

## MIC01-SC(R) MIC System Controller

13.10.2007

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- Web browser interface
- Option for GSM/SMS/GPRS connections
- PID functions
- Distributed Logic and conditional control functions
- Timed controls

### ***Applications***

- High level controller for driving and combining SiTecno modular systems.
- Estate and industrial automation controller

### ***Features***

- Embedded stand-alone controller
- 24V DC power supply
- ARM7 CPU
- Real time operation system
- File system, Web server, TFTP server, Telnet
- Ethernet and optional RS-232C interfaces
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## **Description**

System Controller shall be placed to same LAN with MIC01-CL(R) controllers. System controller collects desired measurement values and states from the Linet controllers and executes various tasks based on this data. System controller returns new control values and states back to MIC controllers, which, in turn pass these values to devices, attached to Linet networks.

## **Functions**

The most important functions in the System Controller SW are the built-in controlling algorithms. These models can be used building generic PID controllers easily for various processes. PID parameters are completely under user control. It possible to arrange these PID processes in serial architectures as well as in nested architectures. It is also possible to tie the control loop setpoints with various factors like environment temperature following e.g. user-defined diagram.

System Controller can also be used for implementing diverse logic control functions. These controls can be based on conditions of clocks or on logic equations between these and other logic controls.

Clock functions can be e.g. used starting some device or function on defined time on defined weekday. All the common logic operations can be executed to process products from inputs, which makes this system extremely flexible. These logic products can be used to make direct control over field device or these can be used in PID setpoint processing.

## **Module types**

Every functional entity in System Controller software is written as own module. This structure is shown on the Figure 1 and presented in more detail on the lines below.

**Controller** module is used for presenting all the Linet controllers available for System Controller. Maximum 20 Linet controllers can be presented to system by defining three fields for each of them: unique name, IP address and UDP port. Controller name is later on used for controller identification.

**Input group** module declares all the inputs, like sensors and level detectors, processed in the System Controller. Again name is requested for unique identification. Input location is defined by controller name and group number. Group number is referencing group the named controller possesses. Raw data collected from the defined location can be filtered and scaled by user defined factors. System Controller can handle 200 inputs.

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**Output group**-module presents all the outputs products like field devices. Again name is requested for unique ID. Also output location is defined by naming controller and devices group number. Again, this group number is associated to the group space in the named Linet controller. Output data can be scaled with user defined factors. System Controller can handle 200 outputs.

**Clock group** module presents all the clock functions present in the system. Again clock name is required as ID. Besides that every clock are provided with activity weekdays. Each active day can be associated with two active periods. System Controller can handle 30 clock groups.

**Condition group** module presents all the conditions present in the system. Again conditions require unique names as ID. User can define conditions, like exceeding limits in specified input group. Comparison can be executed with hysteresis. State comparison can also include required truth or false period before regarding the state in question as valid. System Controller can handle 200 condition groups.

**Logic group** module presents all the logic statements present in the system. Again, unique name is required for the logic group as ID. User defines the logic statement that can include terms from clock groups, condition groups and other logic groups. Logic statements can be defined by using AND, OR, NOT and XOR operators. System Controller can handle 120 logic groups.

**Setpoint group** module presents all the setpoint groups present in the system. Again unique name is required as ID. User defines their mode that can be e.g. temperature dependent setpoint for the PID controller. Maximum five sensors can be defined as inputs whose average is used. This average can be used to determine new setpoint using user-defined curve. Setpoint groups can also take factors from logic groups states as well as output groups' values. Controller can handle 30 setpoint groups.

**PID group** module presents all the control processes present in the system. Again unique name is required as ID. Input and output groups are defined by their ID for the Controller processes. User has full control over the process parameters. Control process can be set working with fixed setpoint or alternatively setpoint group can be used. System Controller can handle 120 PID control groups.

**Series group** module presents all the series control groups present in the system. Again, unique name is required as ID. PID processes used in the series groups shall be introduced in operational order. Series groups can be easily used implementing PID processes, like heating cooling and heat recovery e.g. located along the same air-ventilation pipe with mutual setpoint and reference. Series group manages the PID processes assigned for its responsibility activating always only one of them. Series group can be used with fixed setpoint or setpoint can be taken from an external setpoint group. System Controller can handle 30 Series groups.

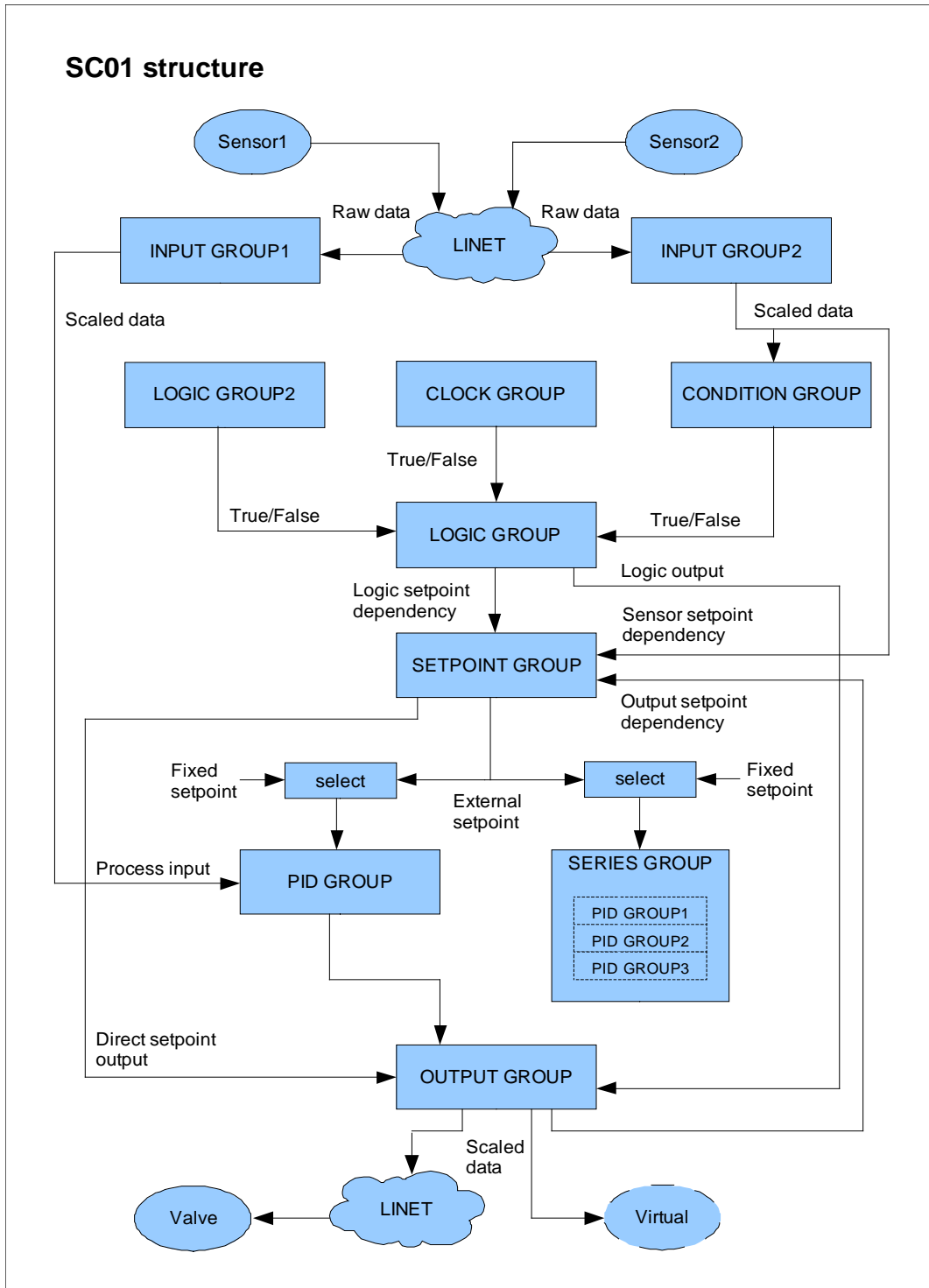


Figure 1. Module structure in System Controller

## ***User Interface***

WEB browser is used for System Controller management and configuration. The user can also access by terminal sessions over optional RS-232C or standard Telnet connections. However, these connections are limited to making different kinds of fixed set-ups.

WEB browser can be used for observing module states system widely in real time. It is also possible to draw trend graphs from PID processes.

System Controller provides also UDP connection that can be used to request and set e.g. PID setpoints. This makes it possible to communicate with e.g. PC based high-level management applications.

Software and WEB page updates can be handled conveniently using TFTP protocol built in the System Controller.

## Technical Specifications

PARAMETER	System Controller	UNIT
<b>Power supply</b>		
Supply voltage	+24	VDC
Max supply current (no GPRS modem)	0.1	ADC
Max supply current (with GPRS modem)	1	ADC
Supply connector	Phoenix-2	
<b>Ethernet interface</b>		
Network interface	10/100Base-T	
Network connector	RJ-45	
Services:	User interface, UDP-interface, TFTP file transfer, telnet	
<b>Serial interfaces (option)</b>		
Standard interface	RS-232	
Standard speed	19200	Bits/s
Standard settings (data, stop, parity)	8,N,1	
Isolation	No	VDC
Optional connector	Pinstrip 6	
Services:	Maintenance	
<b>JTAG interface</b>		
Interface type	ARM7TDMI	
Interface connector	Pinstrip 6	
<b>Memory</b>		
Internal RAM memory	256	kB
External RAM memory	512	kB
Non-volatile FLASH memory	2	MB
<b>Real time clock</b>		
Data format	yy.mm.dd.hh.ss	

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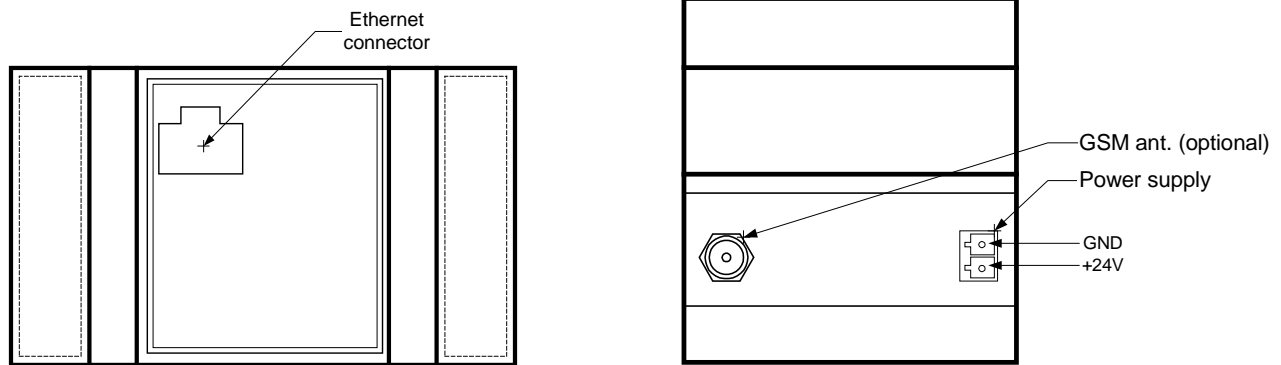
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<b>GSM/GPRS-modem (option)</b> GSM GPRS Services: GSM-data connection to user interface SMS message executor and alarm generators GPRS-connection to remote server (options) Jam detect, FTP- and SMTP-clients (options)	Option Option  Option Option Option Option	
<b>MMC-card interface (option)</b> MMC-card type	uSD	
<b>Operating temperature</b>	(+0) – (+60) degrees	Celsius

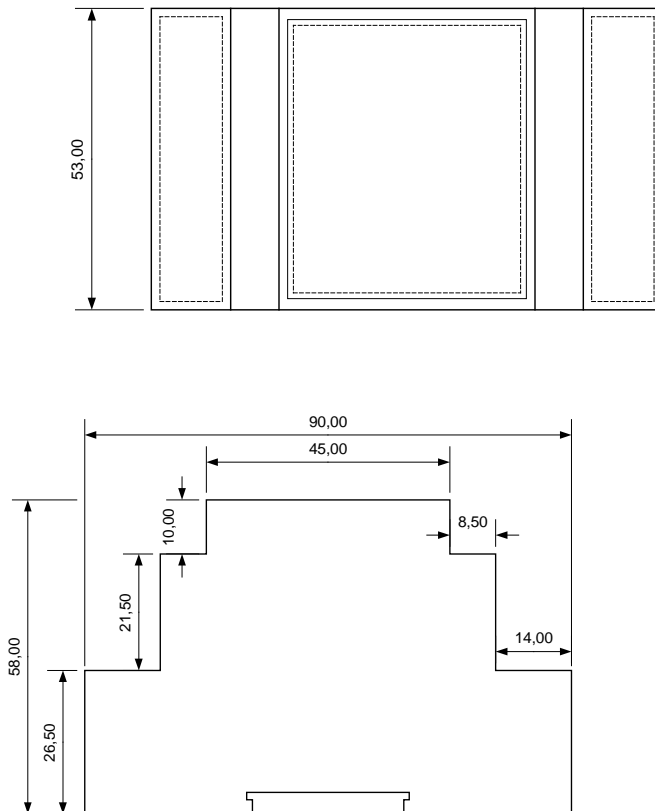
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### Connectors



### Measures:





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