DEIF hybrid compatibility

4189341288M

Photovoltaic and energy storage systems, weather and power measurements

Application notes

DEIF Improve Tomorrow

1. Introduction

1.1 DEIF's hybrid controllers

The DEIF hybrid controllers allow you to combine renewable energy with other power sources.

Controller	Function	Documentation
ASC-4 Solar	Integrate photovoltaic power in a wide range of applications	www.deif.com/documentation/asc-4-solar
ASC-4 Battery	Integrate battery energy and storage	www.deif.com/documentation/asc-4-battery
ASC 150 Solar	Integrate photovoltaic power in a wide range of applications	www.deif.com/documentation/asc-150-solar
ASC 150 Storage	Integrate battery energy and storage in a wide range of applications	www.deif.com/documentation/asc-150-storage
AGC 150 Hybrid	Integrate photovoltaic power in simple applications with gensets	www.deif.com/documentation/agc-150-hybrid

1.2 Compatibility and compliance

DEIF hybrid controllers are compatible with photovoltaic and battery systems from a wide range of manufacturers.

SunSpec compliance

All DEIF hybrid controllers are compliant with the SunSpec standards (see sunspec.org). DEIF controllers are therefore compatible with new inverters that use the generic SunSpec protocol.

Testing

Many PV inverter makers and battery system makers use the same protocol for a wide range of their products. New PV inverters and battery systems often comply with the older protocol. If a specific inverter or battery management system is not listed here, but the maker is listed, there is a good chance that the DEIF controller is compatible.

If your PV inverter or Battery system is not listed, DEIF can help to confirm compliance using the Modbus protocol documentation.

Implementing new protocols

Since new photovoltaic and battery systems are launched every year, DEIF developers continuously implement new protocols. If your system is not listed, please contact DEIF. We can work with you to quickly implement the required protocol.

1.3 Software versions

This document is valid for the following software versions.

Controller	SW version
ASC-4 Solar	4.28
ASC-4 Battery	4.28
ASC 150 Solar	1.19
ASC 150 Storage	1.19
AGC 150 Hybrid	1.19

2. Photovoltaic

2.1 Compatible PV systems

Controller	Modbus RTU (RS-485)	Modbus TCP	PV protocol parameter
ASC-4 Solar	●	●*	7561
ASC 150 Solar	●	●	7561
AGC 150 Hybrid	●	●	17321

NOTE * An external converter is required. This can be supplied by DEIF.

COC = Certificate of compliance

NOTE If different PV inverter types from the same branch use the same SunSpec models, these can often be installed on the same communication bus and support broadcast.

2.1.1 ABB/Fimer

ABB/Fimer	Interface	PV protocol	COC
Pro33	Modbus RTU (RS-485)	ABB PRO	
PVS 50/60	Modbus RTU (RS-485)	SunSpec Generic	
PVS 100/200	Modbus RTU (RS-485)	SunSpec Generic	
PVS 175	Modbus RTU (RS-485)	SunSpec Generic	
PVS 800	Modbus RTU (RS-485)	ABB PVS800	
Trio 5.8-8.0 (ID restricted)	Modbus RTU (RS-485)	ABB TRIO	
Trio 20.0	Modbus RTU (RS-485)	ABB TRIO	●
Trio 27.6	Modbus RTU (RS-485)	ABB TRIO	●
Trio 50.0	Modbus RTU (RS-485)	ABB Trio 50	

2.1.2 CanadianSolar

CanadianSolar	Interface	PV protocol	COC
CSI-110K-T4001A-E	Modbus RTU (RS-485)	Canadian CSI-110K-T4001A-E	

2.1.3 Chint

Chint	Interface	PV protocol	COC
SCA14-36 KTL	Modbus RTU (RS-485)	CPS (Chint Power) 14/36kW	
SCA50-60 KTL	Modbus RTU (RS-485)	CPS (Chint Power) 50/60kW	
CPS SCHxxxKTL: • 100kW_9Boost_1100V • 136kW_12Boost_1100V • 250kW_12Boost_1500V	Modbus RTU (RS-485)	CPS (Chint Power) Boost 100-250kW	

2.1.4 DEIF open

DEIF open	Interface	PV protocol	COC
Inverters using the DEIF open protocol	Modbus RTU (RS-485)	DEIF Open	

2.1.5 Delta

Delta	Interface	PV protocol	COC
RPI M6A	Modbus RTU (RS-485)	Delta RPI	
RPI M10A	Modbus RTU (RS-485)	Delta RPI	
RPI M15A (unicast only)	Modbus RTU (RS-485)	Delta RPI	
RPI M20A (unicast only)	Modbus RTU (RS-485)	Delta RPI	
RPI M30A	Modbus RTU (RS-485)	Delta RPI	
RPI M50A	Modbus RTU (RS-485)	Delta RPI	
RPI M88H	Modbus RTU (RS-485)	Delta RPI M88H	

2.1.6 Deye

Deye	Interface	PV protocol	COC
SUN 1.3K-G	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 3-6K-G	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 4-12K-G05	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 4-12K-G05-P	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 7-10.5K-G	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 15-17K-G03	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 18-25K-G04	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 30-36K-G04	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 30-60K-G03	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 60-80K-G	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 70-110K-G03	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	
SUN 120-136K-G01P3	Modbus RTU (RS-485)	Deye SUN 30-50k-G03	

NOTE For new software version 0603 or later, the Deye PV protocol supports broadcast and modbus ID can be changed.

2.1.7 EVVO

EVVO	Interface	PV protocol	COC
50-70kW	Modbus RTU (RS-485)	EVVO	
1110TL/1600TL/2200TL/3000TL	Modbus RTU (RS-485)	EVVO	

NOTE The EVVO PV protocol does not support broadcast. The protocol only supports Modbus function code 0×06 (single register write) for write telegrams. However, the DEIF controller can use unicast to communicate with multiple inverters.

2.1.8 Fimer

Fimer	Interface	PV protocol	COC
PVS980	Modbus RTU (RS-485)	FIMER PVS980	

2.1.9 Fronius

Fronius	Interface	PV protocol*	COC
Data manager	Modbus RTU (RS-485) or Modbus TCP	SunSpec Generic	
Eco	Modbus RTU (RS-485) or Modbus TCP	SunSpec Generic	
Tauro	Modbus RTU (RS-485) or Modbus TCP	SunSpec Generic	
Symo	Modbus RTU (RS-485) or Modbus TCP	SunSpec Generic	

NOTE * Fronius inverters with firmware 3.7.1-4 and earlier must use the **Fronius before 3.7.1-5** protocol.

2.1.10 Gamesa

Gamesa	Interface	PV protocol	COC
E-series	Modbus TCP	Gamesa E-series	

2.1.11 Goodwe

Goodwe	Interface	PV protocol	COC
XS Series: 0.7-3 kW	Modbus RTU (RS-485)	Goodwe DT series	●
DNS Series: 3-6 kW	Modbus RTU (RS-485)	Goodwe DT series	●
MS Series: 5-10 kW	Modbus RTU (RS-485)	Goodwe DT series	●
A-MS Series: 5-9.6 kW	Modbus RTU (RS-485)	Goodwe DT series	●
SDT G2 Series: 4-15 kW	Modbus RTU (RS-485)	Goodwe DT series	●
SDT G2 Series: 17-25 kW	Modbus RTU (RS-485)	Goodwe DT series	●
LVSMT Series: 12-20 kW	Modbus RTU (RS-485)	Goodwe MT series	●
SMT Series: 25-36 kW	Modbus RTU (RS-485)	Goodwe MT series	●
MT Series: 50-80 kW	Modbus RTU (RS-485)	Goodwe MT series	●
HT Series: 73-136 kW	Modbus RTU (RS-485)	Goodwe HT series	●
HT Series: 225/250 kW	Modbus RTU (RS-485)	Goodwe HT series	●

2.1.12 Growatt

Growatt	Interface	PV protocol	COC
CP100, CP250	Modbus RTU (RS-485)	Growatt CP100-CP250	
CP500, CP630, CP850, CP1000, CP1700, CP2000, CP2520	Modbus RTU (RS-485)	Growatt CP500-CP2520	

Growatt	Interface	PV protocol	COC
MIN 2500TL-X to 6000TL-X MIN 2500TL-XE to 6000TL-XE MID 15KTL3-x to 40KTL3-X MAC 15KTL3-XL to 36KTL3-XL MAC 30KTL3-X LV to 60KTL3-X LV MAC 50KTL3-X MV to 70KTL3-X MV MAX 50KTL3-X LV to 125KTL3-X LV MAX 60KTL3-X MV to 100KTL3-X MV MAX 185KTL3-X HV to 253KTL3-X HV	Modbus RTU (RS-485)	Growatt MAC, MAX and MID series*	
10000UE/12000UE/18000UE/ 20000UE	Modbus RTU (RS-485)	Growatt UE-series**	

NOTE * *Tx min interval* (parameter 7760) must be at least 0.85 s. Growatt recommends 1 s.
NOTE ** Previously *Growatt*.

2.1.13 Havells

Havells	Interface	PV protocol	COC
1-40kW	Modbus RTU (RS-485)	Havells 1-40kW*	
50-70kW	Modbus RTU (RS-485)	Havells 50-70kW*	
80-136kW	Modbus RTU (RS-485)	Havells 80-136kW	

NOTE * *Tx write fnc* (ASC-4 parameter 7564, AGC 150 parameter 17324) must be **Single register 0×06**. To use broadcast, the inverter firmware must be at least 2.40. *Broadcast ID* (ASC-4 parameter 7515, AGC 150 parameter 17313) must be **Enabled** and set to **136**.

2.1.14 HiQ

HiQ	Interface	PV protocol	COC
Truestring	Modbus RTU (RS-485)	HiQ solar truestring	

2.1.15 Huawei

Huawei*	Interface	PV protocol	COC
Smartlogger	Modbus TCP	Huawei smartlogger	
SUN2000-2KTL-L0/-L1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-3KTL-CNL0/-L0/-L1/-M0/-M1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-3.68KTL-L10	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-3.8KTL-USL0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-4KTL-CNL0/-L0/-L1/-M0/-M1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-4.6KTL-L1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-4.95KTL-JPL0/-JPL1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-5KTL-CNL0/-L0/-L1/-M0/-M1/-USL0	Modbus RTU (RS-485)	Huawei V.3	

Huawei*	Interface	PV protocol	COC
SUN2000-6KTL-CNL0/-L1/-M0/-M1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-7.6KTL-USL0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-8KTL/-MO/-M1/-M2	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-9KTL-USL0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-10KTL/-M0/-M1/-M2/-USL0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-11.4KTL-USL0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-12KTL/-M0/-M1/-M2	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-15KTL/-M0/-M2/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-17KTL/-M0/-M2/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-20KTL/-M0/-M2/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-22KTL-US	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-23KTL/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-24.5KTL/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-24.7KTL-JP	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-25KTL-NAM3/-US	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-28KTL/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-29.9KTL/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-30KTL-A/-M3/-NAM3/-US	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-33KTL/-A/-E001/-JP/-NAM3/-NHM3/-US	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-33KTL/-A/-E001/-JP/-NAM3/-NHM3/-US	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-36KTL/-M3/-NAM3/-US	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-40KTL/-JP/-M3/-NAM3/-NHM3/-US	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-42KTL/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-43KTL-IN-C1/-INM3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-44KTL-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-45KTL/-US-HV-D0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-50KTL/-C1/-JPM0/-JPM1/-M0/-M3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-55KTL-HV-D1/-HV-D1-001/-IN-HV-D1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-60KTL-HV-D1/-HV-D1-001/-M0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-63KTL-JPH0/-JPM0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-65KTL-M0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-70KTL-C1/-INM0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-75KTL-C1	Modbus RTU (RS-485)	Huawei V.3	

Huawei*	Interface	PV protocol	COC
SUN2000-90KTL-H0/-H1/-H2	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-95KTL-INH0/-INH1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-100KTL-H0/-H1/-H2/-INM0/-M0/-M1/-USH0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-105KTL-H1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-110KTL-M0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-125KTL-JPH0/-M0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-168KTL-H1	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-175KTL-H0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-185KTL-H1/-INH0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-193KTL-H0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-196KTL-H0/-H1/-H3	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-200KTL-H2	Modbus RTU (RS-485)	Huawei V.3	
SUN2000-215KTL-H0	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-2KTL	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-3KTL/-CN/-CN-4G	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-3.68KTL	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-4KTL/-CN/-CN-4G	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-4.125KTL-JP	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-4.6KTL	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-4.95KTL-JP	Modbus RTU (RS-485)	Huawei V.3	
SUN2000L-5KTL/-CN/-CN-4G	Modbus RTU (RS-485)	Huawei V.3	
SUN8000-500KTL	Modbus RTU (RS-485)	Huawei V.3	
SUN2000 8-28KTL	Modbus RTU (RS-485)	Huawei SUN2000 8-28KTL*	
SUN2000 33-40KTL	Modbus RTU (RS-485)	Huawei SUN2000 33-40KTL*	
SUN2000 50-60KTL	Modbus RTU (RS-485)	Huawei SUN2000 50-60KTL*	
SUN2000 55-60KTL	Modbus RTU (RS-485)	Huawei SUN2000 55-60KTL*	
SUN2000 90-105	Modbus RTU (RS-485)	Huawei SUN2000 90-105KTL*	
SUN2000 100-125KTL	Modbus RTU (RS-485)	Huawei SUN2000 100-125M0-M2*	

NOTE If the inverters have the latest software, use the **Huawei V.3** protocol. For older software, you may need to use one of the protocols marked with a star.

2.1.16 Ingeteam

Ingeteam	Interface	PV protocol	COC
SUN 10 TL	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 10 TL M	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 15 TL	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 15 TL M	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 20 TL	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●

Ingeteam	Interface	PV protocol	COC
SUN 20 TL M	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 33 TL	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 33 TL M	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 40 TL M480	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 100 TL (360V)	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 100 TL (380V)	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 100 TL (400V)	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 100 TL (420V)	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●
SUN 100 TL (440V)	Modbus RTU (RS-485)	Ingeteam 3Play - ABI	●

NOTE *Ingeteam 3Play - ABI* previously called *Ingeteam 3Play*.

Ingeteam/Ingecon	Interface	PV protocol	COC
SUN 100 TL	Modbus RTU (RS-485)	Ingeteam 3Play - ABS	
SUN 160 TL M	Modbus RTU (RS-485)	Ingeteam 3Play - ABS	

2.1.17 INVT

INVT	Interface	PV protocol	COC
iMars BG	Modbus RTU (RS-485)	INVT BG series	
XG 15-25kW Three-Phase On-Grid Solar Inverter	Modbus RTU (RS-485)	INVT XG series	
XG 25-40kW Three-Phase On-Grid Solar Inverter	Modbus RTU (RS-485)	INVT XG series	
XG 50-70kW Three-Phase On-Grid Solar Inverter	Modbus RTU (RS-485)	INVT XG series	
XG 100-136kW Three-Phase On-Grid Solar Inverter	Modbus RTU (RS-485)	INVT XG series	

2.1.18 Kaco

Kaco	Interface	PV protocol	COC
Blueplanet 5.0-10.0 TL3*	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 15.0 TL3*	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 20.0 TL3*	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 50.0 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 60.0 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 87.0 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 92.0 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 105 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 125 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 137 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 150.0 TL3	Modbus UDP/TCP	SunSpec Generic	●

Kaco	Interface	PV protocol	COC
Blueplanet 155 TL3	Modbus UDP/TCP	SunSpec Generic	●
Blueplanet 165 TL3	Modbus UDP/TCP	SunSpec Generic	●
Powador 18.0-20.0 TL3*	Modbus UDP/TCP	SunSpec Generic	●
Powador 60.0 TL3*	Modbus UDP/TCP	SunSpec Generic	●

NOTE * These models are no longer available.

2.1.19 Kehua

Kehua	Interface	PV protocol	COC
SPI320K-B-H series	Modbus 485 (Standard) Modbus TCP (Option required)	Kehua SPI	
SPI250K-B-H series	Modbus 485 (Standard) Modbus TCP (Option required)	Kehua SPI	
SPI125K-B series	Modbus 485 (Standard) Modbus TCP (Option required)	Kehua SPI	
SPI33K-B X2 series	Modbus 485 (Standard) Modbus TCP (Option required)	Kehua SPI	
SPI23K-B X2 series	Modbus 485 (Standard) Modbus TCP (Option required)	Kehua SPI	
SPI12K-B X2 series	Modbus 485 (Standard) Modbus TCP (Option required)	Kehua SPI	
SP18000-B X2 series	Modbus 485 (Standard) Modbus TCP (Option required)	Kehua SPI	

2.1.20 Kostal

Kostal	Interface	PV protocol	COC
PIKO IQ	Modbus TCP	SunSpec Generic	
PLENTICORE	Modbus TCP	SunSpec Generic	

2.1.21 Kstar

Kstar	Interface	PV protocol	COC
KSG1-60	Modbus RTU (RS-485)	KStar	

2.1.22 Matter Energy

Matter Energy	Interface	PV protocol	COC
SPI 20k to 160k	Modbus RTU (RS-485) or Modbus TCP	Matter Energy SPI20k-160k	

2.1.23 Meteocontrol

Meteocontrol	Interface	PV protocol	COC
blue'Log XC	Modbus RTU (RS-485) or Modbus TCP	Bluelog XC	

2.1.24 Polycab

Polycab	Interface	PV protocol	COC
50-60kW	Modbus RTU (RS-485)	Polycab 50-60kW	

2.1.25 Power One

Power One	Interface	PV protocol	COC
SGTU1K-100K	Modbus RTU (RS-485)	Power One	

2.1.26 Refusol

Refusol	Interface	PV protocol	COC
8-23K (kW only)	Modbus RTU (RS-485)	SunSpec Generic	
100K	Modbus RTU (RS-485)	SunSpec Generic	

2.1.27 Schneider

Schneider	Interface	PV protocol	COC
CL 20E	Modbus RTU (RS-485)	Schneider Conext CL 20/25	●
CL 25E	Modbus RTU (RS-485)	Schneider Conext CL 20/25	●
CL 25 NA	Modbus RTU (RS-485)	Schneider Conext CL 20/25	●
CL 30*	Modbus RTU (RS-485)	Schneider CL 30/33/50/60	●
CL 33*	Modbus RTU (RS-485)	Schneider CL 30/33/50/60	●
CL 36E*	Modbus RTU (RS-485)	Schneider CL 30/33/50/60**	●
CL 50*	Modbus RTU (RS-485)	Schneider CL 30/33/50/60	●
CL 60 A/E*	Modbus RTU (RS-485)	Schneider CL 30/33/50/60**	●

NOTE * For the Schneider CL30-50 update, new CL inverters will be introduced, and old ones will be terminated. PV protocol previously *Schneider Conext CL 30/33/50/60*.

NOTE ** Previously *Schneider Conext CL 60*.

2.1.28 Sineng

Sineng	Interface	PV protocol	COC
SP-320K series	RS-485	Sineng SP320K	

2.1.29 SMA

SMA	Interface	PV protocol	COC
Cluster controller	Modbus TCP	SMA cluster controller	
EDML-10 (SMA Data Manager L)	Modbus TCP	SMA Data Manager*	
EDMM-10 (SMA Data Manager M)	Modbus TCP	SMA Data Manager*	
EDMM-US-10 (SMA Data Manager M)	Modbus TCP	SMA Data Manager*	
EDML-10.A (SMA Data Manager M Lite)	Modbus TCP	SMA Data Manager*	
Core1	Modbus UDP/TCP	SunSpec Generic	
Core2	Modbus UDP/TCP	SunSpec Generic	
FSC	Modbus TCP	SMA FSC	
SHP 75	Modbus TCP	SunSpec Generic	
SMA inverter with firmware v2.82 or earlier	Modbus RTU (RS-485)	SMA SunSpec before v2.82	
Solid Q50-60	Modbus RTU (RS-485)	SMA Solid-Q 50	
Solid-Q PRO 60	Modbus RTU (RS-485)	SMA Solid-Q PRO 60	
STP 5000-12000 TL	Modbus UDP/TCP	SunSpec Generic	
STP 20000-25000 TL	Modbus UDP/TCP	SunSpec Generic	
STP 60	Modbus UDP/TCP	SunSpec Generic	

NOTE * The DEIF controller cannot control the reactive power in the AC output for this protocol. The reactive power must be set up from the SMA Data Manager's web interface.

2.1.30 Sofar Solar

Sofar Solar	Interface	PV protocol	COC
SOFAR 1000 to 3000TL	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 10 to 20KTL	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 30 to 40KTL	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 50 to 70KTL	Modbus RTU (RS-485)	Sofar Solar 50-70kW*	
SOFAR 75 to 136KTL	Modbus RTU (RS-485)	Sofar Solar 80-136kW	
SOFAR 3 to 6KTLM	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 7.5KTLM	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 3 to 6KTLM-G2	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 10 to 15KTL-G2	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 20 to 33KTL-G2	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 30 to 40KTL-G2	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 50 to 70KTL-G2	Modbus RTU (RS-485)	Sofar Solar 50-70kW*	
SOFAR 1100 to 3300TL-G3	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
SOFAR 3.3 to 12KTL-X	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	

NOTE * *Tx write fnc* (ASC-4 parameter 7564, AGC 150 parameter 17324) must be **Single register 0×06**. To use broadcast, the inverter firmware must be at least 2.40. *Broadcast ID* (ASC-4 parameter 7515, AGC 150 parameter 17313) must be **Enabled** and set to **136**.

Sofar Solar	Interface	PV protocol	COC
SOFAR 15-24KTLX-G3 series	Modbus RTU (RS-485)	Sofar -G3	
SOFAR 25K-50KTLX-G3 series	Modbus RTU (RS-485)	Sofar -G3	
SOFAR 80KTLX-G3 series	Modbus RTU (RS-485)	Sofar -G3	

2.1.31 SolaX Power

SolaX Power	Interface	PV protocol	COC
X3 FORTH	Modbus RTU (RS-485)	Solax X3-FORTH/MEGA G2	
X3 MEGA G2	Modbus RTU (RS-485)	Solax X3-FORTH/MEGA G2	
X3 MIC G2	Modbus RTU (RS-485)	Solax MIC-G2/Pro-G2	
X3 PRO G2	Modbus RTU (RS-485)	Solax MIC-G2/Pro-G2	

2.1.32 SolarEdge

SolarEdge	Interface	PV protocol	COC
SE17.3K	Modbus RTU (RS-485)	SolarEdge	
SE27.6K	Modbus RTU (RS-485)	SolarEdge	
SE33.3K	Modbus RTU (RS-485)	SolarEdge	
SE55.5K	Modbus RTU (RS-485)	SolarEdge	
SE66.6K	Modbus RTU (RS-485)	SolarEdge	
SE82.8K	Modbus RTU (RS-485)	SolarEdge	
SE100K	Modbus RTU (RS-485)	SolarEdge	
SE120K	Modbus RTU (RS-485)	SolarEdge	
PPC	Modbus RTU (RS-485)	SolarEdge PPC	

2.1.33 Solis

Solis (Ginlong)	Interface	PV protocol	COC
Grid-tied inverters	Modbus RTU (RS-485)*	Solis (Ginlong)	
		Solis Logger NISE	

NOTE * Solis broadcast only works with newer Solis software.

2.1.34 Sungrow

Sungrow	Interface	PV protocol	COC
COM100E	Modbus RTU (RS-485) or Modbus UDP/TCP	Sungrow Logger 1000	
SunGrow Series	Modbus RTU (RS-485)	Sungrow SG series*	

NOTE * In AGC 150 Hybrid, this is *Sungrow SG10_60*.

2.1.35 Tbea

Tbea	Interface	PV protocol	COC
Tbea	Modbus RTU (RS-485)	Tbea	

2.1.36 Thea

Thea	Interface	PV protocol	COC
Thea	Modbus RTU (RS-485)	Thea	

2.1.37 Vacon

Vacon	Interface	PV protocol	COC
Vacon 8000	Modbus RTU (RS-485)	Vacon8000	

2.1.38 ZCS Azzurro

ZCS Azzurro	Interface	PV protocol	COC
AZZURRO 1PH 1100TL-3000TL-V1	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 1PH 1100-3300TL-V3	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 1PH 3000-6000-V1	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 3PH 10KTL-20KTL-V1	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 3PH 30KTL-40-HV-V1	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 3PH 3.3KTL-12KTL-V1	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 1PH 3000-6000-V2	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 3PH 20KTL-33KTL-V2	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 3PH 10KTL-15KTL-V2	Modbus RTU (RS-485)	Sofar Solar 1-40kW*	
AZZURRO 3PH 50KTL-70KTL-HV-V1	Modbus RTU (RS-485)	Sofar Solar 50-70kW*	
AZZURRO 3PH 80KTL-LV to 136-HV	Modbus RTU (RS-485)	Sofar Solar 80-136kW	

NOTE * *Tx write fnc* (ASC-4 parameter 7564, AGC 150 parameter 17324) must be **Single register 0×06**. To use broadcast, the inverter firmware must be at least 2.40. *Broadcast ID* (ASC-4 parameter 7515, AGC 150 parameter 17313) must be **Enabled** and set to **136**.

3. Weather stations

3.1 Compatible weather stations and forecast systems

Weather stations

The weather stations are compatible with **ASC-4 Solar** and **ASC 150 Solar** (parameter 7661). They are also compatible with **AGC 150 Hybrid** (parameter 17422).

Maker	Type	Interface	ASC Weather prot.
ABB	TRIO VSN800	Modbus RTU (RS-485)	ABBTRIO VSN800
Delta	GHI sensor Modbus	Modbus RTU (RS-485)	Delta Ohm
Kipp & Zonen	RT1 Smart Rooftop Monitoring System	Modbus RTU (RS-485)	Kipp and Zonen RT1
Seven Sensor	Seven Sensor 3S	Modbus RTU (RS-485)	Seven Sensor 3S
Seven Sensor	Seven Sensor 3S-TP GHI-Thermopile Pyranometer	Modbus RTU (RS-485)	Seven Sensor 3S-TP

Forecast systems

The forecast systems are compatible with **ASC-4 Solar**.

Maker	Type	Interface	ASC Forecast prot. (7631)
Reuniwatt	SkyInSight	Modbus TCP	Reuniwatt SkyInSight
SteadySun	SteadyEye	Modbus TCP	SteadySun SteadyEye

4. Storage

4.1 Overview

4.1.1 Compatible battery energy storage systems

Controllers

ASC 150 Storage and **ASC-4 Battery** support the protocols listed in this chapter.

Interfaces

Controller	Modbus RTU (RS-485)	Modbus TCP	ESS protocol parameter	BMS protocol parameter	PDS protocol parameter
ASC-4 Battery	●	●*	7561	7681	7882
ASC 150 Storage	●	●	7561	7682	7912

NOTE *An external converter is required. This can be supplied by DEIF.

COC = Certificate of compliance

System types

System	ESS protocol	BMS protocol	PDS protocol
Battery control unit (BCU)	●		
Battery management system (BMS)		●	
Power conversion system (PCS)	●		
Energy storage system (ESS)	●		
Power DC-DC system (PDS)			●

4.1.2 Power and droop/VSG modes

The ESS protocols can support one or more of these power modes.

Power-reactive power (P/Q)

The inverter is grid-following. The inverter matches the busbar voltage and frequency, and generates power based on a P and Q reference. Before the inverter can start, a grid-forming energy source, like a genset or a mains connection, must be connected to the busbar.

If the grid-forming genset or mains trips, the inverter cannot keep the voltage and frequency stable. The inverter therefore also trips, which causes a blackout.

Voltage-frequency (V/f)

The inverter is grid-forming. The inverter tries to keep the output voltage and frequency constant (usually at the nominal voltage and frequency of the grid). This allows the PCS/BCU to generate power and charge without any gensets or mains connected to the busbar.

However, since the inverter keeps the voltage and frequency constant, the inverter generally cannot be connected work in parallel with a genset or mains connection. The constant voltage and frequency would conflict with other voltage and frequency sources. Therefore, if a genset or mains is connected to busbar, the inverter must generally switch back to P/Q mode. Depending on the inverter, a blackout might be required.

Some PCS/BCU support running in V/f mode while parallel with other identical PCS/BCU (which are also in V/f mode).

Droop/VSG

Droop mode is also called VSG-mode (Virtual Synchronous Generator mode). The inverter acts like a generator, which allows the inverter to always be grid-forming. In addition, in droop mode, the output voltage and frequency are controlled using predefined droop slopes. This allows the inverter to be connected in parallel with gensets and sometimes also a mains connection.

If the gensets or mains connection trip, the inverter can then immediately keep the voltage and frequency stable based on the droop slope, to prevent a blackout. The gensets and mains are also able to synchronise back to the inverter.

4.1.3 List for BCU control

Maker	Type	Modbus RTU	Modbus TCP	COC
Any maker	DEIF Generic Modbus protocol for implementation	●	●	
Alfen	TheBattery Connect	●	●	
Aggreko	Y.Cube		●	
ATESS-Growatt	PCS series	●		●
GPSS	GPSS-240-020K-3P-Cxx		●	●
H2	Enerflow		●	●
Huawei	SACU – LUNA		●	
LS PowerBRiC	E-series		●	
Northvolt	VMS	●	●	
Rolls Royce	Qinous RDD		●	●
Sungrow	SunGrow LC100 Utility LFP		●	
Sungrow	SunGrow local controller	●	●	
Sungrow	SC XXX (Upper Computer Communication Protocol for PCS (V1.2.1.1)	●		
Sungrow	LC200		●	
Sungrow	PowerStack		●	
Tesla	Tesla Powerpack		●	

4.1.4 List for BCU and PCS control

Maker	Type	Modbus RTU	Modbus TCP	COC
Any maker	DEIF Generic Modbus protocol for implementation	●	●	
ABB	PQ PluS		●	
Ausar	Ausar MAE	●		
Danfoss Vacon	Danfoss NXP		●	
Delta	PCS1000	●		
Delta	PCS100HV		●	
Dynapower	CPS 1500 and MPS-125 EVH PCS		●	
EPC power	CAB1000	●	●	
Fimer	PVS980-58BC	●		
Jinko	PCS 500K	●	●	

Maker	Type	Modbus RTU	Modbus TCP	COC
Kehua	BCS-B-HUD series	●	●	
KStar	GSE series	●	●	
Matter Energy	Matter Energy PCS	●	●	
Megarevo	MPS series	●	●	
Oztek	OZPCS-RS40	●	●	
Pixii	PowerShaker	●	●	
Sicon	EPCS series	●		
Sinexcel	PWS1-50K to 250K series	●		
Sinexcel	PWS2-30K series	●		
Sinexcel	PWS1-1750KTL		●	
Sino Soar	SP100H	●		
SMA	Sunny Island		●	
TRUMPF	TruConvert AC3025		●*	
TRUMPF	TruConvert DC1008		●*	
Vertiv	V1EA series	●	●	
Yingbo	Yingbo INPPCS-xxx-0.4/w 50/100 kW	●	●	

NOTE * Modbus UDP/TCP

4.1.5 List for BMS control

Maker	Type	Modbus RTU	Modbus TCP	COC
Any maker	DEIF Generic Modbus protocol for implementation	●	●	
Allsparkpower	Allsparkpower	●	●	
BMSer	BMSer Technology V.1	●		
BMSer	BMSER Single Cluster	●	●	
BYD	BYD Cube Pro		●	
CATL	CATL BMS systems		●	
Enervenue	Energy Rack		●	
EOS Energy Block	EOS Energy Block		●	
Gold	ESMU		●	
Gotion	Gotion BMS	●		
GTZKNE	WK-BMS-C	●	●	
GTZKNE	FX34	●	●	
Hangzhou Huasu	CELLCHECK H3G-TA	●		
Hangzhou Huasu	HuaSu LFP 3-Layer BMS		●	
Hangzhou Huasu	Huasu S02/03 BMS		●	
Hangzhou Huasu	Huasu S04 BMS		●	
Kgooer	BMU	●		

Maker	Type	Modbus RTU	Modbus TCP	COC
Lithium Valley	SCU	●	●	
LFP	LiFe Po	●		
HoyCore	HoyCore Outdoor Liquid-Cooling Battery System	●	●	
Narada	NESP and NPFC series	●		
Ningbo	SYL Golden Sigma - model SU340U170K.	●		
Ningbo	Ningbo Golden Shield	●	●	
Ocean Batteries	PD-003V2 BMS	●		
Polarium	BESS	●		
PylonTech	PowerCube H1/H2	●		
Samsung	E1	●		
Shenzhen Coslight Power Technology	ESMU		●	
Sunwoda	BCMU		●	
Sunwoda	Main BCMU		●	.

4.1.6 List for PDS control

Maker	Type	Modbus RTU	Modbus TCP	COC
SinExcel	SinExcel DC/DC PDS	●	●	

PDS = Power DC-DC System

4.2 Protocols

4.2.1 Any maker (generic protocols)

DEIF Generic (PCS or BCU)

Maker	Any
Type	Modbus protocol for implementation
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	DEIF Generic
System	PCS or BCU
Power mode(s)	P/Q, V/f, Droop
Notes	For more information, see the **ASC-4 Battery Modbus client tables** and the **ASC-4 Modbus client User manual**. **ESS protocol M-Logic custom input 1:** The state of ESS custom input 1 is reflected in bit 3 of the config bits written to the PCS/BCU.

DEIF Generic (BMS)

Maker	Any
Type	Modbus protocol for implementation
Interface	Modbus RTU (RS-485) or Modbus TCP

ASC BMS (7681/7682) protocol	DEIF Generic
System	BMS
Notes	For more information, see the **ASC-4 Battery Modbus client tables** and the **ASC-4 Modbus client User manual**.

DEIF Open

Maker	Any
Type	BESS using the DEIF open protocol
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	DEIF Open
System	PCS and/or BMS
Power modes	-

4.2.2 ABB

Maker	ABB
Type	PQ PluS
Interface	Modbus TCP
ASC ESS (7561) protocol	
System	PCS
Power mode(s)	
Notes	Under development. Contact DEIF for more information.

4.2.3 Aggreko

Maker	Aggreko
Type	Y.Cube
Interface	Modbus TCP
ASC ESS (7561) protocol	Aggreko Y-Cube*
System	BCU
Power mode(s)	P/Q
Notes	* Requires a special Aggreko option in ASC-4.

4.2.4 Alfen

Maker	Alfen
Type	TheBattery
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Alfen BCU
System	BCU
Power mode(s)	P/Q, Droop

4.2.5 Allsparkpower

Maker	Allsparkpower
Type	Allsparkpower
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	Allsparkpower BMS
System	BMS

4.2.6 ATESS-Growatt

Maker	ATESS-Growatt
Type	PCS
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	ATESS Growatt
System	BCU
Power mode(s)	P/Q, and V/f with Bypass panel.
Notes	Certificate of compliance

4.2.7 Ausar

Maker	Ausar
Type	Ausar MAE
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	Ausar MAE v4*
System	PCS, ESS
Power mode(s)	P/Q, V/f
Notes	**ESS protocol M-Logic custom input 1:** Enables the "MAE low battery recharge current ripple" mode for maintenance charging."

NOTE * Previously *Ausar MAE v2*.

4.2.8 BMSer

BMSer Technology V1

Maker	BMSer
Type	BMSer Technology V.1
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	BMSer Technology V1
System	BMS
Notes	Ethernet port number 503

BMSer Single Cluster

Maker	BMSer
Type	Battery Cluster Unit

Interface	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	BMSer Single Cluster
System	BMS

4.2.9 BYD

Maker	BYD
Type	Cube Pro
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	BYD Cube Pro
System	BMS

4.2.10 CATL

CATL air cooled BMS

Maker	CATL
Type	CATL BMS systems
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	CATL air cooled BMS*
System	BMS

NOTE *Previously *CATL BMS*.

CATL liquid cooled BMS

Maker	CATL
Type	CATL BMS systems
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	CATL liquid cooled BMS
System	BMS

4.2.11 Danfoss Vacon

Maker	Danfoss Vacon
Type	Danfoss NXP
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Danfoss Vacon NXP
System	PCS
Power mode(s)	P/Q, V/f, Droop
Notes	**ESS protocol M-Logic custom input 1:** Allows the Danfoss Vacon to be in “Keep zero Q” mode when only a genset/s is connected to the busbar.

4.2.12 Delta

Delta PCS1000

Maker	Delta
Type	PCS1000
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	*
System	PCS
Power mode(s)	P/Q, V/f
Notes	*Customer-specific version. Not included in standard release.

Delta EPCS 1200/1500/1725

Maker	Delta
Type	PCS/EPCS
Interface	Modbus TCP
ASC ESS (7561) protocol	Delta EPCS 1200/1500/1725
System	PCS
Power mode(s)	P/Q, V/f

Delta PCS 100HV

Maker	Delta
Type	PCS
Interface	Modbus TCP
ASC ESS (7561) protocol	Delta PCS 100HV
System	PCS
Power mode(s)	P/Q, V/f

4.2.13 Dynapower

Dynapower CPS-1500

Maker	Dynapower
Type	CPS 1500
Interface	Modbus TCP
ASC ESS (7561) protocol	Dynapower CPS-1500
System	PCS
Power mode(s)	P/Q, V/f, Droop

Dynapower MPS-125

Maker	Dynapower
Type	MPS-125 EVH PCS
Interface	Modbus TCP
ASC ESS (7561) protocol	Dynapower MPS-125

System	PCS
Power mode(s)	P/Q, V/f, Droop

4.2.14 Enervenue

Maker	Enervenue
Type	Energy Rack
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Enervenue BMS
System	BMS

4.2.15 EOS Energy Block

Maker	EOS
Type	Energy Block
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	EOS Energy Block
System	BMS

4.2.16 EPC power

Maker	EPC power
Type	CAB1000
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	EPC power
System	PCS
Power mode(s)	P/Q, V/f

4.2.17 FIMER

Maker	FIMER
Type	PVS980-58BC
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	FIMER PVS980-58BC
System	PCS
Power mode(s)	P/Q, Droop

4.2.18 Gold

Maker	Gold
Type	ESMU
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Gold BMS
System	BMS

4.2.19 Gotion

Maker	Gotion
Type	Gotion BMS
Interface	Modbus RTU
ASC BMS (7681/7682) protocol	Gotion
System	BMS

4.2.20 GPSS

Maker	GPSS
Type	GPSS-240-020K-3P-Cxx
Interface	Modbus TCP
ASC ESS (7561) protocol	GPSS
System	BCU
Power mode(s)	P/Q
Notes	Certificate of compliance

4.2.21 GTZKNE

GTZKNE WK-BMS-C

Maker	GTZKNE
Type	WK-BMS-C
Interface*	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	GTZKNE WK-BMS-C
System	BMS

NOTE * A CAN to Modbus converter is required.

GTZKNE FX34 BMS

Maker	GTZKNE
Type	FX34
Interface*	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	GTZKNE FX34 BMS
System	BMS

NOTE * A CAN to Modbus converter is required.

4.2.22 H2

Maker	H2
Type	Enerflow
Interface	Modbus TCP
ASC ESS (7561) protocol	Enerflow
System	BCU

Power mode(s)	P/Q
Notes	Certificate of compliance

4.2.23 Hangzhou Huasu

CellCheck CM BMS

Maker	Hangzhou Huasu
Type	CELLCHECK H3G-TA
Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	CellCheck CM BMS
System	BMS
Notes	Only for PbAc batteries. The charging and discharging capacity are not available in this protocol. The DEIF controller therefore uses the nominal power.

Huasu S04 BMS

Maker	Hangzhou Huasu
Type	HuaSu LFP 3-Layer BMS
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	*Huasu S04 BMS
System	BMS
Notes	Ethernet port number is 4002. It possible to change the port number on a BMS, ESS and PDS.

NOTE *Previously *Huasu BMS*.

Huasu S02/03 BMS

Maker	Hangzhou Huasu
Type	HuaSu LFP 3-Layer BMS
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Huasu S02/03 BMS
System	BMS

4.2.24 HoyCore

Maker	HoyCore
Type	HoyCore outdoor liquid-cooling battery system
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	HoyCore HC01CUBE
System	BMS

4.2.25 Huawei

Maker	Huawei
Type	SACU – LUNA
Interface	Modbus TCP

ASC ESS (7561) protocol	Huawei SACU ESS smartlogger
System	BCU
Power mode(s)	P/Q, Droop (VSG)

4.2.26 Jinko

Maker	Jinko
Type	PCS 500K
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Jinko PCS
System	PCS
Power mode(s)	P/Q, V/f

4.2.27 Kehua

Maker	Kehua
Type	BCS series
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Kehua BCS-B-HUD Series
System	PCS
Power mode(s)	P/Q, V/f, Droop

4.2.28 Kgooer

Maker	Kgooer
Type	BCMU
Interface	Modbus RTU
ASC BMS (7681/7682) protocol	KGooer BMS
System	BMS
Notes	KGooer BCMU, single cluster BM

4.2.29 KStar

Maker	KStar
Type	GSE series
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	KStar GSE 50-630 PCS
System	PCS
Power mode(s)	P/Q, V/f

4.2.30 LFP

Maker	LFP
Type	LiFe Po

Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	LFP
System	BMS
Power mode(s)	Not relevant
Notes	The charging and discharging capacity are not available in this protocol. The DEIF controller therefore uses the nominal power.

4.2.31 Lithium Valley

Maker	Lithium Valley
Type	SCU
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	Lithium Valley BMS
System	BMS

4.2.32 LS PowerBRiC

Maker	LS PowerBRiC
Type	E-series
Interface	Modbus TCP
ASC ESS (7561) protocol	LS PowerBRiC
System	BCU
Power mode(s)	P/Q, V/f

4.2.33 Matter Energy

Maker	Matter Energy
Type	BCU
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	MatterEnergy PCS
System	PCS
Power mode(s)	P/Q, V/f

4.2.34 Megarevo

Maker	Megarevo
Type	MPS series
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	MEGAREVO MPS
System	PCS
Power mode(s)	P/Q, V/f

4.2.35 Narada

Narada BMS V1

Maker	Narada
Type	NESP and NPFC series
Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	Narada BMS V1
System	BMS

Narada BMS V1 w Ctrl

Maker	Narada
Type	NESP and NPFC series
Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	Narada BMS V1 w Ctrl
System	BMS

4.2.36 Ningbo

Ningbo SYL Golden Sigma

Maker	Ningbo
Type	SYL Golden Sigma - model SU340U170K.
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Ningbo BMS
System	BMS

Ningbo Golden Shield

Maker	Ningbo
Type	Ningbo Golden Shield
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC BMS (7681/7682) protocol	Ningbo BMS
System	BMS

4.2.37 Northvolt

Maker	Northvolt
Type	VMS
Interface	Modbus TCP
ASC ESS (7561) protocol	Northvolt VMS
System	ESS
Notes	**ESS protocol M-Logic custom input 1:** Keeps the BCU in Grid Boost mode no matter what is connected to the busbar. Can still be overridden by the set grid mode outputs in M-Logic.

4.2.38 Ocean Batteries

Maker	Ocean Batteries
Type	BAMU
Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	HagalOcean PD-003V2 BMS
System	BMS
Notes	Ocean Batteries was formerly known as Hagal Ocean.

4.2.39 Oztek

Maker	Oztek
Type	OZPCS-RS40
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Oztek OZpcs-RS40
System	PCS
Power mode(s)	P/Q, V/f, Droop

4.2.40 Pixii

Maker	Pixii
Type	PowerShaper
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Pixii PowerShaper
System	PCS and BCU
Power modes	P/Q

4.2.41 Polarium

Maker	Polarium
Type	SLB48
Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	Polarium BMS
System	BMS

4.2.42 PylonTech

Maker	PylonTech
Type	PowerCube H1/H2
Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	PowerCube H1/H2
System	BMS

4.2.43 Rolls Royce

Maker	Rolls Royce
Type	Qinous ESS
Interface	Modbus TCP
ASC ESS (7561) protocol	Qinous
System	BCU
Power mode(s)	V/f, Droop
Notes	Certificate of compliance. Maker was formerly known as Qinous.

4.2.44 Samsung

Maker	Samsung
Type	E1
Interface	Modbus RTU (RS-485)
ASC BMS (7681/7682) protocol	Samsung BMS
System	BMS

4.2.45 Shenzhen Coslight Power Technology

Maker	Shenzhen Coslight Power Technology
Type	ESMU
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Coslight ESMU BMS
System	BMS

4.2.46 Sicon

Maker	Sicon
Type	EPCS series
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	Sicon PCS
System	PCS
Power mode(s)	P/Q, V/f

4.2.47 Sino Soar

Maker	Sino Soar
Type	SP100H
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	Sinosoar SP100H
System	PCS
Power mode(s)	P/Q, V/f

4.2.48 Sinexcel

Sinexcel 30P

Maker	Sinexcel
Type	30P
Type	PWS1-1750KTL
Interface	Modbus TCP
ASC ESS (7561) protocol	SinExcel 30P
System	PCS
Power mode(s)	P/Q, V/f

Sinexcel PWS1

Maker	Sinexcel
Type	PWS1-50K to 250K Series PWS1-500KTL-EX SINEXCEL
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	SinExcel PWS1*
System	PCS
Power mode(s)	P/Q, V/f, Droop

NOTE *Previously *SinExcel*.

Sinexcel PWS2 30K

Maker	Sinexcel
Type	PWS2 Series
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	SinExcel PWS2 30K
System	PCS
Power mode(s)	P/Q, V/f, Droop

SinExcel DC/DC PDS

Maker	Sinexcel
Type	PDS1-xxxK
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC PDS (7882/7902) protocol	SinExcel DC/DC PDS*
System	PDS

NOTE *Reads power of up to 8 DC strings.

4.2.49 SMA

Maker	SMA
Type	Sunny Island
Interface	Modbus TCP

ASC ESS (7561) protocol	SMA Sunny Island
System	PCS
Power mode(s)	P/Q

4.2.50 Sungrow

Sungrow LC100 Utility LFP

Maker	SunGrow
Type	LC100 Utility LFP
Interface	Modbus TCP
ASC ESS (7561) protocol	SunGrow LC100 Utility LFP
System	BCU
Power mode(s)	P/Q, V/f and Droop

Sungrow LC200

Maker	SunGrow
Type	LC200
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	SunGrow LC200
System	BCU
Power mode(s)	P/Q, V/f and Droop

Sungrow local controller

Maker	SunGrow
Type	SunGrow local controller
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Sungrow STXXXCP-50HV
System	BCU
Power mode(s)	P/Q, V/f
Notes	**ESS protocol M-Logic custom input 1:** Disables the need for a heartbeat to be sent from the ASC to the BCU.

Sungrow power stack

Maker	Sungrow
Type	PowerStack
Interface	Modbus TCP
ASC ESS (7561) protocol	Sungrow Powerstack ST
System	BCU
Power mode(s)	P/Q, V/f and Droop
Notes	**ESS protocol M-Logic custom input 1:** Disables the need for a heartbeat to be sent from the ASC to the BCU.

Sungrow SC XXX

Maker	Sungrow
Type	SC XXX (Upper Computer Communication Protocol for PCS (V1.2.1.1)
Interface	Modbus RTU (RS-485)
ASC ESS (7561) protocol	Sungrow PCS
System	BCU
Power mode(s)	P/Q

4.2.51 Sunwoda

Sunwoda BCMU

Maker	Sunwoda
Type	BCMU
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Sunwoda BCMU
System	BMS

Sunwoda Main BCMU

Maker	Sunwoda
Type	Main BCMU
Interface	Modbus TCP
ASC BMS (7681/7682) protocol	Sunwoda Main BCMU
System	BMS

4.2.52 Tesla

Maker	Tesla
Type	Tesla Powerpack
Interface	Modbus TCP
ASC ESS (7561) protocol	Tesla PowerPack
System	BCU
Power mode(s)	P/Q, Droop
Notes	An SEL700B relay, acting as a mains breaker, is needed to switch between grid-tied mode and island (droop mode) without a blackout.

4.2.53 TRUMPF

TruConvert AC3025

Maker	TRUMPF
Type	TruConvert AC3025
Interface	Modbus UDP/TCP
ASC ESS (7561) protocol	TRUMPF TruConvert ACDC
System	PCS
Power mode(s)	P/Q, V/f

TruConvert DC1008

Maker	TRUMPF
Type	TruConvert DC1008
Interface	Modbus UDP/TCP
ASC ESS (7561) protocol	TRUMPF TruConvert DCDC
System	PCS
Power mode(s)	Not relevant: Only controls DC power.

4.2.54 Vertiv

Maker	Vertiv
Type	V1EA series
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Vertiv Custom*
System	PCS
Power mode(s)	P/Q, V/f
Notes	* This is a customer-specific version of the Vertiv PCS.

4.2.55 Yingbo

Maker	Yingbo
Type	Yingbo INPPCS-xxx-0.4/W 50/100kW
Interface	Modbus RTU (RS-485) or Modbus TCP
ASC ESS (7561) protocol	Yingbo
System	PCS
Power mode(s)	P/Q, V/f, Droop

NOTE Multi-PCS control is supported for Yingbo. One PCS acts as the master (the others follow the master). The ASC only communicates with the master PCS.

5. Power measurements

5.1 Power meters

Power measurements are required in single controller applications, as well as in open PMS applications. **ASC-4 Solar**, **ASC-4 Battery**, **ASC 150 Solar** and **ASC 150 Storage** controllers can receive measurements from compatible power meters, which includes these DEIF power meters:

- **MIB 8000C** (www.deif.com/products/mib-8000c)
- **MIC-2 MKII** (www.deif.com/products/mic-2-mkii)
- **MTR-4** (www.deif.com/products/mtr-4)

5.2 Compatible power meters

The DEIF power meter system interface is Modbus RTU (RS-485). For ASC-4, you need option H2.8.

Use parameter 7721 to select the meter protocol for DG power, 7723 for PV/ESS power, and 7725 for mains power.

Meter	Meter protocol	P	Q	Breaker feedback	Notes
ABB A43/44	ABB A43/A44	●	●	-	
ABB SACE Emax 2 protocol	ABB SACE Emax 2	●	●	●	
Accuenergy Acuvim-L series	Accuvim-L	●	●	-	
Acrel ADL	Acrel ADL	●	●	●	
Configurable power meter	Configurable power meter	●	●	●	You can use the USW to set up the controller to use Modbus to read values from your power meter. The controller can read P, Q, and up to four digital inputs.
Diris A40	Socomec Diris A40	●	●	-	
Eastron Smart X96	Eastron Smart X96	●	●	-	
Eastron Smart X96-5G	Eastron Smart X96 with DI	●	●	●	
Eastron SDM630MCT series	Eastron SDM630MCT	●	●	-	
EM6400	Schneider EM6400	●	●	-	
EDMI Genius	EDMI	●	●	-	
EDS MMCT3	EDS-MMCT3-E-C	●	●	-	
iEM3000	Schneider iEM3000	●	-	-	
iEM6400	Schneider EM6400	●	●	-	
Mavolog Pro	Gossen	●	●	-	
MIB 7000	DEIF MIB7000C	●	●	-	This power meter is being phased out.
MIB 8000C	DEIF MIB8000	●	●	●	
MIC-2 MK II	DEIF MIC-2	●	●	●	
MIC (MIC4002)	DEIF MIC4000	●	●	●	This power meter is being phased out.
MIC (MIC4224)	DEIF MIC4000	●	●	●	This power meter is being phased out.

Meter	Meter protocol	P	Q	Breaker feedback	Notes
MTR-3	DEIF MTR-3/4	●	●	-	This power meters is being phased out.
MTR-4	DEIF MTR-3/4	●	●	-	Previously MTR-3.
Multis L40	Socomec Multis L40	●	●	-	
PM2200 and PM5560	Schneider PM5560	●	●	-	
PMU-100	APS PMU-100	●	●	-	
Secure Elite 100/300 series	Secure Elite 100/300 series	●	●	-	Previously Secure Elite XXX series.
Secure Elite 440/500 series	Secure Elite 440/500 series	●	●	-	Previously Secure Elite XXX series.

5.3 Compatible genset controllers

In single controller applications, **ASC-4 Solar**, **ASC-4 Battery**, **ASC 150 Solar** and **ASC 150 Storage** can get power measurements from a genset controller.

The DEIF power meter system interface is Modbus RTU (RS-485). For ASC-4, you need option H2.8.

Use parameter 7721 to select the meter protocol for DG power.

Use parameter 7725 to select the meter protocol for Mains power.

Meter	Meter protocol	P	Q	Breaker feedback
AGC-4 Mk II	DEIF Genset Control*	●	●	●*
AGC-4**	DEIF Genset Control*	●	●	●*
AGC 150	DEIF Genset Control*	●	●	●*
CAT EMCP 4	CAT EMCP 4	●	●	●
CGC 400	DEIF Genset Control*	●	●	●*
GPC-3	DEIF Genset Control*	●	●	●
Cummins PC 3.x/PCC 3000	Cummins PC 3.x/PCC 3000	●	●	●
DSE 8xxx, 7xxx, 6xxx and 4xxx	DSE 8xxx, 7xxx, 6xxx and 4xxx	●	●	●***
Kohler APM403	Kohler APM403	●	●	●

NOTE * The ASC reads the P, Q, and breaker feedbacks from the DEIF controller over an RS-485 connection.
NOTE ** This genset controller is being phased out.
NOTE *** The breaker feedback must be configured in the DSE controller.