



Smart
connections.

Technical Specification

PIKO MP plus
with BYD Battery-Box Premium HVS/HVM



Iris Hellas
Technology Innovations
www.irishellas.com

PIKO MP plus plus power class		1.5-1	2.0-1	2.5-1	3.0-1	3.0-2	3.6-1	3.6-2	4.6-2	5.0-2 ⁹⁾	
Input side (DC)	Max. PV-power (cos φ = 1)	kWp	2.3	3.0	3.75	4.5	5.4		6.9	7.5	
	Nominale DC power	kW	1.54	2.05	2.56	3.07	3.77		4.74	5.2	
	Input voltage range (U _{DCmin} - U _{DCmax})	V	75-450			75-750					
	MPP working voltage range (U _{MPPworkmin} - U _{MPPworkmax})	V	75-360			75-600					
	MPP range at nominal power (U _{MPPmin} - U _{MPPmax})	V	120-360	160-360	200-360	230-600	280-600		360-600	360-600	
	Number of DC inputs		1	1	1	1	2	1	2	2	2
	Number of combined DC inputs (PV or battery)		1	1	1	1	1	1	1	1	1
	Number of independent MPP trackers		1	1	1	1	2	1	2	2	2
	One DC battery input - optional Activation code battery and KOSTAL Smart Energy Meter available at: shop.kostal-solar-electric.com										
	Working voltage for battery input (U _{Dworkbatmin} - U _{Dworkbatmax})	V	75-360			75-600					
Max. charging current/discharging current at battery input	A	13/13									
Output side (AC)	Rated power, cos φ = 1 (P _{AC,r})	kW	1.5	2.0	2.5	3.0	3.68		4.6	5.0	
	Output voltage (U _{ACmin} - U _{ACmax})	V	185...276								
	Rated output current (I _{AC,r})	A	6.6	8.7	10.9	13.1	16		20	22	
	Max. output current (I _{ACmax})	A	12	12	14	14	16		20	22	
	Grid connection		1N~, 400V, 50 Hz								
	Standby/standby incl. 24h home-consumption measurement	W	<3.0/<20.0								
η	Max. efficiency	%	97.4	97.4	97.4	97.0	97.0		97.4	97.4	
	European efficiency	%	96.1	96.5	96.6	96.3	96.3		96.9	96.8	
System data	Protection class according to IEC 60529		IP 65								
	Height/width/depth	mm	657/399/222								
	Weight	kg	12.6	12.6	12.6	13.8	14.0	13.8	14.0	14.0	14.0
	Ambient temperature	°C	-20...60								
	Connection technology, DC side		SUNCLIX plug								
Directives/Certification ¹⁾		IEC/EN 62109-1, IEC/EN 62109-2, IEC/EN 60730, IEC 62116, VDE-AR-N 4105, DIN VDE 0126 1-1, G59/3-2, G83/2, UTE C 15-712-1, CEI 0-21, TOR D4, RD1699, RD 413, UNE 206007-1, IEC 61727, EN 50438*									

Subject to technical changes. Errors excepted. You can find current information at www.kostal-solar-electric.com.

¹⁾ Does not apply to all national annexes

²⁾ The use of these variants of the BYD Battery-Box Premium are not approved for the PIKO MP plus

³⁾ When using the PIKO MP plus as a hybrid inverter in combination with the BYD Battery-Box Premium, the charging power can be greater than the discharging power if the corresponding range of services is high (calculation of the maximum charging power of the battery: maximum charging current PIKO MP plus battery input (13A) x nominal voltage battery)

⁴⁾ Test conditions: 0.2 C charge and discharge at + 25 ° C, 95% real usable capacity with PIKO MP plus system / theoretically usable capacity acc. BYD battery data sheet at 100% DoD

⁵⁾ HVS (High Voltage Small), HVM (High Voltage Medium)

⁶⁾ PIKO MP plus 5.0-2: available from Q2/2020

Technical Specification BYD Battery-Box Premium HVS/HVM

BYD Battery-Box Premium HVS/HVM ⁶⁾			HVS 5.1	HVS 7.7	HVS 10.2	HVS 12.8	HVM 8.3	HVM 11.0	HVM 13.8	HVM 16.6	HVM 19.3	HVM 22.1	
Module type			2.56kWh, 102.4V, 25Ah, 38kg, LiFePO ₄				2.76kWh, 51.2V, 53Ah, 38kg, LiFePO ₄						
System data	Max. Power consumption / charging capacity ³⁾ battery in connection with	PIKO MP plus 1.5-1	kW	1.5	1.5			1.5	1.5				
		PIKO MP plus 2.0-1	kW	2.0	2.0	--- ²⁾		2.0	2.0	--- ²⁾			
		PIKO MP plus 2.5-1	kW	2.5	2.5			2.5	2.5				
		PIKO MP plus 3.0-1	kW	2.66	3.0	3.0	3.0	2.0	2.66	3.0	3.0	3.0	3.0
		PIKO MP plus 3.0-2	kW	2.66	3.0	3.0	3.0	2.0	2.66	3.0	3.0	3.0	3.0
		PIKO MP plus 3.6-1	kW	2.66	3.6	3.6	3.6	2.0	2.66	3.33	3.6	3.6	3.6
		PIKO MP plus 3.6-2	kW	2.66	3.6	3.6	3.6	2.0	2.66	3.33	3.6	3.6	3.6
		PIKO MP plus 4.6-2	kW	2.66	3.99	4.6	4.6	2.0	2.66	3.33	3.99	4.66	4.66
		PIKO MP plus 5.0-2 ⁶⁾	kW	2.66	3.99	5.0	5.0	2.0	2.66	3.33	3.99	4.66	5.0
Usable capacity 95%/100% DoD ⁴⁾		kWh	4.86/ 5.12	7.30/ 7.68	9.73/ 10.24	12.16/ 12.8	7.87/ 8.28	10.49/ 11.04	13.11/ 13.8	15.73/ 16.56	18.35/ 19.32	20.98/ 22.08	
Number of battery modules			2	3	4	5	3	4	5	6	7	8	
Nominal voltage		V	204	307	409	512	153	204	256	307	358	409	
Voltage range		V	160- 240	240- 360	320- 480	400- 600	120- 180	160- 240	200- 300	240- 360	280- 420	320- 480	
Interface to KOSTAL Smart Energy Meter			RS485										
Height		mm	712	945	1178	1411	945	1178	1411	1644	1871	2110	
Width/depth		mm	585/298										
Weight		kg	91	129	167	205	129	167	205	243	281	319	
Ambient temperature		°C	-10...50										
Housing protection class			IP 55										
Safety Standard / Certification			VDE2510-50 / IEC62619 / CEC / CE / UN38.3										

PLENTICORE plus

with BYD Battery-Box Premium HVS/HVM



Technical Specification

PLENTICORE plus power class		3.0	4.2	5.5	7.0	8.5	10	
Input side (DC)	Max. PV power (cos $\varphi = 1$)	kWp	4.5	6.3	8.25	10.5	12.75	15
	Nominal DC power	kW	3.09	4.33	5.67	7.22	8.76	10.31
	Input voltage range ($U_{DCmin} - U_{DCmax}$)	V	120...1000					
	MPP working voltage range ($U_{MPPworkmin} - U_{MPPworkmax}$)	V	120...720					
	Number of DC inputs		3					
	Number of combined DC inputs (PV or battery)		1					
	Number of independent MPP trackers		3					
	DC 3 – battery input optional - Activation code battery available at: shop.kostal-solar-electric.com							
	Working voltage for battery input ($U_{DCworkbatmin} - U_{DCworkbatmax}$)	V	120...650					
Max. charging current/discharging current at battery input	A	13/13						
Output side (AC)	Rated power, cos $\varphi = 1$ ($P_{AC,r}$)	kW	3.0	4.2	5.5	7.0	8.5	10
	Output voltage ($U_{ACmin} - U_{ACmax}$)	V	320...500					
	Rated output current ($I_{AC,r}$)	A	4.33	6.06	7.94	10.10	12.27	14.43
	Max. output current (I_{ACmax})	A	4.81	6.74	8.82	11.23	13.63	16.04 ⁴⁾
	Grid connection		3N~, 230/400 V, 50 Hz					
	Standby	W	7.9					
η	Max. efficiency	%	97.1	97.1	97.1	97.2	97.2	97.2
	European efficiency	%	95.3	96.5	96.2	96.5	96.5	96.5
System data	Protection class according to IEC 60529		IP 65					
	Height/width/depth	mm	563 / 405 / 233					
	Weight	kg	19.6			21.6		
	Ambient temperature	°C	-20...60					
	Connection technology, DC side		SUNCLIX plug					
Directives/Certification ¹⁾		CE, GS, CEI 0-21, CEI10/11, EN 62109-1, EN 62109-2, EN 60529, EN 50438*, EN 50549-1*, NA/EEA, G98, G99, IFS2018, IEC 61727, IEC 62116, RD 1699, RFG, TF3.3.1, TOR Erzeuger, UNE 206006 IN, UNE 206007-1 IN, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105, VJ2018						

BYD Battery-Box Premium		HVS 5.1	HVS 7.7	HVS 10.2	HVS 12.8	HVM 11.0	HVM 13.8	HVM 16.6	HVM 19.3	HVM 22.1	
Modul type		HVS (High Voltage Small) 2.56kWh, 102.4V, 25Ah, 38kg, LiFePO ₄				HVM (High Voltage Medium) 2.76kWh, 51.2V, 53Ah, 38kg, LiFePO ₄					
System data	Max. Power consumption in connection with PLENTICORE plus 3.0-10 ^{2,3,4)}	kW	2.66	3.99	5.32	6.5	2.66	3.3	3.99	4.66	5.32
	Usable capacity 95%/100% DoD ⁵⁾	kWh	4.86/ 5.12	7.30/ 7.68	9.73/ 10.24	12.16/ 12.8	10.49/ 11.04	13.11/ 13.8	15.73/ 16.56	18.35/ 19.32	20.98/ 22.08
	Number of battery modules		2	3	4	5	4	5	6	7	8
	Nominal voltage	V	204	307	409	512	204	256	307	358	409
	Voltage range	V	160- 240	240- 360	320- 480	400- 600	160- 240	200- 300	240- 360	280- 420	320- 480
	Interface to inverter		RS485								
	Height	mm	712	945	1178	1411	1178	1411	1644	1877	2110
	Width/depth	mm	585/298								
	Weight	kg	91	129	167	205	167	205	243	281	319
	Ambient temperature	°C	-10...50								
IP protection class		IP 55									
Certification / Safety Standard		VDE2510-50 / IEC62619 / CEC / CE / UN38.3									

Subject to technical changes. Errors excepted. You can find current information at www.kostal-solar-electric.com.

¹⁾ Does not apply to all national annexes

²⁾ The use of the BYD Battery-Box Premium HVM 13.8, 16.6, 19.3 and 22.1 are not approved for the PLENTICORE plus 3.0

³⁾ Depending on the max. Rated power AC of the inverter (PLENTICORE plus 3.0 max. 3.0 kW, 4.2 max 4.2 kW and 5.5 max 5.5 kW)

⁴⁾ Using the BYD Battery-Box Premium HVM 11.0 or 13.8 is technically possible. Due to the relatively low battery voltage of these variants, a restriction of the charging and final charging power (U_{bat} x 13A max. Input current of the WR) and the system efficiency must be pointed out.

⁵⁾ Test Conditions: 0.2 C charge and discharge at + 25 °C, real usable capacity with PLENTICORE plus system / theoretically usable capacity acc. BYD battery data sheet at 100% DoD

⁶⁾ UK G83/2 and G98-1 settings: The maximum output current is limited to 16 A @ rated AC grid voltage.



Smart
connections.

Technical information

KOSTAL Smart Energy Meter



Iris Hellas
Technology Innovations
www.irishellas.com

KOSTAL Smart Energy Meter: suited to numerous purposes.

Flexible in use

Integrated 3-phase energy measurement of up to 63 A

Higher measurement currents possible using converter

2 LAN interfaces

2 RS485 interfaces (Modbus RTU)

Smart connected

Can be combined with PIKO 4.2-20, PIKO EPC, PIKO CI, PIKO MP plus, PIKO IQ, PLENTICORE plus, PLENTICORE BI

Data display

Functions can be extended via software updates



Smart performance

High measurement accuracy

Current sensor and energy manager for connecting AC batteries

Smart control for multiple-inverter connection

Easy to install

Installation in control cabinet on top-hat rail

Simple device configuration using online interface and preset values

Software is updated via online interface

KOSTAL Smart Energy Meter: in combination with KOSTAL solar inverters

PIKO IQ / PLENTICORE

- 24-hour home consumption measurement
- Dynamic active power control
- Pre-configured Modbus RTU interfaces (RS485)
- Multiple-inverter connection with KOSTAL inverter
- Provision of measurement data when using battery functionality in combination with PLENTICORE
- Battery on the PLENTICORE is recharged from additional local generators

PIKO MP plus

- 24-hour home consumption measurement
- Dynamic active power control
- Pre-configured Modbus RTU interfaces (RS485)
- Battery management with optional battery functionality for the PIKO MP plus¹

PIKO 4.2-20 / PIKO EPC

- 24-hour home consumption measurement
- Dynamic active power control
- Multiple-inverter connection with KOSTAL inverter

PIKO CI

- 24-hour home consumption measurement
- Dynamic active power control

¹ Battery activation code for the KOSTAL Smart Energy Meter can be purchased at shop.kostal-solar-electric.com

Technical data KOSTAL Smart Energy Meter

			KOSTAL Smart Energy Meter ¹
System data	Process data		ARM9 processor with 450 MHz, DDR2 RAM with 128 Mbyte eMMC Flash 4 GByte
	Operating system		Embedded Linux with integrated TCP/IP stack
	LAN interfaces for Modbus TCP		2 x (10/100 Mbit)
	RS485 interfaces for Modbus RTU		2 x (half-duplex, max. 115 200 baud)
	Rated voltage	V	max. 230/400 V~
	Operating voltage	V	110/230 V~ ± 10%
	Frequency range	Hz	50/60 ± 5 %
	Self-consumption - voltage path per phase	VA	< 0.01
	Self-consumption - current path per phase	VA	< 2
	Self-consumption - entire device	W	< 5
	Current (rated current/limiting current)	A	5 / 63 ³
	Starting current	mA	< 25
	Product standards		EN 61010, EN 50428, EN 60950
Measurement accuracy ²	Voltage	%	± 0.5
	Current	%	± 0.5
	Active power	%	± 1.0
	Apparent power	%	± 1.0
	Reactive power	%	± 1.0
	Power factor	%	± 1.0
	Active energy / reactive energy according to IEC 62053-22 / -23 (typical)		Class 1
Mechanical data	Housing material		Fibreglass-reinforced polyamide
	Incandescent wire test according to IEC 695-2-1		Yes
	Protective class		II
	Protection class		IP2X
	Weight	kg	0.3
	Dimensions (H/W/D)	mm	88 x 70 x 65
	Connection cross-section (mechanical, e.g. for connecting external transformers)	mm ²	10-25 (1.5-25)
Conditions	Torque for screw terminals	Nm	2
	Ambient temperature	°C	-25 ... 45
	Storage temperature	°C	-25 ... 70
	Relative humidity (non-condensing)	%	Up to 75% as an annual average Up to 95% on up to 30 days/year
Max. height above sea level for operation	m	2000	

Subject to technical changes. Errors excepted. You can find current information at www.kostal-solar-electric.com. Manufacturer: KOSTAL Industrie Elektrik GmbH, Hagen, Germany

¹ 2-year warranty

² Accuracy class according to IEC 61557-12 With reference to measuring value, Energy Manager.

If using external converters, the particular measurement accuracy must be taken into account. If using current sensors via the sensor bar, subject to the power factor the accuracy of the active power is class 2.

³ Limiting current I_N / phase 63 A. Higher currents possible via converter.

EU Declaration of Conformity

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br., Germany

hereby declares that the inverters

PLENTICORE plus 3.0, 4.2, 5.5, 7.0, 8.5, 10

with which this declaration is concerned, are in accordance with the following guidelines and standards:

Directive 2014/30/EU on the approximation of the laws of the Member States relating to electromagnetic compatibility

- EN 61000-3-2:2014 (Harmonic currents)
- EN 61000-3-3:2013 (Flicker)
- EN 61000-6-2:2005/AC:2005 (Immunity for industrial environments)
- EN 61000-6-3:2007/A1:2011/AC:2012 (Immunity for residential environments)

Directive 2014/35/EU on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits – Low Voltage Directive

- EN 62109-1:2010 (Safety of power converters for use in photovoltaic power systems – Part 1)
- EN 62109-2:2011 (Safety of power converters for use in photovoltaic power systems – Part 2)

Directive 2011/65/EU (RoHS) to limit the use of certain hazardous substances in electrical and electronic equipment

- EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

This declaration applies to all identical specimens of the product. This declaration becomes invalid if a change is made to the unit or the unit is improperly installed.

KOSTAL Solar Electric GmbH – 26.10.2021



KOSTAL
KOSTAL Solar Electric GmbH
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Frank Henn
(Managing Director)



Dr. Armin von Preetzmann
(Vice-President R&D)

This declaration certifies compatibility with the guidelines named, but does not contain any assurance of properties.
Observe the safety instructions in the enclosed product documentation!

EU Declaration of Conformity

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br., Germany

hereby declares that the energy meter

KOSTAL Smart Energy Meter

with which this declaration is concerned, are in accordance with the following guidelines and standards:

Directive 2014/30/EU on the approximation of the laws of the Member States relating to electromagnetic compatibility

- EN 61326-1:2013

Directive 2014/35/EU on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits – Low Voltage Directive

- EN 61010-1:2010/A1:2019/AC:2019-04
- EN 61010-2-030:2010
- EN IEC 61010-2-201:2018

Directive 2011/65/EU (RoHS) to limit the use of certain hazardous substances in electrical and electronic equipment

- EN IEC 63000:2018

This declaration applies to all identical specimens of the product. This declaration becomes invalid if a change is made to the unit or the unit is improperly installed.

KOSTAL Solar Electric GmbH – 26.10.2021



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This declaration certifies compatibility with the guidelines named, but does not contain any assurance of properties.
Observe the safety instructions in the enclosed product documentation!

Self-Declaration „Zero Feed-In“

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br., Deutschland

hereby declares that for the following products:

PIKO IQ 3.0, 4.2, 5.5, 7.0, 8.5,10
PLENTICORE plus 3.0, 4.2, 5.5, 7.0, 8.5,10
PLENTICORE plus 3.0, 4.2, 5.5, 7.0, 8.5,10 G2
PIKO 4.2, 4.6, 5.5, 7.0, 8.5, 10, 12, 15, 17, 20
PIKO 36 EPC

in combination with the energy meter **KOSTAL Smart Energy Meter** or **TQ-System GmbH B-control EM 300 LR** to which this declaration refers, supports the „Zero Feed-In“ operation.

For this purpose, the inverters can be configured via the internal Webserver in that way that 100 % of the produced PV energy is consumed in the household and not fed in into the public grid. For this, the „limitation of the maximum active power“ must be set to 0 watts.

The following deviations need to be considered when the “Zero Feed-In” operation is applied:

PIKO IQ 3.0, 4.2, 5.5, 7.0, 8.5, 10 $\pm 50W$

PLENTICORE plus 3.0, 4.2, 5.5, 7.0, 8.5, 10 $\pm 50W$

PIKO 4.2, 4.6, 5.5, 7.0, 8.5, 10, 12, 15, 17, 20 $\pm 50W$ (only KOSTAL Smart Energy Meter)

PIKO 36 EPC $\pm 50W$ (only KOSTAL Smart Energy Meter)

Furthermore, the accuracy is depending from the power factor of the loads. A high degree of (distortion) reactive power has negative effects on the accuracy of the measured active power.

This declaration applies to all identical specimens of the product. This declaration becomes invalid if a change is made to the unit or the unit is improperly installed.

KOSTAL Solar Electric GmbH – 9.9.2022



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ppa. Dr. Armin von Preetzmann
(Vicepresident R&D)

Guideline

Commissioning PLENTICORE plus inverter in combination with a BYD Battery-Box HV H5.1 - H11.5



This guide does not replace the operating instructions or manuals required for proper assembly and installation.

The trademarks, trade names, product descriptions and other designations used may be protected by law even without special designation (e.g. as trademarks). KOSTAL Solar Electric GmbH does not assume any liability or warranty for their free usability. Great care has been taken in the compilation of illustrations and texts. Nevertheless, errors cannot be excluded. The compilation is made without guarantee. Technical changes and errors excepted.



IMPORTANT INFORMATION

Installation may only be carried out by a trained and qualified electrician! Observe the safety instructions in the operating instructions for the inverter and the battery.

In order to start up the system completely and to make all necessary settings, the Service/PARAKO password and a computer/tablet as well as the battery activation code are required.

The inverter and the battery must be completely disconnected from the voltage supply for all work on the inverter or on the supply lines. Refer to the relevant operating instructions for the respective devices (inverter/battery).

ATTENTION - The following points should always be considered in order to successfully commission the PLENTICORE plus inverter with the BYD Battery-Box HV.

1. That it may be necessary to access the web servers of the inverter, the BYD Battery-Box HV and the KOSTAL Smart Energy Meter (KSEM), a small router should be carried in the case. If a customer network already exists in which all devices are integrated, the use of an external router can be dispensed with. Also in case of service, if something does not work correctly or has to be checked, access to all devices in the system is necessary, e.g. to provide support via TeamViewer.
2. All necessary and current updates for the inverter, battery and smart meter should always be carried on the computer. If no Internet is available, then no update can be carried out.
3. All necessary operating instructions, short manuals or quick guides should always be available on the computer in the current version in paper form or as a PDF file. Without these, installation and subsequent commissioning is not possible. Also **no support** can be granted, if due to missing documents or necessary updates no proper installation was accomplished.
4. Commissioning must be carried out in **3 STEPS**.

STEP 1: Installation and commissioning of the inverter - install the current FW for the inverter, select the energy or smart meter used in the inverter, select the correct sensor position and make the necessary settings (dynamic active power reduction, zero feed-in, etc.). **(However, do not select a battery in the service menu)**

Inverter starts up without error message and feeds in: **YES** **NO**

YES - continue to STEP 2 / **NO** - Determine and eliminate cause of error

STEP 2: Installation of the BYD Battery-Box HV (do not yet connect the DC plug to the inverter, install the current update and configure the battery in the web server.

Battery configured shows no error messages: **YES** **NO**

YES - continue to STEP 3 / **NO** - Determine and eliminate cause of error

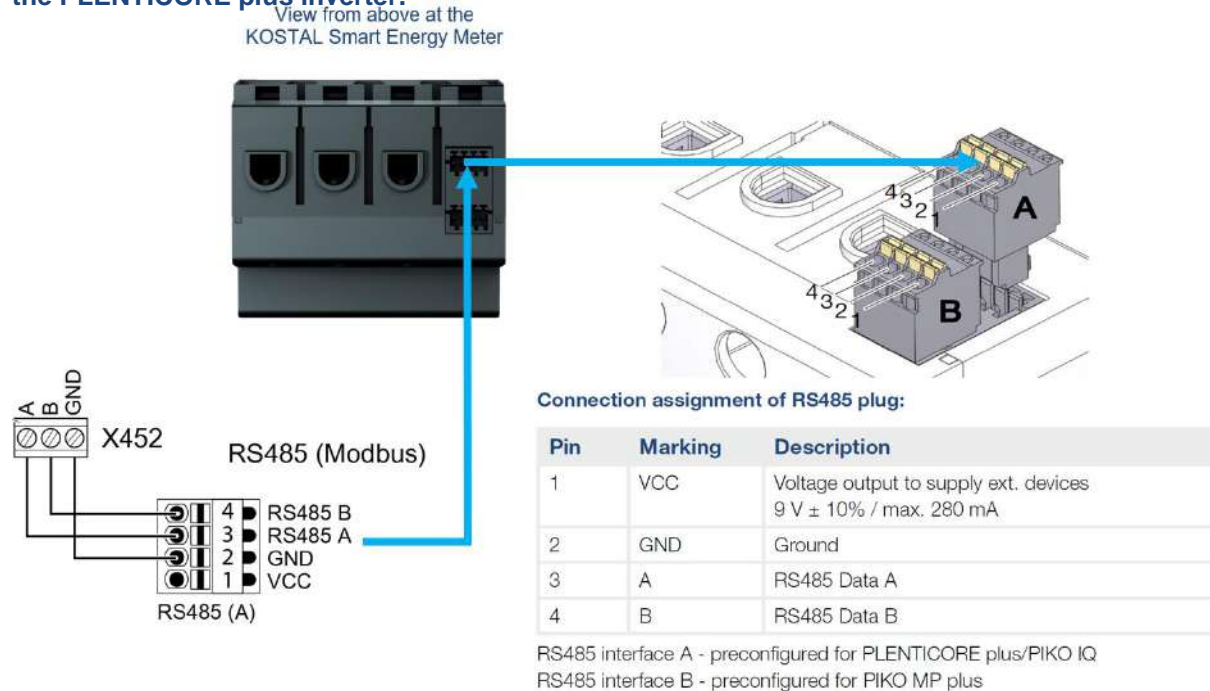
STEP 3: Commissioning the PLENTICORE plus together with the BYD Battery Box HV

- Switch off battery
- Switch off inverter
- Connect the DC cable of the battery to the inverter.
- Switch on the inverter again and wait until it feeds in again.
- Switch battery on again
- Select the battery in the service menu of the inverter.
- After a short time, the battery goes into RUN mode and allows the DC connection to the inverter.

The inverter feeds in and the battery is charged or discharged: **YES** **NO**

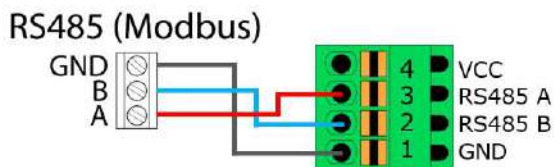
YES - Congratulations / **NO** - Determine and correct cause of error

Connection of the RS485 cable of the Energy Meter or Energy Manager with the SCB (X452) of the PLENTICORE plus inverter.



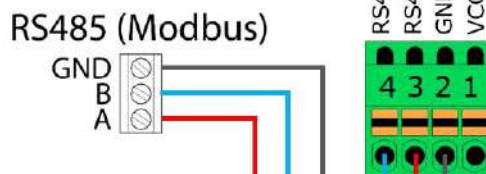
ATTENTION: The B-control EM300 LR and the KOSTAL Smart Energy Meter have different RS485 pin connections.

Terminal X452 on the SCB of the PIKO IQ or PLENTICORE plus inverter



View from above on the B-control EM300 LR

Terminal X452 on the SCB of the PIKO IQ or PLENTICORE plus inverter



View from above on the KOSTAL Smart Energy Meter

- The Modbus RTU interface (A) is preconfigured as standard with the readout intervals for the PLENTICORE plus or PIKO IQ inverters.
- The KOSTAL Smart Energy Meter can be installed directly in the sub-distribution cabinet and connected to the inverter without a PC (adjustment of parameters) and other settings. The device is immediately ready for use.

Interface RS485 A

Enable slave

Preset: PIKO IQ / PLENTICORE plus

Advanced

Slave address: 1

Baudrate: 38400

Databits: 8

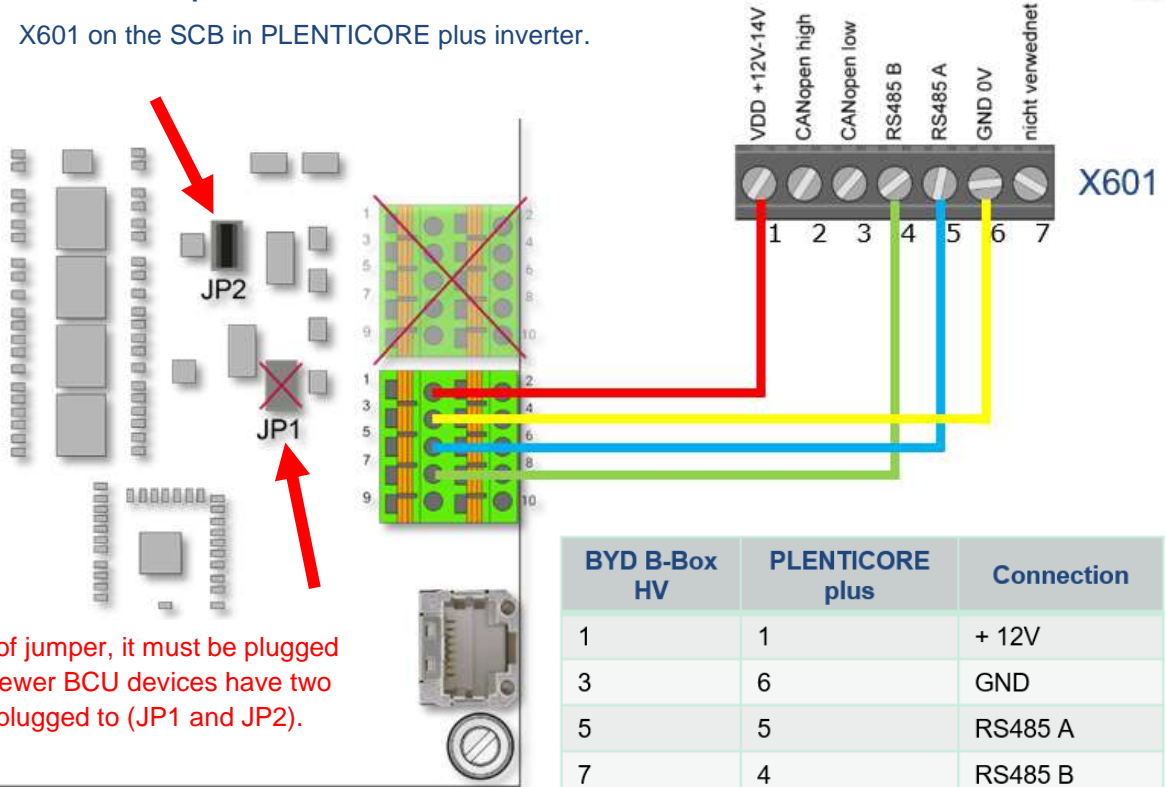
Parity: None

Stopbits: 2



Connection of the RS485 cable of the BCU from the BYD Battery-Box HV to the SCB (X601) of the PLENTICORE plus inverter.

X601 on the SCB in PLENTICORE plus inverter.



Position of jumper, it must be plugged to JP2, newer BCU devices have two jumpers plugged to (JP1 and JP2).

BYD B-Box HV	PLENTICORE plus	Connection
1	1	+ 12V
3	6	GND
5	5	RS485 A
7	4	RS485 B
Cable		
Cat.5e „Twisted-Pair“		
Telecommunication cable „Twisted-Pair“ J-Y(ST)Y 3x2x0,6 GR oder J-Y(ST)Y 4x2x0,6 GR		
Outside diameters max. 6,8 mm		
Length max. 15 m		

Configuring the BCU of the BYD Battery-Box HV via WLAN

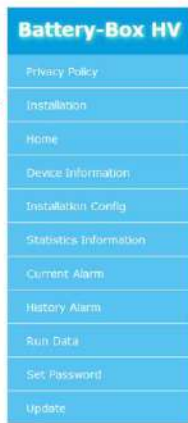
- Activating the WLAN on the computer
- Select the BYD battery from the list of devices in the WLAN network
- Enter the network key for the WIFI of the BYD battery access: **123456789**
- In the URL field of the browser now enter the IP of the BCU: **192.168.5.1**
- A login window will open
- Enter username: **installer** and password: **byd@12345** and confirm
- The web server opens with the **"HOME"** page
- Click on **"Installation"** in the menu
- The **"Installation"** window opens
- All necessary values for the configuration are now entered here

- The installation wizard starts with step 1. Enter the time and date here and click "Next".



Time and Date * Hour: 09 Min: 12 Day: 25 Month: 03 Year: 2019

- In step 2 of the installation, the number of memory modules "**Series Battery Counts**", the inverter manufacturer "**Inverter**" and the country "**Country**" must be entered.
- Then click on the "Finish" button. A small window will appear with the question: "**Are you sure**". Please click the OK button here. Now the installation is finished and the system reboots.



Server IP Address *

Series Battery Counts *

Inverter *

Country *

Asterisk (*) indicates required fields

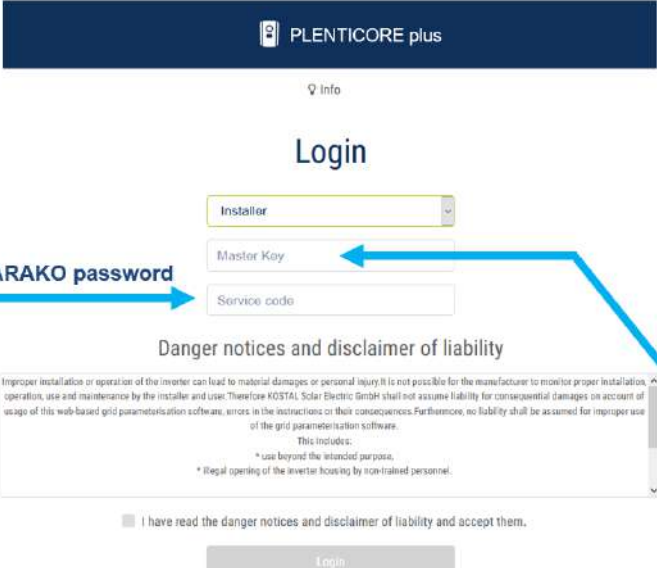
- The time and date must be entered.
- Then click on the "Next" button.
- Series Battery Counts - Enter number of memory modules - 4 to 9
- Inverter - Select inverter manufacturer - KOSTAL
- Country - Select your country – e.g. Germany
- Finally click on the "Finish" button.
- **The battery system restarts and is ready for operation.**

Intelligent verbinden.

Initial commissioning of the PLENTICORE plus inverter

- **Attention:** Commissioning only possible with sufficient PV voltage and irradiation.
- Check the RS485 connection Energy Meter to the SCB of the inverter.
- Plug in the DC plug of the PV strings.
- Connect the DC plug of the battery.
- Switch on AC fuses.
- Switch on DC Switch.
- The start-up process of the inverter has started.
- The installation assistant appears in the inverter display.
- Commissioning can be carried out completely via the display.
- Simply follow the instructions on the display.
- Alternatively, the commissioning can also take place partly via the web server.
 - Select language, date and country in the display.
 - Activate IPv4 / DHCP in the display
 - Select e.g. the NSR Germany country code in the display and complete the installation.
- Make all other settings on the web server of the inverter.
- Read IP address from inverter display.
- Enter the IP of the inverter into the URL line of your browser e.g. Mozilla or Firefox.
- The login window will open.

In order to be able to log on to the web server as an installer, the "**Master key**" which can be found on the inverter label and the service code "**PARAKO password**" are required



PLENTICORE plus

Info

Login

Installer

Master Key

Service code


PARAKO password

Danger notices and disclaimer of liability

I have read the danger notices and disclaimer of liability and accept them.

Login

Inverter label of the PLENTICORE plus



KOSTAL
Solar Electric
Hanferstraße 6 – D-79108 Freiburg, +49 (0) 761-47744-100
www.kostal-solar-electric.com

XXXXXXXXXXXXXXXXXX
Item no.: XXXXXXXXX

DC input: Vmpp: = XXX...XXX V	AC output: 3N-	Vac,r = XXX V
Vdcmac = XXX V	fr = XX Hz	Iacmax = max. XX.X A
Iacmax = XX.X A	Sec,r = XXXXX nVA	cos φ = XX...1
VBelt_max = XXXV		
IBelt_max XX.X A		

Protective Class I, IP 55, -20°C...60°C, OVC DC:II / AC:III, VDE V 0128-1-1

Art. No.: NNNNNNNN
Ser. No.: XXXXXABCXXXX
HW: YXXXX PAR: XXXX
FW: XX.XX UI: XX.XX
Service update: XXXXXXXX
Master key: XXXXXXXXXX

WARNING: dual supply
Do not work on this equipment until it is isolated from both mains and on-site generation supplies:
Isolate on-site generator at: _____
Isolate mains supply at: _____

XXXXXXXXABCXXXXX



- All other settings can now be entered in the service menu.
- Service menu → Energy management: Choice of energy meter and position of the sensor

Energy management

Energy meter	<input type="text" value="TQ EM300"/>	
Sensor position	<input type="text" value="Grid connection point"/>	
Limitation of the active power to [W]	<input type="text" value="10000"/> 	

Dynamic limitation of the active power takes place under consideration of the home consumption.


Energy management


Energy meter	<input type="text" value="KOSTAL Smart Energy I"/>	
Sensor position	<input type="text" value="Grid connection point"/>	
Limitation of the active power to [W]	<input type="text" value="10000"/> 	


Dynamic limitation of the active power takes place under consideration of the home consumption.

- Service menu → Energy management: Activate storage of excess AC energy from local generation.


Energy management

Energy meter KOSTAL Smart Energy Meter 

Sensor position Grid connection point 


Limitation of the active power to [W] 10000 

Dynamic limitation of the active power takes place under consideration of the home consumption.

 Storage of excess AC energy from local generation

If there is a ripple control receiver connected to another inverter's digital inputs, these signals can be allocated to all inverters in the local area network (LAN) for active and reactive power control by means of UDP broadcast.
A local energy manager can also generate signals for active and reactive power control in the local area network.

Activate reception of Broadcast control signals

Save 

Checkbox: "Storage of excess AC energy from local generation."

This feature works with the Energy Manager from B-control, the EM300 LR as well as with the KOSTAL Smart Energy Meter (KSEM).

IMPORTANT: The sensor (Energy Manager/Meter) must be mounted in the "Mains connection point" position.

- Service menu → Battery settings: All settings for the connected battery made here.

Battery settings

Battery type

BYD B-Box HV

Battery settings

Battery use as of [W]

50

Battery use strategy

Automatic

Min. depth of discharge (SoC) [%]

5

Activate smart battery control

Advanced battery options

In exceptional cases, the current battery mode may have to be reset. This may be necessary e.g. if the battery is in sleep mode and battery modules are to be installed.

 Reset battery mode

Save 

- When all settings have been completed, the KOSTAL storage system is running. The green LED on the inverter lights up.
- **The PLENTICORE plus (or PIKO IQ) is now ready for operation.**

A firmware update is available: Download from our homepage

Download and install the software for the PLENTICORE plus inverter that was released/up to date at the time of installation. This software can be downloaded from our homepage under the following link: <https://www.kostal-solar-electric.com/de-de/download/download#PLENTICORE%20plus/PLENTICORE%20plus%2010/Deutschland/Update/>



Install the software package as described in detail in the inverter operating instructions.



Home Current values Statistics Log data Settings Service menu Update Info

Update

Updates and release notes are available in the [download area](#) on the KOSTAL Solar Electric GmbH website.

The latest version can also be downloaded directly [here](#).



Run ✓



IMPORTANT INFORMATION

If the update is successful, the inverter starts in the regular operating mode.

If, contrary to expectations, this does not happen, please disconnect the inverter from the DC and AC side for 2 minutes and then put the device back into operation.

Troubleshooting – Commissioning

- **EC 6006:** „A parameterizable number of attempts to read a value from the sensor failed“
- It indicates an error in the communication between the Energy Meter and the inverter.
 - Check RS485 data cable
 - Check pin configuration of the RS485 connector
 - Is the right Energy Manager/Meter selected?
 - Is the correct sensor position selected?
 - Restart the Energy Meter, use the RESET Button
- **EC 6009:** „Five attempts to communicate with the battery system failed“.
- It indicates an error in the communication between the inverter and the battery.
 - Is the BCU ground correctly connected to Equipotential bonding rail?
 - Check RS485 data cable
 - Check pin configuration of the RS485 connectors
 - Is the battery correctly configured?
 - Check position of jumper, must be plugged in to 2, newer BCU devices have two jumpers plugged in (to 1 and 2)
- **EC 5095:** „The inverter cannot measure the battery voltage at DC input 3“
- With this message no voltage is detected at the DC3 input of the WR from the battery.
 - Is the battery on the circuit breaker switched on?
 - Is an error displayed on the battery's web server?
 - Is the polarity of the DC cables from the battery OK?
 - Is the battery correctly configured?
- **The battery is OK and shows no error.** In this case, restart the PLENTICORE plus inverter. Restart sequence: Switch off the device at the DC switch, switch off AC fuses, remove DC strings and wait 2 minutes. Then plug in the DC strings, switch on the AC fuses and switch on the DC switch again. The device restarts. The EC should no longer be present and the battery has been detected and is in operation.

Further information and help

- Link to the KOSTAL download page: <https://www.kostal-solar-electric.com/de/de/download/download>
- Link to the EFT Software download page: <https://www.eft-systems.de/de/downloads>

Please register the inverter to receive the 5 year warranty.

- Link to registration: <https://shop.kostal-solar-electric.com/de/kostal-smart-warranty.html>

Basic information by communication problems

Experience has shown that switches or WLAN repeaters that do not support multicasting or do not properly process and distribute multicast packets (keywords: IPTV, network printer, IP camera, etc.) are often installed in the event of communication problems.

It must therefore be ensured that the communication interfaces of the PV system are not disturbed in any way.

If multicast filtering with Internet Group Message Protocol (IGMP*) is not used, the interfaces may be overloaded because they must respond permanently to multicast traffic that is not intended for them.

Please note that KOSTAL cannot provide detailed recommendations for suitable network devices or support for the network architecture.

If you are using a Telekom media receiver that is to be connected via WLAN, powerline or switch, you will find a list of working combinations in the official Telekom Helps Community:

<https://telekomhilft.telekom.de/t5/Fernsehen/EntertainTV-neu-Liste-funktionierender-Kombinationen-mit-WLAN/td-p/1867188>

Please consult your network specialist or provider if you need further assistance.

*Note: The current IGMP version 3 is used e.g. for the provision of the IP-TV service "Entertain" of Deutsche Telekom.

In addition, the following points must be observed to ensure interference-free and secure data transmission:

1. Signal, data and communication lines must be strictly separated from power cables. Pay attention to separators in cable ducts.
2. Only use cables and wires for data transmission that are approved and/or suitable for this purpose.
3. The inverter (additional grounding on the casing frame) and the battery (grounding of the BMS) must be at exactly the same ground potential. Determine the low resistance of the individual protective conductors by means of a measurement. Only if the battery and the inverter are properly grounded can trouble-free and reliable data transmission be guaranteed.