CARDIOLINE

Connectivity Tools (v. 3)

User manual

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CARDIOLINE

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Summary

1. GENERAL INFORMATION

This manual is an integral part of the device and should always be available as support material to the clinical practitioner or the operator. Strict compliance with the information contained in this manual is an essential prerequisite for the proper and reliable use of the device.
Have the operator read the manual thoroughly, as a great deal of the information is only described once.

1.1. Other important information

This manual was written with the utmost care. Should you find any details which do not correspond to those contained in this manual, please inform Cardioline SpA, who will proceed to correct such inconsistencies as soon as possible.

The information contained in this manual is subject to change without notice.
All changes will be in compliance with the regulations governing the manufacturing of medical equipment.

The codes relating to this manual are listed below.

Language	Code
ITALIAN	36519162_ENG

1.2. System Requirements

Operating system ..... Windows 7 pro, Windows 8 pro, Windows 10, 32/64 bit

Compatible devices .....
- ECGxxx+ range electrocardiographs
- Touchecg3 electrocardiograph

1.3. Licensing terms

By installing the software, the terms and conditions described as follows are accepted.
Object of this agreement is the consent of a use licence for the software and the operating manual. Cardioline SpA guarantees a personal licence, non-exclusive and non-transferable, for use of the software

and the attached documents. The software and accompanying documents are protected by copyright. The user must comply with copyright law dispositions.
All rights relative to the software are the property of Cardioline SpA. It is not permitted to transfer the software to another computer through networks or data channels.
The programs and the attached documents cannot be changed, copied, merged with other programs or made available to third parties.
The user is deemed responsible for any damage stemming from non-compliance with the copyright, or from violation of the conditions reported in this agreement.

2. SAFETY INFORMATION

Cardioline SpA will be held responsible for the safety, reliability and functionality of the devices only if:

1. the assembly operations, modifications or repairs are carried out by Cardioline SpA or by its Authorised Service Centre;
2. the device is used in compliance with the instructions provided in the use manual.

3. EXPLANATION OF THE SYMBOLS

Symbol	Description
	Operating documentation in electronic format
	Year of manufacture
	Separate collection of electrical waste and electronic equipment

4. INTRODUCTION

4.1. Purpose of the manual

The manual is an installation and configuration guide for the Connectivity Tools application and its functions.

4.2. Recipients

This manual is intended for professional operators and IT engineers. Basic computer knowledge is therefore assumed.

4.3. Intended use

Connectivity Tools is a software module, which allows Cardioline devices to interface with work list and store provider services.
Connectivity Tools have no clinical impact, since it transfers the tests acquired by the devices it is connected to without performing any processing on them.
Connectivity Tools are intended for use by professional operators in a hospital and non-hospital setting.

4.4. Description of the device

Connectivity Tools are software modules, which allows Cardioline devices to interface with work list and store service providers, inserting these into a workflow, which is fully integrated with these systems.

Specifically, each tool ia a Windows service that acts as a bridge between Cardioline devices and the Health Information System, establishing two-direction communication by means of the work list and store services.

The communication protocol depends on the Provider operating in the Health Information System field. Connectivity Tools manage the interaction between the Providers through the use of dynamically loadable modules (plugins), each implementing its own specific communication protocol.

For the use of work lists on devices and the sending of tests, please refer to the operating manuals of the Cardioline devices used.

4.5. Included plugins

Connectivity Tools include various plugin modules, which implement different communication protocols.

4.5.1. Connectivity DICOM

The DICOM plugin allows to receive worklist and to send tests to a PACS (*Picture Archiving and Communication System*), as per the DICOM protocol.
The implemented protocol is described in "Cardioline DICOM Gateway conformance statement" document.

4.5.2. Connectivity TSD

The TSD plugin allows for the reception of the work list and the sending of the tests to the Record system, produced by the company TSD.

4.5.3. Connectivity Cube

The Cube plugin edits the ECGs received to render them compatible and importable into the Cardioline Cube database.

4.5.4. Connectivity GDT

The GDT plugin allows for the reception of the work list and the sending of the tests to a GDT system.

4.5.5. Connectivity PDF

The PDF plugin converts the ECGs received in PDF format and save them in a configurable folder.

4.5.6. Connectivity MUSE

The MUSE plug in allows to transmit exams in an XML format proprietary of the GE MUSE system.

4.5.7. Connectivity PHILIPS

The PHILIPS pulgin allows to transmit exams in an XML format proprietary of the Philips system.

4.5.8. Connectivity MIRTH

Mirth plugin allows for the reception of worklists and the transmission of exams/PDF files
More generally, it allows to implement the input and output of the HL7 protocol.

5. INSTALLATION AND CONFIGURATION

5.1. Installation

The software may be installed with the CD, putting it into the CD player and clicking on the file Connectivity ToolsSetup.exe in the folder.

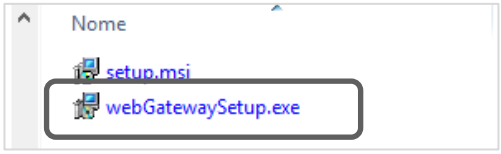

Figure 1: click on Connectivity ToolsSetup.exe to install the software

5.2. Configuration of tools and launch of the webgateway service

Connectivity Tools run as Windows service and automatically start with the computer.
Independently from the specific tool configured, the name webgateway3 comapres among services.
Once the installation completes, you should run the Configuration Tool wizard clicking on its icon located on the desktop to select and configure the connectivity tool.

Figure 2: Connectivity Tools configuration tool icon

Select the plugin you want to configure from the drop-down list of the Configuration Utility windows and follow the next steps.

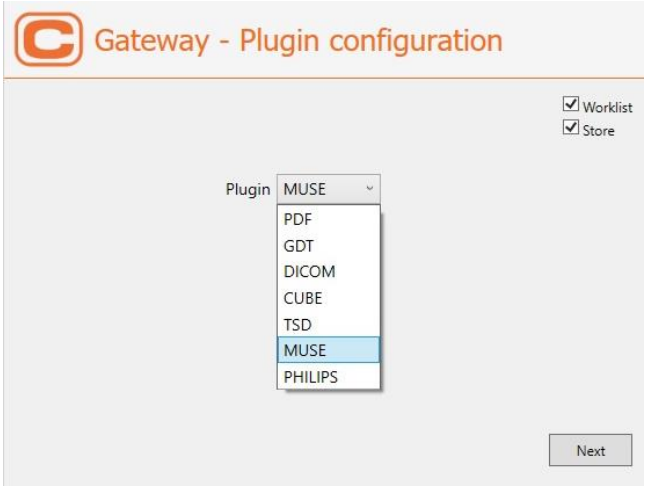

Figure 3: Select the plugin you need to configure

NOTE: worklist and store flags allow you to configure one or both services of, respectively, worklist input and storage output. This way, by selecting only one of the flags, you can configure different protocols for worklist and store.

5.2.1. Configuration of the Connectivity PDF

1. Select "PDF" from the drop-down list.
2. Set the following parameters and click **Next**:
    a. **Destination folder**: folder where the PDF report of the exam is saved, by default *c:/cardioline/pdf*.

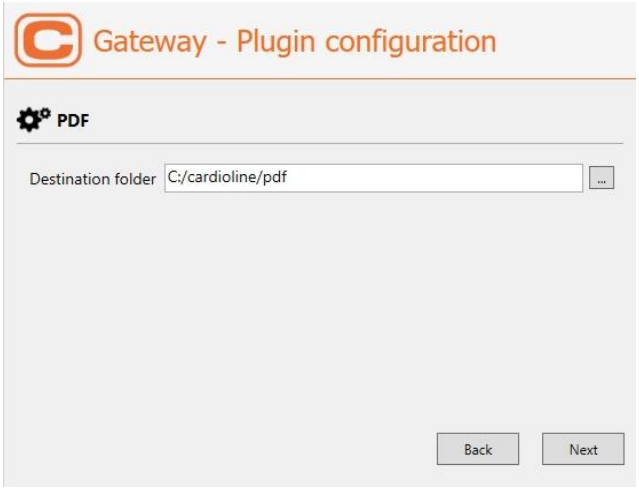

Figure 4: set the folder for the export

3. Set the configurations for the PDF report: traces speed, gain, format, etc and click **Next**.

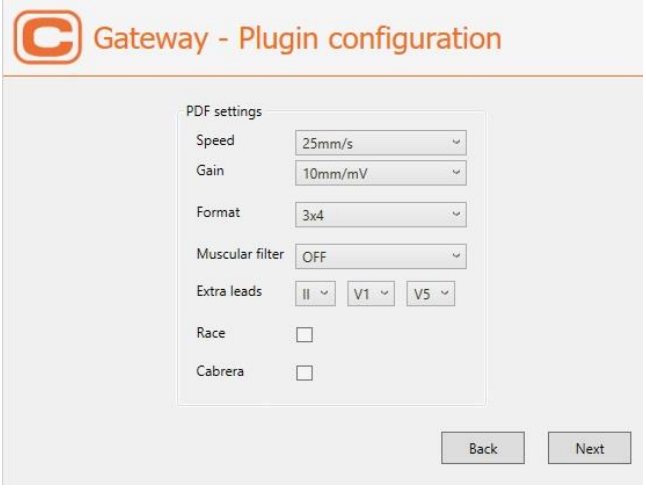

Figure 5: set the configurations for the PDF report

4. The configuration has been completed. Click **Close** to close the window. The service is automatically launched.

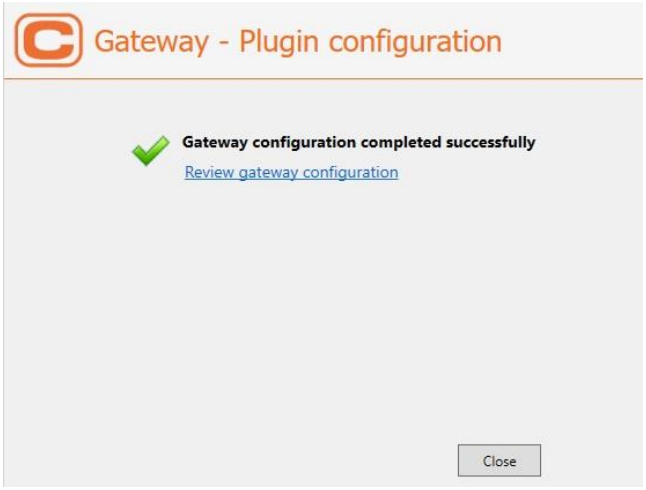

Figure 6: Configuration completed

5.2.2. Configuration of the Connectivity GDT

1. Select "GDT" from the drop-down list.
2. Set the following parameters and click **Next**:
   a. **Worklist folder**: folder where the worklist is imported, by default *c:/cardioline/patients-gdt*
   b. **Destination folder**: folder where the PDF report of the exam is saved, by default *c:/cardioline/gdt*.
   c. **PDF attachment**: if selected a PDF report of the exam is attached to the GDT file.

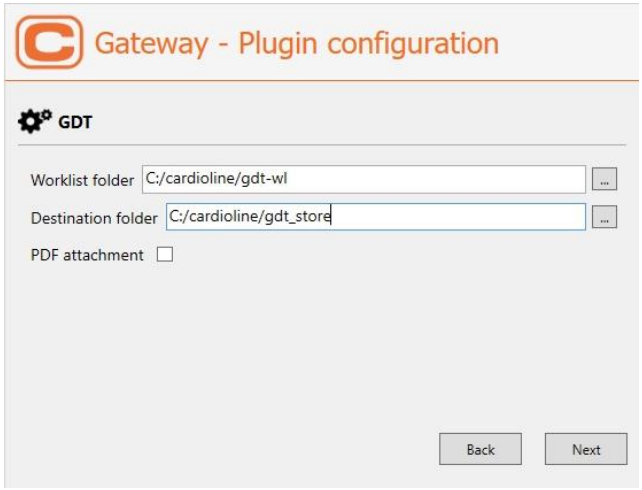

Figure 7: set the folders

3. Set the configurations for the PDF report (if Allega PDF has been selected): traces speed, gain, format, etc and click **Next**.

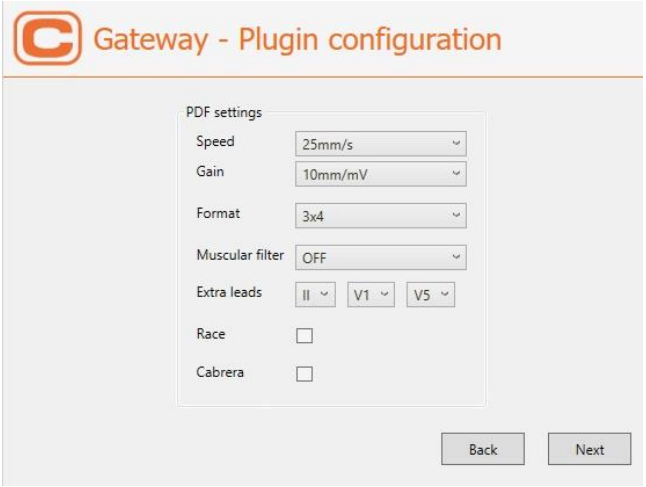

Figure 8: set the configurations for the PDF report

4. The configuration has been completed. Click **Close** to close the window. The service is automatically launched.

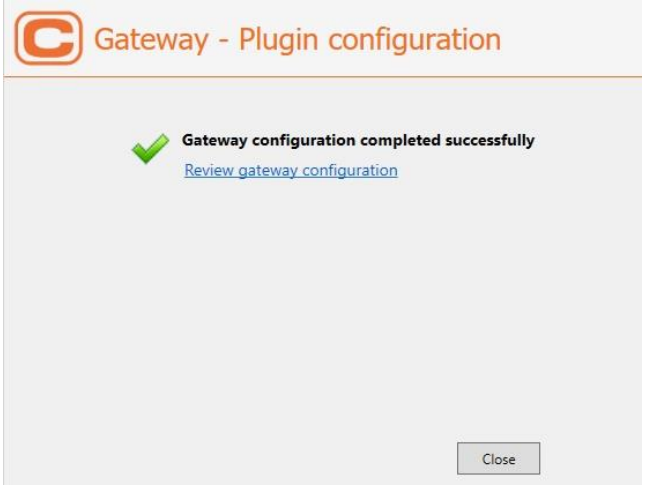

Figure 9: Configuration completed

5.2.3. Configuration of the Connectivity DICOM

1. Select "DICOM" from the drop-down list.
2. Set the following parameters and click **Next**:
    a. **scpMWL**: address of the server from which the worklist is imported, by default *MWLSCP@194.244.33.24:11115*
    b. **scpStore**: address of the server to which the exam is sent, by default *STORESCP@194.244.33.24:11112*.
    c. **localAE**: Application Entity Title – name of the module sent to the DICOM server (optional depending on the settings of the DICOM server).
    d. **Encapsultaed PDF**: if selected the traces are transmitted as a PDF encapsulated in the DICOM file, if not selected the traces are transmitted in 12 leads DICOM format.

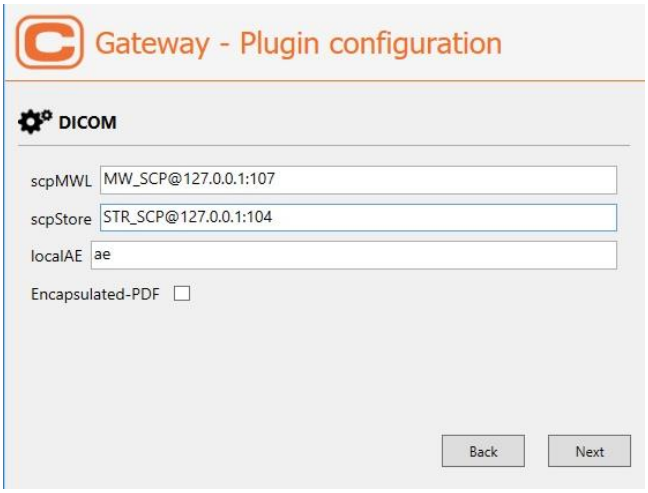

Figure 10: set the addresses

3. If the desired configuration is 12 led DICOM, the configuration is completed.
   If you have chosen encapsulated PDF instead, you need to select the settings for the PDF report also (track speed, gain, format etc) and click **Next**.

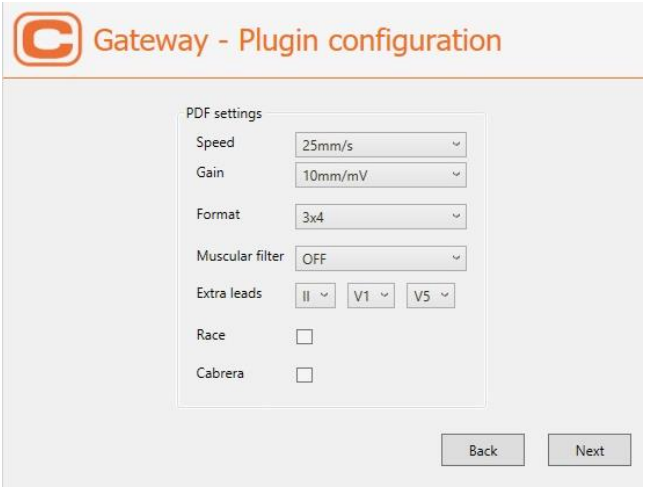

Figure 11: set the configurations for the PDF report

4. The configuration has been completed. Click **Close** to close the window. The service is automatically launched.

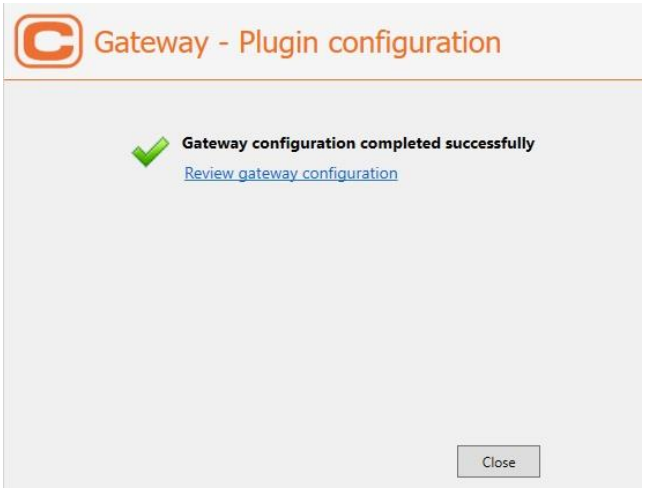

Figure 11: Configuration completed

5.2.4. Configuration of the Connectivity CUBE

1. Select “CUBE” from the drop-down list.
2. Set the following parameters and click **Next**:
    a. **Destination folder**: folder where the file of the exam is saved in order to be imported by Cube, by default *c:/tmp/testoutput*.

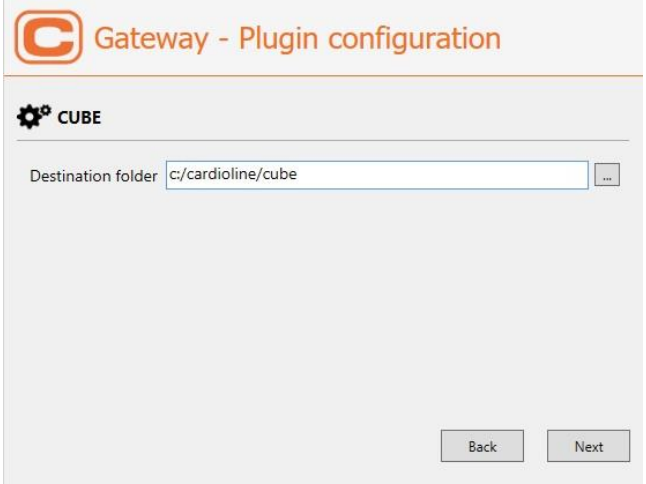

Figure 12: set the folders

3. The configuration has been completed. Click **Close** to close the window. The service is automatically launched.

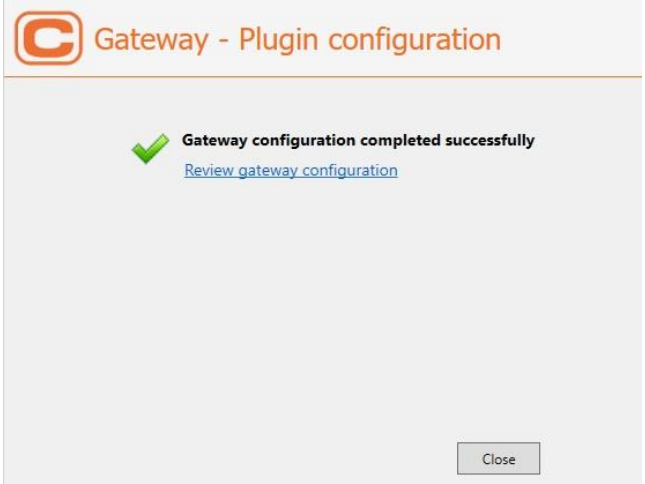

Figure 13: Configuration completed

5.2.5. Configuration of the Connectivity TSD

1. Select “TSD” from the drop-down list.
2. Set the following parameters and click **Next**:
    a. **Worklist folder**: folder where the worklist is imported, by default *c:/cardioline/mwl*
    b. **Destination folder**: folder where the exam file is saved, by default *c:/cardioline/scp*.

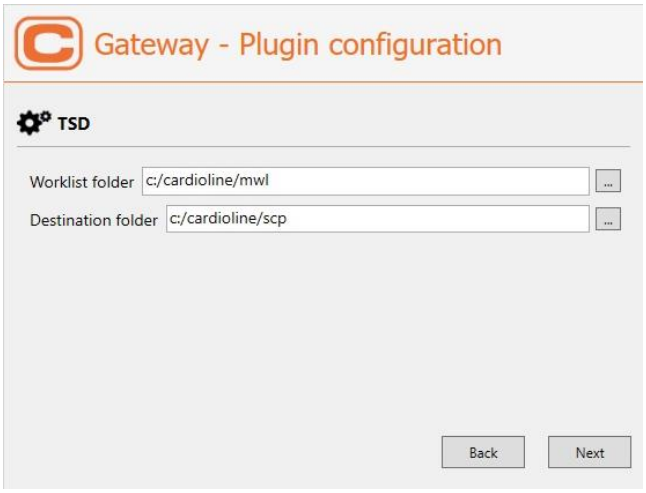

Figure 14: set the folders

3. The configuration has been completed. Click **Close** to close the window. The service is automatically launched.

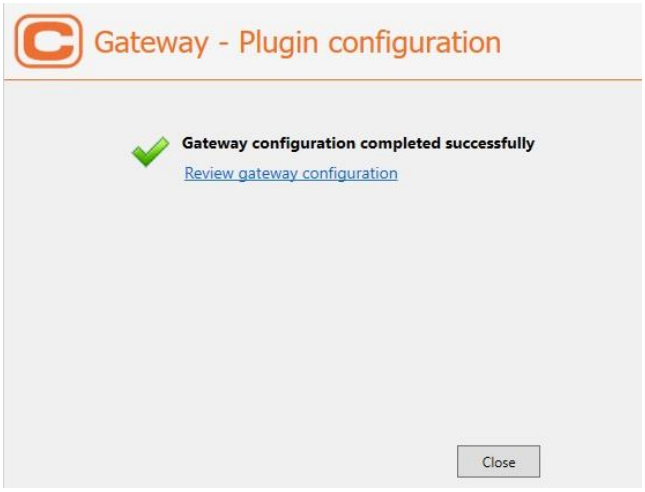

Figure 15: Configuration completed

5.2.6. Configuration of the Connectivity MUSE

1. Select "MUSE" from the drop-down menu.
2. Set the following parameters and click **Next**:
    a. **Destination Folder:** folder where the exam PDF report is saved, by default *c:/cardioline/muse*.

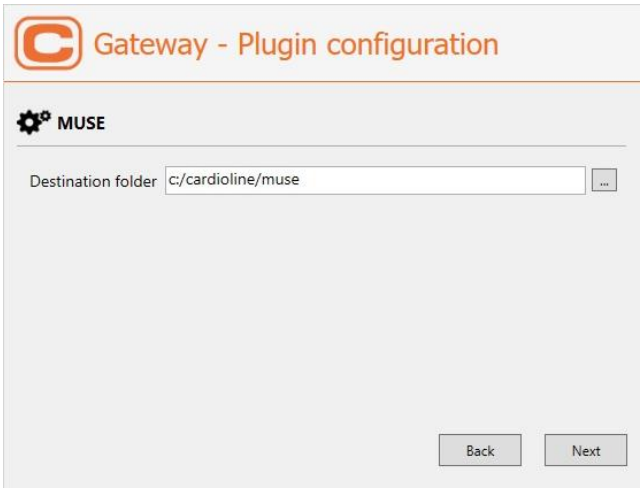

Figure 17: set the folders

3. The configuration has been completed. Click **Close** to close the window. The service is automatically launched.

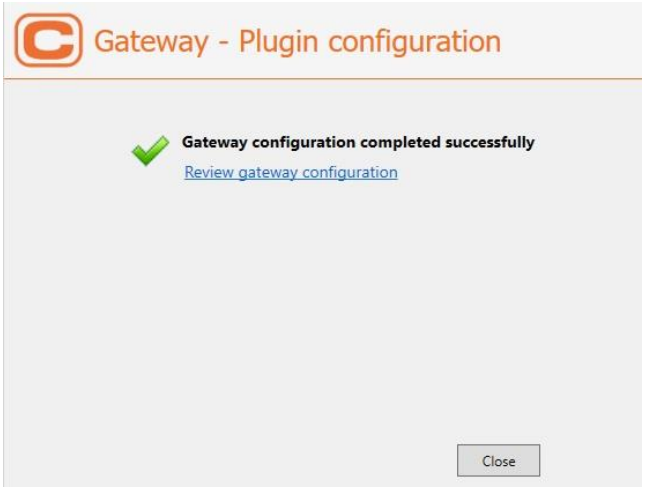

Figure 16: Configuration completed

5.2.7. Configuration of the Connectivity PHILIPS

1. Select " PHILPS " from the drop-down menu.
2. Set the following parameters and click **Next**:
    a. **Destination Folder:** folder where the exam PDF report is saved, by default *c:/cardioline/philips*.

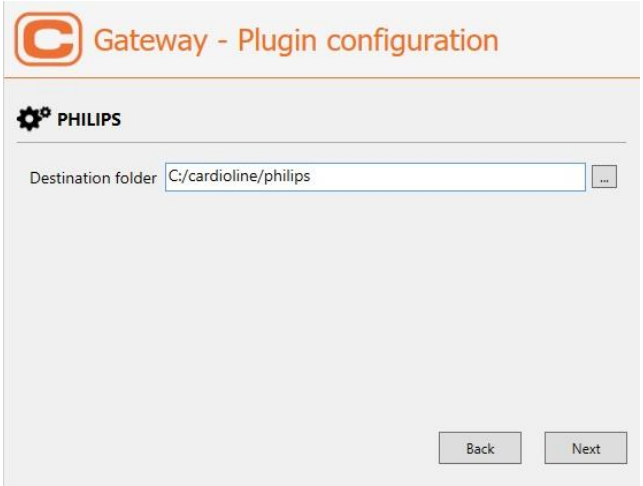

Figure 19: set the folders

3. The configuration has been completed. Click **Close** to close the window. The service is automatically launched.

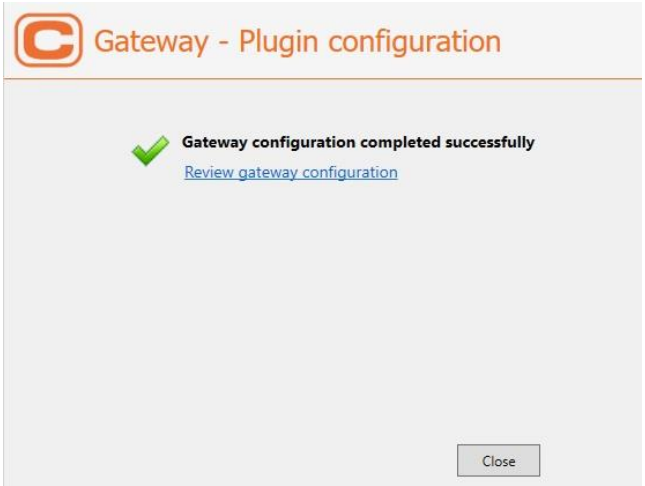

Figure 20: Configuration completed

5.2.8. Configuration of the Connectivity MIRTH

The configuration of this plugin is made directly by Cardioline personnel. Contact Cardioline for support.

5.2.9. Configuration check

Connectivity Tools provides a way to display the configured plugins.

Clicking on the link on the last page of the configuration utility opens the web browser at the internet address *http://localhost:9999/gtw/api/info*, which reports some Connectivity Tools configuration information.

Figure 17: Configuration control link

Figure 18: Configuration completed

This page displays:

1. The active plugin (DICOM in the example)
2. The Connection String to enter into the connectivity settings of the cardiographs connected with Connectivity Tools (*).
3. The software revision number and other information.

*(*) **NOTE**: The proposed Connection String should be verified, in particular if the PC has multiple network adapters installed (including virtual network adapters).*

To test whether Web Gateway is accessible from the network and verify the Connection String, go to another computer located in the network, open the web browser and enter the connection string followed by "/info", e.g. http://192.168.217.1:9999/gtw/api/info.
If the browser displays Connectivity Tools configuration information, you may use the proposed Connection String for configuring your devices located in the LAN, e.g. http://192.168.217.1:9999/gtw/api.

If you do not have another PC to try connecting to Connectivity Tools, you may use a tablet or a smartphone provided that it is connected to your local Wi-Fi network.

If your network has a DNS configured, you may use the computer name in place of the IP address, for example: http://MYCOMPNAME:9999/gtw/api. Likewise, you may try using the computer name to open the information page from a different PC, e.g. http://MYCOMPNAME:9999/gtw/api/info.

5.3. HTTPS protocol implementation

To ensure a secure communication between the devices and our applications, you can implement the HTTPS protocol:

1. If you want to use your own encryption key, place the keystore object in the installation folder (default path: "C:\ProgramFiles(x86)\Cardioline\Connectivity Tools_3.0"), vice versa you can use the **justetest.keystore** provided by Cardioline and already in the folder;
2. Open the configuration file:
   C:\ProgramFiles(x86) \ Cardioline \ Connectivity Tools_3.0 \ config \ gateway-service.cfg
3. Modify the rows:
   keystoreFilePath = ***keyname***
   keyStorePassword = ******

   Set the file name and password correctly;
4. Restart the service: **Connectivity Tools3**

6. TECHNICAL SPECIFICATIONS

Compatible operating systems	Windows 7 pro, Windows 8 pro, Windows 10, 32/64 bit, Windows Server 2008 r2, Windows Server 2012 r2 32/64 bit
Devices that can be connected	▪ ECGxxx+ range electrocardiographs ▪ Touchecg 3 electrocardiograph
Compatible protocols	DICOM TSD GDT MUSE PHILIPS MIRTH
Backup file	automatic backup
Certification	Cardioline DICOM conformance statement

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