



IMAGENEX TECHNOLOGY CORP.

DT100

Sensor Interface Relay (SIR)

Communication Troubleshooting Guide

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1. INTRODUCTION

There are a few considerations when interfacing the DT100 Sensor Interface Relay (SIR) unit to a laptop or desktop personal computer (PC). The following guide provides information to assist users with interfacing the DT101Xi or DT102Xi software to a personal computer through a DT100 SIR unit, or troubleshoot if problems occur during interfacing or general use.

2. HARDWARE

Users may connect the DT100 SIR unit to the PC running the Imagenex DT101Xi or DT102Xi software using either an onboard Ethernet port connected directly to the SIR unit, an onboard Ethernet port connected to the SIR unit through an Ethernet switch; or a USB / Ethernet adaptor connected to the SIR unit.

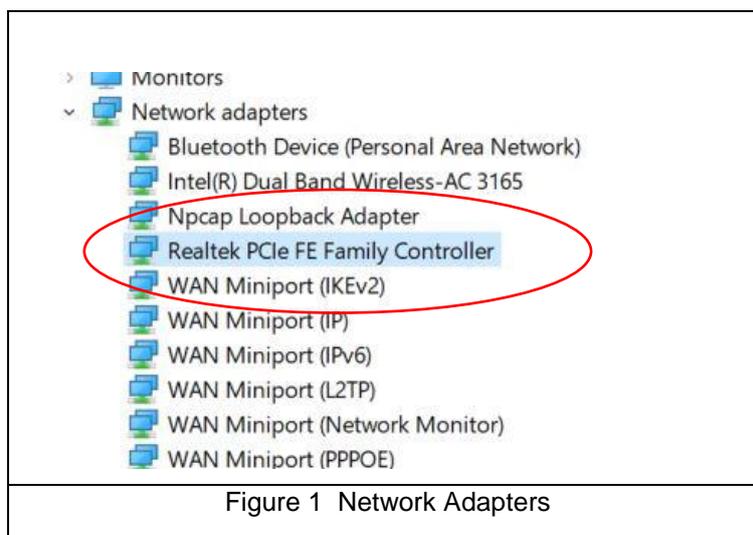
2.1. DIRECT CONNECTION

It is important that the onboard Ethernet port has an adequate specification to accommodate the high data flow rate. The Fast Ethernet (FE) chipset used in some computers does not allow for the required data flow rate and should be avoided. Instead, a chipset supporting Gigabit Ethernet (GBE) should be used.

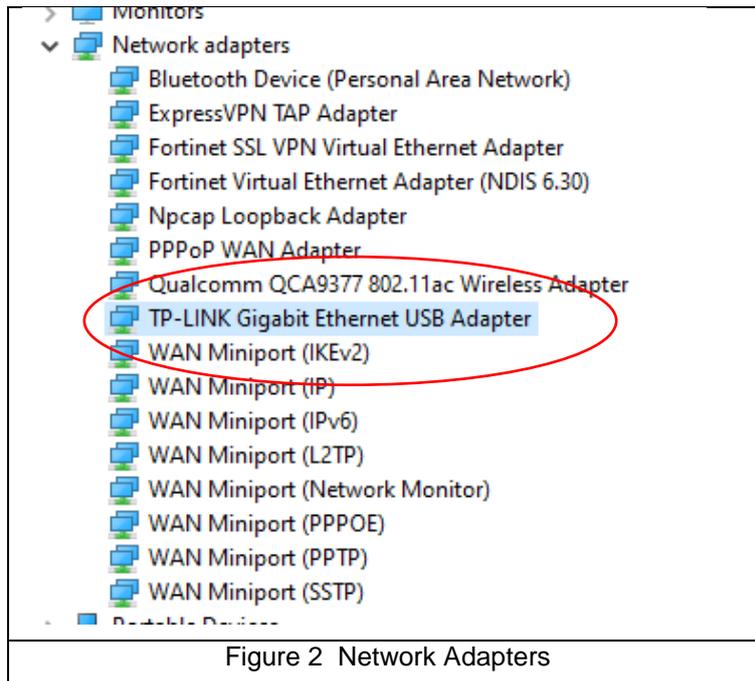
The details of the onboard Ethernet port are found as follows in Windows 10:

Control Panel > System > Device Manager > Network adapters. (*Other version of Windows may differ*)

In the list there may be an FE Family Controller which is **inadequate**:



Instead a chipset supporting Gigabit Ethernet (GBE) should be used:



If the internal Ethernet port supports FE as opposed to GBE, an external USB3.0 to GBE Ethernet adaptor should be used to ensure data flow rates are supported. See *Section 2.3 Connecting through a USB Ethernet Adaptor*.

Once the correct Ethernet adapter is being used, a standard Cat 5E Ethernet (or higher) cable should be connected between the PC Ethernet port and either of the SIR unit Ethernet ports. This cable should not exceed 100m in length.

2.2. CONNECTING THROUGH A SWITCH

If an Ethernet switch is used, the same considerations as described above should be made, and a Gigabit Switch should be used between the SIR unit and the PC. Again, Cat 5E (or higher) cables should be used and the length per cable should not exceed 100m in length.

2.3. CONNECTING THROUGH A USB ETHERNET ADAPTOR

The specification of an external USB3.0 to GBE Ethernet adaptor should be used to ensure data flow rates are supported. The adaptor should support Gigabit Ethernet (GBE) and a TP-LINK Model UE300 appears to work well.

A USB 3.0 port is recommended as it can transfer 5 Gbit/s. These ports are normally (but not always) coloured blue.

The PC can be connected to the either SIR Ethernet port, either directly or through a Gigabit switch. Again, Cat 5E or higher cables should be used and the cable length should not exceed 100m in length.

3. OPERATING SYSTEM

The SIR unit communicates with the DT101_SIR software running on an attached PC. The connection to the SIR unit is made via Ethernet and both the TCP/IP and UDP protocols. In order for connection to occur, the TCP/IP parameters must be set-up in Windows™. The following details the set-up process:

3.1. ETHERNET SET-UP

The following addresses are reserved and should not be used:

	Reserved for	IP Address
IP Address	Network	192.168.0.1
	Sonar (DT101/102Xi)	192.168.0.2
	SIR Unit	192.168.0.10
	Broadcasting	192.168.0.255
Table 1 IP Addresses		

The following IP addresses may therefore be set in for the PC's network adaptor:

	IP Address
IP Address	192.168.0.X
Subnet mask	255.255.255.0
Table 2 IP Addresses	

Where 'X' is a decimal number between 3 and 254 (excluding 1,2 and 10), so the PC's network adaptor IP address could be set to:

	IP Address
IP Address	192.168.0.3
Subnet mask	255.255.255.0
Table 3 IP Addresses	

This is done as follows (Windows™ 10):

- Navigate to the Control Panel and double click 'Network and Sharing Centre'
- Click 'Change adapter settings'
- Right click on the Ethernet adaptor you wish to connect with and select 'Properties'
- Select 'Internet Protocol Version 4 (TCP/IPv4)'
- Click Properties
- Configure as follows and click OK:

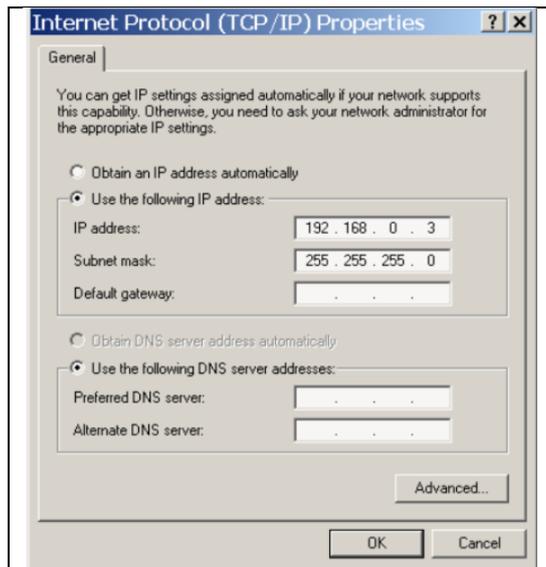


Figure 3 TCP/IP Settings

Note that the IP address need not be identical but the **192.168.0.** part must remain in place. The last digit(s) can be changed, but may **NOT** be 0, 1, 2, 10 nor 255.

The sonar head should function correctly, however if communication does not occur properly, the suggestions listed in the points below may help:

- Ping the SIR Unit. Successful packet receipt will show that there is hardware connection and that the SIR ethernet is functional. In Windows Start type Run > cmd > type ping 192.168.0.10. If functioning correctly, the 'out' packets should be equal to the 'In' packets.
- Disable any network bridges that are present. A network bridge allows a separate port, such as "USB", or "Firewire" to piggyback the Ethernet connection. Under Control Panel > Network and Internet > Network Connections, disable any network bridges.
- Disable any other network devices that are present on the computer. Often, if there are multiple network cards present, Windows™ may communicate incorrectly. Right-click on each invalid connection and select "Disable".
- Clear unnecessary network protocols. De-select all services except for Internet Protocol Version 4 (TCP/IPv4).

- Remove any firewalls present. For the network adapter used, right click and select Properties. Click Configure > Advanced and de-select the Firewall option (if present).
- In the Configure > Advanced (as above) tab, click Speed and Duplex and set Auto Negotiate.
- Select Configure > Power Management (as above). Disable any power saving that shuts down the Ethernet card.
- Windows 10™ is using the Connected Devices Platform Service (or CDPSvc) for multicast streaming and in the event of a UDP port clash, this service needs to be stopped. Press Shift-Ctrl-Esc to invoke the Task Manager and select the Services tab. Right-click on the service "CDPSvc" and select "Stop". Restart the computer. If the CDPSvc service continues to restart on its own, right-click on "CDPSvc" and select Open Services. In the list of Services, locate "Connected Devices Platform Service", right-click then select Properties. In "Startup type:" select "Disabled" then press OK. Restart the computer.

It is advisable to try these options one by one, and see if communication with the SIR unit starts.

4. DT100_SIR SOFTWARE

The addresses in the DT100 SIR software must be set. These include the Sonar IP address and the Output IP Address. The *Sonar IP Address* is the address used to establish communication with the sonar head, and the Output IP address is used to establish communication with third party software.

The default IP address for the sonar head is 192.168.0.2 and must be different to that set up in Windows™ (as detailed in Section 3.1 Ethernet Set-up). Unless a different IP address was specified at the time of ordering, 192.168.0.2 must be used. In the DT101Xi or DT102Xi software (Setup > IP Address: Output IP Address).

The *Output IP Address* is used to communicate with third party software either on separate PCs or on the same PC via a loopback IP address. There are 3 options:

- If communicating with software on the same PC that is running the DT101Xi or DT102Xi software, this IP address should be set to 127.0.0.1.
- If communicating with software on **one** PC, this address should be set to the IP address that is set in Windows™ for that PC.
- If communicating with software on many PCs, a broadcast IP address must be set as 192.168.0.255. This will allow all PCs on the network to read the UDP packets output by the DT101Xi or DT102Xi software program. Care should be taken when using this IP address as if there are additional non-DT101Xi systems on the 192.168.0.X domain and 'broadcast' is used, it may adversely affect communications to and from these systems. These additional PCs must be set to have a user specified unique IP address (in the 192.168.0.X domain) and the subnet mask must be set to 255.255.255.0 in order to receive the broadcast.
- If there are issues with the UDP (for example the UDP message is being blocked by the firewall) this will be evident by a message in the diagnostics window. Options > Diagnostics. The graphic below shows evidence of an error:



Figure 4 SIR Msg Not found