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Biometric Token™

An encrypted instance of a signature.

Pen operator

The person using the pen with a pen-equipped computer.

Signature template

A set of one person's signature data against which a test signature may be compared ("verified").

What is PenOp?

PenOp is a software mechanism that addresses one of the most distinctive features of the pen interface: *the ability to capture a handwritten signature*.

Technically speaking, PenOp is a software *component* that works with other software, known as the "client application". The client application manages documents to be signed and displays them to a user. Then PenOp governs the capture of the user's signature information and the linking of that information to the document controlled by the client. Subsequently, PenOp can be used to verify the user's signature.

PenOp can be used to attach signatures to electronic forms and documents, and can detect whether a document has been modified since it was signed. PenOp can also be used to authenticate the claimed identity of a user, or "*pen operator*", by means of their dynamic signature metrics.

PenOp has a number of built-in safeguards which anticipate the rich variety of situations in which signatures might be used, with particular emphasis on data security, privacy, and legal issues.

What is the PenOp Netscape plug-in?

The PenOp Netscape plug-in is a PenOp component that can be embedded in hypertext markup language (HTML) documents and viewed using the Netscape Navigator web browser. This enables you to sign off documents and forms, such as order forms or contracts, that have been downloaded from a web site. When the signature has been submitted, the PenOp component can then initiate a program on the Netscape server, for example echoing back to the client the contents of the form that has been signed, including the embedded signature.

#Capturing your signature

Signature capture takes place by means of the signature capture window, which looks similar to the following:

| PenOp Signature Capture |
|--|
| I authorize payment of 40 ECUs to Signor F X Marelli for 4 tonnes bulk parmesan |
| PenOpPenOpPenOpPenOpPenOpPenOpPenOpPenOp |

The text at the top of the window is the *Gravity* $Prompt^{\text{TM}}$ which should be used to inform the signatory about the reason for signing.

The gravity prompt appears above the *signature capture area* that contains the PenOp logo and a horizontal signature line. Underneath the signature line at the right-hand side are displayed the claimed ID of the signatory (right-justified) and the time and date of signing. The time/date continues updating until the first pen-down event on the signature capture window, when the clock is stopped.

At the foot of the signature capture window are three buttons placed in the following order (left to right) and with this functionality: **OK** to end signature capture (provided a signature has been entered) by removing the signature capture window, returning control and passing back a <u>biometric token</u> to the calling application; **Clear** to clear the signature capture area and restart; and **Cancel** to end the signature capture process by removing the signature capture window and returning control to the calling application (but not returning a biometric token).

Signature capture error messages

Signature capture errors

Signatures which are too simple are invariably rejected (on the ground that they are too easy to forge). When a bad signature is input, a message box is displayed over the signature capture area. It will contain one of the following messages:

"This signature does not contain enough detail for PenOp - please sign again": this means that there are insufficient variations in speed, indicating a lack of features.

"This signature is too brief for PenOp - please sign again": the total length of line is insufficient.

"This signature is too short for PenOp - please sign again": the total duration of the signature is insufficient.

The message box contains a button labelled **OK** and is dismissible only by tapping this button; after which the signature capture area is cleared but the signature capture window is left on display so that the user may retry.

Interrogate option

A signed PenOp Netscape plug-in is interrogated by using a right mouse button click to display the Properties menu, then selecting the Interrogate option. This causes a window similar to the following to be displayed:

The window shows the Signatory Name, the Date/Time of signing and the Reason for signing text.

| PenOp Signature | Information | × |
|--|--|-----|
| Signatory Name Date/Time | Tim Barker 13:57 April 2, 1996 | |
| Reason for signing I am signing to agre document | e to the terms and conditions identified in this | A P |
| Check Doct | ument Verify Signature Cancel | |

Check Document. Pressing this button causes a recalculation of the document checksum and a comparison on the value stored in the <u>biometric token</u>. A *check document message box* is then displayed with the results: either "Document has not changed" (if the checksums agree) or "** This document is not the same as the document that was signed! **" (if the checksums do not agree).

Verify Signature. This button is enabled only if the licence string permits. When pressed, the *Verify* function is performed.

Cancel. When pressed the interrogate window is removed.

Verify option

The Verify option allows a signature to be verified against a PenOp <u>signature template</u>. This function is only available to signatures where the claimed identity of the signatory corresponds to a fully enrolled user template in the local PenOp database.

| ٧ | Verify 🗙 | | × | |
|---|-----------------------------|------------|-------------------|---|
| | Name held in PenOp database | | | |
| | Tim | Barker | | |
| | | 100 / | A good match | |
| | | 80 | | |
| | | 60 | Score : 88 | |
| | | 40 | | |
| | | 20 | | |
| | | 0 | Different | |
| | Sum. | <u>0</u> K | Apply to template | • |

A value of 100 means that the signature is a very good match to the template, whereas a score of 0 means that they are very different. A verification score of 70 or more will enable the *apply to template* button. Pressing this will cause the signature to be enrolled into the template and the verification performed again. The updated score will be displayed.

OK. Pressing this button will remove the Verify window.

Signature properties

This window allows the user to set properties for the PenOp signature before or after signing has taken place.

| Signature Properties | × |
|---|---|
| Signatory Name Tim Barker | |
| Signature Properties Name of signatory as held in PenOp database | |
| Tim Barker (tjb@penop.com) | - |
| | |
| | |
| | |
| | _ |
| <u> </u> | |

Name of signatory as held in PenOp database: This allows the user to set explicitly the signature template which shall be used for verification. This will default to the signatory name, if the name is known to the system (i.e. they exist in the local PenOp database). A blank entry will be displayed if the user does not exist in the PenOp database. This functionality is useful if a person has signed using a number of names (e.g. John Doe, JD, John Q Doe) and is then created in the PenOp database with their definitive name (e.g. as John Doe).

Stop signature from being deleted: This allows the 'signature is frozen flag' to be set. This flag cannot be cleared when it has been set and confirmed (by pressing OK).

About box

The *About* box displays product and version information, including contact phone numbers and e-mail addresses

| About | | × |
|-------|---|-----------------------------------|
| ≻ | Netscape PenOp Plug-In 1.0 release Copyright PenOp Inc., 1996 | |
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| | | Database Information OK |

Database Information. Pressing this button will display the standard PenOp DLL version information.