

SSA-293562: Vulnerabilities in Industrial Products

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 Current Version: V2.6
 CVSS v3.0 Base Score: 6.5

SUMMARY

Several industrial devices are affected by two vulnerabilities that could allow an attacker to cause a Denial-of-Service condition via PROFINET DCP network packets under certain circumstances. The precondition for this scenario is a direct layer 2 access to the affected products. PROFIBUS interfaces are not affected.

Siemens has released updates for several affected products, is working on updates for the remaining affected products and recommends specific countermeasures until fixes are available.

AFFECTED PRODUCTS AND SOLUTION

Affected Product and Versions	Remediation
SIMATIC CP 343-1 Std: All versions < V3.1.3	Update to V3.1.3 https://support.industry.siemens.com/cs/ww/en/view/109756088
SIMATIC CP 343-1 Lean: All versions < V3.1.3	Update to V3.1.3 https://support.industry.siemens.com/cs/ww/en/view/109756088
SIMATIC CP 343-1 Adv: All versions	See recommendations from section Workarounds and Mitigations
SIMATIC CP 443-1 Std: All versions < V3.2.17	Update to V3.2.17 https://support.industry.siemens.com/cs/ww/en/view/109745387
SIMATIC CP 443-1 Adv: All versions < V3.2.17	Update to V3.2.17 https://support.industry.siemens.com/cs/ww/en/view/109745388
SIMATIC CP 443-1 OPC-UA: All versions	See recommendations from section Workarounds and Mitigations
SIMATIC CP 1243-1: All versions < V2.1.82	Update to V3.1 https://support.industry.siemens.com/cs/ww/en/view/109757489
SIMATIC CP 1243-1 IRC: All versions < V2.1.82	Update to V3.1 https://support.industry.siemens.com/cs/ww/en/view/109757489
SIMATIC CP 1243-1 IEC: All versions	See recommendations from section Workarounds and Mitigations
SIMATIC CP 1243-1 DNP3: All versions	See recommendations from section Workarounds and Mitigations

SIMATIC CM 1542-1: All versions < V2.0	Update to V2.0 https://support.industry.siemens.com/cs/ww/en/view/109744924
SIMATIC CM 1542SP-1: All versions < V1.0.15	Update to V1.0.15 https://support.industry.siemens.com/cs/ww/en/view/109749255
SIMATIC CP 1542SP-1 IRC: All versions < V1.0.15	Update to V1.0.15 https://support.industry.siemens.com/cs/ww/en/view/109749255
SIMATIC CP 1543SP-1: All versions < V1.0.15	Update to V1.0.15 https://support.industry.siemens.com/cs/ww/en/view/109749255
SIMATIC CP 1543-1: All versions < V2.1	Update to V2.1 https://support.industry.siemens.com/cs/ww/en/view/109747253
SIMATIC RF650R: All versions < V3.0	Update to V3.0 https://support.industry.siemens.com/cs/ww/en/view/109743740
SIMATIC RF680R: All versions < V3.0	Update to V3.0 https://support.industry.siemens.com/cs/ww/en/view/109743740
SIMATIC RF685R: All versions < V3.0	Update to V3.0 https://support.industry.siemens.com/cs/ww/en/view/109743740
SIMATIC CP 1616: All versions < V2.7	Update to V2.8.0 https://support.industry.siemens.com/cs/ww/en/view/109762689
SIMATIC CP 1604: All versions < V2.7	Update to V2.8.0 https://support.industry.siemens.com/cs/ww/en/view/109762689
SIMATIC DK-16xx PN IO: All versions < V2.7	Update to V2.8.0 https://support.industry.siemens.com/cs/ww/en/view/109762689
SCALANCE X-200: All versions < V5.2.2	Update to V5.2.2 https://support.industry.siemens.com/cs/ww/en/view/109752018
SCALANCE X-200IRT: All versions < V5.4.0	Update to V5.4.0 https://support.industry.siemens.com/cs/ww/en/view/109755950
SCALANCE X-300/X408: All versions < V4.1.0	Update to V4.1.2 https://support.industry.siemens.com/cs/ww/en/view/109753720
SCALANCE X414: All versions < V3.10.2	Update to V3.10.2 https://support.industry.siemens.com/cs/ww/en/view/109747276
SCALANCE XM400: All versions < V6.1	Update to V6.2 https://support.industry.siemens.com/cs/ww/en/view/109761424

SCALANCE XR500: All versions < V6.1	Update to V6.2 https://support.industry.siemens.com/cs/ww/en/view/109761425
SCALANCE W700: All versions < V6.1	Update to V6.3.1 https://support.industry.siemens.com/cs/ww/en/view/109760470
SCALANCE M-800, S615: All versions < V4.03	Update to V5.00 https://support.industry.siemens.com/cs/ww/en/view/109757544
Softnet PROFINET IO for PC-based Windows systems: All versions < V14 SP1	Upgrade to V14 SP1 https://support.industry.siemens.com/cs/ww/en/view/109747482
IE/PB-Link: All versions < V3.0	Upgrade to V3.0 https://support.industry.siemens.com/cs/ww/en/view/109744504
IE/AS-i Link PN IO: All versions	See recommendations from section Workarounds and Mitigations
SIMATIC Teleservice Adapter Standard Modem, IE Basic, IE Advanced: All versions	See recommendations from section Workarounds and Mitigations
SITOP PSU8600 PROFINET: All versions < V1.2.0	Update to V1.2.0 https://support.industry.siemens.com/cs/ww/en/view/102295547
SITOP UPS1600 PROFINET: All versions < V2.2.0	Update to V2.2.0 https://support.industry.siemens.com/cs/ww/en/view/79207181
SIMATIC ET 200AL: All versions < V1.0.2	Update to V1.0.2 https://support.industry.siemens.com/cs/ww/en/view/109479281
SIMATIC ET 200ecoPN: All versions	See recommendations from section Workarounds and Mitigations
SIMATIC ET 200M: All versions	See recommendations from section Workarounds and Mitigations
SIMATIC ET 200MP IM155-5 PN BA: All versions < V4.0.1	Update to V4.0.1 or newer https://support.industry.siemens.com/cs/ww/en/view/109754281
SIMATIC ET 200MP IM155-5 PN ST: All versions < V4.1	Update to V4.1 https://support.industry.siemens.com/cs/ww/en/view/78647504
SIMATIC ET 200MP IM155-5 PN HF: All versions < V4.2	Update to V4.2 https://support.industry.siemens.com/cs/us/en/view/93012181
SIMATIC ET 200pro: All versions	See recommendations from section Workarounds and Mitigations

SIMATIC ET 200S: All versions	See recommendations from section Workarounds and Mitigations
SIMATIC ET 200SP IM155-6 PN ST: All versions < V4.1.0	Update to V4.1.0 https://support.industry.siemens.com/cs/de/de/view/78648144
SIMATIC ET 200SP IM155-6 PN HF: All versions < 4.2.0	Update to V4.2.0 https://support.industry.siemens.com/cs/ww/en/view/85624387
SIMATIC ET 200SP (except IM155-6 PN ST and IM155-6 PN HF): All versions	See recommendations from section Workarounds and Mitigations
SIMATIC PN/PN Coupler: All versions < V4.0	Upgrade to V4.0 https://support.industry.siemens.com/cs/de/en/view/109749637
Development/Evaluation Kit DK Standard Ethernet Controller: All versions < V4.1.1 Patch04	Update to V4.1.1 Patch04 or newer https://support.industry.siemens.com/cs/ww/en/view/109755160
Development/Evaluation Kit EK-ERTEC 200P: All versions < V4.4.0 Patch01	Update to V4.4.0 Patch01 or newer https://support.industry.siemens.com/cs/ww/en/view/109750012
Development/Evaluation Kit EK-ERTEC 200: All versions < V4.2.1 Patch03	Update to V4.2.1 Patch03 or newer https://support.industry.siemens.com/cs/ww/en/view/109755151
SIMATIC S7-200 SMART: All versions < V2.3	Contact your local Siemens representative or the Siemens customer support at https://w3.siemens.com/aspa_app/ to receive firmware version 2.3. Update to V2.3
SIMATIC S7-300 incl. F and T: All versions < V3.X.14	Update to V3.X.14 https://support.industry.siemens.com/cs/ww/en/ps/13752/dl
SIMATIC S7-400 PN/DP V6 Incl. F: All versions < V6.0.6	Update to V6.0.6 https://support.industry.siemens.com/cs/de/en/view/109474874
SIMATIC S7-400-H V6: All versions < V6.0.7	Update to V6.0.7 https://support.industry.siemens.com/cs/document/109474550
SIMATIC S7-400 PN/DP V7 Incl. F: All versions < V7.0.2	Update to V7.0.2 https://support.industry.siemens.com/cs/ww/en/view/109752685
SIMATIC S7-410: All versions < V8.2	Update to V8.2 https://support.industry.siemens.com/cs/ww/en/view/109476571
SIMATIC S7-1200 incl. F: All versions < V4.2.1	Update to V4.2.1 https://support.industry.siemens.com/cs/ww/en/view/109741461

SIMATIC S7-1500 incl. F, T, and TF: All versions < V2.1	Update to V2.1 https://support.industry.siemens.com/cs/ww/en/view/109478459
SIMATIC S7-1500 Software Controller incl. F: All versions < V2.1	Update to V2.1 https://support.industry.siemens.com/cs/ww/en/view/109478528
SIMATIC WinAC RTX 2010 incl. F: All versions	See recommendations from section Workarounds and Mitigations
SIRIUS ACT 3SU1 interface module PROFINET: All versions < V1.1.0	Update to V1.1.0 https://support.industry.siemens.com/cs/document/109753683
SIRIUS Soft Starter 3RW44 PN: All versions	See recommendations from section Workarounds and Mitigations
SIRIUS Motor Starter M200D PROFINET: All versions	See recommendations from section Workarounds and Mitigations
SIMOCODE pro V PROFINET: All versions < V2.0.0	Update to V2.0.0 https://support.industry.siemens.com/cs/ww/en/view/109749989
SINAMICS DCM w. PN: All versions < V1.4 SP1 HF5	Update to V1.4 SP1 HF5 https://support.industry.siemens.com/cs/ww/en/view/44029688
SINAMICS DCP w. PN: All versions < V1.2 HF 1	Update to V1.2 HF 1 https://support.industry.siemens.com/cs/ww/en/view/109474935
SINAMICS G110M w. PN: All versions < V4.7 SP6 HF3	Update to V4.7 SP6 HF3 https://support.industry.siemens.com/cs/ww/en/view/109482659
SINAMICS G120(C/P/D) w. PN: All versions < V4.7 SP6 HF3	Update to V4.7 SP6 HF3 https://support.industry.siemens.com/cs/ww/en/view/109482659
SINAMICS G130 V4.7 w. PN: All versions < V4.7 HF27	Update to V4.7 HF27 https://support.industry.siemens.com/cs/ww/en/view/103433117
SINAMICS G150 V4.7 w. PN: V4.7: All versions < V4.7 HF27	Update to V4.7 HF27 https://support.industry.siemens.com/cs/ww/en/view/103433117
SINAMICS G130 V4.8 w. PN: All versions < V4.8 HF4	Update to V4.8 HF4 https://support.industry.siemens.com/cs/ww/en/view/109742040
SINAMICS G150 V4.8 w. PN: All versions < V4.8 HF4	Update to V4.8 HF4 https://support.industry.siemens.com/cs/ww/en/view/109742040
SINAMICS S110 w. PN: All versions < V4.4 SP3 HF5	Update V4.4 SP3 HF5 https://support.industry.siemens.com/cs/de/en/view/109474320

SINAMICS S120 prior to V4.7 w. PN: All versions < V4.7	Update to latest version of V5.1 SP1 https://support.industry.siemens.com/cs/document/109758423
SINAMICS S120 V4.7 w. PN: All versions < V4.7 HF27	Update to V4.7 HF27 https://support.industry.siemens.com/cs/de/en/view/92522512
SINAMICS S120 V4.7 SP1 w. PN: All versions	Update to latest version of V5.1 SP1 https://support.industry.siemens.com/cs/document/109758423
SINAMICS S120 V4.8 w. PN: All versions < V4.8 HF4	Update to V4.8 HF4 https://support.industry.siemens.com/cs/de/en/view/109740193
SINAMICS S150 V4.7 w. PN: All versions < V4.7 HF27	Update to V4.7 HF27 https://support.industry.siemens.com/cs/ww/en/view/103433117
SINAMICS S150 V4.8 w. PN: All versions < V4.8 HF4	Update to V4.8 HF4 https://support.industry.siemens.com/cs/ww/en/view/109742040
SINAMICS V90 w. PN: All versions < V1.01	Update to V1.01 https://support.industry.siemens.com/cs/document/109746210
SIMOTION: All versions < V4.5 HF1	Update to V4.5 HF1 https://support.industry.siemens.com/cs/ww/en/view/109742328
SINUMERIK 828D V4.5 and prior: All versions < V4.5 SP6 HF2	Update to V4.5 SP6 HF2 SINUMERIK software can be obtained from your local Siemens account manager
SINUMERIK 828D V4.7: All versions < V4.7 SP4 HF1	Update to V4.7 SP4 HF1. SINUMERIK software can be obtained from your local Siemens account manager
SINUMERIK 840D sl V4.5 and prior: All versions < V4.5 SP6 HF2	Update to V4.5 SP6 HF2 SINUMERIK software can be obtained from your local Siemens account manager
SINUMERIK 840D sl V4.7: All versions < V4.7 SP4 HF1	Update to V4.7 SP4 HF1 SINUMERIK software can be obtained from your local Siemens account manager
SIMATIC HMI Comfort Panels, HMI Multi Panels, HMI Mobile Panels: All versions < V15.1	Update to V15.1 https://support.industry.siemens.com/cs/us/en/view/109761576

WORKAROUNDS AND MITIGATIONS

Siemens has identified the following specific workarounds and mitigations that customers can apply to reduce the risk:

- Apply cell protection concept: <https://www.siemens.com/cert/operational-guidelines-industrial-security>.
- Use VPN for protecting network communication between cells.
- Apply Defense-in-Depth: <https://www.siemens.com/cert/operational-guidelines-industrial-security>.

GENERAL SECURITY RECOMMENDATIONS

As a general security measure Siemens and PNO strongly recommend to protect industrial products with appropriate mechanisms. Hereby, Siemens encourages customers to verify that the affected products are protected as described in PNO Security Guidelines (Download: <https://www.profibus.com/download/profinet-security-guideline/>) and Siemens Operational Guidelines (Download: <https://www.siemens.com/cert/operational-guidelines-industrial-security>) in order to run the devices in a protected IT environment.

Additional information on Industrial Security by Siemens can be found at: <https://www.siemens.com/industrialsecurity>

PRODUCT DESCRIPTION

Communication Processor (CP) modules of families SIMATIC CP 343-1 and CP 443-1 have been designed to enable SIMATIC S7-300/S7-400 CPUs for Ethernet communication.

The SIMATIC CP 1243-1 communication processor connects the S7-1200 controller to Ethernet networks. It provides integrated security functions such as firewall, Virtual Private Networks (VPN) and support of other protocols with data encryption.

The SIMATIC CM 1542-1 communication module is used to connect S7-1500 controllers to PROFINET as IO-Controller.

The SIMATIC CP 1543-1, CP 1543SP-1, CP 1542SP-1 and CP 1542SP-1 IRC communication processors connects the S7-1500 controller to Ethernet networks. It provides integrated security functions such as firewall, Virtual Private Networks (VPN) and support of other protocols with data encryption.

SIMATIC RF600 Readers are used for the contactless identification of every kind of object, e.g. transport containers, pallets, production goods, or it can be generally used for recording goods in bulk.

CP 1616 and CP 1604 are PCI/PCI-104 cards for high-performance connection of field devices to Industrial Ethernet with PROFINET.

The Development Kit DK-16xx PN IO permits an easy integration of CP 1616 and CP 1604 in non-Windows operating system environments.

SCALANCE X switches are used to connect industrial components like Programmable Logic Controllers (PLCs) or Human Machine Interfaces (HMIs).

The SCALANCE M industrial routers are used for secure remote access to plants via mobile networks, e.g. GPRS or UMTS with the integrated security functions of a firewall for protection against unauthorized access and VPN to protect data transmission.

The SCALANCE S firewall is used to protect trusted industrial networks from untrusted networks. It allows filtering incoming and outgoing network connections in different ways.

SCALANCE W700 products are wireless communication devices used to connect industrial components like Programmable Logic Controllers (PLCs) or Human Machine Interfaces (HMIs).

Softnet PROFINET IO for PC-based Windows systems allows setting up open control solutions on standard PC hardware.

TeleControl Server Basic allows remote monitoring and control of plants.

Softnet PROFINET IO for PC-based Windows systems allows setting up open control solutions on standard PC hardware.

IE/PB-Link devices enable existing PROFIBUS devices to be integrated into a PROFINET application.

The IE/AS-i LINK PN IO is a compact network transition between PROFINET/Industrial Ethernet (PROFINET IO-Device) and AS-Interface.

The SITOP PSU8600 expandable power supply system is connected to a 3-phase AC line supply to offer regulated DC power.

SITOP UPS1600 devices augment DC 24V power supply units to offer uninterruptible rated currents up to 40A from battery modules.

SIMATIC ET 200 Interface modules for PROFINET IO are used to connect field devices (IO Devices) to controllers (IO Controller) via PROFINET.

PN/PN coupler is used for connecting two PROFINET networks.

The S7-200 SMART series is a line of micro-programmable logic controllers that can control a variety of small automation applications.

Siemens SIMATIC S7-300 CPU families, S7-400 CPU families, S7-1200 CPU families, and S7-1500 CPU families have been designed for discrete and continuous control in industrial environments such as manufacturing, food and beverages, and chemical industries worldwide.

SIMATIC S7-1500 Software Controller is a SIMATIC software controller for PC-based automation solutions.

SIMATIC WinAC RTX is a SIMATIC software controller for PC-based automation solutions.

SIRIUS ACT is a modular system of pushbuttons and indicator lights for front plate mounting and rear-mounted electrical modules.

SIRIUS 3RW soft starters permit soft starting and soft rampdown of three-phase asynchronous motors.

SIRIUS M200D motor starters for distributed installation start, monitor and protect motors and loads up to 5.5 kW.

SIMOCODE pro is a flexible, modular motor management system for motors with constant speeds in the low-voltage performance range.

The SINAMICS converter family is used to control a wide variety of drives, especially in mechanical engineering and plant construction.

SIMOTION is a scalable high performance hardware and software system for motion control.

SINUMERIK CNC offers automation solutions for the shop floor, job shops and large serial production environments.

SIMATIC HMI Panels are used for operator control and monitoring of machines and plants.

VULNERABILITY CLASSIFICATION

The vulnerability classification has been performed by using the CVSS scoring system in version 3.0 (CVSS v3.0) (<https://www.first.org/cvss/>). The CVSS environmental score is specific to the customer's environment and will impact the overall CVSS score. The environmental score should therefore be individually defined by the customer to accomplish final scoring.

Vulnerability CVE-2017-2680

Specially crafted PROFINET DCP broadcast packets could cause a Denial-of-Service condition of affected products on a local Ethernet segment (Layer 2). Human interaction is required to recover the systems. PROFIBUS interfaces are not affected.

CVSS v3.0 Base Score	6.5
CVSS Vector	CVSS:3.0/AV:A/AC:L/PR:N/UI:N/S:U/C:N/I:N/A:H/E:P/RL:O/RC:C

Vulnerability CVE-2017-2681

Specially crafted PROFINET DCP packets sent on a local Ethernet segment (Layer 2) to an affected product could cause a Denial-of-Service condition of that product. Human interaction is required to recover the system. PROFIBUS interfaces are not affected. This vulnerability affects only SIMATIC HMI Multi Panels and HMI Mobile Panels, and S7-300/S7-400 devices.

CVSS v3.0 Base Score 6.5

CVSS Vector CVSS:3.0/AV:A/AC:L/PR:N/UI:N/S:U/C:N/I:N/A:H/E:P/RL:O/RC:C

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- CNCERT/CC for coordination efforts

ADDITIONAL INFORMATION

For further inquiries on vulnerabilities in Siemens products and solutions, please contact the Siemens ProductCERT:

<https://www.siemens.com/cert/advisories>

HISTORY DATA

V1.0 (2017-05-08):	Publication Date
V1.1 (2017-06-13):	Added update information for SCALANCE X-300/X408, X414, SITOP PSU8600/UPS 1600 PROFINET and S7-400
V1.2 (2017-07-21):	Added update information for SCALANCE XM400, SCALANCE XR500, SIMATIC S7-400-H V6, SINAMICS S110, SINAMICS S120 and SINAMICS V90
V1.3 (2017-08-16):	Added update information for SIMATIC CP 1542SP-1, CP 1542SP-1 IRC, and CP 1543SP-1, SIMATIC ET 200SP, SIMATIC S7-200 SMART, SINAMICS G130, G150, and S150, and SINUMERIK 828D; Adjusted update information for Development/Evaluation Kits
V1.4 (2017-09-13):	Added update information for SCALANCE M800, S615
V1.5 (2017-10-09):	Detailed SIMATIC CP 1243-1, Added update information for SIMATIC CP 1243-1, 1243-1 IRC, SINAMICS DCM and added upgrade information for PN/PN Coupler
V1.6 (2017-11-09):	Added upgrade and update information for Softnet PROFINET IO and SIMATIC ET 200AL
V1.7 (2017-11-23):	Added update information for SCALANCE X-200 and SIMATIC S7-400 PN/DP V6 Incl. F
V1.8 (2018-01-18):	New advisory format, added update information for SIMOCODE pro V PROFINET
V1.9 (2018-01-24):	Corrected information for SIMATIC CM 1542-1 and ET 200MP. Added solution for SINAMICS DCP, and S7-400 V7 PN/DP
V2.0 (2018-02-22):	Refined ET 200MP product family; Added update information for ET 200MP IM155-5 PN ST
V2.1 (2018-03-06):	Added update information for SCALANCE X-200IRT
V2.2 (2018-05-03):	Added update information for SIMATIC CP 343-1 Std and CP 343-1 Lean
V2.3 (2018-11-13):	Updated information for SINAMICS S120, SIMATIC ET 200SP (except IM155-6 PN ST), SIMATIC Panels
V2.4 (2018-12-11):	Updated information for SIMATIC ET 200MP IM155-5 PN HF, SIRIUS ACT 3SU1 interface module PROFINET

V2.5 (2018-12-13): Corrected download links, update for CP 1243-1 not available, see mitigations
V2.6 (2019-01-08): Updated information for CP 1243-1

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