

# TigerSet Communication

## Description and Use

TigerSet is a software upgrade to any TigerStop where remote control of the stop and other equipment is required.

TigerSet lets you bypass the controller and communicate directly with TigerStop through a serial port, using your terminal program. The following instructions are based on Windows HyperTerminal, a program used to control serial devices.

**HyperTerminal is NOT included in Vista or Windows 7.**

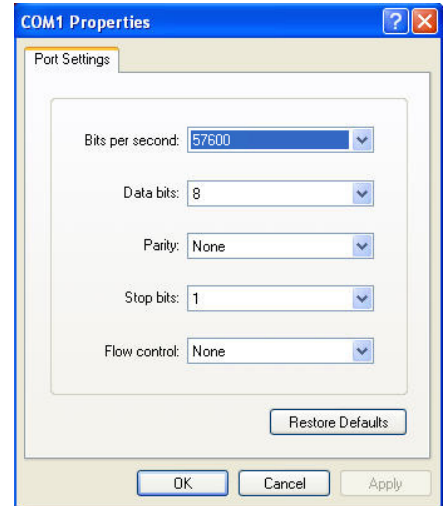
Here are some alternatives that are available on the internet as free software downloads.

1. Tera Term - <http://hp.vector.co.jp/authors/VA002416/teraterm.html>
2. LKA - <http://hem.passagen.se/downloadlka/lka/index.htm>
3. RealTerm - <http://realterm.sourceforge.net/>

TigerSet is available both for current TigerStop version 5.0+, and for upgrading previous TigerStop versions 3.5 to 4.72.

TigerSet must be enabled to use it. Contact TigerStop Technical Support to find out how to add TigerSet to your work station.

To start using TigerSet, connect TigerStop and your PC, and configure the serial port.



HyperTerminal configuration dialog

## Connect and Configure the Serial Port

### Connect TigerStop to your PC

#### TigerStop 5.0+



Fig. A - Tiger 5.0+ Controller

On TigerStop version 5.0+, TigerSet lets a device communicate with TigerStop through the serial port on the amplifier. Run a 9 pin straight-through (DB9-to-DB9) extension cable from your PC to the serial port on the amplifier.



Fig. B - Tiger 5.0+ Serial Port

#### TigerStop 3.5 ~ 4.72



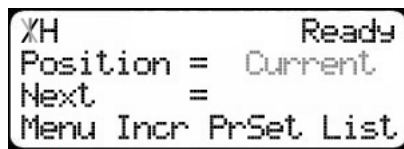
Fig. C - Tiger 3.5-4.72 Controller

On TigerStop versions 3.5 to 4.72, TigerSet lets a device communicate with TigerStop through the serial port on the controller. Run a 9 pin straight-through (DB9-to-DB9) extension cable from your PC to the serial port on the controller.



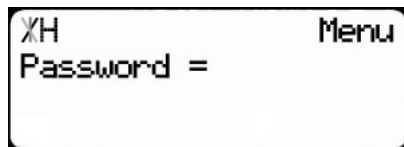
Fig. D - Controller Serial Port

**Verify TigerStop baud rate to be 57600 bps**  
**TigerStop 5.0+**



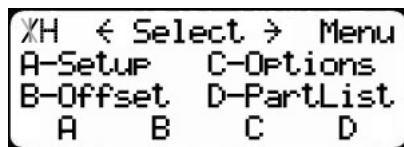
**At the Ready Screen...**

1. press [A] to select **Menu**. After pressing [A] for Menu...
2. Enter the password and press <sub>ok</sub>.



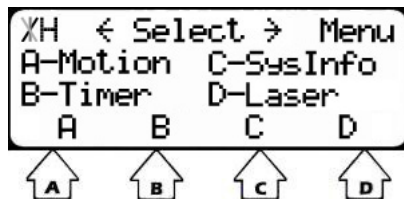
**At Menu screen 1...**

3. press for Menu screen 2.



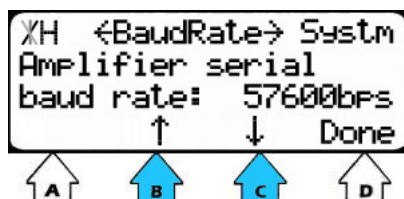
**At Menu screen 2...**

4. press [C] to access System Information.
5. Press to scroll through the system menu items to **BaudRate**.



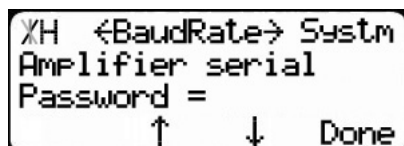
Baud Rate sets the **serial port** baud rate at which your PC and TigerStop amplifier communicate.  
**For TigerSet, the baud rate should be 57600.**

If the baud rate is 57600, just press Done, to accept it and exit the menu.  
 If the baud rate must be changed, follow the steps below.

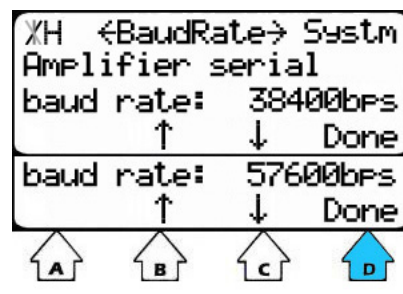
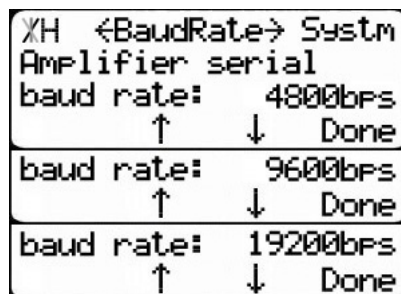
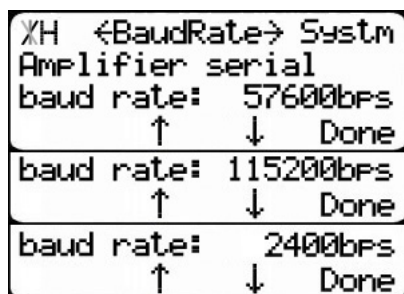


The current baud rate is displayed at this screen.

6. Press [B] or [C] to trigger password prompt.
- Baud rate is a **list parameter**.



7. Enter the password, and press [=].
8. Press [B] or [C] to scroll through the baud rates.



9. Press [D] to save selection and exit to the Ready Screen.

### TigerStop 3.5 ~ 4.72

The first setting in the Service Menu is the Baud Rate for the controller. To change the baud rate, follow the instructions below.

**For use with TigerSet, the baud rate should be set to 57600.**

Access to Service Menu



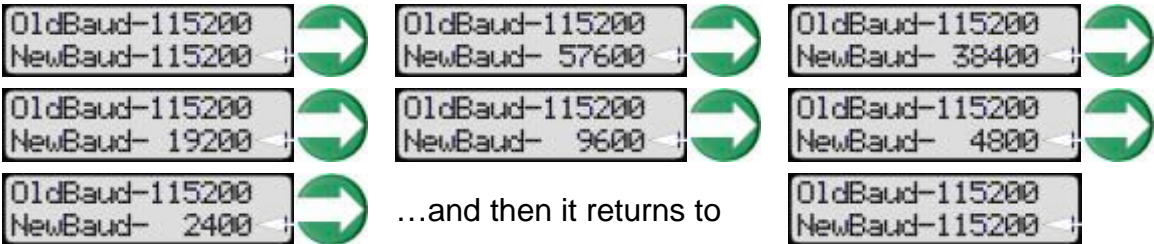
The first setting in the Service Menu is the controller Baud Rate.

- In version 3.0 it appears as **1 - Baud**.
- In version 3.5 and later, it appears as **1 - BR**.
- The baud rate for the controller and the PC's com port must be set to the same value.

To change the baud rate...

- At the service menu  press  to select the Baud Rate parameter. The top line of the screen displays the current baud rate, the bottom line displays the new baud rate.

- Press  to cycle through the available baud rates from highest to lowest...



- When the desired baud rate displays, press  to select it as the new baud rate and return to the service menu .

- To exit the Service Menu, press . The baud rate change takes effect upon exit.

## Configure your terminal program

Example shown is Windows HyperTerminal

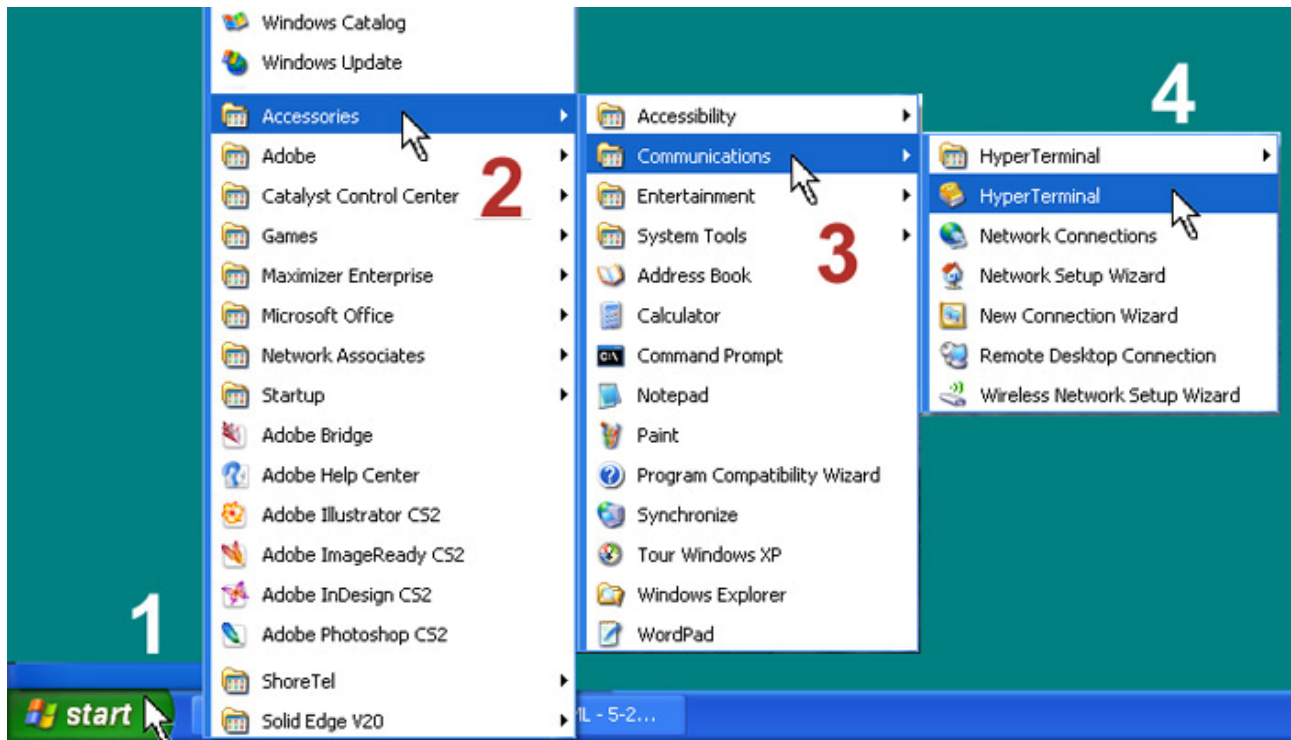


Fig. 1 - Run HyperTerminal.

(1) Click **Start** and open Programs list. (2) Click **Accessories**. (3) Click **Communications**. (4) Click **HyperTerminal**.

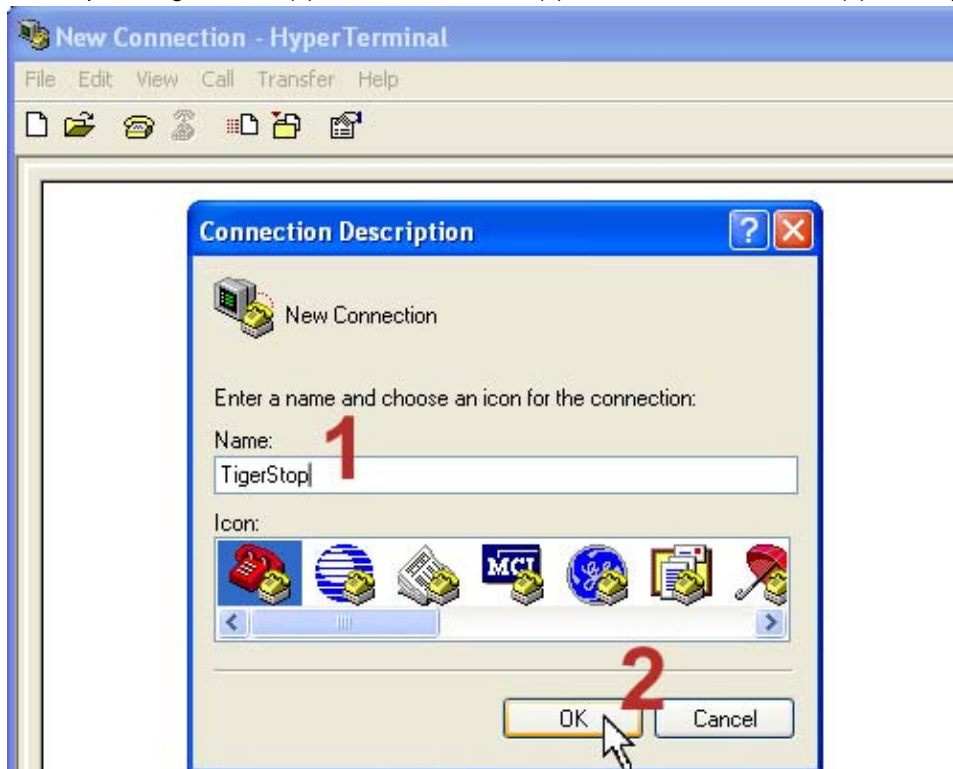


Fig. 2 - Create a new connection.

(1) Type in the name of your new connection. (2) Click **OK** to save it.

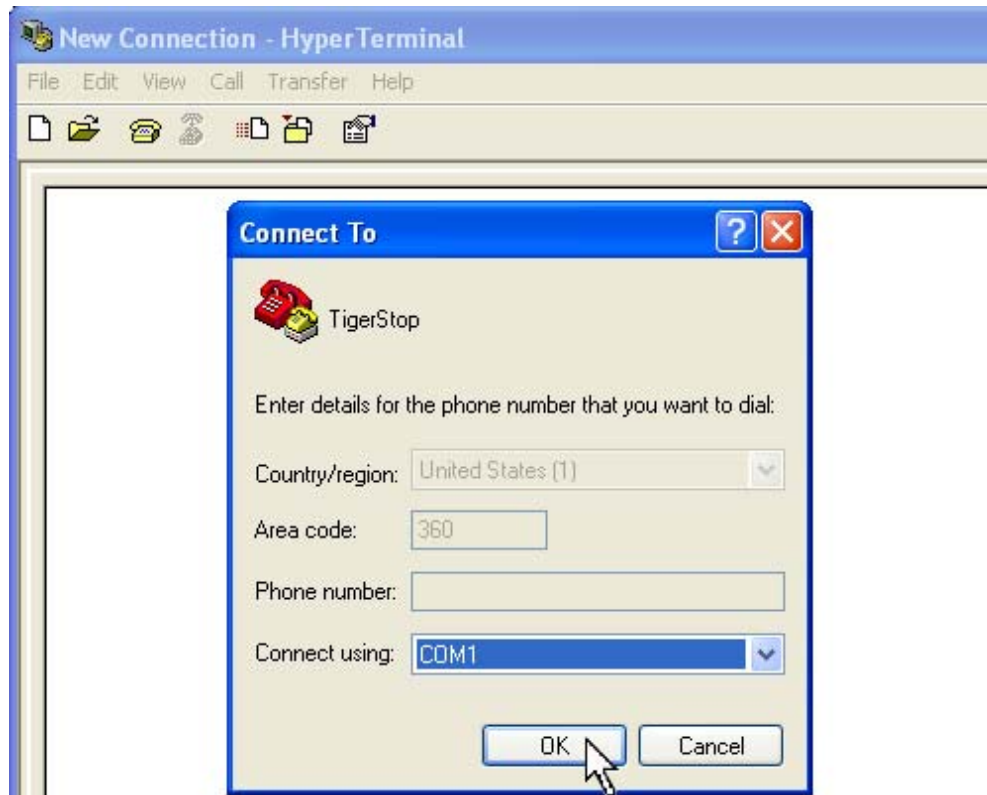


Fig. 3 - Select **Com1** (or the Com port # that corresponds to the serial port you are to connect to) and click **OK** to continue.

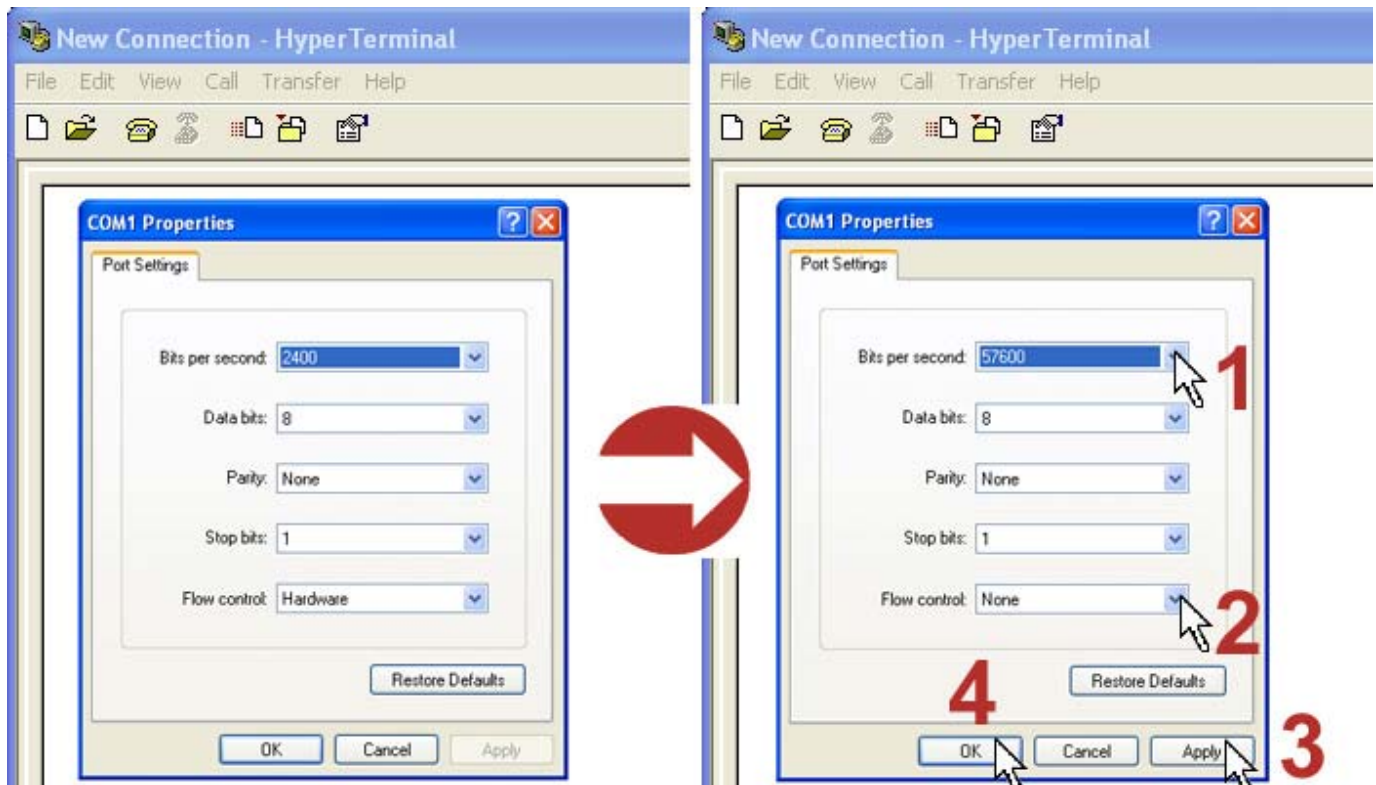


Fig. 4 - Set COM1 properties (set the port settings).

- (1) Click **Bits per second** drop-down menu and select **57600**.
- (2) Click **Flow control** drop-down menu and select **None**.
- (3) Click **Apply**.
- (4) Click **OK** to save the settings and exit.

# Test the TigerSet Connection

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## Check list

- TigerSet has been enabled.
- 9 pin communications cable has been run from the PC or other device to the TigerStop serial port.
- On TigerStop 5.0+ it plugs into the only serial port on the amplifier.
- On TigerStop 3.5 to 4.72 it plugs into the middle port on the top of the controller.
- TigerStop baud rate has been set to 57600.
- HyperTerminal has been correctly configured.

## Test the connection

1. Power up TigerStop, and after clearing the table, press [START] to initiate the **Home routine**. For complete instructions see...Simple Start Up.
2. Make sure that TigerStop finished the Home routine and is at the Ready Screen.
3. Run HyperTerminal (or other terminal program).
4. In HyperTerminal, type **p** and hit **Enter**. If the connection is good, you should see the current TigerStop position displayed on the PC screen. This is the P command.
5. Do another test. Type **g** and a position within the range of your TigerStop, and hit **Enter**. The stop should move to that position. This is the G command.
6. Do one more test. Type **d** and hit **Enter**. The screen should fill up with the 66 system data subcommands. This is the D command. **You're connected!**

## Troubleshoot the connection

If you did not see the current TigerStop position on the PC screen when you typed in **p<cr>**, the connection is faulty.

1. Close the HyperTerminal program, and then start it again. This will give the terminal program another chance to identify the machine.
2. Type **p** and hit **Enter**. The current TigerStop position should display on the PC screen.
3. If it does not, unplug the communications cable running from TigerStop to the PC, and then plug it back into the PC.
4. If you still get no response, check to make sure that TigerSet has been enabled.
5. If you have no success, consult [TigerStop technical support](#) for assistance.

# TigerSet Commands

TigerSet allows a device to communicate with TigerStop through the serial port on the amplifier (versions 5.0 or later) or on the controller (versions 3.5 to 4.72).

## Command Interface version 5.x Overview

Most commands are one or two characters followed by a **<cr>** carriage return. For example...

- To **read** the current TigerStop position, type **p** and **<cr>**. The current position displays.
- To **read** the current kerf setting, type **d** (for data) **23** (item 23) and **<cr>**. The current kerf setting displays. In this example, it is easier to just type **d<cr>** and see the whole list. Kerf is item 23.
- To **write** a new kerf setting, type **d23**, space, **X.YYY**, and **<cr>**. For example: **d23 0.132<cr>** will change the kerf setting to 0.132", and the screen will display **0.132** on line 1 and **A** on line 2, indicating the new value of **0.132** is **A**cknowledged.

**IMPORTANT! After changing a setting, as in the example above, TigerStop must be powered OFF and then ON in order to SAVE the change!**

- If the amplifier returns **A** after executing a command, it is Acknowledged.
- If the amplifier returns **X** after executing a command, it is **Not** Acknowledged.
- For a two letter command, type **mh** and **<cr>**. In this example, the home routine is run.

## Command Summary

Command	Description
A	Analog interface
B	Command and error log
C	Counter interface
D	System data interface
E	Emergency stop
F	Special functions
G	Comm1 Go command, this command moves TigerStop to an absolute position.
H	Comm1 Home command, this command <b>homes</b> TigerStop.
I	Comm1 Input command, TigerStop responds with the status of the <b>DM circuit</b> .
L	Comm2 Look command, TigerStop responds with current position, etc.
M	Move interface, performs several operations related to TigerStop movement.
O	I/O status
P	Comm1 Return position. TigerStop responds with current position.
R	Comm2 Read command. TigerStop responds with current motion values.
S	Comm1 Status command. TigerStop responds with current status.
V	Comm1 Return version. TigerStop responds with software version.
W	Comm2 Write commands.
Z	Return RTOS status.
?	Help. Essentially a <b>TOC</b> of all the commands.

## Command Details

### A Analog Interface, Serial

There are 6 analog subcommands:

- 0 = Read all 5 channels
- 1 = Read drive current
- 2 = Read high voltage
- 3 = Read +15 volts
- 4 = Read amplifier temperature in °C
- 5 = Read +24 volts

#### Examples

Type **a** or **a0** and **<cr>**, items 1 to 5 will display:

- 1, Drive Current, -0.2
- 2, High Voltage, 166.7
- 3, +15 Volt, 15.3
- 4, Amp temp, 25.4C 77.7f
- 5, +24 Volt, 24.6

Type **a1**, **a2**, **a3**, **a4** or **a5** and **<cr>**, only the item you requested will display, without the label:

Type **a6** and **<cr>** or any other number, and an error code will display:

X EC=2 Bad Arg EC = error code, Bad Arg = error text

### B Command and error log, Serial only

Typing **b** and **<cr>** with no number will display the last 20 entries.

Typing **b** with an index number and **<cr>** will display entries starting with your index and working back 20 entries.

#### Examples

Typing **b20** and **<cr>** will display entries 20-40 with 20 the newest and 40 the oldest.

### C Counter interface, Serial

There are 23 counter subcommands:

**c0** = Read, all subcommands, **cn** = Read item number **n**, for n = 1 to 23

#### Examples

Type **c** or **c0** and **<cr>**, items 1 to 23 will display:

- 1, UpTime = 262571
- 2, PowerOns = 11
- 3, WLMoves = 0
- 4, ManualMoves = 2
- 5, Total Moves = 23
- 6, SerComds = 8269
- 7, CanComds = 606
- 8, Total Comds = 8875
- 9, CNTRuserWrts = 0
- 10, CNTRbuWrts = 11
- 11, SluserWrts = 10
- 12, SlbuWrts = 11
- 13, SlfactWrts = 0
- 14, Total Inchs = 582, ft=48.5, miles=0.009, meters=14.783
- 15, C log Index = 100



16, E log Index = 0  
 17, Can Errors = 2575  
 18, Demo Time = 601  
 19, Amp Temp Avg = 20.2c 68.4f  
 20, Amp Temp Max = 27.1c 80.8f  
 21, MotorAmp Avg = 0.2, HP = 0.1  
 22, MotorAmp Max = 0.3, HP = 0.1  
 23, Tool Time ms = 0

Type **c** and a number from 1 to 23 and **<cr>**, only the item you requested will display, without the label.

Type **c** and a higher number and **<cr>**, and an error code will display:

X EC=2 Bad Arg EC = error code, Bad Arg = error text

## D System data interface, Serial

There are 66 system data subcommands:

**d0** = Read, all subcommands, **dn** = Read item number **n**, for **n** = 1 to 66

**Note: The 66 system data subcommands can be different from the example, based on the TigerStop software version installed.**

### Examples

Type **d** or **d0** and **<cr>**, all items will display:

1, P Gain = 2.000 2, I Gain = 0.750 3, D Gain = 20.000  
 4, Vel In = 25.000 5, Vel Out = 25.000 6, Acc In = 75.000  
 7, Acc Out = 75.000 8, Dec In = 75.000 9, Dec Out = 75.000  
 10, Lim Max = 126.000 11, Lim Min = 6.000 12, Calib = 126.000  
 13, Scale = 2.36200 14, Dither = 850 15, Debug = 0  
 16, Clamp 1 = 5.000 17, Clamp 2 = -5.000 18, Position = 126.000  
 19, PrtType = 5 20, PrtBaud = 57600 21, CommBaud = 57600  
 22, JetOffset = 0.000 23, Kerf = 0.125 24, Head Cut = 1.499  
 25, Tail Cut = 1.000 26, Outfeed = -1.000 27, Backoff = 0.000  
 28, Retract = 0.000 29, Ret Offset= 0.000 30, Feed Haz = 0.000  
 31, Load Off = 0.000 32, Max SPL = 120.000 33, opti Score= 2.000  
 34, opti Time = 2.000 35, opti Pen = 0.000 36, Move Delay= 0.000  
 37, Lash = 0.030 38, SM Table = 0 39, SC Trigger= 0  
 40, Motor Type= 0 41, ME Zero = 1 42, language = 0  
 43, conSleep = 0 44, MM ratio = 0 45, contrast = 100  
 46, prt Names = 0 47, prt Cuts = 0 48, prtBarcode= 0  
 49, IOReadMask= 0 50, IOWritMask= 0 51, presettype= 0  
 52, wastefirst= 0 53, conPW = \*\*\*\*\* 54, ClampOn\_D = 0.100  
 55, SawOn\_D = 0.100 56, DMOff\_TO = 5.000 57, TAOOn\_TO = 5.000  
 58, TAOOff\_TO = 5.000 59, DMOOn\_TO = 5.000 60, ClampOff\_D= 0.100  
 61, SawCyc\_D = 0.100 62, RSD\_Rdy\_TO= 1.000 63, Timer10 = 0.100  
 64, AutoTest = 0.000 65, CrossCal = 60.000 66, CrossAlarm= 0

Type **d** and a number from 1 to 66 and **<cr>**, only the item you requested will display, without the label.

Type **d** and a higher number and **<cr>**, and an error code will display:

X EC=2 Bad Arg EC = error code, Bad Arg = error text

## E Comm1 E-stop

Typing **e** and **<cr>** will cause TigerStop to **X out**.

### Restart TigerStop

To restart TigerStop, that is, to get out of status X, you must run the Home Routine.

## F Special functions, Serial

There are 4 special functions subcommands:

- 1 = Write Save Factory [settings]
- 2 = Write Load Factory [settings]
- 3 = Write Load Defaults
- 4 = Write Load HV Defaults

### Examples

Type **f** and a number from 1 to 4 and **<cr>** to select one of the four special functions.

## G Comm1 Go command, Serial

The Go command moves TigerStop to a position.

### Examples

Type **g** and a desired position and **<cr>** to move TigerStop to that position.

## H Comm1 Home command, Serial

The Home command runs the TigerStop home routine.

### Examples

Type **h** and **<cr>** to run the TigerStop home routine.

## I Comm1 Input command, Serial

The Input command returns the condition of the **DM circuit**.

### Examples

Type **i** and **<cr>**. The condition of the DM circuit displays.

## L Comm2 Look commands, Serial

There are 4 look subcommands:

- p = Read position, the same as the Position command
- r = Read raw data on the 6-pin port on amplifier
- s = Read state, the same as the Status command
- t = Read latched

### Examples

Type **l** and the letter **p**, **r**, **s** or **t**, and **<cr>** and position, raw data, state or latched will display.

## M Move interface, Serial

There are 6 move subcommands:

- g = Go to position
- h = **Home** the machine
- s = Stop movement
- e = Write **E-stop**
- m = **Min-max** the machine

### Examples

Type **mg** and a desired position and **<cr>** to move TigerStop to that position.

Type **mh** and **<cr>** to run the TigerStop home routine.

Type **ms** and **<cr>** to stop TigerStop movement. This does **not** perform an **E-stop**.

Type **me** and **<cr>** to perform an an **E-stop**, and cause TigerStop to **X out**.

Type **mm** and **<cr>** to run the TigerStop Min-max Routine.

## O I/O status

I/O Status command returns the status of the I/O's.

### Examples

Type **o** and **<cr>**, and the status of the I/O's will display:

SE=OFF DM=OFF TA=OFF L1=ON L2=ON FS=OFF FST=OFF SC=ON OSM=65 SM=65 T=0

## P Comm1 Position command, Serial

The Position command returns the current position of the stop.

### Examples

Type **p** and **<cr>**. The current TigerStop position displays.

## R Comm1 Read command, Serial

The Read command returns the current values of:

Velocity, Acceleration, Deceleration, Maximum Limit, Minimum Limit

### Examples

Type **r** and **<cr>**. Current values display: 25.000 75.000 75.000 103.497 5.150.

## S Comm1 Status command, Serial

The Status command returns current TigerStop conditions or states.

These states are displayed in the upper left corner of the TigerStop controller LCD screen.

Status	Controller	Description
0	<b>H</b>	TigerStop is in a normal stopped condition, <b>H</b> olding position.
1	<b>A</b>	TigerStop is <b>A</b> ccelerating.
2	<b>C</b>	TigerStop is moving at a <b>C</b> onstant speed.
3	<b>D</b>	TigerStop is <b>D</b> ecelerating.
4	<b>X</b>	TigerStop <b>e</b> xperienced some abnormal condition, drive disabled, <b>a.k.a.</b> "X'd out" Run the home routine to recover.
5	<b>L</b>	TigerStop is executing a Lash reducing movement.
6	<b>W</b>	TigerStop is <b>W</b> aiting to move.
7	<b>S</b>	TigerStop is decelerating to a <b>S</b> top (versions 3.0 to 4.7 only).
8	[blank]	The amplifier is in sleep mode (version 5.0 or later only).
	<b>N</b>	TigerStop amplifier is <b>N</b> ot responding (version 5.0 or later only). Reseat the controller cable and <b>cycle power</b> .

### Examples

Type **s** and **<cr>**.

If TigerStop is at rest, a value of **0** will be displayed.

If TigerStop is moving to a position, a value of **2** will be displayed.

## V Comm1 Version command, Serial

The Version command returns the current software version.

### Examples

Type **v** and **<cr>**. The current amplifier software version displays.

## W Comm2 Write commands, Serial

There are 2 write subcommands:

b = Write Bytes to the I/O

i = Write to a specific bit of the I/O

Data values are in ASCII hexadecimal format. Data bits in data bytes are numbered 0-7.

<lf> = line feed

### Examples

#### wb Command

Type **wb**, **nn**, and **<cr>**.

Data sent to 6-pin port on amplifier:	<b>wbnn&lt;cr&gt;</b>
nn = 2 data bytes 0 = open circuit for specified I/O line 1 = specified I/O bit at 0V	
Example of data sent to the 6-pin port on amplifier:	<b>wb4C&lt;cr&gt;</b>
Example of resulting data from 6-pin port on amplifier:	<b>wb&lt;cr&gt;&lt;lf&gt;</b>
4C (hex) = 01001100 (binary) I/O bits 2, 3, and 6 are at 0V. All other bits are off.	

#### wi Command

Type **wi**, **b**, **d**, and **<cr>**.

Data sent to c6-pin port on amplifier:	<b>wibd&lt;cr&gt;</b>
b = bit to set d = data to which a specified bit will be set	
Example of data sent to the 6-pin port on amplifier:	<b>wi41&lt;cr&gt;</b>
Example of resulting data from 6-pin port on amplifier:	<b>wi&lt;cr&gt;&lt;lf&gt;</b>
Bit 4 is set to 1.	

## Z RTOS status, Serial only

### Examples

Type **z** and **<cr>**, the RTOS status will display:

```
UpTime = 3d:3h:53m:2s, LFS = 5400, MemSegs= 2/4
Task Name  Pri Stack f/u
PID Loop   4  376/ 424
CanTask    6  344/ 256
Rs232Task  7  308/ 292
XmitTask   12 932/1468
ComdTask   13 824/1576
SM Task    14 928/ 272
MoveTask   15 320/ 680
Analog Task 16 284/ 316
FunTask    17 444/ 156
SITask     19 332/ 268
CntrTask   20 472/ 128
HK Task    21 292/ 368
pos = 60.003, drive = 10
```

LFS is Largest Free Segment, the largest free memory segment from the memory pool.

MemSegs X/Y X = memory segment allocated now Y = maximum number allocated.

### ? Help, Serial only

The Help command returns a list of all the commands and an abbreviated description.

## Examples

Type ? and <cr>. A list of commands displays.

A ->Analog#-RWD	B ->comd Log-D	C ->Counters#-RD	D ->Data#-RWD
E ->NI	F1->Save Factory	F2->Load Factory	F3->Load Default
G ->Go pos,vel,accel,decel-W		L ->NI	
ME->Move Estop-W	MG->Move Go pos,vel,accel ,decel-W		MH-> Move Home-W
MM-> Move MinMax-W	MS->Move Stop-W		
O ->Input-R	P ->Position-R	V ->Version-R	
		Z ->OS Data-D	? help-R

# I/O Cable Layout

## What is an I/O Pin?

The TigerStop has both 6 and 8 I/O pins, what are they and how can they be used?

- Each I/O pin is both an Input and an Output and can be used as both at the same time.
- **Input** pins are used to **read** the outside world, and **Output** pins are used to **control** the outside world.
- Input pins are designed to read *dry contacts* meaning they do not need an external voltage to work. Connect your relay, switch or open collector NPN transistor to the Input pin and common then you can read the switch condition via serial I/O commands. Inputs can also be driven with up to 24 volt signals, but the logic threshold is still 2.0 volts or less for a 0 logic state, and 3.0 volts or higher for a 1 logic state.
- Output pins function as a "neutral switch" meaning one side of your output device is connected to the +24 from the 6 or 8 pin connector and the other to the output pin. Max sink current for any one output is 0.5 amps with a max for all outputs of 1.0 amps. The 24 volt supply is fused inside with internal replaceable fuse F1 (20mm glass 1 amp 250volt fast blow).
- Inputs and Outputs are connected to the same pin for each of the 8 bits. With this connection any pin can be used as both Input and Output, you can read your Outputs for test reasons.

**TigerStop 3.5~4.72**

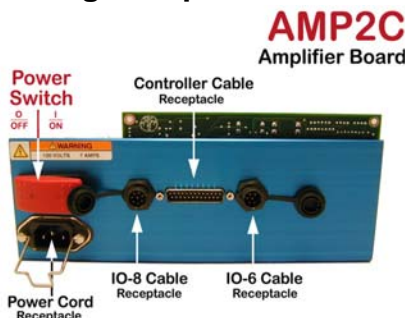


Fig. 1

**TigerStop 5.0+**

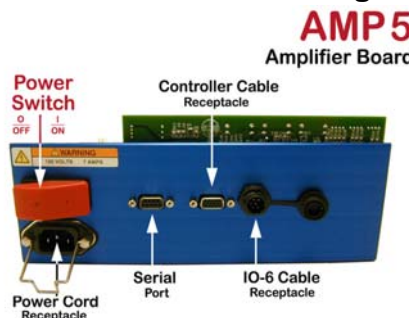


Fig. 2

**COMM**

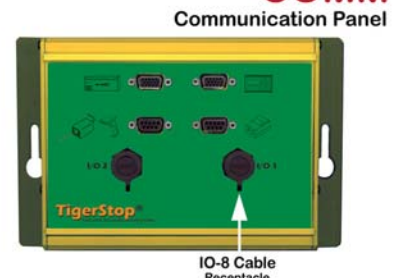


Fig. 3

## TigerStop 3.5 ~ 4.72

All TigerStops versions 3.50 to 4.72 are equipped with one 6 pin I/O receptacle and one 8 pin, both on the amplifier (Fig. 1), on either side of the controller cable receptacle.

## TigerStop 5.0+

All TigerStops versions 5.0 and later are equipped with one 6 pin I/O receptacle on the amplifier (Fig. 2), next to the controller cable receptacle. Additional 8 pin I/O receptacles are available by employing one or more communication panels (Fig. 3). As many as four comm panels can be cabled together to provide as many as eight 8 pin I/O's.

## Setting the logic of the I/O pins

The logic of all I/O pins can be set...

- on TigerStop 3.5~4.72 via the Service Menu in the controller.
- on TigerStop 5.0+ via ...

6 pin I/O Connector		
Pin	Bit	Description
1		0 vdc - Common
2	2	<i>Dead Man</i> input
3	4	Top proximity sensor input
4	3	Foot switch input
5	1	Tool Enable on SIKs, Tool Move on AIKs Output
6		+24 vdc

Fig. 4

8 pin I/O Connector		
Pin	Bit	Description
1		+24vdc
2	3	Foot switch input
3	4	Top proximity sensor input
4	5	Beeper & Light Out
5	6	TigerMeasure input and Image Print Signal
6	7	Clamp 2
7	8	Clamp 1
8		0 vdc - Common

Fig. 5

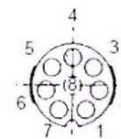
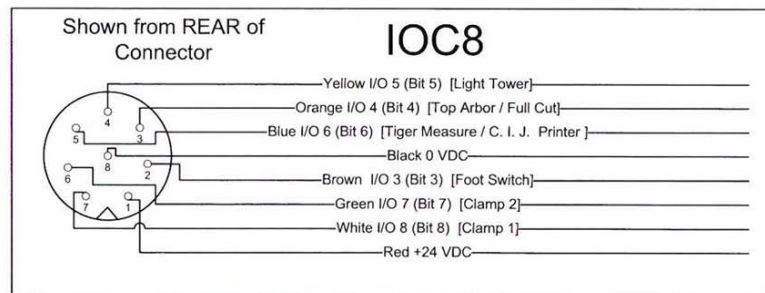
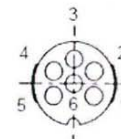
### TigerStop I/O Cable Layout

Cord Connector Arrangements shown from rear of connector (solder view)  
Pin 1 noted with Dimple

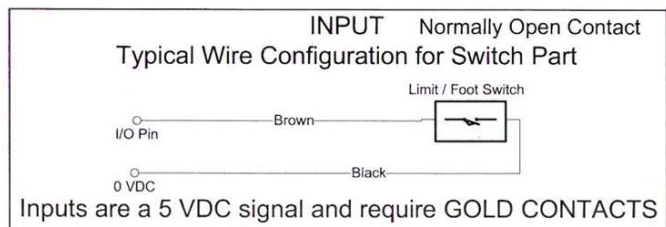
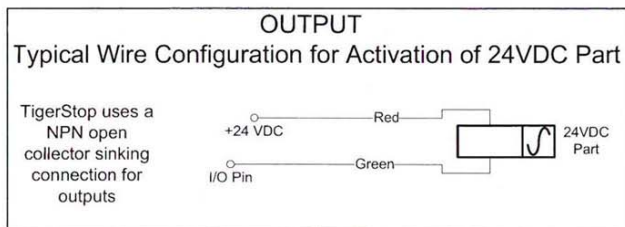
Note,  
There is a Max of 1 AMP of power available on this circuit.



Plug to bare ends normally 12' IOC6, IOC8  
-30 indicates 30' wire length



TigerStop uses a NPN open collector sinking connection.



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TigerStop LLC, Assembly Plant, 12909 NE 95th Street, Vancouver, WA 98682 USA

Customer Service 360.448.6102 — Fax 360.260.0755 — Web [www.tigerstop.com](http://www.tigerstop.com)

