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Fuse	Fuse type	Usage	Supply line from
FI	LV/HRC size 3	Generator	
F2	LV/HRC size 3	Load	
F4	Circuit breaker C32	Sunny Island	
F5	D01 / 6A	Controller assembly K7, Q7	L1 Sunny Island
F6	D01 / 6A	K10, Q10	L1 internal
F7	D01 / 6A	K5, Q5	L1 generator

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Stand-Alone Grid

Cluster

Multicluster System A multicluster system is made up of multiple clusters connected in parallel. The performance of the multicluster system increases with the number of clusters. The clusters are connected in parallel via a Multicluster Box. The size of the Multicluster Box is determined when the system is designed depending on the power requirement.

Multicluster Box

The Multicluster Box is the main AC distribution board in the multicluster system and a component of the SMA multicluster technology. The Multicluster Box connects the Sunny Island clusters with the loads and the power generators within a stand-alone grid.

Master

- Centrally recording user entries

SYSTEM OVERVIEW FOR MULTICLUSTER BOX

EXAMPLES FOR MULTICLUSTER SYSTEMS

Power*	Number	Number of Sunny Island inverters		
	SI 8.0H	SI 6.0H	SI 5048	 batteries[*]*
102 kW	6	9	-	
108 kW	9	6	-	
114 kW	12	3	-	- 5
120 kW	15	-	-	_
126 kW	9	9	-	
132 kW	12	6	-	- 6
138 kW	15	3	-	
144 kW	18	_	_	
150 kW	12	9	-	
156 kW	15	6	_	7
162 kW	18	3	_	
222 kW	21	9	-	
228 kW	24	6	-	10
234 kW	27	3	-	— 10 —
240 kW	30	-	-	
246 kW	24	9	-	
252 kW	27	6	-	11
258 kW	30	3	-	- 11
264 kW	33	-	-	
270 kW	27	9	-	_
276 kW	30	6	-	— 12 —
282 kW	33	3	-	
288 kW	36	-	-	
98 kW***	-	-	15	5
114 kW***	-	6	12	6
144 kW*** Power of the Sunny	3	6	12	7

** 1 battery per cluster

*** Power of the SI5048 for 30 minutes at 25°C: 6,500 W

TERMS USED IN SMA MULTICLUSTER TECHNOLOGY

A stand-alone grid is a utility grid which is independent of the public energy supply. A stand-alone grid with Sunny Island is designed as a single-phase or three-phase AC grid and integrates various kinds of power generators such as PV plants, small wind turbine systems and diesel generators. Batteries for energy storage are also an integral part of stand-alone grids.

The Sunny Island battery inverter forms a stand-alone grid and maintains a stable energy supply by regulating all processes.

A cluster is made up of three Sunny Island inverters and one battery. One Sunny Island inverter per line conductor, and thus a total of three Sunny Island inverters, is connected to form a three-phase stand-alone grid. Within the cluster, one Sunny Island is the master, while the other two are slaves.

The master is the control and communication center in a cluster. It carries out the following tasks:

- Connecting and disconnecting the slaves
- Controlling and monitoring the slaves, e.g. regulating frequency and voltage
- Controlling the battery charge and discharge
- Monitoring the battery capacity and state of charge
- Storing the cluster and battery data on SD card
- Requesting the diesel generator
- Exchanging data with the masters of other clusters
- Updating both slaves after firmware updates
- Displaying system values and system states

Slave

A slave is a functional unit subordinated to the master. A slave receives its configuration settings, current firmware updates, and start/stop commands from its master. It transmits its operating data to its master and executes commands issued by the master.

Main Cluster

The main cluster is the leading cluster within a multicluster system.

The master of the main cluster is the central user interface for the main cluster and all extension clusters of a stand-alone grid. The master of the main cluster is superior to the masters of the extension cluster. The following are some of the tasks performed by the master of the main cluster:

• Starting and stopping the multicluster system

MC-BOX-36-IAA-en-20 | Version 2.0

- Controlling and monitoring the masters of the extension cluster
- Communicating with the multicluster Box

If the master of the main cluster stops operation, the entire multicluster system shuts down. If a diesel generator is integrated in the stand-alone grid, it will take over the power supply to the loads in this case.

Extension Cluster

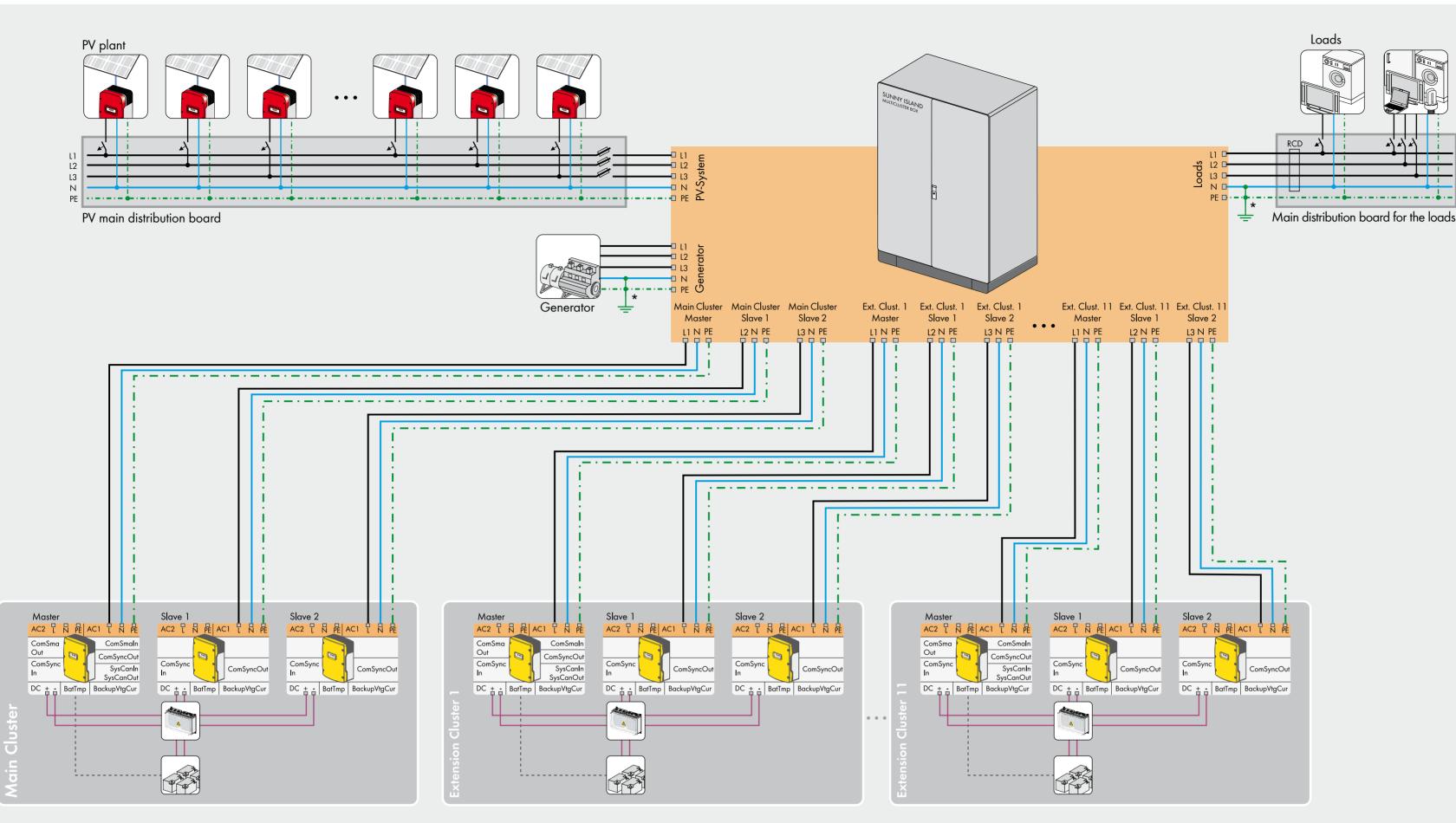
An extension cluster is a cluster within the Multicluster system which is subordinated to the main cluster. The master of the extension cluster obeys the instructions issued by the master of the main cluster. The master of the extension cluster sends the operating data of its cluster to the master of the main cluster. If the master of an extension cluster stops operation, then only this cluster stops operating. The multicluster system continues to operate with reduced power.



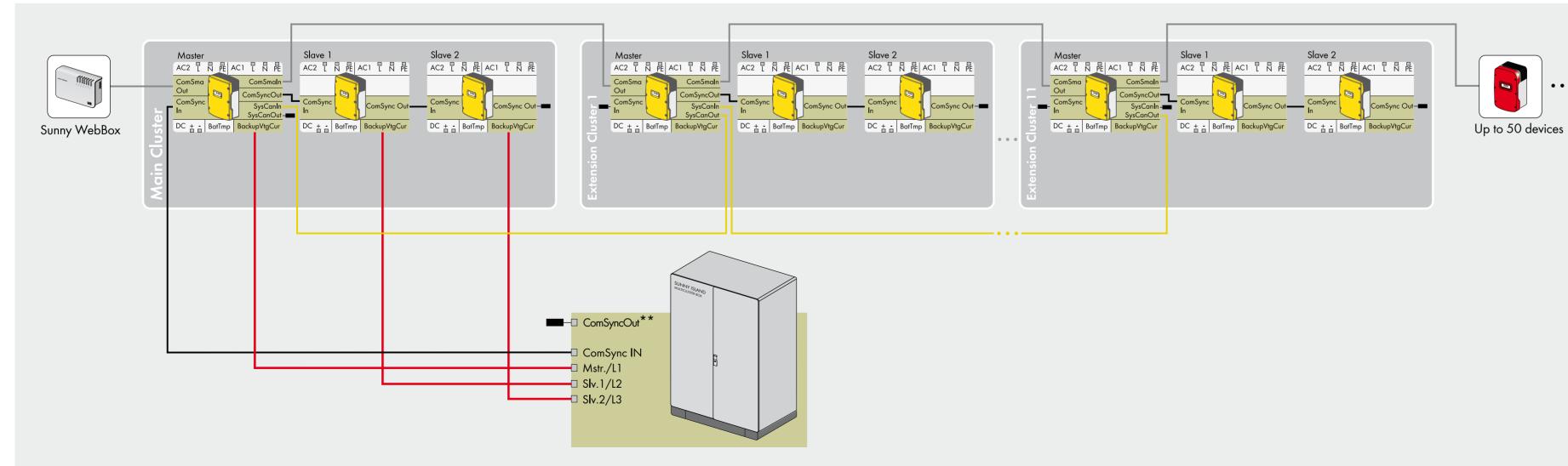
ENGLISH

Installation - Circuitry Overview **MULTICLUSTER BOX 36**





COMMUNICATION CIRCUITRY



LEGEND

	Line conductor
	Neutral conductor
	Grounding conductor
	DC+ and DC- cables
	Battery temperature
	Data cable in a cluster from the master of the main cluster to the Multicluster Box
	Control and measuring cables
	Multicluster data cable (CAN-BUS)
	Data cable for RS485 communication
	Terminator
	BatFuse
	Battery
	Sunny Island
	PV inverter
Comment	:
*	Ground the MC system outside the box on either the generator side or the load side.
* *	The terminator is plugged upon

DATA MODULES FOR SI6.0H/8.0H

delivery.

Interfaces	Data module
SysCanIn and SysCanOut	SI-SYSCAN.BGx
ComSmaIn and ComSmaOut	SI-COMSMA.BGx

PIGGY-BACK FOR SI5048

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Interfaces	Piggy-Back
SysCanIn and SysCanOut	МС-РВ

ComSmaln and ComSmaOut

The pin connectors for the interfaces **ComSmaln** and **ComSmaOut** are located in the connection area of the SI5048 and not at the Piggy-Back.