



ENVIRONMENTAL PRODUCT DECLARATION

# **SIMATIC TOP connect**

## Connecting modules

Type II according to ISO 14021 including life cycle impact assessment (LCIA)



# **SIEMENS**

# General information

This environmental product declaration (EPD) is based on the international standard ISO 14021 (“Environmental labels and declarations – Self declared environmental claims – Type II environmental labelling”). The data in this EPD has been evaluated on a full-scale life cycle assessment (LCA) study according to ISO 14040/44, taking into account the product category rules (PCR) for electronic and electrotechnical products and systems defined in EN 50693, as well as product specific rules (PSR) for low-voltage switchgear and control gear equipment in IEC TS 63058 ED1.0

Siemens is dedicated to an environmentally conscious design of its products in line with IEC 62430 and has implemented an integrated management system according to ISO 9001, ISO 14001 and ISO 45001.

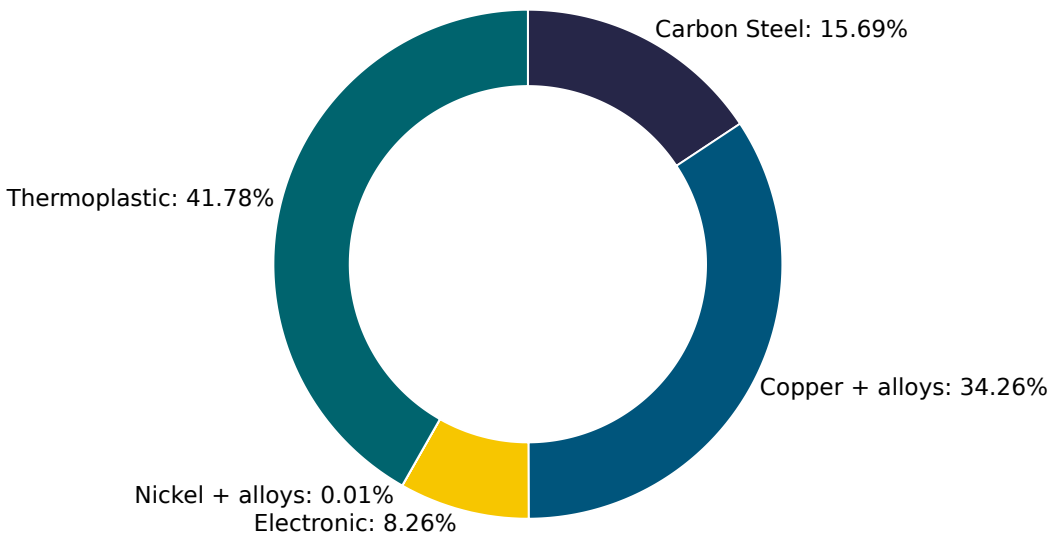
Products	Please refer to appendix
Represented by the reference product	6ES7924-2CA20-0BA0
Product Description	Connection module TP3 32 channels a. 2x33 terminals f. Potential supply Type: Screw terminal with LED, VPE=1 unit 50 pole IDC connector for cable
Functional Unit	Production of 1 pc. SIMATIC TOP connect and use over the reference service lifetime of 10 years. <sup>1</sup>

<sup>1</sup> The lifetime value used for calculation is a reference value and does not equate with the minimum, average or real life time.

# Material composition

The following chart outlines the overall material composition of the calculated reference product without packaging. Product weight of 0.47 kg adds up with packaging weight of 0.04 kg to a total weight of 0.51 kg. Packaging consists of: Graphic Paper, Corrugated box, average composition.




Product Weight 0.47 kg



# Substance assessment

At Siemens, we are committed to the development and production of environmentally sound and sustainably produced equipment. This includes avoiding hazardous substances in our products without compromising their benefits for our customers. Please visit the following website to learn more about how we comply with product-related environmental regulations like RoHS, REACH, WEEE and others: [Product Related Environmental Protection](#)

## Life cycle stages and reference scenarios

 <b>Manufacturing</b>  This stage covers the extraction of natural resources, production of raw materials, manufacturing, packaging, and transportation.	 <b>Distribution and Operation</b>  This stage covers the product's distribution, installation, use, and maintenance. Different operating conditions can lead to deviations from the reference scenario.	 <b>End-of-Life</b>  This stage covers the disassembly or shredding and material recycling of all recyclable materials, as well as energy recovery, thermal treatment and the disposal of all other materials.
<b>Scenarios</b>		
<b>Energy model used:</b> Romania (standard mix) Europe (standard mix)  <b>Transportation model:</b> Truck-trailer (GLO), 34-40t gross weight, 3500 km default distance	<b>Energy model used:</b> Europe (standard mix)  <b>Distribution scenario:</b> Truck-trailer, 34 - 40t gross weight 3500 km  <b>Use Scenario:</b> 3.35 W power dissipation, 100% service uptime: reference lifetime 10 years	<b>Energy model used:</b> EMEA  <b>End-of-Life methodology:</b> Modeled according to Cut-off methodology.

# Key environmental performance indicators

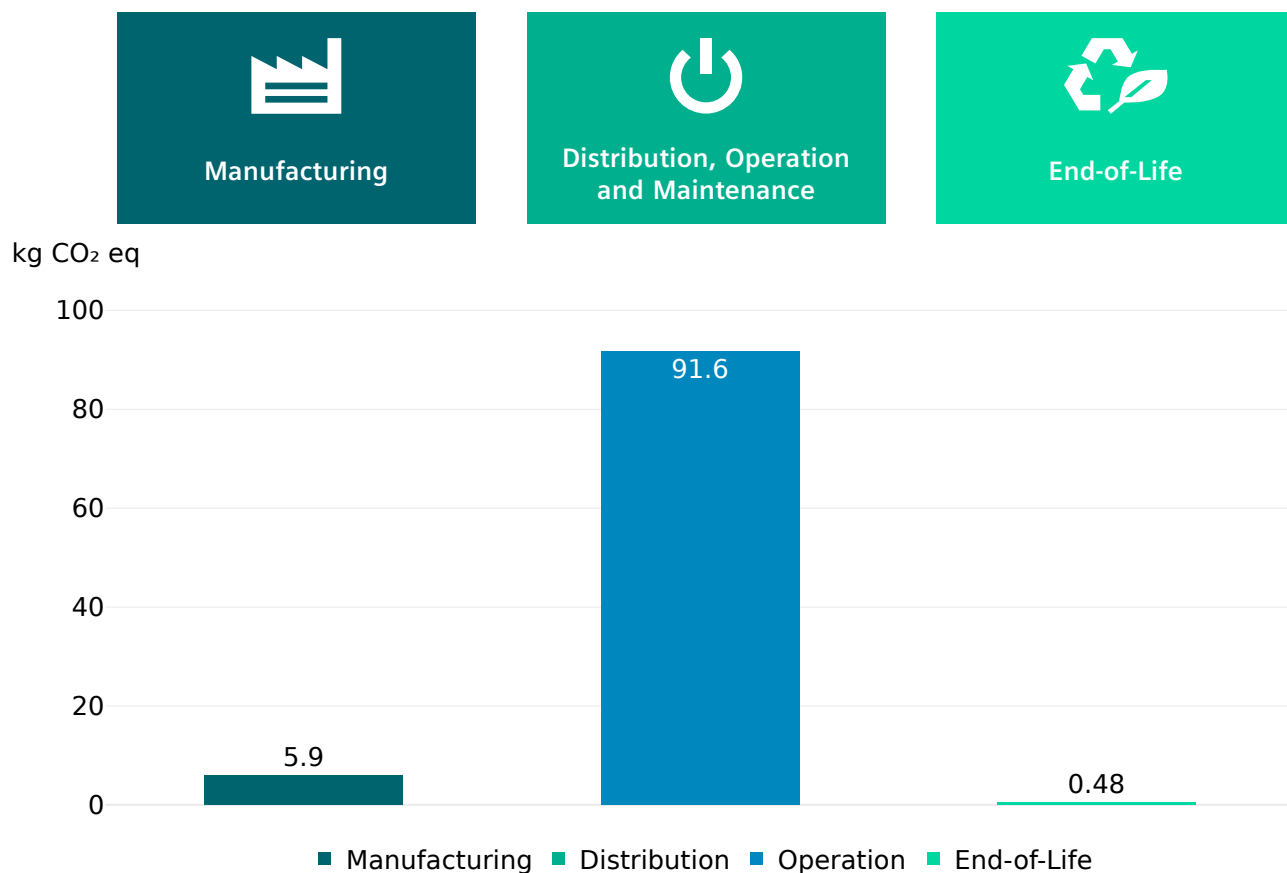
The following impact categories characterize the product's environmental footprint. They have been calculated with LCIA methodology EF3.1; LCA tool: Green Digital Twin (GDT), Database: One Siemens LCA Database (based on MLC CUP 2023.2, formerly GaBi).

To ensure the high quality and completeness of the LCA results, Primary Data have been used whenever possible. Datasets for resources, such as electrical energy or natural gas, are chosen from the region where the device is produced and assembled. If primary data are not available, datasets reflecting state-of-the-art manufacturing technology are considered.

Impact Category	Unit	Total	Manufacturing	Distribution	Operation	End-of-life
Acidification	Mole of H+ eq	2.33E-1	3.88E-2	1.67E-4	1.94E-1	4.27E-4
Climate change – total	kg CO <sub>2</sub> eq	9.81E+1	5.89E+0	1.31E-1	9.16E+1	4.76E-1
Climate change – fossil	kg CO <sub>2</sub> eq	9.73E+1	5.87E+0	1.29E-1	9.08E+1	4.76E-1
Climate change – biogenic	kg CO <sub>2</sub> eq	8.18E-1	1.42E-2	3.50E-4	8.04E-1	7.72E-5
Climate Change, land use and land use change	kg CO <sub>2</sub> eq	1.53E-2	5.38E-3	1.21E-3	9.90E-3	5.72E-6
Ecotoxicity, freshwater – total	CTUe	5.64E+2	3.21E+1	1.27E+0	5.30E+2	9.44E-2
Eutrophication, freshwater	kg P eq	3.84E-4	4.26E-5	4.76E-7	3.40E-4	3.15E-7
Eutrophication, marine	kg N eq	5.16E-2	4.94E-3	5.66E-5	4.64E-2	2.07E-4
Eutrophication, terrestrial	Mole of N eq	5.40E-1	5.24E-2	6.81E-4	4.85E-1	2.34E-3
Human toxicity, cancer – total	CTUh	3.21E-8	4.03E-9	2.58E-11	2.81E-8	7.50E-12
Human toxicity, non-cancer – total	CTUh	6.42E-7	1.93E-7	1.15E-9	4.47E-7	3.27E-10
Ionising radiation, human health	kBq U235 eq	5.06E+1	2.93E-1	4.97E-4	5.03E+1	3.20E-3
Land Use	dimensionless (pt)	7.65E+2	1.25E+1	7.41E-1	7.52E+2	6.87E-2
Ozone depletion	kg CFC-11 eq	8.86E-9	7.18E-9	1.69E-14	1.68E-9	1.29E-13
Particulate matter	Disease incidences	2.15E-6	5.14E-7	1.22E-9	1.63E-6	1.32E-9
Photochemical ozone formation, human health	kg NMVOC eq	1.40E-1	1.55E-2	1.44E-4	1.24E-1	5.32E-4
Resource use, fossils	MJ	1.99E+3	8.54E+1	1.77E+0	1.91E+3	2.93E-1
Resource use, mineral and metals	kg Sb eq	1.00E-3	9.90E-4	8.63E-9	1.40E-5	1.15E-9
Water use	m <sup>3</sup> water eq deprived water	2.18E+1	1.78E+0	1.57E-3	2.00E+1	4.54E-2

# Climate change

This chart shows the overall impact of the product on climate change – total. The operations phase is the lifecycle phase with the biggest overall impact. Different operating conditions can lead to deviations from the reference scenario.



## End-of-Life results

The end-of-life stage was modelled by shredding of the device, followed by sorting and material separation process.



It leads to:

- an overall **product recyclability of up to 48%** mainly due to metal content
- an **energy recoverability of up to 40%** from plastic materials
- a **minimum disposal rate of 11%**

The exact final values depend on the used recycling process and add up to 100%.

**Note:** The device should not be disposed of as unsorted municipal waste. Special treatment for specific components may be mandated by law or recommended for environmental reasons. Observe all local and applicable laws.

# Appendix

For the „Key environmental performance indicators“ of similar products please refer to the following factors:

Product	Description	Manufacturing	Distribution	Operation	End-of-Life
6ES7924-2CA20-0BA0	Connection module TP3 32 channels a. 2x33 terminals f. Potential supply Type: Screw terminal with LED, VPE=1 unit 50 pole IDC connector for cable	1	1	1	1
6ES7924-0AA20-0AA0	Connection module TP1 8 channels u. 2x2 terminals f. Potential supply Type: Screw terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,148	0,148	0,116	0,148
6ES7924-0AA20-0AC0	Connection module TP1 8 channels u. 2x2 terminals f. Potential supply Type: Push-in terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,093	0,093	0,116	0,093
6ES7924-0AA20-0BA0	Connection module TP1 8 channels u. 2x2 terminals f. Potential supply Type: Screw terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,148	0,148	0,269	0,148
6ES7924-0AA20-0BC0	Connection module TP1 8 channels u. 2x2 terminals f. Potential supply Type: Push-in terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,093	0,093	0,269	0,093
6ES7924-0BB20-0AA0	Terminal block TP2 8 channels f. 2 A digital output and 2x6 multiplication terminals Type: Screw terminal without LED, VPE=1 unit 16 pole IDC connection for cable	0,241	0,241	0,149	0,241
6ES7924-0BB20-0AC0	Connection module TP2 8 channels f. 2 A digital output and 2x6 multiplication terminals Type: Push-in terminal without LED, VPE=1 unit 16 pole IDC connection for cable	0,185	0,185	0,149	0,185
6ES7924-0BD20-0BA0	Connection module TPRO with relay 24 V DC, Output 8 NO contacts 230V AC/3 A 30 V DC/3 A, Type: Screw terminal with LED, VPE=1 unit 16 pole IDC connection for cable	0,463	0,463	2,537	0,463
6ES7924-0BD20-0BC0	Connection module TPRO with relay 24 V DC, Output 8 NO contacts 230V AC/3 A 30 V DC/3 A, Type: Push-in terminal with LED, VPE=1 unit 16 pole IDC connection for cable	0,37	0,37	2,537	0,37
6ES7924-0BE20-0BA0	Connection module TPRI with relay 230 V AC, Output 8 NO contacts 24V DC/0.05 A Type: Screw terminal with LED, VPE=1 unit 16 pole IDC connection for cable	0,648	0,648	3,104	0,648

For the „Key environmental performance indicators“ of similar products please refer to the following factors:

Product	Description	Manufacturing	Distribution	Operation	End-of-Life
6ES7924-0BE20-0BC0	Connection module TPRI with relay 230 V AC, Output 8 NO contacts 24V DC/0.05 A Type: Push-in terminal with LED, VPE=1 unit 16 pole IDC connection for cable	0,589	0,589	3,104	0,589
6ES7924-0BF20-0BA0	Connection module TPOO w. optocoupler 24 V DC, Output 8 NO contacts 24V DC/4 A Overload and short circuit-proof, with LED Push-in terminal VPE = 1 unit 16 pole IDC connection for cable	0,537	0,537	3,104	0,537
6ES7924-0BF20-0BC0	Connection module TPOO with optocoupler 24 VDC, Output 8 NO contacts 24V DC/4 A Overload and short circuit-proof, with LED Push-in terminal VPE = 1 unit 16 pole IDC connector f. cable	0,37	0,37	3,104	0,37
6ES7924-0BG20-0BA0	Connection module TPRI with relay 110 V AC, Output 8 NO contacts 24V DC/0.05 A Type: Screw terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,648	0,648	3,045	0,648
6ES7924-0BG20-0BC0	Connection module TPRI with relay 110 V AC, Output 8 NO contacts 24V DC/0.05 A Type: Push-in terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,556	0,556	3,045	0,556
6ES7924-0CA20-0AA0	Connection module TP3 8 channels u. 2x10 terminals f. Potential supply Type: Screw terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,296	0,296	0,112	0,296
6ES7924-0CA20-0AC0	Connection module TP3 8 channels u. 2x10 terminals f. Potential supply Type: Push-in terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,185	0,185	0,112	0,185
6ES7924-0CA20-0BA0	Connection module TP3 8 channels u. 2x10 terminals f. Potential supply Type: Screw terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,296	0,296	0,263	0,296
6ES7924-0CA20-0BC0	Connection module TP3 8 channels u. 2x10 terminals f. Potential supply Type: Push-in terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,185	0,185	0,263	0,185
6ES7924-0CC20-0AA0	Connection module TPA 3-tier for analog Modules of the SIMATIC S7-1500 Type: Screw terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,315	0,315	0,116	0,315

For the „Key environmental performance indicators“ of similar products please refer to the following factors:

Product	Description	Manufacturing	Distribution	Operation	End-of-Life
6ES7924-0CC20-0AC0	Connection module TPA 3-tier for analog Modules of the SIMATIC S7-1500 Type: Push-in terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,204	0,204	0,116	0,204
6ES7924-0CC21-0AA0	Connection module TPA 3-tier for analog Modules of the SIMATIC S7-300 Type: Screw terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,333	0,333	0,116	0,333
6ES7924-0CC21-0AC0	Connection module TPA 3-tier for analog Modules of the SIMATIC S7-300 Type: Push-in terminal without LED, VPE=1 unit 16 pole IDC connector f. cable	0,222	0,222	0,116	0,222
6ES7924-0CH20-0BA0	Connection module TP3 with isolating terminal per channel 8 channels and 2x10 terminals for Potential supply Type: Screw terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,426	0,426	0,358	0,426
6ES7924-0CH20-0BC0	Connection module TP3 with isolating terminal per channel 8 channels and 2x10 terminals for Potential supply Type: Push-in terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,315	0,315	0,358	0,315
6ES7924-0CL20-0BA0	Connection module TP3 with fuse per channel 8 channels and 2x10 terminals for Potential supply Type: Screw terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,463	0,463	0,388	0,463
6ES7924-0CL20-0BC0	Connection module TP3 with fuse per channel 8 channels and 2x10 terminals for Potential supply Type: Push-in terminal with LED, VPE=1 unit 16 pole IDC connector f. cable	0,37	0,37	0,388	0,37
6ES7924-2AA20-0AA0	Connection module TP1 32 channels a. 4x2 terminals f. Potential supply Type: Screw terminal without LED, VPE=1 unit 50 pole IDC connector f. cable	0,574	0,574	0,955	0,574
6ES7924-2AA20-0AC0	Connection module TP1 32 channels a. 4x2 terminals f. Potential supply Type: Push-in terminal without LED, VPE=1 unit 50 pole IDC connector f. cable	0,389	0,389	0,955	0,389
6ES7924-2AA20-0BA0	Connection module TP1 32 channels a. 4x2 terminals f. Potential supply Type: Screw terminal with LED, VPE=1 unit 50 pole IDC connector f. cable	0,574	0,574	1,522	0,574



For the „Key environmental performance indicators“ of similar products please refer to the following factors:

Product	Description	Manufacturing	Distribution	Operation	End-of-Life
6ES7924-2AA20-0BC0	Connection module TP1 32 channels a. 4x2 terminals f. Potential supply Type: Push-in terminal with LED, VPE=1 unit 50 pole IDC connector for cable	0,389	0,389	1,522	0,389
6ES7924-2AK20-0BA0	Connection module TP1 DI-M read 32 channels a. 4x2 terminals f. Potential supply Type: Screw terminal with LED, VPE = 1 unit 50 pole IDC connector f. cable	0,389	0,389	1,522	0,389
6ES7924-2AK20-0BC0	Connection module TP1 DI-M read 32 channels a. 4x2 terminals f. Potential supply Type: Push-in terminal with LED, VPE = 1 unit 50 pole IDC connector f. cable	0,370	0,370	1,522	0,370
6ES7924-2AM20-0BA0	Connection module TP1 M signal 32 channels a. 4x2 terminals f. Potential supply Type: Screw terminal with LED, VPE = 1 unit 50 pole IDC connector f. cable	0,389	0,389	1,522	0,389
6ES7924-2AM20-0BC0	Connection module TP1 M signal 32 channels a. 4x2 terminals f. Potential supply Type: Push-in terminal with LED, VPE = 1 unit 50 pole IDC connector f. cable	0,389	0,389	1,522	0,389
6ES7924-2CA20-0AA0	Connection module TP3 32 channels a. 2x33 terminals f. Potential supply Type: Screw terminal without LED, VPE=1 unit 50 pole IDC connector for cable	0,926	0,926	0,448	0,926
6ES7924-2CA20-0AC0	Connection module TP3 32 channels a. 2x33 terminals f. Potential supply Type: Push-in terminal without LED, VPE=1 unit 50 pole IDC connector for cable	0,63	0,63	0,448	0,63
6ES7924-2CA20-0BC0	Connection module TP3 32 channels a. 2x33 terminals f. Potential supply Type: Push-in terminal with LED, VPE=1 unit 50 pole IDC connector for cable	0,63	0,63	1	0,63
6ES7924-2CC20-0AA0	Connection module TPA 3-tier for analog Modules of the SIMATIC S7-1500 Type: Screw terminal without LED, VPE=1 unit 50 pole IDC connector for cable	0,759	0,759	0,955	0,759
6ES7924-2CC20-0AC0	Connection module TPA 3-tier for analog Modules of the SIMATIC S7-1500 Type: Push-in terminal without LED, VPE=1 unit 50 pole IDC connector for cable	0,463	0,463	0,955	0,463

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