CODESYS Control V3 - Exposed PKI folder

CODESYS Security Advisory 2025-07

Published: 2025-08-04

Last Change: 2025-09-01

Identifiers, Type and Severity

CVE-2025-41659
CERT@VDE: VDE-2025-051
CODESYS: CDS-93244, CDS-93272

CWE-732: Incorrect Permission Assignment for Critical Resource

CVSS v3.1 Base Score: 8.3 | High | CVSS:3.1/AV:N/AC:L/PR:L/UI:N/S:U/C:H/I:H/A:L

1 Summary

A vulnerability in the CODESYS Control runtime system allows low-privileged remote attackers to access the PKI folder via CODESYS protocol, enabling them to read and write certificates and keys. This exposes sensitive cryptographic data and allows unauthorized certificates to be trusted. However, all services remain available, only certificate based encryption and signing features are concerned. The issue affects systems using the optional CmpOpenSSL component for cryptographic operations.

2 Affected Products

The following products are affected in all versions before 3.5.21.20.
• CODESYS Control RTE (SL)
• CODESYS Control RTE (for Beckhoff CX) SL
• CODESYS Control Win (SL)
• CODESYS HMI (SL)
• CODESYS Runtime Toolkit

The following products are affected in all versions before 4.17.0.0.
• CODESYS Control for BeagleBone SL
• CODESYS Control for emPC-A/iMX6 SL
• CODESYS Control for IOT2000 SL
• CODESYS Control for Linux ARM SL
• CODESYS Control for Linux SL
• CODESYS Control for PFC100 SL
• CODESYS Control for PFC200 SL
• CODESYS Control for PLCnext SL
• CODESYS Control for Raspberry Pi SL
• CODESYS Control for WAGO Touch Panels 600 SL
• CODESYS Virtual Control SL

3 Impact

Unauthorized access to PKI files allows attackers to extract sensitive cryptographic keys and manipulate trusted certificates. This compromises system integrity, confidentiality and partially affects availability.

4 Remediation

Update the following products to version 3.5.21.20.
• CODESYS Control RTE (SL)
• CODESYS Control RTE (for Beckhoff CX) SL
• CODESYS Control Win (SL)
• CODESYS HMI (SL)
• CODESYS Runtime Toolkit

Update the following products to version 4.17.0.0.
• CODESYS Control for BeagleBone SL
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• CODESYS Control for IOT2000 SL
• CODESYS Control for Linux ARM SL
• CODESYS Control for Linux SL
• CODESYS Control for PFC100 SL
• CODESYS Control for PFC200 SL
• CODESYS Control for PLCnext SL
• CODESYS Control for Raspberry Pi SL
• CODESYS Control for WAGO Touch Panels 600 SL
• CODESYS Virtual Control SL

The CODESYS Development System and the products available as CODESYS add-ons can be downloaded and installed directly with the CODESYS Installer or be downloaded from the CODESYS Store. Alternatively, as well as for all other products, you will find further information on obtaining the software update in the CODESYS Update area https://www.codesys.com/download/.

Following our general recommendation that the PKI should only be managed via the dedicated X.509 API or the corresponding online services of the CODESYS Control runtime system, the programmatic direct access via SysFile or SysDir operations or online access via the CODESYS file transfer services is denied after an update to a fixed product version. For compatibility reasons, the old behavior can be restored for applications that use these accesses via the following setting:
[CmpOpenSSL]
EnforceBlacklistOnPKIDir=0

However, CODESYS GmbH strongly recommends keeping the new default.

5 General Security Recommendations

As part of a security strategy, CODESYS GmbH strongly recommends at least the following best-practice defense measures:

• Use controllers and devices only in a protected environment to minimize network exposure and ensure that they are not accessible from outside

• Use firewalls to protect and separate the control system network from other networks

• Activate and apply user management and password features

• Limit the access to both development and control system by physical means, operating system features, etc.

• Use encrypted communication links

• Use VPN (Virtual Private Networks) tunnels if remote access is required

• Protect both development and control system by using up to date virus detecting solutions

For more information and general recommendations for protecting machines and plants, see also the CODESYS Security Whitepaper.

6 Acknowledgments

This issue was reported by Luca Borzacchiello of Nozomi Networks.

Coordination done by CERT@VDE.

CODESYS GmbH thanks all parties involved for their efforts.

7 Further Information

For additional information regarding the CODESYS products, especially the above-mentioned versions, or about the described vulnerability please contact the CODESYS support.

8 Disclaimer

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Note: Not all CODESYS features are available in all territories. For more information on geographic restrictions, please contact sales@codesys.com.

9 Bibliography

[1] CERT@VDE: https://cert.vde.com
[2] CODESYS GmbH: CODESYS Security Whitepaper
[3] CODESYS GmbH: Coordinated Disclosure Policy
[4] CODESYS GmbH download area: https://www.codesys.com/download
[5] CODESYS GmbH security information page: https://www.codesys.com/security
[6] CODESYS GmbH support contact site: https://www.codesys.com/support
[7] Common Vulnerabilities and Exposures (CVE): https://cve.mitre.org
[8] Common Weakness Enumeration (CWE): https://cwe.mitre.org
[9] CVSS Calculator: https://www.first.org/cvss/calculator/3.1

The latest version of this document can be found here:

https://www.codesys.com/fileadmin/user_upload/CODESYS_Group/Ecosystem/Up-to-Date/Security/Security-Advisories/Advisory2025-07_CDS-93244.pdf

Change History

Version	Description	Date
1.0	Initial version	2025-08-04
2.0	Update for SL runtimes available	2025-09-01