Operating Instructions

Chassis Monitoring Module (CMM)

Schroff Parts No. 23207-022

Pentair
Enclosures
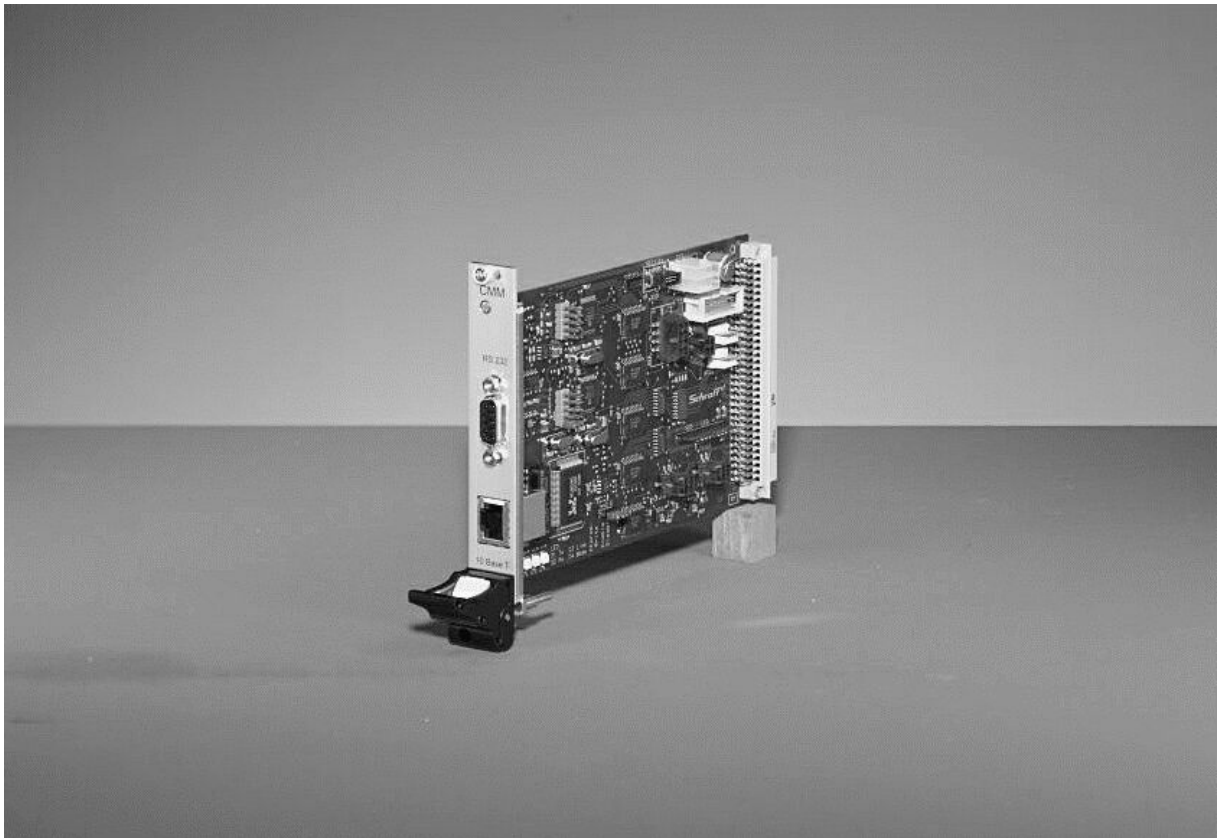
Chassis Monitoring Module (CMM)

Table of Content

1   Caution & Notes

NOTE:
Please read this operating instructions carefully before applying power. The warranty is subject to correct input voltages being applied. Repairs or modifications made by anyone other than SCHROFF will invalidate the warranty. This documentation has been complied with the utmost care. We cannot however guarantee its correctness in every respect.

CAUTION
This component level monitoring board. is intended exclusively for installation within other equipment by an industrial assembly operation or by professional installers. This monitoring board is not designed to be operated outside of an enclosure which provides a means of mechanical, electrical, and fire protection.

FUSING
There are no fuses on the Chassis Monitoring Module (CMM). The installer who installs the CMM in an enclosure has to take care of proper fusing.

There are no user-serviceable parts on the CMM

LIMITED WARRANTY
Schroff warrants each CMM of its manufacture for a period of two (2) years from the date of original shipment. This warranty applies to defects in materials and workmanship that result in non-performance to published specifications. The product(s) must be returned to Schroff by prepaid freight for repair with a Schroff pre-assigned RMA number.
Schroff assumes no liabilities for consequential damages of any kind through the use or misuse of its products by any user. No other obligations are expressed or implied. Please note that the specifications, terms, and conditions stated are subject to change without notice.

SCHROFF GmbH
Langenalber Strasse 96 – 100
D – 75334 Straubenhardt
Phone: +49 7082 794 – 0
Fax: +49 7082 794 – 200
Web: www.schroff.biz

Introduction:

The purpose of a chassis monitoring system is to monitor, control and ensure correct operation of equipment. VME- and CPCI-applications with increased reliability demands, require such a control system. The Schroff CMM unit recognises the system-parameters

➢ Voltage tolerances
➢ Temperature values
➢ Fan speed (in combination with the Fan Control Module, FCM)
➢ Customized signals

2   Functional Description

The CMM monitors up to four different dc voltages continuously for exceeding the high- or low-limit of the voltage tolerance. An error signal is generated if the tolerance is exceeded. The error status can be displayed by LEDs, RS232 serial interface or at the HTML page. There are two additional DC-voltage inputs available for the voltage-range +/-24Vdc. All voltages are system ground based.

Up to seven temperature sensors can be connected direct to the unit. Four additional temperature values are transferred from the FCM. A temperature fail is generated if one of the temperatures is higher than the adjustable temperature alarm level.

There are 16 digital inputs. They can be used to identify power-ok-signals, shelf-address, VME-signals and customized applications.

Ten digital outputs are available for customized applications. Four signals are open-collector isolated by opto-couplers. Six signals are TTL-compatible non-isolated.

The CMM is able to communicate with the fan control module (FCM). One connector ensures direct connection to the FCM, power supply and communication. The temperature values of FCM and the speed of fans are transferred to the CMM.

3   Technical Data

CMM Power Supply

Operating Voltage:	5 Vdc
Operating current approx.:	400 mA

Mechanical Dimensions

Board size: 3U x 160mm (euroboard)
Front panel size: 3U x 4HP
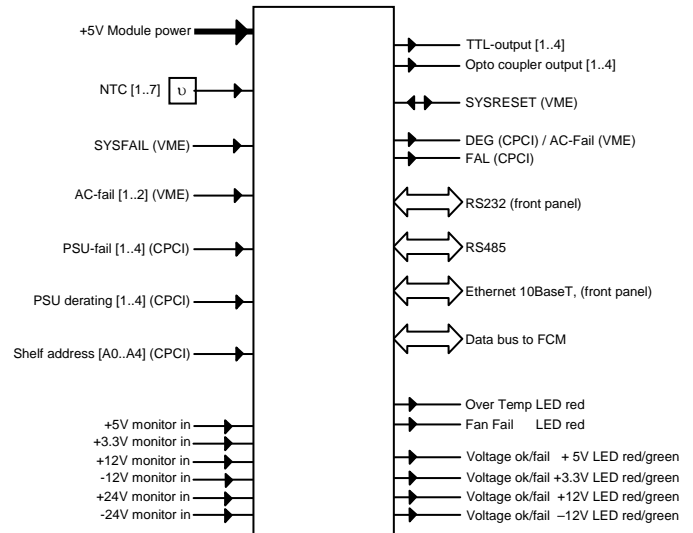19"-pluggable (In accordance with IEC 60297,IEEE 1011.10/11)

Ambient temperature

Service	0 ° C ......+70 °C
Storage	-40 ° C ...+85 °C

Humidity

30 – 80 %%, no condensation

4   Inputs / Outputs

Input / Output diagram:

Input Signal Monitoring

The following signals are being monitored continuously:

➢ **Voltage monitoring**
Up to 6 DC voltages are monitored continuously. The status of +3.3V, +5V, +12V, -12V is signaled by the green/red LED output (within tolerance /out of tolerance). The condition of the +24V, -24V is signaled by default setting via digital outputs   6   and   7   (see   chapter   6).

+ 12,0	VDC	Tolerance:	± 0.6V
+ 5,0	VDC	Tolerance:	± 0.25V
+ 3,3	VDC	Tolerance:	± 0.25V
– 12,0	VDC	Tolerance:	± 0.6V
+ 24,0	VDC	Tolerance:	± 2.4V
– 24,0	VDC	Tolerance:	± 2.4V

➢ **NTC temperature sensors**
Up to 7 NTC temperature sensors can be connected to the CMM. **The number of connected NTCs must be registered manually in the configuration mode of the CMM** (see chapter 6). Two temperature alarm thresholds (20°C...70°C) can be set. If the CMM is connected to the FCM, the NTC with the highest temperature reading of both modules gives the fan speed.

> ### Digital Inputs

16 freely selectable digital input signals.
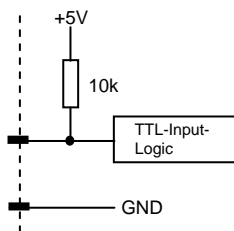
The following table shows the default assignment of the digital inputs. This assignment and status (active low/high) can be modified in the configuration mode of the CMM (see chapter 6).:

Input	Default	R96 pin	Default assigned to	User defined assignement possible
DIN0	SYSFAILin	A9	SYSFAIL_out / OUT5	Yes
DIN1	FALin1	C2	FAL_out / OUT9	Yes
DIN2	FALin2	C3		
DIN3	FALin3	C4	OR-wired	Yes
DIN4	FALin4	C5		
DIN5	DEGin1	C6	DEG_out / OUT8	Yes
DIN6	DEGin2	C7		Yes
DIN7	DEGin3	C8	OR-wired	Yes
DIN8	DEGin4	C9		Yes
DIN9	HA_A0	C15	No assignment to digital output	No
DIN10	HA_A1	C16		No
DIN11	HA_A2	C17		No
DIN12	HA_A3	C18		No
DIN13	HA_A4	C19		No
DIN14	AC-fail1	C11	AC-fail_out / OUT4 OR-wired	Yes
DIN15	AC-fail2	C12		

> ### SYSRESET digital Input

The SYSRESET is connected as Input/Output. In the Input mode it can be assigned to switch a digital output.

Outputs Signals

> ### LED display
> 6 LEDs can be directly connected to the LED outputs:
>
> 4 two colored LEDs (red/green), for +3.3V, +5V, ±12V OK/out-of-tolerance indication.

2 red LEDs for fault indication of "Fan Fail" and "Temp Fail" signals (fail=LED on, OK=LED off)

There are no LED's or other optical or acoustic signal indicators mounted on the front panel or the module itself.

> ### Digital Outputs

10 digital output signals are available:

- 4 open-collector output signals isolated by opto-couplers:

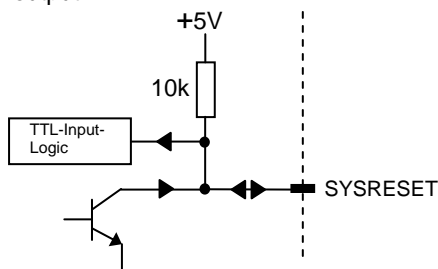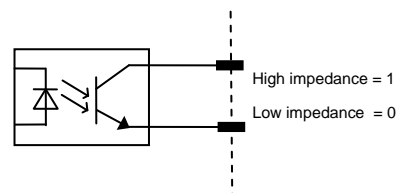- 6 TTL-compatible non-isolated signals:
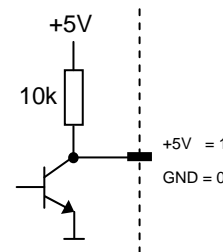
The following table shows the default assignment of the digital outputs. This assignment and status (active low/high) can be modified in the configuration mode of the CMM (see chapter 6).

output	Default-assignment	Type	R96 pin
OUT0	broken sensor wire	Optocoupler Output	A13 / A14
OUT1	Temperature ok CMM	Optocoupler Output	A15 / A16
OUT2	Temperature ok FCM	Optocoupler Output	A17 / A18
OUT3	Fan Fail_out	Optocoupler Output	A19 / A20
OUT4	AC-fail_out	TTL-Output	A22
OUT5	SYSFAIL_out	TTL-Output	A23
OUT6	V5 (+24V) out of tolerance	TTL-Output	A24
OUT7	V6 (-24V) out of tolerance	TTL-Output	A25
OUT8	DEG_out	TTL-Output	A11
OUT9	FAL_out	TTL-Output	B27

Communication Buses

> **Data bus to Fan Control Module (FCM)**

I²C-bus for internal System communication and connection of the Fan Control Module (FCM): If connected to FCM, the CMM can read the maximum value of the four FCM temperature sensors and also can read the average FCM fan speed.

> **RS485 interface**
> Serial interface on the R96 connector. No protocol available. For customized applications only.

> **Ethernet interface 10Base-T (front panel RJ45 connector)**
> Available Protocol: http
> Output of HTML-pages on a Web-Browser.

The user-interface via HTML page is available without additional software, a usual browser like Microsoft Internet Explorer can be used. There are three pages accessible
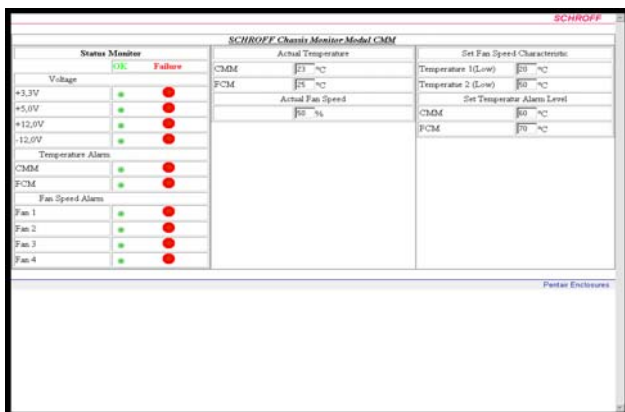:
Page 1: status monitor,
The status monitor displays the status of four voltage values, the temperature and the fan speed. The voltages are 3.3V, 5V, 12V, -12V. Temperature alarm is given from CMM and FCM separately. Up to four fans speeds are monitored.

Page 2: temperature- and fan speed-display
The temperature- and fan speed-display shows the actual maximum temperature of sensors from CMM and from FCM.
The target fan speed, depending on the actual highest temperature value on FCM and CMM-sensors, is displayed.

Page 3: characteristics-setting.
Not available

> **RS232 interface (front panel 9 way SUB-D connector)**
> The RS232 interface operates in two modes:
> 1. Configuration mode
> 2. Measurement mode

Configuration mode:
In this mode, all user definable parameters can be set:
- Preset of digital inputs on active high or active low
- Preset of digital outputs on active high or active low
- setting of the temperature alarm thresholds
- activation/deactivation of voltage measurement
- Selection of the output parameters of the RS232
- Selection of failure messages which are sent via RS232
- setting of digital outputs

Measurement Mode
Output of actual system parameters and alarm-messages (display on Hyper-terminal). The following system parameters can be sent:

HA: PICMG 2.6 Hardware Address. Condition of digital inputs DIN9...DIN13 (as decimal figure)
T1...T7: temperature of NTC 1...7 (in °C)
T8:   max. temperature of NTC 1...7 of CMM (in°C)
T9:   max. temperature of NTC 1...4 of FCM (in °C)
U1...U6: System voltages +3.3V, +5V, +12V, +24V, -12V, -24V (in mV)
S1:   Average fan speed (in %)

These parameters are sent to the RS232 at 2 second intervals.

If one of the 10 digital outputs changes to the alarm state, this information is provided on the RS232:
e.g: "ERROR → OUT 6"
These messages are sent to the RS232 at 2 second intervals until the alarm disappears

Example of an output block, which is sent in a 2 second interval to the RS232:

```
HA: 22
T1:24 T2:24 T3:27 T4:23 T5:24 T6:29 T7:23 T8:29 T9:28
U1:3244 U2:4944 U3:11921 U5:-12050
S1:61
ERROR -- > OUT6
ERROR -- > OUT8
```

5 Connectors
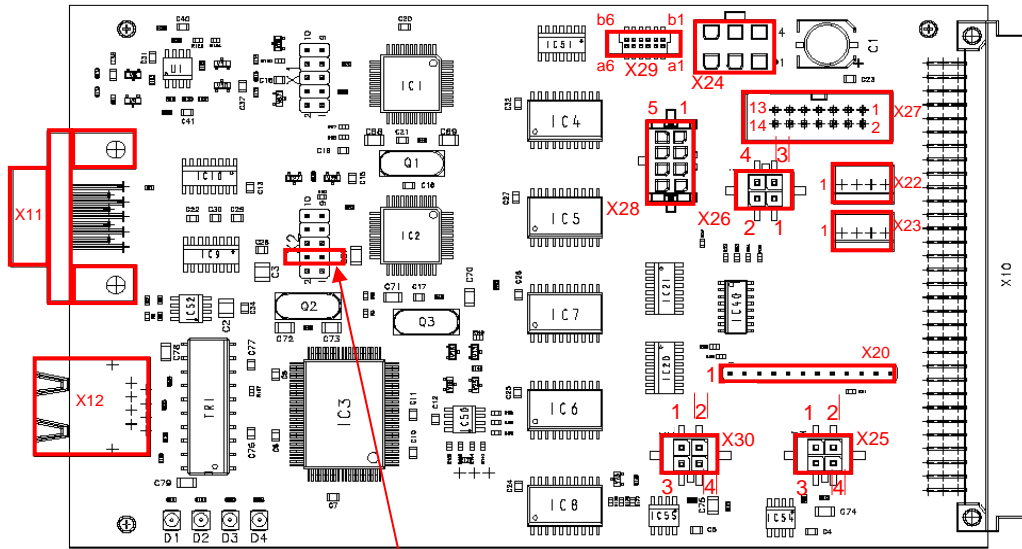
LEDs:
D1: Tx
D2: Rx
D3: Link
D4: Mode

Jumper for configuration

X10: CMM system connector
R96 DIN 41612 96pins female

Row Pin	a	b	c
1	Vcc (+5V)	Vcc (+5V)	Vcc (+5V)
2	+12V (V3) in	Temp 1+	DIN1 / FALin1
3	+5V (V2) in	Temp 1-	DIN2 / FALin2
4	+3.3V (V1) in	Temp 2+	DIN3 / FALin3
5	-12V (V5) in	Temp 2-	DIN4 / FALin4
6	+24V (V4) in	Temp 3+	DIN5 / DEGin1
7	-24V (V6) in	Temp 3-	DIN6 / DEGin2
8		Temp 4+	DIN7 / DEGin3
9	DIN0 / SYSFAIL	Temp 4-	DIN8 / DEGin4
10	SYSRESET	Temp 5+	
11	OUT8 / DEG_out	Temp 5-	DIN14 / AC-fail1
12		Temp 6+	DIN15 / AC-fail2
13	OUT0 (c) / broken NTC wire	Temp 6-	
14	OUT0 (e) / broken NTC wire	Temp 7+	reserved
15	OUT1 (c) / temp failure CMM	Temp 7-	DIN9 / HA_A0
16	OUT1 (e) / temp failure CMM	+3V3 anode gr	DIN10 / HA_A1
17	OUT2 (c) / temp failure FCM	+3V3 anode re	DIN11 / HA_A2
18	OUT2 (e) / temp failure FCM	+5V anode gr	DIN12 / HA_A3
19	OUT3 (c) / fan fail_out	+5V anode re	DIN13 / HA_A4
20	OUT3 (e) / fan fail_out	+12V anode gr	
21		+12V anode re	I2C/SDA
22	OUT4 / AC-fail_out	-12V anode gr	I2C/SCL
23	OUT5 / SYSFAIL_out	-12V anode re	I2C/GND
24	OUT6 / +24V (V4) failure	FanFail anode re	+5V aux
25	OUT7 / -24V (V6) failure	TempFail anode re	+5V aux
26		GND	
27	Eth Rx+	OUT9 / FAL_out	RS485 Rx+
28	Eth Rx-		RS485 Rx-
29			
30	Eth Tx+		RS485 Tx+
31	Eth Tx-		RS485 Tx-
32	GND	GND	GND

Remark: +5V aux ——— R40 0 Ohm / R41 0 Ohm ——— Vcc (+5V)

Power supply default setting: +5V aux and Vcc (+5V) have same potential
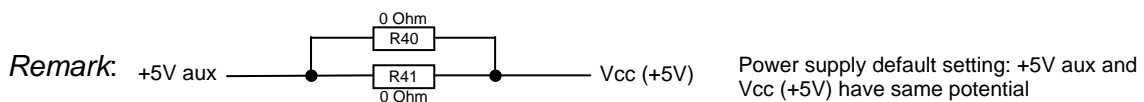
X11: RS232 interface
D-Sub DIN 41652 9pin female

Pin	type	Name	Description
5		GND	Ground
2		TxD	RS232: TxD
8		CTS	RS232: CTS
3		RxD	RS232: RxD
7		RTS	RS232: RTS

X12: RJ 45 Ethernet
8pin RJ 45

Pin	type	Name	Description
1		Eth Tx+	Ethernet TransmitA
2		Eth Tx-	Ethernet TransmitB
3		Eth Rx+	Ethernet ReceiveA
4		GND	Ground
5		GND	Ground
6		Eth Rx-	Ethernet ReceiveB
7		GND	Ground
8		GND	Ground

X20: Connector for LED display
Male connector: 2,54 mm grid 12pin

Pin	type	Name	Description
1	out	+3V3 anode gr	LED +3.3V green anode
2	out	+3V3 anode re	LED +3.3V red anode
3	out	+5V anode gr	LED +5V green anode
4	out	+5V anode re	LED +5V red anode
5	out	+12V anode gr	LED +12V green anode
6	out	+12V anode re	LED +12V red anode
7	out	-12V anode gr	LED -12V green anode
8	out	-12V anode re	LED - 12V red anode
9	out	FanFail anode re	LED FanFail red anode
10	out	TempFail anode re	LED TempFail red anode
11	out	GND	Ground
12	out	GND	Ground

X22: Temperature connector
Tyco 640456-4   4pins

Pin	type	Name	Description
1	In	Temp 1+	connection NTC pin1
2	In	Temp 1-	connection NTC pin2
3	In	Temp 2+	connection NTC pin1
4	in	Temp 2-	connection NTC pin2

X23: Temperature connector
Tyco 640456-4   4pins

Pin		Name	Description
1	In	Temp 3+	connection NTC pin1
2	In	Temp 3-	connection NTC pin2
3	In	Temp 4+	connection NTC pin1
4	in	Temp 4-	connection NTC pin2

X24: FCM connector 6pin
Molex 39-28-1063

Pin	type	Name	Description
2		I2C/SDA	CMM-Bus-SDA
1		I2C/SCL	CMM-Bus-SCL
3		I2C/GND	CMM-Bus-GND
6		+5V aux	Power supply input
4		Vcc (+5V)	Power supply input
5		GND	Ground

X25: RS485 interface
Molex 43045-0418   4pins

Pin	type	Name	Description
1		RS485 Rx+	RS485: Receive A
2		RS485 Rx-	RS485: Receive B
3		RS485 Tx+	RS485: Transmitt A
4		RS485 Tx-	RS485: Transmitt B

X26: Signals-Input
Molex 43045-0418   4pins

Pin	type	Name	Description
1	In	DIN14/ AC-fail1	Digital input 14 / default
2	in	DIN15/ AC-fail2	Digital input 15 / default
3		GND	Ground
4		GND	Ground

X27: Signals-Input
Male connector: 2,54 mm grid 2*7pins

Pin	type	Name	Description
1	In	DIN1 / FALin1	Digital input 1 / default
2	In	DIN2 / FALin2	Digital input 2 / default
3	In	DIN3 / FALin3	Digital input 3 / default
4	In	DIN4 / FALin4	Digital input 4 / default
5	In	DIN5 / DEGin1	Digital input 5 / default
6	In	DIN6 / DEGin2	Digital input 6 / default
7	In	DIN7 / DEGin3	Digital input 7 / default
8	in	DIN8 / DEGin4	Digital input 8 / default
12		GND	Ground

X28: Signals-Input
Molex 43045-0818   8pins

Pin		Name	Description
7		+5V aux	Power supply input
8		GND	Ground
1	In	+12V (V3) in	+ 12V voltage monitor input
2	In	+5V (V2) in	+ 5V voltage monitor input
3	In	+3.3V (V1) in	+ 3.3V voltage monitor input
4	In	-12V (V5) in	- 12V voltage monitor input
5	In	+24V (V4) in	+ 24V voltage monitor input
6	in	-24V (V6) in	+ 24V voltage monitor input

X29: Utility connector 12pin
Erni 063 179

Pin	type	Name	Description
A3		GND	Ground
A4	In	+12V (V3) in	+ 12V voltage monitor input
B3	In	+5V (V2) in	+ 5V voltage monitor input
B4	In	+3.3V (V1) in	+ 3.3V voltage monitor input
B5	In	-12V (V5) in	- 12V voltage monitor input
A1	In	DIN0 / SYSFAIL	Digital input 0 / default
B1	In	SYSRESET	VME SYSRESET signal
A2	out	OUT8 / DEG_out	Digital output 8 / default
B2	out	OUT9 / FAL_out	Digital output 9 / default
A5	In	DIN1 / FALin1	Digital input 1 / default
A6	In	DIN2 / FALin2	Digital input 2 / default

X30: Signals-Output
Molex 43045-0418   4pins

Pin	type	Name	Description
1	out	OUT4 / AC-fail_out	Digital output 4 / default
2	out	OUT5 / SYSFAIL_out	Digital output 5 / default
3	out	OUT6 / +24V (V4) failure	Digital output 6 / default
4		GND	Ground

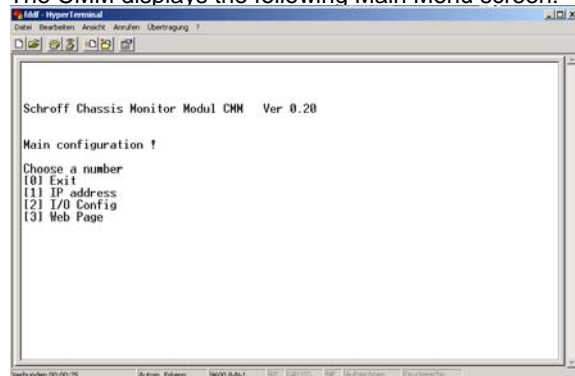# 6   Configuration of the CMM

➢ **Preparations**
  - Switch off CMM

  - Plug-in Jumper „config" on connector X2 (see page 5). This will set the CMM in the configuration mode.

  - Connect the CMM to the serial port of the PC by a 1:1 serial cable

  - Start the Hyperterminal

  - Settings in the Hyperterminal:

direct connection e.g.	COM1
Bit/s:	9600
Data bits:	8
Parity:	None
Stop bit:	1
Protocol:	None
ECHO:	off

  - Power up the CMM:

The CMM displays the following Main Menu screen:

Remark: press [0] or ESC to exit a menu w/o saving

> **To save the configuration press [0] on the main configuration screen and remove the Jumper before powering off the CMM**

From the Main Menu you can select to enter the IP-address, the I/O-configuration and the settings of the html Web page.
To select any option on the Main Menu, enter the number of the option. The program displays the desired screen.

➢ **Set IP-Address and Serial number**
  Type 1 to set the IP address and the serial number
  The following screen displays:
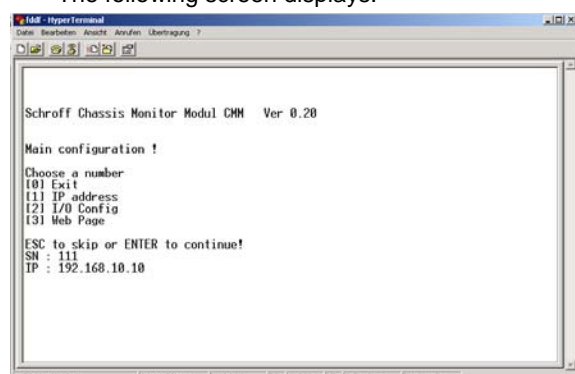
SN = Serial Number (3-digit number): Type-in any 3-digit number. This entry is mandatory. This number is used to create the MAC-address of the CMM.

IP = IP-address. Enter the desired IP-address, e.g. 192.168.10.10

Type <enter> to save the IP and serial number settings and to return to the Main Menu. The CMM confirms it by displaying "saved!"

➢ **I/O configuration of the CMM**

  The CMM display following I/O configuration screen:
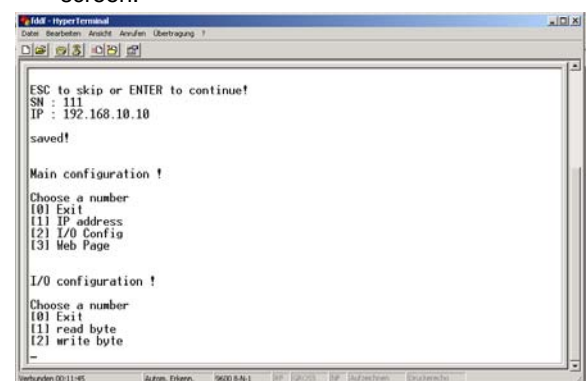
  To select an option, type 1 for "Read byte" or 2 for "write byte":
  read byte: This option allows to read the existing CMM configuration.
  Write byte: This option allows to enter a new or modified CMM configuration

➢ **Read byte**

  In order to read the existing configuration, the address of the respective parameter has to be entered. The assignment of addresses and parameters is described in detail in the following chapter "Write byte"

➢ **Write byte**
  The following settings can be modified:

  - Preset of digital outputs to "active high" or "active low"
  - Preset of digital inputs to "active high" or "active low"
  - Setting of temperature alarm thresholds
  - activation/deactivation of voltage measurement
  - activation/deactivation of temperature sensor inputs
  - Selection of the parameters and alarm messages   which are output via RS232
  - Connection of Input parameters with digital outputs

General procedure:

Enter the address given in the tables below. Then complete the respective byte which is calculated by replacing the "x" by "1" or "0". Complete the horizontal "sum" to a 8 bit binary figure.
Finally recalculate the binary figure to a decimal figure. For example, binary 11111111 is decimal 255. Enter the calculated decimal figure. Press <enter> to save the configuration.

♦ **Preset of digital outputs to "active high" or "active low"**

X = 0: output transistor is high-impedance in the alarm-mode and low impedance in Non-alarm-mode (idle-mode)
X = 1: output transistor is low-impedance in the alarm-mode and high impedance in Non-alarm-mode (idle mode)

Address 7	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix	1					1	1	1
OUT0						x		
OUT1				x				
OUT2			x					
OUT3		x						
Sum:	1	x	x	x	x	1	1	1
Default (Decimal 255):	1	1	1	1	1	1	1	1

Address 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix	1	1						
OUT4								x
OUT5							x	
OUT6						x		
OUT7					x			
OUT8				x				
OUT9			x					
Sum:	1	1	x	x	x	x	x	x
Default: (Decimal 255)	1	1	1	1	1	1	1	1

♦ **Preset of digital inputs to "active high" or "active low"**

X = 0: digital input is GND in Alarm state and open or +5V in non-alarm state (idle state)
X = 1: digital input is open or +5V in Alarm state and GND in non-alarm state (idle state)

Address 9	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix								
DIN1								x
DIN2							x	
DIN3						x		
DIN4					x			
DIN5				x				
DIN6			x					
DIN7		x						
DIN8	x							
Sum:	x	x	x	x	x	x	x	x
Default: (Decimal 255)	1	1	1	1	1	1	1	1

Adresse 10	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix	1			0	0	0	0	0
DIN9								
DIN10								
DIN11								
DIN12								
DIN13								
DIN14			x					
DIN15		x						
Sum:	1	x	x	0	0	0	0	0
Default: (decimal 224)	1	1	1	0	0	0	0	0

Remark: The digital input DIN0 (Sysfail is X by default and cannot be modified)

♦ **Setting of temperature alarm thresholds**

The temperature thresholds are entered directly in degree centigrade. The minimum temperature that can be entered is 20°C and the maximum temperature is 70°C.

Threshold A:
xx = temperature in °C

Address 16	
Temperature	**xx**
Default:	60

Threshold B:
xx = temperature in °C

Address 15	
Temperature	**xx**
Default:	40

Remark: There is no rule to which of the two thresholds is the lower and which one is the higher one. The LED "Temp Fail" output switches the LED on when the lower threshold is exceeded.

♦ **activation/deactivation of voltage measurement**

You can selectively activate or deactivate the voltage measurement of each voltage input. If a voltage input is deactivated, also the respective LED output is deactivated.

X = 0: voltage input deactivated
X = 1: voltage input activated

Address 11	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix	0	0						
V1 ((+3.3V)								x
V2 (+5V)							x	
V3 (+12V)						x		
V4 (+24V)					x			
V5 (-12V)				x				
V6 (-24V)			x					
Sum:	0	0	x	x	x	x	x	x
Default: (Decimal 63)	0	0	1	1	1	1	1	1

♦ **Activation/deactivation of temperature sensor inputs**

Connected temperature sensors need to be configured manually. All 7 temperature sensor inputs are activated by default. If there are less than 7 temperature sensors connected to the CMM, the unconnected inputs need to be deactivated. Otherwise, a "Temp Fail" Alarm will be generated since the CMM detects a broken sensor wire.

X = 0: Temperature sensor input deactivated
X = 1: Temperature sensor input activated

Address 14								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix	0							
NTC1								x
NTC2							x	
NTC3						x		
NTC4					x			
NTC5				x				
NTC6			x					
NTC7		x						
Sum:	**0**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Default: (Decimal 127)	0	1	1	1	1	1	1	1

♦ **Selection of the parameters and Alarm messages which are output via RS232**

The parameters of the CMM like temperatures, voltages and fan speed can be sent via RS232 to the Hyperterminal. The following tables describe the activation/deactivation of the RS232 output parameters

Example of an output block, which is sent at 2 second intervals to the RS232:

```
HA: 22
T1:24 T2:24 T3:27 T4:23 T5:24 T6:29 T7:29 T8:23
T9:28
U1:3244 U2:4944 U3:11921 U5:-12050
S1:61
ERROR -- > OUT6
ERROR -- > OUT8
ERROR -- > OUT9
```

HA: PICMG 2.16 Hardware Address. Condition of digital inputs DIN9...DIN13 (as decimal figure)
T1...T7: temperature of NTC 1...7 (in °C)
T8: max. temperature of NTC 1...7 of CMM(in °C)
T9: max. temperature of NTC 1...4 of FCM (in °C)
U1...U6: system voltages +3.3V, +5V, +12V, +24V, -12V, -24V (in mV)
S1: average fan speed (in %)
ERROR: Alarm message of a digital output

Output parameter

X = 1: Output of the parameter
X = 0: No output of the parameter

Address 47								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix								
HA								x
T1							x	
T2						x		
T3					x			
T4				x				
T5			x					
T5		x						
T7	x							
Sum:	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Default: (Decimal 255)	1	1	1	1	1	1	1	1

Address 48								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix								
T8								x
T9							x	
V1, +3.3V						x		
V2, +5V					x			
V3, +12V				x				
V4, +24V			x					
V5, -12V		x						
V6, -24V	x							
Sum:	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Default: (Decimal 255)	1	1	1	1	1	1	1	1

Address 49								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix		0	0	0	0	0	0	
Fan speed (S1)								x
Output globally on/off	x							
Sum:	**x**	**0**	**0**	**0**	**0**	**0**	**0**	**x**
Default: (Default 129)	1	0	0	0	0	0	0	1

♦ **Alarm messages:**
  X = 0: No output of the alarm message
  X = 1: Output of the alarm message

Address 50	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix	0	0	0	0				
Alarm OUT0								x
Alarm OUT1							x	
Alarm OUT2						x		
Alarm OUT3					x			
Sum:	**0**	**0**	**0**	**0**	**x**	**x**	**x**	**x**
Default: (Decimal 15)	0	0	0	0	1	1	1	1

Address 51	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
fix	0	0						
Alarm OUT4								x
Alarm OUT5							x	
Alarm OUT6						x		
Alarm OUT7					x			
Alarm OUT8				x				
Alarm OUT9			x					
Sum:	**0**	**0**	**x**	**x**	**x**	**x**	**x**	**x**
Default: (Default 63)	0	0	1	1	1	1	1	1

♦ **Connection of Input parameters with digital outputs**

The input parameters can individually be assigned to the 10 digital outputs. If more than one input parameter is assigned to an output, the inputs are logically OR-wired to the output.

Bit =1: Input parameter assigned to output
Bit =0: Input not assigned to output

↓Ouput	Input parameters →	23 nc	22 nc	21 V6 (-24V) out of tolerance	20 V5 (-12V) out of tolerance	19 V4 (+24V) out of tolerance	18 V3 (+12V) out of tolerance	17 V2 (+5V) out of tolerance	16 V1 (+3.3V) out of tolerance	15 nc	14 FCM-Auxiliary	13 FCM-TempFail	12 FCM-FanFail	11 DIN14 OR DIN15 / AC-fail_1 OR AC-fail_2	10 SYSRESET aktive	9 Temperaturr Threshold 1	8 Temperature Threshold 2	7 Broken wire of Temp. Sensor	6 DIN0 / SYSFAIL_in	5 DIN7 OR DIN8 / DEG_in_3 OR DEG_in_4	4 DIN5 OR DIN6 / DEG_in_1 OR DEG_in_2	3 DIN4 / FAL_in_4	2 DIN3 / FAL_in_3	1 DIN2 / FAL_in_2	0 DIN1 / FAL_in_1
OUT0	←	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
		Address 19					Address 18						Address 17												
OUT1	←	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
		Address 22						Address 21						Address 20											
OUT2	←	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
		Address 25						Address 24						Address 23											
OUT3	←	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		Address 28						Address 27						Address 26											
OUT4	←	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
		Address 31						Address 30						Address 29											
OUT5	←	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
		Address 34						Address 33						Address 32											
OUT6	←	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Address 37						Address 36						Address 35											
OUT7	←	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Address 40						Address 39						Address 38											
OUT8	←	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
		Address 43						Address 42						Address 41											
OUT9	←	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
		Address 46						Address 45						Address 44											

Remark: The table shows the CMM default conjunction of input parameters to digital outputs

➢ **Web page Menu**
This menu is reserved to download the html-code to the CMM. There is no user configuration possible