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| Office of The Ohio Attorney General |
| Livescan Electronic Ten-print Interface Specification |
| Version 8.1 |
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| This document Issued by the Ohio Bureau of Criminal Identification & Investigation provides a communication standard for transactions between Livescan devices and the State of Ohio’s Automated Fingerprint Identification System (AFIS). |

[1 Introduction 3](#_Toc254877542)

[1.1 System Description 3](#_Toc254877543)

[1.2 Interface Description 3](#_Toc254877544)

[1.3 Specification Scope 3](#_Toc254877545)

[2 Description of Transactions 5](#_Toc254877546)

[2.1 Ten-Print Submissions 5](#_Toc254877547)

[2.1.1 Arrest Ten-Print Submission (CAR) 5](#_Toc254877548)

[2.1.2 Judicial Ten-Print Submission (JLR) 6](#_Toc254877549)

[2.1.3 Correctional Facility Ten-Print Submission (CFR) 6](#_Toc254877550)

[2.2 Responses to Ten-Print Submissions 7](#_Toc254877551)

[2.2.1 Submission Results - Electronic (SRE) 7](#_Toc254877552)

[2.2.2 Transaction Error (ERR) 7](#_Toc254877553)

[3 Certification, Setup and Testing 7](#_Toc254877554)

[3.1 Vendor Certification 7](#_Toc254877555)

[3.2 Setting Up a New Livescan Site 8](#_Toc254877556)

[3.3 Test Procedure required for each new installation 8](#_Toc254877557)

[4 Additional Requirements 8](#_Toc254877558)

[4.1 Electronic Fingerprint Images 8](#_Toc254877559)

[4.2 Fingerprint Image Compression / Decompression Algorithm 9](#_Toc254877560)

[4.3 Fingerprint Image Quality Specifications 9](#_Toc254877561)

[5 Data Transmission Procedures 10](#_Toc254877562)

[5.1 Procedure for File Transfer 10](#_Toc254877563)

[5.2 File Naming Convention 11](#_Toc254877564)

[5.3 Procedure for Response Messages 11](#_Toc254877565)

[6 Document Change History 12](#_Toc254877566)

# Introduction

## System Description

The State of Ohio has an operational Automated Fingerprint Identification System (AFIS) with an integrated Computerized Criminal History (CCH) Database. The Ohio Bureau of Criminal Identification and Investigation (BCI&I) accepts electronic submission of fingerprint records from local Ohio law enforcement agencies, courts, and Correctional Facilities. This electronic interface is designed to transfer fingerprint records between remote Livescan devices at the local level and the State AFIS. The design of this interface is deliberately similar to the FBI’s *Electronic Biometric Transmission Specification*. By implementing a similar interface for local electronic submissions, the Ohio AFIS is positioned to forward records to the FBI’s Integrated Automated Fingerprint Identification System (IAFIS). Figure 1 below illustrates the flow of electronic ten-print submissions. This document describes the interface shown between the local Ohio agencies and the BCI&I. The FBI in conjunction with the National Institute of Standards and Technology (NIST), and the fingerprint identification community, has developed a standard for electronically encoding and transmitting fingerprint images as well as, identification, arrest, and correctional facility data. This standard is an American National Standards Institute (ANSI) standard entitled *Data Format for the Interchange of Fingerprint Information*. The NIST standard defines the content, format and units of measurement for the exchange of information that may be used in the fingerprint identification of a subject.

## Interface Description

While the NIST standard referenced above will allow all Livescan devices to communicate with Ohio’s AFIS, the purpose of this document is to specify certain requirements to which Ohio agencies must adhere to communicate electronically with the Ohio AFIS. This interface description does not deviate from the NIST standard, but further describes the portions of the standard that are to be defined by the NIST message receiver (that is, the Ohio AFIS). The basic requirements for Logical Records **Type-1, Type-4, and Type 15** set forth in the NIST standard are also applicable to transmissions to the Ohio AFIS. However, the Ohio-specific requirements for the contents and format of **Type-2** Logical Records, as well as for any special requirements for the other record types are contained in this description.

## Specification Scope

This document specifies the file and record content, format and data codes necessary for the exchange of fingerprint identification information between local users and the Ohio AFIS. It provides a description of all requests and responses associated with electronic ten-print fingerprint identification services.

Ten-print services can be accessed through electronic ten-print submissions. Electronic submissions involve processing and evaluation judgments by BCI&I personnel. All transactions and messages are compliant with the NIST standard for exchange of fingerprint information.

**Figure 1 – Electronic Ten-Print Transaction Workflow**



# Description of Transactions

## Ten-Print Submissions

Electronic Ten-Print Submissions will originate from Livescan devices at local law enforcement agencies, Courts, and Correctional Facilities. **Livescan devices must edit all input data that will be included in a NIST record, whether the data is entered using the Livescan keyboard or from an external source such as a booking system. The Livescan devices must send edited “error free” NIST records to the Ohio AFIS.** **Edits must be based on the information contained in this document. All Ohio Revised Codes in NIST records submitted to the Ohio AFIS must be defined in the ORC table approved by BCI&I. NIST records containing undefined ORC codes will be rejected.**

When the NIST record arrives at BCI&I, the Ohio AFIS will edit the images and conduct a subject search. If no identification is effected through comparison of candidates resulting from subject search, a fingerprint search will be executed throughout the Ohio AFIS. The fingerprint images of any resulting file candidates will be compared to the search fingerprint images by BCI&I fingerprint examiners. If applicable, SRE or ERR responses from the Ohio AFIS to the contributor will be electronically returned. The response times depend on the time of the request and the BCI&I staff available at that time. For example, if a request is sent at a time when Ohio AFIS operators are off duty, the response time for that request will be longer.

There are 3 types of ten-print electronic submissions that will be accepted by the Ohio AFIS. The particular type of submission is identified in the Type of Transaction (TOT) Field in the Type-1 record that is used with each transaction. The following are the TOTs for ten-print submissions:

|  |  |
| --- | --- |
| **TOT** | **TRANSACTION** |
| CAR | Arrest Ten-Print Submission |
| JLR | Judicial Ten-Print Submission |
| CFR | Correctional Facility Ten-Print Submission |

### Arrest Ten-Print Submission (CAR)

CAR transactions are submitted to BCI&I when a subject is arrested. Only one CAR transaction should be submitted for each arrest. A new arrest record will be added to the Ohio CCH database for each CAR transaction that is successfully completed. All CAR transactions will contain a unique ITN generated by the Livescan device – not from an external source such as a booking system. If the Livescan site is setup to receive a response, an SRE or ERR message will be generated when the transaction is completed. All CAR transactions must contain at least 1 arrest charge.

The types and (occurrences) of logical records included in an electronic arrest ten-print submission are as follows:

|  |  |
| --- | --- |
| Type-1 (1) | Header Record |
| Type-2 (1) | containing SUBJECT-GROUP and ARREST-GROUP data |
| Type-4 (14) | 10 Rolled Impressions and 4 sets of Plain Impressions |
| Type-15 (4) | 2 lower palms and 2 writer’s palms (palm prints are optional) |

### Judicial Ten-Print Submission (JLR)

JLR transactions are submitted by the court and contain arrest and final disposition information. These transactions are submitted to BCI&I after a subject have been to court and at least one charge disposition is known. All JLR transactions will contain a unique ITN generated by the Livescan device – not from an external source such as a booking system. If the Livescan site is setup to receive a response, an SRE or ERR message will be generated when the transaction is completed. All JLR transactions must contain at least 1 arrest charge and 1 court charge.

The types and (occurrences) of logical records included in an electronic judicial ten-print submission are as follows:

|  |  |
| --- | --- |
| Type-1 (1) | Header Record |
| Type-2 (1) | Containing SUBJECT-GROUP, ARREST-GROUP and COURT-GROUP data |
| Type-4 (14) | 10 Rolled Impressions and 4 sets of Plain Impressions |
| Type-15 (4) | 2 lower palms and 2 writer’s palms (palm prints are optional) |

**Note: A JLR transaction must not be submitted to BCI&I if any of the following cases apply:**

1. the arresting agency already submitted a CAR transaction for the same arrest
2. The subject is a juvenile without a convicted disposition.

### Correctional Facility Ten-Print Submission (CFR)

CFR transactions are submitted by correctional reception centers when a subject arrives at the institution. CFR transactions contain final disposition and confinement information. All CFR transactions must contain a unique ITN generated by the Livescan device – not from an external source such as a booking system. If the Livescan site is setup to receive a response, an SRE or ERR message will be generated when the transaction is completed.

All CFR transactions must contain at least 1 court charge.

The types and (occurrences) of logical records included in an electronic correctional facility ten-print submission are as follows:

|  |  |
| --- | --- |
| Type-1 (1) | Header Record |
| Type-2 (1) | Containing SUBJECT-GROUP, COURT-GROUP and CUSTODY-GROUP data |
| Type-4 (14) | 10 Rolled Impressions and 4 sets of Plain Impressions |
| Type-15 (4) | 2 lower palms and 2 writer’s palms (palm prints are optional) |

## Responses to Ten-Print Submissions

The Ohio AFIS response to electronic submissions will provide search results or indicate an error via the following TOTs:

|  |  |
| --- | --- |
| **TOT** | **TRANSACTION** |
| SRE | Submission Results – Electronic |
| ERR | Transaction Error |

### Submission Results - Electronic (SRE)

This transaction is returned by the Ohio AFIS in response to (CAR, JLR, CFR) ten-print submissions. It includes an Ident or a Non-Ident decision and the State identification number (SID) of the subject. If the subject is not identified, a new SID will be assigned and reported back to the contributor.

In response to an electronic ten-print submission, the following logical records will be returned as an SRE message:

|  |  |
| --- | --- |
| Type-1 (1) | Header Record |
| Type-2 SRE (1) | Record containing an Ident or Non-Ident Response, name, and State ID number |

### Transaction Error (ERR)

This transaction is returned by the Ohio AFIS to indicate a transaction error. When a transaction is rejected because data field(s) failed editing criteria or because the fingerprint images are of poor quality, a Transaction Error (ERR) response will be transmitted back to the submitting agency. **Each reason(s) for rejection will be detailed in the Status/Message (MSG) field.**

In response to an electronic ten-print submission, the following logical records will be returned as an ERR message:

|  |  |
| --- | --- |
| Type-1 (1) | Header Record |
| Type-2 ERR (1) | Record containing a status/error message |

# Certification, Setup and Testing

## Vendor Certification

**Vendors must be certified by BCI&I before installing their Livescan devices in Ohio. Livescans can only transmit the transaction types for which they have been approved.**

Vendors may be required by BCI&I to recertify their software every two years.

To become certified, vendors must setup a Livescan device at BCI&I and prove that their product conforms to the latest Livescan Specifications. They will be expected to enter test records designed by BCI&I, transmit them to BCI&I, and receive ERR and SRE responses. Their software must edit demographic data and capture acceptable fingerprint images.

## Setting Up a New Livescan Site

The Agency where the Livescan is being installed must:

1. Contact OAG Tech Support ([TechSupport@OhioAttorneyGeneral.gov](mailto:TechSupport@OhioAttorneyGeneral.gov)) to obtain:
   1. A block of ITN’s.
   2. The latest version of the ORC-LTR table.
   3. Send Configuration for NIST & SIG files. This includes a connection address for the OAG STFP server and a set of credentials. Each Livescan device will be issued its own set of credentials. Each device will use its OAG-assigned credentials to send transactions directly to a drop location on the OAG FTPS server.
   4. Response Configuration for SRE & ERR return messages. This is a vendor provided e-mail address. An OAG mail server will send an e-mail message to an e-mail address provided by the vendor.
2. Perform test procedure described in Section .

**BCI may disconnect a Livescan site at any time if it sends transactions that do not comply with the specifications. The Livescan Agency will be informed before the site is disconnected.**

## Test Procedure required for each new installation

The Livescan agency must contact BCI&I before sending any test records.

**When testing CAR or JLR transactions, send 3 adult test records and 3 juvenile test records described in Appendix A.**

**When testing CFR transactions, send 2 adult test records and 1 juvenile test records described in Appendix A.**

Test records will be manually placed into the Ohio AFIS Workflow, where the fingerprint images and data will be examined. The records will be rejected, creating ERR responses, and these responses must reach the Livescan.

# Additional Requirements

## Electronic Fingerprint Images

Electronic fingerprint images shall be captured and transmitted to the Ohio AFIS in accordance with the standard for the electronic interchange of fingerprint information, *Data Format for the Interchange of Fingerprint Information,* for the Type-4 record. In addition, the transmitting resolution must be 500 pixels per inch and the sizes of the transmitted images are as follows:

1. Ten individual rolled impression images shall each be 1.6 inches wide and 1.5 inches high. In record type 4, the Horizontal Line Length (HLL) shall be 0320(hex), which is 800 pixels and the Vertical Line Length (VLL) shall be 02EE (hex), which is 750 pixels.
2. Two individual plain impression thumb images shall each be 0.77 inches wide and 2 inches high. In record type 4, the Horizontal Line Length (HLL) shall be 0181(hex), which is 385 pixels and the Vertical Line Length (VLL) shall be 03E8 (hex), which is 1000 pixels.
3. Two plain impression four finger block images shall each be 3 inches wide and 2 inches high. In record type 4, the Horizontal Line Length (HLL) shall be 05DC (hex), which is 1500 pixels and the Vertical Line Length (VLL) shall be 03E8 (hex), which is 1000 pixels.

The fingerprint images captured by the Livescan device shall not be cropped, prior to transmission to the Ohio AFIS, unless the original images exceed the dimensions stated above. If the original images exceed the dimensions stated above, then they shall be cropped no smaller than the dimensions stated above.

## Fingerprint Image Compression / Decompression Algorithm

Images submitted to the Ohio AFIS shall be compressed using the WSQ algorithms at a specified ratio of no greater than 15:1. However, the effective compression ratio may be greater due to the amount of white space in the image.

The *WSQ Gray-Scale Fingerprint Image Compression Specification* provides the definitions, requirements, and guidelines for specifying the FBI’s WSQ compression algorithm. The document specifies the class of encoders required, decoder process, and coded representations for compressed image data. The Ohio AFIS adheres to the FBI’s specification for fingerprint image compression and decompression. The specification provides an informative overview of the elements of the algorithm. Refer to it for details.

## Fingerprint Image Quality Specifications

The FBI’s Image Quality Specifications are provided in Appendix F of *Electronic Fingerprint Transmission Specification.* Fingerprint images transmitted electronically to the Ohio AFIS shall adhere to the FBI’s fingerprint image quality specification, regarding fingerprint scanners.

**Livescan machines must keep the following Image Quality/Sequence Errors to a minimum:**

* **Poor quality or incomplete fingerprint**
* **Fingers or hands out of sequence**
* **Finger or hand printed twice**
* **Finger missing and no reason given**

**When capturing fingerprints, the Livescan machine must cross check fingers with the flats to make sure fingers are not out of order. The Livescan operator must make at least two attempts to capture each fingerprint. On the third attempt, the operator may override the machine and accept the fingerprint.**

# Data Transmission Procedures

This section contains specifications that govern how the Ohio AFIS will accept fingerprint and text data from the remote Livescan device, and also how the Ohio AFIS will send responses back to the device for processing. The description focuses on software and procedural considerations. The Livescan must be connected to the internet in order to reach the Ohio AFIS.

The Ohio AFIS will allow only FTPS data transfers to be processed for electronic ten-print submissions. No e-mails, remote log-ins, or any other kind of transactions are permitted. Responses will be sent via SMTP. Therefore, in order to communicate with the Ohio AFIS, the Livescan device must have both an FTPS client and an e-mail program.

## Procedure for File Transfer

For each transaction, two files will be transferred to the Ohio AFIS FTPS server: a \*.NIST file and a \*.SIG file. Test files will go to the TEST folder, and production files will go to the PROD folder. The procedure for file transfer is as follows:

1. The vendor Livescan device connects via FTPS to the OAG FTPS server.
2. The vendor writes the NIST file to the appropriate folder. Incoming transaction NIST data must be in the format described in Appendix B and Appendix D. The file name must follow the naming convention described in section . NIST files must have a .NIST extension.
3. Upon successful upload of the NIST file, the vendor writes a signal file to the same folder. The signal file has a .SIG extension, and must also be named following the naming convention described in section . The signal file is a text file containing the following data:

**SIGF:vendor\_trans\_no.NIST**

**\_\_END\_\_**

'SIGF' is the name of the signal file. '\_\_END\_\_' is the end of file marker. CAFIS will not process the signal file unless the '\_\_END\_\_' marker is present.

1. Verification of receipt of these files should be obtained from the FTPS logs of the sender’s FTPS client. BCI will not send a response until the record has been processed.

## File Naming Convention

The .SIG and .NIST file should be named as follows:

**[prefix]\_[ORI]\_[ITN].\***

Prefixes correspond to the transaction type, as illustrated below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Transaction Type** | **Prefix** | **Example NIST File Name** | **Corresponding signal file name** |
| CAR Adult | CARA | CARA\_OHBCI0000\_999999ZZ.NIST | CARA\_OHBCI0000\_999999ZZ.SIG |
| CAR Juvenile | CARJ | CARJ\_OHBCI0000\_999999ZZ.NIST | CARJ\_OHBCI0000\_999999ZZ.SIG |
| CFR | CFR | CFR\_OHBCI0000\_999999ZZ.NIST | CFR\_OHBCI0000\_999999ZZ.SIG |
| JLR Adult | JLRA | JLRA\_OHBCI0000\_999999ZZ.NIST | JLRA\_OHBCI0000\_999999ZZ.SIG |
| JLR Juvenile | JLRJ | JLRJ\_OHBCI0000\_999999ZZ.NIST | JLRJ\_OHBCI0000\_999999ZZ.SIG |

The ORI should be the ORI of the submitting agency, and should match the value in 1.08 of the corresponding NIST file. The ITN should be the ITN of the transaction, and should match the value in 2.102 of the corresponding NIST file.

## Procedure for Response Messages

Once the NIST file and SIG file are transferred to the Ohio AFIS via FTPS, the ten-print transaction is processed by the Ohio AFIS. When processing completes, an E-mail response (see section

*Responses to Ten-Print* Submissions) is sent back to the e-mail address configured for the requesting agency, as agreed upon by BCI and the vendor. There must be an e-mail program available to receive this response, for processing by the Livescan software. The E-mail program must be based on the Internet’s Simple Mail Transfer Protocol (SMTP) with the Multipurpose Internet Mail Extensions (MIME).

# Document Change History

| Version | Date | Description/ Reason for Change |
| --- | --- | --- |
| 2009 | 5/1/2009 | ***Appendix A***  LCI-A and LCI-J fields were added  UCR-A and UCR-J fields were added  CTY changed to optional for JLR  ORI-J was removed from CFR  ***Appendix B***  The Definition for the LCI-A and LCI-J has been added.  The Definition for the LTR-A and LTR-J has been updated.  The Definition for the ORC-A and ORC-J has been updated.  The Definition for the UCR-A and UCR-J has been added.  ***Appendix C***  Print Requirements have changed. JLR disposition data must print.  ***Appendix E***  Certification Check Lists have been updated.  ***ORC-LTR Table***  2 fields (LCI and UCR) were added to the ORC-LTR table.  ***ORI-Jfile Table***  2 fields (COUNTY-NAME and county-code) were added to the ORC-Jfile table.  ***UCR-CODES Table***  A new table was created containing UCR codes and their descriptions. |
| Version 8.1 | TBD | Inbound transmission method changed from e-mail via LEADS to FTPS. |