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Halcro Logic  
Communications Information

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## Overview

The Halcro Logic range of multi-channel power amplifiers can be remotely controlled and configured from a computer connected either via a serial cable or Ethernet network. Special software is not necessary, but the Halcro HRAS software will make this easier.

The computer can be used to turn the amplifier to On and to Standby, to inhibit individual modules, to query amplifier status, and to change the communication settings.

## Basic communication settings

The settings for serial communications are:

Speed:	38400 bps
Data bits:	8
Parity:	None
Stop bits:	1
Flow control	None

The serial port supports both pseudo-binary and ASCII communication modes. The Ethernet connection uses a different port for each type of communication.

By default, the serial port operates in pseudo-binary mode and supports the following commands:

*m=xx	set amplifier enable bitmask to hex value
*m?	print current amplifier enable mask in hex
*p0	power off (standby)
*p1	power on
*s?	status query
LF LF LF	exit to ASCII mode

The Status message sent in response to a status query is:

```
"*S?:P0V1110A0000000T0000000C00000
00D0000000F0000000H00000000"
```

This message is sent to pseudo-binary interface (both serial and Ethernet) whenever one of the items monitored indicates an error or when requested. The message is interpreted like this:

```
*Sx:PaVbcdeAffffffTgggggggChhhhhhhDjjj
jjjFkkkkkkkHmmmmmmmm
```

*Sx:	message header
x = ?:	message result of query
x= !:	message result of internal status change

## P main power

a=0: off      a=1: on

## V voltage status:

b=0: - 5 V fail      b=1: - 5 V ok  
 c=0: + 5 V fail      c=1: + 5 V ok  
 d=0: +12 V fail      d=1: +12 V ok  
 e=0: +72 V fail      e=1: +72 V ok

## A amplifier status:

f=0: amplifier off  
 f=1: amplifier on

## T temperature status:

g=0: over temp  
 g=1: temp ok

## C load status:

h=0: over current  
 h=1: current ok

## D amplifier condition

j=0: amplifier fail  
 j=1: amplifier OK

## F fan Status

K=0: fan fail  
 k=1: fan OK

In A, T, and C fields, order of flags is Amp7...Amp1.

H = time run in On mode (Standby not included) in minutes.

You can enter ASCII mode by sending three consecutive LF (line feed) characters to the control module via the serial port. Once in ASCII mode the multi-channel amplifier must be turned off then on again to return to pseudo-binary mode. On an Ethernet network, use port 2323 for ASCII mode and port 2324 for pseudo-binary mode.

The following is a command list for both the RS232 and Ethernet ASCII mode:

## List of commands:

help	print list of commands
version	print firmware version information
status	print status information
on	enter full-power mode
standby	enter Standby mode
off	enter Standby mode
enable (mask)	print/set amplifier enable mask; hex number that indicates which amps are on or inhibited
set	print settings
set ip <addr>	print or set IP address
set netmask <addr>	print or set netmask
set broadcast <addr>	print or set broadcast address
set gateway <addr>	print or set gateway
set dhcp <state>	print or enable/disable DHCP; options are auto, always, never
net	show active settings
net reload	apply new settings
exit	disconnect

## Enable details

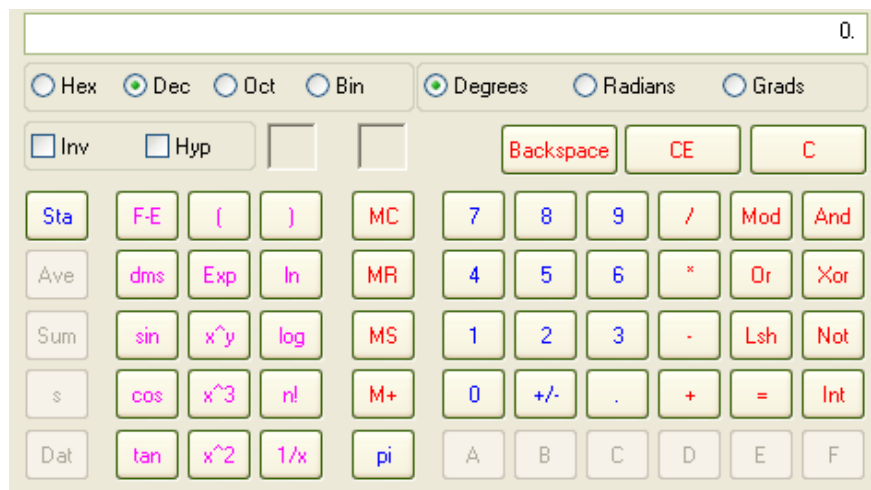
The enable mask is a hex number that is derived from a binary representation of the amplifier modules you wish to enable. For example if all seven amplifier modules are to be enabled the binary mask is 1111111. This converts to the hex number 7F.

If you wish to enable amplifier modules 1, 3, 5, 7 the binary mask for this is 1010101, which converts to the hex number 55.

The calculator provided with Windows is very useful for calculating the enable mask.

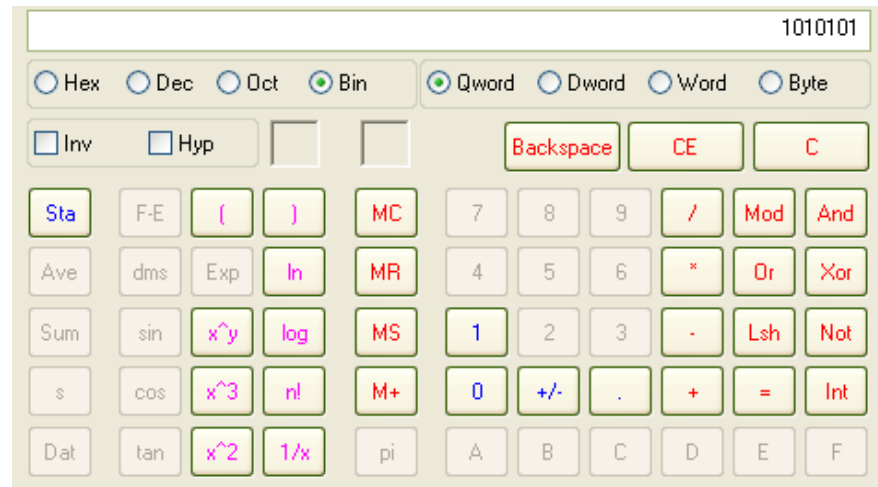
- o Open the calculator.
- o Select Scientific from the View menu.

The calculator is shown below:



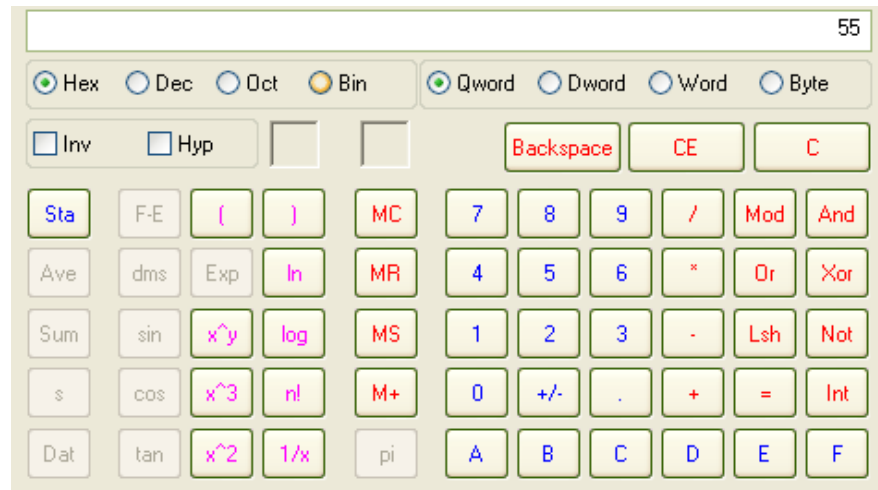
To continue:

- o Select Bin and type the binary mask desired, as shown:



To display the hex number required, as shown:

- o Select Hex.



To check the current, enable value type 'enable', and the multi-channel amplifier will reply with the hex number of the current mask.

To change the current, enable value type 'enable 55' to set the enable mask to the value calculated above.

## DHCP details

There must be a DHCP server on the network for the multi-channel amplifier to obtain an IP address automatically. This can come from a Windows domain server, for example, or from a computer sharing an Internet connection with a workgroup.

DHCP servers are available to install on most operating systems. Depending on the DHCP server settings, the multi-channel amplifier may get a different IP address each time it is turned On via the mains switch. Switching from Standby to On will not cause the IP address to change.

A DHCP server that is part of a Windows computer running Internet sharing will probably assign a different IP address each time the multi-channel amplifier starts. Halcro's HRAS software will automatically detect the multi-channel amplifier on the network no matter what the IP address is set to, but this may cause problems with Hyper Terminal connections. Please be patient, as it may take some time for a DHCP to assign an IP address to the amplifier.

There are three DHCP settings:

*Never:* In this setting an IP address must be manually assigned via the serial communications before the multi-channel amplifier can be used on an Ethernet network. The multi-channel amplifier will not request an IP address from a DHCP server even if one is available on the network.

*Auto:* In this setting the multi-channel amplifier will request a new IP address from a DHCP server if one has not been manually set.

*Always:* In this setting the multi-channel amplifier will always request an IP address from the DHCP server. The setting of the server will determine if a new address is issued or the previous one reused.

## Net reload details

Once a network setting has been changed, the 'net reload' command must be sent to enable these changes. The commands that require 'net reload' are:

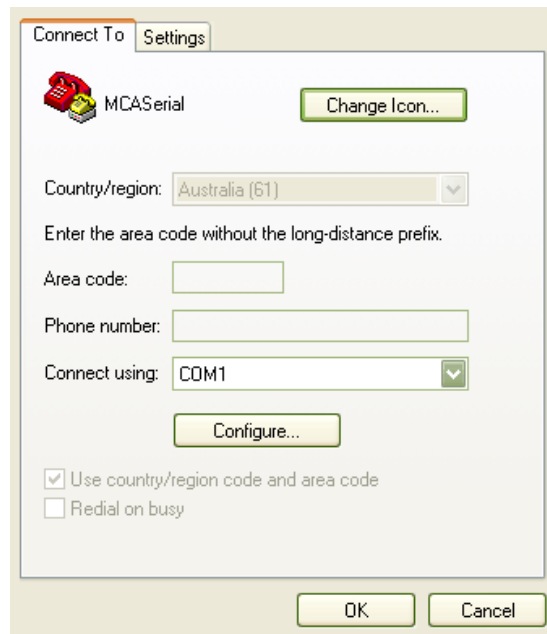
```
set ip <addr>
set netmask <addr>
set broadcast <addr>
set gateway <addr>
set dhcp <state>
```



## Serial mode

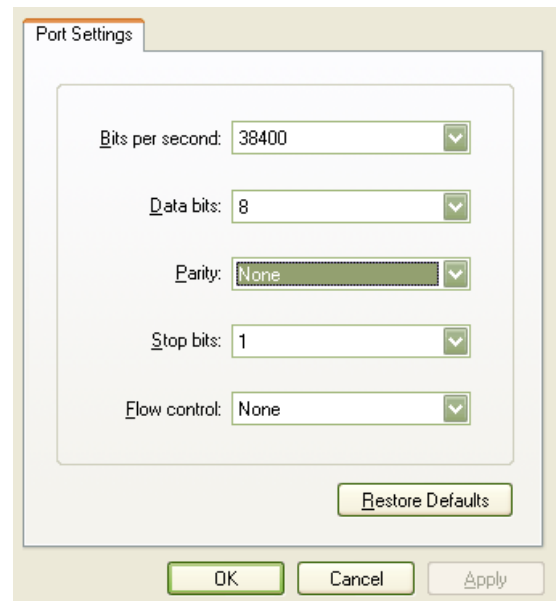
To connect:

- o Start HyperTerminal.
- o Select: File>New to create a new connection, as shown below:



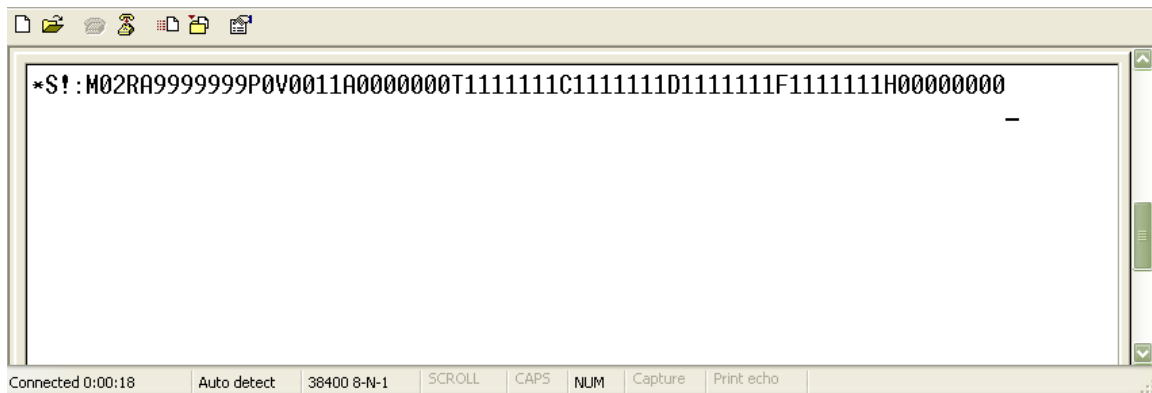
- o Set 'Connect using:' to the Com Port you will use to connect.
- o Press Configure...

- o Set the options as shown below:



- o Press OK to connect to the multi-channel amplifier.
- o Turn the multi-channel amplifier mains power On.

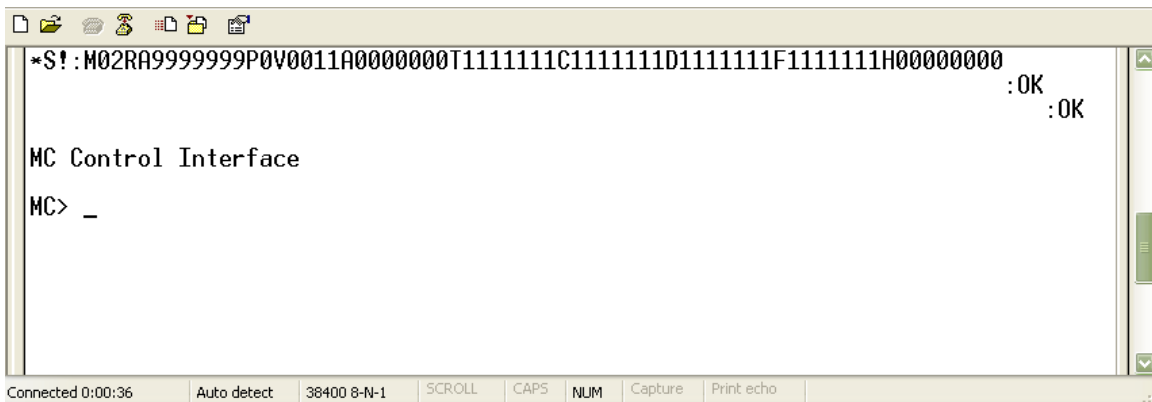
The multi-channel amplifier will send a status message:



The multi-channel amplifier is now in pseudo-binary mode and the commands specified earlier can be used.

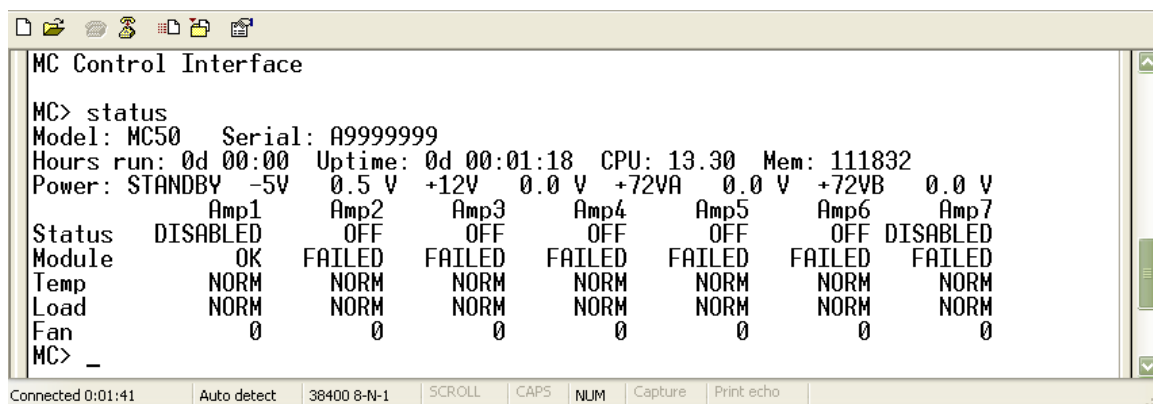
The multi-channel amplifier switches to ASCII mode:

- o Press Return three times.



ASCII commands can now be issued.

For example Type 'status', return:



```

MC Control Interface

MC> status
Model: MC50      Serial: A9999999
Hours run: 0d 00:00  Uptime: 0d 00:01:18  CPU: 13.30  Mem: 111832
Power: STANDBY  -5V   0.5 V  +12V   0.0 V  +72VA   0.0 V  +72VB   0.0 V

Status  Amp1    Amp2    Amp3    Amp4    Amp5    Amp6    Amp7
Module  DISABLED OFF     OFF     OFF     OFF     OFF     DISABLED
Temp    NORM    NORM    NORM    NORM    NORM    NORM    NORM
Load    NORM    NORM    NORM    NORM    NORM    NORM    NORM
Fan      0       0       0       0       0       0       0
MC> _

```

Connected 0:01:41    Auto detect    38400 8-N-1    SCROLL    CAPS    NUM    Capture    Print echo

## Ethernet mode

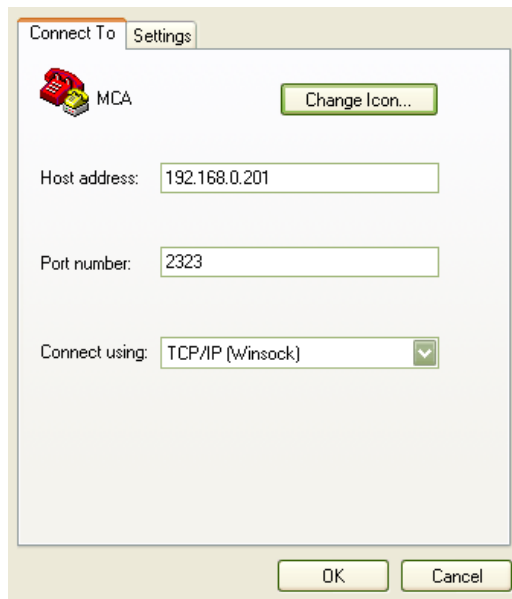
The multi-channel amplifier and the control computer must both be connected to a working Ethernet network and the multi-channel amplifier must have a known IP address.

You may have to connect with a serial connection first and type the command 'net' to get the current IP address of the multi-channel amplifier.

*Note that if the DHCP state is 'Always' or 'Auto' the IP address may change each time the multi-channel amplifier is restarted. This depends on the setting of the DHCP server.*

To connect:

- o Select: File>New to create a new connection.
- o Set Connect using to TCP/IP (Winsock).
- o Set the Host address to the IP address of the multi-channel amplifier.
- o Set the Port number to 2323 for ASCII mode or 2324 for pseudo-binary mode.



Once connected, the commands are the same as for the serial communications mode.

## Using Internet Explorer

Once the multi-channel amplifier is established on an Ethernet network the internal web page can be accessed via a web browser.

- o Type 'http://IP address' into the address bar of Internet Explorer where 'IP address' is the IP address of the multi-channel amplifier, such as:

http://192.168.0.191.

- o Press 'Go'.

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