

# Microprocessor Power Control Panel MPSM-S1

## OPERATING MANUAL



**ZPAS**  
GROUP

solutions for connections





Please carefully read this operating manual before first start-up and usage of the MPSM-S1 device. This will assure the safety for you and other personnel. Please keep this operating manual in well protected location and return it to the next owner to provide that all contained here information will be available for the persons that use this device in the future.

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# Safety rules

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This chapter contains all basic rules regarding safe operation of MPSM-S1 device.

## Graphical symbols



Attention!



Earthing – main point of PE circuit connection.



Before using the MPSM-S1 device please familiarize yourself with the device construction, and especially with all functions and operating design. If necessary, please contact with specialist for help. Please read carefully the operating manual attached to this device and always observe instruction described below!



Do not dispose any electric devices with general wastes.

## General safety rules



*Caution:* In this way you can avoid any damages to the device and property.



*Caution:* In this way you can avoid any accidents and injuries resulted from electric shock.

- Do not operate damaged, uncompleted or modified device without written permission of the manufacturer. Before starting-up the device, please ensure that all electrical installation is checked by the qualified electrician. Electrical installation should be protected with the proper protection cable.
- Do not start the device, when the electrical protection or other parts, such as power cable or power socket are damaged.
- Protect the device against operation in the conditions that exceed the conditions described by the manufacturer.
- Use only original accessories and do not modify the device.
- Only qualified personnel of ZPAS S.A. service center can open the device. If the device requires any repair, always contact with our nearest service center.
- Any connections to the electric power supply must be performed only by the qualified electrician and conform with IEC 60364-1 requirements.
- The switch placed on the back side of device disconnects only the power supply for electronics; in normal conditions it disconnects only the current circuits.



*Attention:* This device is not equipped with the manual switch for current circuits sockets.



*Attention:* Do not open the device housing, especially when the device is connected to the electric power supply.

# Designation

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This device is designed for operation in the industrial environment. After assembly of special metal brackets, delivered with the device, the device can be installed in IT cabinets equipped with 19" bearing beams or frames. The MPSM-S1 device can be used also as a stand-alone device; for this purpose the special rubber foots can be used, that can be glued to the special grooves placed on the lower part of the enclosure. This device can be used only in places, in which its functionality can be used and all operational and safety conditions will be observed.

# General description

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The correct power supply and temperature are the most important factors that provide correct operation of the modern automated technologies, electronics, industrial computers and other devices. These factors are necessary to provide the operational continuity of the most important devices, server-rooms, IT and power engineering.

The MPSM-S1 device is a programmable power control panel that provides power, current, voltage measurements on each slot, and also temperature and humidity measurements. The device is equipped with the rare functionalities, and this is why it may be indispensable in many installations.

## Useful functions

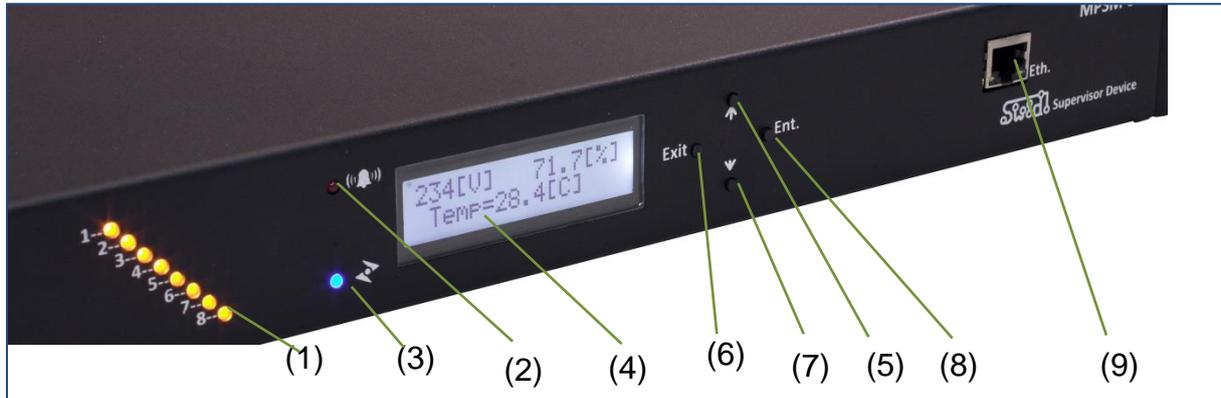
- **SOFT-START – this function provides the soft start for the servers, cabinets, industrial automation elements, etc.**  
It provides possibility of defining the start-up delays for individual slots of the panel after the power supply restoration or after SLAVE slots activation. In this way, the user can set the dedicated scenario for the all devices powered from MPSM-S1 panel.
- **MASTER-SLAVE – energy conservation**  
Automatic shutdown of the SLAVE slots (devices), when the MASTER device (slot) starts up. The MASTER slot current consumption level is continuously monitored by the power control panel, and when it exceeds the level programmed by the user, the SLAVE slot will start again. The turning on/off operation is equipped additionally with the time decay (delay) function also programmable by the user. Each MPSM-S1 panel slot can operate in MASTER, SLAVE or NONE mode (except the MASTER-SLAVE functionality). Such solution provides that all changes in the configuration of devices powered by the MPSM-S1 control panel can be made without physical switching of the devices in the dedicated slots (operational continuity).
- **PDU-TERMOSTAT – multistage control of ventilators, heaters and air-conditioners.**  
For each slot of the panel the temperature values can be defined for which the slot must be activated. The individual slot can be also activated with the signal that is below or above the defined temperature value.
- **PDU-HUMIDISTAT – multistage control of air humidifiers and dryers**  
For each slot of the panel the humidity levels can be defined for which the slot must be activated. The individual slot can be also activated with the signal that is below or above the defined temperature value, for example for the alarming purposes.
- **Outputs control**  
Possibility of turning-off any slot of the panel regardless of the operating mode and time.

- **On-line monitoring for:**
  - currents and power on individual slots
  - current and connected collective power
  - voltage in power supply network
  - ambient temperature and humidity
  
- **Alarm states signaling for:**
  - exceeding the programmed current value or under-load of the individual slots
  - exceeding programmed current value or under-load of the all connected receivers
  - power supply network voltage above or below of the programmed values
  - ambient temperature above or below the programmed values
  - ambient temperature above or below the programmed values
  
- **Device settings:**
  - hysteresis ( $\Delta T$ ) for thermostat
  - hysteresis ( $\Delta RH$ ) for humidistat
  - time delay for **MASTER-SLAVE function**
  - overload displaying mode: **power (VA)** or **current (A)**
  - return to factory settings
  
- **Internal database:**
  - recording of measurements, events, alarms
  - timer, calendar with battery support
  - even 24 months of continuous recording (**8GB SD RAM**)
  
- **Ethernet interface:**
  - data reading/writing through the computer network (LAN/WLAN)
  - remote administration and on-line monitoring
  - SNTP/DHCP
  - managing application runs under Windows operating system
  
- **Display settings**

Thanks to the special technique in that the software was created, all functions are executed simultaneously. This means that using the program menu during settings edition, the device in the background performs all status tasks and immediately reacts on any changes in the user settings and readings from its measurement systems. The device after power failure will remember the last saved configuration. Internal timer and calendar operate even during long-lasting power failure.

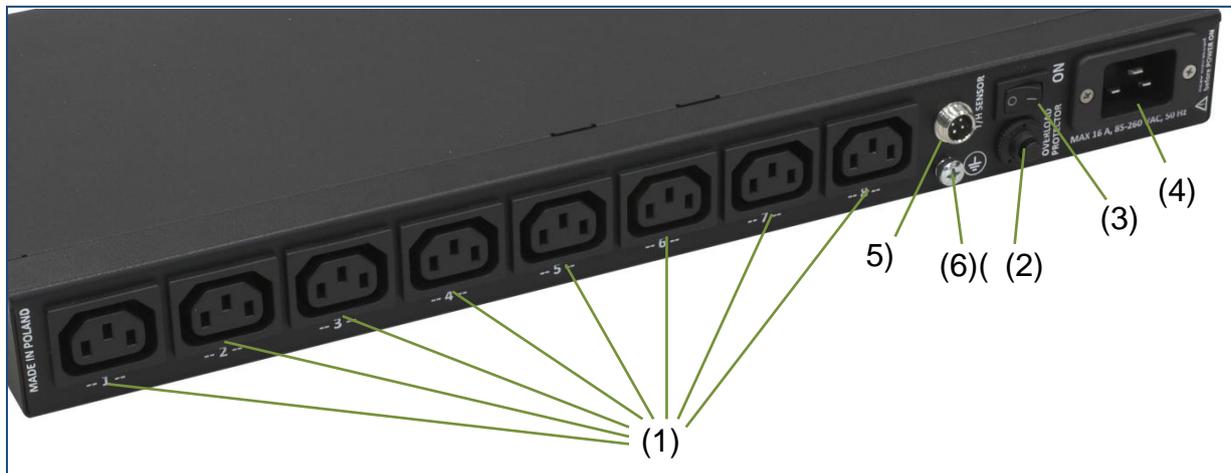
## Device construction

The device is equipped with the metal housing. Front and back sides of the device are described below. The side walls have the venting perforation. They contain also the holes for the mounting brackets needed for assembly in the 19" cabinets. The lower plate contains four ribs that allow to assemble the glued feet, needed when the device should operate as the stand-alone device.



*MPSM-S1 front panel*

- |  |  |
|--|--|
| (1) turning-on indicators for slots 1~8  | (7) <b>DOWN</b> navigation button (down) |
| (2) alarm state indicator                | (8) <b>ENTER</b> navigation button       |
| (3) indicator for series of measurements | (9) ETHERNET slot                        |
| (4) LCD text display                     |  |
| (5) <b>UP</b> navigation button (up)     |  |
| (6) <b>EXIT</b> navigation button        |  |



*MPSM-S1 back panel*

- |   |
|---|
| (1) power supply outputs slots for external devices 1~8 |
| (2) automatic fuse 20 A for the current circuits        |
| (3) device main switch                                  |
| (4) power supply input slot 16 A                        |
| (5) temperature sensor slot                             |
| (6) main earthing point                                 |

## Operation description

The device is equipped with ten independent measurement systems for electrical values and temperature/humidity. During one second, the MPSM-S1 device executes thousands of partial measurements to perform calculations of the final results. The values obtained in the such way are transferred to the analysis processor, in which all functions and alarms of the device are implemented. Simultaneously, all measurement values are presented also on the LCD display.

By comparing the measured and given values, the MPSM-S1 device undertakes the proper actions, e.g. proper slots or alarms control. The MPSM-S1 panel simultaneously measures the time between suitable events, to perform certain status operation also in the function of time.

All user settings are entered using the keyboard placed on the front panel. The **ENTER** button allows to move to the selected menu item or select next parameter during configuration. The **EXIT** button allows to move to a higher level in the menu or to exit and save the settings during the configuration. The **UP/DOWN** buttons are used for parameter values settings or for selecting functions or views in the menu. The flashing blue lamp signals the measurements realization. The red lamp is used as the alarm indicator, when it flashes, this means that one of the alarms occurred. The yellow lamps are used as the slot indicators – they are flashing when the given slot is active (the power supply is present on the slot).

## MANAGEMENT

```
>>> MENU <<<
0.SLOT-MANAGEME.
[0.SLOT-MANAGEME.
Slot1=ON [↓/↑] ... [0.SLOT-MANAGEME.
Slot8=ON [↓/↑]]
```

### Description

The **MANAGEMENT** allows to disable the slot regardless of the operation mode. The slot is disabled immediately after changing from **ON** to **OFF**. After exiting this menu option, the device saves the settings, and this means that after power supply restoration, the slot will be still enabled.



*Attention:* Remember that the **ON** value (enabled) means that the slot management is allowed by the other functions of the power control panel. This also means, that despite of the **ON** value, the slot can be disabled by one of the functions, and such situation is correct.

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **MANAGEMENT function**. The **ON/OFF** operations can be performed using the **UP** key (slot enabled) and **DOWN** key (slot disabled). To provide a higher level of security, this keys should be also pressed and hold for more than 5 seconds, to make the changes. The control of the another slot is realized by pressing the **ENTER** button. When the **EXIT** button is pressed at any time, the new configuration is saved in the non-volatile memory and the user is returned to the main menu.



*Attention:* It is important to remember, when the value is changed to **OFF**, the slot is immediately and completely disabled.

### Application

This functionality is basic and mandatory in case of power control. It can be treated as the physical shutdown of the receiver.

### Settings

Parameter	Range	Resolution	Factory settings
Slot1~Slot8	ON/OFF	-	ON

## SOFT-START



### Description

The **SOFT-START** function is used for defining the times delays of turning on the individual slots. **00''00'** (00minutes:00seconds) means the start time of the MPSM-S1 logics after the power supply restoration or after activation of the **MASTER** slot for the **SLAVE type slots**. All time values for the individual slots are referred to the **00''00'** time.

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **SOFT-START function**. The settings for the slots turning on time delays are performed by the **UP/DOWN** keys in the range from **00''00'** to **99''59'**, e.g. the maximum delay time can be 1h:39m:59s. The next slot can be set by pressing the **ENTER button**. When the **UP** or **DOWN** button will be pressed, the value will change by one stop. When the button will be pressed for more than 5 seconds, the value of the automatic change will increase up to 30 stops. This rule is valid for both **UP** and **DOWN buttons**. After making all changes the **EXIT** button should be pressed. All parameters will be saved in the non-volatile memory and user will return to the main menu.

### Application

When the power supply is restored to the cabinet, all devices placed in the cabinet are started-up. In such cases, the UPS power supply systems can be temporarily overloaded. Also, the over-current protection systems in the cabinet power supply lines can be started-up, and all devices will be shutdown. In such cases, application of one or more MPSM-S1 panels can be a solution within one cabinet, server room or whole power supply circuit. All serially installed MPSM-S1 panels should be configured by taking into account the switching-on time delay of the last receiver for the previous panel. In such way it is possible to build the scenarios for switching-on the extended device frameworks.

The next significant advantage of the **SOFT-START** function is the fact, that we arrange not only the physical, but also the logical start-up parameters. The IT or automation system often require the special logical scenario for switching-on the proper section of the system. For example, when the main server in the applicable system loading and ports scanning phase will not see the devices, such as JBOD, disk array, type library, SUN switch, because they are using own loading processes and not reported the ready state, and without manual intervention the server will not see them, and for example the back-up procedure cannot be performed.

The physically and logically correctly configured MPSM-S1 panel should switch on all set of the receivers.

Parameter	Range	Resolution	Factory settings
Slot1	0[s]~1:39:59[s]	1[s]	0[s]
Slot2	0[s]~1:39:59[s]	1[s]	2[s]
Slot3	0[s]~1:39:59[s]	1[s]	4[s]
Slot4	0[s]~1:39:59[s]	1[s]	6[s]
Slot5	0[s]~1:39:59[s]	1[s]	8[s]
Slot6	0[s]~1:39:59[s]	1[s]	10[s]
Slot7	0[s]~1:39:59[s]	1[s]	12[s]
Slot8	0[s]~1:39:59[s]	1[s]	14[s]

## MASTER-SLAVE



### Description

The **MASTER-SLAVE** function is used for the automatic switching-on of the **SLAVE** devices, when the **MASTER** device is switched on, and vice-versa – switching-off the **SLAVE** devices, when the MPSM-S1 panel detects that the **MASTER** device is switched-off. In any case, the **MASTER** slot is always powered. The level of the current received by the **MASTER** receiver in the continuous mode is monitored by the MPSM-S1 panel, and when the threshold value will be exceeded during the **DelayMS** time defined in the **PDU-SETTING** parameter, the **SLAVE** slots will be switched. The **SLAVE** slots are switched-on according to the scenario of the **SOFT-START** function, where the **00'00'** time is the time of the **MASTER** device activation plus **DelayMS** time.

Each slot can operate in the one of the following modes:

- **none** – the slot is outside of the **MASTER-SLAVE** function
- **slave** – the **SLAVE** type slot
- **00.02[A]~10.00[A]** – **MASTER** type slot configured with activation threshold value

The MPSM-S1 panel allows also to define one **MASTER** slot and any number of the **SLAVE** slots. The advantage of this solution is the fact, that each change in the configuration can be performed without plug-in the receivers into the dedicated slots, assuring the continuity of the device operation.



**Attention:** The **MASTER-SLAVE** function is disabled automatically, when the **MASTER** slot is not defined or, when the defined **MASTER** slot is not active.

The setting procedure for this function should be started from defining the **MASTER** slot and then the threshold values for the **SLAVE** slots activation (this is usually 1/3

of the power for the normal operation of the **MASTER** device). Next, we have to define the **SLAVE** slots and set the **DelayMS** time. During this phase the MPSM-S1 panel checks that the **MASTER** slot state was changed firmly, and after that time the **SLAVE** slots will be switched on or off.

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **MASTER-SLAVE function**. By using the **UP/DOWN** buttons we can change the operating modes of the given slot. The lower limit of the **slave** changes refers to the **SLAVE** operation mode. The next and default value is **none**, when the function is disabled for the given slot. Moving up, and starting from **00.02[A]** value we can set the threshold values for the activation of the **SLAVE** type slots. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be pressed and hold for more than 5 seconds, the value of the automatic change will increase up to 30 units. This rule is valid for both **UP** and **DOWN** buttons. The upper level of the settings is the maximum current value **10.00[A]** for the given slot. By using the **ENTER** key, we can move to the configuration of the next slot. Saving and exit to the main menu is done by pressing the **EXIT** button.



*Attention:* It is important to remember, that the changes in the settings have immediate effect.

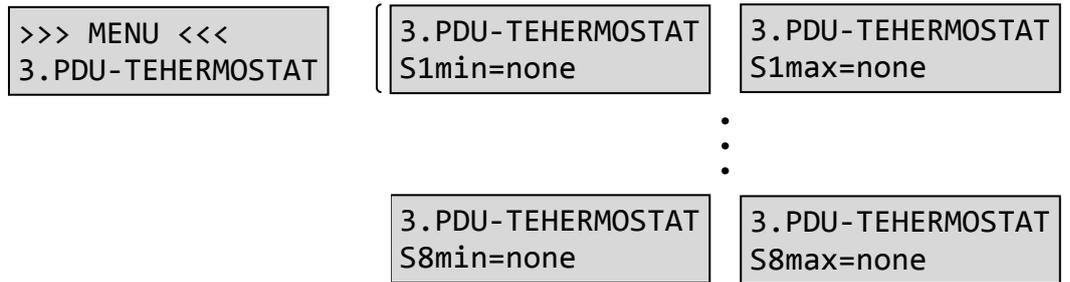
### Application

The **MASTER-SLAVE** function supports the energy conservation. This function is used within the systems, where the main **MASTER** device can be separated and the **SLAVE** type devices that should not operate, when the main device is switched-off. The example of such system can be a server, disk array, backup system (type library), switch, KVM console. When the server will be switched-off with the signal from the UPS device, the other elements of the system are redundant and will discharge the UPS batteries. In such case, the MPSM-S1 panel, when the **MASTER-SLAVE** function is set and active, after the **DelayMS** time, will switch-off all the remaining devices in the system. When the power supply will be restored, all elements of the system will be switched-on again by the MPSM-S1 panel in the proper order and according to the time delays values.

### Settings

Parameter	Range	Resolution	Factory settings
Slot1~Slot8	slave/none/0.02~10.0[A]	0.01[A]	none
DelayMS	5[s]~1:39:59[s]	1[s]	5[s]

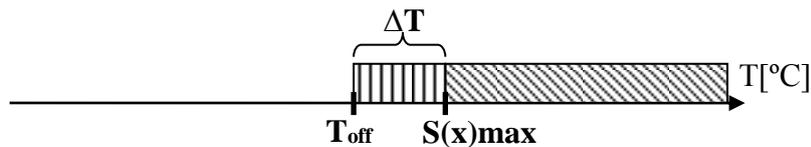
## PDU-THERMOSTAT



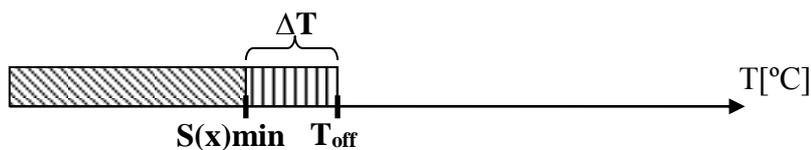
### Description

The **PDU-THERMOSTAT** function allows to define in the accessible easily manner the management of the ambient temperature in the cabinet or whole room. To do this, we created the mechanism that allows to define the activation temperature values for each slot. This mechanism uses the  $\Delta T$  (**DeltaT**) hysteresis that is configured in the **PDU-SETTING** menu and provides the correct characteristics of the cooling and heating devices operation. When the value is set to **none**, the parameter is disabled and the MPSM-S1 panel ignores it. For each slot we can set the following parameters:

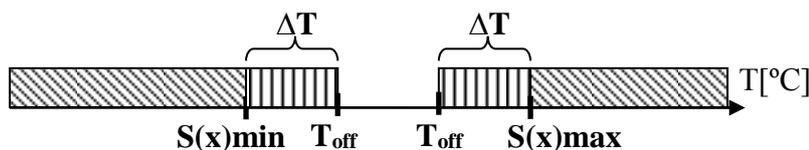
- a) **S(x)max** – temperature above which the **S(x)** slot will be activated



- b) **S(x)min** – temperature value above which the **S(x)** slot will be activated



- c) when we set **S(x)min** and **S(x)max** for the slot, then the slot will be active below **S(x)min** and above **S(x)max**.



-  - slot active
-  -  $\Delta T$  (DeltaT)
- $T_{off}$  - slot switching-off temperature



*Attention:* When the temperature and humidity sensor will be damaged as a result of disconnection or mechanical damage, the board will signal the alarm of exceeding the maximum temperature and humidity values. All devices controlled by the **THERMOSTAT** and **HUMIDISTAT** function will be immediately disconnected.

### *Example*

S1max=21.0[°C],  
S3max=22.0[°C]  
S7max=28.0[°C]

S2min=14.0[°C]  
S4min=12.0[°C]  
S8min=08.0[°C]

Values for **THERMOSTAT** function for MPSM-S1 slots, defined as in the above example, trigger for temperature 21.0[°C] activation of the **S1** slot, from which the fan is powered. When the temperature still rises and reaches 22.7[°C] value, additionally the **S3** is activated, where the second fan is connected. If the temperature will still rise and reach 28.0[°C] level, the **S7** slot would be activated that controls all fans panel or other cooling device (air-conditioner). If the temperature will still rise, and the larger number of cooling devices was not defined, then the next temperature increment would trigger the temperature alarm described in the next chapters of this document (MPSM-S1 panel would use its light and audio alarms to signal such situation).

When the temperature will still decrease and reach 14.0[°C] level, then the **S2** slot will be activated, and the heater will be powered. Further decrease of the temperature will activate S4 and S8 slots accordingly. This is the opposite situation like in case the temperature increase.

### *Navigation*

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **PDU-THERMOSTAT** function. By using the **UP/DOWN** buttons we can change the operating modes of the given slot. Then, the lower limit of changes is displayed as **none**, and this means that the slot is switched-off from the **PDU-THERMOSTAT** function. Going upward, we can assign the activation threshold values for **S(x)min** and **S(x)max** slots. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be pressed and hold for more than 5 seconds, the value of the automatic change will increase up to 30 units. This rule is valid for both **UP** and **DOWN** buttons. The lower limit of the settings is the maximum admissible temperature of the temperature and humidity sensor (85[°C]), the lower limit is equal to 0.1[°C]. By using the **ENTER** key, we can move to the configuration of the next slot. Saving and exit to the main menu is done by pressing the **EXIT** button.

### *Application*

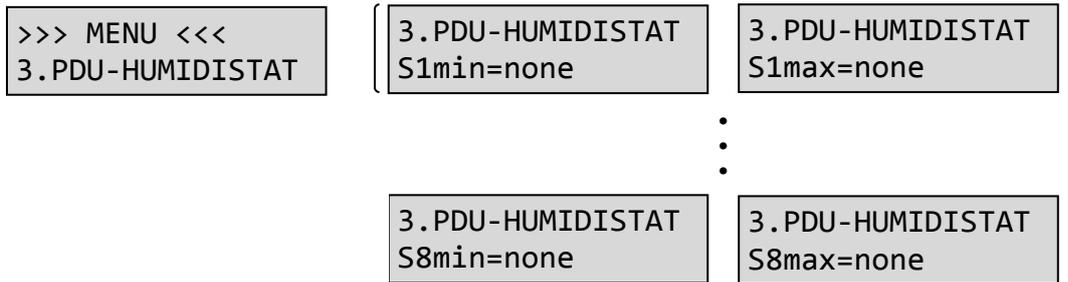
The control and regulation of the temperature in the cabinet or room, where the important IT devices are located, is a priority for the stable operation of such devices.

The MPSM-S1 panel with unique set of functions, including the **PDU-THERMOSTAT** function, is very flexible and effective solution for temperature controlling and management. In the most simple form, we can connect to the MPSM-S1 panel the ventilations panels offered by ZPAS (double panel PD-2W or quadruple panel PWD-4W), and after programming the devices we will provide monitoring, alarms and basic temperature regulation in the cabinet. Advanced digital temperature sensor is located on the unscrewed cable that facilitates assembly procedure, and also extends the application possibilities of this solution. It should be pointed out that besides from the thermostat functionality, each slot is continuously measured in terms of the overload, and the measurements results are presented on the display, what informs us about the output power of the cooling or heating devices. The correctly configured **SOFT-START** function does not allow to switch-on all air-conditioning devices, when the power supply is restored.

*Settings:*

Parameter	Range	Resolution	Factory settings
<b>S1min~S8min</b>	none/0.1~85.0[°C]	0.1[°C]	none
<b>S1max~S8max</b>	none/0.1~85.0[°C]	0.1[°C]	none
<b>DeltaT</b>	0.1~30[°C]	0.1[°C]	0.5[°C]

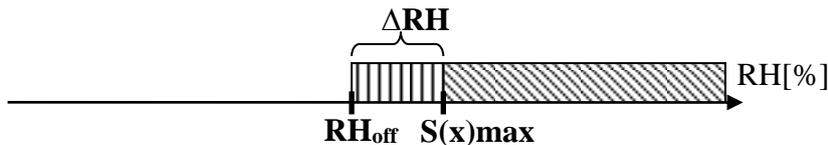
## PDU-HUMIDISTAT



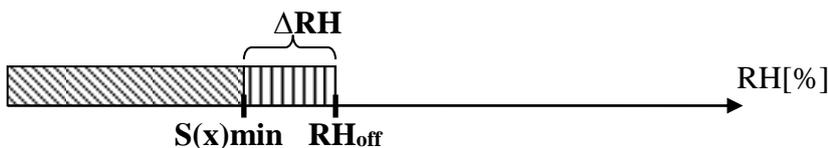
### Description

The **PDU-HUMIDISTAT** function allows to define in the accessible AND easily manner the management of the ambient humidity in the cabinet or in the whole room. To do this, we created the mechanism that allows to define the threshold settings for RH (related humidity). This mechanism uses the  $\Delta RH$  (**DeltaRH**) hysteresis that is configured in the **PDU-SETTING** menu and provides the correct characteristics of the cooling and heating devices operation. When the value is set to **none**, the parameter is disabled and the MPSM-S1 panel ignores it. For each slot we can set the following parameters:

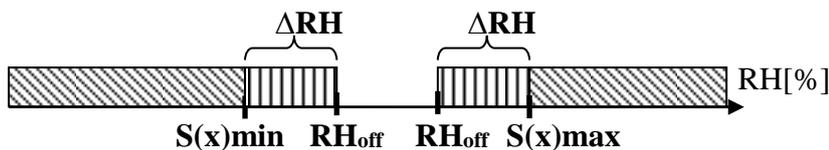
- a) **S(x)max** – humidity value above which the **S(x)** slot will be activated



- b) **S(x)min** – humidity value below which the **S(x)** slot will be activated



- c) when we set **S(x)min** and **S(x)max** for the slot, then the slot will be active below **S(x)min** and above **S(x)max**.



- slot active
- $\Delta RH$  (DeltaRH)
- $RH_{off}$  - humidity value for slot switching-on



**Attention:** When the temperature and humidity sensor will be damaged as a result of disconnection or mechanical damage, the board will signal the alarm of exceeding the maximum temperature and humidity values. All devices controlled by the **THERMOSTAT** and **HUMIDISTAT** function will be immediately disconnected.

### *Example*

S1max=65.0[%],  
S3max=75.0[%]  
S7max=80.0[%]

S2min=35.0[%]  
S4min=25.0[%]  
S8min=20.0[%]

Values for **HUMIDISTAT** function for MPSM-S1 slots, defined in the above example, trigger for humidity 65.0[%] activation of the **S1** slot, from which the air-dryer is powered. When the humidity still rises and reaches 75.0[%] value, additionally the **S3** is activated, where the second air-dryer is connected. If the humidity would still rise and reach 80.0[%] level, additionally the **S7** slot would be activated for steering for example the alarm system. If the humidity would still rise, and the larger number of air-drying devices was not defined, then the next humidity increment would trigger the humidity alarm described in the next chapters of this document (MPSM-S1 panel would use its light and audio alarms to signal such situation).

When the humidity will still decrease and reaches 35.0[%] level, then the **S2** slot will be activated, and the humidifier will be powered. Further decrease of the humidity will activate S4 and S8 slots accordingly. This is the opposite situation to the case, when the humidity value is increased.

### *Navigation*

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **PDU-HUMIDISTAT** function. By using the **UP/DOWN** buttons we can change the operating modes of the given slot. Then, the lower limit of changes is displayed as **none**, and this means that the slot is switched-off from the **PDU-HUMIDISTAT** function. Going upward, we can assign the activation threshold values for **S(x)min** and **S(x)max** slots. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be pressed and hold for more than 5 seconds, the value of the automatic change will increase up to 30 units. This rule is valid for both **UP** and **DOWN** buttons. The upper limit of the settings is the maximum admissible value (RH=100[%]), the lower limit is equal to 0[%]. By using the **ENTER** key, we can move to the configuration of the next slot. Saving and exit to the main menu is done by pressing the **EXIT** button.

### *Application*

The control and regulation of the humidity in the cabinet or room, where the important IT devices are located, is a priority for the stable operation of such devices. The MPSM-S1 panel with unique set of functions, including the **PDU-HUMIDISTAT** function, is very flexible and effective solution for humidity controlling and

management. In the most simple form, we can connect to the MPSM-S1 panel generally available humidifiers or air-dryers 230 V AC / max 10 A, and after programming the devices we will provide monitoring, alarms and basic humidity regulation in the cabinet. Advanced digital humidity sensor is located on the unscrewed cable that facilitates assembly procedure, and also extends the application possibilities of this solution. It should be pointed out that besides the humidistat functionality, each slot is continuously measured in terms of the overload, and the measurements results are presented on the display, what informs us about the output power of the humidifiers and air-drying devices. The correctly configured **SOFT-START** function does not allow to switch-on all air-conditioning devices, when the power supply is restored.

*Settings:*

Parameter	Range	Resolution	Factory settings
S1min~S8min	none/0.1~99.9[%]	0.1[%]	none
S1max~S8max	none/0.1~99.9[%]	0.1[%]	none
DeltaRH	0.1~30[%]	0.1[%]	5[%]

## CURRENT-ALARMS

```
>>> MENU <<<
4.CURRENT-ALARMS
```

```
4.CURRENT-ALARMS
S1min=none
```

```
4.CURRENT-ALARMS
S1max=10.00[A]
```

.

```
4.CURRENT-ALARMS
S8min=none
```

.

```
4.CURRENT-ALARMS
S8max=10.00[A]
```

.

```
4.CURRENT-ALARMS
PDUmin=none
```

.

```
4.CURRENT-ALARMS
PDUmax=10.00[A]
```

### Description

The **CURRENT-ALARMS** function allows to configure the current alarm values for the receivers located both, above and below the configured threshold limits. Such settings can be made individually for each slot, and also collectively for the MPSM-S1 panel. The **S(x)min** value means, when the current will decrease below this value, then the alarm will be activated on the slot No. **x**. However, when we set **S(x)max** value, the alarm will be activated when the current maximum value on **S(x)** slot will be reached. The device measures such values and signals with the alarm, when the critical values are exceeded, including also currents for individual slots, and also for collective current for MPSM-S1 panel. When the value is set to **none**, the parameter is disabled and the MPSM-S1 panel ignores it. Actually active alarms can be viewed on the display, using **UP/DOWN** buttons. Alarms are signaled by the bell icons displayed at both sides of the parameter value which triggered such alarm.

```
00.00[A] 25.0[C]
🔔Slot1=05.00[A]🔔
```

```
00.00[A] 25.0[C]
🔔Power=07.00[A]🔔
```

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **CURRENT-ALARMS** function. By using the **UP/DOWN** buttons we can change the setting values. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be pressed and hold for more than 5 seconds, the value of the automatic change will increase up to 30 units.

By using the **ENTER** key, we can move to the configuration of the next parameter. After configuration of the alarm values for the individual **S1~S8** slots, we can configure these parameters for the collective current of MPSM-S1 panel. After setting correct values we can exit this function by using **EXIT** key. The settings will be saved in the non-volatile memory of the device.

### Application

Systems that need control of the load value. The first example can be a power supply from the UPS device, where by connecting another device, we must pay attention to overload. By monitoring the power of the slots and collective power we can optimally choose the correct model of the UPS device or set of devices. The next example can be a power supply of the alarm installation that is activated only in case of emergency, otherwise is in the control mode. It is possible that such installation will be damaged or disconnected by the mistake. In such case, the correctly configured MPSM-S1 panel will alarm us about such situation, because it will measure the incorrect load or its absence in the power supply circuit of the alarm installation.

### Settings

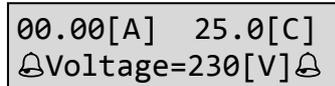
Parameter	Range	Resolution	Factory settings
<b>S1<sub>min</sub>~S8<sub>min</sub>~PDU<sub>min</sub></b>	none/0.01~10[A]	0.01[A]	0[A]
<b>S1<sub>max</sub>~S8<sub>max</sub>~PDU<sub>max</sub></b>	none/0.01~10[A]	0.01[A]	10[A]

## VOLTAGE-ALARMS



### Description

The **VOLTAGE-ALARMS** function is used for control of the voltage critical values, e.g. minimum (**PDUmin**) and maximum (**PDUmax**) values. The device measures such values and signals with the alarm, when the critical values are exceeded, including also voltage values. The settings refer to the all MPSM-S1, because the voltage value on the slots is the same. Actually active alarms can be viewed on the display, using **UP/DOWN** buttons. Alarms are signaled by the bell icons displayed at both sides of the parameter value which triggered such alarm.



### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **VOLTAGE-ALARMS** function. By using the **UP/DOWN** buttons we can change the voltage values. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be pressed and hold for more than 5 seconds, the value of the automatic change will increase up to 5 units.

By using the **ENTER** key, we can move to the configuration of the next parameter. After setting correct values we can exit this function by using **EXIT** key. The settings will be saved in the non-volatile memory of the device.

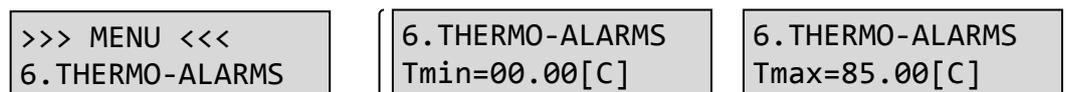
### Application

Systems that need control of the load value. Failures of the power lines often result in the voltage drops, what can cause the incorrect operation of the power supply adapters. Sometimes, we are even not aware that the voltage in the line is lower or higher. The switched power supply adapters for the servers by the increase of the current keys are more loaded and more likely exposed on the failures. In case of considerable differences in the power supply voltage values, IT devices can switch on or off.

### Settings

Parameter	Range	Resolution	Factory settings
<b>PDUmin</b>	85-260[V]	1[V]	207[V]
<b>PDUmax</b>	85-260[V]	1[V]	253[V]

## THERMO-ALARMS



### Description

The **THERMO-ALARMS** function is used for setting the critical values of temperature measured by the internal sensor. It allows to enter minimum value (**Tmin**), and also maximum value (**Tmax**). The device measures these values and signals with the alarm, when the critical values are exceeded, including also temperature value. Actually active alarms can be viewed on the display, using **UP/DOWN** buttons. Alarms are signaled by the bell icons displayed at both sides of the parameter value which triggered such alarm.

The display shows '00.00[A] 25.0[C]' on the top line and '🔔Temp=25.00[C]🔔' on the bottom line, indicating an active alarm at 25.00°C.

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **THERMO-ALARMS** function. By using the **UP/DOWN** buttons we can change the temperature setting values. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be pressed and hold for more than 30 seconds, the value of the automatic change will increase up to 5 units.

By using the **ENTER** key, we can move to the configuration of the next parameter. After setting correct values we can exit this function by using **EXIT** key. The settings will be saved in the non-volatile memory of the device.

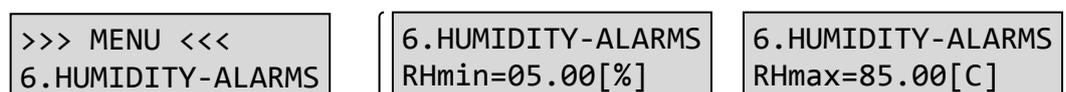
### Application

Systems that need control of the temperature value. IT or power devices generate large amounts of the heat, especially when there is large number of such devices within the closed space (cabinet, server room, etc.). The technologically advanced devices require specific operational conditions, mainly specific ambient temperature. Otherwise, their operation can be unstable and can lead to malfunctions. The MPSM-S1 panel is equipped with advanced thermostat and alarm functions, and is designed for such applications.

### Settings

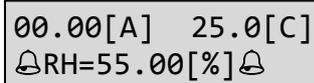
Parameter	Range	Resolution	Factory settings
<b>Tmin</b>	0~85.0[°C]	0.1[°C]	0.0[°C]
<b>Tmax</b>	0~85.0[°C]	0.1[°C]	85.0[°C]

## HUMIDITY-ALARMS



### Description

The **HUMIDITY-ALARMS** function is used for setting the critical values of humidity (RH) measured by the internal sensor. It allows to enter minimum value (**RHmin**), and also maximum value (**RHmax**). The device measures these values and signals with the alarm, when the critical values are exceeded, including also humidity value. Actually active alarms can be viewed on the display, using **UP/DOWN** buttons. Alarms are signaled by the bell icons displayed at both sides of the parameter value which triggered such alarm.



00.00[A] 25.0[C]  
⚠RH=55.00[%]⚠

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **HUMIDITY-ALARMS** function. By using the **UP/DOWN** buttons we can change the humidity setting values. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be pressed and hold for more than 30 seconds, the value of the automatic change will increase up to 5 units.

By using the **ENTER** key, we can move to the configuration of the next parameter. After setting correct values we can exit this function by using **EXIT** key. The settings will be saved in the non-volatile memory of the device.

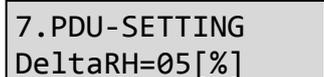
### Application

Systems that need control of the humidity value. The IT or power devices often require the air-conditioned closed rooms. In such conditions, the humidity oscillations are very large, thus very dangerous. The technologically advanced devices require specific operational conditions, mainly specific air humidity. When the humidity is insufficient, the device malfunctions can appear. The MPSM-S1 panel is equipped with the advanced humidistat and alarm functions, and is designed for such applications.

### Settings

Parameter	Range	Resolution	Factory settings
RHmin	0~99.9[%]	0.1[%]	5.0[%]
RHmax	0~99.9[%]	0.1[%]	95.0[%]

## PDU-SETTING



### Description

The **PDU-SETTING** function is used for setting the basic values of the MPSM-S1 parameters. First, we define units in which the measurements results will be presented – this can be **amps (A)** or **volt-amps (VA)**. The next parameter is **DeltaT**, describe in details for **PDU-THERMOSTAT** function. Then, we define **DeltaRH**, in other words humidistat inertia level (see **PDU-HUMIDISTAT**). Next, we can go to **DelayMS** configuration - parameter described for **MASTER-SLAVE** function. Finally, we can use **<FACTORY-RESET>** function, which resets factory settings for the MPSM-S1 panel.



*Attention:* The **<FACTORY-RESET>** function allows to reset MPSM-S1 parameters and settings to the factory settings. New settings are saved, and the panel is restarted. Thus, all devices connected to the MPSM-S1 can be disconnected.

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **PDU-SETTING** function. By using the **UP/DOWN** buttons we can change the units, temperature, humidity and time settings. When the **UP** or **DOWN** button will be pressed and hold, the value will change by one unit. When the button will be hold for five seconds, the value of the automatic change will increase up to 30 units for time settings, or up to 10 units for the temperature settings.

By using the **ENTER** key, we can move to the configuration of the next parameter. The **<FACTORY-RESET>** function is confirmed by pressing and hold the **UP** button for more than 5 seconds. After setting correct values we can exit this function by using **EXIT** key. The settings will be saved in the non-volatile memory of the device.

### Application

This function allows to create the proper and customized configuration of the MPSM-S1 device. Simultaneously, we can in simply way come back to the factory settings.

### Settings

Parameter	Range	Resolution	Factory settings
Unit's	Amp/Volt-Amp	-	Amp
DeltaT	0~30[°C]	0.1[°C]	1[°C]
DeltaRH	0.1~30[%]	0.1[%]	5[%]
DelayMS	5[s]~1:39:59[s]	1[s]	10[s]

## DISPLAY-SETTING



### Description

The **DISPLAY-SETTING** function is used for selecting the slots, for which the parameters, e.g. current or volt-amps, will be presented on the scrolled bar of the LCD display. The **ON** value means that the load value on the given slot will be presented on the display, and **OFF** means that this value will be not presented. When all items will be disabled, the lower scrolled bar will disappear, and the lower line of display will be empty.

### Navigation

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **DISPLAY-SETTING** function. The **ON/OFF** operations can be performed using the **UP** key (switching **ON**) and **DOWN** key (switching **OFF**). To move to the settings display of the next slot press the **ENTER** button. When the **EXIT** button is pressed at any time, the new configuration is saved in the non-volatile memory and the user is returned to the main menu.

### Application

This function is useful, when all slots of the panel are used, and there is no need to present them on the display.

### Settings

Parameter	Range	Resolution	Factory settings
Slot1~Slot8	ON/OFF	-	ON

## INFORMATION

```
>>> MENU <<<  
9.INFORMATION
```

```
SWIDI-Supervisor  
Device v.2.25
```

### *Description*

This function allows to display all basic information about the device, e.g. name and firmware version.

### *Navigation*

To enter this option, in main menu press and hold for more than 5 seconds the **ENTER** button on the **INFORMATION** function. The **EXIT** key allows to return to the main menu.

## Logics and programming

The functionality is designed in manner that provides the greatest configuration possibilities in the power supply automation systems. By using the following principles, we can model the given control system within wide and flexible MPSM-S1 functionality.



*Attention:* Observe the following principles during programming of the device, to correctly adapt the MPSM-S1 device for the operation in the system.

*Rules for programming MPSM-S1 device:*

- The programming activities in the system that operates on-line are connected with the risk of unintentional disconnection of the receivers in case, when the parameters entered by the user will be not compatible with the logics of the device. Before programming, it is important to make sure that eventual power supply failure for the connected receiver will not disturb the operation of the other devices. In case of doubts, the logics can be checked also on the second, supplementary MPSM-S1 panel.
- This should be considered, that any changes in the configuration have immediate effect. The panel continuously scans and uses the new configuration.
- Every change in the configuration should be completed by the saving in the device memory.

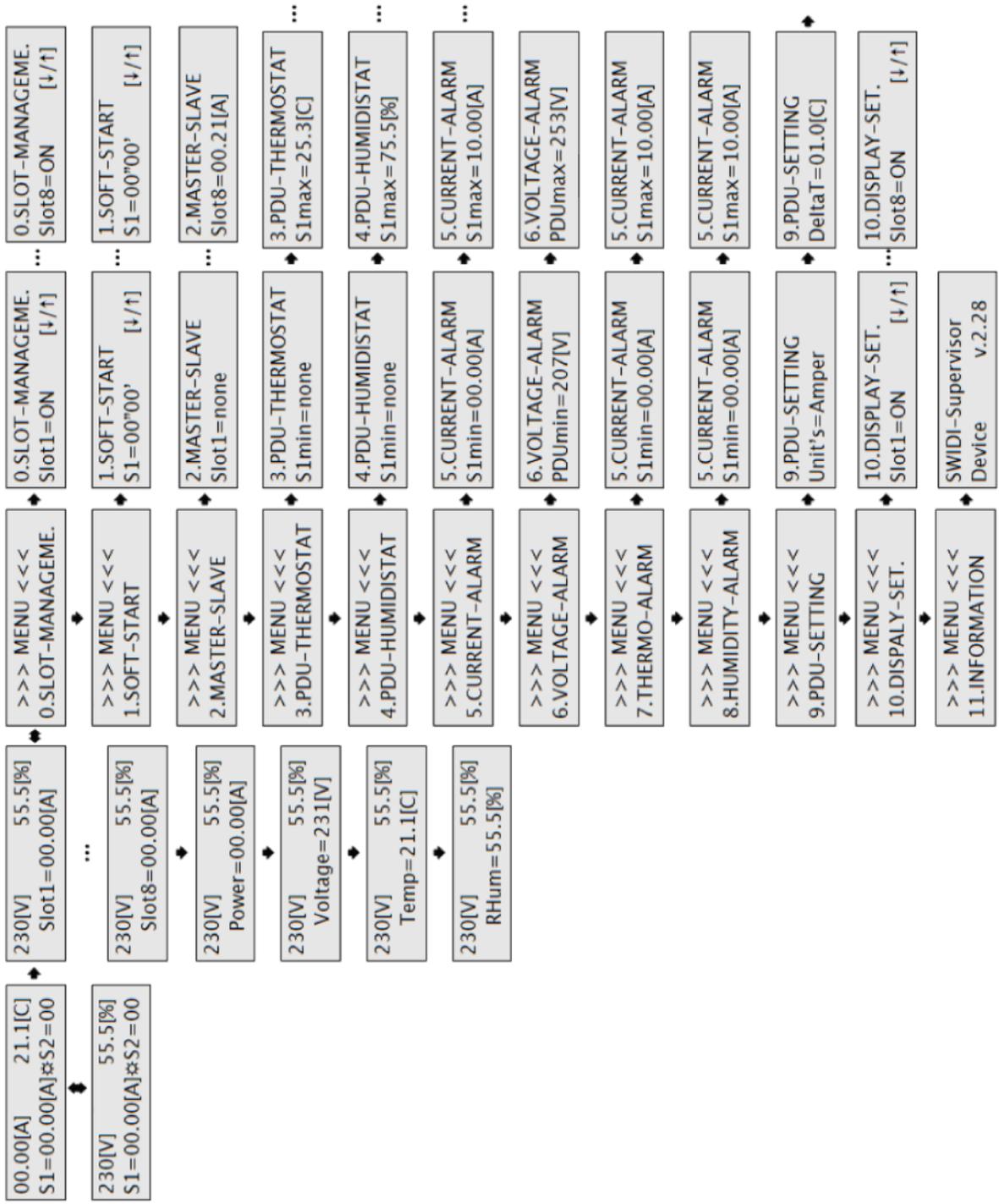


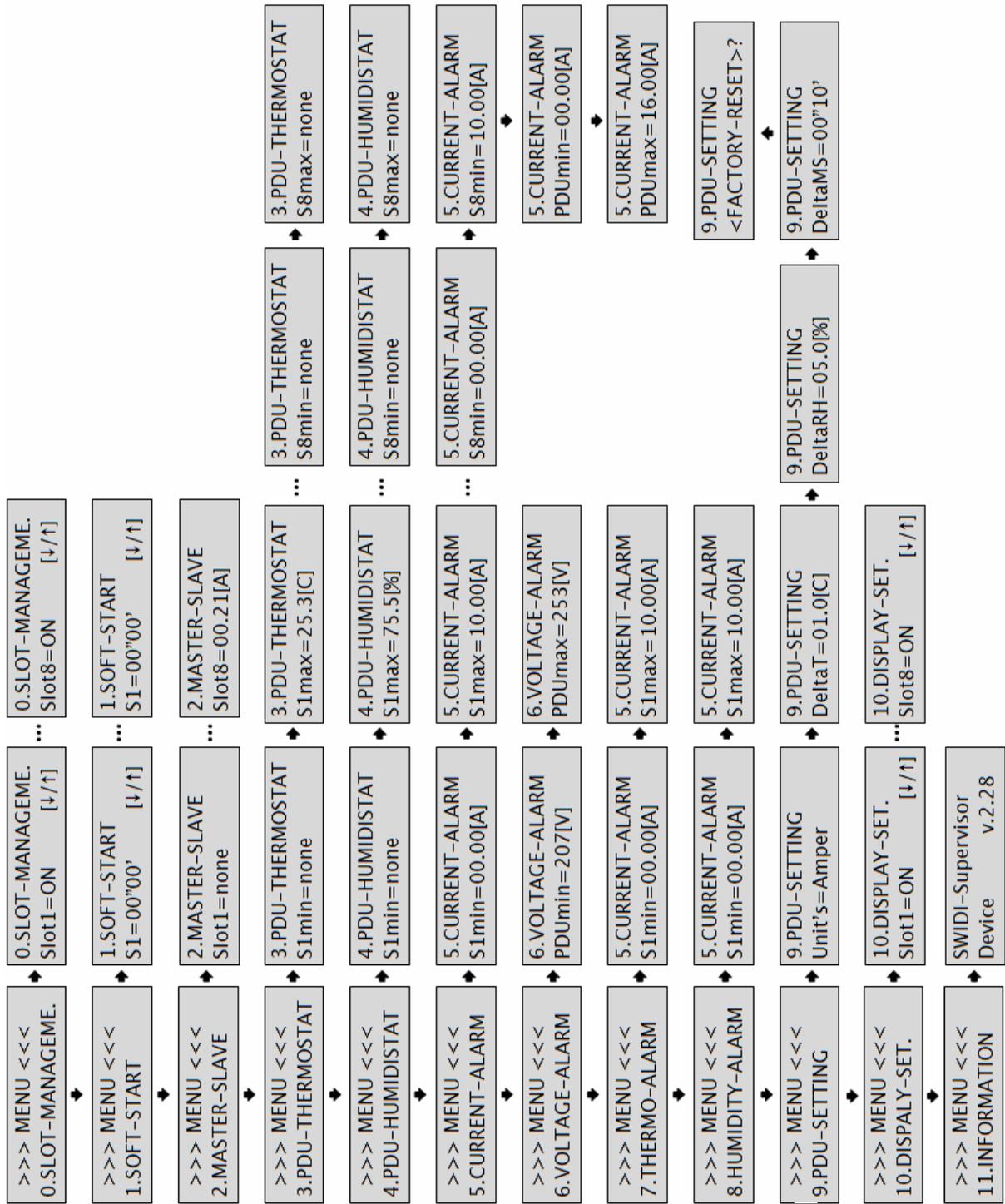
*Attention:* Please familiarize yourself carefully with the device logics, to correctly program the device.

*Principles of the MPSM-S1 logics:*

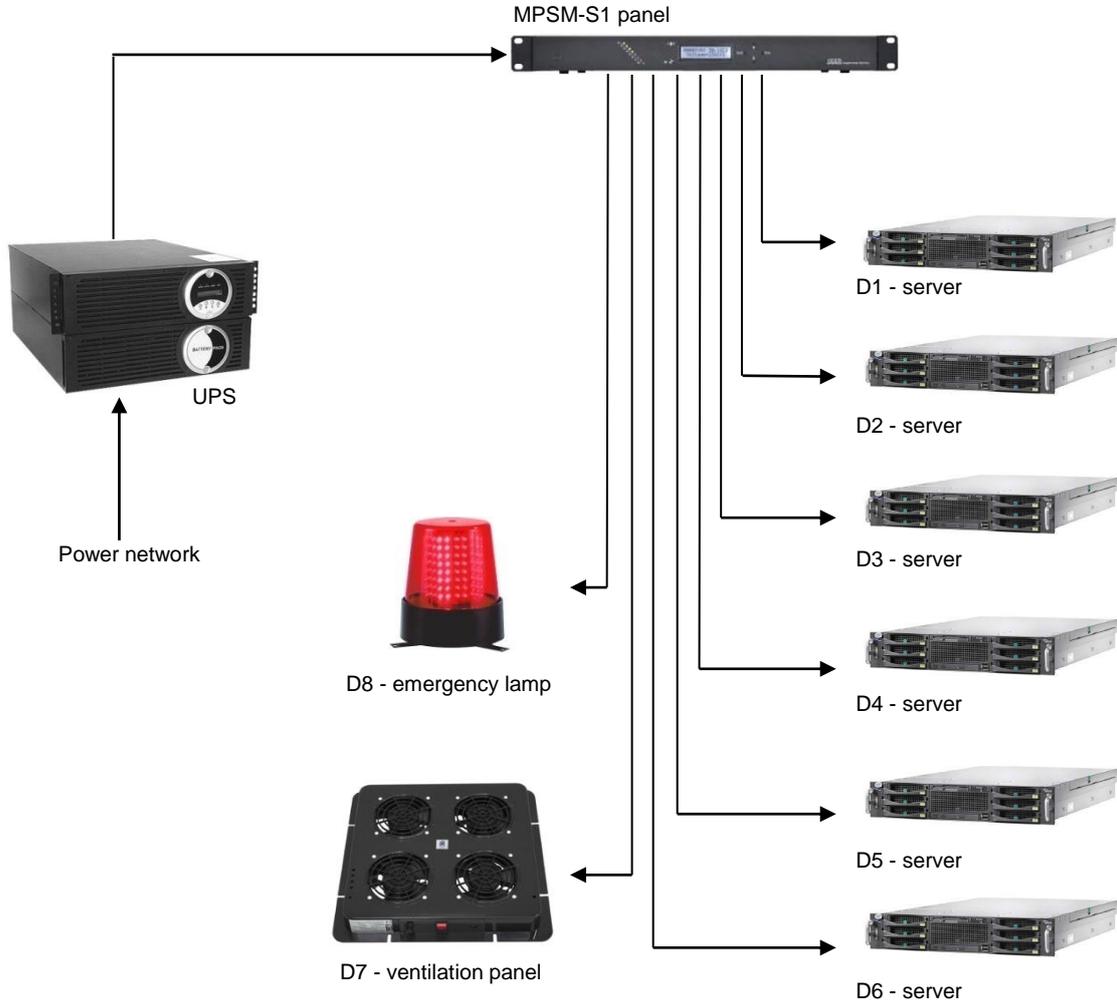
- The slot disable by the **MANAGEMENT** function will be always disabled.
- Several different functions can be defined on one slot. Logical product (AND operation) of this functions decides that the given slot will be activated or not. This means that, if one of the functions defined on the slot disables them, this slot will disabled.
- The **MASTER-SLAVE** function is disabled automatically, when the **MASTER** slot is not defined or when the defined **MASTER** slot is not active (enabled).
- When the temperature and humidity sensor will be damaged as a result of disconnection or mechanical damage, the panel will signal the alarm of exceeding the maximum temperature and humidity values, and immediately disconnects all devices controlled by the **THERMOSTAT** and **HUMIDISTAT** functions

## Display MENU layout





# Sample application 1



Example of programming the panel function:

### SOFT-START

Scenario for switching-on the device when the power supply is restored:

Time	Action
0 s	Start of power supply
2 s	D7 (fans)
2 s	D8 (alarm system)
64 s	D1 (server)
66 s	D2 (server)
68 s	D3 (server)
70 s	D4 (server)
72 s	D5 (server)
74 s	D6 (server)

### MASTER-SLAVE

Function disabled on the all slots

### THERMOSTAT

Scenario for switching-on the cooling devices (slots) after exceeding the programmed temperature limits:

D7: $t_{max} = 25.5^{\circ}\text{C}$
D8: $t_{max} = 28^{\circ}\text{C}$

### INTERNAL ALARMS

Overload alarms

D1: $I_{min} = 0,1 \text{ A}$
D2: $I_{min} = 0,1 \text{ A}$
D3: $I_{min} = 0,1 \text{ A}$
D4: $I_{min} = 0,1 \text{ A}$
D5: $I_{min} = 0,1 \text{ A}$
D6: $I_{min} = 0,1 \text{ A}$

Temperature alarms

$T_{max} = 30^{\circ}\text{C}$

Voltage alarms

$U_{max} = 250 \text{ V}$

$U_{min} = 207 \text{ V}$

### *Description of the example 1*

The MPSM-S1 device supports the cabinet in which are installed: six servers, UPS device, ventilation panel with four fans and alarm system.

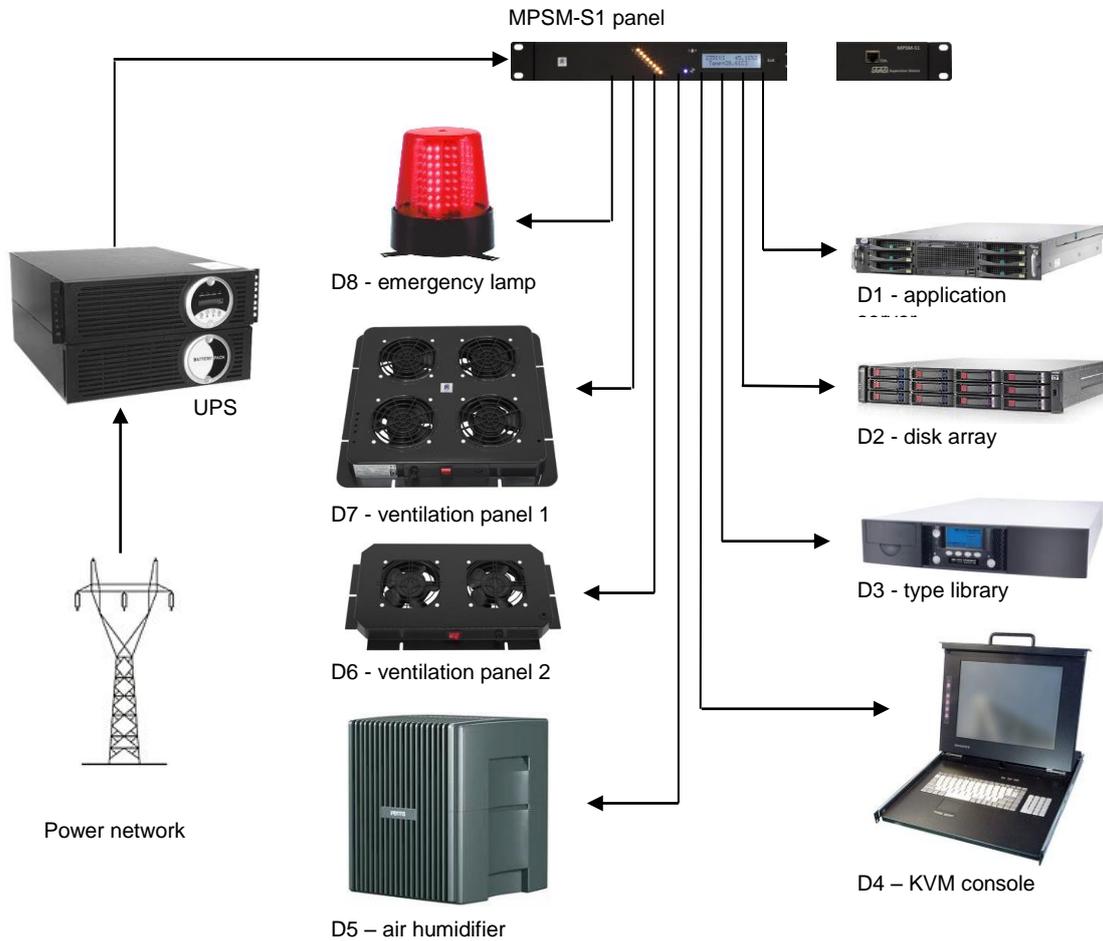
The MPSM-S1 panel in such configuration provides the following advantages:

- ✓ correct scenario for switching-on the devices
- ✓ maintain the constant temperature by controlling the ventilation panel
- ✓ MPSM-S1 alarm and external alarm (emergency lamp), when the ventilation panel is not able to cool down the cabinet
- ✓ MPSM-S1 alarm, when one of the servers will be disconnected or disabled as a result of malfunctions or other activities
- ✓ monitoring of power supply voltage level and MPSM-S1 alarm, when the voltage value exceeds the allowable limits
- ✓ on-line visualization of the temperature, voltage, current values or power on each slot and the total sum for all slots displayed on the LCD display



*Attention:* The parameter values used in the example are only demonstrative and can differ from the values in the real systems.

## Sample application 2



Example of programming the panel function:

### SOFT-START

Scenario for switching-on the devices when the power supply is restored:

Time	Action
0 s	Start of power supply
2 s	D6
4 s	D7
6 s	D8
8 s	D4
10 s	D5
12 s	D3
14 s	D2
90 s	D1

### MASTER-SLAVE

Scenario for switching-on the Slave devices after switching-on the Master device:

D1 - Master  
D2, D3, D4 - Slave  
T = 5 s (switching-off or switching-on delay time for Slave devices)  
I = 0,5 A (the current is received from Master slot, below which the Master device is treated as disabled)

### THERMOSTAT/ HUMIDISTAT

Scenario for switching-on the cooling devices and air humidifiers, when the programmed temperature and humidity limits are exceeded:  
D5: RH<sub>min</sub>= 20%  
D6: t<sub>max</sub>= 25°C  
D7: t<sub>max</sub>= 27°C  
D8: t<sub>max</sub>= 32°C  
RH<sub>min</sub>= 15%

### INTERNAL ALARMS

Overload alarms  
D1: I<sub>min</sub>= 0,1 A  
Temperature alarms  
T<sub>max</sub>= 35°C  
Voltage alarms  
U<sub>max</sub> = 250 V  
U<sub>min</sub> = 207 V  
If the current, temperature or voltage values will be outside of the programmed limits, the internal alarm will appear (sound alarm or flashing message on the display).

## *Description of the example 2*

The MPSM-S1 device supports the a cabinet in which is installed the set of devices operating on one logical solution, UPS, main ventilation panel, auxiliary ventilation panel, air humidifier and alarm system. The logical solution means the set of devices dependent on each other. Each device is responsible for the correct operation of the whole system. In this case, the scenario for switching-on the set is very important. For example, when the server will be activated faster than disk array, then the server will not see the disk array during checking the readiness of the individual devices in the set, thus the whole system will not be activated. In this example the server is activated as the last device with additional delay time. In this way, we can assure that the peripherals of the system (disk array, type library, etc.) are ready to work and they will respond with readiness during the data scanning process. Additionally, when the main device of the set will be switched-off, the operation of the other devices will not be needed and they will be switched-off by the MPSM-S1 panel.

The MPSM-S1panel in such configuration provides the following advantages:

- ✓ correct scenario for switching-on the devices
- ✓ disconnects after the **Delta Ms** time the device dependent on the main server, when the server will be remotely or physically disabled.
- ✓ maintain the constant temperature by controlling the basic ventilation panel, and in the next step, when the temperature will still increase, switching-on the auxiliary fans
- ✓ maintain the constant humidity in the room by switching-on the air humidifier, when the humidity RH drops below 20%
- ✓ MPSM-S1 alarm and external alarm (emergency lamp), when MPSM-S1 panel will exhaust its resources and will not be able to lower the temperature in the cabinet or, when the air humidity drops below 15%.
- ✓ MPSM-S1 alarm, when the server will be disconnected or disabled as a result of malfunctions or other activities
- ✓ monitoring of power supply voltage level and MPSM-S1 alarm, when the voltage value exceeds the allowable limits
- ✓ on-line visualization of the temperature, humidity, voltage, current values or power on each slot and the total sum for all slots displayed on the LCD display



*Attention:* The parameter values used in the example described above are only demonstrative and can differ from the values in the real systems.

## Package content

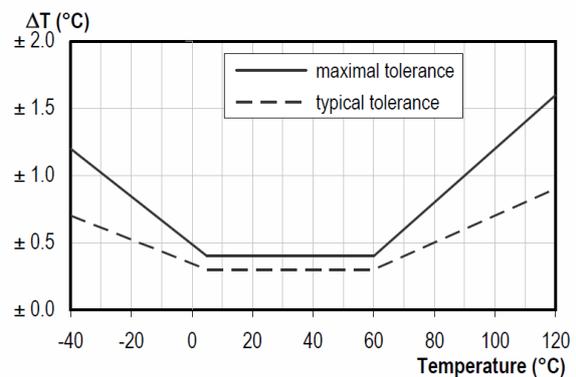
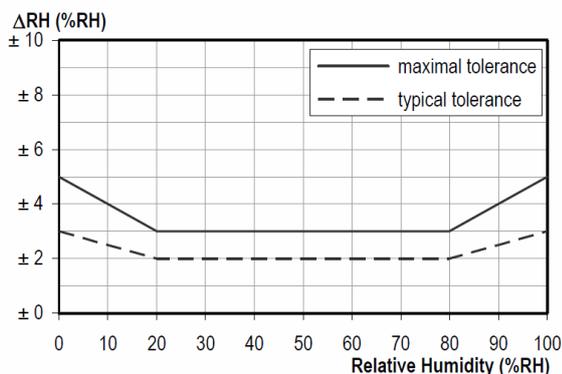
Product name	Package	Catalog number
Microprocessor Power Control Panel MPSM-S1 Accessories delivered with the device: - Humidity/temperature sensor with cable 1,8 m - Power cable type IEC C19 - Bracket 19", mounting elements, rubber feet - Screwed shelf with cable holders - CD with software and instructions	1 set	WZ-4994-01-00-161

## Temperature and humidity sensor

External temperature and humidity sensor is a digital device that communicates with MPSM-S1 panel through the I<sup>2</sup>C data-bus. Such solution eliminates the measurement error resulted from the analog disturbances induced in the cables. Additionally, the sensor is equipped with the 14-bits transducer ADC and measurements compensation system.

### Parameters

Parameter	Range
Tightness	IP60
Cable	1.8[m]
Tolerance $\Delta RH$	$\pm 2.0$ [%]
Tolerance $\Delta T$	$\pm 0.3$ [°C]

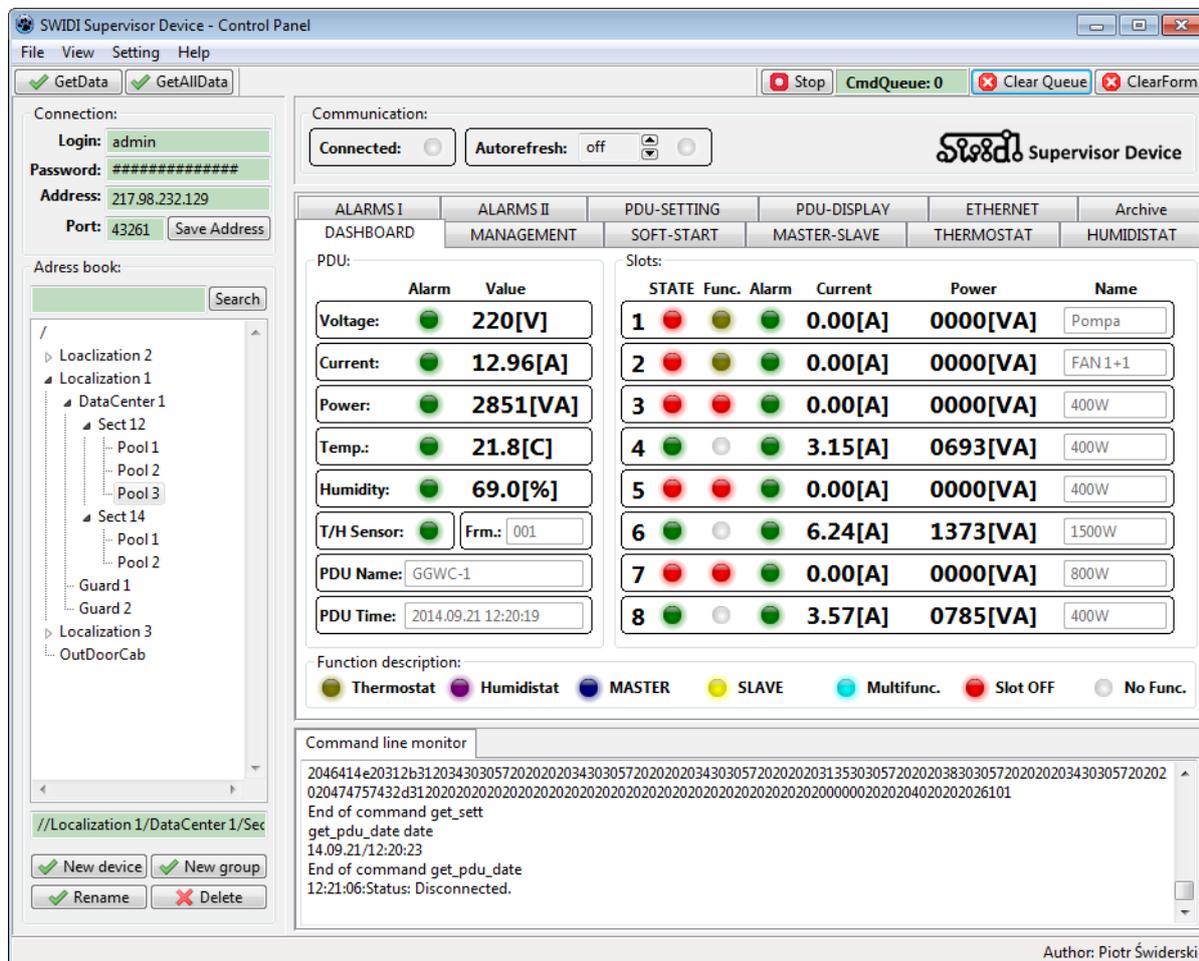


### Measurement error in function of humidity (RH) and temperature (T)

# Software

During the globalization era, persons responsible for management of IT devices are often located far away from the devices, and also devices are distributed in the field, generating smaller and larger systems. For convenient and remote management of the IT devices infrastructure through the MPSM-S1 panel, we created the dedicated software for Windows operating system. This software uses the embedded address book and connects with individual MPSM-S1 panel, reads out the data, sets its logics and saves data. Thanks to this, we can manage and control big systems from one location.

## Software description



## Software useful functions

- ✓ read-out and presentation:
  - measurements data
  - devices status
  - alarms,
  - settings
- ✓ read-out and presentation of the archives from the internal database (SD card, 8 GB):
  - measurements data
  - status of controlled devices
  - alarms
  - settings changes with details
- ✓ address book for MPSM-S1 devices has a tree structure
- ✓ transmission commands preview
- ✓ connected devices names, and MPSM-S1 names
- ✓ time, calendar, time zone settings
- ✓ ETHERNET interface parameters settings
- ✓ parameters settings and internal database monitoring
- ✓ text messages transmission to the MPSM-S1 device
- ✓ MPSM-S1 administrative parameters

### *Address book*

The address book allows to create the tree of MPSM-S1 devices locations. When we are using the distributed objects, then the devices are represented in the address book tree. A physical and also logical groups can be the branches of the tree. Each MPSM-S1 device recorded in the tree has own IP address, login, password and port number. The port number and password are optional , and they not must be recorded, however it is very convenient for the large systems. The port number must be defined. It provides wide possibilities for the network configurations (ports redirection). The address book is encrypted in AES256 standard, and can not be open without entering the protecting password.

### *Operational panel*

The operational panel includes the tabs system, that contains all functions of the MPSM-S1 panel. The **DASHBOARD** tab provides the indicators board with most important parameters measured by the device.

The panels set includes also **ARCHIVE** tab, where by appropriate setting of the filters, we can download and display archive data, such as measurements, alarms, changes in settings, changes in slots statutes. We can generate any number of the windows with archive data for the comparison purposes.

### *Connection panel*

The connection panel contains all information about the connection with MPSM-S1 device. It includes also the information about the number of the commands waiting for execution. There is the possibility to restrain, resume, reset the queue of commands, and also to cancel the content of the operational panel. Automatic data refresh function can be also enabled here. This function provides cyclic connections with the device and data download using the **GetData** function described in chapter "Data download from other devices".

### *Commands monitor*

The commands panel is a text panel on which all commands and responses to and from the MPSM-S1 device are displayed. The content of the window can be canceled and saved in the file.

## Configuration of ETHERNET network connection

Default MPSM-S1 network parameters:

- IP address: **192.168.1.99**
- Mask: **255.255.255.0**
- Gate: **192.168.1.1**
- **DHCP** is enabled
- Login: **admin**
- Password: **mpsms1**

Return to the default parameters is possible, when the function **MENU->PDU-SETTING->FACTORY-RESET** will be activated from the device panel.

The individual settings are entered through the software under the **ETHERNET** tab. After entering new network parameters, they should be confirmed by the **COMMIT** function, and then using the **RestartEth** button. When the **ResetEth** button is pressed, the MPSM-S1 device will not be disconnected.



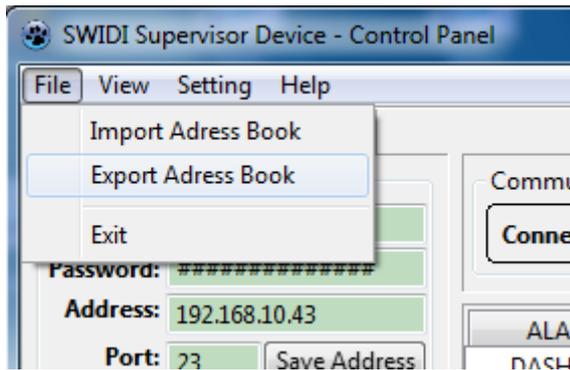
*Attention:* After changing the network connection parameters, the communication with the MPSM-S1 device can be lost



*Attention:* The **<FACTORY-RESET>** function allows to reset MPSM-S1 parameters and settings to the factory settings. New settings are saved, and the panel is restarted. Thus, all devices connected to the MPSM-S1 can be disconnected.

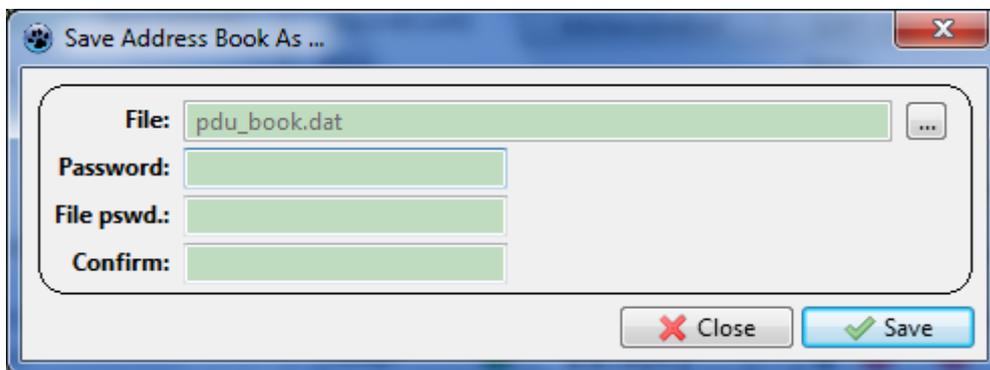
## Address book import/export

The import/export address book functions are available in the program's main menu.



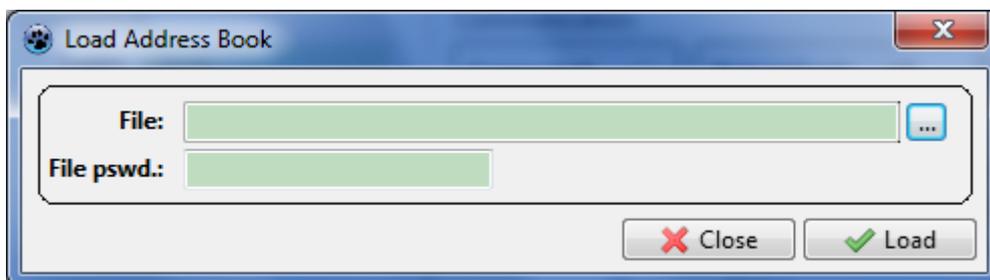
To **export** the address book to the file for archiving purposes or to transfer it to the other users, all fields of the form should be filled.

**Save Address Book As ...**



<b>File</b>	Name and location of the output file
<b>Password</b>	Valid password of the program administrator (same as for the start of the application)
<b>File pswd.</b>	New password for protection of the exported file
<b>Confirm</b>	Repetition of the new password for verification purposes

To **import** the address book to the program, all fields of the **Load Address Book** form should be filled.

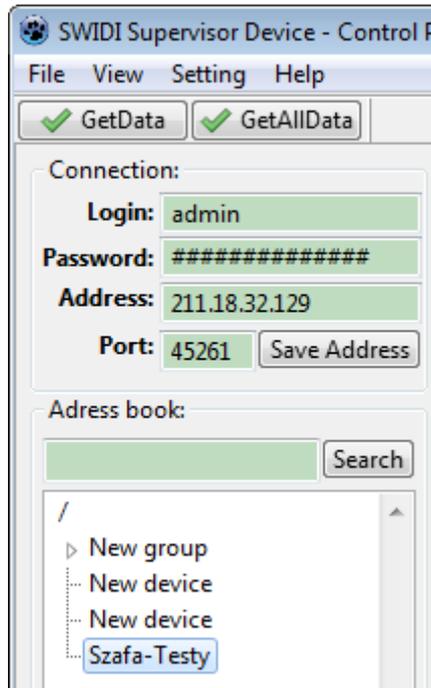


<b>File</b>	Name and location of the input file
<b>File pswd.</b>	Password by which the file is protected

After successful import, the imported address book should be saved (**Save Address**)

## Data download from the devices

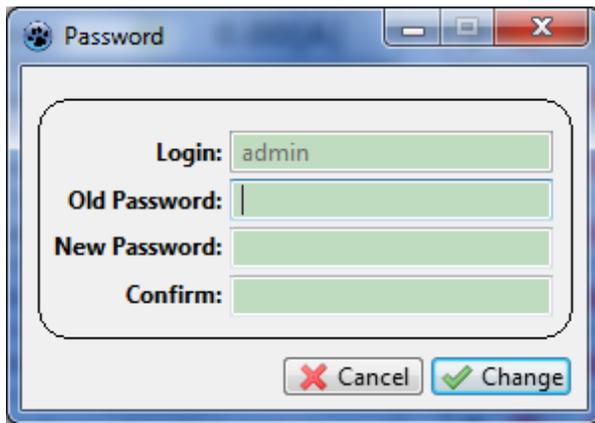
To download data from the MPSM-S1 devices, the device saved in the address book should be chosen by double clicking. When all data in 'Connection' connection section will be populated, press 'GetAllData' or 'GetData' button.



<b>GetAllData</b>	Download of the all settings, actual measurements and states
<b>GetData</b>	Download of the some settings, actual measurements and states

## Changing program password

The default administrator password should be changed after first start of the application. To do this, in the main menu w menu under **setting** tab, for **password** option all available fields should be filled.



<b>Old Password</b>	Valid password of the program administrator (same as for the start of the application)
<b>New Password</b>	New password
<b>Confirm</b>	Repetition of the new password for verification purposes

## Program update



*Attention:* Before any update operations, the export of the address book to the file should be performed according to instructions described in the chapter "Import/Export of the address book".

Updated versions of the program are available on our website under the tab **Support->Software**

<http://www.zpas.pl/mpsm>

The downloaded file should be unpacked to the same directory in which the program is installed, and overwrite.

After this, the new S1Panel.exe file should be executed and the password should be entered.

If the process will be successful, the address book will be displayed.

When the program will create a new empty file of the address book with default password 'admin', the import of the exported earlier content should be performed.

There is also the possibility to manually copy the address book file '**config.dat**' to the new or another program installation. In this case, for such installations we must use the same password as for the first installation. Of course, it can be changed after the first login.



*Attention:* The address book file '**config.dat**' is encrypted with a strong coding algorithm and the user password: 'admin'. This password is the same as the program password.

# Start-up

---

## Assembly

After assembly of the special metal brackets (delivered with the device), the device can be installed in IT cabinets equipped with 19" bearing beams or frames. The MPSM-S1 device can operate also as the stand-alone device. For this purpose the special rubber feet can be used, that can be glued to the special grooves placed on the lower part of the enclosure. After placing the device in the target location, the temperature and humidity sensor should be connected. The sensor is equipped with the oval bayonet connector with the pressing nut. The connector of the temperature and humidity sensor can be inserted into the plug only in one position. The connector should be turned until the bayonet reaches the slot in the plug and inserts into its position. Then the pressing nut should be screwed. The device is ready for connection to the power network.

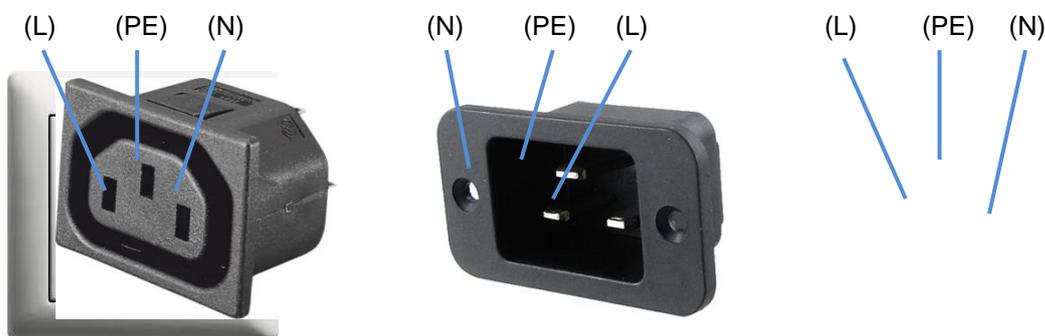
 **Attention:** When connecting the external sensor, please do not use the excessive force, because it can damage the plug.

 **Attention:** The device should be installed in such way, that its side venting perforations can not be shielded. This will provide the correct recirculation of the hot air from the MPSM-S1 device.

 **Attention:** When arranging the cable of the external sensor, the cable should not be the subject of wearing, bending or squeezing and should not come into contact with the sharp edges.

## Connecting to the power network

Before connecting the MPSM-S1 device, please make sure that the power conforms the requirements of IEC 60364-1 standard, and L, N, PE cables are placed in the correct positions.



*Correct positions of L, N, PE cables in the slots.*



*Attention:* This device is not equipped with the manual switch for current circuits slots.

When the not original cable is used, what is not recommended, it should be chosen by the qualified electrician. Minimum requirements for the power cable are as follows: cross-section **3 x 2.5 mm<sup>2</sup>** and length not greater than **3.5 m**. Before connecting the power cable, please make sure that the main switch of the MPSM-S1 device is in the **OFF** position. All receivers should be connected before connecting the device to the power network. The system prepared in such way is ready for connecting the power supply. After connecting the power supply, the MPSM-S1 device can be started-up using the main switch positioned in the **ON** position.

## Starting-up the MPSM-S1 device

After pressing the main switch into the **ON** position, the start-up process begins, as follow:

- the reset signal is generated, when the initial states are established,
- electronics status is checked,
- all controls of the device, alarm signal and LCD display are enabled during the efficiency test,
- user settings are recorded,
- temperature and humidity sensor, LCD display and other modules are programmed
- automatic calibration process of the all measurement systems is performed,
- low level initial processes are performed.

The start-up process lasts ca. 7 seconds. During this process, all controls are flashing and sound alarm signal is on.



*Attention:* If there will not be any of the test signals, please contact with the service department.

## ETHERNET configuration

The MPSM-S1 device must be started. Using the network cable, connect the Ethernet slot to the LAN network or directly to the computer which is used for the configuration.

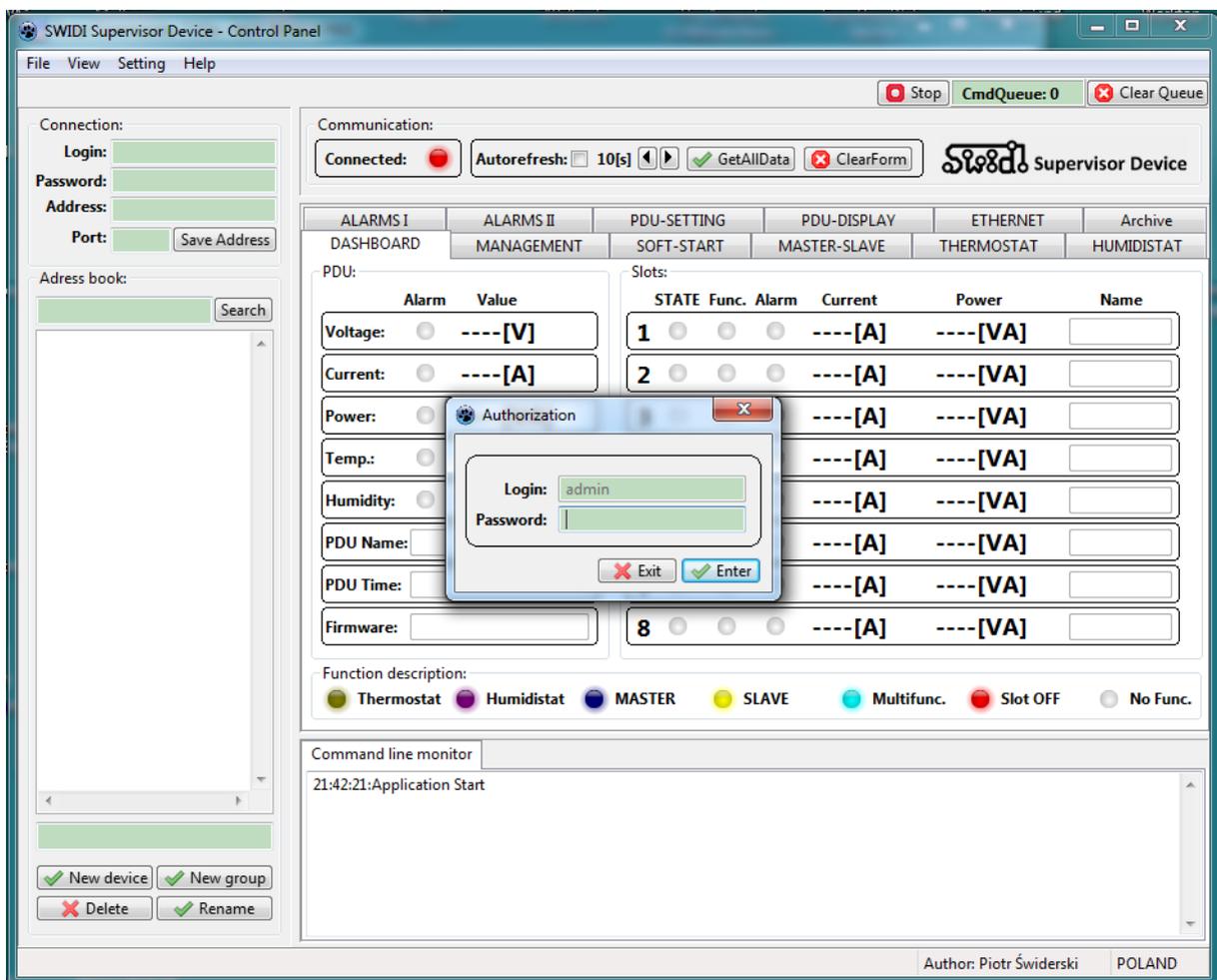


*Attention:* When the device is connected to the LAN network, make sure that the default address 192.168.1.99 is not used in this network.

The computer used for the configuration should have the following network settings:

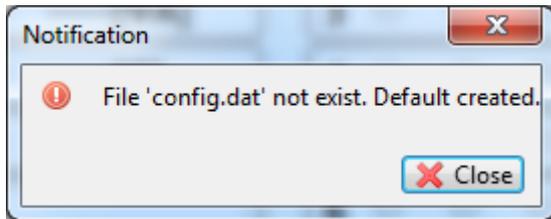
IP address : 192.168.1.x      where x={1..255} without 99  
Mask : 255.255.255.0

Then, on the computer start the program **S1Panel.exe**

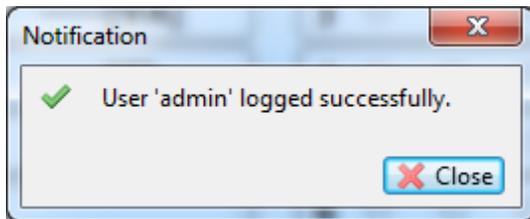


After this enter the **'admin'** password

After pressing the **Enter** button, the information about the lack of the configuration file should appear. This file should be created.

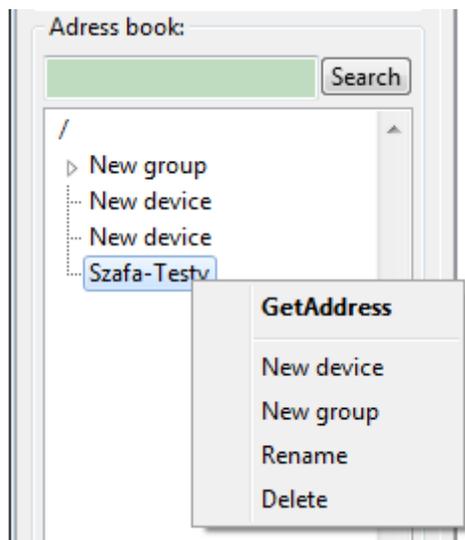


Close this message with the **Close** button. Then, the information about successful login of the **admin** user should be displayed.

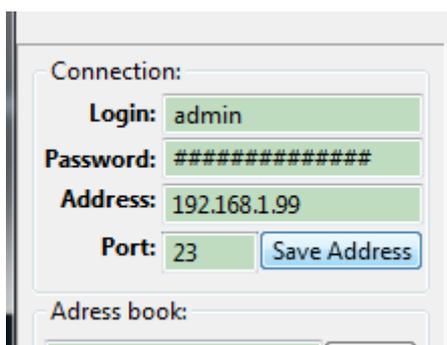


Close this message with the **Close** button.

Go to the **Address book** windows, where the new device can be configured.



In the **Connection** window, enter:



factory password for each device is "mpsms1". Press the **SaveAddress** button.

By double clicking the icon of the defined device, the parameters needed for the 'Connection' section will be downloaded. In the next step, use the **GetAllData** or **GetData** button described in the chapter 'Data download from other devices'.

After this, go to the **ETHERNET** tab and in the **Ethernet Setting** panel write target parameters for the device.

Then, in the same panel confirm the new configuration using the **Commit** button. When all changes will be sent, and the new settings received, use the **RestartEth** button to activate the configuration or eventually switch off and then on the MPSM-S1 device.

After the network configuration:

1. Change the user password for the MPSM-S1 device (ETHERNET tab, Login/Password panel and confirm with **Commit** button).
2. Change the password for S1Panel program, Menu **Setting** -> **Password**.

## Maintenance and technical inspections

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This device will not need any maintenance activities, if it will be operated correctly, in other words in the conditions recommended by the manufacturer.

Technical inspections should be performed between second and third year of the device usage. Next technical inspections will be determined by the technician after inspection of the device. Any technical inspection can be performed in the service center. Periodic technical inspections are payable.

# Disposal and environmental protection

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Take care for the environment. Always dispose the device, accessories and packaging for the utilization.



Do not dispose any electric devices with general wastes.

Dispose the device for the recycling. All plastic and metal parts used for the production of the device can be separated, and after this utilized. Contact with our service center. Utilization of your device will be performed for free.

## Warranty

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- The device is covered by 12-months warranty.
- Removal of the seal or opening of the enclosure will void the warranty.
- In case of the valid warranty claims, please contact by phone with our service center (address is included on the end of this document). Our service center will give you all further information.
- Any damages resulted from natural usage, wear or incorrect operation are excluded from the warranty.
- All damages resulted from the material or production defects will be removed free of charge by delivery of the new device or by the repair. All warranty claims will be considered only, if non-disassembled device will be returned to our service center along with the purchase proof and copy of this warranty.
- Any repairs not covered by the warranty can be performed in our service center. In such cases, additional charges may apply. Our service center will provide the cost calculation.
- Utilization of your device will be performed free of charge.



*Attention:* Do not attempt to repair or alter the device. When you have problems with the device, please contact with our service center.

# Additional accessories

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When building the control systems based on the MP5M-S1 device, we can use all range of accessories offered by ZPAS, such as:



## Humidity and temperature sensor with cable 1.8 m

Catalog number: WN-0200-03-00-011



## Ventilation panel PD-2W

Equipment: 2 fans 230 V, 50 Hz, 2x15 W

Catalog number: WN-0200-03-00-011 (grey), -161 (black)



## Ventilation panel PWD-2W

Equipment: 2 fans 230 V, 50 Hz, 2x15 W

Catalog number: WN-0200-07-01-011 (grey), -161 (black)



## Ventilation panel PWD-4W

Equipment: 4 fans 230 V, 50 Hz, 4x15 W

Catalog number: WN-0200-06-01-011 (grey), -161 (black)



## Ventilation panel PW-1.2

Equipment: 2 fans 230 V, 50 Hz, 2x15 W

Catalog number: WZ-5606-25-01-011 (grey), -161 (black)



## Ventilation panel PW-2.4

Equipment: 4 fans 230 V, 50 Hz, 4x15W

Catalog number: WZ-5606-35-01-011 (grey), -161 (black)



## Ventilation panel PW-2.6

Equipment: 6 fans 230 V, 50 Hz, 6x15W

Catalog number: WZ-5606-10-01-011 (grey), -161 (black)



## Power board LZ-221S with Schuko sockets

Equipped with: back-lit switch, 12 SCHUKO sockets

Catalog number: WZ-LZ22-10-SU-000



## Power board LZ-532

Equipped with: emergency lamp, over-voltage protection with power network filter, switch, 12 sockets with earthing pin, 4 computer slots

Catalog number: WZ-LZ53-20-00-000

Those are only some examples that can be used during set-up of solutions based on the MP5M-S1 device offered by ZPAS Group. The full offer of ZPAS Group is provided in the catalogs available on our website: [www.zpasgroup.pl](http://www.zpasgroup.pl)

# Technical data

<b>Power input</b>	<b>Voltage</b>	85-260 V AC
	<b>Power consumption</b>	30 W
	<b>Frequency</b>	50 Hz
	<b>Maximum summary current on slots</b>	16 A
<b>Power output</b>	<b>Output voltage</b>	85-260 V AC (depending on the voltage)
	<b>Current of the individual slot</b>	i(max)=10 A (continuous) i(min)=15 mA i(max,R=0)= 4 mA (opened circuit)
<b>Protections</b>	<b>Current (thermal overload relay)</b>	i(max)=20 A constant for 150% i(max) switching-off in 1 hour for 200% i(max) switching-off in 5-25 seconds for 300% i(max) switching-off in 1.6 – 4.8 seconds parameters for operating temperature 25 °C
<b>Measurements</b>	<b>Voltages</b>	Measurement range: 85-260 V AC Resolution: 1 V Class: 5% (for sinusoidal changes) Measurements frequency: 1/sec
	<b>Current</b>	Measurement range: 0-10 A Resolution: 0.01 A Class: 5% (for sinusoidal changes) Measurements frequency: series 8/sec
	<b>Power</b>	Measurement range: f(u,i) ≈0-2500 VA Resolution: f(u,i) ≈1-3 VA Class: 5% (for sinusoidal changes) Measurements frequency: series 8measurements/sec
	<b>Temperature</b>	Measurement range: 0-85°C Resolution: 0.1°C Measurement error: typical ± 0.3°C Measurements frequency: 1/sec
	<b>Humidity</b>	Measurement range: 0-100% Resolution: 0.1% Measurement error: typical ± 2% Measurements frequency: 1/sec
	<b>Operating conditions</b>	<b>Operating temperature</b>
<b>Operating humidity</b>		20 ~ 80% (without condensation)
<b>Enclosure</b>	<b>Dimensions</b>	19" x 1U x 190 mm
	<b>Weight</b>	2.5 kg

<b>Protection class</b>	IP 20
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**Attention:** Because of the continued product development and changes in the technical requirements, ZPAS S.A. reserves the right to change technical parameters.

# Declaration of conformity

This device was tested by **Laboratorium Badawcze Instytutu Automatyki Systemów Energetycznych Sp. z o.o. (Research Laboratory of Power Systems Automation Institute)** This device conforms to the following standards.

Standard	Description
<b>PN-EN 61000-6-2:2008</b>	Electromagnetic compatibility (EMC) - Part 6-2: General standards - Resistance in industrial environments
<b>PN-EN 61000-6-4:2008</b>	Electromagnetic compatibility (EMC) - Part 6-4: General standards - Emission standard in industrial environments
<b>PN-EN 61131-2:2008</b>	Programmable controllers - Part 2: Requirements and studies regarding equipment
<b>PN-EN 61010-1:2004</b>	Safety requirements for the electric measurements instruments, automation systems and laboratory devices - Part 1: General requirements

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fax: 71 348 2183  
e-mail: lab@iase.wroc.pl



Laboratorium Badawcze  
ŚWIADCTWO WYKONANIA BADAŃ Nr 62/DL/III/2011

<b>Przedmiot badań:</b> Mikroprocesorowy Panel Sterowania Mocą typu MPSM-T, nr fabryczny 001/2011 (element systemu SWIDI – Supervisor System)			
<b>Zleceniodawca:</b>	Zakład Produkcji Automatyki Sietowej S.A. Przygorze 209, 57-431 Woiłbórz	<b>Zlecenie badań nr:</b>	436 800 / 606
		<b>Z dnia:</b>	19.04.2011 r.
<b>Zakres badań:</b> Badania bezpieczeństwa użytkowania według normy PN-EN 61010-1:2004: – oznakowanie i dokumentacja (p. 5.1, 5.2, 5.3, 5.4), – ochrona przed porażeniem elektrycznym (p. 6.2, 6.3, 6.4, 6.5, 6.6, 6.8, 6.9, 6.10, 6.11), – ochrona przed zagrożeniami mechanicznymi (p. 7), – dopuszczalne temperatury urządzenia i odporność na ciepło (p. 10.1, 10.2), – podzespoły (p. 14.4, 14.8, 14.9). Z zakresu badań wyłączono następujące punkty normy: 8, 9, 11, 12, 13 i 15.			
<b>Metody badań:</b> Zgodnie z normą PN-EN 61010-1:2004 Wymagania bezpieczeństwa dotyczące elektrycznych przyrządów pomiarowych, automatyki i urządzeń laboratoryjnych – Część 1: Wymagania ogólne			
<b>Data rozpoczęcia badań:</b>	15.07.2011 r.	<b>Data zakończenia badań:</b>	22.07.2011 r.
<b>Wyniki badań:</b> Badany Mikroprocesorowy Panel Sterowania Mocą typu MPSM-T, nr fabryczny 001/2011, po zmianach konstrukcyjnych obudowy wprowadzonych podczas badań oraz po modyfikacji dokumentacji i oznaczeń, przeszedł badania bezpieczeństwa użytkowania z wynikiem pozytywnym, zgodnie z zakresem badań podanym powyżej. Wymieniona norma PN-EN 61010-1:2004 jest zharmonizowana z dyrektywą 2006/95/WE (LVD).			
	<b>Imię i nazwisko</b>	<b>Data</b>	<b>Podpis</b>
<b>Badania wykonał:</b>	mgr inż. Donat Zemko	22.07.2011 r.	Kierownik LABORATORIUM BADAWCZEGO <i>Donat Zemko</i> mgr inż. Donat Zemko
<b>Sprawdził:</b>	mgr inż. Paweł Kudyba	22.07.2011 r.	<i>P. Kudyba</i>

LB-F-1501-04  
Wyd. 01  
Data wyd. 10.11.2010 r.

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Laboratorium Badawcze  
ŚWIADCTWO WYKONANIA BADAŃ Nr 61/DL/III/2011

<b>Przedmiot badań:</b> Mikroprocesorowy Panel Sterowania Mocą typu MPSM-T, nr fabryczny 001/2011 (element systemu SWIDI – Supervisor System)			
<b>Zleceniodawca:</b>	Zakład Produkcji Automatyki Sietowej S.A. Przygorze 209, 57-431 Woiłbórz	<b>Zlecenie badań nr:</b>	436 800 / 606
		<b>Z dnia:</b>	19.04.2011 r.
<b>Zakres badań:</b> Badania kompatybilności elektromagnetycznej (EMC): 1. Badania emisji zaburzeń przewodzonych w przyłączu zasilania sieciowego według normy PN-EN 61000-6-4:2008 (środowisko przemysłowe). 2. Badania emisji zaburzeń promieniowanych według normy PN-EN 61000-6-4:2008. 3. Badania odporności na zaburzenia elektromagnetyczne według normy PN-EN 61000-6-2:2008 (środowisko przemysłowe).			
<b>Metody badań:</b> Zgodnie z następującymi normami: PN-EN 61000-4-2:2011, PN-EN 61000-4-3:2007 + A1:2008, PN-EN 61000-4-4:2010, PN-EN 61000-4-5:2010, PN-EN 61000-4-6:2009, PN-EN 61000-4-11:2007, PN-EN 55015-2-1:2009, PN-EN 55016-2-3:2010 z odstępstwami. UWAGA 1: Odporność na pole elektromagnetyczne badano na stanowisku pomiarowym w komorze bezodbiłkowej w zakresie częstotliwości: 80 MHz + 1 GHz i 1,4 GHz + 2,7 GHz. UWAGA 2: Emisję zaburzeń promieniowanych badano w komorze semi-bezodbiłkowej z odległości pomiarowej 3 m. Poziom dopuszczalny emisji określony w PN-EN 61000-6-4:2008 zwiększono o 10 dB. Antenę pomiarową ustawiono na stałej wysokości 1,5 m nad ziemią odniesienia. Zmierzano kąty obrotu EUT w pełnym zakresie 360°.			
<b>Data rozpoczęcia badań:</b>	09.05.2011 r.	<b>Data zakończenia badań:</b>	21.06.2011 r.
<b>Wyniki badań:</b> Badany Mikroprocesorowy Panel Sterowania Mocą typu MPSM-T, nr fabryczny 001/2011, po zmianach konstrukcyjnych wprowadzonych podczas badań w celu zwiększenia odporności na zaburzenia elektromagnetyczne i zmniejszenia poziomu emisji zaburzeń promieniowanych, spełnia założone wymagania EMC, zgodnie z zakresem badań podanym powyżej. Normy wymienione w zakresie badań są zharmonizowane z Dyrektywą 2004/108/WE w sprawie zbliżenia ustawodawstwa Państw Członkowskich w zakresie kompatybilności elektromagnetycznej.			
	<b>Imię i nazwisko</b>	<b>Data</b>	<b>Podpis</b>
<b>Badania wykonał:</b>	mgr inż. Paweł Kudyba	22.07.2011 r.	<i>P. Kudyba</i>
<b>Sprawdził:</b>	mgr inż. Donat Zemko	22.07.2011 r.	Kierownik LABORATORIUM BADAWCZEGO <i>Donat Zemko</i> mgr inż. Donat Zemko

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# Troubleshooting

User of the MPSM-S1 device can individually in some extent identify and remove problems regarding the device operation. In such cases, the following table will be helpful.

STATE	SYMPTOM	ACTIONS
<b>The device is not working.</b>	All controls of the device are off.	<ol style="list-style-type: none"> <li>1. Make sure that the main switch on the back side of the MPSM-S1 device is in the <b>ON</b> position.</li> <li>2. Check that the power cable is correctly connected, and the power is supplied to the device.</li> <li>3. Check that the automatic fuse mounted on the back wall is pressed.</li> <li>4. Please, contact with our service center.</li> </ol>
<b>No measurements of the temperature and humidity.</b>	The device signals temperature and humidity alarm. "--E--"symbol is displayed during temperature and humidity measurement.	<ol style="list-style-type: none"> <li>1. Check that the temperature and humidity sensor is correctly connected.</li> <li>2. Make sure, that the socket was not damaged during installation of the sensor.</li> <li>3. Check that the sensor cable is not damaged.</li> <li>4. Make sure that the temperature in place of sensor installation is within the 0~85°C range.</li> <li>5. Please, contact with our service center.</li> </ol>
<b>The device is working.</b>	For some value instead of measurement result, the "--E--" symbol is displayed.	<ol style="list-style-type: none"> <li>1. Make sure, that the device or individual slot is not overloaded.</li> <li>2. Connect the receiver that causes the overload to the other slot, and check that the problem persists.</li> <li>3. Please, contact with our service center.</li> </ol>
<b>The device is working.</b>	Behavior of the MPSM-S1 device is not consistent with the instruction description.	<ol style="list-style-type: none"> <li>1. Make sure that the MPSM-S1 device is configured correctly according to the instructions.</li> <li>2. Restore the factory settings and configure the device again.</li> <li>3. Please, contact with our service center.</li> </ol>
<b>The device is working.</b>	The receiver connected to the MPSM-S1 slot is not live but the port status is active.	<ol style="list-style-type: none"> <li>1. Tighten the power cable to the receiver from the slot side and from the receiver side.</li> <li>2. Connect another device to this slot, and check that it is operational.</li> <li>3. Please, contact with our service center.</li> </ol>

# Diagrams

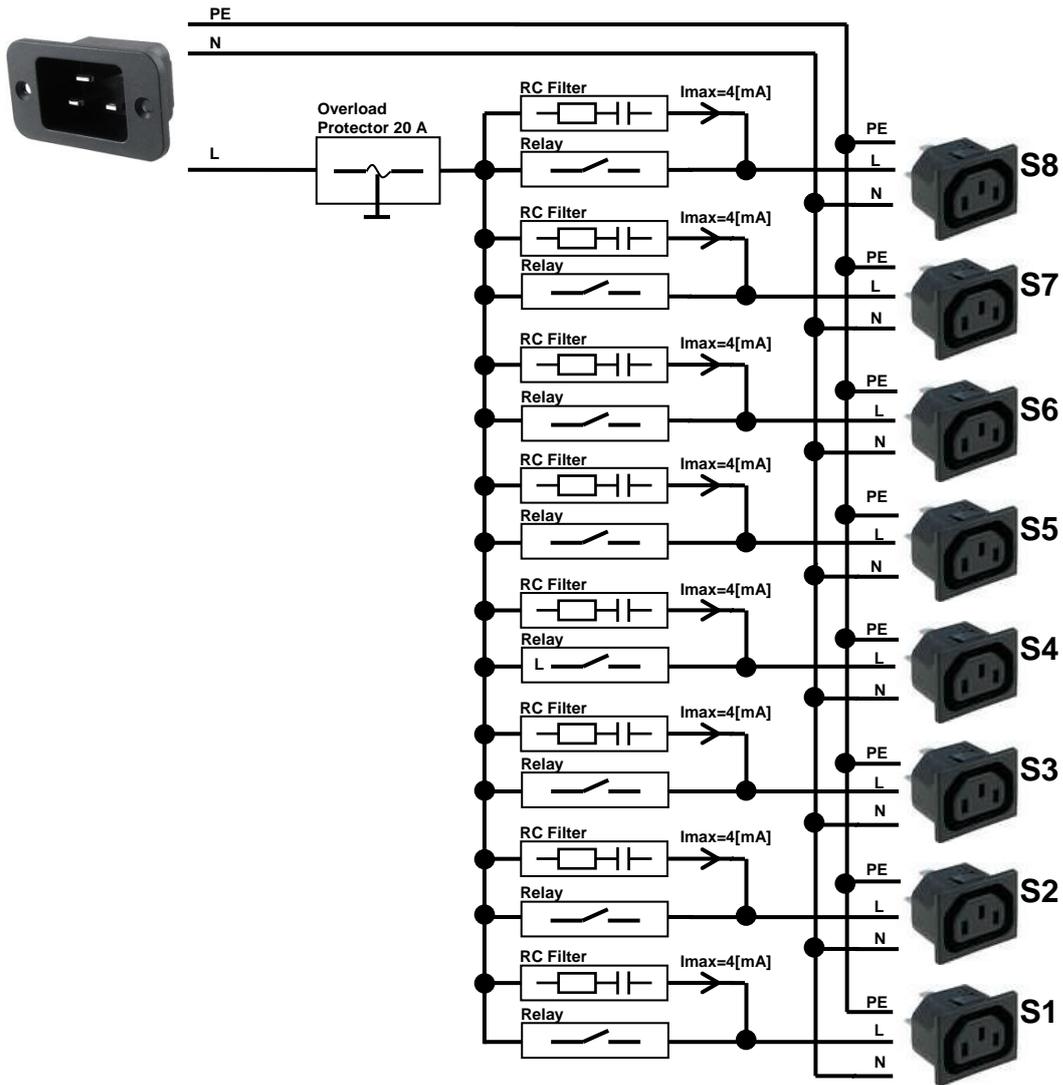
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*MPSM-S1- front view*



*MPSM-S1 - back view*



*MPSM-S1 – current circuits diagram*



*MPSM-S1 – temperature and humidity sensor*

# ZPAS GROUP Service Center

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Last update date: 21.09.2014

# SNMP-Traps codes

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Code	Description 1	Type	Description 2
0	InfoSlot1ON	E	Slot 1 is enabled
1	InfoSlot1OFF	E	Slot 1 is disabled
2	InfoSlot2ON	E	Slot 2 is enabled
3	InfoSlot2OFF	E	Slot 2 is disabled
4	InfoSlot3ON	E	Slot 3 is enabled
5	InfoSlot3OFF	E	Slot 3 is disabled
6	InfoSlot4ON	E	Slot 4 is enabled
7	InfoSlot4OFF	E	Slot 4 is disabled
8	InfoSlot5ON	E	Slot 5 is enabled
9	InfoSlot5OFF	E	Slot 5 is disabled
10	InfoSlot6ON	E	Slot 6 is enabled
11	InfoSlot6OFF	E	Slot 6 is disabled
12	InfoSlot7ON	E	Slot 7 is enabled
13	InfoSlot7OFF	E	Slot 7 is disabled
14	InfoSlot8ON	E	Slot 8 is enabled
15	InfoSlot8OFF	E	Slot 8 is disabled
16	InfoPDUSettingChanged	E	MPSM-S1 settings were changed
18	AlarmPDUCurrMin	A	Alarm – summary current below the programmed minimum
19	AlarmPDUCurrMax	A	Alarm – summary current above the programmed maximum
20	AlarmPDUCurrEnd	A	End of alarm from the device summary current
21	AlarmVoltageMin	A	Alarm – power supply voltage below the programmed minimum
22	AlarmVoltageMax	A	Alarm – power supply voltage above the programmed minimum
23	AlarmVoltageEnd	A	End of alarm from power supply voltage
24	AlarmTempMin	A	Alarm – temperature read-out is below the minimum
25	AlarmTempMax	A	Alarm – temperature read-out is above the maximum
26	AlarmTempEnd	A	End of temperature alarm
27	AlarmHumMin	A	Alarm – humidity read-out is below the minimum
28	AlarmHumMax	A	Alarm – humidity read-out is above the maximum
29	AlarmHumEnd	A	End of humidity alarm
43	AlarmSensON	A	Alarm of temperature/humidity sensor error
44	AlarmSensOFF	A	End of alarm of temperature/humidity sensor error
45	AlarmS1CurrMin	A	Alarm – current on slot 1 is below the programmed minimum
46	AlarmS1CurrMax	A	Alarm – current on slot 1 is above the programmed maximum
47	AlarmS1CurrEnd	A	End of alarm from current of slot 1
48	AlarmS2CurrMin	A	Alarm – current on slot 2 is below the programmed minimum
49	AlarmS2CurrMax	A	Alarm – current on slot 2 is above the programmed maximum
50	AlarmS2CurrEnd	A	End of alarm from current of slot 2
51	AlarmS3CurrMin	A	Alarm – current on slot 3 is below the programmed minimum
52	AlarmS3CurrMax	A	Alarm – current on slot 3 is above the programmed maximum
53	AlarmS3CurrEnd	A	End of alarm from current of slot 3
54	AlarmS4CurrMin	A	Alarm – current on slot 4 is below the programmed minimum
55	AlarmS4CurrMax	A	Alarm – current on slot 4 is above the programmed maximum
56	AlarmS4CurrEnd	A	End of alarm from current of slot 4
57	AlarmS5CurrMin	A	Alarm – current on slot 5 is below the programmed minimum
58	AlarmS5CurrMax	A	Alarm – current on slot 5 is above the programmed maximum
59	AlarmS5CurrEnd	A	End of alarm from current of slot 5
60	AlarmS6CurrMin	A	Alarm – current on slot 6 is below the programmed minimum
61	AlarmS6CurrMax	A	Alarm – current on slot 6 is above the programmed maximum

Code	Description 1	Type	Description 2
62	AlarmS6CurrEnd	A	End of alarm from current of slot 6
63	AlarmS7CurrMin	A	Alarm – current on slot 7 is below the programmed minimum
64	AlarmS7CurrMax	A	Alarm – current on slot 7 is above the programmed maximum
65	AlarmS7CurrEnd	A	End of alarm from current of slot 7
66	AlarmS8CurrMin	A	Alarm – current on slot 8 is below the programmed minimum
67	AlarmS8CurrMax	A	Alarm – current on slot 8 is above the programmed maximum
68	AlarmS8CurrEnd	A	End of alarm from current of slot 8