

## Electronic test- & calibration documents, Denmark

**Element Metech electronic test- and calibration documents are produced as pdf files and signed digitally.**

**The documents are distributed by Element Metech per e-mail service and are available on Metech Instrument Organiser, to registered users.**

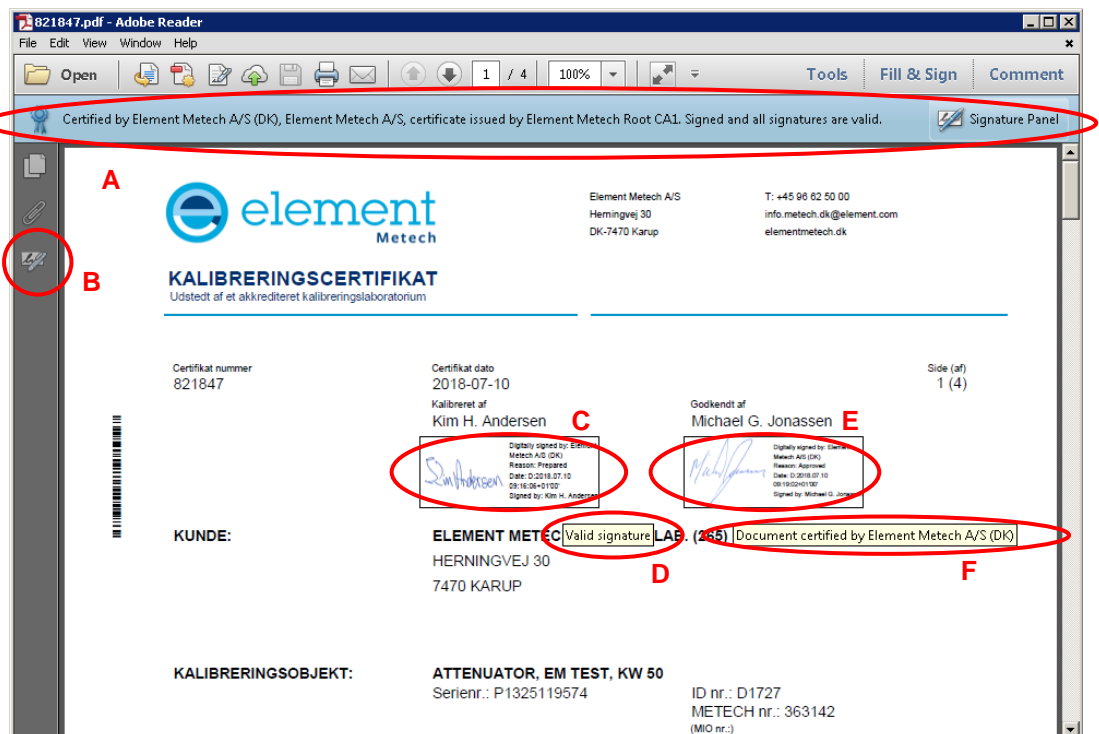
**If paper documents are still needed, contact Element Metech and you will be registered for printed copies of the digitally signed documents.**

### Element Metech digital signatures

Element Metech digital signatures replace the hand written signatures in test- & calibration documents (fulfilling requirement of ISO/IEC 17025, 5.10.2 j). A digital signature can be used to prove that a document was signed by the originator. In addition, a digital signature can also prove that a document has not been modified since it was signed.

A digitally signed document from Element Metech is signed with an Element Metech company certificate, authorised by the signer (as author / approver of the document). The signer is linked to the signature by the Element Metech domain security system. The Element Metech company certificates are chaining up to the Element Metech Root Certificate Authority (CA), issuing the certificates. The root CA public certificate can then be used by the recipient, to verify that the signature was applied by an Element Metech company.

When the pdf document is opened in Adobe Acrobat Reader, the top information bar (A) indicates that the document is certified and valid (if Element Metech Root CA public certificate is trusted – see description below). The signatures icon (B) indicates that the document is digitally signed. The signature is also visible in the document (C & E). If the mouse pointer is moved over the signature field (C or E), the tool tip text (D or F) is visible. The text indicates whether the signature is valid or not.



The screenshot shows Adobe Reader displaying a PDF document titled '821847.pdf'. The top status bar (A) indicates the document is certified and valid. A toolbar icon (B) shows the document is signed. The document content includes the Element Metech logo, contact information, and a 'KALIBRERINGS CERTIFIKAT'. Two signatures are present: one by Kim H. Andersen (C) and one by Michael G. Jonassen (E). Tooltips (D and F) are shown over the signature fields, indicating 'Valid signature' and 'Document certified by Element Metech A/S (DK)'. A 'Signature Panel' icon is visible in the top right corner.

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**Germany**  
 T: +49 (0) 40-52 95 610  
 E: [info.metech.de@element.com](mailto:info.metech.de@element.com)

## How to verify that a document is signed by Element Metech

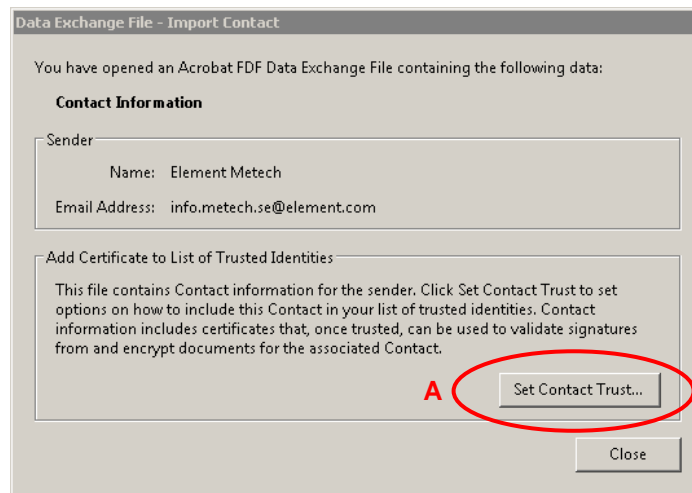
To verify the signature, you have to download and 'Trust' the Element Metech Root CA public certificate. This is done once for each computer or profile, where verification should be possible. For large companies, 'root certificates' can be trusted for the entire network domain. Contact your local IT department.

### Download and trust Element Metech digital signatures

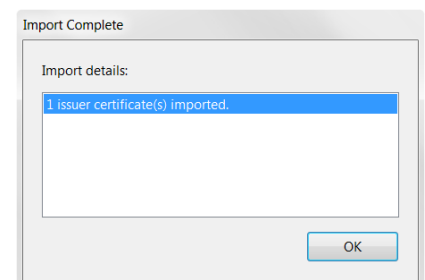
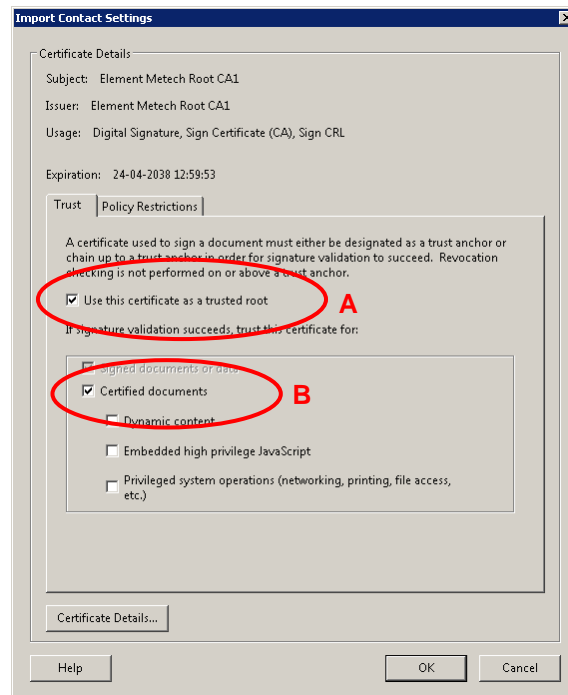
For users not running Adobe Acrobat Reader as pdf browser, download [Element Metech Root CA certificate \(crt-file\)](#) and follow the instructions for your application to trust the certificate. (For certificates before 25<sup>th</sup> of June 2018 use this [Exova Metech Root CA certificate \(crt-file\)](#)).

If you are running the recommended Adobe Acrobat Reader, download [Element Metech Root CA certificate \(fdf-file\)](#). (For certificates before 25<sup>th</sup> of June 2018 use this [Exova Metech Root CA certificate \(fdf-file\)](#)).

Open the file and press **Set Contact Trust** (A).



Tick **Use this certificate as a trusted root** (A) and **Certified documents** (B) and press **OK**.



If the import is successful, it will look like this.

Press **OK** to close this window.

Press **Close** to finish the import.

Close the browser window to return to the information site.

The Element Metech Root CA public certificate is now trusted and all Element Metech signed documents, opened on this computer or profile, and validated according to instructions below, should indicate that the signature is valid.

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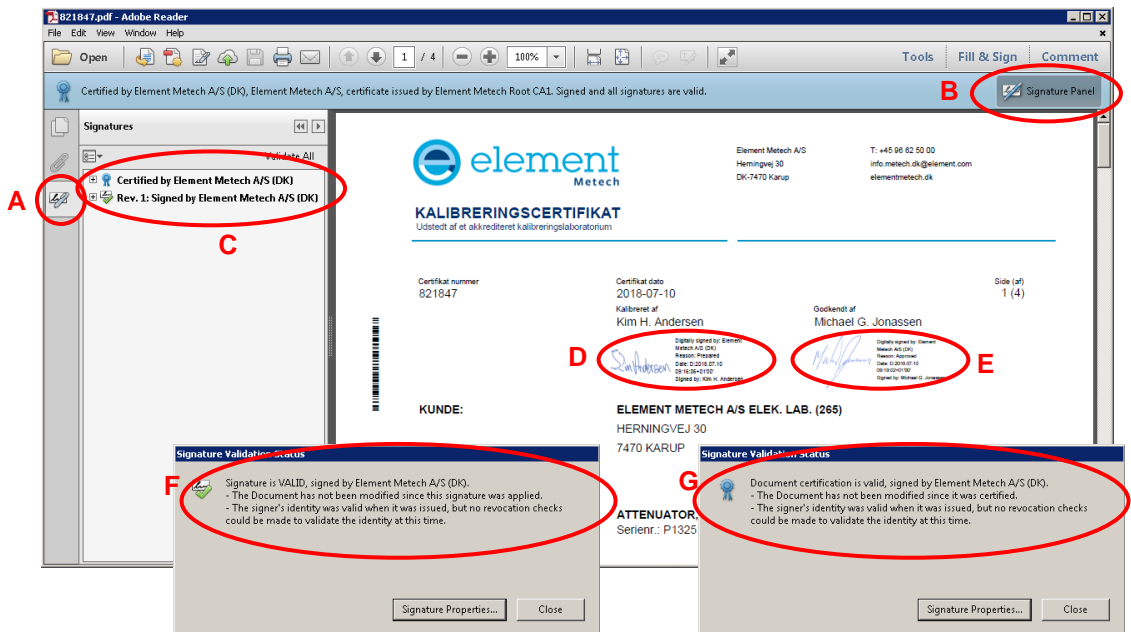
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## Validate a signature and verify that the document has not been modified

To validate the signature, either click the signatures icon (A) or the 'Signature Panel' button (B) to open the signature information panel and right click the signature row (C), or right click in the signature field (D or E), and select **Validate Signature**. The 'Signature Validation Status' (F or G) will then indicate that the signature is VALID and that the document has not been modified. More information can be found by pressing the button **Signature Properties**.



The signature for the author (D) will report that the signature is valid (F).

The signature for the approver (E) will report that the document certification is valid (G).

Note: Element Metech does not provide Certificate Revocation Lists (CRL) to check for revoked certificates since it is a small number of certificates and they are only used in a secure server environment. The signature time stamp is from the server, performing the signature.

## How does it work technically?

The signer uses a pair of cryptographic keys, a private key and a public key. These keys are contained in certificate files, together with information about the signer. The private key is kept secret by the signer and the public key is published to anyone who needs it. The signer calculates a "checksum" (hash) for the document to sign. The hash is then encrypted by using the private key. This is the digital signature and is included in the document file. The public key is also included in the document.

The recipient uses the public key to decrypt the hash. If this worked, it proves that the document was signed by the signer's private key. The recipient then calculates the hash for the document and compares it to the decrypted hash, if it is the same, it proves that the document has not been modified.

Element Metech uses a two tier hierarchy for the certificates (key pairs). The highest level is the root Certificate Authority (CA). The CA uses a 'self-signed' certificate to sign the issued certificates that are actually used to sign documents with. The CA public key can then be used to verify any signature, performed by any of the issued certificates.

To verify that the signature is performed by Element Metech, the recipient has to receive the Element Metech Root CA public key. If it is considered certain that the public key comes from Element Metech, the public key (certificate file) can be imported as a trusted root. All certificates signed by Element Metech will then have the signature validation status 'Valid' in the pdf browser.

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