CYTEC IF-6

TCP/IP TO RS232

CONTROL INTERFACE

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11-00-30-1	IF-6 LAN IF WIRING
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IF-6

TCP/IP TO RS232

CONTROL INTERFACE

1.0 GENERAL

CYTEC's IF-6 10Base-T LAN interface is designed for unshielded twisted pair (UTP) interface to TCP/IP Networks and acts as a Server for controlling CYTEC Switching Systems. The interface is fully configurable, and setup information is permanently stored in internal NVRAM.

The Switching System is controlled by raw TCP/IP transfer to a preset port number 2001 in the LAN interface. The data is received by the LAN Interface on the RJ45 connection labeled "UTP" and is output as RS232 serial data on the RJ45 port labeled "RS232". The short RJ45 to D9 cable must be installed between the LAN interface RS232 port and the D9 RS232 port on the rear panel of the switch for the LAN to be able to communicate to the Cytec control module. This cable must be installed by the user once the LAN interface has been set up. A description of all switching system commands is contained in the **Cytec Switching System Operator's Manual** including the RS232 specific commands. Return data from the Switching System (when applicable) is sent back to the requesting Client by raw TCP/IP transfer to the requesters port.

Many details of network operation are covered in the additional **"One Port"** manual dealing exclusively with the TCP/IP to RS232 convertor. This manual is provided by the manufacturer of the "One Port" device that Cytec refers to as an IF-6 LAN Interface. This manual should be referenced for information beyond the basic start up configuration settings covered in this manual. Keep in mind when reading the **"One Port"** Manual that the device is often used as a RS232 to TCP/IP convertor. The manual is written from the perspective of using the device to talk to a *network from an RS232 device* whereas Cytec uses the device to talk to an *RS232 device from a network*. This is a very subtle detail but it will help you to understand why the terminology used in the One Port manual is different than what is used in this manual.

The "**One Port**" manual can be obtained from www.versalynx.com

Make sure you received one long RJ45 to D9S terminal connection cable for RS232 setup and one short RJ45 to D9S (or RJ45 to D25S) matrix cable to connect the IF-6 to the RS232 controller of your switch matrix. These cables are shown in **(Drwg. #11-00-30-1)**. **You can not communicate to the Cytec switch through the LAN interface until the short cable has been installed between the two ports.** Cytec leaves both of these connections external on the rear panel because some customers like the ability to use either port under certain circumstances and because it makes troubleshooting easier.

Note that one cable is much longer than the second. The longer cable can be used to connect to the terminal PC for setting up the LAN interface. The shorter cable connects between the LAN interface and the RS232 control connection on the Cytec switching system. The two cables are NOT interchangeable.

1.1 INITIAL SETUP

The device may be configured via RS232 or LAN. You can only set up the device via LAN if you can Telnet to the IP address. If the IP address is unknown, you are on a segmented network, or you need to get through a gateway that has not been established on the Cytec LAN interface, you will probably need to set the unit up via the RJ45 RS232 port.

Set up via LAN connection:

Plug a network cable into the UTP / LAN RJ45 connector on the rear panel. The unit is shipped from Cytec with the TCP/IP address set to 10.0.0.2. If you can ping this address, you can set it up using any Telnet program. The LAN interface set up is accessed via the default Telnet port of 23. Once you establish a Telnet connection you can simply use the commands listed below. Use whatever Telnet program you are familiar with.

Set up via RS232 connection:

The IF-6 can also be configured via its RS232 port. This setup procedure allows the user to enter a valid IP Address, Sub-net mask, gateway and any of the other commands shown in the appendix of the One Port Manual. These values must be properly set in order for the IF-6 to communicate over your TCP/IP network.

Connect the long D9 to RJ45 cable provided between a computer D9 RS232 (Com port) and the port labeled RS232 of the IF-6. The proper terminal settings are 9600 baud, 8 bits, 1 stop bit, no parity, and hardware flow control. These are the default settings for Windows OS computers.

Set up
All commands should be followed by the <enter> key. Issuing a command without specifying any parameters will display the current values associated with that command. Try the following example to verify the current set TCP/IP address.

Type: hosts

The IF-6 should respond:

```
10.0.0.2        cytec
127.0.0.1       localhost.
```

The TCP/IP address is 10.0.0.2 (This value may be different if you specified an IP address when you ordered your system). See the shipped configuration sheet in this manual. The host name is cytec.

Type: ifconfig
The reponse is:

```
lo0: flags=49<UP, LOOPBACK,RUNNING>
        inet 127.0.0.1 netmask FF000000
ec0: flags=61<UP,NOTRAILERS,RUNNING>
        inet 10.0.0.2 netmask FF000000
        ether   00:20D0:00:13:24.
```

The Netmask is 255.0.0.0 (FF000000Hex) and follows the TCP/IP address on the second line from the bottom.

1.2 SETTING IP ADDRESS AND NETMASK

Type:

ifconfig xxx.xxx.xxx.xxx yyy.yyy.yyy.yyy

where the desired TCP/IP address is xxx.xxx.xxx.xxx and the desired netmask is yyy.yyy.yyy.yyy. Both values are in dotted-decimal format. The entries can be confirmed by issuing the ifconfig command without parameters.

Example: Set IP address 145.143.75.27 and Netmask 255.255.255.0.

Type:

ifconfig 145.143.75.27 255.255.255.0

ifconfig

The reponse is:

```
lo0: flags=49<UP, LOOPBACK,RUNNING>
        inet 127.0.0.1 netmask FF000000
ec0: flags=61<UP,NOTRAILERS,RUNNING>
        inet 145.143.75.27 netmask FFFFFF00          <---IP Address and Netmask
        ether    00:20D0:00:13:24.
```

1.3 SETTING THE PORT

The IF-6 accepts raw TCP/IP at port 2001.

Type:

snet tcp

The response is:

TCP:

icon	=	on
msl	=	2 seconds
port	=	2001
urg	=	one octet per packet.

A similar command sets the port.

Example: set port to 2001.

Type:

snet tcp port 2001

snet tcp

The response is:

TCP:

icon	=	on
msl	=	2 seconds
port	=	2001
urg	=	one octet per packet.

Once the IP address, netmask and raw serial port number are set, the IF-6 may be connected to a UTP 10BASE-T network. If you set up the LAN interface via RS232 disconnect the long D9 to RJ45 set up cable from the LAN interface. Connect the short RJ45 to D9 cable between the RJ45 port labeled “RS232" and the D9 connector labeled “RS232" on the rear panel of the Cytec chassis. The switch matrix is now ready to be controlled via the network.

1.4 SETTING THE GATEWAY

To allow access from a different but attached network, you will need to provide the IF-6 with the IP address of the gateway that connects the two networks. You can do this with the **route** command:

Type:

route add net default xxx.xxx.xxx.xxx 1

Where xxx.xxx.xxx.xxx is the TCP/IP address of the gateway.

2.0 NETWORK OPERATION

2.1 CONNECTION VERIFICATION

The network connection may be verified at any time by using a ping utility. Any network ping program will verify a proper network connection to the IF-6 and that it is set to the correct IP address. If you cannot ping the IF-6, then there is a problem with either the network connection or the TCP/IP settings which you must go back and correct.

2.2 COMMUNICATING TO THE SWITCH

Once the switch has been set up and you have successfully pinged the IP address, you can try communicating to it using Telnet. To communicate directly to the Cytec switch you must Telnet to the TCP/IP passthrough port. This port is 2001 unless you have changed it during set up. By default nearly all Telnet programs communicate with port 23. Cytec's LAN interface will only accept LAN interface set up commands on port 23 and will not allow communication to the switch on any port other than the TCP/IP passthrough port. Most Telnet programs allow communication on any port by entering the port # after the command to call the Telnet program, or by setting the port number in the programs options.

Example

Windows Telnet is called through the Start/Run command line prompt.
Typing "Telnet" and hitting return will connect you by default to port # 23.
Typing "Telnet 2001" will connect you to the Cytec Switch through the TCP/IP interface port #2001.

Once you have established a Telnet session on the TCP/IP passthrough port, try communicating to the switch by typing:

N <enter>

The switch should respond with the control module # and firmware rev, ie:

"6-013-5 Rev 6.20"

Note that this response is specific to your system does not need to be exactly what is shown in this example.

At this point you can begin trying switch control commands and verify that the switch is operating.

3.0 TCP/IP SETTINGS

	Factory Default	Cytec Setting	New Setting
IP ADDRESS:	0.0.0.0	10.0.0.2	
HOST NAME:	Oneport	Cytec	
NETMASK:	255.0.0.0	255.0.0.0	
TCP/IP PORT*:	3001	2001	
Download Port*:	2001	3001	
GATEWAY	None	None	
IDLE	0	0	
BANNER	ON	OFF	OFF (Can not be changed)
PROMPT	ON	OFF	OFF (Can not be changed)
LOCKMEM	OFF	OFF	

* On units sold before 2005 the factory default was 2001 for TCP/IP Port, and there was no download port.

4.0 TROUBLESHOOTING, RESETS, AND DEFAULT VALUES

4.1 REBOOT

If for any reason you find that the LAN interface will not communicate due to sockets not being terminated (see section 4.6) it is possible to reestablish a connection by using a small executable program called reset.exe. This program is available from Cytec and can be run from the command line prompt in Windows (Start menu, *Run...*).

The syntax for the command line is:

reset.exe [IP address:Port #]

i.e. – if your IP is 10.0.0.2, and the port # is 2001 go to the start button in Windows, click on run. In the dialog box that appears enter:

reset 10.0.0.2:2001

and then hit enter or click OK. This will cause the One Port to reboot and clear the socket. This can be a great help when you need to reboot the One Port but are not within the physical area of the Cytec controller or if you do not want to interrupt the switching system in order to reboot just the One Port.

If you do not enter the port number the reset program defaults to port 3001 which is now the firmware download port. This will return an error and then reboot the LAN interface which will have the intended effect but the error message may cause confusion.

4.2 RESETTING THE ONE PORT TO DEFAULT VERSALYNX FACTORY VALUES

If for any reason you are completely locked out of access to the LAN interface, i.e. – you have no idea of what IP address or RS232 baud rate the LAN interface has been set to, it is possible to reset all of the LAN interface values to defaults by toggling the power On and Off five times with less than a 5 second period between each On/Off cycle. The default values will not allow the LAN interface to work correctly with the Cytec system but they can all be reset by following the instructions in section 4.4. **It is possible for the LAN interface to be reset accidentally** if people toggle the power on and off or if there is a series of power fluctuations on the AC line.

4.3 ACCIDENTAL RESET AND DEFAULT VALUES

If the LAN interface is accidentally reset to defaults you will be able to tell because it will stop functioning normally. You will no longer be able to ping the IP address. If you have an LCD Manual Control you will see gibberish displayed on the screen after reboot instead of the normal "Cytec Ready" reboot message. Another indication is that if you try to connect to communicate to the RS232 port of the LAN interface, it will give a % prompt and the banner word "One Port" will appear. The default values are typically:

(For units produced after 2005)
IP = 0.0.0.0
TCP/IP Port = 3001
Firmware Download Port = 2001
Banner = ON
Prompt = ON

(For units produced before 2005)
IP = 192.10.160.3
No Download port
TCP/IP Port = 2001

These values will need to be changed in order for the LAN interface to function with the Cytec RS232 module.

See section 4.5 for instructions on disabling the reset feature!

4.4 RESETTING THE LAN INTERFACE TO CYTEC DEFAULT VALUES

In order to get the LAN interface functioning properly with the Cytec RS232 control module you will need to change most of the Versalynx default values. Do this using the RS232 port or by Telneting into the default telnet port of 23:

Turn Banner and Prompt off – Command = Silent
The Cytec RS232 Control module can not communicate with the LAN interface if the Banner and Prompt are turned on. You can turn these off using the Silent command as follows:

silent -banner -prompt// The minus sign before the words banner and prompt turn these off//

Change TCP/IP port and Download Port – Command = Snet
You need to reverse the DNL (Download) ports and the TCP port numbers. You can actually change these to any values you want if necessary but in order to change them to the Cytec Default values you would do the following:

snet dnl port 3002	// Moves the DNL port to an unused number to avoid a conflict.//
snet tcp port 2001	//Changes the TCP port to 2001.//
snet dnl port 3001	//Changes the DNL port # to 3001.//

Change the IP address – Command = Ifconfig
You will now need to change the IP address back to the Cytec default or, if you want to save a step, just to the IP address you desire.

Ifconfig 10.0.0.2 (or your IP address xxxx.xxxx.xxxx.xxxx) // Resets the IP address//

4.5 DISABLING THE "RESET TO DEFAULT VALUES" FEATURE

You can disable the ability to reset to default values by toggling the unit on and off using the "Lockmem" command. Be advised that if you turn this feature off and lose all records of settings for both the LAN connection and the RS232 port it may be extremely difficult to ever restore communications. That being said, we leave it to the customer to make that determination and act according to their best judgment. In certain situations it make be advantageous to turn prevent this from ever happening.

lockmem [**on** | **off**]

DESCRIPTION
Without arguments, **lockmem** reports the lock state of the system parameters. When the lock state is **off** (unlocked), the system parameters are reset to the factory default values after The One Port is turned off and on five consecutive times without keyboard input. Otherwise, the system parameters are not affected by power cycles (i.e., the settings are retained).

OPTIONS
on The system parameters are not affected by power cycles.

off The system parameters are reset to the factory default values after five power cycles.

4.6 IDLE SETTING

By default the LAN Interface is set to maintain an established socket until the software that requests the socket terminates the socket. While this is good when the requesting software wants to maintain control of the device indefinitely, it can cause problems in situations such as:

The network connection is somehow broken, i.e. a hub, router or switch goes down.
The computer that established the connection never shuts it off, effectively locking everyone else out.
The computer that established the connection crashes.

At this point, the only way to recover is to reboot the Cytec unit.

To avoid this problem, many customers will reset the idle time to some known value such as 60 seconds and then run a status command or N command every 45 seconds and verify that something was returned. This allows the socket to time out if the LAN interface doesn't receive a signal from the connected computer. Other options can be written into the software to allow time outs for other issues that may be associated with this such as users walking away from computers without closing the software in systems that allow multiple users to access the switch.

The idle setting is described as follows:

idle
Set the maximum time before a raw TELNET or socket connection is automatically shutdown due to no packet activity. The valid range is from zero to 3,600 seconds. Zero means no timeout. The default value is 0 (zero).

Use the **snet** command to change the idle setting:

snet idle 60

This would change the idle setting to 60 seconds.

4.7 Firmware Updates

Though rarely necessary, the firmware can be updated by uploading new firmware to port 3001. Contact Cytec for technical support if you ever need to do this and we will get you the tools you need.

CONTACT 1-800-346-3117
OR WWW.CYTEC-ATE.COM
OR E-mail: sales@cytec-ate.com
FOR TECHNICAL ASSISTANCE

*** WARRANTY ***

CYTEC Corp. warrants that all products are free from defect in material and workmanship and perform to published specifications for five years from date of shipment. This warranty is in lieu of any other warranty expressed or implied.

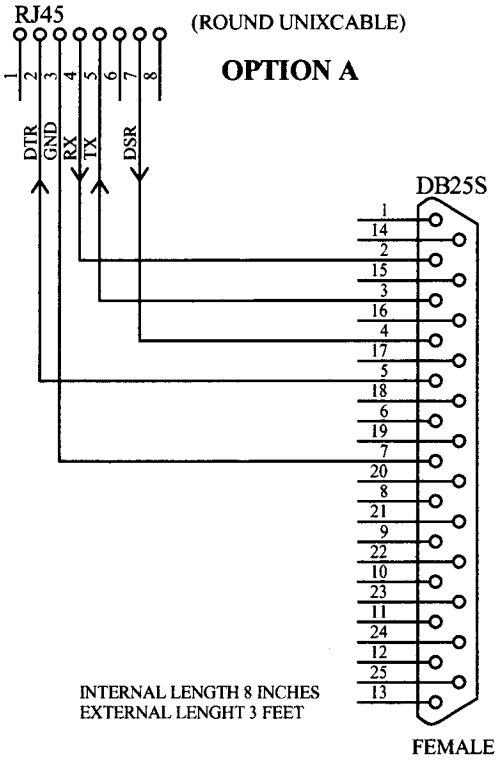
The liability of CYTEC Corp. shall be limited to replacement or repair of any defective units which are returned F.O.B. to its factory. Units which have been subjected to abuse, misuse, accident, alteration, neglect, or unauthorized repair are not covered by this warranty.

No liability is assumed for expendable items such as lamps or fuses.

CONTACT 1-800-346-3117
OR WWW.CYTEC-ATE.COM
OR E-mail: sales@cytec-ate.com
FOR TECHNICAL ASSISTANCE

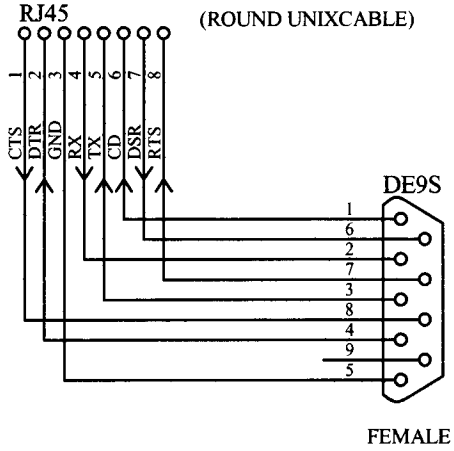
IF-6 -- IF-3
RS232 TO MATRIX CABLE
(ROUND UNIXCABLE)

OPTION A



INTERNAL LENGTH 8 INCHES
EXTERNAL LENGHT 3 FEET

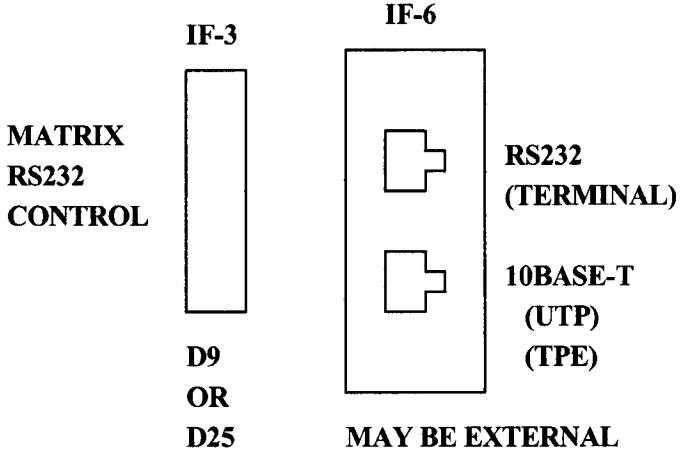
IF-6
RS232 TO PC CABLE
(ROUND UNIXCABLE)



ALWAYS REQUIRED

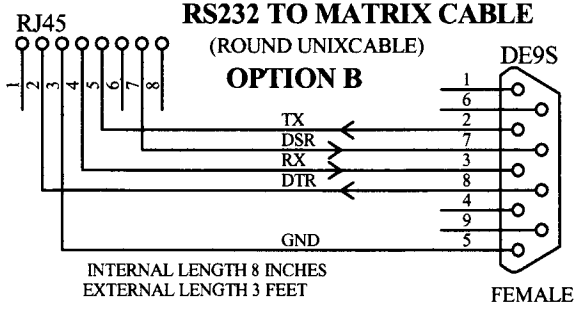
EXTERNAL LENGTH 6 FEET

REAR PANEL CONECTIONS



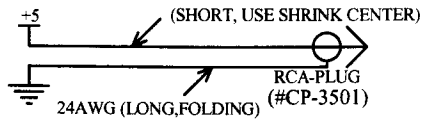
IF-6 -- IF-3
RS232 TO MATRIX CABLE
(ROUND UNIXCABLE)

OPTION B



INTERNAL LENGTH 8 INCHES
EXTERNAL LENGTH 3 FEET

LAN DC POWER (INTERNAL)

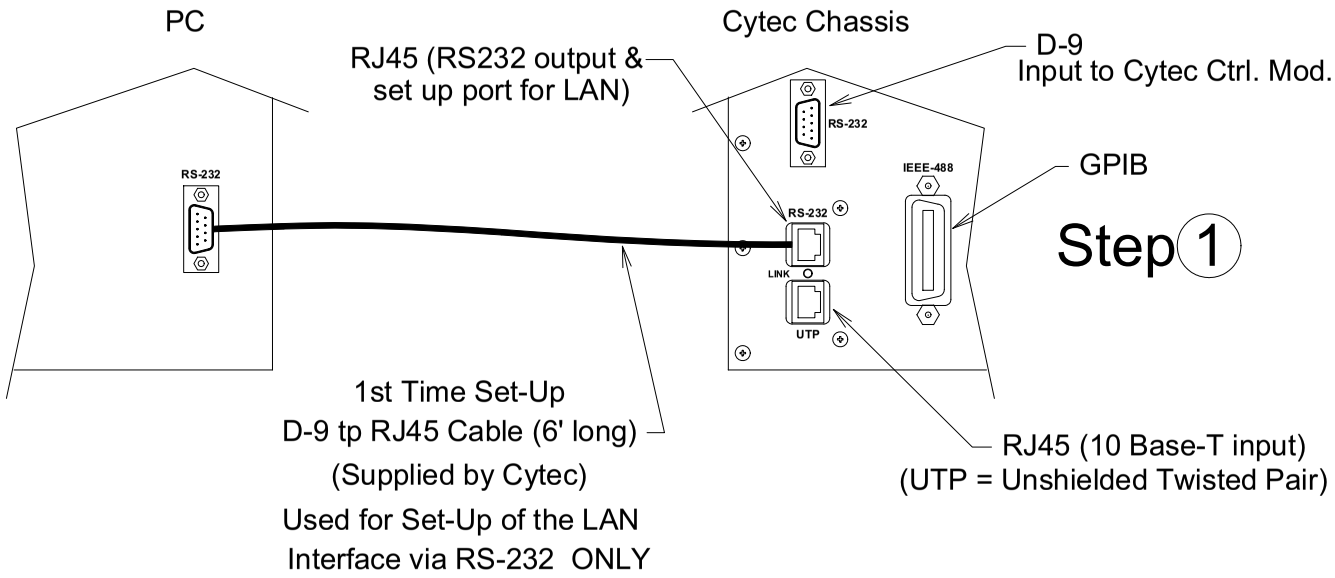


REVISED FROM:

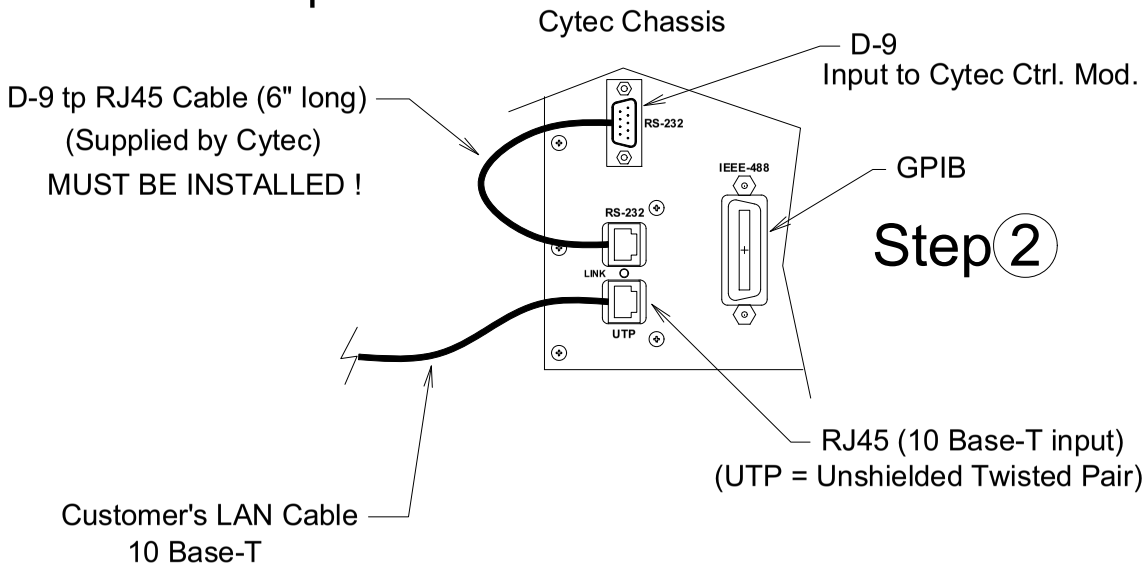
CYTEC CORP.

APPROVED BY	DRAWING NUMBER	DRAWN BY: RHB
DATE: 4-Dec-2002	110030-1	REVISION: 1
SIZE: A	TITLE: IF6 LAN IF WIRING	
110030-1.sch		SHEET 1 OF 1

10 Base-T LAN Set Up



10 Base-T LAN Operation



CYTEC CORP. TOL. +/- .010" U.O.S.

DATE: 1/23/08	CAD FILE: 99-62-30.dcd	DRAWN BY: DR	
SIZE:	TITLE: LAN Connections Diagram		
COMMENTS:		DRAWING NUMBER: 99-62-30	