

# Master-Slave Connection With Electronic Loads PLI Series

To increase power or current, up to five electronic loads of the same model can be operated in parallel as one system in master-slave mode.

The system behaves externally as one single device.

## Safety Instructions



Read the user manual for the electronic load and especially the safety instructions before starting to operate the system!

Series connection of load inputs to increase the input voltage is NOT permitted!

## Functional Principle in Master-Slave Operation

In a master-slave system connection, the master unit controls the input current of the entire system. It also displays the measured values of the system at its user interface and returns them when queried via one of the data interfaces (except CAN). The voltage measured at the master unit is the basis for the controlled nominal values in voltage, power and resistance operation.

## Conditions

All system units (master and slave device(s)) must be identical in series, model and firmware version.

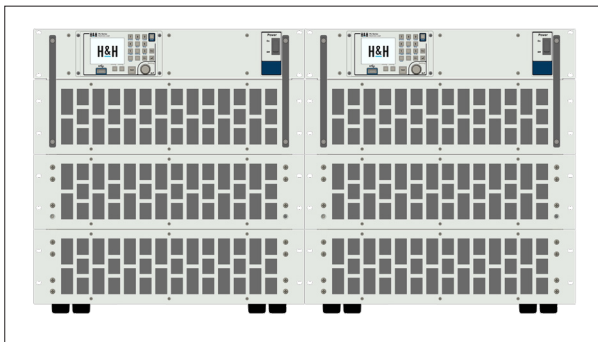
## Terms

### System Unit

An electronic load is a system unit. It operates in one of the system modes Single, Master or Slave. The factory setting for the system mode is Single. The system mode is not changed during a reset or when power is cycled.

### System Connection

A system connection consists of minimum two system units: exactly one master and up to four slave units.



2 x PLI4306ZV

## Single Mode

In single mode, the electronic load is not connected to any other system unit via the CAN interface or the I/O port. The entire device functionality and all data interfaces are available without restriction.

## Master Mode

In master mode, the system unit controls one or more slave units via the CAN interface and the I/O port.

## Slave Mode

In slave mode, the system unit is controlled by the master unit via the CAN interface and the I/O port. Otherwise, it cannot be operated.

## Configuring System Connection

1. Power all system units on. Keep load inputs and the output of DUT (source) off.
2. Set master mode at the electronic load which shall control all other units and display the total measured values:  
*Main Menu/Configuration/System (Master/Slave)*  
Select Unit Mode *Master*.
3. Similarly, on the first electronic load to be controlled by the master unit, set slave operation with slave address 2.
4. If required, set up to three additional electronic loads to slave operation. Set slave addresses 3 to 5. Each address may only exist once in the system!
5. Power all system units off.
6. Connect all system unit's CAN interfaces with K-MS-CAN cables. Connect all system unit's I/O ports with K-MS-PLI cables.

7. First, power the slave unit(s) on. Keep load inputs off.
8. Then, power the master unit on. Keep load input off.
9. Connect the load inputs of all system units twisted to the DUT. Route the cables of all system units to the DUT, see schematic drawing below.

Each system unit now displays the active system mode ("Master" or "Slave") and the address of the system unit at the user interface.

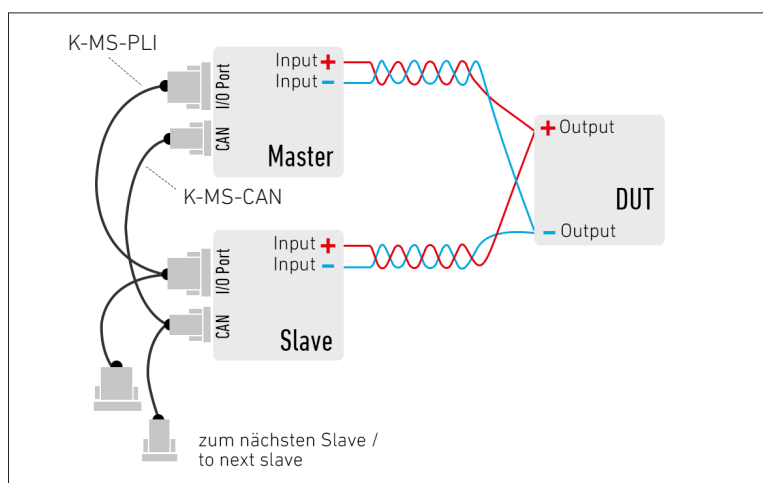
The system connection is now configured and can be controlled via the master unit. The master unit detects the current consumption and the input state of the slave units and displays measurement and status values of the entire system connection.

The system configuration is maintained after switching off and on as well as after a reset.

## Restrictions in Master-Slave Mode

### Restrictions in System Connection:

- Data acquisition and data logging functions are not available.
- Discharge function is not available.
- Internal resistance measurement function is not available.
- Maximum power point tracking (MPPT) functions are not available.
- Adjustment functions are not available.
- Functions for production services and for setting and reading device parameters are only restrictedly available.
- The I/O port is not available when using the master-slave cable K-MS-PLI (see Subd25-doubler on page 3).



Schematic drawing master-slave connection

## Restrictions in Master Mode:

- The external CAN interface is not available for communication with a controlling computer.
- Some single functions, menu entries of the user interface and some SCPI commands are not or only restrictedly available.

## Restrictions in Slave Mode:

- Communication via any data interface is not possible.
- The menu structure in the user interface is reduced to a few diagnostics functions.

## End System Connection

1. Switch load inputs of all system units off.
2. Set single mode at all system units:  
*Main Menu/Configuration/System (Master/Slave)*  
Select Unit Mode *Single*.
3. Power all system units off.
4. Disconnect all K-MS-PLI cables from the I/O ports.  
Disconnect all K-MS-CAN cables from the CAN interfaces.
5. Power all system units on.

## Master-Slave Cable and I/O Port Doubler

The cables used for master-slave control can either be ordered from H&H or assembled by the user himself. The cables are used to connect two system units. They also provide a coupling for the connection of a further slave unit. Another set of cables is required for each additional slave unit.

### Pin Assignment K-MS-PLI (Order No. 67-036-020-17):

Master			Slave*	
Pin	Signal		Pin	Signal
13	GND	↔	13	GND
6	/STAT-ON	↔	18	/INP-ON
1	GND	↔	3	LEVEL-
2	IMON	↔	15	LEVEL+

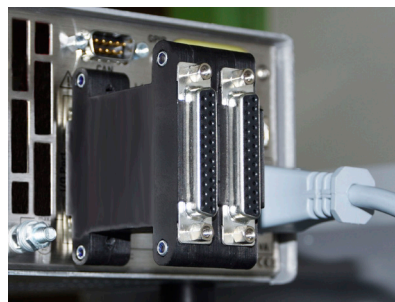
\* and further slaves

### Pin Assignment K-MS-CAN (Order No. 67-037-020-24):

Master			Slave*	
Pin	Signal		Pin	Signal
2	CAN_L	↔	2	CAN_L
3	GND	↔	3	GND
6	GND	↔	6	GND
7	CAN_H	↔	7	CAN_H

\* and further slaves

To be able to access e.g. monitor signals when using the H&H cables, there is the SubD25-doubler as an accessory. It is plugged between the I/O port of the load and the K-MS-PLI cable (xx = PLI).



Subd25-doubler (Order No. 63-000-002-24)