

SynQor MCOTS-C-270-xx-FEx Terminal Commands

The SynQor MCOTS-C-270-xx-FE contains a serial port to facilitate system monitoring. Commands are sent to request individual data, the FE responds to each command individually. The FE's external serial port IO pins are at 3.3V logic levels, not RS232 levels.

See the device datasheet for IO pin level & polarity details.

Commercial data converters are available to translate these levels to RS232 or USB.

The serial port uses 9600 baud, 8 data bits, no parity, and one stop bit. Commands can be sent, and output viewed, with any standard terminal emulator. The interface is case sensitive. To view user text, set the terminal emulator for local echo.

Some data are writeable; written values are, however, volatile and will revert to default upon power cycling.

A pause of >5 seconds between any two command characters will timeout/reset the command parser. No response is generated.

This timeout value is user settable - see Hung Parser Timeout below.

The protocol supports communication to/from individual modules on a shared serial bus via a unique 'network address'.

In this document, the symbol ␣ will be used to represent ascii 13 (cr) OR ascii 10 (lf) OR both (they're all equivalent).

Value Formats

Data supplied to, and returned from, the FE can be communicated in several formats, broadly divided into strings and numeric values. While strings are a unique type, numeric data can be further divided into several interchangeable formats.

Strings	Up to 64 ascii characters, and "enclosed in double quotes". A null string is "". Strings can contain unprintable and control characters which can, of course, affect the appearance of any terminal emulator receiving them.		
Numerical Formats	Fmt	Numeric Range	Description
	char	0 to 127	An ascii character, preceeded by single quote character ' to remove ambiguity. Responses using char format will always contain the ' prefix.
	hex	0x0 to 0xFFFF	0x and then zero to four ascii hex characters
	U int	0 to 65535	Unsigned decimal numeral, optionally preceeded by 'u'
	int	-32768 to 32767	Signed decimal numeral, specified by '+' or '-' prefix
mks	±###.#	Decimal numerals <i>containing a decimal point</i> are interpreted as real MKS values and are internally converted to/from machine units. MKS values are naturally signed. MKS format is recommended whenever referring to a real-life datum.	

Command Formats

Both data read and data write commands are supported

Data Write Command Syntax

{Net Addr}	{Access Address}	{Action Specifier}	{Write Value}	{Terminator}
m	0-127	=	"String" or 16-bit numerical	(cr) or (lf) or both, ␣

Net Addr: The network address character, which takes a default value of 'm on power-up. 'A thru 'z is a single unit's address, while '@ is interpreted as all units. To avoid collision, the response to '@ commands is automatically muted.

See the Enumerate command to automatically assign unique network addresses for multi-unit applications.

Access Addr: The address to write, see table below.

Addresses can be specified in char, hex, or int formats, see Value Formats below.

Action Specifier: The = character specifies a data write command.

Only select addresses are writeable.

Write Value: Values to write can be supplied in the formats described below;

The supplied format will determine the format of the response datum.

Terminator: a carriage return character (cr) = ascii 13, OR a linefeed character (lf) = ascii 10, OR both ␣.

SynQor MCOTS-C-270-xx-FEx Terminal Commands

Data Read Command Syntax

{Net Addr}	{Access Address}	{Action Specifier}	[Format]	{Terminator}
m	0-127	?	optional value of 0	(cr) or (lf) or both, ↵

Net Addr: The network address character, which takes a default value of 'm' on power-up. while valid, the '@' address mutes responses to avoid collision; it's not useful for read operations. See the Enumerate command to automatically assign unique network addresses for multi-unit applications.

Access Addr: The address to read, see table below.

Addresses can be specified in char, hex, or int formats, see Value Formats below.

Action Specifier: The '?' character specifies a data read command.

Format: The numerical response datum format of a read command can be controlled by supplying the command with an argument value of 0. The format of the 0 specifies the desired return datum format (see table below). In the absence of a 0 argument, the datum is returned in its natural or mks format.

Terminator: a carriage return character (cr) = ascii 13, OR a linefeed character (lf) = ascii 10, OR both ↵.

Examples of controlling the return datum format of read commands

m77?↵	No value supplied, return datum in default (mks or natural) format
m77?0.↵	Value of 0 supplied in mks, return in mks/natural format
m77?.↵	
m77?0↵	Unsigned value of 0 supplied, return as unsigned int.
m77?u0↵	
m77?u↵	Signed value of 0 supplied, return as signed int.
m77?+0↵	
m77?+↵	Value of 0 supplied in hex, return in hex.
m77?0x↵	
m77?x↵	

Response Format

Immediately after reception of its terminator, each valid command generates a response.

Invalid commands do not generate a response.

Response Syntax

{Net addr}	{Access Address}	{Is Now}	{Value}	{Terminator}
m	0-127	=	"String" or 16-bit numerical	↵

Net Addr: The FEs echoes its network address, 'm' in the example above.

Access Address: Echo of the address specifier in the same format as supplied.

Char addresses will be prefixed by '.

Is Now: The character '='

Value: The address's current value.

See above for descriptions of the return datum format to both read and write commands.

Char format will always contain leading ', hex format will always contain 0x and four ascii hex value characters.

Terminator: ↵ concludes the response

SynQor MCOTS-C-270-xx-FEx Terminal Commands

Addresses

The following table contains a summary of the addresses that contain useful data.

Access Address			Name	Read / Write	Natural Format	Natural Units
hex,	dec,	or char				
0x0	0		ID String	R	string	
0xC	12		Build Revision	R	hex	
0xD	13		Code Revision	R	string	
0x23	35	#	Powered Days	R	int	days
0x24	36	\$	Powered Hours	R	int	hours
0x25	37	%	Powered Minutes	R	int	minutes
0x26	38	&	Powered Seconds	R	##.##	seconds
0x49	73	l	Input Current	R	#.###	Amperes
0x4D	77	M	Output Voltage	R	##.###	Volts
0x4E	78	N	Output Current	R	#.###	Amperes
0x50	80	P	Input Power	R	###.###	Watts
0x53	83	S	Input Voltage	R	###.##	Volts
0x54	84	T	Buck Temperature	R	###.##	°C
0x55	85	U	BQ Temperature	R	###.##	°C
0x56	86	V	Midbus Voltage	R	##.###	Volts
0x57	87	W	Boost Temperature	R	###.##	°C
0x63	99	c	I Share Voltage	R	#.###	Volts
0x69	105	i	Midbus Current	R	##.###	Amperes
0x6E	110	n	Battle Short Enable Mode	R/W	int	
0x70	112	p	Midbus Power	R	####.##	Watts
0x77	119	w	Battle Short Warnings	R	int	

SynQor MCOTS-C-270-xx-FEx Terminal Commands

Address Details

Address: hex decimal char
0x0 0

Name: ID String

Description: The unit's ID string "Synqor MCOTS-C-270-xx-FE"

Response units: string

Read/Write: Read Only

Example Cmd: Typical Response:
m0x0?✓ m0x0000= "Synqor MCOTS-C-270-40-FE"✓
m0?✓ m0= "Synqor MCOTS-C-270-40-FE"✓

Address: hex decimal char
0xC 12

Name: Build Revision

Description: The unit's Build Revision

Natural Response units: hex

Read/Write: Read Only

Example Cmd: Typical Response:
m0xC?✓ m0x000C= 0x0000✓
m12?✓ m12= 0x0000✓

Address: hex decimal char
0xD 13

Name: Code Revision as a number

Description: The unit's Code Revision

Response units: string

Read/Write: Read Only

Example Cmd: Typical Response:
m0xD?✓ m0x000D= "8"✓
m13?✓ m13= "8"✓

SynQor MCOTS-C-270-xx-FEx Terminal Commands

	hex	decimal	char	Response units	
Powered Days	0x23	35	#	int 0-65535	Read
Powered Hours	0x24	36	\$	int 0-23	Read
Powered Minutes	0x25	37	%	int 0-59	Read
Powered Seconds	0x26	38	&	decimal 0-59.9	Read

Discussion: Together these contain the number of days, hours, minutes and seconds that power has been applied. They can be written to any value (or cleared) at any time, and will count time thereafter.

Example Cmds:

m35?✓
m36?✓
m35=0✓
m36=0✓

Typical Responses:

m35= 329✓
m36= 3✓
m35= 0✓
m36= 0✓

Interpretation:

Unit has been powered for 329 days and 3 hours.
Days variable reset to 0.
hours variable reset to 0.

Address:

hex	decimal	char
0x49	73	I

Name:

Input Current

Description:

The approximate input current to the unit.

Natural Response units:

decimal Amperes DC

Read/Write:

Read Only

Discussion:

Example Cmd:

mI?✓

Typical Response:

m I= 3.200✓

Interpretation:

The input is handling 3.200 A (in)

SynQor MCOTS-C-270-xx-FEx Terminal Commands

Address: hex decimal char
0x4D 77 M

Name: **Output Voltage**

Description: The Boost-Stage output voltage

Response units: decimal Volts DC

Read/Write: Read Only

Discussion:

Example Cmd:
mM?✓

Typical Response:
m'M= 28.000✓

Interpretation:
The unit is producing 28.000 VDC.

Address: hex decimal char
0x4E 78 N

Name: **Output Current**

Description: The FEs output current

Natural Response units: decimal Amperes DC

Read/Write: Read Only

Discussion:

Example Cmd:
mN?✓

Typical Response:
m'N= 30.000✓

Interpretation:
The output is delivering 30.000 Adc (out)

Address: hex decimal char
0x50 80 P

Name: **Input Power**

Description: The FEs input power

Natural Response units: Watts

Read/Write: Read Only

Discussion:

Example Cmd:
mP?✓

Typical Response:
m'P= 650.000✓

Interpretation:
The unit's input is drawing 650 W in.

SynQor MCOTS-C-270-xx-FEx Terminal Commands

Address: hex decimal char
 0x53 83 S
Name: **Input Voltage**
Description: The DC Input Voltage
Natural Response units: decimal Volts
Read/Write: Read Only
Discussion: The value is the DC input voltage.

<u>Example Cmd:</u>	<u>Typical Response:</u>	<u>Interpretation:</u>
mS?✓	m'S= 270.00✓	The DC input voltage is 270.00 Vdc

Address: hex decimal char
 0x54 84 T
Name: **Buck Temperature**
Description: The unit's internal temperature at Buck Fets.
Natural Response units: signed decimal °C
Read/Write: Read Only
Discussion:

<u>Example Cmd:</u>	<u>Typical Response:</u>	<u>Interpretation:</u>
mT?✓	m'T= 63.00✓	The Buck Fets are at about 63.00 °C.

Address: hex decimal char
 0x55 85 U
Name: **BQ Temperature**
Description: The BusQor internal temperature.
Natural Response units: signed decimal °C
Read/Write: Read Only
Discussion:

<u>Example Cmd:</u>	<u>Typical Response:</u>	<u>Interpretation:</u>
mU?✓	m'U= 52.50✓	The BusQor Fets are at about 52.50 °C.

Address: hex decimal char
 0x56 86 V
Name: **Midbus Voltage**
Description: The BusQor output voltage
Response units: decimal Volts DC
Read/Write: Read Only
Discussion:

<u>Example Cmd:</u>	<u>Typical Response:</u>	<u>Interpretation:</u>
mV?✓	m'V= 36.000✓	The boost stage is producing 36.000 VDC.

SynQor MCOTS-C-270-xx-FEx Terminal Commands

Address: hex decimal char
0x57 87 W

Name: **Boost Temperature**

Description: The unit's internal temperature at Boost Fets.

Natural Response units: signed decimal °C

Read/Write: Read Only

Discussion:

Example Cmd: mW?✓	Typical Response: m'W= 65.00✓	Interpretation: The Boost Fets are at about 65.00 °C.
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Address: hex decimal char
0x63 99 c

Name: **I Share Voltage**

Description: This is the scaled representation of output current. 0.200V = 0A and 2.200V = FL

Natural Response units: decimal Amperes DC

Read/Write: Read Only

Discussion:

Example Cmd: mC?✓	Typical Response: m'C= 1.200✓	Interpretation: The I Share voltage is reading 1.200 Vdc
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Address: hex decimal char
0x69 105 i

Name: **Midbus Current**

Description: The HVNQ **input** current (ie output current of BusQor)

Natural Response units: decimal Amperes DC

Read/Write: Read Only

Discussion:

Example Cmd: mi?✓	Typical Response: m'i= 30.000✓	Interpretation: The input current of the HVNQ is reading 30.000 A
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SynQor MCOTS-C-270-xx-FEx Terminal Commands

Address: hex decimal char
 0x6E 110 n
Name: **Battle Short Enable Mode**
Description: Allows engaging Battle Short mode via serial interface
Natural Response units: hex
Read/Write: Read/Write
Discussion: value of 10 (0xA) allows Battle Short mode to follow BS Pin [default]
 writing value of 11 (0xB) turns on Battle short mode regardless of BS Pin value

<u>Example Cmd:</u>	<u>Typical Response:</u>	<u>Interpretation:</u>
mn?↵	m'n= 0x000A↵	unit m is obeying BS pin
@n=11↵	none (response muted for global addr @)	Everyone: Battle Short Mode = On
mn=10↵	m'n= 10↵	unit m, obey BS pin again

Address: hex decimal char
 0x70 112 p
Name: **Midbus Power**
Description: Returns the BusQor output power
Natural Response units: Watts
Read/Write: Read Only
Discussion:

<u>Example Cmd:</u>	<u>Typical Response:</u>	<u>Interpretation:</u>
mp?↵	m'p= 650.000↵	The BusQor is processing 650.000 W

Address: hex decimal char
 0x77 119 w
Name: **Battle Short Warnings**
Description: Status bits associated with the BATTLE SHORT pin (warnings)
Responses: bit 0 NA
 bit 1 Warn Over Temperature
Natural Response units: hex
Read/Write: Read Only
Discussion: These flags indicate the reason the BATTLE SHORT pin internal pull-down transistor has been turned off

<u>Example Cmd:</u>	<u>Typical Response:</u>	<u>Interpretation:</u>
mw?↵	m'w= 0x0001↵	Battle Short Warning is due to temperature