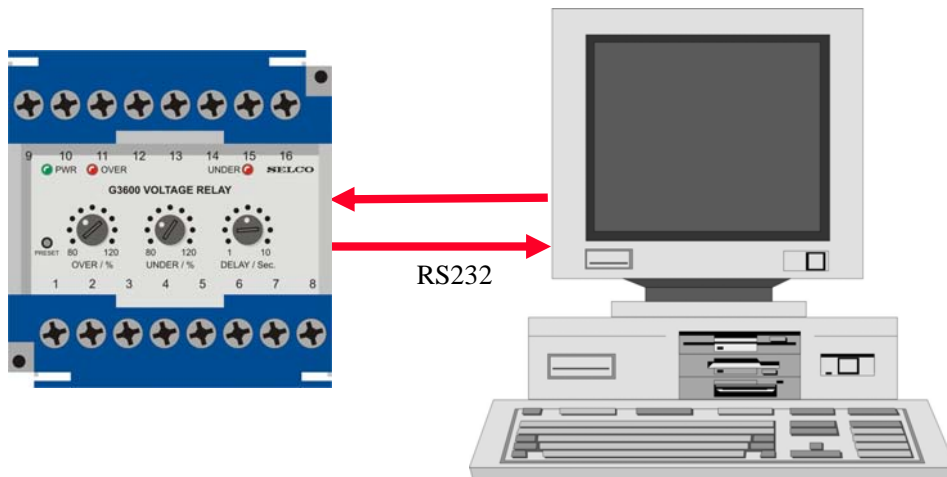


**G0100 Programming Kit for
G-Line Relays
T7900 Electronic Potentiometer**



User's Manual

G0100-33E

SELCO A/S

**Meterbuen 6-12 - DK-2740 Skovlunde
Denmark**

Phone: 45 7026 1122 - Fax: 45 7026 2522

e-mail: selco.dk@selco.com

www.selco.com

TABLE OF CONTENT

Preface.....	3
Connecting the PC	4
Installing HyperTerminal.....	6
Configuring HyperTerminal	10
Starting a pre-configured HyperTerminal.....	16
Reading the current configuration	18
Commands	19
G2000 Power Relay	19
G2200 Current Relay	20
G3000 Frequency Relay	21
G3100 Voltage Relay.....	22
G3300 Voltage Relay.....	23
G3600 Voltage Relay.....	24
T7900 used as an Electronic Potentiometer.....	25
T7900 used as a Power Reference Unit	27

Preface

The SELCO G-Line relays and the SELCO T7900 Electronic Potentiometer can be configured using a standard PC and standard communication software (e.g. HyperTerminal which is a part of any windows operating system).

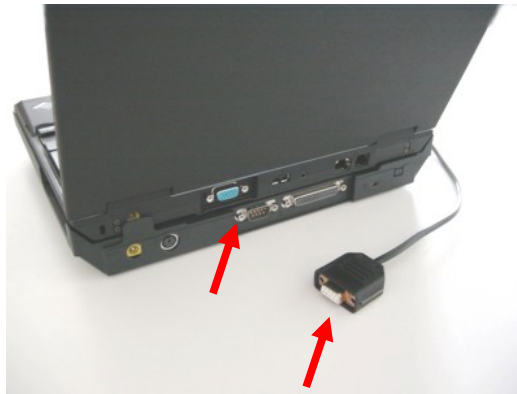
The optional SELCO G0100 Programming Kit is the connection between the PC and the SELCO G-Line relay. The G0100 includes a special communication cable, which connects the PC serial port to the PROG connection of the SELCO G-Line relay or T7900 Electronic Potentiometer.

Advanced configuration is not required, but the feature allows the user to customize the behavior of the SELCO G-Line relay or T7900.

The SELCO G-Line relay or T7900 should be removed from the installation before any PC based configuration is attempted.

Connecting the PC

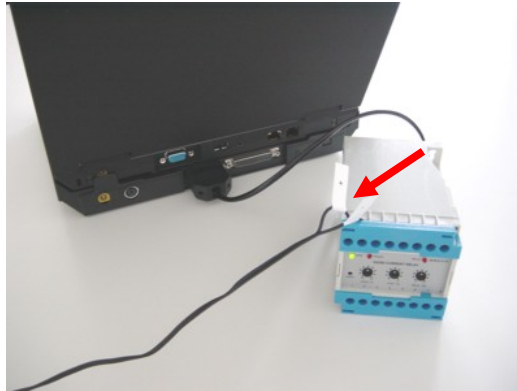
The communication cable included with the SELCO G0100 Programming Kit is used to connect the PC to the SELCO G-Line Relay or T7900. Follow the below procedure to prepare the system.



Connect the DB9 female plug of the communication cable to the male DB9 RS232 port of the PC.



Connect the RJ11 modular plug of the cable to the PROG connection located at the rear side of the SELCO G-Line relay or the front of T7900. You will need to depress the small plastic tab in order to make the plug “snap” into the connector.



Connect a +24 VDC power supply to the SELCO G-Line relay or T7900. The positive wire (+) connects to terminal 9 and the negative wire (-) connect to terminal 10 of the G-Line relay (terminals 11 and 12 respectively of the T7900). Turn on the power supply and check that the green PWR LED ignites.



Turn on the PC and await the completion of the boot sequence.



The Windows desktop has loaded and the PC is now ready for use.

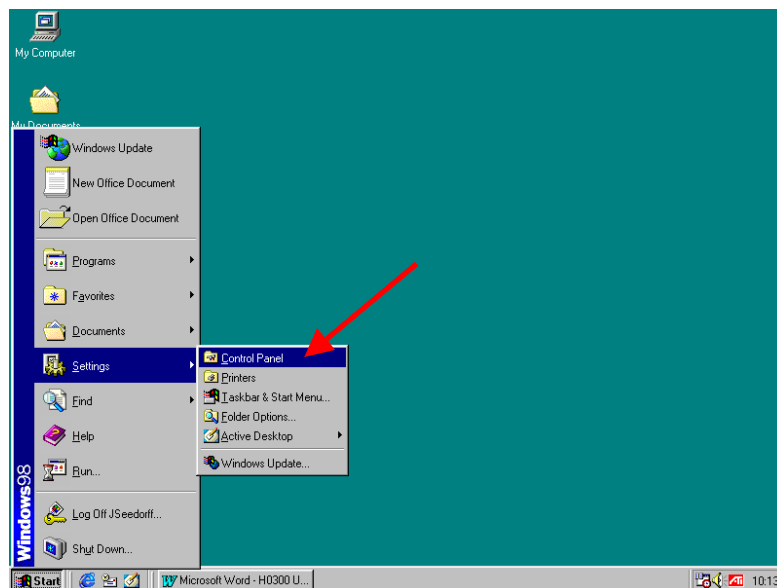
Installing HyperTerminal

HyperTerminal is the PC based software program supplied with the Microsoft Windows operating system. HyperTerminal is delivered together with Windows 9x, Windows ME, Windows NT, Windows 2000 and Windows XP.

Whether or not HyperTerminal is already installed on your PC, depends on which version of Windows that you are running. Also, you may or may not have selected to install HyperTerminal when you originally installed the Windows operating system onto your PC.

You can move on to the next section if HyperTerminal is already accessible on your system. If not, you need to install it. This is done from the *Add or Remove Program* icon located in the Windows Control Panel.

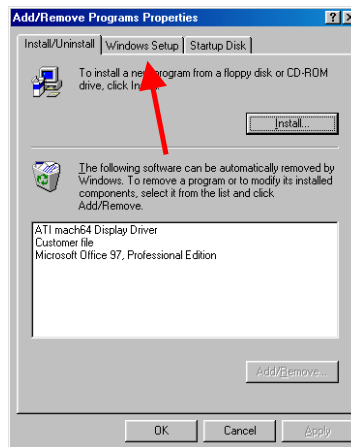
Follow the procedure below to install HyperTerminal on Windows 9x.



Left click on the *Start* button located at the lower left corner of the Windows desktop. Then select *Control Panel* from the *Settings* menu.

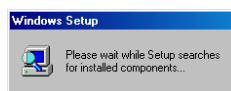


The *Control Panel* windows will emerge on the screen. Now double-click (left mouse button) on the *Add/Remove Programs* icon.

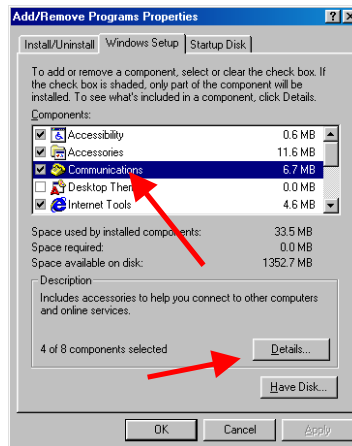


Double clicking on the *Add/Remove Programs* icon will bring up the *Add/Remove Programs Properties* dialog.

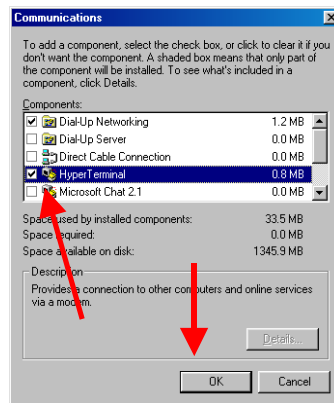
The HyperTerminal application is part of Windows setup (its on the Windows CD-ROM), thus its necessary to left click on the *Windows Setup* tab.



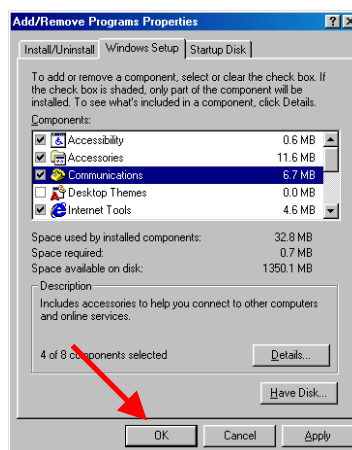
Before showing the installed components, Windows needs a couple of seconds to scan the PC. This is done while showing the above message.



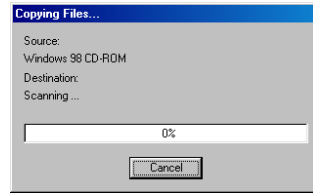
Now left click on *Communications* components and then left click on the *Details* button.



Left click on the check box just left of the *HyperTerminal* application. Then left click on the *OK* button.



Left click on the *OK* button to begin installing the HyperTerminal application.



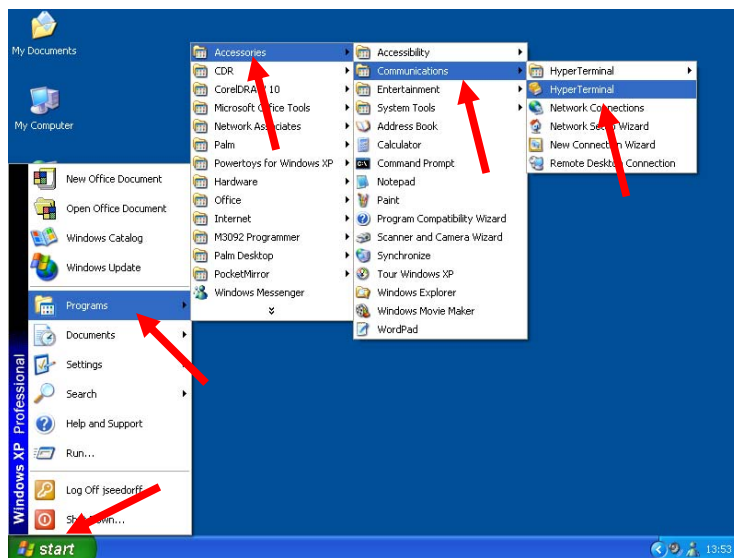
Windows will now ask for the installation CD-ROM. After inserting the CD-ROM, Windows will install the files for the HyperTerminal application.

Configuring HyperTerminal

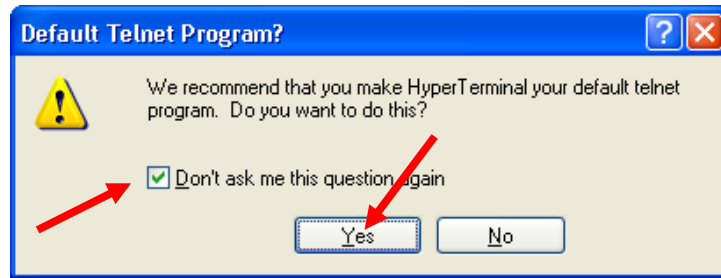
The examples show below is based on the HyperTerminal application delivered with Windows XP Professional. Other versions of HyperTerminal may vary a bit in appearance; however the configuration sequence is much the same.



First, start up the PC and wait until the Desktop is ready for your command.

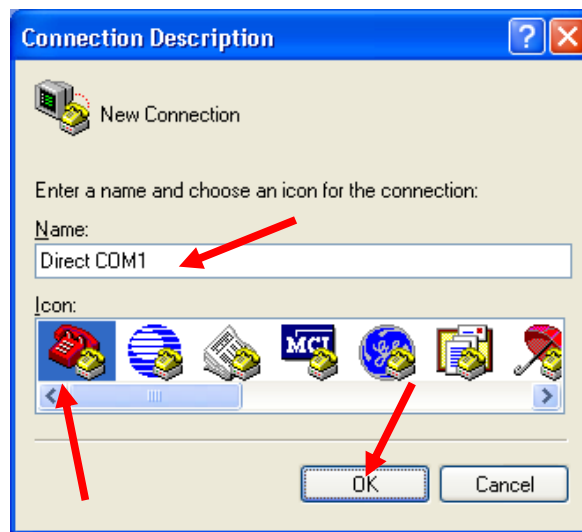


Left click on the *Start* button at the lower left corner to activate the *Windows Start Menu*. Then move the mouse pointer to *Programs*, *Accessories*, *Communications*. To start the application, left click on *HyperTerminal*.



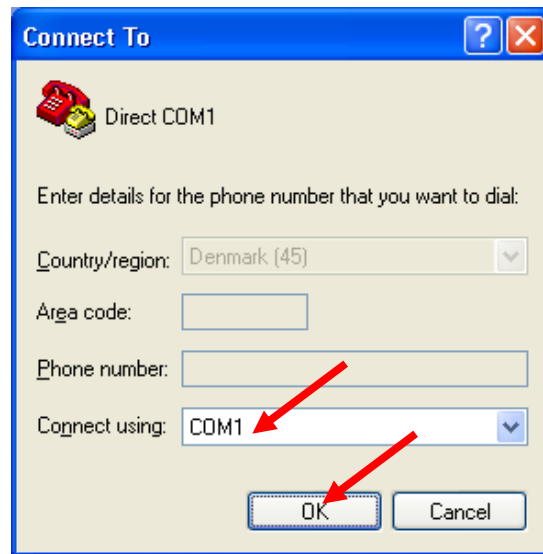
Left click on the *Don't ask me this question again* check box.

Left click on the *Yes* button to continue.



Left click in the *Name* box and enter a name for the new connection (e.g. *Direct COM1*). Then select the icon of your choice (move the slider and left click on the icon).

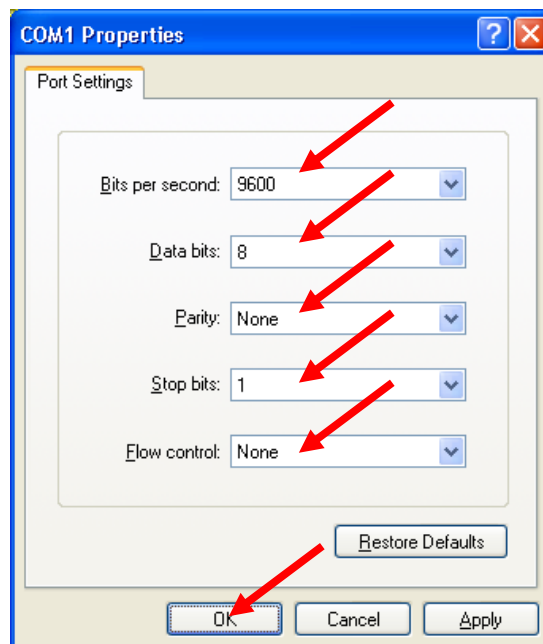
Left click on the *OK* button to continue.



At the *Connect Using* combo box, left click to select the COM-port. Select the COM-port to which the G-Line unit or T7900 has been connected (e.g. *COM1* or *COM2*).

It's normally not possible to use COM1 and COM3 (or COM2 and COM4) simultaneously. Thus you cannot use COM3 for the G0100 while you are using COM1 for the mouse. COM1 and COM2 can however be used simultaneously, as these two COM-ports works on different interrupts.

Left click on the *OK* button to continue.



Select *9600* from the *Bits per second* combo box.

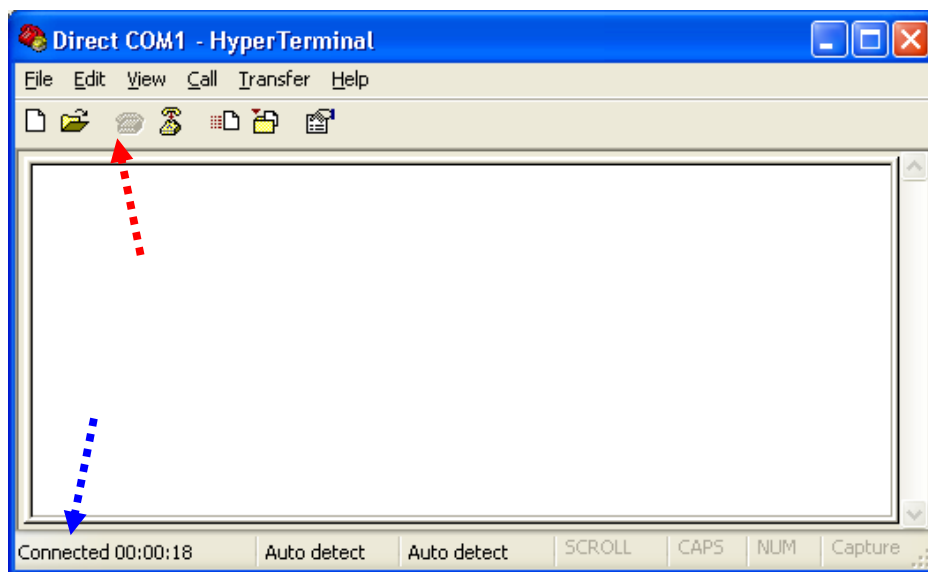
Select *8* from the *Data bits* combo box.

Select *None* from the *Parity* combo box.

Select *1* from the *Stop bits* combo box.

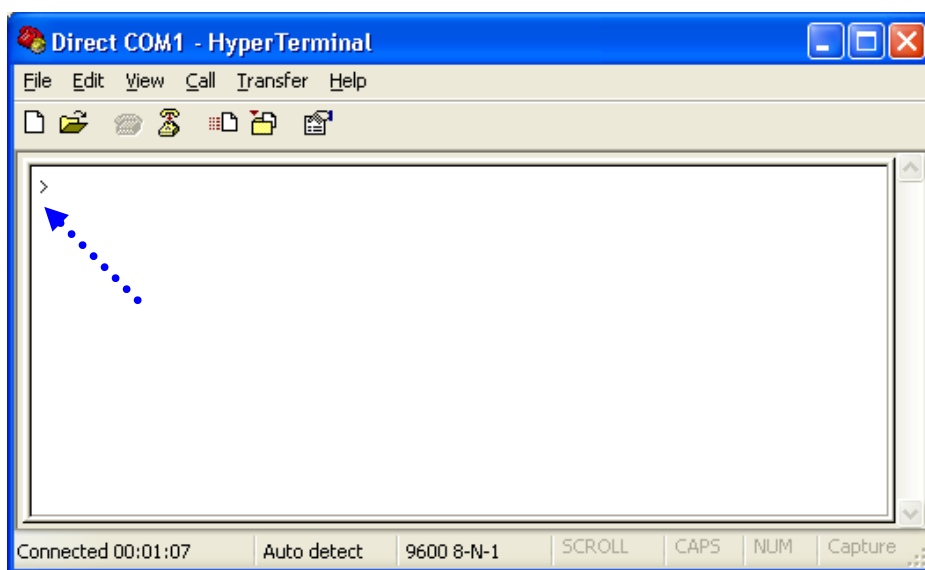
Select *None* from the *Flow control* combo box.

Left click on the *OK* button to continue.



The *HyperTerminal* application is now ready for use.

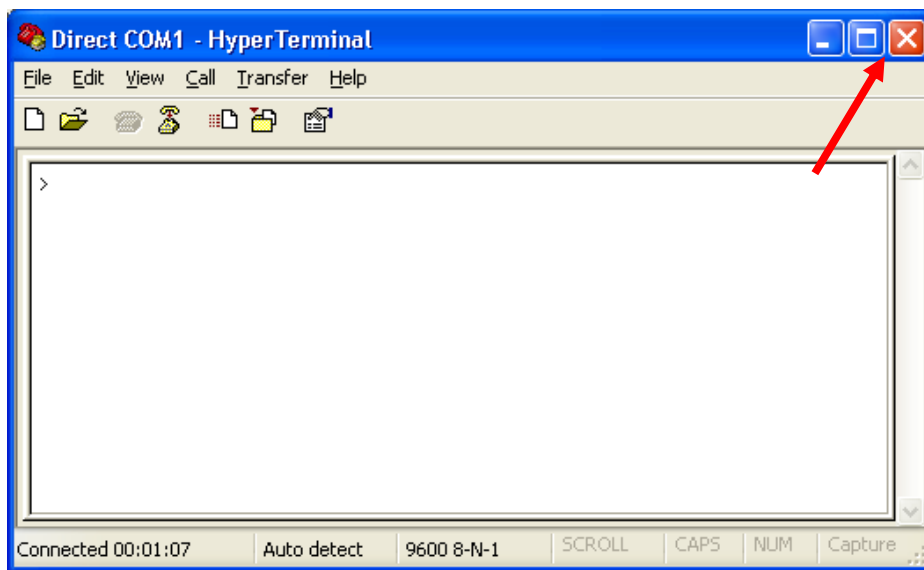
Check that the word *Connected* appears at the low left hand corner of the window. If not, left click on the call icon (third icon on the toolbar).



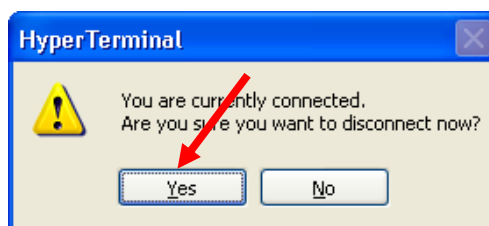
Hit the *ENTER* key to check the connection to the unit. Provided that the connection is OK, the SELCO G-Line relay or T7900 should respond with a “>” prompt. This means that the relay is ready for communication.

You might want to save the *HyperTerminal* configuration so that you don’t have to repeat the configuration next time you are using it. To save the configuration, left click on the *File* the menu of the menu bar.

Left click on *Save*.

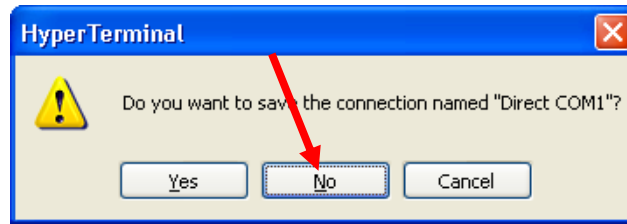


To test the pre-saved configuration, first close the HyperTerminal application (left click on the orange X in the upper right corner of the windows).



HyperTerminal needs conformation that you really want to close down the communication.

Left click on the *Yes* button to do so.



You will now be asked if you want to save the HyperTerminal configuration.

Left click on the *No* button to decline.

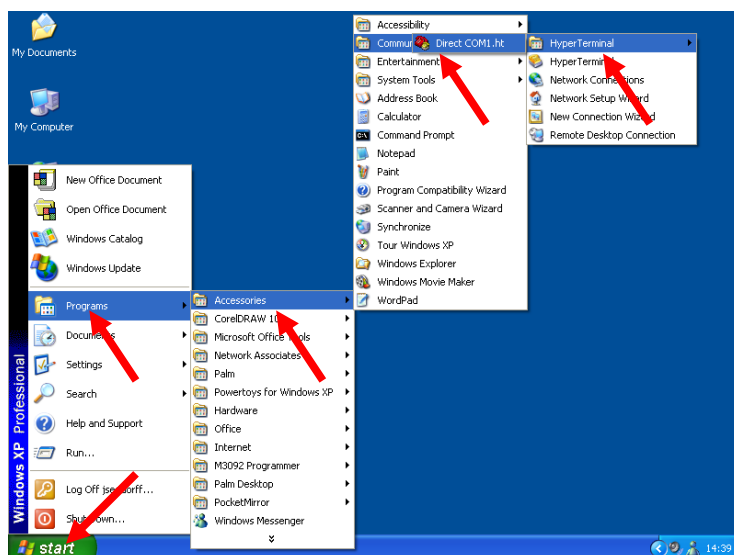
This will end the HyperTerminal Session.

Starting a pre-configured HyperTerminal

The previously saved configuration can be used next time start up HyperTerminal. This saves you the work of going through the configuration procedure each time you need to access the configuration of a SELCO G-Line relay or T7900.



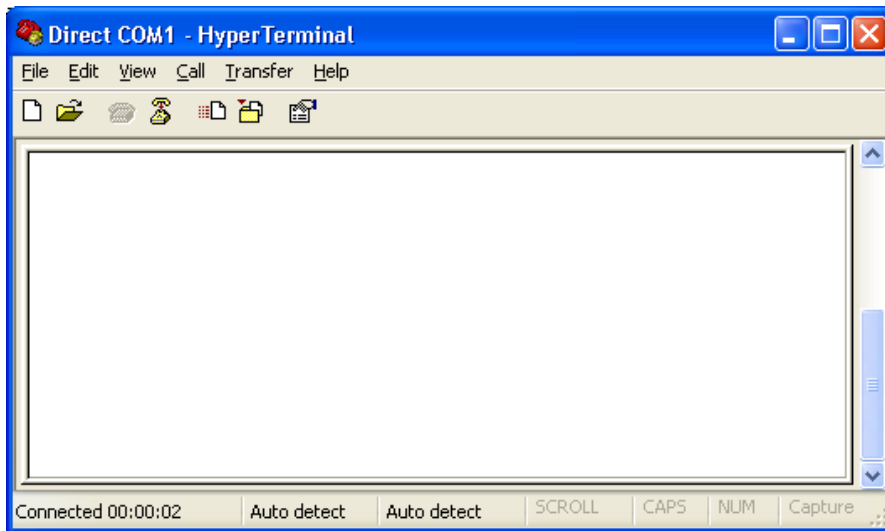
First start up the PC and wait until the Desktop is ready for your command.



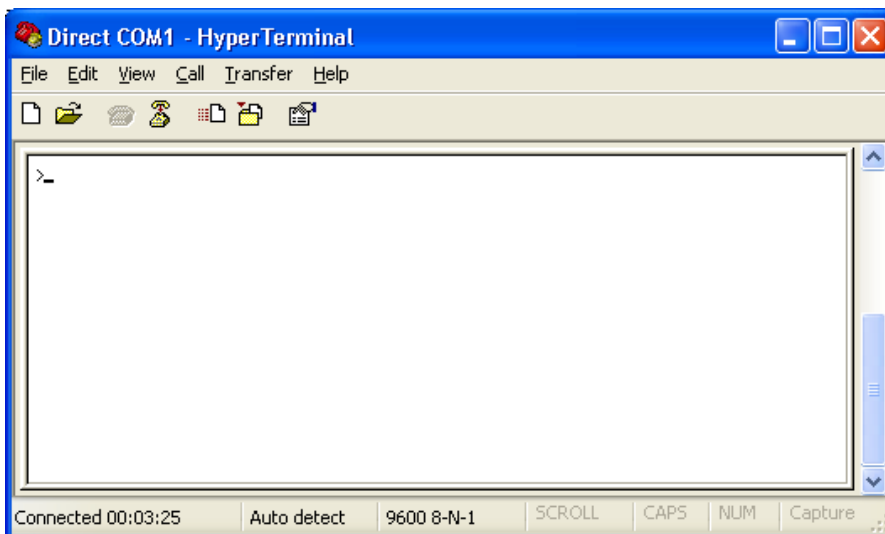
It's now time to restart *HyperTerminal* using a previously saved configuration.

Left click on the *Start* button at the lower left corner to activate the *Windows Start Menu*. Move the mouse pointer to *Programs*, *Accessories*, *Communications*, *HyperTerminal* (folder). Then left click on configuration filename (e.g. *Direct COM1.ht*).

This will cause the *HyperTerminal* application to execute using the pre-stored configuration.



HyperTerminal will now start instantly using the previously stored configuration (Direct COM1).



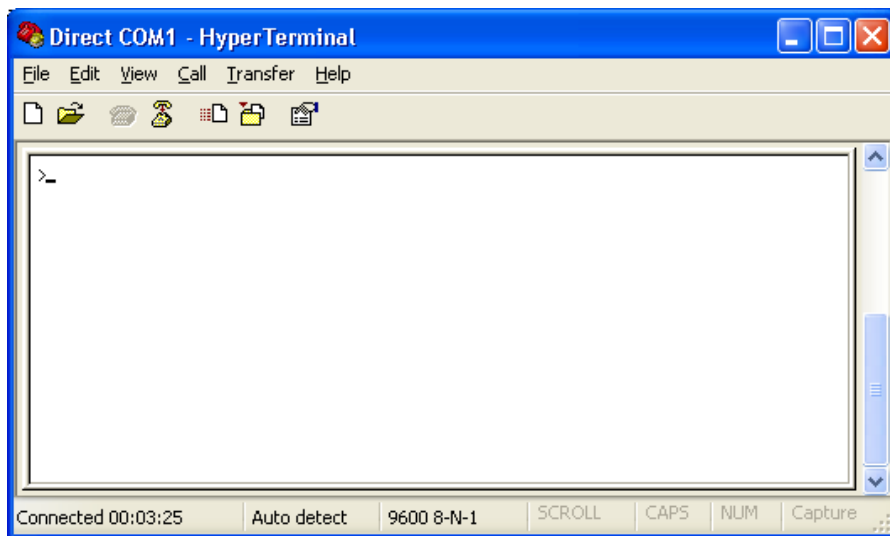
Hit the ENTER key to confirm that the communication with the G-Line unit or T7900 is up and running (A ">" prompt should appear).

The SELCO G-Line Relay is now ready for communication.

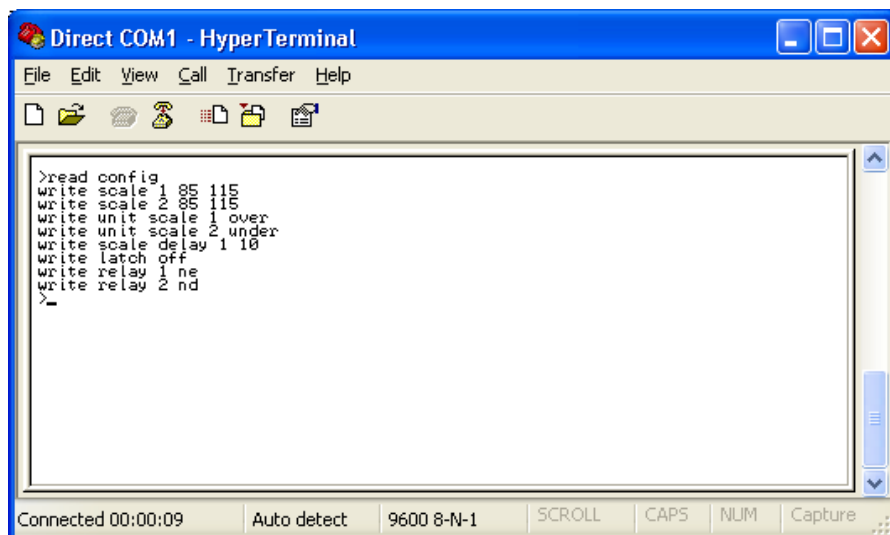
Reading the current configuration

The command set and the current configuration can be easily read from the SELCO G-Line relay or T7900.

Start up HyperTerminal, as shown in the above section “Starting a pre-configured HyperTerminal”.



HyperTerminal is now ready and the “>” prompt indicates that the SELCO G-Line relay or T7900 is ready to receive your command.



Type the command *read config* or *?* at the “>” prompt. The SELCO G-Line relay or T7900 will respond with a list of all valid commands plus its present configuration.

Commands

G2000 Power Relay

Default configuration:

Write Function Reverse
 Write Scale Trip 2 20
 Write Scale Hyst 1 10
 Write Scale Delay 2 20
 Write Relay Contact 1 ND
 Write Relay Contact 2 ND
 Write Relay Reset 2 Auto

Commands				Parameter 1		Parameter 2	
Write	Default						
	Function			<Function>			
				Default	Optional		
				Reverse	Forward		
	Scale	Trip		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				2 % (Reverse) 50 % (Forward)	2 % (Reverse) 50 % (Forward)	20 % (Reverse) 140 % (Forward)	50 % (Reverse) 150 % (Forward)
		Hyst		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				1 %	1 %	10 %	50 %
		Delay		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				2 sec.	1 sec.	20 sec	360 sec
	Relay	Contact	1	<Function>			
				Default	Optional		
				ND	NE		
			2	<Function>			
				Default	Optional		
				ND	NE		
		Reset	2	<Function>			
				Default	Optional		
				Auto	External		

G2200 Current Relay

Default configuration:

Write Function Over

Write Scale Trip 50 140

Write Scale Hyst 1 10

Write Scale Delay 3 30

Write Relay Contact 1 ND

Write Relay Contact 2 ND

Write Relay Reset 2 Auto

Commands				Parameter 1		Parameter 2	
Write	Default						
	Function			<Function>			
				Default	Optional		
				Over	Under		
	Scale	Trip		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				50 %	10 %	140 %	150 %
				(Over)	(Over)	(Over)	(Over)
				50 %	10 %	140 %	150 %
				(Under)	(Under)	(Under)	(Under)
		Hyst		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				1 %	1 %	10 %	50 %
		Delay		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				3 sec.	1 sec.	30 sec	360 sec
	Relay	Contact	1	<Function>			
				Default	Optional		
				ND	NE		
			2	<Function>			
				Default	Optional		
				ND	NE		
		Reset	2	<Function>			
				Default	Optional		
				Auto	External		

G3000 Frequency Relay

Default configuration:

Write Function 1 Over
 Write Function 2 Under
 Write Scale Trip 1 85 115
 Write Scale Trip 2 85 115
 Write Scale Delay 1 10
 Write Relay Contact 1 NE
 Write Relay Contact 2 ND
 Write Relay Reset 1 Auto
 Write Relay Reset 2 Auto

Commands			Parameter 1		Parameter 2	
Write	Default					
	Function		1	<Function>		
				Default	Optional	
				Over	Under	
			2	<Function>		
				Default	Optional	
				Under	Over	
	Scale	Trip	1	<Lower Limit>	<Upper Limit>	
				Default	Minimum	Default
				85 %	75 %	115 %
				(Over)	(Over)	(Over)
				85 %	75 %	115 %
				(Under)	(Under)	(Under)
			2	<Lower Limit>	<Upper Limit>	
				Default	Minimum	Default
				85 %	75 %	115 %
				(Over)	(Over)	(Over)
				85 %	75 %	115 %
				(Under)	(Under)	(Under)
		Delay		<Lower Limit>	<Upper Limit>	
				Default	Minimum	Default
				1 sec.	1 sec.	10 sec
	Relay	Contact	1	<Function>		
				Default	Optional	
				NE	ND	
			2	<Function>		
				Default	Optional	
				ND	NE	
		Reset	1	<Function>		
				Default	Optional	
				Auto	External	
			2	<Function>		
				Default	Optional	
				Auto	External	

G3100 Voltage Relay

Default configuration:

Write Function Over

Write Scale Trip 100 120

Write Scale Hyst 1 10

Write Scale Delay 1 10

Write Relay 1 Contact ND

Write Relay 2 Contact ND

Write Relay 2 Reset Auto

Commands				Parameter 1		Parameter 2	
Write	Default						
	Function			<Function>			
				Default	Optional		
				Over	Under		
	Scale	Trip		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				100 % (Over)	70 % (Over)	120 % (Over)	130 % (Over)
				100 % (Under)	70 % (Under)	120 % (Under)	130 % (Under)
		Hyst		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				1 %	1 %	10 %	50 %
		Delay		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				1 sec.	1 sec.	10 sec	360 sec
	Relay	Contact	1	<Function>			
				Default	Optional		
				ND	NE		
			2	<Function>			
				Default	Default		
				ND	ND		
		Reset	2	<Function>			
				Default	Optional		
				Auto	External		

G3300 Voltage Relay

Default configuration:

Write Function Over
 Write Scale Trip 80 115
 Write Scale Hyst 1 10
 Write Scale Delay 1 10
 Write Psym 6
 Write Relay Contact 1 ND
 Write Relay Contact 2 NE
 Write Relay Function 2 PU
 Write Relay Reset 2 Auto

Commands				Parameter 1		Parameter 2	
Write	Default						
	Function			<Function>			
				Default	Optional		
				Over	Under		
	Scale	Trip		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				80 % (Over)	70 % (Over)	120 % (Over)	130 % (Over)
				80 % (Under)	70 % (Under)	120 % (Under)	130 % (Under)
		Hyst		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				1 %	1 %	10 %	50 %
		Delay		<Lower Limit>		<Upper Limit>	
				Default	Minimum	Default	Maximum
				1 sec.	1 sec.	10 sec	360 sec
	Psym			<Value>			
				Default	Range		
				6 %	2 – 20 %		
	Relay	Contact	1	<Function>			
				Default	Optional		
				ND	NE		
			2	<Function>			
				Default	Default		
				NE	ND		
		Function	2	<Function>			
				Default	Optional		
				PU	PF		
		Reset	2	<Function>			
				Default	Optional		
				Auto	External		

G3600 Voltage Relay

Default configuration:

Write Function 1 Over
 Write Function 2 Under
 Write Scale Trip 1 80 115
 Write Scale Trip 2 80 115
 Write Scale Delay 1 10
 Write Relay Contact 1 ND
 Write Relay Contact 2 NE
 Write Relay Reset 1 Auto
 Write Relay Reset 2 Auto

Commands			Parameter 1	Parameter 2
Write	Default			
	Function		1	<Function>
				Default Optional
				Over Under
			2	<Function>
				Default Optional
				Under Over
	Scale	Trip	1	<Lower Limit> <Upper Limit>
				Default Minimum Default Maximum
				80 % 70 % 120 % 130 %
				(Over) (Over) (Over) (Over)
				80 % 70 % 120 % 130 %
				(Under) (Under) (Under) (Under)
			2	<Lower Limit> <Upper Limit>
				Default Minimum Default Maximum
				80 % 70 % 120 % 130 %
				(Over) (Over) (Over) (Over)
				80 % 70 % 120 % 130 %
				(Under) (Under) (Under) (Under)
		Delay		<Lower Limit> <Upper Limit>
				Default Minimum Default Maximum
				1 sec. 1 sec. 10 sec 360 sec
	Relay	Contact	1	<Function>
				Default Optional
				ND NE
			2	<Function>
				Default Optional
				NE ND
		Reset	1	<Function>
				Default Optional
				Auto External
			2	<Function>
				Default Optional
				Auto External

T7900 used as an Electronic Potentiometer

The default configuration can be set by the command “Write Default”.

Default configuration when used as electronic potentiometer (CONFIG switch no. 1 at the front T7900 is off):

```
Write Function Volt
Write RANge -10 10
Write REference 0
Write RUBber-band OFF
```

In general, at least the letters written in capitals are enough to define a command. Thus “W F V” is enough to define that the Function is Volt.

Levels for voltage and current should always be entered with resolution 0.5 (e.g. 1.5, 2.0, 2.5 etc.). Values in % should be entered with resolution 1 (e.g. 10, 11, 12 etc.).

Write Function:

The parameters for “Write Function” are “Volt”, “Amp” or “PWM”. The default range will depend on the actual function as shown below:

```
Write Function Volt
Write RANge -10 10
Write REference 0
Write RUBber-band OFF
```

```
Write Function Amp
Write RANge 4 20
Write REference 12
Write RUBber-band OFF
```

```
Write Function PWM
Write RANge 0 100
Write REference 70
Write RUBber-band OFF
```

Write RANge:

The range can be defined as any range between -10V – +10V (e.g. 0V – +1V) or 0mA – 20mA (e.g. 4mA – 20mA) or PWM default range 10-90%. The range can be changed between 0% - 100% with a resolution of 1%.

Write REference:

The reference can be any value in the interval defined in “Write Range”.

If the PRESET button has been used to change the reference in voltage or current mode the “Write Reference” command will not appear when reading out from the T7900.

Read Preset:

The preset level can in this case be read by the command “Read Preset”. The read-out now has a better resolution than the normal resolution of 0.5.

Write RUBber-band:

The parameter can be “ON” or “OFF”. “OFF” will give normal output characteristic and “ON” will give “Rubber band” output characteristic.

T7900 used as a Power Reference Unit

The default configuration can be set by the command “Write Default”.

Default configuration when used as a power reference unit (CONFIG switch no. 1 at the front of T7900 is on):

```
Write Function Volt
Write RAnge -10 10
Write Powerref 1 10
Write Powerref 2 20
Write Powerref 3 40
```

In general, at least the letters written in capitals are enough to define a command. Thus “W F V” is enough to define that the Function is Volt.

Levels for voltage and current should always be entered with intervals of 0.5 (e.g. 1.5, 2.0, 2.5 etc.). Values in % should always be entered with intervals of 1 (e.g. 10, 11, 12 etc.).

Write Function:

Valid parameters for “Write Function” are “Volt” or “Amp”. If “PWM” is used as parameter, the T7900 will change into the mode where it behaves like an electronic potentiometer.

Write RAnge:

The range can be defined as any range between -10V – +10V (e.g. 0V – +1V) or 0 – 20mA (e.g. 4mA – 20mA).

Write Powerref:

The three contact inputs IN1, IN2 and IN3 of the T7900 will by default set the following levels of the output voltage V_{out1} when the contacts are closed (connected to REF):

```
IN1: 10% of full level
IN2: 20% of full level
IN3: 40% of full level
```

These settings can be changed with the commands “Write Powerref 1”, “Write Powerref 2” and “Write Powerref 3” to any level between 0 and 100%.