

DATENBLATT SMART-METER-ADAPTER

Kontakt: Bei Fragen wenden Sie sich bitte an info@oesterreichsenergie.at.

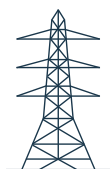
Der Smart-Meter-Adapter dient als Brücke zwischen dem privaten Heimnetzwerk des Anwenders und dem Smart-Meter des Netzanbieters. Er soll dem privaten Anwender eine einfache Möglichkeit bieten, die eigenen Zählerdaten zu erfassen und für eigene Zwecke zu verarbeiten.

Der Smart-Meter-Adapter arbeitet dabei nur „lokal“ und stellt von sich aus keine Verbindung zum Internet her.

Funktionsbeschreibung:



- Der Smart-Meter-Adapter dient als Schnittstelle zwischen dem Smart-Meter und dem Endkunden.
- Der Smart-Meter-Adapter empfängt die Verbrauchsdaten vom Smart-Meter und stellt diese über WLAN bereit.
- Die Daten werden am Dashboard angezeigt und können über JSON API, MQTT oder Modbus TCP abgefragt werden.
- Es werden alle gängigen Smart-Meter der österreichischen Netzbetreiber unterstützt.
- Die Entschlüsselung der Verbrauchsdaten findet im Adapter statt. Die notwendigen Schlüssel werden vom Netzbetreiber zur Verfügung gestellt.
- Die Versorgung erfolgt über USB oder, wenn es der Zähler unterstützt, durch den Zähler.
- Abnehmbare WLAN Antenne (SMA)
- Keine Speicherung von Verbrauchswerten im Adapter
- Einsatz nur in Innenräumen
- Die Anzeigemöglichkeiten variieren je nach Zählertyp und Netzbetreiber
- Zeitgleich werden nicht mehr als 3 Verbindungen zugelassen, bei verschiedenen Clients ist eine neue Anmeldung notwendig



Versorgung:	USB-C
Schutzart:	IP20
Umgebungstemperatur:	-25°C bis +75°C
Luftfeuchte:	≤ 95% REH, nicht kondensierend
Unterstützte SmartMeter-Schnittstellen:	IR, DSMR, MBUS, WMBUS, MEP
Verschlüsselung WLAN:	IEEE 802.11 unverschlüsselt, WEP, WPA, WPA2
Betriebsmodus WLAN:	Access-Point, Infrastruktur
WLAN SSID (ad hoc Modus):	befindet sich am seitlichen Etikett (Beispiel: Energie_AA:BB:CC)
Leistungsaufnahme:	typ. 1W, abhängig von WLAN Signalstärke
Breite:	1 Teilungseinheit einer Standardhutschiene
Montagemöglichkeiten:	Hutschienenmontage, Wandmontage, Klebmontage

Folgende Varianten des Smart-Meter-Adapters stehen zur Verfügung:					
DSMR	MEP	Infrarot	MBUS RJ11	MBUS RJ45	wireless MBUS

Unterstützte Smart-Meter

Hersteller	Typ	Netzbetreiber	Schnittstelle/Protokoll
Iskra	AM550-TD0.11	KNG-Kärnten Netz GmbH	DSMR / DIMS
Iskra	AM550-ED0.13	Wiener Netze GmbH KNG-Kärnten Netz GmbH	IR / DIMS
Kaifa	MA110M	Netz Niederösterreich GmbH Salzburg Netz GmbH Innsbrucker Kommunalbetriebe AG TINETZ-Tiroler Netze GmbH Vorarlberger Energienetze GmbH	MBUS / DIMS
Kaifa	MA309MH4LAT1	Netz Niederösterreich GmbH Salzburg Netz GmbH Innsbrucker Kommunalbetriebe AG TINETZ-Tiroler Netze GmbH Vorarlberger Energienetze GmbH	MBUS / DIMS
Kaifa	MA309MH4LAT2	Innsbrucker Kommunalbetriebe AG Salzburg Netz GmbH TINETZ-Tiroler Netze GmbH Vorarlberger Energienetze GmbH	MBUS / DIMS
Kaifa	MA309MT4LAT	Innsbrucker Kommunalbetriebe AG Salzburg Netz GmbH TINETZ-Tiroler Netze GmbH Vorarlberger Energienetze GmbH	MBUS / DIMS
Landis+Gyr	E450 ZmXi 3 20 C Q UO L1D321 S4	Energie Klagenfurt GmbH	MBUS / DIMS
Landis+Gyr	E570 ZMY410CQU0L40.01.1021 S2	Energie Klagenfurt GmbH	MBUS / DIMS
Landis+Gyr	E450 ZCXi	Stromnetz Graz GmbH & Co KG Energienetze Steiermark GmbH	MBUS / DIMS
Landis+Gyr	E450 ZMXi	Stromnetz Graz GmbH & Co KG Energienetze Steiermark GmbH	MBUS / DIMS
Landis+Gyr	E450	Wiener Netze GmbH	IR / DIMS
NES	83332-3IAAD	Linz Netz GmbH	MEP / MEP
NES	83334-3IABMA	Linz Netz GmbH	wMBUS / MBUS
Sagemcom	S210	Stromnetz Graz GmbH & Co KG Energienetze Steiermark GmbH	DSMR / DIMS
Sagemcom	T210	Stromnetz Graz GmbH & Co KG Energienetze Steiermark GmbH	DSMR / DIMS
Sagemcom	S210	Netz Niederösterreich GmbH	MBUS / DIMS
Sagemcom	T210	Netz Niederösterreich GmbH	MBUS / DIMS
Siemens	IM350	KNG-Kärnten Netz GmbH Wels Strom GmbH	DSMR / DIMS
Siemens	IM150	Wels Strom GmbH	DSMR / DIMS
Siemens	IM150 SMS25A0010	Wiener Netze GmbH	IR / DIMS
Siemens	IM350 SMS25A00010	Wiener Netze GmbH	IR / DIMS
Siemens	TD-3510	Netz Oberösterreich GmbH	IR / MBUS
Siemens	TD-3511	Netz Oberösterreich GmbH	IR / MBUS
Siemens	TD-3512	Netz Oberösterreich GmbH	IR / MBUS
Landis&Gyr	E450 ZMXi 3 20 C Q UO L1D3.31 S4	Netz Burgenland GmbH	MBUS / DIMS
Landis&Gyr	E450 ZMXi 3 20 C Q UO L1D3.31 S4	Netz Burgenland GmbH	IR / DIMS
Kamstrup	Omnipower Zähler + HAN-NVE Modul	Verschiedene Netzbetreiber Verenigung Österreichischer Elektrizitätswerke	MBUS / DIMS
Honeywell	HS330SH2LAT1	Innsbrucker Kommunalbetriebe AG Salzburg Netz GmbH TINETZ-Tiroler Netze GmbH Vorarlberger Energienetze GmbH	MBUS / DIMS
Honeywell	HS3300SH4LAT1	Innsbrucker Kommunalbetriebe AG Salzburg Netz GmbH TINETZ-Tiroler Netze GmbH Vorarlberger Energienetze GmbH	MBUS / DIMS

Beschreibung JSON API

Abfrage der aktuellen Verbrauchsdaten über Adresse: <https://IP/api/data/measurement.json>. Im Header muss ein Authorization-Token mitgesendet werden. Dieser Token ist über die GUI abrufbar.

Antwort, abhängig vom Smart-Meter:

```
{
  „1-0:1.8.0“: {
    „value“: 105119,
    „time“: 1104625548
  },
  „1-0:2.8.0“: {
    „value“: 0,
    „time“: 1104625548
  },
  „1-0:1.7.0“: {
    „value“: 33,
    „time“: 1104625548
  },
  „1-0:2.7.0“: {
    „value“: 0,
    „time“: 1104625548
  },
  „api_version“: „v1“,
  „sma_time“: 14011.8
}
```

Abfrage Statusinformationen über Adresse: <https://IP/api/sma/status.json>

Antwort:

```
{
  „sma_status_id“: 2,
  „api_version“: „1.0“,
  „sma_time“: 14285.1,
  „meter“: {
    „id“: 2,
    „supplier_id“: 7,
    „supplier“: „Netz Oberösterreich“,
    „manufacturer_id“: 2,
    „manufacturer“: „Siemens“,
    „interface_id“: 2,
    „interface“: „IR-Lesekopf“,
    „name“: „TD351x“
  },
  „sma_module_type_id“: 2,
  „sma_module_type“: „UART“,
  „meter_valid_package_cnt“: 142829,
  „meter_invalid_package_cnt“: 0,
  „sma_status“: „running“,
  „login“: false,
  „wifi“: {
    „mac“: „8c:df:a1:05:c5:d7“,
    „ssid“: „NetworkSSID“,
    „ip“: „10.2.2.211“,
    „netmask“: „255.255.255.0“,
    „gw“: „10.2.2.254“,
    „urc“: 0,
    „rssi“: -34
  }
}
```

```
}  
  „fw_version“: „c59cf4b510“,  
  „partition“: „ota_1“,  
  „fw_build“: „Jan 26 2022 07:50:33“,  
  „idf_version“: „v4.3.2“  
}
```

Beschreibung MQTT API

Der Smart-Meter-Adapter fungiert als MQTT Client, der MQTT Broker ist konfigurierbar. Über ein konfigurierbares Topic werden die Zählerdaten im JSON Format an den MQTT Broker weitergereicht (Publish).

MQTT API

MQTT API

Verbindungsstatus:

Protokoll	<input type="text" value="TCP-mqtt"/>
Broker	<input type="text" value="192.168.1.140"/>
Port	<input type="text" value="1883"/>
Client ID	<input type="text" value="sma_061D7C"/>
Topic	<input type="text" value="sma"/>

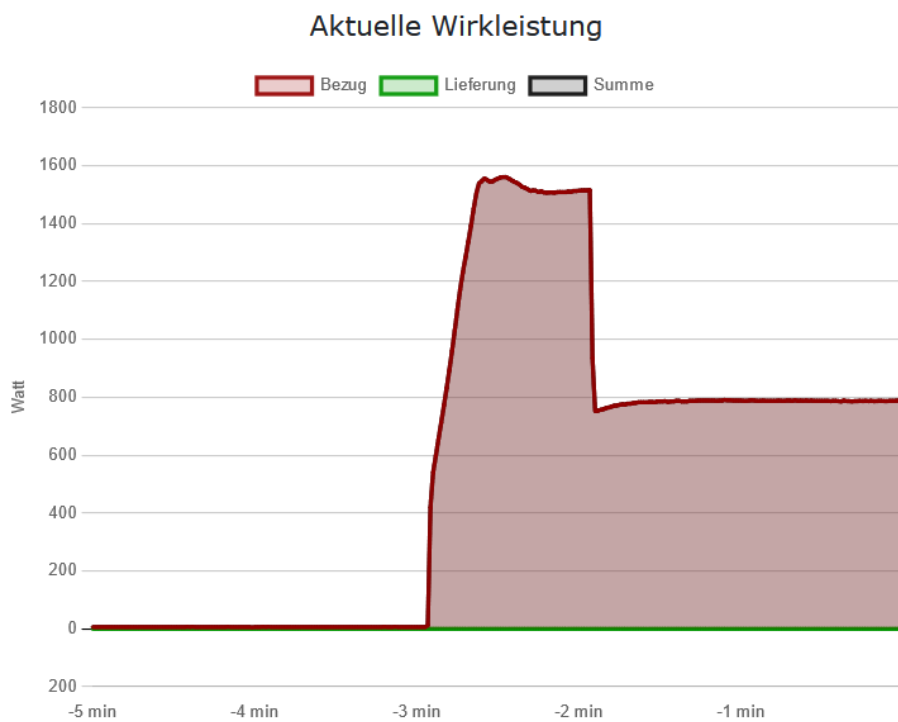
Benutzername	<input type="text" value="user"/>
Passwort	<input type="password" value="••••••"/>
Zertifikat	<input type="button" value="Durchsuchen..."/> <input type="text" value="Keine Date...sgewählt."/>

Konfiguration löschen

Speichern

Beschreibung Dashboard über HTTPS und HTTP

Das Dashboard kann über die Adresse <https://<IP>> abgerufen werden. Die Auswahl der angezeigten Werte kann je nach Smart-Meter voneinander abweichen.



Basisdaten

Zählerstand

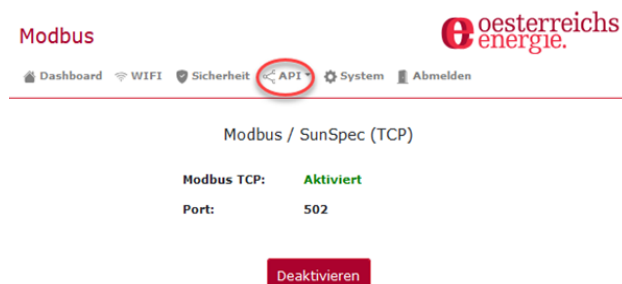
1.8.0	Wirkenergie Bezug	106,366 kWh
2.8.0	Wirkenergie Lieferung	0,000 kWh
3.8.1	Blindenergie Bezug T1	0,000 kvarh
4.8.1	Blindenergie Lieferung T1	129,974 kvarh

Momentanwerte

1.7.0	Wirkleistung Bezug	787 W
2.7.0	Wirkleistung Lieferung	0 W
3.7.0	Blindleistung Bezug	0 var
4.7.0	Blindleistung Lieferung	19 var

Auslesen der Register über Modbus TCP

Die Daten des Smart-Meter-Adapters können über Modbus TCP bereitgestellt werden. Dazu muss Modbus unter API / Modbus aktiviert werden.



Die Kodierung der Register folgt dem Standard der SunSpec Alliance. Eine Spezifikation kann unter folgendem Link gefunden werden: <https://sunspec.org/wp-content/uploads/2019/08/SunSpec-Specification-Meter-Models-A12023-1.2.pdf> Beim Zugriff auf die Register ist darauf zu achten, dass ein Offset von 69 zu addieren ist, da die Register 0-69 einem Header dienen. Somit entspricht die im Dokument angeführte „Position 1“ dem Register 70 (69+1).

Um die Register über die Konsole auszulesen, kann unter Linux „modbus-cli“ verwendet werden. Befehle in den folgenden Beispielen verwenden dieses Tool.

Die Werte in den Registern werden skaliert. Die entsprechenden Skalierungen sind in separaten Registern zu finden, welche auch in der SunSpec Spezifikation angeführt werden. Jedem Abschnitt ist eine Skalierung zuzuordnen. Die Beschreibung eines solchen Registers ist zum Beispiel: „AC Voltage Scale Factor“.

Folgende Tabelle zeigt die Positionen der Ströme der einzelnen Phasen:

MODBUS-REGISTRIERADRESSE	SunSpec-Registeradresse	Inhalt	Befehl
73	4	Strom der Phase L1	modbus \$IP_ADRESSE 73
74	5	Strom der Phase L2	modbus \$IP_ADRESSE 74
75	6	Strom der Phase L3	modbus \$IP_ADRESSE 75
76	7	Skalierung des Stroms	modbus \$IP_ADRESSE 76 (Standard: $-3=10^{-3}$)

Um auch 4-Byte Register anzuzeigen, muss am Ende des Befehls \I angehängt werden. Zwei Beispiele:

109-110	39-40	Wirkenergie Lieferung	modbus \$IP_ADRESSE 109\I
116-117	47-48	Wirkenergie Bezug	modbus \$IP_ADRESSE 116\I

Es werden nur die Daten befüllt, welche der Smart-Meter zur Verfügung stellt.

Lizenzen

Dieses Produkt verwenden folgende Komponenten unter den angegebenen Lizenzen:

Apache 2

Folgende Komponenten unter der Apache 2 Lizenz werden verwendet:

ESP_IDF source code
Mbed TLS
ESP-MQTT

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