



ACR File Detector

User Guide

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1 Technology Overview

1.1 Introduction

Kantar offers “unique content” identification audio watermark technologies that unlocks a wealth of applications ranging from content tracking to synchronized experiences. Applications powered by Kantar’s technologies are able to automatically recognise and accurately synchronise with on-air content.

Different watermarking technologies are available:

1. **SNAP:** A unique technology optimized for both audience measurement and synchronized applications, leveraging a unique watermark structure. The SNAP technology has been designed for working with TV, Radio, OTT (catch-up TV, VOD) and podcast signals. The Detector SDK is integrated in fixed or portable meters and offers broadcasters with the best technology to create one-to-one relation with their audience,
2. **KAM_ID_INK:** The audio watermarking technology from Kantar designed for production and post-production facilities. KAM_ID_INK has been designed for co-existing with the SNAP watermarking. SNAP will remain the technology used by broadcasters and Pay TV operators. KAM_ID_INK will enable other actors to propose a range of new services using content identification without interfering with the applications of the broadcasters or Pay TV operators.
3. **KAM_ID:** The Kantar implementation of the SMPTE “Open Binding of IDs (OBID)” standard (SMPTE ST 2112-10). KAM_ID allows for embedding either an EIDR or an Ad-ID compact ID code (see SMPTE ST 2112-10).
4. **KAM_TL:** The Kantar implementation of the SMPTE “OBID Time Label & Content Distribution IDs (OBID-TLC)” standard (SMPTE ST 2112-20). KAM_TL is designed to insert an EIDR Video Service ID and a broadcast timestamp (see SMPTE ST 2112-20).

The audio watermarking is a two-step process:

1. **The embedding process:** In this step, the watermarks are embedded within the audio signal. This embedding is performed either during an offline audio processing, or during the live playout of the content.
2. **The detection process:** In this step, watermarks previously embedded are decoded by applications running on tablets or smartphones.

The embedding and the detection processes share different parameters:

- The technology
- The watermark structure
- The watermarking key, when applicable.

1.2 Watermark Information

The Kantar audio watermark is a binary sequence of numbers that is inserted into the audio stream at a periodic interval. Once extracted from the audio, the information is automatically translated into a “watermark payload”. The watermark payload will survive audio compression, digital-to-analog and analog-to-digital conversions, and many other types of format transformation. The payload will carry the information necessary for identifying and synchronizing the application with the content being watched.

1.3 License Information

Kantar watermarking uses the concept of a “watermark key”, a unique symmetric code necessary to grant interoperability between the watermark embedding and the watermark decoding process. This key is included in the license key delivered by Kantar and is required to run the ACR File Detector. If you do not already have this license, please contact Kantar support (www.kantarmedia.com/watermarkinghelpdesk).

It should be noted that:

- In no circumstances, shall an application be deployed on a public application store with a demonstration license. All applications shall be compiled with a commercial license before being published.
- In no circumstances, shall content embedded with a demonstration license be distributed by the company responsible for integrating the SDK in an application.

1.4 Certification procedure

The watermarking technology is the basis of the TV audience measurement and then crucial for the audience measurement operator in charge of delivering the audience measurement figures. Kantar imposes a certification of any product integrating the Kantar watermarking technology for audience measurement in order to ensure that the watermark is correctly applied on the audio streams to be aired. A certification process shall be passed for EACH new version of the product integrating the Embedding or Detection SDK. To limit the extra workload related to this certification process, Kantar proposes a dedicated tool, the QC File Detector and a light paper procedure. The integrator of the watermarking SDK is then autonomous to perform the certification himself. This certification shall be registered to Kantar.

To have a complete description of the Kantar certification procedure, please ask support.

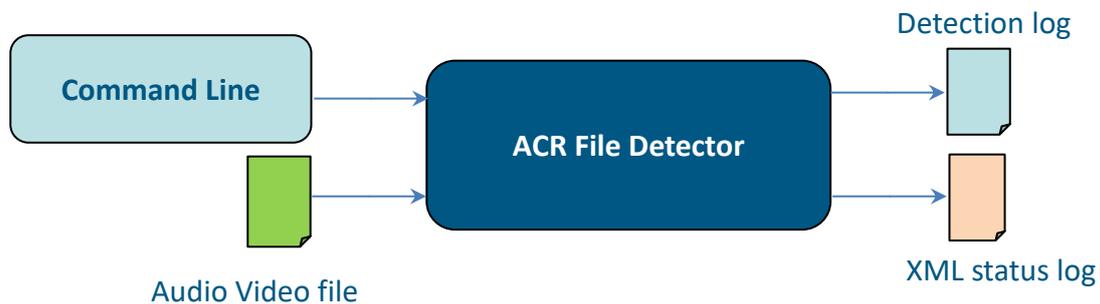
2 ACR File Detector overview

2.1 Introduction

ACR File Detector is a standalone watermark detection application used to verify that an input file is properly watermarked.

The software is a windows or linux console application and is protected by a Kantar license. It generates a log file that records the timestamps and Static ID of the payload(s) decoded.

The following figure describes the ACR File Detector workflow:



2.2 Platforms

Supported platforms are the following ones:

- Windows 7 Pro 64 Bits.
- Windows 8 Pro 64 bits,
- Windows 10 64 bits.
- Linux Debian 9 64 bits (built using GNU GCC 6.3.0, glibc 2.24)

2.3 Input / output files

ACR File Detector is launched with the following information:

- Watermarking technology to detect
- Path and name of the file to be analysed. This file must be shared and accessible.
- Directory for the detection log.
- Detection level: Level 1, 2 or 3.
- Optional parameters (see § 4.3).

2.3.1 Input file

By default (at detection level 1 or 2), only the first audio track of the input file is processed for watermark detection.

If the input file contains more than one audio track (ex: multilingual material), multitrack detection can be enabled by activating level 3 detection.

ACR File Detector supports the following formats:

Audio sample rate:

- 22.05kHz, 24kHz, 44.1kHz or 48kHz.

Video:

- AVI
- ASF
- GXF
- MPEG,
- MPEGTS
- MOV
- MP4
- M4A
- MXF Files (OP1a to OP3c and D10) (without external references)

Audio codecs:

- AAC
- AC3
- ALAW
- DTS
- EAC3
- MP3
- Wav
- wav extended Files
- PCM (16/24/32 bits, little- endian, 22.05 / 44.1 / 48KHz)

2.3.2 Input configuration

ACR File Detector offers three levels of detection:

- Level 1: The detection process terminates when a first Identifier (Static ID) or a first timestamp is found. The output status is OK if one static identifier or timestamp is found.
Note: Level 1 is not available for KAM TL technology: use level 2 instead
- Level 2: The detection process terminates when the whole file is analysed. The output status is OK if a watermark is found. Only the first audio track is analysed.
- Level 3: Multitrack mode: same as level 2 but all audio tracks present in the input file are analysed. One output log is generated for each audio track.

2.3.3 Output log**2.3.3.1 Introduction**

The ACR File Detector generates the XML detection status log of the processed file. The log is written in the specified directory.

2.3.3.2 Format of output logs

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<DetectorLog>
  <LogVersion>3.1.0</LogVersion>
  <ProductVersion>8.0.137637</ProductVersion>
  <ProductName>ACR File Detector - KAM ID</ProductName>
  <CommandLine>C:\FILE_QC_DETECTOR\detector\ACRFileDetectorCLI.exe --techno KAMID --
input C:\FILE_QC_DETECTOR\Workspace\bbb_1min_16bit.wav --level 2</CommandLine>
  <Stream>bbb_1min_16bit.wav</Stream>
  <Status>OK</Status>
  <ProcessEnd>Automatic stop</ProcessEnd>
  <DetectionLevel>2</DetectionLevel>
  <TimecodeLoop>1</TimecodeLoop>
  <Payload>
    <StaticId>12</StaticId>
    <IdentifierType>AWM_KAM_ID_ADID</IdentifierType>
```

```

</Payload>
<Payload>
  <StaticId>21</StaticId>
  <IdentifierType>AWM_KAM_ID_EIDR</IdentifierType>
</Payload>
<FirstTimestamp>N/A</FirstTimestamp>
<LastTimestamp>N/A</LastTimestamp>
<StartTime>2019-06-11 09:13:25</StartTime>
<EndTime>2019-06-11 09:13:25</EndTime>
</DetectorLog>

```

2.3.3.3 Explanations

- **Log version:** This is the version of the output log.
- **Product version:** the version of the QC file detector.
- **Product name:** QC file detector product name with active detection technology.
- **Command line:** the command line used for the detection.
- **Stream:** name of the file that has been processed by the detector.
- **Status:** status of the detection, it could be OK or NOK.
- **ProcessEnd:** explain how the detection process has been finished. It could be:
 - Automatic stop (end of detection processing).
 - Manual stop (canceled by user or system) in this case the status is set to NOK.
- **Detection level:** QC detection mode selected by the user (1, 2 or 3):
 - 1: the detection stops as soon as a first static ID or timestamp found (use this level if your goal is just to check that the file is watermarked).
 - 2 and 3: the detection is performed on the entire file (complete analysis, all the static IDs are processed).
- **TimecodeLoop:** indicates that the detector is attending to see the time code loop when reaching maximum value (this field does not appear for a SNAP detection and is always set to 1 for other technologies).
- **Payload:** for non SNAP detection, one payload section is inserted per detected watermark
 - Detection level 1, only the first detected payload is displayed.
 - Detection level 2 and 3, all the detected payloads are listed
 - Content of the payloads:
 - **StaticId:** static ID detected
 - **IdentifierType:** type of content detected: this may be the type of payload (ADID, EIDR, INK) or the detection slot number in KAM TL technology
- **StaticId:** for SNAP detection
 - Detection level 1, only the first static ID found is displayed.
 - Detection level 2 and 3, all the static IDs are displayed.
- **FirstTimestamp:** value of the first decoded timestamp.
- **LastTimestamp:** value of the last decoded timestamp.
- **StartTime:** detection start time.
- **EndTime:** detection end time.

3 Installation

3.1 Setup and configuration

3.1.1 Windows installation of the ACR File Detector

N.B: for Windows 7, 8 and 10, user is invited to modify User Account Control to “Never notify” to ensure the software will work properly.

To do so:

- Click on start in the search program enter “rights”.
- Click on “Change user control settings”.
- Set it to ‘never notify’.
- Restart your computer.

N.B: for Windows 8 and 10, you will have to launch the command line using administrator rights (right click/“Run as administrator”).

- Use an administrator account to install the software.
- Execute “setupACRFileDetectorCLI-XXX.exe” (with «XXX» replaced by the version number), and follow the instructions.
- Note about Windows 8 platform: during the installation you may be asked to install .NET 3.5. Just follow the windows instructions to complete the installation.

3.1.2 Linux installation of the ACR File Detector

- Extract files of ACRFileDetectorCLI.XXX.debian9.x86_64.tar.gz (with XXX replaced by the version number).
- Launch AuthorizationCodeCL command line application to generate the AuthorizationCode.txt file
- Get licenses files (see 3.1.3).
- Copy the Kantar license in the same directory as the binaries.

3.1.3 Licenses

The ACR File Detector requires one Kantar Software license that prevents the execution of the software of a non-authorized person.

This license is tied to hosting platform, meaning that you cannot exchange this license between 2 hosting platforms.

3.1.3.1 Get the Kantar license

Send back by email the AuthorizationCode.txt to Kantar support.

This file is in the installation folder.

Then Kantar will send you back the appropriate license package (zip file). The zip file contains a license.lic file and Summary.txt

3.1.3.2 Installation of the licenses

Once you have the license files you simply need to copy those files in the installation folder. Please make sure to keep the Summary.txt file in the installation folder in order to help further support.

Warning: Be careful, the first time you will launch your application with a new license you will need to do it with administrator’s rights (run as administrator).

4 Command Line

4.1 Principle

The ACR File Detector ACRFileDetectorCLI binary is a windows or linux console application.

Here is an example to process the iceage_wmk.wav file with SNAP detection level 2 and to create the output log file in the default directory (same of the input file):

Windows:

```
ACRFileDetectorCLI.exe --techno SNAP --input "c:\Audio Content\iceAge_wmk.wav" --level 2
```

Linux:

```
./ACRFileDetectorCLI --techno SNAP --input /home/Audio\ Content\iceAge_wmk.wav --level 2
```

4.2 Usage

Windows:

```
ACRFileDetectorCLI.exe --techno TechnologyName --input inputFilePath [--log logPath] [--level detectionLevel] [--productLicense licensePath] [--verbose] [--version]
```

```
ACRFileDetectorCLI.exe --help
```

Linux:

```
./ACRFileDetectorCLI --techno TechnologyName --input inputFilePath [--log logPath] [--level detectionLevel] [--productLicense licensePath] [--verbose] [--version]
```

```
./ACRFileDetectorCLI --help
```

4.3 Options

4.3.1 Mandatory

- **--techno:** Define the technology to use for watermarking, it must match with license used. Possible values are SNAP, KAMID, INK and KAMTL
- **--input:** The complete full name (path+name) of the input file to be processed.

4.3.2 Options

- **--log:** Define the log directory where detector log will be created - default: same folder as the input file.
- **--level:** Detection level – 1, 2 or 3 (default 1, or 2 for KAM TL):
 - 1: Check the presence of static Id. (not supported by KAM TL)
 - 2: Complete analysis of the input file (first audio track only).
 - 3: Complete analysis of the input file (all present audio tracks).
- **--productLicense:** Define path where product license (*.lic) is stored. If not set license.lic file must be next to command line executable
- **--verbose:** Enable verbose mode: outputs detailed logging in console window and log file - default: disable. If set, the console output is saved in a text file named input_file_name-LogFile.txt. This file is located on the binary directory. The output file could be easily imported in MS Excel for deeper investigation.
- **--help:** Display general usage. If --techno is specified, usage of specified technology is displayed.
- **--version:** Display product version.

4.3.3 Advanced options

- **--certificationMode:** only available for SNAP and INK technology (default 0: no certification)

The certification mode is used only for embedder or detection SDK integration certification.

A dedicated user guide explains the complete certification process: ask Kantar support for further information

Possible values are:

- 0: no certification (default)
- 1: embedder certification (used in the embedder certification procedure)
- 2: detector line in certification (used in the detector certification procedure)
- 3: detector mic in certification (used in the detector certification procedure)
- 4: detector mic side in certification (used in the detector certification procedure)

A. Licenses and 3rd party software used

A.1 Third party software

A.1.1 Intel IPP

A.2 Open Source

A.2.1 PThread Win64

<http://www.gnu.org/licenses/old-licenses/lgpl-2.1.en.html>

A.2.2 FFMPEG 4.1.0– LGPL 2.1

<http://www.gnu.org/licenses/old-licenses/lgpl-2.1.html>

A.2.3 Boost 1.60

Boost Software License - Version 1.0 - August 17th, 2003

http://www.boost.org/LICENSE_1_0.txt

Boost/Thread License

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A.2.4 Expat

<http://opensource.org/licenses/MIT>

A.2.5 TinyXML 2.6.1

http://zlib.net/zlib_license.html

A.2.6 Libsoxr

<https://sourceforge.net/p/soxr/code/ci/master/tree/LICENCE>

A.2.7 Inno Setup

<http://www.jrsoftware.org/files/is/license.txt>

A.2.8 Jsoncpp

<http://jsoncpp.sourceforge.net/LICENSE>

B. Technical Support by Kantar

To get technical assistance, check on the status of problems, or report new problems, contact Kantar Product Support via e-mail, phone, or fax. We welcome any suggestions, improvements and feedback concerning the present User Guide or software described herein.

B.1 Web technical support

www.kantarmedia.com/watermarkinghelpdesk

B.2 Phone support

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12 square du Chêne Germain
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France
Tel: +33 2 90 92 37 37
Fax: +33 2 99 22 61 63

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