Starter Kit Plus

Demo kit with smart components and periMICA

Quick start guide

Perinet
Seamless IoT Connectivity

Abstract

The Starter Kit Plus contains the Perinet Smart Components and a periMICA modular edge computer and provides a proof of concept of an IoT application running with our solution.

The Smart Components are electronic components that can establish seamless communication - with no gaps and protocol conversions - between field devices (i.e. sensors and actuators) and any IT-system or edge device within the local network they are connected to.

Discover Seamless IoT Connectivity with your Starter Kit!

Document Information

Title	Starter Kit Plus
Subtitle	Demo kit with smart components and periMICA
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Contents

1 Package content

1.1 Item List

Item	Description	Product
1	1 pc. periNODE smart adapter 0-10V Article No. PRN.000.002	
2	1 pc. periNODE smart adapter GPIO Article No. PRN.000.010	
3	1 pc. periSWITCH 3-port Article No. PRN.000.008	
4	1 pc. periSTART media converter Article No. PRN.000.003	
5	3 pcs. periLINE hybrid SPE cable Article No. PRN.000.017	

6	1 pc. periSTART power supply 24VDC Article No. PRN.000.035	
7	1 pc. periMICA modular edge computer Article No. PRN.000.025	
8	1 pc. PoE injector incl. power supply & Ethernet cable (RJ45//RJ45) Article No. PRN.100.347	
9	1 pc. M8 A-coded Fast Ethernet cable Article No. PRN.100.362	
10	1 pc. M12 X-coded Fast Ethernet cable Article No. PRN.100.003	

11	1 pc. Contactor	
12	1 pc. Distance sensor	
13	1 pc. Reset cable Article No. PRN.100.437	

Table 1: Starter Kit Plus Components

1.2   Assembling

Prerequisites

- PC / Laptop

- Network ports (e.g. ethernet switch)

- Power sockets

Set up the Starter Kit Plus

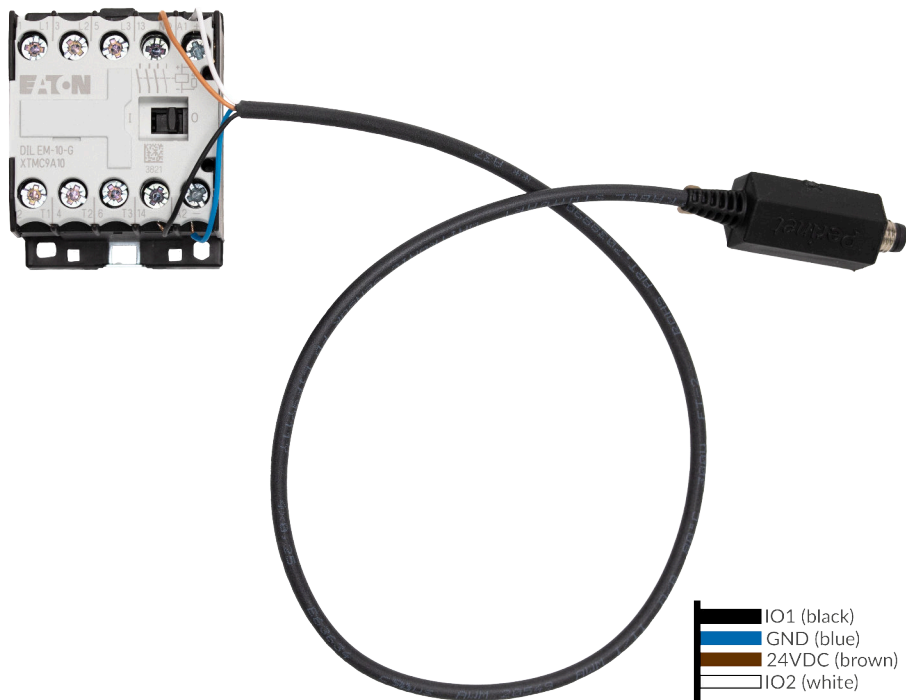Please connect the GPIO to the contactor as shown in Figure 1.

Figure 1: periNODE GPIO connected with the contactor

Connect the rest of the components as shown in Figure 2 below. Make sure the ethernet switch is connected to the local network.
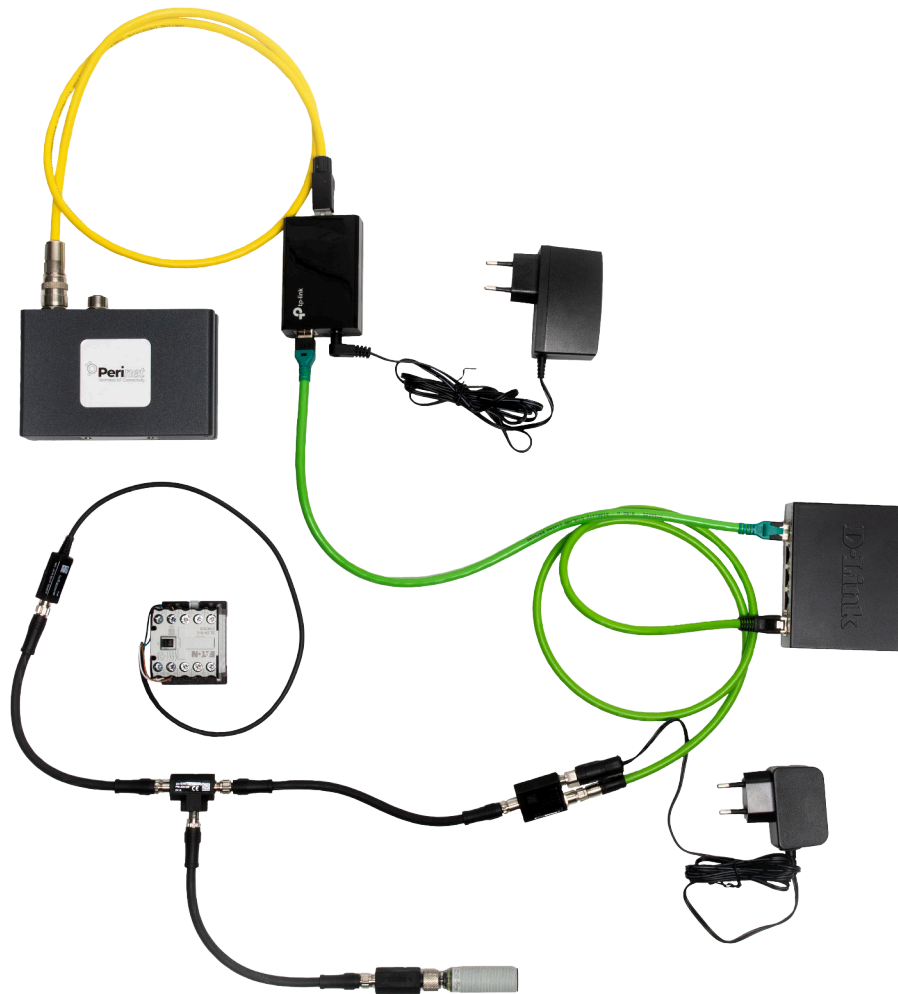
Figure 2: Starter Kit Plus setup

Warning: Please connect all devices before the power supply (100V...240V).

The Starter Kit Plus is now ready for login.

2   IoT Application Setup

2.1   periMICA Setup

The access credentials of the periMICA - *device name* and *password* - can be found on the back panel of the device as shown in Figure 3.
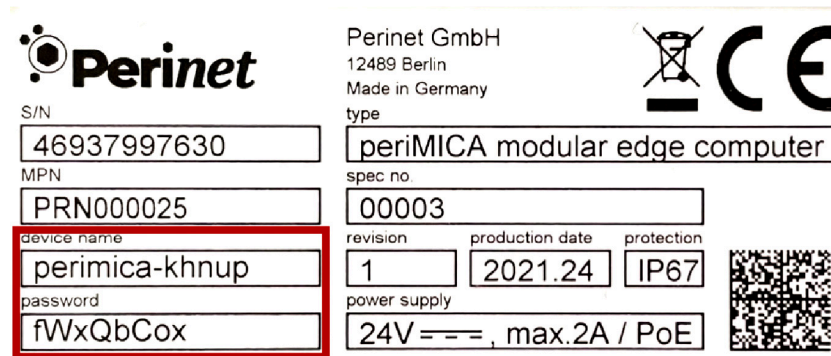
Figure 3: periMICA back panel

2.2   Logging in

Open a web browser and enter the URL of the periMICA in its address bar. The URL is determined by the *device name*, as follows: `https://<devicename>.local`.

A security warning as in Figure 4 may display, please ignore it and continue.
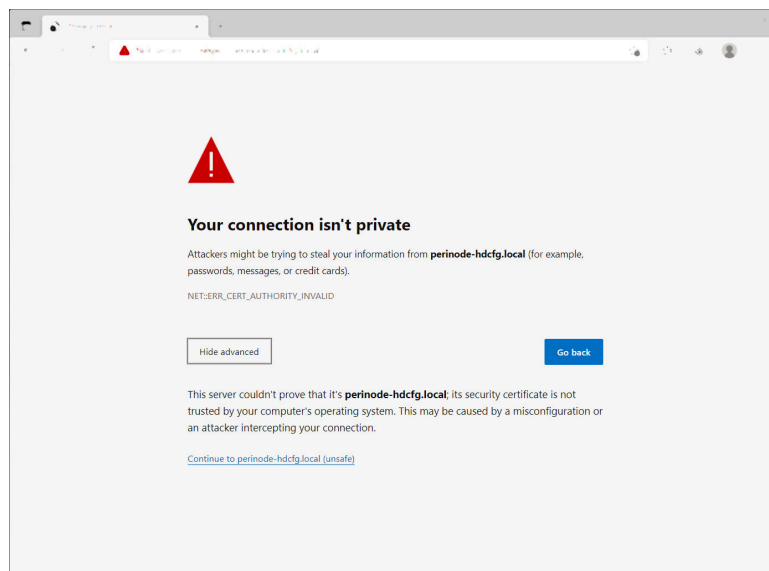
Figure 4: Browser security warning

In the example in Figure 3, the device name is *perimica-khnup*, thus the URL for this periMICA is `https://perimica-khnup.local` and the password is *fWxQbCox*.

After the System Login tab appears as in Figure 5, please enter the device credentials.
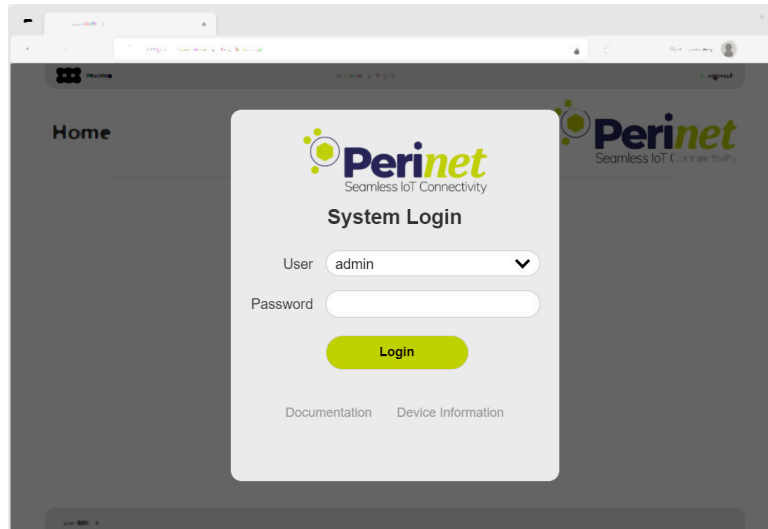
Figure 5: Login of periMICA

2.3 Security Certificate Installation

Please click on the *GettingStarted* container as can be seen in Figure 6.

Warning: You may receive a security warning as previously. Please ignore it for now and follow the instructions.
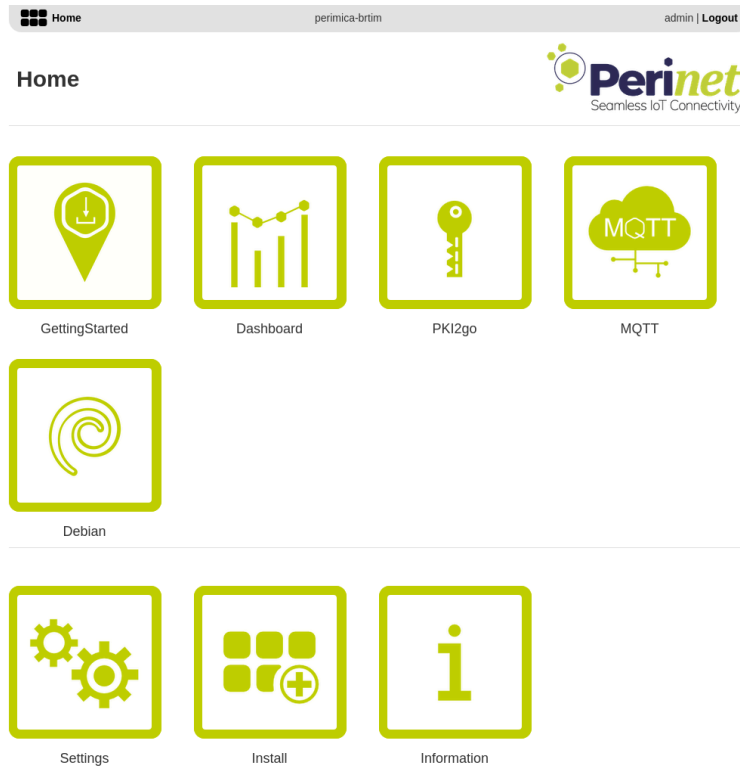
Figure 6: periMICA homepage

On the webpage of the container, the instructions to install the client certificates are given, as can be seen in Figure 7.

Perinet kindly recommends following these instructions step by step. Trying to access the containers or periNODEs without installing the client certificate first may lead to denied access.

Figure 7: GettingStarted container's homepage

At the first access of each container/periNODE, a message like in Figure 8 will be displayed. Select the previously installed certificate chain and click *OK* to continue.
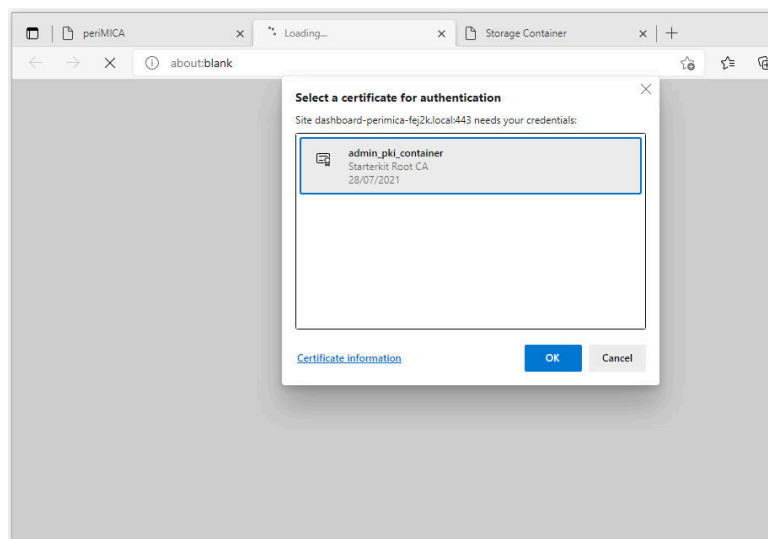

Figure 8: Client authentication

For your convenience, please read Section 4 about troubleshooting to be aware of possible problems.

Note: After installing and using the certificates, you have now completed the setup! All the pre-installed and pre-configured containers, as well as the periNODE smart adapters functionalities are available for exploration.

3 Exploring the Starter Kit

3.1 Access The periMICA Dashboard

The periMICA has a built-in Grafana dashboard that shows live sensor data.

On the Dashboard container homepage, please click on *Open Dashboard* as can be seen in Figure 9, to see the GPIO and distance values coming from the sensors included in the Starter Kit like shown in Figure 10.
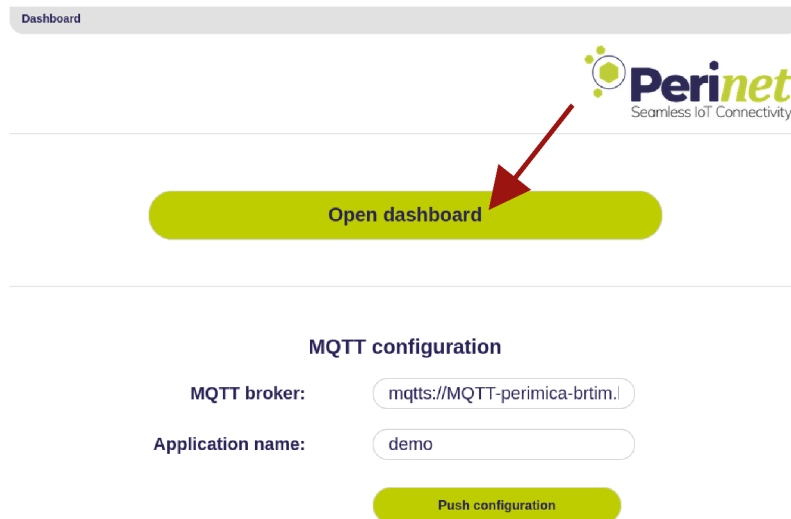
Figure 9: Dashboard container homepage
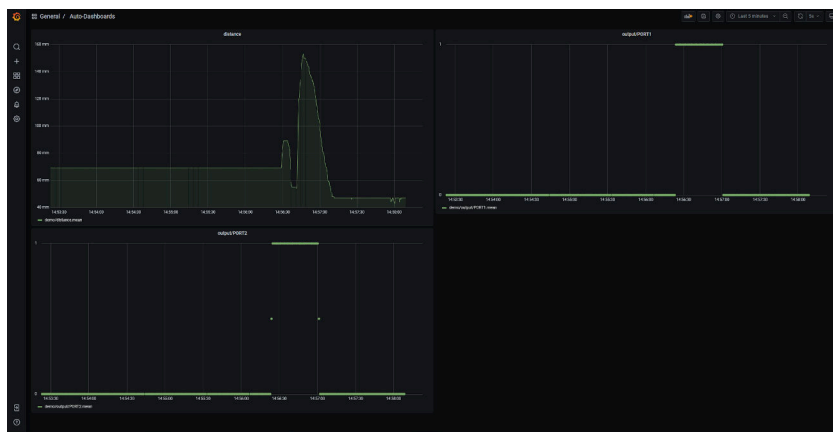
Figure 10: Grafana dashboard

3.2 periMICA Containers

A detailed description of each periMICA container can be found in the corresponding *Container User Guide*, available on `https://docs.perinet.io`.

3.3 Access The periNODE Web UI

The periNODE smart adapters have a friendly Web User Interface (UI) for device management and configuration.

To access the Web UI, open your browser and enter the URL of the node in its address bar. The URL is determined by the node name, written on the device, as follows: `https://<nodename>.local`.

Figure 11 shows a periNODE smart adapter for 0-10V signal type. In this case the node's name is perinode-aab8k, thus the URL for this periNODE is: `https://perinode-aab8k.local`.

Figure 11: Label of a periNODE 0-10V

Based on the above, use the node name corresponding to the device in your kit.

Figure 12 shows the homepage of the periNODE that displays the live sensor values.

Figure 12: periNODE homepage

Since the periNODEs in the Starter Kit Plus are bound to the periMICA application, Perinet suggests to not change the configuration.

4 Troubleshooting

Problem	Solution
Client certificate to access a periNODE is lost	Please consult the *Smart Components Datasheet* to reset the periNODE using the reset cable. It is available on `https://docs.perinet.io`.
"Your connection is not private" warning in browser	Please ignore this warning, and continue by choosing "advanced" and "Proceed to domain".
The green LED of the I/O connector is on solid, but periMICA is not accessible.	Check if the orange LED besides the PoE connector is flashing. If this is not the case, the M12 X-coded push-pull was connected wrongly. Unplug the connector and check if the plastic around the socket is deformed (see picture). Insert a pointy object (such as a ballpoint pen) into the hole to carefully remove the deformation, then plug the M12 X-coded push-pull safely back into the PoE connector.
You experience messages about invalid certificates, which should not be invalid.	The date has become invalid. This happens e.g. when the Starter Kit was powered off for more than 3 days and had no internet access while bootup. If the periMICA is not able to reach any NTP (Network Time Protocol) server, its Time & Date are not automatically synchronized. This can generate security errors when trying to access the containers installed. To fix this problem you can configure the Time & Date manually in *periMICA Homepage → Settings → Time & Date*.
In Grafana, values do not appear at the current point in time ("now").	

Table 2: Troubleshooting

5 Further Documentation

5.1 Starter Kits

Document Name	Description
Starter Kit Plus Product Summary [19]	A product features summary documentation for the *Starter Kit Plus*.
Starter Kit Plus Quick Start Guide [20]	A setup guide for the *Starter Kit Plus* product.
Starter Kit Plus User Guide [22]	A detailed description of the setup *Starter Kit Plus*.
Starter Kit Plus Security Certificates Installation Guide [21]	A small guide on how to install security prerequisites for accessing the various entities of the *Starter Kit Plus* setup.
Starter Kit Product Summary [23]	A product features summary documentation for the available *Starter Kit*s.
Starter Kit Quick Start Guide [24]	A setup guide for the *Starter Kit* products.

5.2 periMICA

Document Name	Description
periMICA Product Summary [8]	A product features summary documentation for the *periMICA*.
periMICA Quick Start Guide [9]	A setup guide for the product *periMICA*. The starting point when you are new to the product.
periMICA User Guide [10]	A detailed description and reference documentation of the product *periMICA*.
PKI2go Container User Guide [16]	A detailed description of the public key infrastructure (PKI) periMICA container 'PKI2GO'.
Security Certificates Installation Guide [17]	A guide on how to install prerequisites certificates on various platforms (MAC, Windows and linux).
periMICA Debian Container User Guide [7]	A detailed description of the base container of a periMICA lxc-based container. It's the starting point for container development.

5.3 Smart Components

Document Name	Description
PeriLINE Product Summary [6]	A product features summary documentation for the product *periLINE*.
periNODE 0-10V Product Summary [11]	A product features summary documentation for the product *periNODE 0-10V*.
periNODE Pt100 Product Summary [13]	A product features summary documentation for the product *periNODE Pt100*.
periNODE GPIO Product Summary [12]	A product features summary documentation for the product *periNODE GPIO*.
periSWITCH 3-port Product Summary [15]	A product features summary documentation for the product *periSWITCH 3-port*.
periSTART Standard Product Summary [14]	A product features summary documentation for the product *periSTART standard*.
Smart Components Datasheet [18]	A detailed reference documentation of the Smart Components products (*periLINE*, *periNODE 0-10V*, *periNODE Pt100*, *periNODE GPIO*, *periSWITCH 3-port*, *periSTART standard*).

5.4 periCORE

Document Name	Description
periCORE Product Summary [5]	A product features summary documentation for the product *periCORE*.
periCORE Datasheet [1]	A detailed reference documentation of the product *periCORE*.
periCORE Development Kit Product Summary [2]	A product features summary documentation for the product *periCORE Development Kit*.
periCORE Development Kit Setup Application Note [3]	A setup guide for the product *periCORE Development Kit*. The starting point when you are new to the product which describes how to quickly set up a development environment for firmware development for a periCORE based product.
periCORE Development Kit User Guide [4]	A guide and reference documentation for the product *periCORE Development Kit*.

6 Contact & Support

For customer support, please call us at **+49 30 863 206 701** or send an e-mail to *support@perinet.io*.

For complete contact information visit us at `www.perinet.io`

A List of Figures

B   List of Tables

C   Glossary

NTP Network Time Protocol. 16

PKI Public Key Infrastructure. 17

D   References

[1]   Perinet GmbH. periCORE Datasheet. PRN.100.375. `https://docs.perinet.io/`.

[2]   Perinet GmbH. periCORE Development Kit Product Summary. PRN.100.546. `https://docs.perinet.io/`.

[3]   Perinet GmbH. periCORE Development Kit Setup Application Note. PRN.100.376. `https://docs.perinet.io/`.

[4]   Perinet GmbH. periCORE Development Kit User Guide. PRN.100.378. `https://docs.perinet.io/`.

[5]   Perinet GmbH. periCORE Product Summary. PRN.100.301. `https://docs.perinet.io/`.

[6]   Perinet GmbH. PeriLINE Product Summary. PRN.100.386. `https://docs.perinet.io/`.

[7]   Perinet GmbH. periMICA Debian Container User Guide. PRN.100.462. `https://docs.perinet.io/`.

[8]   Perinet GmbH. periMICA Product Summary. PRN.100.389. `https://docs.perinet.io/`.

[9]   Perinet GmbH. periMICA Quick Start Guide. PRN.100.391. `https://docs.perinet.io/`.

[10]   Perinet GmbH. periMICA User Guide. PRN.100.392. `https://docs.perinet.io/`.

[11]   Perinet GmbH. periNODE 0-10V Product Summary. PRN.100.380. `https://docs.perinet.io/`.

[12]   Perinet GmbH. periNODE GPIO Product Summary. PRN.100.382. `https://docs.perinet.io/`.

[13]   Perinet GmbH. periNODE Pt100 Product Summary. PRN.100.381. `https://docs.perinet.io/`.

[14]   Perinet GmbH. periSTART Standard Product Summary. PRN.100.383. `https://docs.perinet.io/`.

[15]   Perinet GmbH. periSWITCH 3-port Product Summary. PRN.100.385. `https://docs.perinet.io/`.

[16]   Perinet GmbH. PKI2go Container User Guide. PRN.100.465. `https://docs.perinet.io/`.

[17]   Perinet GmbH. Security Certificates Installation Guide. PRN.100.447. `https://docs.perinet.io/`.

[18]   Perinet GmbH. Smart Components Datasheet. PRN.100.387. `https://docs.perinet.io/`.

[19]   Perinet GmbH. Starter Kit Plus Product Summary. PRN.100.568. `https://docs.perinet.io/`.

[20]   Perinet GmbH. Starter Kit Plus Quick Start Guide. PRN.100.394. `https://docs.perinet.io/`.

[21]   Perinet GmbH. Starter Kit Plus Security Certificates Installation Guide. PRN.100.397. `https://docs.perinet.io/`.

[22]   Perinet GmbH. Starter Kit Plus User Guide. PRN.100.548. `https://docs.perinet.io/`.

[23]   Perinet GmbH. Starter Kit Product Summary. PRN.100.567. `https://docs.perinet.io/`.

[24]   Perinet GmbH. Starter Kit Quick Start Guide. PRN.100.569. `https://docs.perinet.io/`.

E   Revision History

Revision	Date	Author(s)	Description
1	2022-02-15	dher	Initial Release, slight modification from Starter Kit Maxi
2	2022-05-16	beng	
3	2022-06-01	asch	Upgrade documentation system, enhance warning and troubleshooting notes
4	2022-08-24	shoe	add Section 5