OKI

OKI
DICOM Embedded Printer
DICOM Printing Function User's Guide

C610 DM / C711 DM / C831 DM / C910 DM

ES6410 DM / ES7411 DM / ES8431 DM / ES9410 DM

Important note:

This manual describes all the functionalities available in the full option version of OKI Dicom Embedded Server. Depending on the actual product purchased there may be some variance in available functionality.

Introduction

This manual describes how to print from devices supporting the DICOM protocol using the DICOM embedded Server in the OKI Dicom Embedded printer.

Refer to the user manual of the standard printer model for instructions on tasks such as how to load paper and replace consumables with the OKI Dicom Embedded printer.

The OKI Dicom Embedded printer prints DICOM format images sent via a network from medical imaging applications and medical devices.

The OKI Dicom Embedded printer can generate pages in both grayscale and color.

CAUTION!
This is not medical equipment. Do <u>not</u> use the printed images from this equipment for medical diagnosis.

Features of the OKI Dicom Embedded printer

- High quality printing with ProQ2400 © multi-level technology
- Compliant with the DICOM 3.0 standard
- Reliability
- Ergonomic features
- Achieves low-cost DICOM-compatible printing

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Document Terminology

Control panel and web interface messages are all provided in English in this document.

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1. Setting up the OKI Dicom Embedded Printer

1-1 Install the printer

The following procedures are performed while referencing the Setup Guide/ User's Guide/ Network Guide supplied on CD/DVD with the printer.

1. Remove the OKI Dicom Embedded Printer (hereinafter referred to as "printer") from the packing box and install it.
2. Remove the protective tapes and the protective sheets from the printer.
3. Open the top cover, and remove the stopper (orange) of the fuser unit.
4. Install the image drum.
5. Load paper on the paper tray. (For DICOM format image printing only A4, Letter and for A3 printer models A3 and Tabloïd are supported.)
6. Connect the AC cord to the printer, and turn on the power.

   Note!: Do not connect the network cable to the printer yet.

7. Enter the IP address provided by your network administrator with the printer control panel.

Perform test printing, and confirm that the IP address is set for the printer correctly.

8. Connect the network cable to the printer.

Next, set up the printer from your computer.

Prepare a computer connected to the same network as the printer.

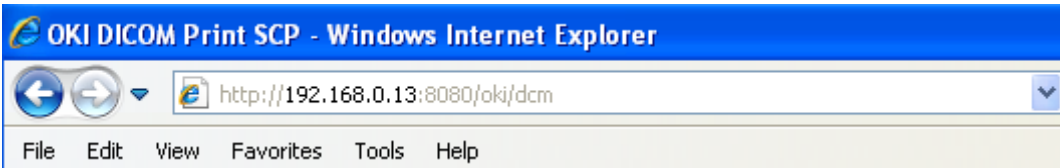# 1-2 Open the embedded DICOM server home page

1. Open the web browser on your computer.

   Note!: This will work even if the computer is not connected to the Internet.

2. In the address bar of your web browser, enter the IP address set to the printer as follows.
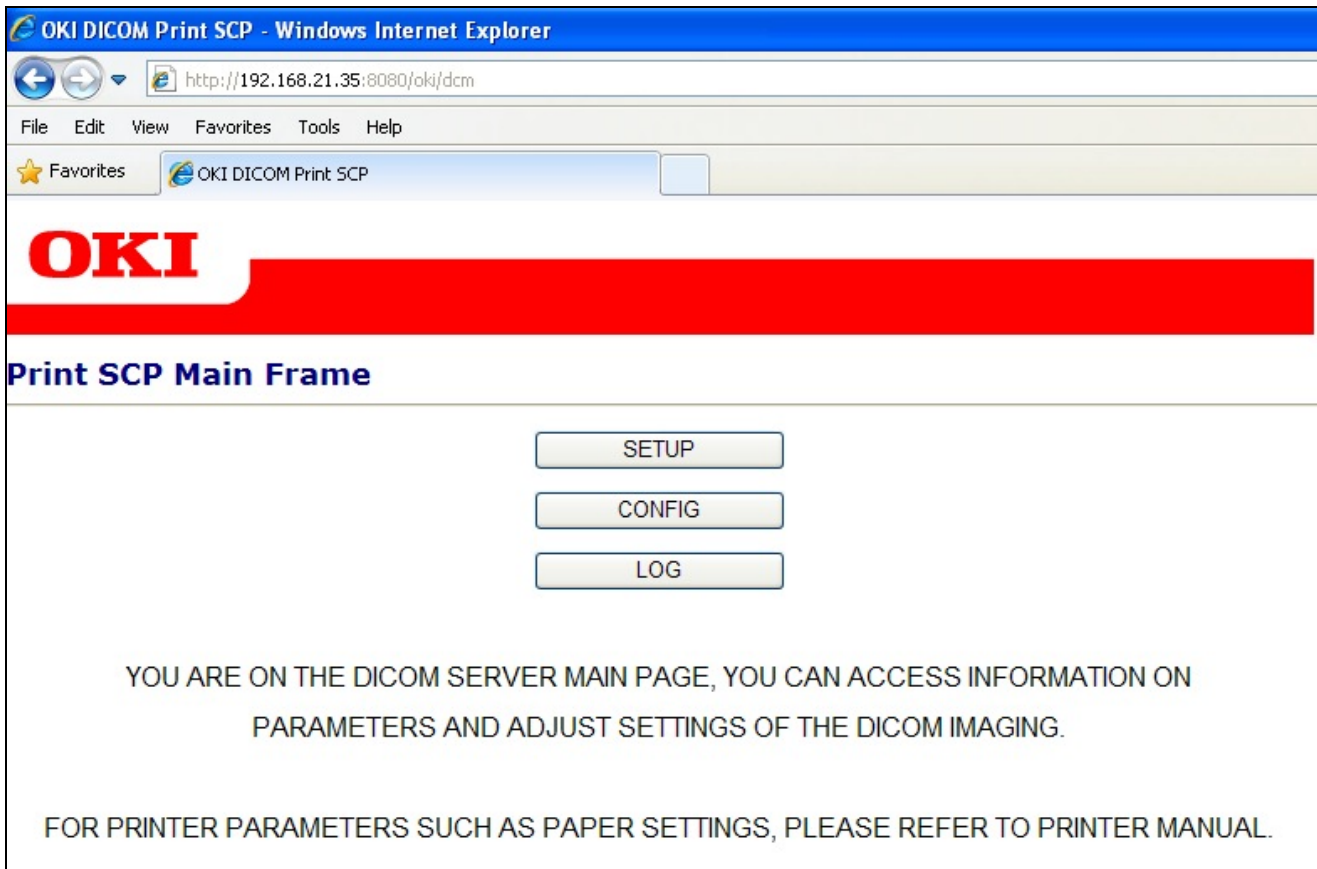
Example:

When the IP address set to the printer is 192.168.0.13, enter "http://192.168.0.13:8080/oki/dcm" in the address bar.
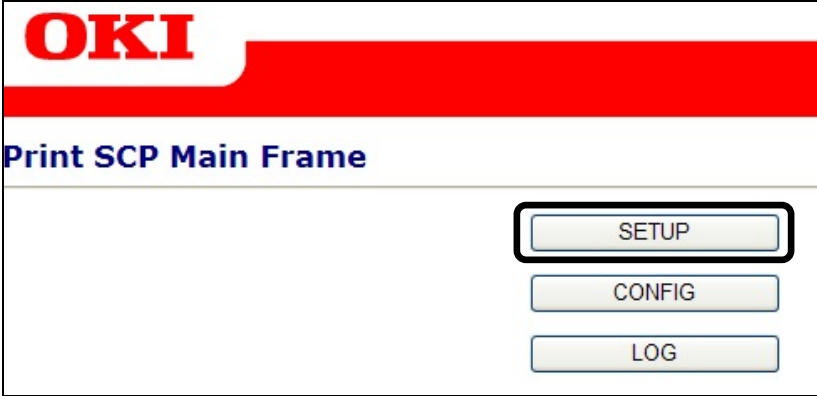

Note!: This action might not be successful if done just after "Ready" is displayed on the printer control panel. In this event, wait for 5 to 10 seconds and try again.

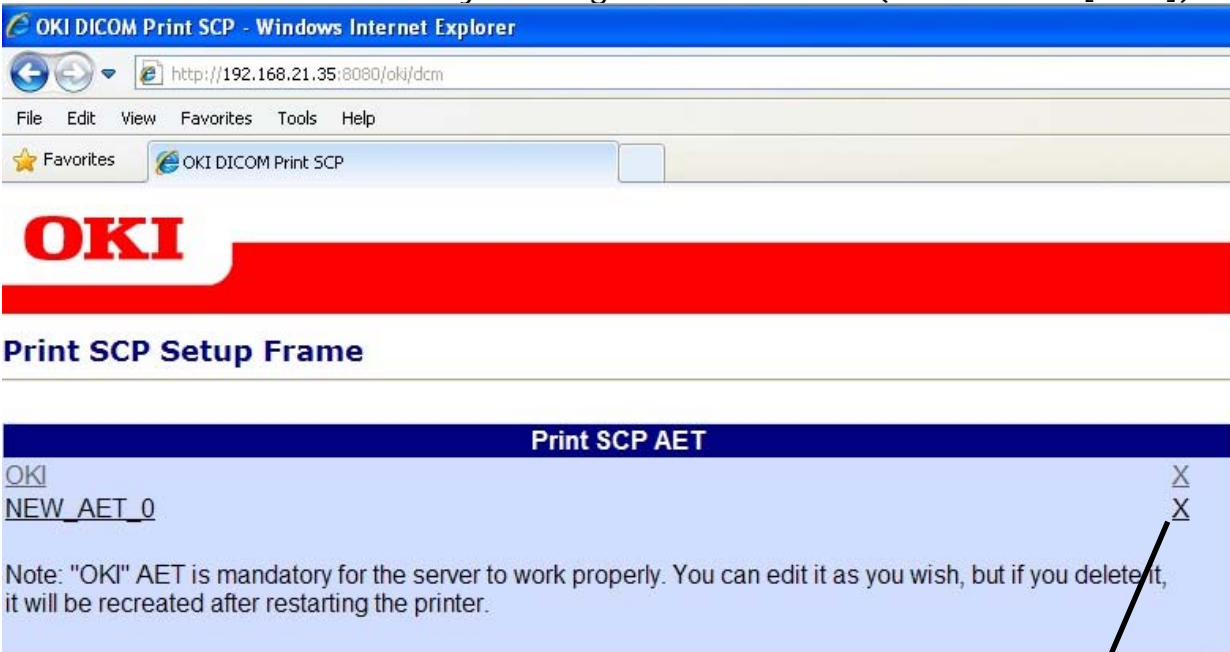The embedded DICOM server home page is displayed.

1-3 Open the SETUP menu

1. Click [**SETUP**]

2. The print rules represented by the AET (Application Entity Title) will be listed. You can create as many rules as you need to match your requirements.

   You can edit the rules by clicking the rule names (in this case [**OKI**]).

Delete the rule by clicking [**X**].
Add new rule by clicking [**ADD**].
Return to the home page by clicking [**HOME**].

Options for the [OKI] print rule

OKI

Print SCP Setup Frame

Print SCP AET Configuration	
AET Name	OKI
Use US format paper	☐
Page Format	CLIENT
Border Density	CLIENT
Empty Image Density	CLIENT
Header	
Dmin & Dmax use console	☑
Dmin % (0 to 99)	0
Dmax % (1 to 100)	100
Hi Quality Glossy Black Mode	☐
Black gamma (0.01 to 2.90)	1.2
Cyan gamma (0.01 to 2.90)	0.75
Magenta gamma (0.01 to 2.90)	0.72
Yellow gamma (0.01 to 2.90)	0.77
Activate Halftoning	☐
Smoothing	NORMAL
Polarity	CLIENT

SAVE   Reset

HOME

Depending on the model purchased some features may not be available - please see the table below.

Options for the [OKI] print rule / Model	ES6410 DM	C610 DM	ES7411 DM	C711 DM	ES8431 DM	C831 DM	ES9410 DM	C910 DM
AET Name	X	X	X	X	X	X	X	X
Use US format paper	X	X	X	X	X	X	X	X
Page Format					X	X	X	X
Border Density	X	X	X	X	X	X	X	X
Empty Image Density	X	X	X	X	X	X	X	X
Header	X	X	X	X	X	X	X	X
Dmin & Dmax use console	X	X	X	X	X	X	X	X
Hi Quality Glossy Black Mode disable		X	X	X	X	X	X	X
Black gamma		X	X	X	X	X	X	X
Cyan gamma	X	X	X	X	X	X	X	X
Magenta gamma	X	X	X	X	X	X	X	X
Yellow gamma	X	X	X	X	X	X	X	X
Activate Halftoning							X	X
Smoothing	X	X	X	X	X	X	X	X
Polarity	X	X	X	X	X	X	X	X

Options description

A large number of rules can be added to the system, and the following information can be configured for each rule:

Print SCP AET Configuration	
AET Name	OKI

AET Name

AET is an abbreviation for Application Entity Title. The call method is assumed to be compliant with the DICOM Print SCU protocol.

The AETs defined in this rule have a maximum length of 16 characters (a - z, A - Z, 0 - 9).

Note!: ● *The names are case-sensitive.*

● *In the event of an error or if a name is not present, the printer will use the [**OKI**] AET by default.*

Use US format paper	☐
Page Format	CLIENT ˅

Use US format paper

Check this box if you want the Dicom Server to print in Letter/Tabloid size.

Page Format : [**CLIENT**] , [**A4 or Letter**], [**A3 or Tabloid**]

If the printer supports A3/Tabloid paper, you can force the printout on the format you wish A4/Letter or A3/Tabloid.

Border Density	CLIENT ˅
Empty Image Density	CLIENT ˅

Border Density: [**WHITE**] or [**BLACK**]

This option defines the background of black or white images.

[**CLIENT**] signifies that the settings will be managed by the DICOM console.

Empty Image Density: [**WHITE**] or [**BLACK**]

This option defines an image-free zone in black or white.

[**CLIENT**] signifies that the settings will be managed by the DICOM console.

Header	

Header

This function is used to customize the header of your printouts.

This customization is limited to one line of text only.

Dmin & Dmax use console	☑
Dmin % (0 to 99)	0
Dmax % (1 to 100)	100

Dmin & Dmax use console, Dmin, Dmax

Adjust the image brightness.

[**Dmin & Dmax use console**] is enabled by default.

You can define and adjust [**Dmin**] (low-pass filter)/[**Dmax**] (high-pass filter). You can change the two parameters to optimize the rendering.

When [**Dmin & Dmax use console**] is disabled, you can use the values of Dmin from 0 to 99% and Dmax from 100 to 1% to optimize the rendering.

[**Dmin**] cannot bet set to a value larger than [**Dmax**].

You can easily optimize the render settings of [**Dmin**] and [**Dmax**] for operations on your medical equipment

- Create a printer with CALIBRATION specified as the AET and with the printer IP address and DICOM port value is 11112 unless you have modified it.
- Use a 1x1 layout.
- Send an image to the printer.

A 3x3 grid of copies of this image is generated using different values of Dmin and Dmax.

Compare these images with the one displayed on the screen of your equipment.

Select the image that most closely match the screen image, and adjust the Dmin and Dmax values of your AET accordingly.

Repeat the procedure if necessary.

Hi Quality Glossy Black Mode	☐
Black gamma (0.01 to 2.90)	1.2
Cyan gamma (0.01 to 2.90)	0.75
Magenta gamma (0.01 to 2.90)	0.72
Yellow gamma (0.01 to 2.90)	0.77

Hi Quality Glossy Black mode

Activated as default setting, gives you the best output when printing grey images. No influence on color images.

Black Gamma

Adjust the gamma for Black when grey images are printed in pure black. Values can be within a range from 0.01 to 2.90, with increments of 0.01. Values below 1.00 will lighten the Black component of the image and values above 1.00 will darken it.

Cyan Gamma

Adjust the gamma for Cyan. Values can be within a range from 0.01 to 2.90, with increments of 0.01. Values below 1.00 will lighten the Cyan component of the image and values above 1.00 will darken it.

Magenta Gamma

Adjust the gamma for Magenta. Values can be within a range from 0.01 to 2.90, with increments of 0.01. Values below 1.00 will lighten the Magenta component of the image and values above 1.00 will darken it.

Yellow Gamma

Adjust the gamma for Yellow. Values can be within a range from 0.01 to 2.90, with increments of 0.01. Values below 1.00 will lighten the Yellow component of the image and values above 1.00 will darken it.

Smoothing	NORMAL ▼
Polarity	CLIENT ▼

Smoothing

Define the aspect rendering of the printed image. The choices are [**CLIENT**], [**NORMAL**] or [**SHARP**]. By default, [**NORMAL**] is selected.

[**SHARP**]: Force the use of the image sharpening filter (which only works on monochrome images).

[**CLIENT**]: Manage the settings from the DICOM console.

[**NORMAL**]: Normal mode.

Polarity

[**NOTMAL**] or [**REVERSE**] mode to print images in positive or negative.

[**CLIENT**]: Manage the settings from the DICOM console.

Activate Halftoning	☐

Activate Halftoning

This setting is recommended for expert users only.

When halftoning is activated you have access to several parameters relating to all four colors used by the printer.

These settings can significantly affect the printout. The output is the responsibility of the user. No support can be provided on how to determine or setup the values.

Make whatever setting you fill appropriate for the kind of exam you have to print.

4. Save the edited settings.

   When you have finished editing the values, save the settings by clicking [**SAVE**].

   [SAVE] [Reset]

   *Memo: Click [**Reset**] to restore to the past saved settings.*

5. Click [**HOME**] on the AET list screen to return to the home page.

1-4 Open the CONFIG menu

1. Click [**CONFIG**] on the DICOM server home page.

The CONFIG page is displayed. This will give you a summary of all information.

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1-5 Open the LOG menu

1. Click [**LOG**] on the DICOM server home page.

OKI

Print SCP Main Frame

SETUP

CONFIG

LOG

The log menu is displayed.

OKI

Print SCP Log Frame

Start initialization
DICOM Print SCP Version 3.40 Build on June 2012
Starting DICOM Print server
DICOM Print server STARTED on Port: 11112
Server Launched on port 11112
InitializationInvoker#NOMAL MODE
PreInstallLicenseInitializationThread#START
Call VM constitute --> Read ser obj end
Call VM constitute --> obj is License
Call VM constitute --> canRead true
Printer Service Max License-->100
Service ser Exist
PreInstallLicenseInitializationThread#License Verify sucsess
PreInstallLicenseInitializationThread#END
2000-01-01 00:00:23 - AutoDeploy: Source or destination missing
2000-01-01 00:00:24 - ServerXmlReader: Config=$TOMCAT_HOME/conf/server.xml
2000-01-01 00:00:24 - ContextXmlReader: Context config=$TOMCAT_HOME/conf/apps-oki.xml
2000-01-01 00:00:24 - ContextXmlReader: Context config=$TOMCAT_HOME/conf/apps-admin.xml
2000-01-01 00:00:24 - ContextXmlReader: Context config=$TOMCAT_HOME/conf/apps-examples.xml
2000-01-01 00:00:24 - ContextXmlReader: Context config=$TOMCAT_HOME/conf/apps-127.0.0.1.xml
2000-01-01 00:00:24 - AutoWebApp: Loaded from config: DEFAULT:/oki
2000-01-01 00:00:24 - AutoWebApp: Auto-Adding DEFAULT:/conman
2000-01-01 00:00:24 - AutoWebApp: Loaded from config: DEFAULT:/examples
2000-01-01 00:00:25 - ContextManager: Tomcat configured and in stable state
2000-01-01 00:00:25 - ContextManager: Adding DEFAULT:/oki
2000-01-01 00:00:26 - ContextManager: Adding DEFAULT:/admin
2000-01-01 00:00:27 - ContextManager: Adding DEFAULT:/examples
2000-01-01 00:00:27 - ContextManager: Adding DEFAULT:/conman

This page lists the DICOM dialogue logs during printing. This is useful for identifying the source of an error in the event of problems.

1-6 How to print the test pattern

Those test patterns are designed to help you troubleshooting your printer consumables quality.

1. Select [**Print Information**] on the printer control panel.
2. Select [**Demo Page**].
3. Select [**CMY test**] to check the color imaging units or [**K test**] for black unit.
4. The test pattern is printed.