

Setup Notes

Image type sent
Image type passed to the host application.

Send any comments found in the file
This option will extract any comments found in the image file as comments in the host application.

Reduce resolution
Here you can configure the plugin to reduce the resolution of the imported images. Do this to improve performance for images that does not need to have the high resolution they were originally stored in. Images with a resolution below the setting will not be changed.

The **Device** options allow you to specify a manufacturer and model for images sent. As an example you can use this if you always import images captured with the same camera.

User Instruction

Open a patient in MiPACS. Click the Manual Import plugin toolbar button. Browse for and select one or more image files. The files are imported.

Known Issues

The plugin does not support import of non-image objects like word files. If attempting to import a non image object the plugin has to be restarted to continue working.

Tested Configuration

MiPACS version: 4.0
OS: Windows 7, 8.1

B13. Medspace

Description

Medspace plugin can be used to export images to the Medspace communications service. It requires that you have an active Medspace account.

Installation

- Install MiPACS, with the MiPACS and Medspace plugin options selected.
- Run MiPACS (As Administrator if UAC is turned on), go to **Tools** | **Medspace Plugin** | **Setup Medspace Plugin**. Provide your Medspace user name and password and configure the plugin according to your preferences.
- Open a patient, select images or a series/image card and click the Medspace plugin icon to test the system.

User Instruction

Open a patient in MiPACS. Select either a whole series/image card in the list or some images on a series/image card. Click the Medspace plugin icon to add them to a case in Medspace. Selecting individual images in MiPACS will only export the selected images to Medspace. Selecting a series or image card in the list will include all its images. Only approved images are exported. If successful, your internet browser will open with the Medspace case open and the images added to the Images tab.

Known Issues

#37 Does not use the new Medspace API.

Tested Configuration

MiPACS version: 4.0
Medspace API version: Medspace Webservices 1.0
OS: Windows 8.1

B14. Morita

Description

The Morita plugin can be used to capture images from Morita dental imaging devices. This includes Panoramic and Cephalometric devices.

Installation

- Install and configure your Morita devices and their drivers according to Morita instructions. You do not have to install any Morita provided imaging software.
- Install MiPACS with the MiPACS and Morita plugin options selected.
- Run MiPACS, go to **Tools** | **Morita plugin** | **Setup Morita plugin** to configure the plugin.
- Open a patient in MiPACS. Notice that the plugin is active and capture an image to test the system. There is no need to manually activate the plugin.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Open a patient in MiPACS. Notice the Morita plugin status. When showing a green light and status ACTIVE you can start capture on your device. The images will be captured to the selected patient.

Known Issues

No known issues.

Tested Configuration

MiPACS version: 4.0
DixelD OCX: 6.4.0.6
Hardware: Simulated using raw data files only
OS: Windows 7 32 bit, 8.1 64 bit

B15. Planmeca

Description

The Planmeca plugin can be used to acquire images from all Planmeca devices supported by the Planmeca DIDAPIUI drivers/subsystem. This includes intraoral sensors Dixi, Dixi2, Dixi3, ProSensor as well as panoramic and ceph devices.

Installation

- Install MiPACS, with the MiPACS and Planmeca plugin options selected.
- Install the "DIDAPI" drivers version 5.1 or newer. Make sure the "DIDAPIUI" and "JRE" components are selected during the installation of the drivers.
- Run MiPACS and test the system.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Select a patient. Activate capture by clicking the activation button for your device on the plugin toolbar. A dialog is shown during capture. It indicates the state of the device. Capture images. Close the dialog when done capturing.

Known Issues

OS compatibility depends on available drivers. Ethernet interfaces usually work in both 32 and 64 bit environments while other devices may be restricted to 32 bit.

For best workflow, it is recommended to check both the options: **Auto close exposure dialog** and **Hide preview during capture** in the plugin setup.

Plugin status indicator in toolbar may not always show the right status. Look for the actual status on the separate status and preview dialog shown when activating the device.

Tested Configuration

MiPACS version: 4.0
Driver versions: DIDAPI 5.1.0
OS: Windows 7 x64, Windows 8.1 x64
Hardware: Planmeca Dixi2 Ethernet interface
IO, Panoramic & Ceph simulators.

B16. Schick Intraoral

Description

The plugin can be used to acquire images from the Schick brand sensors including CDR 2000, wireless, CDR Elite and Schick 33.

Installation

- Install MiPACS with the Schick Plugin option selected. Select a database and add the license key.
- Run the driver installer for your sensor model. Refer to separate instructions from Sirona/Schick depending on model and OS (see www.schickbysirona.com).
- Connect your sensor(s) and verify that they are detected OK by the computer in Device manager. They should show up under their own categories "CDR devices".
- Start MiPACS. If a calibration file is provided with your sensor, go to Tools, Schick Plugin, Setup Schick plugin, click "sensor options" and select the tab "Calibration". Install the calibration file for your sensor.
- If installed correctly the plugin will activate the sensor automatically.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Select a patient. When the plugin status indicator shows ACTIVE you can start capturing. The default settings make the plugin activate automatically as soon as a patient is selected. Make sure the status indicator shows ACTIVE before exposing the sensor.

Known Issues

There are no x64 drivers for the CDR 2000 sensors when used with the older black "remote" boxes.

Tested Configuration

MiPACS version: 4.0
Devices: CDR 2000, Schick 33
OS: Windows 7 32-bit, Windows 8.1 64-bit

B17. Sirona

Description

The plugin can be used to acquire images from the 2D Sirona devices including Orthophos panoramic product family devices, XIOS, XIOS plus and XIOS XG Supreme intraoral sensors.

Installation

- Install MiPACS with the Sirona plugin option selected.
- Select a database and add the license key in MiPACS.
- Install the Sirona SIDEXIS XG software version 2.6 or higher
- Install the drivers for your device (XIOS or Ortophos).
- Install any calibration/Correction files included with your device.
- Run MiPACS and test the system.
- For best performance follow the instructions for calibrating your entire system. See the installation instructions.

User Instruction

Select a patient. Activate capture by clicking the activation button for your device on the plugin toolbar. A dialog is shown during capture. It indicates the state of the device. Follow the instructions in the dialog to capture images. Close the dialog when done capturing.

Known Issues

No known issues.

Comments

XIOS XG Supreme sensors can run with the Schick plugin for an alternate, less intrusive workflow.

Tested Configuration

MiPACS version: 4.0
Device: XIOS XG Supreme
Windows versions: Windows 8.1 64 bit
SIDEXIS version: XG 2.61

B18. Soredex

Description

The plugin can be used to acquire images from Soredex branded and some other PaloDEx group devices using "dsd" drivers. This includes Digora Optime and Instrumentarium Express scanners. Soredex ToTo sensor, Soredex Vidi intraoral camera.

Installation

- Install the PaloDEx IAM drivers version 4.22 or higher.
- Run the MiPACS installer with the MiPACS and the Soredex plugin options selected.
- Restart the computer.
- Run MiPACS and test the system.
- Calibrate the system to get optimal image quality. See the Installation instructions.

User Instruction

Some Soredex devices like Digora Optime scanners are "always-on" devices and will allow scanning as soon as a patient is selected in the host application. Others may require you to click the activation button of the plugin before capture.

Known Issues

No known issues.

Tested Configuration

MiPACS version: 4.0
Driver versions: IAM 4.22.10099
Windows versions: Windows 7, Windows 8.1
Tested devices: Digora Optime, Digora Toto, Soredex Vidi, Instrumentarium Express

B19. TWAIN

Description

The TWAIN plugin can be used to import images from a device supported by TWAIN: a standard for connecting imaging devices to PC's. Most standard flatbed scanners and some dental imaging devices have TWAIN drivers that allow them to be used with this plugin.

Installation

- Install any TWAIN supported devices and their drivers.
- Install MiPACS with the MiPACS and TWAIN plugin options selected.
- Run MiPACS, go to **Tools** | **TWAIN plugin** | **Setup TWAIN plugin** to configure the plugin. The plugin setup dialog has a list with detected TWAIN devices. Check the ones you want to use from the application toolbar.

User Instruction

Open a patient in MiPACS. Activate the TWAIN scanner by clicking its button on the toolbar to import images from it. The images will be imported to the selected patient.

Known Issues

If no TWAIN devices are detected the plugin setup dialog cannot be opened. Install your TWAIN devices and drivers before configuring the plugin.

Most TWAIN drivers are made for one by one scans using a dialog on screen. This usually makes them inconvenient to use for capturing a series of images. Check if your device has a dedicated plugin to use instead of TWAIN for a better workflow.

Tested Configuration

MiPACS version: 4.0
OS: Windows 7, 8.1

B20. Video

Description

The Video plugin can be used to capture still images from a video camera connected to your PC. Video cameras supported include many dental intraoral cameras and web cameras. Cameras with DirectShow drivers are supported.

The hand piece buttons on some intraoral cameras are supported. A game port or COM port (or simulated through USB) connected foot switch is also supported for controlling the capture.

Installation

- Install your camera and its drivers. Install any footswitch and its drivers.
- Install MiPACS with the MiPACS and Video plugin options selected.
- Run MiPACS, go to **Tools** | **Video plugin** | **Setup Video plugin** to configure the plugin. Select a compatible model from the list of supported devices. Optionally configure the method to use with the camera buttons or foot switch.
- Open a patient and click the Video camera plugin activation button to test the system.

Setup Notes

The settings for your camera driver are reached from the setup menu within the live video window. This is also where you can select your driver if you have more than one installed. Make sure you run as an administrator if UAC is turned on when changing settings.

Camera models known to work with this plugin are listed below. If the setting for one camera is known to support more models, they are listed on the same line. Some may have OS compatibility requirements that differ from the main application.

- Cameras using DirectShow drivers: Panasonic EJ-CA02EPA
- SUNICam USB
- Schick USBCam
- Schick USBCam 2
- Sopro 617
- Owandy Real Hi-T
- OwandyCam
- DEXIS DEXcam 3: Gendex GXC-300 (can also be used with Gendex plugin)

- Empia 28XX-based using Snapshot feature: USB CCD CAM MD760, AdvanceCAM AIC899/TPC
- Soredex Digora Vidi
- Camera using UVC hardware triggering: Imagin ImageMaster, many webcams
- KaVo DIAGNOCam (Follow instructions in dialog to enable capture button)

User Instruction

Open a patient in MiPACS. Turn on your camera if needed. Activate capture by clicking the Video plugin activation button on the toolbar. A live video Window will be shown. Here you can freeze, release and capture images using the menu of the window, keyboard or camera buttons or footswitch if configured.

Captured images are shown in the "Captured images" bar on the right side of your screen. When you are done capturing images close the live video window to let the captured images import into the host application.

In most configurations you can use the following keyboard commands in the live video window:

Space Freeze/Release
Enter Capture
Esc Close capture session
F Full screen

Known Issues

There are many methods to implement the capture buttons on dental intraoral cameras. The creativity to come up with new methods is still thriving. Therefore you may find that your camera's method to implement capture buttons is not supported. If this is the case we recommend using keyboard, menus or a footswitch.

Tested Configuration

MiPACS version: 4.0
Hardware: Gendex GXC-300, Soredex Digora Vidi, Panasonic EJ-CA02EPA
OS: Windows 7, 8.1

B21. Canon EOS Direct Capture

Configure Direct Image Capturing with Canon EOS Camera

This instruction will help you to configure your system for capturing images to MiPACS with a Canon EOS camera. The purpose is to be able to have the camera connected to your computer with a USB cable and also to be able to capture images which will be stored directly in a pre-selected template in MiPACS without touching the computer. This is the most convenient way of capturing images. The prerequisite is that the USB cable is connected to the computer during capturing.

There are alternatives to direct capturing: You can capture images without having your camera connected to the computer and transfer the images when connecting the camera to the computer or by means of a card reader. This method, however, requires a few additional steps and will not be described here. There are also Wi-Fi equipped cameras transferring images wirelessly. This method will not be described here either.

Settings In Windows

Connect your camera to the computer with the USB cable. Any windows popping-up automatically should be cancelled. You will find the settings for this behavior under the Auto play option in the Control panel. Either uncheck the “Use auto play…” option on top or specifically choose “Take no action” for your camera in the list below.

Installation of Canon Software

Install the application **Canon EOS Utility** on your computer. The installation CD comes with the camera and is probably called something like “Canon EOS Digital Solution Disk”. You do NOT need to install any other application from the disk (such as for example ZoomBrowser).

Setup Canon Software

- Create a folder on your local disk, e.g. C:\EOSImages.
- Go to Start, All Programs, Canon Utilities, EOS Utility, EOS Utility.
- Click “Preferences” at the very bottom (the camera does not need to be connected in order to perform these settings.
- On the first tab “Basic settings”, select the option “Show [Camera settings/Remote shooting] screen”. Leave the other options unchecked.
- In the “Destination folder” tab, fill in the path to the folder you just created. All other checkboxes are to be left unchecked.
- Click OK. Close the EOS Utility.

Configure Autoimport for Mipacs

- Install Autoimport plugin with MiPACS, You will find it as an option in the main MiPACS installation. Run the MiPACS installation.
- Start MiPACS (As Administrator if UAC is turned on). Go to Tools, Autoimport plugin, Setup Autoimport plugin. Fill in the path to the folder you just created under “Watched folder” and add a file pattern like this: C:\EOSImages*.JPG
- Check the option “Auto-activate on startup”. Click OK.
- Restart MiPACS and verify that the Autoimport plugin is active (i.e. green light to the right of the camera icon).

Other Settings In Mipacs

To ensure that the camera images end up in a certain template, the “Auto template” option should be activated. This is done as follows: Decide what template you want to use for your camera images, for example PA5. Or create a new template. Go to System, Preferences, Capture. Select Autoimport plugin from the list. Check “Use auto selected template on capture” and select your template in the drop down list.

Camera Preferences and Testing

In order to get the best performance, configure the camera to save pictures in JPG format and reduce the resolution to the lowest acceptable level.

Switch off the camera. Connect the camera to the computer with the USB cable and turn it on again. Now you will be able to capture an image which will directly transfer straight into the active patient’s folder in MiPACS.

B22. SQL Backup Script

Description

sqlbackup is a command line tool that creates a backup of a local MiPACS database running on a SQL server. Version 2.0 is updated for MiPACS 4.0 and is tested on SQL Server 2012 and 2014.

Important

This version will attempt to convert the database to the SIMPLE recovery model which is appropriate for smaller organizations. This tool might not be useful for larger installations that need to run the full recovery model in order to enable point-in-time recovery.

Please note that the database backup does not include images. In addition to backing up the database, the image folders need to be copied separately to the backup destination.

Parameters

In order for the tool to work, five parameters need to be specified:

- A path where the backup file is written. This may be a local folder or a network path but must be writable by the SQL server process. If a path is not given, it defaults to "C:\DEbackup".
- A user name for connecting to the SQL server. This could for instance be "sa". If a user name is not entered, connection using Windows authentication will be attempted.
- The password corresponding to the user name. Leave this blank for Windows authentication.
- Name of the computer running the SQL server and the instance name if other than the default instance, on the form "SERVER\INSTANCE". SQL Server Express instances often have the name SERVER\SQLEXPRESS.
- Name of the database to back up.

Default Settings

The script can be customized by editing the default values in the beginning of the script. Once this is set up, the backup can be run manually by just double-clicking the tool. In addition, the script can be scheduled using the Windows Task Scheduler to run e.g. every night.

Logging

By default, information about the most recent backup (such as errors) is logged to the file "sqlbackup_report.txt" written to the same path as the backup file. All previous backups are logged in "sqlbackup.log". If the parameter "logging" under default settings is changed to OFF, the information will instead be printed in the command window.

Tested Configuration

MiPACS version: 4.0
Database engines: SQL Server 2012 and 2014
OS: Windows 7, 8.1

B23. Patient Selector

Description

Patient Selector is one of the methods used for integrating/linking MiPACS to a patient management system (PMS). It can be used if there is no way to link using a native solution (using DELink.dll) or command line (using command line link). Patient Selector uses “screen scraping” methods to get the patient data from the PMS when linking. Several configurations can be created to link to different PM systems. There are no presets included in the installation. Check with your distributor if there is one needed or made for your PMS.

Installation

The files needed for using Patient Selector are installed with the main application installer. You only need to add the configuration to match your PMS. You can create configurations yourself or import configurations in a file. To enable the Patient Selector you must run the file PatientScanLink.exe from the application folder. It will add a “head” icon to the System tray. Right-click the head and get into the Setup menu. From there you can check the “Run Patient Selector on Windows Startup” option to make sure it runs automatically on subsequent restarts. This Setup dialog is also where you add your PMS configurations and choose options for the behavior of the link. See more under **Configuration**.

User Instruction

Select a patient in the PMS. Click the head icon in System tray. MiPACS will open with the same patient selected in the PMS.

Configure Patient Selector Behavior

In the Setup dialog (right-click the head icon and select Setup), these options can be configured:

Check the Systems to Scan for
Check the PMS configurations you want to be used when clicking the head icon. There are also buttons for adding, editing and deleting items in this list. For more info about the creation of PMS links, see Configure PMS Links below.

Prompt for Add or Merge on New Patients
When this option is turned on, any patient found but not yet present in the MiPACS database will trigger a dialog where you have the option to merge it with an existing patient. This is useful in cases where different patient IDs or patient ID formats have been used. This option is on by default since it is also useful when creating a new configuration. When you have a working configuration and a database with consistent patient ID’s we recommend you to turn this option off.

Show Warning on Patients with No Unique ID
This option will trigger a warning message if a patient found when linking does not have a patient ID. If your PMS configuration includes the patient ID, this could indicate an incomplete record in your PMS. It is also useful when configuring and troubleshooting PMS configurations. This option is turned on by default.

Run Patient Selector on Windows Startup
This option should be turned on for all stations that use the Patient Selector. It causes the Patient Selector head icon to be present in System tray on every startup.

Enable Debug Mode
With this option turned on, a message box with the detected window data from the PMS is shown before trying to use it to open MiPACS. This option is useful when configuring and troubleshooting the PMS configurations. Turn it off for production use.

Configure PMS Links

Add a New Link
Click **New** in the Setup dialog. Give the PMS configuration a name under **PM system name**. In the "Dialog caption" that shows up you specify options needed to identify the PMS main window and extract patient info from the main window title bar.

Under **Fixed title**, type a part of the PMS main window title that is fixed/always the same. For example, if the PMS title bar says

PMS - John Doe; 123456

the part that goes into this row would be "PMS ". You must have something in Fixed title that is unique enough to tell it apart from all other windows currently open by the user.

Under **Title mask**, specify the patient info variables to use for the link and string data to enable the Patient Selector to find and separate them. In the example title above a suitable title mask would be

PMS - %FN %LN; %ID

See Variables That Can be Used in the Mask Fields for all variables that can be used. Consider that names could have spaces in them and that the first or last name could be blank. Under **Main class** you can specify an optional windows class name for the main PMS window. This can help to separate it from other windows in cases where the title bar content is not enough and the class name is unique enough.

If the patient information needed is NOT in the title bar of your PMS system, you must add **Controls**. Use the buttons below the list to Add, Edit and Delete controls. When adding controls you specify **Fixed text**, **Class name** and **Mask** in the same way as mentioned above for the main

window title bar. In addition, there is an **ID number** that can be used to identify the control in a window. At least one of Fixed text, Class name or ID number must be filled in to be able to identify the control.

Edit a Link

Click **Edit** to edit an existing PMS link configuration. Right-clicking the Edit button will open a special analyze window that can be used to find information about the PMS window and its controls. Use this information when filling in the **Class** and control **ID number** fields of a PMS configuration. The content and use of this window is for advanced users only.

Delete a Link

Click **Delete** to delete a PMS link configuration.

Variables That Can be Used in the Mask Fields

%ID Patient ID number
%LN Patient Last Name
%FN Patient First Name
%FN Patient full name. Patient selector will try to separate the name into first and last.
%BD Patient birth date. Must be in a format that Windows will recognize as a date.
%XX Text to ignore

Please note that some parts of the fixed text in between the wanted text may need to be specified to find the right positions; this includes spaces. So, if a space separates ID from first name, enter %ID %FN in the mask (with a space in between the variables).

Additional Information

The PMS link configurations are stored in the PMSystems.INI file that you can find in the application folder (Default: C:\Program Files\MiPACS or C:\Program Files (x86)\MiPACS)

To move a configuration made to other workstations, simply copy the PMSystems.INI and replace any existing files. Restart the workstation to make sure the new INI is used.

Contact Medicor Imaging for support if needed!

B24. Command Line Link

The Command line link is intended for linking patient management (PM) systems capable of sending patient information on the command line to MiPACS. This is an instruction on how to configure and use the command line link.

Setup Instruction

- Configure your PM-system to launch the file "cmdLink.exe" and make it add relevant patient information on the command line. There might be special instructions on how to do this for your PM-system. Ask your distributor for this if you do not have that information.
- Open the cmdLink setup by double-clicking the file cmdLink.exe in the MiPACS application folder in Program Files.
- Create your own custom configuration to work with your PM-system by following the instructions in "Custom configuration".
- Test the system by selecting a patient and clicking the link in your PM-system. It should start your imaging application and open the same patient.

Custom Configuration

Before creating new or editing existing configurations you should check with Medicor Imaging or the PM-system manufacturer if there is already a configuration made for your system.

Edit and Create New Configurations for the Command Line Link
The cmdLink.exe looks for files ending with ".CLC" in the MiPACS application folder. Each CLC file contains a configuration for linking to a specific PM-system. If you double-click the cmdLink.exe file in Explorer you will be able to select CLC-file/PM-system to be used.

If your system is not in the list you can easily add it simply by creating a new text file. Name it after your PM-system and save it with the extension ".CLC" in the MiPACS application folder. To edit an existing file you can click the button "Edit configuration".

Depending on how your PM-system's command line looks like you specify either a [Prefix] or a [Mask] section in the CLC file.

If the PM-system sends a command line with prefixes like this:

/ID=561231-1234 /FN=John /LN=Smith /BD=1956-12-31 /Sex=M

you should create a [Prefix] section. But if your PM-system sends a command line with all fields in a specific order with a separator but no prefixes like this:

-561231-1234;John;Smith;1956-12-31;M

you should create a [Mask] Section. Please note that you cannot have both these section in the same CLC file. If a Mask is specified the Prefixes will be ignored.

Sample CLC File with Prefix Section
(This sample shows the default values used if no configuration is selected.)

```
[Prefix]
ID=/ID=
Firstname=/FN=
Lastname=/LN=
Birthdate=/BD=
Sex=/Sex=
[Settings]
BirthDateMask=
Prompt=No
```

Sample CLC File with Mask Section

```
[Mask]
Mask=-<ID>;<Firstname>;<Lastname>;<Birthdate>;<Sex>
[Settings]
BirthDateMask=YYYY-MM-DD
Prompt=No
```

Parameters

The file is in the so-called INI-format. Please include the headers ([Prefix] or [Mask] and [Settings]) and make sure you type the parameter names exactly as above.

Prefixes

The prefixes are used on the command line to define each field.

(i.e.: CMDLINK.EXE /ID=561231-1234 /FN=John /LN=Smith/BD=1956-12-31 /Sex=M)

PM-systems might use fixed or configurable prefixes when calling the imaging system. By defining the prefixes for each field under [Prefix] you can make the cmdLink understand your PM-system.

Mask

When not using prefixes each field is defined by its position on the line.

(i.e.: CMDLINK.EXE 561231-1234;John;Smith;1956-12-31;M)

In the line above ID is always the first field, Firstname the second and so on. In the Mask= parameter you specify the fields surrounded by < > like this:
Mask=<ID>;<Firstname>;<Lastname>;<Birthdate>;<Sex>

Fields

Here is a description of each field that cmdLink is able to receive:

ID: This is the unique ID for the patient. It must be provided by the PM-system. It can contain both numbers and letters up to 64 characters.

Firstname and Lastname: At least lastname should also be provided by the PM system for good functionality. Both fields can contain up to 100 characters. (Please note that the command line length is limited by the OS.)

Birthdate: This parameter is optional. If used you must also set the "BirthDateMask" below the [Settings] header so that the date format is understood properly.

Sex: This parameter is optional. If used the values provided by the PM-system should be M for male and F for female. Only the first letter of the value will be used.

Settings

BirthDateMask: Controls the way the birthdate is understood by the BD parameter. 4 character years are recommended. Preferably specify the date in ISO format like this: YYYY-MM-DD. If no BirthDateMask is specified it will use the regional settings of Windows to read the date.

Prompt:
YES means: If the ID provided by the PM-system is not found in MiPACS the user will be prompted if he/she wants to associate it with an existing patient or add the patient as new. This is useful if MiPACS has been used for a while before implementing this link. If you choose to associate the patient with an existing one the ID will be changed in MiPACS to match the ID in the PM-system.

NO means: If the ID provided by the PM-system is not found in MiPACS it will always be added as a new patient. The default value is NO.

Please note that if "Prompt=Yes" or "Prompt=No" is provided on the command line it will override the value set in the CLC file.

Activate the Configuration

Double-click the file cmdlink.exe in explorer. Select your configuration file in the list and click OK. The cmdlink.exe and the .CLC files should be located in the MiPACS application folder. Contact Medicor Imaging if you need assistance!

Appendix C: Installation Approval Form

The technician signs this form for each computer to confirm that the installation was performed correctly according to the Installation instructions. Use additional forms if there are more than 10 computers.

The responsible dentist signs the form after calibration to verify correct installation and to approve each system for diagnostic use.

Practice Name: _____

Contact Information: _____

_____

Date: _____

Names (print): _____

Technician Dentist

Room No. or Computer name	Installation performed correctly (signed by technician)	Approved for diagnostic use (signed by dentist)

Submit this form to Medicor Imaging via email support@medicorimaging.com.

C. Digital Image Application (DEXIS)

1. Overview of Application

The DEXIS software is a software program for general dental and maxillofacial diagnostic imaging. It controls capture, display, enhancement and saving of X-ray digital images from digital imaging systems. It can also handle other types of images acquired by digitizing film with a flatbed scanner, or color images from intra-oral and extra-oral dental cameras.

2. System Requirements

Please refer to the following web link for System Requirements.

https://www.kavo.com/en-us/resource-center/system-recommendations-imaging-software

Prior version system requirements can be found at https://www.kavo.com/en-us/imaging-solutions/dexis-imaging-suite-imaging-software#technical-details

3. Basic Network Setup

See User Manual on page 17 for Network Setup.

The user manual is located in \DEXIS_950b3_International\Engl-US\DManUS.pdf for DEXIS 9 and \DEXIS-CD10US_10.1.6.3\Engl-US\DexisEn.PDF for DEXIS 10.

4. Installation Steps

See user Dexis User Manual Installation Section

5. Data Backup Information

- If using DEXIS 9, backup the “data” folder typically located in C:\DEXIS\DATA
- If Using DEXIS 10, backup the data folder typically located in C:\DEXIS Imaging Suite\Data
- Also backup the DEXIS SQL database if not kept in the DEXIS data folder.

6. Antivirus Exclusions

The following folders should be excluded from AV:

- C:\DEXIS
- C:\Program Files (x86)\DEXIS
- C:\ProgramData\Kavo Kerr

This screen should appear at the end of each installation of DEXIS to remind the installer of the folders to exclude.

7. Support

Dexis support can be contacted by calling 888-883-3947 Option 7