

# ***OPERATIONS MANUAL***

SYNC2IP, Sync / Async to IP Converter

**Model:** SYNC2IP

**Ordering Part Number:** 180000

2-Port Sync2IP Converter  
1U Rackmount Chassis

**Ordering Part Number:** 180050

4-Port Sync2IP Converter  
1U Rackmount Chassis

**Ordering Part Number:** 277000

2-Port Sync2IP, RS-232 DTE to IP Converter, DC Powered  
Small Form Factor Chassis

**Ordering Part Number:** 291000

2-Port Sync2IP MICRO W/LCD  
RS-232 DTE to IP Converter, DC Powered  
Micro Form Factor Chassis

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# TABLE OF CONTENTS

<b>TABLE OF CONTENTS .....</b>	<b>2</b>
<b>1 PRODUCT INTRODUCTION .....</b>	<b>1</b>
1.1 Configuration Applications .....	2
1.2 Data Flow .....	3
1.2.1 Port Data Rates .....	3
1.3 SYNC Flow Control .....	4
1.3.1 Sync Pass-through Configuration .....	4
1.3.2 Sync Sourced-clock Configuration .....	5
1.4 ASYNC Flow Control .....	5
1.5 DHCP and Fixed IP Addressing .....	6
1.6 Peer Port Number .....	6
1.7 Panel Controls and Indicators .....	7
1.7.1 LED Indicators .....	7
1.7.2 LCD Display .....	7
1.7.3 Push Buttons .....	7
1.8 Operator Configuration .....	8
1.8.1 LCD Status Displays .....	9
1.8.2 LCD Configuration Displays .....	9
1.9 Web Browser Interface .....	14
1.9.1 Configuration Page .....	14
1.9.2 Firmware Upgrade Page .....	16
1.9.3 Firmware Options .....	17
<b>2 CHAPTER – AC VOLTAGE INSTALLATION .....</b>	<b>17</b>
2.1 AC Voltage Selection .....	17
2.2 3.2 Voltage Selection Fuses .....	17
2.3 3.3 Power Connection .....	17
<b>3 CHAPTER – DC VOLTAGE INSTALLATION .....</b>	<b>18</b>
3.1 DC Voltage Installation .....	18
<b>3.2 Serial Interface Card Swap or Replacement .....</b>	<b>19</b>
<b>4 Appendix .....</b>	<b>20</b>
4.1 Specifications .....	20

# 1 PRODUCT INTRODUCTION

The Sync2IP is an interface conversion product that transports serial communications over an Ethernet LAN. It converts a full duplex synchronous or asynchronous serial data stream to a UDP/IP packet stream. The serial stream consists of transmit and receive data with selected control signals.

Two or more Sync2IP units are required to transparently connect serial devices over the LAN. Data conversion is independent of the serial port protocol. When a port is set to Async it will only connect to a Peer that is also Async. The same is true for Sync. If one peer is set as Async and the other is set as Sync then neither will acknowledge the existence of the other.

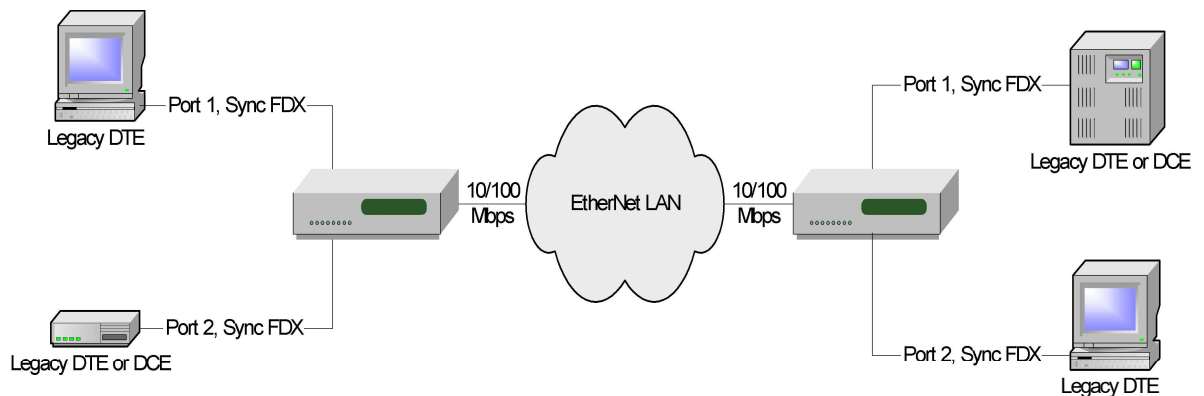
In the synchronous mode the Sync2IP sends and receives the data bit-for-bit at the synchronous port operating clock rate. Therefore, the interconnected Sync ports must operate at the same nominal clock rate. There is no guaranteed delivery in Sync mode. If the LAN traffic is too congested and/or packets are lost then error recovery is the responsibility of the customer device.

In the asynchronous mode the data is sent on byte boundaries, and when Async flow-control is honored the interconnected Async ports may operate at different speeds. The Async byte format supported is 8 data bits, 1 stop bit, and no parity. Therefore the Async byte frame is 10 bits in length. In Async mode there is guaranteed delivery. Packets will be retransmitted for up to 15 seconds, after which time the “session” will be reset.

The Sync2IP is configured via the front panel LCD display and input buttons. An optional Browser interface is also available.

Any combination of DCE and DTE devices may be supported over the peer-to-peer connection between one Sync2IP and the other. However, in Sync mode the Sync2IP does not support a connection of two DCE customer devices.

The diagram of Figure 1-1 illustrates the Sync2IP, in Sync mode, in a basic network configuration. Serial port A of one Sync2IP is connected over the LAN to serial port A of the peer Sync2IP. Likewise for serial port B.



**Figure 1-1**

Supported port rates on the Sync2IP vary from 1200 bps to 64 Kbps for simultaneous two-port operation, and up to 128 Kbps for single-port operation.

## 1.1 Configuration Applications

A peer-to-peer connection may be configured between any two Sync2IP ports on the network. Each box is assigned a unique IP address, and a gateway address if operating through a router or server. Although each box has only one address, IP supports a large number of logical port numbers, one of which is assigned to each port present on the Sync2IP box and its peer.

With the above addressing in mind, it is possible to configure a network of interconnected devices, not limited to the simple two-box configuration shown above. Figure 1-2 is a diagram illustrating an example of four Sync2IP boxes with various ports interconnected as peers.

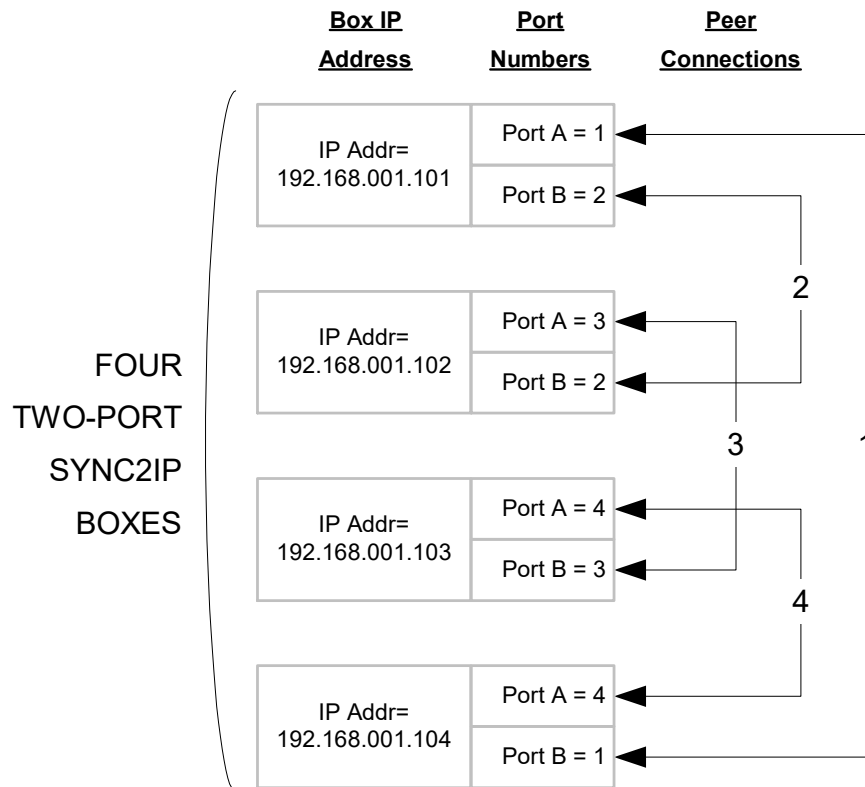


Figure 1-2

In this example the linked ports are given unique number pairs for simplicity, i.e., four links numbered one through four and corresponding to the IP port number. However, two peers in the network can have the same IP port numbers as long as the port numbers match and that the port numbers are unique for each IP address.

## 1.2 Data Flow

The Sync2IP processes LAN bound serial data and packetizes the data for transport over the LAN connection. On the opposite end of the link, the packets are disassembled and the data is sent serially to the device in the same way it was received. All serial data is sent in this manner from one port to the other.

The LAN segment of the path has a much higher capacity for data transport than each individual link of the Sync2IP. However, since it is a medium shared with other traffic, loading will vary over time. This has the effect of altering the latency of packets from one port to its peer while the connection is maintained.

In order to minimize the chance of serial output data being disrupted by either too many or too few packets in a period of time, the packet data must be buffered at both Sync2IP source and destination units. The buffers allow the data to make a smooth transition between the constant flow of data bits on the serial interface and the bursty flow of packets on the LAN.

Packet size is determined by data rate. A new packet of serial data is assembled and sent on average every 20mS. So for low data rates, packets are small, whereas for higher data rates, packets are proportionally larger.

### 1.2.1 Port Data Rates

The available data rates available for port operation are listed in the following table:

**Table 1**

<u>Rate</u>	<u>Sync</u>	<u>Async</u>	<u>Available operation</u>
1200	Y	Y	Single & Dual-port Boxes
1800	Y	Y	"
2400	Y	Y	"
3600	Y	Y	"
4800	Y	Y	"
7200	Y	Y	"
8000	Y	N	"
9600	Y	Y	"
14000	Y	N	"
14400	Y	Y	"
16000	Y	N	"
19200	Y	Y	"
24000	Y	N	"
28800	Y	Y	"
32000	Y	N	"
38400	Y	Y	"
48000	Y	N	"
51200	Y	N	"
56000	Y	N	"
57600	Y	Y	"
64000	Y	N	"
72000	Y	N	Single-port boxes only
115200	Y	Y	Single-port boxes only
128000	y	N	Single-port boxes only

### 1.3 SYNC Flow Control

No hardware control signals (DTR, DSR, etc.) are used for Sync flow control. With differences between local oscillators, variable LAN latency, and the fact that timing cannot be transferred across a LAN, some method of flow control must be used to insure average end-to-end timing parity is maintained. Each connected pair of ports must operate at the same average data rate so that eventual data underruns or overflows do not occur.

Sync mode flow control in the Sync2IP is managed by adjusting output clock rates that in turn determine how fast the data is transferred between the attached device and Sync2IP unit. This is accomplished by continuously monitoring the utilization of data buffer pools in the data path on the interconnected Sync2IP units.

Specifically, it is the state of the buffer pools that support inbound data from the LAN to the device that is monitored, and then used to adjust one of the serial data clocks along that path.

Two configurations are supported: a) a DTE connected to a DCE, and b) a DTE connected to a DTE. The timing orientation of these two configurations are also different and are referred to as Pass-through and Sourced-clock, respectively, as shown in Figure 1-3.

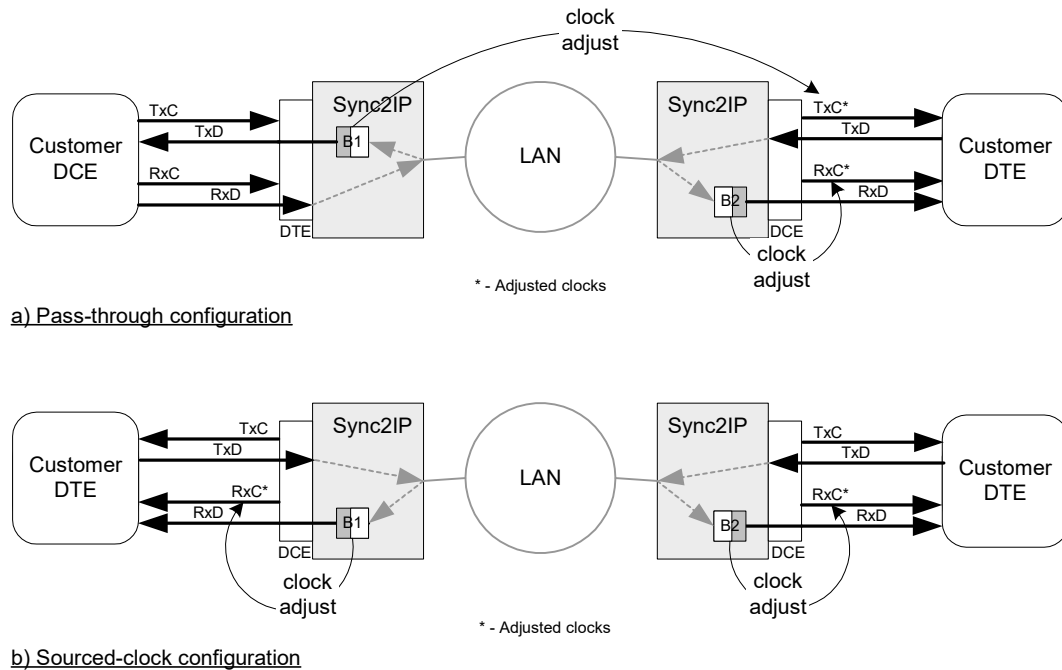


Figure 1-3

#### 1.3.1 Sync Pass-through Configuration

In the Pass-through configuration (a), clocks are provided to the leftmost Sync2IP by the attached DCE. Flow control cannot be exerted at this end of the link because the Sync2IP does not source the clock. At the far end, the DCE port of the rightmost Sync2IP generates clocks at a nominal rate selected by the user to match the rate of the

DCE source. The DCE clocks are independently adjusted based on the utilization of buffer pools B1 and B2.

In the case of transmit data clock, TxC, should buffer pool B1 begin to fill above a prescribed threshold (high mark), the rate of TxC is marginally reduced to restrict the flow of data and allow the buffer pool utilization to balance. By the same token, should B1 begin to empty (low mark), the rate of TxC is marginally increased.

The information needed to allow the rightmost Sync2IP to know when to adjust the clock, is carried over the LAN from one unit to the other via separate control packets.

Receive data clock, RxC, is adjusted more directly, by monitoring the buffer pool B2. The rate of RxC is reduced when B2 reaches a low mark, and is increased when B2 reaches a high mark.

For either adjusted clock, when the corresponding buffer pool is balanced between the low mark and high mark, the clock will operate at the nominal rate.

### 1.3.2 Sync Sourced-clock Configuration

In the Sourced-clock configuration (b), all four clock generators on both Sync2IP units are configured to operate at the same nominal rate. For both units, RxC is adjusted when needed and TxC is held constant at the nominal value determined by the local oscillator.

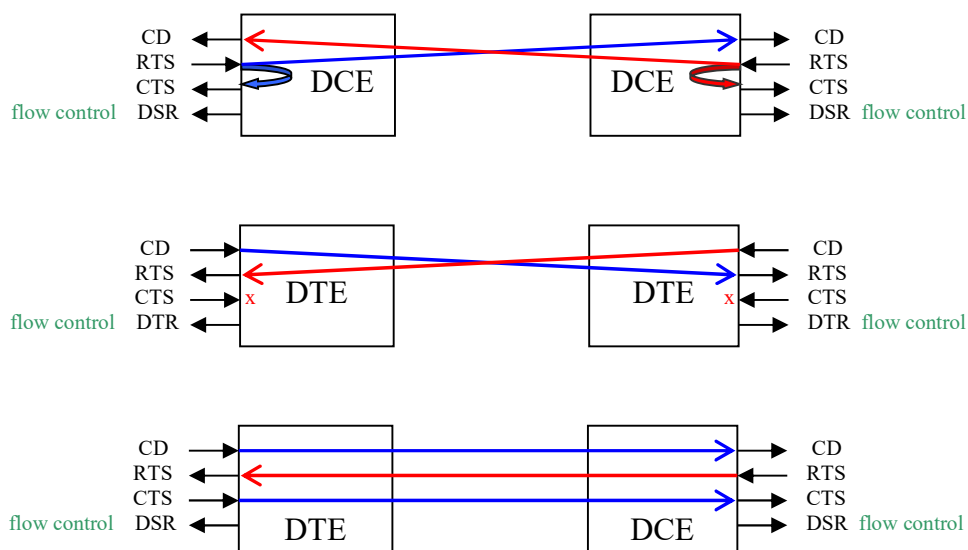
On the DCE interfaces, RxC is adjusted by monitoring the buffer pool, either B1 or B2, which outputs the local RxD, just as described above for the DCE on the pass-through configuration. As before, both clocks are adjusted independently.

## 1.4 ASYNC Flow Control

In Async mode the two Async ports are decoupled by the LAN link. Therefore the Async speeds at each end do not have to match. This of course can lead to under and over-flow. This is dealt with by using hardware flow control. DSR (when Sync2IP is a DCE) and DTR (when Sync2IP is a DTE) are used for this purpose. The Sync2IP will drop either DSR or DTR when it can take no more data. For this to work, the user device must have a pin (perhaps CTS) that it is monitoring for permission to transmit. A special cable will have to be used that connects the Sync2IP DTR or DSR to the pin being monitored by the user device.

The same flow control mentioned above is used if packet traffic on the LAN becomes slow (no matter what the Async speeds are).

Following are the possible RS-232 control lead mappings for the Async mode:



## ***1.5 DHCP and Fixed IP Addressing***

Each Sync2IP box must be assigned a unique network IP address in order to send and receive data between two linked ports. When Sync2IP boxes are configured, the operator will choose the method by which this is done, either by manually assigned addresses, or by automatically assigned addresses using DHCP. Most routers and servers support DHCP, but if DHCP is not in use, then IP addresses must be manually assigned. It is recommended that addresses be manually assigned, even if DHCP is available.

**NOTE: If DHCP is used, it is important to be familiar with how the IP addresses are assigned. This is because the Sync2IP port-to-port connection depends on each box knowing the IP address of the peer to which it is connected. Should a box on the network experience a power cycle, for example, the DHCP server may assign it a different IP address in which case, the connection(s) to its peer will be lost.**

In some cases, the DHCP server may be programmed to “remember” the association between the Ethernet MAC address and the last assigned IP address, and thereby re-assign the same IP address each time the Sync2IP comes online. This would alleviate the above problem.

Whether IP addresses for a Sync2IP box are fixed or assigned via DHCP, the operator will need to know the IP addresses of each box in order to set up port-to-port connections.

## ***1.6 Peer Port Number***

Each Sync2IP box may have one or two physical ports. An IP address, of which there is one assigned per box, can have 4096 logical port numbers. The operator may assign any one of the logical port numbers, 1 – 4096 to each physical port. The only requirement is that the logical port numbers assigned to each peer of a two-port connection be the same. For simple paired-box configurations, it is recommended to assign the logical port number identical to the physical port to avoid confusion. In configurations involving three or more Sync2IP boxes, it may become necessary to use other logical port numbers that do not match the physical port number. As long as the logical port number assigned to both peers on the connection is the same, the link will work.



## 1.7 Panel Controls and Indicators

From left to right, the front panel consists of four LED indicators, an LCD display, and three push buttons, as seen in Figure 1-4.

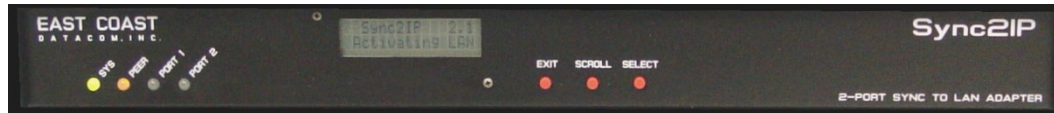


Figure 1-4

### 1.7.1 LED Indicators

The following table describes the purpose of the LED indicators and their meaning by color:

Table 2

<u>LABEL</u>	<u>WHEN OFF</u>	<u>WHEN YELLOW</u>	<u>WHEN GREEN</u>
<b>SYS</b>	POWER is Off	System Initializing	Normal Operation
<b>LINK</b>	LAN not connected	Establishing Connection	Normal Connection
<b>PORT 1</b>	Port is Idle	Out of Sync	Port Connected
<b>PORT 2</b>	Idle Port – Off-line	Out of Sync	Port is Enabled

### 1.7.2 LCD Display

The LCD display is used to present status information and to view, set up, and modify configuration settings. The LCD display is capable of displaying two lines of information. The first line is typically a menu title or status heading. The second line represents the contents of the status information or configuration parameter setting.

The display contents are responsive to the use of the pushbuttons to select menus and move between configuration selection options.

### 1.7.3 Push Buttons

Three push buttons are used to navigate the various display/configuration screens. Following are the button functions:

- EXIT:** This button is used to exit the current menu level.
- SCROLL:** This button is used to scroll between the selectable items in the current menu. Scrolling can be either vertically (between items at the current level) or horizontally (the next digit to be edited of an item).
- SELECT:** This button is used to move to the next menu level, or to change a digit while editing a configuration parameter. *(When editing there is no 'ENTER' button for a change, when you EXIT the display whatever was showing is the new current value.)*

## ***1.8 Operator Configuration***

The LCD displays both status and configuration menus. Status is the top most display level and is the default at power-on. At this top level the SCROLL button will scroll between three status displays. The SELECT or the EXIT button will move to the next level, which is the first configuration level. The three status displays are shown in the following subsection.

The menu tree is as follows:

- Status
  - System
  - Port1LEDs
  - Port2LEDs
- Current IP Cfg
  - IP Address
  - IP Mask
  - IP Gateway Adr
  - Display MAC Adr
  - Reset IP Link?
- Local IP Config
  - IP Address
  - IP Mask
  - IP Gateway Adr
  - DHCP On/Off
  - Access Password
- PEER 1 Config
  - Base Speed
  - Sync or Async
  - Peer IP Address
  - Port Session #
  - Reset Session?
- PEER 2 Config
  - Base Speed
  - Sync or Async
  - Peer IP Address
  - Port Session #
  - Reset Session?
- Save Settings?

## 1.8.1 LCD Status Displays

Port 1 $\alpha$	Port 2
InSync	InSync

S.1

SCROLL: Advances to next Status display (S.2).

SELECT: Moves to first Configuration display (C.1).

EXIT: Moves to first Configuration display (C.1).

Contents: Displays the Sync status of each port. The  $\alpha$  symbol is appended to the port number when it is operating in the Async mode. The possible states are:

1. InSync - Sync port connection is operating normally
2. Active - Async port connection is normal
3. !Sync - out-of-sync
4. !Peer - peer IP address not resolving
5. ► Peer - peer not responding
6. O!sync - data overrun error
7. U!sync - data underrun error
8. N/A - the port interface is not present (Port 2 only)

1	RS	CS	CD	SR	TR
0	0	*	*	*	*

S.2

SCROLL: Advances to next Status display (S.3).

SELECT: Moves to first Configuration display (C.1).

EXIT: Moves to first Configuration display (C.1).

Contents: Displays the state of the control leads, RS(RTS), CS(CTS), CD(DCD), SR(DSR), TR(DTR) for the Port 1.

The possible states are:

1. O – Off
2. \* - On

2	RS	CS	CD	SR	TR
*	0	*	*	*	*

S.3

SCROLL: Advances to topmost Status display (S.1).

SELECT: Moves to first Configuration display (C.1).

EXIT: Moves to first Configuration display (C.1).

Contents: Same as for S.2 above, except the status is for Port 2.

## 1.8.2 LCD Configuration Displays

Sync2IP	2.1
>Save	Settings?

C.1

SCROLL: Advances to next Configuration display (C.2).

SELECT: Steps down to next level of this menu (not shown).

EXIT: Returns to the Status display (S.1).

Contents: Via the SELECT button, allows the operator to save the current settings in non-volatile memory to be applied at power-on, otherwise the previously stored settings will be used at power-on.

Sync2IP	2.1
>Current	IP Cfg

C.2

SCROLL: Advances to next Configuration display (C.3).  
SELECT: Steps down to next level of this menu (C.2.1).  
EXIT: Returns to the Status display (S.1).

Contents: Via the SELECT button, allows the operator to step down to menus where the current active IP configuration settings may be viewed.

Current IP Cfg.
>IP Address

C.2.1

SCROLL: Advances to next Configuration display (C.2.2).  
SELECT: Displays the current assigned IP address of the local box. The value is not editable on this menu level  
EXIT: Returns to the top-level Configuration display (C.2).  
Contents: Via the SELECT button, allows the operator to view the current active IP Address.

Current IP Cfg.
>IP Mask

C.2.2

SCROLL: Advances to next Configuration display (C.2.3).  
SELECT: Displays the current assigned IP mask of the local box. The value is not editable on this menu level  
EXIT: Returns to the top-level Configuration display (C.2).  
Contents: Via the SELECT button, allows the operator to view the current active IP Mask.

Current IP Cfg.
>IP Gateway Adr

C.2.3

SCROLL: Advances to next Configuration display (C.2.4).  
SELECT: Displays the current assigned IP mask of the local box. The value is not editable on this menu level  
EXIT: Returns to the top-level Configuration display (C.2).  
Contents: Via the SELECT button, allows the operator to view the current active IP Mask.

Current IP Cfg.
>Display MAC Adr

C.2.4

SCROLL: Advances to next Configuration display (C.2.5).  
SELECT: Displays the unique MAC address of the local box. The value is not editable.  
EXIT: Returns to the top-level Configuration display (C.2).  
Contents: Via the SELECT button, allows the operator to view the current MAC address.

Current IP Cfg.
>Reset IP Link?

C.2.5

SCROLL: Advances to top of menu level (C.2.1).  
SELECT: Steps down to next level of this menu (not shown).  
EXIT: Returns to the top-level Configuration display (C.2).  
Contents: Via the SELECT button, allows the operator to manually reset the IP link.

<div>Sync2IP 1.0</div> <div>&gt;Local IP Config</div> <div>C.3</div>	<div>SCROLL: Advances to next Configuration display (C.4).</div> <div>SELECT: Steps down to next level of this menu (C.3.1).</div> <div>EXIT: Returns to the Status display (S.1).</div> <div>Contents: Via the SELECT button, allows the operator to step down to menus where the default (stored in FLASH memory) IP configuration settings are displayed and the current IP configuration settings may be modified.</div>
<div>Default IP Cfg.</div> <div>&gt;IP Address</div> <div>C.3.1</div>	<div>SCROLL: Advances to next Configuration display (C.3.2).</div> <div>SELECT: Displays the current default IP address of the box, which is modified via use of the SCROLL and SELECT buttons.</div> <div>EXIT: Returns to the top-level Configuration display (C.3).</div> <div>Contents: Via the SELECT button, allows the operator to modify the current IP address.</div>
<div>Default IP Cfg.</div> <div>&gt;IP Mask</div> <div>C.3.2</div>	<div>SCROLL: Advances to next Configuration display (C.3.3).</div> <div>SELECT: Displays the current default IP mask of the box, which is modified via use of the SCROLL and SELECT buttons.</div> <div>EXIT: Returns to the top-level Configuration display (C.3).</div> <div>Contents: Via the SELECT button, allows the operator to modify the current IP mask.</div>
<div>Default IP Cfg.</div> <div>&gt;IP Gateway Adr</div> <div>C.3.3</div>	<div>SCROLL: Advances to next Configuration display (C.3.4).</div> <div>SELECT: Displays the current default Gateway/Router IP address, which is modified via use of the SCROLL and SELECT buttons.</div> <div>EXIT: Advances to next Configuration display (C.3.4).</div> <div>Contents: Via the SELECT button, allows the operator to modify the current IP Gateway address.</div>
<div>Current IP Cfg.</div> <div>&gt;DHCP On/Off</div> <div>C.3.4</div>	<div>SCROLL: Advances to next Configuration display (C.3.5).</div> <div>SELECT: Steps down to next level of this menu (not shown).</div> <div>EXIT: Returns to the top-level Configuration display (C.3).</div> <div>Contents: Via the SELECT button, allows the operator to alternate selection of DHCP On or Off.</div>
<div>Current IP Cfg.</div> <div>&gt;Access Password</div> <div>C.3.5</div>	<div>SCROLL: Advances to next Configuration display (C.3.1).</div> <div>SELECT: Steps down to next level of this menu (not shown).</div> <div>EXIT: Returns to the top-level Configuration display (C.3).</div> <div>Contents: Allows edit/entry of Web page access password.</div>

Sync2IP 2.1  
>Peer 1 Config

C.4

SCROLL: Advances to next Configuration display (C.5).  
SELECT: Steps down to next level of this menu (C.4.1).  
EXIT: Returns to the Status display (S.1).

Contents: Via the SELECT button, allows the operator to step down to menus where the default (stored in FLASH memory) Peer 1 configuration settings are displayed and the current Peer 1 configuration settings may be modified.

Peer 1 Config  
>Base Speed

C.4.1

SCROLL: Advances to next Configuration display (C.4.2).  
SELECT: Displays the current Peer 1 port rate, which is modified via use of the SCROLL and SELECT buttons.

*The Base Speed is the speed the Port is to operate at. This speed is selectable via a scrolling menu. Pushing SELECT will enter the scrolling speed selection menu. Whatever speed is being displayed when the EXIT button is pushed will be the selected speed.*

EXIT: Returns to the top-level Configuration display (C.4).  
Contents: Via the SELECT button, displays the current Peer 1 base port speed and allows modification of the speed.

Peer 1 Config  
>Sync or Async

C.4.2

SCROLL: Advances to next Configuration display (C.4.3).  
SELECT: Steps down to next level of this menu (not shown).

EXIT: Returns to the top-level Configuration display (C.4).  
Contents: Allows selection of Sync or Async mode.

Peer 1 Config  
>Peer IP Address

C.4.3

SCROLL: Advances to next Configuration display (C.4.4).  
SELECT: Displays the current Peer 1 IP address, which is modified via use of the SCROLL and SELECT buttons.

*The Peer IP Address is the address of the remote Sync2IP box that a "session" is to be established with. Peer 1 and Peer 2 may have different remote Sync2IP boxes as their targets.*

EXIT: Returns to the top-level Configuration display (C.4).  
Contents: Via the SELECT button, displays the current Peer 1 IP address and allows the operator to modify the number.

Peer 1 Config  
>Port Session #

C.4.4

SCROLL: Advances to next Configuration display (C.4.5).  
SELECT: Displays the current Port 1 PEER number, which is modified via use of the SCROLL and SELECT buttons.

*The peer number is converted into the IP port number for the IP "session". The Peer Number (0000-9999) is converted into an IP port number in the range 0xC000-0xE70F (example: Peer #0001 is IP Port Number 0xC001).*

EXIT: Returns to the top-level Configuration display (C.3).  
Contents: Via the SELECT button, displays the current Port 1 Peer Number and allows modification of the number.

Peer 1 Config  
>Reset Session?

C.4.5

SCROLL: Advances to next Configuration display (C.4.1).  
SELECT: Steps down to next level of this menu (not shown).

EXIT: Returns to the top-level Configuration display (C.4).  
Contents: Allows for resetting of this port peer session only.

Sync2IP	2.1
>Peer 2 Config	

C.5

SCROLL: Advances to next Configuration display (C.1).  
 SELECT: Steps down to next level of this menu (C.5.1).  
 EXIT: Returns to the Status display (S.1).

*The function of this screen is the same as described above for the Peer 1 menu, except that it applies to Peer 2. Therefore the sub-menus are not described here, but appear and function similar to those for Peer 1.*

Contents: Via the SELECT button, allows the operator to step down to menus where the default (stored in FLASH memory) Peer 2 configuration settings are displayed and the current Peer 2 configuration settings may be modified.

## 1.9 Web Browser Interface

### 1.9.1 Configuration Page

An HTML Browser can be used to configure the Sync2IP settings and monitor the running status. Each Sync2IP box has an internal html server program that can be accessed providing the means to perform the configuration operations.

The internal server provides a single page access to the Sync2IP status and configuration, an example of which is shown in Figure 3-2.

**Sync2IP**  
2-PORT SYNC TO LAN ADAPTER

Box Version Sync2IP 03\_3 ☐ Use DHCP

Box IP Addr 192.168.001.100 Box IP Mask 255.255.255.000

Box IP Gateway 192.168.001.254

Port 1 is Sync DCE with status = !Peer ☐ Reset Port1 Session

Port 1 Speed 14400bps

Port 1 PEER IP Addr 192.168.001.101 RTS CTS DCD DSR DTR

Port 1 PEER # 0001

Port 2 is Sync DTE with status = !Peer ☐ Reset Port2 Session

Port 2 Speed 14400bps

Port 2 PEER IP Addr 192.168.001.101 RTS CTS DCD DSR DTR

Port 2 PEER # 0002

UPDATE REFRESH STORE FLASH

Access Password:

East Coast Data Com, Inc. www.ecdata.com/sync2ip/ma Internet

Figure 1-5

The web page in Figure 1-5 presents all the same options, settings, and statuses that are available via the Sync2IP front panel. The web page does not auto-update, therefore the operator will have to REFRESH the page to acquire the most current status.



The web page is accessed via a web browser like Internet Explorer. The IP address of the desired Sync2IP box is entered into the Address field of the browser. This is the numeric IP address only since no aliases are assigned.

Configuration parameters are available on the web page as either edit boxes, drop-down lists, or a check box. Changing these items on the page does not update the Sync2IP unit until the UPDATE button is used. Likewise the new parameters, so updated, are not stored to Flash in the Sync2IP unit until the STORE FLASH button is used. The STORE FLASH button will remain disabled until some change has been sent to the Sync2IP unit via the UPDATE button. When the STORE FLASH button is active it is a reminder that the unit has new parameters but FLASH is out of date.

The REFRESH button does just that. It requests the most current settings and status from the Sync2IP unit.

The RESET SYNC2IP LINK button is used to restart the LAN connection at the Sync2IP unit. This is used to activate any changed IP setting that may have been updated. Of course if the Box IP Addr is changed then that new IP address will need to be used to re-connect to the Sync2IP unit.

There is a required Access Password, which is always 8 numeric digits. This password is needed for the UPDATE, STORE FLASH, and RESET SYNC2IP LINK buttons to function. The REFRESH button does not need the Password. This Access Password is only available for modification via the front panel of the Sync2IP unit.

## 1.9.2 Firmware Upgrade Page

An HTML Browser can be used to upgrade the firmware in the Sync2IP. This is a separate webpage accessed via a hidden button field on the main Sync2IP webpage. The hidden button is located within the product picture at the top of the main page. The “Sync2IP” product name on the product front panel in the picture is the location of the hidden button. By placing the mouse over the “Sync2IP” name and left clicking, the separate firmware upgrade page will be loaded, as shown in Figure 1-3.

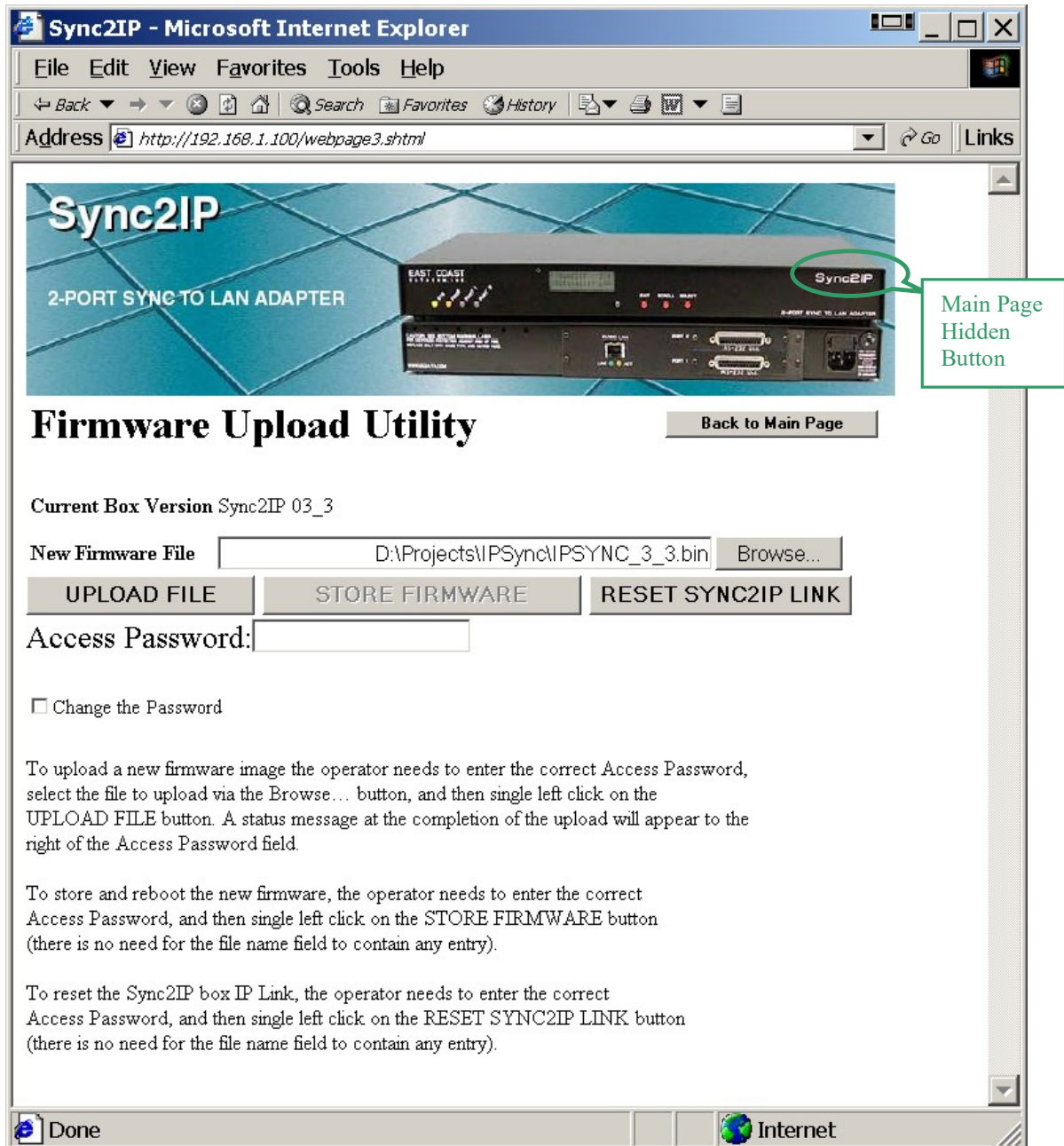


Figure 1-3

It is a two-step process to upload a new firmware upgrade to a Sync2IP unit. The first step is to upload the new firmware into RAM in the unit. The second step is to store this new firmware into Flash and reboot the unit. The correct Access Password is needed for both steps.

Until the Sync2IP unit has received a valid firmware upload the STORE FIRMWARE button will remain disabled.

To upload a new firmware image the operator needs to enter the correct Access Password, select the file to upload via the Browse... button, and then single left click on the UPLOAD FILE button. A status message at the completion of the upload will appear to the right of the Access Password field.

To store and reboot the new firmware the operator needs to enter the correct Access Password, and then single left click on the STORE FIRMWARE button (there is no need for the file name field to contain any entry). There will be no status message on this web page. Instead a new very concise page will be displayed to remind the operator that since the unit has rebooted the connection will need to be re-established. After approximately one minute the connection should be re-established. The Sync2IP unit will have maintained the same IP address and configuration as was in Flash before the STORE FIRMWARE button was activated.

### **1.9.3 Firmware Options**

There are two firmware options for the Sync2IP product. IPSync\_03\_5.bin and IPSync\_03\_7.bin Release 03\_7.bin has additional entry fields that allow local and remote box names, entry for serial interfaces installed to assist users to uniquely identify the unit.

## **2 CHAPTER – AC VOLTAGE INSTALLATION**

### **2.1 AC Voltage Selection**

It is *very* important to check that the unit is set to the correct voltage setting for your application before applying AC power. Located on the rear of the unit you will find a rotary 110/220 VAC switch. Using a coin or small screwdriver, *gently* turn the switch to the appropriate power position as required for your installation (110 or 220 VAC).

### **2.2 3.2 Voltage Selection Fuses**

Located on the back of the product you will find an IEC Power receptacle. This receptacle contains a fuse drawer. Two (2) fuses are located in this compartment. Little Fuse Part #: 0.160ma = 218.160 for 110VAC or 0.080ma = 218.080 for 220VAC Shurter, Inc. Part #: 0.160ma = 034.3109 for 110VAC or 0.080ma = 034.3106 for 220VAC

### **2.3 3.3 Power Connection**

Before connecting the MSD-2 to an AC power source the top cover should be installed with the supplied #4-40 screws. AC power is supplied to the MSD-2 via the supplied power cord terminated by a grounded 3-prong plug. Select an appropriate location accessible to and within four to five feet of an AC outlet. The AC Power source **MUST** be grounded.

### **3 CHAPTER – DC VOLTAGE INSTALLATION**

#### **3.1 DC Voltage Installation**



#### **POWER/GROUND CONNECTION**

Before connecting the Sync2IP to a DC power source the top cover MUST be installed with the supplied #8-32 screws.

**1)** Connect your ground lead to the #8 stud located on the rear of the Sync2IP marked GND

The mating DC Power connector is ITT CANNON PT# MS3106E12S3SY CONNECTOR CIRCULAR STRAIGHT PLUG 02CT SOCKET

**2)** Connect the -28V NEGATIVE to the solder pin marked "B"

**3)** Connect the 28V RTN (return or +) wire to the solder pin marked "A"

#### **INPUT VOLTAGE**

The Sync2IP is designed to accept DC voltages of -18 to -36 VDC. Located on the back of the Sync2IP is ITT CANNON PT# MS3102E12S-3PY Circular Connector, MIL-DTL-5015 Series, Box Mount Receptacle, 2 Contacts, Solder Pin, Threaded.

## VOLTAGE FUSES

The Sync2IP is designed with internal safety fuses for your protection. Located inside the product are two 315ma slow blow 5 x 20mm fuses. If the power LED is not illuminated, disconnect the input DC power source, remove the top cover and inspect the fuses. Spare fuses may be obtained by calling ECDATA.COM replacement fuse Part # 714003 or by calling: Shurter, Inc. Part # 034.3112

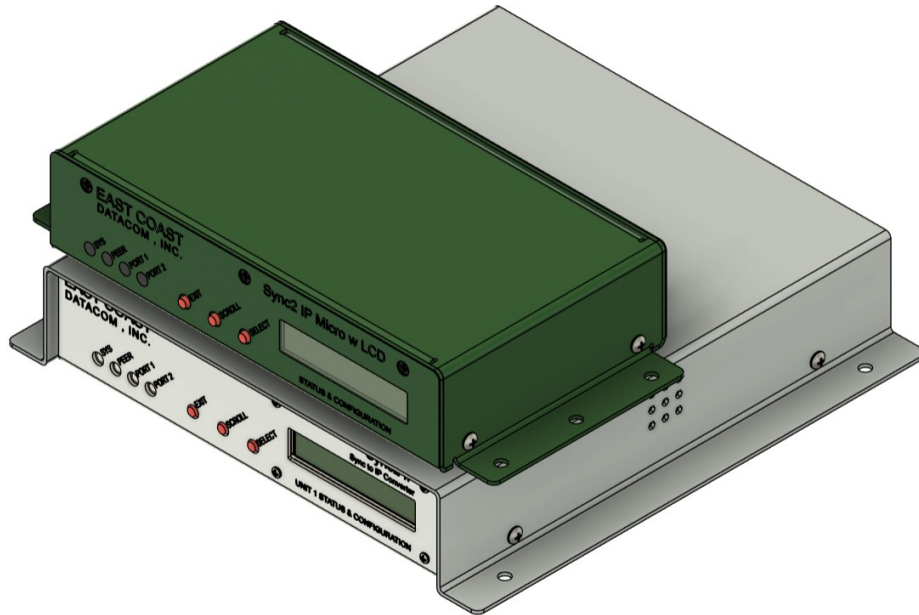


Figure 6 - 291000 & 277000 Size Compare

### **3.2 Serial Interface Card Swap or Replacement**

Certain models of the Sync2IP have removable serial interface cards. Such as RS-232, RS-530, V.35, X.21 on models 180000 and 180050. The cards may be DCE or DTE cards depending on the usage application. To remove, replace or change the serial interface cards, please follow the directions below.

- 1) Unplug power cord and all cables that are attached to the East Coast Sync2IP.
- 2) Remove the four Philips head screws that hold the top cover secure with a Phillips screwdriver.
- 3) Remove the top cover.
- 4) Remove the two captive screws on each side of the Port 2 cover plate.
- 5) Install the new interface modules **being careful to connect the 34 pin headers to match up with the socket**. Reinstall screws on either side of 232 DCE modules
- 6) Re-install cover.

## 4 Appendix

### 4.1 Specifications

#### Application

Serial to TCP/IP protocol adapter, to send a full duplex serial data stream over a UDP/IP stream

#### Capacity

Up to two Serial Sync or Async Ports converted to one 10/100 Base-T LAN Port

#### Interface

Serial: Async or Sync  
LAN: 10/100 Base-T, RJ-45

#### Data Rates

Serial Data: 1200 bps to 64 Kbps for simultaneous two-port operation, and up to 128 Kbps for single-port operation  
LAN: 10/100Mbps

#### Data Format

Data transparent at all data rates

#### Configuration

Browser Interface or Front Panel LCD and push buttons

#### User Configuration

Stored in Flash memory

#### Firmware Upgrades

Upgraded via 10/100 LAN Port

#### Indicators

System: Green or Yellow  
Peer: Green or Yellow  
Port 1: Green or Yellow  
Port 2: Green or Yellow  
Link: Green, Activity: Yellow

#### Power Source

*AC Power Option:* 90-120 to 200-240VAC, 50/60Hz, external 110/220 volt select switch, IEC Power Inlet

*DC Power Opt.* Voltage, Input -18 to -72 VDC

#### Environmental

Lead Free: RoHS Compliant Operating Temp: 32° to 122° F (0° to 50° C) Relative Humidity: 5 to 95% Non-Condensing Altitude: 0 to 10,000 feet

#### MTBF – Telcordia Issue 1

AC Powered: 371,246 hours  
DC Powered: 330,734 hours

#### Dimensions

CONSULT FACTORY

#### Weight

4 pounds (1.82 Kg)

#### Warranty

Three Years, Return To Factory

#### Ordering Information:

PT# 180000  
Model: Sync2IP\_2  
Desc: 2-Port Chassis, Sync / Async to 1-Port LAN Adapter

PT# 180050  
Model: Sync2IP\_4  
Desc: 4-Port Chassis, Sync / Async to 2-Port LAN Adapter

PT# 277000  
Model: Sync2IP MINI (Industrial Temp)  
Desc: 2-Port Chassis, Sync / Async to 1-Port LAN Adapter, DC Power, RS-232 DTE Ports

PT# 291000  
Model: Sync2IP MICRO (Industrial Temp)  
Desc: 2-Port Chassis, Sync / Async to 1-Port LAN Adapter, DC Power, RS-232 DTE Ports

#### Serial Interface Options(Up to 4-per chassis)

Part #	Model
129014	RS-232 DCE I/F Module
129032	RS-232 DTE I/F Module
129010	V.35 DCE I/F Module
129028	V.35 DTE I/F Module
129011	RS-530 DCE I/F Module
129029	RS-530 DTE I/F Module
129012	RS-422 DCE I/F Module
129030	RS-422 DTE I/F Module

**CONTACT:** [support\(at\)ecdata.com](mailto:support(at)ecdata.com)

**Web Site:** [www.ecdata.com](http://www.ecdata.com)