



# TCP/IP Readers User's Guide V2.2

This manual provides information on how to setup, program, and interface IBC readers with internal tcp/ip communication chips. This is a supplemental manual which should be used along with the manual for your specific reader.

Additional copies of this manual can be obtained by contacting IBC or an authorized distributor. This manual may not be copied or duplicated in any way without the express written consent of IBC.

Any errors or omissions from this manual should be noted and sent to the Technical Services dept. of IBC for correction.

If you need any additional information concerning the tcp/ip readers, contact IBC's Technical Support department from 08:00 to 17:00 Eastern Standard Time, at 860-659-9660, or e-mail us ([support@interbar.com](mailto:support@interbar.com)). Technical information and update information is also available on the internet at our home page <http://interbar.com>.

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## **Revisions**

The TCP version 2.2 utility has been changed to reflect changes in Version 2.2 of the IBC TCP firmware.

Prior versions of the IBC firmware, when performing a local network search, returned the reader information directly to the ip address of the requesting pc. This made it difficult to identify a reader which may have been programmed with a different net id.

The Version 2.2 firmware returns the search data to a multicast address, making it possible to "find" IBC network devices that are not on the same logical net or subnet.

Version 2.2 of the TCP/IP utility is backward compatible with devices running 2.1 firmware. The local search function will still continue to work with these devices except that it will not be able to identify IBC 2.1 devices which are not on the same logical net.

## Product Description

IBC readers with tcp/ip connectivity contain an embedded ethernet chip which allows direct tcp/ip communications with the reader.

The embedded chip operates independently from the reader. It's only function is to provide bi-directional communications between the reader and a tcp connection.

This makes the tcp/ip connection "transparent" to the reader. IBC chose to implement the tcp/ip architecture in this manner so that this complete transparency could occur.

Once a connection is made through a tcp/ip socket, normal serial communications to and from the reader can occur. There is no change in the command set or functionality of the reader.

In addition to tcp/ip, the embedded chip can also control udp (connectionless) communications.

## Operating Modes

The reader can operate in one of three modes:

- Tcp/ip server
- Tcp/ip client
- Udp (peer-to-peer)

In the Tcp/ip **server** mode, the connection to the reader is initiated from a host, such as a pc. The host connects to the reader using a "socket". Once this connection is made, the host is the exclusive user of the reader. No other users will be able to connect to the reader until the host closes the "socket".

In the Tcp/ip **client** mode, it is the reader that initiates a connection. The reader will

continue to attempt to make a connection to a server, which in most cases will be a pc. The pc side of the connection opens a "socket" and listens on a specific port for a connection attempt by the reader. When the pc acknowledges the connection request, the host becomes the exclusive user of the reader.

The Udp mode is a connectionless mode. You do not have to specifically make a "connection" to the reader using a socket as you would with a tcp connection. You can simply send udp messages to the reader and wait for udp responses.

Although Udp is a *connectionless* protocol, the embedded tcp/ip controller in our reader will allow direct communications only from a pre-programmed ip address. You must program the reader to tell it what ip address it will be talking to, so the reader will accept transmissions only from that ip address, and not from others.

For normal one-to-one interaction between a reader and a pc, the server mode is the suggested mode of operation. In cases where multiple readers will be sending real-time data to one pc, the client or udp modes are the suggested modes of operation, simply because they can operate without being solicited.

## Ports

Connections to and from devices on the internet are achieved by using what are known as *virtual* ports. To talk with a device, you need to know not only the IP address that you want to talk with, but also the port number that you want to talk with.

Ports on a device are identified by a unique number. For example, on the internet, most browser traffic (http) uses port 80.

There are 3 of these virtual ports in the IBC tcp/ip readers which are readily accessible from the network. Two of these ports are what we call **data ports**, and 1 is referred to as a **control port**.

The data ports are the ports where normal traffic (communications to and from the reader) will occur. By default, we use port 57 for tcp server and client connections and port number 53002 for Udp connections. When you want to connect to a reader which is operating as a server, you will connect to port number 57 (by default). When a reader operating as a client connects to a pc, it will request a connection on port 57 (by default). To talk with a reader operating as a Udp peer device, you will connect to port number 53002 (by default). These ports are programmable options in the reader and you can change them easily.

The third port in the reader is called the *control port*. The control port is used for programming the reader, and also optionally for controlling data connections. More about this will be discussed later.

Note that the tcp server functions and tcp client functions share the same data port. This means that the reader cannot operate as both a client and a server at the same time. The reader must be specifically programmed to operate either as a client or a server, if you are using tcp.

Although Udp uses it's own data port, the reader cannot accept udp messages and tcp/ip messages at the same time. In order to accept and respond to Udp messages, the reader must be programmed to operate in the Udp mode. The 2nd data port used for Udp communications is set up as a 2nd data port only so that it is not confused with the tcp data ports.

Remember that the embeded tcp/ip chip in the reader operates independently from the reader itself. When you are communicating using the data ports, you are talking directly to the reader, and not to the embeded tcp/ip chip. When you use the control port, you are talking directly to the embeded tcp/ip chip.

Note that in certain installations where firewalls are running, it may not be possible to connect to specific ports or possibly even to the default ports in the reader. You should check with your system administrator prior to installing the reader to ensure that you can connect to the programmed reader ports.

Do **not** use port 53001 for any traffic. Port 53001 is a reserved port which is used for multicast traffic.

## Tcp/Udp Protocols

Tcp and Udp are completely different protocols. The tcp protocol requires a connection between devices, which normally infers a one-to-one relationship. The protocol itself maintains control over the connection by making sure that each side is alive and each side acknowledges transmissions. The Udp protocol, on the other hand, does not maintain a connection and does not verify receipt of transmitted data.

Note that although tcp/ip is an ack/nak protocol based transmission, it is still possible to loose data with tcp/ip connections. Physically connecting a tcp/ip reader to a network does not imply that reader data is automatically transmitted to a "receiver" on the network. For tcp/ip communications to operate properly, there needs to be a "socket" connection between the reader (server) and a client.

For example, if you were to take an rs232 output reader, power it, and scan barcodes without connecting the reader to the serial port the data would be lost. The same thing will happen if you connect a tcp/ip reader to a network and you do not have a server-client connection established.

For "J" series readers, the server-client connection needs to be active at all times. For stand-alone readers, the connection needs to be active only when uploading and downloading occur.

With the Udp protocol, there is no acknowledgement within the protocol layer and therefore Udp is potentially less reliable than tcp/ip, although there are many good uses for Udp, especially in environments where multiple readers need to transmit to the same pc.

It is suggested that for "online" style applications, that user feedback always be implemented in some manner, so that the

user knows that the transaction has completed. We *recommend highly* that readers with the tcp/ip interface be ordered always with led's, so that the led's can be used for user feedback.

## **Reader Parameters**

The following parameters can be reprogrammed in the tcp/ip reader:

- IP Address
- Subnet
- Data Port Number
- Control Port Number
- Connection Speed
- UDP Port Number
- Password
- Gateway Address
- Server Address
- Server Port Number
- DHCP
- Reader Identifier
- Data Communication Password Control

These items are defined in detail below:

### **IP Address**

This is the unique IP address given to the reader. The IP address must be unique on your local network. The default IP address in the reader is 192.168.1.55.

### **Subnet**

This is the subnet value used for your network. Most people use a Class C subnet which is 255.255.255.0. This is also the default subnet programmed in the reader.

### **Data Port Number**

This is the port you will use for communications to and from the reader when the

reader is operating as a Tcp Server. The default Data Port number is 57.

### **Control Port Number**

This is the port used for programming and sending control commands to the reader. The default Control Port number is 87.

### **Connection Speed**

The connection speed can be set to:

- 10BaseT Half Duplex
- 10BaseT Full Duplex
- 100BaseT Half Duplex
- 100BaseT Full Duplex
- Auto Negotiate

Note that Auto Negotiate is different than Auto Sense. An Auto Sense system senses the speed only. Auto Negotiation is a system where both devices negotiate to come up with an acceptable speed. Some older switches or Access Point Routers use the Auto Sense system. If you program the reader to Auto Negotiate and connect it to an Auto Sense system, the chances are pretty good that you will not be able to establish a connection.

The default speed for the reader is 10BaseT Half Duplex. This speed is quick enough for any type of data communication the reader will experience. The only reason to change the default speed is if you connect the reader to a hub or switch which cannot handle both 100BaseT and 10BaseT at the same time. Some of these switches will force the 100BaseT devices to run at 10BaseT so that all devices run at the same speed. In this case, changing the speed setting would be appropriate.

### **UDP Port Number**

This is the port for incoming UDP traffic to the reader. This is not the outgoing traffic port. The default Udp incoming port is 53002. This means that if you want to

send a Udp message to the reader, you will send it to port 53002, or whatever port you reprogram the reader to for Udp incoming traffic.

### **Password**

There is a 5-character password programmed into the reader, Before you can program the reader parameters, you must send the correct password to the reader. The password can be reprogrammed and *we encourage you to do so.*

There is also a password protection option in the reader, which uses this same password. If the password protection option is turned on - data cannot be received by the reader on the tcp data ports until the correct password is sent over the control port. The Udp data port is not affected by the password protection.

The default password is 11111.

### **Gateway Address**

The Gateway Address is the address of the router in your system which directs traffic. The default setting is 192.168.1.1 . You only need to change this address if you have a router which uses a different address.

### **Server Address**

The Server Address parameter serves multiple purposes. When the reader is configured as a *tcp client*, the reader will attempt to establish a connection with this address. The Server Address will have to be programmed to the IP address of the pc which will be listening for the connection.

In Udp mode, the Server Address parameter represents the IP address of the reader's peer, or the device it will be talking to. When you set this parameter and the reader needs to transmit a Udp message, that message will be sent to the IP address programmed into the Server Address parameter. In addition, because it is assumed that the reader's udp transmissions are meant to be received by only one receiver, *all udp messages received*

by the reader are checked to be sure that they originated from the same IP address programmed into this Server Address parameter. In other words - when you program the reader to operate in the Udp mode - even though it is connectionless, it is assumed that the reader is sending and receiving data from only one IP address - the IP address programmed into the Server Address parameter.

The default Server Address is set to 192.168.1.102

### **Server Port Number**

In the Tcp Client mode, the reader attempts to establish a connection with the pc that has the same IP address as that which is programmed into the Server Address parameter. It will attempt to connect to that pc using this port number.

In the Udp mode - when the reader sends a message to the pc using the Server Address, will also send the data to this port.

The default Server Port number is 57.

### **Dhcp**

Dhcp is a protocol which is used for obtaining dynamic IP addresses (from a router or a dhcp server). In some systems, people use a static IP address (one which never changes), or a dynamic IP address which can change every time the device is turned on. Depending on the type of network that you are running, you may wish to turn Dhcp on. By default, Dhcp is turned off in the reader, which means that the reader is always addressed with the same IP address.

Note that if you turn DHCP on and will be programmig the reader to operate as a Tcp Server, the IP address may change each time the reader is turned on. For this reason, when the reader is run as a server, we recommend not using DHCP.

## Reader Identifier

There is a 20-character reader identifier stored in the reader, which can be used to "name" or identify a reader. Although IP addresses or Macs can be used to uniquely identify a device - the IP or Mac address does not give a descriptive identification of the device. If you program the Reader Identification parameter, you can use it to identify the reader in a descriptive way. By default, the Reader Identification is set to "ibc reader".

## Data Communication Password

There is an option to turn on data password protection in the reader. In this mode, the reader will not accept any incoming traffic unless the proper password has been sent to the Control Port. If you want to make sure that no one can communicate with the reader in any way, unless they have the proper password, then you will want to turn this option on.

## Password Protection

There are two levels of password protection in the reader. The first level is the default level which requires that you always send a password to the reader in order to program the reader.

The second level of password protection involves the *data connections* themselves. If you wish, you can also password protect these data connections. If you do this, you cannot talk to the reader through the tcp data ports without first sending the password to the control port. This protects the reader from being connected to by unauthorized sources.

Note that if you turn the data password protection on, you must connect to the control port and send the password *prior* to any data transmission on the data port, and you must keep the control port connection active while communications are

in progress.

The Data Port password protection applies to reader receive transmissions only, and not to reader transmissions. The reader can still transmit data to the programmed receiver even if the password has not been entered. The Data Port password protection is designed to keep unauthorized parties out of the reader, not to keep the reader from transmitting its data to a legitimate source.

The Data Port Password Protection applies only to the tcp ports, and not the Udp ports. It is assumed that if you are using Udp then the Server Address parameter is protection enough to ensure that data traffic is legitimate.

## Programming

Programming the reader is done by connecting to the Control Port (tcp port 87 by default), and sending the proper programming commands. You can also use the IBC Tcp utility program to program the reader.

Prior to sending any programming commands, you must send the reader the PASS command followed by the 5 character password for the reader. The reader will not accept any programming commands unless the proper password is sent.

Once you send the PASS command with the proper password, you can then use the programming commands to program the reader.

The defaults for each of the programmable parameters in the reader is as follows:

IP Address	192.168.1.55
Subnet	255.255.255.0
Data Port	57
Control Port	87
UDP Port	53002
Password	11111
Gateway Address	192.168.1.1
Server Address	192.168.1.102

Server Port 57  
DHCP OFF  
Speed 10baseT half duplex  
Reader Identifier ibc reader

Prior to changing any of these parameters, it is suggested that you first connect to the reader using the default settings, and verify reader operation. If you are passing through a *router or firewall* to get to the reader, you may have to set up the firewall or router to allow communications with the default port 87 in order to do this.

The programming commands are listed later in the manual.

Note that each of the programming commands sent to the reader must be followed by a c/r (hex 0d). The reader will respond with OK if the command is accepted.

## How to Use the Reader

Depending on whether you are running tcp or udp, the methods of connecting and communicating with the reader will vary. The following are some examples of how to communicate with the reader in the different modes. These examples assume that you are using the defaults which are set in the reader.

### Reader as a Tcp Server

The reader is set up as a Tcp server which means that you must establish a connection to the reader before any data can be transferred back and forth. The steps to do this are as shown below. Those items marked with an \* are done only if the data port password protection is turned on.

- 1) Open a tcp socket in your software for the data communications.
- 2) Open a tcp socket to the control port\*
- 3) Set the remoteport property for the data connection to 57.
- 4) Set the remoteport property of the control connection to 87\*

- 5) Set the IP address for the Data connection
- 6) Set the IP address for the Control connection\*
- 7) Invoke a connect request on port 87 wait for the connect and send the password\*
- 8) Invoke a connect request on port 57 wait for the connect and start data communications.
- 9) When completed, close both ports.

### Reader as a Tcp Client

The reader is set up as a Tcp client which means that the reader must establish a connection to the pc before any data can be transferred back and forth. In order to do this, you must *listen* for the data connection and then accept the data connection when it arrives. The steps to do this are as shown below. Those items marked with an \* are done only if the data port password protection is turned on.

- 1) Open a tcp socket in your software for the data communications.
- 2) Open a tcp socket to the control port\*
- 3) Set the remoteport property of the control connection to 87\*
- 4) Set the IP address for the Control connection\*
- 5) Invoke a connect request on port 87 wait for the connect and send the password\*
- 6) Set the remoteport property for the data connection to 0.
- 7) Invoke a listen request on port 57 wait for the reader to connect and start data communications.
- 8) When completed, close both ports.

### Reader as a Udp Peer

The reader is set up as a Udp peer which means that the reader will accept and send Udp transmissions over the network from and to the specified programmed host. The steps to do this are as shown below. Note that the Udp port cannot be protected by the Data Port protection password.

- 1) Open a tcp socket in your software for the Udp transmit.
- 2) Open a tcp socket in your software for the Udp receive.
- 3) Set the remoteport property for the receive socket to 0.
- 4) Set the localport property for the receive socket to 57.
- 5) Set the remoteport property for the transmit socket to 53002.
- 6) Set the IP address property for the transmit socket to 192.168.1.55.
- 7) Invoke a bind request on port 57
- 8) Transmit Udp data over the transmit socket.
- 9) Receive Udp data over the receive socket.

You do not need to maintain a "connection".

## Command Set for V2.0

All commands sent to the reader must be followed by a carriage return (hex 0d).

When you send a command you will receive a response back from the reader. If the command asks the reader for information, such as the IBCIDENTIFY command, the reader data will be returned followed by a carriage return (hex 0d). If the command does not require the reader to return data, but simply to execute a command, the reader will respond with "OK" if the command was accepted.

Note that in all cases where you must send data, such as an IP address or a Port Number, do not blank fill the number. The only exception to this rule is the password which must be 5 characters long. For example, to change the Tcp Data Port to 100, send the command DPT100 and not DPT100 followed by 2 spaces.

If you reprogram any of the dynamic operating parameters, such as the IP address or a port number - the change is made permanent in the reader but the changes will not take effect until you either reprogram the reader, or issue the REBOOT command.

The following commands do not require that the password be sent:

**IBCIDENTIFY** Returns the reader's current IP Address followed by ":" followed by the reader's MAC address followed by ":" followed by the Reader Identification.  
For example, with the default settings, this command will return 192.168.1.55:mmmmmmmmmmmm:ibc reader  
where mmm... is the MAC address for the reader

**PASSxxxxx** This command sends the password xxxxx to the reader, so that the reader can be reprogrammed or other commands can be sent..

The following commands require that the password has already been sent:

**CON** Returns the reader connection speed the reader is connected at. This is not the programmed connection speed, but rather the actual speed that the reader connected at. The response can be any of the following: 10HD, 10FD, 100HD, 100FD, 10HDM, 10FDM, 100HDM, 100FDM. The M suffix is appended when the speed was set by manual command as opposed to auto negotiate.

**MAC** Returns the reader's MAC address as 12 hex characters.  
**SPEEDx** Changes the reader connection request speed to x, which can be:

- 1 - 10 half duplex
- 2 - 10 full duplex
- 3 - 100 half duplex
- 4 - 100 full duplex
- 5 - auto negotiate

**NEWPASSxxxxx** Changes the password to xxxxx  
**CIPxxx.xxx.xxx.xxx** Changes the reader IP address  
**DPTxxxxx** Changes the reader tcp data port number

CPTxxxxx	Changes the reader's tcp control port number
DHCPX	Turns DHCP on or off (0=off, 1=on)
DPASSx	Turns the Data Password Protection on or off (0=off 1-on)
CSNxxx.xxx.xxx.xxx	Changes the subnet value
GTWxxx.xxx.xxx.xxx	Changes the Gateway address
SIPxxx.xxx.xxx.xxx	Changes the Server IP address which is used for tcp client connections and Udp receive and transmit connections.
UDPP XXXXX	Changes the Udp receive port number.
IDENTxxxxx.....	Changes the Reader Identifier (up to 20 characters max)
SPRTxxxxx	Changes the Server Port which is used for Tcp Client connections and Udp connections.
MODEX	Changes the reader operating mode to one of the following: 0 - Tcp Server 1 - Tcp Client 2 - Udp Peer
REBOOT	Reboots (restarts) the reader.
STAT	This command returns all of the settings in the reader. Each value is sent without space padding, and each value is delimited with a ":". To parse the string, simply look for the colons and parse the data up until the point of each colon. The returned parameters (in order) are:  Current IP address the reader is operating at MAC address Reader Identifier Version Identifier (format xx.xx) Reader Programmed IP address Tcp Data Port Number Tcp Control Port Number Gateway address Server IP address Server Port Number Operating mode Speed setting DHCP setting reserved (up to 5 characters - do not use) Subnet mask Udp Port Number reserved (up to 5 characters - do not use) Data Password required setting

**NOTE** once you have changed parameters, you must unpower the reader and then power up again for the new settings to take effect, or you must issue the REBOOT command. Note that when you issue the REBOOT command you will loose your current connection because the reader will automatically close the connection.

## Using the IBC TCP/IP V2.2 Utility Software

The IBC TCP/IP Utility software can be found on IBC's internet software page. This software can be used for reprogramming the parameters in the reader as well as testing readers and searching for readers on the network.

The software has 7 screens for performing certain functions. Each screen is accessed by clicking on the appropriate screen function on the left side of the main screen. When you click on these items, the appropriate sub screen will be displayed.

### Utility Program Selection Menu

**Local Network Search**

Use this screen to search for IBC Tcp enabled readers on a local network

**Wide Network Search**

Use this screen to search for IBC Tcp enabled readers on a wide area network

**Program Reader**

Use this screen to program the reader

**Server Connect**

Use this screen to test communications with a reader set up as a Tcp Server

**Client Connect**

Use this screen to test communications with a reader set up as a Tcp Client

**Udp Connect**

Use this screen to test communications with a reader set up as a Udp Peer

**Flash Reader**

Use this screen to download new firmware into the reader

## Search Readers on a Local Network

Search for Readers on a Local Network

IP Address	Mac Address	Reader Identification	Ctl Port

     **Db**click on a reader to program it     

To resolve a duplicate IP, click on the reader and then click on "Resolve Dup"

This screen allows you to search for tcp/ip enabled IBC readers on a local network. To search for readers click on the *Start Search* button or hit the F1 key. Any readers which are found on the local network are shown, with their IP address, MAC address, and also Reader Identification.

If you wish to reprogram one of the readers displayed, simply double click on that reader and the programming screen will appear with the IP address and default control port already typed in.

Although technically not allowed, it is possible that multiple readers connected to the network have the same IP address. This will occur, for example, if you connect two new readers and you have not changed their IP addresses yet. On a local physical network only, the IBC utility software can resolve this issue. To change the IP address for one specific reader, click on the Resolve Dup button and follow the instructions.

**NOTE** this screen does not search IP addresses one by one. It uses an IGMP multicast command to identify the IBC readers. This IGMP command will not pass through routers which are not multicast enabled and therefore use of this screen is restricted to local physical networks only. The IGMP command is sent on Port 53001 and therefore this screen will not work if Port 53001 is blocked by a router or firewall.

The local network search can also identify readers which are not programmed with the same network id or subnet, as long as they are physically on the same network.

For example, you can have one reader configured as 192.168.1.55, subnet 255.255.255.0, and another reader configured as 10.19.20.20, subnet 255.255.0.0. The local search will find both of these readers, provided that the firmware in the readers is at least V2.2. Prior versions of reader firmware are not capable of responding to the search request if the pc is not on the same logical net.

It is important to note that in order for the search utility to work, the readers need to be physically connected to the same network and reachable without going through a router. If you need to go through a router, then multicast traffic must be enabled on the router in order to pass the traffic.

If you have a situation where a reader is programmed to a different net and you want to program it to the net you are currently connected to, follow this sequence:

- 1) Find the reader using the local search. Make sure the reader is physically connected to the local network.
- 2) Change the ip address of the reader to an address which is valid for your current local network. Do not worry about the submask because you can change this later. You do this by clicking on the Resolve Dup button and changing the ip address to a local address.
- 3) Search again to ensure that the ip address has been changed. After you know it has been changed, go to the Program screen and attempt to get the parameters and then change them.
- 4) Note that in some cases, depending on the subnet mask, it may still not be possible to directly communicate with the reader. If this is still the case, you can temporarily change the subnet mask on your pc to a class B subnet (255.255.0.0) and you should then be able to communicate in order to change the subnet mask in the reader.

## Search Readers on a Wide Area Network

**Search for Readers on a Wide Area Network**

Starting IP Address

Port Number   Slow Mode

IP Address	Mac Address	Reader Identification

**Dblick on reader to program it**

This screen allows you to search for tcp/ip enabled IBC readers on a wide area network. To search for readers set the starting IP address to search, and set the Control Port number. Then click on the *Start Search* button or hit the F1 key. Any readers which are found on the network are shown, with their IP address, MAC address, and also Reader Identification.

This screen searches for the readers one-by-one, incrementing the IP address each time. By default, the screen will wait about 1 second to see if a reader responds to its request. On networks which are congested, it may take longer for a reader to respond. If you are not getting a response from a reader or have a congested network, click on the *slow mode* box, which will increase the wait time to about 3 seconds for each reader.

If you wish to reprogram one of the readers displayed, simply double click on that reader and the programming screen will appear with the IP address and default control port already typed in.

## Programming a Reader

**Program Reader**

IP Address 
 Control Port 
 Password

<p><b>Reader IP Address</b> <input style="width: 100%;" type="text"/></p> <p><b>Reader Data Port (tcp)</b> <input style="width: 100%;" type="text"/></p> <p><b>Reader Data Port (udp)</b> <input style="width: 100%;" type="text"/></p> <p><b>Reader Control Port</b> <input style="width: 100%;" type="text"/></p> <p><b>Reader Subnet Mask</b> <input style="width: 100%;" type="text"/></p> <p><b>Reader Gateway Address</b> <input style="width: 100%;" type="text"/></p> <p><b>Server Address</b> <input style="width: 100%;" type="text"/></p> <p><b>Server Port</b> <input style="width: 100%;" type="text"/></p> <p><b>Identifier</b> <input style="width: 100%;" type="text"/></p> <p><b>Password</b> <input style="width: 100%;" type="text"/></p> <p><b>Mac Address</b> <input style="width: 100%;" type="text"/></p>	<p><b>Operating Mode</b></p> <p><input type="checkbox"/> Server <input type="checkbox"/> Client <input type="checkbox"/> Udp</p> <p><b>Speed</b></p> <p><input type="checkbox"/> 10hd <input type="checkbox"/> 10fd <input type="checkbox"/> 100hd <input type="checkbox"/> 100fd <input type="checkbox"/> Auto</p> <p><b>Dhcp</b></p> <p><input type="checkbox"/> On <input type="checkbox"/> Off</p> <p><b>Password required for Data Transfer</b></p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><b>Firmware Version:</b> <input style="width: 100%;" type="text"/></p>
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To program a reader, enter in the IP address for the reader and also the Control Port Number. You will also need to enter in the 5-character password. Click *Get Parameters* and the current settings in the reader will be displayed. Note that the password field will be blank and the Mac Address and Firmware fields will be not be enabled.

You can change any of the parameters on the screen and when you are finished - click on *Set Parameters* to start the reader programming.

If you want to change the password in the reader, enter a new 5-character password. If you do not want to change the password - then leave that field blank.

Note that if you forget your password - there is no way to connect to the reader or reset the password. If you change the password make sure that you write it down and store it in a safe place.

Once you have reprogrammed the reader - you will need to click on the *Reboot* button in order to restart the reader with the new parameter settings.

## Testing a reader which is set up as a Server

Connect to reader operating as a Server

IP Address	<input type="text"/>	Control Port Number	<input type="text"/>
Data Port Number	<input type="text"/>	Password	<input type="text"/>

     **Current Status**  
**Disconnected**     

Use the F10 key to send a NULL character

This screen allows you to connect to a reader which is programmed to operate as a server. You must enter in the IP address for the reader and also the Data Port number. If you have the Data Port Password protection ON, then you must also enter in the number for the Control Port and the password, otherwise the screen will not be able to send and receive data.

To connect, click on the *Connect* button.

Once you have connected, you can type data which will be sent to the reader, and any data received from the reader will be displayed on the screen.

NOTE that if you connect to the reader and then change screens without disconnecting - the reader will still remain connected and other screens potentially may not work.

## Testing a reader which is set up as a Client

**Connect with reader operating as a Client**

Data Port Number	<input type="text"/>	Control Port Number	<input type="text"/>
		Password	<input type="text"/>

     **Current Status**        
**Disconnected**

Use the F10 key to send a NULL character

This screen allows you to connect to a reader which is programmed to operate as a client. You must enter in the IP address for the reader and also the Data Port number. If you have the Data Port Password protection ON, then you must also enter in the number for the Control Port and the password, otherwise the screen will not be able to send and receive data.

To connect, click on the *Listen* button. The IBC tcp/ip readers attempt to connect to their host device every couple of seconds. If the reader is present at the entered IP address, then it should momentarily connect.

Once you have connected, you can type data which will be sent to the reader, and any data received from the reader will be displayed on the screen.

NOTE that if the reader has connected and then you change screens without clicking the *Stop* button - the reader will still remain connected and other screens potentially may not work.

## Testing a reader which is set up as a Udp Peer

Connect to reader using UDP

IP Address	<input type="text"/>	ReceivePort Number	<input type="text"/>
Data Port Number	<input type="text"/>		

**Listen**      **Current Status**      **Stop**

**Offline**

Use the F10 key to send a NULL character

**Clear Screen**

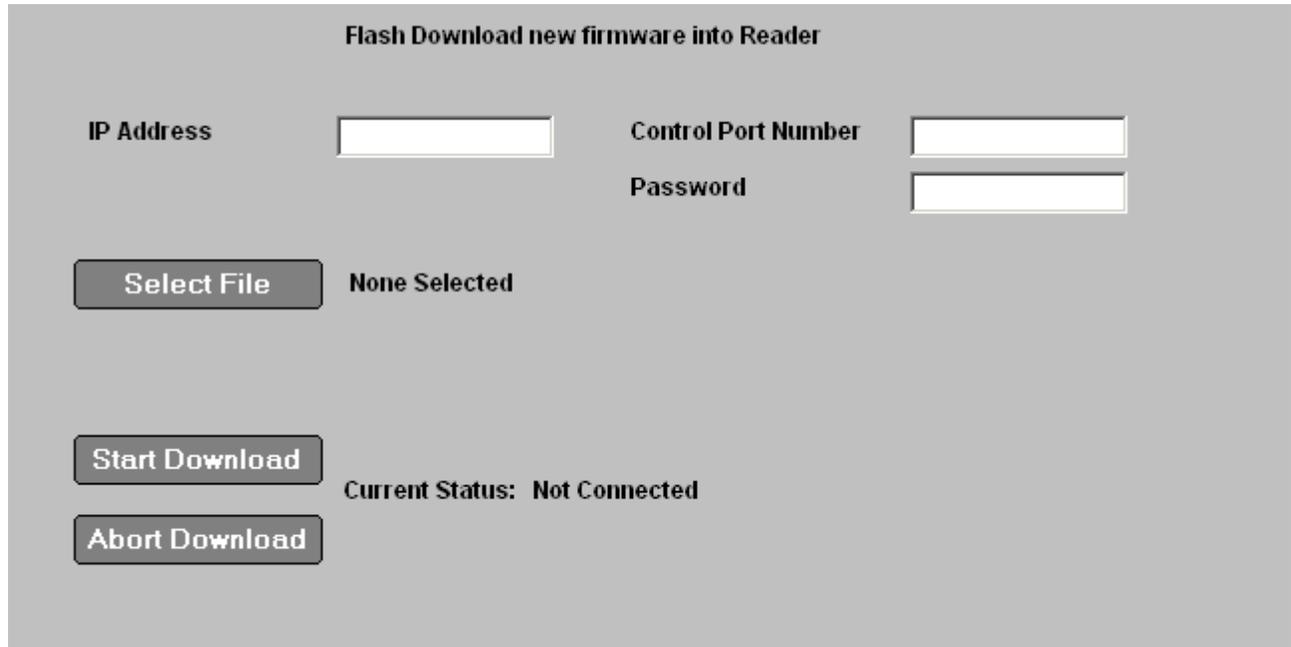
This screen allows you to connect to a reader which is programmed to operate as a Udp peer. You must enter in the IP address for the reader and also the Data Port number. You must also enter in the Receive Port Number, which will be the *Server Port* which is programmed into the reader.

To connect, click on the *Listen* button.

Once you have connected, you can type data which will be sent to the reader, and any data received from the reader will be displayed on the screen.

NOTE that if the reader has connected and then you change screens without clicking the *Stop* button - the reader will still remain connected and other screens potentially may not work.

## Firmware Updating



**Flash Download new firmware into Reader**

IP Address  Control Port Number   
Password

None Selected

Current Status: Not Connected

All IBC Tcp/ip readers are capable of receiving new updated firmware by utilizing this Flash Download screen.

To send the new firmware to the reader, you must enter in the IP address for the reader, and also the Control Port number and the current Password.

Click on the *Select File* button to select the file which is to be downloaded (supplied by IBC) and then click on *Start Download*.

The new firmware will start to be downloaded and the status will be displayed on the screen. You can abort the download at any time by clicking on the *Abort Download* button. Aborting the download does not harm the reader in any way. The reader will not load the new firmware unless a full download completes.

When the download is complete, you will be asked if you want to restart (reboot) the reader. If you respond yes then the reader will be restarted, and will load the new firmware into it's memory. This process can take up to 3 minutes.

NOTE that during the download process the reader internally stores the downloaded information but does not reflash itself until a reboot or restart occurs. This process can take up to a few minutes. Even if you respond No to the request to restart the reader - the next time the reader is restarted or powered up - it will load in the new firmware automatically so upon a restart of a freshly downloaded reader, you can expect up to a few minutes to occur before you are able to connect to the reader.