

## CIP Connections

- @Producer: For each produced tag, the number of connections equals the number of consumers of that tag.
- @Consumer: 1 connection for each consumed tag

## Packets Per Second Calculations

- **For Rack Optimized, or Direct Connections:**  
 $P/S = (2 \times \text{connections}) / RPI$
- **Producer/Consumer P/S:**  
 $\text{Producer P/S} = (1 + \text{connections}) / RPI$   
 (one for the produced tag plus one for each connection)  
 $\text{Consumer P/S} = 2 / RPI$  (for each consumed tag)

## OSI Reference Model

- 7 Application
- 6 Presentation
- 5 Session
- 4 Transport TCP-UDP
- 3 Network (IP addresses, Routers, L3 switches)
- 2 Devices (L2 switches, MAC addresses)
- 1 Physical (hubs, wires, bits)

## TCP & UDP Port Numbers

Well Known	0 – 1023		
Registered	1024 – 49141		
Dynamic/Private	49152 – 65535		
	TCP	UDP	
FTP	20,21	DHCP	67,68
Telnet	23	TFTP	69
SMTP	25	NTP	123
DNS	53	DNS	53
HTTP	80	SNMP	161
POP3	110		
CSP	2222		
CIP	44818	CIP	2222

For a complete list, see knowledgebase Doc ID# 29402

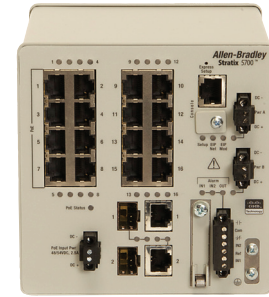
## IP Address Notes

- **CIDR, Slash, or Prefix Notation**  
 Example: 100.100.100.100 /22 indicates that 22 bits of the subnet mask are used for the network and subnet portion. /22 **Represents a subnet of 255.255.252.0**
- **Private Addresses**  
 10.0.0.0 – 10.255.255.255 - (10.0.0.0 /8)  
 172.16.0.0 – 172.31.255.255 - (172.16.0.0 /12)  
 192.168.0.0 – 192.168.255.255 - (192.168.0.0 /16)
- **Classful addressing ranges**  
 Class A 0.0.0.0 – 127.255.255.255 /8  
 Class B 128.0.0.0 – 191.255.255.255 /16  
 Class C 192.0.0.0 – 223.255.255.255 /24
- **Multicast**  
 Class D 224.0.0.0 – 239.255.255.255 /4
- **EtherNet/IP Multicast Addresses**  
 239.192.1.0 – 239.192.128.255

arp -a returns ARP cache of your computer

tracert 10.88.89.1 returns the route, including hops across routers to 10.88.89.1

## The Ethernet Cheat Sheet



CLI for determining how the switch is configured.

- Switch# **sho vlan** displays configured VLANs
- Switch# **sho ip int brief** (show ip interface brief to see how ip addresses relate to vlans. Use this to determine VLAN/Interface correspondence.
- Switch# **sho ip int** (displays a detailed report on each interface)
- Switch# **sho parser macro** (displays contents of Global and Smartport Macros)
- Switch# **sho ip igmp snooping querier** (display the switch that is the IGMP Querier)
- Switch# **sho ip route** (display available routes)
- Switch# **sho run** (shows the running config)
- Switch# **sho run | include ip route** (shows running config routes *that are configured*)

This Guide is intended as a quick reference for common commands and formulas used when working with Ethernet.

## Unknown IP Address

**Device Manager** – Pushing the Express Setup Button briefly will cause the lowest numbered open Fa interface to flash, indicating that interface has been set to **169.254.0.1** – **Set your PC to 169.254.0.2, 255.255.255.248, and you will be able to access Device Manager through that port, and make the necessary changes to the switch address and VLANs.**

### Compact Flash Card swap

- 1 Remove a CF card from a known switch
- 2 Remove power from the unknown switch
- 3 Insure that the unknown switch is not connected to any other switch
- 4 Insert the “known” CF in the “unknown” switch
- 5 Power up the switch
- 6 Wait for the switch to boot. Both switches are now configured exactly the same. Access the switch via Device Manager
- 7 Remove the “known” CF and swap it with the original “unknown” CF
- 8 Open the Express Setup page to set the IP address correctly
- 9 Save your changes to the CF by clicking *Submit*

**Console Cable** – Connect the console port of the switch to your PC serial port using the blue console cable.

Use Putty, or other terminal emulator to access the switch via the Command Line Interface. (CLI)

*See CLI commands for help in determining the configuration, and setting the IP address and VLANs.*

## Reset the switch to out of box condition

- 1 Cycle power to the switch
- 2 Press and hold the *Express Setup* button, with a paper clip while the switch is going through power up
- 3 You will need to hold the button in for about 20 seconds. Release the *Express Setup* button when you see 3 LEDs turn red.

The switch will continue to boot into IOS (Internetworking Operating System). During the process the config.txt and vlan.dat files are erased from the compact flash card.

The reboot process will take approximately three minutes.

**Default password** for the Stratix 8000 = **switch**

## CLI Switch Prompts

Example: In this example the switch name is *Switch*

Switch > initial prompt before entering the password

Type “en” to enter the enable mode

Switch # > show commands work from this level

Type “conf t” to enter the priviledged exec mode

Switch (config) # > priviledged exec mode allows setting IP addresses, VLANs etc.

The prompt will change again when an interface is being configured.

Switch (config-if) #

“Cntrl Z” or “end” to back up a prompt level

## Setting the IP address of the switch using CLI

Example: assigning a IP address to VLAN 5

Switch (config): int vlan 5 (prepare to configure VLAN 5)

Switch (config): ip address 172.16.0.67 255.255.255.0

### Delete the IP address

Switch (config): int vlan 5 (prepare to configure VLAN 5)

Switch (config) #: no ip address (delete the IP address assigned to VLAN 5)

## Assigning VLANs to a specific interface using CLI

Switch (config): int fa1/1 (prepare to configure interface fa1/1)

The prompt will change:

Switch (config if): switchport access vlan 5 (assign fa1/1 to vlan 5)

sdm prefer labase-routing: to enable routing profile on a 5700/8000

ip routing: to turn routing on

## More helpful CLI

Switch # logging console or no logging console - turns on / off continuous logging when connected

Switch (config)# ip route 0.0.0.0 0.0.0.0 10.88.11.2  
(sample default route: send all other to 10.88.11.2)