CTI 3570 SERIES
INDUSTRIAL ETHERNET SWITCH
INSTALLATION AND OPERATION GUIDE
Version 1.0

CTI Part # 062-00355-010

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REVISION HISTORY

V1.0	10/24/02	Original Release

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CHAPTER 1. DESCRIPTION

1.1. Introduction

Using Ethernet networking in the manufacturing environment can enhance information flow, improve maintainability, and simplify access for better monitoring and diagnostics. However, the unique challenges of operating in harsh environments demand network components which are designed especially for industrial installations.

The 3570 Series of 5-port Industrial Ethernet Switches from CTI is designed specifically for providing network access to small clusters of factory floor equipment. In addition to its ability to withstand harsh production requirements, the 3570 Series includes features like spacesaver DIN rail mounting and redundant power supply connection which make it even easier to integrate into a typical industrial installation.

Features

- Five Ethernet ports, available in four different configurations of copper and fiber media
- Isolated power supply
- 10/100 Mbps with auto-negotiation, auto-crossover and auto-sensing on all RJ45 ports

Figure 1. 3570 Front Panel

1.2. Power Supply

The 3570 requires an external power supply for operation. For use in high-availability applications, it includes provision for connecting dual redundant power supplies. An isolation barrier is designed onboard the 3570 for isolating the input supply from the switching circuitry, and the incoming power is fused. This reduces the chance of damaging the 3570 circuitry from power surges occurring on external power lines.

The input power specification is: 11-32VDC

Power is connected to the 3570 using the connector at the top of the case.

1.3. Ethernet Ports

All 3570 Series Ethernet switches provide five ports for Ethernet connection. Depending on the model switch you have, the switch has a combination of RJ45 (twisted pair) and MTRJ (fiber) connectors:

3570-5C	5 RJ45 ports
3570-1F	4 RJ45, 1 MTRJ
3570-2F	3 RJ45, 2 MTRJ
3570-3F	2 RJ45, 3 MTRJ

All ports are IEEE802.3 compliant, and RJ45 ports include auto-negotiation, auto-sensing, and auto-crossover. This allows connection of any Ethernet device without worrying about speed, cable rollover, or full/half duplex. The switch automatically detects the characteristics of the attached device/cable and sets up its port accordingly.

Figure 2. RJ45 Ethernet Ports on 3570-5C

1.4. LED Indicators

All 3570 Series Ethernet switches provide LED indication of major functions to assist in installation and troubleshooting.

POWER LEDs – P1 and P2 LEDs are lighted when power inputs P1 and P2 are above the minimum threshold voltage.

LINK/ACT LEDs (1 per port)

OFF - nothing is connected to the port (no link beat)
ON – there is a good connection to a device, but no data is being transmitted or received
FLASHING - a good connection exists and data is being transmitted

10/100 LEDs (1 per port)

OFF - connection is 10Mbit/s
ON – connection is 100Mbit/s

CHAPTER 2. INSTALLATION

The installation of the 3570 Ethernet switch consists of the following steps:

1) Unpacking
2) Mounting on the DIN rail
3) Connecting power
4) Connecting network cables
5) Checkout

2.1. Unpacking

Open the shipping carton and remove the special anti-static bag that contains the 3570. After discharging any static build-up, remove the module from the static bag. Do not discard the static bag. Always use this bag for protection against static damage when the module is not inserted into the I/O base.

CAUTION:
The components on the 3570 printed circuit card can be damaged by static electricity discharge. To prevent this damage, the module is shipped in a special anti-static bag. Static control precautions should be followed when removing the module from the bag and when handling the printed circuit card during configuration.

2.2. Mounting on the DIN rail

The 3570 is designed for DIN rail mounting. To install, simply engage the top of the rail in the top channel of the 3570, then rotate the unit downward until it snaps into place.

To remove the unit, insert a screwdriver into the red tab and pry the tab outward until the lock in released, then rotate the unit upward and lift off.

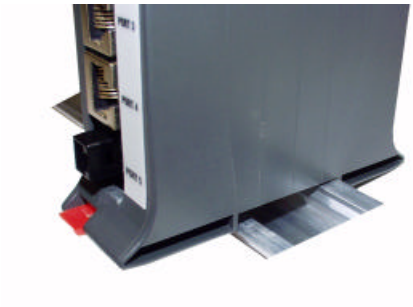

Figure 3. Attaching the 3570 to the DIN rail

Figure 4. Removing the 3570 from the DIN rail

2.3. Connecting Power

The 3570 requires an external 11-32VDC power supply (300mA) for operation. For high-availability applications, it supports the connection of two independent power supplies in a redundant configuration. If one supply fails, the switch will draw power from the other supply to continue operating.

The external supply is connected using the removable screw-terminal connector located at the top of the switch.

If the 3570 is being connected in a single-supply configuration, attach the '+' and '-' terminals from the power supply to the P1+ and P1- connectors. For a dual supply, attach the second power supply at P2+ and P2-.

The power connector terminal labeled "CHASSIS GND" should be connected to a convenient earth ground on the panel.

Figure 5. Single Power Supply Wiring

Figure 6. Dual Power Supply Wiring

2.4. Connecting Network Cables

Connecting to the RJ45 Ports

Insert the RJ45 plug on your twisted pair cable into an RJ45 jack on the 3570. Push the plug into the jack until the plug clicks into place. To remove the plug, simply depress the latching tab and pull the plug out of the jack.

Connecting to the MTRJ Port(s)

Insert the MTRJ plug on your fiber cable into an MTRJ jack on the 3570. Push the plug into the jack until the plug clicks into place. To remove the plug, simply depress the latching tab and pull the plug out of the jack.

Figure 7. RJ45 and MTRJ cables on 3570-1F

2.5. Checkout

Once power is applied and network cables are attached, checkout of the 3570 requires only 4 steps:

1. Verify P1 LED is ‘ON’
2. Verify P2 LED is ‘ON’ if a second power supply is connected
3. Verify LINK/ACT LEDs are on or blinking for ports connected to active devices
4. Verify 10/100 LEDs are ‘ON’ for ports connected to 100Mbit devices

CHAPTER 3. TROUBLESHOOTING

If you experience a problem in communicating with the module, consider the following troubleshooting guidelines:

1. Check the P1 and P2 LEDs on the front of the 3570. If one or both of these is not ON, the module is not receiving power.

2. Verify the voltages at the power supply input connector at the top of the module. P1 and P2 (optional) voltages should be 11-32VDC.

3. If the voltage(s) are good and both power LEDs are off, the internal fuse and blown and the unit must be returned to CTI for repair.

4. Verify continuity of Ethernet fiber or copper cables. Plug a known good device and cable into each of the ports and make sure the LINK/ACT light for that port comes on.

CHAPTER 4. PRODUCT SPECIFICATIONS

Ports: 5 (combinations of copper and fiber depending on model)

Power supply: isolated, fused, requires user-supplied 11-32 VDC / 300mA current, supports redundant supplies, removable connector

Ethernet standards: IEEE 802.3, 802.3u, 802.3x, all standard 802.3 protocols supported

Port Speed: 10 or 100 Mbps (half or full duplex)

Auto-crossover: all ports

Auto-sensing: full and half duplex

Auto-negotiation: 10 or 100 Mbps

Broadcast storm protection: all ports

LED indicators: power supply 1, power supply 2, link/active (each port), 10/100 (each port)

Ethernet isolation: 1200 Vrms

Mounting configuration: DIN rail

Connector (power): Removable

Module Size: 120D x 101H x 35W (mm)

Operating Temperature: 0^{o} to 60^{o}C (32^{o} to 140^{o}F)

Storage Temperature: -40^{o} to 85^{o}C (-40^{o} to 185^{o}F)

Relative Humidity: 5% to 95% (non-condensing)

Agency Approvals Pending: UL, ULC, Class 1, Div. 2, CE

Shipping Weight: 1.0 lb. (0.45 Kg)

CHAPTER 5. PORT AND SWITCH SPECIFICATIONS

10/100BaseTx Port (RJ45)

Port connector: shielded RJ45
Auto-crossover: all ports
Auto-sensing: full and half duplex
Auto-negotiation: 10BaseT and 100BaseTx
Flow control: automatic
Ethernet isolation: 1200 Vrms
Cable requirements: Cat 5 twisted pair
Cable distance: 100m (max)

100BaseFx Port (fiber)

Port mode: multimode
Port connector: MT-RJ
Optimal fiber cable: 62.5/125, 50/125
Center wavelength: 1300nm
Tx output power: -14dBm to -22dBm
Rx input sensitivity: -31dBm peak (min)
Cable distance: 2km (max)

Switch Specifications

Forwarding mode: store and forward
Memory bandwidth: 1.4 Gbps
MAC addresses: 1K
Address learning: automatic
Address aging: removed after 300 seconds
Address migration: automatic
Backoff operation: drops after 16 collisions
Back pressure: automatic for half-duplex
Broadcast storm protection: limits to 25%
Buffer memory: 128K
Buffers (total): 1024
Buffers per port: 205
Buffer size: 128 bytes
Illegal frames: dropped per IEEE 802.3
Late collisions: dropped after 512 bit times

LIMITED PRODUCT WARRANTY

CTI warrants that this CTI Industrial Product shall be free from defects in material and workmanship for a period of one (1) year after purchase from CTI or from an authorized CTI Industrial Distributor. This CTI Industrial Product will be newly manufactured from new and/or serviceable used parts which are equal to new in the Product.

Should this CTI Industrial Product fail to be free from defects in material and workmanship at any time during this (1) year warranty period, CTI will repair or replace (at its option) parts or Products found to be defective and shipped prepaid by the customer to a designated CTI service location along with proof of purchase date and associated serial number. Repair parts and replacement Product furnished under this warranty will be on an exchange basis and will be either reconditioned or new. All exchanged parts or Products become the property of CTI. Should any Product or part returned to CTI hereunder be found by CTI to be without defect, CTI will return such Product or part to the customer.

This warranty does not include repair of damage to a part or Product resulting from: failure to provide a suitable environment as specified in applicable Product specifications, or damage caused by an accident, disaster, acts of God, neglect, abuse, misuse, transportation, alterations, attachments, accessories, supplies, non-CTI parts, non-CTI repairs or activities, or to any damage whose proximate cause was utilities or utility like services, or faulty installation or maintenance done by someone other than CTI.

Control Technology Inc. reserves the right to make changes to the Product in order to improve reliability, function, or design in the pursuit of providing the best possible Product. CTI assumes no responsibility for indirect or consequential damages resulting from the use or application of this equipment.

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REPAIR POLICY

In the event that the Product should fail during or after the warranty period, a Return Material Authorization (RMA) number can be requested orally or in writing from CTI main offices. Whether this equipment is in or out of warranty, a Purchase Order number provided to CTI when requesting the RMA number will aid in expediting the repair process. The RMA number that is issued and your Purchase Order number should be referenced on the returning equipment's shipping documentation. Additionally, if the product is under warranty, proof of purchase date and serial number must accompany the returned equipment. The current repair and/or exchange rates can be obtained by contacting CTI's main office at 1-800-537-8398.

When returning any module to CTI, follow proper static control precautions. Keep the module away from polyethylene products, polystyrene products and all other static producing materials. Packing the module in its original conductive bag is the preferred way to control static problems during shipment. Failure to observe static control precautions may void the warranty. For additional information on static control precautions, contact CTI's main office at 1-800-537-8398.