1 General information

The StecaGrid coolcept / coolcept³ inverters communicate with selected energy meters via a Modbus RTU interface. The scope of functionality described here is available for the following types:

Manufacturer	Type	Phases	Inverter Firmware
B+G	SDM220 Modbus	Single-phase	HMI APP 2.10.0 or later
B+G	SDM630 Modbus	Three-phase	HMI APP 2.7.0 or later
Carlo Gavazzi	EM24-DIN.AV9.3.X.IS.X	Three-phase	HMI APP 2.7.0 or later
Herholdt	ECS1-63 CP Modbus	Single-phase	HMI APP 2.10.0 or later
Herholdt	ECS3-80 B Modbus	Three-phase	HMI APP 2.7.0 or later
Herholdt	ECS3-63 CP Modbus	Three-phase	HMI APP 2.7.0 or later
Janitza	ECS1-63 CP Modbus	Single-phase	HMI APP 2.10.0 or later
Janitza	ECS3-5 Basic MID Modbus	Three-phase	HMI APP 2.7.0 or later
Janitza	ECS3-63 CP Modbus	Three-phase	HMI APP 2.7.0 or later
Schneider Electric	IEM3155	Three-phase	HMI APP 2.10.0 or later

The following applies:

- Only the energy meters that are pre-programmed into the StecaGrid inverters cab be used. These combinations have been tested and correct functionality is ensured when the inverter and energy meter are correctly installed and configured.
- It is possible that other models not listed here but from the same manufacturer may also seem to operate with the same settings. However, full and correct functionality cannot be guaranteed for these.
- The energy meter must measure consumption from the grid in a positive direction. Please observe the respective manufacturer's installation and operating manual for this.

Please note: **The technical information in this document does not replace the comprehensive installation and operating manuals for the StecaGrid coolcept / coolcept³ inverters and for the various energy meters!**

2 StecaGrid coolcept / coolcept³ configuration

A 4-core telephone cable with a 4P4C plug (commonly known as an RJ10 plug) can be used at the inverter side. The individual strands of the cable are connected to screw connections at the various energy meters.

Device connection	Inverter RJ10	Bus signal
Contact / Pin	1	Data A
	2	Data B
	3	Ground
	4	---

Fig.1 Contact/pin assignments of RJ10 plug

Notes on the electrical connection of StecaGrid inverters to selected energy meters:

- Material damage caused by electrical voltage! The data connection cable may only be manufactured by a technical specialist.
- Danger of destroying the Modbus RTU input of the inverter! Contact 4 of the RJ10 socket on the inverter carries voltage <20V. Do not use this contact.

After connecting the StecaGrid coolcept / coolcept³ inverter to an energy meter via the data connection cable you must then make the following energy management settings in the inverter menu.

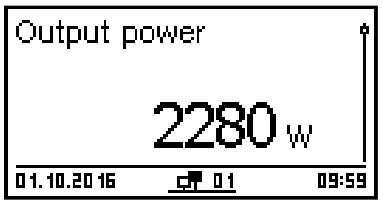


Fig. 2 Status display

Pressing the "**SET**" button brings you to the "Main menu"

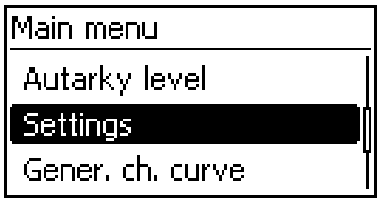


Fig. 3 Main menu

Select the "**Settings**" item in the main menu

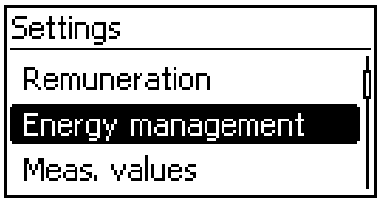


Fig. 4 Settings

Select the "**Energy management**" item in the "Settings" menu

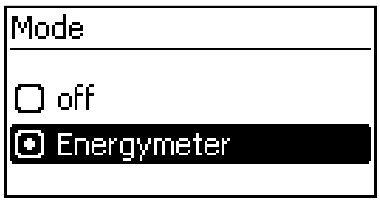


Fig. 5 Mode

Select "**Energy meter**" in the "Mode" screen

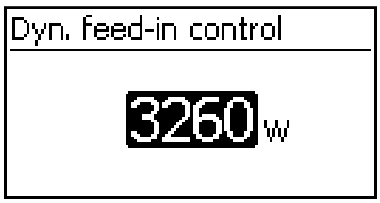


Fig. 6 Dynamic feed limitation

In the "**Dyn. feed in control**" screen, set the maximum power that may be fed into the public mains grid
(This can be e.g. 70% of the max. PV generator power)

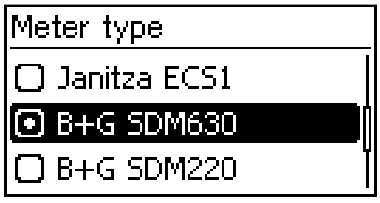


Fig. 7 Meter type

Select the "**Meter type**" item in the "Configuration" menu

3 Energy meter configuration

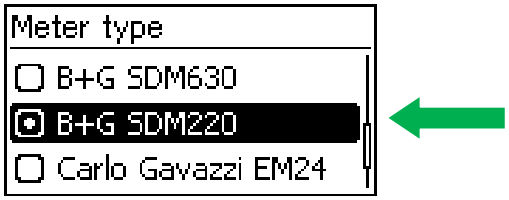
If the energy meters listed below are used with their respective factory settings then **no** settings need to be made in the energy meter configuration menu. If the factory settings are changed then the following settings must be adjusted at the energy meter.

Menu item	Settings
Address	See energy meter
Baud rate	See energy meter
Parity	See energy meter
Stop bits (quantity)	See energy meter

Please note: **Information on operating the respective energy meter is provided in the latest version of the manufacturer's installation and operating manual!**

4 B+G SDM220 Modbus

This single-phase energy meter is designated as "**B+G SDM220**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the B+G SDM220 energy meter	
Menu item	**Settings**
Address	1
Baud rate	9600Baud
Parity	None
Stop bits	2

Device connection	Inverter RJ10	Bus signal	B+G SDM220
Contact / Pin	1	Data A ≙ A	**9**
	2	Data B ≙ B	**8**
	3	Ground ≙ GND	**7**
	4	---	---

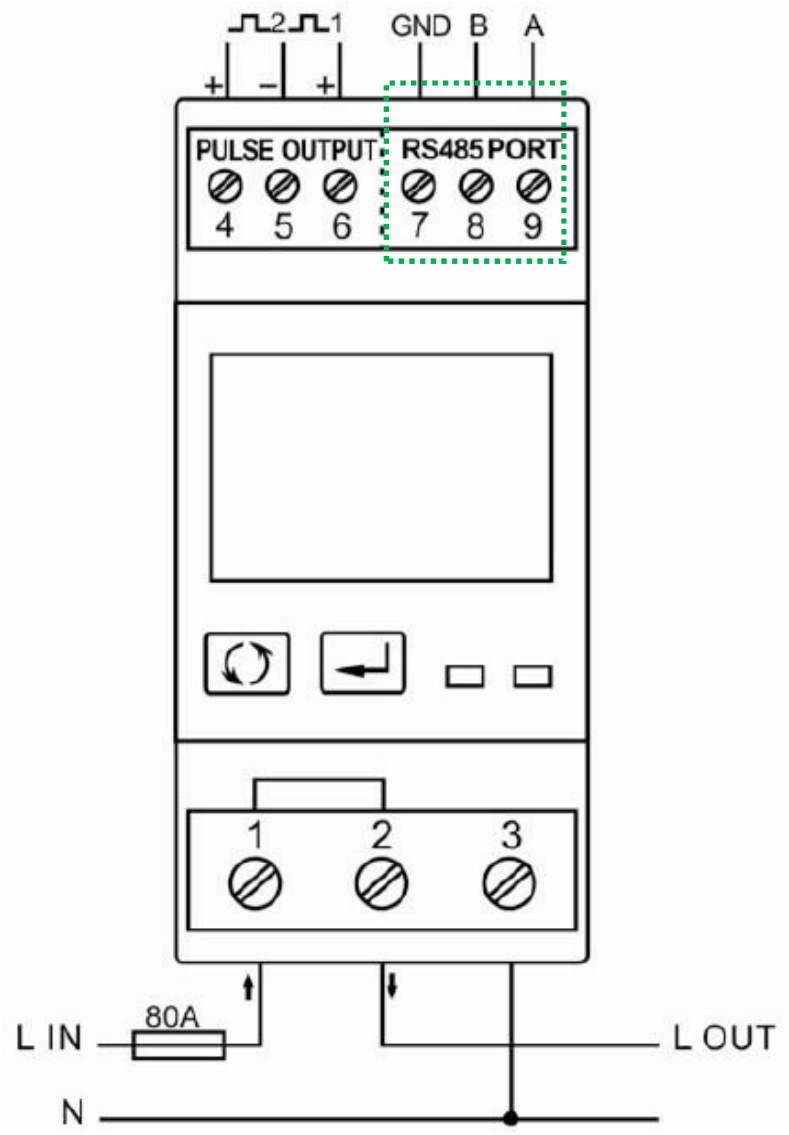
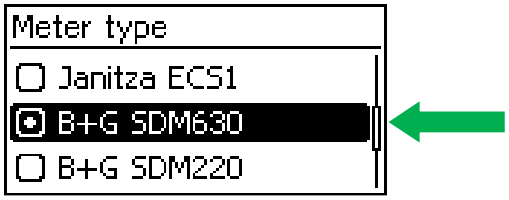


Fig. 8 Circuit diagram for B+G SDM220 Modbus

5 B+G SDM630 Modbus

This three-phase energy meter is designated as "**B+G SDMSDM630**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the B+G SDM630 energy meter	
Menu item	**Settings**
Address	1
Baud rate	9600 Baud
Parity	None
Stop bits	2

Device connection	Inverter RJ10	Bus signal	B+G SDM630
Contact / Pin	1	Data A ≙ A	**9**
	2	Data B ≙ B	**10**
	3	Ground	---
	4	---	---

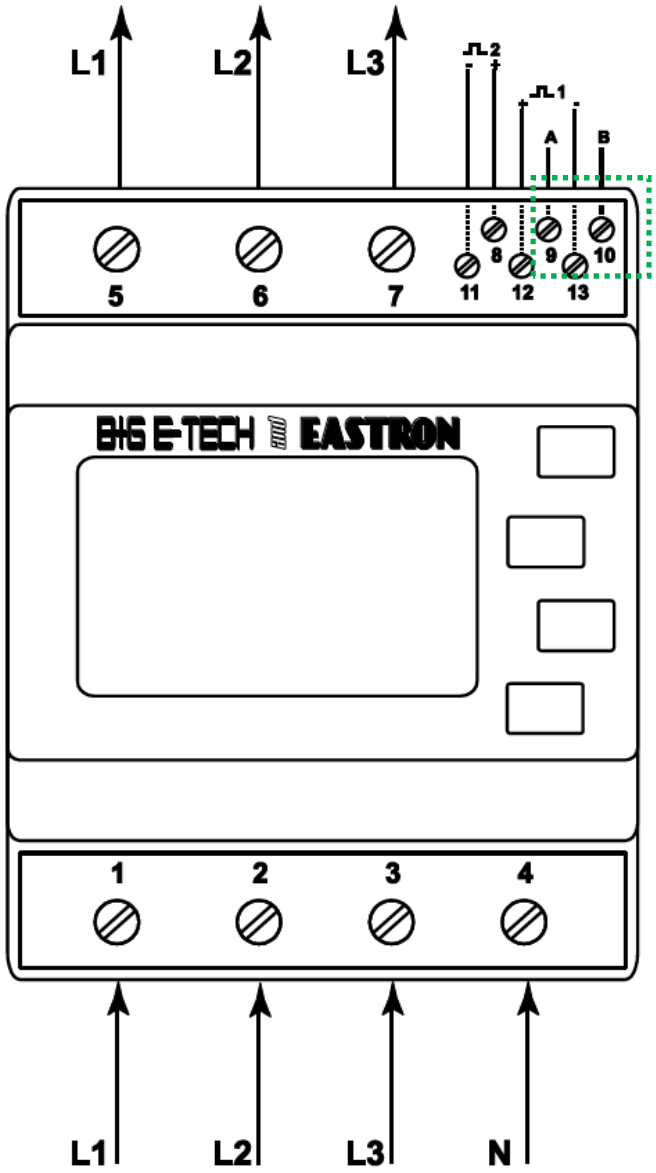
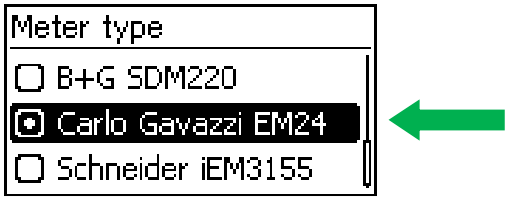


Fig. 9 Circuit diagram for B+G SDM630 Modbus

6 Carlo Gavazzi EM24-DIN.AV9.3.X.IS.X

This three-phase energy meter is designated as "**Carlo Gavazzi EM24**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Schneider iEM3155 energy meter	
Menu item	**Settings**
Address	1
Baud rate	9600 Baud
Parity	None
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Carlo Gavazzi EM24
Contact / Pin	1	Data A ≙ B+	**42**
	2	Data B ≙ A-	**41**
	3	Ground ≙ GND	**43**
	4	---	---

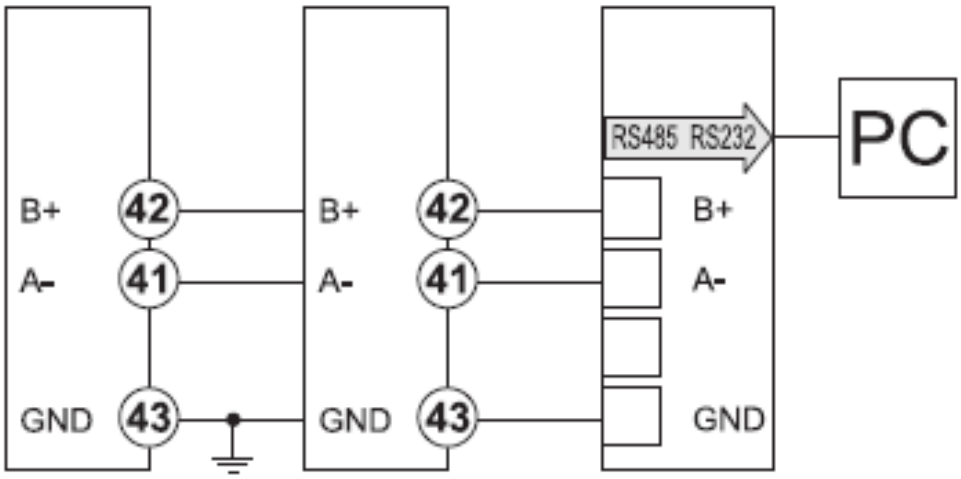
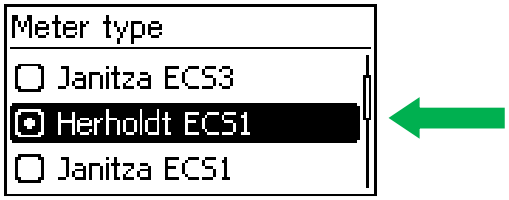


Fig. 10 Circuit diagram for Carlo Gavazzi EM24-DIN.AV9.3.X.IS.X

Please note: **The energy meter is supplied configured with default Baud rate of 9600 Baud. Up to firmware version HMI APP 2.9.0, a different default Baud rate was stored in the inverter. You must change the Baud rate of the energy meter to 4800 Baud when using this firmware.**

7 Herholdt ECS1-63 CP Modbus (ECSEM213 / ECSEM214MID)

This single-phase energy meter is designated as "**Herholdt ECS1**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Herholdt ECS1 energy meter	
Menu item	**Settings**
Address	1
Baud rate	19200 Baud
Parity	None
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Herholdt ECS1
Contact / Pin	1	Data A ≙ D1	**5**
	2	Data B ≙ D0	**4**
	3	Ground ≙ Common	**3**
	4	---	---

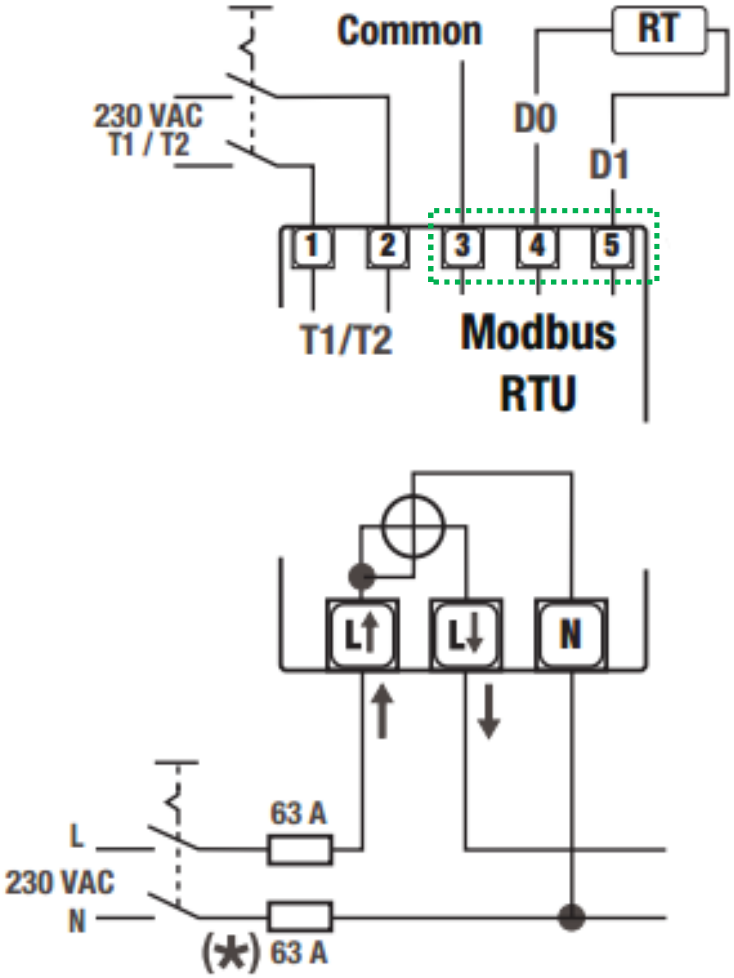
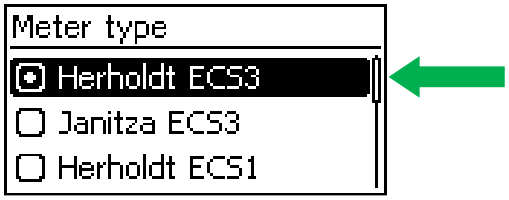


Fig. 11 Circuit diagram for Herholdt ECS1-63 CP Modbus

8 Herholdt ECS3-80 B Modbus (ECSEM 72)

This three-phase energy meter is designated as "**Herholdt ECS3**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Herholdt ECS3 energy meter	
Menu item	**Settings**
Address	1
Baud rate	19200 Baud
Parity	None
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Herholdt ECS3
Contact / Pin	1	Data A ≙ D+	**6**
	2	Data B ≙ D-	**5**
	3	Ground ≙ Shield	**7**
	4	---	---

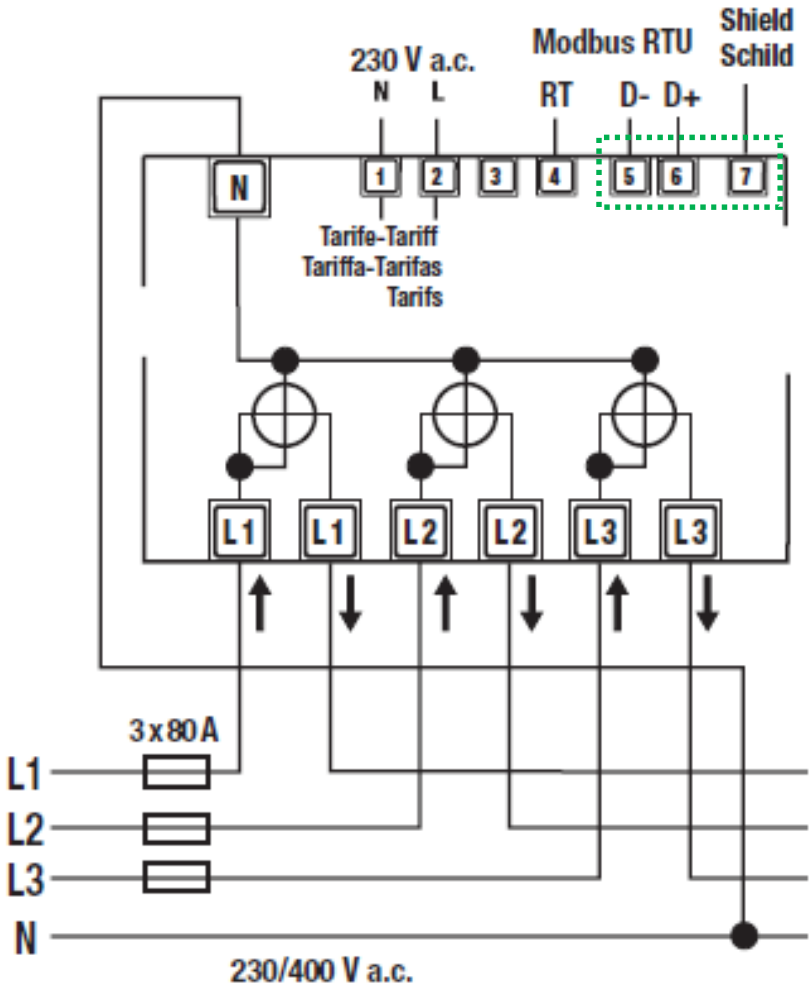
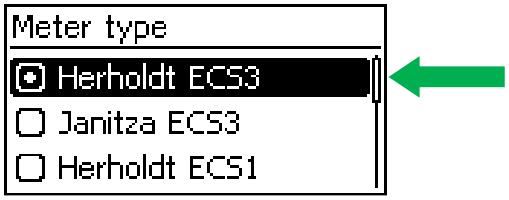


Fig. 12 Circuit diagram for Herholdt ECS3-80 B Modbus

9 Herholdt ECS3-63 CP Modbus (ECSEM113 / ECSEM114MID)

This three-phase energy meter is designated as "**Herholdt ECS3**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Herholdt ECS3 energy meter	
Menu item	**Settings**
Address	1
Baud rate	19200 Baud
Parity	None
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Herholdt ECS3
Contact / Pin	1	Data A ≙ D+	**6**
	2	Data B ≙ D-	**5**
	3	Ground ≙ Shield	**7**
	4	---	---

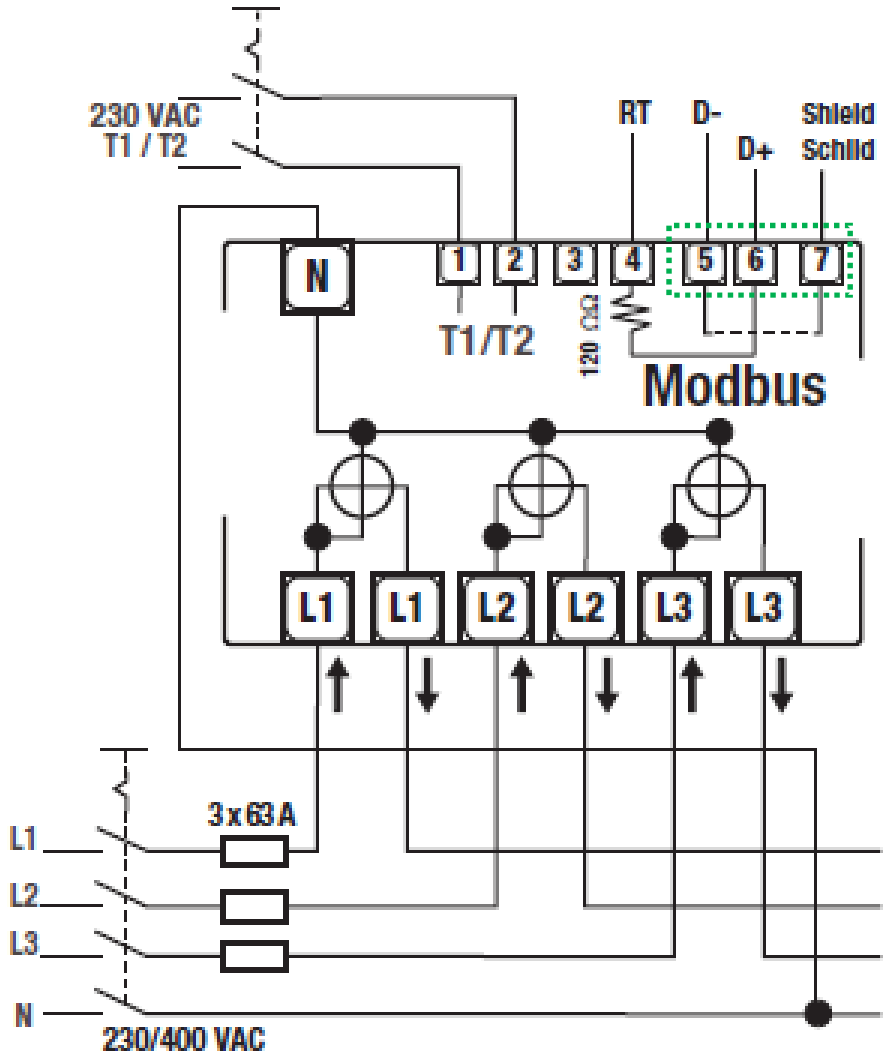
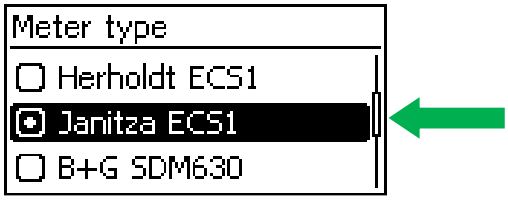


Fig. 13 Circuit diagram for Herholdt ECS3-80 B Modbus

10 Janitza ECS1-63 CP Modbus (ECSEM213 / ECSEM214MID)

This single-phase energy meter is designated as "**Janitza ECS1**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Janitza ECS1 energy meter	
Menu item	**Settings**
Address	1
Baud rate	19200 Baud
Parity	None
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Janitza ECS1
Contact / Pin	1	Data A ≙ D1	**5**
	2	Data B ≙ D0	**4**
	3	Ground ≙ Common	**3**
	4	---	---

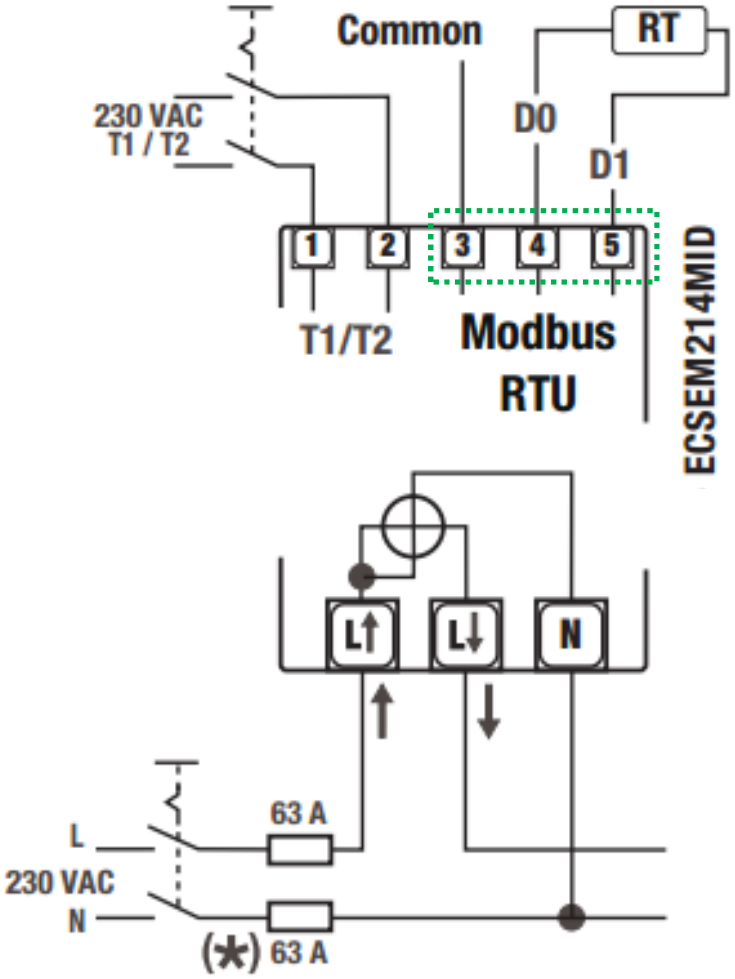
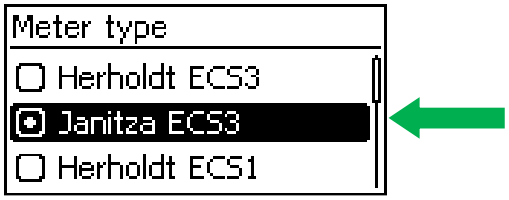


Fig. 14 Circuit diagram for Janitza ECS1-63 CP Modbus

11 Janitza ECS3-5 Basic MID Modbus (ECSEM68MID)

This three-phase energy meter is designated as "**Janitza ECS3**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Janitza ECS3 energy meter	
Menu item	**Settings**
Address	1
Baud rate	19200 Baud
Parity	None
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Janitza ECS3
Contact / Pin	1	Data A ≙ D+	**2**
	2	Data B ≙ D-	**3**
	3	Ground ≙ Shield	**1**
	4	---	---

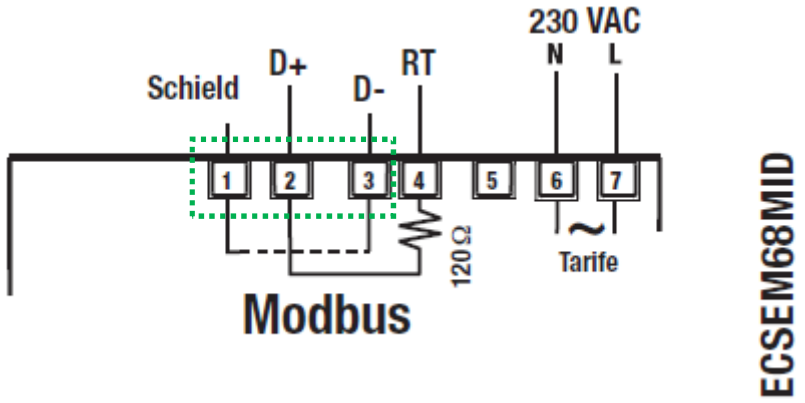
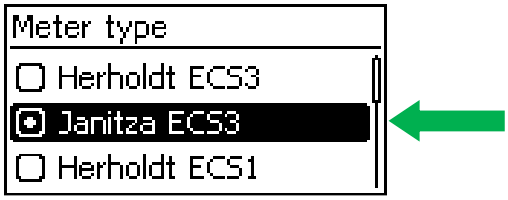


Fig. 15 Circuit diagram for Janitza ECS3-5 Basic MID Modbus

12 Janitza ECS3-63 CP Modbus (ECSEM113 / ECSEM114MID)

This three-phase energy meter is designated as "**Janitza ECS3**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Janitza ECS3 energy meter	
Menu item	**Settings**
Address	1
Baud rate	19200 Baud
Parity	None
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Janitza ECS3
Contact / Pin	1	Data A ≙ D+	**6**
	2	Data B ≙ D-	**5**
	3	Ground ≙ Shield	**7**
	4	---	---

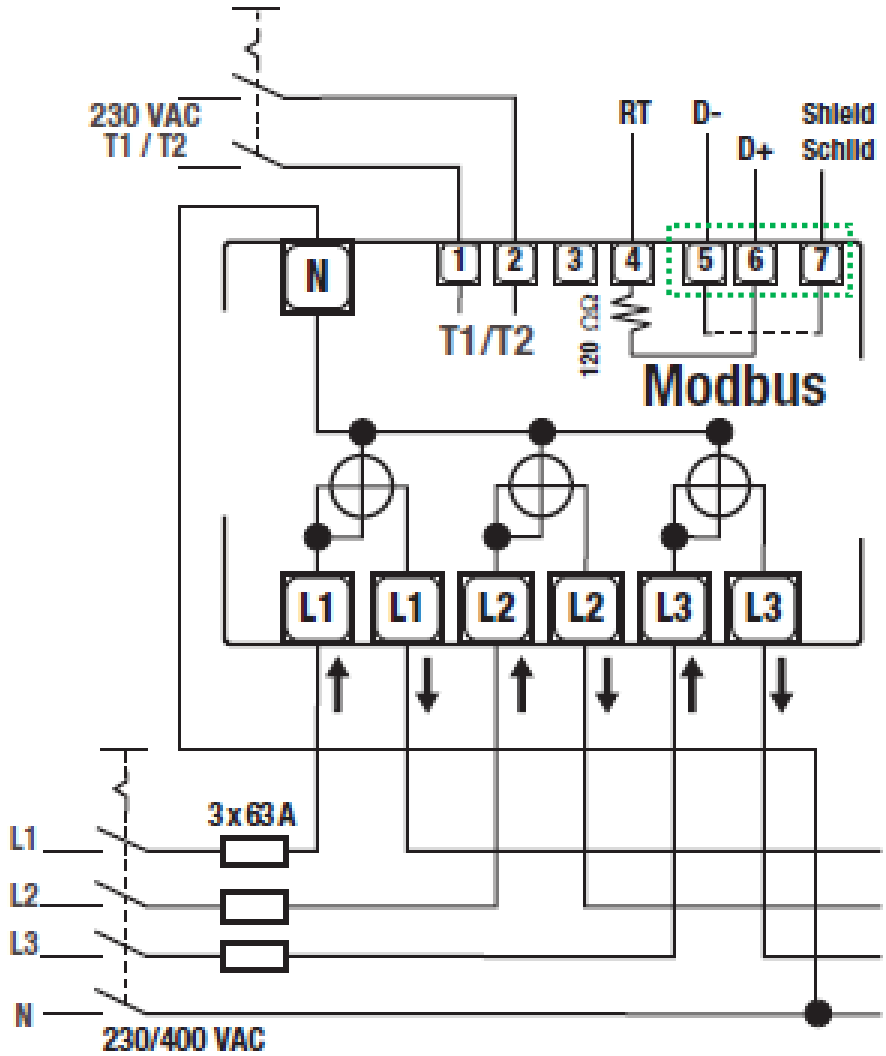
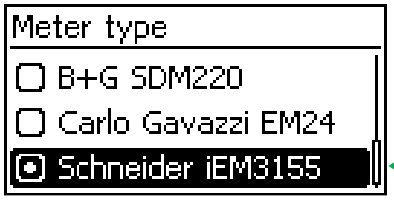


Fig. 16 Circuit diagram for Herholdt ECS3-80 B Modbus

13 Schneider Electric IEM3155 (A9MEM3155)

This three-phase energy meter is designated as "**Schneider iEM3155**" in the "Meter type" field in the energy management settings of the StecaGrid coolcept / coolcept³.



RS485 interface settings at the Schneider iEM3155 energy meter	
Menu item	**Settings**
Address	1
Baud rate	19200 Baud
Parity	Even
Stop bits	1

Device connection	Inverter RJ10	Bus signal	Schneider iEM3155
Contact / Pin	1	Data A ≙ D1	**D1/+**
	2	Data B ≙ D0	**D0/-**
	3	Ground ≙ 0V	**0V**
	4	---	---

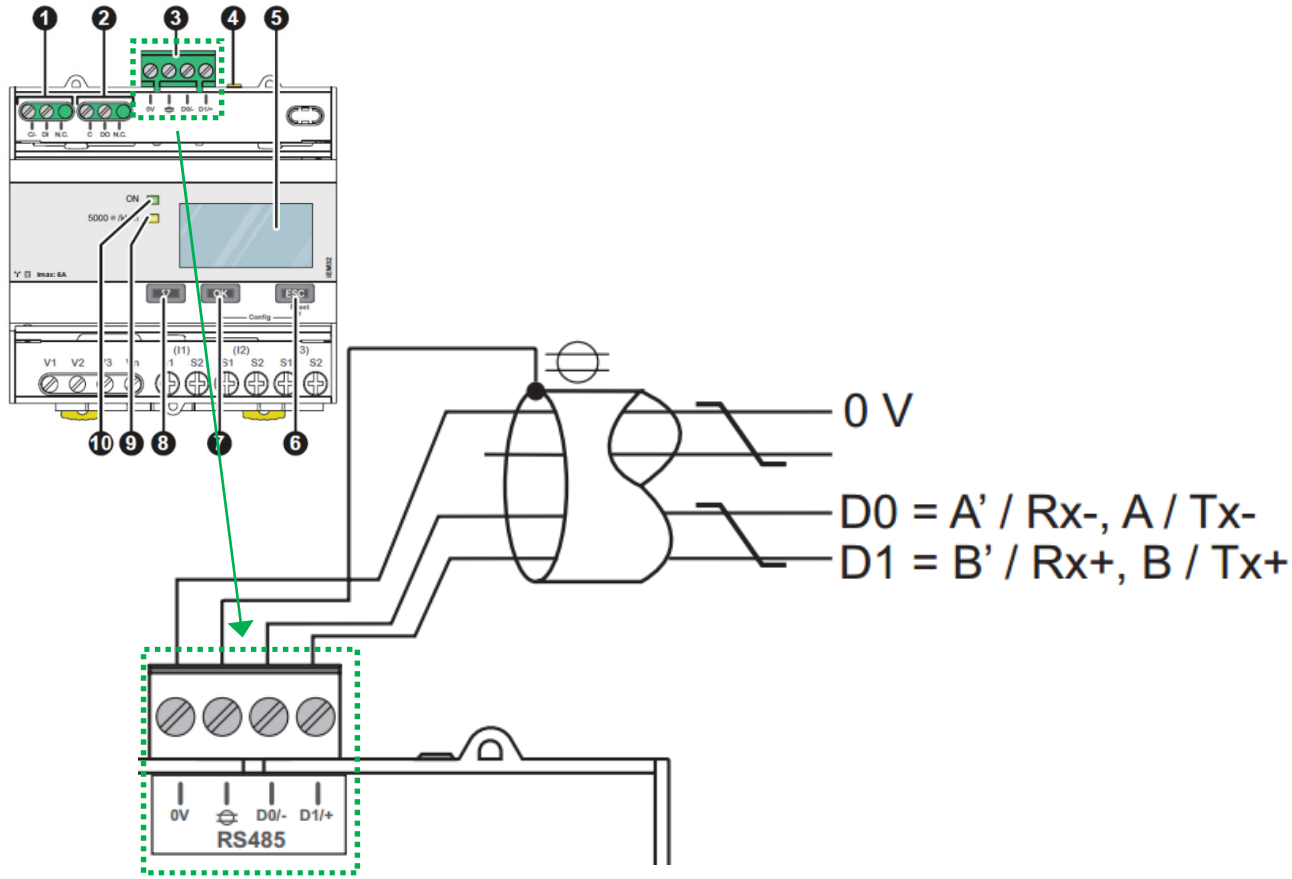
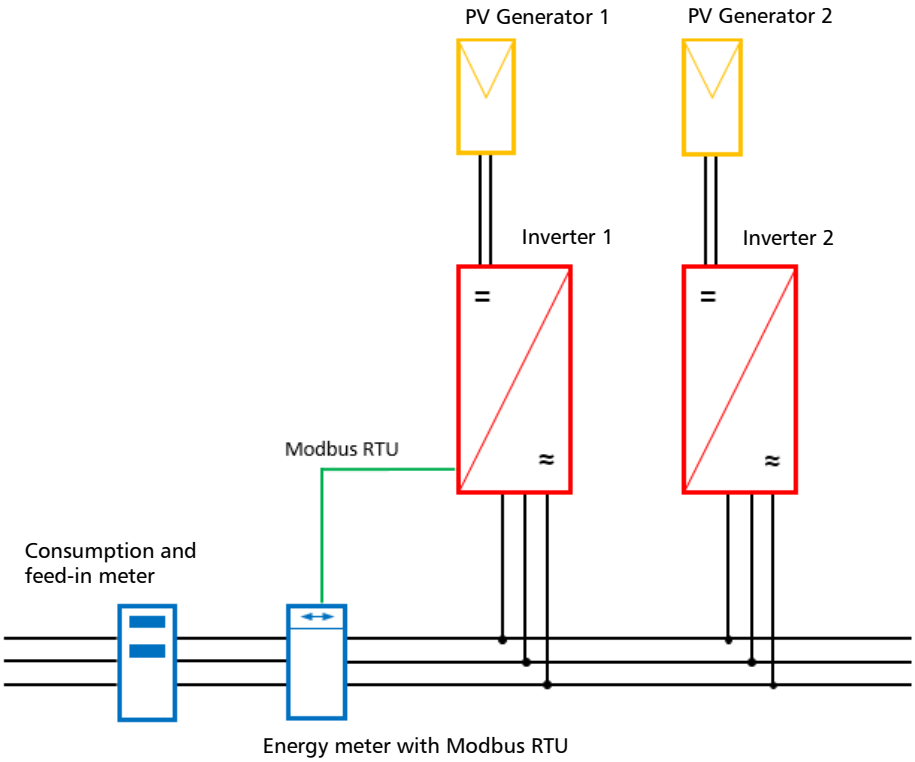


Fig. 17 Circuit diagram for Schneider Electric IEM3155

14 PV systems with one energy meter and two StecaGrid coolcept / coolcept³ inverters

The general recommendation is to connect the energy meter to the inverter having the greatest AC output power. This is the easiest way of reducing the feed in power to the specified value. If this is not possible due to the technical prerequisites of the system then the following formula must be used to determine whether or not a sufficient reduction can be achieved.

The ratio of the PV power of PV generator 2 (PV2) to the total PV generator power (PV1 + PV2) yields the minimum possible power limit for the total PV generator power. This results in the following formula for calculating the minimum possible power limit.
Minimum possible power limiting = PV2 : (PV1 + PV2)



Example:
PV1 = 6000Wp / WR1 = StecaGrid 5503 / PV2 = 3400Wp / WR2 = StecaGrid 3203

Specification:
This should be variably reduced to 70% of the maximum PV generator power.

Calculation of the minimum possible power limit:
PV2 : (PV1 + PV2) = 3400Wp : (6000Wp + 3400Wp) = 0.36
Minimum possible possible power limit= 36% of the max. PV generator power of 9400W (DC)

Result:
The energy meter is connected to inverter 1 (StecaGrid 5503). Under the "Dyn. feed in control" menu item in the inverter, a value of 6580W (= PV1 + PV2 * 0.7) is set.

If necessary, inverter 1 can reduce its output power to ensure that the maximum permissible value of 6580W at the grid transfer point is not exceeded. The specified power limiting to 70% of the maximum PV generator power is thus adhered to.