MINI-MUX user manual

(english)

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MINI-MUX

1 Description

The Mini-MUX for Siemens S5 is thought for a permanent connection of OP / PG / AG.

An industrial metal case (prepared for the cabinet or panel mount) is integrated in the entire electronics. The device can be attached directly to the panel.
The connecting mechanism, pin assignment and electrical data match restricted with the specific controller specification, so that the user can work directly with the usual cables of connected devices and without special adapters, such as PGs and control devices.

1.1 Mini-MUX

• Only the PLC-socket is independently active
• The OP socket is completely passive and is able to do L1 protocols and limited PG protocols
• The programming port is only able to do PG protocols and it is electrically powered by the PLC
• No PG-Bus protocol possible
• Compact device in a metal case: 135 x 110 x 50 mm

To note:

If you want to run the L1 bus parallel to a PG, you must remember that the PLC sets a reception bit in a received L1 protocol. This bit is to be queried, so you can read the receive register of the PLC. But is coming a PG protocol from the PG-MUX device in the PLC, this sets back the bit (the PLC is saying: That one which had just walked in is no L1 protocol). To ensure that the PLC program detects that something is stored in the L1 receive mailbox, they must be query the reception bit different from most places in the program, so it is not missed. That may be the case with slow PLC or at large programs.

With control panels you should generally set a 'TIME OUT' (if possible), because when a PG for example, transfers a long DB, the control panel may not be at the TIME-OUT. Good values are at about 3-5 sec.

Operates the control panel with the PG protocol, it can happen that the control panel addressed directly in a database access. Now if you change this data DB and then writes back, it may happen that the control panel does not notice this and still access on the old DB (the control panel does not realize this). This may also occur when an FB or similar exchanges, since the memory allocation changes in the PLC. In this case, you can correct the interference with a compression function (PLC organized fresh).

2 System requirements

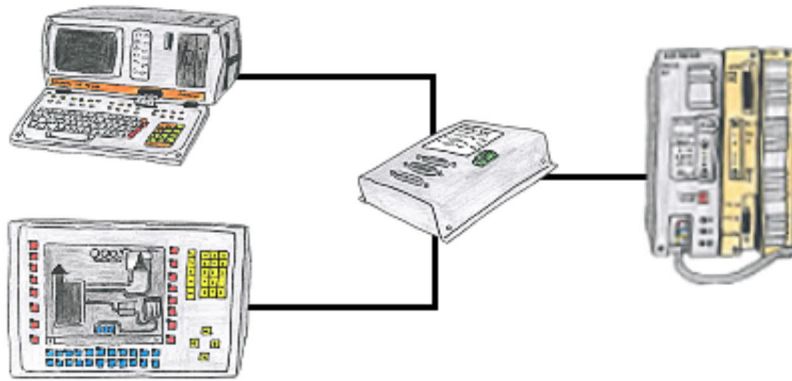## 2.1 Operating system (s)

• no

2.2 Software

• no

2.3 Hardware

- 24 V/DC with minimum 350 mA power supply
- one to the respective MUX compatible PLC
- Programmer or operating terminal

3 Connecting options

A programmer and a operating terminal simultaneously to a PLC

4 Control elements

4.1 LED

Green LED off:	Power OFF / error (Multiplexer is not powered)
Green LED flashes:	error (device malfuntion or power supply interfere)
Green LED on:	Power ON (Multiplexer is supplied with power and runs without error)

5 Installation

5.1 Hardware

To guarantee a service without problems, please lay these devices at the earthing terminal (which is exclusively designed for that) on earth potential!

In order to put the Multiplexers into service, they have to be connected with the voltage supply.

You can connect the PG-MUX-II either to 24V DC or 230V AC. The normal line voltage is connected to the Multiplexer via a cable (which is delivered with the device) at the front of the Multiplexer. If you want to use the 24V DC supply (which is in the switchboard), you must connect it to the green Phoenix-screw terminal next to the 230V voltage part.
The right polarity is printed on the front label. Thus, the MUX-II can be operated independently of its environment with either 24V DCC or 230V AC without any additional appliances.

The Mini-MUX, however, can only be operated with 24V DC. The polarity of this voltage is written down on the label as well.

The connection cable (fifteen-pin, fed through 1to1 of course for the Siemens-control) which is delivered with the PG-MUX-II connects the AG with the Multiplexer. This connection cable is optionally available for the Mini-MUX.
The cable is plugged in on the PG-interface of the plc and is then connected to the AG-interface of the Multiplexer.
From now on, users have two equivalent interfaces at their disposal (except Mini-MUX).

6 Implementing

Connect your module as described in the chapter " Hardware installation " to the PLC and to the programming device or to your computer.

If you want to respond to a PLC via the module you have to comply the requirements as descript in the chapter "system requirements" . In addition,please make sure that the module is properly connected

The multiplexer has 1 PG and 1 OP interface. The interfaces are compatible with AS511 L1 (with Siemens), BUEP19/BUEP19E (Bosch), Sucom A (at Klöckner-Moeller) and KS functions (AEG).

Once infected, the multiplexer determines the necessary identification data from the PLC (slave number, etc.). Both interfaces are ready now. At both interfaces can be limited to use PG functions are performed simultaneously. The Mini-MUX only operate on the OP interface, the L1 protocol operate Vedas and the other is used for the programming device or devices with AS511.

In the normal MUX function shines the green LED on the MUX. If this is extinguished or flashing, an error is occurred.

6.1 Optimisation of Velocity

(only for the Multiplexers for Siemens-S5)

In order to achieve a faster Multiplex process between L1 and PG-mode, the Multiplexer sets parameter values with a PG-number to the connected AG when identifying a L1-parameter setting. The PG-number is the same as the L1-slave number

If now during the operation, the S5-user-software sets new parameter values to the AG (for example OB21=Run after Stop) and thus overwrites the PG-number there, may occur a time overflow when the PG is accessed the next time via the Multiplexer.

This problem can be avoided if the S5 programmer always sets the parameter vales to a PG-number.

In this case, the Multiplex proceedings take place without any problems. It has to be avoided that the L1-number or the PG-number respectively are changed during the operation since the Multiplexer gets these numbers from the PLC only when the connection between the MUX and the PLC is established. The Multiplexer does not recognise it if these numbers have been changed.

The L1- or the PG-number respectively are deposited in word 57 of the operating system.

You can also increase the speed a bit at control panels by the need to set operate flag words close to each other. The access is much faster to the control panel for example access can closed 100-103 MW and not on eg MW75, FW 106, MW15 etc.

6.2 Restrictions

The OP-socket of the Multiplexer is completely passive, i.e. it has neither 5V and 24V DC exits nor 20mA source of current. Only the four transmission signal lines RxT+ (pin 9), RxD- (pin 2), TxD+ (pin 6), TxD- (pin 7) are allocated on this interface. Moreover, the communication protocol of this interface is restricted, i.e. higher commands for programming devices are not supported, like for example transfer module, RUN/STOP, control module, ..., because this interface has been designed simplier as the interface of a control device.

The PG-socket can process all functions of the PG (exception: Process Command, PG-BUS-protocol), but it cannot L1-protocol (it does not use a programming device). The PG-socket of the Mini-MUX get its supply completely out from the PLC. Thus, if the PLC does not give out any 20mA sources of supply or voltages, consequently those cannot cling to the PG-socket.

7 Technical data

Supply voltage:	24V DC +/- 20%
Power consumption:	3 watt
Display:	LED for function and watchdog supervision
Interfaces:	**to the PLC:** TTY/20mA current loop (multiplexer aktiv, PLC passiv) **to the PD/PC:** PD TTY/20mA current loop (multiplexer aktiv, 100 % mechanically and electr. compatible) OP TTY/20mA current loop (multiplexer passiv, restricted to control panel function)
Operating temperature:	0 - 55°C
Case:	metal case with mounting flange
Dimensions:	95 x 135 x 35 mm
Scope of delivery:	Mini-MUX Power connector 2pins big
Scope of delivery:	Mini-Prommer-III Power connector 2pins big

7.1 Pin assignment Mini-MUX

7.1.1 AG Interface PS3 (RS485)

This Interface should be 1:1 connected with the Siemens-PLC, for a correct work of the Multiplexer. . The PG-MUXII have internally connected active receiver and transmitter. The pins 2, 9, 6, 7 must be connected 1:1 with the PLC.

Pin	Notation	Signalname	direction
1	Mext	External ground	
2	TTY OUT–	Send data –	Out
3	+5V	Current supply +5V DC	
4	+24V	Current supply +24V DC	
5	GND	Internal ground	
6	TTY IN +	Receiver data +	In
7	TTY IN –	Receive data –	In
8	Mext	externe Masse	
9	TTY OUT +	Send data +	Out
10	M24V	Ground for 24V	
11	I-IN	20mA current source input	In
12	GND	Internal ground	
13	I-IN	20mA current source input	In
14	+5V	Power supply +5V	
15	GND	Internal ground	

7.1.2 PD interface

PG-Interface

This pining is the same pining of the PG-Interface on a Siemens S5

Pin	Notation	Signalname	Direction
1	Mext	External ground	
2	TTY IN –	Receiver minus	In
3	+5V	Current supply +5V DC	
4	+24V	Current supply +24V DC	
5	GND	internal ground	
6	TTY OUT +	Transmitter plus	Out
7	TTY OUT –	Transmitter minus	In
8	Mext	External ground	
9	TTY IN +	Receiver plus	Out
10	M24V	Ground +24V	
11	I-OUT	20mA current source	In
12	GND	internal ground	
13	I-OUT	20mA current source	Out
14	+5V	Current supply +5V	
15	GND	internal ground	

7.1.3 OP-Interface

This interface is completely passive and requires an active operating panel!

Pin	Notation	Siganlname	Direction
1	Mext	external ground	
2	TTY IN –	Receiver minus	In
6	TTY OUT +	Transmitter plus	Out
7	TTY OUT –	Transmitter minus	In
8	Mext	external ground	
9	TTY IN +	Receiver plus	In

8 Troubleshooting

8.1 Troubleshooting

LED on MUX is dark

Is the supply voltage not applied or poled correctly?

The MUX operates with troubles

Is the earth-cable connected?
Are some unspecificated cables connected?

The OP does not operate at the Mini-MUX

Is the OP passive or does it need voltage from the MUX?
Is it plugged in the PG-socket and does it work with L1?

The OP operates with troubles?

Is it possible to adjust "Time out" at the OP?
Does it work with a cross protocol?
Are the power sources of the OP alright (when operating with the Mini-MUX)?

The L1-bus operates with troubles

Is the receive buffer bit enquired too slowly?
(this bit disappears with a following PG-access, so please enquire several times)

The L1-BUS does not operate at all

Has the PG/L1-number in the plc changed?