FlexSwitch ${ }^{\text {TM }} 1$ Fx+4U Model 6550-FK Replacement Kit
User Manual


## PRODUCT OVERVIEW

The 6550-FK is the direct replacement for the discontinued FlexSwitch Model 600XC 1Fx +4 U . The 6550-FK replacement kit consists of one iConverter 10/100BASE-Tx to 100BASE-Fx Media Converter Module and one iConverter 4Tx Switch Module installed in a iConverter 2-Module Chassis.

The 6550-FK provides auto-negotiating 10/100 RJ-45 ports with auto-crossover that enables easy attachment to hubs, switches and workstations. The 100BASE-Fx fiber port supports half or full duplex operation.

The 6550-FK features on-board and front panel accessible DIP-Switches for manual configuration of the ports.

## Chassis Models

| FlexSwitch Replacement Matrix |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Disconnected <br> Part | Replacement Part |  |  |  |
|  | Connector Type |  | Fiber Type | Distance |
|  | SC | ST |  |  |
| $6550-0$ | $6550-0-F K$ | - | MM | 5 km |
| $6550-2$ | $6550-2-F K$ | - | SM | 30 km |
| $6550-3$ | $6550-3-F K$ | - | SM | 60 km |
| $6551-0$ | - | $6551-0-F K$ | MM | 5 km |
| $6551-2$ | - | $6551-2-F K$ | SM | 30 km |

## INSTALLATION PROCEDURE

1) Configure DIP-Switches
2) Install Module in Chassis and Connect Cables
3) Installing the Chassis
4) Apply AC Power
5) Verify Operation

## 1) Configure DIP-Switches

The 6550-FK has been pre-configured with Auto-Negotiation enabled on all RJ-45 ports for plug and play easy of use. However, the iConverter Modules offer additional configuration flexibility.

## 4 Port Switch Module

Each 4-Port Switch Module has been pre-configured for Auto-Negotiation with Backplane A and B Enabled.

| Left |  | Right |
| :---: | :---: | :---: |
| BPAEN | . | BPADIS |
| BP B EN | . | BP B DIS |
| MAN | $\cdot$ | AN |
| 10 | $\cdot$ | $100 \stackrel{\square}{\square}$ |
| HD | - | FD |
| MAN | $\checkmark$ | AN 7 |
| 10 | $\cdot$ | 100 N |
| HD |  | FD |

## 4 Port Switch Module Default DIP-Switch Settings

## Backplane Port A Enable/Disable

This DIP-Switch must be in the LEFT "Enable" position for the module to operate correctly. The switch provides backplane connectivity with the other switch module.

## Backplane Port B Enable/Disable

This DIP-Switch must be in the LEFT "Enable" position for the module to operate correctly. The switch provides backplane connectivity with the other switch module.

## Port 1 and Port 2 RJ-45 Auto-Negotiate/Manual

When this DIP-Switch is in the RIGHT "AN" position, the Port automatically determines the speed and duplex mode of the connecting copper device. If the connecting device cannot provide the proper signal to indicate its own mode of operation, this DIP-Switch should be set to the LEFT "Man" position. Manual mode requires manually configuring the RJ-45 port to match the speed and the duplex mode of the connecting device using the Speed and Duplex DIP-Switches.
When a port is configured for Auto-Negotiation, the automatic crossover detection is enabled for that particular port. Automatic crossover detection is disabled when the port is configured for manual negotiation.

## Port 1 and Port 2 Speed 10/100Mbps

When the port is configured for Manual Mode (SW3/SW6 in the LEFT position), the Speed DIP-Switch determines the speed of operation for the designated port. Setting the Speed DIP-Switch to the RIGHT "100" position forces the port to operate at 100Mbps. Setting this DIP-Switch to LEFT "10" position forces the port to operate at 10Mbps. Adjust the Speed DIP-Switch to match the speed of the connecting device.

## Port 1 and Port 2 Duplex Full/Half-Duplex

When the port is configured for Manual Mode (SW3/SW6 in the LEFT position), the Duplex DIP-Switch determines the duplex operation mode for the port. Setting the Duplex DIPSwitch to the RIGHT "FD" position forces the port to operate in Full-Duplex. Setting this

DIP-Switch to the LEFT "HD" position forces the port to operate in Half-Duplex. Adjust the Duplex DIP-Switch to match duplex mode the connecting UTP device.
When a port is configured for Auto-Negotiation, the Duplex DIP-Switch will determine if the port advertises Full-Duplex or Half-Duplex. When the Duplex DIP-Switch is in the "FD" position, the port advertises Full-Duplex and Half-Duplex capability. When in the Duplex DIP-Switch is in the "HDX" position, the port advertises only in Half-Duplex capability.

## Fiber Module - Front Panel

The modules have been pre-configured as illustrated below. Using the front panel DIPSwitches, the module can be reconfigured for customer-specific applications.

| Fiber Full-Duplex $=$ FDX $\square \square$ | HDX $=$ Fiber Half-Duplex |
| ---: | :--- |
| UTP Auto Negotiate $=$ AN | Man $=$ UTP Manual |
| UTP 100Mbps $=100$ | 10 |
| HDX $=$ UTP 10Mbps |  |
| UTP Full-Duplex $=$ FDX $\square$ UTP Half-Duplex |  |

## Fiber Module Front Panel Default DIP-Switch Settings

## Fiber Full/Half-Duplex

When in the Fiber Full/Half-Duplex DIP-Switch is in the "FDX" position, the fiber port operates in Full-Duplex mode. When in the "HDX" position, the fiber port operates in Half-Duplex mode and its distance is limited by the IEEE 802.3 standard to 412 meters.

## UTP Auto/Manual Negotiate

When the UTP "AN/Man" DIP-Switch is in the Auto-Negotiate "AN" position, the converter Auto-Negotiates and matches the 10/100 speed and duplex mode of a mating Auto-Negotiating device connected to its RJ-45 port.
When the UTP "AN/Man" DIP-Switch is in the "Man" position, the converter does not autoNegotiate and operates in the mode selected by the Full/Half Duplex "FDX/HDX" and "10/100" DIP-Switches.

## UTP 10/100

When the UTP "AN/Man" DIP-Switch is in the "Man" position, the UTP "10/100" DIP-Switch selects the speed of the RJ-45 port. When in the "100" position (factory default), the RJ-45 port operates at 100 Mbps . When in the " 10 " position the RJ-45 port operates at 10 Mbps .

## UTP Full/Half-Duplex

When the UTP "AN/Man" DIP-Switch is in the "Man" position, the "FDX/HDX" DIP-Switch selects the duplex mode of the RJ-45 port. When in the "FDX" position, the RJ-45 port operates in Full-Duplex mode. When in the "HDX" position, the RJ-45 port operates in Half-Duplex. Set the duplex mode to match the connecting device and check for link status.
Note: Attaching the Auto-Negotiating RJ-45 port of the 6540-FK to a device with a manual/ forced /hard-coded RJ-45 port may result in an unpredictable port setting with excessive collisions and poor link performance. When operating in Manual mode, both mating ports MUST be set manually to the same speed and duplex mode.

## On Board DIP-Switches

The modules have on-board DIP-Switches for the configuration of the Link Modes and Backplane connectivity. For more information on Link Mode, see the Link Mode Application Note.
The modules are pre-configured as illustrated below.

| 4 | $\square$ RFD | $=$ Remote Fault Detect Enable |
| :--- | :--- | :--- |
| 3 | $\square$ | BPOEN |$=$ Backplane Enable

## On-Board DIP-Switches Showing Factory Default Settings

## Remote Fault Detection

When the Remote Fault Detect "RFD" DIP-Switch is in the UP position, the RFD mode is selected. When in the DOWN position, the RFD mode is disabled.

Note: Connecting two converters with both set to RFD mode is an illegal setting and will cause a "deadly embrace" lockup.

## A and B Backplane Enable

This DIP-Switch must be in the UP position for the module to operate correctly. The backplane must be enabled for the modules to communicate.

## Link Propagate/Link Segment

When both the Link Propagate/Link Segment "LP" and the Remote Fault Detect "RFD" DIP-Switches are in the DOWN position, Link Segment mode is enabled. When the Link Propagate/Link Segment "LP" DIP-Switch is in the UP position, and the Remote Fault Detect "RFD" DIP-Switch is in the DOWN position, Link Propagate mode is enabled.
Note: Setting both the "LP" and the " RFD" to the UP positions on the same module is an illegal mode that will result in unpredictable behavior.

## 2) Install Module in the Chassis and Connect the Cables

The modules are pre-installed in the 2-Module chassis with the backplane enabled on both modules.
a. Carefully slide the module into an open slot in the chassis. Align the module with the installation guides and ensure that the module is firmly seated against the backplane. Secure the module by fastening the front panel thumbscrew (push in and turn clockwise to tighten) to the chassis front. Verify the "Pwr" LED is ON (indicating the chassis is powered).

b. Connect an appropriate multimode or single-mode fiber cable to the fiber port of the installed modules. It is important to make sure that the transmit (TX) is attached to the receive side of the device at the other end and the receive $(R X)$ is attached to the transmit side.
c. Connect the RJ-45 ports via a Category 5 cable to a 10BASE-T or 100BASE-Tx Ethernet device.
3) Installing the Chassis

Wall and Rack Mounting
The 2-Module chassis can be wall/rack mounted by attaching the optional wall/rack mount brackets (8249-0). A 19" Rack Mount Shelf (8260-0) is available to install two 2-Module chassis.
The operating temperature of this equipment is 0 to 50 degrees C . If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack must not exceed the maximum rated temperature for the chassis used.

Installation of the equipment should be such that the air flow in the front and back of the unit is not compromised or restricted.

Installing this equipment into a rack in such a way as to make it unstable may cause injury or death. Always make sure that the rack you are installing this equipment into is properly secured, stable, balanced and designed to carry the weight and weight distribution of this equipment.

Never use this equipment to carry any weight except its own. Never use it as a shelf to support the weight of other equipment

## 4) Apply AC Power

Power source should be available within 5 ft . of the chassis and installed per the National Electrical Code, ANSI/NFPA-70.

This equipment requires a $100-240 \mathrm{VAC}, 0.5 \mathrm{Amp}, 50 / 60 \mathrm{~Hz}$ power outlet. Appropriate overloading protection should be provided on the AC power source outlets utilized.
Appropriate overloading protection should be provided on all AC power source outlets utilized.
Attach the AC power cord to the back of the chassis. Connect the AC power cords to the AC outlets and switch the outlets ON.

Any installed iConverter modules will illuminate the power LED.

## WARNING!!

NEVER ATTEMPT TO OPEN THE CHASSIS OR SERVICE THE POWER SUPPLY OR FAN MODULE. OPENING THE CHASSIS MAY CAUSE SERIOUS INJURY OR DEATH. THERE ARE NO USER REPLACEABLE OR SERVICEABLE PARTS IN THIS UNIT.


Rear of 2-Module Chassis with Power Cord

## 5) LED Indicators

Each module has LED indicators to provide connection information.
4 Port Switch Module

| LED Function <br> "Legend" | Color | OFF | ON |
| :--- | :--- | :--- | :--- |
| Power <br> "Pwr" | Yellow | No power | Module has power |
| Port $x$ <br> "100 Link" | Green | Not linked at 100Mbps | ON: Linked at 100Mbps <br> Blinking: Data activity |
| Port $x$ <br> "10 Link" | Green | Not linked at 10Mbps | ON: Linked at 10Mbps <br> Blinking: Data activity |
| $x=$ Port number (1-4) |  |  |  |

## Fiber Module

| LED Function <br> "Legend" | Color | OFF | ON |
| :--- | :--- | :--- | :--- |
| Power <br> "Pwr" | Yellow | No power | Module has power |
| Port 1 Fiber <br> Duplex <br> "FDX" | Green | Fiber in Half Duplex | Fiber in Full Duplex |
| Port 1 Fiber <br> Link <br> "Lk/Act" | Green | No fiber link | ON: Fiber linked <br> Blinking: Fiber activity |
| Port 2 RJ-45 <br> Negotiation <br> "AN" | Green | RJ-45 in Manual negotiation | RJ-45 in Auto negotiation |
| Port 2 RJ-45 <br> Speed <br> "100" | Green | RJ-45 not linked at 100Mbps | RJ-45 linked at 100Mbps |
| Port 2 RJ-45 <br> Speed <br> "10" | Green | RJ-45 not linked at 10Mbps | RJ-45 linked at 10Mbps |
| Port 2 RJ-45 <br> Duplex <br> "FDX" | Green | RJ-45 in Half Duplex | RJ-45 in Full Duplex |
| Port 2 RJ-45 <br> Link <br> "Lk/Act" | Green | No RJ-45 link | ON: RJ-45 linked <br> Blinking: Data activity |

## LED Indicators

## Mechanical



| Standards | IEEE 802.3 |  |
| :---: | :---: | :---: |
| Regulatory Compliances | Safety: EMI: ACT: | UL, CE, UKCA FCC Class A TAA, BAA, NDAA |
| Environmental | RoHS, WEEE, REACH |  |
| Frame Size | 1,536 bytes |  |
| Port Type | Copper: <br> Fiber: | 10/100BASE-T (RJ-45) <br> 100BASE-FX (ST, SC) |
| Cable Type | Copper: <br> Fiber: | EIA/TIA 568A/B, Cat 5 UTP and higher <br> Multimode: $50 / 125 \mu \mathrm{~m}, 62.5 / 125 \mu \mathrm{~m}$ Single-mode: $9 / 125 \mu \mathrm{~m}$ |
| AC Power Requirements | 100 to $240 \mathrm{VAC}, 50 / 60 \mathrm{~Hz}$ 0.5A @ 120VAC |  |
| Dimensions W x D x H | $6.7^{\prime \prime} \times 5.51^{\prime \prime} \times 1.87$ " $\quad(435.6 \mathrm{~mm} \times 228.6 \mathrm{~mm} \times 44.5 \mathrm{~mm})$ |  |
| Weight | 3.0 lbs. (1.36 kg) |  |
| Temperature | Commercial: 0 to $50^{\circ} \mathrm{C}$  <br> Storage: -40 to $80^{\circ} \mathrm{C}$ |  |
| Humidity | $5 \%$ to 95\% non-condensing |  |
| Altitude | -100m to 4,000m |  |
| Warranty | Lifetime warranty with 24/7/365 free Technical Support |  |

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